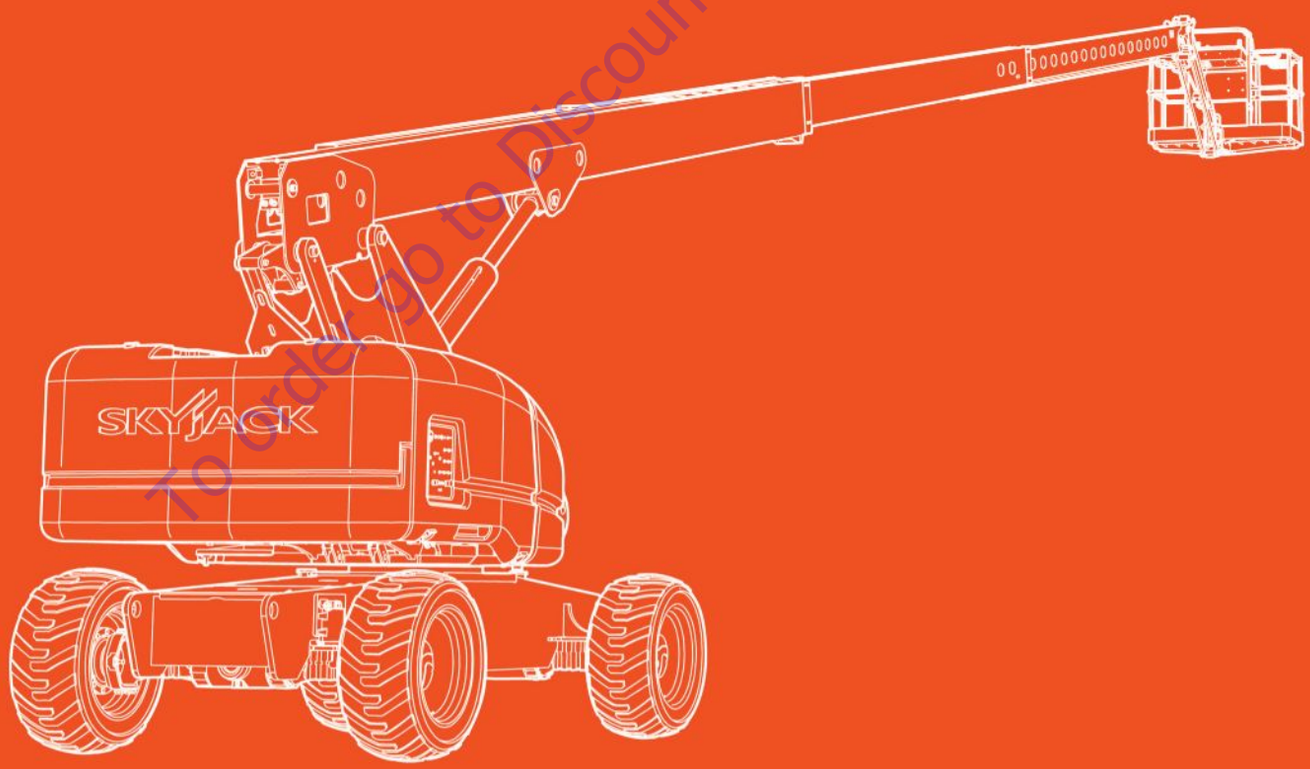
SKYJACK

SERVICE MANUAL

SJ82 T, SJ86 T

TELESCOPIC BOOMS



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August 2020
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This manual is for MEWPs with serial numbers:

SJ82 T: A402 000 001 - A402 999 999
SJ86 T: A402 000 001 - A402 999 999

THIS SAFETY ALERT SYMBOL MEANS ATTENTION!

BECOME ALERT! YOUR SAFETY IS INVOLVED.

The Safety Alert Symbol identifies important safety messages on MEWPs, 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.

⚠ 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 MEWP.

Table of Contents

Section 1 – Scheduled Maintenance

1.1 Read and Heed

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

1.1-1 Aerial Platform and Mobile Elevating Work Platform Definition

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

1.1-2 Purpose of Equipment

The SKYJACK Telescopic Boom Series MEWPS are designed to transport and raise personnel, tools and materials to overhead work areas.

1.1-3 Use of Equipment

The MEWP is a highly maneuverable, mobile work station. Work platform elevation and elevated driving must only be done on a firm, level surface.

1.1-4 Manual

Operating Manual: 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.

1.1-5 Service Policy and Warranty

SKYJACK warrants each new product to be free of defective parts and workmanship for the first 2 years or 3000 hours, whichever occurs first. Any defective part will be replaced or repaired by your local SKYJACK dealer at no charge for parts or labor. In addition, all products have a 5 year structural warranty. Contact the SKYJACK Service Department for warranty statement extensions or exclusions.

1.1-6 Operator Safety Reminders, Warnings and Precautions

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

1.2 Maintenance and Service

1.2-1 Maintenance and Inspection Schedule

The actual operating environment of the work platform governs the use of the maintenance schedule. The inspection points covered in 1.5 Pre-Delivery/ Maintenance Inspection Checklist indicates the areas of the MEWP to be maintained or inspected and at what intervals the maintenance and inspections are to be performed.

1.2-2 Owner's Annual Inspection Record

It is the responsibility of the owner to arrange quarterly and annual inspections of the MEWP. 1.4 Owner's Annual Inspection Record 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.

1.2-3 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 MEWP 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 MEWP.

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.

1.2-4 Maintenance and Service Safety Tips

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

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

Anyone operating or servicing this MEWP 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.

Ensure personnel are clear from under unsupported components/systems that are at risk of movement during maintenance.

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, disconnect the main power conenctors.

Keep personnel clear of components, systems or unsupported loads that may move unexpectedly during maintenance procedures.

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

1.2-5 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 preotection 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.

1.2-6 Hydraulic 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.

1.2-7 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.

1.3 Scheduled Maintenance

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.

1.3-1 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 MEWP.

1.3-2 Maintenance and Inspection

Death or injury can result if the MEWP 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 MEWP.

⚠ 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 MEWP in the following configuration:
  - MEWP parked on a flat and level surface
  - Disconnect the batteries by disconnecting the main power connectors.
- Repair any damaged or malfunction components before operating MEWP.
- Keep records on all inspections.

1.3-3 Maintenance Instructions

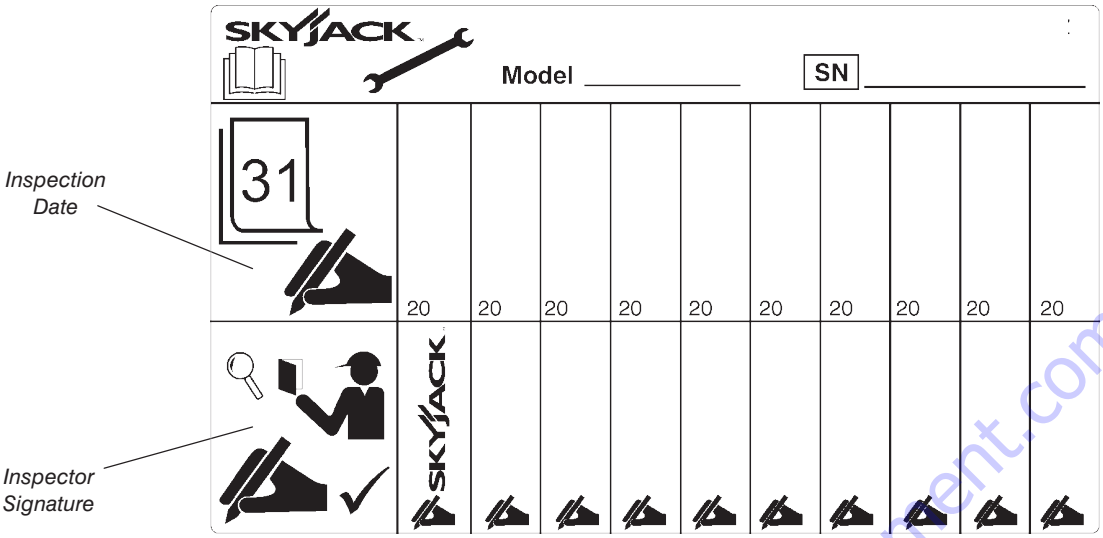
This manual consists of four schedules to be done for maintaining on an MEWP. Inspection schedule frequency is shown below:

Issue or Symptom		
PDI/Frequent	**B**	Perform PDI prior to each delivery, or Frequent Inspection every 200 days or 200 hours.
Annual	**B + C**	Perform Scheduled Maintenance Inspections every year.
Additional	*	Perform at time sensitive maintenance intervals.

- Make copies of the maintenance and inspection checklist to be used for each inspection.
- Check the schedule on the checklist for the type of inspection to be performed.
- Place a check in the appropriate box after each inspection procedure is completed.
- Use the maintenance and inspection checklist and step-by-step procedures in Section 1 to perform these inspections.
- If any inspection receives a fail, tag and remove the MEWP from service.
- If any MEWP component(s) has been repaired, an inspection must be performed again before removing the tag. Place a check in the repair column.

Legend	
Pass	**P**
Fail	**F**
Repaired	**R**
Not applicable	**N/A**

Table 1.4 Owner's Annual Inspection Record



⚠ WARNING

Do not use the MEWP if there is no inspection recorded in the last 13 months. If you do not obey, there is a risk of death or serious injury.

IMPORTANT

The Owner's annual inspection record is located on the scissor assembly. It must be filled out after an annual inspection has been completed. Do not use the MEWP if an inspection has not been recorded in the last 13 months.

1.5 Pre-Delivery/Maintenance Inspection Checklist

Frequent/Periodic/Annual/PDI Checklist

Articulating Booms and Telescopic Booms

Serial Number: Starting with serial number A000 000 000 or B000 000 000 and above

Product Owner:

Product User:

Model:

Date/Time:

Hourmeter Reading:

Inspection Type (Choose one): ☐ Pre-delivery ☐ Frequent ☐ Periodic ☐ Annual

Use this table for pre-delivery inspections (PDI) before each rental, lease or sale and as an instruction for all frequent inspections and annual inspections. Refer to the operation and service manuals for inspection instructions (for example, visual inspection and function tests, torque specs, engine oil, chain inspection intervals, and more).

Inspection Type Schedule	
PDI/Frequent/Periodic	B
Annual	B+C

B - Do the pre-delivery inspection before the machine is sent out or during the frequent inspections at 200 days or 200 hour intervals. For more instructions, refer to the operation and service manuals.

C - Do the scheduled maintenance Inspections each year. For more instructions, refer to the service manual.

P - Pass
N/A - Not Applicable

Put a check mark in the "Pass" column as you meet the requirements of the inspection for each item. Add a comment if the item does not pass inspection.

Items for Inspection		P	N/A
Service Bulletins. Make sure there are no open service bulletins.	B		
Annual Inspection. Make sure you complete it within 13 months.	B		
Labels. In place, correctly attached and you can read them.	B		
Limit Switches. Correctly installed and no obstructions or damage.	B		
ENGINE COMPARTMENT			
Main Power Disconnect Switch. Cables and switch tight and in working order.	B		
Battery. No damage, tight connections and sufficient fluid levels. Clean terminals and cable ends.	B		
Swing Drive. Tight fittings, hoses and bolts. No damage, missing components or leaks.	B		
Hydraulic Pump and Motor. Tight fittings, hoses and bolts. No damage, missing components or leaks.	B		
Engine and Components. Do a check of the engine and components for any loose, missing, damaged, or failed items. Do a check of the oil and coolant levels. Make sure you do not exceed the recommended oil and coolant change intervals.	B		
Air Filter. Do a check of the filter. Replace the air filter if necessary.	C		
Fuel Filter. Do a check of the filter. Replace the fuel filter if necessary.	C		
Radiator. Do a check of the coolant condition and replace if necessary.	C		
CONTROL COMPARTMENT			
Turret Transportation Lock. Unlocked and no damage or missing components.	B		
Base Control Console. Operate the switches and make sure they all operate correctly. No damage or missing components.	B		
Hydraulic Tank. Filler cap closed tightly and no damage or leaks.	B		
Hydraulic Oil. Level between min. and max. marks.	B		
Hydraulic Oil. Do a check and replace oil and filters if necessary.	C		
Hydraulic Return Filter. Correctly attached and no damage, missing components or leaks.	B		
Hydraulic Return Filter. Do a check of the filter. Replace the filter if necessary.	C		
Manifolds. Tight fittings and hoses and no damage or leaks. Tight wire connections, no missing components and correctly working valves.	B		
High-pressure Filter. Do a check of the filter. Replace the filter if necessary.			
Emergency Power Unit. Tight fittings and hoses. No leaks. Tight wire connections and no damage or missing components.	B		
Fuel Tank and Lines. Filler cap, tank, fittings and hoses are closed tightly and no damage or leaks.	B		
BASE			
Base Weldment. No deformation or cracks.	B		
Rotary Manifold. Tight fittings and hoses, and no leaks.	B		
Turret Rotation Motor/Gear. Tight fittings, hoses and bolts. No damage, missing components or leaks. Make sure the gears are lubricated.	B		
Turret Rotation Motor/Gear. Lubricate the gears.	C		

Items for Inspection		P	N/A
Axles. Correctly attached and no missing components. Tight fittings and hoses and no leaks.	B		
Axles. Do a check of the brakes.	C		
Oscillating Cylinders. Correctly attached and no missing components. Tight fittings and hoses and no leaks.	B		
Oscillating Cylinders. Correctly attached and no missing components. Tight fittings and hoses and no leaks. Do a check of the mounting bolts torque seal.	C		
Steer Cylinder. Correctly attached and no missing components. Tight fittings and hoses and no leaks.	B		
Steer Linkage. No damage/wear or missing components.	B		
Wheel/Tire Assembly. Do a check of all tires for damage, wear and correctly aligned.	B		
Wheel/Tire Assembly. No loose bolts. Wheel nuts torqued as recommended.	C		
PLATFORM			
Railings and Gates. Correctly attached and no damage or missing components.	B		
Platform Floor. Correctly attached and no damage or missing components.	B		
Footswitch. Correctly attached. Operates correctly with no modifications.	B		
Fall-Protection Anchorage. Anchorages are correctly attached and no damage.	B		
AC Power Socket. No obstructions, dirt, or damage.	B		
Platform Control Console. Operate the switches and make sure they all operate correctly. No damage or missing components.	B		
Manual Storage Box. Manuals and documents are in the storage the box, in good condition, and you can read them.	B		
BOOM			
Rotary Actuator. No damage or missing components. Tight fittings, hoses and bolts and no leaks.	B		
Jib. No damage or missing components. Tight hoses and bolts and no leaks.	B		
Boom. No damage or missing components. No deformation or cracks in welds. Tight fittings, hoses, bolts, and pins. No leaks.	B		
Cable Track. No damage or missing components.	B		
Wear Pads. No damage, wear or missing components. Fasteners tight.	B		
Riser. No damage or missing components. No deformation or cracks in welds. Tight fittings, hoses, bolts, and pins. No leaks.	B		
Cylinders. No damage or missing components. Tight fittings and hoses and no leaks. Pins and bushing are tight and correctly installed.	B		
Control Cables and Hoses. No damage or missing components. No leaks.	B		
Wire Ropes. No damage or missing components. Tight jam nuts. No spring gaps. Do not exceed the inspection interval.	B		
OPTIONAL EQUIPMENT			
Special Options and Approved Attachments. Correctly attached and no damage or missing components.	B		
Function Tests. Refer to the operating manual for your serial number for information on how to run these tests.			PASS / FAIL

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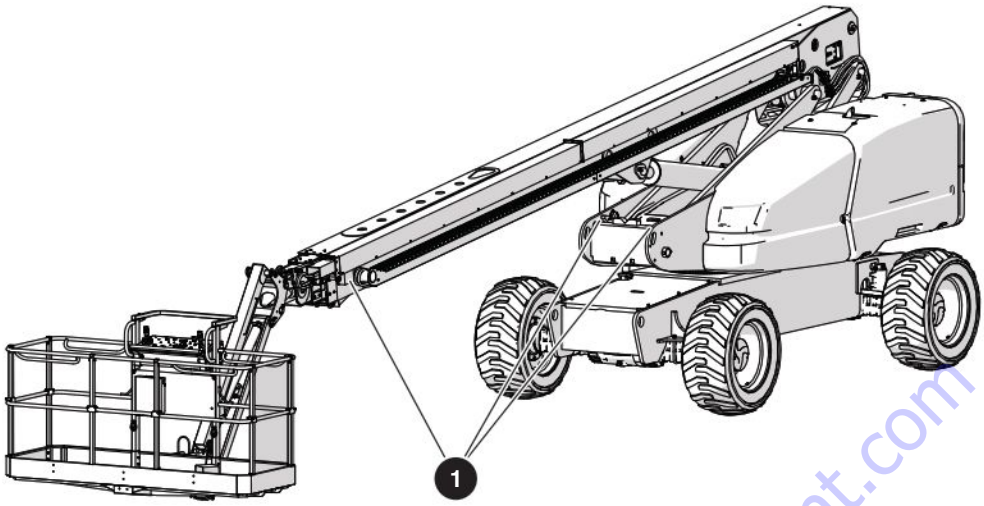
Comments:

The undersigned has made sure that all areas in the list have received an inspection.
The undersigned has told the machine owner of all inconsistencies in the inspection and corrected them before machine operation.

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

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



1.6 Scheduled Maintenance Inspections

Do an inspection of the MEWP in this sequence.

⚠ WARNING

Do not operate a MEWP until all malfunctions have been corrected. If you do not obey, there is a risk of death or serious injury.

⚠ WARNING

Turn the main power disconnect switch to the off position before you do the visual and daily maintenance inspections. If you do not obey, there is a risk of death or serious injury.

1.6-1 Electrical

Do a check on these areas for chafed, corroded, and loose wires:

- Boom to platform cable harness
- Engine compartment electrical panel
- Engine wiring harness
- Rotary manifold wiring

1.6-2 Hydraulic

Do a check on these areas and make sure there are no signs of leakage:

- Hydraulic tank filter, fittings, hoses, emergency-power unit, turret and base surfaces
- Engine compartment fittings, hoses, primary pump, filter, turret and base surface
- All hydraulic cylinders
- All hydraulic manifolds
- The ground area below the MEWP.

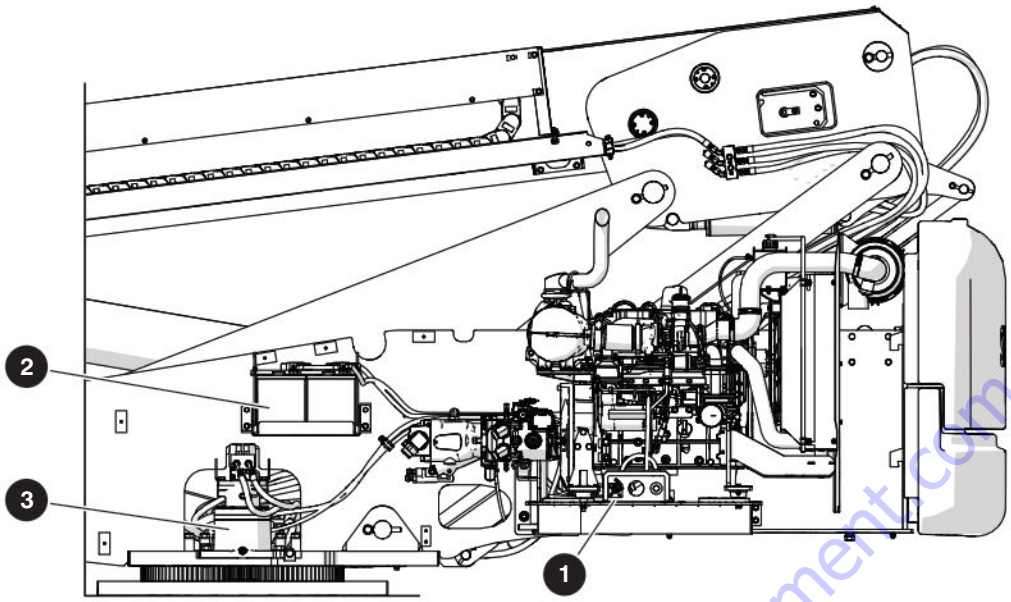
1.6-3 Labels (B)

Refer to the labels section in the Operating Manual. Make sure all the labels are in the correct location, are in good condition, and you can read them.

1.6-4 Limit switches (B)

Do an inspection of all limit switches ❶ located inside the turret and on the boom. Inspect for the following:

- Broken or missing actuator arms
- Missing fasteners
- Loose wiring.



1.6-5 Engine Compartment

Do the inspection that follows:

Make sure all compartment latches are latched tightly and in good condition.

1 Main power disconnect switch (B)

- Turn the **main power disconnect** switch to the off position.
- Make sure the switch rotates and stays in the on and off position.
- Make sure the cables are not loose.

2 Batteries (B)

⚠ WARNING

Explosion hazard. Keep flames and sparks away. Do not smoke near the batteries. If you do not obey, there is a risk of death or serious injury.

⚠ WARNING

Corrosion hazard. Do not touch battery acid. Wear the correct PPE. If the battery acid touches you, immediately flush the area with cold water and get medical aid.

B - Frequent Inspection

1. Do an inspection of the battery case for damage.
   - Clean the battery terminals and cable ends thoroughly with a terminal cleaning tool or wire brush.
2. Make sure all the battery connections are tight.
3. If applicable, check the battery fluid level.
   - If the plates do not have a minimum 13 mm (1/2 inch) of solution above them, add distilled or demineralized water.
   - Replace the battery if it is damaged or cannot hold a lasting charge.

⚠ WARNING

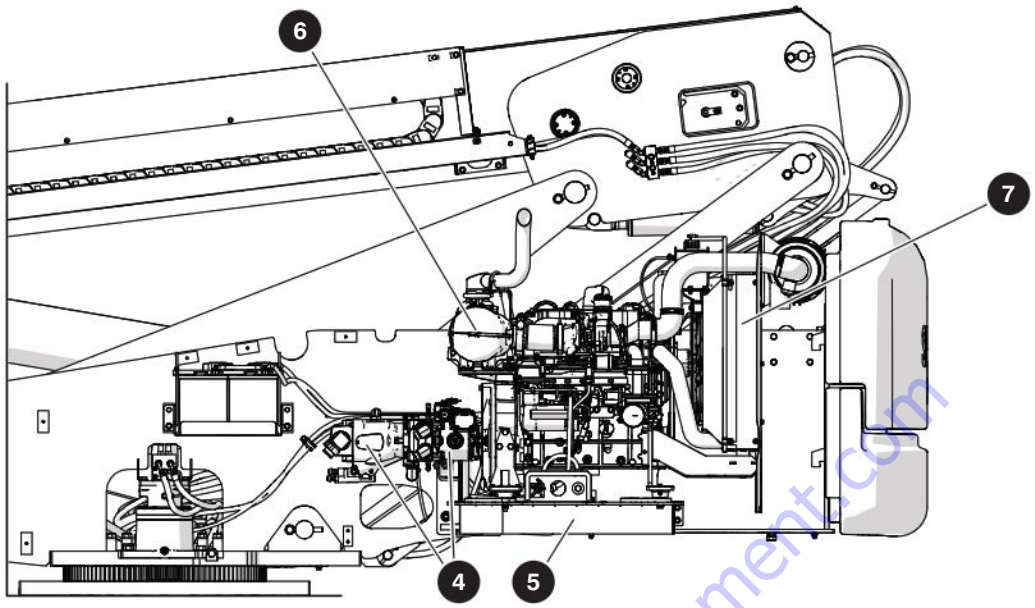
Only use original or manufacturer-approved parts and components for the MEWP. If you do not obey, there is a risk of death, serious injury, or machine damage.

3 Swing drive motor (B,C)

- Make sure there are no loose or missing parts.
- Make sure there is no visible damage.
- Make sure all bolts are correctly tightened.
- Make sure all fittings and hoses are correctly tightened and there are no hydraulic leaks.

C - Annual Inspection

- For the brake/motor oil replacement procedure, refer to 5.5-3 Check the Swing Drive Oil.



4 Hydraulic pump and motor (B)

- Make sure there are no loose or missing parts.
- Make sure there is no visible damage.
- Make sure all bolts are correctly tightened.
- Make sure all fittings and hoses are correctly tightened and there are no hydraulic leaks.

Engine and Components

5 Engine pivot tray (B)

- Make sure there are no loose or missing parts.
- Make sure there is no visible damage.
- Make sure that the engine is correctly attached to the pivot tray.
- Make sure the tray-securing bolt is in place.

6 Muffler and exhaust (B)

- Make sure that the muffler and exhaust systems are correctly attached with no visible damage.

Engine fuel leaks (B,C)

- Make sure that there no fuel leaks at the engine.
- Make sure there is no visible damage.

⚠ WARNING

Explosion or fire hazard. Do not smoke near the fuel system. If you do not obey, there is a risk of death or serious injury.

Engine fuel filter (B,C)

- Make sure there are no loose or missing parts.
- Make sure there is no visible damage.

C - Annual Inspection

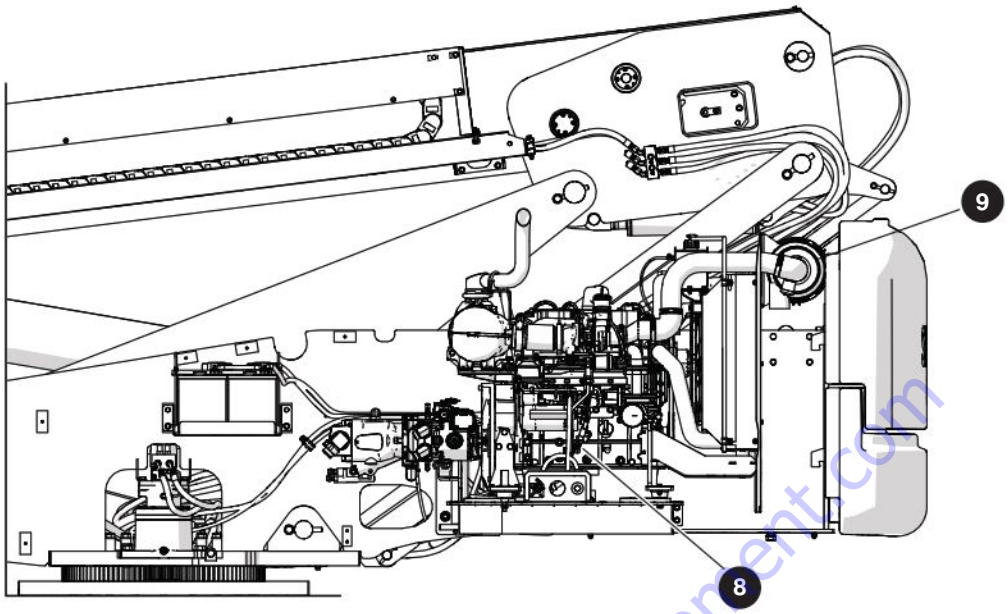
- For the engine fuel filter replacement procedure, refer to the engine manual.

7 Radiator (B, C)

- Make sure there are no loose or missing parts.
- Make sure there is no visible damage.
- Make sure that the radiator is correctly attached to the engine tray.
- Check the coolant level and add more if necessary.

C - Annual Inspection

- Check the coolant strength. For recommended coolant change intervals, refer to the engine manual.



8 Engine oil level (B)

⚠ WARNING

Burn hazard. Do not touch hot engine components without the correct PPE. Let the engine cool before you do an inspection or servicing. If you do not obey, there is a risk of death or serious injury.

- Use the dipstick to check the oil level.
- The oil level must be between the marks L (low) and H (high). Add oil if it is necessary. Refer to 2.13 Engine Specifications for recommended oil types.

B - Frequent Inspection

- For recommended oil change, refer to engine manual

B - Frequent Inspection

- For the recommended oil change interval and procedure, refer to the engine manual.

9 Air filter (B,C)

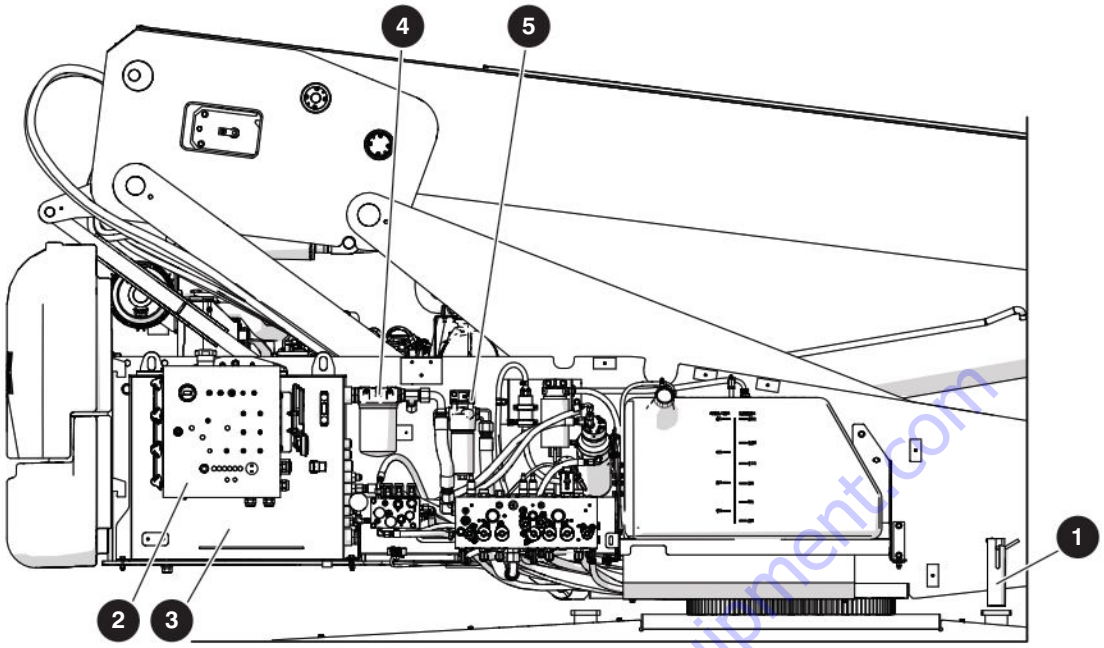
- Make sure there are no loose or missing parts.
- Make sure there is no visible damage.
- Squeeze the lips of the vacuator valve to remove the dirt and dust.
- Do an inspection of the service indicator on the air cleaner. Replace the filter element if necessary.

B - Frequent Inspection

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

C - Annual Inspection

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



1.6-6 Control Compartment

Do the inspection that follows:

Make sure all compartment latches are latched tightly and in good condition.

1 Turret transportation lock (B)

- Make sure the turret transportation lock is unlocked.
- Make sure there are no loose or missing parts.
- Make sure there is no visible damage

2 Base Control Console (B)

- Make sure there are no loose or missing parts.
- Make sure there is no visible damage, and all the switches are in their off/neutral positions.

3 Hydraulic Tank (B)

- Make sure the hydraulic filler cap closes tightly.
- Make sure there is no visible damage or hydraulic leaks.

Hydraulic Oil (B, C)

- Make sure the boom is in the stowed position.
- Do a check on the **gauge** on the side of the hydraulic oil tank. The hydraulic oil level must be at or a small distance above the top mark of the gauge. Add oil if it is necessary. Refer to 2.10 Hydraulic Specifications & Gear Oil.

C - Annual Inspection

- For hydraulic oil replacement procedure, refer to 5.7-2 Change the Hydraulic Oil.

4 Hydraulic Return Filter (B,C)

- Make sure the filter element is attached and tight.
- Make sure there is no visible damage or hydraulic leaks.

C - Annual Inspection

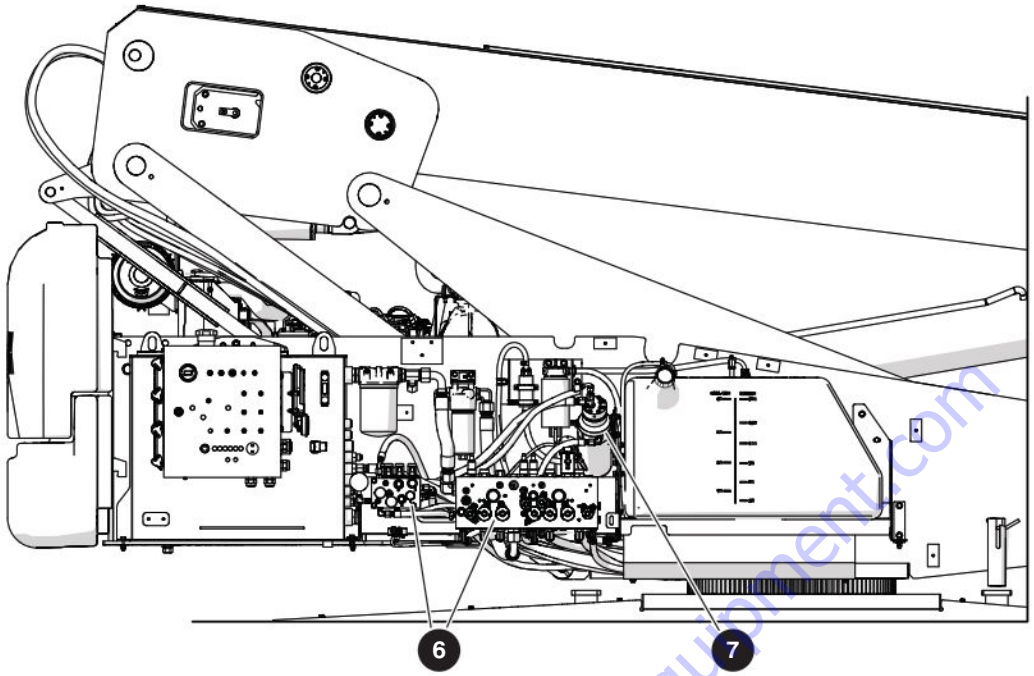
- For the hydraulic tank filter replacement procedure, refer to 5.7-1 Change the Hydraulic Tank Filter.

5 High-pressure filter (B,C)

- Make sure the housing is attached and tight.
- Make sure there is no visible damage or hydraulic leaks.

C - Annual Inspection

- For the filter element replacement procedure, refer to 5.5-1 Check and Replace the High Pressure Filter.



6 Manifolds (B)

- Make sure all fittings and hoses are correctly tightened.
- Make sure there is no indication of hydraulic leakage.
- Make sure there are no loose wires or missing fasteners.

7 Emergency Power Unit (B)

- Make sure there are no loose or missing parts.
- Make sure there are no loose wires or missing fasteners.
- Make sure there is no visible damage.
- Make sure all the fittings and hoses are correctly tightened and there are no hydraulic leaks.

8 Fuel Tank and Lines (B)

IMPORTANT

Before you use the MEWP, make sure there is sufficient fuel for the estimated task.

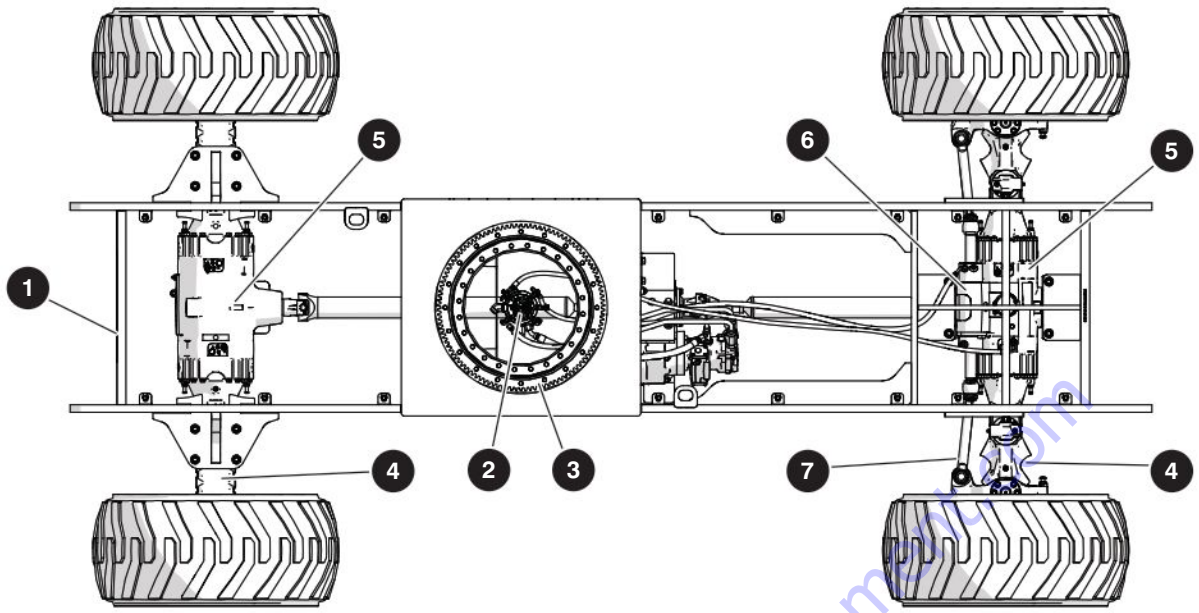
⚠ DANGER

Explosion or fire hazard. Do not smoke near the fuel system. If you do not obey, there is a risk of death or serious injury.

- Make sure that the fuel filler cap closes tightly.
- Make sure there is no visible damage to the tank, gauge, hoses, or fittings.
- Make sure there is no indication of fuel leakage from the tank, gauge, hoses, fittings, pump, and filter.

⚠ WARNING

Environmental hazard. Immediately remove gasoline, diesel fuel, engine oil, and hydraulic fluid spills and leaks with rags. Discard these rags in accordance with national, state/provincial/territorial, and local regulations. Spilled fluids can damage the environment. When spilled fluids go into the water (for example, a sewage system, streams, rivers, or other surface water), they can kill aquatic life.



1.6-7 Base

1 Base weldment (B)

- Make sure there are no visible cracks in welds or structure and there are no signs of deformation.

3 Rotary manifold (B)

- Make sure all hoses are correctly tightened and there is no sign of hydraulic leakage.

3 Turret rotation gear (B,C)

- Make sure there are no loose or missing parts.
- Make sure there is no visible damage.

C - Annual Inspection

- For the lube procedure, refer to 5.10 Grease Points.

4 Axles (B,C)

- Make sure the front and rear axles are correctly attached.
- Make sure there are no loose or missing parts.
- Make sure all the fittings and hose connections are tight.
- Make sure there is no sign of hydraulic leakage.

C - Annual Inspection

- Check the brakes annually. Refer to the procedure 5.9-6 Brake Inspection.

5 Brakes (B)

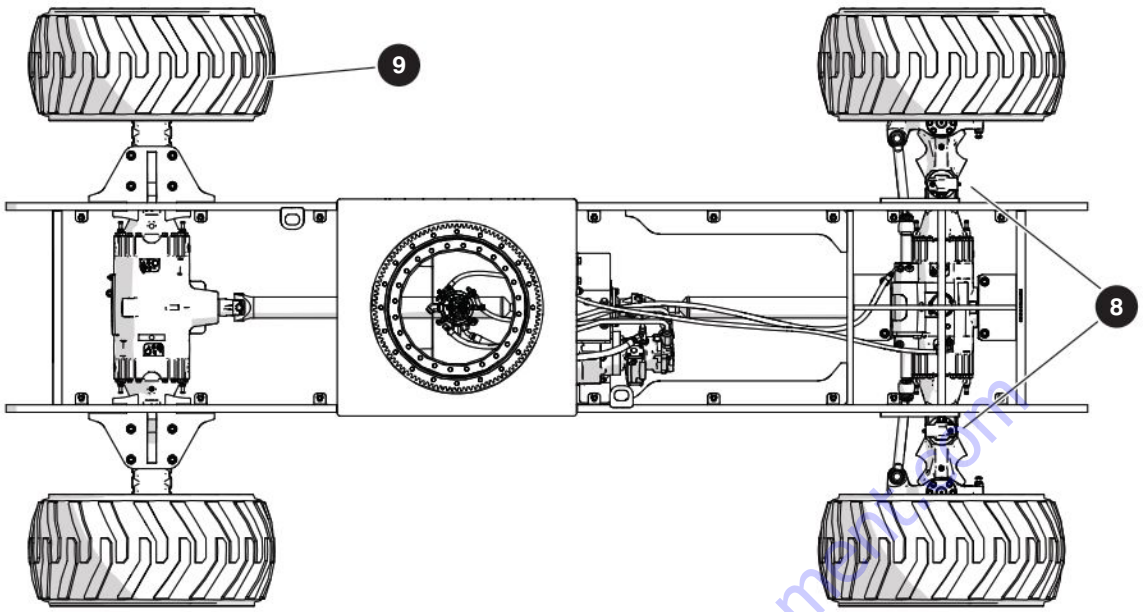
- Make sure there are no loose or missing parts.
- Make sure all the fittings and hoses are correctly tightened and there are no hydraulic leaks.

6 Steer cylinder (B)

- Make sure there are no loose or missing parts.
- Make sure all the fittings and hoses are correctly tightened and there are no hydraulic leaks.

7 Steer linkage (B)

- Make sure there are no loose or missing parts.
- Make sure the tie rod end studs are locked and there is no visible damage.



8 Oscillating cylinders (B,C)

- Make sure the oscillating cylinders are correctly attached, and there are no visible spaces.
- Make sure there are no loose or missing parts.
- Make sure all the fittings and hose connections are tight.
- Make sure there is no sign of hydraulic leakage.
- Do a check of the heads of the oscillating cylinder mounting bolts to make sure the torque seal is visible and undamaged. If the torque seal is damaged or is missing, remove and replace the affected bolts. Refer to 5.9-7 Oscillating Cylinder Bolt Replacement.

NOTE

The oscillating axle is locked when the MEWP is in the elevated travel position or at the elevated travel speed. Refer to 2.14 Axle Oscillation Diagrams.

9 Wheel/tires (B,C)

- Do a check on all tire treads and sidewalls for cuts, cracks, holes, and unusual wear.
- Do a check on each wheel for damage, and cracked welds.
- Do a check on each lug nut for the correct torque to make sure they are not loose.
- Make sure the wheels are correctly aligned vertically and horizontally.
- Make sure there are no loose or missing parts.
- Make sure there is no visible damage.

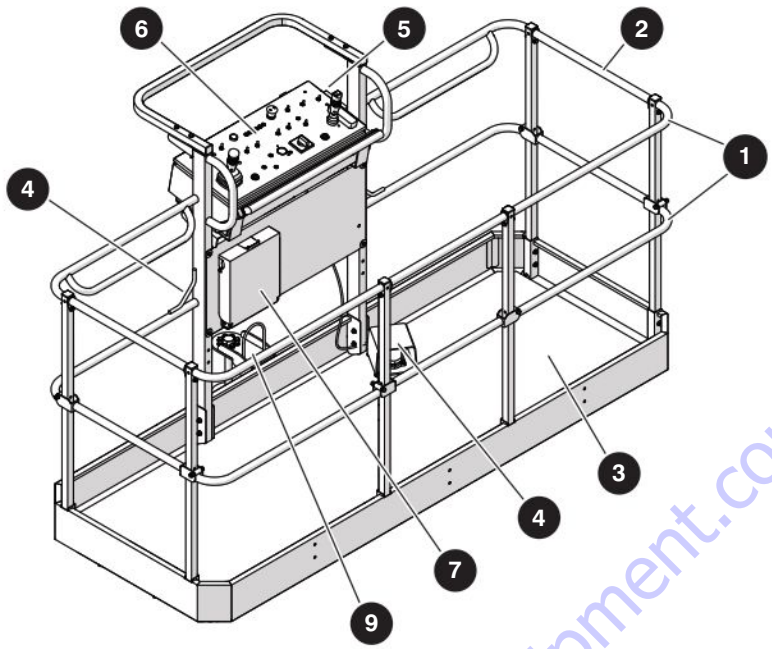
B - Frequent Inspection

- For proper torque information, refer to 2.2 MEWP Torque Specifications.

WARNING

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

Refer to 2.8 Tire Specifications.



1.6-8 Platform Assembly

1 2 Railings and gates

- Make sure there are no loose or missing parts, and there is no visible damage.
- Make sure the fasteners are correctly installed.
- Make sure the platform railings 1 are in the correct position.
- Make sure the gates or drop bars 2 are in good condition and operate correctly.

3 MEWP floor

- Make sure the MEWP floor is solid and there is no visible damage.

4 Footswitch

- Make sure the footswitch is in good working order and has not been tampered with, disabled or blocked.

5 Fall-protection anchorages

- Make sure that the fall-protection anchorages are correctly installed.
- Make sure there is no visible damage.

6 AC power socket

- Make sure that the socket is free of dirt or blockages.

7 Platform control console (B)

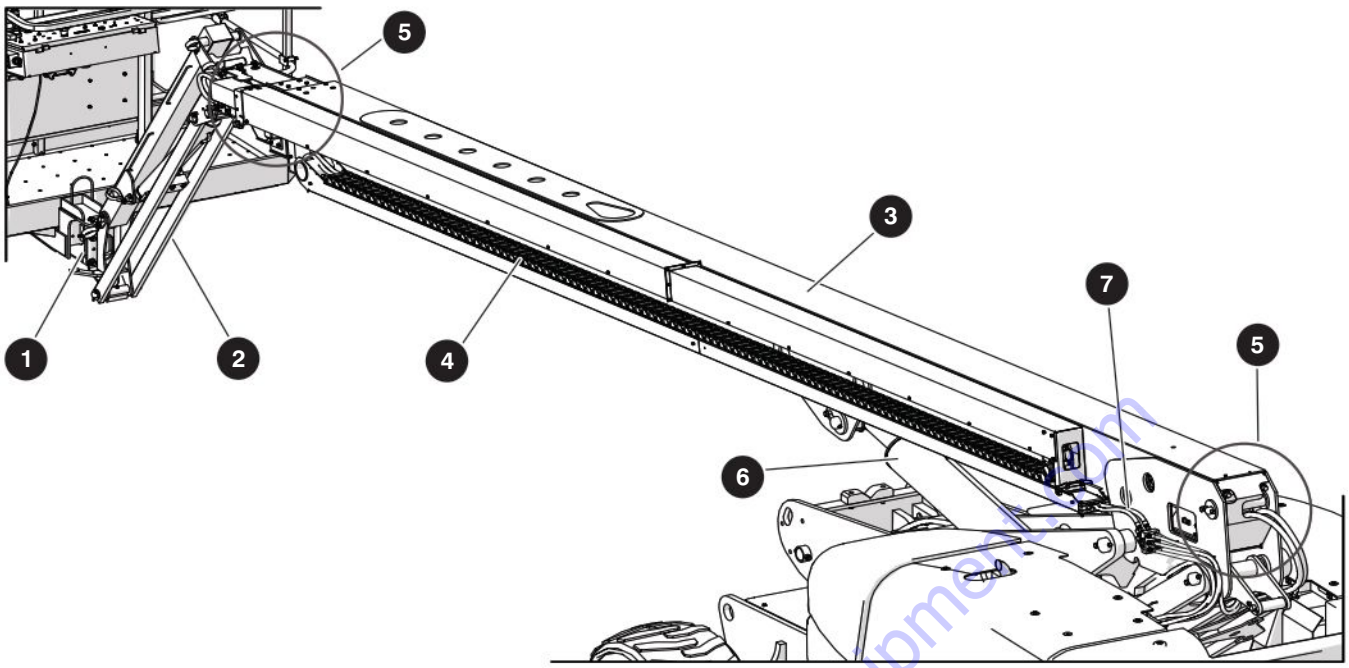
- Make sure all switches and controllers are in the neutral position.
- Make sure there are no loose or missing parts, and there is no visible damage.

8 Manual storage box (B)

- Make sure that the operation manual and other important documents are in the manual storage box.
- Make sure that the documents are in good condition, and you can read them.
- Always put the manuals and other documents back in the storage box after use.

9 Load Cell - CE & AS (B)

- Make sure there are no loose or missing parts, and there is no visible damage.
- Make sure the fasteners are correctly installed.
- Make sure the cables are in good condition.
- Make sure the cable connections are tight.
- Make sure there is no debris lodged between the platform and the boom adaptor.



1.6-9 Boom Assembly

1 Rotary actuator

- There are no loose or missing parts, and there is no visible damage.
- All fasteners are correctly tightened.
- All hoses are correctly tightened and there is no sign of hydraulic leakage.

2 Jib (if equipped) (B)

- There are no loose or missing parts, and there is no visible damage.
- All fasteners are correctly tightened.
- All hoses are correctly tightened and there is no sign of hydraulic leakage.

3 Boom (B)

- There are no loose or missing parts, and there is no visible damage.
- All fasteners are correctly tightened.
- All hoses are correctly tightened and there is no sign of hydraulic leakage.
- Make sure there are no visible cracks in welds or structure and there are no signs of deformation.

4 Cable Track (B)

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

5 Wear Pads (B)

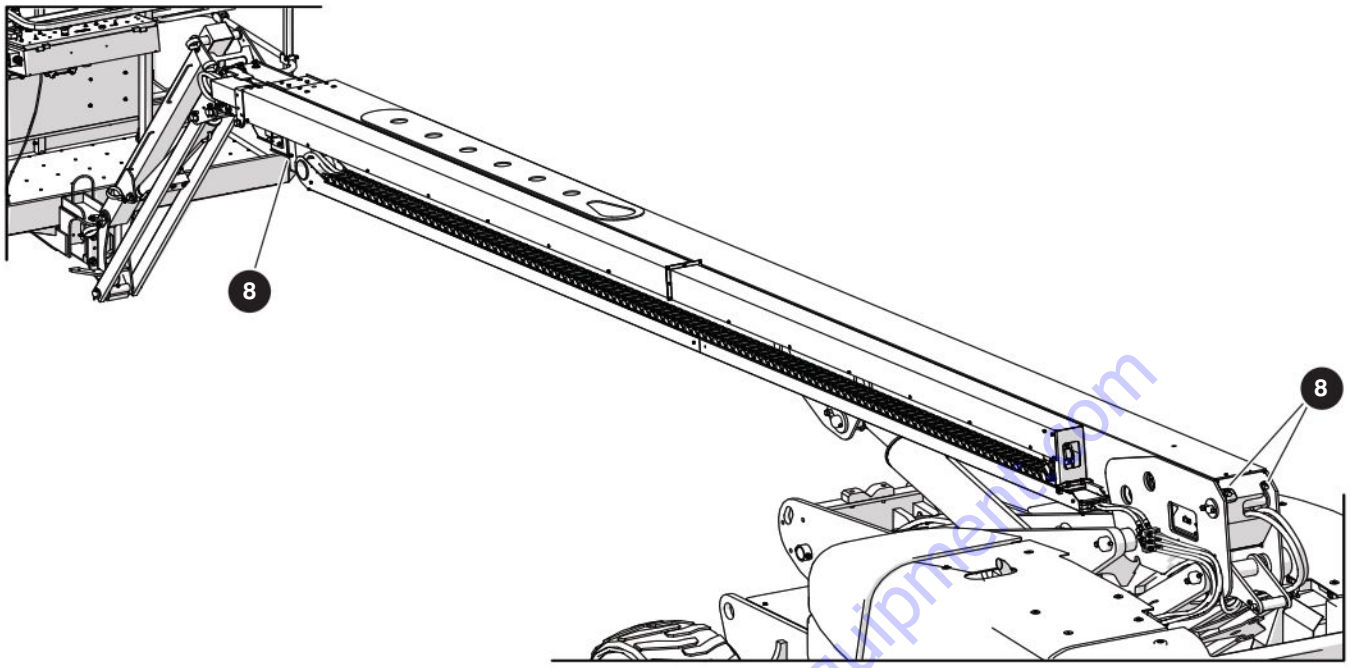
- All fasteners are correctly tightened.
- There are no loose or missing parts, and there is no visible damage to the wear pads.

6 Cylinders (B)

- Make sure the cylinders are correctly installed.
- Make sure there is no indication of leaks or damage.
- Make sure all pins and bushings are secure and properly tightened.

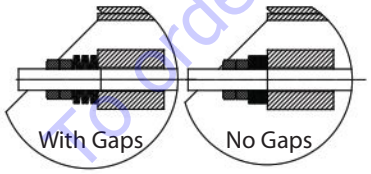
7 Control Cables and Hoses (B)

- There are no loose or missing parts, and there is no visible damage.
- All hoses are correctly tightened and there is no sign of hydraulic leakage.

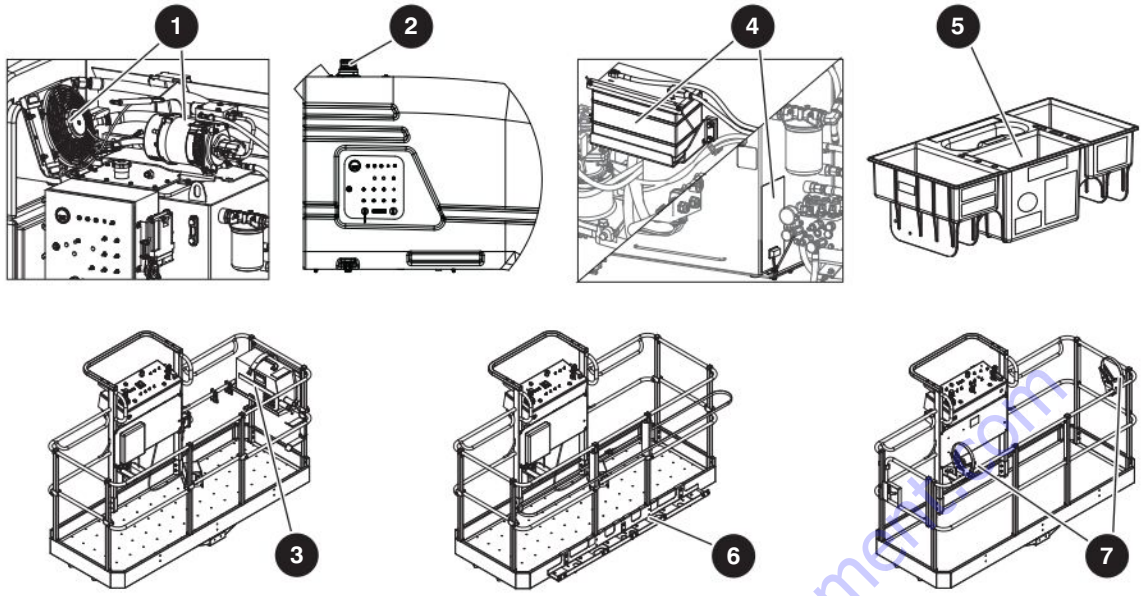


8 Wire ropes (B)

- There are no loose or missing parts, and there is no visible damage.
- All fasteners are correctly tightened.
- Make sure that the nuts are correctly tightened and are locked together.
- Make sure that there are no gaps between the springs. For the wire rope tension procedure, refer to 5.4-19 Proper Wire Rope Tension.



Cable Disc Springs



1.6-10 Optional equipment (B)

Do the inspection that follows, and make sure:

1 Generator

- There are no loose or missing parts, and there is no visible damage.
- All hoses are correctly tightened and there is no sign of hydraulic leakage.

2 Flashing amber light

- The lamp is correctly attached, and there is no visible damage.

3 Welder

- The welder and the welder tray are correctly attached.
- There are no loose or missing parts, and there is no visible damage.
- There are no loose wires or missing fasteners.

4 Cold or arctic weather package

- The heater plugs are correctly attached with no visible damage.
- There is no sign of engine oil leakage.

5 Tool tray

- The tray is correctly attached with lock-pins, and there is no visible damage.

6 Glazier

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

7 Pipe rack

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

1.7 Function Tests

Function tests are designed to discover any malfunctions before an 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.

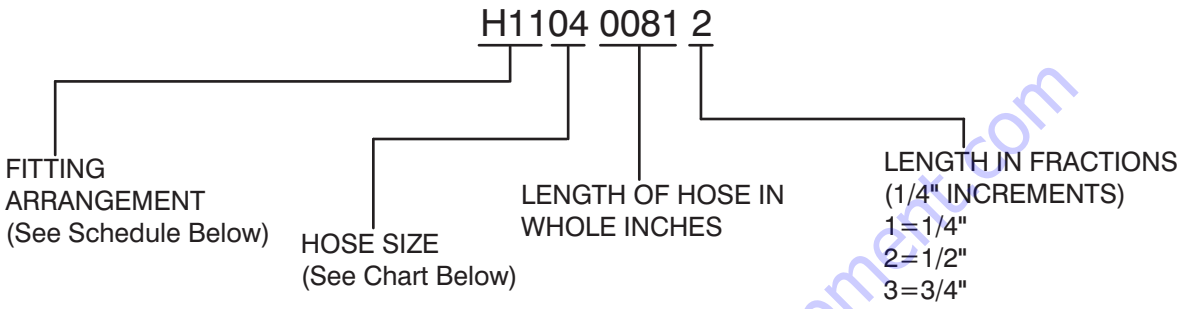
- After repairs are completed, the operator must perform a pre-operation inspection and a series of function tests again before putting aerial platform into service.
- Prior to performing function tests, be sure to read and understand the “Start Operation” section of the operating manual.
- For function tests that are to be performed, please refer to the operating manual that corresponds to the correct serial number. Found there will be detailed instructions for which tests to perform, as well as how to properly and successfully perform them.

NOTE

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

Section 2 – Maintenance Tables and Diagrams

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, and a medium length 90° JIC female swivel fitting for the other end. The hose must meet or exceed the S.A.E. 100R13 hose specification, and be a total of 81-1/2" long.

NOTE

Hose ends and hose must be from same manufacturer per S.A.E. J1273 Nov. '91, Sections 3.10 and 4.2. Hose ends and hose must be of the same size i.e. #4 size fittings must be used with #4 size hose.

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

Fitting Arrangement Schedule			
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

Hose Prefix	Hose End Fitting	Hose End Fitting	S.A.E. Hose Specification
H15	REUSABLE FEMALE, 37° JIC, SWIVEL	REUSABLE FEMALE, 37° JIC, SWIVEL	300 PSI
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
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
H57	SHORT 45°, FEMALE, SAE ORFS, SWIVEL	FEMALE, SAE ORFS, SWIVEL	100R13
H58	FEMALE, SAE ORFS, SWIVEL	FEMALE, SAE ORFS, SWIVEL	100R13
H59	MEDIUM 90°, FEMALE, SAE ORFS, SWIVEL	FEMALE, SAE ORFS, SWIVEL	100R13
H60	FEMALE, 37° JIC, SWIVEL	FEMALE, 37° JIC, SWIVEL	100R17
H61	FEMALE, 37° JIC, SWIVEL	FEMALE, 37° JIC, SWIVEL	100R16
H62	SHORT 90°, FEMALE, 37° JIC, SWIVEL	FEMALE, 37° JIC, SWIVEL	100R16
H63	MEDIUM 90°, FEMALE, 37° JIC, SWIVEL	FEMALE, 37° JIC, SWIVEL	100R16
H64	LONG 90°, FEMALE, 37° JIC, SWIVEL	FEMALE, 37° JIC, SWIVEL	100R16
H65	MEDIUM 67°, FEMALE, 37° JIC, SWIVEL	FEMALE, 37° JIC, SWIVEL	100R12
H66	FEMALE, 37° JIC, SWIVEL	NO FITTING	100R4
H67	FEMALE, 37° JIC, SWIVEL	FEMALE, 37° JIC, SWIVEL	100R19
H68	SHORT 45°, FEMALE, 37° JIC, SWIVEL	FEMALE, 37° JIC, SWIVEL	100R19
H69	MEDIUM 90°, FEMALE, 37° JIC, SWIVEL	FEMALE, 37° JIC, SWIVEL	100R19
H70	LONG 90°, FEMALE, 37° JIC, SWIVEL	FEMALE, 37° JIC, SWIVEL	100R19
H71	LONG 90°, FEMALE, SAE ORFS, SWIVEL	FEMALE, SAE ORFS, SWIVEL	100R15

Table 2.2 MEWP Torque Specifications

Location	Description	Torque (ft-lb)	Torque (Nm)
Base			
Trunnion Mount	BOLT, Hex head (3.4"-10 x 4.5", Grade 8)	210	285
Rear Axle Mount	BOLT, Hex head (M20 x 2.5 120mm, Grade 10.9)	210	285
Oscillating Axle Mount	BOLT, Hex head (M20 x 2.5 120mm, Grade 10.9)	280	380
Lockout Cylinder Pin	BOLT, Hex head (3/8"-16 x 1", Grade 5)	23	31
Swing Drive Motor	BOLT, Hex head (3/4"-10 x 2", Grade 8)	280	380
Rotation Gear	BOLT, Hex head (3/4"-10 x 5", zinc, Grade 8)	280	380
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 (3/4"-10 x 4", zinc, Grade 8)	280	380
Engine			
Deutz Engine Mount	BOLT, Hex head (1/2"-13 x 3.75", Grade 5)	55	75
Coupling Assembly	BOLT (M10)	40	55
Muffler	NUT	40	55
Engine			
Deutz Engine Mount	BOLT, Hex head (1/2"-13 x 3.75", Grade 5)	55	75
Coupling Assembly	BOLT (M10)	40	55
Muffler	NUT	40	55
Cylinders			
Jib	ROD NUT	347	470
Platform			
Rotary Mount	BOLT, Hex head, patch (3/8"-16 x 7/8", zinc, Grade 8)	35	48
	BOLT, Hex head (1"-8 x 10.5", zinc, Grade 8)	480	569
Rotary Manifold	BOLT, Hex head (1/2"-13 x 2", Grade 8)	80	108
Rotary Actuator	BOLT, Hex head (3/4"-10 x 3", Grade 8)	210	285
Load Cell Mounting	BOLT, Hex head patch (ZP, M16 x 1.5 x 4.5", Grade 8.8)	130	177
	BOLT, Hex head (1/2"-13 x 2.25", Grade 8)	80	108
Special Options			
Generator Support	BOLT, Hex head (1/2”-13 x 2”, Grade 8)	55	75
Oil Cooler Support	BOLT, Hex head (1/2”-13 x 2”, Grade 8)	55	75

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Table 2.3 Axle 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)
Coarse 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 Torque Specifications for Fasteners (US)

Size	Torque Type	SAE2		SAE 5		SAE 8	
		Dry	Lubed	Dry	Lubed	Dry	Lubed
4-40	(in-lb)	(5)	(4)	(8)	(6)	(12)	(9)
	Nm	0.6	0.5	0.9	0.7	1.4	1.0
4-48	(in-lb)	(6)	(5)	(9)	(7)	(13)	(10)
	Nm	0.7	0.6	1.0	0.8	1.5	1.1
6-32	(in-lb)	(10)	(8)	(16)	(12)	(23)	(17)
	Nm	1.1	0.9	1.8	1.4	2.6	1.9
6-40	(in-lb)	(12)	(9)	(18)	(13)	(25)	(19)
	Nm	1.4	1.0	2.0	1.5	2.8	2.1
8-32	(in-lb)	(19)	(14)	(30)	(22)	(41)	(31)
	Nm	2.1	1.6	3.4	2.5	4.6	3.5
8-36	(in-lb)	(20)	(15)	(31)	(23)	(43)	(32)
	Nm	2.3	1.7	3.5	2.6	4.9	3.6
10-24	(in-lb)	(27)	(21)	(43)	(32)	(60)	(45)
	Nm	3.1	2.4	4.9	3.6	6.8	5.1
10-32	(in-lb)	(31)	(23)	(49)	(36)	(68)	(51)
	Nm	3.5	2.6	5.5	4.1	7.7	5.8
1/4-20	(in-lb) ft-lb	(66)	(50)	8	(75)	12	9
	Nm	7.5	5.6	11	8.5	16	12
1/4-28	(in-lb) ft-lb	(76)	(56)	10	(86)	14	10
	Nm	8.6	6.3	14	9.7	19	14
5/16-18	ft-lb	11	8	17	13	25	18
	Nm	15	11	23	18	34	24
5/16-24	ft-lb	12	9	19	14	25	20
	Nm	16	12	26	19	34	27
3/8-16	ft-lb	20	15	30	23	45	35
	Nm	27	20	41	31	61	47
3/8-24	ft-lb	23	17	35	25	50	35
	Nm	31	23	47	34	68	47
7/16-14	ft-lb	32	24	50	35	70	55
	Nm	43	33	68	47	95	75
7/16-20	ft-lb	36	27	55	40	80	60
	Nm	49	37	75	54	108	81
1/2-13	ft-lb	50	35	75	55	110	80
	Nm	68	47	102	75	149	108
1/2-20	ft-lb	55	40	90	65	120	90
	Nm	75	54	122	88	163	122

Size	Torque Type	SAE2		SAE 5		SAE 8	
		Dry	Lubed	Dry	Lubed	Dry	Lubed
9/16-12	ft-lb	70	55	110	80	150	110
	Nm	95	75	149	108	203	149
9/16-18	ft-lb	80	60	120	90	170	130
	Nm	108	81	163	122	230	176
5/8-11	ft-lb	100	75	150	110	220	170
	Nm	136	102	203	149	298	230
5/8-18	ft-lb	110	85	180	130	240	180
	Nm	149	115	244	176	325	244
3/4-10	ft-lb	175	130	260	200	380	280
	Nm	237	176	353	271	515	380
3/4-16	ft-lb	200	150	300	220	420	320
	Nm	271	203	407	298	569	434
7/8-9	ft-lb	170	125	430	320	600	460
	Nm	230	169	583	434	813	624
7/8-14	ft-lb	180	140	470	360	660	500
	Nm	244	190	637	488	895	678
1-8	ft-lb	250	190	640	480	900	680
	Nm	339	258	868	651	1220	922
1-12	ft-lb	270	210	710	530	1000	740
	Nm	366	285	963	719	1356	1003
1-14	ft-lb	280	210	730	540	1020	760
	Nm	380	285	990	732	1383	1030
1 1/8-7	ft-lb	350	270	800	600	1280	960
	Nm	475	366	1085	813	1735	1302
1 1/8-12	ft-lb	400	300	880	660	1440	1080
	Nm	542	407	1193	895	1952	1464
1 1/4-7	ft-lb	500	380	1120	840	1820	1360
	Nm	678	515	1519	1139	2468	1844
1 1/4-12	ft-lb	550	420	1240	920	2000	1500
	Nm	746	569	1681	1247	2712	2034
1 3/8-6	ft-lb	670	490	1460	1100	2380	1780
	Nm	908	664	1979	1491	3227	2413
1 3/8-12	ft-lb	750	560	1680	1260	2720	2040
	Nm	1017	759	2278	1708	3688	2766
1 1/2-6	ft-lb	870	650	1940	1460	3160	2360
	Nm	1180	881	2630	1979	4284	3200
1 1/2-12	ft-lb	980	730	2200	1640	3560	2660
	Nm	1329	990	2983	2224	4827	3606

NOTE: *Lubed includes lubricants such as lubrizing, oil, grease, or uncured Loctite.*

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Table 2.5 Torque Specifications for Fasteners (Metric)

Size	Torque Type	SAE2		SAE 5		SAE 8	
		Dry	Lubed	Dry	Lubed	Dry	Lubed
M5 x 0.80	(in-lb)	(54)	(41)	(78)	(59)	(12)	(9)
	Nm	6.1	4.6	8.8	6.7	1.4	1.0
M6 x 1.00	(in-lb)	(92)	(69)	(133)	(99)	(13)	(10)
	Nm	10.4	7.8	15	11.2	1.5	1.1
M7 x 1.00	(in-lb)	(156)	(116)	(222)	(167)	(23)	(17)
	Nm	17.6	13.1	25.1	18.9	2.6	1.9
M8 x 1.25	(in-lb)	(225)	(169)	(333)	(242)	(25)	(19)
	Nm	25.4	19.1	37.6	27.3	2.8	2.1
M10 x 1.50	ft-lb	37	28	53	40	(41)	(31)
	Nm	50	38	72	54	4.6	3.5
M12 x 1.75	ft-lb	65	49	93	69	(43)	(32)
	Nm	88	66	126	94	4.9	3.6
M14 x 2.00	ft-lb	104	78	148	111	(60)	(45)
	Nm	141	106	201	150	6.8	5.1
M16 x 2.00	ft-lb	161	121	230	172	(68)	(51)
	Nm	218	164	312	233	7.7	5.8
M18 x 2.50	ft-lb	222	167	318	238	12	9
	Nm	301	226	431	323	16	12
M20 x 2.50	ft-lb	314	235	449	337	14	10
	Nm	426	319	609	457	19	14
M22 x 2.50	ft-lb	428	321	613	460	25	18
	Nm	580	435	831	624	34	24
M24 x 3.00	ft-lb	543	407	776	582	25	20
	Nm	736	552	1052	789	34	27
M27 x 3.00	ft-lb	796	597	1139	854	45	35
	Nm	1079	809	1544	1158	61	47
M30 x 3.50	ft-lb	1079	809	1543	1158	50	35
	Nm	1463	1097	2092	1570	68	47
M33 x 3.50	ft-lb	1468	1101	2101	1576	70	55
	Nm	1990	1493	2849	2137	95	75
M36 x 4.00	ft-lb	1886	1415	2699	2024	80	60
	Nm	2557	1918	3659	2744	108	81

NOTE: *Lubed includes lubricants such as lubrizing, oil, grease, or uncured Loctite.* *1375AA*

Table 2.6 Torque Specifications for Hydraulic Couplings & Hoses

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

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

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

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Table 2.7 Axles Maintenance Intervals

Operation	Component	Frequency	Lubricants
Check Levels	Differential	monthly	SAE 80W-90 API GL-5
	Planetary reduction	every 200 hours	
	Gear box	monthly	
Oil Change	Differential	every 800 hours *	SAE 80W-90 API GL-5
	Planetary reduction	every 1000 hours *	
	Self-locking differential gear	every 700 hours * &	
	Gear box	once at 50 hours after every 1000 hours	
Tighten	Gear box screws/bolts	every 200 hours	N/A
	Wheel Nuts	every 200 hours	

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

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	-	-

*****Initially after 100 working hours*
& *when it starts sounding noisy*

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NOTE
1 Nm = 0.7376 ft-lb

Table 2.8 Tire Specifications

	SJ82T/86T
Tire Size	Outrigger R4 18-625
	18.71" x 41.16" (47.52 cm x 104.55 cm)
Pressure	Foam-filled
Tire Ply Rating	16
Wheel Nuts Torque	275 ft-lb (373 Nm)

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⚠ WARNING

Do not use tires other than those specified for this machine. Do not mix different types of tires. Tires other than those specified can adversely affect stability. Failure to operate with matched, approved tires in good condition can result in death or serious injury. Replace tires with the exact, Skyjack-approved types only.

⚠ 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. Sample warning text.

Table 2.9 Floor Loading Pressure

Model	Weight		Total Aerial Platform Load					
			Wheel		LCP		OUP	
	lb	kg	lb	kg	psi	kPa	psf	kPa
SJ82T ANSI/CSA	37,600	17 055	17,850	8097	175	1207	325	15.6
SJ86T ANSI/CSA	37,800	17 145	17,850	8097	175	1207	330	15.8
SJ86T CE & AS	38,691	17 550	17,857	8100	175	1210	334	16

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- 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.
- The welder option will add approximately 350 lb (158.8 kg) to total aerial platform weight and 175 lb (79.4 kg) to max. wheel load.

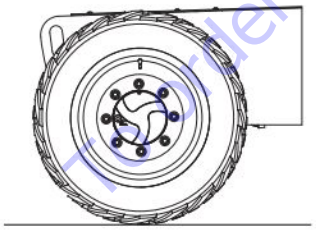
NOTE:

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.

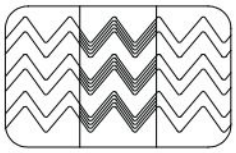
Locally Concentrated Pressure (LCP)

Foot Print Area identified by test

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



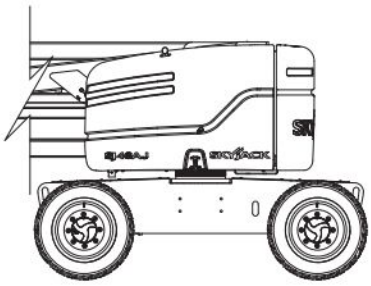
Foot Print Area



Overall Uniform Pressure (OUP)

Base Area = Length x Width

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



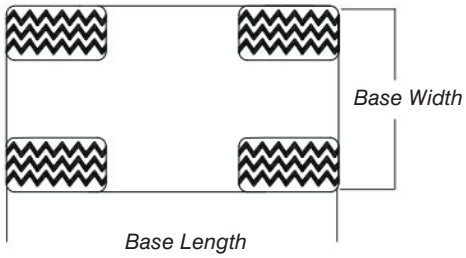


Table 2.10 Hydraulic Specifications & Gear Oil

Description		US	Metric
Pumps			
Drive Pump	Displacement	2.48 in^3/r 37 gpm @ 3600 rpm	40.6 cm^3/r
	Drive Pump Pressure	3000 psi	207 bar
	Charge Pump Displacement	0.84 in^3/r	13.8 cm^3/r
	Charge Pump Pressure	300 - 320 psi	20.68 - 22.41 bar
System Pump	Displacement - Static	3.00 in^3/r	49.2 cm^3/r
	System Pump Pressure	3050 psi	210 bar
Filters			
High Pressure Filter	Max. Operating Pressure	4000 psi	276 bar
Return Filter	Max. Operating Pressure	120 psi	8 bar
Motors			
Drive Motor	Displacement - Low	0.90 in^3/r	14.7 cm^3/r
	Displacement - High	2.48 in^3/r	40.6 cm^3/r
Swing Motor	Motor Displacement	6.1 in^3/r	100 cm^3/r
	Maximum Operating Pressure	3000 psi	206.8 bar
Cylinders			
Extension Cylinder	Bore	3.93 in	9.98 cm
	Rod Diameter	2.95 in	7.493 cm
	Stroke	255 in	64.77 m
	Maximum Boom Pressure	3000 psi	207 bar
Lift Cylinder	Bore	7.48 in	19 cm
	Rod Diameter	3.93 in	9.98 in
	Stroke	84.06 in	2.13 m
	Maximum Lift Pressure	3000 psi	207 bar
Steering Cylinder	Bore	3.06 in	7.77 cm
	Stroke	4.31 in	10.94 cm
Hydraulic & Gear Oils			
Hydraulic Oil Cooler Option	100°F to 115°F (38°C to 45°C)	Oil cooler option recommended	
Standard Hydraulic Oil	-15°F to 100°F (-26°C to 38°C)	Shell Tellus T46, Petro-Canada Hydrex MV46	
Arctic Hydraulic Oil	-40°F to 100°F (-40°C to 38°C)	Esso/Mobil UNIVIS HVI 26, Petro-Canada Hydrex Extreme	
Biodegradable Hydraulic Oil	-20°F to 90°F (-29°C to 32°C)	Shell Naturelle HF-E 46	
Hydraulic Tank Capacity		59 gal (223.3 L)	
Standard Gear Oil	-20°F to 115°F (-29°C to 45°C)	SAE 80W-90 API GL5	
Arctic Gear Oil	-40°F to 115°F (-40°C to 45°C)	Duratran XL Synthetic Oil	
Gear Oil Capacity		10 gal (38 L)	

**For other component specifications, refer to the hydraulic schematic.* *1397AB*

Table 2.11 Specifications & Features - Dimensional Data

	SJ82 T ANSI/CSA		SJ86 T ANSI/CSA		SJ86 T CE	SJ86 T AS
Height & Reach						
Working Height - Maximum	26.82 m	88'	28.04 m	92'	28.04 m	28.04 m
Platform Height - Maximum	24.99 m	82'	26.21 m	86'	26.21 m	26.21 m
Horizontal Reach - Maximum	22.1 m	72' 6"	23.41 m	76' 10"	23.41 m	23.41 m
Horizontal Reach at Maximum Height	8.15 m	26' 8"	8.61 m	28' 3"	8.61 m	8.61 m
Tailswing	1.52 m	60"	1.52 m	60"	1.52 m	1.52 m
Platform						
Platform Size	0.9 x 2.4 m	36" x 96"	0.9 x 2.4 m	36" x 96"	0.91 x 2.44 m	0.91 x 2.44 m
	0.9 x 1.8 m	36" x 72"	0.9 x 1.8 m	36" x 72"	0.91 x 1.83 m	0.91 x 1.83 m
Platform Rotation	170°	170°	170°	170°	170°	170°
Platform Rotation Radius	1.61 m	63-3/4"	1.62 m	64"	1.62 m	1.62 m
Platform Height - Stowed	0.48 m	19"	0.48 m	19"	0.28 m	0.28 m
Overall Railing Height	1.34 m	52-3/4"	1.34 m	52-3/4”	1.35 m	1.35 m
Platform Railing Height	1.09 m	43"	1.09 m	43"	1.12 m	1.12 m
Dimensional Data						
Height Stowed	2.59 m	8'-6"	2.59 m	8'-6"	3 m	3 m
Length Stowed	11.52 m	37' 10"	12.34 m	40' 6"	12.95 m	12.95 m
Width	2.44 m	8'	2.44 m	8'	2.49 m	2.49 m
Wheelbase	3.35 m	11'	3.35 m	11'	3.35 m	3.35 m
Ground Clearance - Chassis	0.41 m	16"	0.43 m	17"	0.4 m	0.4 m
Ground Clearance - Front Axle	0.34 m	13-1/4"	0.36 m	14-1/4"	0.34 m	0.34 m
Axle Oscillation	0.04 m	1-3/4"	0.04 m	1-3/4"	1-3/4”	1-3/4”
Inside Turning Radius	6.10 m	19' 11"	6.20 m	20' 5"	6.20 m	6.20 m
Outside Turning Radius	7.18 m	23' 7"	7.20 m	23' 7"	7.20 m	7.20 m
Turret Rotation	360°	360°	360°	360°	360°	360°
Weight						
Weight	17 055 kg	37,600 lb	17 145 kg	37,800 lb	17 550 kg	17 550 kg

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Table 2.12 Specifications & Features - Performance and Speeds

	SJ82 T ANSI/CSA		SJ86 T ANSI/CSA, CE, AS	
Performance & Speeds				
Gradeability - Maximum	45%		45%	
Drive Speed - Stowed/Low Torque	4.8 km/h	3.0 mph	4.8 km/h	3.0 mph
Drive Speed - Stowed/High Torque	1.9 km/h	1.2 mph	1.9 km/h	1.2 mph
Drive Speed - Elevated/Low Torque	0.8 km/h	0.5 mph	0.8 km/h	0.5 mph
Drive Speed - Elevated/High Torque	0.8 km/h	0.5 mph	0.8 km/h	0.5 mph
Turret Rotation Time - Stowed	95-130 seconds		95-130 seconds	
Turret Rotation Time - Extended	190-220 seconds		190-220 seconds	
Platform Rotation Time	10-20 seconds		10-20 seconds	
Boom Up Time	90-100 seconds		90-100 seconds	
Boom Down Time	90-100 seconds		90-100 seconds	
Boom Extend Time	60-70 seconds		60-70 seconds	
Boom Retract Time	60-70 seconds		60-70 seconds	
Jib Up Time	N/A		18-28 seconds	
Jib Down Time	N/A		10-16 seconds	
Steer Left Time	5-8 seconds		5-8 seconds	
Steer Right Time	5-8 seconds		5-8 seconds	
Lift Capacity				
Lift Capacity	227 / 340 kg	500 / 750 lb	227 / 340 kg	500 / 750 lb
Maximum Number of Persons	2 / 3		2 / 3	
Electrical				
System Voltage	12 V DC		12 V DC	
Battery Type	Lead/Acid		Lead/Acid	

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Table 2.13 Engine Specifications

			SJ82T/SJ86T
Deutz TD2.9L	RPM Settings		900 Low / 1600 / 2600 High
	Horsepower @ 2600 rpm (intermittent)		55.4 kW / 75 hp
	Fuel Type		Diesel
	Fuel Tank Capacity		45 gal (170.3 L)
	Standard Oil Factory Fill	0°F to 115°F (-18°C to 45°C)	SAE 15W-40 API CF/CG/CH-6
	Cold Lube Oil Option	-20°F to 90°F (-29°C to 32°C)	SAE 5W-30 API CF/CG/CH-6
	Arctic Lube Oil Option	-40°F to 115°F (-40°C to 45°C)	SAE 0W-40 API CF/CG/CH-6
	Standard & Arctic Coolant	-40°F to 115°F (-40°C to 45°C)	Delo 50/50 Extended Life Coolant
	Coolant Capacity		3.0 gal (11.4 L)
	Lube Oil Sump Capacity		2.64 gal (10.0 L)
Deutz TCD2.2	RPM Settings		1200 Low / 1600 / 2600 High
	Horsepower @ 2600 rpm (intermittent)		55.4 kW / 75 hp
	Fuel Type		Diesel
	Fuel Tank Capacity		45 gal (170.3 L)
	Standard Oil Factory Fill	0°F to 115°F (-18°C to 45°C)	SAE 15W-40 API CF/CG/CH-6
	Standard Coolant	-40°F to 115°F (-40°C to 45°C)	Delo 50/50 Extended Life Coolant
	Coolant Capacity		3.0 gal (11.4 L)
	Lube Oil Sump Capacity		2.11 gal (8.0 L)
Deutz D2011L04i	RPM Settings		1600 Low / 2100 / 2675 High
	Horsepower @ 2600 rpm (intermittent)		48 kW / 65 hp
	Fuel Type		Diesel
	Fuel Tank Capacity		45 gal (170.3 L)
	Standard Oil Factory Fill	0°F to 115°F (-18°C to 45°C)	SAE 15W-40 API CF/CG/CH-6
	Cold Lube Oil Option	-20°F to 90°F (-29°C to 32°C)	SAE 5W-30 API CF/CG/CH-6
	Arctic Lube Oil Option	-40°F to 115°F (-40°C to 45°C)	SAE 0W-40 API CF/CG/CH-6
	Lube Oil Sump Capacity		2.64 gal (10.0 L)

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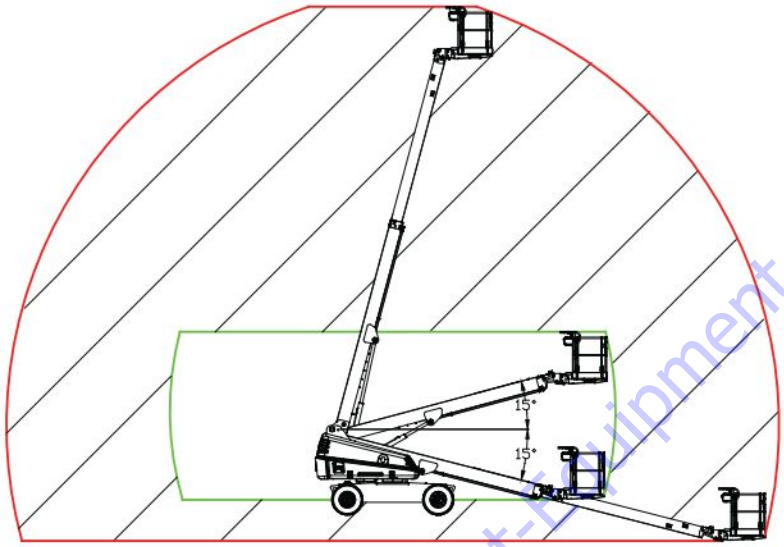
Table 2.14 Axle Oscillation Diagrams

⚠ WARNING

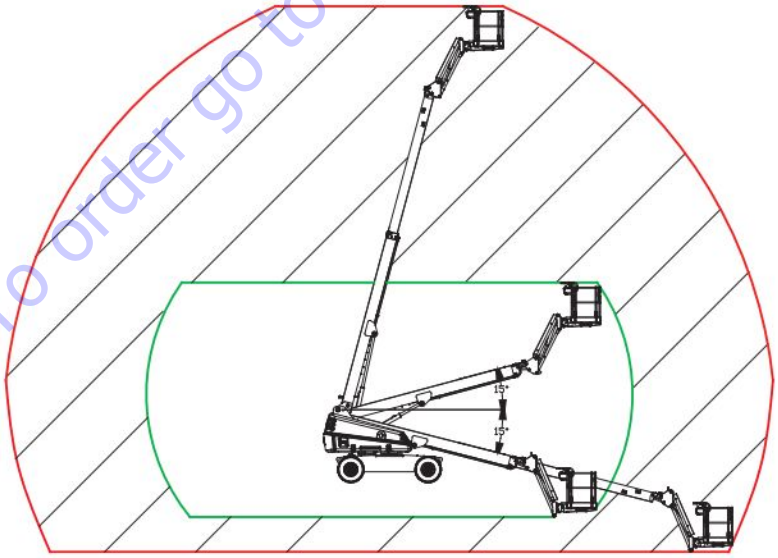
Do not raise the platform in work mode if it is not on a firm level surface.



Axle oscillation free (travel mode) - drive speed 3.0 mph (4.8 km/h) max

Axle oscillation locked (work mode) - drive speed 0.5 mph (0.8 km/h) max

Axle Oscillation - SJ82 T



Axle oscillation free (travel mode) - drive speed 3.0 mph (4.8 km/h) max

Axle oscillation locked (work mode) - drive speed 0.5 mph (0.8 km/h) max

Axle Oscillation - SJ86 T

Diagram 2.15 Dimension and Reach Diagram - SJ82 T

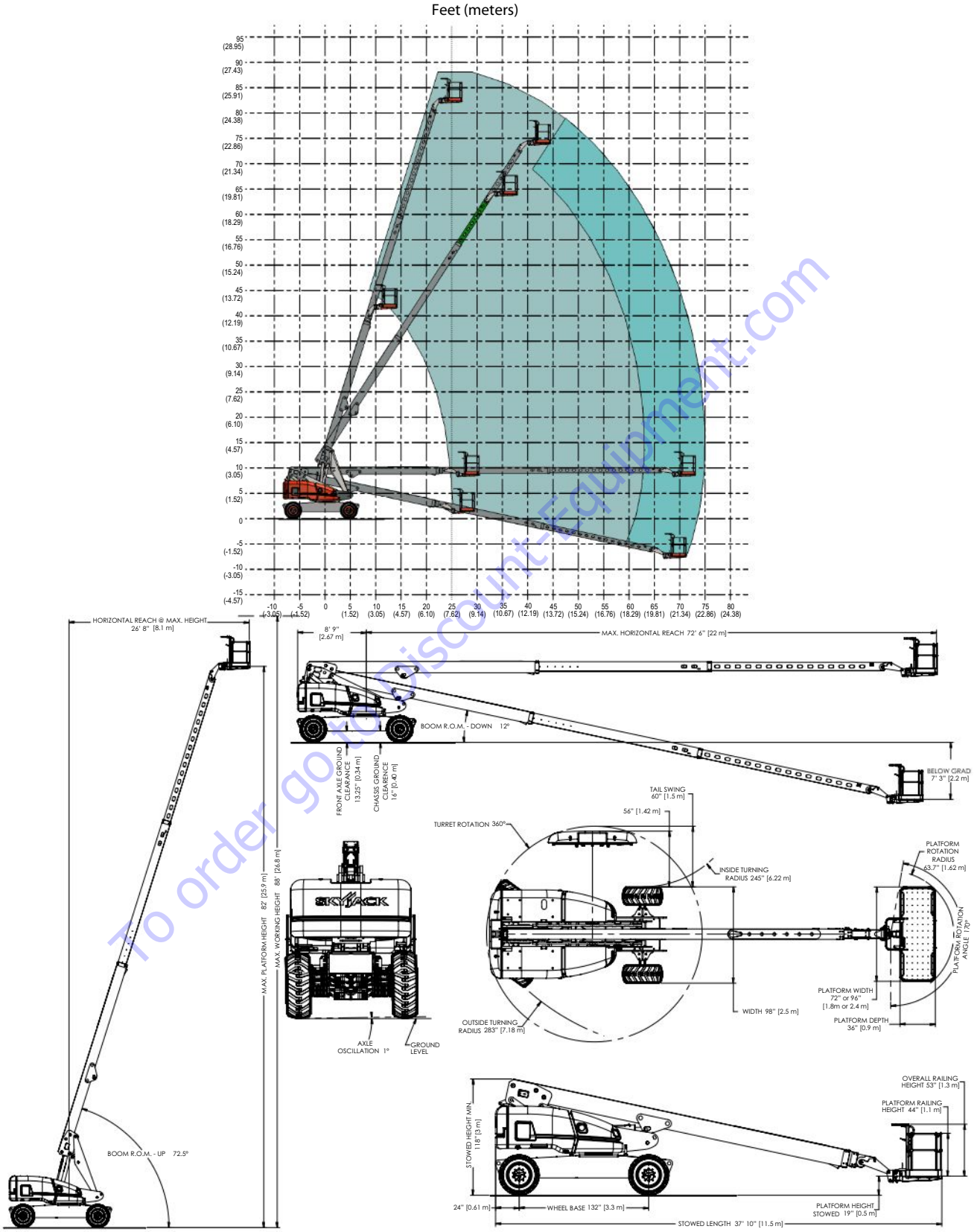
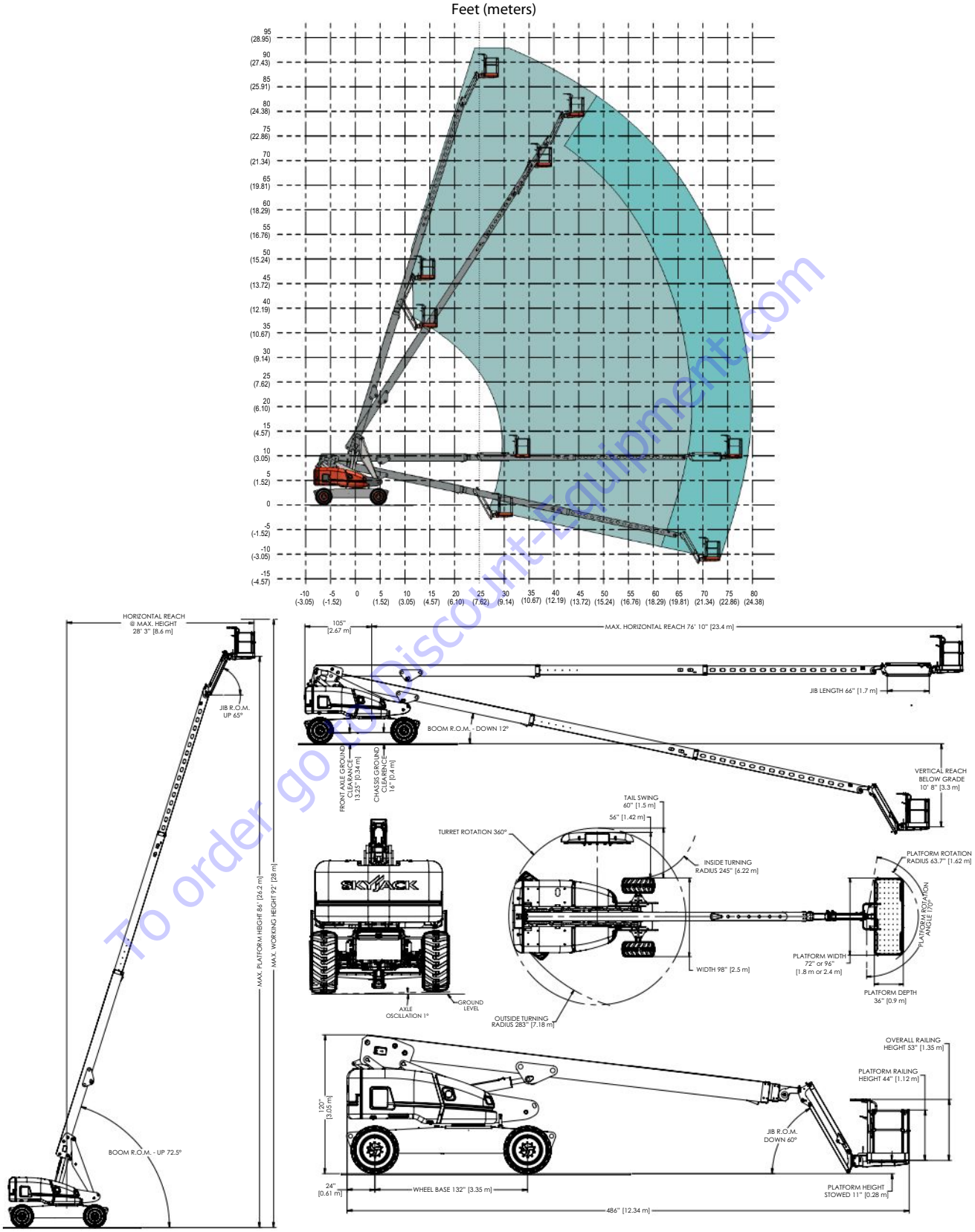


Diagram 2.16 Dimension and Reach Diagram - SJ86 T



Section 3 – System Component Identification and Schematics

Table 3.1 Electrical Symbol Chart

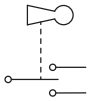
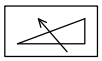
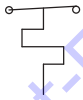
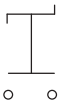
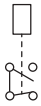
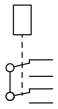
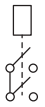
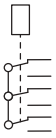
 CIRCUITS CROSSING NO CONNECTION	 HOURMETER	 KEY SWITCH	 LIMIT SWITCH
 CIRCUITS CONNECTED	 LIGHT	 FOOT SWITCH	 CAM OPERATED LIMIT SWITCH
 BATTERY	 HYDRAULIC VALVE COIL	 TOGGLE SWITCH	 LIMIT SWITCH N.O
 GROUND	 PROPORTIONAL HYDRAULIC VALVE COIL	 ANGLE TRANSDUCER & TILT SWITCH	 LIMIT SWITCH N.O HELD CLOSED
FUSE	 ELECTRIC MOTOR	 TEMPERATURE SWITCH	 LIMIT SWITCH N.C.
 CIRCUIT BREAKER	 HORN	 SINGLE POLE SINGLE THROW RELAY	 LIMIT SWITCH N.C HELD OPEN
 VOLT METER	 PUSH BUTTON	 SINGLE POLE DOUBLE THROW RELAY	 BEEPER
 CAPACITOR	 ROTARY SWITCH	 DOUBLE POLE DOUBLE THROW RELAY	 DIODE
 POTENTIOMETER	 EMERGENCY STOP BUTTON	 DOUBLE POLE SINGLE THROW RELAY	
RESISTOR	 RHEOSTAT	 TRIPLE POLE DOUBLE THROW RELAY	

Table 3.2 Hydraulic Symbol Chart

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

3.3 Wire Number and Color Code

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

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

3.4 Wire Numbers and Color Codes - Additional

AC Cord Color Code (Battery Charger & Platform Power Outlet)		
Standard Definition	**NEC Colors**	**IEC Colors**
Protective Ground/Protective Earth	Green	Green/Yellow
Neutral	White	Blue
Line, Single Phase	Black	Black or Brown or Grey

Note: Standard colors referenced from IEC 60445:2010, Annex A: Table 1. *1789AA*

Load Cell Color Code							
Wire No.	**Wire Color**	**Wire No.**	**Wire Color**	**Wire No.**	**Wire Color**	**Wire No.**	**Wire Color**
02	Brown	60	Yellow	161	White	unused	Beige
02	Blue	60	Red	162	Green	unused	Purple
						unused	Black

1790AA

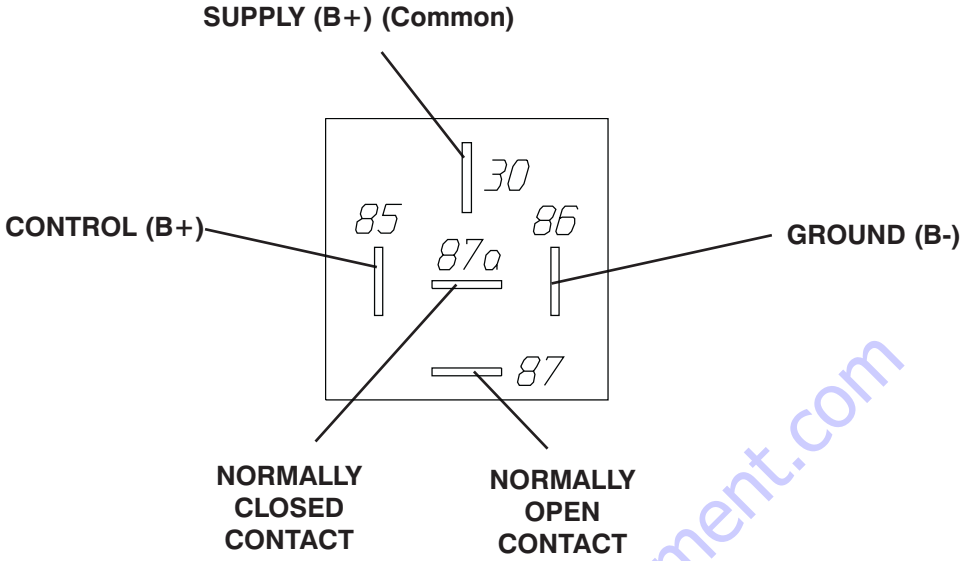
3.5 Hydraulic Parts List

Index No.	Skyjack Part No.	Description
2H-19	171435	VALVE, Control - lift cushion flow
2H-21A	159805	VALVE, Control - pressure dump
2H-42	168755	VALVE, Control - flow enable
2H-85	168056	VALVE, Control - flow enable, 12 kW generator
2H-85	168056	VALVE, Control - flow enable, 3.5 kW generator
3H-26	159827	VALVE, Control - brake release
3H-45	159827	VALVE, Control - 2-Speed
3H-65	159827	VALVE, Control - axle lock out
3H-V1	N/A	VALVE, Control - pressure compensator
3H-V2	N/A	VALVE, Control - load sense compensator
4H-13	168756	VALVE, Control - boom up
4H-14	168756	VALVE, Control - boom down
4H-15	N/A	VALVE, Control - drive pump control reverse
4H-16	N/A	VALVE, Control - drive pump control forward
4H-34	166036	VALVE, Control - jib down
4H-35	166036	VALVE, Control - jib up
4H-36	168757	VALVE, Control - platform rotate left
4H-37	168757	VALVE, Control - platform rotate right
4H-38	168758	VALVE, Control - boom retract
4H-39	168756	VALVE, Control - boom extend
4H-40	159803	VALVE, Control - platform level down
4H-41	159803	VALVE, Control - platform level up
5H-23A	159807	VALVE, Control - steer right
5H-24A	159807	VALVE, Control - steer left
5H-32	159806	VALVE, Control - swing right
5H-33	159806	VALVE, Control - swing left
C1	165079	CYLINDER, Boom lift
C2	165080	CYLINDER, Boom extend
C3	165081	CYLINDER, Master
C4	165082	CYLINDER, Slave
C5	165083	CYLINDER, Jib
C6	212871	CYLINDER, Axle lock
C7	1212871	CYLINDER, Axle lock
C8	170903	CYLINDER, Steer
C9	N/A	CYLINDER, Brake - front
C10	N/A	CYLINDER, Brake - rear
CB1	171421	VALVE, Counterbalance - swing drive
CB2	171421	VALVE, Counterbalance - swing drive
CB3	159841	VALVE, Counterbalance - boom lift
CB4	165486	VALVE, Counterbalance - boom extend
CB5	165486	VALVE, Counterbalance - boom extend
CB6	159841	VALVE, Counterbalance - platform level
CB7	159841	VALVE, Counterbalance - platform level
CB8	159841	VALVE, Counterbalance - jib
CB9	159841	VALVE, Counterbalance - jib
CB10	141399	VALVE, Counterbalance - platform rotate

Index No.	Skyjack Part No.	Description
CB11	141399	VALVE, Counterbalance - platform rotate
CB12	212872	VALVE, Counterbalance - axle lock
CB13	212872	VALVE, Counterbalance - axle lock
CB14	171388	VALVE, Counterbalance - lift cylinder
CV1	171389	VALVE, Check - main inlet
CV2	171410	VALVE, Check - auxiliary pump
CV3	171411	VALVE, Check - steer load sense
CV4	159815	VALVE, Check - main LS
CV5	159815	VALVE, Check - main LS
CV6	171412	VALVE, Check - swing drive load sense
CV7	171412	VALVE, Check - main boom load sense
CV8	171412	VALVE, Check - extension load sense
CV9	159815	VALVE, Check - main LS
CV10	159815	VALVE, Check - main LS
CV11	171411	VALVE, Check - level override load sense
CV12	141712	VALVE, Check - pilot pressure
CV13	171413	VALVE, Check - brake manifold
CV14	N/A	VALVE, Check - EPU
CV16	N/A	VALVE, Check - 3.5 kW generator
CV17	159814	VALVE, Check - 12 kW generator manifold LS
CV18	171410	VALVE, Check - 12 kW generator manifold
CV19	N/A	VALVE, Check - 12 kW generator
CV20	159814	VALVE, Check - 3.5 kW generator LS
DSV1	166062	COMPENSATOR, Swing
DSV2	171417	COMPENSATOR, Boom lift
DSV3	171417	COMPENSATOR, Boom extend
EPU	168672	PUMP, Emergency
F1	161932	FILTER, High pressure
F2	161933	FILTER, Return
FR1	166058	FLOW REGULATOR, Pressure-compensated
M1	171944	MOTOR, Drive - axle
M2	170930	MOTOR, Swing
M3	171419	MOTOR, Generator - 3.5 kW
M4	171438	MOTOR, Generator - 12 kW
MB1	165487	MANIFOLD, Main
MB2	216511	MANIFOLD, Brake
MB3	168661	MANIFOLD, Jib
MB4	163541	MANIFOLD, No jib
MB5	168618	MANIFOLD, 3.5 kW generator
MB6	171437	MANIFOLD, 12 kW generator
OC1	160800	COOLER, Oil
OR1	171414	ORIFICE, 0.090" - main manifold
OR2	171415	ORIFICE, 0.055” - main manifold
OR3	171416	ORIFICE, 0.020” - main manifold
OR4	171416	ORIFICE, 0.020” - main manifold
OR5	171416	ORIFICE, 0.020” - main manifold
OR6	171416	ORIFICE, 0.020” - main manifold

Index No.	Skyjack Part No.	Description
OR8	171422	ORIFICE, 0.035” - main manifold
OR9	171420	ORIFICE, 0.073” - bleed off
OR10	171450	VALVE, Flow regulator - 3.5 kW generator
OR11	171450	VALVE, Flow regulator - 12 kW generator
P1	169006	PUMP, Hydrostatic
P1A	154119	PUMP, Charge
P2	165101	PUMP, System
PR1	216235	VALVE, Pressure reducing
QD1	122420	QUICK DISCONNECT
RA1	144710	ACTUATOR, Rotary - platform ***- SJ86 T***
RA2	167073	ACTUATOR, Rotary - turret
RA3	165466	ACTUATOR, Rotary - platform ***- SJ82 T***
RV1	168759	VALVE, Relief - main manifold
RV2	171385	VALVE, Relief - swing drive
RV3	166047	VALVE, Relief - platform level
RV4	171386	VALVE, Relief - boom extend
RV5	N/A	VALVE, Relief - brake manifold
RV6	N/A	VALVE, Relief - drive
RV7	N/A	VALVE, Relief - drive
RV8	N/A	VALVE, Relief - charge
SV1	141414	VALVE, Shuttle - brake manifold
SV2	166054	VALVE, Shuttle - brake manifold
SV3	159803	VALVE, Shuttle - main manifold
SV4	N/A	VALVE, Shuttle - swing drive brake
V1	141436	VALVE, Control - brake release override
V2	166053	VALVE, Control - loop flush
V3	159831	VALVE, Control - brake hand pump
V4	171387	VALVE, Control - pilot operated
V5	171387	VALVE, Control - pilot operated
V6	221775	VALVE, Control - pilot operated
V7	221776	VALVE, Control - pilot operated
V8	166053	VALVE, Control - loop flush

3.6 Electrical Parts List



Index No.	Skyjack Part No.	Description
01ACR	127131	RELAY, 12 Volt 40 Amp (E-pump)
01CR	127131	RELAY, 12 Volt 40 Amp (E-pump)
07CR	127131	RELAY, 12 Volt 40 Amp (E-pump enable)
08CR	127131	RELAY, 12 Volt 40 Amp (Engine start interlock)
08CR1	127131	RELAY, 12 Volt 40 Amp (Dump valve interlock)
09CR	127131	RELAY, 12 Volt 40 Amp (ECU power or Telematics)
11CR	127131	RELAY, 12 Volt 40 Amp (Cold start)
17ACR1	127131	RELAY, 12 Volt 40 Amp (Steer reverse)
17ACR2	127131	RELAY, 12 Volt 40 Amp (Steer reverse)
19CR	127131	RELAY, 12 Volt 40 Amp (Boom down throttle)
21CR	127131	RELAY, 12 Volt 40 Amp (Dump valve)
27CR	127131	RELAY, 12 Volt 40 Amp (Tilt alarm)
45CR1	127131	RELAY, 12 Volt 40 Amp (Torque mode)
45CR2	127131	RELAY, 12 Volt 40 Amp (Torque mode)
49CR	127131	RELAY, 12 Volt 40 Amp (Horn)
54ACR	127131	RELAY, 12 Volt 40 Amp (Cold start)
56ACR	127131	RELAY, 12 Volt 40 Amp (Fuel pump)
57ACR	127131	RELAY, 12 Volt 40 Amp (Anti-restart)
57ACR1	127131	RELAY, 12 Volt 40 Amp (Generator interlock)
60CR	127131	RELAY, 12 Volt 40 Amp (Main power enable)
76ACR	127131	RELAY, 12 Volt 40 Amp (MIL light)
77CR	127131	RELAY, 12 Volt 40 Amp (E-pump enable)
77CR1	127131	RELAY, 12 Volt 40 Amp (Hourmeter/counter)
78CR	127131	RELAY, 12 Volt 40 Amp (High idle)
79CR	127131	RELAY, 12 Volt 40 Amp (Low idle)
82CR	127131	RELAY, 12 Volt 40 Amp (Overload light)
86CR	127131	RELAY, 12 Volt 40 Amp (Oil cooler)
120CR	127131	RELAY, 12 Volt 40 Amp (Low capacity enable) **- ANSI/CSA**
120CR	127131	RELAY, 12 Volt 40 Amp (High capacity light) **- CE & AS**

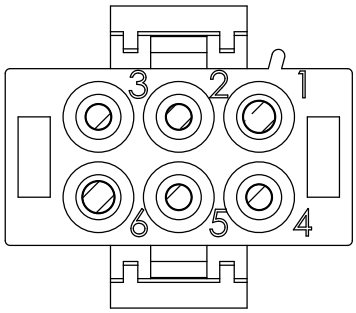
Index No.	Skyjack Part No.	Description
121CR	127131	RELAY, 12 Volt 40 Amp (Boom down enable) **- ANSI/CSA**
121CR2	127131	RELAY, 12 Volt 40 Amp (Telescope out enable) **- ANSI/CSA**
121CR3	127131	RELAY, 12 Volt 40 Amp (High capacity light) **- ANSI/CSA**
121CR4	127131	RELAY, 12 Volt 40 Amp (High capacity light) **- ANSI/CSA**
123CR	127131	RELAY, 12 Volt 40 Amp (Load capacity enable) **- ANSI/CSA**
123CR	127131	RELAY, 12 Volt 40 Amp (Load sense fault - boom down) **- CE & AS**
123CR1	127131	RELAY, 12 Volt 40 Amp (Load sense fault - telescope out) **- CE & AS**
162BCR	127131	RELAY, 12 Volt 40 Amp (Overload counter)
165CR	127131	RELAY, 12 Volt 40 Amp (Diff lock)
2H-19	159839	COIL, 12 Volt (Lift cushion valve)
2H-21A	159821	COIL, 12 Volt (Dump valve)
2H-42	159819	COIL, 12 Volt (Flow enable valve)
2H-85	168056	COIL, 12 Volt (Optional 3.5 kW generator valve)
3H-26	159827	COIL, 12 Volt (Brake valve)
3H-45A	159827	COIL, 12 Volt (2 speed valve)
3H-65	159827	COIL, 12 Volt (Axle lockout valve)
3H-165	159827	COIL, 12 Volt (Differential lock valve)
3H-V1	N/A	COIL, 12 Volt (Pressure compensator)
3H-V2	N/A	COIL, 12 Volt (Load sense compensator)
4H-13	159820	COIL, 12 Volt (Boom down valve)
4H-14	159820	COIL, 12 Volt (Boom up valve)
4H-15	N/A	COIL, 12 Volt (Reverse drive valve)
4H-16	N/A	COIL, 12 Volt (Forward drive valve)
4H-34	159821	COIL, 12 Volt (Jib down valve) **- SJ86 T**
4H-35	159821	COIL, 12 Volt (Jib up valve) **- SJ86 T**
4H-36	159819	COIL, 12 Volt (Platform left rotate valve)
4H-37	159819	COIL, 12 Volt (Platform right rotate valve)
4H-38	159820	COIL, 12 Volt (Boom in valve)
4H-39	159820	COIL, 12 Volt (Boom out valve)
4H-40	159821	COIL, 12 Volt (Platform level down valve)
4H-41	159821	COIL, 12 Volt (Platform level up valve)
5H-23A	159821	COIL, 12 Volt (Steer right valve)
5H-24A	159821	COIL, 12 Volt (Steer left valve)
5H-32	159820	COIL, 12 Volt (Turret rotate left valve)
5H-33	159820	COIL, 12 Volt (Turret rotate right valve)
A1	138224	JOYSTICK (Drive/steer)
A2	138225	JOYSTICK (Boom/turret)
A3	138226	CONTROLLER, Speed control selector
AT1	166163	SWITCH, Tilt (analog 28°)
B1	103295	BATTERY, 12V (Wet)
B2	103295	BATTERY, 12V (Wet)
BP1	103057	BEEPER, 4-28 VDC Slow pulsing (Platform control console)
BP2	103056	BEEPER, 7.5-16 VDC (Base control console) **- ANSI/CSA**
BP3	144387	ALARM, Overload **- CE & AS**
CB1	117325	CIRCUIT BREAKER (15 Amp)
CB2	117325	CIRCUIT BREAKER (15 Amp)
CB3	117325	CIRCUIT BREAKER (15 Amp)

Index No.	Skyjack Part No.	Description
CB4	117326	CIRCUIT BREAKER (20 Amp)
CB5	141631	CIRCUIT BREAKER (50 Amp)
CB6	141630	CIRCUIT BREAKER (15 Amp)
DXX	102921	DIODE
FU1	138848	FUSE, 50 Amp
FS1	138230	SWITCH, Low fuel
H1	146652	HORN, 12 Volt
LB1	169001	LIGHT, Work (optional)
LB2	169001	LIGHT, Work (optional)
LB3	144078	LIGHT, Flashing (optional)
LS1	111356	LIMIT SWITCH, Direction sensing
LS2	165090	LIMIT SWITCH, Boom Angle - Creep
LS3	165429	LIMIT SWITCH, Boom Extend/Retract - Creep
LS4	168762	LIMIT SWITCH, Boom Angle - Dual Load
LS5	165428	LIMIT SWITCH, Boom Extend/Retract - Dual Load
M1	170713	PUMP, Emergency
PL1	147229	LED BLOCK, Red (12 volts) (Base control console)
PL2	138229	MODULE, Upper indicating
PL3	170502	LIGHT, Amber (Engine failure) (Base control console)
PL4	170502	LIGHT, Amber (Low fuel) (Base control console)
PL5	164832	LIGHT, Red (Oil pressure) (Base control console)
PL6	171501	LIGHT, Green (Glow plug) (Base control console)
PL7	164832	LIGHT, Red (Engine temperature) (Base control console)
PL8	170502	LIGHT, Amber (Water in fuel) (Base control console)
PL9	147229	LED BLOCK, Red (12 volts) (Platform control console)
PL10	170501	LIGHT, Green (Low capacity) (Platform control console)
PL11	170501	LIGHT, Green (High capacity) (Platform control console)
PL12	170501	LIGHT, Green (Low capacity) (Base control console)
PL13	170501	LIGHT, Green (High capacity) (Base control console)
PL14	170502	LIGHT, Amber (Load zone border) (Base control console)
PL15	171502	LIGHT, Amber (Load zone border) (Platform control console)
PL16	171502	LIGHT, Amber (Differential lock) (Platform control console)
R1	144714	RESISTOR, 7 ohm 25 W
R2	168783	RESISTOR, 4 ohm 25 W **- Deutz D2011**
	144523	RESISTOR, 7 ohm 25 W **- ANSI/CSA Deutz TD2.9L**
	144714	RESISTOR, 6 ohm 25 W **- CE Deutz TD2.9L**
R3	144523	RESISTOR, 7 ohm 25 W **- Deutz D2011**
	163021	RESISTOR, 120 ohm 1/2 W **- Deutz TD2.9L**
R4	172005	RESISTOR, 3 ohm 25 W **- ANSI/CSA Deutz D2011**
	139088	RESISTOR, 6 ohm 25 W **- CE & AS D2011**
	164855	RESISTOR, 1.0k ohm 1/2 W **- Deutz TD2.9L**
R5	143952	RESISTOR, 51 ohm 2 W **- Deutz D2011**
	164856	RESISTOR, 3.3k ohm 1/22 W **- Deutz TD2.9L**
R6	172005	RESISTOR, 3 ohm 25 W **- ANSI/CSA Deutz D2011**
	168783	RESISTOR, 4 ohm 25 W **- CE & AS Deutz D2011**
	164857	RESISTOR, 3.9k ohm 1/2 W **- Deutz TD2.9L**
R7	151643	RESISTOR, 250 ohm 1 W

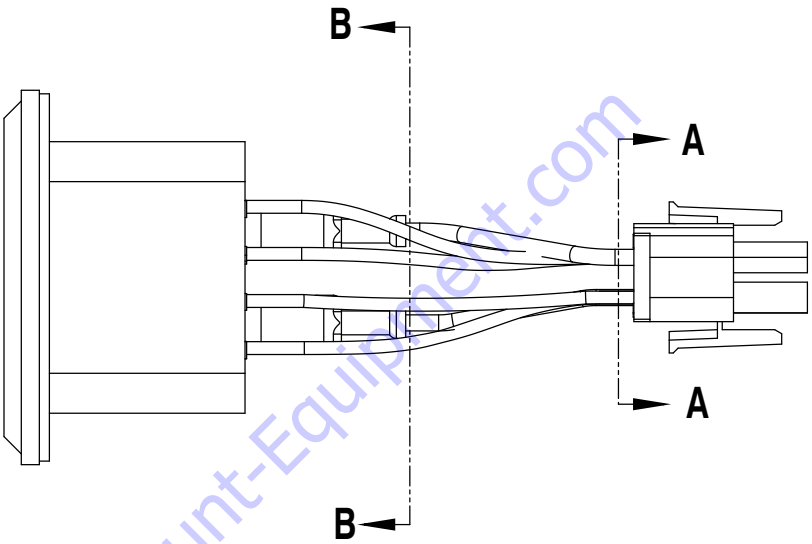
Index No.	Skyjack Part No.	Description
R8	151643	RESISTOR, 250 ohm 1 W
R9	151643	RESISTOR, 250 ohm 1 W
R10	151643	RESISTOR, 250 ohm 1 W
R11	151643	RESISTOR, 250 ohm 1 W
R12	171987	RESISTOR, 1 ohm 1/4 W **- Deutz D2011**
	168783	RESISTOR, 4 ohm 25 W **- Deutz TD2.9L**
R13	139088	RESISTOR, 6 ohm 25 W **- ANSI/CSA Deutz TD2.9L & D2011**
	171987	RESISTOR, 1 ohm 1/4 W **- CE & AS Deutz D2011**
R14	172005	RESISTOR, 3 ohm 25 W **- Deutz D2011 & ANSI/CSA Deutz TD2.9L**
	168783	RESISTOR, 4 ohm 25 W **- CE Deutz TD2.9L**
R15	144714	RESISTOR, 11 ohm 25 W **- ANS/CSA**
	171988	RESISTOR, 2 ohm 25 W **- CE & AS Deutz D2011**
	139088	RESISTOR, 6 ohm 25 W **- CE Deutz TD2.9L**
R16	171988	RESISTOR, 2 ohm 25 W **- ANSI/CSA Deutz D2011 & CE TD2.9L**
	172005	RESISTOR, 1 ohm 1/4 W **- ANSI/CSA Deutz TD2.9L**
R17	138783	RESISTOR, 4 ohm 25 W **- ANSI/CSA Deutz TD2.9L**
	171987	RESISTOR, 1 ohm 1/4 W **- CE Deutz TD2.9L**
R18	171988	RESISTOR, 1 ohm 25 W **- ANSI/CSA Deutz TD2.9L**
	171987	RESISTOR, 1 ohm 1/4 W **- CE Deutz TD2.9L**
S1	119725	SWITCH, Main power disconnect
S2	138277	KEYSWITCH, Base/Off/Platform (Base control console) **- ANSI/CSA&AS**
	144366	KEYSWITCH, Base/Off/Platform (Base control console) **- CE**
S3	147053	N.C. CONTACT, Emergency stop (Base control console)
S4	147053	N.C. CONTACT, Emergency stop (Platform control console)
S5	138278	SWITCH, Ignition/emergency pump toggle (Base control console)
S6	138278	SWITCH, Ignition/emergency toggle (Platform control console)
S8	102853	SWITCH, Diagnose toggle (Base control console)
S9	124446	SWITCH, Ignition (Platform control console)
S10	115747	SWITCH, Throttle toggle (Platform control console)
S11	154127	FOOTSWITCH
S12	138278	SWITCH, Boom up/down toggle (Base control console)
S13	102853	SWITCH, Turret rotate toggle (Base control console)
S14	102853	SWITCH, Telescope in/out toggle (Base control console)
S15	102853	SWITCH, Platform leveling toggle (Base control console)
S16	102853	SWITCH, Platform rotate toggle (Base control console)
S17	102853	SWITCH, Jib up/down toggle (Base control console) (SJ86 T)
S18	102853	SWITCH, Telescope in/out toggle (Platform control console)
S19	102853	SWITCH, Platform leveling toggle (Platform control console) **- ANSI/CSA**
S20	102853	SWITCH, Platform rotate toggle (Platform control console)
S21	102853	SWITCH, Jib up/down toggle (Platform control console) **- SJ86 T**
S22	144266	SWITCH, Electrical generator (Platform control console)
S23	147054	SWITCH, Horn (Platform control console)
S24	168678	SWITCH, Load zone toggle (Platform control console)
S25	148988	SWITCH, Load zone select (Base control console)
S28	148988	SWITCH, Differential lock (Platform control console)
S48	115574	SWITCH, Drive torque toggle (Platform control console)
TT1	103336	HOUR METER **- ANSI/CSA**

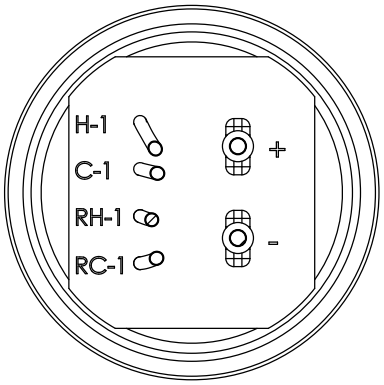
Index No.	Skyjack Part No.	Description
	170787	HOUR METER **- CE & AS**
X22	138576	PORT, Diagnose **- Deutz engine**
X23	138574	CONNECTOR, Engine **- Deutz engine**

3.7 Hourmeter/Counter Harness - CE



SECTION A-A
SCALE 2 : 1

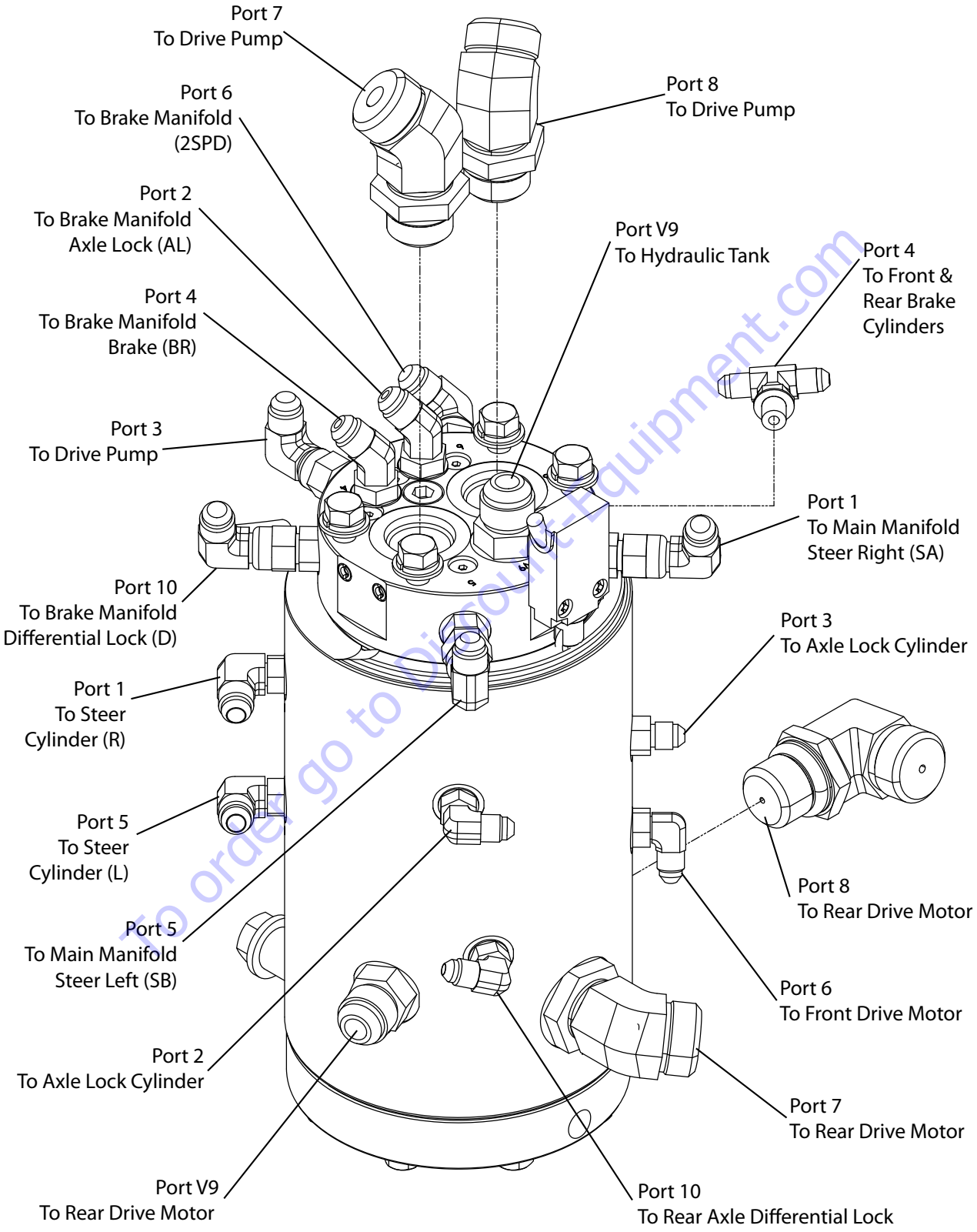




SECTION B-B

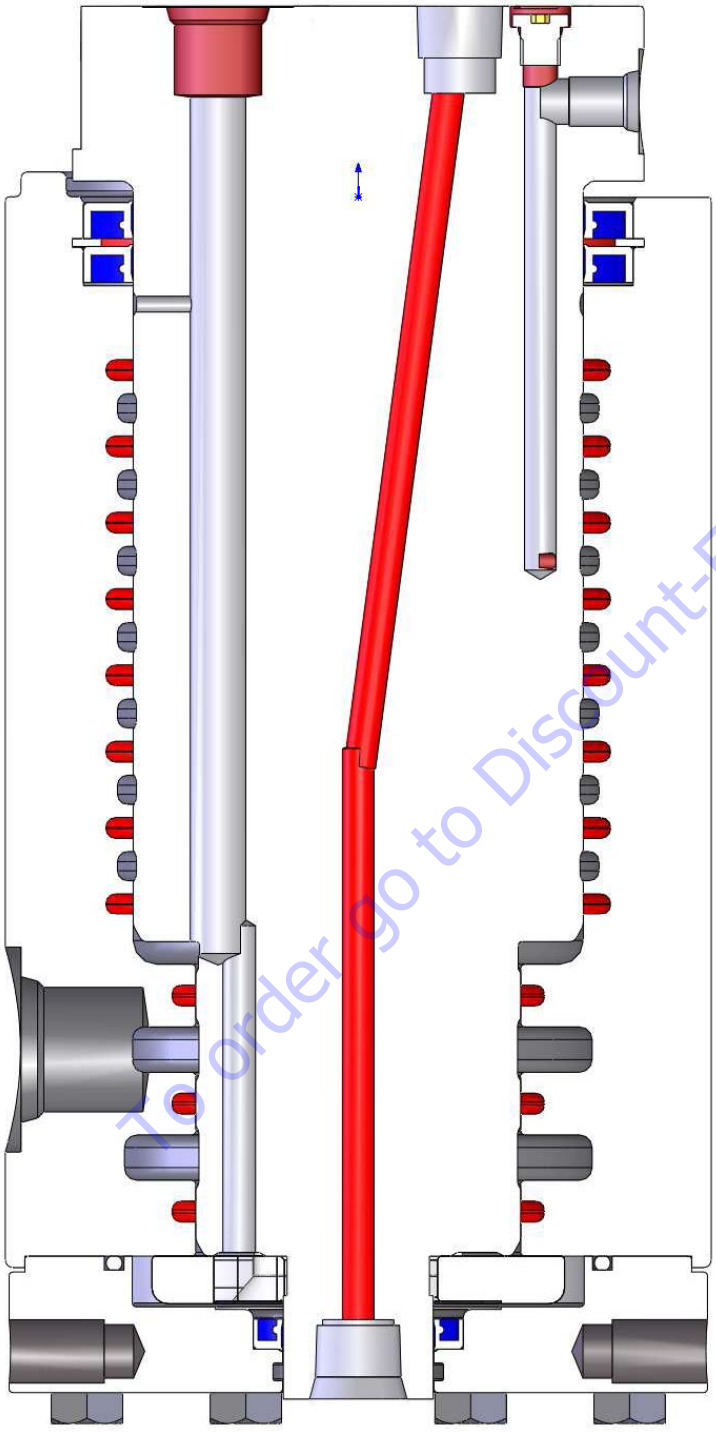
DESCRIPTION	IDENTIFICATION	COLOUR	CAVITY ID.
+12 VDC	+	PURPLE	1
HOURMETER	H-1	RED	2
COUTNER	C-1	BLUE	3
HOUR RESET	RH-1	GREEN	4
COUNTER RESET	RC-1	WHITE	5
GROUND	-	WHITE	6

3.8 Rotary Manifold Port Identification



M167068AH-1

3.8 Rotary Manifold Port Identification



Seals

Fluid Port

Port 1: Steer Right

Port 2: Axle Oscillation Unlock Signal

Port 3: Axle Oscillation Cylinder Pressure

Port 4: SAHR Brake Release

Port 5: Steer Left

Port 6: Hydraulic Motor 2 Speed,

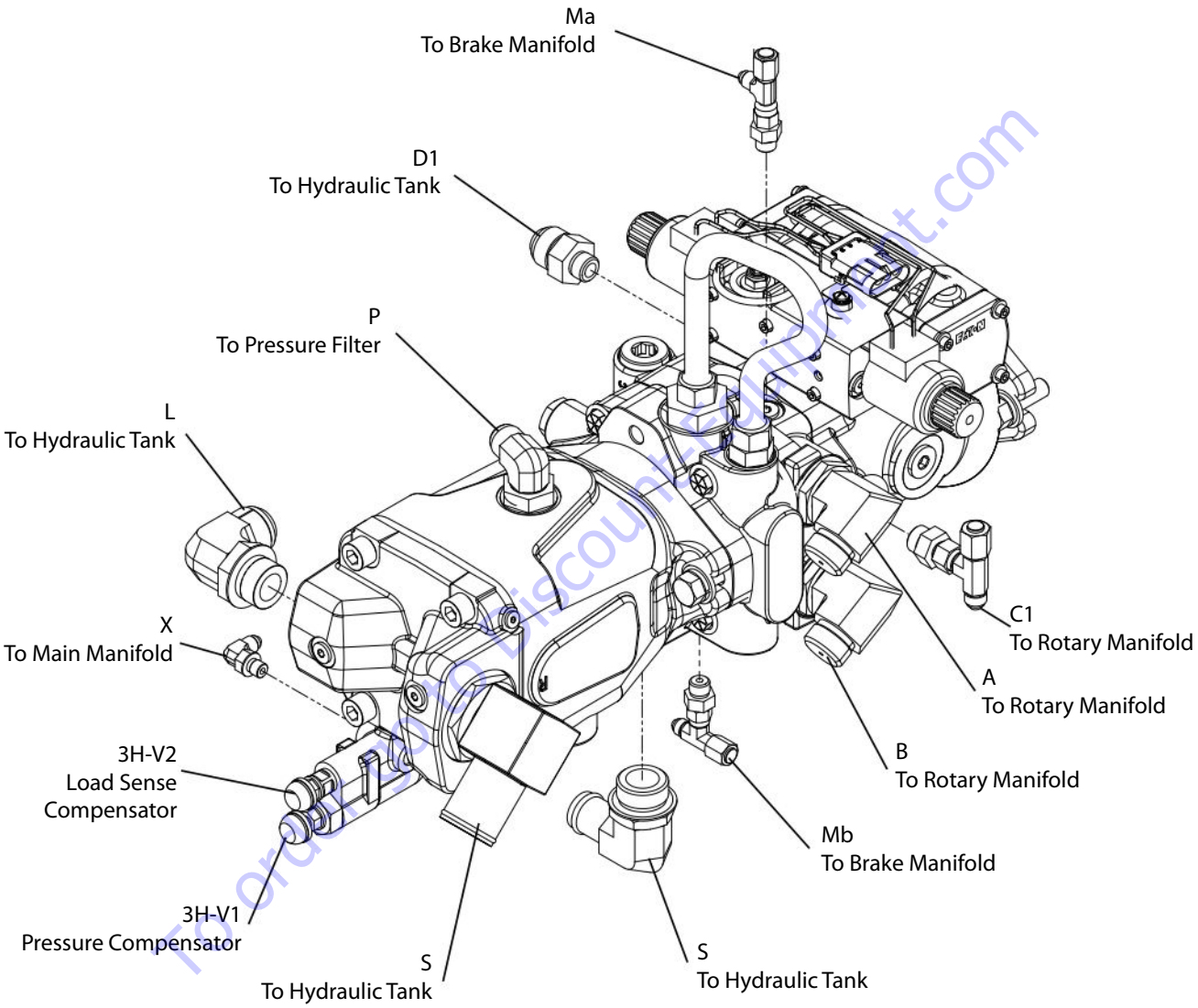
Port 10: Differential Lock (if equipped)

Port 9: Hydraulic Motor Drain

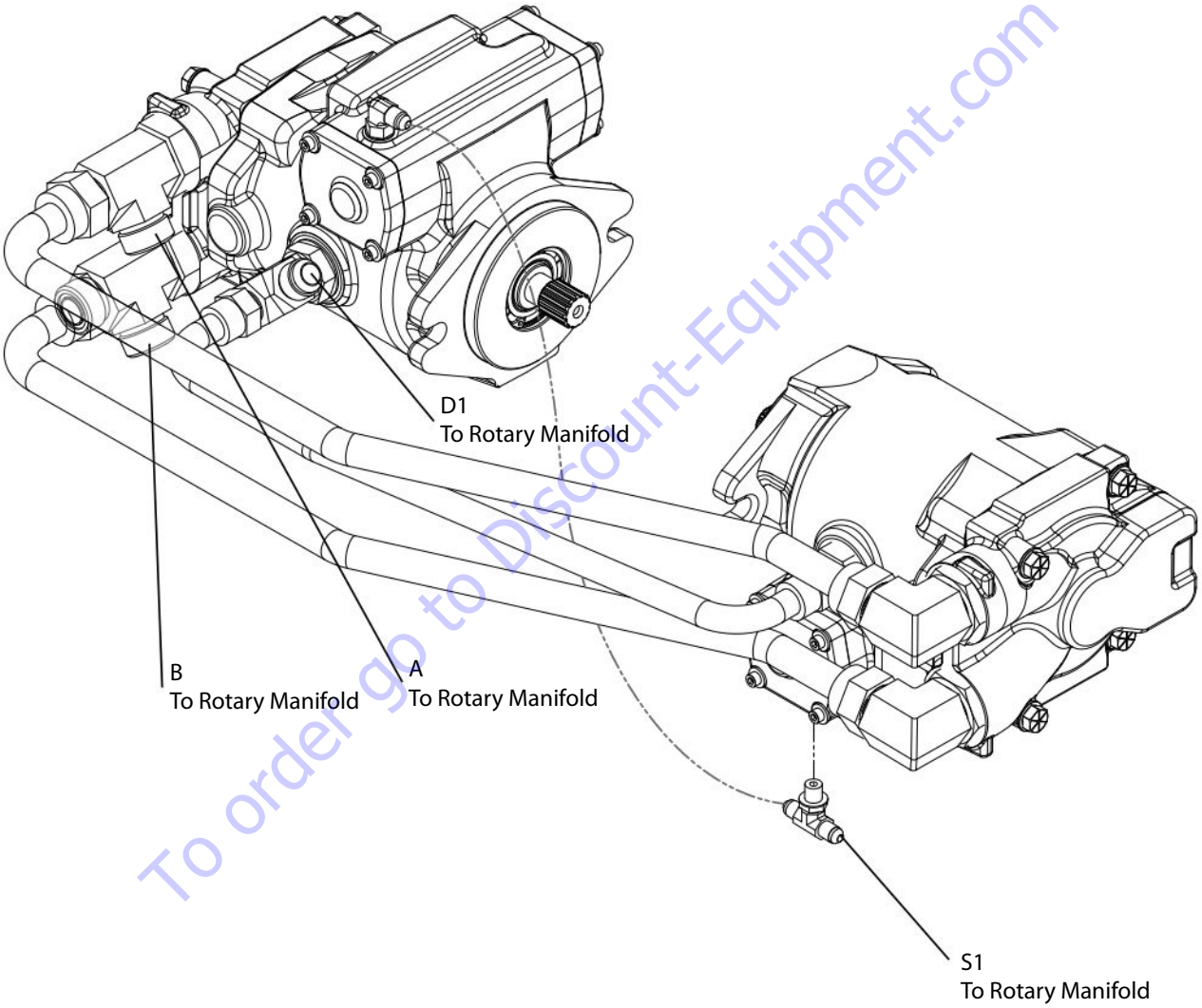
Port 7: Hydraulic Motor; Drive FWD

Port 8: Hydraulic Motor; Drive REV

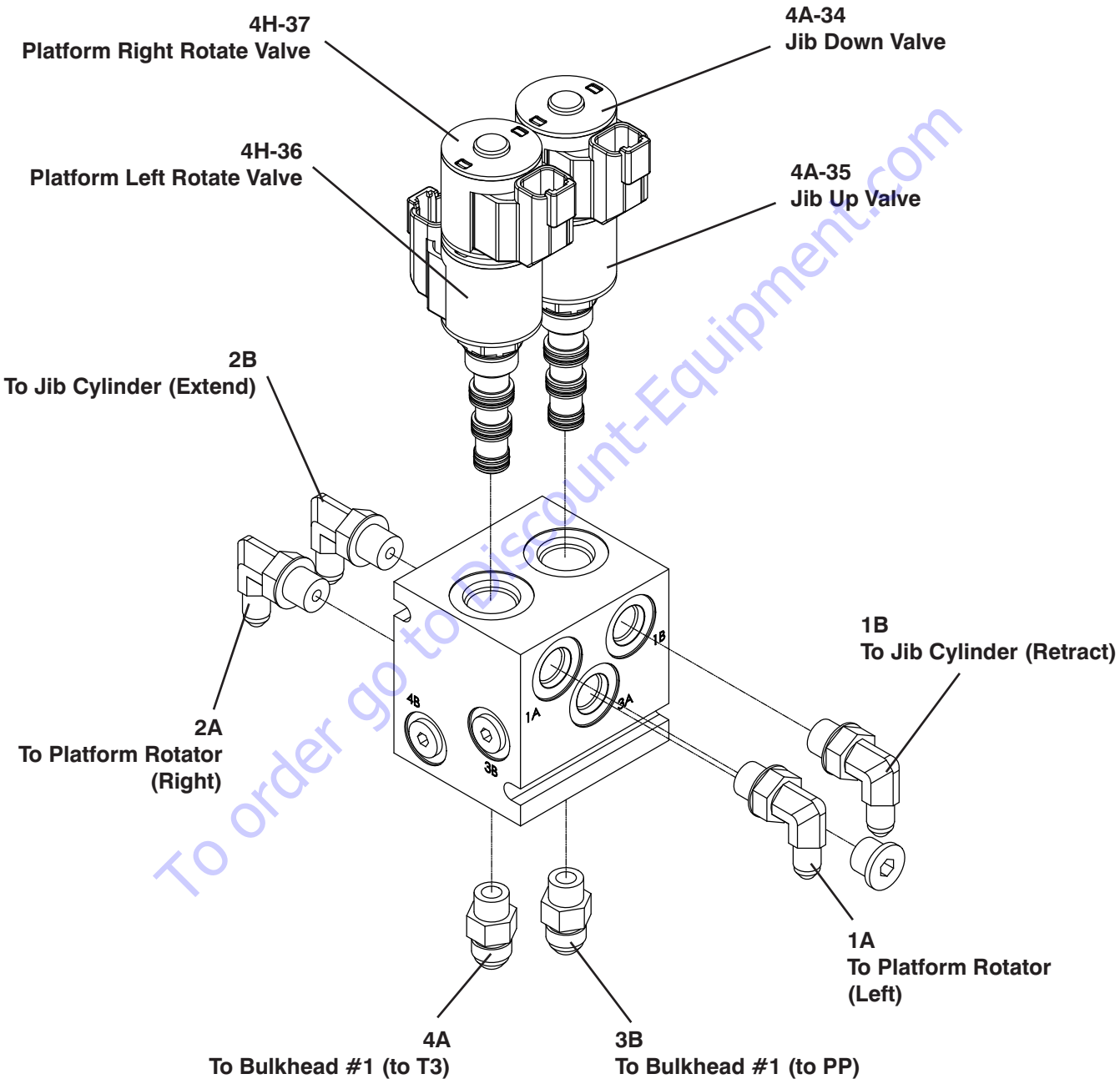
3.9 System and Drive Pump Port Identification



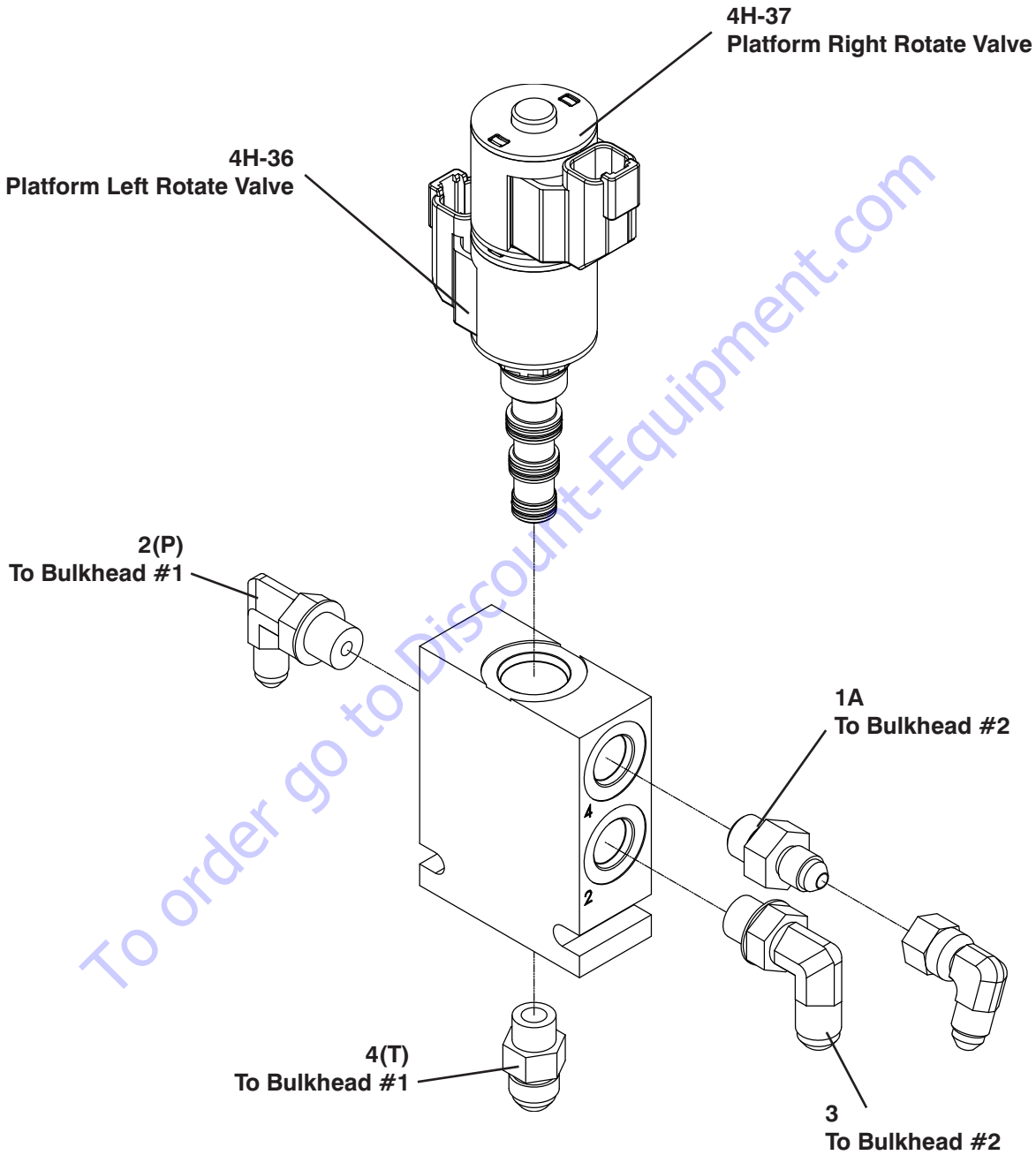
3.10 Drive Motors Port Identification



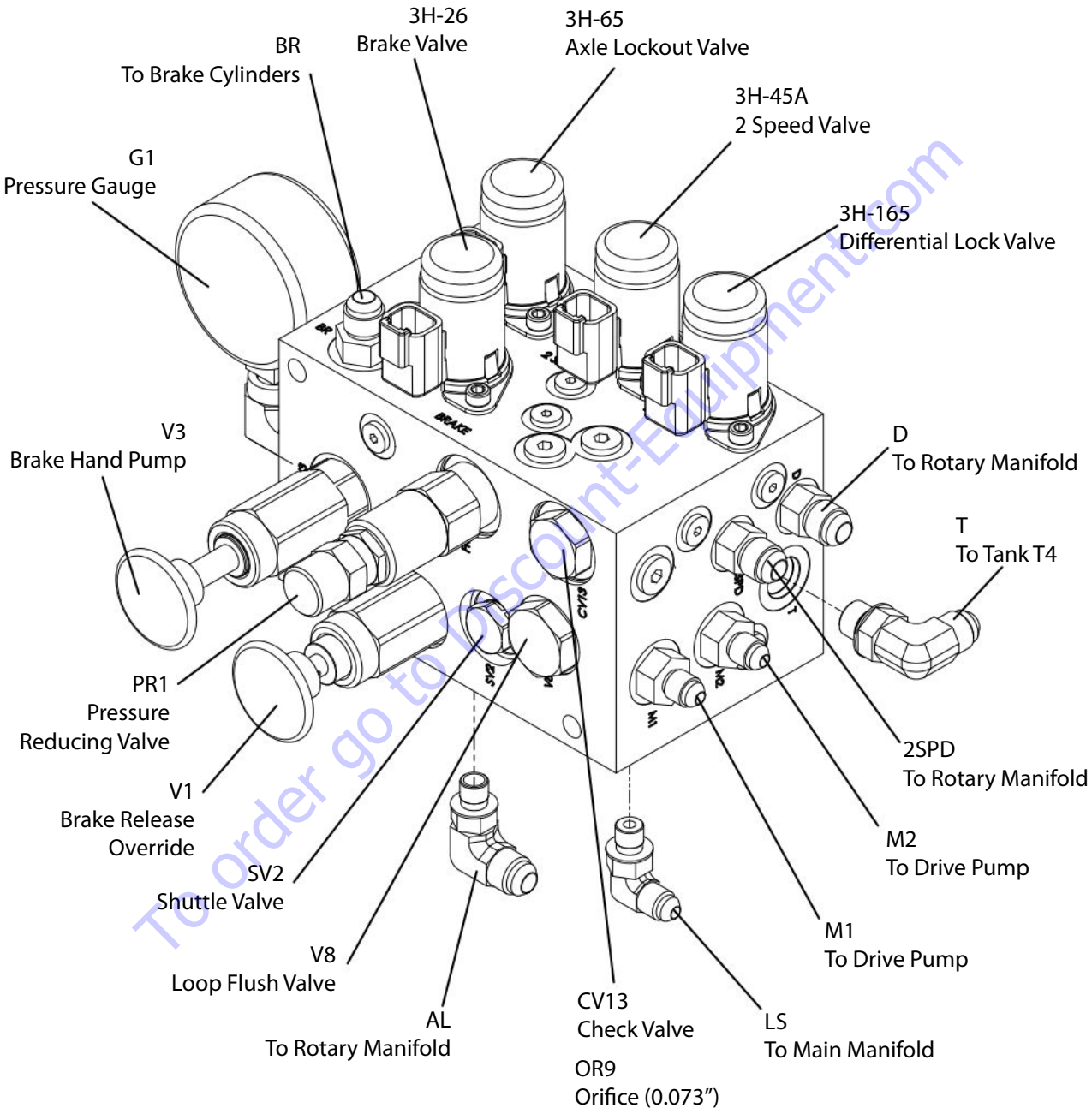
3.11 Jib Valve Port Identification



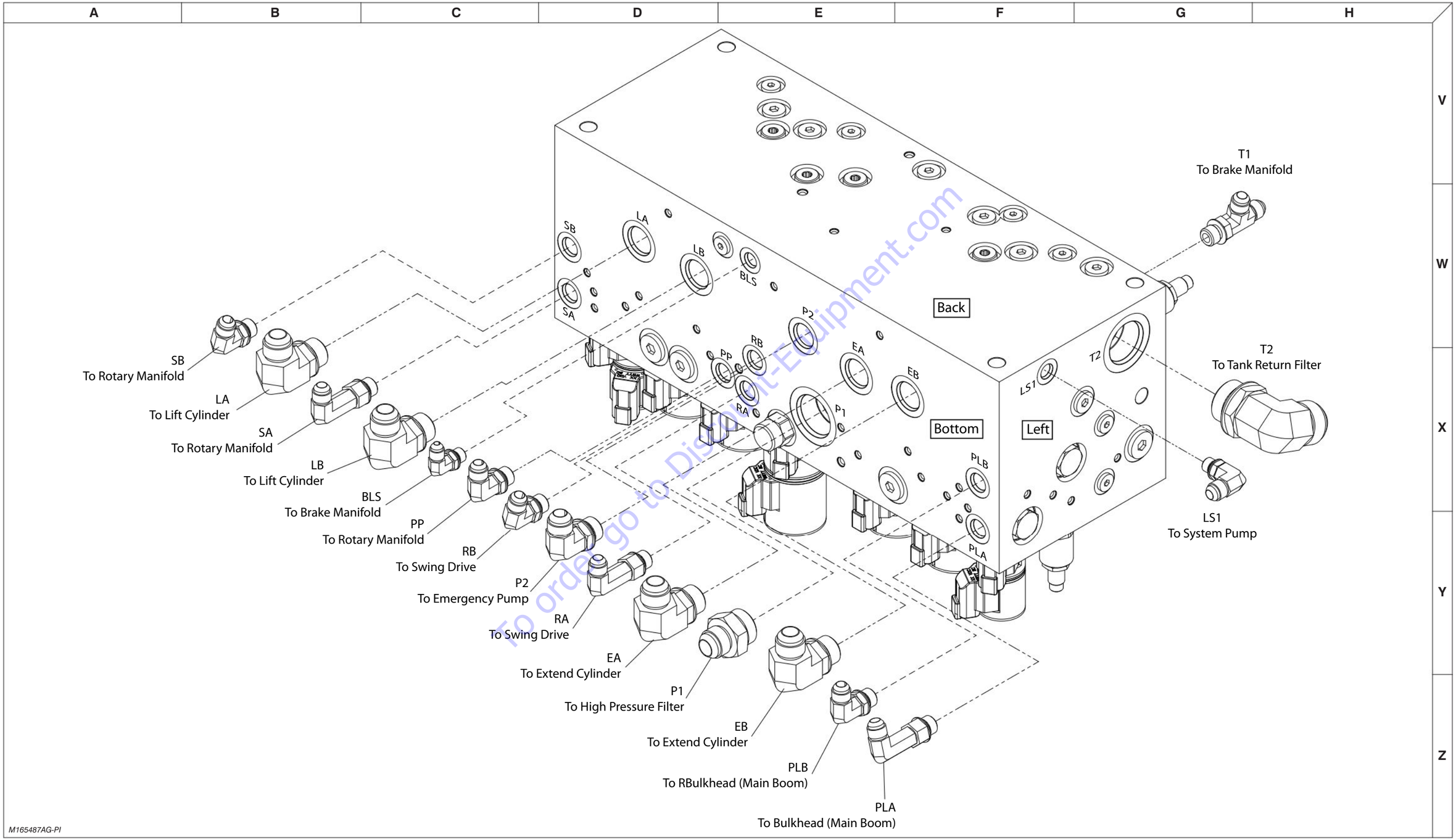
3.12 No Jib Valve Port Identification



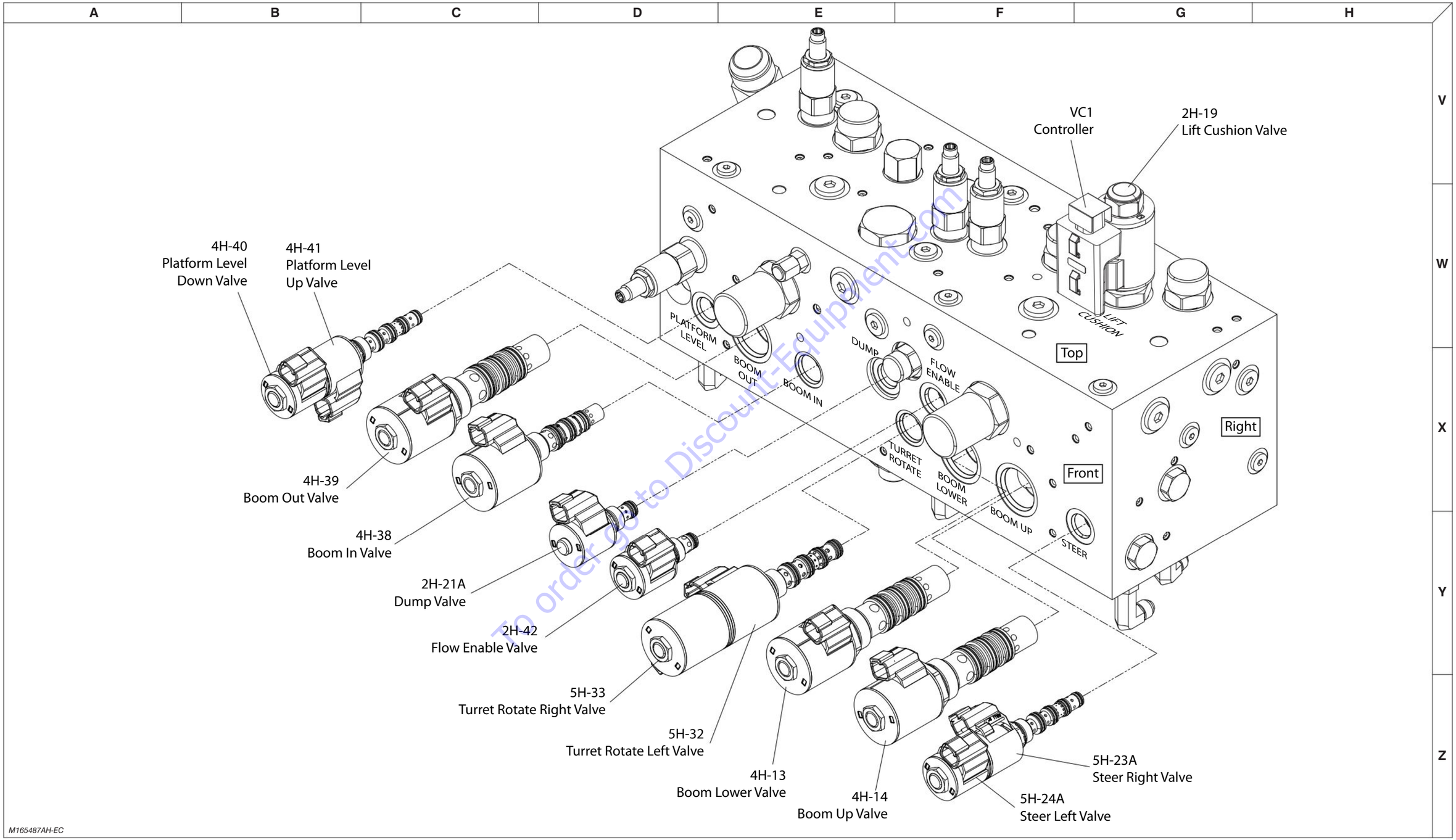
3.13 Brake Manifold Port Identification



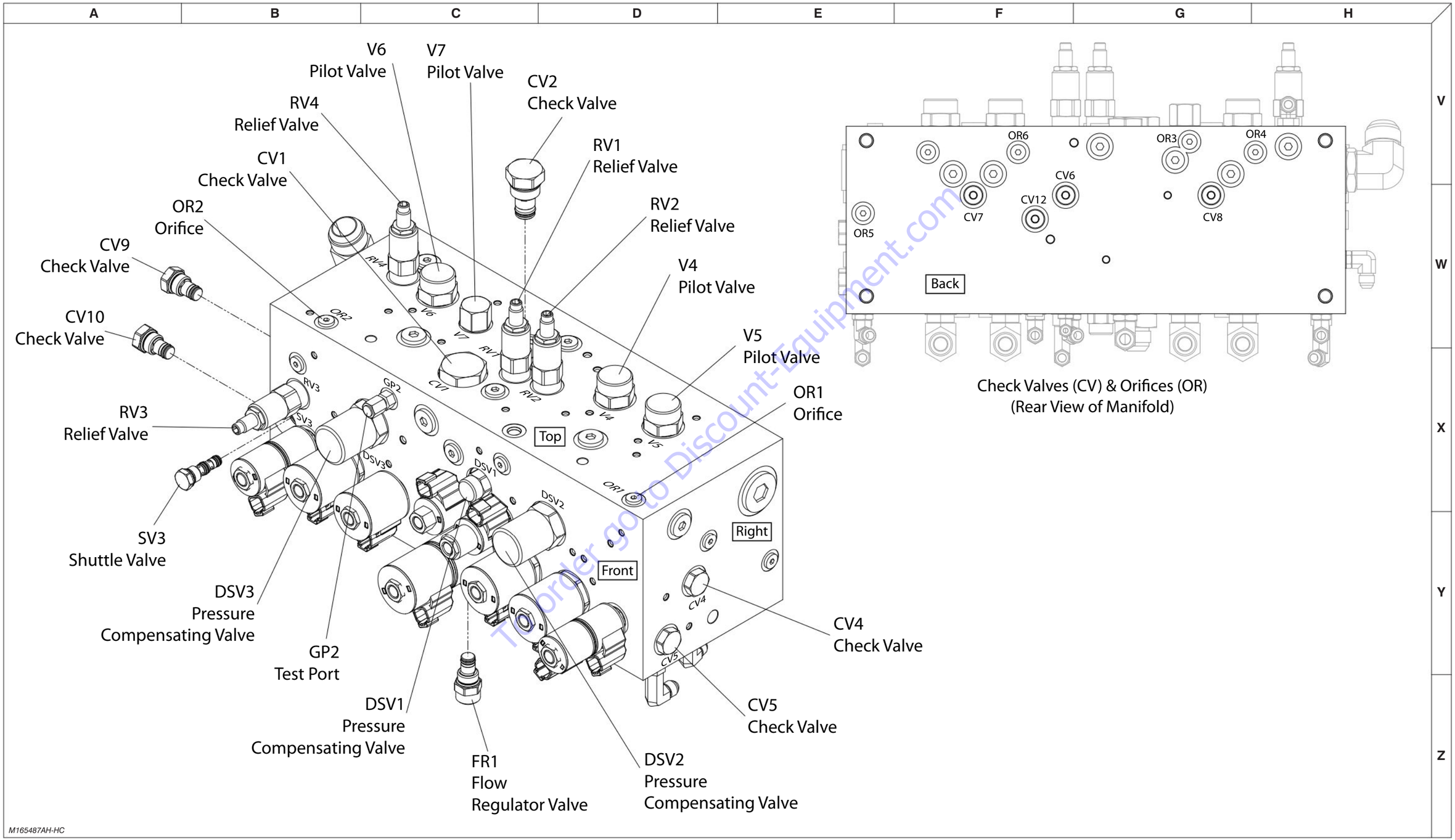
3.14 Main Manifold Port Identification



3.15 Main Manifold Electrical Component Identification

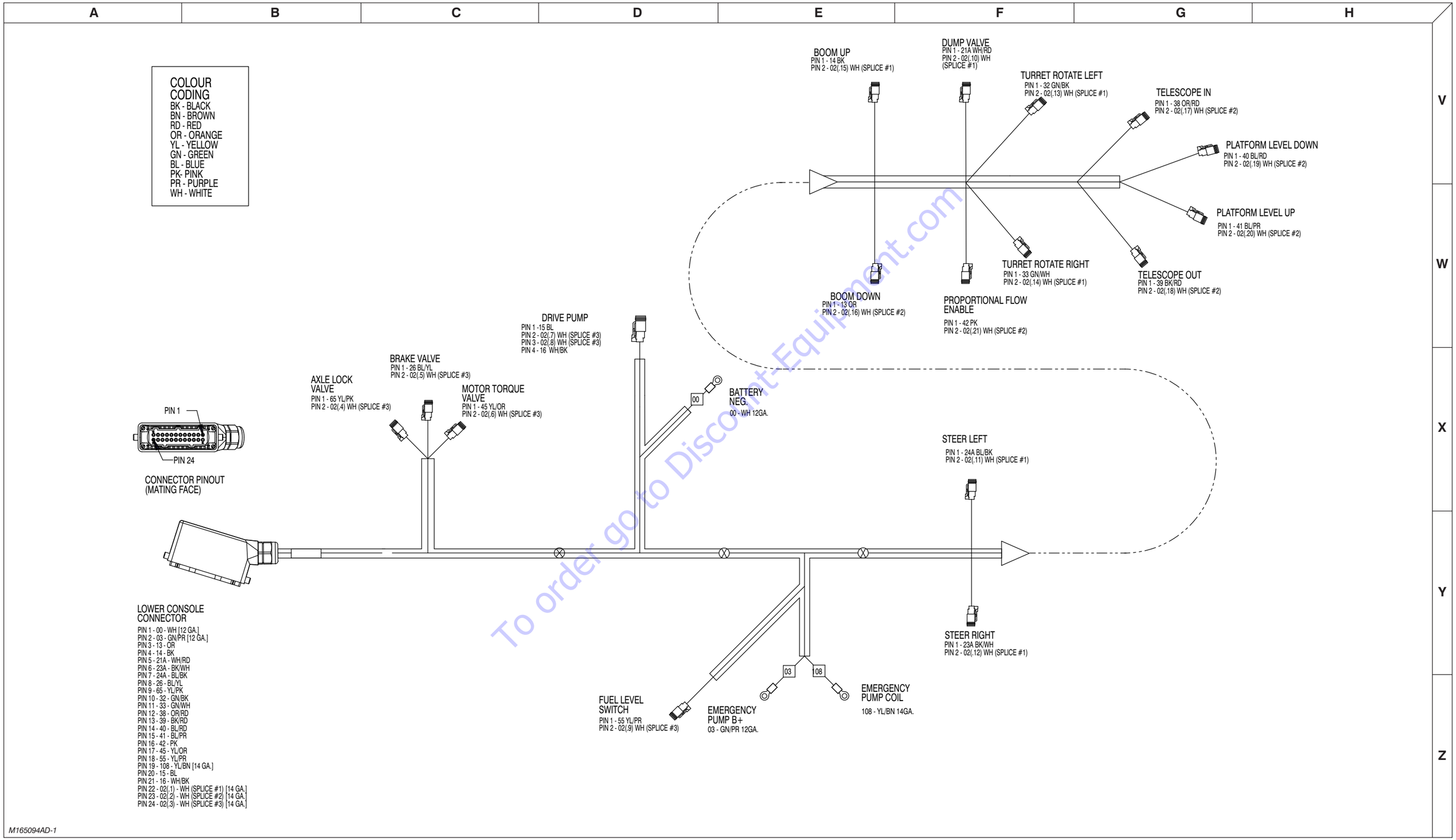


3.16 Main Manifold Hydraulic Component Identification

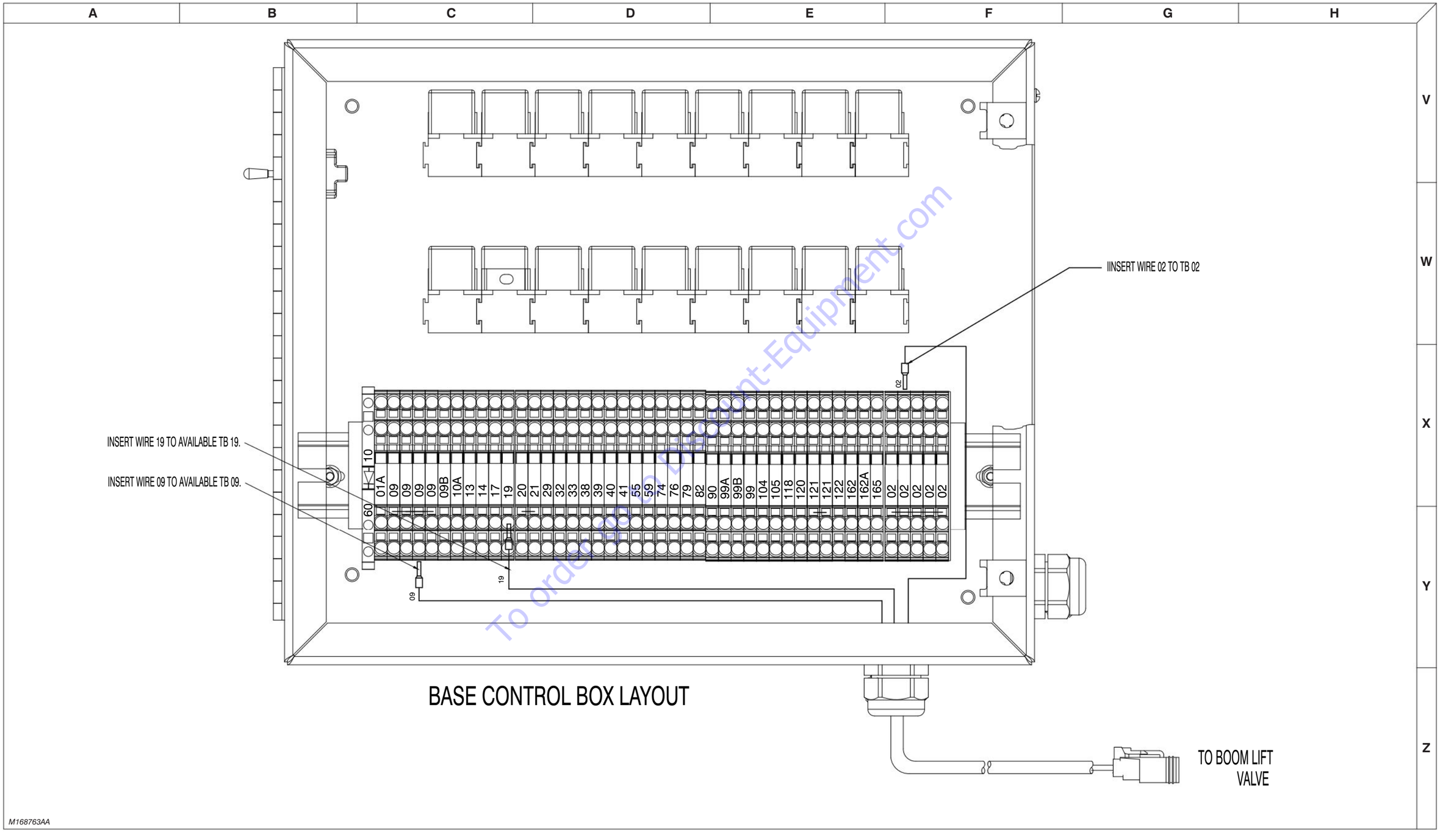


M165487AH-HC

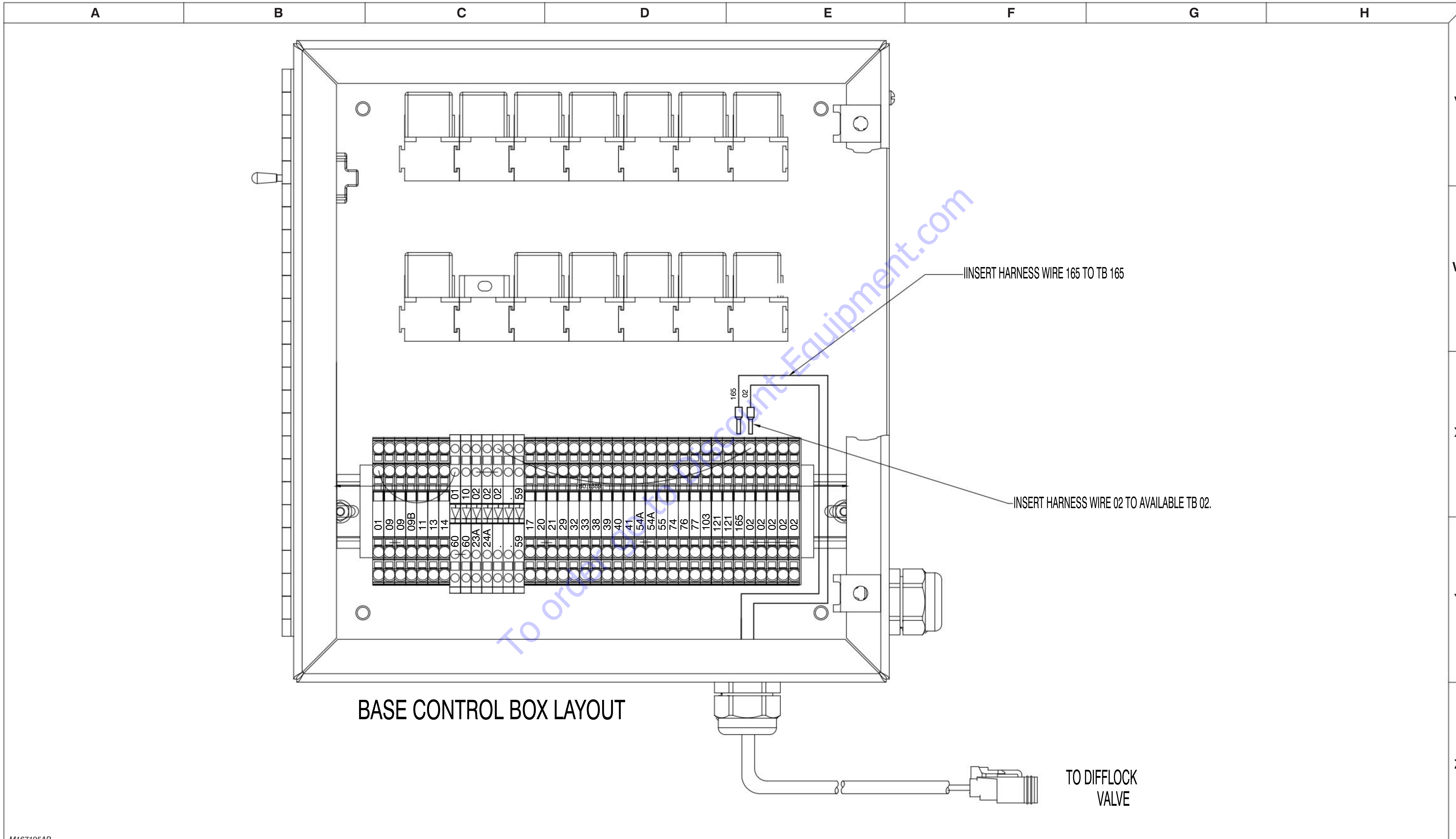
3.17 Main Harness Wiring Diagram



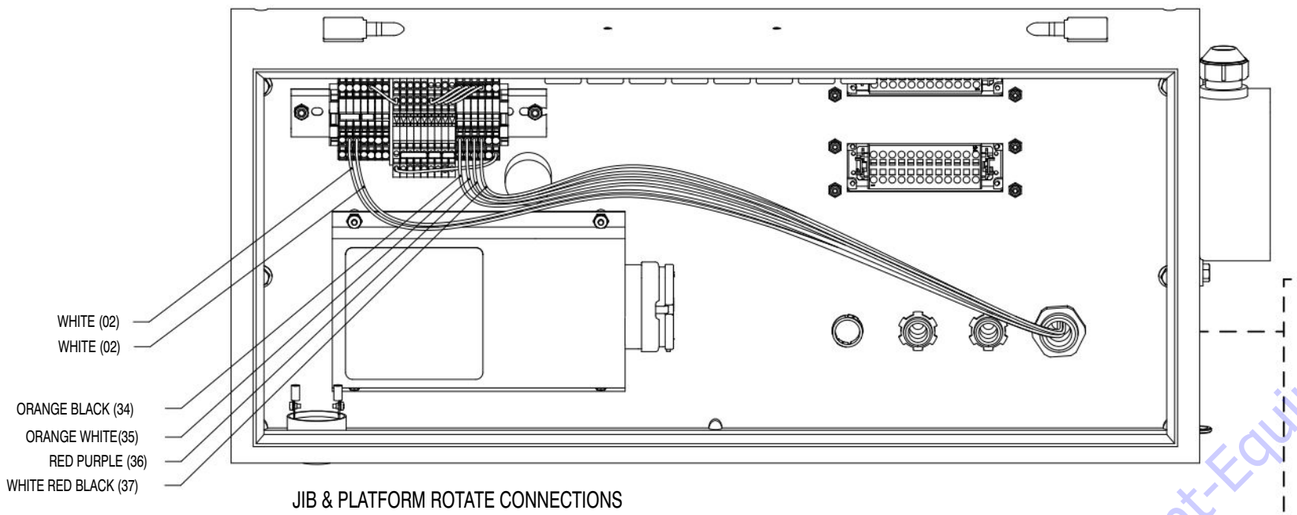
3.18 Boom Lift Valve Harness



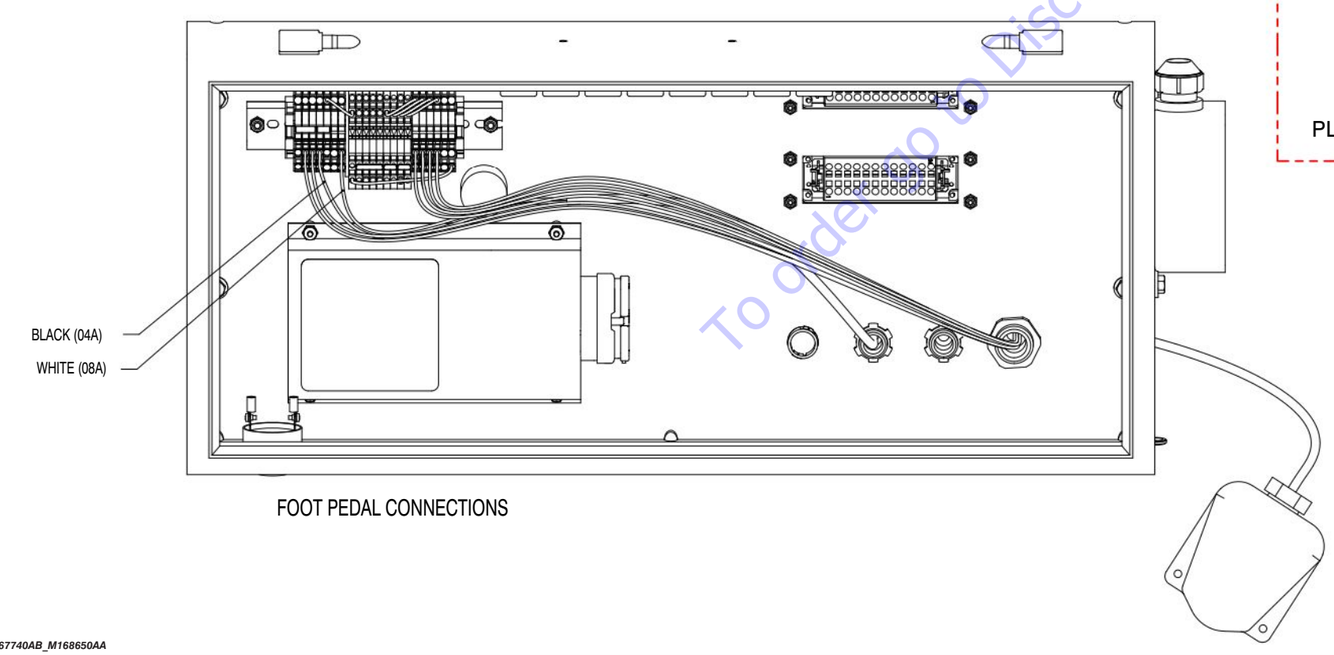
3.19 Differential Lock Harness



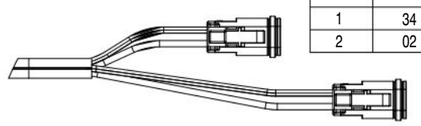
3.20 Platform Rotate & Jib Harnesses



JIB & PLATFORM ROTATE CONNECTIONS

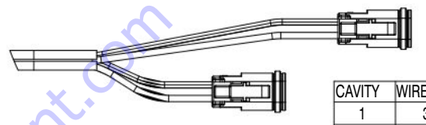


FOOT PEDAL CONNECTIONS



CAVITY	WIRE NO.	COLOUR	DESCRIPTION
1	34	ORANGE/BLK	JIB DOWN
2	02	WHITE (SPLICE 2)	GROUND

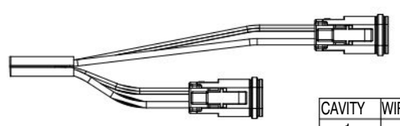
CAVITY	WIRE NO.	COLOUR	DESCRIPTION
1	35	ORANGE/WHITE	JIB UP
2	02	WHITE (SPLICE 2)	GROUND



CAVITY	WIRE NO.	COLOUR	DESCRIPTION
1	36	RED/PURPLE	ROTATE CW
2	02	WHITE (SPLICE 1)	GROUND

CAVITY	WIRE NO.	COLOUR	DESCRIPTION
1	37	WHITE/RED/BLK	ROTATE CCW
2	02	WHITE (SPLICE 1)	GROUND

JIB & PLATFORM ROTATE HARNESS - SJ86T



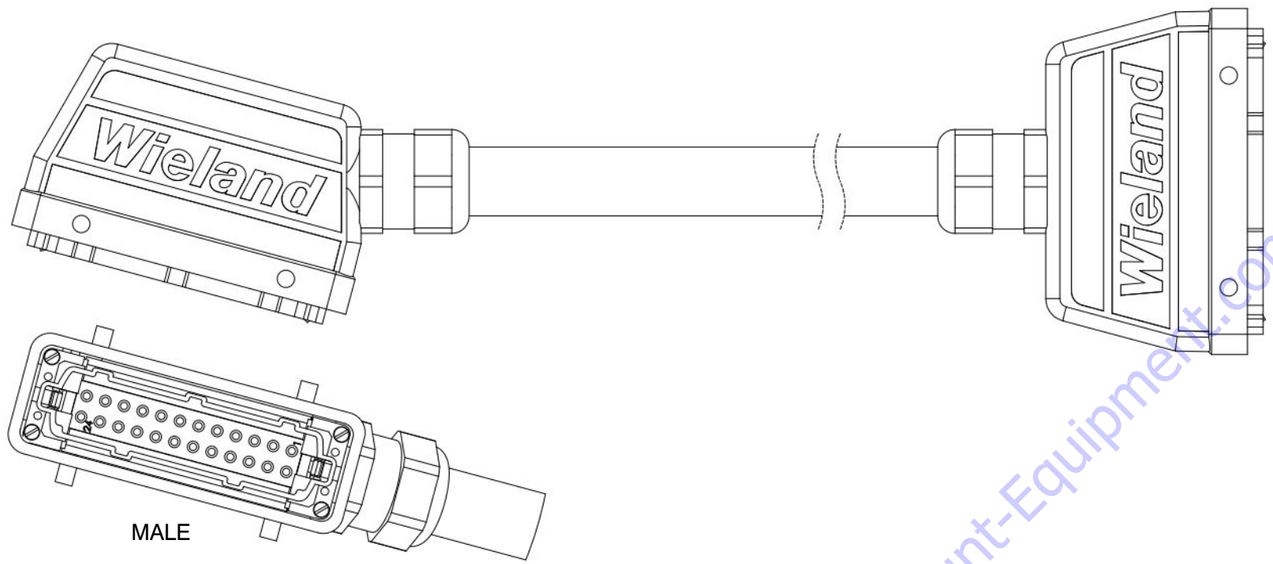
CAVITY	WIRE NO.	COLOUR	DESCRIPTION
1	36	RED/PURPLE	ROTATE CW
2	02	WHITE (SPLICE)	GROUND

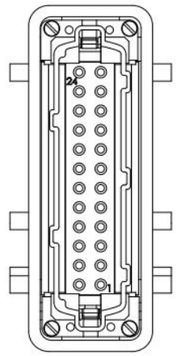
CAVITY	WIRE NO.	COLOUR	DESCRIPTION
1	37	WHITE/RED/BLK	ROTATE CCW
2	02	WHITE (SPLICE)	GROUND

PLATFORM ROTATE HARNESS - SJ81T

M168644AB_M167740AB_M168650AA

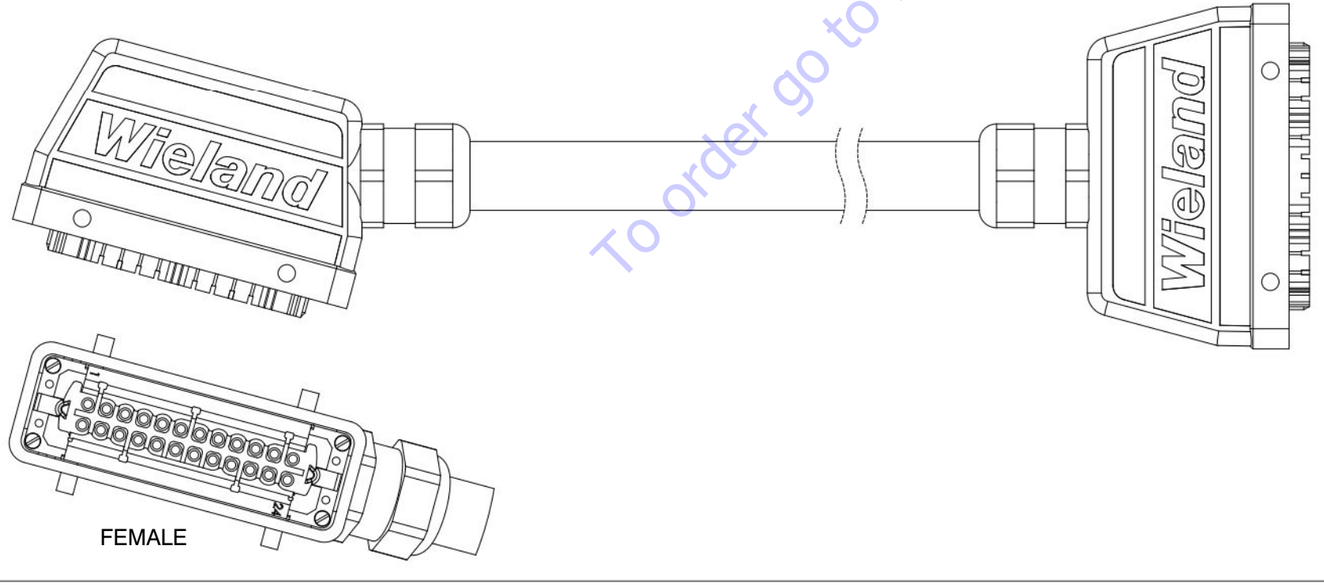
3.21 Platform to Base Control Cable Harnesses

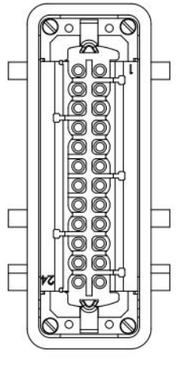




BASE & PLATFORM CONNECTIONS

POSITION 1 - WIRE 1
POSITION 2 - WIRE 2
POSITION 3 - WIRE 3
POSITION 4 - WIRE 4
POSITION 5 - WIRE 5
POSITION 6 - WIRE 6
POSITION 7 - WIRE 7
POSITION 8 - WIRE 8
POSITION 9 - WIRE 9
POSITION 10 - WIRE 10
POSITION 11 - WIRE 11
POSITION 12 - WIRE 12
POSITION 13 - WIRE 13
POSITION 14 - WIRE 14
POSITION 15 - WIRE 15
POSITION 16 - WIRE 16
POSITION 17 - WIRE 17
POSITION 18 - WIRE 18
POSITION 19 - WIRE 19
POSITION 20 - WIRE 20
POSITION 21 - WIRE 21
POSITION 22 - WIRE 22
POSITION 23 - WIRE 23
POSITION 24 - WIRE 24





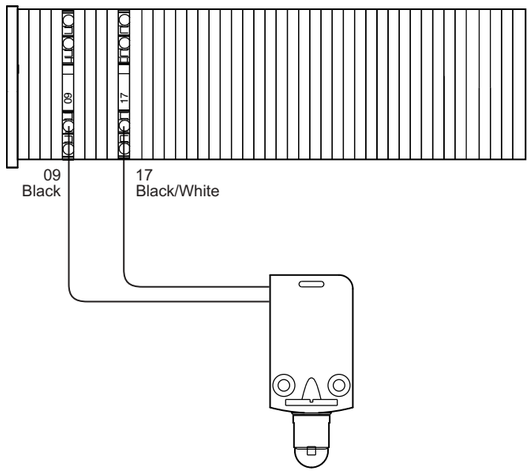
BASE & PLATFORM CONNECTIONS

POSITION 1 - WIRE 1
POSITION 2 - WIRE 2
POSITION 3 - WIRE 3
POSITION 4 - WIRE 4
POSITION 5 - WIRE 5
POSITION 6 - WIRE 6
POSITION 7 - WIRE 7
POSITION 8 - WIRE 8
POSITION 9 - WIRE 9
POSITION 10 - WIRE 10
POSITION 11 - WIRE 11
POSITION 12 - WIRE 12
POSITION 13 - WIRE 13
POSITION 14 - WIRE 14
POSITION 15 - WIRE 15
POSITION 16 - WIRE 16
POSITION 17 - WIRE 17
POSITION 18 - WIRE 18
POSITION 19 - WIRE 19
POSITION 20 - WIRE 20
POSITION 21 - WIRE 21
POSITION 22 - WIRE 22
POSITION 23 - WIRE 23
POSITION 24 - WIRE 24

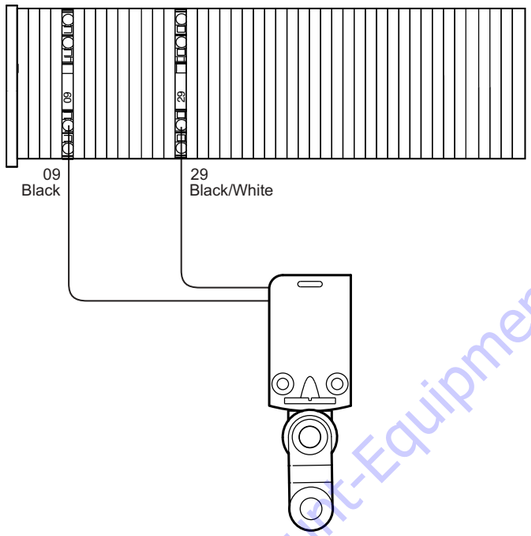
M165497AD_M165499AD

3.22 Limit Switch Connections

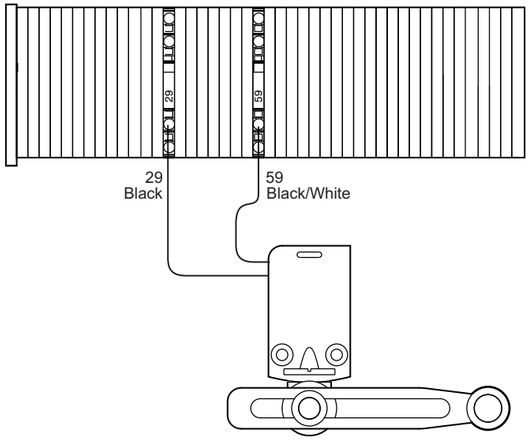
LS1 - Direction Sensing Limit Switch



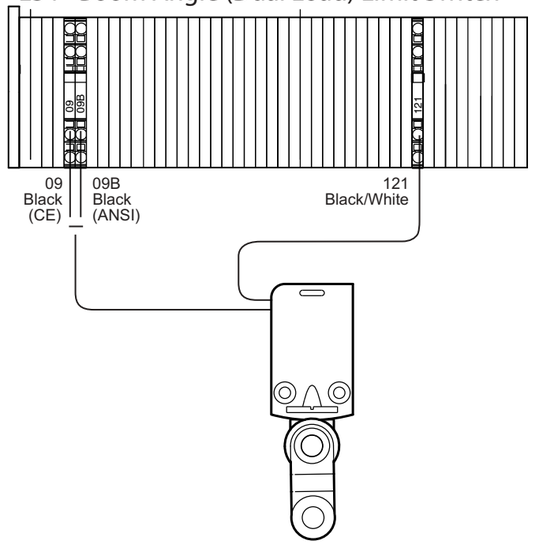
LS2 - High Speed / Tilt Override Limit Switch



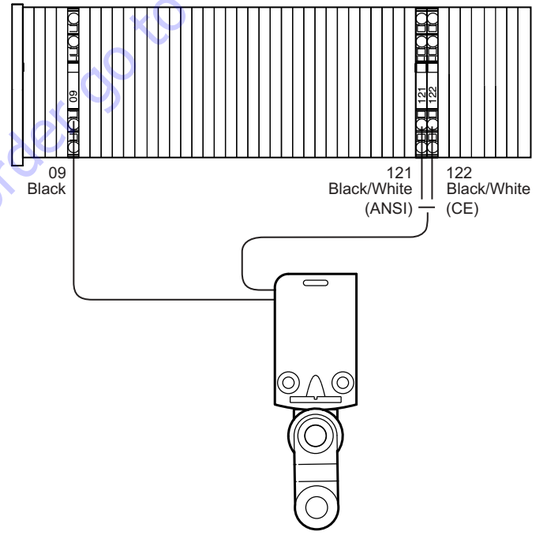
LS3 - Fly In Limit Switch



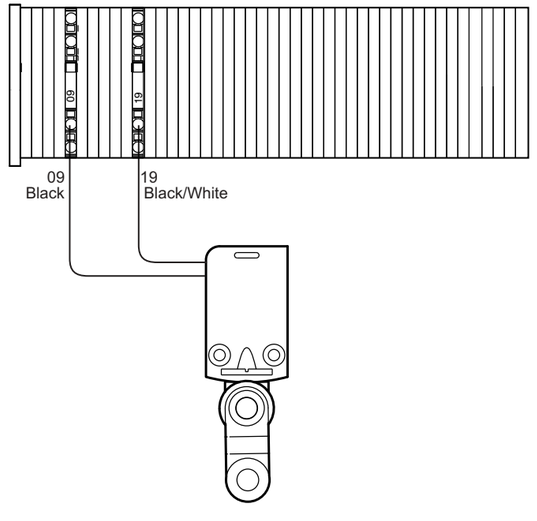
LS4 - Boom Angle (Dual Load) Limit Switch



LS5 - Boom Extension (Dual Load) Limit Switch

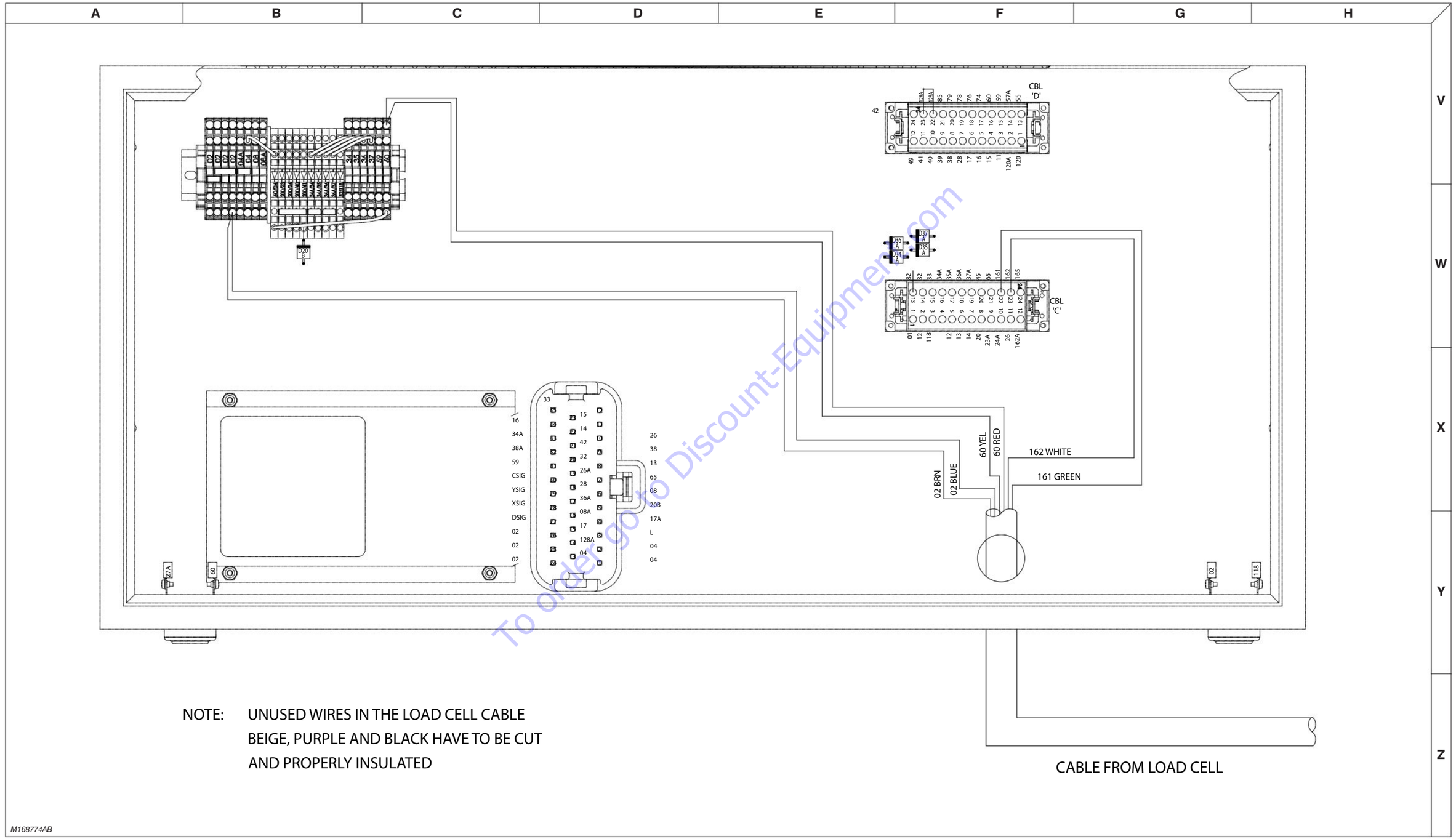


LS6 - Lift Cushion Limit Switch



M63752AA

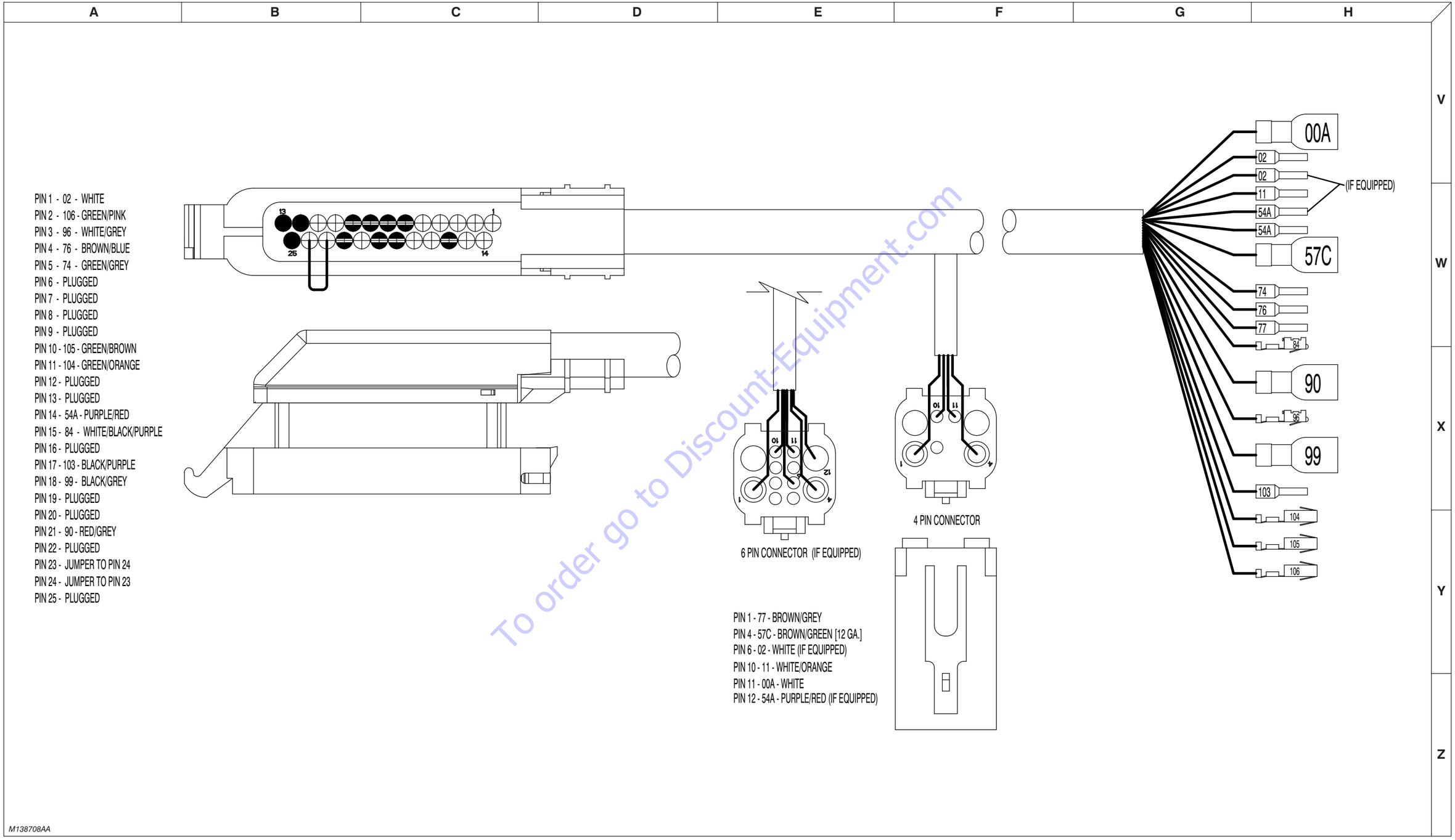
3.23 Load Sensing Cable Connection - CE & AS



NOTE: UNUSED WIRES IN THE LOAD CELL CABLE BEIGE, PURPLE AND BLACK HAVE TO BE CUT AND PROPERLY INSULATED

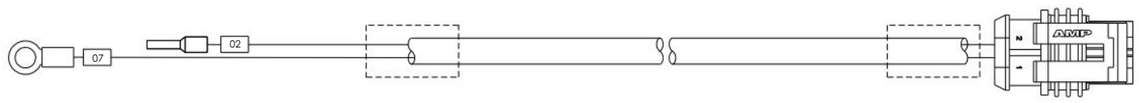
M168774AB

3.24 ECU Engine Wiring Diagram - Deutz Diesel Engine



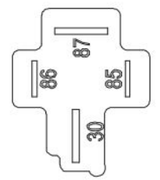
M138708AA

3.25 Glow Plug and EGR Harnesses - Deutz Diesel Engine

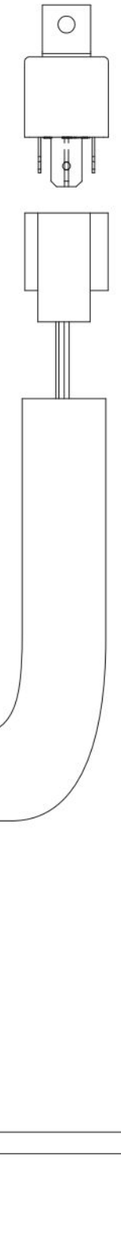


EGR CONNECTOR PIN OUT
CAVITY 1 = 07 WHITE
CAVITY 2 = 02 BLACK

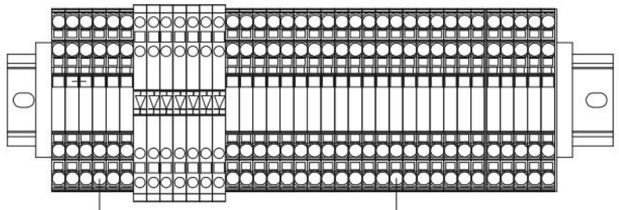
RELAY CONNECTOR PIN-OUT
30 - 11A RED
85 - 54A BLK
86 - 11 WHT
87 - 11B RED



TO AIR BOX



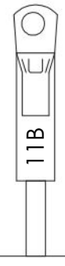
BASE CONTROL BOX TERMINAL STRIP WIRING:



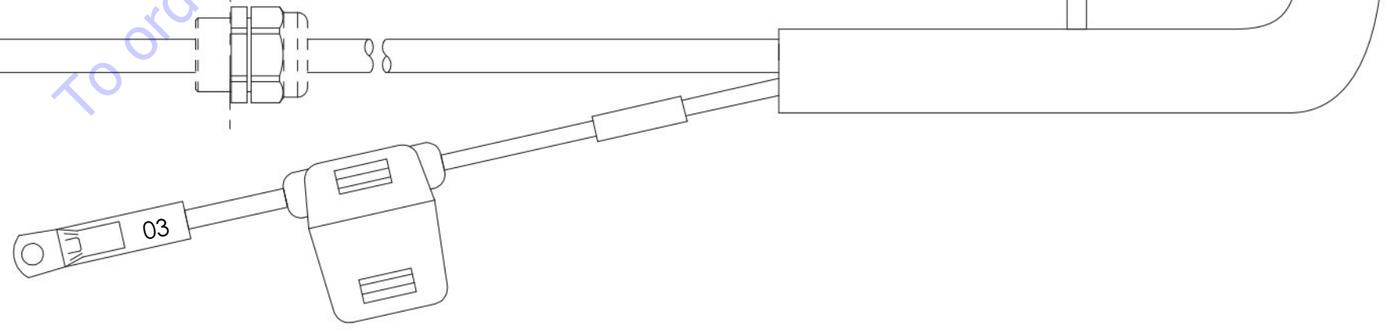
11 WHT

54A BLK

TO ENGINE GLOW PLUG
POWER FEED STUD

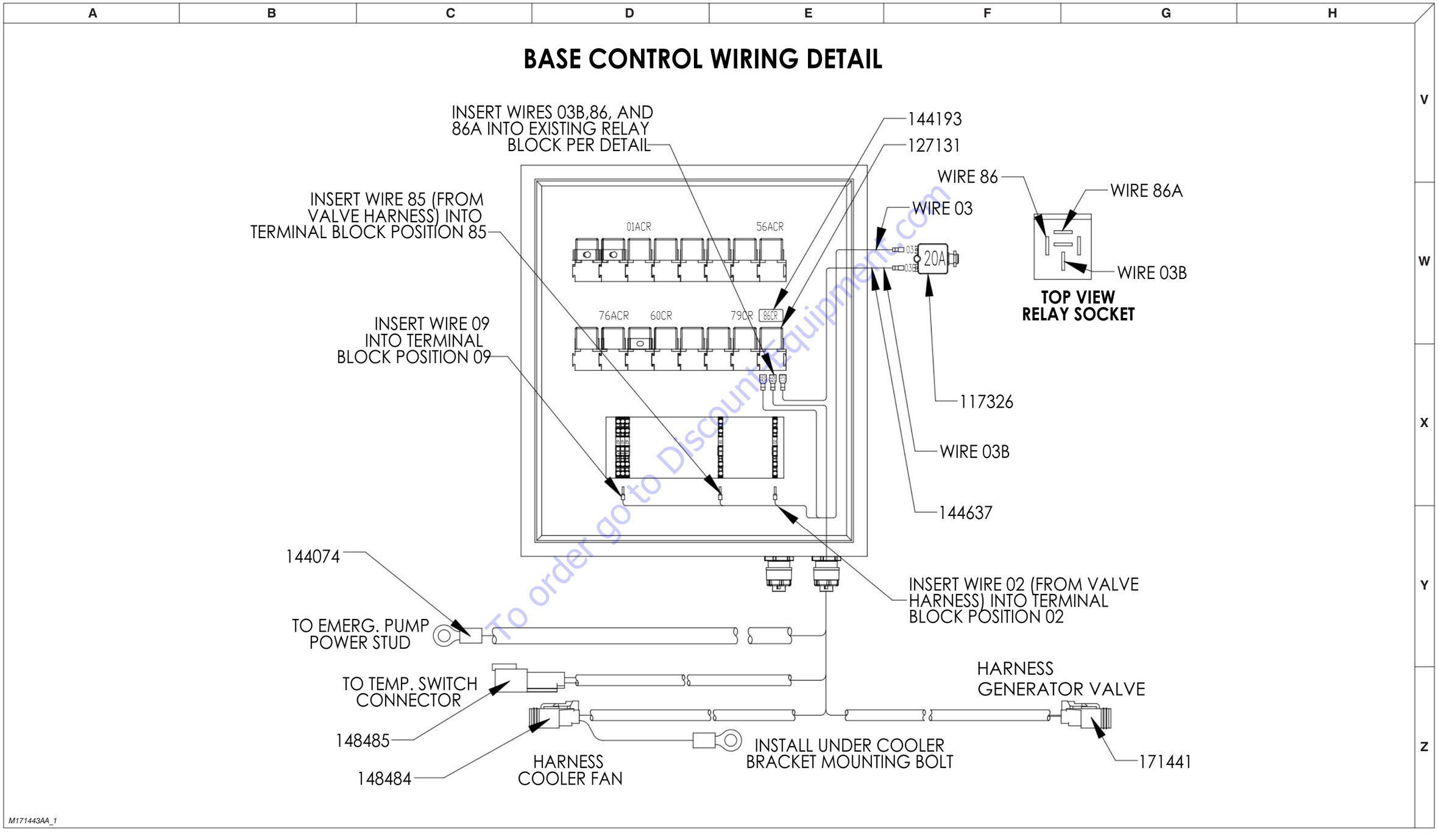


TO ENGINE STARTER



M138849AB

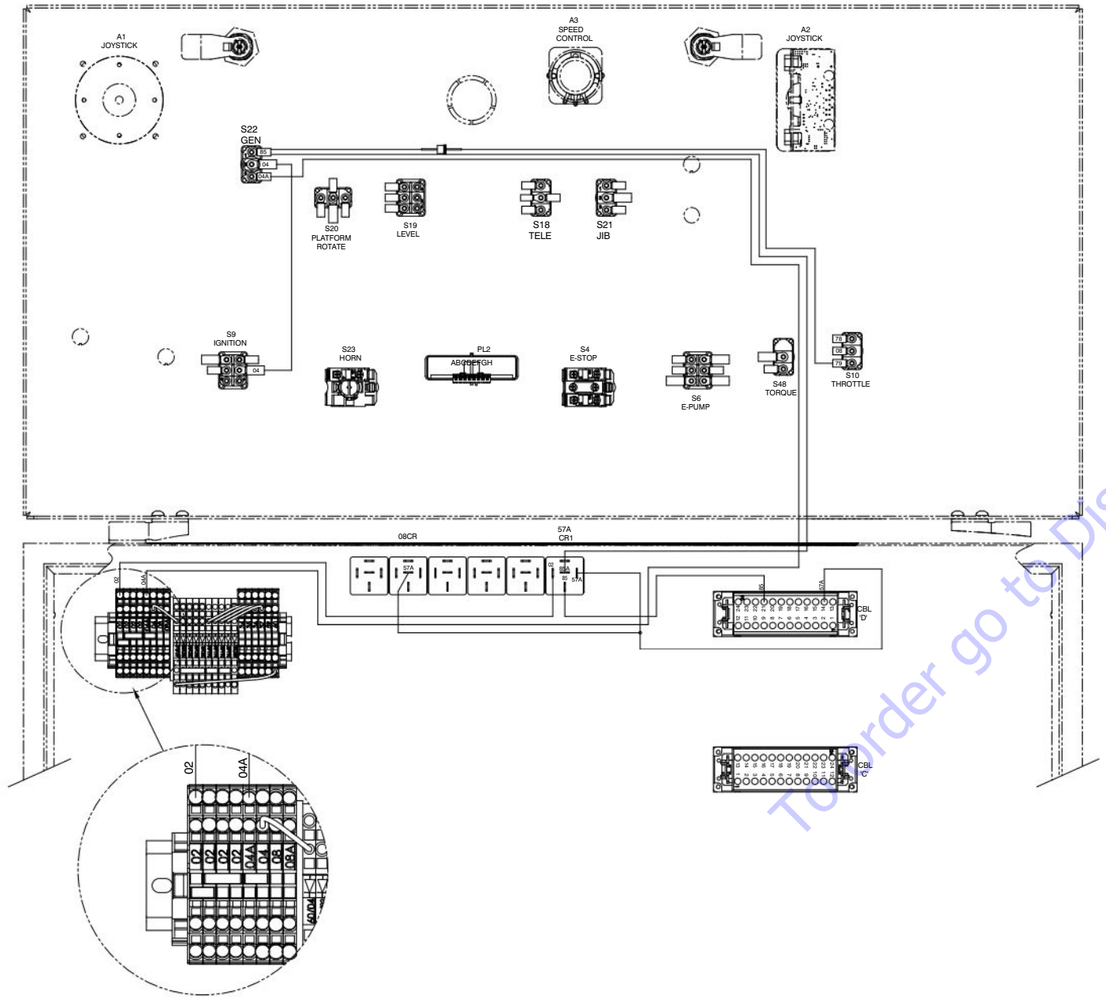
3.26 Generator and Oil Cooler Harness Connections



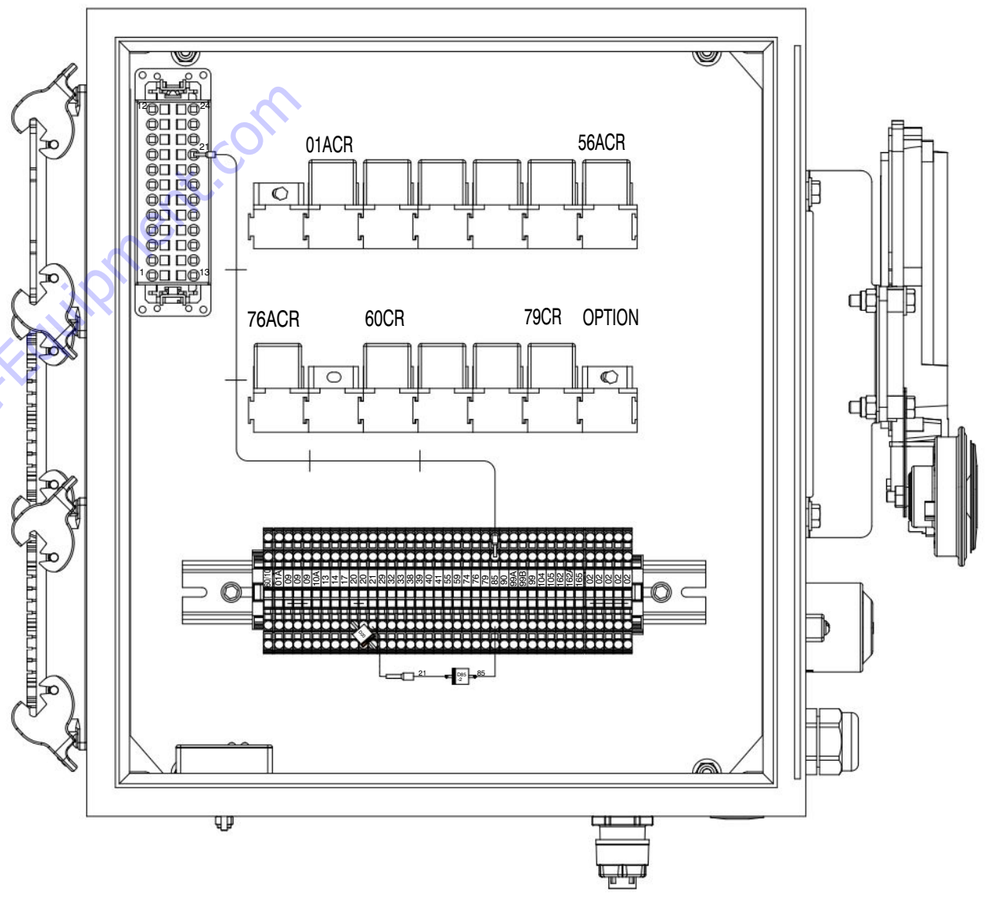
3.27 Generator Wiring

A	B	C	D	E	F	G	H

Platform Control Box

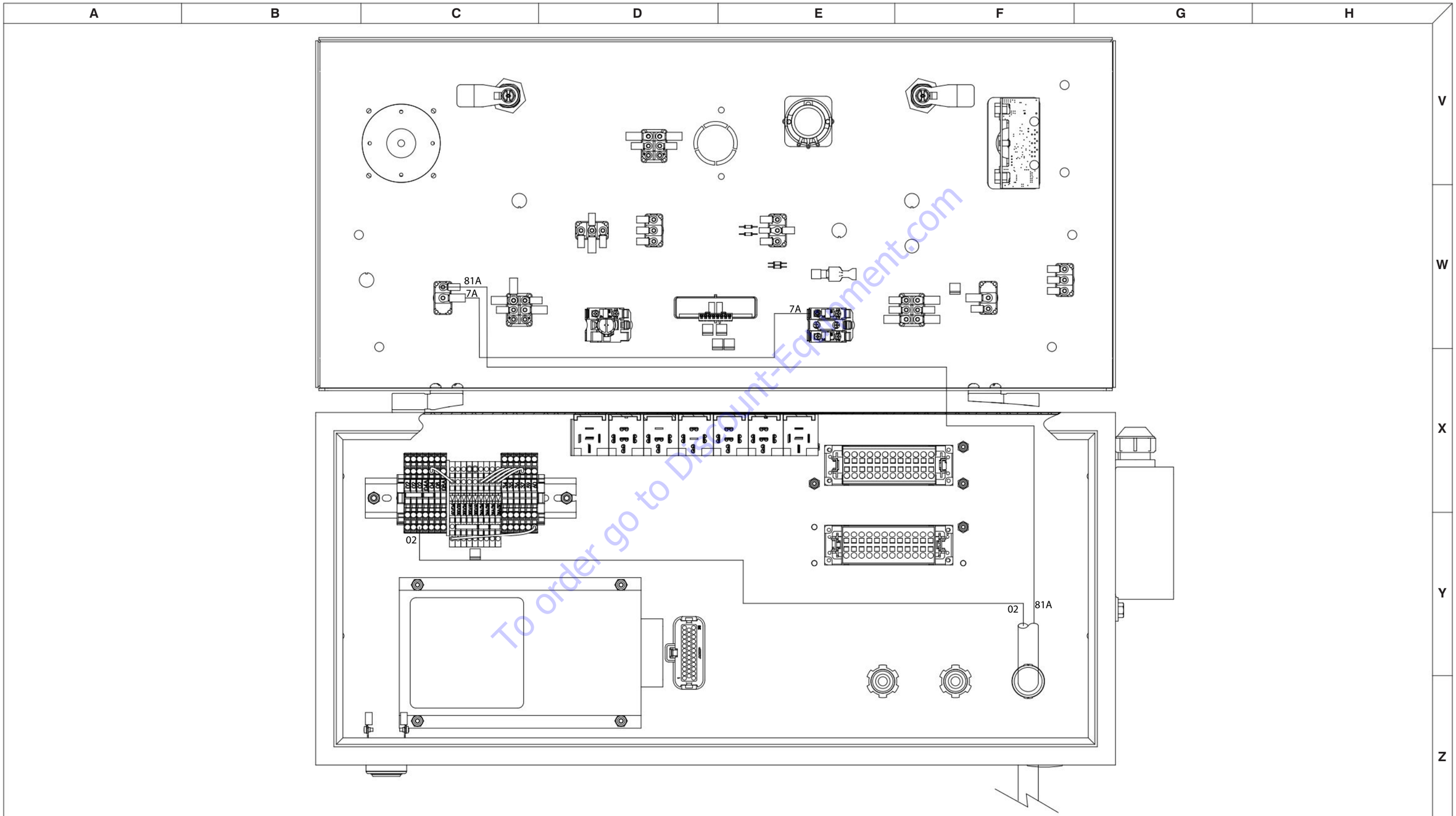


Base Control Box



M169566AC_M166385AA

3.28 Platform Work Light



3.29 Positive Air Shut-Off Option Harness

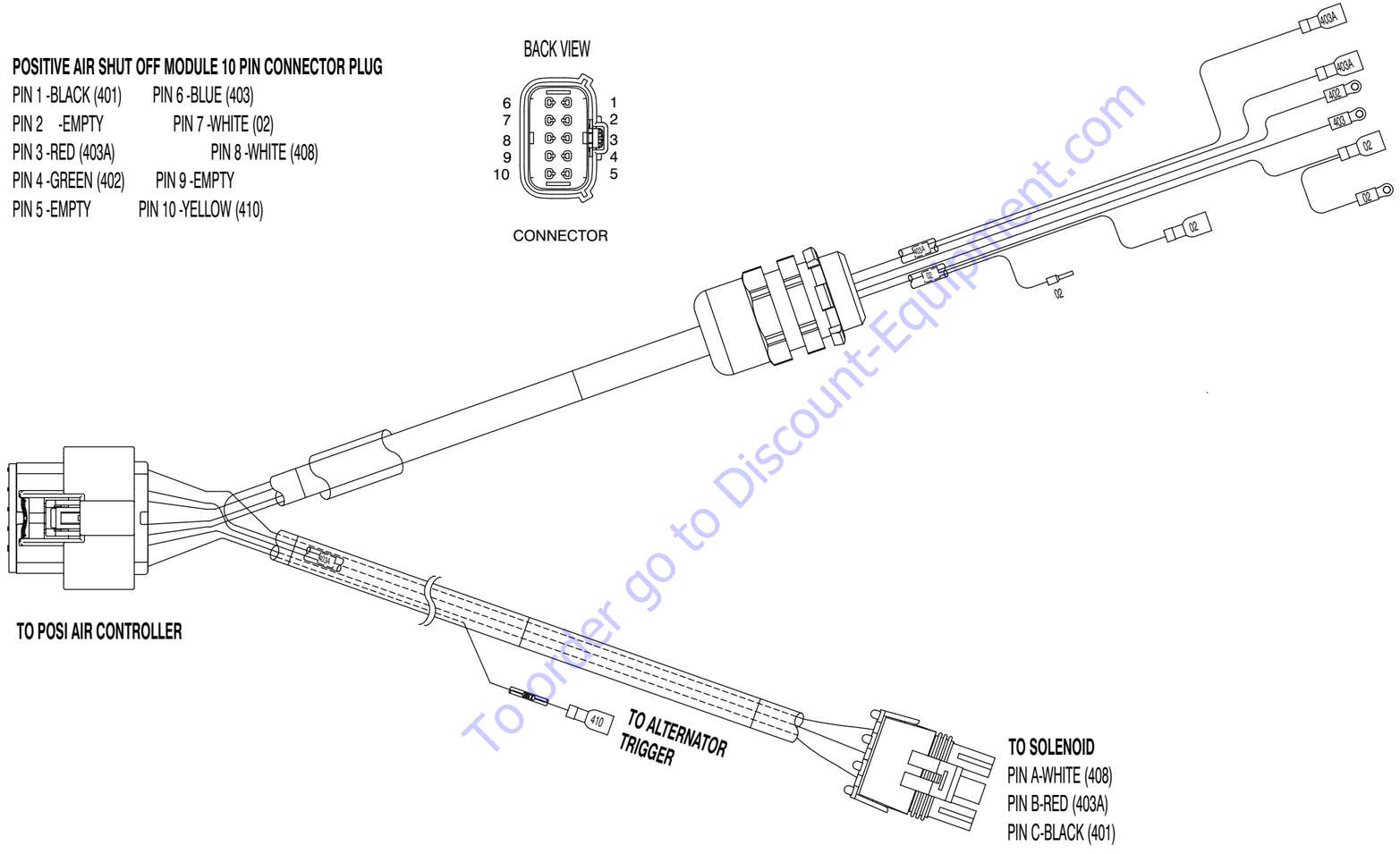
A	B	C	D	E	F	G	H

POSITIVE AIR SHUT OFF MODULE 10 PIN CONNECTOR PLUG

PIN 1 -BLACK (401) PIN 6 -BLUE (403)
PIN 2 -EMPTY PIN 7 -WHITE (02)
PIN 3 -RED (403A) PIN 8 -WHITE (408)
PIN 4 -GREEN (402) PIN 9 -EMPTY
PIN 5 -EMPTY PIN 10 -YELLOW (410)

BACK VIEW

CONNECTOR



TO ELECTRICAL PANEL
403A RED
402 GREEN
403 BLUE
02 WHITE (GROUND)

TO POSI AIR CONTROLLER

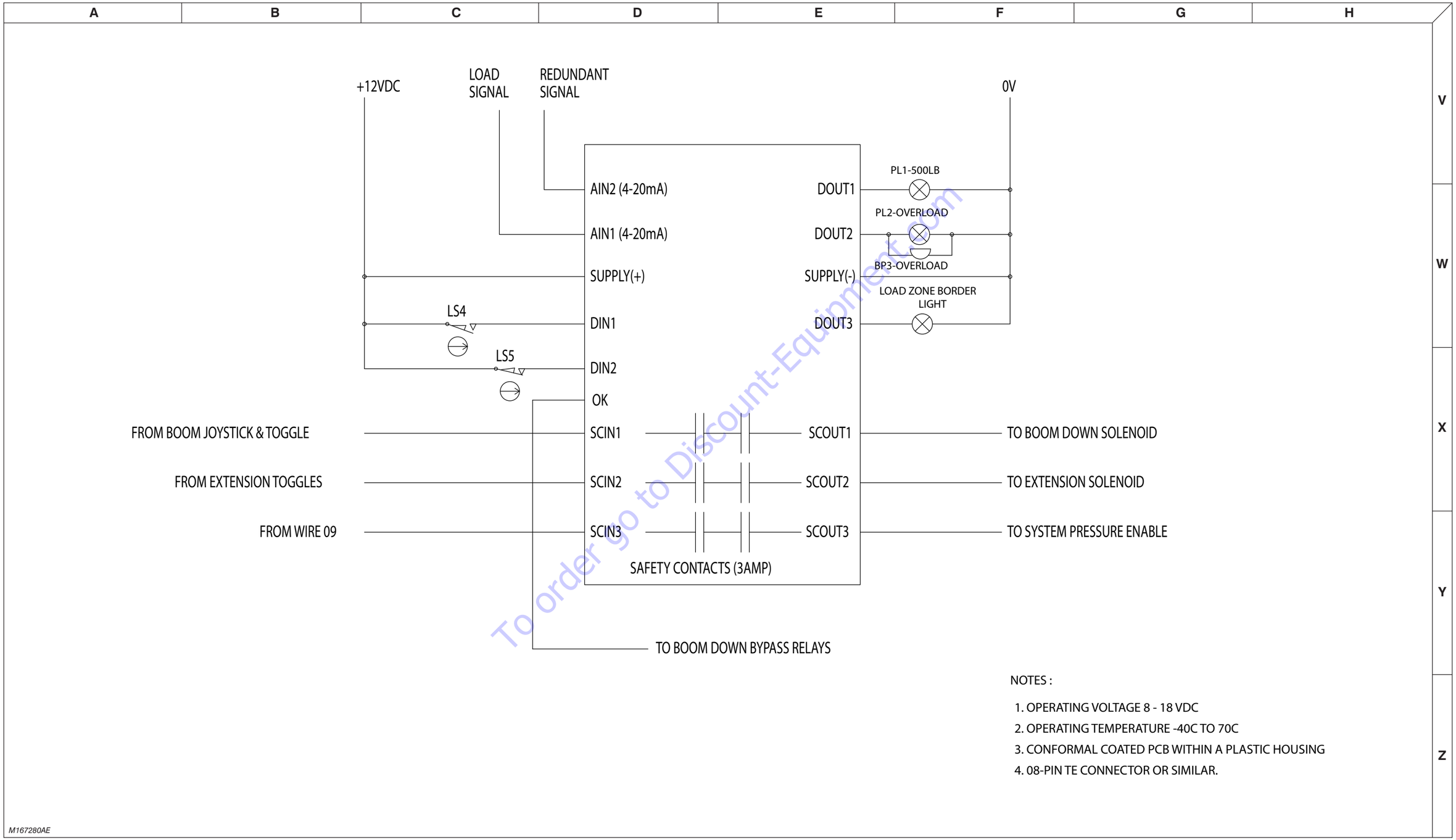
TO ALTERNATOR TRIGGER

TO SOLENOID
PIN A-WHITE (408)
PIN B-RED (403A)
PIN C-BLACK (401)

M171529AA-2

V	W	X	Y	Z

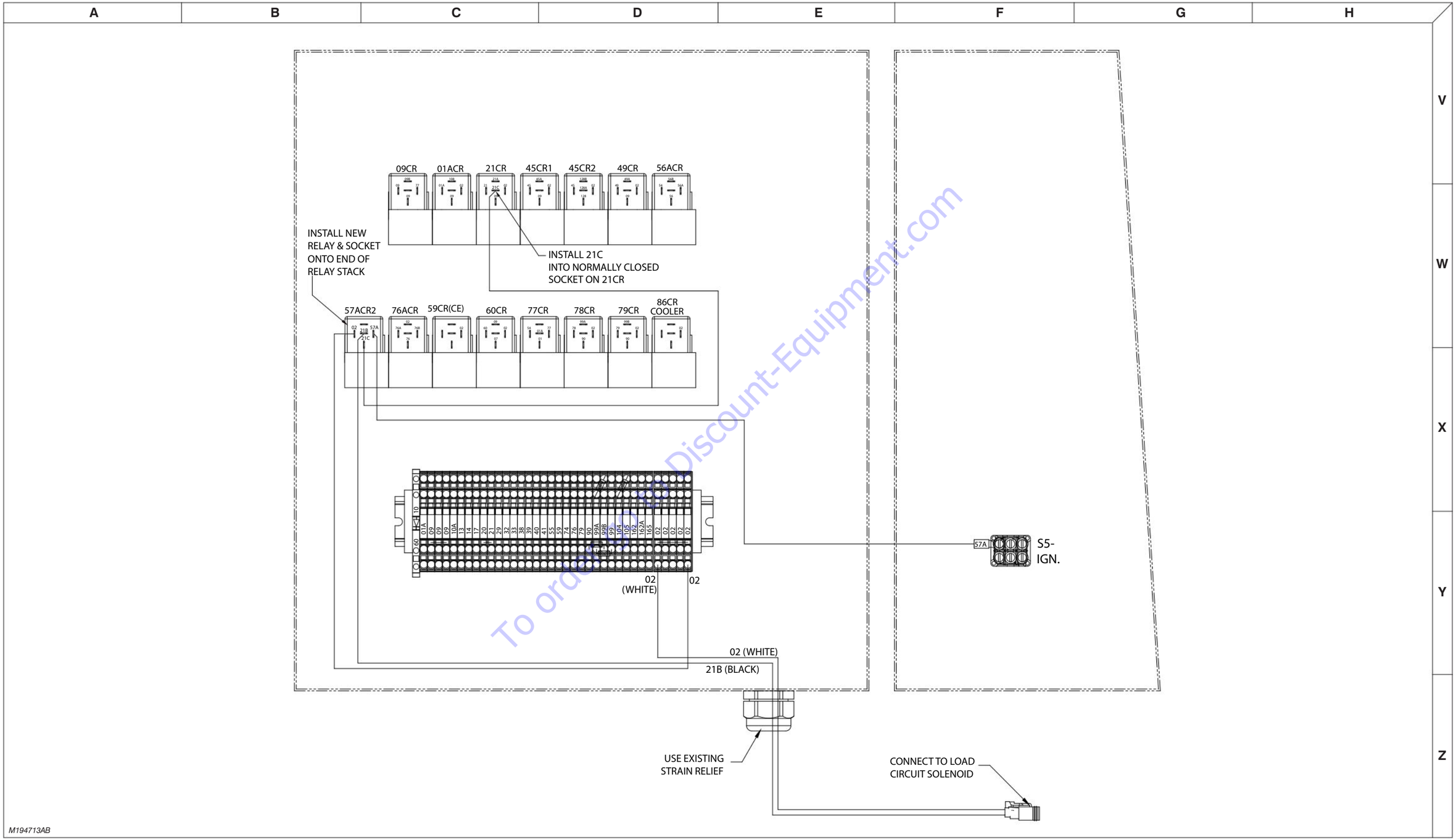
3.30 Dual Capacity Sensing Module



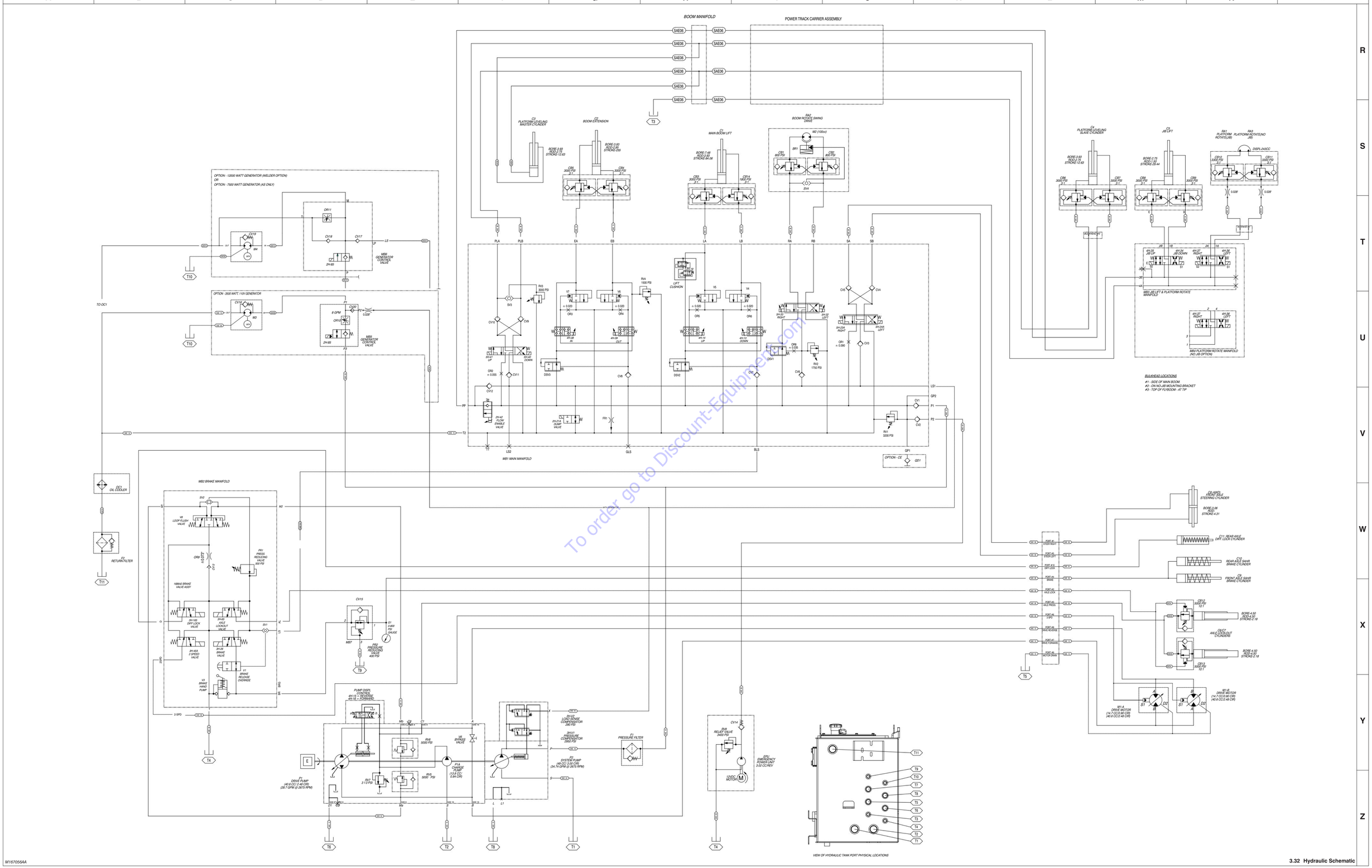
NOTES :

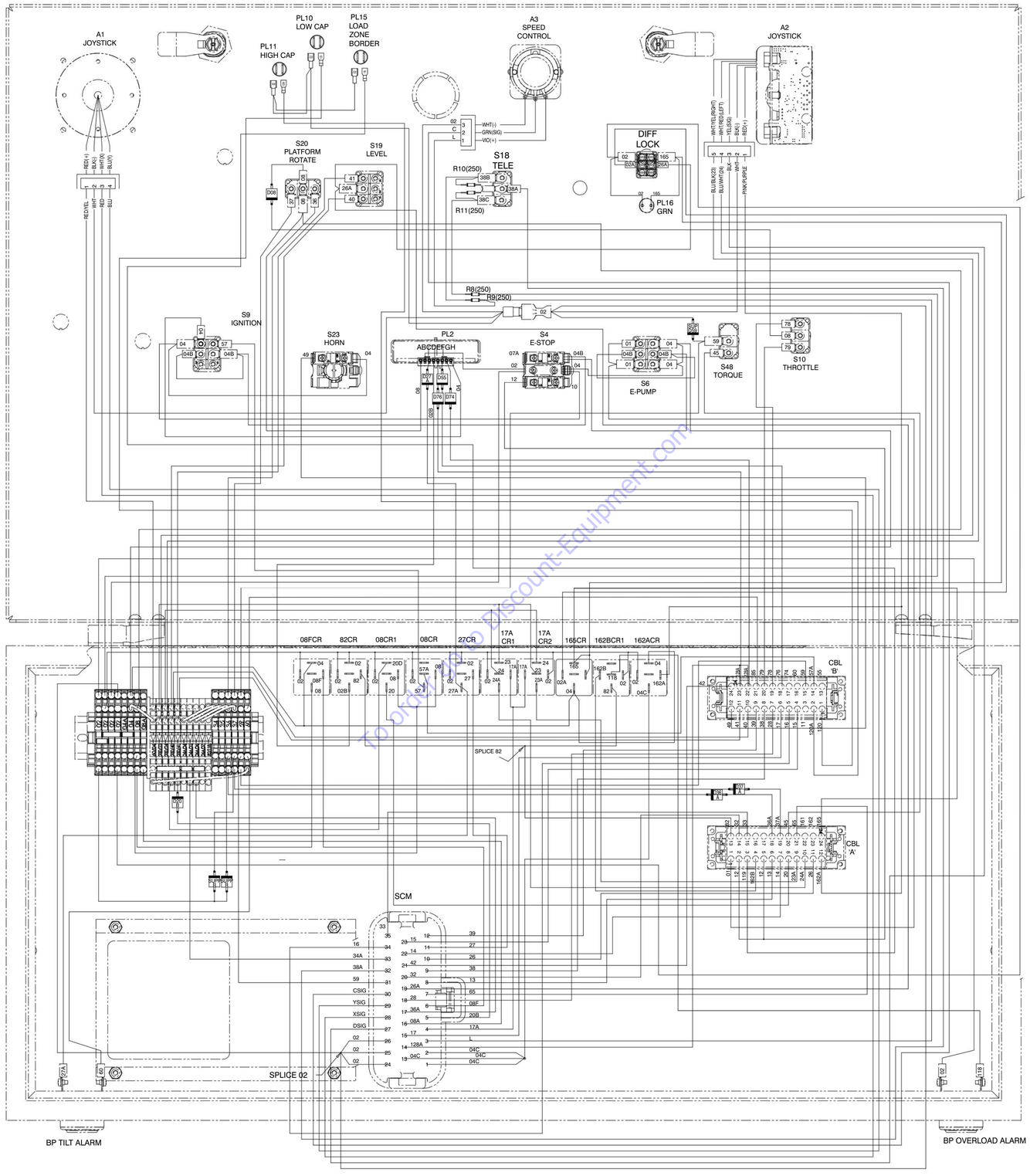
1. OPERATING VOLTAGE 8 - 18 VDC
2. OPERATING TEMPERATURE -40C TO 70C
3. CONFORMAL COATED PCB WITHIN A PLASTIC HOUSING
4. 08-PIN TE CONNECTOR OR SIMILAR.

3.31 Load Circuit - ANSI/CSA with Deutz TD2.9L and Arctic Package

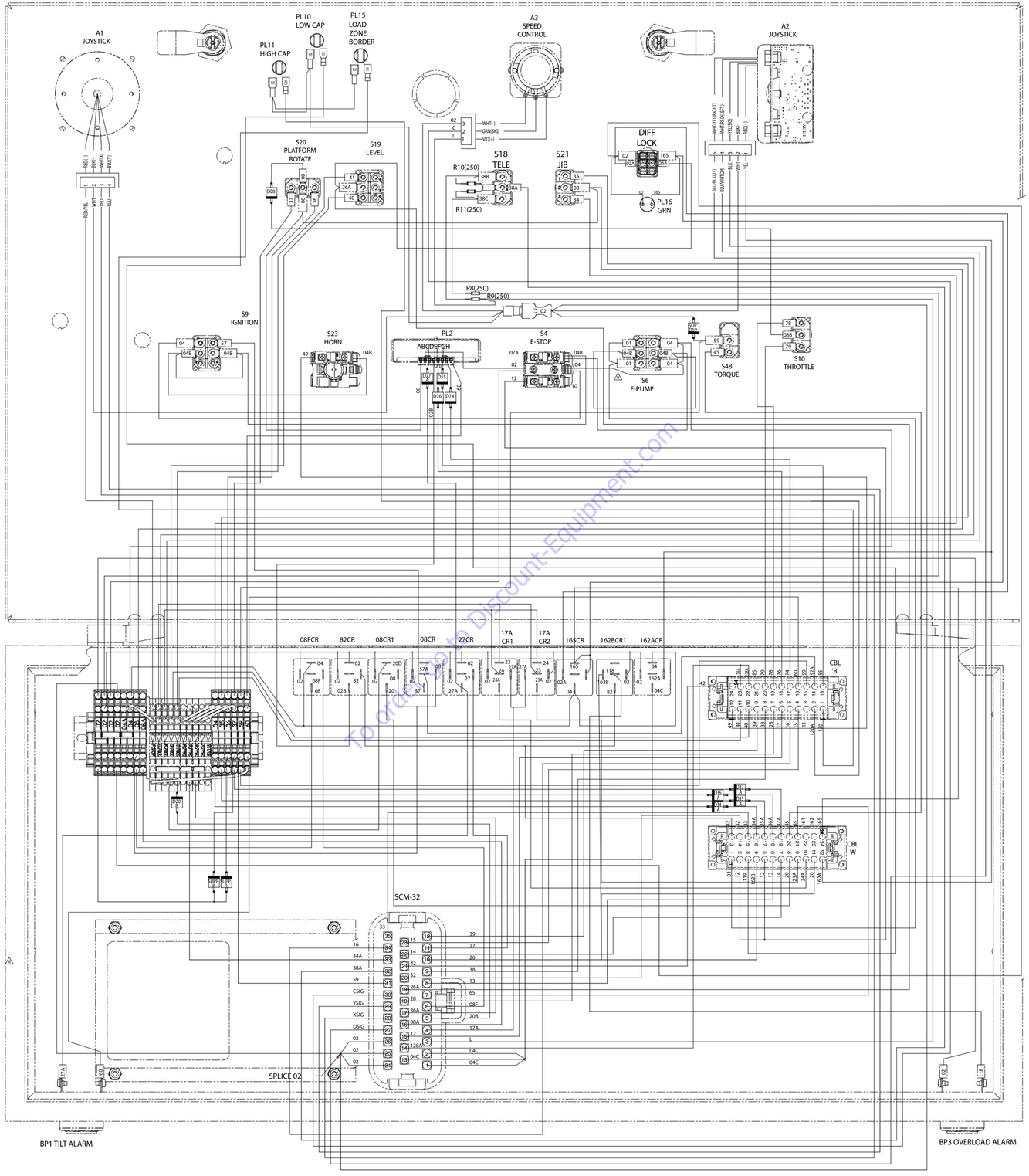


3.32 Hydraulic Schematic



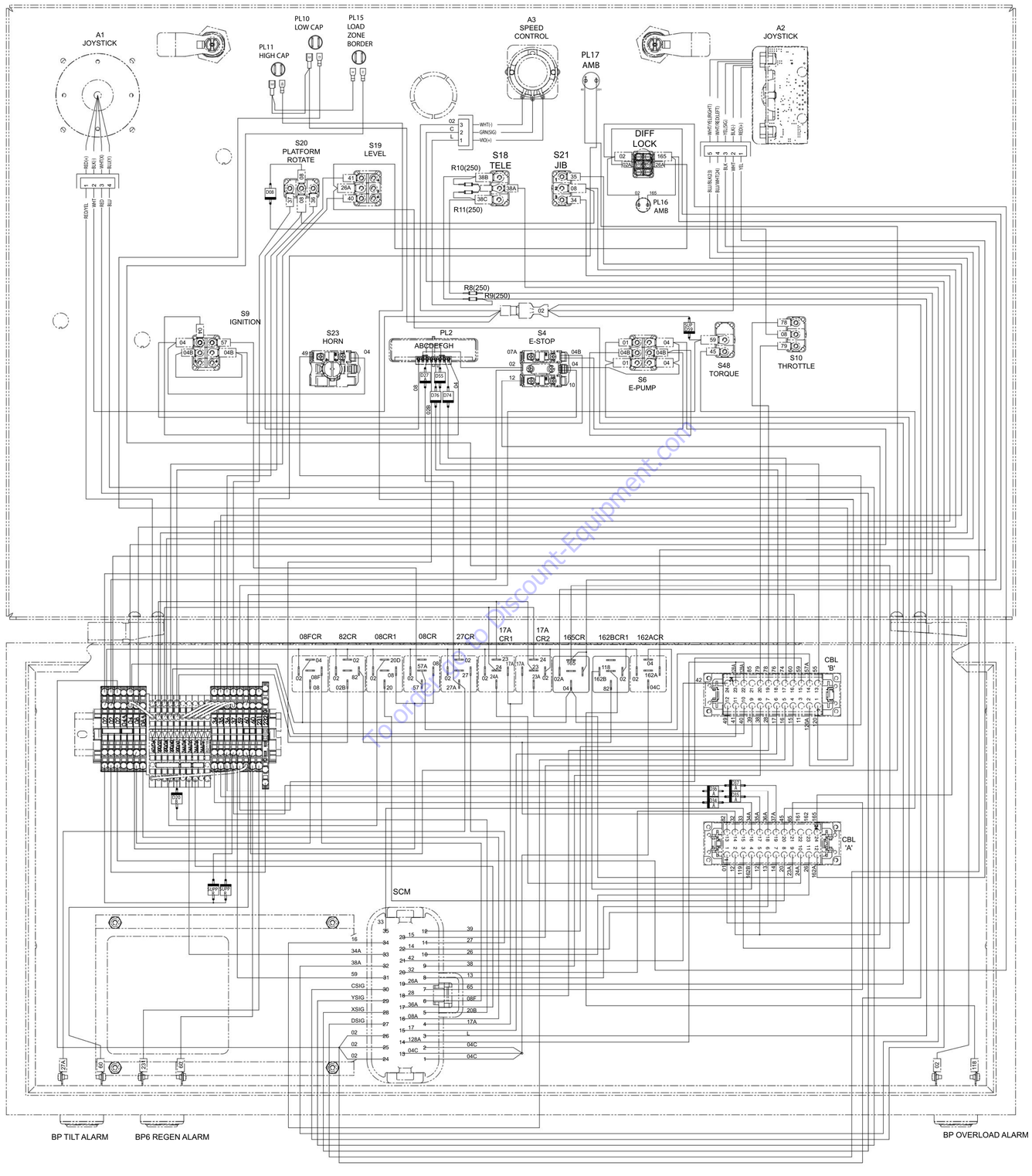


M218444AD



M231432AB

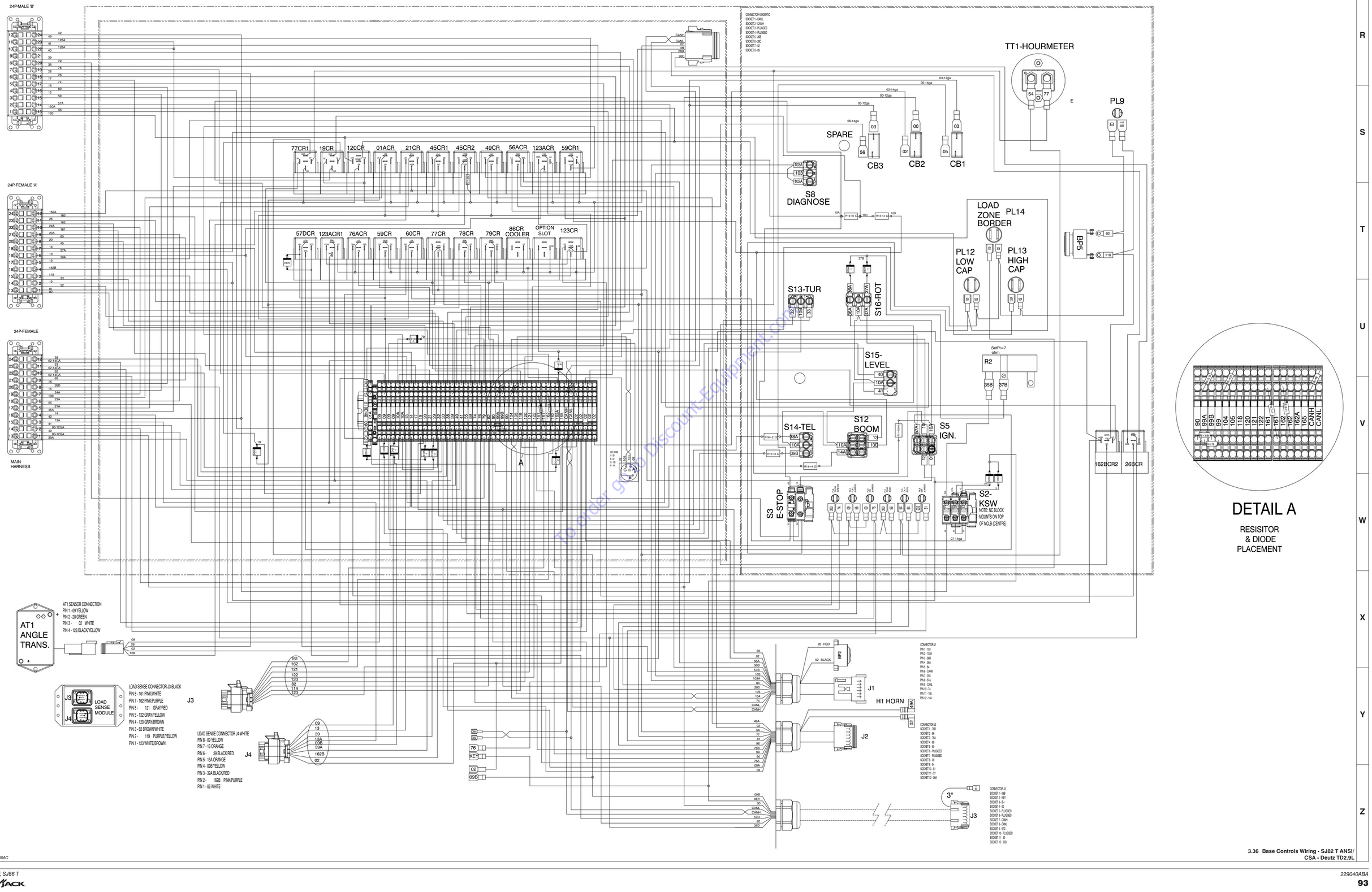
3.35 Platform Controls Wiring - SJ86 T with Deutz TCD2.2 Engine



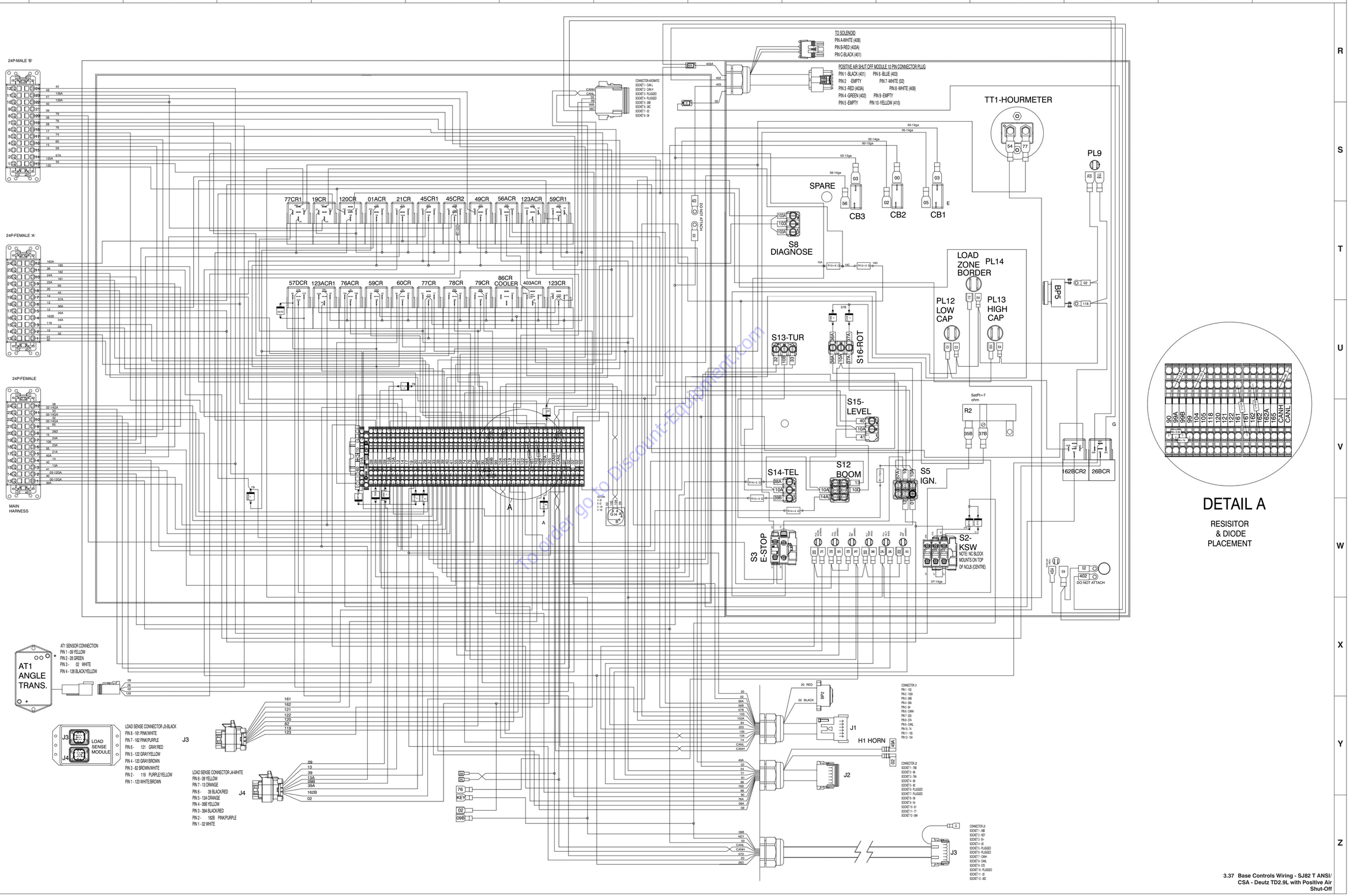
M224640AD

3.35 Platform Controls Wiring - SJ86 T with Deutz TCD2.2 Engine

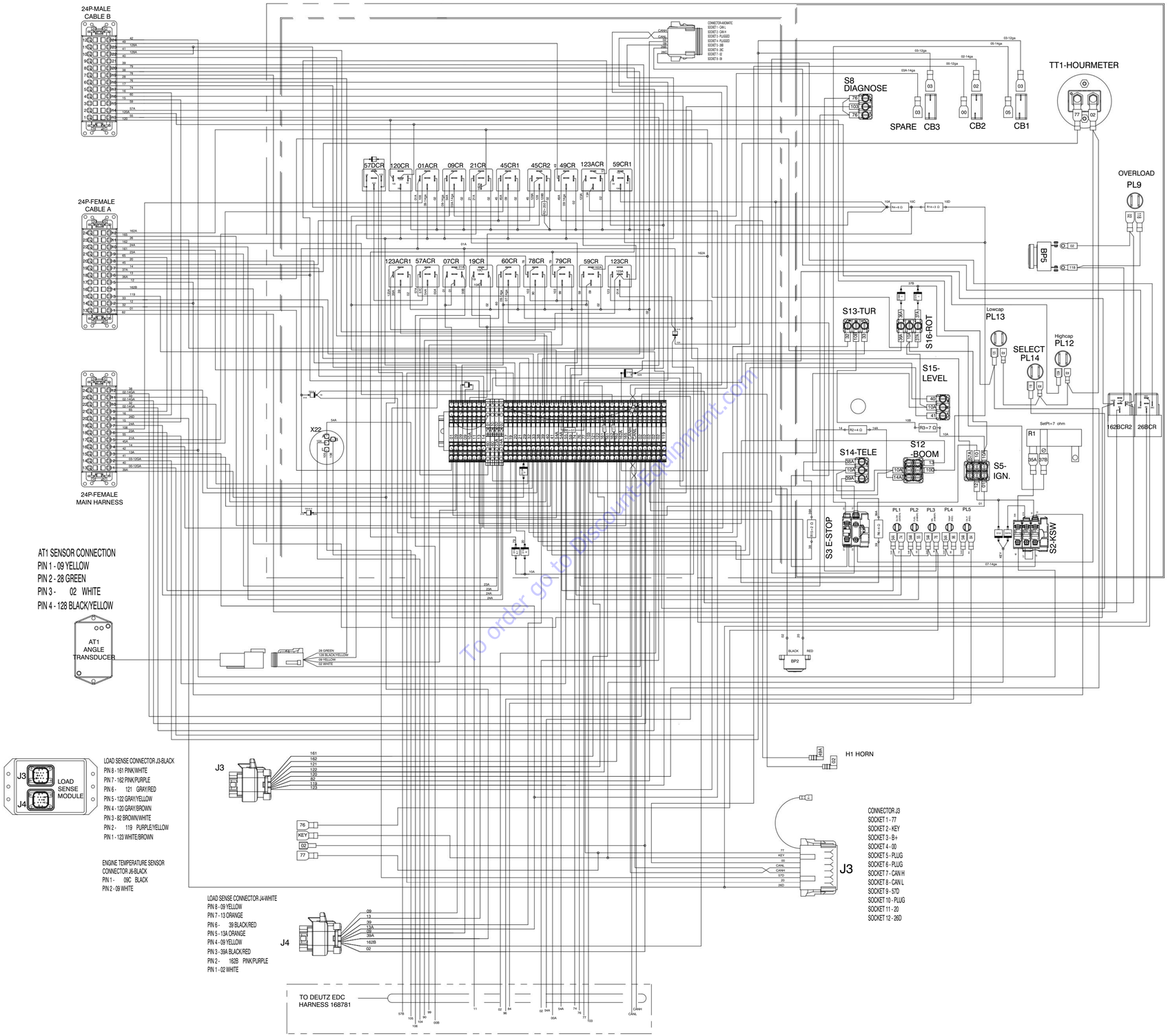
3.36 Base Controls Wiring - SJ82 T ANSI/CSA - Deutz TD2.9L



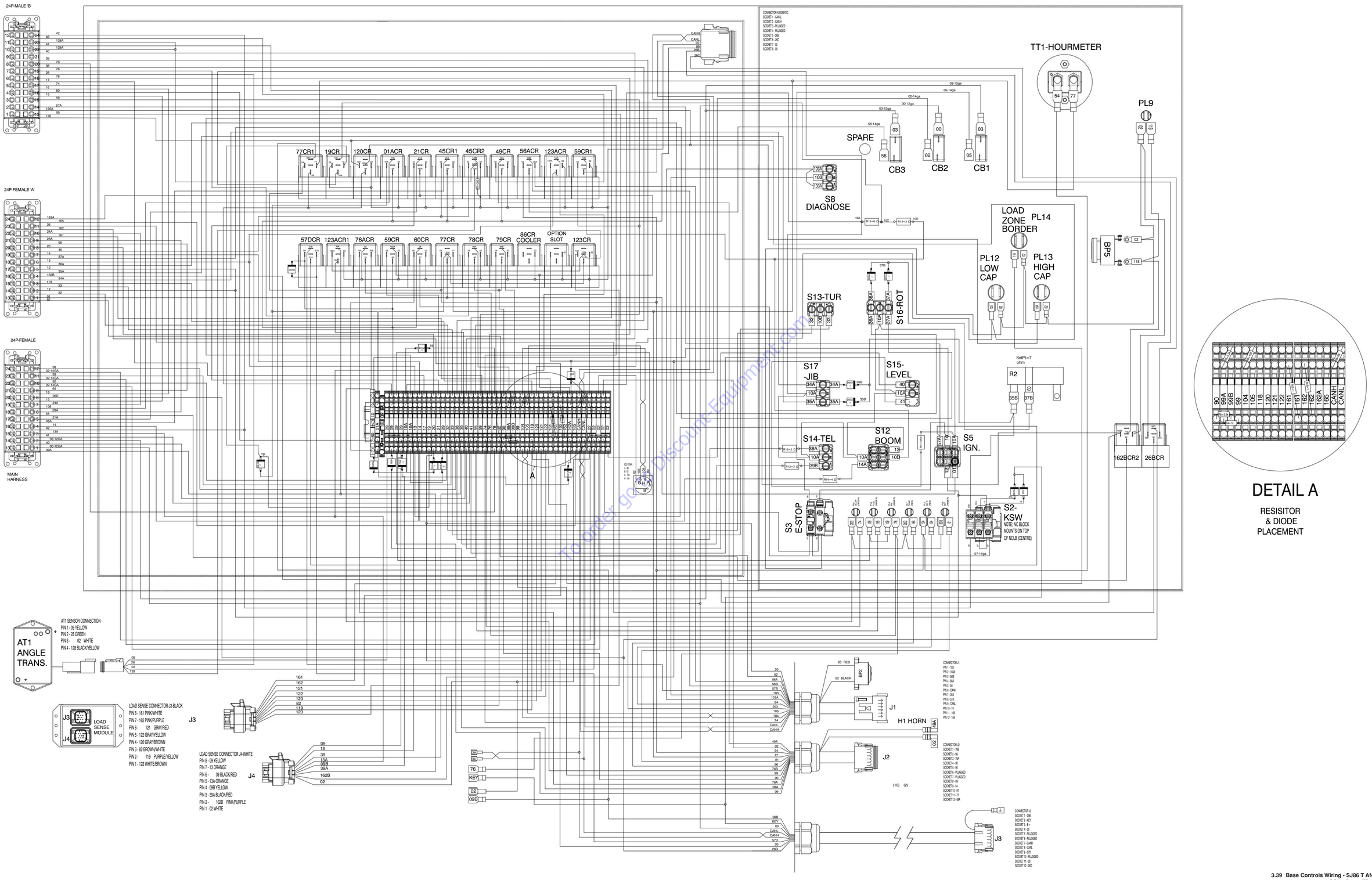
3.37 Base Controls Wiring - SJ82 T ANSI/CSA - Deutz TD2.9L with Positive Air Shut-Off



3.38 Base Controls Wiring - SJ82 T ANSI/CSA - Deutz D2011



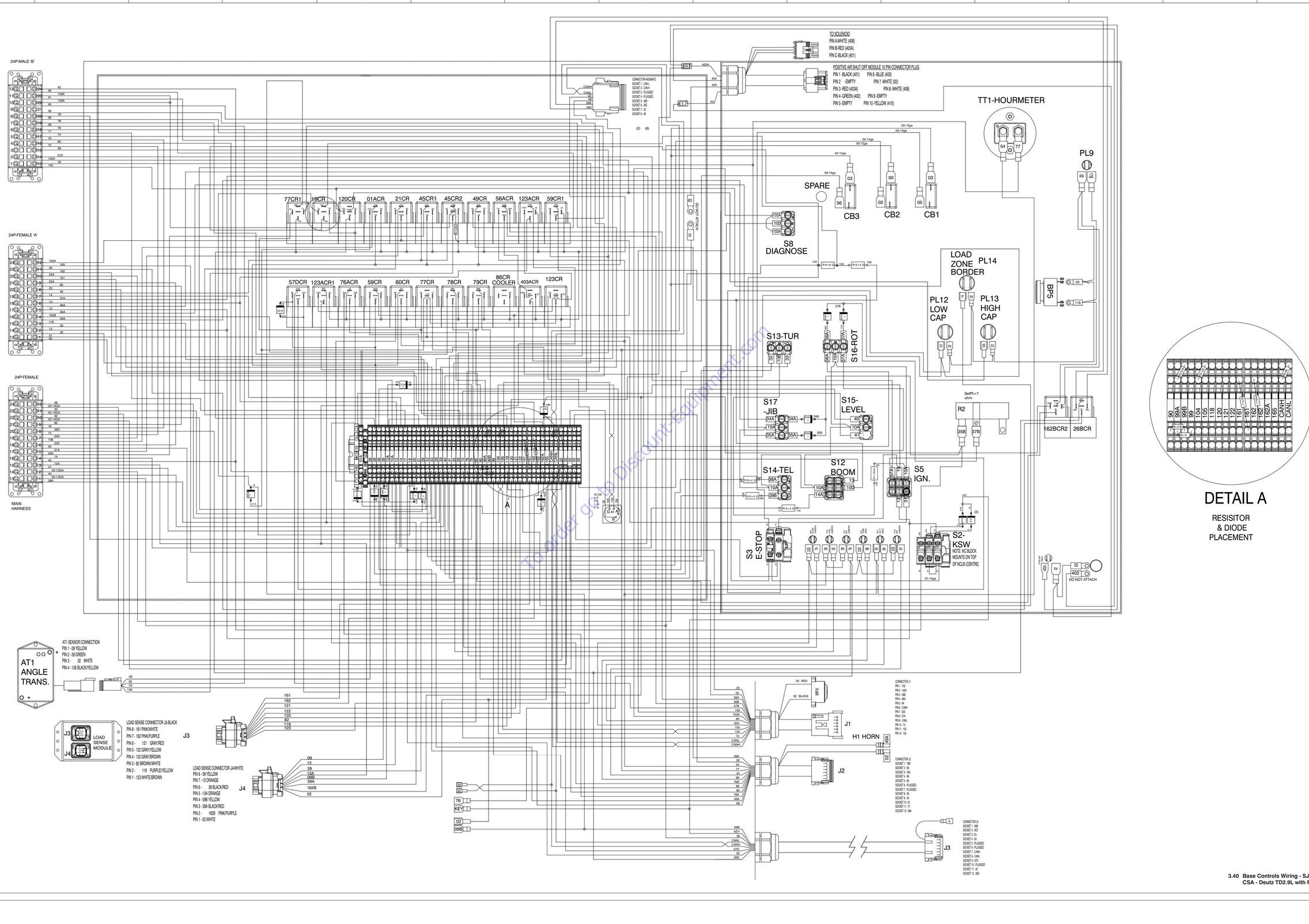
M231383AB

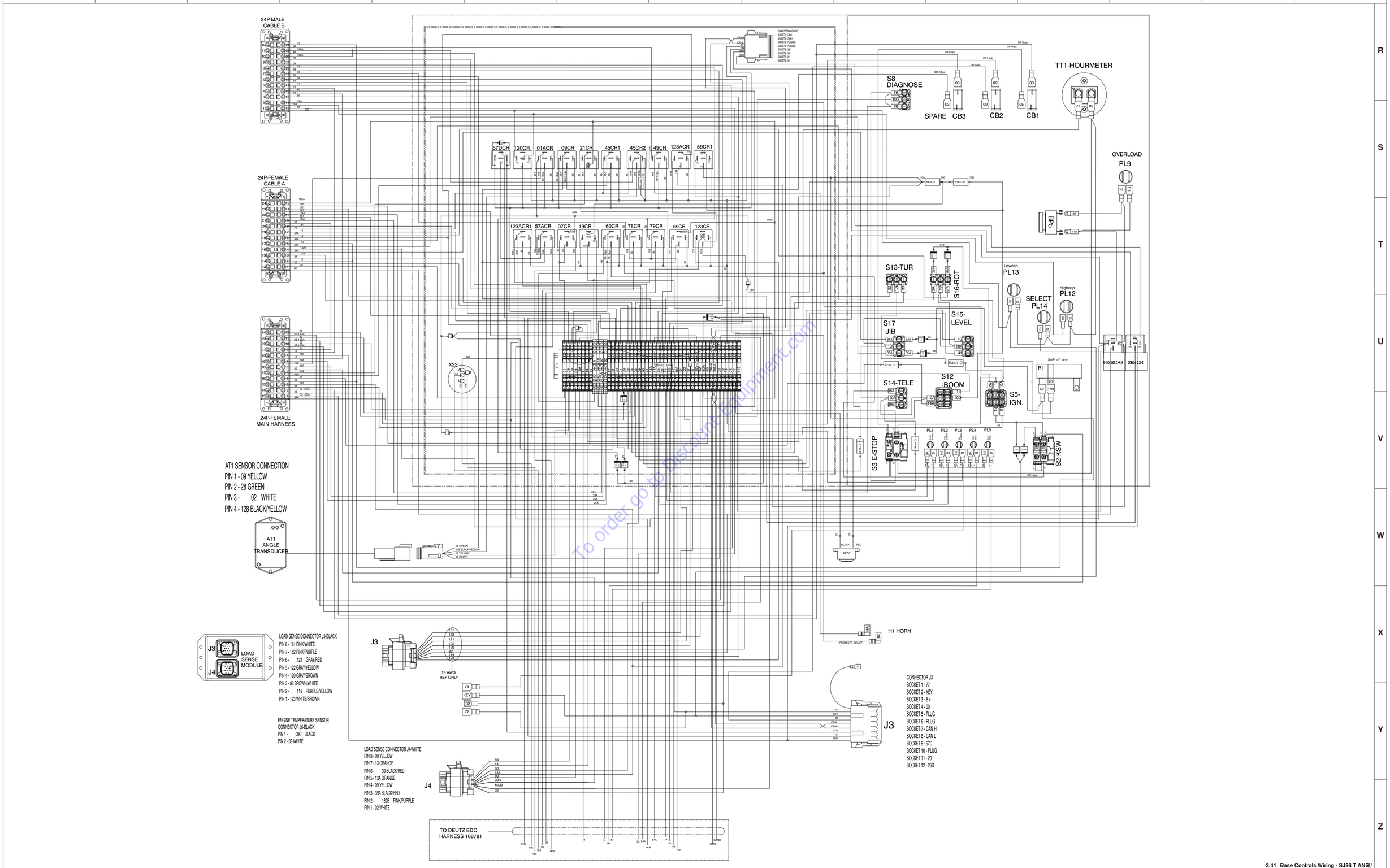


M232010AB

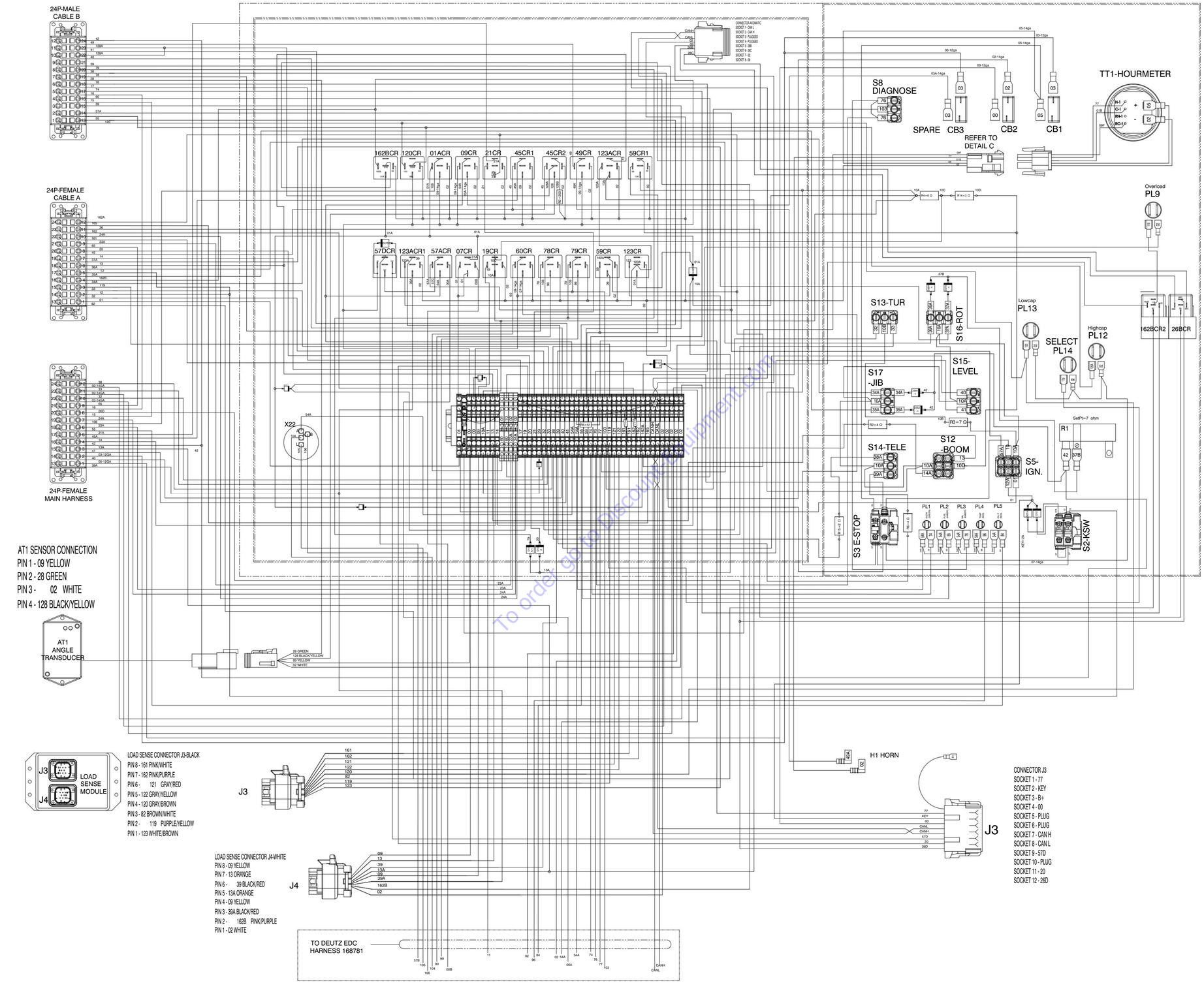
3.39 Base Controls Wiring - SJ86 T ANSI/ CSA - Deutz TD2.9L

3.40 Base Controls Wiring - SJ86 T ANSI/CSA - Deutz TD2.9L with Positive Air Shut-Off

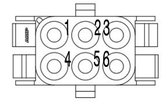




M231382AB



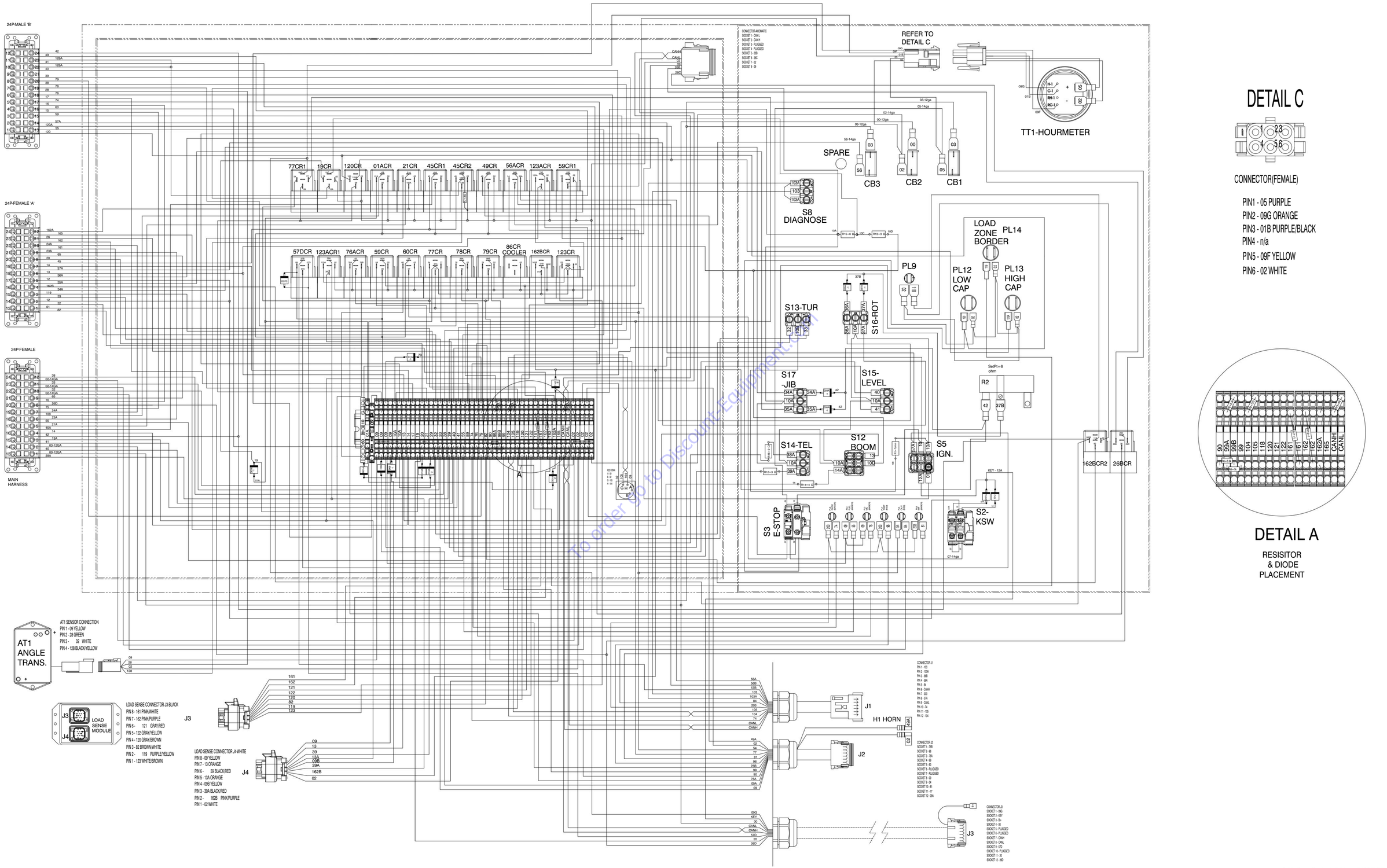
DETAIL C



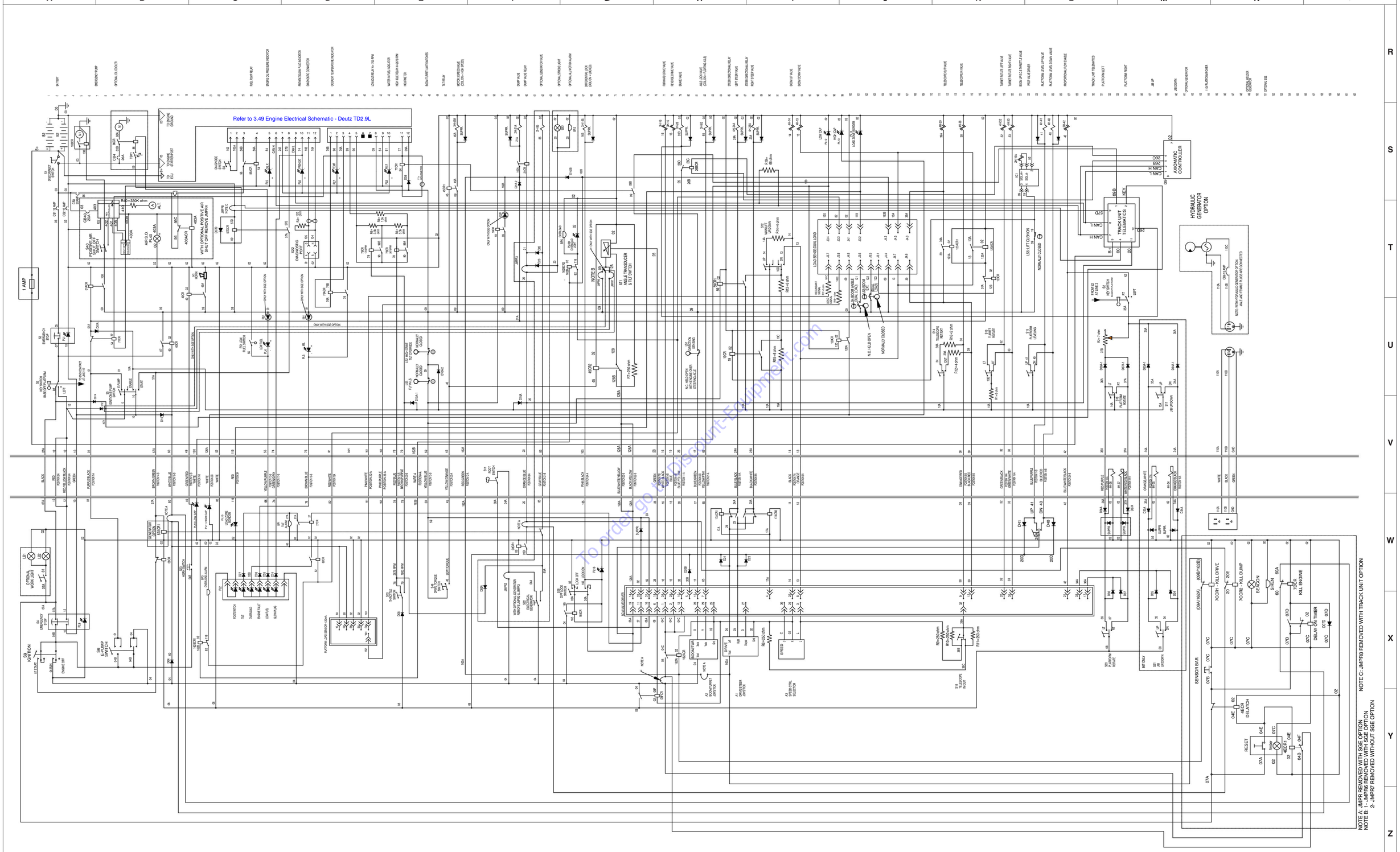
CONNECTOR(FEMALE)

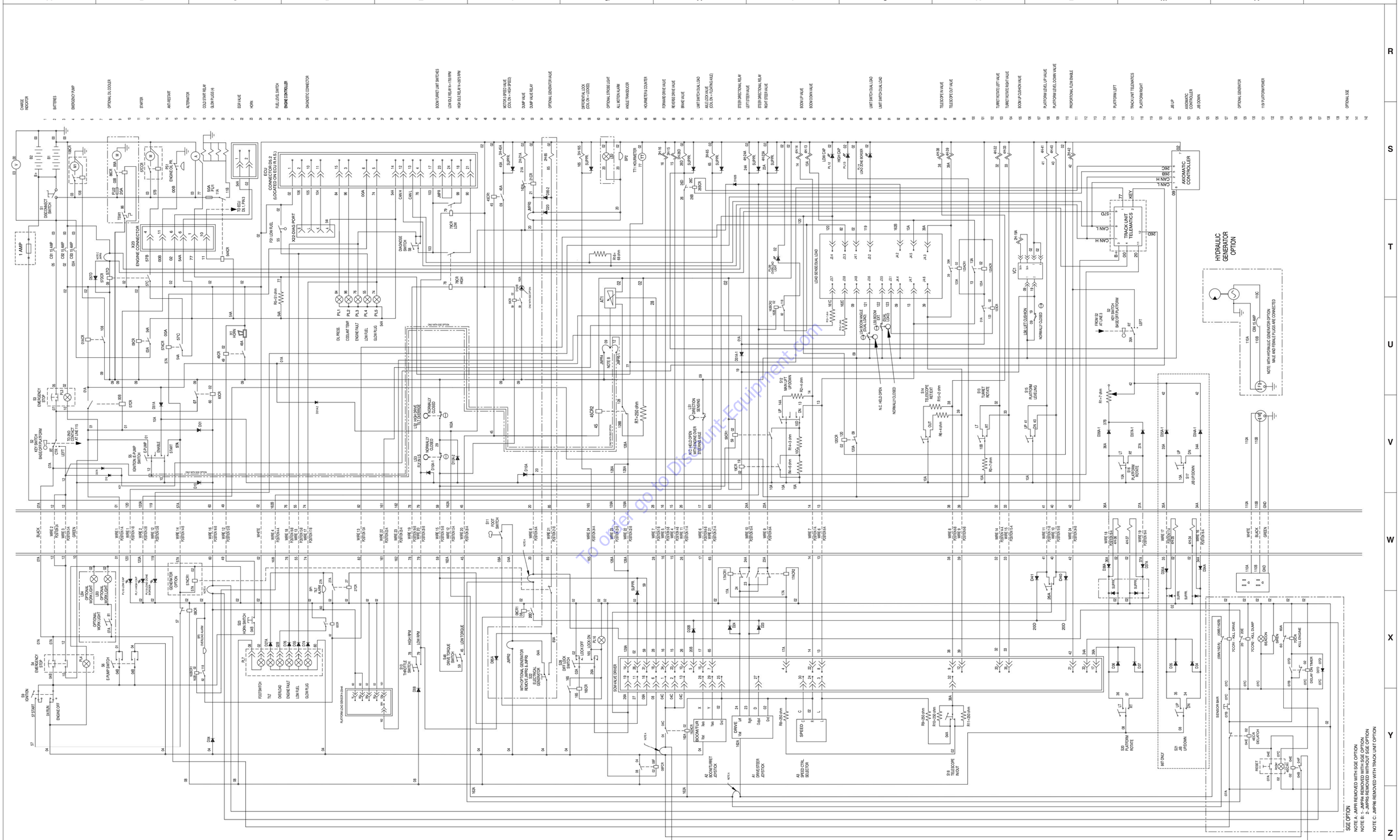
PIN1 - 05 PURPLE
PIN2 - 77 BROWN
PIN3 - 01B PURPLE/BLACK
PIN4 - n/a
PIN5 - 09F YELLOW
PIN6 - 02 WHITE

M231385AB

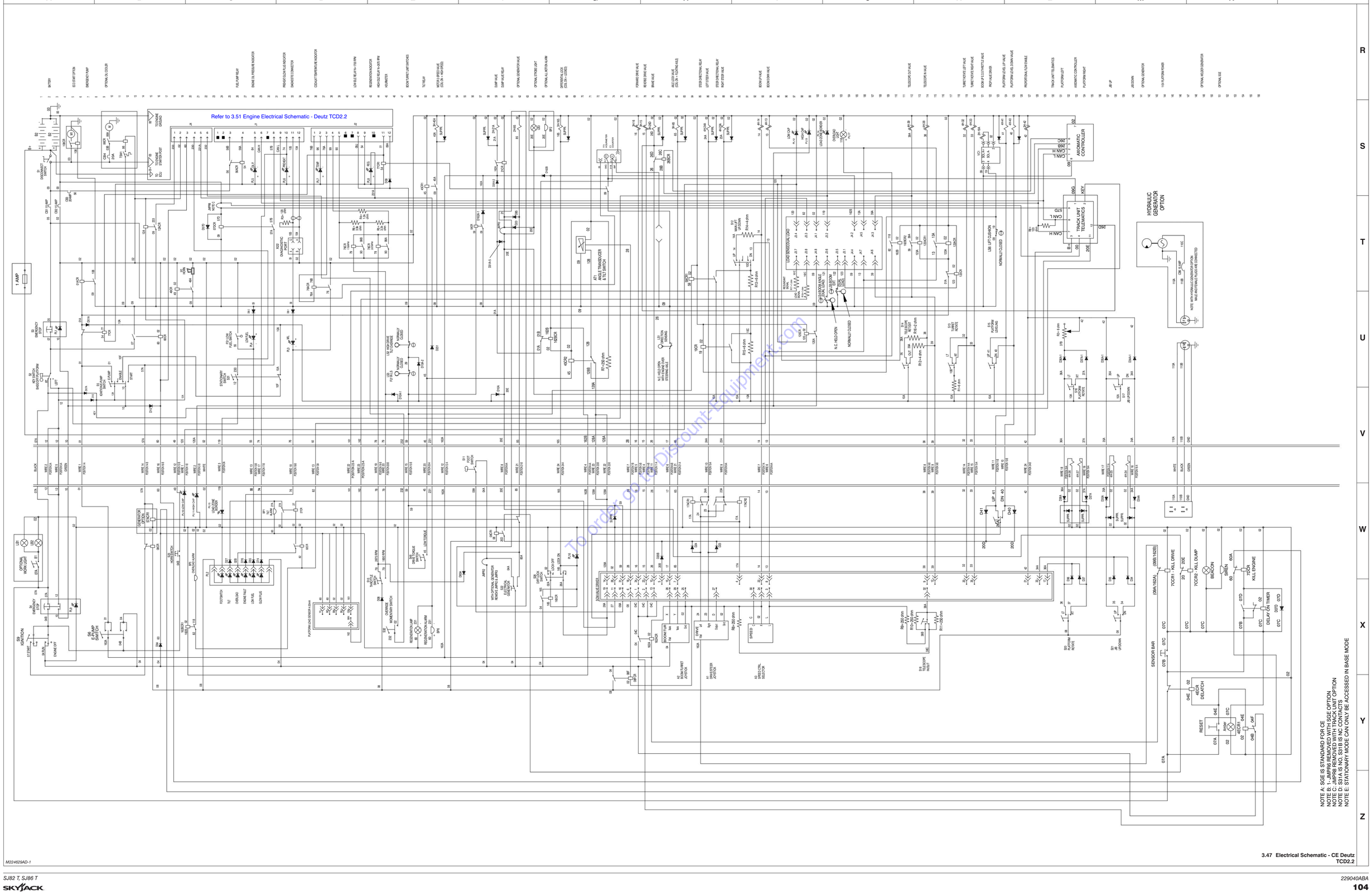

24P-MALE 'B'
24P-FEMALE 'A'
24P-FEMALE
MAIN HARNESS
77CR1 19CR 120CR 01ACR 21CR 45CR1 45CR2 49CR 56ACR 123ACR 59CR1
57DCR 123ACR1 76ACR 59CR 60CR 77CR 78CR 79CR 86CR COOLER 162BCR 123CR
CONNECTOR-ABOMATIC
SOCKET-1 - CANL
SOCKET-2 - CANH
SOCKET-3 - PLUGGED
SOCKET-4 - PLUGGED
SOCKET-5 - 39B
SOCKET-6 - 26C
SOCKET-7 - IE
SOCKET-8 - 1B
REFER TO DETAIL C
TT1-HOURMETER
SPARE
CB3
CB2
CB1
S8 DIAGNOSE
LOAD ZONE BORDER
PL14
PL9
PL12 LOW CAP
PL13 HIGH CAP
S13-TUR
S16-ROT
S17 -JIB
S15- LEVEL
S14-TEL
S12 BOOM
S5 IGN.
KEY - 12A
S3 E-STOP
S2- KSW
162BCR2
26BCR
A
B
C
D
E
F
G
H
J
K
AT1 ANGLE TRANS.
AT1 SENSOR CONNECTION
PIN 1 - 09 YELLOW
PIN 2 - 28 GREEN
PIN 3 - 02 WHITE
PIN 4 - 128 BLACK/YELLOW
J3
J4
LOAD SENSE MODULE
LOAD SENSE CONNECTOR J3-BLACK
PIN 8 - 161 PINK/WHITE
PIN 7 - 162 PINK/PURPLE
PIN 6 - 121 GRAY/RED
PIN 5 - 122 GRAY/YELLOW
PIN 4 - 120 GRAY/BROWN
PIN 3 - 82 BROWN/WHITE
PIN 2 - 119 PURPLE/YELLOW
PIN 1 - 123 WHITE/BROWN
LOAD SENSE CONNECTOR J4-WHITE
PIN 8 - 09 YELLOW
PIN 7 - 13 ORANGE
PIN 6 - 39 BLACK/RED
PIN 5 - 13A ORANGE
PIN 4 - 09B YELLOW
PIN 3 - 39A BLACK/RED
PIN 2 - 162B PINK/PURPLE
PIN 1 - 02 WHITE
J1
J2
J3
H1 HORN
CONNECTOR J1
PIN 1 - 103
PIN 2 - 103A
PIN 3 - 39B
PIN 4 - 39A
PIN 5 - 84
PIN 6 - CANH
PIN 7 - 203
PIN 8 - CANL
PIN 10 - 74
PIN 11 - 105
PIN 12 - 104
CONNECTOR J2
SOCKET 1 - 76B
SOCKET 2 - 96
SOCKET 3 - 76A
SOCKET 4 - 99
SOCKET 5 - 90
SOCKET 6 - PLUGGED
SOCKET 7 - PLUGGED
SOCKET 8 - 09
SOCKET 9 - 54
SOCKET 10 - 81
SOCKET 11 - 77
SOCKET 12 - 09A
CONNECTOR J3
SOCKET 1 - 99G
SOCKET 2 - KEY
SOCKET 3 - 9+
SOCKET 4 - 00
SOCKET 5 - PLUGGED
SOCKET 6 - PLUGGED
SOCKET 7 - CANH
SOCKET 8 - CANL
SOCKET 9 - 07D
SOCKET 10 - PLUGGED
SOCKET 11 - 2D
SOCKET 12 - 26D
DETAIL C
CONNECTOR(FEMALE)
PIN1 - 05 PURPLE
PIN2 - 09G ORANGE
PIN3 - 01B PURPLE/BLACK
PIN4 - n/a
PIN5 - 09F YELLOW
PIN6 - 02 WHITE
DETAIL A
RESISITOR & DIODE PLACEMENT
To order go to Discount Equipment.com

M23143OAA


A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
R
S
T
U
V
W
X
Y
Z
Refer to 3.49 Engine Electrical Schematic - Deutz TD2.9L
1 AMP
AXIOMATIC CONTROLLER
TRACK UNIT TELEMATICS
HYDRAULIC GENERATOR OPTION
SENSOR BAR
7CCR1 - KILL DRIVE
7CCR2 - KILL DUMP
BEACON
SIREN
KILL ENGINE
DELAY ON TIMER
RESET
NOTE B
NOTE C: JMPR8 REMOVED WITH TRACK UNIT OPTION
NOTE A: JMPR REMOVED WITH SGE OPTION
NOTE B: 1- JMPR6 REMOVED WITH SGE OPTION
2- JMPR7 REMOVED WITHOUT SGE OPTION
M218476AA-1
3.45 Electrical Schematic - ANSI/CSA
Deutz TD2.9L

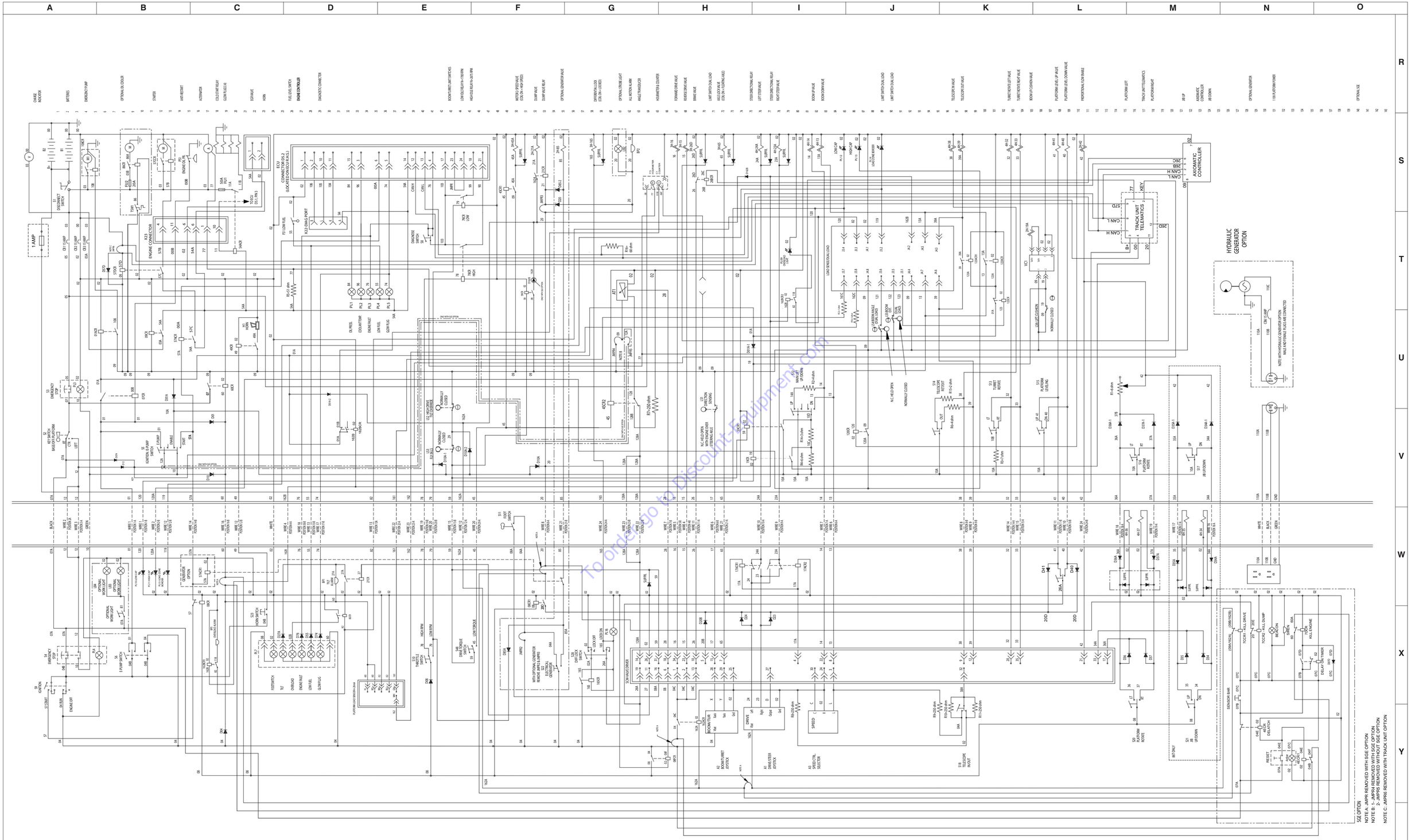


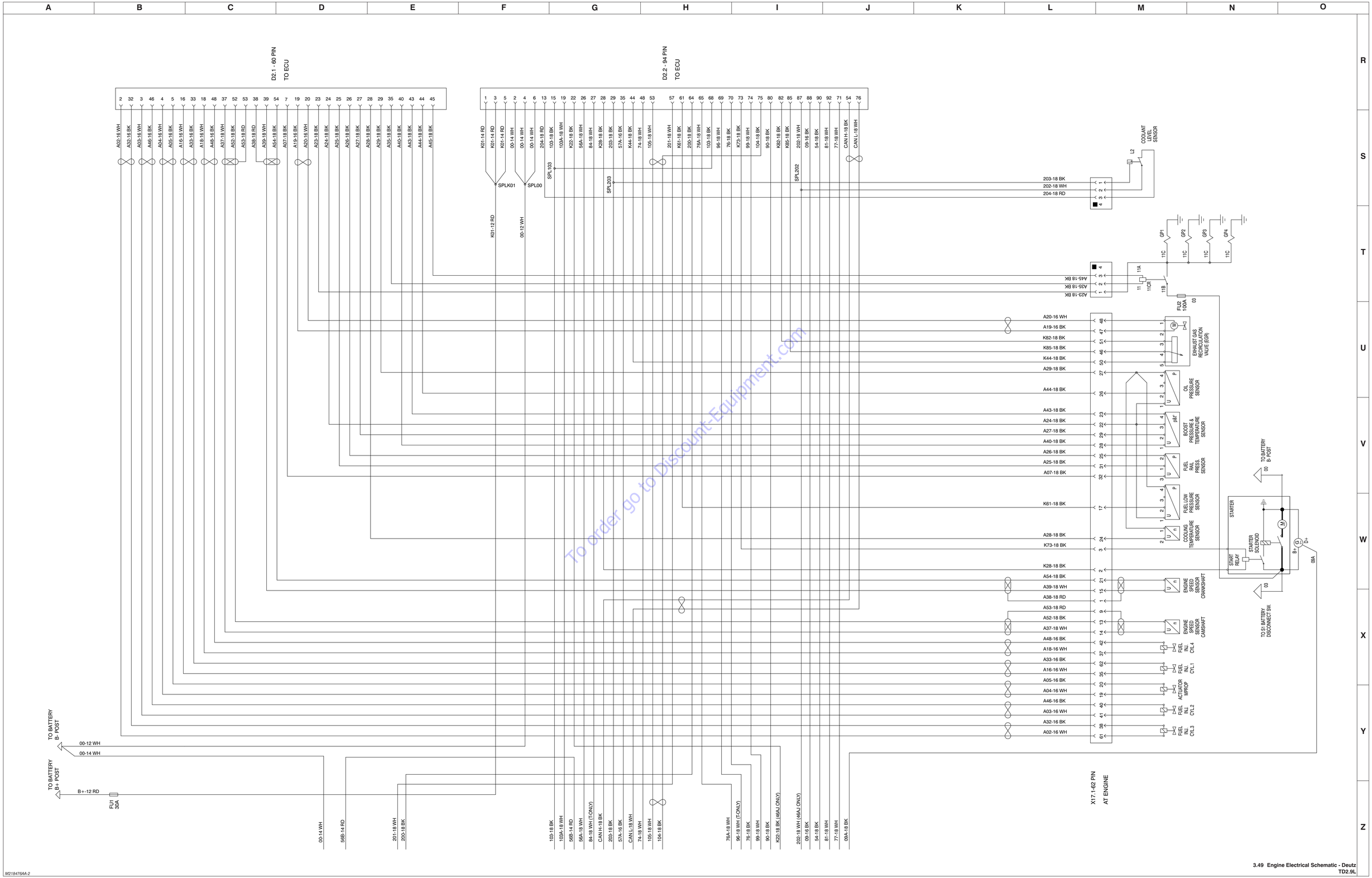
3.47 Electrical Schematic - CE Deutz TCD2.2



3.47 Electrical Schematic - CE Deutz TCD2.2

M224629AD-1

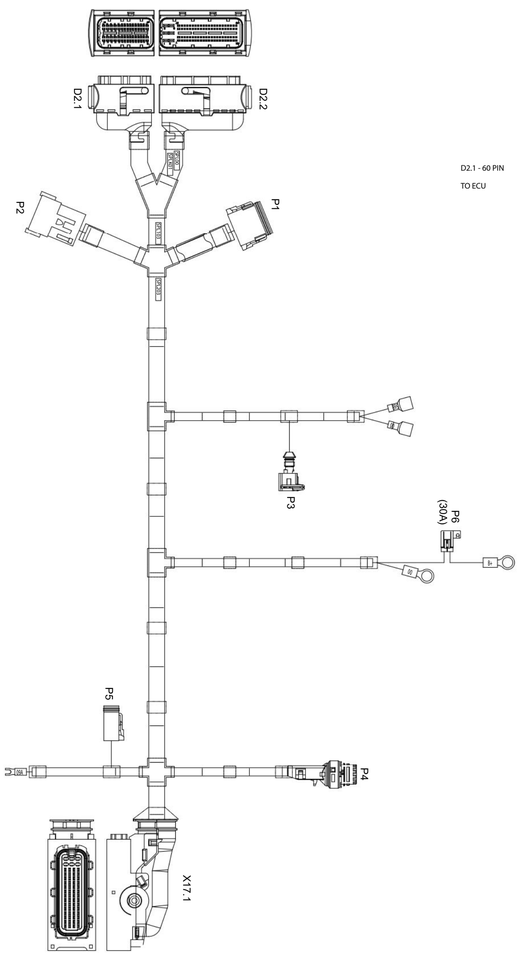




M218476AA-2

3.49 Engine Electrical Schematic - Deutz TD2.9L

3.50 Engine Interface Harness Schematic - Deutz TD2.9L



D2.2 - 94 PIN
TO ECU

D2.1 - 60 PIN
TO ECU

X17.1 - 62 PIN
TO ENGINE

P4
TO COOLANT SENSOR

D
TO ALTERNATOR

P5
TO PRE-HEAT

P6

P1
TO CTRL PNL

P2
TO CTRL PNL

P3
TO WATER SENSOR

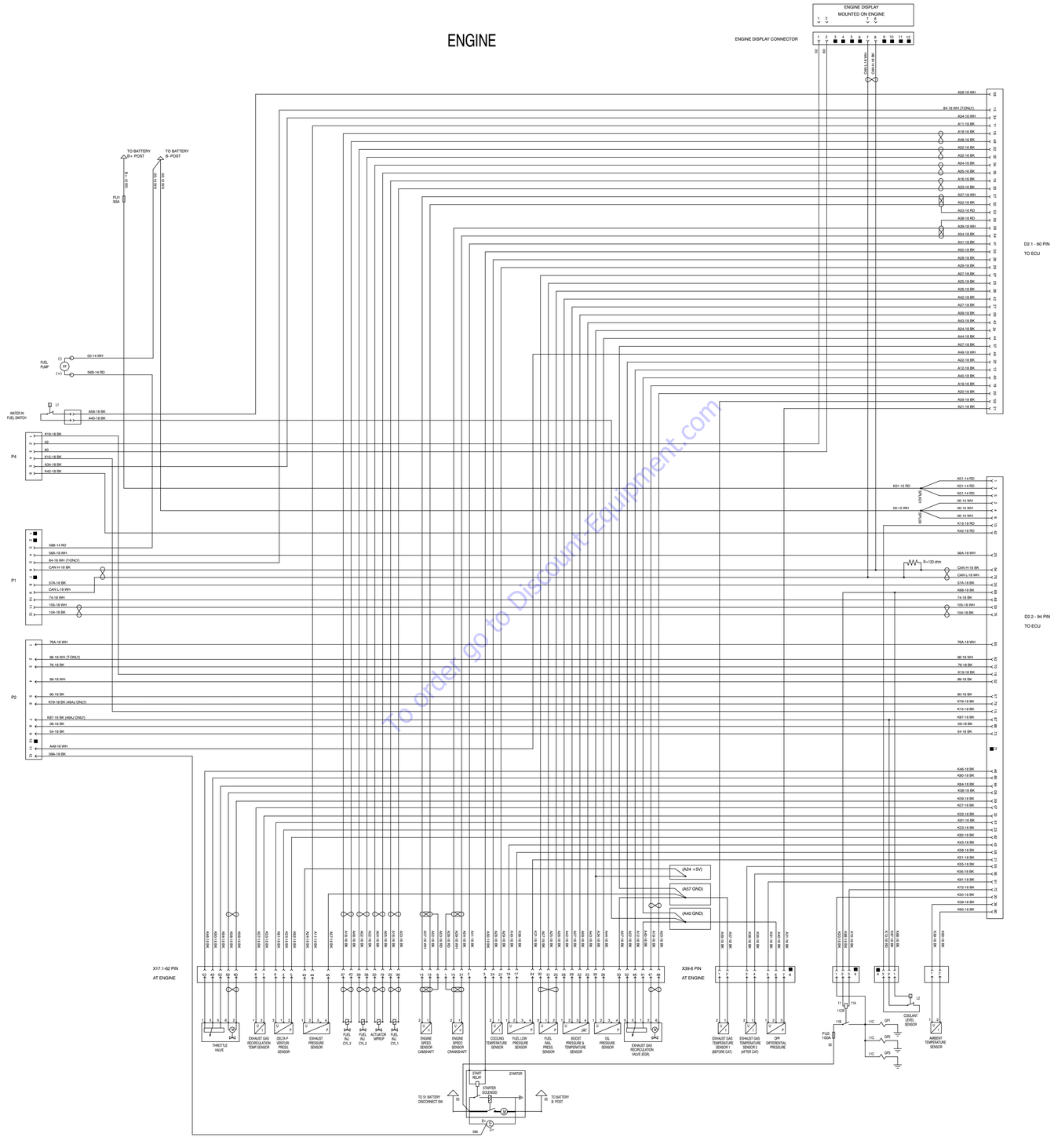
TO FUEL PUMP

TO BATTERY

M195628AA

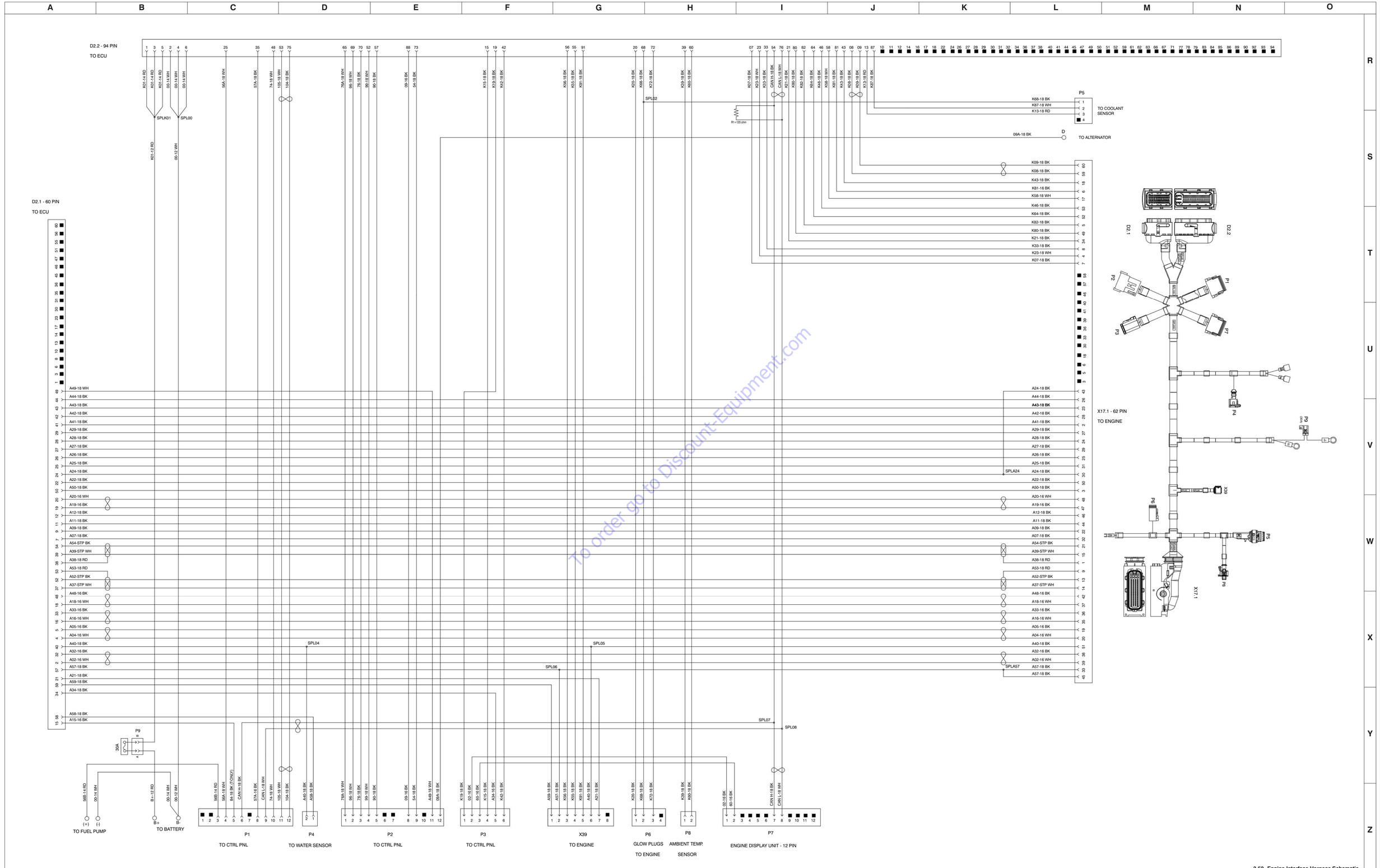
3.50 Engine Interface Harness Schematic - Deutz TD2.9L

3.51 Engine Electrical Schematic - Deutz TCD2.2



M224629AD-2

3.52 Engine Interface Harness Schematic - Deutz TCD2.2



M224638AD-1

3.52 Engine Interface Harness Schematic - Deutz TCD2.2

Section 4 – Troubleshooting Information

4.1 Introduction

The following pages contain a table of Troubleshooting for locating and correcting most service trouble which can develop. Careful and accurate analysis of the systems listed in the table of Troubleshooting 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”. See the example below for clarification.

1. Probable cause	**Remedy**

NOTE

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

4.2 Electrical System

4.2-1 All Controls Inoperative

1. Battery disconnected or discharged.	**Connect battery or recharge.**
2. Loose or broken B+ cable from battery to battery disconnect switch S1.	**Check continuity. Replace if defective.**
3. Open or defective battery disconnect switch S1.	**Close switch. Replace if defective.**
4. Loose or broken wire #03 from battery disconnect switch S1 to circuit breaker CB1.	**Check continuity. Replace if defective.**
5. Circuit breaker CB1 tripped or defective.	**Reset breaker, check for defective wiring. Replace if defective.**
6. Loose or broken wire #05 from circuit breaker CB1 to base emergency stop switch S3.	**Check continuity. Replace if defective.**
7. Open or defective base emergency stop switch S3.	**Close switch. Replace if defective.**
8. Loose or broken wire #07 from base emergency stop switch S3 to base key S2.	**Check continuity. Replace if defective.**
9. Open or defective key select switch S2.	**Close switch. Replace if defective.**
10. Loose or broken wire #60 from base terminal block to relay 60CR.	**Check continuity. Replace if defective.**
11. Loose or broken wire #07 from base emergency stop switch S3 to relay 60CR.	**Check continuity. Replace if defective.**
12. Loose or broken wire #02 from relay 60CR to base terminal block.	**Check continuity. Replace if defective.**
13. Defective relay 60CR.	**Check relay. Replace if defective.**
14. Loose or broken wire #9 from relay 60CR to base terminal block.	**Check continuity. Replace if defective.**
15. Loose or broken wire #02 from base terminal block to circuit breaker CB2.	**Check continuity. Replace if defective.**
16. Circuit breaker CB2 tripped or defective.	**Reset breaker, check for defective wiring. Replace if defective.**
17. Loose or broken wire #00 from circuit breaker CB2 to battery negative.	**Check continuity. Replace if defective.**

4.2-2 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 to platform emergency stop switch S4.	**Check continuity. Replace if defective.**
3. Open or defective platform emergency stop switch S4.	**Check switch. Replace if defective.**
4. Loose or broken wire #04B from platform emergency stop switch S4 to Ignition switch S9.	**Check continuity. Replace if defective.**
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 Ignition/E-pump switch S5.	**Check continuity. Replace if defective**
3. Loose or broken wire #12 from base key switch S2 to base connector plug A pins #2 & 3.	**Check continuity. Replace if defective**
4. Loose or broken wires #12 in boom cable A or its connectors.	**Check for continuity between pins on cable A. Check for loose or corroded connections on cable connectors. Replace if wire is defective.**
5. Loose or broken wire #12 from plug A pin #2 & 3 to emergency stop switch S4 in platform control console.	**Check continuity. Replace if defective**
6. Open or defective emergency stop switch S4.	**Check switch is in on position. Check continuity through switch. Replace if defective.**
7. Loose or broken wire #10 from base terminal block to Ignition/E-pump (enable) switch S5.	**Check continuity. Replace if defective**
8. Open or defective Ignition/E-pump (enable) switch S5.	**Check switch. Replace if defective**

4.2-3 Engine Will Not Crank

From Base	
1. Loose or broken wire #57A from base start switch S5 to relay 57ACR (Deutz D2011 and GM 3.0l engines).	**Check continuity. Replace if defective.**
2. Defective base start switch S5.	**Check start switch. Replace if defective.**
From Platform	
NOTE *Engine will not crank from platform with footswitch depressed.*	
1. Loose or broken wire #4 from emergency stop switch S4 to start switch S6.	**Check continuity. Replace if defective.**
2. Defective start switch S6.	**Check continuity through contacts of relay. 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 (Deutz D2011, GM 3.0L) or to base start switch S5 (Deutz TD2.9L).	**Check continuity. Replace if defective.**
From Platform or Base	
With the following conditions: ▪ Deutz Diesel D2.9L	
1. Loose or broken wire #57A from base start switch S5 to 12 pin connector (J1) pin 8.	**Check continuity. Replace if defective.**
2. Loose or broken wire #57A from 12 pin connector (P1) pin 8 to 94 pin ECU connector, pin 35.	**Check continuity. Replace if defective.**
3. Loose or broken B+ wire from battery B+ to ECU fuse connector P6 pin A.	**Check continuity. Replace if defective.**
4. ECU 30A fuse open or defective.	**Check for defective wiring. Replace if defective. Replace fuse.**

5. Loose or broken wire #K01 from ECU fuse connector P6 pin B to 94 pin ECU connector 3 places pins 1, 3, and 5.	**Check continuity. Replace if defective.**
6. Loose or broken ground wire #00 from battery B- to 94 pin ECU connector 3 places pins 2, 4, and 6.	**Check continuity. Replace if defective.**

NOTE

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

With the following conditions:

- Deutz Diesel D2011

1. Loose or broken wire #57A at relay 57ACR (2 places).	**Check for connections at relay. Check for voltage on relay (2 places).**
2. Loose or broken wire #57A from relay 57ACR to relay 57BCR.	**Check continuity. Replace if defective.**
3. Loose or broken wire #00A from X23 engine connector pin #11 to relay 57ACR.	**Check continuity. Replace if defective.**
4. Loose or broken wire #00A from X23 engine connector pin #11 to engine oil pressure switch.	**Check continuity. Replace if defective.**
5. Defective relay 57ACR.	**Check relay. Replace if defective.**
6. Loose or broken wire #09 from base terminal block to relay 09CR.	**Check continuity. Replace if defective.**
7. Loose or broken wire #03A from circuit breaker CB3 to relay 09CR.	**Check continuity. Replace if defective.**
8. Tripped or defective circuit breaker CB3.	**Reset circuit breaker. Check continuity through circuit breaker. Replace if defective.**
9. Loose or broken wire #3 from circuit breaker CB3 to turret harness plug pin #2.	**Check continuity. Replace if defective.**
10. Loose or broken wire #02 from relay 09CR to base terminal block.	**Check continuity. Replace if defective.**
11. Defective relay 09CR.	**Check relay. Replace if defective.**
12. Loose or broken wire #54A from relay 09CR to base terminal block.	**Check continuity. Replace if defective.**
13. Loose or broken wire #54A from base terminal block to relay 57BCR1.	**Check continuity. Replace if defective.**
14. Defective contacts in relay 57BCR1.	**Check continuity between wires #54A and #57C when cranking. If no continuity, replace relay.**
15. Loose or broken wire #57C from relay 57BCR1 to X23 engine connector pin #4.	**Check continuity. Replace if defective.**

16. Loose or broken wire #57C from X23 engine plug to start solenoid 57CCR.	**Check continuity. Replace if defective.**
17. Loose or broken starter cable #03 from disconnect switch S1 to start solenoid 57CCR.	**Check continuity. Replace if defective.**
18. Defective start solenoid 57CCR.	**Check solenoid. Replace if defective.**
19. Defective starter motor.	**Check starter motor. Replace if defective.**

With the following conditions:

- Equipped with Elevate/Trackunit Telematics Ready

NOTE

If the unit is equipped with an Access keypad, a passcode is required from the machine owner.

1. Loose or broken B+ wire from battery + to telematics pin 3.	**Check continuity. Replace if defective.**
2. Loose or broken B- wire 00 from battery - to telematics pin 4.	**Check continuity. Replace if defective.**
3. Loose or broken wire 07 from S3 base Emergency stop switch to 57DCR pin 86.	**Check continuity. Replace if defective.**
4. Loose or broken wire 57A from S5 ignition switch to 57DCR pin 30.	**Check continuity. Replace if defective.**
5. If telematics device is not installed: loose, broken or missing Jumper JMPR1 from 57DCR pin 85 to ground 00.	**Check continuity. Replace if defective or missing.**
6. Loose or broken wire 57D from telematics pin 9 to 57DCR pin 85.	**Check continuity. Replace if defective.**
7. Missing output from telematics pin 9.	**Check for ground on pin 9. If no ground, contact the machine owner.**
8. Defective relay 57DCR.	**Check relay. Replace if defective.**
9. Loose or broken wire 57B from 57DCR pin 87 to engine starter contactor coil.	**Check continuity. Replace if defective.**
10. Defective telematics module.	**Check telematics assembly; repair or replace as required.**

4.2-4 Engine Cranks but Will Not Start

Deutz Diesel D2.9L	
1. Loose or broken wire #54 from 94 pin ECU connector, pin90 to 12 pin connector (P2), pin 9.	**Check continuity. Replace if defective.**
2. Loose or broken wire #54 from 12 pin connector (J2) pin 9 to relay 56ACR.	**Check continuity. Replace if defective.**
3. Loose or broken wire #03 to circuit breaker CB3.	**Check continuity. Replace if defective.**
4. Circuit breaker CB3 tripped or defective.	**Reset breaker, check for defective wiring. Replace if defective**
5. Loose or broken wire #56 from CB3 to relay 56ACR.	**Check continuity. Replace if defective.**
6. Loose or broken wire #56A from relay 56ACR to 12 pin connector (J1) pin 4.	**Check continuity. Replace if defective.**
7. Loose or broken wire #56A from 12 pin connector (P1) pin 4 to 94 pin ECU connector, pin 26.	**Check continuity. Replace if defective.**
8. Loose or broken wire #56B from relay 56ACR to 12 pin connector (J1) pin 3.	**Check continuity. Replace if defective.**
9. Defective relay 56ACR.	**Check continuity through contacts of relay. Replace if defective.**
10. Loose or broken wire #56B from 12 pin connector (P1) pin 3 to fuel pump.	**Check continuity. Replace if defective.**
11. Loose or broken ground wire #00 from fuel pump to battery B-.	**Check continuity. Replace if defective.**
12. Engine pre-heat circuit inoperative.	**Refer to Engine manufacturer's manual to diagnose.**

NOTE

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

Deutz Diesel D2011	
1. Loose or broken wire #57B from relay 57ACR to relay 57BCR (2 places).	**57BCR maintains power for start circuit before engine starts and after oil pressure switch opens to relay 57BCR1. Check wire #57B for continuity. Replace if defective.**
2. Loose or broken wire #57A from relay 57ACR to relay 57BCR.	**Check continuity. Replace if defective.**
3. Loose or broken wire #02 from base terminal block to relay 57BCR.	**Check continuity. Replace if defective.**

4. Defective relay 57BCR.	**Check relay. Replace if defective.**
5. Glow plug circuit not operating.	**See "Glow Plug Circuit Inoperative" in this section.**
6. 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.

4.2-5 Glow Plug Circuit Inoperative - Deutz D2011 diesel engine

1. Defective glow plug fuse FU1 50 amp.	**Check fuse. Replace if defective.**
2. Loose or broken wire #03 from start solenoid 57CCR 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.

4.2-6 Glow Plug Circuit Inoperative - Deutz D2.9 diesel engine

1. Defective glow plug fuse FU2 100 amp.	**Check fuse. Replace if defective.**
2. Loose or broken wire #03 from start solenoid to fuse holder FU1.	**Check continuity. Replace if defective.**
3. Loose or broken wire #11B from fuse holder FU1 to relay 11CR.	**Check continuity. Replace if defective.**
4. Loose or broken wire #11C from relay 11CR to glow plugs.	**Check continuity. Replace if defective.**

5. Loose or broken wire #11 from 60 pin ECU connector D2.1 pin 35 to relay 11CR.	**Check continuity. Replace if defective.**
6. Loose or broken wire #11A from 60 pin ECU connector D2.1 pin 45 to relay 54ACR.	**Check continuity. Replace if defective.**
7. Defective relay 11CR.	**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.

4.2-7 All Base Control Console Inoperative

1. Loose or broken wire #10 from base emergency stop switch S3 to ignition/ pump switch S5.	**Check continuity. Replace if defective.**
2. Defective ignition/ pump switch S5.	**Check continuity through switch when activated. Replace if defective.**
3. Loose or broken wire #10A from ignition/ pump switch S5 to basket rotation switch S16.	**Check continuity. Replace if defective.**
4. Loose or broken wire #10A from basket rotation switch S16 to level switch S15.	**Check continuity. Replace if defective.**
5. Loose or broken wire #10A from level switch S15 to jib switch S17.	**Check continuity. Replace if defective.**
6. Loose or broken wire #10A from jib switch S17 to telescope switch S14.	**Check continuity. Replace if defective.**
7. Loose or broken wire #10A from telescope switch S14 to boom switch S12.	**Check continuity. Replace if defective.**
8. Loose or broken wire #10A from boom switch S12 to base terminal block.	**Check continuity. Replace if defective.**
9. Loose or broken wire #10A from base terminal block to diode D10A.	**Check continuity. Replace if defective.**
10. Open or defective diode D10A.	**Check diode. Replace if defective.**
11. Loose or broken wire #20 from diode D10A to base terminal block.	**Check continuity. Replace if defective.**
12. Missing or broken jumper JMPR3 on base terminal block between wires #20 and #21.	**Check for jumper. Replace if missing or broken.**

NOTE

Jumper is removed if equipped with generator option.

13. Loose or broken wire #21 from base terminal block to relay 21CR.	**Check continuity. Replace if defective.**
14. Loose or broken wire #02 from base terminal block to relay 21CR.	**Check continuity. Replace if defective.**
15. Loose or broken wire #09 from base terminal block to relay 21CR.	**Check continuity. Replace if defective.**
16. Defective relay 21CR.	**Check relay. Replace if defective.**
17. Loose or broken wire #21A from relay 21CR to turret harness plug pin #5.	**Check continuity. Replace if defective.**
18. Loose or broken wire #21A from turret harness plug pin #5 to dump valve 2H-21A.	**Check continuity. Replace if defective.**
19. Loose or broken wire #02 from dump valve 2H-21A to turret harness plug.	**Check continuity. Replace if defective.**
20. Defective dump valve coil 2H-21A.	**Check continuity and resistance through coil. Replace if defective.**

4.2-8 No Movement from Base Control Console

No Boom Up

1. Loose or broken wire #10A from ignition/ pump 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 resistor R17.	**Check continuity. Replace if defective.**
4. Defective resistor R17.	**Check continuity. Replace if defective.**
5. Loose or broken wire #14 from resistor R17to base terminal block.	**Check continuity. Replace if defective.**
6. Loose or broken wire #14 from base terminal block to turret harness plug pin #4.	**Check continuity. Replace if defective.**
7. Loose or broken wire #14 from turret harness plug pin #4 to boom up valve 4H-14.	**Check continuity. Replace if defective.**
8. Loose or broken wire #02 from turret harness plug to boom up valve 4H-14.	**Check continuity. Replace if defective.**
9. Defective boom up coil 4H-14.	**Check continuity and resistance through coil. Replace if defective.**

No Boom Down

NOTE

Boom Down may be disabled by the dual load zone system and/or overload system if equipped. Please first ensure the boom is fully retracted and there are no faults in the overload system.

1. Loose or broken wire #10A from ignition/ pump switch S5 to boom switch S12.	**Check continuity. Replace if defective.**
2. Defective boom switch S12.	**Check continuity through switch while activating down function between wires #10B 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. Follow steps on No Boom Down Function from Base or Platform Consoles.**

No Turret Rotate Left

1. Loose or broken wire #10A from ignition/ pump switch S5 to resistor R2.	**Check continuity. Replace if defective.**
2. Open resistor R2.	**Check resistor for 7 ohms. If no resistance found, replace resistor.**
3. Loose or broken wire #10B from resistor R1 to turret rotate switch S13.	**Check continuity. Replace if defective.**
4. Defective turret rotate switch S13.	**Check continuity through switch while activating rotate left function between wires #10B and #32. If no continuity found, replace switch.**
5. Loose or broken wire #32 from turret rotate switch S13 to base terminal block.	**Check continuity. Replace if defective.**
6. Loose or broken wire #32 from base terminal block to turret harness plug pin #10.	**Check continuity. Replace if defective.**
7. Loose or broken wire #32 from turret harness plug pin #10 to turret rotate left valve 4H-32.	**Check continuity. Replace if defective.**
8. Loose or broken wire #02 from turret harness plug to turret rotate left valve 4H-32.	**Check continuity. Replace if defective.**
9. Defective turret rotate left valve coil 4H-32.	**Check continuity and resistance through coil. Replace if defective.**

No Turret Rotate Right	
1. Loose or broken wire #10A from ignition/ pump switch S5 to resistor R2.	**Check continuity. Replace if defective.**
2. Open resistor R2.	**Check resistor for 7 ohms. If no resistance found, replace resistor.**
3. Loose or broken wire #10B from resistor R1 to turret rotate switch S13.	**Check continuity. Replace if defective.**
4. Defective turret rotate switch S13.	**Check continuity through switch while activating rotate left function between wires #10B and #33. If no continuity found, replace switch.**
5. Loose or broken wire #33 from turret rotate switch S13 to base terminal block.	**Check continuity. Replace if defective.**
6. Loose or broken wire #33 from base terminal block to turret harness plug pin #11.	**Check continuity. Replace if defective.**
7. Loose or broken wire #33 from turret harness plug pin #10 to turret rotate left valve 4H-33.	**Check continuity. Replace if defective.**
8. Loose or broken wire #02 from turret harness plug to turret rotate left valve 4H-33.	**Check continuity. Replace if defective.**
9. Defective turret rotate left valve coil 4H-33.	**Check continuity and resistance through coil. Replace if defective.**
No Telescope Retract From Base Control Console	
1. Loose or broken wire #10A from ignition/ pump 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 turret harness plug pin #12.	**Check continuity. Replace if defective.**
5. Loose or broken wire #38 from turret harness plug pin #12 to telescope retract valve 3H-38.	**Check continuity. Replace if defective.**
6. Loose or broken wire #02 from turret 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.**

No Telescope Extend

NOTE

Boom Down may be disabled by the dual load zone system and/or overload system if equipped. Please first ensure the boom is fully retracted and there are no faults in the overload system.

1. Loose or broken wire #10A from ignition/ pump 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 turret harness plug pin #13.	**Check continuity. Replace if defective.** **Follow steps on No Boom Telescope Extend Function from Base or Platform Consoles.**

No Platform Rotate Left

1. Loose or broken wire #10A from ignition/ pump 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 D36-1.	**Check diode. Replace if defective.**
4. Loose or broken wire #37A from diode D36-1 to resistor R1.	**Check continuity. Replace if defective.**
5. Loose or broken wire #36 from platform rotate switch S16 to base connector plug A pin #18.	**Check continuity. Replace if defective.**
6. 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.**
7. Loose or broken wire #36 plug A pin #18 to platform terminal block.	**Check continuity. Replace if defective.**
8. Loose or broken wire #36 from platform terminal block to platform rotate left valve 4H-36.	**Check continuity. Replace if defective.**
9. Loose or broken wire #02 from platform terminal block to platform rotate left valve 4H-36.	**Check continuity. Replace if defective.**
10. Defective platform rotate left valve coil 4H-36.	**Check continuity and resistance through coil. Replace if defective.**

No Platform Rotate Right

1. Loose or broken wire #10A from ignition/ pump 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 D37-1.	**Check diode. Replace if defective.**
4. Loose or broken wire #37A from diode D37-1 to resistor R1.	**Check continuity. Replace if defective.**
5. Loose or broken wire #37 from platform rotate switch S16 to base connector plug A pin #19.	**Check continuity. Replace if defective.**
6. 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.**
7. Loose or broken wire #37 plug A pin #19 to platform terminal block.	**Check continuity. Replace if defective.**
8. Loose or broken wire #37 from platform terminal block to platform rotate right valve 4H-37.	**Check continuity. Replace if defective.**
9. Loose or broken wire #02 from platform terminal block to platform rotate right valve 4H-37.	**Check continuity. Replace if defective.**
10. Defective platform rotate right valve coil 4H-37.	**Check continuity and resistance through coil. Replace if defective.**

No Platform Rotate Left or Right

1. Open resistor R1 (ANSI)/ R2 (CE, AS).	**Check resistor for 10 ohms (45T) or 13 ohms (40T). If no resistance found, replace resistor.**
2. Loose or broken wire #35A from resistor R2 to base key switch S2. (ANSI)	**Check continuity. Replace if defective**
3. Open or defective base key switch S2.	**Select base control on switch. Check continuity through switch. Replace if defective.**
4. Loose or broken wire #42 from base key switch S2 (ANSI) or resistor R2 (CE, AS) to turret harness plug pin #16.	**Check continuity. Replace if defective**
5. Loose or broken wire #42 from turret harness plug pin #16 to proportional flow enable valve 2H-42.	**Check continuity. Replace if defective**
6. Loose or broken wire #02 from turret harness plug to proportional flow enable valve 2H-42.	**Check continuity. Replace if defective**
7. Defective proportional flow enable valve coil 2H-42.	**Check continuity and resistance through coil. Replace if defective.**

No Jib Up

1. Loose or broken wire #10A from ignition/ pump 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 D35-1.	**Check diode. Replace if defective.**
4. Loose or broken wire #35A from diode D35-1 to resistor R2.	**Check continuity. Replace if defective.**
5. Loose or broken wire #35 from jib up switch S17 to base connector plug A pin #17.	**Check continuity. Replace if defective**
6. 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.**
7. Loose or broken wire #35 from plug A pin #17 to platform terminal block.	**Check continuity. Replace if defective**
8. Loose or broken wire #35 from platform terminal block to jib up valve 4H-35.	**Check continuity. Replace if defective**
9. Loose or broken wire #02 from platform terminal block to jib up valve 4H-35.	**Check continuity. Replace if defective**
10. Defective jib up valve coil 4H-35.	**Check continuity and resistance through coil. Replace if defective.**

No Jib Down

1. Loose or broken wire #10A from ignition/ pump 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 D34-1.	**Check diode. Replace if defective.**
4. Loose or broken wire #35A from diode D34-1 to resistor R2.	**Check continuity. Replace if defective**
5. Loose or broken wire #34 from jib down switch S17 to base connector plug A pin #16.	**Check continuity. Replace if defective**
6. 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.**
7. Loose or broken wire #34 from plug A pin #16 to platform terminal block.	**Check continuity. Replace if defective**
8. Loose or broken wire #34 from platform terminal block to jib down valve 4H-34.	**Check continuity. Replace if defective**

9. Loose or broken wire #02 from platform terminal block to jib down valve 4H-34.	**Check continuity. Replace if defective**
10. Defective jib down valve coil 4H-34.	**Check continuity and resistance through coil. Replace if defective.**
No Jib Up Or Down	
1. Loose or broken wire #35A from resistor R2 to base key switch S2.	**Check continuity. Replace if defective**
2. Open or defective base key switch S2.	**Select base control console on switch. Check continuity through switch. Replace if defective.**
3. Loose or broken wire #42 from base key switch S2 to turret harness plug pin #16.	**Check continuity. Replace if defective**
4. Loose or broken wire #42 from turret harness plug pin #16 to proportional flow enable valve 2H-42.	**Check continuity. Replace if defective**
5. Loose or broken wire #02 from turret harness plug to proportional flow enable valve 2H-42.	**Check continuity. Replace if defective**
6. Defective proportional flow enable valve coil 2H-42.	**Check continuity and resistance through coil. Replace if defective.**
No Manual Platform Level Up	
1. Loose or broken wire #10A from ignition/ pump 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 turret harness pin plug pin#15.	**Check continuity. Replace if defective**
5. Loose or broken wire #41 from turret harness pin plug pin#15 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.**
8. Loose or broken wire #41 from base terminal block to base connector plug B pin #11.	**Check continuity. Replace if defective**
9. 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.**

10. Loose or broken wire #41 from plug B pin #11 to platform terminal block.	**Check continuity. Replace if defective**
11. Open diode D41 located in platform terminal block.	**Check diode. Replace if defective.**
No Manual Platform Level Down	
1. Loose or broken wire #10A from ignition/ pump 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 turret harness pin plug pin #14.	**Check continuity. Replace if defective**
5. Loose or broken wire #40 from turret harness pin plug pin #14 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.**
8. Loose or broken wire #40 from base terminal block to base connector plug B pin #10.	**Check continuity. Replace if defective**
9. 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.**
10. Loose or broken wire #40 from plug B pin #10 to platform terminal block.	**Check continuity. Replace if defective**
11. Open diode D40 located in platform terminal block.	**Check diode. Replace if defective.**

4.2-9 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 #4B from emergency stop switch S4 to platform terminal block.	**Check continuity. Replace if defective.**
3. Loose or broken jumper wire #4B on emergency stop switch S4.	**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 #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 OCM pin voltage reference.**
14. Loose or broken wire #08 from valve driver pin #6 to relay 08CR1.	**Check continuity. Replace if defective.**
15. Loose or broken wire #02 from platform terminal block to relay 08CR1.	**Check continuity. Replace if defective.**
16. Loose or broken wire #20D from platform terminal block to relay 08CR1.	**Check continuity. Replace if defective.**
17. Loose or broken wire #20 from 08CR1 relay to plug A pin #8 in platform control console.	**Check continuity. Replace if defective.**
18. Defective relay 08CR1.	**Check relay. Replace if defective.**

No Manual Platform Level Up

NOTE
This function times out after 15 seconds when operating this function only

1. Loose or broken wire #08 from platform terminal block (ANSI) or wire 26A from OCM pin 19 (CE, AS) to platform level switch S19.	**Check continuity. Replace if defective.**
2. Defective platform level switch S19.	**Check continuity through switch while activating level up function between wires #08 and #41. If no continuity found replace switch.**
3. Loose or broken wire #41 from platform level switch S19 to platform terminal block.	**Check continuity. Replace if defective.**
4. Open diode D41 located in platform terminal block.	**Check diode. Replace if defective.**

No Manual Platform Level Down

NOTE
This function times out after 15 seconds when operating this function only

1. Loose or broken wire #08 from platform terminal block to platform level switch S19.	**Check continuity. Replace if defective.**
2. Defective platform level switch S19.	**Check continuity through switch while activating level up function between wires #08 and #40. If no continuity found replace switch.**
3. Loose or broken wire #40 from platform level switch S19 to platform terminal block.	**Check continuity. Replace if defective.**
4. Open diode D40 located in platform terminal block.	**Check diode. Replace if defective.**

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 #20B.	**Check pin #5 for 12 volts. If no voltage present with foot on footswitch check section 5 for OCM pin voltage reference.**

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 OCM pin voltage reference.**
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 turret harness plug pin #4.	**Check continuity. Replace if defective.**
11. Loose or broken wire #14 from turret harness plug pin #4 to boom up valve 4H-14.	**Check continuity. Replace if defective.**
12. Loose or broken wire #02 from turret 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.**

No Boom Down

NOTE

Boom Down may be disabled by the dual load zone system and/or overload system if equipped. Please first ensure the boom is fully retracted and there are no faults in the overload system.

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 #20B.	**Check pin #5 for 12 volts. If no voltage present with foot on footswitch check section 5 for OCM pin voltage reference.**
6. No output on pin #8 of the valve driver to wire #13.	**Check pin #8 for minimum 3.5 volts. If no voltage present with foot on footswitch check section 5 for OCM pin voltage reference.**
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 turret harness plug pin #3.	**Check continuity. Replace if defective.** **Go to No Boom Lower Function from Base or Platform Control Consoles.**
No Turret Left	
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 #20B.	**Check pin #5 for 12 volts. If no voltage present with foot on footswitch check section 5 for OCM pin voltage reference.**
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 OCM pin voltage reference.**
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 turret harness plug pin #10.	**Check continuity. Replace if defective.**
11. Loose or broken wire #32 from turret harness plug pin #10 to turret left valve 4H-32.	**Check continuity. Replace if defective.**
12. Loose or broken wire #02 from turret 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.**
No Turret Right	
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 #20B.	**Check pin #5 for 12 volts. If no voltage present with foot on footswitch check section 5 for OCM pin voltage reference.**
6. No output on pin #35 of the valve driver to wire #33.	**Check pin #10 for minimum 3.5 volts. If no voltage present with foot on footswitch check section 5 for OCM pin voltage reference.**
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 turret harness plug pin #11.	**Check continuity. Replace if defective.**
11. Loose or broken wire #33 from turret harness plug pin #11 to turret right valve 4H-33.	**Check continuity. Replace if defective.**
12. Loose or broken wire #02 from turret 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.**
No Telescope In	
1. Loose or broken purple wire from speed controller to resistor R9 in platform control console.	**Check continuity. Replace if defective.**
2. Open or defective resistor R9.	**Check resistor. Replace if defective.**
3. Loose or broken wire #38B from resistor R9 to telescope switch S18.	**Check continuity. Replace if defective.**
4. Defective telescope switch S18.	**Check continuity through switch while activating the function between wires #38B and #38A.**
5. Loose or broken wire #38A from telescope switch S18 to valve driver pin #32.	**Check continuity. Replace if defective.**
6. Voltage out of range at valve driver pin #32.	**Check voltage while operating telescope in. Voltage should be between 4.75 and 5.25 volts. Refer to telescope voltage reference table in section 5 if out of this range.**

7. No output on pin #5 of the valve driver to wire #20B.	**Check pin #5 for 12 volts. If no voltage present with foot on footswitch check section 5 for OCM pin voltage reference.**
8. No output on pin #9 of the valve driver to wire #38.	**Check pin #9 for minimum 3.5 volts. If no voltage present with foot on footswitch check section 5 for OCM pin voltage reference.**
9. Loose or broken wire #38 from valve driver pin #9 to plug B pin #8 in platform control console.	**Check continuity. Replace if defective.**
10. 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.**
11. Loose or broken wire #38 from base connector plug B pin #8 to base terminal block.	**Check continuity. Replace if defective.**
12. Loose or broken wire #38 from base terminal block to turret harness plug pin #12.	**Check continuity. Replace if defective.**
13. Loose or broken wire #38 from turret harness plug pin #12 to telescope in valve 3H-38.	**Check continuity. Replace if defective.**
14. Loose or broken wire #02 from turret harness plug to telescope in valve 3H-38.	**Check continuity. Replace if defective.**
15. Defective telescope in valve coil 3H-38.	**Check continuity and resistance through coil. Replace if defective.**

No Telescope Out

NOTE

Telescope extend function may be disabled by the dual load zone system and/or overload system if equipped. Please first ensure the boom is fully retracted and there are no faults in the overload system.

1. Loose or broken purple wire from speed controller to resistor R9 in platform control console.	**Check continuity. Replace if defective.**
2. Open or defective resistor R9.	**Check resistor. Replace if defective.**
3. Loose or broken wire #38B from resistor R9 to telescope switch S18.	**Check continuity. Replace if defective.**
4. Open or defective resistor R10.	**Check resistor. Replace if defective.**
5. Defective telescope switch S18.	**Check continuity through switch while activating the function between wires #38C and #38A.**
6. Loose or broken wire #38A from telescope switch S18 to valve driver pin #32.	**Check continuity. Replace if defective.**
7. Voltage out of range at valve driver pin #32.	**Check voltage while operating telescope out. Voltage should be between 2.25 and 2.75 volts. Refer to telescope voltage reference table in section 5 if out of this range.**

8. No output on pin #5 of the valve driver to wire #20B.	**Check pin #5 for 12 volts. If no voltage present with foot on footswitch check section 5 for OCM pin voltage reference.**
9. No output on pin #12 of the valve driver to wire #39.	**Check pin #12 for minimum 3.5 volts. If no voltage present with foot on footswitch check section 5 for OCM pin voltage reference.**
10. Loose or broken wire #39 from valve driver pin #12 to plug B pin #9 in platform control console.	**Check continuity. Replace if defective.**
11. 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.**
12. Loose or broken wire #39 from base connector plug B pin #9 to base terminal block.	**Check continuity. Replace if defective.**
No Platform Rotate or Jib Function	
1. Loose or broken wire #08 from platform terminal block to rotate switch S20 and jib switch S21.	**Check continuity. Replace if defective.**
2. No output on pin #21 of the valve driver to wire #42.	**Check pin #20 for minimum 3.5 volts. If no voltage present with foot on footswitch check section 5 for OCM pin voltage reference.**
3. Loose or broken wire #42 from valve driver pin #21 to plug B pin #24 in platform control console.	**Check continuity. Replace if defective.**
4. Loose or broken wire #42 in boom cable B or its connectors.	**Check for continuity between pins #24 on cable B. Check for loose or corroded connections on cable connectors. Replace if wire is defective.**
5. Loose or broken wire #42 from base connector plug B pin #24 to base key switch S2.	**Check continuity. Replace if defective.**
6. Loose or broken wire #42 from base key switch S2 to turret harness plug pin #16.	**Check continuity. Replace if defective.**
7. Loose or broken wire #42 from turret harness plug pin #16 to proportional flow enable valve 2H-42.	**Check continuity. Replace if defective.**
8. Loose or broken wire #02 from turret harness plug to proportional flow enable valve 2H-42.	**Check continuity. Replace if defective.**
9. Defective proportional flow enable valve 2H-42.	**Check continuity and resistance through coil. Replace if defective.**
No Platform Rotate Left	
1. Defective platform rotate switch S20.	**Check continuity through switch while activating rotate left function between wires #08 and #36.**
2. Loose or broken wire #36 from platform rotate switch S20 to platform terminal block.	**Check continuity. Replace if defective.**

3. Loose or broken jumper wire #36 on platform terminal block.	**Check continuity. Replace if defective.**
4. Open or defective diode D36 in platform terminal block.	**Check diode. Replace if defective.**
5. Loose or broken wire #36A from platform terminal block to valve driver pin #17.	**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.**
No Platform Rotate Right	
1. Defective platform rotate switch S20.	**Check continuity through switch while activating rotate right function between wires #08 and #37.**
2. Loose or broken wire #37 from platform rotate switch S20 to platform terminal block.	**Check continuity. Replace if defective.**
3. Loose or broken jumper wire #37 on platform terminal block.	**Check continuity. Replace if defective.**
4. Open or defective diode D37 in platform terminal block.	**Check diode. Replace if defective.**
5. Loose or broken wire #36A from platform terminal block to valve driver pin #17.	**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.**
No Jib Up	
1. Defective jib switch S21.	**Check continuity through switch while activating jib up function between wires #08 and #35.**
2. Loose or broken wire #35 from jib switch S21 to platform terminal block.	**Check continuity. Replace if defective.**
3. Loose or broken jumper wire #35 on platform terminal block.	**Check continuity. Replace if defective.**
4. Open or defective diode D35 in platform terminal block.	**Check diode. Replace if defective.**
5. Loose or broken wire #34A from platform terminal block to valve driver pin #33.	**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.**

No Jib Down

1. Defective jib switch S21.	
2. Loose or broken wire #34 from jib switch S21 to platform terminal block.	**Check continuity. Replace if defective.**
3. Loose or broken jumper wire #34 on platform terminal block.	**Check continuity. Replace if defective.**
4. Open or defective diode D34 in platform terminal block.	**Check diode. Replace if defective.**
5. Loose or broken wire #34A from platform terminal block to valve driver pin #33.	**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 down valve coil 4H-34.	**Check continuity and resistance through coil. Replace if defective.**

4.2-10 Throttle Inoperative, Mid and High - Deutz D2.9L

1. Loose or broken wire #90 from base terminal block to connector J2 pin #5.	**Check continuity. Replace if defective.**
2. Loose or broken wire #90 from connector P2 pin #5 94 pin ECU connector pin 80.	**Check continuity. Replace if defective.**
3. Loose or broken wire #99 from base terminal block to connector J2 pin 4	**Check continuity. Replace if defective.**
4. Loose or broken wire #99 from connector P2 pin 4 to 94 pin ECU connector pin 74	**Check continuity. Replace if defective.**
5. Resistor R4 open or poor connection at base terminal block.	**Measure resistance (1KΩ) between 99 and 99A. Check connections. Replace if defective.**
6. Resistor R5 open or poor connection at base terminal block.	**Measure resistance (3.3KΩ) between 99A and 99B. Check connections. Replace if defective.**
7. Resistor R6 open or poor connection at base terminal block.	**Measure resistance (3.9KΩ) between 99B and 90. Check connections. Replace if defective.**

4.2-11 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.**
With the following conditions: ▪ Deutz D2.9L Diesel	
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 #90 from relay 79CR to base terminal block.	**Check continuity. Replace if defective.**
9. Loose or broken wire #99B from relay 79CR to base terminal block.	**Check continuity. Replace if defective.**
10. Defective relay 79CR.	**Check relay. Replace if defective.**
With the following conditions: ▪ Deutz D2011 Diesel	
11. Loose or broken wire #79 from base plug B pin #20 to relay 79CR.	**Check continuity. Replace if defective.**
12. Loose or broken wire #02 from base terminal block to relay 79CR.	**Check continuity. Replace if defective.**
13. Loose or broken wire #99 from relay 79CR to ECU connector pin #18.	**Check continuity. Replace if defective.**
14. Loose or broken wire #103 from relay 79CR to base terminal block.	**Check continuity. Replace if defective.**
15. Loose or broken wire #103 from base terminal block to ECU connector pin #17.	**Check continuity. Replace if defective.**
16. Defective relay 79CR.	**Check relay. Replace if defective.**

4.2-12 High Throttle Inoperative

1. Loose or broken wire #08 from platform terminal block to throttle switch S10.	**Check continuity. Replace if defective.**
2. Defective throttle switch S10.	**Check continuity through switch while activating high throttle function between wires #08 and #78. If no continuity found replace switch.**
3. Loose or broken wire #78 from throttle switch S10 to plug B pin #19 in platform control console.	**Check continuity. Replace if defective.**
4. 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.**
With the following conditions: ▪ Deutz D2.9L Diesel	
5. Loose or broken wire #78 from base plug B pin #19 to relay 78CR.	**Check continuity. Replace if defective.**
6. Loose or broken wire #02 from base terminal block to relay 78CR.	**Check continuity. Replace if defective.**
7. Loose or broken wire #90 from relay 78CR to base terminal block.	**Check continuity. Replace if defective.**
8. Loose or broken wire #99A from relay 78CR to base terminal block.	**Check continuity. Replace if defective.**
9. Defective relay 78CR.	**Check relay. Replace if defective.**
With the following conditions: ▪ Deutz D2011 Diesel	
10. Loose or broken wire #78 from base plug B pin #17 to relay 78CR.	**Check continuity. Replace if defective.**
11. Loose or broken wire #02 from base terminal block to relay 78CR.	**Check continuity. Replace if defective.**
12. Loose or broken wire #90 from relay 78CR to ECU connector pin #21.	**Check continuity. Replace if defective.**
13. Loose or broken wire #103 from relay 78CR to base terminal block.	**Check continuity. Replace if defective.**
14. Loose or broken wire #103 from base terminal block to ECU connector pin #17.	**Check continuity. Replace if defective.**
15. Defective relay 78CR.	**Check relay. Replace if defective.**

4.2-13 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 OCM pin voltage reference.**
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 turret harness plug pin #8.	**Check continuity. Replace if defective.**
5. Loose or broken wire #26 or #02 from turret 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.**

4.2-14 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 #4 from platform terminal block to drive joystick A2 in platform control console.	**Check continuity. Replace if defective.**
2. Loose or broken wire #02 from platform terminal block to drive joystick A2.	**Check continuity. Replace if defective.**
3. Defective drive joystickA2.	**See drive joystick test procedure in section 5.**
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 OCM pin voltage reference.**
4. Loose or broken wire #16 from valve driver pin #34 to plug B pin #5 in platform control console.	**Check continuity. Replace if defective.**

5. Loose or broken wire #5 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.**
6. Loose or broken wire #16 from base plug B pin #5 to turret harness plug pin #21.	**Check continuity. Replace if defective.**
7. Loose or broken wire #16 or #02 from turret harness plug to forward drive valve 3H-16.	**Check continuity. Replace if defective.**
8. Defective forward drive valve coil 3H-16.	**Check continuity and resistance through coil. Replace if defective.**
No Reverse 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 #23 to wire #15.	**Check pin #23 for minimum 2 volts. If no voltage present with foot on footswitch check section 5 for OCM pin voltage reference.**
4. Loose or broken wire #15 from valve driver pin #23 to plug B pin #4 in platform control console.	**Check continuity. Replace if defective.**
5. 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.**
6. Loose or broken wire #15 from base plug B pin #4 to turret harness plug pin #20.	**Check continuity. Replace if defective.**
7. Loose or broken wire #15 or #02 from turret harness plug to reverse drive valve 3H-15.	**Check continuity. Replace if defective.**
8. Defective reverse drive valve coil 3H-15.	**Check continuity and resistance through coil. Replace if defective.**
No Left Steer	

NOTE

This function times out after 15 seconds when operating this function only.

1. Loose or broken wire #24 from drive joystick A2 to platform terminal block.	**Check continuity. Replace if defective.**
2. Open or defective diode D24 in platform terminal block.	**Check diode. Replace if defective.**
3. Loose or broken wire #24 from platform terminal block to relay 17ACR1.	**Check continuity. Replace if defective.**
4. Defective N/C contacts in relay 17ACR1.	**Check relay. Replace if defective.**

5. Loose or broken wire #24A from relay 17ACR1 to plug A pin #10 in platform control console.	**Check continuity. Replace if defective.**
6. 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.**
7. Loose or broken wire #24A from base plug A pin #10 in base terminal block.	**Check continuity. Replace if defective.**
8. Loose or broken wire #24A from base terminal block to turret harness plug pin #7.	**Check continuity. Replace if defective.**
9. Loose or broken wire #24A or #02 from turret harness plug to left steer valve 4H-24A.	**Check continuity. Replace if defective.**
10. Defective left steer valve coil 4H-24A.	**Check continuity and resistance through coil. Replace if defective.**

No Right Steer

NOTE

This function times out after 15 seconds when operating this function only.

1. Loose or broken wire #23 from drive joystick A2 to platform terminal block.	**Check continuity. Replace if defective.**
2. Open or defective diode D23 in platform terminal block.	**Check diode. Replace if defective.**
3. Loose or broken wire #23 from platform terminal block to relay 17ACR2.	**Check continuity. Replace if defective.**
4. Defective N/C contacts in relay 17ACR2.	**Check relay. Replace if defective.**
5. Loose or broken wire #23A from relay 17ACR2 to plug A pin #9 in platform control console.	**Check continuity. Replace if defective.**
6. 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.**
7. Loose or broken wire #23A from base plug A pin #9 to base terminal block.	**Check continuity. Replace if defective.**
8. Loose or broken wire #23A from base terminal block to turret harness plug pin #6.	**Check continuity. Replace if defective.**
9. Loose or broken wire #23A or #02 from turret harness plug to right steer valve 4H-23A.	**Check continuity. Replace if defective.**
10. Defective left steer valve coil 4H-23A.	**Check continuity and resistance through coil. Replace if defective.**

4.2-15 No High Speed Drive

NOTE

Aerial platform must be level and boom must be below 15 degrees and fully retracted for high speed drive.

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 below 15 degrees. 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. 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 in platform control console 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 OCM pin voltage reference.**
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 base plug A pin #20 to relay 45CR1.	**Check continuity. Replace if defective.**
17. Loose or broken wire #02 from base terminal block to relay 45CR1.	**Check continuity. Replace if defective.**
18. Loose or broken wire #09 from base terminal block to relay 45CR1.	**Check continuity. Replace if defective.**
19. Defective relay 45CR1.	**Check relay. Replace if defective.**
20. Loose or broken wire #45A from base terminal block to turret harness plug pin #17.	**Check continuity. Replace if defective.**
21. Loose or broken wire #45A or #02 from turret 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.**

4.2-16 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 angle transducer/ tilt switch AT1.	**Check continuity. Replace if defective.**
2. Misadjusted, no output or defective angle transducer/ tilt switch AT1.	**Adjust angle transducer/ tilt switch if required. Check for 12 volts on wire #28. If no voltage present with angle transducer/ tilt switch adjusted it is defective, replace angle transducer/ tilt switch.**
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 #18.	**Check continuity. Replace if defective.**

4.2-17 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 base 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 OCM pin voltage reference.**

4.2-18 Steer Direction Sensing Inoperative

1. No output on valve driver pin #4 to wire #17A.	**Check pin #4 for 12 volts. If no voltage present with foot on footswitch check section 5 for OCM pin voltage reference.**
2. Loose or broken wire #17A from valve driver pin #4 to relays 17ACR1 and 17ACR2.	**Check continuity. Replace if defective.**
3. Loose or broken wire #02 from platform terminal block to relays 17ACR1 and 17ACR2.	**Check continuity. Replace if defective.**
4. Defective relays 17ACR1 and 17ACR2.	**Check relay. Replace if defective.**

NOTE

If only one relay is bad and one is OK, you will have steer in one direction only.

4.2-19 No boom down or extend Functions from Base or Platform Consoles (ANSI)

1. Defective diode D09-1 in base control console.	**Check diode. Replace if defective.**
2. Loose or broken wire #9B from base terminal block to LS4 (boom angle) and/or LS5 (boom extension) dual load zone limit switches.	**Check continuity. Replace if defective.**
3. Open or defective limit switch LS4. Switch is NCHO (normally open held open). Closed above 57°	**Adjust limit switch if required. Check continuity through switch. Replace if defective.**
4. Open or defective limit switch LS5. Switch is NC (normally closed). Open beyond	**Adjust limit switch if required. Check continuity through switch. Replace if defective.**
5. Loose or broken wire #121 from LS4 (boom angle) and/or LS5 (boom extension) dual load zone limit switches to base terminal block.	**Check continuity. Replace if defective.**
6. Loose or broken wire #121 from base terminal block to boom down and boom extend cut out relays CR121 and 121CR2.	**Check continuity. Replace if defective.**

4.2-20 No boom down Function from Base or Platform Consoles (ANSI)

1. Loose or broken wire #13 from base terminal block to 121CR pin 30.	**Check continuity. Replace if defective.**
2. Loose or broken wire #02 from 121CR relay pin 86 to ground.	**Check continuity. Replace if defective.**
3. Defective relay 121CR.	**Check relay. Replace if defective**
4. Loose or broke wire #13A from 121CR relay to harness plug pin #3.	**Check continuity. Replace if defective.**
5. Loose or broke wire #13A from harness plug pin #3 to boom down valve 4H-13A.	**Check continuity. Replace if defective.**
6. Loose or broken wire #02 from turret harness plug to boom down valve 4H-13A.	**Check continuity. Replace if defective.**
7. Defective boom down coil 4H-13A.	**Check continuity and resistance through coil. Replace if defective**.

4.2-21 No boom extend Function from Base or Platform Consoles (ANSI)

1. Loose or broken wire #39 from base terminal block to 121CR2 pin 30.	**Check continuity. Replace if defective.**
2. Loose or broken wire #02 from 121CR2 relay pin 86 to ground.	**Check continuity. Replace if defective.**
3. Defective relay 121CR2.	**Check relay. Replace if defective**
4. Loose or broke wire #39A from 121CR2 relay to harness plug pin #13.	**Check continuity. Replace if defective.**
5. Loose or broke wire #39A from harness plug pin #13 to boom extend valve 4H-39A.	**Check continuity. Replace if defective.**
6. Loose or broken wire #02 from turret harness plug to boom extend valve 4H-39A.	**Check continuity. Replace if defective.**
7. Defective boom extend coil 4H-39A.	**Check continuity and resistance through coil. Replace if defective.**

4.2-22 No boom down Function from Base or Platform Consoles (CE, AS)

1. Loose or broken wire #13 from base terminal block to load sense/dual load zone module white connector J4 pin 7.	**Check continuity. Replace if defective.**
2. No output on load sense/dual load zone module white connector J4 pin 5 to wirer 13A.	**Check pin #5 for 12 volts. If no voltage present when operating down function check section 5 for module information.**
3. Loose or broke wire #13A from load sense/dual load zone module white connector J4 pin 5 to harness plug pin #3.	**Check continuity. Replace if defective.**
4. Loose or broke wire #13A from harness plug pin #3 to boom down valve 4H-13A.	**Check continuity. Replace if defective.**
5. Loose or broken wire #02 from turret harness plug to boom down valve 4H-13A.	**Check continuity. Replace if defective.**
6. Defective boom down coil 4H-13A.	**Check continuity and resistance through coil. Replace if defective.**

4.2-23 No boom extend Function from Base or Platform Consoles (CE, AS)

1. Loose or broken wire #39 from base terminal block to load sense/dual load zone module white connector J4 pin 6.	**Check continuity. Replace if defective.**
2. No output on load sense/dual load zone module white connector J4 pin 3 to wirer 39A.	**Check pin #5 for 12 volts. If no voltage present when operating down function check section 5 for module information.**
3. Loose or broke wire #13A from load sense/dual load zone module white connector J4 pin 5 to harness plug pin #3.	**Check continuity. Replace if defective.**
4. Loose or broke wire #13A from harness plug pin #3 to boom down valve 4H-13A.	**Check continuity. Replace if defective.**
5. Loose or broken wire #02 from turret harness plug to boom down valve 4H-13A.	**Check continuity. Replace if defective.**
6. Defective boom down coil 4H-13A.	**Check continuity and resistance through coil. Replace if defective.**

4.3 Hydraulic System

4.3-1 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.**

4.3-2 All Boom Functions Inoperative

1. Open or defective dump/ enable 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 RV1.	**Set valve to specifications. Check O-rings and clean valve. Repair or replace valve as required.**
3. System pump P2 out of adjustment or is defective.	**Refer to section 5 for pump set up procedure. Replace if defective.**
4. Defective load sense adjusting valve 3H-V2.	**Check valve. Replace if defective.**
5. Defective pressure compensator valve 3H-V1.	**Check valve. Replace if defective.**
6. Plugged or defective high pressure filter F1.	**Check filter. Replace if plugged or defective.**

4.3-3 No Main Boom Up

1. Stuck or defective differential sensing valve DSV2.	**Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.**
2. Stuck or defective lift up valve 4H-14.	**Clean valve. Check operation of valve. Repair or replace valve as required.**
3. Stuck or defective shuttle valve SV2.	**Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.**
4. Stuck or defective check valve CV5.	**Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.**
5. Stuck or defective counterbalance valve CB3.	**Clean valve. Check O-rings on valve. Repair or replace valve as required.**
6. Defective lift cylinder C1.	**Check seals on cylinder. Replace as necessary. Replace cylinder if defective.**

4.3-4 No Main Boom Down

1. Stuck or defective differential sensing valve DSV2.	**Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.**
2. Stuck or defective lift up valve 4H-13.	**Clean valve. Check operation of valve. Repair or replace valve as required.**
3. Stuck or defective shuttle valve SV2.	**Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.**
4. Stuck or defective check valve CV5.	**Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.**
5. Stuck or defective counterbalance valve CB3.	**Clean valve. Check O-rings on valve. Repair or replace valve as required.**
6. Defective lift cylinder C1.	**Check seals on cylinder. Replace as necessary. Replace cylinder if defective.**

4.3-5 No Turret Rotate

Left Rotate

1. Stuck or defective differential sensing valve DSV1.	**Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.**
2. Stuck or defective rotate left valve 4H-32.	**Clean valve. Check operation of valve. Repair or replace valve as required.**
3. Stuck or defective shuttle valve SV1.	**Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.**
4. Stuck or defective check valve CV4.	**Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.**
5. Stuck or defective relief valve RV2.	**Set valve to specifications. Check O-rings and clean valve. Repair or replace valve as required.**
6. Stuck or defective shuttle valve SV7.	**Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.**
7. Stuck or defective counterbalance valve CB2.	**Clean valve. Check O-rings on valve. Repair or replace valve as required.**
8. Turret rotate brake BR1 not releasing.	**Inspect brake for worn seals or broken components. Repair and replace as necessary.**
9. Worn or defective swing drive motor M2.	**Check motor. Repair or replace if defective.**

Right Rotate

1. Stuck or defective differential sensing valve DSV1.	**Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.**
2. Stuck or defective rotate left valve 4H-33.	**Clean valve. Check operation of valve. Repair or replace valve as required.**
3. Stuck or defective shuttle valve SV1.	**Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.**

4. Stuck or defective check valve CV4.	**Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.**
5. Stuck or defective relief valve RV2.	**Set valve to specifications. Check O-rings and clean valve. Repair or replace valve as required.**
6. Stuck or defective shuttle valve SV7.	**Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.**
7. Stuck or defective counterbalance valve CB1.	**Clean valve. Check O-rings on valve. Repair or replace valve as required.**
8. Turret rotate brake BR1 not releasing.	**Inspect brake for worn seals or broken components. Repair and replace as necessary.**
9. Worn or defective swing drive motor M2.	**Check motor. Repair or replace if defective.**

4.3-6 No Boom Extend

1. Stuck or defective differential sensing valve DSV3.	**Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.**
2. Stuck or defective boom extend valve 3H-39.	**Clean valve. Check operation of valve. Repair or replace valve as required.**
3. Stuck or defective check valve CV11.	**Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.**
4. Stuck or defective check valve CV6.	**Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.**
5. Stuck or defective relief valve RV4.	**Set valve to specifications. Check O-rings and clean valve. Repair or replace valve as required.**
6. Return valve V5 stuck in the open position.	**Clean valve. Check operation of valve. Repair or replace valve as required.**
7. Stuck or defective counterbalance valve CB4.	**Clean valve. Check O-rings on valve. Repair or replace valve as required.**
8. Return valve V4 stuck in the closed position or is defective.	**Clean valve. Check operation of valve. Repair or replace valve as required.**
9. Defective extension cylinder C2.	**Check seals on cylinder. Replace as necessary. Replace cylinder if defective.**

4.3-7 No Boom Retract

1. Stuck or defective differential sensing valve DSV3.	**Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.**
2. Stuck or defective boom extend valve 3H-38.	**Clean valve. Check operation of valve. Repair or replace valve as required.**
3. Stuck or defective check valve CV10.	**Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.**
4. Stuck or defective check valve CV6.	**Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.**
5. Stuck or defective relief valve RV4.	**Set valve to specifications. Check O-rings and clean valve. Repair or replace valve as required.**
6. Return valve V4 stuck in the open position.	**Clean valve. Check operation of valve. Repair or replace valve as required.**
7. Stuck or defective counterbalance valve CB5.	**Clean valve. Check O-rings on valve. Repair or replace valve as required.**
8. Return valve V5 stuck in the closed position or is defective.	**Clean valve. Check operation of valve. Repair or replace valve as required.**
9. Defective extension cylinder C2.	**Check seals on cylinder. Replace as necessary. Replace cylinder if defective.**

4.3-8 No Jib Up

1. Stuck or defective proportional flow enable valve 2H-42.	**Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.**
2. Stuck or defective check valve CV9.	**Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.**
3. Stuck or defective jib up valve 4H-35.	**Clean valve. Check operation of valve. Repair or replace valve as required.**
4. Stuck or defective counterbalance valve CB9.	**Clean valve. Check O-rings on valve. Repair or replace valve as required.**
5. Defective jib cylinder C5.	**Check seals on cylinder. Replace as necessary. Replace cylinder if defective.**

4.3-9 No Jib Down

1. Stuck or defective proportional flow enable valve 2H-42.	**Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.**
2. Stuck or defective check valve CV9.	**Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.**
3. Stuck or defective jib up valve 4H-34.	**Clean valve. Check operation of valve. Repair or replace valve as required.**
4. Stuck or defective counterbalance valve CB8.	**Clean valve. Check O-rings on valve. Repair or replace valve as required.**
5. Defective jib cylinder C5.	**Check seals on cylinder. Replace as necessary. Replace cylinder if defective.**

4.3-10 No Platform Rotation

Right Rotation

1. Stuck or defective proportional flow enable valve 2H-42.	**Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.**
2. Stuck or defective check valve CV9.	**Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.**
3. Stuck or defective jib up valve 4H-37.	**Clean 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 rotary actuator RA1.	**Check actuator. Repair or replace as necessary.**

Left Rotation

1. Stuck or defective proportional flow enable valve 2H-42.	**Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.**
2. Stuck or defective check valve CV9.	**Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.**

3. Stuck or defective jib up valve 4H-36.	**Clean valve. Check operation of valve. Repair or replace valve as required.**
4. Stuck or defective counterbalance valve CB10.	**Clean valve. Check O-rings on valve. Repair or replace valve as required.**
5. Defective rotary actuator RA1.	**Check actuator. Repair or replace as necessary.**

4.3-11 Platform will not Level

Level Down

1. Stuck or defective platform level down valve 4H-40.	**Clean valve. Check operation of valve. Repair or replace valve as required.**
2. Stuck or defective dual check valve DCV2.	**Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.**
3. Stuck or defective check valve CV8.	**Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.**
4. Stuck or defective shuttle valve SV3.	**Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.**
5. Stuck or defective relief valve RV3.	**Set valve to specifications. Check O-rings and clean valve. Repair or replace valve as required.**
6. Stuck or defective counterbalance valve CB6.	**Clean valve. Check O-rings on valve. Repair or replace valve as required.**
7. Plugged orifice OR2.	**Check orifice. Clean if plugged or replace if defective.**
8. Defective leveling cylinder C3 or slave cylinder C4.	**Check seals on cylinder. Replace as necessary. Replace cylinder if defective.**

Level Up

1. Stuck or defective platform level down valve 4H-41.	**Clean valve. Check operation of valve. Repair or replace valve as required.**
2. Stuck or defective dual check valve DCV2.	**Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.**
3. Stuck or defective check valve CV7.	**Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.**
4. Stuck or defective shuttle valve SV3.	**Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.**
5. Stuck or defective relief valve RV3.	**Set valve to specifications. Check O-rings and clean valve. Repair or replace valve as required.**
6. Stuck or defective counterbalance valve CB7.	**Clean valve. Check O-rings on valve. Repair or replace valve as required.**
7. Plugged orifice OR2.	**Check orifice. Clean if plugged or replace if defective.**
8. Defective leveling cylinder C3 or slave cylinder C4.	**Check seals on cylinder. Replace as necessary. Replace cylinder if defective.**

4.3-12 Brake will not Release

1. Stuck or defective shuttle valve SV5.	**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 SV6.	**Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.**
5. Defective or misadjusted relief valve RV5.	**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 BR1.	**Check seals on cylinder. Replace as necessary. Replace cylinder if defective.**

4.3-13 Brake will not Engage

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

4.3-14 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 RV8.	**Set valve to specifications. Check O-rings and clean valve. Repair or replace valve as required.**
3. Worn charge pump P1A.	**Check pump. Replace if defective.**
4. Defective pump displacement control 4H-15 and 4H-16.	**Check control. Replace if defective.**
5. Open bypass valve V6.	**Close bypass valve.**
6. Worn or defective drive pump P1.	**Check pump. Replace if defective.**
7. Worn or defective drive motor M1.	**Check motor. Replace if defective.**
Forward Drive	
1. Defective pump displacement control 4H-16.	**Check control. Replace if defective.**
2. Defective or misadjusted drive relief valve RV6.	**See section 5 for drive pump set up procedures.**
Reverse Drive	
1. Defective pump displacement control 4H-15.	**Check control. Replace if defective.**
2. Defective or misadjusted drive relief valve RV7.	**See section 5 for drive pump set up procedures.**

4.3-15 Differential Lock will not Engage

1. 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.**
2. Bypassing or defective differential lock cylinder C10.	**Check seals on cylinder. Replace as necessary. Replace cylinder if defective**

4.3-16 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.**

4.3-17 No Steer

Steer Right	
1. Stuck or defective right steer valve 4H-23A.	**Clean valve. Check operation of valve. Repair or replace valve as required.**
2. Stuck or defective dual check valve DCV2.	**Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.**
3. Stuck or defective check valve CV2.	**Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.**
4. Plugged orifice OR1.	**Check orifice. Clean if plugged or replace if defective.**
5. Defective steer cylinder C8 for 4WD or C9 for 2WD.	**Check seals on cylinder. Replace as necessary. Replace cylinder if defective.**
Steer Left	
1. Stuck or defective right steer valve 4H-24A.	**Clean valve. Check operation of valve. Repair or replace valve as required.**
2. Stuck or defective dual check valve DCV2.	**Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.**
3. Stuck or defective check valve CV3.	**Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.**
4. Plugged orifice OR1.	**Check orifice. Clean if plugged or replace if defective.**
5. Defective steer cylinder C8 for 4WD or C9 for 2WD.	**Check seals on cylinder. Replace as necessary. Replace cylinder if defective.**
Axle Will Not Oscillate	

NOTE

Axle will only oscillate when boom is fully retracted and is no greater than 15 degrees above horizontal.

1. Stuck or defective axle lockout valve 3H-65.	**Clean valve. Replace if defective.**
2. One or more counterbalance valves (CB12 or CB13) failed to shift or is defective.	**Clean valve. Check O-rings on valve. Repair or replace valve as required.**
Axle Will Not Lock	

NOTE

Axle is in constant float if boom is fully retracted and is below 15 degrees of elevation.

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 cylinders C6 and C7.	**Check seals on cylinder. Replace as necessary. Replace cylinder if defective.**
3. Counterbalance valves (CB12 or CB13) out of adjustment or are defective.	**Clean valve. Check O-rings on valve. Repair or replace valve as required.**

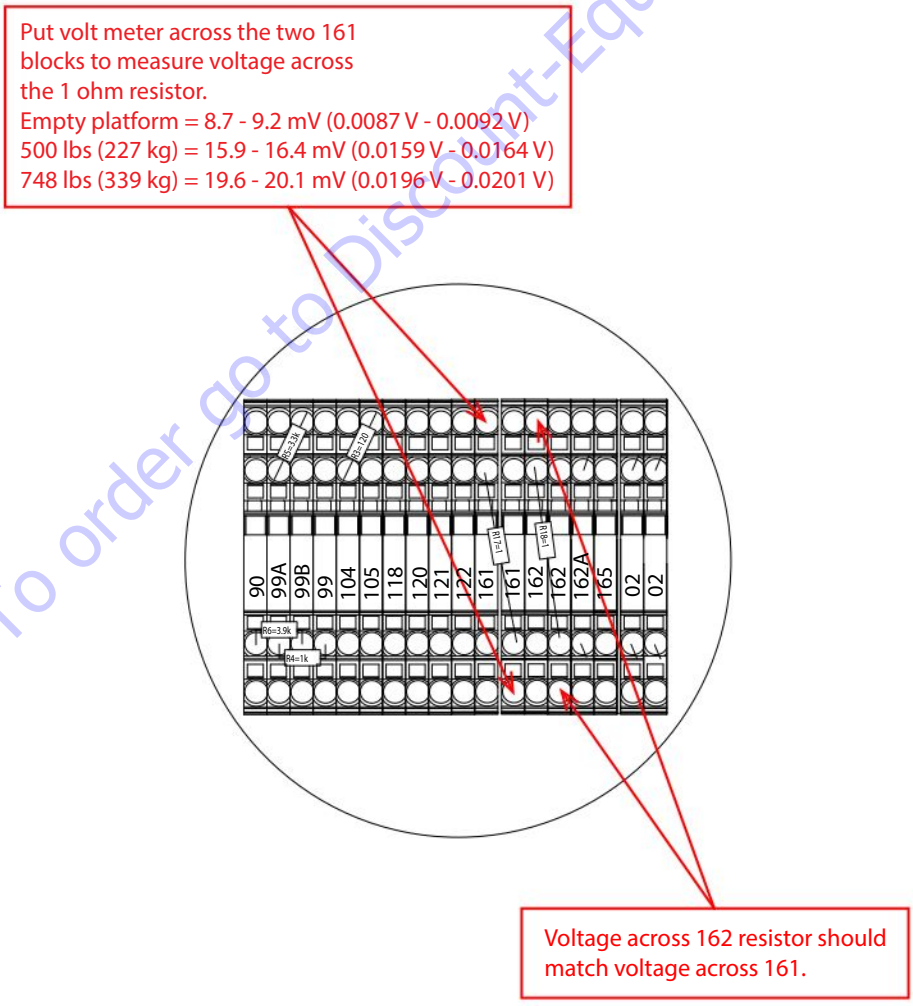
4.4 Load Sensing System - CE

4.4-1 Green LED on Load Sense/Dual Load Zone Module is not on

1. Loose or broken wires #9 and #02 at base terminal block to load sense/dual load zone module white connector J4 pins #8 and #1	**Check for connections. Check for voltage (12V).**

4.4-2 Load Sense indicates overload or overload warning with platform empty or below weight

1. Load cell has lost its calibration.	**Refer to calibration procedure for recalibration of load cell.**
2. Load cell circuit not operating.	**Check Voltage across 1Ω (ohm) resistors 161 and 162 in base control console.**



4.4-3 Load Sense/Dual Load Zone Module Error

When a fault is detected, the module outputs will have limited operation depending on the fault type:

For ANY and all faults:

- Load zone border light is turned on
- Low capacity lamp and high capacity lamp will flash alternately
- Overload lamp will flash
- The Red diagnostic LED on The module will be illuminated (no flashing)

If a short circuit is detected on wire 120, 82, or 119:

- The output that is shorted will be disabled (open, high Z to ground)
- 120 shorted: high capacity light on solid, border light on solid, overload light flashes
- 82 shorted: capacity lights flash alternately, border light on solid, overload light off
- 119 shorted: capacity lights flash alternately, border light off, overload light flashes

If a short circuit is detected on any safety contact (wire 162B, 13A, or 39A):

- All safety contacts will be disabled (opened)
- Stowed Position: all functions are available
- Off limits(boom extended and/or boom above 10°): No functions and overload alarm pulses with overload light.

If the measured load falls below the tare (no load/empty platform) calibration point by 2.0mA, for 1.5 seconds:

- 13A is disabled (open) – Down Function is disabled. Will self-clear when the measured load returns to normal.
- Module Amber and Green diagnostic LEDs flash together

If a discrepancy is detected between the load cell analog inputs (delta > 2mA for 2.0 seconds):

- Wire 162B, 13A, and 39A are disabled (opened) - – Stowed Position: all functions are available: lower and retract functions may not be operable. Off limits: (boom extended and/or boom above 10□): No functions and overload alarm pulses with overload light.
- Module Amber and Green diagnostic LEDs on the module flash alternately

To reset the module hold the actuator button down for 5 seconds, or shut the MEWP platform power off using the ignition switch or e-stop..

4.4-4 No Light/Alarm when Platform is Overloaded

Overload Indicator Light does not Turn On when Platform is Overloaded:

1. Defective lamp	**Check lamp. Replace if defective**
2. Load cell circuit not operating.	**Check Voltage across 1Ω (ohm) resistors 161 and 162 in base control console. See Fig. 1 above**
3. Load sense/dual load zone module out of calibration.	**Calibrate module. Refer to section 5 of this manual for procedure.**
4. No output from module.	**Check Voltage at black connector J3 pin #3 for 12V when platform is loaded with 110% of rated capacity. (Boom fully retracted and 12" (30cm) off the ground.)**
5. Loose or broken wire #82 from the base terminal strip to connector A pin #13.	**Check continuity. Replace if defective.**
6. Loose or broken wire #82 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.**
7. Loose or broken wire #13 plug A pin #13 to 82CR pin 85.	**Check continuity. Replace if defective.**
8. Defective relay 82CR.	**Check relay. Replace if defective.**
9. Load cell circuit not operating.	**Check for connections with wire #02A at pilot light strip and relay 82CR, and wire #82 at platform terminal block and relay 82CR.**

Audible Alarm does not Turn ON when Platform is Overloaded:

1. Defective alarm BP3.	**Check alarm. Replace if defective.**
2. Loose or broken wire #13 plug A pin #13 to 162ACR1 pin 30.	**Check continuity. Replace if defective.**
3. Loose or broken wire #118 from relay 162ACR1 to alarm BP3	**Check continuity. Replace if defective.**
4. Loose or broken wire #2 from alarm BP3 to platform terminal block.	**Check continuity. Replace if defective.**
5. Defective relay 162ACR1.	**Check relay. Replace if defective.**

Section 5 – Procedures

5.1 General

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

NOTE

The illustrations shown in this manual are for instructional purposes only. The models and components shown may appear somewhat different from those on your actual MEWP.

5.1-1 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.

Before performing routine maintenance underneath the boom, support it using a maintenance support or equivalent supporting device. Refer to Figure 01 and 5.1-2 How to Install the Boom Maintenance Support. Contact Skyjack Parts to order a maintenance support.

WARNING

Remove all material and personnel from the platform while using the maintenance support(s).

1. Park the MEWP on a firm, level surface.
2. Retract and lower the boom and platform until the MEWP is in the stowed position.
3. Turn the engine off.
4. Pull out the emergency stop buttons on the base controls and on the platform controls.
5. Turn the battery disconnect switch to the off position ◯ .

After completing any procedure which involves modifying, adjusting, or replacing any hydraulic or electrical components, perform all of the function tests given in your unit's Operating Manual.

WARNING

Make sure you maintain three points of contact when mounting and dismounting the platform.

WARNING

Do not operate any platform controls without the proper fall protection secured to the designated location in the platform. Failure to do so could result in death or serious injury!

WARNING

Make sure there are no people or obstructions in the test area, and there is sufficient space for the boom and drive functions required for the given procedures.

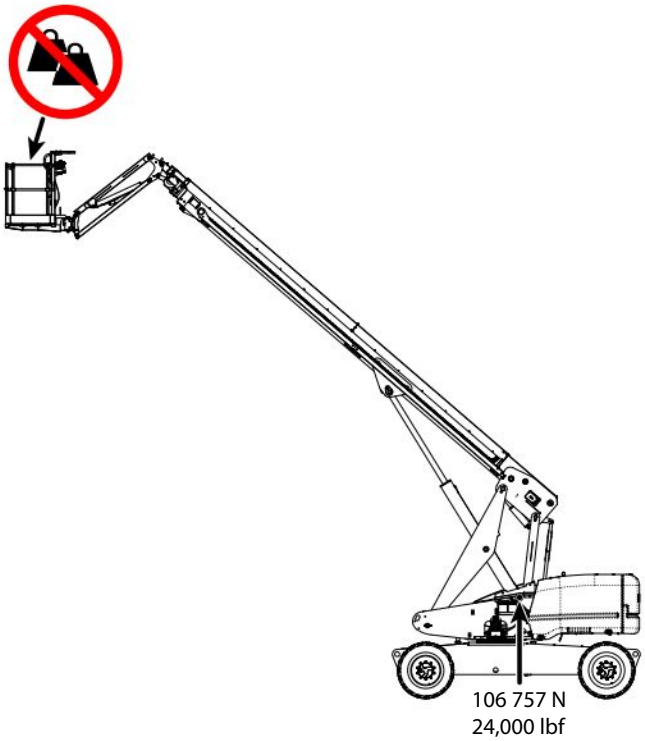


Figure 01 *Support location*

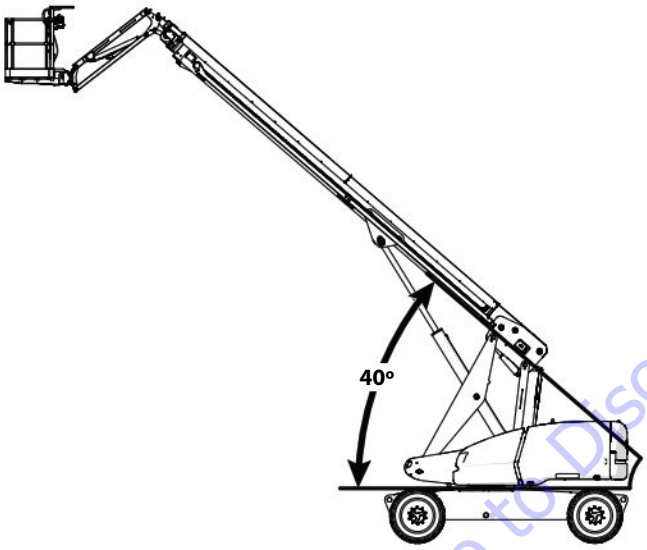
5.1-2 How to Install the Boom Maintenance Support

The boom maintenance support, or an equivalent supporting device in the same location capable of supporting a minimum of 106 757 N (24,000 lbf), must be used whenever work is done underneath the boom. Refer to 5.1-1 Safety and Workmanship.

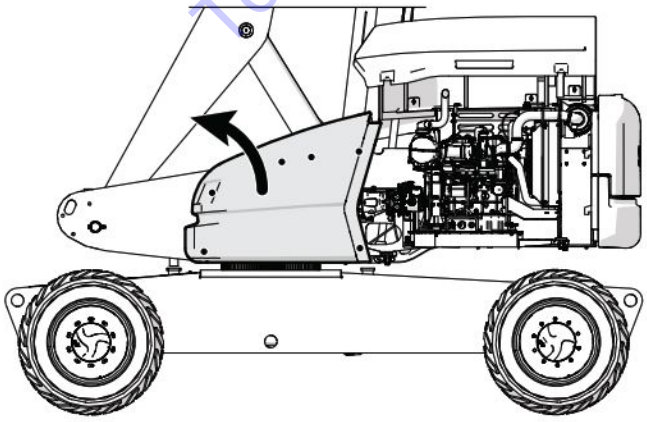
IMPORTANT

Due to the weight of the maintenance support and the size of the MEWP, it is recommended that you have a second person assist with this procedure.

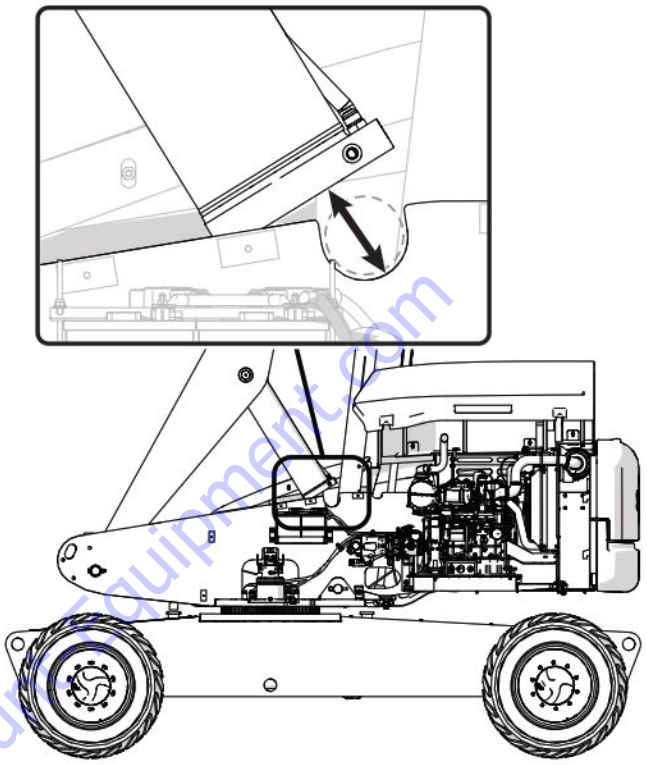
1. Raise the boom to an angle of 40°.



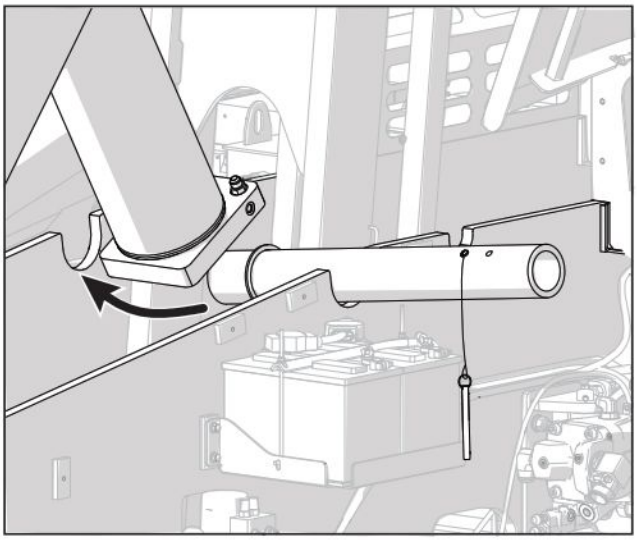
2. Open the engine side cowling. Remove and set aside the fixed cowling from the engine side of the boom. There are six sets of hardware to remove - one outside the cowling and five inside the cowling.



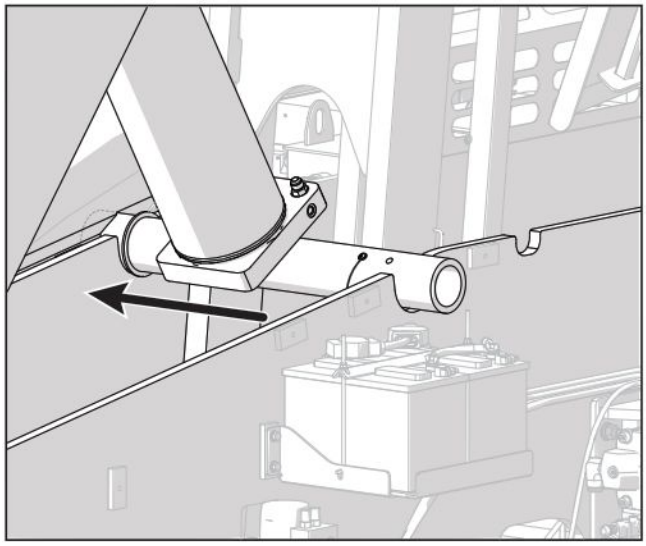
3. Check that the bottom of the main lift cylinder is clear of the maintenance support notch in the turret wall. If it is not, raise the boom higher.



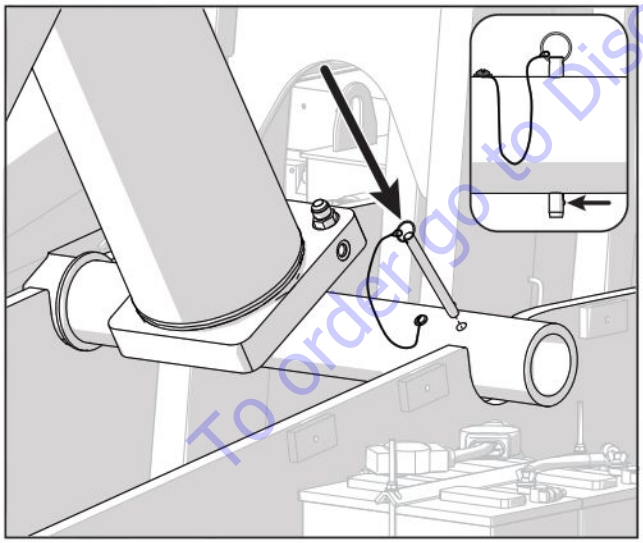
4. Make sure the lock-pin is out of the support.
5. Lift the boss end of the maintenance support bar over the notch in the turret wall. Then angle it downward a little and slide it under the main lift cylinder.



6. Continue to slide the support bar in. Set the boss end in the notch in the opposite turret wall. Note: The boss must be on the inside of the turret.

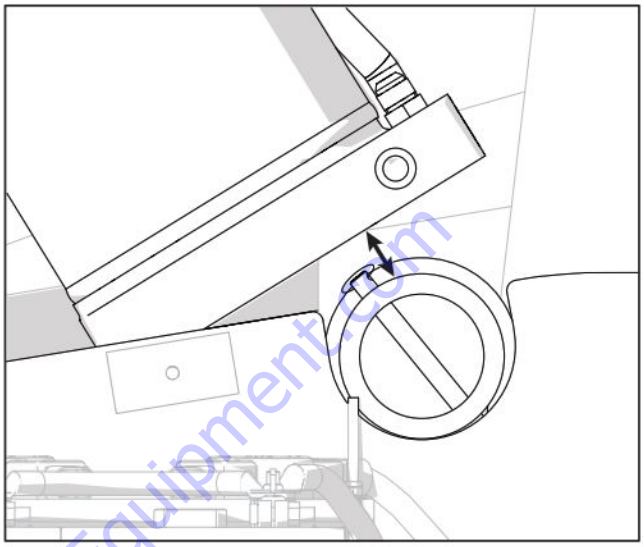


7. Push the lock-pin through the hole in the maintenance support. Make sure the detent ball comes all the way out the other side.



IMPORTANT

Do not lower the main lift cylinder onto the maintenance support bar. The bottom of the cylinder should stop just above the support.



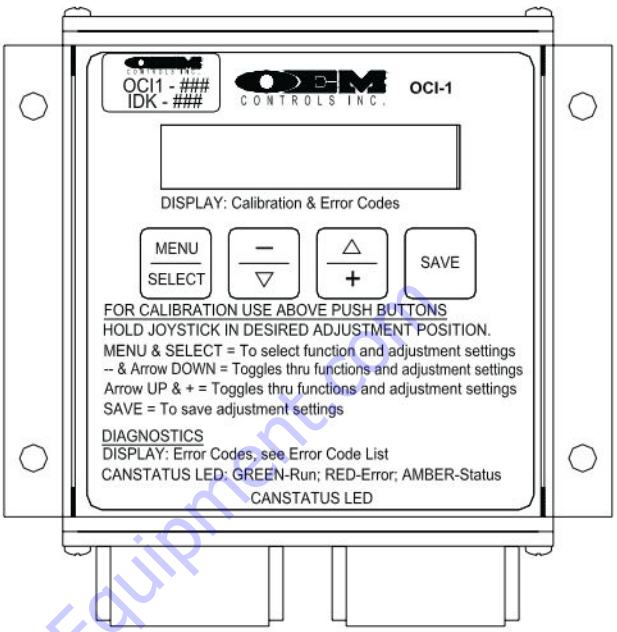
5.2 Platform

5.2-1 Human Machine Interface (HMI)

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

To access the SCM console, open the platform control cover.

The SCM 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

5.2-2 User Interface Keys

1.0	MENU / SELECT	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	SAVE	1.3-1 <SAVE> saves the new data to EEPROM (permanent memory storage).
1.4	▲ / + and ---- / ▼	Simultaneously pressing <UP> and <DOWN> resets the HMI to menu screen 0.

5.2-3 SCM Character Functions Charts

SCM Keypad	
Keys	**Short Form**
Menu/Select	(M/S)
▼/-	(-)
▲/+	(+)
Save/Exit	(S/E)

Function Attribute	
THRESH	Threshold
RAMPDN	Ramp Down
RAMPUP	Ramp Up
LOWRNG	Low Range
MAXOUT	Maximum Output

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SCM Function (Channel) Names	
DRIVE REV Fn01A	Drive Reverse
DRIVE FWD Fn01B	Drive Forward
ROTATE L Fn02A	Turret Rotate Left
ROTATE R Fn02B	Turret Rotate Right
BOOM DOWN Fn03A	Main Boom Down
BOOM UP Fn03B	Main Boom Up
FLY IN Fn04A	Boom Telescope Retract
FLY OUT Fn04B	Boom Telescope Extend
PROP FLOW Fn05A	Jib and Platform Rotate
PROP FLOW Fn05B	Unused Channel
LR REV Fn06A	Virtual Channel
LR FEW Fn06B	Virtual Channel

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5.2-4 SCM Operating Values Chart

Input	Expected Value	Description
AI 1	0.5V to 8.5V	Drive Joystick
AI 2	0.5V to 8.5V	Turret Rotation Joystick
AI 3	0.5V to 8.5V	Boom Elevation Joystick
AI 4	0.5V to 7.5V	Flow Enable Rotary Potentiometer
DI 1	0 or 1	Direction Reverse Limit Switch
DI 2	0 or 1	Footswitch Actuated
DI 3	0 or 1	Telescope Out Toggle Switch
DI 4	0 or 1	Telescope In Toggle Switch
DI 5	0 or 1	Jib Toggle Enabled
DI 6	0 or 1	Platform Rotation Toggle Enabled
DI 11	0 or 1	High Speed Drive Enable Limit Switch
Output	**Adjustable Parameter**	**Description**
PWM 1	25 to 75%	Drive Reverse
PWM 2	25 to 75%	Drive Forward
PWM 3	21 to 35%	Turret Rotate Left
PWM 4	21 to 35%	Turret Rotate Right
PWM 5	21 to 35%	Main Boom Down
PWM 6	38 to 47%	Main Boom Up
PWM 7	0 to 100%	Jib and Platform Rotate
PWM 11	40 to 48%	Boom Telescope Retract
PWM 12	45 to 70%	Boom Telescope Extend
Output	**Expected Value**	**Description**
DOUT 1	0 or 1	Steering Reverse Relay
DOUT 2	0 or 1	Load Sense Valve Enable
DOUT 3	0 or 1	Footswitch Actuated Indicator
DOUT 4	0 or 1	Holding Brake OFF (energize to release)
DOUT 5	0 or 1	Manual Platform Level Enable

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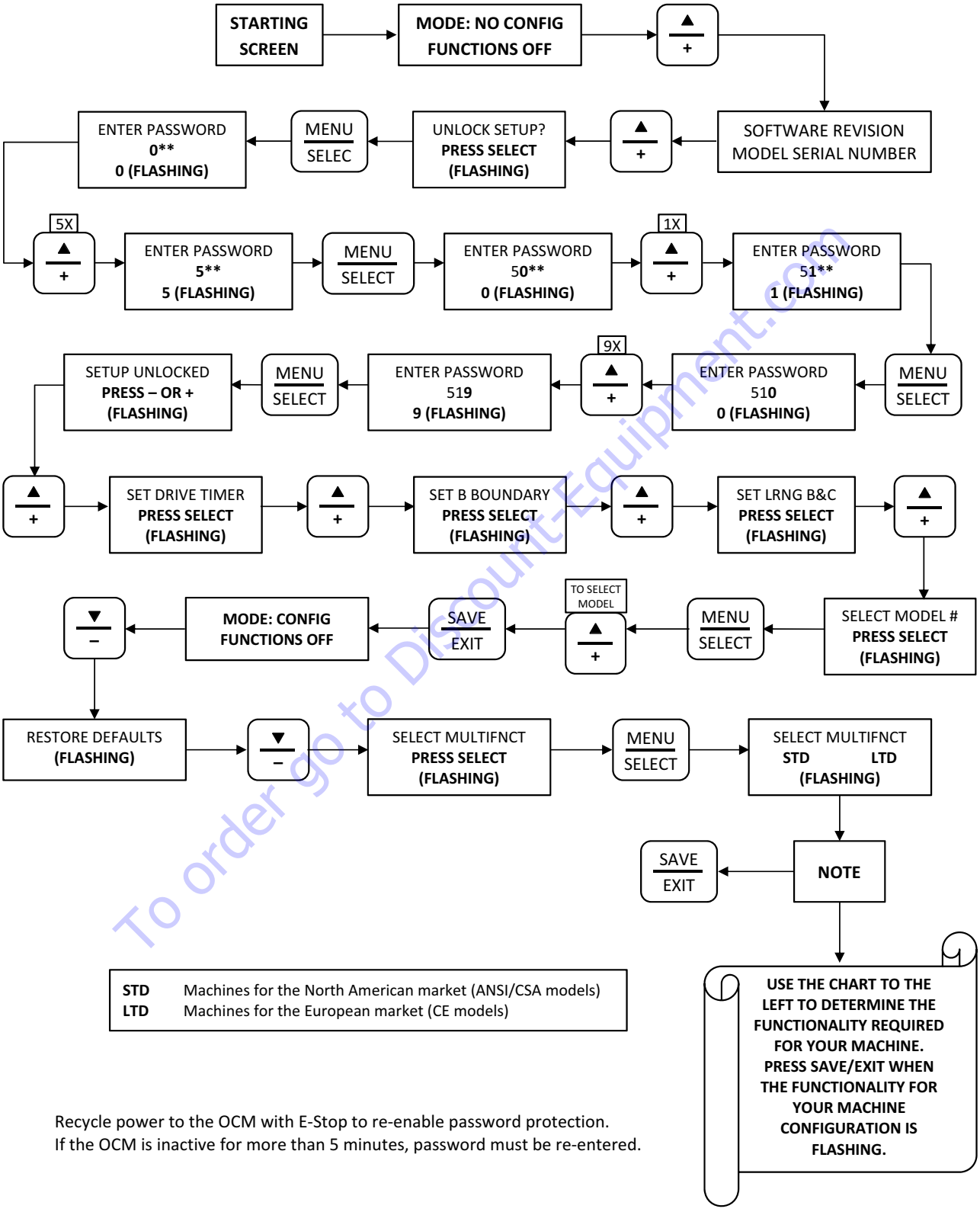
5.2-5 How to Select SCM Functionality



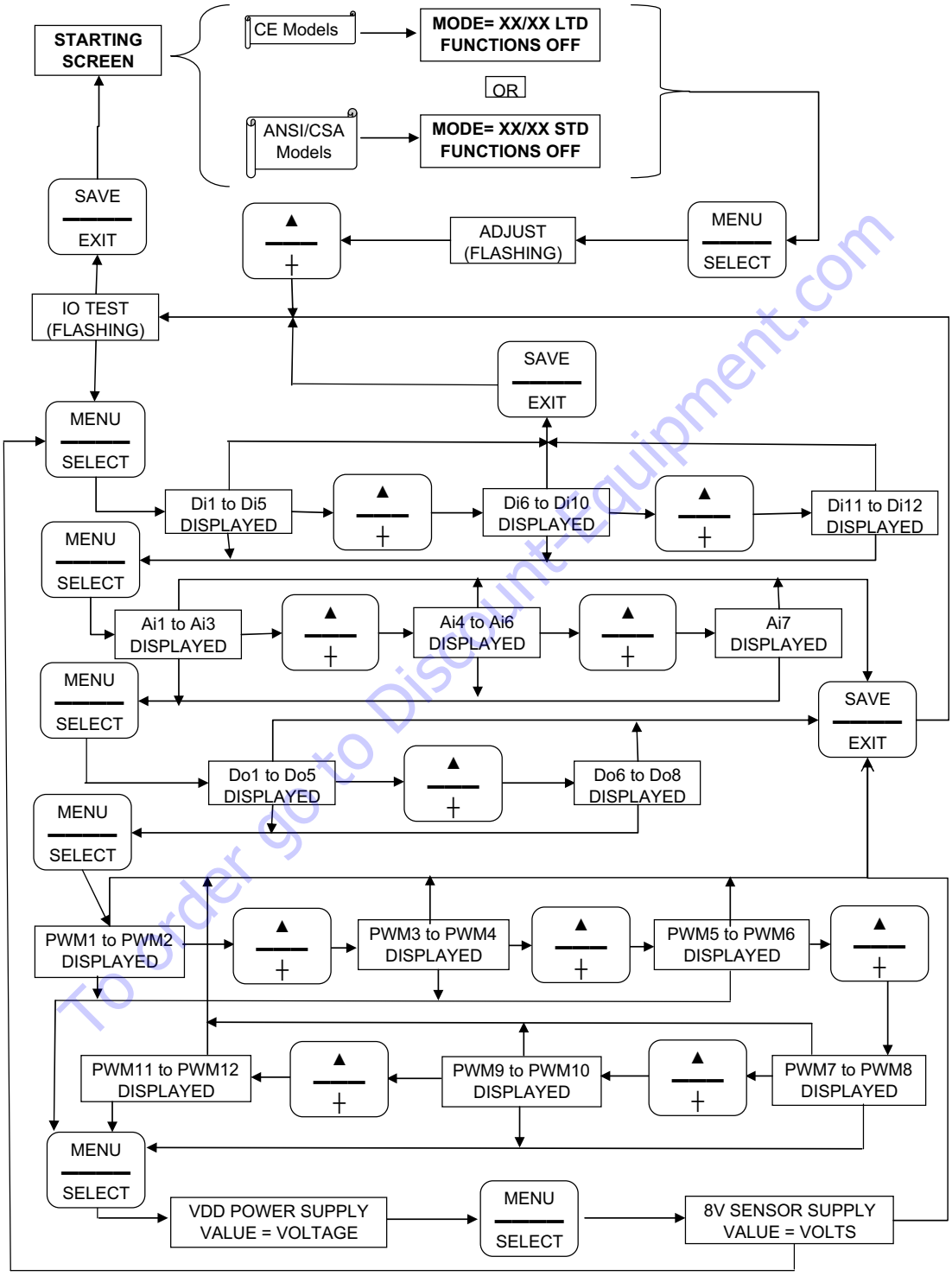
STD	Machines for the North American market (ANSI/CSA models)
LTD	Machines for the European market (CE models)

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

5.2-6 How to View SCM Operation

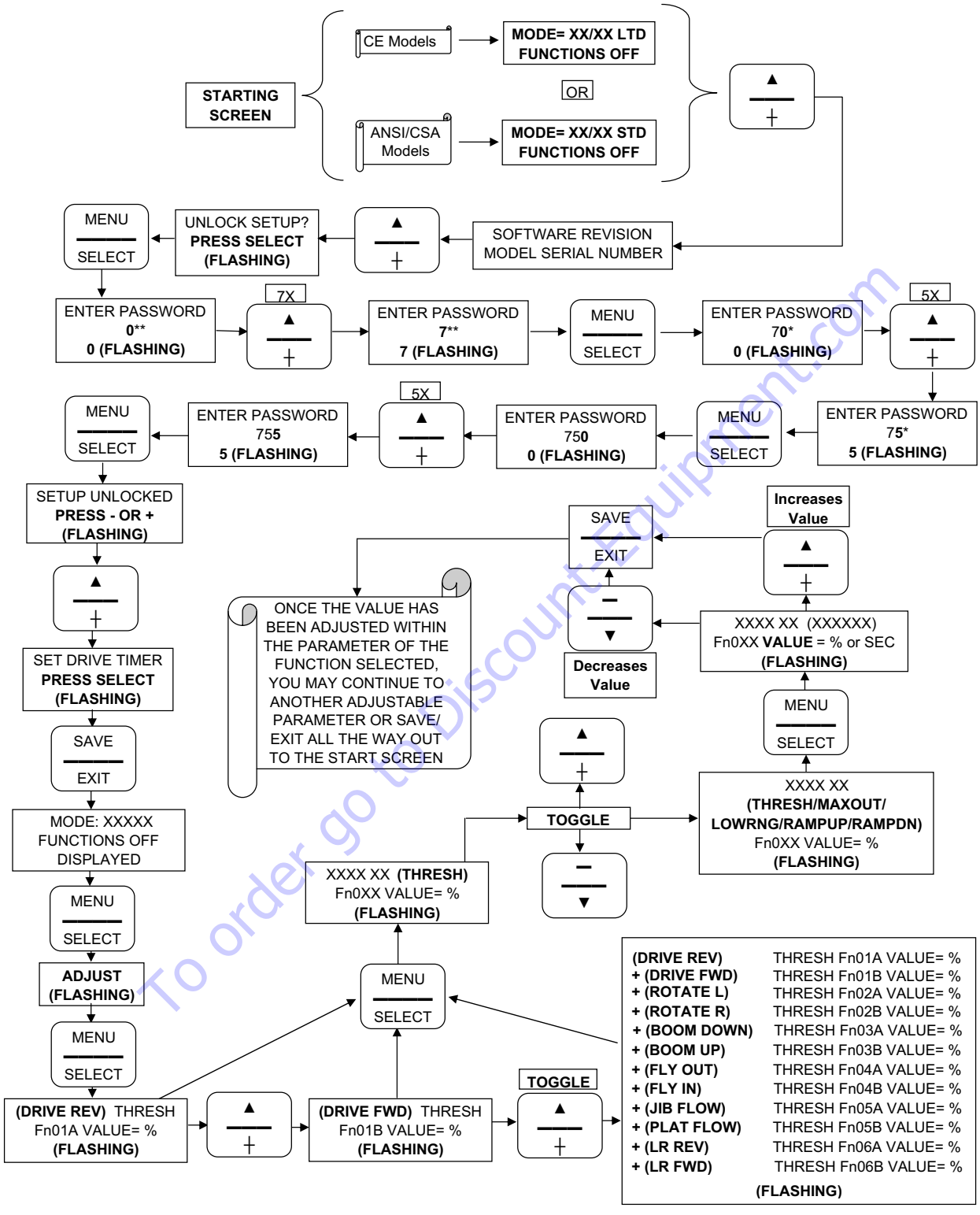
As a joystick or toggle switch is being activated, the OCM screen will display the active function and % output.

Also, the following procedure will allow monitoring of all input and output channels:



See 5.2-4 SCM Operating Values Chart for operating values for the previous observations.

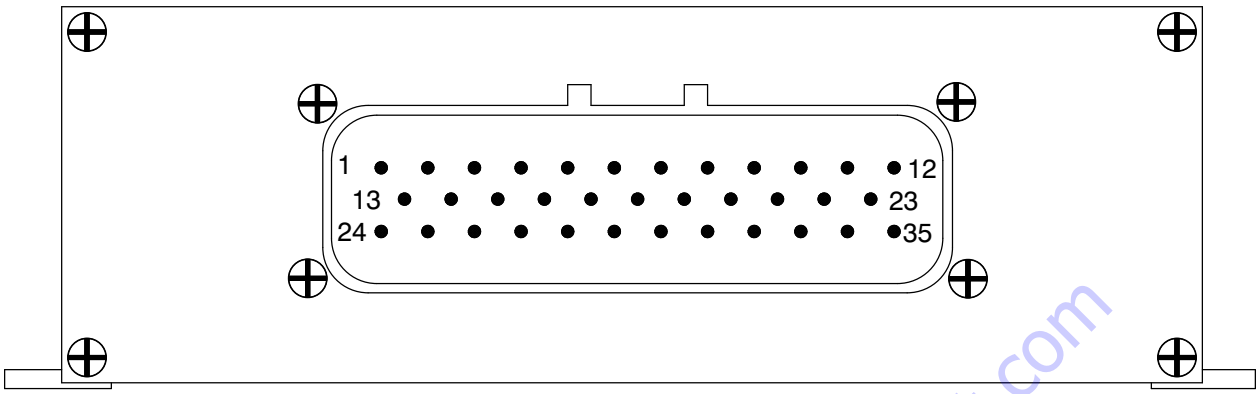
5.2-7 How to Unlock and Modify SCM Settings



Recycle power to the SCM with the E-Stop to re-enable password protection.

If the SCM is inactive for more than 5 minutes, password must be re-entered.

5.2-8 SCM Pin Voltage Reference



All voltages given are with SCM 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 - 8 volt output (purple wire) to boom speed controller.
7.5 volts= speed control in circuit. Test between pin 3 and 02 wire.

Pin 4 - Turret position. 12 volt output on wire 17A to relays 17ACR1 and 17ACR2 for directional sensing.
0 volts= Platform over drive axle.
12 volts= Platform over steer axle. Test between pin 4 and 02 wire.

Pin 5 - 12 volt output on wire 20B to load sense dump valve when any function selected.
Test between pin 5 and 02 wire while selecting a function.

Pin 6 - 12 volt output on wire 08 to boom control switches.
Test between pin 6 and 02 wire.

Pin 7 - 12 volt output on wire 65 to axle lock valve 3H-65 to float axle. 0 volts when above limit switches.
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 4.85 volts depending on position of joystick. Threshold= 1.5 volts. Test between pin 8 and 02 wire while operating boom down.

Pin 9 - Telescope in selected. Proportional output on wire 38 to telescope in valve 3H-38.
0 volts to 4.65 volts depending on boom speed control potentiometer.
Threshold= .95 volts.
Test between pin 9 and 02 wire while operating telescope in.

Pin 10 - 12 volt output on wire 26 to brake valve 3H-26 to release brakes.
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 - Telescope out selected. Proportional output on wire 39 to telescope out valve 3H-39.
0 volts to 6.8 volts depending on boom speed control potentiometer position. Threshold= .95 volts.
Test between pin 12 and 02 wire while operating telescope out.

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 wire 17 (limit switch LS1).
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 - Platform rotate selected. 12 volt input from wire 36A.
Test between pin 17 and 02 wire.

Pin 18 - 12 volt input from angle sensor on wire 28. 12V= <5 degrees.
Test between pin 18 and 02 wire.

Pin 19 - Diff. lock enable toggle switch (ANSI/CSA & CE) / Platform level toggle switch (CE only).
Driving = 0 volts
Not driving = 12 to 13.5 volts

Pin 20 - Turret rotate left selected. Proportional output on wire 32 to turret rotate left valve 4H-32.
0 volts to 5 volts depending on position of joystick. Threshold= .5 volts. Test between pin 20 and 02 wire while operating turret rotate left.

Pin 21 - Platform rotate or jib function selected. Proportional output on wire 42 to proportional flow enable valve 2H-42.
0 volts to 3.85 volts while operating platform rotate depending on boom speed control potentiometer position. Threshold= 2.3 volts.
0 volts to 9 volts while operating jib function depending on boom speed control potentiometer position. Threshold= 2.3 volts.
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 6.3 volts depending on joystick position. Threshold= 1.5 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 7.5 volts depending on joystick position. Threshold= 1.5 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 - Accelerator input. Signal wire (green wire) from boom speed controller.
Proportional voltage. .5 volts= slow speed up to 7.5 volts= fast speed.
Test between pin 30 and 02 wire while operating telescope in/out, jib up/down or basket rotate.

Pin 31 - 12 volt input from wire 59. From LS2 boom elevation limit switch and LS3 telescope limit switch.
12 volts= full speed. 0 volts= creep speed (one or more limit switches open). Test between pin 31 and 02 wire.

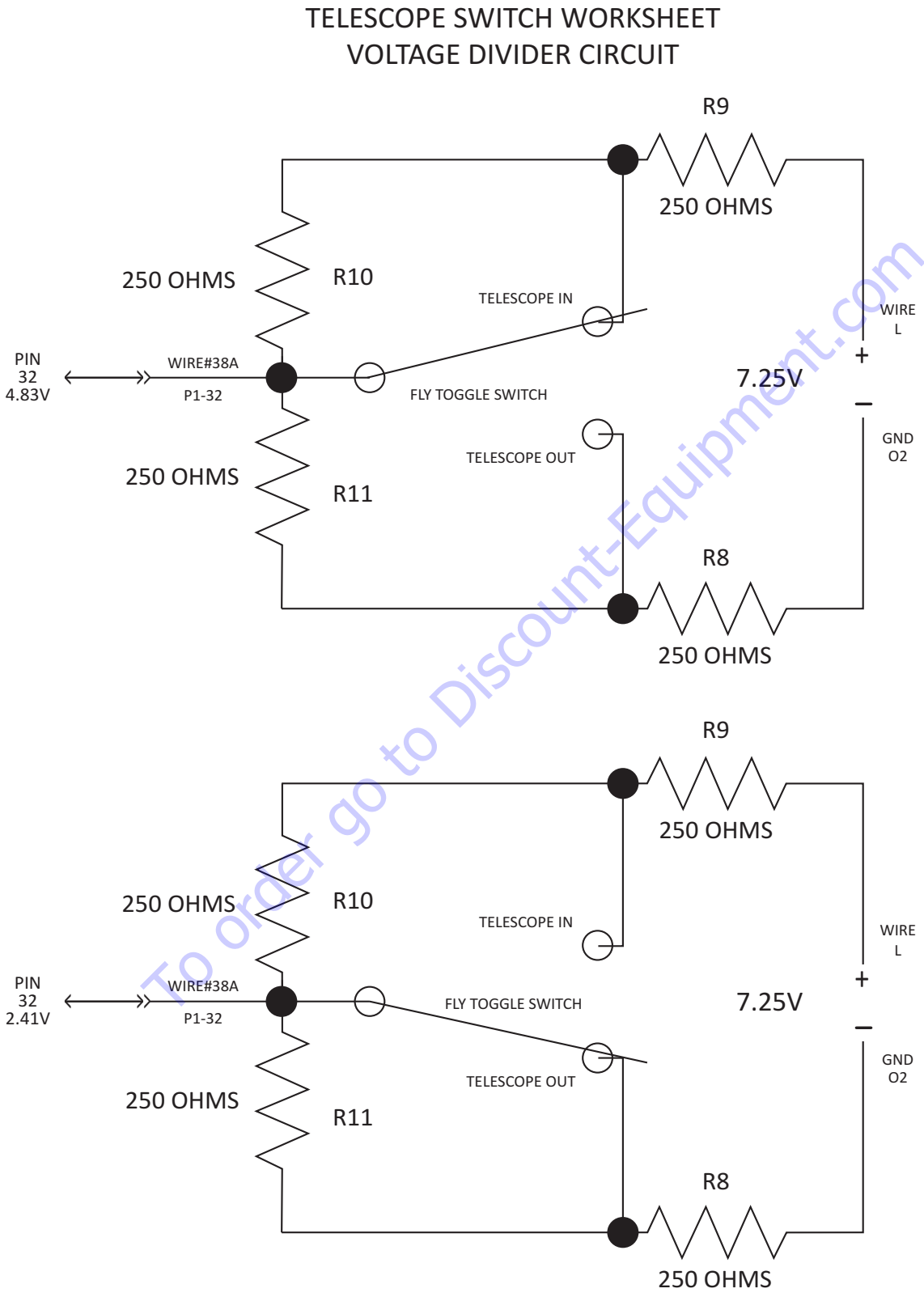
Pin 32 - Telescope selected. Input from wire 38A.
Neutral position= 3.58 volts.
Telescope in function= 4.83 volts.
Telescope out function= 2.41 volts.
Test between pin 32 and 02 wire.

Pin 33 - Jib function enable. 12 volt input from wire 34A.
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 7.5 volts depending on joystick position. Threshold= 1.5 volts. Test between pin 34 and 02 wire while operating forward drive.

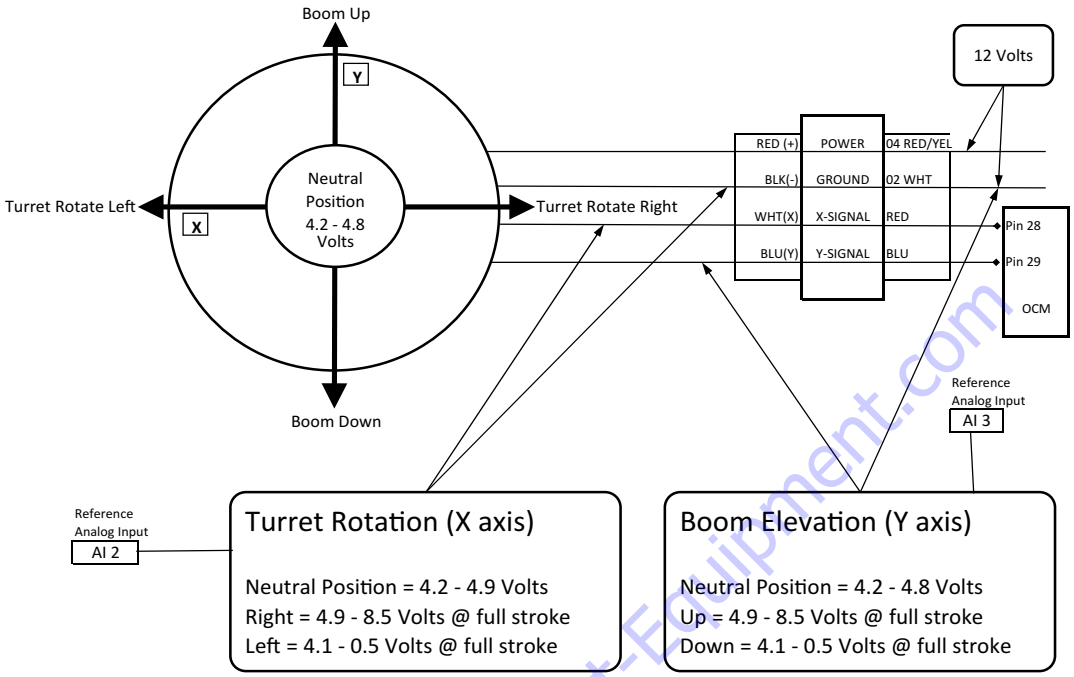
Pin 35 - Turret rotate right selected. Proportional output on wire 33 to turret rotate right valve 4H-33.
0 volts to 5 volts depending on position of joystick. Threshold= .5 volts. Test between pin 10 and 02 wire while operating turret rotate right.

5.2-9 Fly Boom Switch Voltage References

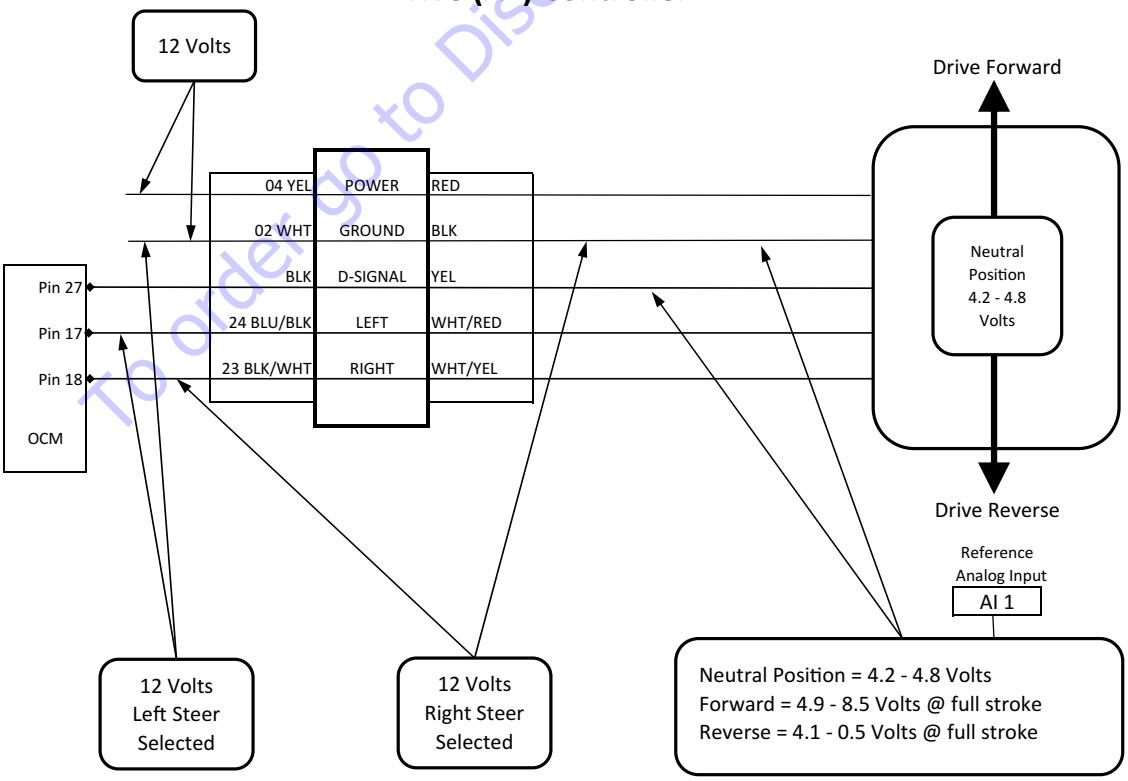


5.2-10 Platform Controller Voltage References

Boom/Turret (A1) Controller



Drive (A2) Controller



5.3 Load Sensing System

5.3-1 Load Sensing System Overload Status

The platform load sensing system is a device that senses for an overload on the platform before the system disables boom and drive functions. This system is active when the MEWP is powered on.

If the platform is overloaded while in work mode (boom is raised greater than 15 degrees from horizontal or is extended greater than 6 inches), the load sensing system will disable all normal functions and signal the operator with an indicator light and an audible alarm.

If the platform is overloaded while in travel mode, the load sensing system will signal the operator with an indicator light and an audible alarm but will not disable any normal functions.

The following table shows the progression of warnings, indicated to the operator, up to the point of overload.

Weight	Indicator Light	Audible Alarm			Platform Function Controls		
		ANSI/CSA	CE & AS	KC	ANSI/CSA	CE & AS	KC
93% - 99%	On	Off	Off	Off	Enabled	Enabled	Enabled
100%	Flashing	Off	Pulsing	Off	Enabled	Disabled	Enabled
>100% in Work Mode	Flashing	Pulsing	Pulsing	Pulsing	Disabled	Disabled	Disabled
>100% in Travel Mode	Flashing	Pulsing	Off	Pulsing	Disabled	Enabled	Boom: Disabled Drive: Enabled

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⚠ WARNING

Do not operate the emergency power unit if the platform capacity is exceeded. If the platform is overloaded due to contact with an overhead obstruction, do one of the following:

- **Remove the obstruction from the platform, then after a four-second delay normal functions can be resumed.**
- **Use the emergency power unit at the base control console to release the platform from the obstruction.**

⚠ WARNING

If the platform load sensing system is in fault mode (capacity zone lights flash alternately, overload light flashes and capacity zone border light illuminates), do the following:

- **Ensure the platform is level and there are no obstructions contacting the platform.**
- **Shut the MEWP off using either the ignition switch or the e-stop. Restart the engine.**

If the platform load sensing system remains in fault mode, the emergency power unit may be used to lower the platform from the base controls. Contact a qualified/competent person for repairs.

5.3-2 Dual Capacity Overload Module Function Table

Position		Load in Platform	Boom Function Availability				Inputs			Outputs					
A	E	Platform Load (lbs/kg)	Boom Up	Boom Down	Boom Extend	Boom Retract	Load Cell Voltage measured across resistors 161 & 162 (3) (millivolts)	Boom Angle Wire 121 Limit sw. LS4 (volts)	Boom Extension Wire 122 Limit sw. LS5 (volts)	DOUT1 low capacity Wire '120'	DOUT2 Overload Indicator - Wire '82'	DOUT3 Border Lamp Wire '119'	SCOUT1 (Boom Down) Wire '13A'	SCOUT2 (Boom Extend) Wire '39A'	SCOUT3 (System Enable) Wire '162B'	
@powerup	@powerup	N/A	disable	disable	disable	disable	N/A	any	any	1s pulse	1s pulse	1s pulse	disable	disable	disable	
0	0	up to 695/315	allow	allow	allow	allow	up to 18.8	0	12	off	off	off	enable	enable	enable	
0	0	695/315 to 748/339	allow	allow	allow	allow	18.9 to 19.9	0	12	off	on	off	enable	enable	enable	
0	0	over 748/339	disable	disable	disable	disable	over 20	0	12	0	pulsing 1hz	off	enable	enable	disable	
1	0	up to 695/315	allow	allow	allow	allow	up to 18.8	12	12	off	off	off	enable	enable	enable	
1	0	695/315 to 748/339	allow	allow	allow	allow	18.9 to 19.9	12	12	off	on	off	enable	enable	enable	
1	0	over 748/339	disable	disable	disable	disable	over 20	12	12	0	pulsing 1hz	off	enable	enable	disable	
1	1	up to 695/315	allow	allow	allow	allow	up to 18.8	12	0	off	off	off	enable	enable	enable	
1	1	695/315 to 748/339	allow	allow	allow	allow	18.9 to 19.9	12	0	off	on	off	enable	enable	enable	
1	1	over 748/339	disable	disable	disable	disable	over 20	12	0	0	pulsing 1hz	off	enable	enable	disable	
0	1	up to 500/227	allow	allow	allow	allow	9 to 16	0	0	on	off	off	enable	enable	enable	
0	1	500/227 to 538/244	allow	allow	allow	allow	16.1 to 17.1	0	0	on	on	off	enable	enable	enable	
0	1	over 538/244 (1)	allow	disable	disable	allow	over 17.2 (1)	0	0	off	off	pulsing 2 hz	disable	disable	enable	note (1)
0	1	over538/244 (2)	disable	disable	disable	disable	over 17.2 (2)	0	0	on	pulsing 1hz	off	enable	enable	disable	note (2)

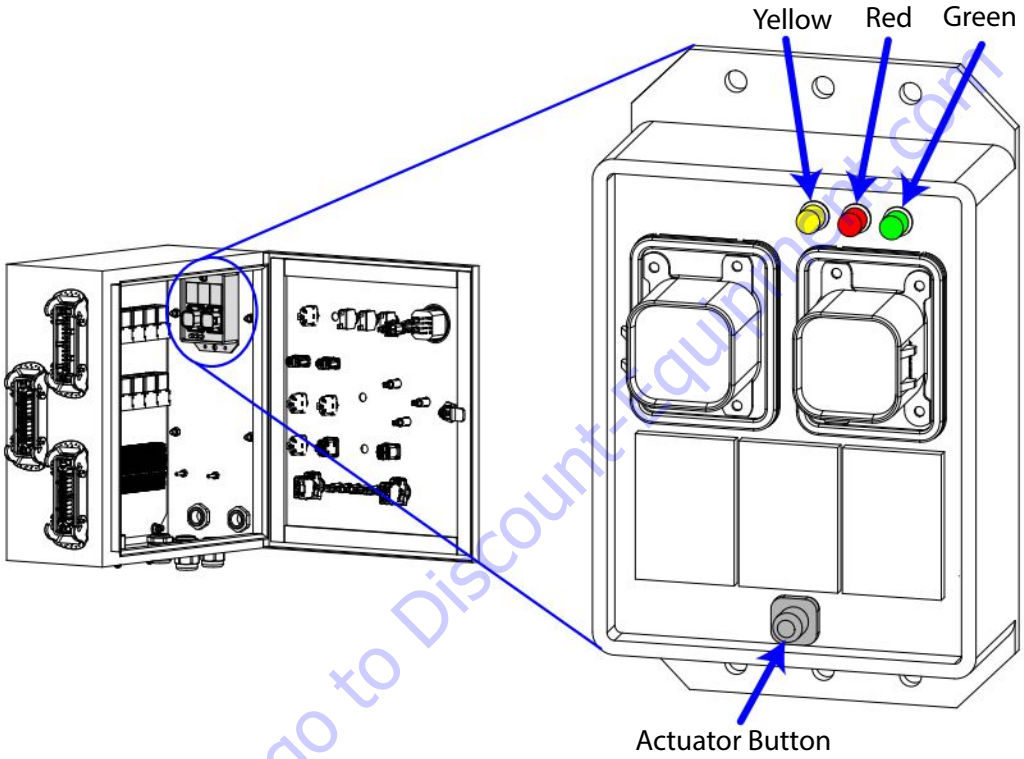
Notes: (1) existing load in platform in excess of 538 lbs. (244 kg.) moving into zone A0E1
(2) platform load below 538 lbs. (244 kg.) in zone A0E1 then load added so total becomes in excess of 538 lbs. (244 kg.)
(3) voltage across 161 & 162 resistors is approximate and will vary slightly from machine to machine.

Legend:
"A" is angle of boom
"E" is extension of boom

5.3-3 Calibration of Load Sensing System

NOTE

There is a time-out period of 10 minutes for each step in the calibration process (indicated by a solid green light). Should you exceed 10 minutes, the calibration process must be started over from the beginning.



Preparation

1. Ensure the aerial platform is on firm, level ground.
2. Fully retract and lower the boom.
3. Turn the engine off ◯ .
4. Pull out both emergency stop buttons and the flip the engine enable switch to the on position | .
   Result: The overload indicator light and audible alarm pulse two times.
5. Make sure the platform is unloaded and is free from any surface contact. Remove all options from the platform.
6. Open the base control box door, and locate the dual capacity module on the inside right wall of the control box.

Calibrate the Tare Point (No Load)

7. Press and release the actuation button twice, then press it a third time, this time holding it for about 3 seconds.
   Result: A solid yellow LED light turns on, and the green LED will start to flash.
8. Press the actuation button.
   Result: The green LED will flash quickly indicating the tare weight is being calibrated. Wait for the light to stop flashing.

Calibrate Trip Point 1

9. The yellow LED will remain solid and the red LED will begin flashing.
10. Load the platform to the Trip Point 1 calibration point (see table below). Press the Actuation button.
    Result: The red LED will flash quickly indicating that Trip Point 1 is being calibrated. Wait for the red LED to stop flashing - this indicates that the calibration point has been stored.

Calibrate Trip Point 2

11. The yellow LED will remain solid and the red AND green LEDs will begin flashing.
12. Load the platform to the Trip Point 2 calibration point (see table below). Press the Actuation button.
    Result: The Red and Green LEDs will flash quickly indicating that Trip Point 2 is being calibrated. Wait for the Red and Green LEDs to stop flashing - this indicates that the calibration point has been stored.
13. The Red, Green, and Yellow LEDs will flash simultaneously for approximately 2 seconds. This indicates that calibration is complete.
14. The Green LED will become solid, which is normal operating mode.

Model	Trip Point 1	Trip Point 2
SJ86 T	244 kg (538 lbs)	244 kg + 94 kg = 339 kg (538 lbs + 210 lbs = 748 lbs)

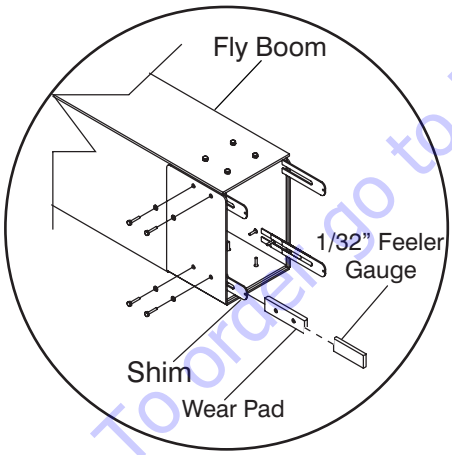
5.4 Boom

5.4-1 Check Wear Pads

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

5.4-2 Shim Wear Pads

1. Ensure the MEWP is on a firm level surface and is in the stowed position.
2. Raise the main boom to a comfortable working height (chest high) and extend the fly boom until the wear pads are accessible.
3. Loosen the wear pad fasteners.
4. Shim the wear pads as necessary to obtain zero to 1/32”(0.8 mm) clearance and zero drag.



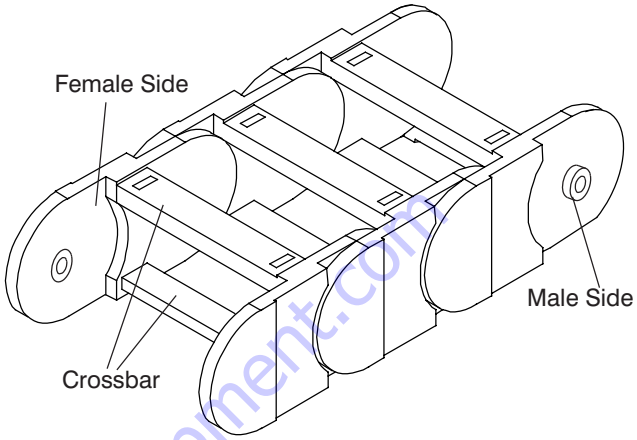
5. Extend and retract the fly boom through the entire range of motion and observe for loose points.

NOTE

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

5.4-3 Cable Carrier Repair

To repair the cable carrier, simply use a screwdriver. Snap each crossbar off from either side of the chain, either by hand or by using the screwdriver as a lever. Install new crossbars by snapping the links together.

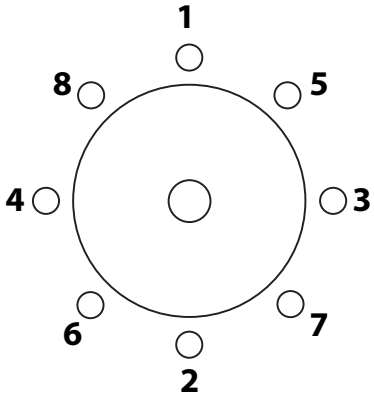


5.4-4 Rotary Actuator Bolt Torque Procedure

⚠ WARNING

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

1. Set the torque wrench to 17 ft-lb and tighten the mounting bolts in a cross pattern sequence.



2. Set the torque wrench to 35 ft-lband tighten mounting bolts with the same sequence.
3. Torque the center bolt to 480 ft-lb.

5.4-5 Boom Section Wear Pad Replacement

If wear pads inside the boom sections are worn and cannot be shimmed to meet the specification, they must be replaced. Wear pads that are worn past the specification can impair machine operation. For wear pad limit specification, refer 5.4-1 Check Wear Pads.

⚠ WARNING

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

The boom sections must be disassembled to replace the wear pads. Typically the bottom platform-end and the top counterweight-end pads on each boom section wear out first. Check which ones need to be replaced before disassembly.

NOTE

To disassemble the boom sections, the extension cylinder and cable assembly inside the boom must be removed first. See 5.4-17 Extension Cylinder and Cable Assembly Removal

To disassemble the boom sections, the fly boom and mid boom must be slid fully out of the main boom. Provide enough space at the platform end of the machine at least the length of boom assembly.

Preparation:

- Remove the jib boom and the platform before disassembly. Removing these components limits twisting when lifting, and provides better control when sliding the boom sections out. See 5.4-6 Platform and Jib Boom Removal. If the machine does not have a jib boom, just the platform is removed.
- Before beginning, place the machine in the proper shut down position, parked on level ground.
- Make sure the e-stops are pushed in and the key is off.
- Turn the main power disconnect switch off. Lock out the switch.

⚠ CAUTION

There is a risk of personal injury or equipment damage if repositioning the boom with the platform removed. Use the base controls with auxiliary power (engine off) to reposition the boom safely.

IMPORTANT

If boom repositioning is necessary during this procedure, select emergency power position from start–function enable–emergency power switch, then activate desired boom function.

When operating on auxiliary power, do not operate more than one function at a time to avoid overloading the 12-volt auxiliary pump motor.

⚠ CAUTION

Risk of personal injury or equipment damage. Always use suitable lifting equipment and safe rigging practices when performing the following procedures.

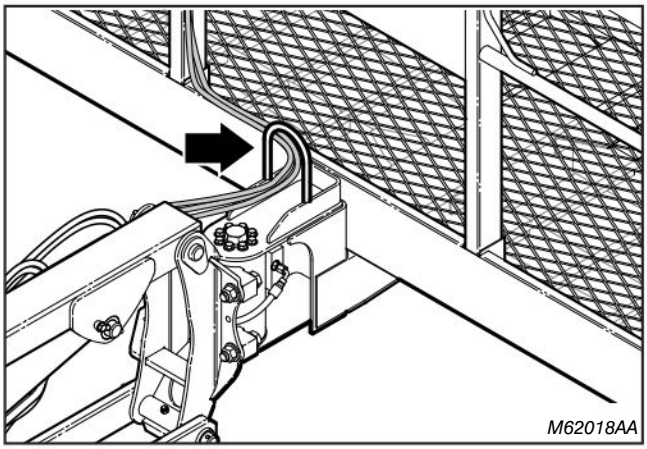
NOTE

If boom repositioning is required with the platform removed and control cables disconnected, reconnect the two main (24 pin) control cables and the jib and platform rotate harness (as equipped) to the platform control box. See 5.4-20 Wire Rope Inspection.

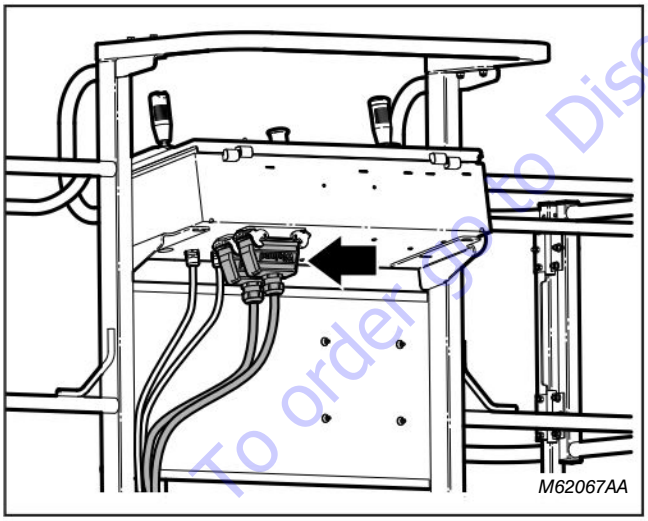
The machine cannot operate with the two platform control harnesses disconnected.

5.4-6 Platform and Jib Boom Removal

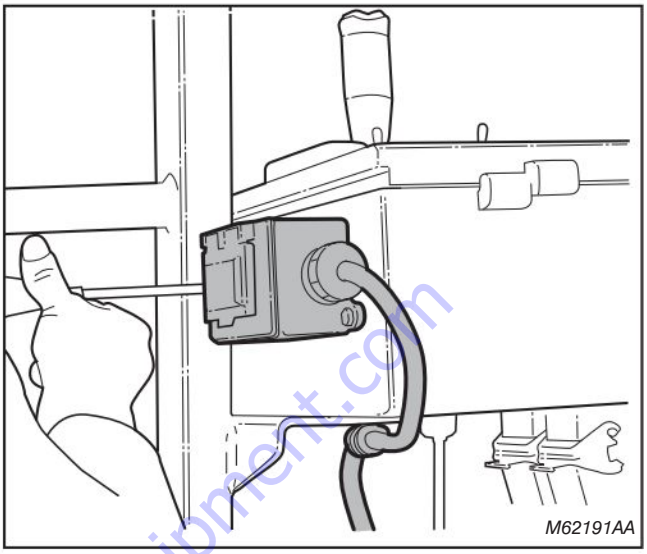
Before removing the platform and jib boom from the machine, the electrical harnesses routed across the platform swivel joint must be disconnected.


M62018AA

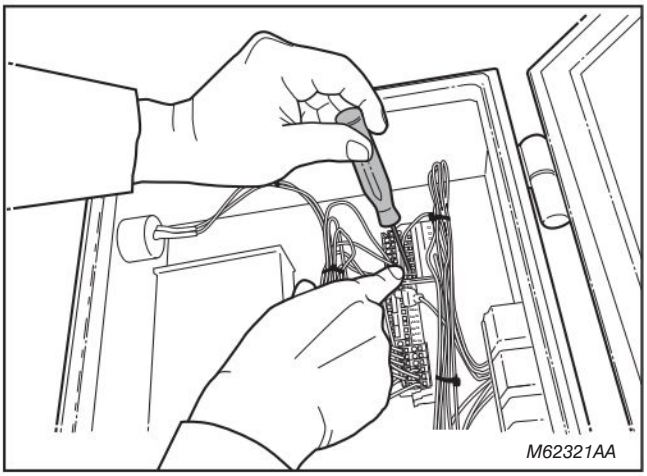
1. Disconnect the two 24-pin control cables from the bottom of the control box.


M62067AA

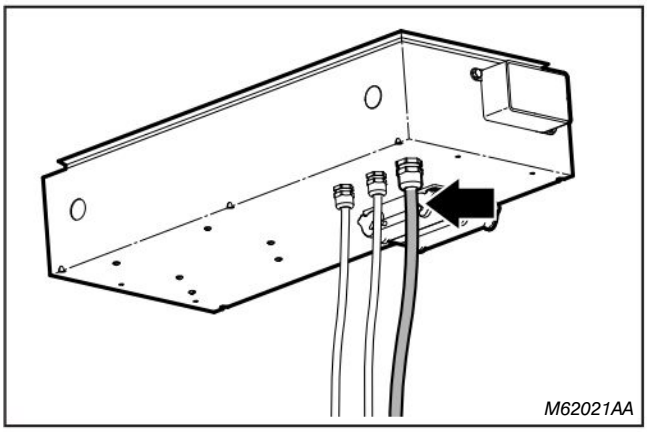
2. Remove the auxiliary AC receptacle box if its harness is bundled with the other harnesses. Remove the harness clamps.


M62191AA

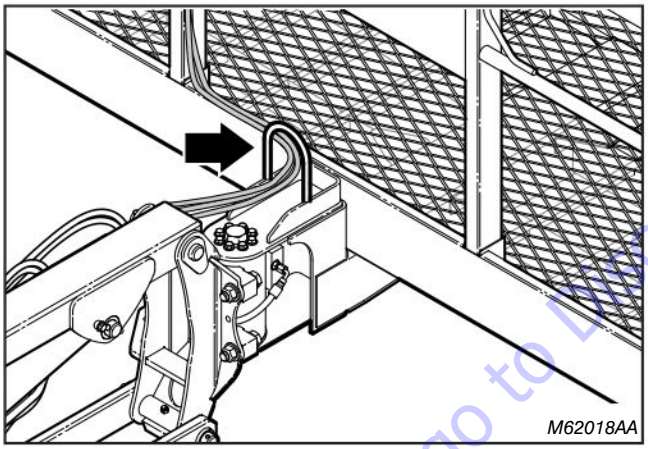
3. Open the control console lid and disconnect the jib and platform rotate harness.
4. Remove tie wraps and make note of wire labels for reinstallation.
5. To release each wire, insert a small flat screwdriver into the slot beside it in the terminal strip.


M62321AA

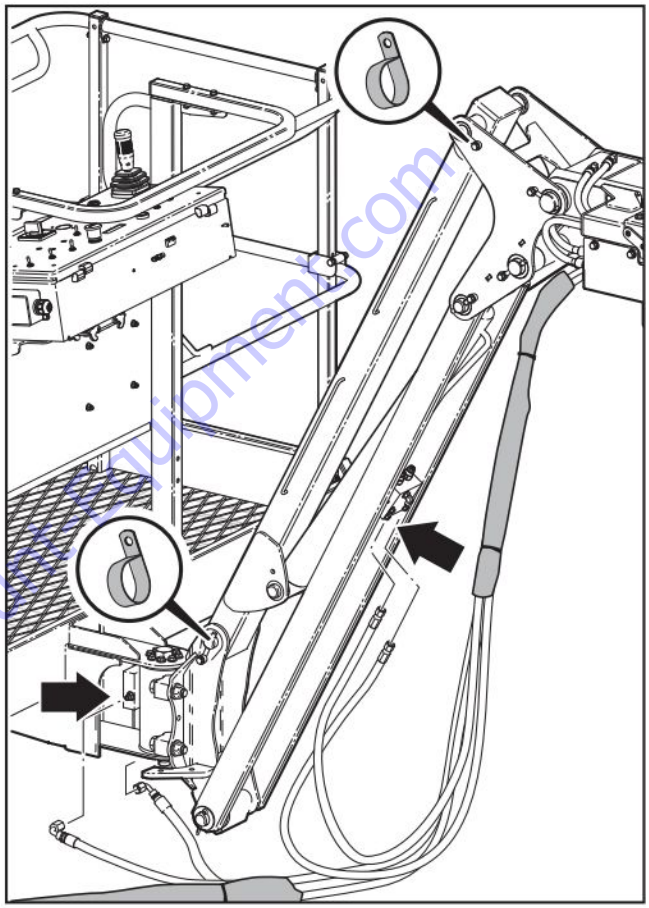
6. Pull the disconnected harness out of the strain relief connector in the box.



7. Pull all harnesses through the cable guard on the swivel joint.

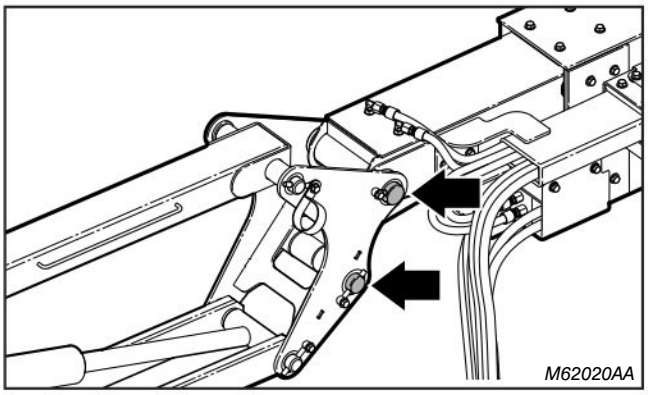


8. Mark and disconnect the hydraulic hoses for the jib cylinder and the platform rotary actuator. Use a suitable container or rags to catch any oil spillage. Cap hoses and ports to keep them clean.
9. Remove the hoses and wire cable bundle from the P-clamps on the side of the jib boom.



10. Using suitably rating lifting equipment and safe rigging practices, connect lifting slings to the jib boom and platform. Tension the slings enough to lightly take the weight off the mounting bracket pins.

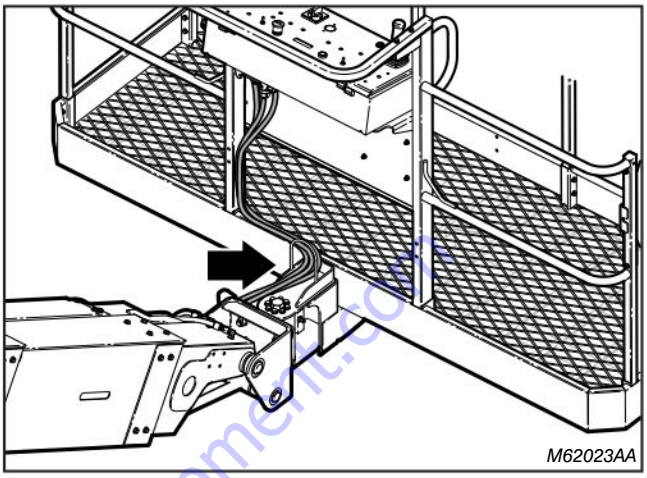
11. Remove the pins mounting the jib boom to the fly boom and the slave cylinder.



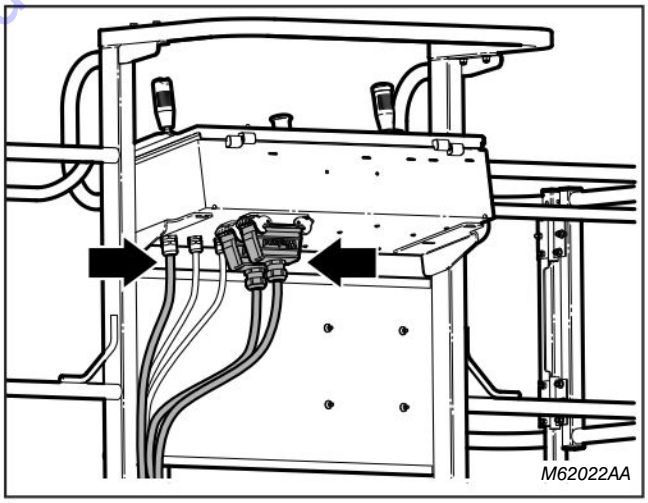
12. Carefully move the jib/platform assembly away from the end of the machine. Set it down on suitable blocking nearby. Place it close enough to the end of the main boom so the control cables can be reconnected in the event boom repositioning is required.

5.4-7 Platform Removal (no Jib Boom)

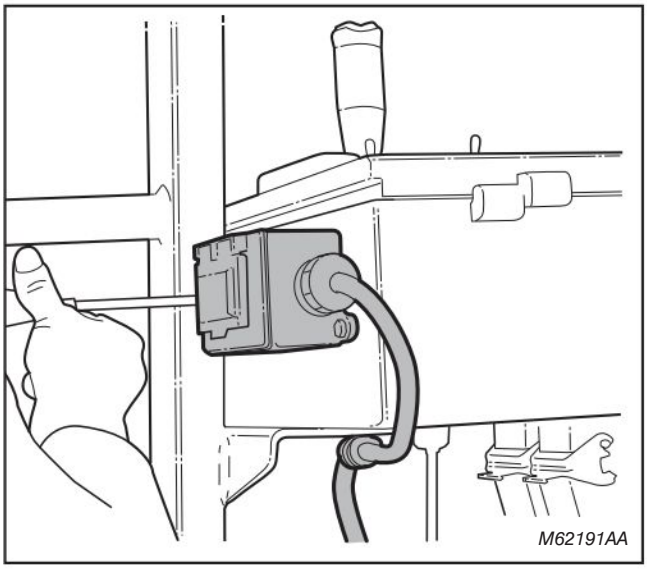
Before removing the platform from the machine, disconnect the electrical harnesses routed across the platform swivel joint.



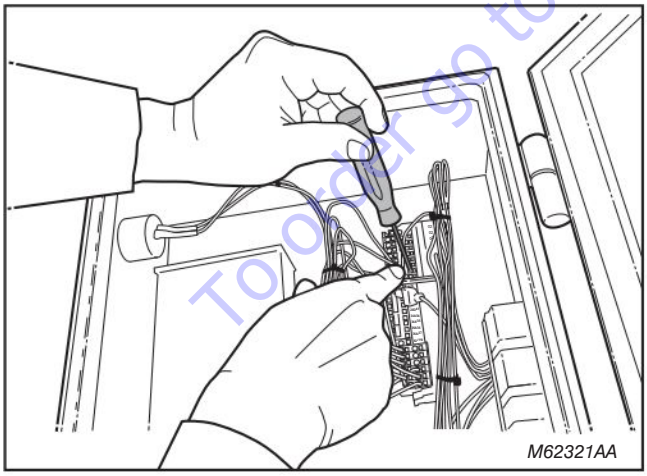
1. Disconnect the two 24-pin control cables from the control box.



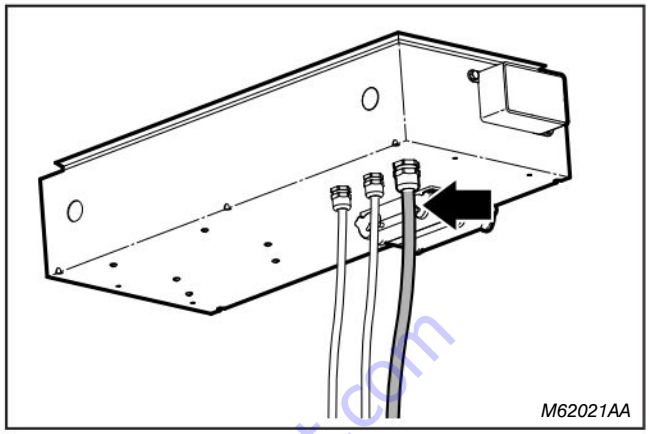
2. Remove the auxiliary AC receptacle box if its harness is bundled with the other harnesses. Remove the harness clamps.



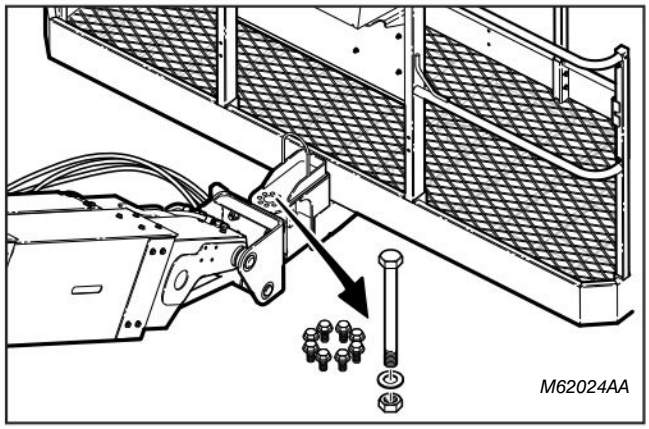
3. Open the control console lid and disconnect the jib and platform rotate harness.
4. Remove tie wraps and make note of wire labels for reinstallation.
5. To release each wire, insert a small flat screwdriver into the slot beside it in the terminal strip.



6. Pull the disconnected harness out of the strain relief connector in the box.



7. Pull all harnesses through the cable guard on the swivel joint.
8. Remove the hoses and wire cables from the P-clamp on the side of the fly boom.
9. Using suitably rated lifting equipment and safe rigging practices, attach slings to the platform assembly. Tension the slings to lightly support the platform.
10. Remove the 8 bolts that secure the rotary actuator valve to the platform base mount.
11. Remove the main pivot bolt.



12. Carefully move the platform assembly away from the end of the machine. Set it down on suitable blocking nearby. Place it close enough to the end of the main boom so the control cables can be reconnected in the event boom repositioning is required.

5.4-8 Operating Machine Functions from Base Controls

⚠ CAUTION

There is a risk of personal injury or equipment damage if repositioning the boom with the platform removed. Use the base controls with auxiliary power (engine off) to reposition the boom safely.

If boom repositioning is necessary with the platform removed, reconnect the two cable harnesses and the jib/platform rotate harness to the platform control box.

IMPORTANT

If boom repositioning is necessary during this procedure, select emergency power position from start–function enable–emergency power switch, then activate desired boom function.

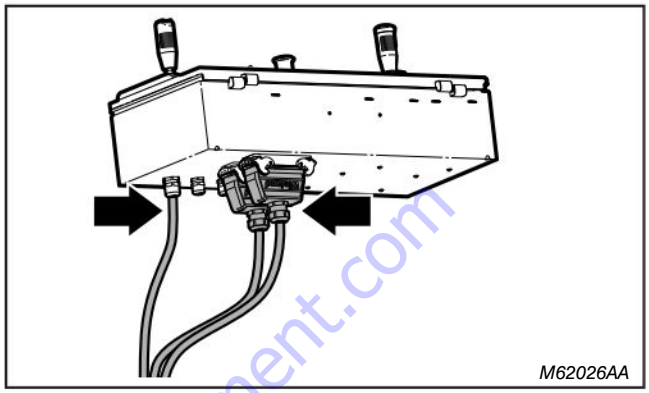
When operating on auxiliary power, do not operate more than one function at a time to avoid overloading the 12-volt auxiliary pump motor.

IMPORTANT

Be aware that the short length of control cables connected to the platform control box limits boom movement.

Connect the jib and platform rotate harness as shown on the Platform Controls Wiring diagrams in Section 3.

1. Pull jib and platform rotate harness through the strain relief connector on the bottom of the box and tighten the connector. Make sure the wires can reach the terminal block on the left-hand side on the box. Note the color and markings for each wire.



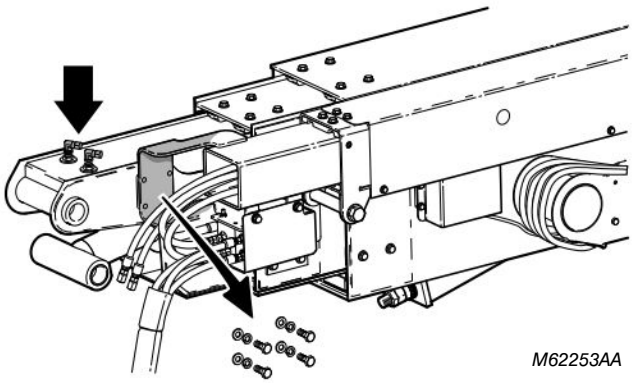
2. Inserting a small flat screwdriver into the slot beside the wire position in the terminal strip depresses the spring mechanism. Insert the end of the wire, then pull out the screwdriver to secure it.
3. Once the wires are all connected, close the lid and turn the two box latches to fasten it.

To continue work:

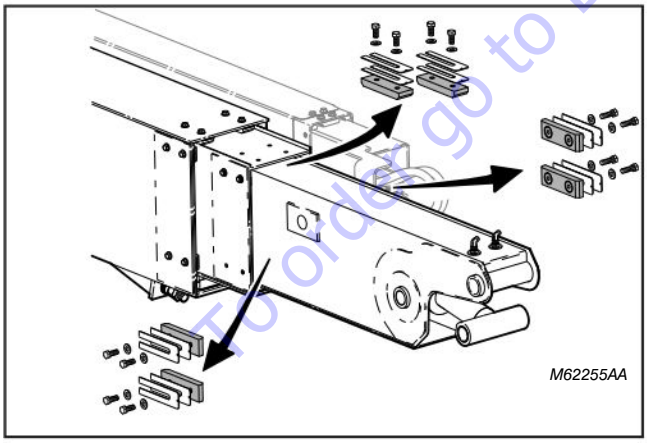
- Place the boom in a horizontal (0°) position.
- Shut down the machine.
- Turn the main electrical disconnect switch off. Lock out the switch.

5.4-9 Fly Boom Section Removal

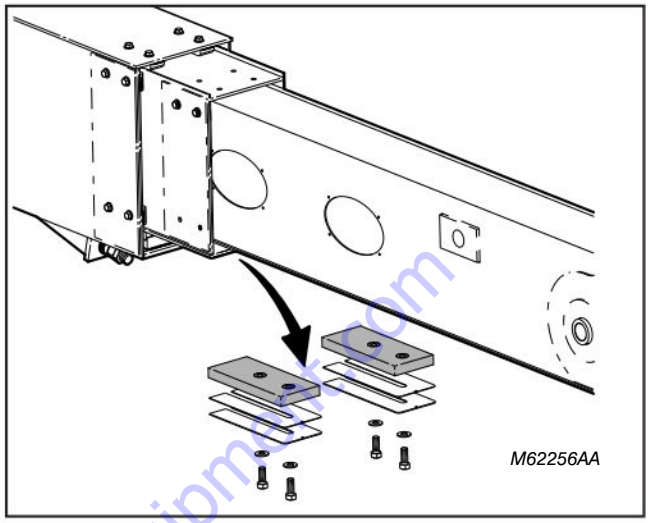
1. On the platform end of the boom, mark and remove the slave cylinder hoses on the top side of the fly boom tip. Crack the lines slowly to relieve any residual pressure. Use a suitable container or rags to catch any oil spillage. Cap hoses and ports to keep them clean.
2. Remove the fasteners for the cable/hose tube support on the side of the fly boom.


M62253AA

3. Remove the top and side wear pads and shims inside the platform end of the mid boom. Store the shims with their repective parts for reassembly later.


M62255AA

4. Place a suitable stand that can bear the weight of the fly boom ahead of the machine. Attach a lifting sling to the tip of the fly boom. Lift it up slightly, then remove the bottom wear pad.

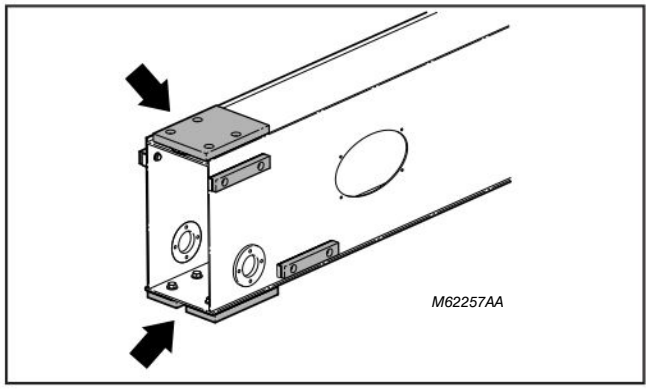

M62256AA

5. Lift/slide the fly boom out 2/3 of the way. Pull it out straight to avoid binding. Set it down on the stand to re-sling as required. Balance the load as it is being removed.

NOTE

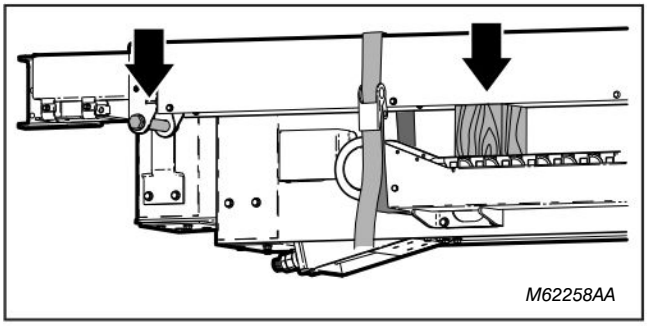
All the wear pads must be removed from the platform end of the mid boom so the fly boom section can be pulled all the way out. The wear pads on the counterweight end of the fly boom section would otherwise prevent removal.

6. Slide the fly boom completely out of the mid boom and set it down on suitable blocking.
7. Replace the wear pads on the counterweight end of the fly boom. Use Loctite 242 or 243 on the wear pad fasteners.

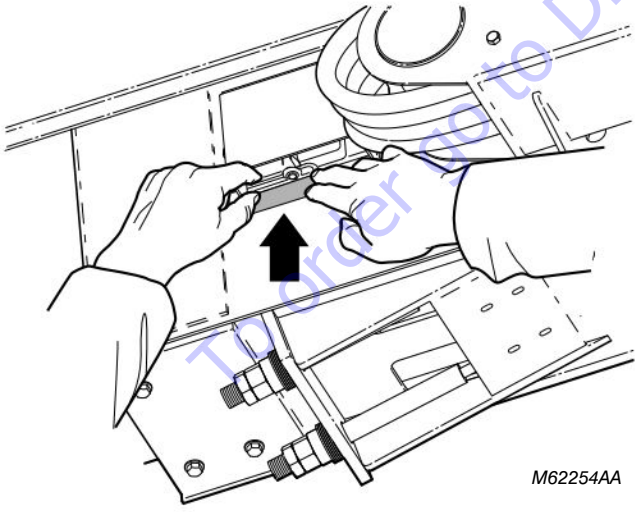

M62257AA

5.4-10 Mid Boom Section Removal

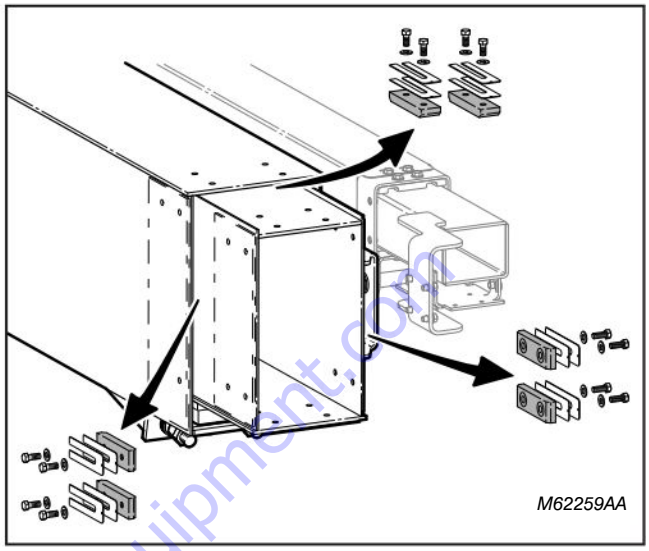
1. Place blocking inside the cable/hose tube to support the e-chain track when the main support bolt is removed. Cut the blocks about 5” (12 cm) high. Place them about 4 ft (1.2 m) apart.
2. Remove the main power track carrier bolt from the platform end of the mid boom. Allow the cable/hose tube to rest on the blocking. Secure it with a strap.


M62258AA

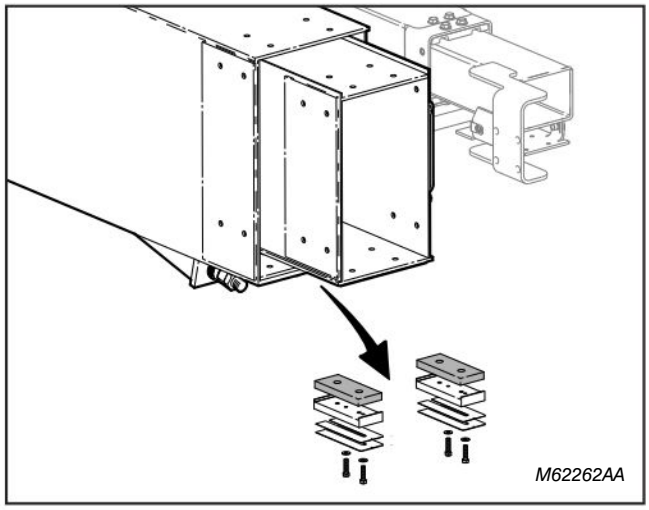
3. Locate the limit switch on the left-hand side of the main boom, at the platform end of the lower e-chain tube. Pull in the limit switch arm and place a piece of tape over the switch hole. The tape prevents the switch from being damaged as the fly boom is removed.


M62254AA

4. Place a suitable stand that can bear the weight of the mid boom about 2/3 the boom length ahead of the machine.
5. Connect lifting slings to the platform end of the mid boom.
6. Remove the top and side wear pads and shims inside the platform end of the main boom. Store the shims with their respective parts for reassembly later.


M62259AA

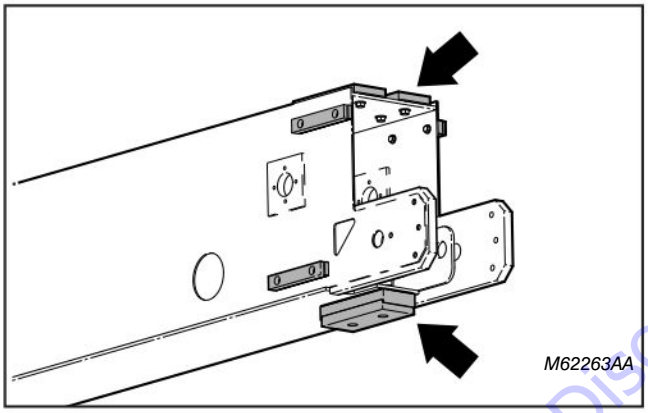
7. Slide the mid boom out 2/3 of the way. Slide it out straight to avoid binding.
8. Set it down on the stand and re-sling to lift from two points.
9. Remove bottom wear pads, support blocks and shims from the platform end of the main boom.


M62262AA

NOTE

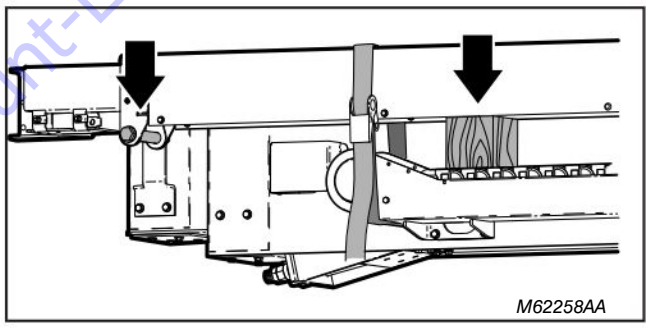
All the wear pads must be removed from the platform end of the main boom so the mid boom section can be pulled all the way out. The wear pads on the counterweight end of the mid boom section would otherwise prevent removal.

10. Slide the mid boom completely out of the main boom and set it down on suitable blocking.
11. Replace the wear pads on the counterweight end of the boom section. Install with the shims that were removed. Apply Loctite 242 or 243 to the wear pad fasteners.

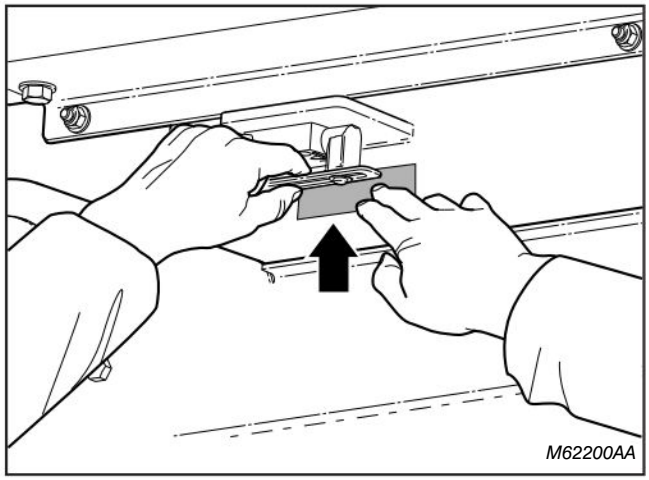


5.4-11 Mid Boom Section Installation

1. Attach two lifting slings to the mid boom. Using suitable lifting equipment, slide the mid boom section slowly into the platform end of the main boom. Be careful not to damage the wear pads.
2. When it is about 1/3 of the way in, install the bottom wear pad. Apply Loctite 242 or 243 to the wear pad fasteners.
3. Place a suitable stand under the end of the boom. Lower it onto the stand and remove one lifting sling.
4. Continue sliding the boom all the way in until the holes in the mid boom nose and the cable/hose tube support line up.
5. Install the top and side wear pads and shims in the main boom nose. Apply Loctite 242 or 243 to the fasteners.
6. Install the main power track carrier bolt. Remove the blocking and strap supporting the cable/ hose tube.

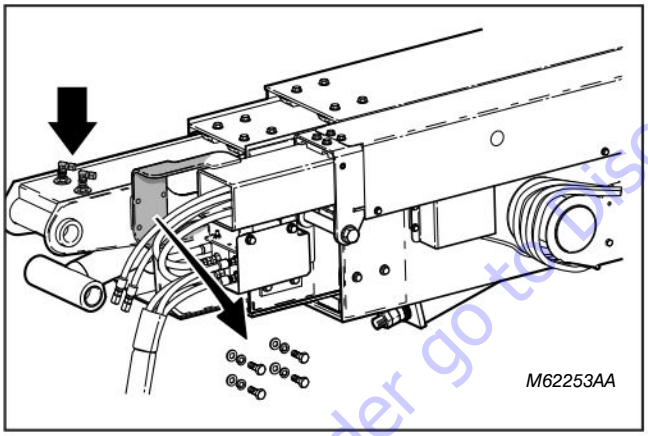


7. Remove the tape from the limit switch hole on the left-hand side of the main boom.



5.4-12 Fly Boom Section Installation

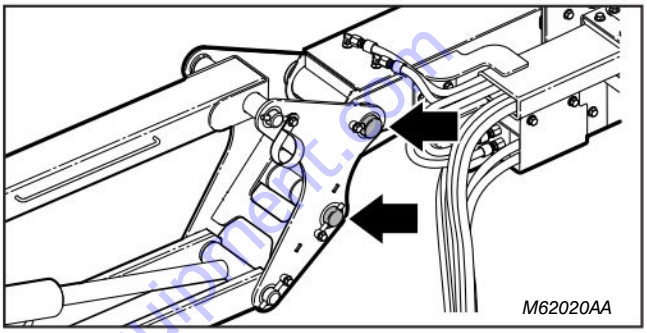
1. Attach two lifting slings to the fly boom. Using suitable lifting equipment, slide it slowly into the nose of the mid boom. Be careful not to damage the wear pads.
2. When it is about 1/3 of the way in, install the bottom wear pad. Apply Loctite 242 or 243 to the wear pad fasteners.
3. Place a suitable stand under the end of the boom. Lower it onto the stand and remove one lifting sling.
4. Continue sliding the boom all the way in until the holes in the boom tip and the e-chain support bracket line up.
5. Install the top and side wear pads and shims in the mid boom nose. Apply Loctite 242 or 243 to the wear pad fasteners.
6. Install the fasteners for cable/hose tube support in the fly boom. Connect the platform level hydraulic hoses.



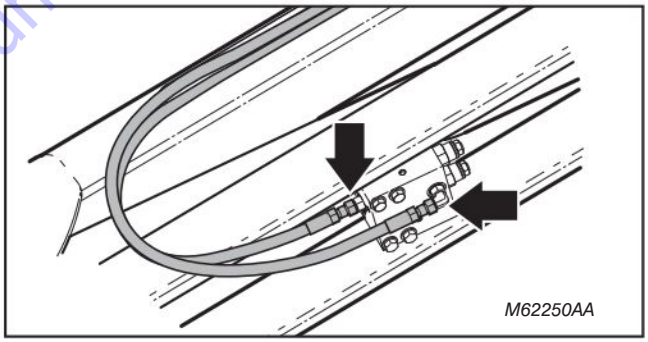
5.4-13 Platform and Jib Boom Installation

For torque specifications, refer to 2.2 MEWP Torque Specifications.

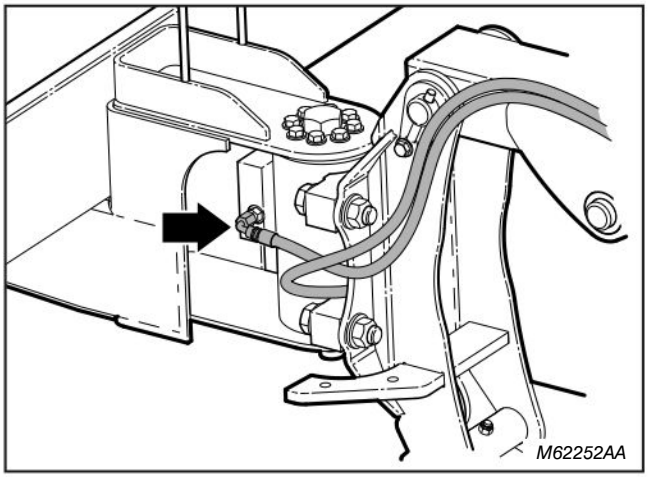
1. Connect lifting slings to the jib assembly.
2. Using suitable lift equipment, move it into position and insert the jib pin and slave cylinder pin. Insert the keeper pins.



3. Connect the hydraulic hoses for the jib cylinder.



4. Connect the hoses for the platform rotary actuator.



5. Install the hoses and P-clamps to the side of the jib boom.

IMPORTANT

Make sure all wiring cables are routed and secured to avoid pinching or chafing as the platform moves.

6. Connect the platform control console. Refer to the Platform Controls Wiring diagrams in Section 3.

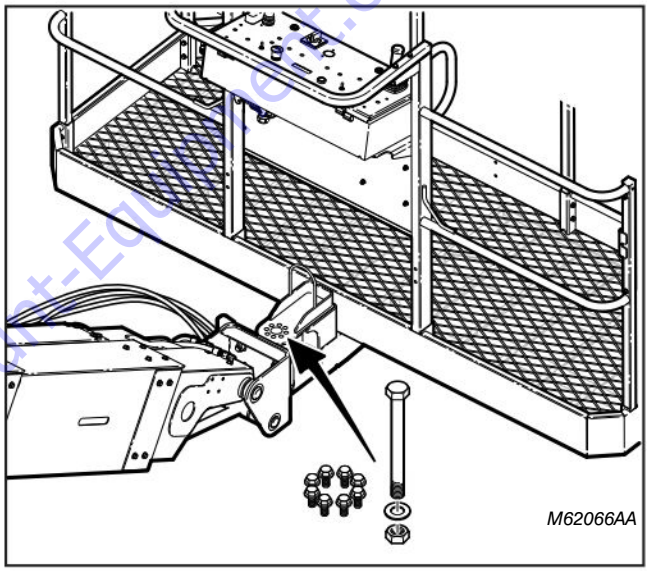
⚠ CAUTION

Risk of personal injury or equipment damage. Test equipment operation before putting machine into service. See Function Tests in the Operating Manual.

5.4-14 Platform Installation (no Jib Boom)

For torque specifications, refer to 2.2 MEWP Torque Specifications.

1. Connect lifting slings to the platform assembly.
2. Using suitable lifting equipment, move the platform into place.
3. Install the main pivot bolt pin, flat washer and hex nut. Tighten to the correct torque.
4. Install the bolts that secure the rotary actuator to the platform base mount. Apply Loctite 242 to the bolt threads. Tighten to the correct torque.



5. Connect the hydraulic hoses to the platform rotator.
6. Install the P-clamp for the hoses and wire cables to the side of the fly boom nose.

IMPORTANT

Make sure all wiring cables are routed and secured to avoid pinching or chafing as the platform moves.

Connect the platform control console. Refer to the Platform Controls Wiring diagrams in Section 3.

⚠ CAUTION

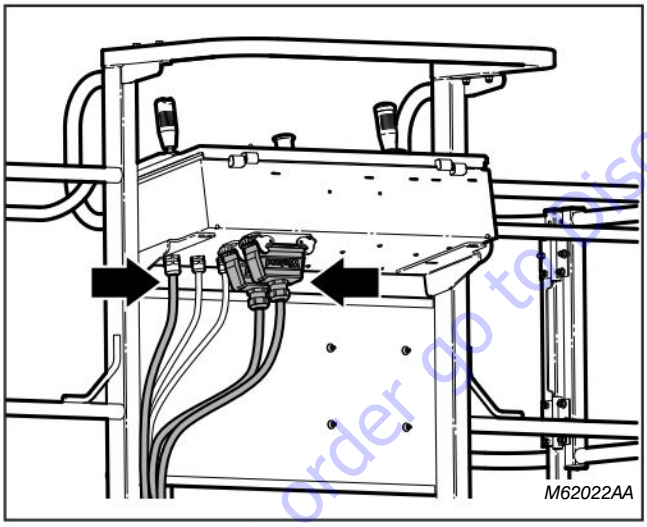
Risk of personal injury or equipment damage. Test equipment operation before putting machine into service. See Function Tests in the Operating Manual.

5.4-15 Platform Control Console Connection

Refer to the Platform Controls Wiring diagrams in Section 3 to properly identify control console wiring connections.

Once the platform is installed, make sure all harnesses to be connected to the platform control box are routed through the guard hoop on the platform base.

1. Connect the two platform control cable harnesses.
2. Pull the jib (if equipped) and platform rotate harness through the strain relief connector in the bottom of the platform control box. Make sure the wires can reach the terminal block on the left-hand side of the box.
3. Tighten the strain relief connector locknut to secure it.



4. Note the color and markings for each wire. Connect the wires as shown on the wiring diagram.
5. Tie-wrap the harnesses inside the control box as before.

IMPORTANT

Make sure all wiring cables are routed and secured to avoid pinching or chafing as the platform moves.

⚠ CAUTION

Risk of personal injury or equipment damage. Perform a function and range of controls check before putting machine into service. See Function Tests in the Operating Manual.

5.4-16 Extension Cylinder and Wire Rope Replacement

Inspecting the cable assembly and extension cylinder for wear requires completely removing them from inside the boom assembly. Adequate space must be provided to do so. See 5.4-20 Wire Rope Inspection.

⚠ CAUTION

Risk of personal injury or equipment damage if repositioning boom during this procedure. Use base controls with auxiliary power (engine off) to reposition safely.

⚠ CAUTION

Risk of personal injury or equipment damage. Always use suitable lifting equipment and safe rigging practices when performing the following procedures.

IMPORTANT

When operating on auxiliary power, do not operate more than one function at a time to avoid overloading the 12-volt auxiliary pump motor.

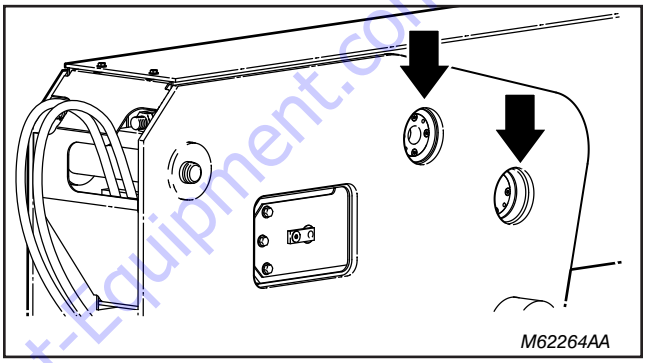
IMPORTANT

Prevent hydraulic system contamination by capping all hydraulic connections after disconnecting. Sample warning text.

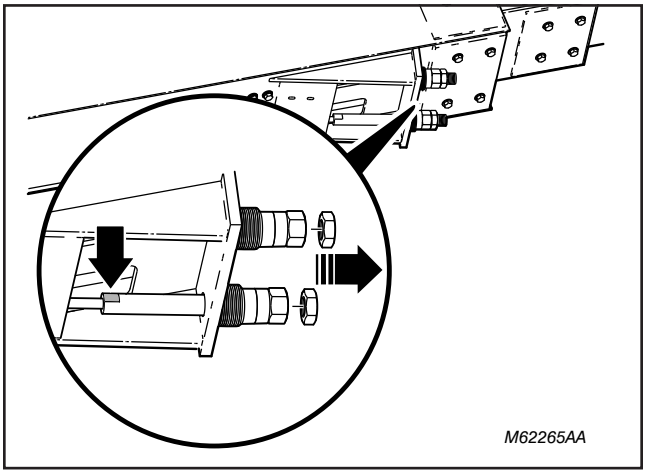
5.4-17 Extension Cylinder and Cable Assembly Removal

- Place the boom in a horizontal (0°) position.
- Shut down the machine.

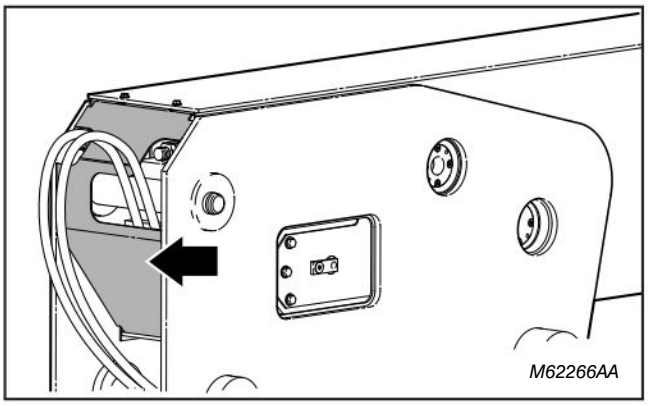
1. Extend/retract the boom to align the flange pins with the holes in the side of the main boom. The lower flange pins connect the wire rope terminal assembly to the fly boom. The upper flange pins connect the cylinder base to the mid boom.



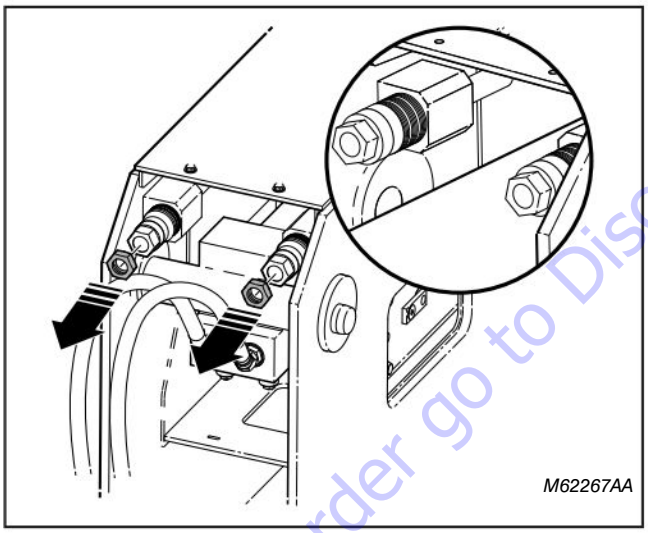
2. Place the machine in the proper shut down position, parked on level ground. Make sure the e-stops are pushed in and the key is off. Turn the main disconnect switch to off position. Lock out the switch ◯ .
3. Loosen the wire ropes on the platform end of the machine first. Remove the jam nut, then use the flat on the end of wire rope anchor to hold it while backing off the main nut. Leave the main nut on the wire rope anchor about one full nut thread.



4. Remove the boom end cover.



5. Loosen the wire ropes on the counterweight end of the machine. Remove the jam nut, then use the flat on the end of wire rope anchor to hold it while backing off the main nut. Leave the main nut on the anchor about one full nut thread.



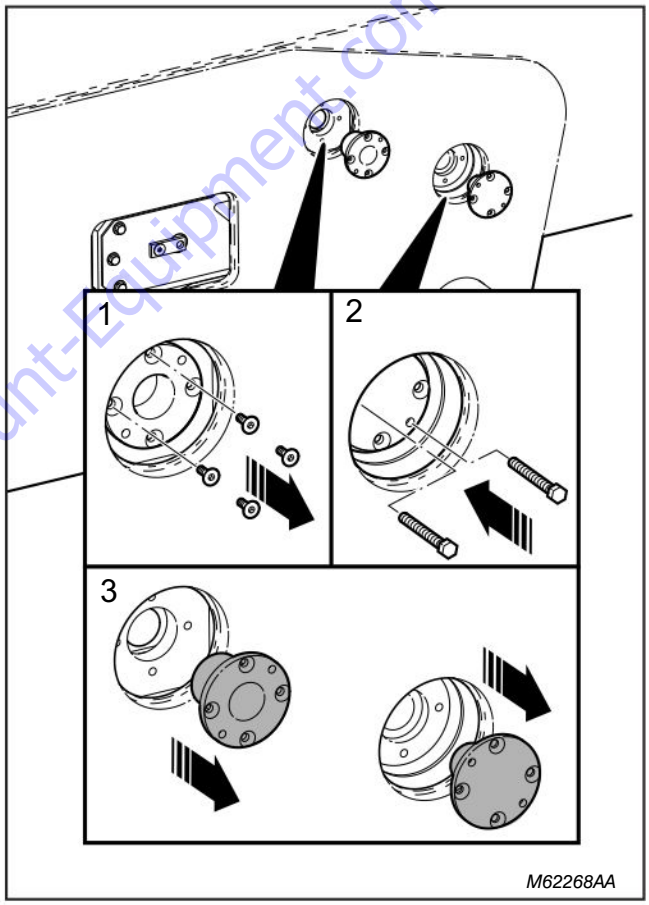
6. When all wire ropes are slackened, the disc springs (washers) and spacers can be removed from each wire rope anchor. Remove the washers and spacers, then put the hex nut back on one full nut thread to temporarily hold the wire rope in place.

7. Once the wire ropes are slackened, remove the boom flange pins and fasteners.

NOTE

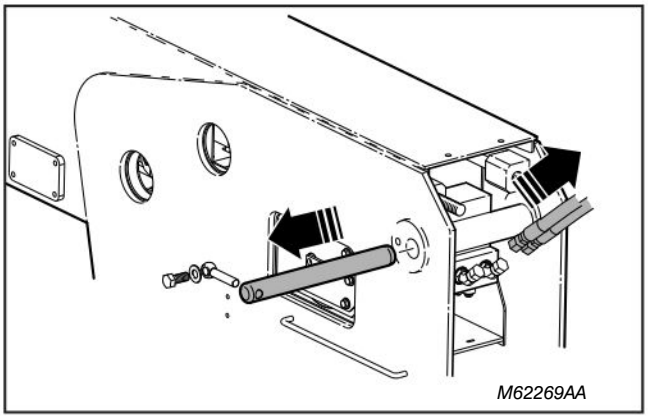
The flange pins may not line up in the holes exactly, but can be moved into place using a pry bar once the cables are slackened.

8. Use two ¼-20 UNC bolts to help as a puller when removing the flange pins. Threaded holes are located in the flange pin collar. The bolts should be full thread with no shoulder, and at least 2 in. (50 mm) long.

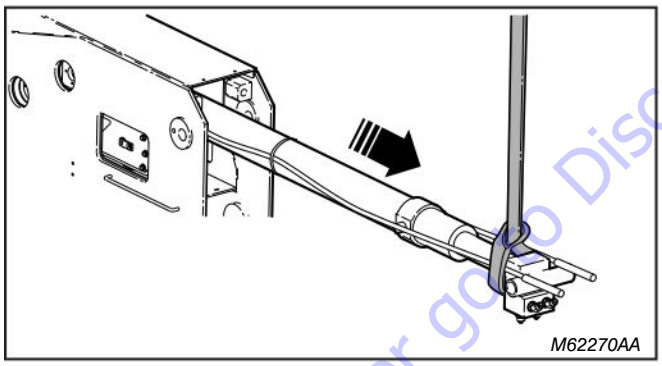


9. Remove the hex nuts from all 4 wire rope anchors.

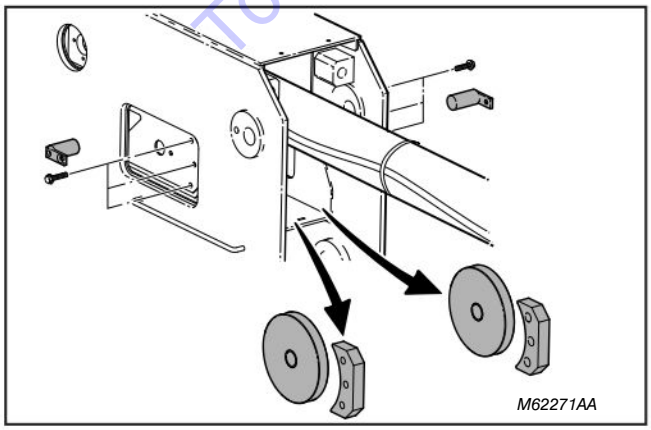
10. Mark and disconnect the hoses from the extension cylinder. Cap hoses and ports to keep them clean.
11. Remove the extension cylinder base-end pin.


M62269AA

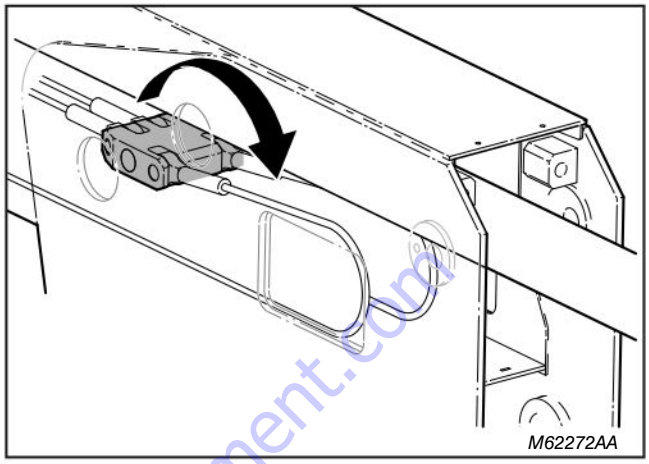
12. Place a lifting strap on the extension cylinder. Pull the cylinder out along with the upper wire ropes to about 1/3 of the way. The wire ropes can be tie-wrapped to the cylinder to help keep them from getting tangled.


M62270AA

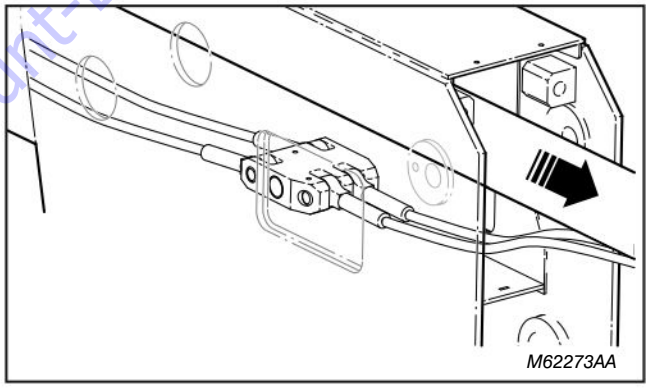
13. Remove the mid boom pulleys and cable stops. Continue to pull the cylinder out.


M62271AA

14. Flip the wire rope terminal plate over so the tapered end faces the counterweight end of the machine. Flipping it over makes it easier to remove with the cylinder.


M62272AA

15. Pull the cylinder out 2/3 of the way. Allow the upper wire ropes to come out with the cylinder.

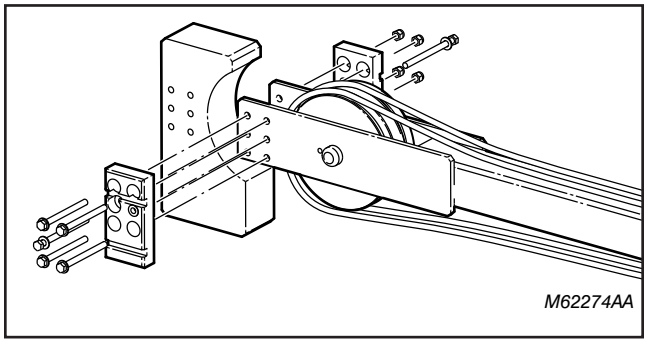

M62273AA

NOTE

Make sure wire ropes do not get tangled or caught on other components.

16. Lower the end of cylinder onto a support. Connect lifting straps at both ends of the extension cylinder.
17. Continue to slide the cylinder completely out of the boom. Balance the load as it is being removed.
18. Lower the cylinder onto suitable supports.

19. Remove the cable stop and wire ropes from the extension cylinder pulley.



20. Inspect the extension cylinder wear pads for wear or damage. Replace if required.
21. Perform an inspection of the wire ropes at this time. See 5.4-20 Wire Rope Inspection.

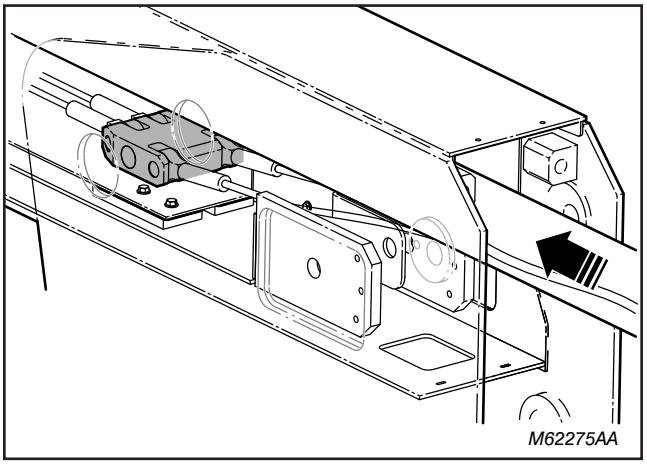
5.4-18 Extension Cylinder and Wire Rope Assembly Installation

1. Attach two lifting slings to the extension cylinder. Using suitable lifting equipment, raise and slide the end slowly into the counterweight end of the boom assembly. The upper wire ropes can be tie-wrapped to the cylinder to keep them from getting tangled. Be sure to remove the tie wraps as the cylinder is being installed.

NOTE

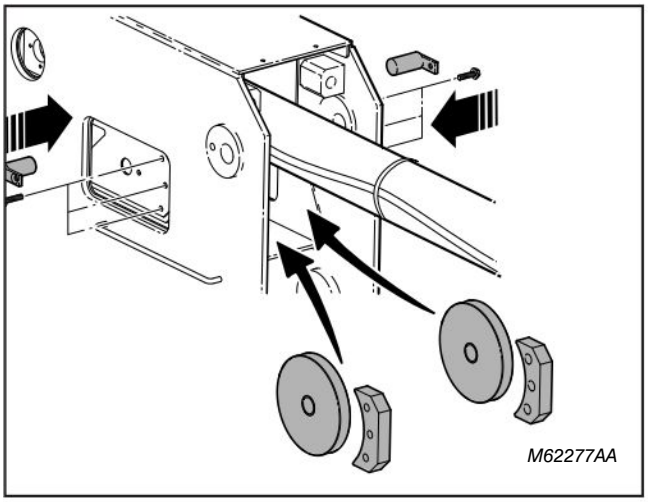
Make sure the cables do not get tangled or caught on other components.

2. Orient the wire ropes correctly. Identify which cable ends go to the platform end, and which go to the counterweight end of the machine. The tapered end of the wire rope terminal plate is towards the platform end of the machine when installed. The shorter length wire ropes anchor at the platform end.
3. Lift and slide the end of the cylinder into the boom, being careful not to tangle the wire ropes.
4. Once the pulley end of the cylinder is into the boom, one lifting sling can be removed. Lower the cylinder onto a suitable stand or support and remove one sling. Connect the lifting sling to the end of the cylinder.
5. Carefully feed the wire ropes in as the cylinder is being pushed in.
6. Slide the cylinder 2/3 of the way in until the wire rope terminal plate has passed where the mid boom pulleys mount.

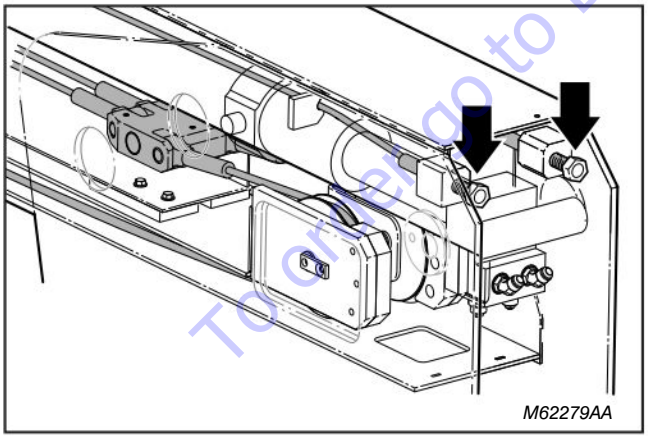


Wire Rope Terminal Plate

7. Route the platform end wire ropes between the main and mid booms, through to the anchor points at the platform end. Install one hex nut on each cable end.
8. Install the mid boom pulleys. Pull the slack cable and fit it onto the pulleys. Install the cable stops.

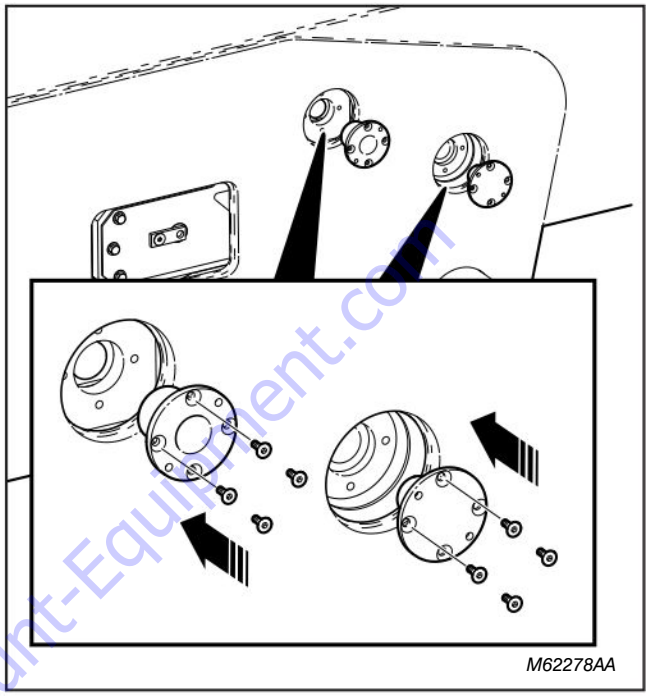


9. Continue sliding the cylinder inward, making sure the wire ropes do not get tangled.
10. Install the counterweight end of the wire ropes into the anchor points. Install one hex nut on each anchor to secure it.



Counterweight-end Wire Ropes

11. Install the flange pins for the cable support and the wire rope terminal plate into the side of the boom. If the flanges need to be rotated, thread two bolts into the puller holes and turn with a pry bar.

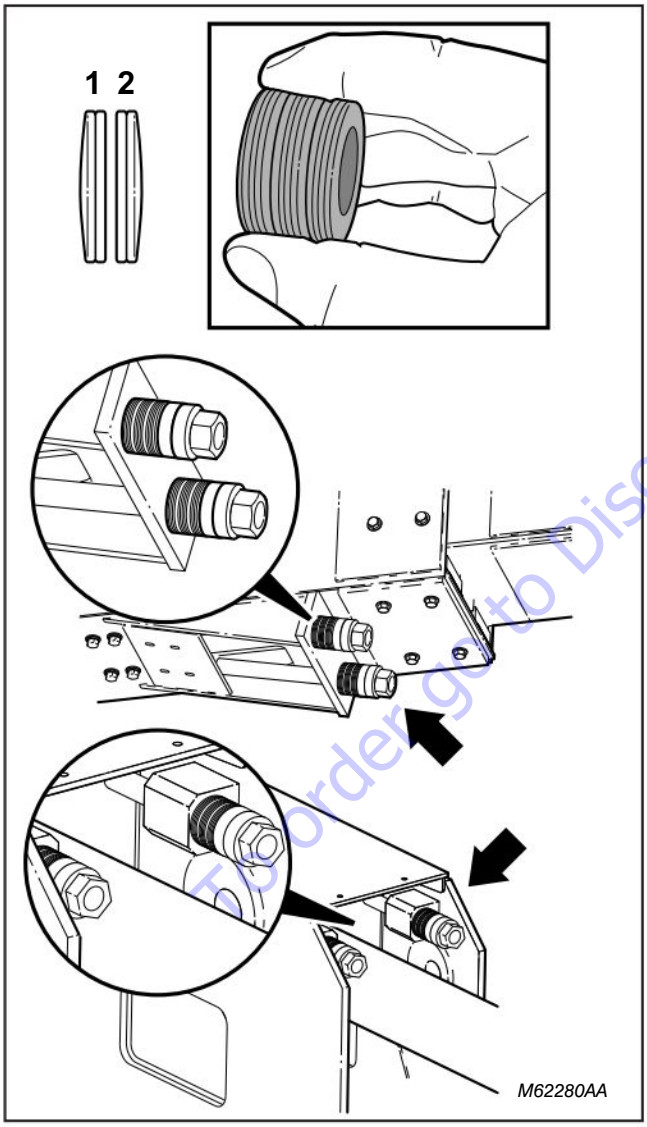


12. Install the extension cylinder base-end pin. Install the keeper pin to secure it.
13. Install the extension cylinder hydraulic hoses.

14. Remove the hex nut on each cable end and install the 2 spacers and 12 disc springs. The orientation of the disc springs is important. They must be installed by reversing the direction of every second pair. Turn the hex nuts on one thread to secure them.

IMPORTANT

Reverse the direction of every second pair of disc springs. Orientation of the disc springs is critical for proper wire rope tension.

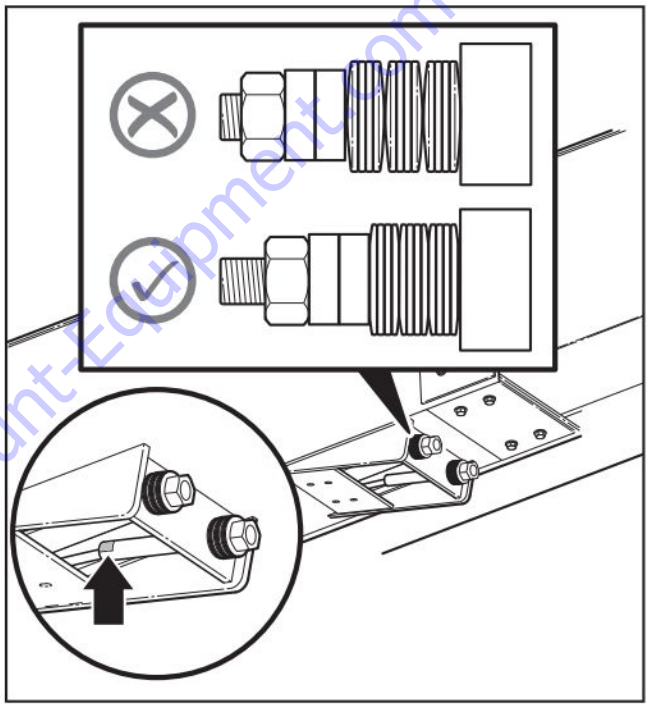


15. Tighten all wire rope ends at the anchors until they are tensioned correctly. See 5.4-19 Proper Wire Rope Tension.
16. Install the boom end cover.

5.4-19 Proper Wire Rope Tension

The wire rope assembly is tensioned correctly when the disc springs are fully compressed.

1. With the jam nut removed, use the flat on the wire rope anchor to hold it while tightening the hex nut. Tighten the anchors equally until all the disc springs are fully compressed, then turn one additional ½ turn. Note: you will still see small gaps between reversed discs, even when fully compressed.



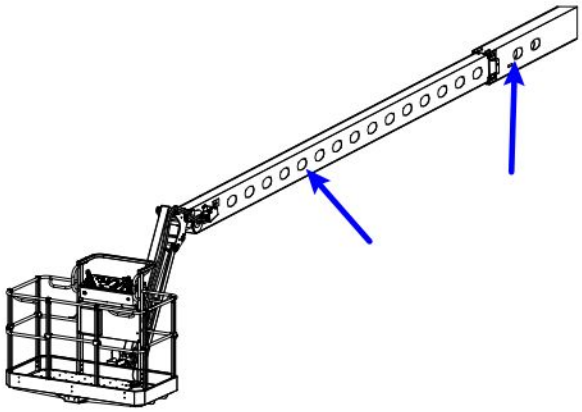
2. When tensioned correctly, install the jam nuts on all the wire rope anchors.

⚠ CAUTION

There is a risk of personal injury or equipment damage. Test the equipment operation before putting the machine into service. See the Function Tests in the Operating Manual.

5.4-20 Wire Rope Inspection

- Perform a visual inspection of the wire ropes annually. Check for wear or damage. Make sure wire ropes are tensioned correctly. See 5.4-19 Proper Wire Rope Tension.
- A visual inspection can be performed by fully extending the boom, and inspecting the cables through the sight holes along the boom arm.



- Perform a full inspection of the wire rope assembly every ten years. To perform a full inspection, the extension cylinder and wire rope assembly must be fully removed from the boom assembly. See 5.4-17 Extension Cylinder and Cable Assembly Removal.

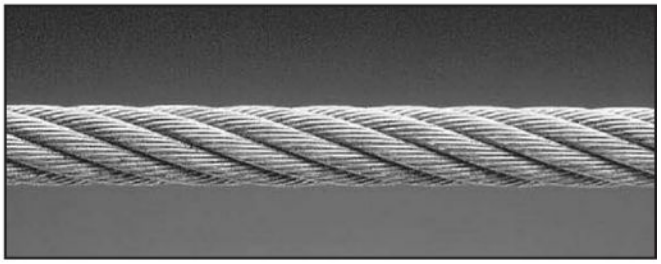
IMPORTANT

Perform a full inspection of the wire ropes at the start of the 10th year of wire rope life. They must be inspected every 2 years if not replaced at that time.

Perform a visual inspection annually.

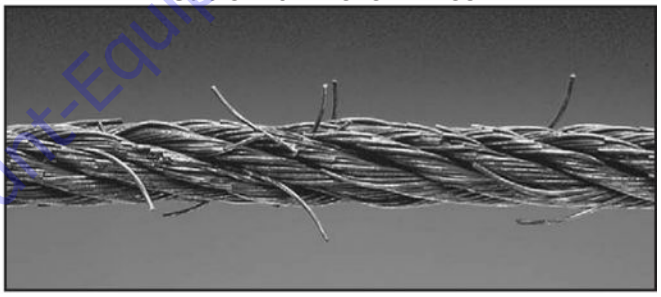
If a wire rope needs replacement, the entire wire rope assembly must be replaced immediately.

Check wire ropes for wear or damage. A wire rope with broken wires, severe corrosion, excessive stretch, deformed strands, variations in diameter (necking), or any change from its normal appearance, must be replaced.

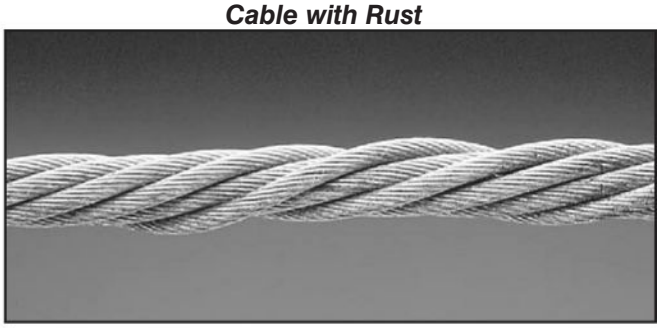


Cable in Good Condition

Cable with Broken Wires



Cable with Rust



Cable with Necking

Sheave Inspection

Check sheaves (pulleys) for wear or damage, For example, wobble (tilt), cracks, loose on pin, or excessive noise during operation.

Sheave Pins Inspection

Check for loose or missing sheave (pulley) pins.

5.4-21 Limit Switch Checking and Adjusting

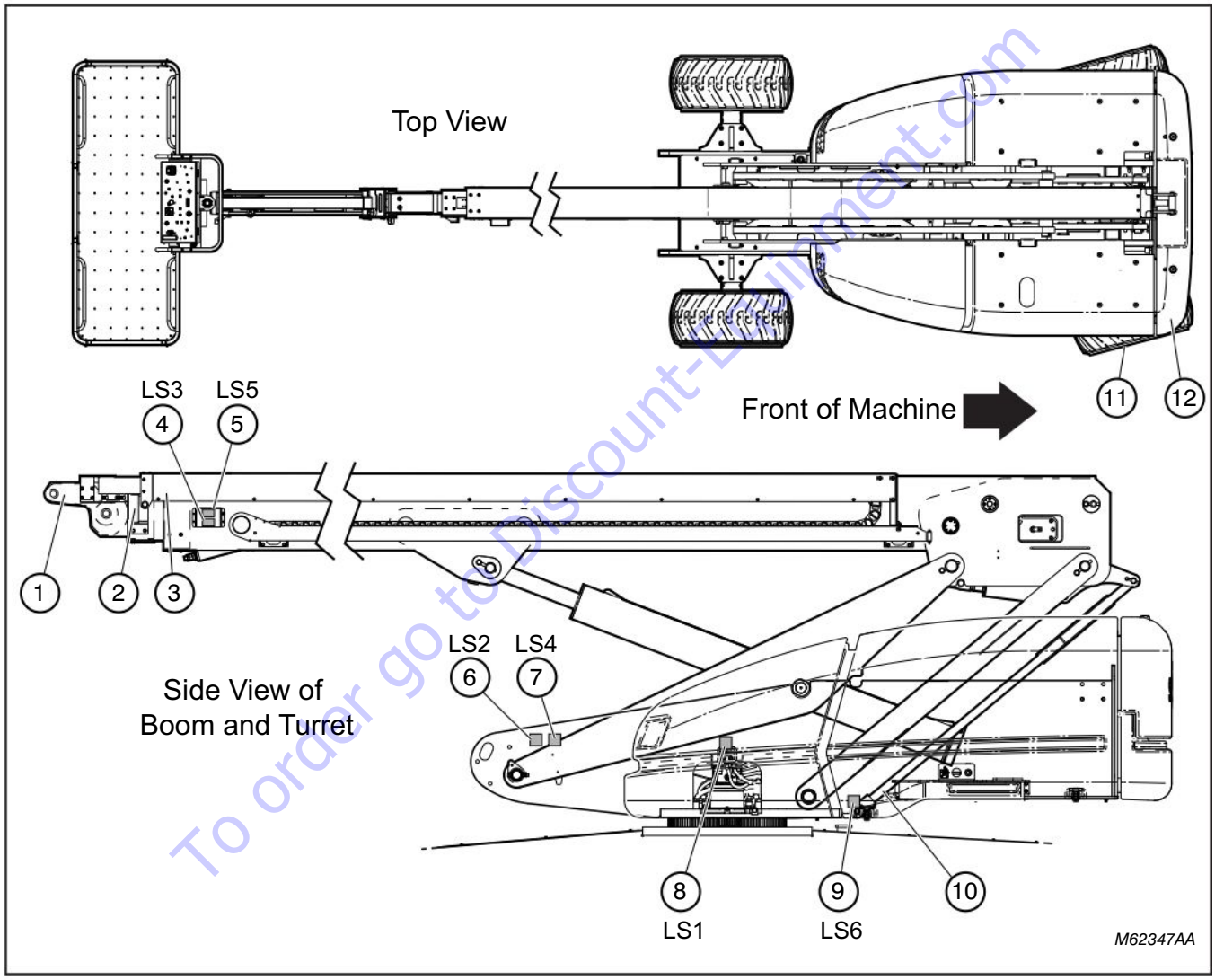
There are six limit switches on the SJ82 T and SJ86 T machines. Use the following procedures to check and adjust them.

Preparation:

- Park the machine on a flat, level surface.
- Provide enough room around the machine for lifting / swinging the boom and driving.

Tools required:

- Calibrated digital protractor (to measure boom angles)
- Multi-meter with continuity setting
- Level



Components and limit switch locations

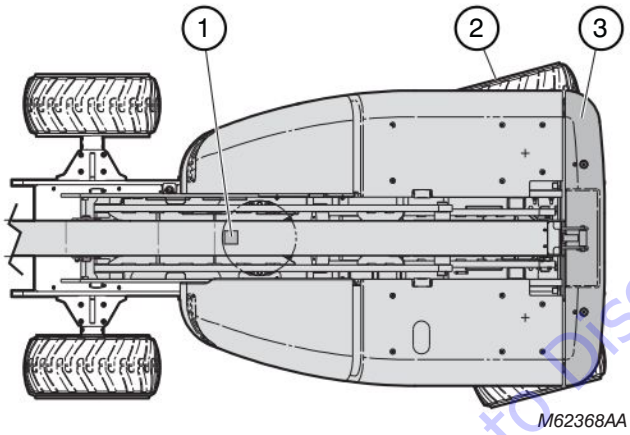
1. Fly Boom Section
2. Mid Boom Section
3. Main Boom Section
4. Fly-in Limit Switch (LS3)
5. Boom Extension (dual load) Limit Switch (LS5)
6. High Drive / Tilt Override (LS2)
7. Boom Angle (dual load) (LS4)
8. Directional Sensing Limit Switch (LS1)
9. Cushion Limit Switch (LS6)
10. Master Cylinder Link
11. Steering Axle
12. Counterweight

5.4-22 Directional Sensing Limit Switch (LS1)

LS1 detects when the turret is rotated more than 90° from being in line with the base. When rotated past 90°, the directions for forward-reverse travel and left-right steering are reversed. The platform controls remain natural and operate as indicated as the turret rotates about the base.

LS1 is normally closed and opens when the switch roller contacts a cam on the top of the rotary manifold. When rotating the turret, LS1 circuit opens as it rides up on the cam. It closes when the switch roller is off the cam.

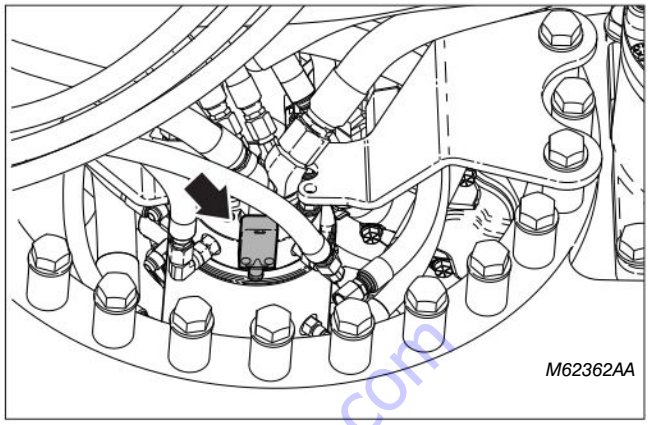
LS1 is normally closed and held open when the counterweight is over the steering axle.



Counterweight shown over steering axle

1. LS1 Limit Switch
2. Steering Axle
3. Counterweight

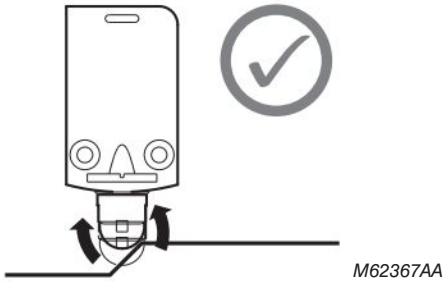
LS1 is mounted on the rotary manifold in the base frame.



LS1 location on rotary manifold (some parts hidden for clarity)

NOTE

Make sure the switch roller rotates freely and the plunger is free to move as the turret rotates.



Limit switch plunger and roller

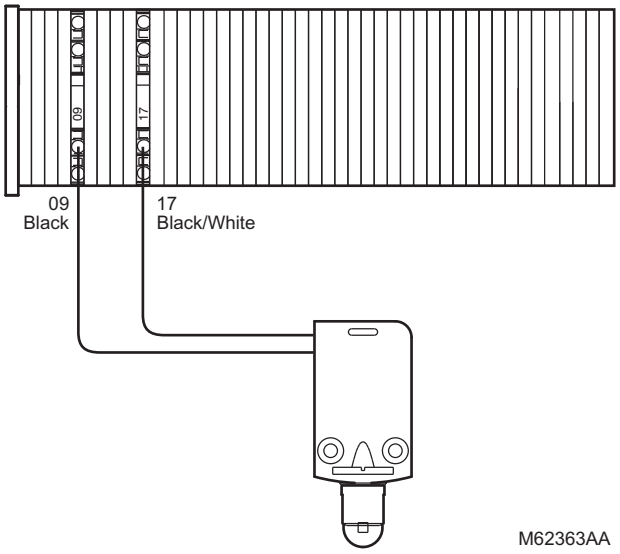
WARNING

Ensure there are no personnel or obstructions in the test area and there is sufficient room to drive the machine and reposition the boom.

Check Switch Operation:

1. Align the turret with the counterweight over the steering axle. Verify the machine operates as the controls indicate using the platform controls. Check that forward–reverse controls and left–right steering operate as indicated.
2. Locate the terminal strip inside the base control panel. Set the multi-meter to *continuity-check* mode.

3. Place the multi-meter probes on terminal positions (**09 Black**) and (**17 Black/white**).



LS1 terminal connections

4. Check that the circuit is open with the multi-meter.
5. Rotate the turret around the base past 90° and stop. Verify machine directions continue to operate as the controls indicate.

⚠ WARNING

The drive orientation can change when the turret is swung 90 degrees off center of the normal driving position (roughly when boom is swung past the rear tire). Drive re-orientation does not occur while driving and rotating until the joystick is released for 6 seconds or when the footswitch is released.

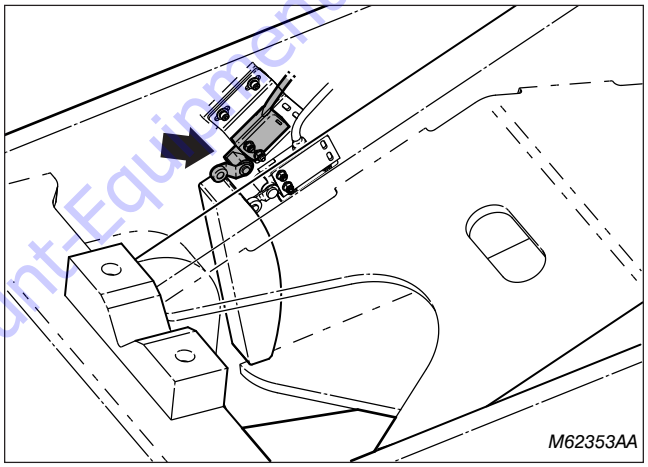
6. Verify the circuit is now closed with the multi-meter. Continuity is indicated when the turret is rotated past 90°. Check both clockwise and counterclockwise directions.

5.4-23 High Speed Drive / Tilt Override Limit Switch (LS2)

LS2 detects when the boom is raised above horizontal. The machine drives at normal speed with the boom fully lowered, but is limited to a slow drive speed of 0.5 mph (0.8 km/h) when the boom is raised.

LS2 is normally closed. It opens when it contacts a cam on the turret frame when the boom is raised up past horizontal. The switch roller contacts the cam and the system switches from normal to slow drive speed.

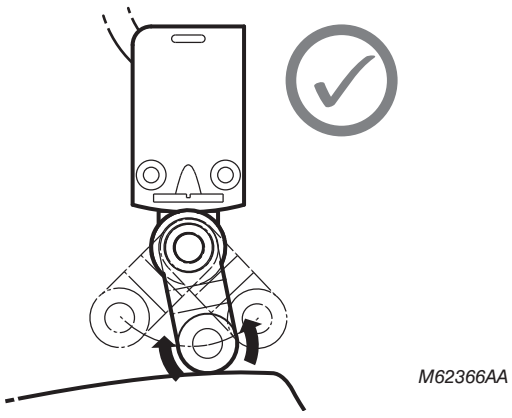
LS2 is the upper switch located on the rear, left-hand side of the turret frame.



LS2 location on turret frame

NOTE

Make sure the switch roller rotates freely and the switch arm is free to move as the boom raises and lowers.



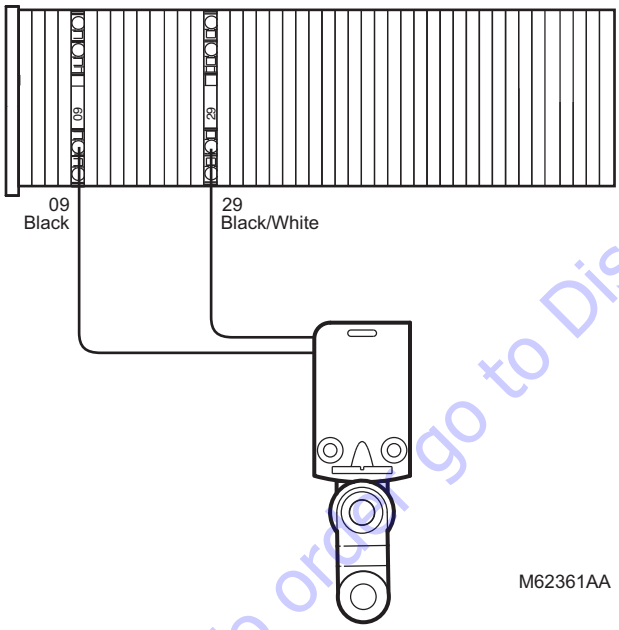
Limit switch arm and roller

⚠ WARNING

Ensure there are no personnel or obstructions in the test area and there is sufficient room to drive the machine and reposition the boom.

Check Switch Operation:

1. Fully retract the boom assembly.
2. Position the main boom so it is horizontal. Use a level to verify.
3. Place a digital protractor on the underside of the main boom. Calibrate it to 0° (horizontal).
4. Locate the terminal strip inside the base control panel. Set the multi-meter to *continuity-check* mode.
5. Place the multi-meter probes on terminal positions (**09 Black**) and (**29 Black/white**).



LS2 terminal connections

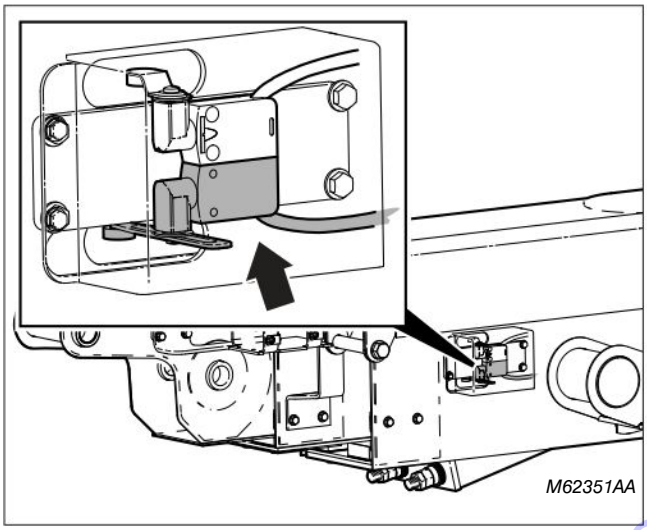
6. Lower the boom below horizontal. Verify the switch roller is not contacting the cam on the frame and the switch circuit is closed (continuity). Adjust the switch position if required.
7. Raise the boom to horizontal. Verify the switch roller now contacts the cam and the switch circuit is open (no continuity).
8. Verify the machine only drives at slow drive speed when the boom is raised above horizontal.
9. Confirm proper limit switch operation by driving the machine with the boom fully lowered, and then with it raised above horizontal.

5.4-24 Fly-in Limit Switch (LS3)

LS3 limits machine drive speed to 1/2 mph (0.8 km/h) when the boom is extended.

LS3 is normally closed. A slotted hole in the mid boom trips the switch as the boom extends.

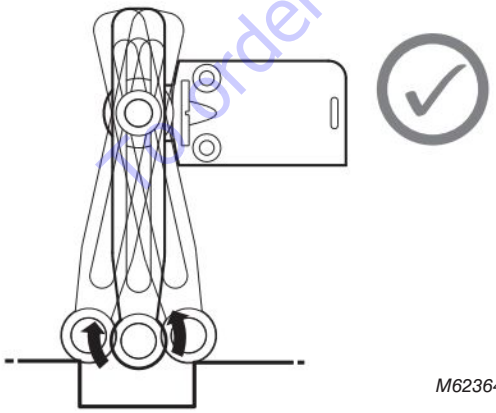
LS3 is the lower limit switch on the platform end of the main boom.



LS3 location on main boom

NOTE

Make sure the switch roller rotates freely and the switch arm is free to move as the boom extends and retracts.



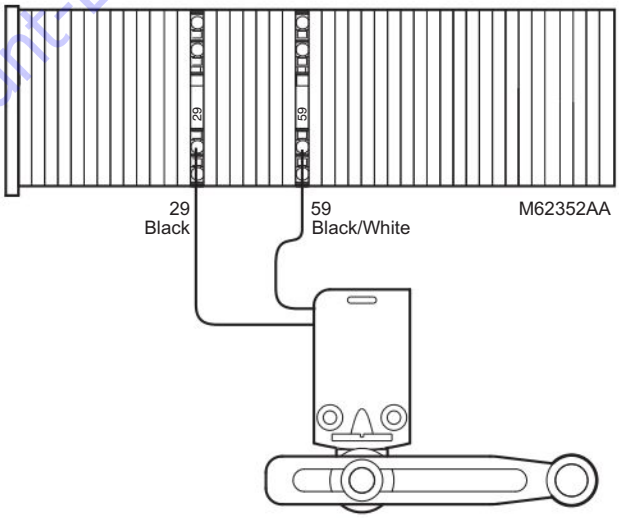
Limit switch arm and roller

WARNING

Ensure there are no personnel or obstructions in the test area and there is sufficient room to reposition the boom.

Check Switch Operation:

1. Retract the boom fully.
2. Place the boom in a horizontal position (or slightly less than 0°).
3. Extend the boom outwards 4 ft (1.2 m). At this point, the limit switch has tripped and the contacts should be open.
4. Locate the terminal strip inside the base control panel. Set the multi-meter to *continuity-check* mode.
5. Place the multi-meter probes on terminal positions (**59 black**/**white**) and (**29 black**).
6. Verify the switch circuit is open and there is no continuity.



LS3 terminal connections

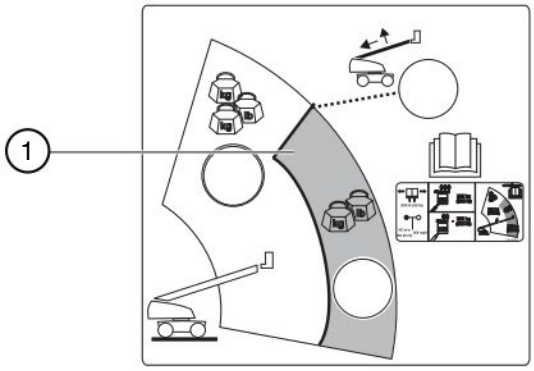
7. Retract the boom. Verify there now is continuity in the circuit.
8. Extend and retract the boom to check switch operation. The circuit should open and close when the switch roller passes through the slotted hole in the mid boom.
9. Perform a test drive to verify the machine drive speed is slowed with the boom extended.

5.4-25 Boom Angle (Dual Load) Limit Switch (LS4)

LS4 detects the angular position of the boom so the system can switch to and from the low and high capacity load zones, as the boom raises or lowers.

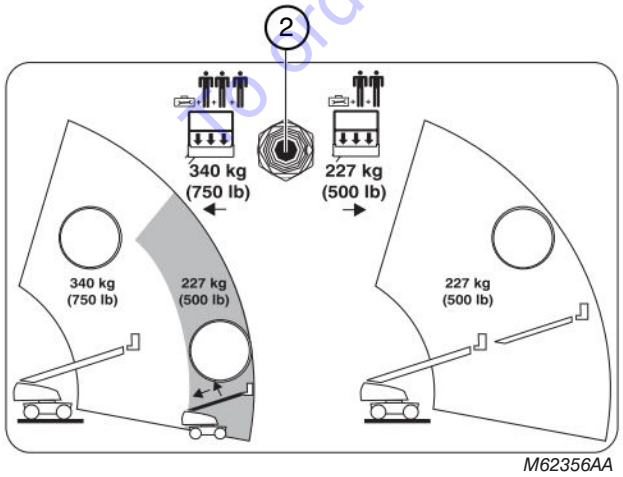
LS4 is normally closed. It is held open by a cam on the turret frame. When the boom is raised past 57°, the switch roller loses contact with the cam and the circuit closes.

When equipped with automatic platform load sensing (CE machines), an overload state can be detected automatically. The system does not allow the boom to further lift or extend into the 500 lb (227 kg) zone (1) when overloaded.



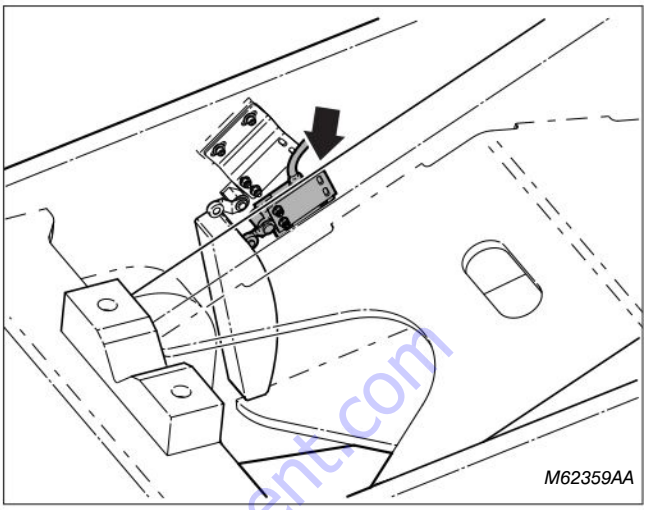
Automatic platform load sensing

When not equipped with automatic platform load sensing (ANSI machines), the operator must manually toggle the platform capacity selector switch (2) to further lift or extend the boom from the 750 lb (340 kg) zone into the 500 lb (227 kg) zone.



Platform capacity selector switch

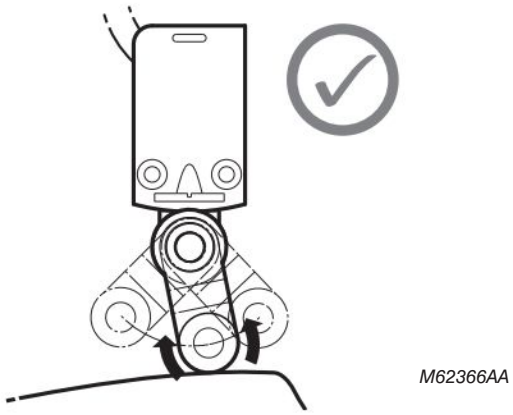
LS4 is the lower switch located on the rear, left-hand side of the turret frame.



LS4 location on turret frame

NOTE

Make sure the switch roller rotates freely and the switch arm is free to move as the boom raises and lowers.



Limit switch arm and roller

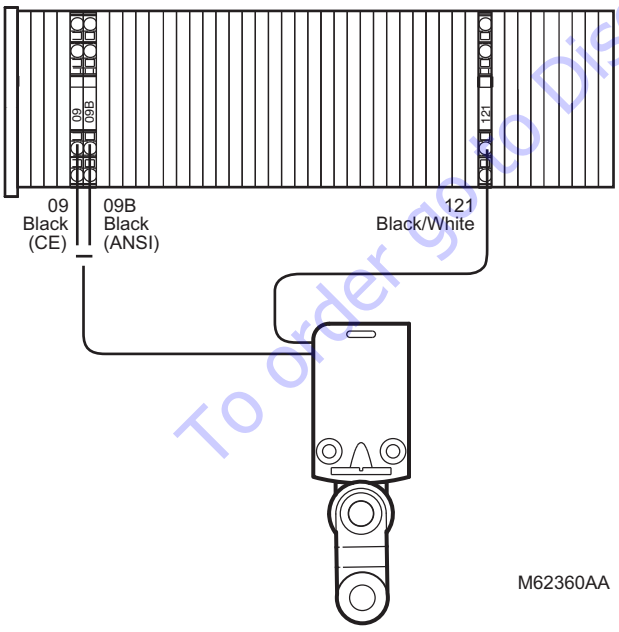
⚠ WARNING

Ensure there are no personnel or obstructions in the test area and there is sufficient room to reposition the boom.

Check Switch Operation:

1. Position the main boom so it is horizontal. Use a level to verify.
2. Place a digital protractor on the underside of the main boom. Calibrate it to 0° (horizontal).
3. Position the boom angle at 57° from horizontal.
4. Locate the terminal strip inside the base control panel. Set the multi-meter to *continuity-check* mode.
5. Place the multi-meter probes on terminal positions shown below (as equipped):

Automatic platform load sensing (CE machines)	Wire 121 Black/White and 09 Black
Standard load sensing (ANSI machines)	Wire 121 Black/White and 09B Black



LS4 terminal connections

6. Loosen the switch and move it so that the switch arm roller is just off the cam. At this point, the multi-meter should show the circuit is closed (continuity).
7. Adjust the switch position so that the roller is just on the edge of the cam and the circuit is open (no continuity). Verify with the multi-meter.

NOTE

The LS4 roller should not fall off the cam before reaching 57°. Additionally, continuity may not occur in the circuit until the boom angle reaches 58.5°.

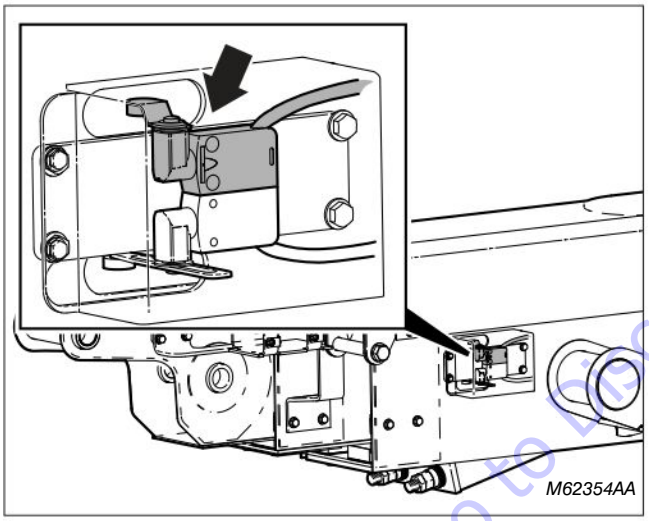
8. Tighten the switch in this position, then raise and lower the boom to confirm the switch is operating correctly.

5.4-26 Boom Extension (Dual Load) Limit Switch (LS5)

LS5 enables the system to change to and from the low and high capacity load zones, as the boom extends or retracts.

LS5 is normally closed. The switch roller makes contact with a ramp on the side of the mid boom to open its contacts. When the boom is extended far enough, the switch roller rides up on the ramp, the contact opens, and the system changes from the high to the low capacity zone.

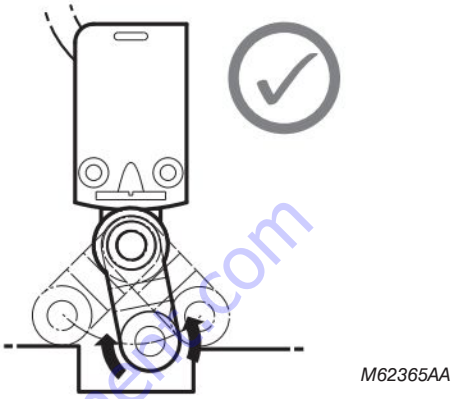
LS5 is the upper limit switch on the platform end of the main boom.



LS5 location on main boom

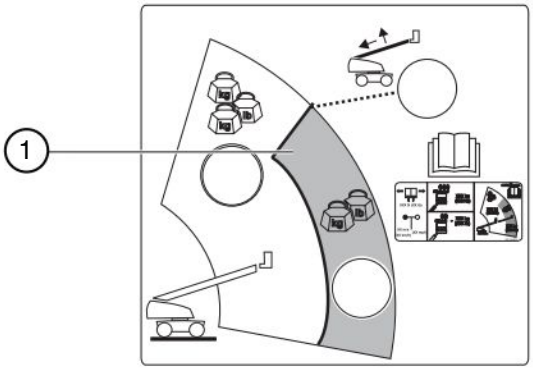
NOTE

Make sure the switch roller rotates freely and the switch arm is free to move as the boom extends and retracts.



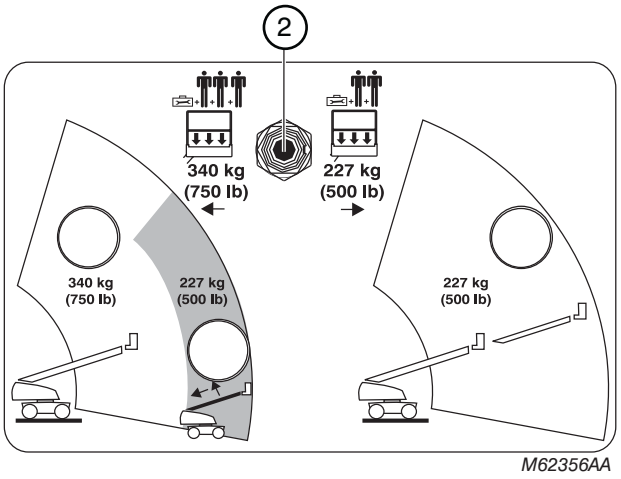
Limit switch arm and roller

When equipped with automatic platform load sensing (CE machines), an overload state is detected automatically when the switch trips. The system then does not allow the boom to extend into the 500 lb (227 kg) zone (1).



Automatic platform load sensing

When not equipped with automatic platform load sensing (ANSI machines), the operator must manually toggle the platform capacity selector switch (2) from the 750 lb (340 kg) zone to the 500 lb (227 kg) zone.



Platform capacity selector switch

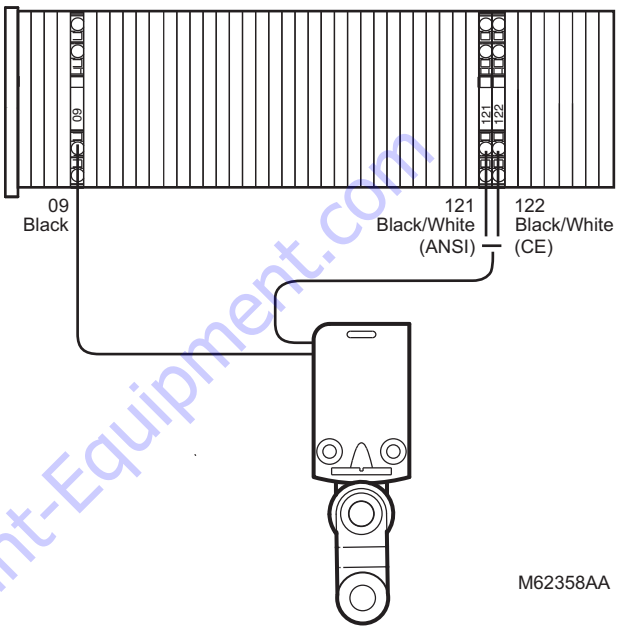
⚠ WARNING

Ensure there are no personnel or obstructions in the test area and there is sufficient room to reposition the boom.

Check Switch Operation:

1. Remove any load from the platform. Remove all tools and equipment.
2. Locate the terminal strip inside the base control panel. Set the multi-meter to *continuity-check* mode.
3. Fully extend the boom. The LS5 contact is normally closed, but with the boom extended the switch roller is riding up on the ramp on the side of the mid boom and its contact is open.
4. Place the multi-meter probes on terminal positions shown below (as equipped):

Automatic platform load sensing (CE machines)	Wire 122 Black/White and 09 Black
Standard load sensing (ANSI machines)	Wire 121 Black/White and 09 Black



LS5 terminal connections

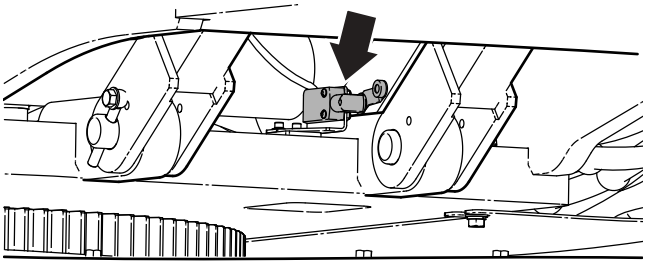
5. Observe the multi-meter display. There should be no continuity with the contact open.
6. Retract the boom and continue to observe the multi-meter. It should indicate no continuity until the switch roller loses contact with the ramp.
7. Stop retracting when the multi-meter shows continuity. At this point, the switch contact has closed.
8. Extend the boom again and observe the multi-meter as the boom extends. It should change from showing continuity back to no continuity when the roller arm contacts the ramp.

5.4-27 Lift Cushion Limit Switch (LS6)

LS6 slows the raising boom speed before the main lift cylinder reaches the stop at full extension.

LS6 is normally closed. As the lift cylinder approaches full extension, the switch roller makes contact with the master cylinder link. The switch trips to open the circuit.

LS6 is located on the inside of the turret on the left-hand side, near the lower end of the master cylinder link.



M62348AA

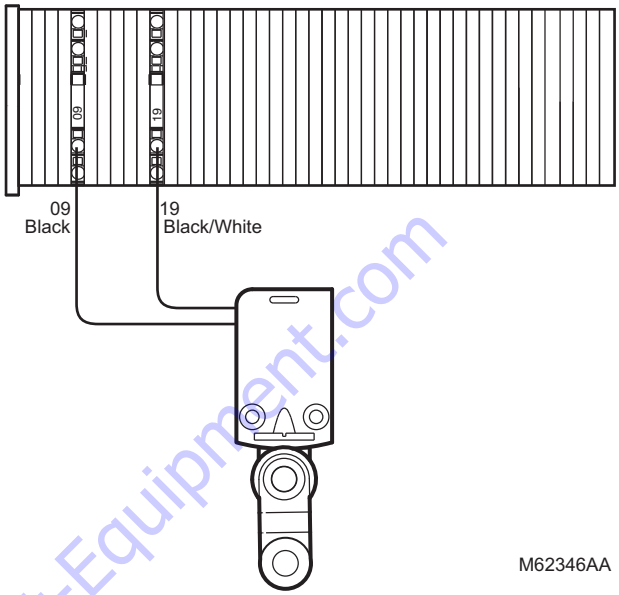
LS6 location inside turret

⚠ WARNING

Ensure there are no personnel or obstructions in the test area and there is sufficient room to raise the boom.

Check Switch Operation:

1. Position the main boom horizontal. Use a level to verify.
2. Place a digital protractor on a clean surface on the underside of the main boom. Calibrate it to 0° (horizontal).
3. Locate the terminal strip inside the base control panel. Set the multi-meter to *continuity-check* mode.
4. Place the multi-meter probes on terminal positions (**19 black**/**white**) and (**09 black**). The multi-meter should show the circuit is closed (continuity).



LS6 terminal connections

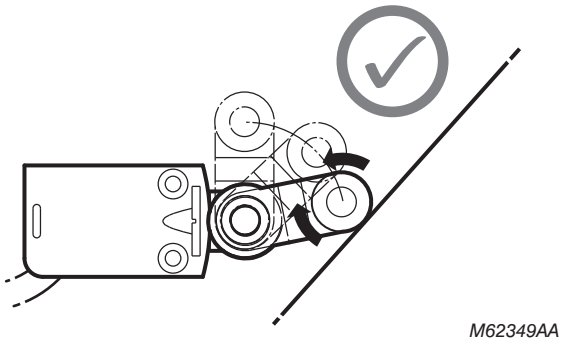
5. Raise the boom up all the way until the lift cylinder is fully extended. Observe if speed slows (LS6 has tripped) when the boom angle reaches 57°.
6. Check the multi-meter reading. There should be no continuity when the switch trips.

If raise speed does not slow as specified, adjust the limit switch using the following steps:

NOTE

Before performing any adjustment procedures, make sure LS6 is installed properly. Check angular position of the limit switch. Switch roller arm must not be close to the limits of its rotation and is free to swing to either side.

Make sure the switch roller rotates freely and is in full contact with the flat edge of the master cylinder link.



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Limit switch arm and roller

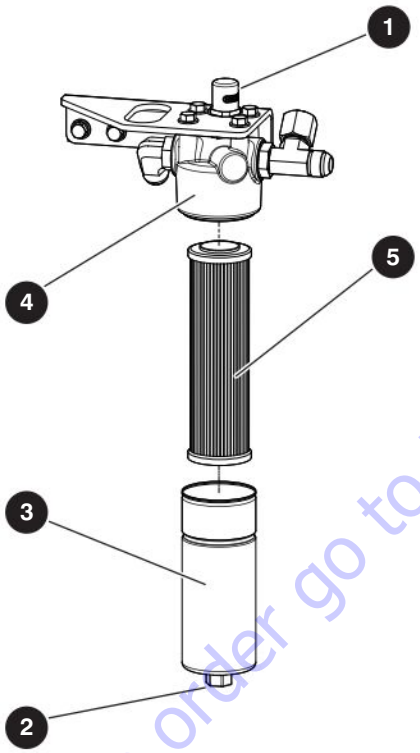
Adjustment Procedure:

1. Position the boom angle at 57° from horizontal.
2. Loosen the limit switch mounting screws.
3. Position the switch so that the roller is just touching the master cylinder link and the switch contact is open. Adjust the switch using both horizontal and vertical slots until an audible click sound is heard as the switch trips. The multi-meter should show no continuity.
4. Tighten the switch mounting screws.
5. Test the switch function by raising and lowering the boom.
6. Adjust the switch position as required so that it trips at 57° and boom movement slows as it approaches full extension.
7. Check repeatability by raising and lowering the boom.

5.5 Turret

5.5-1 Check and Replace the High Pressure Filter

1. Start the engine from the base control console.
2. Inspect the filter restriction indicator gauge 1. The filter should be operating with the gauge pointing to the green area. If it is in the red area, the filter needs to be replaced.
3. To replace the filter, turn the engine off.
4. Place a suitable container under the filter.

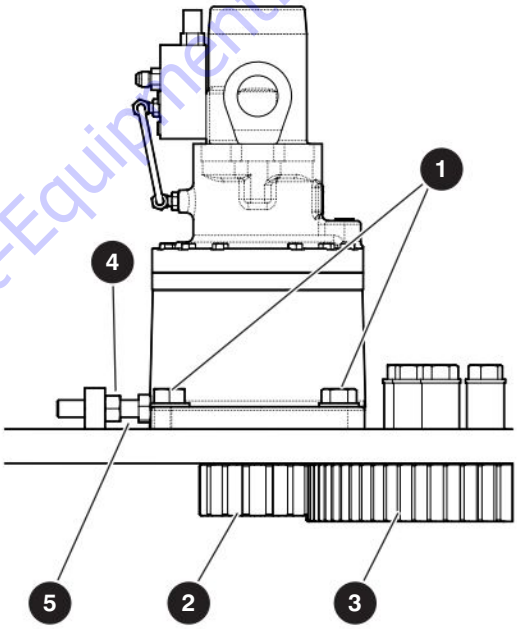


5. Using a 30 mm box wrench on the filter housing nut 2, loosen filter housing 3 and remove it from the filter head 4.
6. Remove the filter element 5 from the filter head and install a new high pressure filter element.
7. Apply hydraulic oil to the o-ring on the high pressure filter housing.
8. Reinstall the housing, screwing it in fully, then backing it off by one quarter turn.

5.5-2 Adjust the Turret Rotation Gear Backlash

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

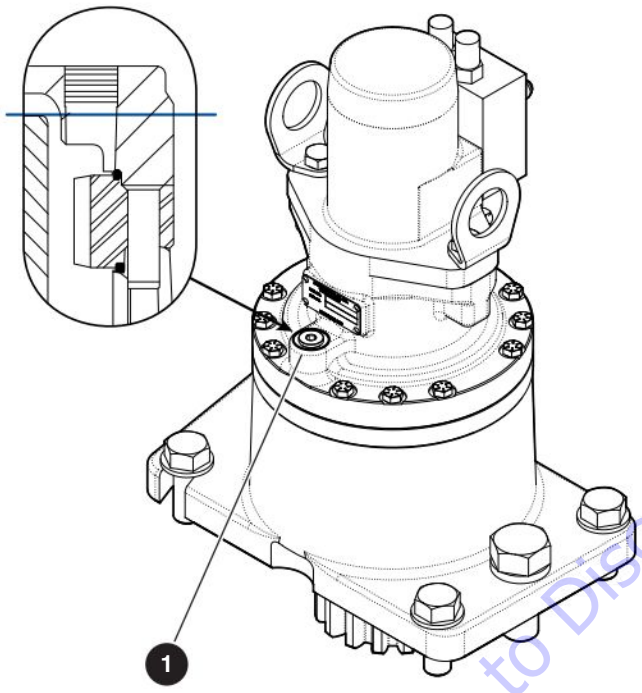
1. Loosen the mounting fasteners 1 on the swing drive.
2. Push the swing drive towards the rotation gear as close as possible (this will push the swing drive gear 2 into the rotation gear 3).



3. Loosen the lock nut 4 on the adjustment bolt 5.
4. Tighten the adjustment bolt clockwise until it contacts the plate of the swing drive.
5. Turn the adjustment bolt ½ turn counterclockwise, then tighten the lock nut on the adjustment bolt.
6. Pull the swing drive away from the rotation gear until it contacts the adjustment bolt.
7. Tighten the mounting fasteners on the swing drive.
8. Rotate the turret 360° and check for a smooth rotation of the turret.

5.5-3 Check the Swing Drive Oil

1. Remove the plug from the fill port ❶ on the back of the swing drive.
2. Check the oil level. The oil level should be slightly below the port threads.
3. Add oil if needed. Refer to 2.10 Hydraulic Specifications & Gear Oil for recommended oil types.

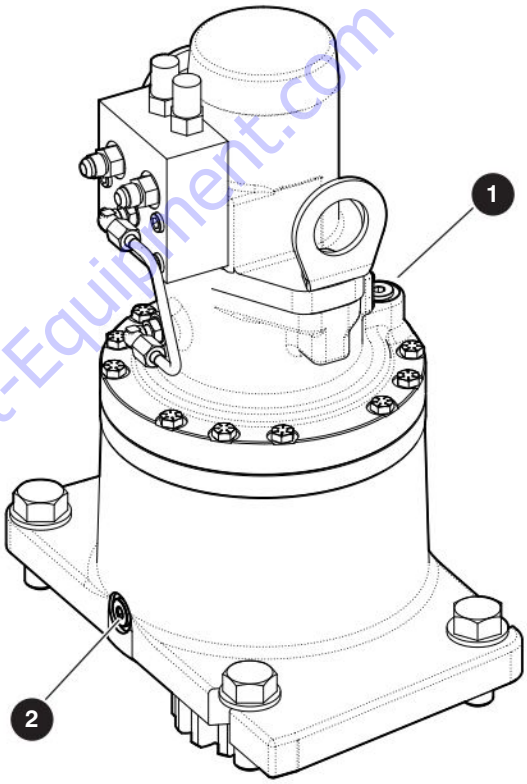


5.5-4 Change the Swing Drive Oil

NOTE

The oil change must be performed on a flat, level surface.

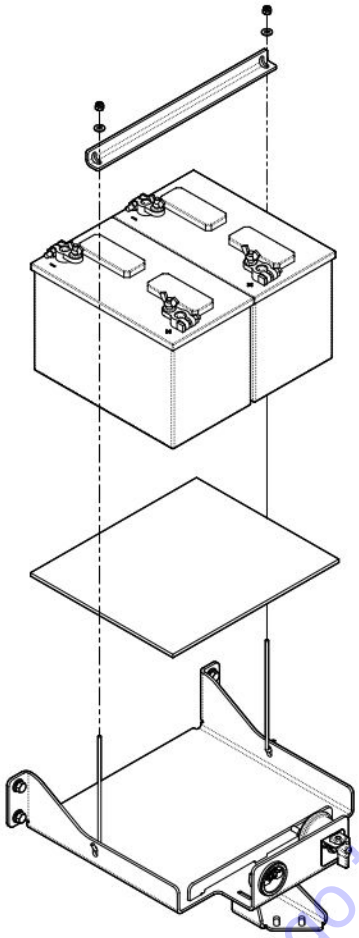
1. Remove the plug from the fill port ❶.
2. Place a suitable container under the drain port ❷.



3. Remove the plug from the drain port.
4. Allow the oil to drain.
5. Reinstall the drain plug.
6. Refill the swing drive with approximately 32 oz (1 L) of oil (refer to 2.10 Hydraulic Specifications & Gear Oil for recommended oil types).
7. Reinstall the plug at the fill port.

5.5-5 Battery Replacement

1. Turn the main power disconnect switch ❶ to the off position.



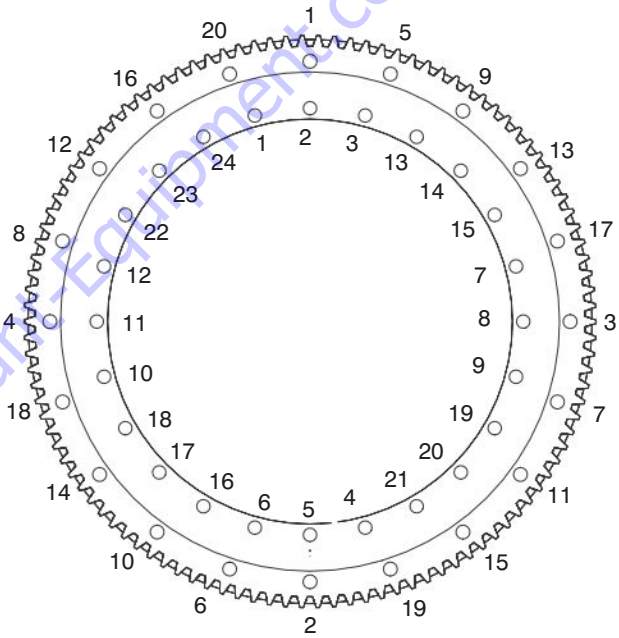
2. Remove the positive and negative connectors from the batteries.
3. Remove the battery retainer bracket nuts and washers ❷.
4. Remove the bracket ❸.
5. Remove the batteries ❹.
6. Replace the battery pad ❺ if needed.
7. Replace the batteries and secure them with the bracket, j-hooks, washers and nuts.
8. Clean the terminal posts and clamps of the batteries, and apply acid-free and acid-resistant grease.
9. Re-connect the batteries with the positive and negative connector cables (ensure the clamps make good contact).

5.5-6 Turret Rotation Gear Bolt Torque Sequence

⚠ WARNING

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

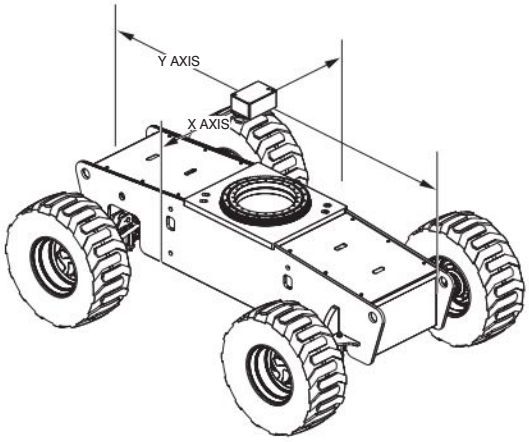
1. Set the torque wrench to 140 ft-lb (190 Nm) and tighten the mounting bolts in a criss-cross pattern sequence.



2. Set the torque wrench to 280 ft-lb (380 Nm) and tighten the mounting bolts with the same sequence.

5.5-7 Electronic Tilt Switch Setup Procedure

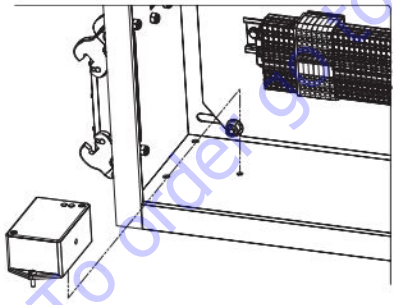
Tilt Switch Replacement



1. Park the MEWP on a firm level surface.
2. Disconnect the tilt switch from the 4 pin connector.

NOTE
Make sure the part number of the old tilt switch and new tilt switch are the same.

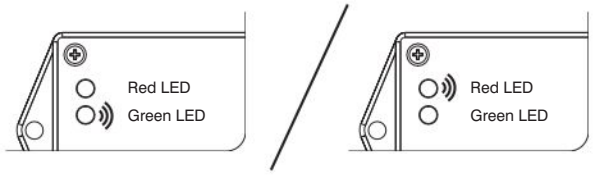
3. Remove the old tilt switch from the mount.



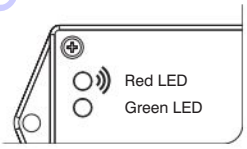
4. Install the new switch on the mount and connect the switch plug to the 4 pin connector.

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

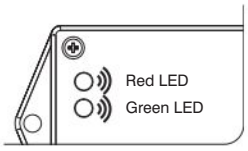
5. Turn the main disconnect switch to the ON position | .
6. Turn te base/off/platform key switch to the base position .
7. Pull out both emergency stop buttons .
8. Verify the switch is powered (red or green LED will be continually blinking).



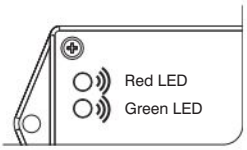
9. Program the tilt switch:
   a. Press and release the set to zero button 3 times. Observe LED flash codes as shown below.
   b. Only the red LED will blink for 4 seconds.



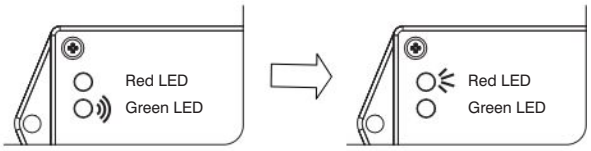
   c. Both LEDs will flash for 1 second.
   Results: The switch is learning the new zero position.



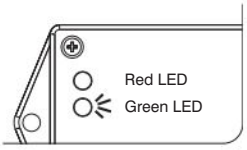
   d. Both LEDs will turn on solid for 1 second.
   Results: The new zero position has been learned.



   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. Only the red LED will blink for 4 seconds.

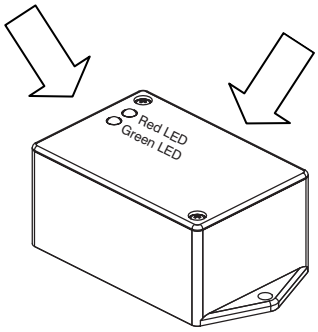


10. Turn the main power disconnect switch to the off position ○ .
11. Push in the emergency stop buttons .
12. Proceed to Verify Tilt Circuit.

Reprogramming the Existing Tilt Switch

Light Indicators

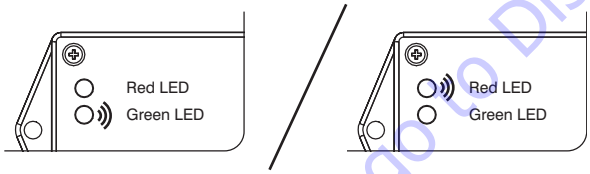
The set to zero button is located on this face next to the harness



NOTE

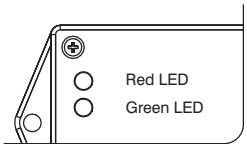
The tilt circuit is only powered when the controls are powered up.

1. Turn the main disconnect switch to the ON position | .
2. Turn the base/off/platform key switch to the base position .
3. Pull out both emergency stop buttons .
4. Verify switch is powered (red or green LED will be continually blinking).

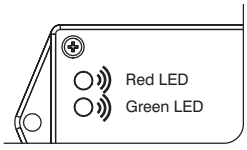


5. Reprogram the Tilt Switch

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



   b. Both LEDs will flash.



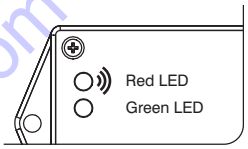
IMPORTANT

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

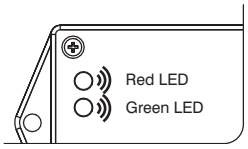
   c. Press and release the set to zero button 3 times.

   d. If the 5 second period has expired prior to completion, repeat steps "a", "b" and "c".

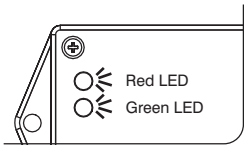
   e. Observe program delay / stabilization time (only the red LED will blink for 4 seconds).



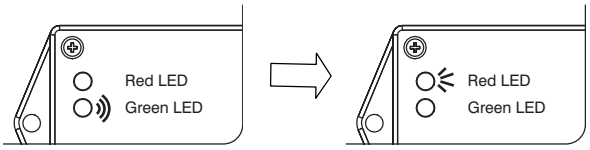
   f. Both LEDs will flash for 1 second.
   Results: The switch is learning the new zero position.



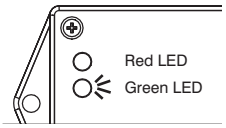
   g. Both LEDs will turn on solid for 1 second.
   Results: The new zero position has been learned.



   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.



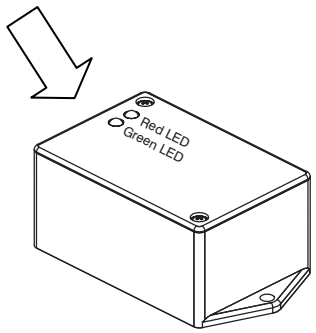
   i. The green LED will turn on solid.
   Results: The switch is ready for normal operation.



6. Turn the main power disconnect switch to the off position ◯ .
7. Push in the emergency stop buttons .
8. Proceed to Verify Tilt Circuit.

Verify Tilt Circuit

Light Indicators



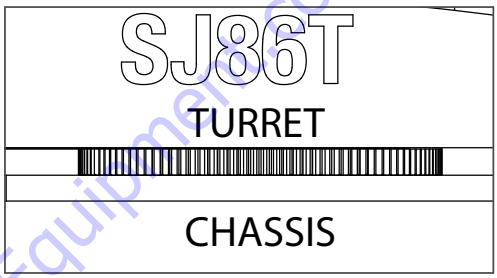
Operations of the Tilt Switch

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.**

5.5-8 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

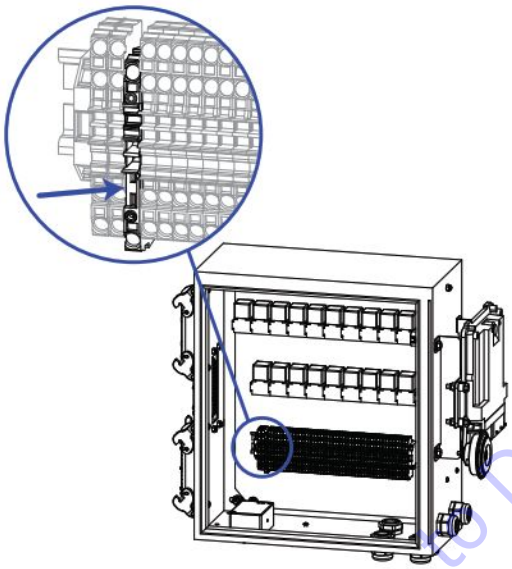
5. Zero the dial indicator.
6. Rotate the turret 180° in the clockwise direction until the boom is centered over the rear axle. (Rotating the turret in the counterclockwise direction will cause the rotation gearbox pinion to impact the dial indicator).
7. If, when you are rotating the turret, the boom 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.

5.5-9 Resetting the Emergency Lowering Counter (CE only)

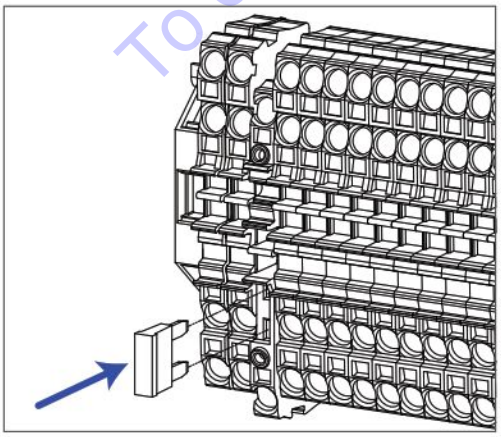
The emergency lowering counter increments each time the emergency power unit is activated while the platform is in work mode and overloaded.

To reset the counter:

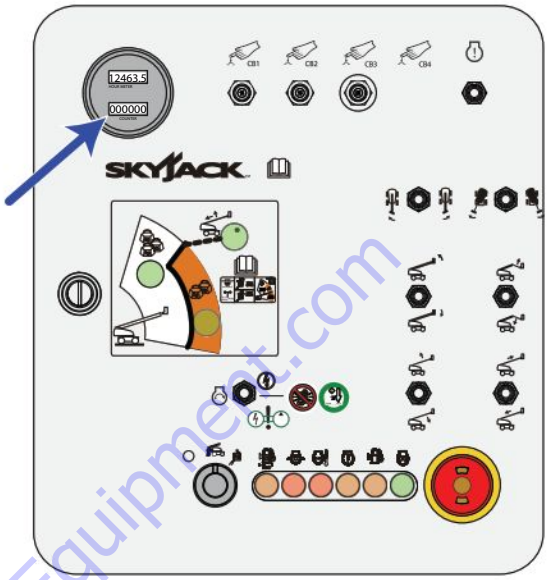
1. Locate the terminal block with the integrated fuse holder inside the base control box.



2. Using any standard automotive fuse, insert it into the slot in the terminal block.



3. Remove the fuse.
4. Check the counter on the base control box door to verify it has been reset to zero.



5.6 Deutz Diesel Engines

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

5.6-1 Replace Engine Oil and Filter

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

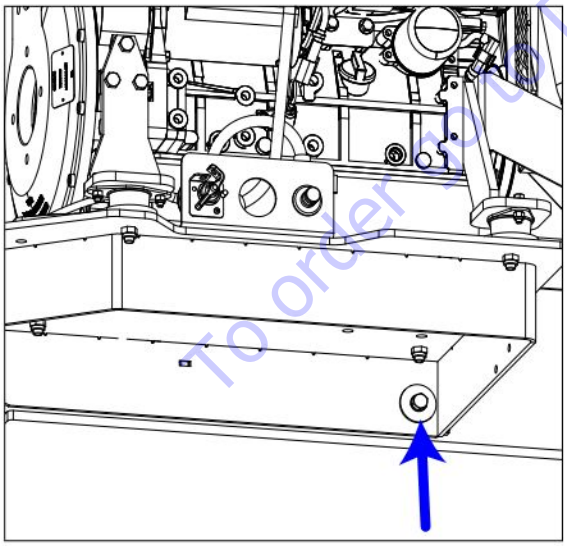
NOTE

Warm the engine to normal operating temperature before starting this procedure.

CAUTION

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

1. Turn the engine off.
2. Remove the bolt securing the engine tray to the turret.



3. Swing the engine tray away from the turret.
4. Place a suitable container under the engine oil drain.
5. Remove the oil drain plug and allow all engine oil to drain into the container.

WARNING

Dispose of oil in accordance with local and federal regulations.

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

5.6-2 Replace the Fuel Filter

1. Remove the bolt securing the engine tray to the turret.
2. Pull the locking pin down and swing the engine tray away from the turret.
3. Close the fuel shut-off valve.
4. Place a suitable container under the fuel filter.
5. Remove the fuel filter and catch any escaping fuel.

⚠ WARNING

Dispose of fuel in accordance with local and federal regulations.

6. Clean any dirt from filter carrier sealing surface.
7. Apply a thin layer of oil or diesel fuel to the rubber gasket of the new fuel filter.
8. Install the fuel filter and tighten it by hand, then tighten the filter cartridge with final half-turn.
9. Clean up any fuel that may have spilled during this procedure.
10. Open the fuel shut-off valve.
11. Check for fuel leakage.
12. Swing the engine tray back to its original position.
13. Reinstall the engine tray bolt.

5.6-3 Replace the Air Filter

Engine specifications require that this procedure be performed more often if dusty conditions exist. Refer to the engine manual.

⚠ CAUTION

Perform this procedure with the engine off.

1. Remove the mounting fasteners from the air filter canister, and remove the end cap.
2. Remove the filter from inside of the canister.
3. Clean the inside of the canister and gasket with a dry cloth.
4. Insert a new filter into the canister.
5. Reinstall the end cap.

5.6-4 Check the 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 the fan belt while the engine is running. Remove the key to prevent accidental operation.

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

5.6-5 Check the Oil Cooler (Deutz D2011 only)

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

5.6-6 Deutz TD2.9L Fault Codes

Code	SPN	FMI	Blink Code	Error Identification
8	132	1	2-2-6	The air mass flow AFS_dm is greater than or equal to AFS_PhysRng.Min_C. Physical range check is low for air mass flow sensor.
9	172	2	2-2-6	Air inlet filter temperature, plausibility error.
26	523891	14	2-6-3	When AirHt_ctDefSRCLoOn_mp is lower than AirHt_ctMaxDef_C. DFC to SRC Low error when heater is on.
28	523953	2	7-2-8	Healing takes place if the condition for error detection is not present. Air temperature monitoring plausibility check array.
30	523955	2	7-2-8	Healing takes place if the condition for error detection is not present. Air temperature monitoring plausibility check array.
36	523923	3	7-2-9	
37	523924	3	1-6-7	Short circuit to battery error of actuator relay 2.
38	523925	3	7-3-1	Short circuit to battery of actuator relay 3.
40	523927	3	7-3-3	Short circuit to battery of actuator relay 6.
41	523923	4	7-2-9	Short circuit to ground error. Detailed information not available.
42	523924	4	1-6-7	Short circuit to ground of actuator relay 2.
43	523925	4	7-3-1	Short circuit to ground of actuator relay 3.
44	523926	4	7-3-2	Short circuit to ground of actuator relay 4.
45	168	3	3-1-8	Sensor battery voltage error; signal range check is high.
46	168	4	3-1-8	Sensor battery voltage error; signal range check is low.
47	168	2	3-1-8	High battery voltage; warning threshold is exceeded.
48	168	2	3-1-8	High battery voltage; Shot off threshold exceeded.
55	523910	14	6-9-5	Air pump doesn't achieve air mass flow setpoint. Burner Control - burner air pump.
56	524013	7	8-5-6	Burner Control. Burner does not start after several trials (burner flame lost detection). Burner flame unintentional deleted.
57	524020	14	8-6-3	Burner Control: Power reduction due to low lambda. Engine power: Not enough oxygen for regeneration.
58	523911	0	7-2-3	Burner dosing valve (DV2); Overcurrent at the end of the injection phase.
59	523911	12	7-2-3	Burner dosing valve (DV2); Powerstage over temperature.
60	523911	3	7-2-3	Burner dosing valve (DV2); Short circuit to battery.
62	523911	4	7-2-3	Burner dosing valve (DV2); Short circuit to ground.
63	523911	11	7-2-3	Burner dosing valve (DV2); Short circuit high side powerstage.
64	523912	2	7-2-2	Burner dosing valve (DV2) downstream pressure sensor; plausibility error.
66	523912	0	7-2-2	Physical range check high for burner dosing valve (DV2) downstream pressure; Shut off regeneration.

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5.6-6 Deutz TD2.9L Fault Codes

Code	SPN	FMI	Blink Code	Error Identification
69	523912	1	7-2-2	Physical range check low for burner dosing valve (DV2) downstream pressure; Shut off regeneration. When burner injector is actuated, the measured pressure does not rise above 1250mbar abs (expected: about 2400mbar).
72	523912	3	7-2-2	Sensor error burner dosing valve (DV2) downstream pressure sensor; Signal range check high.
73	523912	4	7-2-2	For engines < 4l: Throttle valve error, Open load or short cut to battery, blocked valve or wrong control signal for valve. For engines with Burner T4i: Pressure Sensor error after valve (DV2), lower limit reached.
74	523913	3	7-2-1	Sensor error glow plug control diagnostic line voltage; Signal range check high.
75	523913	4	7-2-1	Sensor error glow plug control diagnostic line voltage; Signal range check low.
76	523914	5	7-2-1	Glow plug control; Open load. Water pump control (PWM) only TTCD 6.1/7.8.
77	523914	12	7-2-1	Glow plug control; Powerstage over temperature.
78	523914	3	7-2-1	Glow plug control; Short circuit to battery. Water pump control (PWM).
79	523914	4	7-2-1	Glow plug control; Short circuit to ground. Water pump control (PWM).
82	1235	14	2-7-1	CAN-Bus 2 = CAN_C reports Bus-error (for engines <8L and CV52 it is the engine-CAN@250kbaud) CAN Bus error passive; warning CAN C - engine CAN.
83	16	0	2-7-1	No detail information.
84	639	14	2-7-1	CAN-Bus 0: "BusOff-Status"
85	1231	14	2-7-1	CAN-Bus 1: "BusOff-Status"
86	1235	14	2-7-1	CAN-Bus 2 = engine bus "BusOff-Status"
87	16	0	2-7-1	BusOff error CAN.
88	102	2	2-2-3	Charged air pressure above warning threshold.
89	102	2	2-2-3	Charged air pressure above shut off threshold.
90	110	2	2-2-5	Defect fault check for absolute plausibility test.
92	110	0	2-2-5	Physical range check high for coolant temperature.
93	110	1	2-2-5	Physical range check low for coolant temperature.
96	110	3	2-2-5	Sensor error coolant temperature; Signal range check high.
97	110	4	2-2-5	Sensor error coolant temperature; Signal range check low.
98	110	0	2-3-2	High coolant temperature; Warning threshold exceeded.
99	110	0	2-3-2	Coolant temperature; System reaction initiated.
101	111	1	2-3-5	Coolant level too low.
106	598	2	3-2-5	Plausibility check for clutch.
121	1109	2	3-4-1	Engine shut off demand ignored.

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5.6-6 Deutz TD2.9L Fault Codes

Code	SPN	FMI	Blink Code	Error Identification
122	523698	11	5-9-1	Shut off request from supervisory monitoring function.
124	523969	11	7-7-4	Fault entry for override control mode.
125	523717	12	5-9-5	Timeout error of CAN-transmit-frame AmbCon; Weather environments.
126	523603	9	3-3-8	Timeout Error of CAN-receive-frame AMB; Ambient temperature sensor.
128	3224	9	5-9-7	Timeout error of CAN-receive-frame AT1IG1; NOX sensor upstream.
129	3224	2	5-9-6	DLC error of CAN-receive-frame AT1IG1Vol NOX sensor.
130	3224	9	5-9-7	Timeout error of CAN-receive-frame AT1IG1Vol; NOX sensor.
133	523938	9	7-6-6	Timeout error (BAM to packet) for CAN-receive-frame AT1IGCVol1.
134	523939	9	7-6-6	Broadcast announce message of the calibration message of the upstream catalytic NOx sensor has failed.
135	523940	9	7-6-6	Timeout error (PCK2PCK) for CAN-Receive-Frame AT1IGCVol1.
136	3234	2	1-1-4	DLC error of CAN-Receive-Frame AT1O1.
137	3234	9	1-1-7	Timeout error of CAN-Receive-Frame AT1OG1. NOX sensor (SCR-system downstream cat; DPF-system downstream cat).
138	3234	2	1-1-4	DLC error of CAN-Receive-Frame AT1O1Vol.
139	3234	9	1-1-7	Timeout error of CAN-Receive-Frame AT1OG1Vol.
140	523941	9	7-6-7	Timeout error (BAM to packet) for CAN-Receive-Frame AT1OGCVol2.
141	523942	9	7-6-7	Calibration message 1 of the after catalyst Nox sensor has failed.
142	523943	9	7-6-7	Timeout error (PCK2PCK) for CAN-Receive-Frame AT1OGCVol2.
153	523992	9	7-9-3	Not used.
155	0	0	-	Not used.
164	523211	9	3-3-1	Timeout error of CAN-Receive-Frame EBC1.
167	523704	12	6-1-5	Timeout error of CAN-Transmit-Frame EEC3.
168	523935	12	7-6-3	Timeout error of CAN-Transmit-Frame EEC3VOL1. Engine send messages.
169	523936	12	7-6-4	Timeout error of CAN-Transmit-Frame EEC3VOL2. Engine send messages.
171	523212	9	3-3-3	Timeout error of CAN-Receive-Frame ComEngPrt. Engine Protection.
172	523741	14	6-1-8	Engine shut off request through CAN.
174	523213	12	3-3-4	Timeout error of CAN-Transmit-Frame ERC1.
178	523706	12	6-2-3	Timeout error of CAN-Transmit-Frame FlEco.
179	523240	9	5-2-7	Timeout CAN-message FunModCtl. Function Mode Control.
193	523937	9	7-6-5	Timeout DFC for NOxSensGlbReqTx.
196	3227	2	6-3-8	DFC SAE J1939 error.
198	523216	9	3-3-7	Timeout error of CAN-Receive-Frame PrHtEnCmd. Pre-heat command, engine command.
202	523793	9	6-7-8	Timeout error of CAN-Receive-Frame UAA10. AGS sensor service message.
203	523794	9	6-7-8	Timeout error of CAN-Receive-Frame UAA11. AGS sensor data.
212	523803	9	6-7-8	Timeout error of CAN-Receive-Message RxEngPres. Status Burner Air Pump.

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5.6-6 Deutz TD2.9L Fault Codes

Code	SPN	FMI	Blink Code	Error Identification
273	3219	2	6-4-9	DFC SAE J1939 error.
281	523766	9	1-1-8	Timeout error of CAN-Receive-Frame Active TSC1AE.
282	523767	9	1-1-8	Timeout error of CAN-Receive-Frame Passive TSC1AE.
283	523768	9	1-1-9	Timeout error of CAN-Receive-Frame Active TSC1AR.
284	523769	9	1-1-9	Timeout error of CAN-Receive-Frame Passive TSC1AR.
291	523776	9	1-1-9	Timeout error of CAN-Receive-Frame TSC1TE - active.
292	523777	9	1-1-9	Passive timeout error of CAN-Receive-Frame TSC1TE. Setpoint.
293	523778	9	1-1-8	Timeout error of CAN-Receive-Frame TSC1TR.
294	523779	9	1-1-8	Passive timeout error of CAN-Receive-Frame TSC1TR.
299	523788	12	6-5-5	Timeout error of CAN-Transmit-Frame TrbCH. Status Wastegate.
300	523605	9	1-1-8	Timeout error of CAN-Receive-Frame TSC1AE. Traction Control.
301	523606	9	1-1-9	Timeout error of CAN-Receive-Frame TSC1AR. Retarder.
305	898	9	1-1-8	Timeout error of CAN-Receive-Frame TSC1TE. Setpoint.
306	520	9	1-1-9	Timeout Error of CAN-Receive-Frame TSC1TR; control signal
313	523858	12	6-7-9	Timeout error of CAN-Transmit-Frame UAA11.
322	523867	12	6-7-9	Timeout error of CAN-Transmit-Frame UAA1 on CAN 2. Control burner air pump.
360	523982	0	7-3-7	Powerstage diagnosis disabled. High battery voltage.
361	523982	1	7-3-7	Powerstage diagnosis disabled. Low battery voltage.
362	523090	2	3-2-9	Engine brake Pre-Selection switch. Plausibility error.
376	630	12	2-8-1	Access error EEPROM memory (delete).
377	630	12	2-8-1	Access error EEPROM memory (read).
378	630	12	2-8-1	Access error EEPROM memory (write).
381	411	4	6-9-3	Physical range check low for EGR differential pressure.
384	2791	12	4-1-5	Actuator EGR valve. Powerstage over temperature.
387	523612	12	5-5-5	Internal software error ECU. Injection cut off.
388	190	0	2-1-4	Engine speed above warning threshold. Overspeed detection in component engine protection.
389	190	0	2-1-4	Engine speed above warning threshold (FOC-Level 1).
390	190	11	2-1-4	Engine speed above warning threshold (FOC-Level 2).
391	190	14	2-1-4	Engine speed above warning threshold (Overrun Mode).
411	108	11	2-9-2	Ambient air pressure received from a CAN-bus is reported as defective.
412	108	3	2-9-2	Sensor error ambient air pressure. Signal range check high.
413	108	4	2-9-2	Sensor error ambient air pressure. Signal range check low.
415	171	0	3-1-2	Environment temperature sensor, temperature above upper physical threshold.
416	171	1	3-1-2	Environment temperature physical range check low.

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5.6-6 Deutz TD2.9L Fault Codes

Code	SPN	FMI	Blink Code	Error Identification
417	171	3	3-1-2	Sensor error SCR-System environment temperature. DPF-System air inlet temperature, signal range check high.
418	171	4	3-1-2	Sensor error SCR-System environment temperature. DPF-System air inlet temperature, signal range check low.
419	190	8	2-1-2	Sensor camshaft speed, disturbed signal.
420	190	12	2-1-2	Sensor camshaft detection. Out of range, signal disrupted, no signal.
421	190	2	2-1-3	Offset angle between crank- and camshaft-sensor is too large.
422	190	8	2-1-2	Sensor crankshaft detection. Out of range, signal disrupted or no signal.
423	190	12	2-1-2	Speed detection, out of range, signal disrupted or no signal.
455	975	5	2-3-8	PWM-Signal fan, open load or short-circuit ground.
457	975	3	2-3-8	PWM-Signal fan, short-circuit to battery.
458	975	4	2-3-8	PWM-Signal fan, open load or short circuit to ground
459	1639	12	2-3-8	Fan speed sensor, electrical error, signal disturbed or very low fan speed.
460	1639	0	2-3-8	Sensor error fan speed. Signal range check high or engine speed resp. Fan speed too big.
461	1639	1	2-3-8	Sensor error fan speed, signal range check low or fan speed too low.
462	523602	0	2-3-8	High fan speed, warning threshold exceeded.
463	523602	0	2-3-8	High fan speed, shut off threshold exceeded.
464	97	3	2-2-8	Sensor error water in fuel, signal range check high.
465	97	4	2-2-8	Sensor error water in fuel, signal range check low.
472	94	3	2-1-6	Sensor error low fuel pressure, signal range check high.
473	94	4	2-1-6	Sensor error low fuel pressure, signal range check low.
474	94	1	2-1-6	Low fuel pressure, warning threshold exceeded.
475	94	1	2-1-6	Low fuel pressure, shut off threshold exceeded.
483	174	11	2-2-7	Fuel temperature not plausible.
486	523618	3	1-3-3	Sensor error gearbox oil temperature, signal range check high.
487	523618	4	1-3-3	Sensor error gearbox oil temperature, signal range check low.
488	523619	2	1-3-3	Physical range check high for exhaust gas temperature upstream (SCR-CAT).
489	523619	2	1-3-3	Shutoff condition. No detailed information!
500	523915	0	1-6-5	HCl dosing valve (DV1); overcurrent at the end of the injection phase
501	523915	12	1-6-6	HCl dosing valve (DV1): Powerstage over temperature.
502	523915	3	1-5-9	HCl dosing valve (DV1): Short circuit to battery.
503	523915	3	1-6-4	Short circuit to battery high side, HCl dosing valve (DV1).
504	523915	4	1-5-9	HCl dosing valve (DV1): Short circuit to ground.
505	523915	11	1-6-4	HCl dosing valve (DV1): Short circuit high side powerstage.

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5.6-6 Deutz TD2.9L Fault Codes

Code	SPN	FMI	Blink Code	Error Identification
506	523916	2	7-1-9	Sensor HCl dosing valve (DV1) downstream pressure: Plausibility error.
508	523916	0	7-1-9	HCl dosing valve (DV1) downstream pressure: Physical range check high. Shut off regeneration.
511	523916	1	7-1-9	HCl dosing valve (DV1) downstream pressure: Physical range check low. Shut off regeneration.
514	523916	3	7-1-9	Sensor error HCl dosing valve (DV1) downstream pressure: Signal range check high.
515	523916	4	7-1-9	Sensor error HCl dosing valve (DV1) downstream pressure: Signal range check low.
525	523917	4	7-1-8	Sensor error DV1 & DV2 upstream pressure: Signal range check low.
534	523918	3	7-1-7	Sensor error DV1 & DV2 upstream temperature: Signal range check high.
535	523918	4	7-1-7	Sensor error DV1 & DV2 upstream temperature: Signal range check low.
542	1638	2	3-1-4	Hydraulic oil temperature check for Shut off condition.
543	676	11	263	Cold start aid relay error.
544	676	11	263	Cold start aid relay: Open load.
545	729	5	263	Cold start aid relay open load.
547	729	12	263	Cold start aid relay: Over temperature error.
549	729	3	263	Intake Air Heater Device: Short circuit to battery.
551	729	4	263	
559	523895	13	1-5-8	Check of missing injector adjustment value programming (IMA) injector 1.
560	523896	13	1-5-8	Check of missing injector adjustment value programming (IMA) injector 2.
561	523897	13	1-5-8	Check of missing injector adjustment value programming (IMA) injector 3.
562	523898	13	1-5-8	Check of missing injector adjustment value programming (IMA) injector 4.
563	523899	13	1-5-8	Check of missing injector adjustment value programming (IMA) injector 5.
564	523900	13	1-5-8	Check of missing injector adjustment value programming (IMA) injector 6.
565	523350	4	151	Injector cylinder-bank 1: Short circuit.
566	523352	4	152	Injector cylinder-bank 2: Short circuit.
567	523354	12	153	Injector powerstage output defect.
568	651	5	154	Injector 1 (in firing order): Interruption of electric connection.
569	652	5	155	Injector 2 (in firing order): Interruption of electric connection.
570	653	5	156	Injector 3 (in firing order): Interruption of electric connection.
571	654	5	161	Injector 4 (in firing order): Interruption of electric connection.
572	655	5	162	Injector 5 (in firing order): Interruption of electric connection.
573	656	5	163	Injector 6 (in firing order): Interruption of electric connection.
575	523756	14	1-5-5	Special pattern for special cases. No detailed information!
576	523757	14	1-5-6	Special pattern for special cases. No detailed information!
577	523758	14	1-6-1	Special pattern for special cases. No detailed information!

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5.6-6 Deutz TD2.9L Fault Codes

Code	SPN	FMI	Blink Code	Error Identification
578	523759	14	1-6-2	Special pattern for special cases No detailed information!
579	523760	14	1-6-3	Special pattern for special cases No detailed information!
580	651	3	154	Injector 1 (in firing order): Short circuit.
581	652	3	155	Injector 2 (in firing order): Short circuit.
582	653	3	156	Injector 3 (in firing order): Short circuit.
583	654	3	161	Injector 4 (in firing order): Short circuit.
584	655	3	162	Injector 5 (in firing order): Short circuit.
585	656	3	163	Injector 6 (in firing order): Short circuit.
590	655	4	1-6-2	High side to low side short circuit in the injector 5 (in firing order).
591	656	4	1-6-3	High side to low side short circuit in the injector 6 (in firing order).
592	523615	5	135	Metering unit (Fuel-System): Open load.
593	523615	12	135	Metering unit (Fuel-System): Powerstage over temperature.
594	523615	3	135	Metering unit (Fuel-System): Short circuit to battery, highside.
595	523615	4	135	Metering unit (Fuel-System): Short circuit to ground, high side.
596	523615	3	135	Metering unit (Fuel-System): Short circuit to battery, low side.
597	523615	4	135	Metering Unit (Fuel-System): Short circuit to ground, low side
598	523615	3	1-3-5	Metering unit, short circuit to battery.
599	523615	4	1-3-5	Metering unit, short circuit to ground.
605	1323	12	2-4-1	Too many recognized misfires in cylinder 2 (in firing order).
607	1323	12	2-4-1	Too many recognized misfires in cylinder 4 (in firing order).
608	1323	12	2-4-1	Too many recognized misfires in cylinder 5 (in firing order).
609	1323	12	2-4-1	Too many recognized misfires in cylinder 6 (in firing order).
610	1322	12	2-4-1	
611	1346	0	2-4-1	Misfire detection monitoring No detailed information!
612	523612	12	555	Internal ECU monitoring detection reported error.
613	523612	12	555	ECU reported internal software error. Internal ECU monitoring detection reported error.
614	523612	12	555	ECU reported internal software error.
615	523612	12	555	ECU reported internal software error.
616	523612	12	555	ECU reported internal software error.
617	523612	12	555	ECU reported internal software error.
618	523612	12	555	ECU reported internal software error.
619	523612	12	555	Injection system,electrical error injectors.
620	523612	12	555	ECU reported internal software error.
621	523612	12	555	ECU reported internal software error.
623	523612	12	555	ECU reported internal software error.

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5.6-6 Deutz TD2.9L Fault Codes

Code	SPN	FMI	Blink Code	Error Identification
624	523612	12	555	ECU reported internal software error.
625	523612	12	555	ECU reported internal software error.
627	523612	12	555	ECU reported internal software error.
628	523612	12	555	ECU reported internal software error.
629	523612	12	555	Diagnostic fault check to report the accelerator pedal position error.
630	523612	12	555	Diagnostic fault check to report the engine speed error.
631	523612	12	555	Error in the plausibility of the injection energizing time.
632	523612	12	555	Error in the plausibility of the start of energising angles.
633	523612	12	555	Diagnostic fault check to report the error due to non plausibility in ZFC.
634	523612	12	555	Diagnosis fault check to report the demand for normal mode due to an error in the PoI2 quantity.
635	523612	12	555	Diagnosis fault check to report the error to demand for an ICO due to an error in the PoI2 shut-off.
636	523612	12	555	Diagnosis fault check to report the error to demand for an ICO due to an error in the PoI3 efficiency factor.
637	523612	12	555	Internal ECU monitoring detection reported error.
638	523612	12	555	Monitoring of Fuel Quantity Correction.
639	523612	12	555	Diagnostic fault check to report the plausibility error in rail pressure monitoring.
640	523612	12	555	Diagnostic fault check to report the error due to torque comparison.
641	523612	12	555	Diagnosis of curr path limitation forced by ECU monitoring level 2.
642	523612	12	555	Diagnosis of lead path limitation forced by ECU monitoring level 2.
643	523612	12	5-5-5	Diagnosis of set path limitation forced by ECU monitoring level 2.
644	523612	3	5-5-5	Reported Over Voltage of Supply.
646	523612	4	5-5-5	Reported UnderVoltage of Supply.
648	523008	1	4-2-4	Manipulation control was triggered.
649	523008	2	4-2-4	Timeout error in Manipulation control.
654	2634	12	7-5-7	Early opening defect of main relay No detailed information!
656	2634	12	7-5-7	DFC for stuck main relay error No detailed information!
659	3226	2	8-1-3	Nox feed back fault detection No detailed information!
692	523752	0	7-5-8	Plausibiliti error during Rich to Lean switch over No detail informationen!
693	523752	0	7-5-8	Monitoring of Nox signal readyness No detail informationen!
714	523612	12	5-5-5	Diagnostic fault check to report WDA active due to errors in query-/response communication.
715	523612	12	5-5-5	Diagnostic fault check to report ABE active due to undervoltage detection.
716	523612	12	5-5-5	Diagnostic fault check to report ABE active due to overvoltage detection.
717	523612	12	5-5-5	Diagnostic fault check to report WDA/ABE active due to unknown reason.

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5.6-6 Deutz TD2.9L Fault Codes

Code	SPN	FMI	Blink Code	Error Identification
720	98	2	2-1-1	Plausibility Check. No detailed information!
732	100	3	2-2-4	Sensor error oil pressure; signal range check high.
733	100	4	2-2-4	Sensor error oil pressure sensor; signal range check low.
734	100	0	2-3-1	High oil pressure; warning threshold exceeded.
735	100	0	2-3-1	High oil pressure; shut off threshold exceeded.
736	100	1	2-3-1	Low oil pressure; warning threshold exceeded.
737	100	1	2-3-1	Low oil pressure; shut off threshold exceeded.
743	175	3	1-4-4	Sensor error oil temperature; signal range check high.
744	175	4	1-4-4	Sensor error oil temperature; signal range check low.
745	175	0	1-4-4	High oil temperature; warning threshold exceeded.
746	175	0	1-4-4	High oil temperature; shut off threshold exceeded.
747	1237	2	1-4-5	Override switch; plausibility error.
750	107	3	1-3-6	Sensor error airfilter differential pressure; short circuit to battery.
751	107	0	1-3-6	Sensor error airfilter differential pressure; short circuit to ground.
752	107	0	1-3-6	Air filter differential pressure; air filter cologged.
753	523919	2	6-9-4	DPF burner air pump pressure sensor, plausibility error.
755	523919	0	6-9-4	DPF burner air pump pressure sensor, pressure above upper shutoff threshold.
758	523919	1	6-9-4	DPF burner air pump pressure sensor, pressure below lower shutoff threshold.
761	523919	3	6-9-4	DPF burner air pump pressure sensor, short circuit to battery or open load.
762	523919	4	6-9-4	DPF burner air pump pressure sensor, short circuit to ground.
763	523920	2	7-1-6	Exhaustgaspressure upstream burner, plausibility error.
765	523920	0	7-1-6	Exhaust gas pressure upstream burner, pressure above upper shutoff threshold.
770	523920	3	7-1-6	Exhaust gas pressure upstream burner, short circuit to battery or open load.
771	523920	4	7-1-6	Exhaust gas pressure upstream burner, short circuit to ground.
772	102	2	2-2-3	Pressure downstream charge air cooler, plausibility error.
774	102	1	2-2-3	Pressure downstream charge air cooler, pressure below lower physical threshold.
776	102	3	2-2-3	Pressure downstream charge air cooler, short circuit to battery or open load.
777	102	4	2-2-3	Pressure downstream charge air cooler, short circuit to ground.
780	523699	3	1-1-3	Boost pressure control; negative governor deviation below limit.
781	523699	4	1-1-3	Learning value too high. No detailed information!
785	523889	3	1-1-3	Over temperature of device driver of pressure control valve. No detailed information!

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5.6-6 Deutz TD2.9L Fault Codes

Code	SPN	FMI	Blink Code	Error Identification
791	411	0	6-9-3	Delta pressure across venturi in EGR line above physical high limit.
793	411	0	6-9-3	Plausibility Check fault for deviation of desired and actual EGR-mass flow, where the latter is calculated out of EGR Delta Pressure Sensor.
795	411	3	6-9-3	Sensor error differential pressure Venturiunit (EGR), signal range check low.
796	411	4	6-9-3	Sensor error differential pressure Venturiunit (EGR), signal range check high.
805	524025	14	8-4-5	Particulate filter regeneration. (3x) over the max. has been aborted allowed recovery time. Regeneration after time X is not successful (the error occurs when the regeneration times).
806	524058	2	8-4-4	Particulate filter; regeneration not succesful.
807	3253	2	6-9-2	Differential pressure DPF, plausibility error.
809	3251	0	6-9-2	Differential pressure DPF maximum value is exceeded.
810	3251	0	6-9-2	Differential pressure sensor across DPF exceeds warning high limit.
812	3251	1	6-9-2	Differential pressure DPF, pressure below lower shutoff threshold.
813	3251	1	6-9-2	Differential pressure DPF, pressure below lower warning threshold.
814	3253	3	6-9-2	Electrical error differential pressure B58 (DPF). (Signal range check high).
815	3253	4	6-9-2	Electrical error differential pressure (DPF). signal range check low.
825	523009	9	2-5-3	The pressure relief valve (PRV) has reached the number of allowed activations.
826	523470	2	1-4-6	Pressure relief valve is forced to open, perform pressure increase.
827	523470	2	1-4-6	Pressure Relief Valve (PRV) forced to open. Performed by pressure increase.
828	523470	12	1-4-6	Pressure Relief Valve (PRV) forced to open. Shutoff conditions.
829	523470	12	1-4-6	Pressure Relief Valve (PRV) forced to open. Warning conditions.
830	523470	14	1-4-6	Open Pressure Relief Valve (PRV).
831	523470	11	1-4-6	Pressure Relief Valve (PRV) error; Rail pressure out of tolerance range.
832	523470	11	1-4-6	Rail pressure out of tolerance range. The PRV can not be opened at this operating point with a pressure shock.
833	523009	10	2-5-3	Open time of Pressure Relief Valve (PRV) for wear out monitoring had exceeded.
834	523906	5	7-6-1	Electrical fuel pre - supply pump; open load.
835	523906	12	7-6-1	Electrical fuel pre - supply pump. ECU powerstage over temperature.
836	523906	3	7-6-1	Electrical fuel pre - supply pump; short circuit to battery.
837	523906	4	7-6-1	Electrical fuel pre - supply pump. Short circuit to ground.
847	1176	0	1-3-9	Pressure sensor upstream turbine, Physical Range Check high.
848	1176	1	1-3-9	Pressure sensor upstream turbine, Physical Range Check low.
849	1176	3	1-4-1	Pressure sensor upstream turbine, signal range check (SRC) high.
850	1176	4	1-4-1	Pressure sensor upstream turbine, signal range check (SRC) low.
856	523613	0	1-3-4	Rail pressure metering unit, Positive governor deviation.

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5.6-6 Deutz TD2.9L Fault Codes

Code	SPN	FMI	Blink Code	Error Identification
857	523613	0	1-3-4	Rail pressure metering unit, Rail pressure disrupted. Maximum positive deviation of rail pressure exceeded.
858	523613	0	1-3-4	Rail pressure metering unit, Rail pressure disrupted. Maximum positive deviation of rail pressure in metering unit exceeded (RailMeUn1).
859	523613	0	1-3-4	Rail pressure metering unit, Rail pressure below the target range. (RailMeUn2) Railsystem leakage detected.(RailMeUn10)
861	523613	1	1-3-4	Rail pressure metering unit, Minimum rail pressure exceeded (RailMeUn3). Negative deviation of rail pressure second stage (RailMeUn22).
862	523613	0	1-3-4	Rail pressure metering unit, Maximum rail pressure exceeded.
864	523613	2	1-3-4	Rail pressure metering unit, Setpoint of metering unit in overrun mode not plausible.
865	523613	0	1-3-4	Setpoint of metering unit in overrun mode not plausible.
874	157	0	1-4-7	Rail pressure raw value is intermittent. No detailed information!
875	157	1	1-4-7	rail pressure raw value is above maximum offset. No detailed information!
876	523470	7	1-4-6	Maximum rail pressure exceeded (PRV).
877	157	3	1-4-7	Sensor error rail pressure. Sensor voltage above upper limit.
878	157	4	1-4-7	Sensor error rail pressure. Sensor voltage below lower limit.
881	523633	11	1-4-9	Longterm adaption factor below threshold.
882	523633	11	1-4-9	Nox conversion rate insufficient (SCR-Cat defect, bad DEF quality).
883	523633	11	1-4-9	Nox conversion rate insufficient (SCR-Cat defect, bad DEF quality); temperature range 1
887	3234	11	1-8-4	DFC for plausibility error Min for NOx sensor downstream of SCR Cat.
889	3224	1	1-8-5	DFC for plausibility error Max for NOx sensor upstream of SCR Cat.
892	4345	11	2-3-6	Sensor backflow line pressure (SCR); plausibility error.
893	4343	11	8-7-1	SCR Monitoring; Pressure stabilisation error, general pressure check error (SCR).
894	4374	13	8-7-2	Pressure stabilisation error dosing valve (SCR).
897	523632	16	8-7-5	Pump pressure SCR metering unit too high.
898	523632	18	8-7-6	Pump pressure SCR metering unit too low.
899	523632	0	8-7-7	Pressure overload of SCR-System.
900	523632	1	8-7-8	Pressure build-up error SCR-System.
903	4365	0	8-8-1	DEF tank temperature too high.
905	3241	0	8-8-3	Sensor SCR catalyst upstream temperature too high; plausibility error.
908	3361	7	8-8-6	DEF dosing valve blocked (SCR).
914	523720	2	1-4-8	DEF supply module heater temperature; plausibility error (normal condition).
915	523720	2	1-4-8	Sensor DEF supply module heater temperature; plausibility error (cold start condition).

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5.6-6 Deutz TD2.9L Fault Codes

Code	SPN	FMI	Blink Code	Error Identification
916	523721	2	6-8-9	Sensor DEF supply module temperature; plausibility error (normal condition).
917	523721	2	6-8-9	Sensor DEF supply module temperature; plausibility error (cold start condition).
918	523981	11	2-4-3	SCR plausibility, OBD and diagnosis; Stuck in range check of DEF tank temperature sensor. DEF-tank without heating function (heating phase).
919	523330	14	1-3-1	Immobilizer status; fuel blocked.
920	523330	14	1-3-1	DFC to block the fuel by Sia. No detailed information!
921	523330	14	1-3-1	DFC to indicate that TEN-code or UC-code received if ECU is learned. No detailed information!
922	523330	14	1-3-1	DFC to indicate that no code is received via CAN. No detailed information!
923	523330	14	1-3-1	DFC to indicate that wrong code is received. No detailed information!
925	523720	8	1-4-8	DEF supply module heater temperature; duty cycle in failure range.
926	523720	8	1-4-8	DEF supply module heater temperature; duty cycle in invalid range.
927	523721	11	6-8-9	Urea supply module temperature measurement not available.
928	523722	8	6-9-1	DEF supply module PWM signal; period outside valid range.
929	523722	8	6-9-1	Detect faulty PWM signal from Supply Modul.
930	523721	8	6-8-9	DEF supply module temperature; duty cycle in failure range.
931	523721	8	6-8-9	Urea supply module temperature; duty cycle in invalid range.
932	29	3	1-2-6	Handthrottle idle validation switch; short circuit to battery
935	91	3	2-2-6	Sensor error accelerator pedal. signal range check high.
937	29	4	1-2-6	Handthrottle; short circuit to ground.
940	91	4	2-2-6	Sensor error accelerator pedal. Signal is below the range.
942	523921	3	7-1-4	Sensor error burner temperature; signal range check high.
943	3532	3	1-2-7	Sensor error DEF tank level; signal range check high.
944	523921	4	7-1-4	Sensor error burner temperature; signal range check low.
946	1079	13	2-8-2	Failure of sensor supply voltage 1.
947	1080	13	2-8-2	Failure of sensor supply voltage 2.
948	523601	13	2-8-2	Failure of sensor supply voltage 3.
956	677	3	5-1-2	Starter relay high side. Short circuit to battery.
957	677	4	5-1-2	Starter relay high side short circuit to ground.
958	677	5	5-1-2	Starter relay low side no load error.
959	677	12	5-1-2	Starter relay powerstage over temperature.
960	677	3	5-1-2	Starter relay low side short circuit to battery.
961	677	4	5-1-2	Starter relay low side short circuit to ground.
965	523922	3	7-1-5	Burner shut of valve; short circuit to battery.
969	624	5	5-1-3	SVS lamp; open load.

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5.6-6 Deutz TD2.9L Fault Codes

Code	SPN	FMI	Blink Code	Error Identification
970	624	12	5-1-3	SVS lamp: powerstage over temperature
971	624	3	5-1-3	SVS lamp; short circuit to battery
972	624	4	5-1-3	SVS lamp; short circuit to ground
973	523612	14	5-5-5	Softwarereset CPU SWReset_0
974	523612	14	5-5-5	Softwarereset CPU SWReset_1
975	523612	14	5-5-5	Softwarereset CPU SWReset_2
976	91	11	2-2-6	Plausibility error between APP1 and APP2 or APP1 and idle switch.
978	29	2	1-2-6	Plausibility error between sensor and idle switch, Acceleratio Pedal Detection. In case of Hand Throttle with Low Idle Switch, it is the plausibility check between hand throttle and idle switch.
980	523550	12	5-1-5	Terminal 50 was operated too long.
981	172	3	2-2-6	Air flow temperature sensor; short circuit to battery or open load.
982	172	4	2-2-6	Air flow temperature sensor; short circuit to ground.
986	523921	0	7-1-4	Burner temperature, temperature above upper shutoff threshold.
989	523921	1	7-1-4	Burner temperature, temperature below lower shutoff threshold.
992	105	1	1-2-8	Charged Air cooler down stream temperature. Temperature below lower physical threshold.
994	105	3	1-2-8	Electrical error charged air temperature. Signal range check high.(SRC)
995	105	4	1-2-8	Electrical error charged air temperature. Signal range check low.
996	105	0	2-3-3	Charged air cooler temperature. System reaction initiated. High charged air cooler temperature. Warning threshold exceeded.
997	105	0	2-3-3	High charged air cooler temperature. Shut off threshold exceeded.
998	105	11	1-2-8	Diagnostic fault check for charged air cooler downstream temperature sensor No detailed information!
1007	412	3	6-8-2	Electrical error EGR cooler downstream temperature. Signal range check high.
1008	412	4	6-8-2	electrical error EGR cooler downstream temperature. Signal range check low.
1011	523960	0	7-7-1	Physical range check high for EGR cooler downstream temperature.
1012	523960	1	7-7-1	Physical range check low for EGR cooler downstream temperature.
1014	51	6	5-9-4	Actuator error EGR-Valve (2.9;3.6) or Throttle-Valve (4.1;6.1;7.8). Signal range check high.
1015	520521	5	5-9-4	Actuator error EGR-Valve (2.9;3.6) or Throttle-Valve (4.1;6.1;7.8); signal range check low.
1016	51	7	5-9-4	Actuator position for EGR-Valve (2.9;3.6) or Throttle-Valve (4.1;6.1;7.8) not plausible.
1022	51	6	5-9-4	Actuator error EGR-Valve (2.9;3.6) or Throttle-Valve (4.1;6.1;7.8); signal range check high

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5.6-6 Deutz TD2.9L Fault Codes

Code	SPN	FMI	Blink Code	Error Identification
1023	51	5	5-9-4	Actuator error EGR-Valve (2.9;3.6) or Throttle-Valve (4.1;6.1;7.8); signal range check low.
1024	51	3	5-9-4	Position sensor error of actuator EGR-Valve (2.9;3.6) or Throttle-Valve (4.1;6.1;7.8). Signal range check high.
1025	51	4	5-9-4	Position sensor error actuator EGR-Valve (2.9;3.6) or Throttle-Valve (4.1;6.1;7.8). Signal range check low.
1026	4769	2	6-8-4	Temperature downstream DOC, plausibility error.
1029	4766	0	6-8-4	Temperature downstream DOC, temperature above upper shutoff threshold.
1030	4766	0	6-8-4	Temperature downstream DOC, temperature above upper warning threshold.
1034	4769	3	6-8-4	Sensor error exhaust gas temperature downstream (DOC); signal range check high.
1035	4769	4	6-8-4	Sensor error exhaust gas temperature downstream (DOC); signal range check low.
1036	4768	2	6-8-3	Temperature upstream DOC, plausibility error.
1039	4765	0	6-8-3	Temperature upstream DOC, temperature above upper shutoff threshold.
1040	4765	0	6-8-3	Temperature upstream DOC, temperature above upper warning threshold.
1044	4768	3	6-8-3	Electrical error exhaust gas temperature upstream (DOC); signal range check high.
1045	4768	4	6-8-3	Electrical error exhaust gas temperature upstream (DOC); signal range check low.
1047	3248	4	6-8-5	Sensor error particle filter downstream temperature; signal range check low.
1067	1180	3	5-5-6	Sensor error exhaust gas temperature upstream turbine; signal range check high.
1069	4360	0	6-6-8	Exhaust temperature upstream SCR-Cat, temperature above upper physical threshold.
1070	4360	1	6-6-8	Sensed exhaust temperature before SCR-Cat is < physical low limit.
1071	4361	2	6-6-8	Signal error for CAN message No detail informationen!
1166	523948	1	7-7-2	Zerofuel calibration injector 3 (in firing order); minimum value exceeded.
1167	523949	1	7-7-2	Zerofuel calibration injector 4 (in firing order); minimum value exceeded.
1168	523950	1	7-7-2	Zerofuel calibration injector 5 (in firing order); minimum value exceeded.
1170	523612	12	5-5-5	Internal software error ECU.
1180	168	0	3-1-8	Physical range check high for battery voltage.
1181	168	1	3-1-8	Physical range check low for battery voltage.
1183	172	1	2-2-6	Air inlet filter sensor out of physical range check.
1187	523980	14	7-8-4	Bad quality of reduction agent detected.
1193	1180	0	5-5-6	Physical range check high for exhaust gas temperature upstream turbine.
1194	1180	1	5-5-6	Physical range check low for exhaust gas temperature upstream turbine.

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5.6-6 Deutz TD2.9L Fault Codes

Code	SPN	FMI	Blink Code	Error Identification
1219	524018	14	7-8-6	HMI engine derate service state. DPF wasn't regenerated, power reduction phase 1 (manuell regeneration request).
1220	524022	14	7-8-6	HMI engine derate stop state. DPF wasn't regenerated, power reduction phase 2 (manuell regeneration request).
1222	190	14	2-1-2	Camshaft- and Crankshaft speed sensor signal not available on CAN.
1223	51	5	5-9-4	Actuator EGR-Valve (2.9;3.6) or Throttle-Valve (4.1;6.1;7.8); open load.
1224	51	6	5-9-4	Actuator EGR-Valve (2.9;3.6) or Throttle-Valve (6.1,7.8); over current.
1226	51	3	5-9-4	EGR-Valve (2.9;3.6) or Throttle-Valve (4.1;6.1;7.8); short circuit to battery.
1227	51	3	5-9-4	EGR-Valve (2.9;3.6) or Throttle-Valve (4.1;6.1;7.8); short circuit to battery.
1228	51	4	5-9-4	EGR-Valve (2.9;3.6) or Throttle-Valve (4.1;6.1;7.8); short circuit to ground.
1229	51	4	5-9-4	EGR-Valve (2.9;3.6) or Throttle-Valve (4.1;6.1;7.8); short circuit to ground.
1230	51	6	5-9-4	Actuator error EGR-Valve (2.9;3.6) or Throttle-Valve (4.1;6.1;7.8); Overload by short-circuit.
1231	51	11	5-9-4	Power stage overtemperature due to high current.
1232	51	4	5-9-4	actuator AGR valve (2.9;3.6) throttle valve (4.1;6.1;7.8); Voltage below thresh-old.
1239	523984	3	7-8-8	UB7; Short circuit to battery error of actuator relay 7.
1241	523986	4	1-7-6	UB6; Short circuit to ground actuator relais 6.
1242	523987	4	7-9-1	UB7; Short circuit to ground actuator relay 7.
1247	524019	11	8-6-2	Burner Control; Air Line - Blocked Air Pump; air lines blocked.
1248	523910	9	6-9-5	Burner Control; Air Pump - CAN Lost Air Pump; CAN communication lost.
1249	523910	7	6-9-5	Air pump; CAN communication interrupted no purge function available.
1250	523910	12	6-9-5	Air Pump; internal error.
1252	523910	0	6-9-5	Air Pump; operating voltage error.
1254	524014	1	8-5-8	Air inlet EPV - pressure too low. Air pressure glow plug flush line; below limit.
1255	524013	7	8-5-7	Burner Control; Flame lost max. Burner operation is interrupted too often.
1257	523915	7	8-5-3	HCI dosing valve (DV1); blocked open.
1258	524016	11	8-5-9	Burner Control; HFM - Electrical Fault HFM sensor; electrical fault.
1259	524016	2	8-5-9	Burner Control; HFM - Plausibilitätsfehler 1 Amount of air is not plausible to pump speed.
1261	523910	6	6-9-5	Burner Control Air Pump; over current Air pump electrically overloaded.
1262	523922	7	8-5-4	Burner Control; Shut-off Valve - Blocked closed Burner Shut Off Valve; blocked closed.
1263	524021	11	8-6-4	Burner Control; Fuel line ShutOff downstream - broken Burner fuel line pipe leak behind Shut Off Valve.

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5.6-6 Deutz TD2.9L Fault Codes

Code	SPN	FMI	Blink Code	Error Identification
1264	523922	7	8-5-5	Burner Shut Off Valve; blocked open.
1285	524038	9	8-2-4	Timeout error of CAN-Receive-Frame ComMS_Sys1TO (error memory Slave); Master-Slave internal CAN message.
1286	524039	9	8-2-5	Timeout error of CAN-Receive-Frame ComMS_Sys2TO (error memory Slave); Master-Slave internal CAN message.
1287	524040	9	8-2-6	Timeout error of CAN-Receive-Frame ComMS_Sys3TO (error memory Slave); Master-Slave internal CAN message.
1288	524041	9	8-2-7	Timeout error of CAN-Receive-Frame ComMS_Sys4TO (error memory Slave); Master-Slave internal CAN message.
1289	524042	9	8-2-8	Timeout error of CAN-Receive-Frame ComMS_Sys5TO (error memory Slave); Master-Slave internal CAN message.
1290	524043	9	8-2-9	Timeout error of CAN-Receive-Frame ComMS_Sys6TO (error memory Slave); Master-Slave internal CAN message.
1291	524045	9	8-3-1	Master Slave, Error of message counter CAN receive message ComMSMoFOvR; ComMSMoFOvR1CNT.
1292	524046	9	8-3-2	Master-Slave CAN; Error Checksum of CAN-Receive Message.
1293	524047	9	8-3-3	Master-Slave CAN; Error of message length of CAN receive message ComMSMoFOvR;_ComMSMoFOvR1DLC.
1294	524048	9	8-3-4	Timeout error CAN message ComMSMoFOvR1TO error memory Slave.
1299	523788	0	6-5-5	Wastegate plauisibility error off CAN transmit message.
1300	523788	0	6-5-5	Timeout Error of CAN-Receive-Frame ComTrbChActr; Wastegate.
1302	524024	11	8-6-6	Deviation of the exhaust gas temperature setpoint to actual value downstream (DOC) too high.
1324	523995	13	7-9-5	Check of missing injector adjustment value programming (IMA) injector 7 (in firing order).
1325	523996	13	7-9-6	check of missing injector adjustment value programming (IMA) injector 8 (in firing order).
1326	523997	4	7-9-7	Injector cylinder bank 1 slave; short circuit.
1327	523998	4	7-9-8	Injector cylinder bank 2 slave; short circuit.
1328	523999	12	7-9-9	Injector powerstage output Slave defect.
1329	524000	5	1-7-7	Injector 7 (in firing order); interruption of electric connection.
1330	524001	5	1-7-8	Injector 8 (in firing order); interruption of electric connection.
1333	524000	3	1-7-7	Injector 7 (in firing order); short circuit.
1334	524001	3	1-7-8	Injector 8 (in firing order); short circuit.
1337	2797	4	5-6-5	Timeout of Short-Circuit Ground Diagnosis Cyl. Bank 0;_ IVDiaShCirGndToutBnk_0.
1338	2798	4	5-6-6	Timeout of Short-Circuit Ground Diagnosis Cyl. Bank 1;_ IVDiaShCirGndToutBnk_1.
1339	2797	4	5-6-5	Injector diagnostic; Short circuit to ground cylinder bank 0.
1340	2798	4	5-6-6	Injector diagnostic; Short circuit to ground cylinder bank 1.

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5.6-6 Deutz TD2.9L Fault Codes

Code	SPN	FMI	Blink Code	Error Identification
1341	524035	12	5-5-5	Injector diagnostics; time out error in the SPI communication.
1342	524036	12	5-5-5	Injector diagnostics Slave; time out error in the SPI communication.
1345	524069	9	8-9-6	Timeout Error of CAN-Receive-Frame MSMon_FidFCCTO; Master-Slave CAN communication faulty.
1357	524052	11	8-3-6	Error memory Slave reports FID MSMonFC2 (collective error).
1368	524052	11	8-3-6	Error memory Slave reports FID MSMonFC3 (collective error).
1378	523919	2	6-9-4	Sensor air pump airpressure; plausibility error.
1379	523920	2	7-1-6	Sensor exhaust gas back pressure burner; plausibility error.
1380	3253	2	6-9-2	Sensor differential pressure (DPF); plausibility error.
1381	164	2	8-3-9	Rail pressure safety function is not executed correctly ().
1389	523922	5	7-1-5	Burner Shut Off Valve; open load.
1390	523922	12	7-1-5	Burner Shut Off Valve; powerstage over temperature.
1392	523922	4	7-1-5	Burner Shut Off Valve; short circuit to ground.
1395	523921	2	7-1-4	Burner temperature sensor; Plausibility Check for burner temperature sensor Sensor burner temperature; plausibility error.
1398	1136	0	6-8-1	Physical range check high for ECU temperature.
1402	4769	2	6-8-4	Sensor exhaust gas temperature OxiCat downstream (normal operation); plausibility error.
1403	4769	2	6-8-4	Sensor exhaust gas temperature OxiCat downstream (regeneration); plausibility error.
1411	1188	11	8-1-4	Wastegate actuator; internal error.
1412	1188	11	8-1-4	Wastegate actuator; EOL calibration not performed correctly.
1413	1188	13	8-1-4	Wastegate actuator calibration deviation too large, recalibration required.
1414	1188	2	8-1-4	Wastegate; status message from ECU missing.
1415	1188	7	8-1-4	Wastegate actuator; blocked.
1417	1188	11	8-1-4	Wastegate actuator; over temperature (> 135°C).
1418	1188	11	8-1-4	Wastegate actuator; operating voltage error.
1423	51	0	5-9-4	Warning threshold for an internal actuator error exceeded, < 4L EGR. actuator und >4L Air Intake Flap.
1424	51	1	5-9-4	Shut off threshold for an internal actuator error exceeded, < 4L EGR.actuator und >4L Air Intake Flap.
1425	172	0	2-2-6	air temperature within air filter box above maximum physical value.
1431	524028	2	8-1-5	CAN message PROEGRActr; plausibility error.
1432	524029	2	8-1-5	Timeout Error of CAN-Receive-Frame ComEGRActr - exhaust gas recirculation positioner.
1436	524034	5	8-1-6	Disc separator; open load.
1437	524034	12	8-1-6	Disc separator; powerstage over temperature.
1438	524034	3	8-1-6	Disc separator; short circuit to battery.

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5.6-6 Deutz TD2.9L Fault Codes

Code	SPN	FMI	Blink Code	Error Identification
1439	524034	4	8-1-6	Disc separator; short circuit to ground.
1440	524030	7	8-1-5	EGR actuator; internal error.
1441	524031	13	8-1-5	EGR actuator, calibration error.
1442	524032	2	8-1-5	EGR actuator; status message "EGRCust" is missing.
1443	524033	7	8-1-5	EGR actuator; due to overload in Save Mode.
1455	3711	12	7-1-1	Temperature during stand-still main phase too low or too high.
1458	523960	0	7-7-1	High exhaust gas temperature EGR cooler downstream; warning threshold exceeded.
1464	0	0	-	
1466	0	0	-	
1467	0	0	-	
1469	0	0	-	
1470	0	0	-	
1471	0	0	-	
1472	0	0	-	
1481	524025	5	8-4-5	DPF system; operating voltage error.
1482	524044	9	1-8-8	CAN message ComMS_Sys7 not received from slave.
1484	524068	2	8-9-5	Master ECU and Slave ECU have been identified as the same types.
1485	524052	11	8-3-6	Master ECU and Slave ECU data sets or software are not identical.
1486	523718	5	6-7-6	SCR mainrelay; open load (only CV56B).
1488	523718	3	6-7-6	SCR mainrelay; short circuit to battery (only CV56B).
1489	523718	4	6-7-6	SCR mainrelay; short circuit to ground (only CV56B).
1661	524116	9	1-9-4	Timeout error of CAN-Transmit-Frame SCR2.
1662	524117	9	9-4-1	Timeout error of CAN-Transmit-Frame SCR3.
1663	524097	9	9-2-1	Timeout error of CAN-Transmit-Frame DPFBrnAirPmpCtl.
1664	524098	9	9-2-2	Timeout error of CAN-Transmit-Frame ComDPFBrnPT.
1665	524099	9	9-2-3	Timeout error of CAN-Transmit-Frame ComDPFC1.
1666	524100	9	9-2-4	Timeout error of CAN-Transmit-Frame ComDPFHisDat.
1667	524101	9	9-2-5	Timeout error of CAN-Transmit-Frame ComDPFTstMon.
1668	524105	9	9-2-9	Timeout error of CAN-Transmit-Frame ComEGRMsFlw (EGR Steller).
1669	524108	9	9-3-2	Timeout error of CAN-Transmit-Frame ComEGRTVActr (EGR actuator).
1670	524110	9	9-3-4	Timeout error of CAN-Transmit-Frame ComETVActrTO.
1671	524112	9	9-3-6	Timeout ComIntake Throttle Valve Actr.
1672	524118	9	9-4-2	Timeout error of CAN-Receive-Frame ComRxCM1.
1675	524103	9	9-2-7	Timeout error of CAN-Receive-Frame ComRxDPFBrnAirPmp.
1676	524104	9	9-2-8	Timeout error of CAN-Receive-Frame ComRxDPFCtl.

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5.6-6 Deutz TD2.9L Fault Codes

Code	SPN	FMI	Blink Code	Error Identification
1677	524106	9	1-9-5	Timeout error of CAN-Receive-Frame ComRxEGRMsFlw1 (EGR actuator)
1678	524107	9	9-3-1	Timeout error of CAN-Receive-Frame ComRxEGRMsFlw2 (EGR actuator).
1679	524109	9	9-3-3	Timeout error of CAN-Receive-Frame ComRxEGRTVActr (EGR actuator).
1680	524111	9	9-3-5	Timeout error of CAN-Receive-Frame ComRxETVActr.
1681	524113	9	9-3-7	Timeout error of CAN-Receive-Frame ComRxITVActr.
1682	524120	9	9-4-4	Timeout error of CAN-Receive-Frame ComRxSCRHtDiag.
1683	524121	9	9-4-5	Timeout error of CAN-Receive-Frame ComRxTrbChActr (wastegate actuator).
1684	524122	9	9-4-6	Timeout error of CAN-Receive-Frame ComRxUQSens (Urea quality).
1685	524123	9	9-4-7	Timeout error of CAN-Receive-Frame ComSCRHtCtl.
1686	524124	9	9-4-8	Timeout error of CAN-Receive-Frame ComTxAT1IMG.
1687	524125	9	9-4-9	Timeout error of CAN-Receive-Frame ComTxTrbChActr (Wastegate actuator).
1698	524133	2	9-5-6	HMI system; set if restore button blocked.
1699	524134	0	9-5-7	DPF, ash load exceeds the shutoff threshold.
1700	524134	0	9-5-7	DPF, ash load exceeds the warning threshold.
1701	524135	0	9-5-8	DPF, soot load exceeds the shutoff threshold.
1702	524135	14	9-5-8	DPF, soot load exceeds the service request threshold.
1703	524135	0	9-5-8	DPF, soot load exceeds the warning threshold.
1705	524156	9	9-7-2	Timeout error of CAN-Receive-Frame ComRxEBC2.
1706	524157	9	9-7-3	Fan control; time out for fan governing.
1708	524159	0	9-7-5	Fan; short circuit battery or open load.
1709	524159	1	9-7-5	Fan; short circuit ground.
1710	524160	5	9-7-6	Fan; in/outlet valve 1; open load.
1712	524160	3	9-7-6	Fan; in/outlet valve 1; short circuit battery.
1713	524160	4	9-7-6	Fan; in/outlet valve 1; open load ground.
1714	524161	5	9-7-7	Fan; in/outlet valve 2; open load.
1716	524161	3	9-7-7	Fan; in/outlet valve 2; short circuit battery.
1717	524161	4	9-7-7	Fan; in/outlet valve 2; open load ground.
1718	524162	12	9-7-8	Fan; fancontrol; angle sensor defect.
1719	524163	12	9-7-9	Fan; fancontrol; fan or valve defect.
1752	2791	7	4-1-5	EGR actuator, actuator blocked.
1753	2791	2	4-1-5	EGR actuator, CAN error.
1754	2791	13	4-1-5	EGR actuator, EOL calibration error.
1755	2791	12	4-1-5	EGR Actuator, internal electrical fault.
1756	2791	13	4-1-5	EGR actuator, learning process aborted.
1757	2791	6	4-1-5	EGR actuator current is above maximum threshold.
1758	2791	3	4-1-5	EGR actuator supply voltage is above the maximum threshold.

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5.6-6 Deutz TD2.9L Fault Codes

Code	SPN	FMI	Blink Code	Error Identification
1759	2791	4	4-1-5	EGR actuator supply voltage is below minimum threshold.
1760	2791	13	4-1-5	EGR actuator, learning process out of range.
1761	2791	7	4-1-5	EGR actuator, broken spring detected.
1762	2791	16	4-1-5	EGR actuator, temperature high.
1763	2791	0	4-1-5	EGR actuator, temperature critical high.
1788	1188	7	8-1-4	Turbocharger wastegate, mechanical blocking detected.
1789	1188	2	8-1-4	Turbocharger wastegate, CAN Error.
1790	1188	13	8-1-4	Turbocharger wastegate, EOL calibration error.
1791	1188	12	8-1-4	Turbocharger wastegate, internal electrical error.
1792	1188	13	8-1-4	Turbocharger wastegate, learning process aborted.
1793	1188	6	8-1-4	Turbocharger wastegate, current above maximum threshold.
1794	1188	3	8-1-4	Turbocharger wastegate, supply voltage above maximum threshold.
1795	1188	4	8-1-4	Turbocharger wastegate, supply voltage below minimum threshold.
1796	1188	13	8-1-4	Turbocharger wastegate, learning process out of range.
1797	1188	7	8-1-4	Turbocharger wastegate, broken spring detected.
1799	1188	0	8-1-4	Turbocharger wastegate, temperature critical high.
1827	524141	7	1-9-2	DEF dosing valve, dosing valve blocked.
1857	523612	12	5-5-5	Engine starter, plausibility error of starter release condition.
1858	524147	7	9-6-6	SCR-System, reverting valve blocked.

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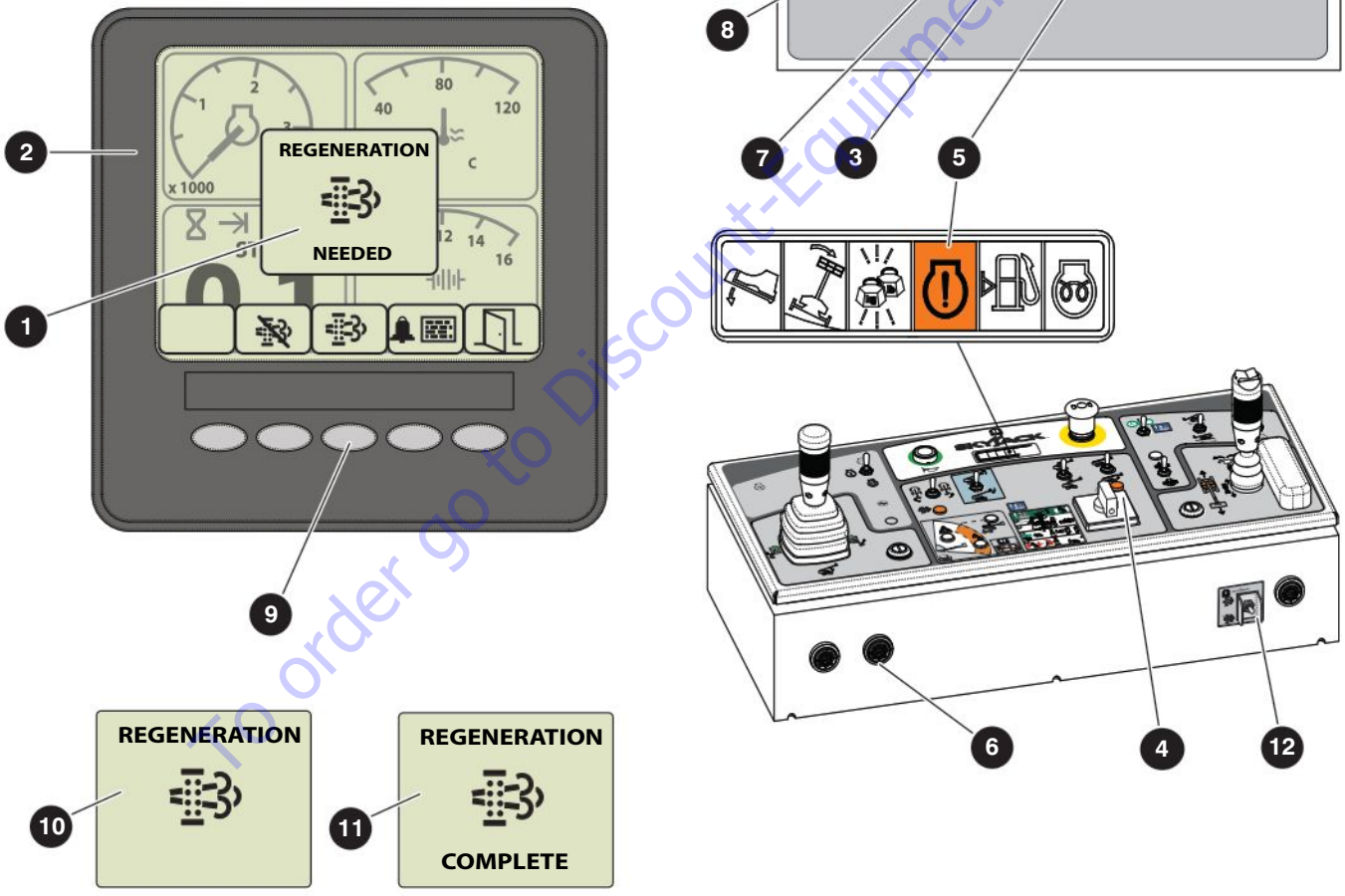
5.6-7 Diesel Particulate Filter (DPF) and Standstill Regeneration - Deutz TCD2.2 Engine

About the DPF and Standstill Regeneration

The DPF system is a closed diesel particulate filter system that collects the soot during the operation of the engine to decrease diesel particulate emissions.

As soon as the soot load is at 100%, the system starts a standstill regeneration request. The request is sent and shown ❶ on the screen of the Deutz engine display module ❷ (found below the engine control console) and identified by the flashing standstill lights on the base ❸ and platform ❹ controls.



Standstill Regeneration Stages

Standstill Lamps ❸❹	Engine Lamp ❺	Audible Alarm ❻	Engine Torque	Action Required
Flashes slowly	Off	Pulsates slowly	100%	Do the standstill operation at the next available opportunity, within 3 to 4 hours.
Flashes slowly	On	Pulsates slowly	75%	Do the standstill operation immediately.
Flashes quickly	Flashes	Pulsates quickly	40%	a. The standstill operation is no longer possible with on-machine controls. Contact an authorized repair facility.
				b. Failure to do the standstill has caused diesel particulate filter failure, and regeneration is no longer possible. Contact an authorized repair facility to replace the filter.

Do the Standstill Regeneration

1. Move the MEWP to an open, well-ventilated area, away from any flammable material. Park it on a firm level surface, and fully stow the MEWP.
2. While the engine runs, turn the off/base/platform switch ❼ on the base controls to the base position.
3. Move the standstill switch ❽ on the base controls to the right to start the standstill regeneration. The base functions will not operate while the standstill switch is turned on.
4. On the engine display module ❷ press and hold the middle button ❾ (below the regeneration symbol) for 7 seconds.

⚠ WARNING

Do not touch hot engine components. Serious injury can occur if you touch hot surfaces.

5. The engine display module changes to the Regeneration Ongoing symbol ❿, the standstill lights illuminate continuously, and the engine speed can change.
6. Standstill regeneration takes approximately 45 minutes. During this time you must not use the MEWP.

IMPORTANT

Complete the standstill regeneration fully. If you interrupt the process, the standstill request continues.

7. When the standstill regeneration is complete, the Regeneration Ongoing symbol changes to Regeneration Complete ⓫, the standstill lights ❸❹ go off, and the engine speed goes back to normal.
8. Move the standstill switch to the left. You can use the MEWP normally.

IMPORTANT

Only use the standstill regeneration override switch ⓬ on the front of the platform control box when absolutely necessary to move the MEWP to park it in a safe location when the derated engine torque/rpm prevents sufficient torque to drive the MEWP.

It temporarily (for approximately 30 minutes) restores full engine power and speed.

Use of the derate override switch can cause diesel particulate filter failure.

5.7 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.

5.7-1 Change the Hydraulic Tank Filter

1. Place a suitable container under the hydraulic tank filter.
2. Remove the oil filter and catch any escaping oil.

⚠ WARNING

Dispose of hydraulic oil in accordance with local and federal regulations.

3. Clean inside the filter head.
4. Apply a thin layer of clean hydraulic oil to the new oil filter gasket.
5. Install the filter and tighten it firmly.
6. Clean up any oil that may have spilled during this procedure.
7. Start the engine from the base control console.
8. Check for leakage.

5.7-2 Change the Hydraulic Oil

1. Turn the engine on and allow hydraulic oil to warm up.
2. Shut the engine off.
3. Place a suitable container under the hydraulic tank drain port.
4. Remove the oil drain plug and allow all of the hydraulic oil to drain into the container.

⚠ WARNING

Dispose of hydraulic oil in accordance with local and federal regulations.

5. Install the oil drain plug with new seal ring and tighten it firmly.
6. Refill the hydraulic tank with new oil as per the specifications (refer to 2.10 Hydraulic Specifications & Gear Oil).
7. Check for leakage.
8. Clean up any oil that may have spilled during this procedure.
9. Check the hydraulic oil level on the sight gauge. The oil level should be at or slightly above the top mark on the sight gauge.

NOTE

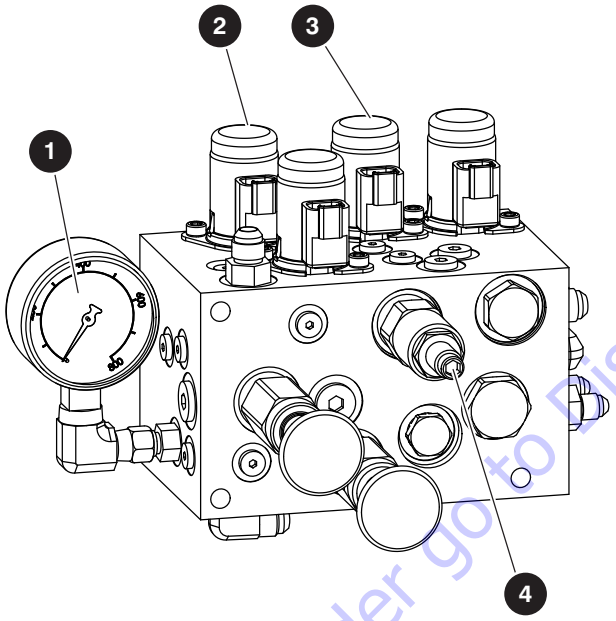
Samples of hydraulic oil should be drawn from the reservoir and tested annually. These samples should be taken when the oil is warmed through normal operation of the system. The sample should be analyzed by a qualified lubrication specialist to determine if it is suitable for continued use. Oil change intervals will depend on the care used in keeping the oil clean, and the operating conditions. Dirt and/or moisture cotamination 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.

5.8 Manifolds and Hydraulic Pumps

5.8-1 Hydraulic Brake Pressure Adjustment

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

1. Locate the pressure gauge ❶ on the brake valve assembly.



IMPORTANT

Failure to remove the wiring may cause damage to components downstream.

2. Remove the wiring from two valves: axle lockout valve ❷ wires 65 and 02, and two speed valve ❸ wires 45 and 02. Mark the valves to ensure you put the wiring back in the correct positions later.

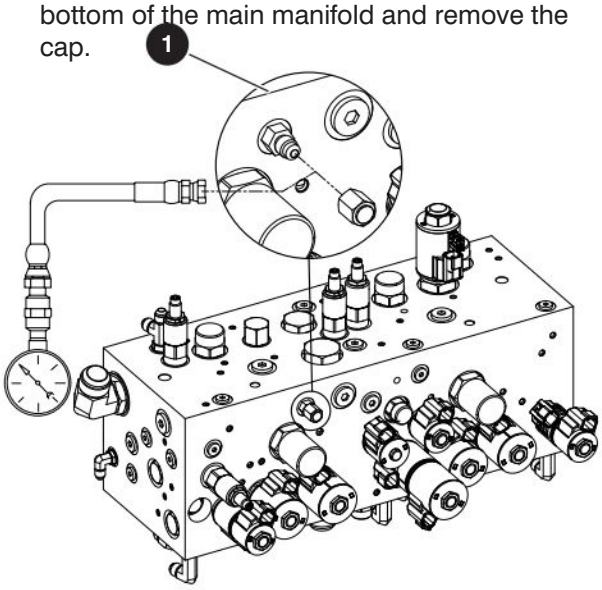
IMPORTANT

Valve damage will occur if tightened too much.

3. Locate the brake system pressure reducing valve PR1 ❹. Loosen the lock nut and turn the adjustment stem gently clockwise 2 full turns.
4. Start the engine from the platform control console and extend the boom slightly (approximately 12” (30 cm)) to achieve low speed drive.
5. Drive the MEWP forward or reverse. The pressure gauge reading should be 400 psi. Stop the aerial platform. Follow the next steps for adjusting the relief valve pressure if needed. If no adjustment is required, skip ahead to step 10.
6. Locate the brake system pressure reducing valve PR1 and turn the valve gently counterclockwise to the initial position.
7. Drive the MEWP forward or reverse. The pressure gauge reading should be 400 psi.
8. Stop the MEWP and adjust the pressure reducing valve PR1 1/4 turn at a time by turning it either clockwise to increase the pressure, or counterclockwise to decrease the pressure.
9. Repeat steps 7 and 8 until the brake pressure is achieved (400 psi) then tighten the lock nut on the brake system pressure reducing valve PR1.
10. Reinstall the wiring in the same positions it was removed from in step 3.
11. Test the brake and two speed functions.

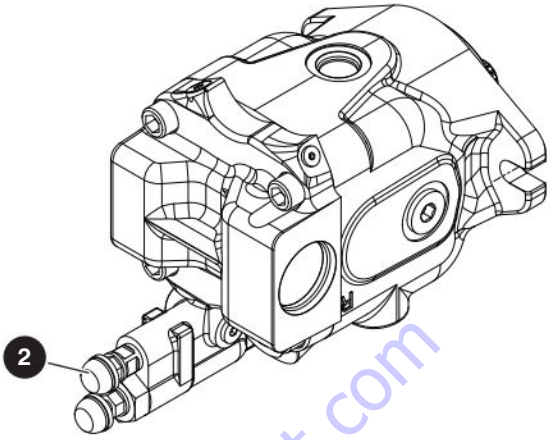
5.8-2 Hydraulic Standby Pressure Adjustment

1. Locate the GP2 port ❶ on either the top or bottom of the main manifold and remove the cap.



Main Manifold and Pressure Gauge

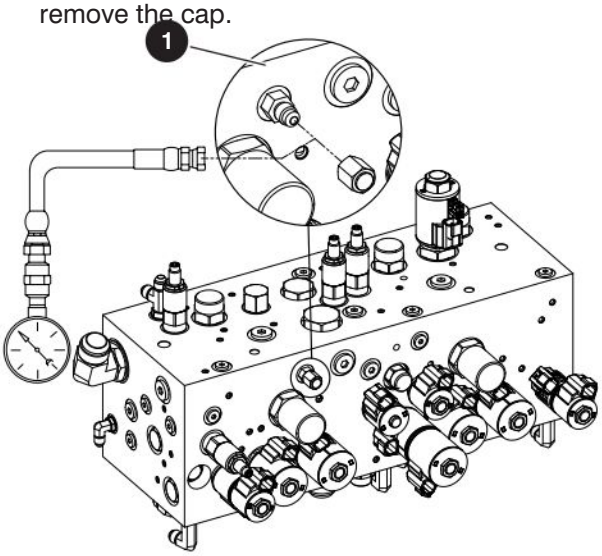
2. Connect a pressure gauge (600 psi) to the GP2 port.
3. Start the ngine from the base control console and let it run for 2-5 minutes.
4. Check the reading on the gauge (standard pressure should be 330 psi) and follow the next steps for adjusting pressure if needed.
5. Locate the load sense compensator ❷ on the system pump.



6. Loosen the lock nut.
7. Adjust the load sensing pressure by turning the adjusting stem either clockwise to increase pressure or counterclockwise to decrease pressure.
8. Tighten the lock nut after pressure is set to 330 psi.
9. Turn the engine off.
10. Remove the pressure gauge from the GP2 port and cap the port.

5.8-3 Hydraulic High Pressure Adjustment

1. Locate GP2 port ❶ on the main manifold and remove the cap.



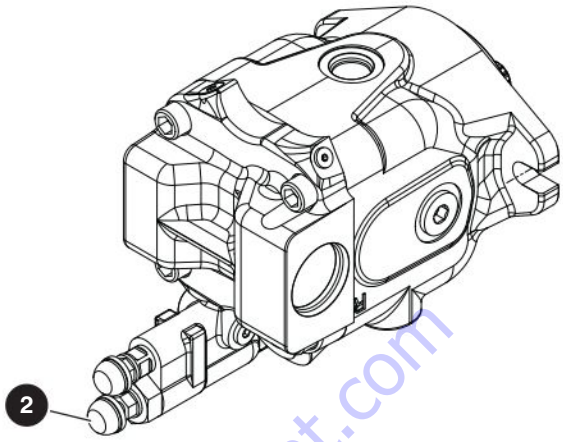
Main Manifold and Pressure Gauge

2. Connect a pressure gauge (5000 psi) to the GP2 port.

⚠ WARNING

To protect the gauge, do not activate any controls during this procedure.

3. Start the engine from the base control console and let it run for 2-5 minutes.
4. Without driving, steer fully to one direction and then check the reading on the gauge. Standard pressure should be 3050 psi. Follow the next steps for adjusting the pressure, if needed.
5. Locate the pressure compensator ❷ on the system pump.

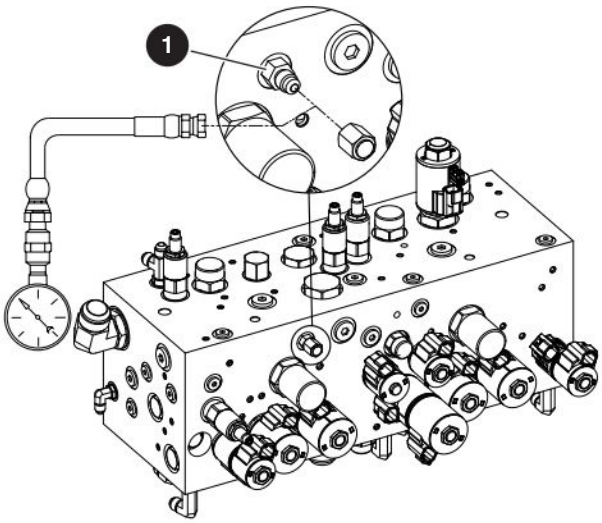


6. Loosen the lock nut.
7. Adjust the system pump pressure by turning the adjusting stem either clockwise to increase pressure or counterclockwise to decrease pressure.
8. Tighten the lock nut after pressure is set to 3050 psi.
9. Turn the engine off.
10. Remove the pressure gauge from the GP2 port and cap the port.

5.8-4 Hydraulic System Relief Valve Adjustment

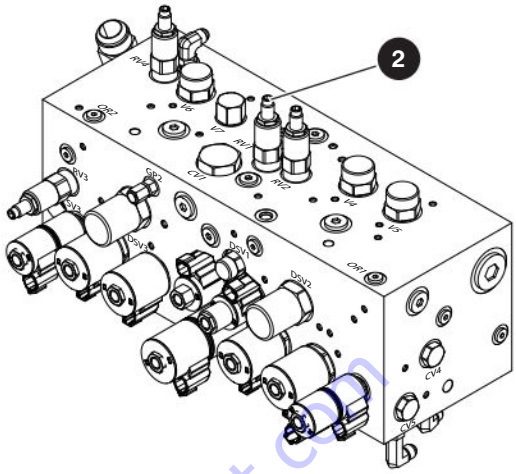
To adjust the system relief valve (RV1), you are required to temporarily adjust the high pressure setting on the system pump to 3300 psi. Refer to 5.8-3 Hydraulic High Pressure Adjustment.

1. Locate the GP2 port ❶ on the main manifold and remove the cap.



Main Manifold and Pressure Gauge

2. Connect a pressure gauge (5000 psi) to the GP2 port.
3. Start the engine from the base control console and let it run for 2-5 minutes.
4. Steer fully to one direction and then check the reading on the gauge. Standard pressure should be 3250 psi. Follow the next steps for adjusting pressure if needed.
5. Locate the system relief valve (RV1) ❷.

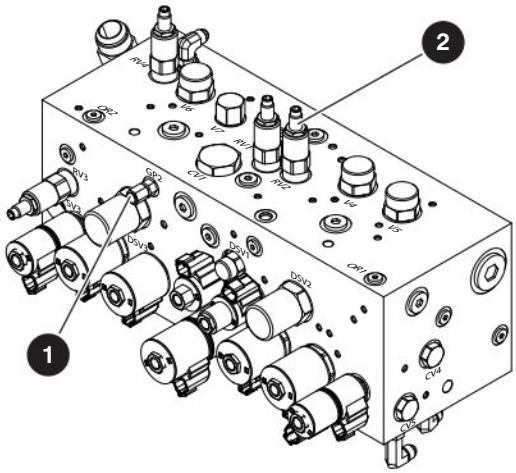


Main Manifold

6. Loosen the lock nut on the system relief valve. Turn the adjusting stem clockwise to increase pressure and counterclockwise to decrease pressure.
7. Tighten the lock nut on the system relief valve once 3250 psi is observed on the gauge. You must steer fully in one direction to activate pressure reading on gauge.
8. Reset the system pump to 3050 psi. Refer to 5.8-3 Hydraulic High Pressure Adjustment.

5.8-5 Turret Rotate Relief Valve Adjustment

1. Locate the GP2 port ❶ on the main manifold.
2. Connect a pressure gauge (5000 psi) to the GP2 port.

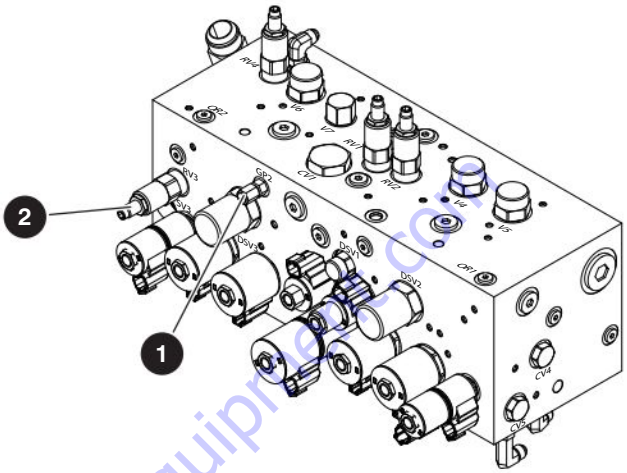


Main Manifold

3. Start the engine from the base control console and let it run for 2-5 minutes.
4. Raise the main boom to ensure the basket will not contact the ground.
5. Engage the turret transport lock.
6. Attempt to rotate the turret. The pressure should be 1250 psi. Follow the next steps for adjusting the pressure, if needed.
7. Locate the turret rotate relief valve RV2 ❷.
8. Loosen the lock nut on the turret rotate relief valve RV2. Turn the adjusting stem clockwise to increase the pressure and counterclockwise to decrease the pressure.
9. Tighten the lock nut on the turret rotate relief valve RV2 once 1250 psi is observed on the gauge. You must activate the turret rotate to obtain a pressure reading on the gauge.
10. Disengage the turret transport lock.

5.8-6 Platform Level Relief Valve Adjustment

1. Locate the GP2 port ❶ on the main manifold.
2. Connect a pressure gauge (5000 psi) to the GP2 port.

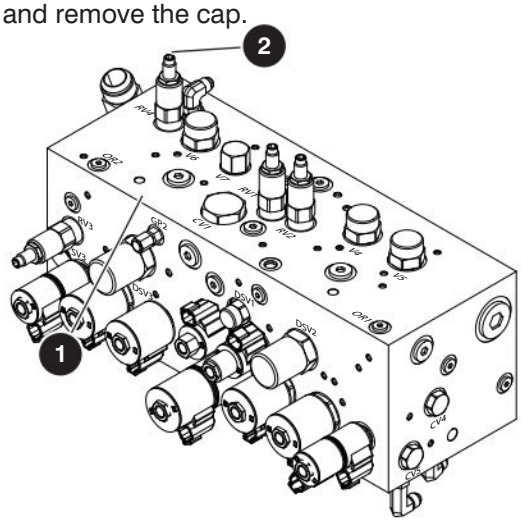


Main Manifold

3. Start the engine from the base control console and let it run for 2-5 minutes.
4. Raise the main boom to ensure the basket will not contact the ground.
5. Fully raise or lower the platform level and check the reading on the gauge. The pressure should be 3000 psi. Follow the next steps for adjusting the pressure, if needed.
6. Locate the platform leveling relief valve RV3 ❷ .
7. Loosen the lock nut on the platform level relief valve RV3. Turn the adjusting stem clockwise to increase the pressure and counterclockwise to decrease the pressure.
8. Tighten the lock nut on the platform level relief valve RV3 once 3000 psi is observed on the gauge. You must fully raise or lower the platform level to activate a pressure reading on the gauge.

5.8-7 Fly Boom Relief Valve Adjustment

1. Locate the GP2 port ❶ on the main manifold and remove the cap.

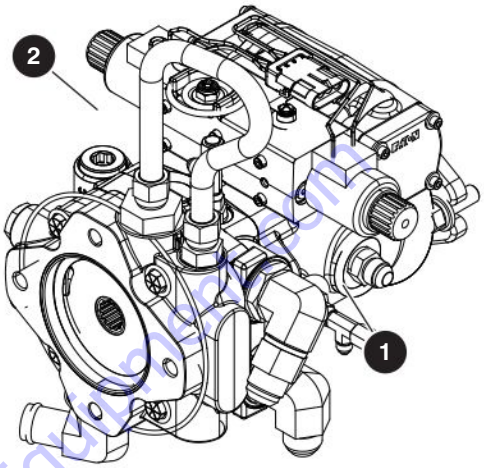


Main Manifold

2. Connect a pressure gauge (5000 psi) to the GP2 port.
3. Start the engine from the base control console and let it run for 2-5 minutes.
4. Fully extend the boom and check the reading on the gauge. The pressure should be 1500 psi. Follow the next steps for adjusting the pressure, if needed.
5. Locate the fly boom relief valve RV4 ❷.
6. Loosen the lock nut on the fly boom relief valve RV4. Turn the adjusting stem clockwise to increase the pressure and counterclockwise to decrease the pressure.
7. Tighten the lock nut on the fly boom relief valve RV4 once 1500 psi is observed on the gauge. You must fully extend the boom to activate a pressure reading on the gauge.

5.8-8 Test Charge Pump Pressure on Drive Pump

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



Drive Pump - TP3

3. Start the engine from the base control console.

⚠ WARNING

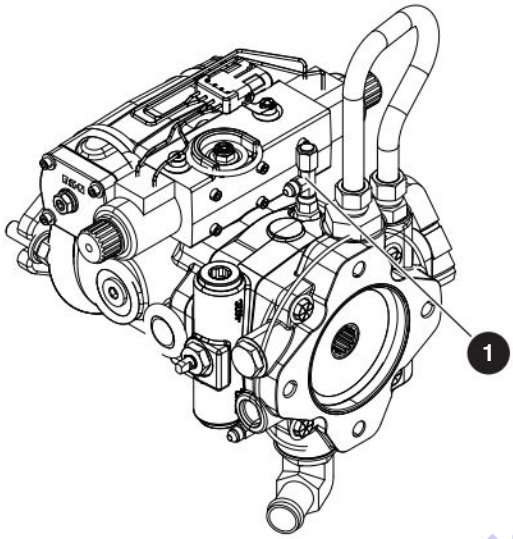
To protect the gauge, do not activate any controls during this procedure.

4. Check the reading on the gauge. Standard pressure should be 313 ±31 psi.
5. Replace the charge pump relief valve RV10 ❷ if the standard pressure is not achieved.
6. Repeat steps 2, 3, and 4 after the charge pump relief valve is replaced.
7. If the pressure is still not in range, repair or replace the pump as necessary.

5.8-9 Test Forward Drive Pressure on Drive Pump

NOTE
Make sure the charge pump pressure test is completed first.

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



Drive Pump - TP1

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

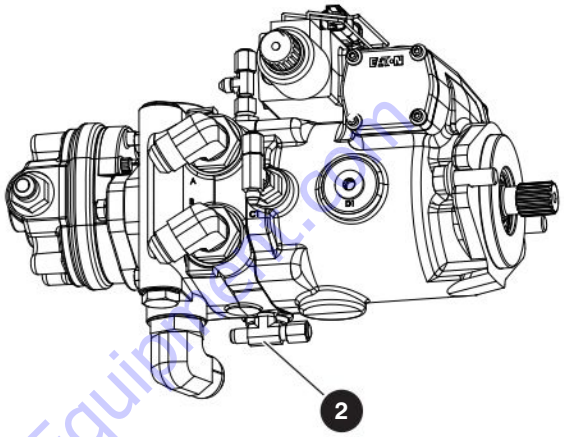
NOTE
Activating the drive function too quickly will stall the engine.

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

5.8-10 Test Reverse Drive Pressure on Drive Pump

NOTE
Make sure the charge pump pressure test is completed first.

1. Locate test port TP2 ❷ on the drive pump.



Drive Pump - TP2

Connect a pressure gauge (10000 psi) to test port TP2.

WARNING
To protect the gauge, do not activate any controls during this procedure.

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

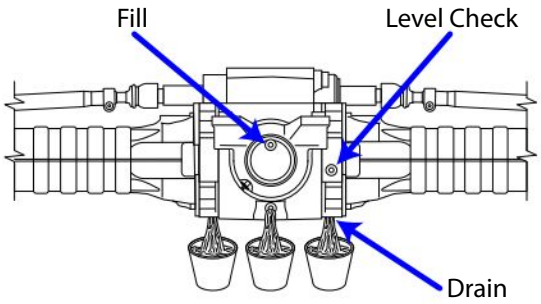
NOTE
Activating the drive function too quickly will stall the engine.

5. Check the reading on the gauge. The standard pressure should be 5000 psi.
6. Replace the pump if the pressure is not achieved.
7. Turn the engine off.

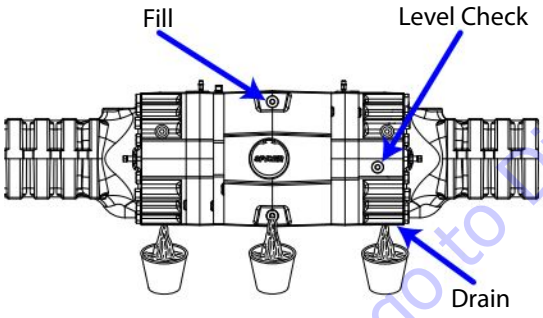
5.9 Axles

5.9-1 Change the Oil in the Axles

1. Place a suitable container under the axle.
2. Remove the fill plug.
3. Remove all three drain plugs to allow the oil to drain into the container.



Front Axle



Rear Axle

4. Reinstall all of the drain plugs.
5. Remove the check plug.

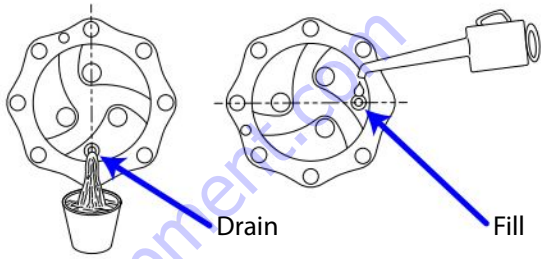
NOTE

The axle is full when oil is leaking from the check port.

6. Refill the axle with new oil as per specifications Refer to 2.10 Hydraulic Specifications & Gear Oil .
7. Reinstall both of the fill and check plugs.

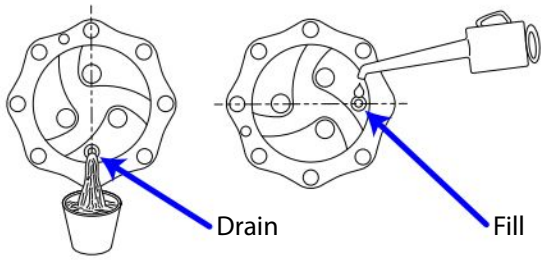
5.9-2 Check the Oil Level in the Torque Hubs

1. Drive the aerial platform to rotate the hub until the plug is in the 3 or 9 o'clock position. Shut off the engine.
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. Refer to 2.10 Hydraulic Specifications & Gear Oil. for oil specifications.



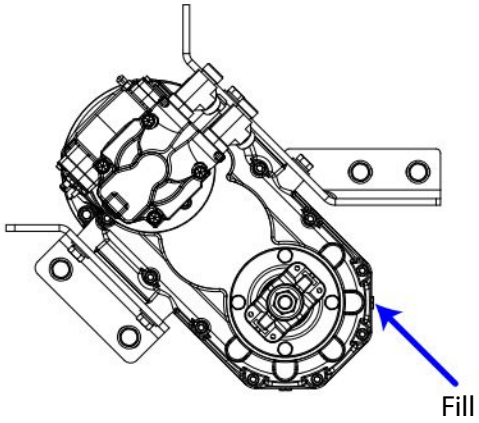
5.9-3 Change the Oil in the Torque Hubs

1. Start the engine and drive the boom until the fill/drain port of one of the hubs is in the 6 o'clock position. Shut off the engine. Place a container under the fill/drain port.
2. Remove the plug and allow all of the oil to drain, watching carefully to avoid spills.
3. Restart the engine and drive the boom until the drain plug is in the 3 or 9 o'clock position. Shut off the engine.
4. Refill the hub with new oil as per specifications. Refer to 2.10 Hydraulic Specifications & Gear Oil.
5. Repeat the above steps with the other three wheel hubs.



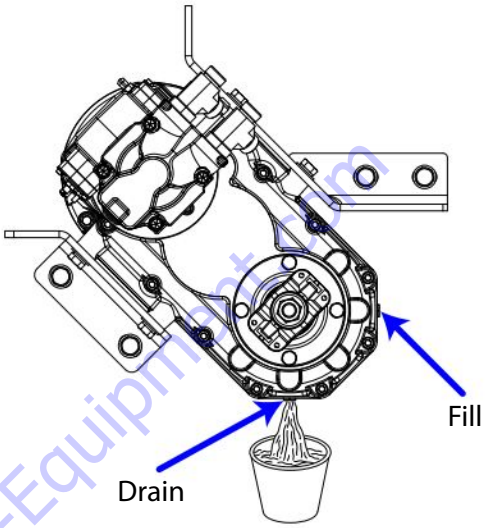
5.9-4 Check the Oil Level in the Axle Gearbox

1. Remove the fill plug ❶ from the gear box.
2. Check the oil level. It should be even with the bottom of the fill plug hole. Add oil if needed. Refer to 2.10 Hydraulic Specifications & Gear Oil. for oil specifications.



5.9-5 Change the Oil in the Axle Gearbox

1. Place a suitable container under the gearbox.
2. Remove the fill plug.
3. Remove the drain plug to allow oil to drain into the container.



4. Reinstall the drain plug.

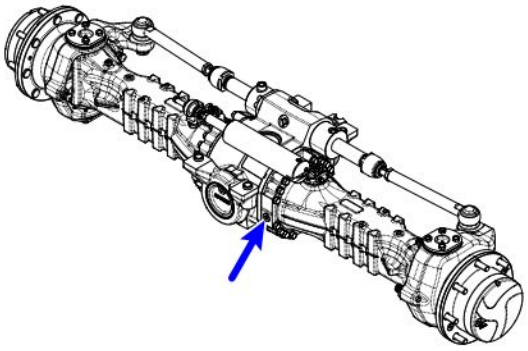
NOTE

The gearbox is full when oil is leaking from the check port.

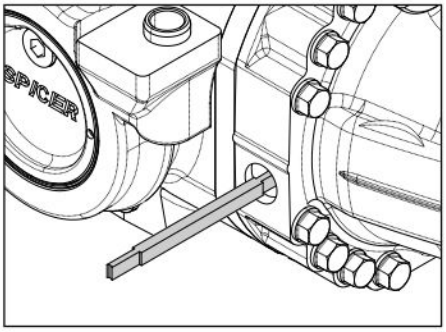
5. Refill the gearbox with new oil as per specifications. Refer to 2.10 Hydraulic Specifications & Gear Oil.
6. Reinstall the fill plug.

5.9-6 Brake Inspection

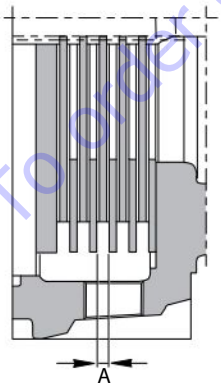
1. Remove the oil level plug from one of the braking axle arms, as shown below.



2. Insert a 4.5 mm (front steer axle) or 5.2 mm (rear rigid axle) 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 (front) or 5.2 (rear). Reinstall the oil level plug.

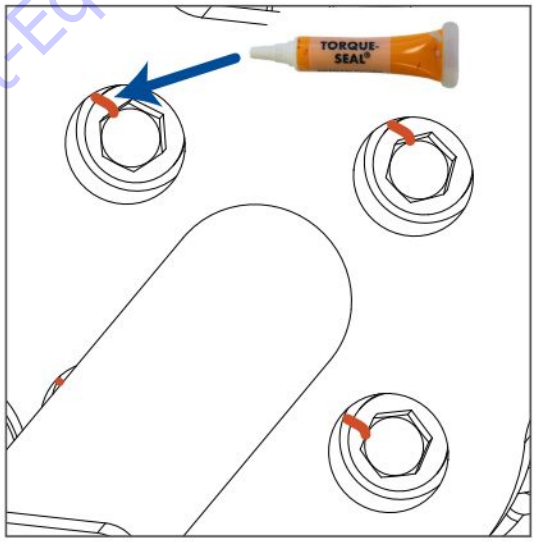


4. Repeat the inspection on the other axle arm. If the gap is smaller than 4.5 mm (front) or 5.2 mm (rear) between the disks of either arm (i.e. the gauge doesn't fit), the brake disks must be replaced on both arms.
5. Repeat the procedure on the opposite axle.

5.9-7 Oscillating Cylinder Bolt Replacement

If upon inspection it is determined that the oscillating cylinder bolts have missing or damaged torque seal, the affected bolts must be replaced. If replacing more than one bolt, do so one at a time to prevent the cylinder from shifting.

1. Remove the affected bolt.
2. Clean the cylinder's corresponding internal threaded hole thoroughly.
3. Replace the removed bolt with a new 0.5"-13 x 1.75" grade 8 bolt, applying liquid blue Loctite 242 or 243 to the bottom half of the bolts.
4. Hand tighten the bolt.
5. Torque the new bolt to 80 ft-lbs.
6. Apply a line of torque seal to each new bolt extending from the bolt head over the washer and to the chassis wall.

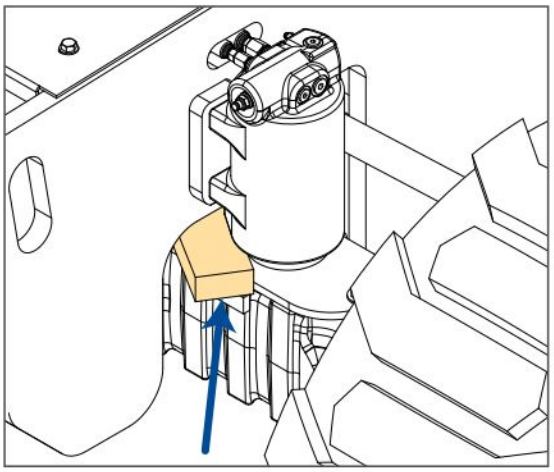


5.9-8 Oscillating Cylinder Replacement

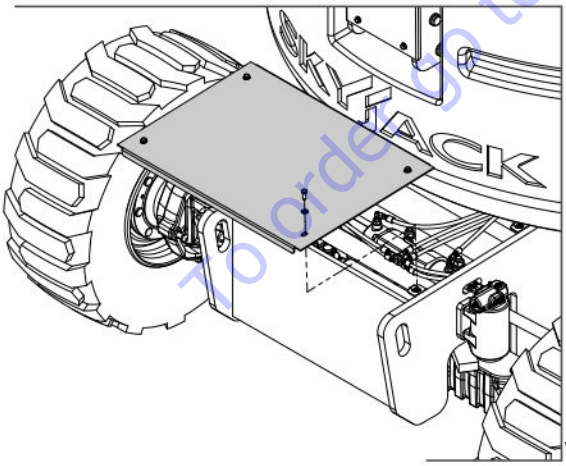
⚠ CAUTION

The oscillating axle cylinder weighs approximately 43 lbs (19.5 kg), so a second person to assist with the removal and replacement would be helpful.

1. Wedge a block of wood between the front axle and the chassis, to prevent the axle from oscillating during the procedure.

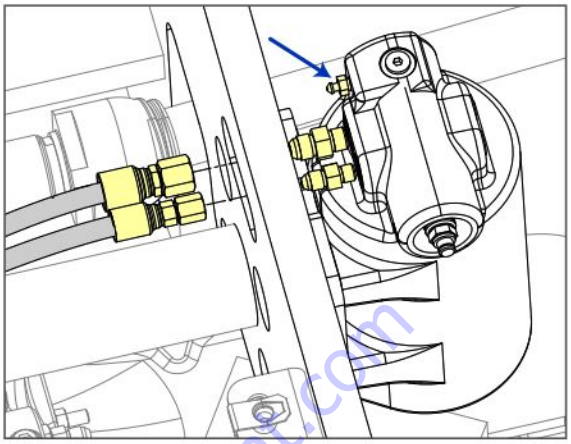


2. Remove and set aside the base cover from the oscillating axle end of the chassis.

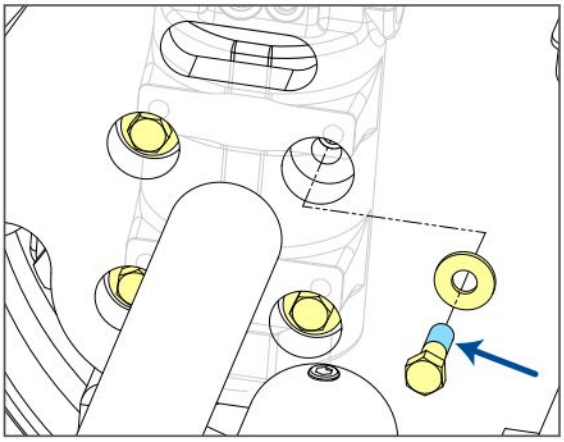


With a rag in hand to catch any leaking oil, slowly loosen the bleeder screw to release any trapped air within the cylinder, then tighten it again. Slowly loosen the oscillating axle cylinder hoses to release the pressure, then disconnect them fully, being sure to plug the hose ends.

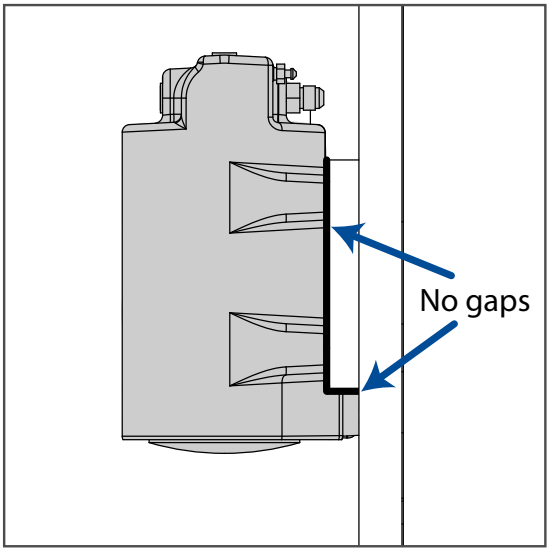
3. Remove and set aside the cylinder fittings, ensuring they stay clean.



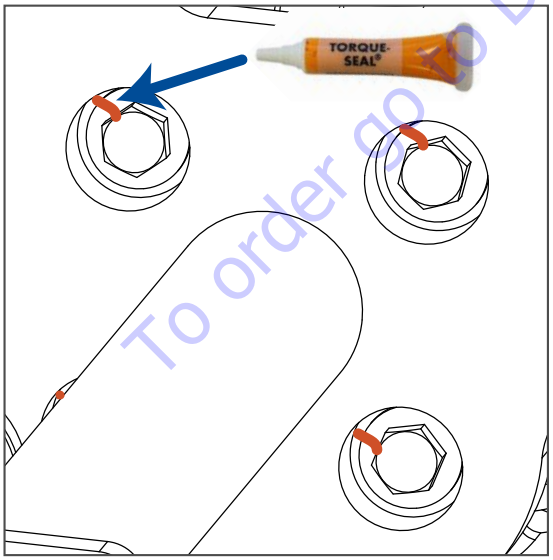
4. Remove and throw away the bolts and washers securing the cylinder to the chassis. Lift the cylinder away.
5. Lift a new cylinder into place and install new bolts (0.5”-13 x 1.75” grade 8) and 0.50” hardened washers, applying liquid blue Loctite 242 or 243 to the lower half of the bolts before installing them. Hand tighten the bolts.



6. Adjust the oscillating cylinder position until there is continuous contact between the cylinder mounting surface and the mounting plate, and between the mounting plate and the cylinder shoulder, with no gaps. Torque the bolts to 80 ft-lbs [108 Nm].



7. Apply a line of torque seal to each bolt extending from the bolt head over the washer and to the chassis wall.



8. Reinstall the cylinder fittings, torquing the larger one to 24 ft-lbs [33 Nm] and the smaller one to 15 ft-lbs [20 Nm].
9. Remove the plugs and reconnect the hoses to the cylinder fittings, torquing the larger hose end to 21 ft-lbs [28 Nm] and the smaller hose end to 12 ft-lbs [16 Nm].
10. Reinstall the base cover and remove the block of wood.
11. Turn the engine on and let it run for a few minutes to pressurize the cylinder, then turn it off again.
12. Check the oil level using the hydraulic tank sight gauge. Add more hydraulic oil if needed.
13. Bleed the cylinder (refer to the next procedure).

5.9-9 Bleed the 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.

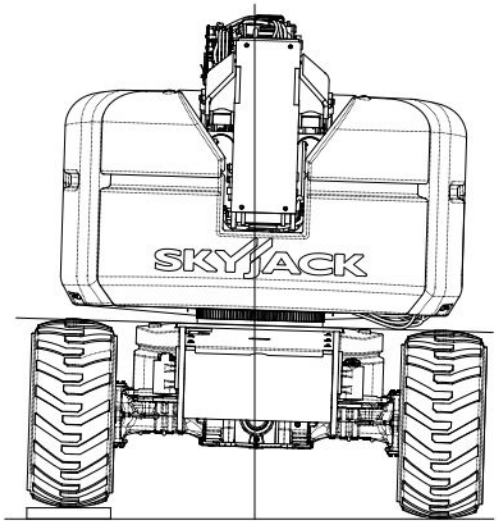
Items you will need before starting:

- oil container
- hose (to reach from bleeders to bucket)

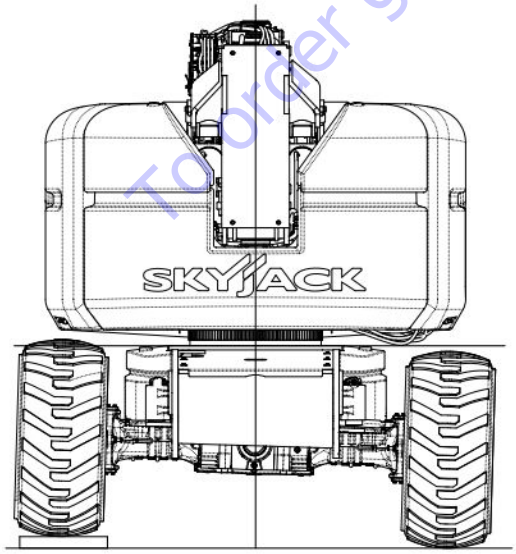
1. Locate a bleeder on either side of the oscillating axle cylinder.
2. Connect a hose to the bleeder nipple.
3. Start the engine and slowly open the bleeder to allow the oil to flow in a continuous stream.
4. Close the bleeder.
5. Repeat the procedure with the other oscillating axle cylinder.

5.9-10 Test the Oscillating Axle Cylinders

1. Extend the fly boom 1 ft (30) cm while on a firm, level surface.
   - **Result:** The steer axle should be locked.
2. Drive one of the steer tires up onto a 6” (15 cm) block or curb.
   - **Result:** An appropriate tilt of the MEWP chassis should occur.



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



5.10 Grease Points

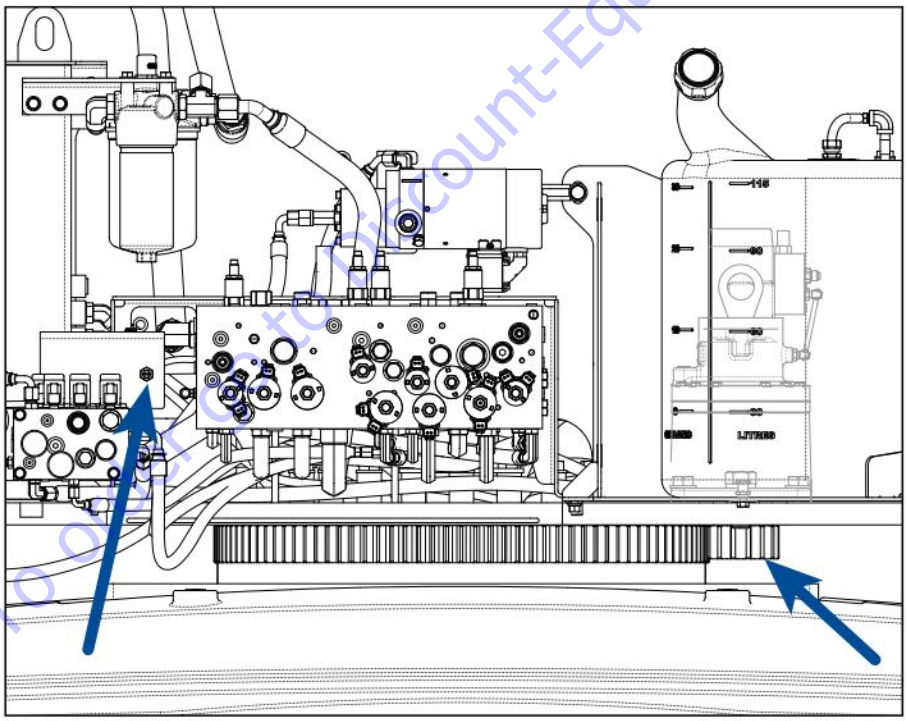
Maintaining proper lubrication is essential for good performance and service life of the MEWP. If the bearing and gear of the MEWP are improperly greased, it could result in component damage.

5.10-1 Grease the Turret Ring Gear

1. Open the control side cowling, and locate the turret ring gear grease fitting beside the hydraulic tank.
2. Pump grease into the fitting, and continue pumping until new lube appears continuously around the grease seal lip of the ring gear.
3. Rotate the turret in increments of 4 to 5 inches (10 to 13 cm) at a time, and repeat step 2 until the entire bearing has been greased.

5.10-2 Grease the Turret Swing Drive

1. Apply open gear lube to each tooth of the swing drive gear, located under the turret.

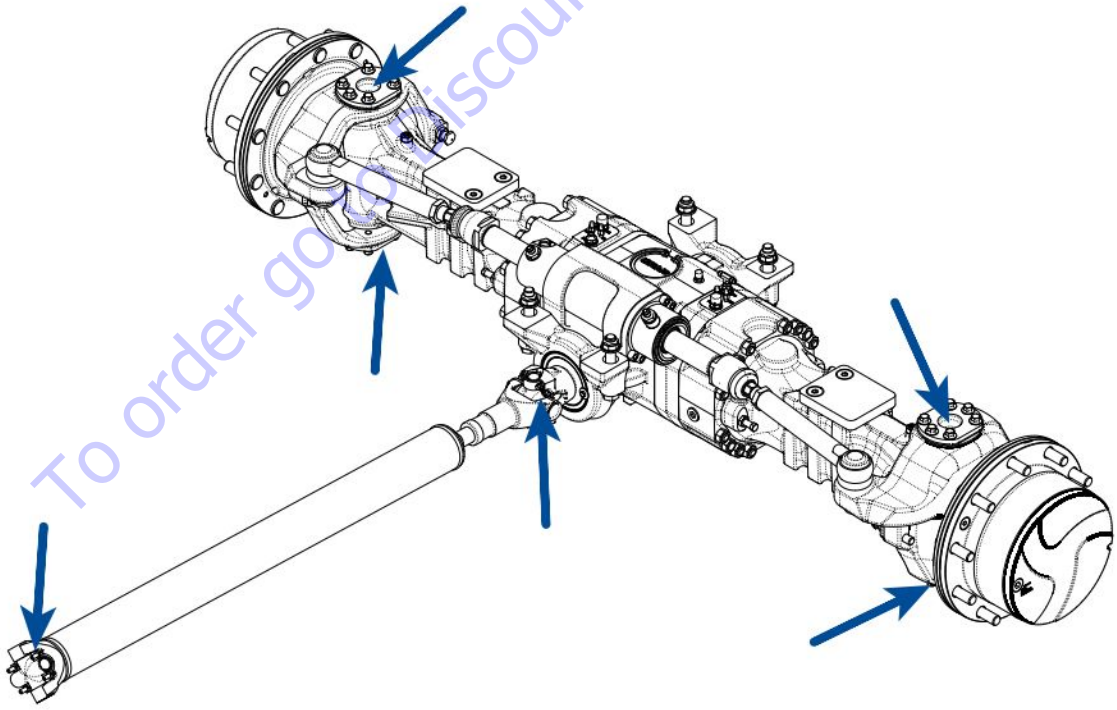


5.10-3 Grease the Axles

1. Open the axle cover plates and locate the grease fittings.
2. Pump grease into the grease fittings.

5.10-4 Grease the Drive Shaft

1. Locate the grease fittings on the drive shaft u-joints, and pump grease into the fittings.



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