

OPERATION MANUAL



WHITEMAN
MODEL PRX
RIDE-ON POWER FLOAT
(FORD 3.7L DUAL FUEL GAS/PROPANE ENGINE)

Revision #1 (01/05/21)



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PROPOSITION 65 WARNING



SILICOSIS/RESPIRATORY WARNINGS

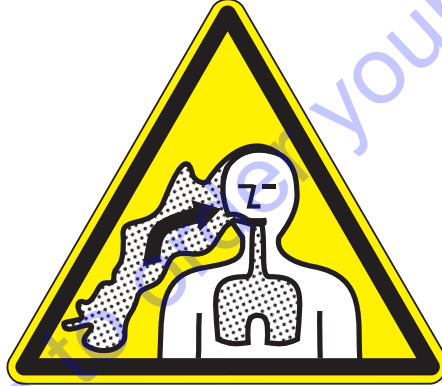
⚠ WARNING



SILICOSIS WARNING

Grinding/cutting/drilling of masonry, concrete, metal and other materials with silica in their composition may give off dust or mists containing crystalline silica. Silica is a basic component of sand, quartz, brick clay, granite and numerous other minerals and rocks. Repeated and/or substantial inhalation of airborne crystalline silica can cause serious or fatal respiratory diseases, including silicosis. In addition, California and some other authorities have listed respirable crystalline silica as a substance known to cause cancer. When cutting such materials, always follow the respiratory precautions mentioned above.

⚠ WARNING



RESPIRATORY HAZARDS

Grinding/cutting/drilling of masonry, concrete, metal and other materials can generate dust, mists and fumes containing chemicals known to cause serious or fatal injury or illness, such as respiratory disease, cancer, birth defects or other reproductive harm. If you are unfamiliar with the risks associated with the particular process and/or material being cut or the composition of the tool being used, review the material safety data sheet and/or consult your employer, the material manufacturer/supplier, governmental agencies such as OSHA and NIOSH and other sources on hazardous materials. California and some other authorities, for instance, have published lists of substances known to cause cancer, reproductive toxicity, or other harmful effects.

Control dust, mist and fumes at the source where possible. In this regard use good work practices and follow the recommendations of the manufacturers or suppliers, OSHA/NIOSH, and occupational and trade associations. Water should be used for dust suppression when wet cutting is feasible. When the hazards from inhalation of dust, mists and fumes cannot be eliminated, the operator and any bystanders should always wear a respirator approved by NIOSH/MSHA for the materials being used.

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PRX Ride-On Power Float

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NOTICE

Equipment specifications are subject to change without notice.

CHECKLISTS

Training Checklist			
No.	Description	OK?	Date
1	Read operation manual completely		
2	Machine layout, location of components, checking of coolant and hydraulic oil levels		
3	Fuel system, refueling procedure		
4	Operation of spray and lights		
5	Operation of controls (machine not running)		
6	Safety controls, safety stop switch operation		
7	Emergency stop procedures		
8	Startup of machine		
9	Maintaining a hover		
10	Maneuvering		
11	Concrete finishing techniques		
12	Shutdown of machine		
13	Lifting of machine (lift loops)		
14	Machine transport and storage		

Daily Pre-Operation Checklist		✓	✓	✓	✓	✓	✓
1	Engine oil level						
2	Engine coolant level						
3	Hydraulic oil level						
4	Drive system coolant level						
5	Fuel check						
6	Condition of pans						
7	Safety stop switch operation						
8	Steering control operation						

SAFETY INFORMATION

DO NOT operate or service the equipment before reading the entire manual. Safety precautions should be followed at all times when operating this equipment. Failure to read and understand the safety messages and operating instructions could result in injury to yourself and others.






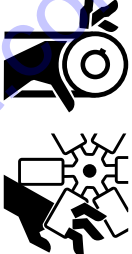


SAFETY MESSAGES

The four safety messages shown below will inform you about potential hazards that could injure you or others. The safety messages specifically address the level of exposure to the operator and are preceded by one of four words: **DANGER**, **WARNING**, **CAUTION** or **NOTICE**.

SAFETY SYMBOLS

 DANGER
Indicates a hazardous situation which, if not avoided, WILL result in DEATH or SERIOUS INJURY .
 WARNING
Indicates a hazardous situation which, if not avoided, COULD result in DEATH or SERIOUS INJURY .
 CAUTION
Indicates a hazardous situation which, if not avoided, COULD result in MINOR or MODERATE INJURY .
NOTICE
Addresses practices not related to personal injury.








Potential hazards associated with the operation of this equipment will be referenced with hazard symbols which may appear throughout this manual in conjunction with safety messages.





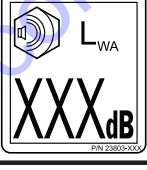





Symbol	Safety Hazard
	Lethal exhaust gas hazards
	Explosive fuel hazards
	Burn hazards
	Rotating parts hazards
	Pressurized fluid hazards
	Hydraulic fluid hazards

SAFETY INFORMATION

SAFETY DECALS

Decals associated with the safe operation of this equipment are defined below.

DECAL	DEFINITION
	DANGER Explosion Hazard Hot steam or coolant may escape when radiator cap is removed, causing severe burns . Allow radiator to cool before removing cap.
	DANGER Guard Hazard DO NOT operate equipment with guards removed. Serious bodily injury could result.
	DANGER Rotating Blade Hazard Keep hands, fingers, and feet clear of engine fan blades and guard rings. Moving parts can cut. DO NOT remove guards. Stop engine before servicing.
	DANGER Ask for Training This machine to be operated by qualified personnel only. Ask for training as needed.
	DANGER Inhalation Hazard DO NOT use this equipment in an enclosed area . The engine used with this equipment emits harmful levels of carbon monoxide which can cause severe bodily harm or even death!
 DANGER HIGH VOLTAGE <small>PIN 22047</small>	
DANGER High Voltage Hazard Maintenance service to be performed by a trained qualified electrician. Possibility of electrocution exists causing severe bodily harm or even death!	
 <small>PIN 34630</small>	
WARNING Fire, Smoking, Explosion, Inhalation Hazard DO NOT smoke or light matches near this equipment. This equipment contains highly flammable fuel. DO NOT use this equipment in an enclosed area.	

DECAL	DEFINITION
	WARNING Cancer and Reproductive Harm This equipment may contain or produce chemicals and substances known to cause cancer, birth defects and other reproductive harm. ALWAYS work in a well-ventilated area and ALWAYS wear approved safety equipment.
	NOTICE Read Manual To avoid injury you must read and understand operator's manual before using this machine.
	NOTICE Lifting Location Attach a suitable lifting device here to lift the unit.
	NOTICE Protective Clothing ALWAYS wear appropriate clothing when operating the trowel.
	NOISE LEVEL Indicates value of the sound power of the equipment measured at operator's seat. XXXdB <small>PIN 22039/204</small>
	NOTICE Tie-Down Location ALWAYS tie-down equipment with rope during transport. <small>PIN 42021</small>
	NOTICE Radio Noise This product complies with Canadian ICES-002. <small>THIS PRODUCT COMPLIES WITH CANADIAN ICES-002 CE PRODUIT EST CONFORME À LA NORME NMB-002 DU CANADA PIN 3254</small>
	UNLEADED GASOLINE The engine used in this equipment runs on unleaded gasoline .
	WARNING Lifting/Crush Hazard NEVER allow any person to stand underneath the trowel while lifting. ALWAYS make sure handle is securely attached.
	CAUTION Burn Hazard HOT PARTS can burn skin. DO NOT touch hot parts . Allow machine sufficient amount of time to cool before performing maintenance.

SAFETY INFORMATION


GENERAL SAFETY

CAUTION

- **NEVER** operate this equipment without proper protective clothing, shatterproof glasses, respiratory protection, hearing protection, steel-toed boots and other protective devices required by the job or city and state regulations.



- Avoid wearing jewelry or loose-fitting clothes that may snag on the controls or moving parts as this can cause serious injury.

- **NEVER** operate this equipment when on medication or when not feeling well due to fatigue or illness. 

- **NEVER** operate this equipment under the influence of drugs or alcohol.



- **ALWAYS** clear the work area of any debris, tools, etc. that would constitute a hazard while the equipment is in operation.

- No one other than the operator is to be in the working area when the equipment is in operation.

- **NEVER** use the equipment for any purpose other than its intended purposes or applications.

NOTICE

- This equipment should only be operated by trained and qualified personnel 18 years of age and older.

- Whenever necessary, replace nameplate, operation, and safety decals when they become difficult read.

- Manufacturer does not assume responsibility for any accident due to equipment modifications. Unauthorized equipment modification will void all warranties.

- **NEVER** use accessories or attachments that are not recommended by Multiquip for this equipment. Damage to the equipment and/or injury to the user may result.

- **ALWAYS** know the location of the nearest fire extinguisher.



- **ALWAYS** know the location of the nearest first aid kit.



- **ALWAYS** know the location of the nearest phone or **keep a phone on the job site**. Also, know the phone numbers of the nearest **ambulance, doctor and fire department**. This information will be invaluable in the case of an emergency.



SAFETY INFORMATION

POWER FLOAT SAFETY

DANGER

- Engine fuel exhaust gases contain poisonous carbon monoxide. This gas is colorless and odorless, and can cause **DEATH** if inhaled.
- The engine of this equipment requires an adequate free flow of cooling air. **NEVER** operate this equipment in any enclosed or narrow area where the free flow of air is restricted. If the air flow is restricted it will cause injury to people and property and serious damage to the equipment or engine.



- **NEVER** operate the equipment in an explosive atmosphere or near combustible materials. An explosion or fire could result causing **severe bodily harm or even death**.



WARNING

- **NEVER** use your hand to find hydraulic leaks. Use a piece of wood or cardboard. Hydraulic fluid injected into the skin must be treated by a knowledgeable physician immediately or **severe injury or death** can occur.
- **ALWAYS** keep clear of rotating or moving parts while operating the float.
- **NEVER** disconnect any **emergency or safety devices**. These devices are intended for operator safety. Disconnection of these devices can cause **severe injury, bodily harm or even death**. Disconnection of any of these devices will void all warranties.



CAUTION

- **NEVER** allow passengers or riders on the float during operation.
- **NEVER** lubricate components or attempt service on a running machine.
- **NEVER** place your feet or hands inside the guard rings while starting or operating this equipment.

NOTICE

- **ALWAYS** keep the machine in proper running condition.
- Fix damage to the machine and replace any broken parts immediately.
- **ALWAYS** store equipment properly when it is not being used. Equipment should be stored in a clean, dry location out of the reach of children and unauthorized personnel.
- A safety manual for operating and maintenance personnel of concrete power trowels produced by the Association of Equipment Manufacturers (AEM) can be obtained for a fee by ordering through their website at www.aem.org.

Order SKU PT-160

ENGINE SAFETY

WARNING

- **NEVER** place hands or fingers inside the engine compartment while the engine is running.
- **NEVER** operate the engine with heat shields or guards removed.
- Keep fingers, hands, hair and clothing away from all moving parts to prevent injury.
- **DO NOT** remove the radiator cap while the engine is hot. High-pressure boiling water will gush out of the radiator and severely scald any persons in the general area of the float.
- **DO NOT** remove the coolant drain plug while the engine is hot. Hot coolant will gush out of the coolant tank and severely scald any persons in the general area of the float.
- **DO NOT** remove the engine oil drain plug while the engine is hot. Hot oil will gush out of the oil tank and severely scald any persons in the general area of the float.



CAUTION

- **NEVER** touch the hot exhaust manifold, muffler or cylinder. Allow these parts to cool before servicing the equipment.



SAFETY INFORMATION

NOTICE

- **NEVER** run the engine without an air filter or with a dirty air filter. Severe engine damage may occur. Service the air filter frequently to prevent engine malfunction.
- **NEVER** tamper with the factory settings of the engine or engine governor. Damage to the engine or equipment can result if operating in speed ranges above the maximum allowable.



FUEL SAFETY (GASOLINE)

DANGER

- **NEVER** start the engine near spilled fuel or combustible fluids. Fuel is extremely flammable and its vapors can cause an **explosion** if ignited.
- **ALWAYS** refuel in a well-ventilated area, away from sparks and open flames.
- **ALWAYS** use extreme caution when working with **flammable** liquids.
- **DO NOT** fill the fuel tank while the engine is running or hot.
- **NEVER** overfill the fuel tank, as spilled fuel could ignite if it comes into contact with hot engine parts or sparks from the ignition system.
- Store fuel in appropriate containers, in well-ventilated areas and away from sparks and flames.
- **NEVER** use fuel as a cleaning agent.
- **NEVER** smoke around or near the equipment. **Fire or explosion** could result from fuel vapors or if fuel is spilled on a hot engine.



FUEL SAFETY (LPG/PROPANE)

DANGER

- **NEVER** fill the propane tank within 25 ft. (7.6 m) of buildings and line of adjoining structures that may be a source of ignition.
- Remove all combustible materials including dry grass and leaves within 25 ft. (7.6 m) of the LPG dispenser.
- Before filling, visually inspect the propane tank for dents, cracks or excessive corrosion.
- **DO NOT** fill the propane tank if it is damaged, corroded, displays leaks at fittings/valves, or contains foreign material.
- **DO NOT** fill the propane tank if pressure relief or fill valves are damaged.
- **ALWAYS** fill the propane tank in a well-ventilated area, away from sparks and open flames. Liquid propane gas is odorless and invisible.
- **DO NOT** fill the propane tank while the engine is running or hot.
- **NEVER** smoke around or near the equipment. **Fire or explosion** could result from gas vapors.
- Accumulation of liquid propane gas vapors may result in the development of an oxygen-deficient atmosphere which carries a risk of **asphyxiation**.
- **NEVER** enter a gas cloud area. This condition produces an oxygen-deficient atmosphere that could be **fatal**.



CAUTION

- **ALWAYS** use protective gloves when handling the propane tank. Liquid propane gas will cause cold burns if it comes into contact with skin.
- The eyes and body must be protected when handling all liquid propane gas products. **ALWAYS** wear protective safety glasses and clothing.
- Liquid propane gas is heavier than air. An underground or low-level leak might not be detected immediately.

SAFETY INFORMATION

BATTERY SAFETY

DANGER

- **DO NOT** drop the battery. There is a possibility that the battery will explode.
- **NEVER** expose the battery to open flames, sparks, cigarettes, etc. The battery contains combustible gases and liquids. If these gases or liquids come into contact with a flame or spark, an **explosion** could occur.



WARNING

- **ALWAYS** wear safety glasses when handling the battery to avoid eye irritation. The battery contains acids that can cause injury to the eyes and skin.
- Use well-insulated gloves when picking up the battery.
- **ALWAYS** keep the battery charged. If the battery is not charged, combustible gas will build up.
- **DO NOT** charge the battery if frozen. The battery can explode. When frozen, warm the battery to at least 61°F (16°C).
- **ALWAYS** recharge the battery in a well-ventilated environment to avoid the risk of a dangerous concentration of combustible gases.
- If the battery liquid (dilute sulfuric acid) comes into contact with **clothing or skin**, rinse skin or clothing immediately with plenty of water.
- If the battery liquid (dilute sulfuric acid) comes into contact with **eyes**, rinse eyes immediately with plenty of water and contact the nearest doctor or hospital to seek medical attention.



CAUTION

- **ALWAYS** disconnect the **NEGATIVE** battery terminal before performing service on the equipment.
- **ALWAYS** keep battery cables in good, working condition. Repair or replace all worn cables.

TRANSPORTING SAFETY

CAUTION

- **DO NOT** allow any person or animal to stand underneath the equipment while it is being lifted.
 - Ride-on trowels are very heavy and awkward to move around. Use proper heavy lifting procedures. **NEVER** attempt to lift the float by the guard rings.
 - **NEVER** lift the float with the operator on the machine.
- ### NOTICE
- Two lifting straps should have a minimum lifting capacity of 4,166 lb. (1,890 kg) and the lifting gear must be capable of lifting at least this amount.
 - Before lifting, make sure that the lift loops are not damaged.
 - **ALWAYS** make sure the crane or lifting device has been properly secured to the lift loops of the equipment.
 - **ALWAYS** shut down the engine before transporting.
 - **DO NOT** lift the equipment while the engine is running.
 - Tighten the fuel tank cap securely and close the fuel cock to prevent fuel from spilling.
 - **NEVER** lift the machine to unnecessary heights.
 - **ALWAYS** tie down equipment during transport by securing the equipment with straps. Inspect the straps to make sure they are not frayed or damaged.



TOWING SAFETY

CAUTION

- In addition to meeting Department of Transportation (DOT) safety towing regulations, **ALWAYS** check with your local, county or state safety towing regulations before towing the float.



SAFETY INFORMATION

ENVIRONMENTAL SAFETY/DECOMMISSIONING

NOTICE

Decommissioning is a controlled process used to safely retire a piece of equipment that is no longer serviceable. If the equipment poses an unacceptable and unrepairable safety risk due to wear or damage or is no longer cost effective to maintain (beyond life-cycle reliability) and is to be decommissioned (demolition and dismantlement), be sure to follow the rules below.

- **NEVER** pour waste or oil directly onto the ground, down a drain, or into any water source.
- Contact your country's Department of Public Works or a recycling agency in your area and arrange for proper disposal of any electrical components, waste, or oil associated with this equipment.
- When the life cycle of this equipment is over, remove the battery and bring it to an appropriate facility for lead reclamation. Use safety precautions when handling batteries that contain sulfuric acid.
- When the life cycle of this equipment is over, it is recommended that the frame and all other metal parts be sent to a recycling center.



Metal recycling involves the collection of metal from discarded products and its transformation into raw materials to use in the manufacturing of new products.

Recyclers and manufacturers alike promote the process of recycling metal. Using a metal recycling center promotes energy cost savings.

EMISSIONS INFORMATION (GASOLINE)

NOTICE

The engine used in this equipment is a dual fuel engine (gasoline/LPG). The gasoline side of the engine has been designed to reduce harmful levels of carbon monoxide (CO), hydrocarbons (HC) and nitrogen oxides (NOx) contained in gasoline exhaust emissions.

This engine has been certified to meet US EPA evaporative emissions requirements in the installed configuration.

Attempts to modify or make adjustments to the engine emission system by unauthorized personnel without proper training could damage the equipment or create an unsafe condition.

Additionally, modifying the fuel system may adversely affect evaporative emissions, resulting in fines or other penalties.

EMISSIONS INFORMATION (LPG)

NOTICE

The LPG (propane) side of the engine used in this equipment uses components that meet US EPA Phase 3 and CARB Large Spark Ignited (LSI) emission regulations.

Any modifications to the fuel system or any adjustments made to the engine will cause the engine to be in **non-compliance** with emission regulations.

Emission Control Label

The emission control label is an integral part of the emission system and is strictly regulated.

The label must remain with the engine for its entire life.

If a replacement emission label is needed, please contact your authorized engine distributor.

LIFTING AND TRANSPORTING

WORK SAFELY!

⚠ WARNING



Failure to comply with these lifting instructions may result in **slings failure** and **severe personal injury or death**.

Only **qualified personnel** with proper training should perform this procedure. Follow all rigging and lifting safety rules when performing this procedure.

LIFTING SAFETY

⚠ CAUTION

- **NEVER** allow any person to stand underneath the equipment while lifting.
- Ride-on trowels are very heavy and awkward to move around. Use proper heavy lifting procedures and **DO NOT** attempt to lift the float by the guard rings.
- **NEVER** lift the float with the operator on the machine.

NOTICE

- Before lifting, make sure that the lift loops are not damaged.
- **ALWAYS** make sure any lifting device has been properly secured to the lift loops of the float.
- **DO NOT** lift the float to unnecessary heights.
- **ALWAYS** shut down the engine before transporting.
- Tighten the fuel tank cap securely and close the fuel cock to prevent fuel from spilling.

SLING INSPECTION

Inspect the lifting slings provided with your float (Figure 1) **before each use**. If replacement slings are needed, refer to the parts manual included with your float for part numbers, and order from your Multiquip parts dealer or importer.

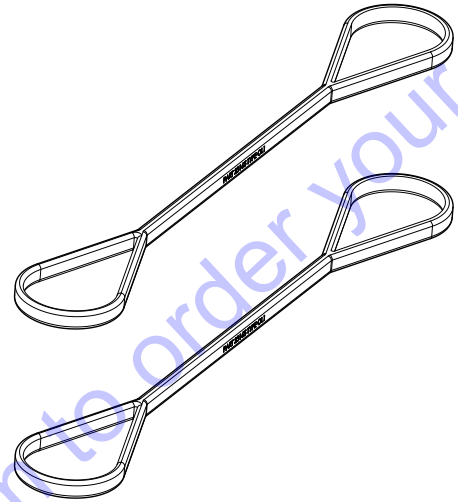
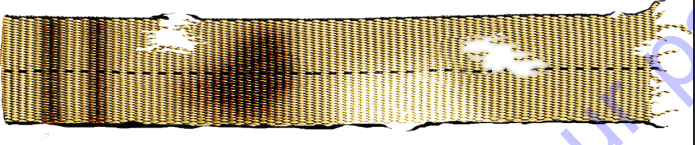

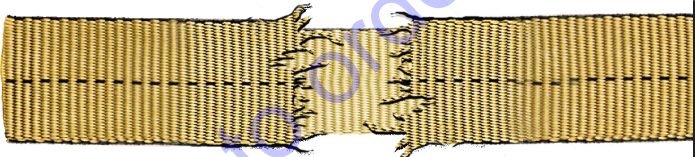
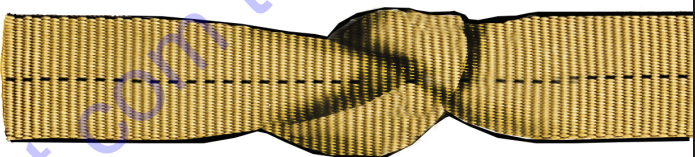


Figure 1. Lifting Slings

LIFTING AND TRANSPORTING

The Occupational Safety and Health Administration (OSHA) Regulation 29 CFR Part 1926.251 (e)(8)—*Removal from service* requires that the slings be inspected prior to each use, and **removed from service immediately** if any of the following conditions are found:

<ul style="list-style-type: none">■ Holes, tears, cuts, or snags■ Embedded particles■ Abrasive wear that exposes core fibers	
<ul style="list-style-type: none">■ Missing or unreadable Rated Capacity tags■ Melting, charring, weld spatter, or chemical burns	
<ul style="list-style-type: none">■ Broken or worn stitching that exposes the core fibers	
<ul style="list-style-type: none">■ Knots	
<ul style="list-style-type: none">■ Any other condition which may cause doubt as to the strength of the sling	

LIFTING AND TRANSPORTING

LIFTING PROCEDURE

The correct lifting slings (Figure 1) have been supplied with your float, in accordance to its weight per Occupational Safety and Health Administration (OSHA) Regulation 29 CFR Part 1926.251—*Rigging equipment for material handling*.

WARNING

ALWAYS inspect the lifting slings **before** each use.

NOTICE

MAKE SURE the forklift has adequate lifting capacity to lift the float.

The proper sling hitch method for connecting the lifting slings to the ride-on float is the **choker hitch**. The rated capacity of the slings for this method is indicated on the sling labels. **DO NOT** use any other type of sling hitch!

1. Secure the lifting slings to the lift loops (Figure 2) located to the left and right of the operator's seat.

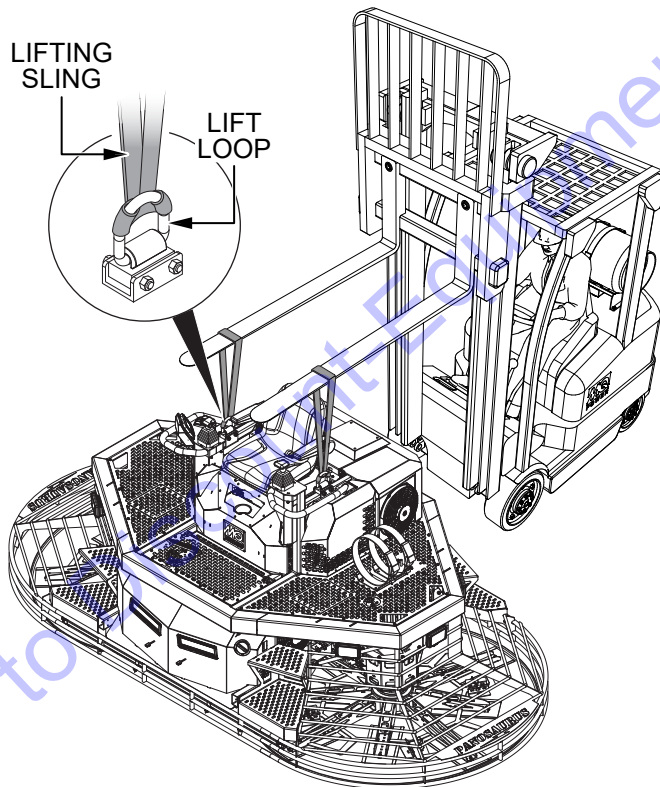


Figure 2. Lifting the Float

2. Insert forklift forks through the loops at the ends of the lifting slings (Figure 2). Keep the slings as close to vertical as possible.
3. If the choke angle (Figure 3) is 120 degrees or less, the lifting strength of the slings must be derated as shown in Table 1, in accordance with ASME Standard B30.9.

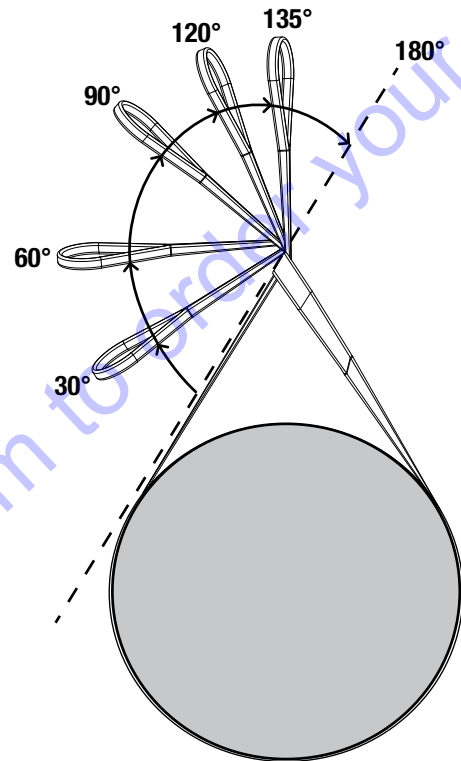


Figure 3. Choke Angle

Table 1. Choker Hitch Sling Capacity	
Choke Angle (°)	Rated Capacity (%)
Over 120	100
90–120	87
60–89	74
30–59	62
0–29	49

LIFTING AND TRANSPORTING

TRANSPORTING THE FLOAT

After the float has been lifted onto a flatbed truck, do the following:

1. Locate the tie-down symbols (Figure 4) on each side of the float.

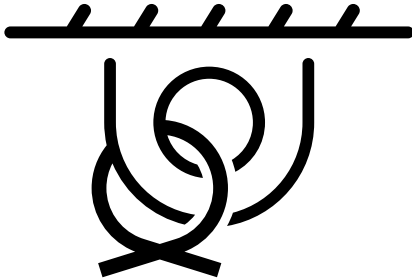


Figure 4. Tie-Down Symbol

2. Attach suitable tie-down straps to the locations marked by the tie-down symbols. Be sure to connect the tie-down strap hooks directly to the float as shown in Figure 5. **DO NOT** wrap the tie-downs around the frame as shown in Figure 6.

NOTICE

Use tie-downs with flat hooks or U-hooks only.

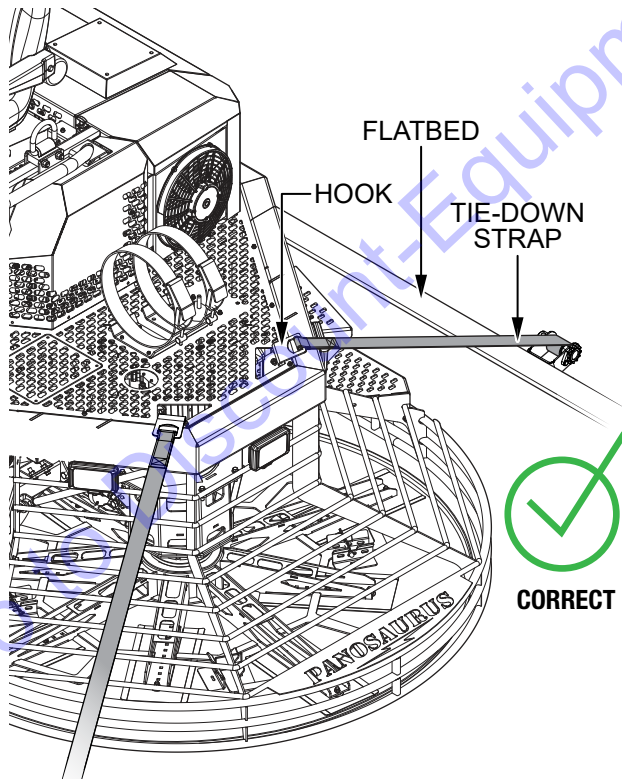


Figure 5. Tie-Down Method (Correct)

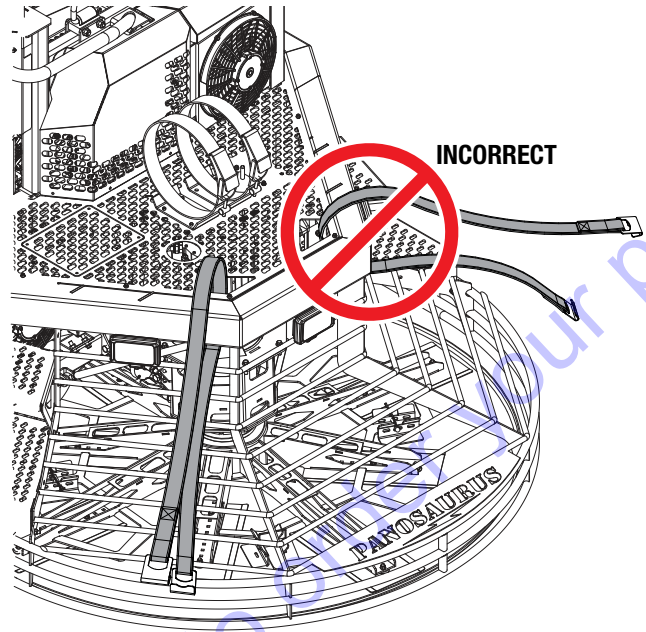


Figure 6. Tie-Down Method (Incorrect)

3. Secure the float to a flatbed (Figure 5) with the tie-down straps, making sure they are properly tied to prevent movement of the float during transport.

SPECIFICATIONS

Table 2. PRX Float Specifications

Operating Weight	4,166 lb. (1,890 kg)	
Dry Weight	3,750 lb. (1,701 kg)	
Rotors	2	
Rotor Diameter	70 in.	
Rotor Speed	0–100 rpm	
Legs per Rotor	8	
Path Width	146 in. (3,708 mm)	
Hydraulic Oil Capacity	Reservoir	0.45 gal. (1.70 liters)
	Full System	3.5 gal. (13.2 liters)
Drive System Coolant Capacity	Reservoir	4 qt. (3.8 liters)
	Full System	3 gal. (11.4 liters)
Drive System Coolant Type	Prediluted 50/50 GM Dex-Cool specification GM6277M or equivalent	

Table 3. Ford Engine Specifications

Model	Ford Power Products CSG-637	
Type	3.7-liter, liquid-cooled	
Cylinders	6	
Displacement	225.7 CID (3,699 cm ³)	
Compression Ratio	10.5:1	
Bore x Stroke	3.7 x 3.4 in. (94 x 86 mm)	
Maximum Output	Gasoline	107 hp (80 kW @ 3,200 rpm)
	Propane	118 hp (88 kW @ 3,200 rpm)
Oil Capacity with Filter	6.0 qt. (5.7 liters)	
Engine Oil Type	Motorcraft SAE 5W-20 Premium Synthetic Blend Motor Oil	
Engine Coolant Type	Prediluted 50/50 GM Dex-Cool specification GM6277M or equivalent	
Spark Plug Type	12405	
Spark Plug Gap	0.049–0.053 in. (1.25–1.35 mm)	
Gasoline	Type	87 or 89 octane unleaded
	Capacity	35 gallons (132 liters)
Propane	Type	HD-5
	Capacity	33.5 lb. (15.2 kg/36.3 liters)

Table 4. PRX Noise and Vibration Emissions

Guaranteed ISO 11201:2010 Based Sound Pressure Level at Operator Station in dB(A)	91
Guaranteed ISO 3744:2010 Based Sound Power Level in dB(A)	127
Whole Body Vibration per ISO 2631-1:1997 in m/s ² $\Sigma A(8)$	0

NOTES:

1. Sound pressure and power levels are "A" weighted measures per ISO 226:2003 (ANSI S1.4-1981). They are measured using operating conditions of the machine which generate the most repeatable but highest values of the sound levels. Under normal circumstances, the sound level will vary depending on the condition of the material being worked upon.
2. The vibration level indicated is the vector sum of the RMS (root mean square) values of amplitudes on each axis, standardized to an 8-hour exposure period, and obtained using operating conditions of the machine that generate the most repeatable but highest values in accordance with the applicable standards for the machine.
3. Per EU Directive 2002/44/EC, the daily exposure action value for whole body vibration is 0.5 m/s² $\Sigma A(8)$. The daily exposure limit value is 1.15 m/s² $\Sigma A(8)$.

DIMENSIONS

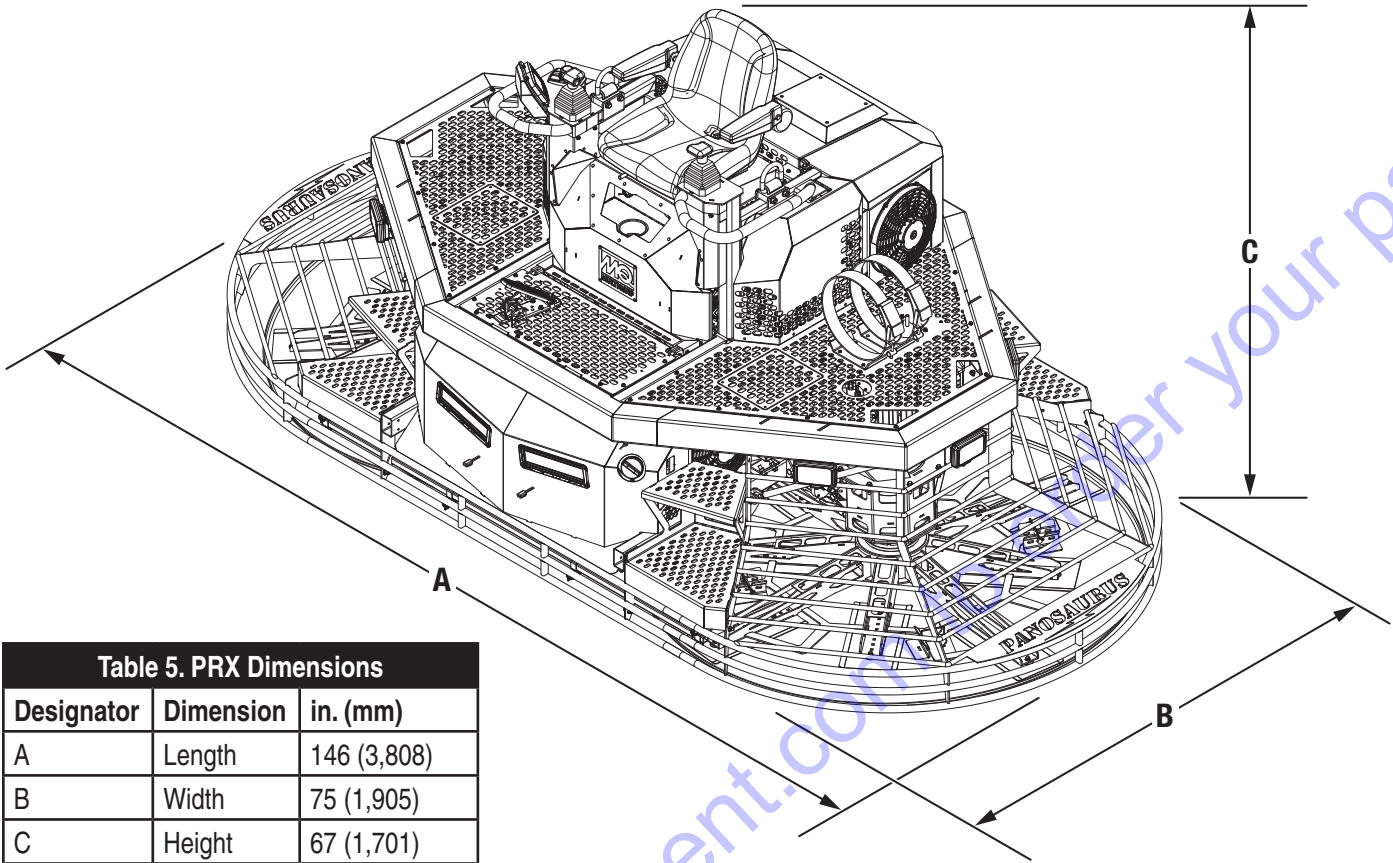


Table 5. PRX Dimensions		
Designator	Dimension	in. (mm)
A	Length	146 (3,808)
B	Width	75 (1,905)
C	Height	67 (1,701)

Figure 7. PRX Dimensions

INTENDED USE

Operate the PRX ride-on power float, tools, and components in accordance with the manufacturer's instructions. Use of any other tools for stated operation is considered contrary to designated use. The risk of such use lies entirely with the user. The manufacturer cannot be held liable for damages as a result of misuse.

SAFE OPERATION

Read all safety information carefully. Safety instructions will be found throughout this manual and on the machine. Keep all safety information in good, readable condition. Operators should be well trained on the operation and maintenance of the float.

TRAINING

For proper training, please use the *Training Checklist* form located in the front of this manual. This checklist will provide an outline for an experienced operator to provide training to a new operator.

FAMILIARIZATION

The PRX ride-on power float is designed for the floating of concrete slabs.

Walk around the float and take note of the major components—engine, float pans, air cleaner, fuel system, fuel shut-off valve, ignition switch, etc. Make sure there is always a proper level of lubricating oil in the engine and hydraulic oil in the hydraulic oil reservoir.

Before using your power float, test it on a flat, watered-down section of finished concrete. This test run will familiarize you with the float's controls and will increase your confidence in operating the float. You will learn how the float handles under actual operating conditions. Refer to the *Operation* section of this manual for more information.

ENGINE

The PRX is equipped with a Ford CSG-637 dual-fuel engine which operates on either unleaded gasoline or propane (LPG). Refer to the engine owner's manual for specific instructions regarding engine operation and maintenance.

DUAL FUEL SYSTEM

An optional propane (LPG) tank is available for use with the PRX. Using the digital control panel, an operator can switch between gas and propane fuel systems without interrupting operation.

DIGITAL CONTROLS

The PRX is equipped with a digital control panel and display that communicates with the Engine Control Unit (ECU) using the SAE J1939 Controller Area Network (CAN) bus protocol.

FLOAT PANS

The PRX is equipped with eight legs per rotor, equally spaced in a radial pattern, to which 70-inch float pans are attached. The float pans flatten concrete as they are rotated across the surface.

ELECTRIC DRIVE SYSTEM

The PRX is equipped with a unique electric drive and cooling system. See *How It Works* on the next page for more information.

GENERAL INFORMATION

HOW IT WORKS

Drive System Overview

The PRX is powered by a Ford Power Products CSG-637 V6 gasoline/propane engine (Figure 8A). This engine is coupled to a permanent magnet, synchronous, 3-phase, liquid-cooled generator (Figure 8J). The generated power is then rectified to 380 VDC and actively regulated by a generator controller (Figure 8K).

The DC lines from the generator controller are fed into a capacitor bank (Figure 8H) consisting of six 4,700 μ F capacitors. The capacitors help regulate bus voltage and stabilize abrupt load changes by absorbing back-EMF and providing boost current as required. The DC bus then branches out to two motor controllers (Figure 8B).

The motor controllers invert back to 3-phase AC and control the speed of two permanent magnet, synchronous, 3-phase, liquid-cooled drive motors (Figure 8E) through a variable-duty-cycle phase control signal.

The drive motors are then coupled to planetary reduction gearboxes (Figure 8G) which are, in turn, attached to twin 70-inch rotors (Figure 8F).

See Figure 9 for a block diagram of the electric drive system.

Electric Drive Cooling System

The electronics are cooled using a CANbus-controlled water pump (Figure 8D) running a 50/50 water glycol mix as a medium. There are three parallel cooling loops supplied by the pump that are plumbed through two heat exchangers (Figure 8C) in series. Each loop is dedicated to a single motor or generator and its mating controller.

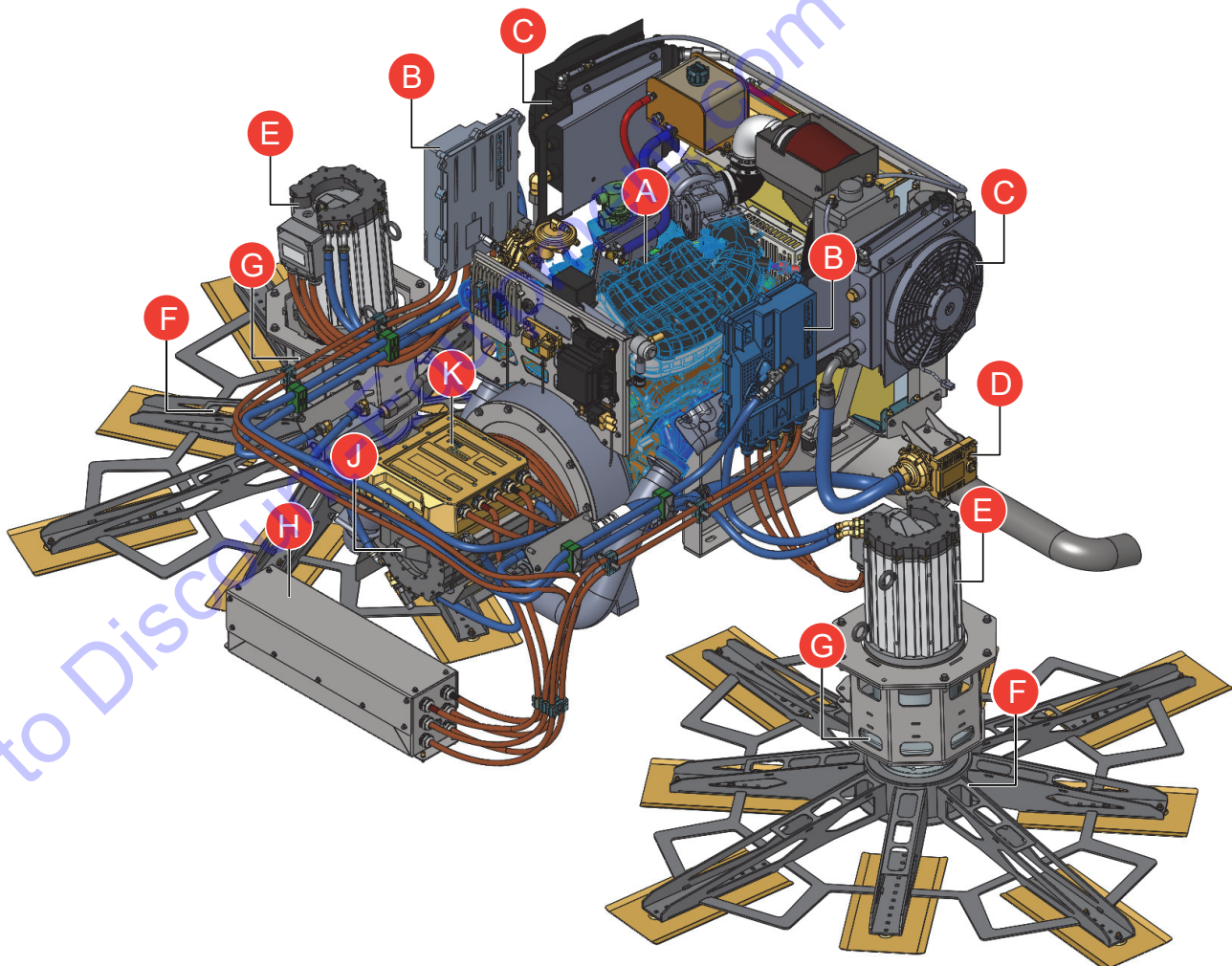


Figure 8. PRX Electric Drive System

GENERAL INFORMATION

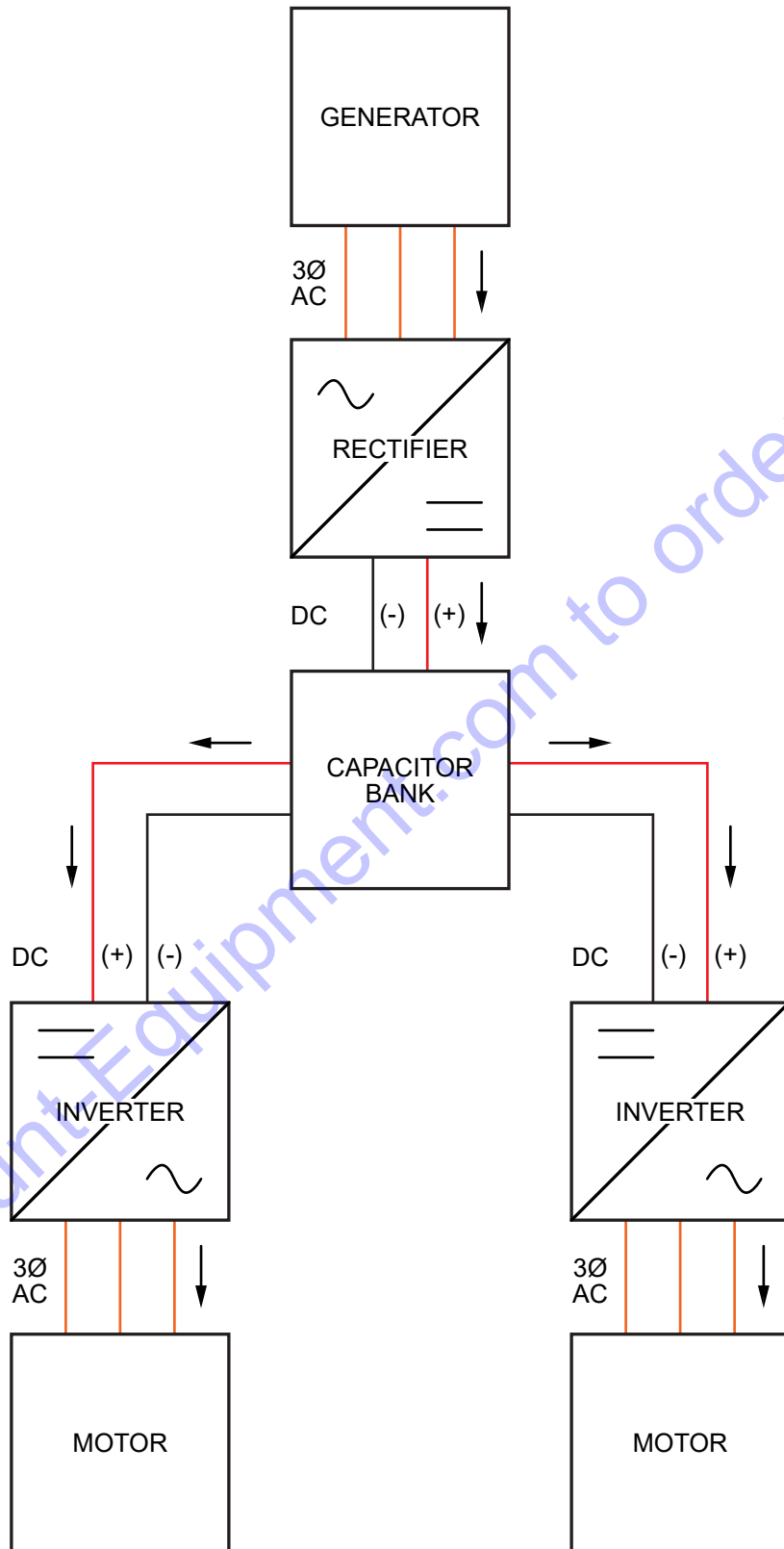


Figure 9. PRX Electric Drive System
(Block Diagram)

GENERAL INFORMATION

Hydraulic System

The hydraulic system serves two functions:

- The hydraulics provide the steering for the float in the same manner and function as all Whiteman Hydrostatic Riders. However, two additional steering cylinders have been added to assist fore-aft movement. The steering pressure setting is also now adjustable from the operator's position in real time to fine-tune control and maneuverability.
- The hydraulic fluid flushes the planetary gearboxes, providing active cooling and particulate filtration.

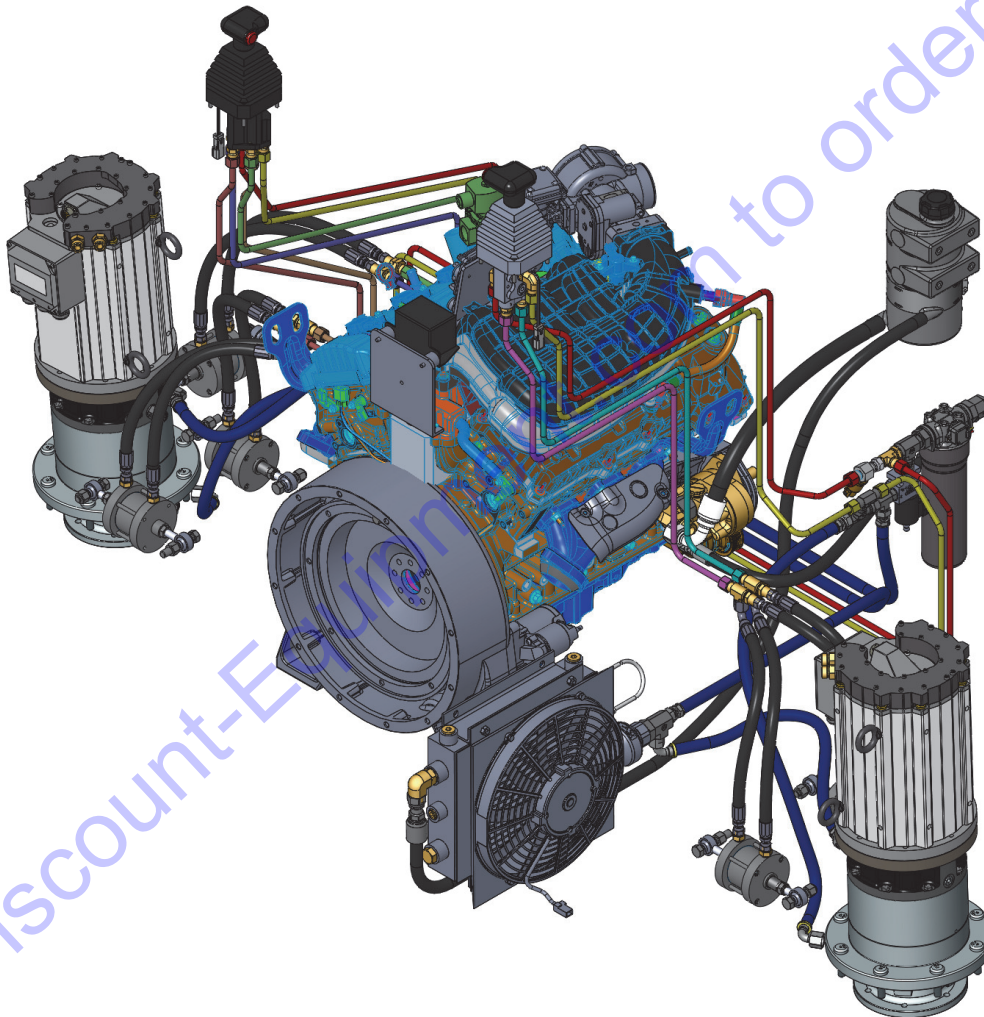


Figure 10. PRX Hydraulic System

COMPONENTS (FLOAT)

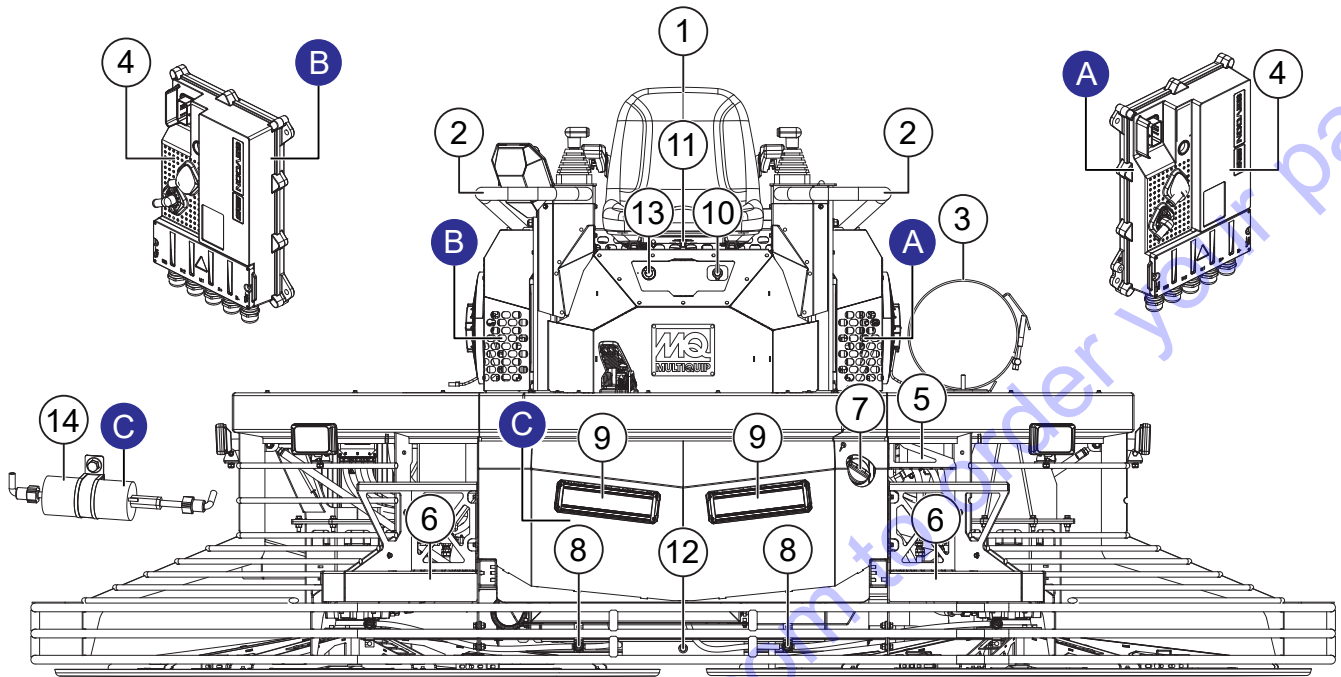


Figure 11. PRX Components

- 1. Operator's Seat** — Adjustable operator's seat tilts forward for service access.
- 2. Grab Bars (2)** — Always use a grab bar to lift yourself onto the float.
- 3. Propane Tank Bracket** — Includes straps with latches to secure the optional propane tank to the frame.
- 4. Motor Controllers (2)** — Two inverters convert direct current (DC) from the capacitor bank into alternating current (AC) to power the drive motors.
- 5. Battery** — Provides +12 VDC to the electrical system.
- 6. Steps (Front)** — Use the steps to board and deboard the float.
- 7. Fuel Filler Cap** — Remove the fuel filler cap to add unleaded gasoline to the fuel tank. Use 87 or 89 octane gasoline only.
- 8. Retardant Spray Nozzles (2)** — Actuated by the buttons on the steering control handles, the spray nozzles deliver uniform coverage of retardant over the slab surface.
- 9. Headlamps (2)** — Front-facing, 30-watt, LED bar lights provide illumination for indoor or nighttime finishing.
- 10. Accessory Port** — Dual USB port for personal electronic devices. Maximum current per port is 2.1 amps.
- 11. Seat Switch** — Safety feature stops pan rotation when the operator leaves the seat. The rotors will not turn and engine speed will not rise above idle unless the operator is seated.
- 12. Fuel Tank (Gasoline)** — Holds 35 gallons (132 liters) of unleaded gasoline. Use 87 or 89 octane gasoline only.
- 13. Service Port** — Connect the Whiteman Service Tool (WST) here to install and update software and to perform adjustments and calibrations.
- 14. Fuel Pump** — Delivers gasoline fuel to the engine.

COMPONENTS (FLOAT)

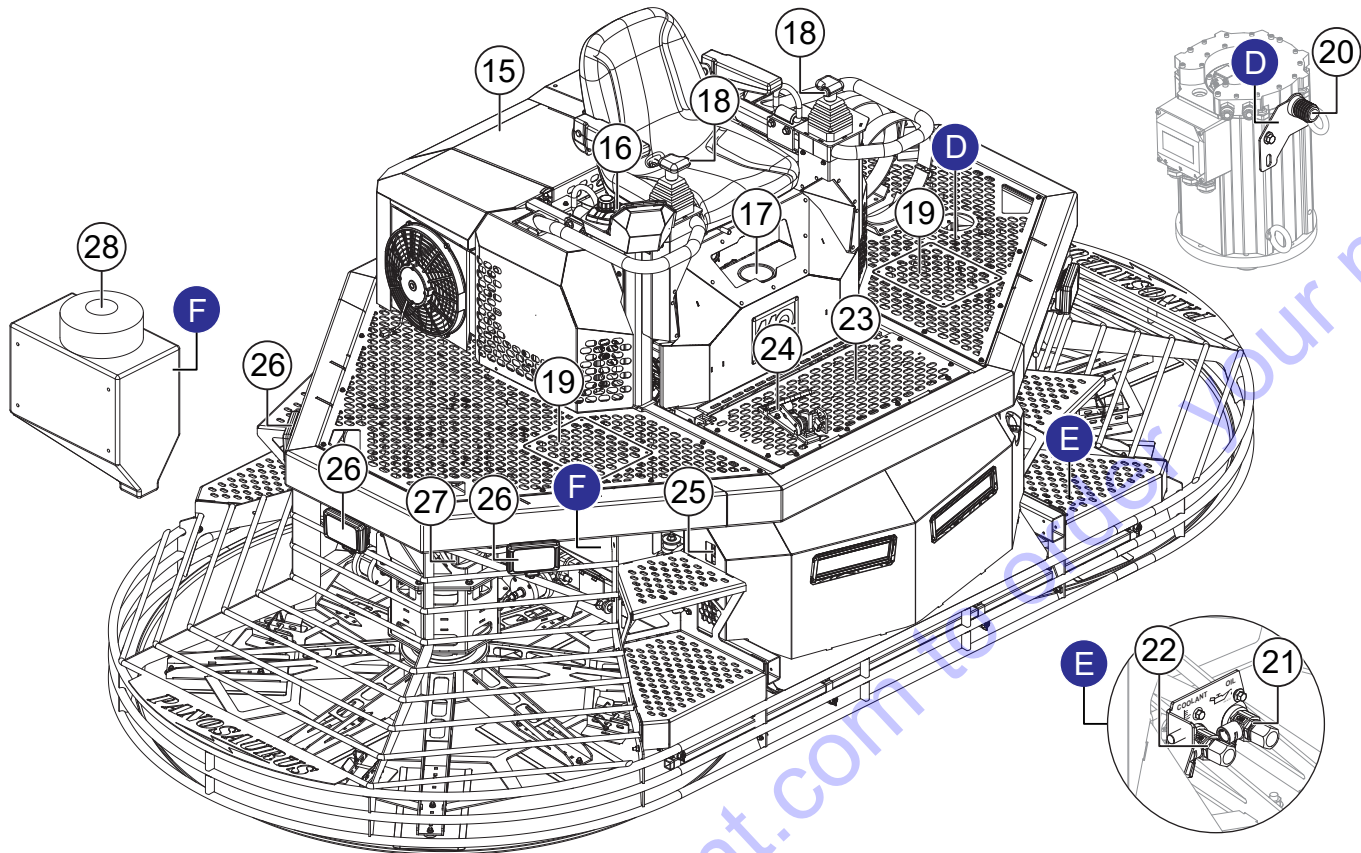


Figure 12. PRX Components (Continued)

15. **Hood** — Open the hood to access the engine compartment.
16. **Control Panel** — Includes controls for engine speed, rotor speed, fuel selection, lights, and more. Refer to the **Components (Control Panel)** and **Operation** sections for more information.
17. **Cup Holder** — Stainless steel cup holder.
18. **Retardant Spray Control Buttons (2)** — Located on the steering control handles, these buttons control the flow of retardant spray through the two spray nozzles at the front of the float.
19. **Deck Access Panels (2)** — Remove for service access.
20. **LPG Line Stow** — Connect the LPG line to this fitting when removing the propane tank.
21. **Engine Oil Drain Valve** — Open the valve to drain the engine oil.
22. **Drive System Coolant Drain Valve** — Open the valve to drain the electric drive system coolant (water glycol).
23. **Foot Platform** — Spacious platform provides easy access to the operator's seat and service areas.
24. **Foot Pedal** — Controls rotor speed. Slightly depress the foot pedal for minimal rotor speed. Fully depress the foot pedal for maximum rotor speed.
25. **Drive Bypass Switch (Right Side)** — Use either drive bypass switch to jog the rotors while lifting the float from a concrete pad to prevent surface marring. Refer to the **Operation** section for more information.
26. **Right-Side Lights (3)** — 20-watt LED lights provide illumination for indoor or nighttime finishing.
27. **Drive Motor (Right Side)** — This permanent magnet, synchronous, 3-phase, liquid-cooled electric motor drives the right-side rotor assembly.
28. **Retardant Tank** — Remove the filler cap to add retardant to the tank. Holds up to 3 gallons (11.4 liters) of retardant.

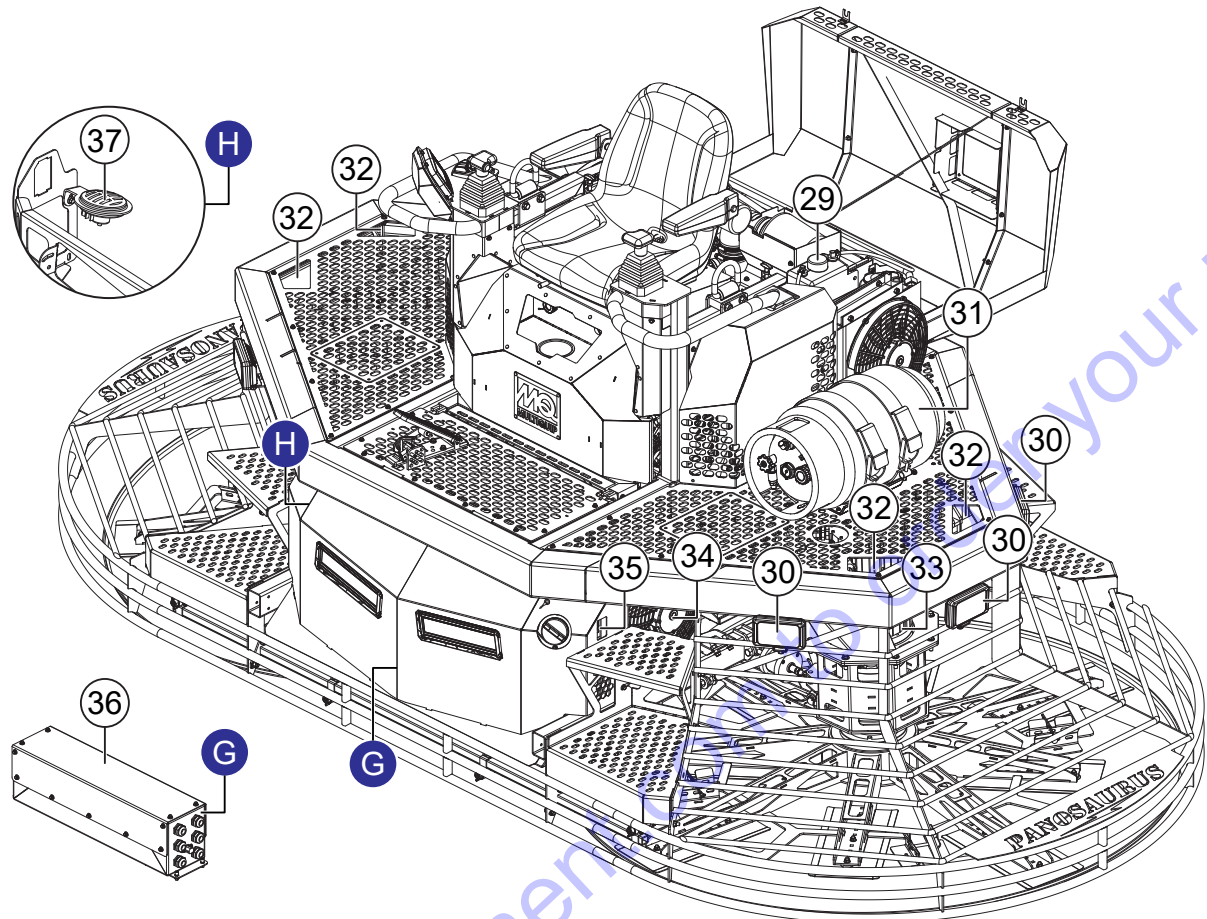


Figure 13. PRX Components (Continued)

- 29. **Coolant Bottle** — Contains the water glycol that cools the electric drive system. Holds up to 4 quarts (3.79 liters) of coolant. Includes a float level switch so that the user is notified on the digital display when coolant is low. Use only prediluted 50/50 antifreeze/coolant which meets the requirements of GM Dex-Cool specification GM6277M.
- 30. **Left-Side Lights (3)** — 20-watt LED lights provide illumination for indoor or nighttime finishing.
- 31. **Propane Tank (Optional)** — Holds up to 33.5 lb. (36.3 liters) of propane (LPG). Use HD-5 propane only.
- 32. **Tie-Down Locations (4)** — Secure tie-down straps to these attachment points when transporting the float.
- 33. **Drive Motor (Left Side)** — This permanent magnet, synchronous, 3-phase, liquid-cooled electric motor drives the left-side rotor assembly.
- 34. **Hydraulic Cooler (Steering System)** — A single heat exchanger with a serviceable magnetic filter maintains hydraulic oil temperature.
- 35. **Drive Bypass Switch (Left Side)** — Use either drive bypass switch to jog the rotors while lifting the float from a concrete pad to prevent surface marring. Refer to the *Operation* section for more information.
- 36. **Energy Storage Bank** — 380-volt capacitor bank stores and balances energy from the generator controller and sends it to the motor controllers.
- 37. **Horn** — Sounds when the horn button on the control panel is pressed.

! DANGER

HIGH VOLTAGE! There is a risk of electrical shock from energy stored in capacitors. **DO NOT** attempt to open or perform maintenance on the energy storage bank. Contact the MQ Service Dept. for assistance.

COMPONENTS (FLOAT)

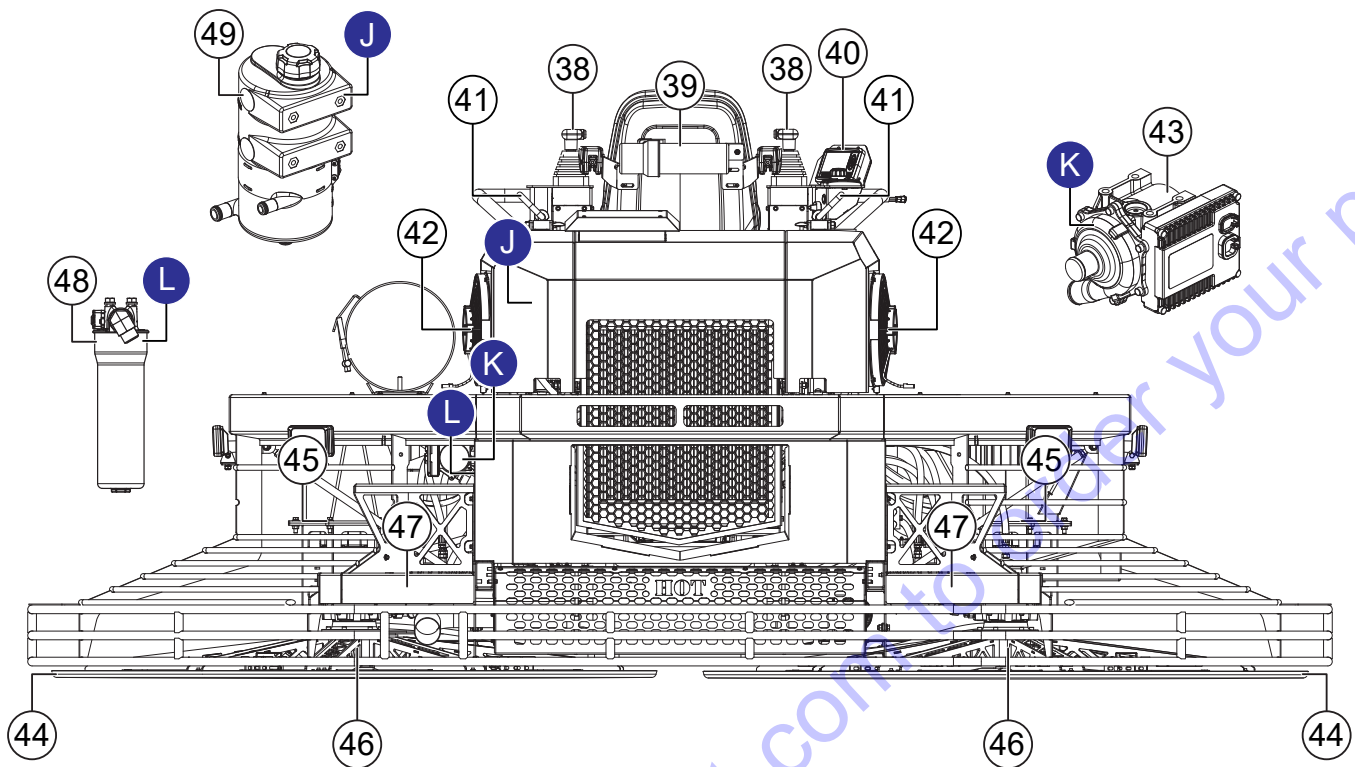


Figure 14. PRX Components (Continued)

- 38. **Steering Control Handles (2)** — Located to the left and right of the operator, these dual palm-grip joysticks are linked to five hydraulic steering cylinders. Refer to the **Operation** section to learn more about steering.
- 39. **Documentation Holder** — Storage for float and engine manuals.
- 40. **Digital Display** — 3.5-inch LCD color display provides machine and engine information at a glance. Refer to the **Components (Control Panel)**, **Operation**, and **Troubleshooting** sections for more information.
- 41. **Lift Loops (2)** — Attach lifting slings here to lift the float. Refer to the **Lifting and Transporting** section for more information.
- 42. **Heat Exchangers (Drive System)** — Twin heat exchangers maintain the temperature of the water glycol that cools the electric drive system.
- 43. **Coolant Pump** — Circulates the water glycol that cools the electric drive system.
- 44. **Float Pans (2)** — 70-inch float pans attach to the rotors.
- 45. **Gearboxes (2)** — Planetary reduction gearboxes connect the electric drive motors to the rotors.
- 46. **Rotors/Spiders (2)** — Each rotor consists of an eight-legged spider assembly to which a 70-inch float pan is attached.
- 47. **Steps (Rear)** — Use the steps to board and deboard the float.
- 48. **Hydraulic Filter** — Filters hydraulic oil contaminants. Equipped with 10-micron absolute synthetic filter media.
- 49. **Hydraulic Oil Reservoir** — Contains up to 0.45 gallons (1.70 liters) of hydraulic oil. Includes a float level switch so that the user is notified on the digital display when the hydraulic oil level is low.

COMPONENTS (ENGINE)

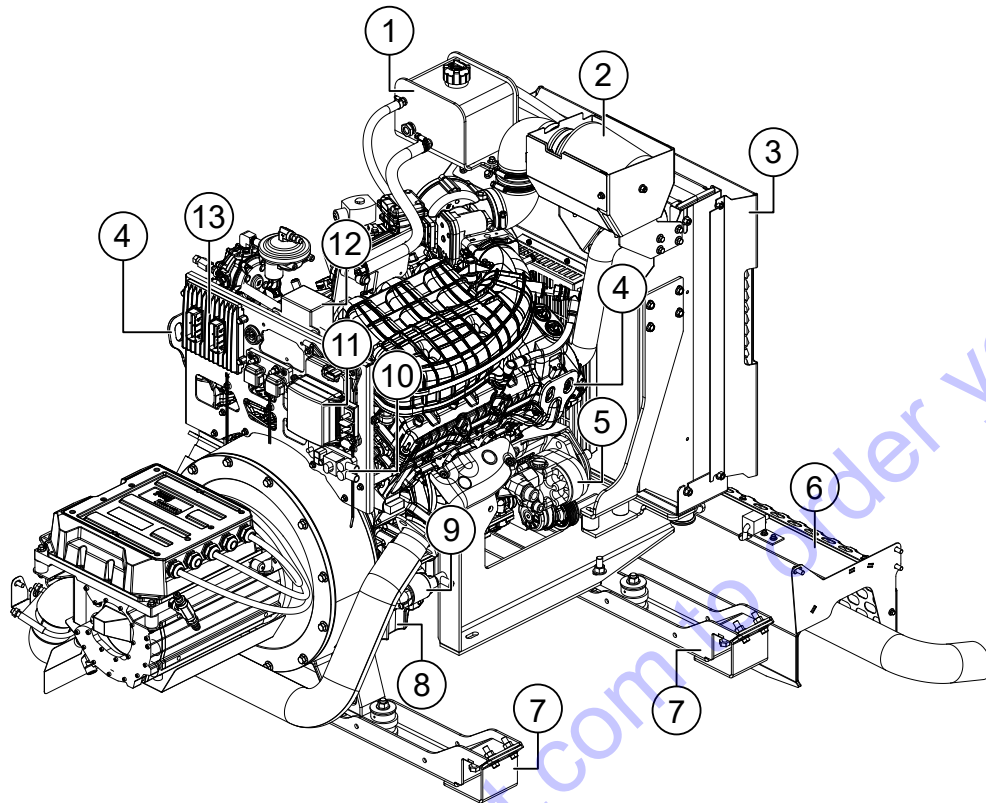


Figure 15. Ford Engine Components

1. **Radiator Degas Tank** — Provides for thermal expansion and venting of engine coolant. Remove the filler cap to add engine coolant.
2. **Air Cleaner** — Prevents dirt and debris from entering the engine cylinders.
3. **Radiator** — Holds coolant (water/antifreeze mixture) which keeps the engine at a safe operating temperature.
4. **Lifting Eye (2)** — Use these attachment points when the engine must be lifted for service. Located on either side of the engine.
5. **Hydraulic Pump** — Circulates the steering system hydraulic oil.
6. **Heat Shield** — Prevents contact with the hot muffler.
7. **Engine Mounting Bracket (2)** — Mounting brackets with rubber isolators secure the engine to the frame.
8. **Oil Pan** — Holds a maximum of 6 quarts (5.7 liters) of engine oil.
9. **Starter** — Starts the engine when the ignition key is rotated to the **START** position.
10. **Power Relay Module** — Contains main system fuses.
11. **Machine Fuse and Relay Box** — Contains fuses and relays for machine control.
12. **Engine Fuse and Relay Box** — Contains fuses and relays for engine control.
13. **Machine Control Unit (MCU)** — Connects to machine sensors, switches, actuators, fuse box, engine and display to control the machine.

COMPONENTS (ENGINE)

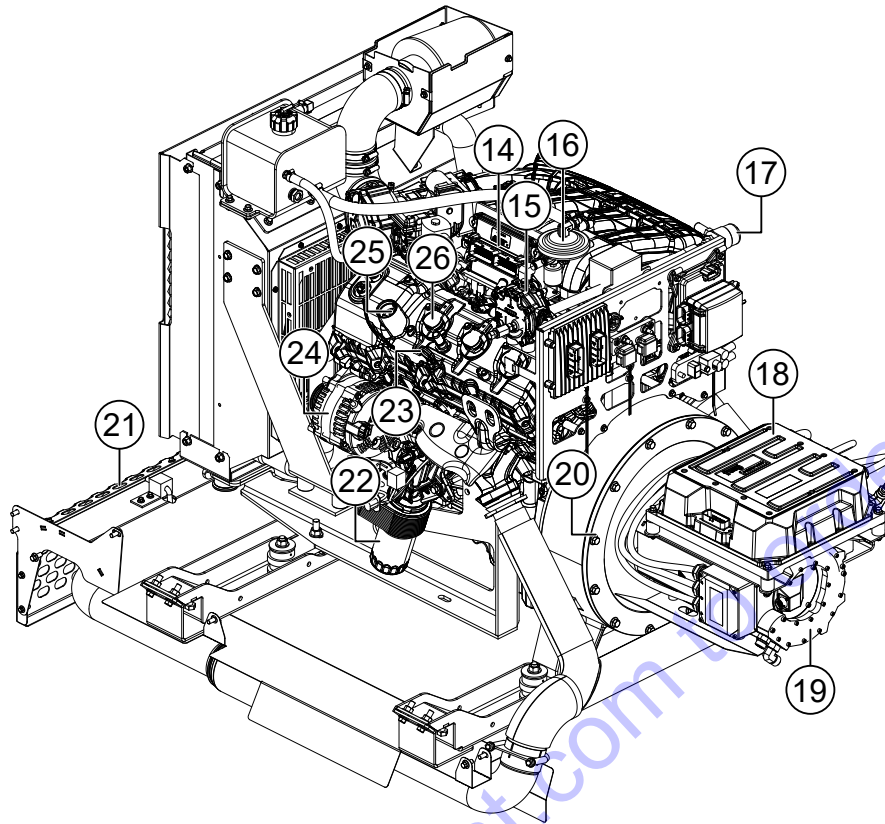


Figure 16. Ford Engine Components (Continued)

14. **Engine Control Unit (ECU)** — Communicates with engine sensors and actuators to ensure optimal engine performance.
15. **LPG Vapor Regulator** — Converts propane from liquid to gas and delivers it to the engine.
16. **LPG Shutoff Valve** — Controls the flow of LPG fuel.
17. **Propane Filter** — Filters LPG contaminants.
18. **Generator Controller** — Rectifies alternating current (AC) from the generator into direct current (DC) for the capacitor bank.
19. **Generator** — Converts mechanical energy from the engine into 3-phase alternating current (AC) to power the electric drive system.
20. **Generator-Engine Adaptor** — Secures the generator to the engine.
21. **Muffler/Catalytic Converter** — Reduces noise and emissions. **NEVER** touch the muffler while the engine is running.
22. **Oil Filter** — Filters engine oil contaminants.
23. **Oil Dipstick** — Remove to check the amount and condition of oil in the crankcase.
24. **Alternator** — Provides current to the electrical system and charges the battery.
25. **Oil Filler Port** — Remove the cap to add fresh oil as specified in Table 3.
26. **Spark Plug (6)** — Provides spark to the ignition system. Set the spark plug gap to 0.049–0.053 in. (1.25–1.35 mm).

COMPONENTS (CONTROL PANEL)

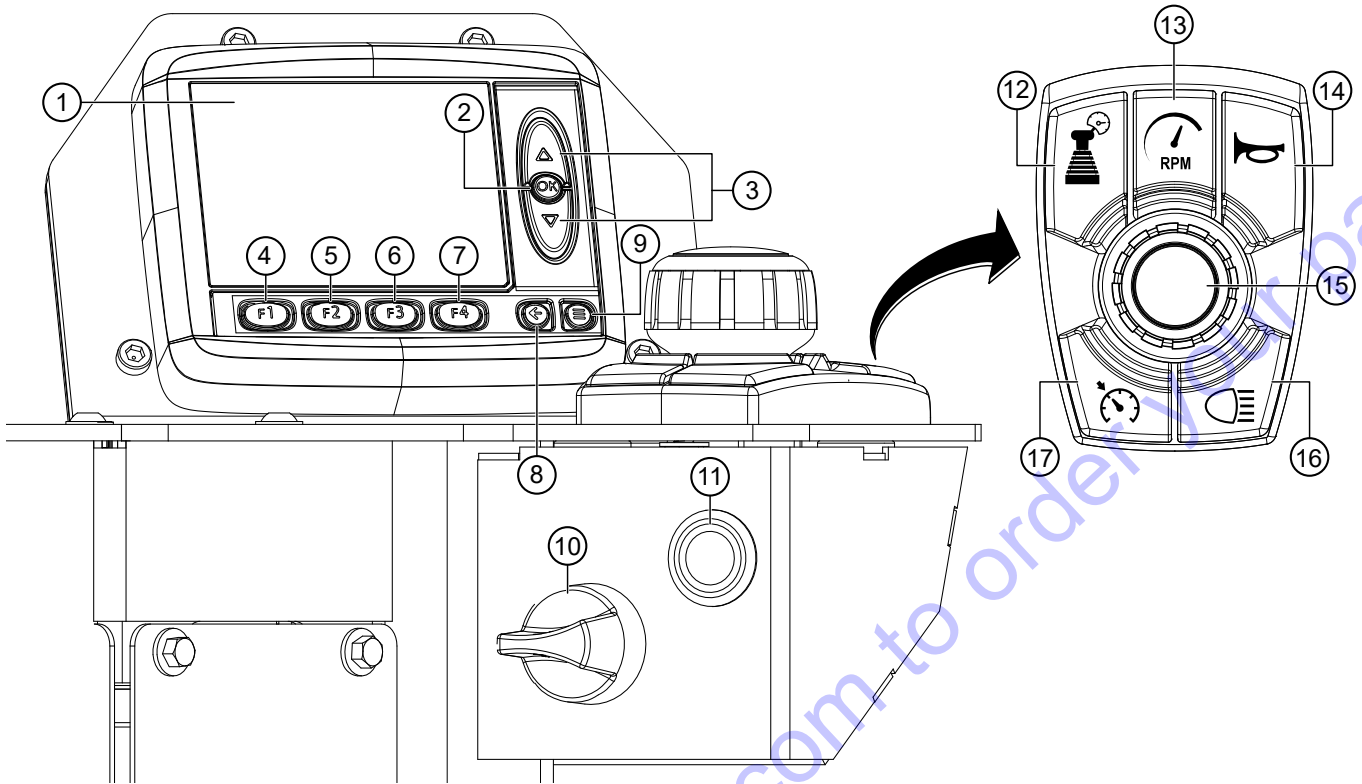


Figure 17. Digital Display and Control Panel

1. **Digital Display** — 3.5-inch LCD color display provides information such as rotor speed, fuel selection, fuel level, engine and machine faults, engine speed, and cruise control.
2. **Enter (OK) Button** — Press to save the value or confirm the selection you have made.
3. **Up and Down Arrow Buttons** — Press to scroll up or down through menu options.
4. **F1 Button** — Press to display fault information.
5. **F2 Button** — Press to display engine information.
6. **F3 Button** — Press to display machine information.
7. **F4 Button** — Press to change units of measurement.
8. **Back (ESC) Button** — Press to return to the previous screen.
9. **Menu Button** — Press to display the menu screen.
10. **Ignition Switch** — Insert the ignition key here and turn clockwise to start the engine.
11. **Fuel Selector Button** — Press to toggle between gasoline and LPG fuel modes.
12. **Steering Sensitivity Button** — Press to display the steering sensitivity adjustment screen.
13. **Maximum Rotor Speed (RPM) Button** — Press to display the maximum rotor speed adjustment screen.
14. **Horn** — Press this button to sound the horn.
15. **Control Knob** — The control knob has multiple functions:
 - Turn the control knob to adjust the currently selected setting (rotor speed, steering pressure, etc.)
 - While on the main screen, press the control knob to decrease engine speed from operating speed (3,200 rpm) to idle (900 rpm).
16. **Lights Button** — Press to turn the float lights ON/OFF.
17. **Cruise Control Button** — Press to turn cruise control ON/OFF.

BATTERY

⚠ CAUTION

Use all safety precautions specified by the battery manufacturer when handling the battery. See the **Safety Information** section of this manual for details on battery safety.

The PRX is equipped with an AGM battery. The battery may need to be charged for a brief period of time as per the battery manufacturer's instructions. Connect the battery as follows:

1. To access the battery, lift and remove the left-side deck access panel (Figure 18). Set the panel aside.

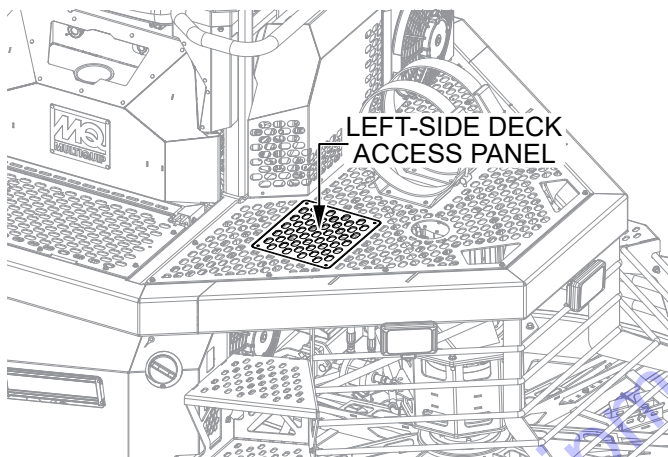


Figure 18. Battery Access

2. Make sure the battery is well seated in the battery box and secured with the two battery bolts (Figure 19).

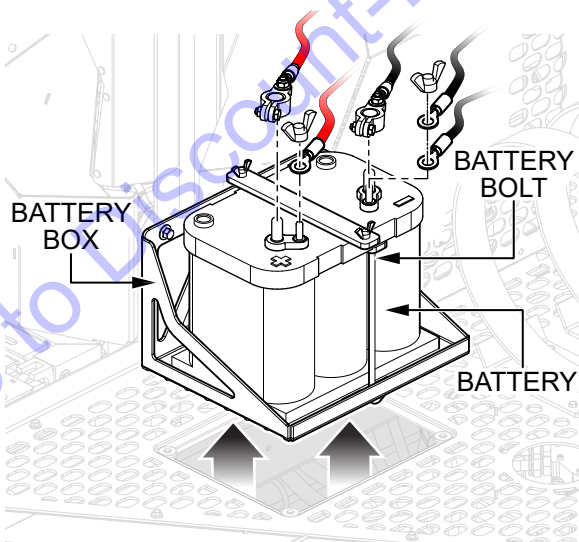


Figure 19. Battery Connection

3. Connect the two positive (**RED**) battery cables to the positive (+) terminals on the battery, then connect the three negative (**BLACK**) battery cables to the negative (-) terminal. See Figure 19.
4. Reinstall the left-side deck access panel.

PROPANE TANK (OPTIONAL)

1. Place a new propane tank onto the propane tank bracket (Figure 20). Align the locking slot with the locking pin on the tank bracket.

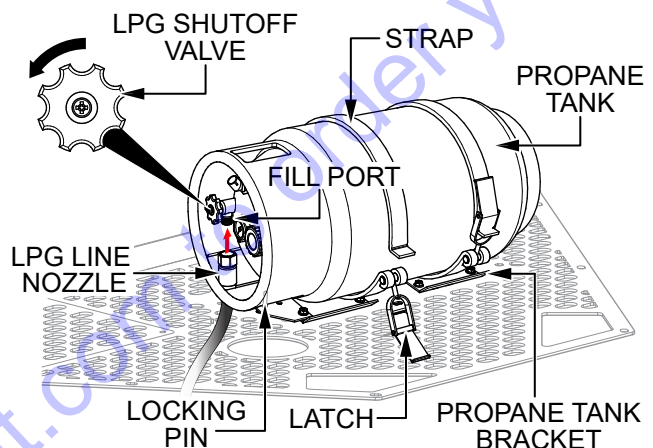


Figure 20. Propane Tank Installation

2. Secure the latches on the propane tank straps (Figure 20).
3. Connect the LPG line nozzle to the propane tank fill port (Figure 20).
4. Turn the LPG shutoff valve (Figure 20) counterclockwise to open.

⚠ WARNING

Engines using LPG fuel should be operated only in areas with adequate ventilation. **NEVER** operate in confined areas or in areas where the free flow of air is restricted.

ENGINE OIL

1. Make sure the float is on a secure, level surface with the engine stopped.
2. Open the hood as shown in Figure 21.

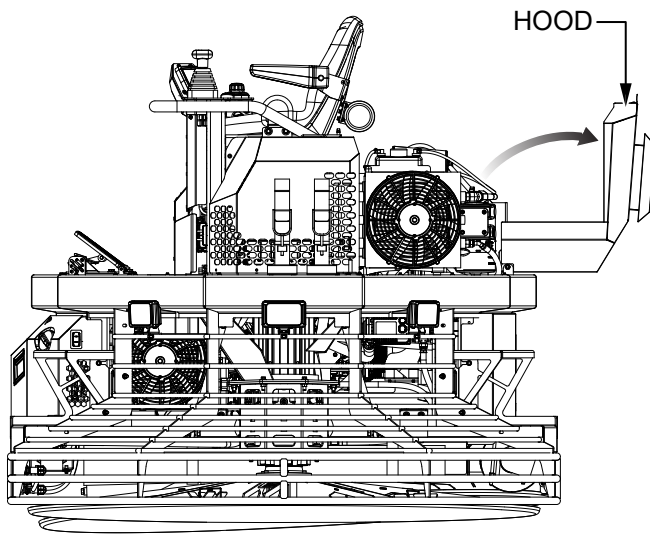


Figure 21. Float Hood (Open)

3. Pull the engine oil dipstick (Figure 22) out of its holder and wipe it with a clean cloth.

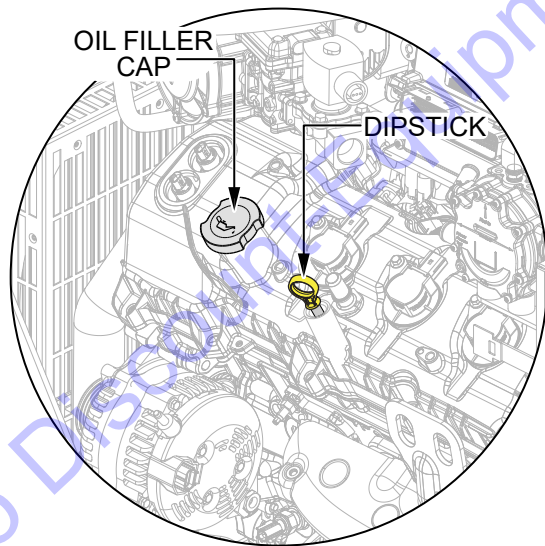


Figure 22. Engine Oil Components

4. Fully insert the dipstick then remove it again.

5. Determine if engine oil is low. Oil should be between the upper and lower marks (Figure 23) on the dipstick.

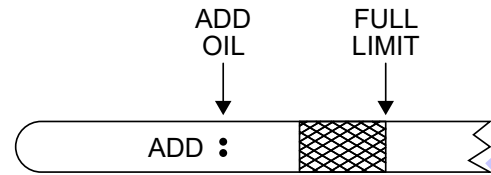


Figure 23. Engine Oil Level

6. If the oil is below the lower mark on the dipstick, remove the oil filler cap (Figure 22) and add engine oil up to the upper mark on the dipstick. Refer to Table 6 for recommended oil viscosity.

CAUTION

NEVER overfill the oil pan. **ALWAYS** allow time for any added oil to make its way to the oil pan before rechecking the level.

Table 6. Recommended Oil Viscosity Grades

SAE Grade	Temperature Range (°F)	Temperature Range (°C)
SAE 5W20	-20 to 100	-30 to 40
SAE 5W30	-20 to 100	-30 to 40
SAE 5W40	-20 to 100	-30 to 40
SAE 10W30	0 to 100	-10 to 40
SAE 10W40	0 to 100	-10 to 40

NOTICE

To maintain proper engine performance and durability, use only engine oils with an API classification of SJ or SH. **NEVER** use supplemental oil additives or other engine treatments.

7. When replacing the dipstick, make sure it is fully inserted into its holder to keep the crankcase sealed.

ENGINE COOLANT

1. Make sure the float is on a secure, level surface with the engine stopped and the hood open as shown in Figure 21. Make sure the engine is cooled down to 110°F (40°C) or less.
2. Inspect the level of coolant in the radiator degas tank through the sight glass on the side of the tank (Figure 24). The proper level of coolant is shown by the level indicators molded into the tank wall.

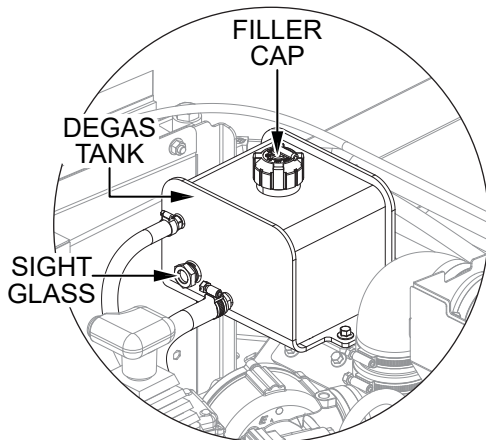


Figure 24. Radiator Degas Tank

3. If the coolant level is low, turn the degas tank filler cap (Figure 24) 90 degrees counterclockwise, pause to allow any pressure to drop, then turn the cap fully counterclockwise and remove it.

WARNING

Hot coolant can cause severe burns. **NEVER** remove the cap while the radiator is **HOT**.

4. Add coolant as necessary with prediluted 50/50 GM Dex-Cool specification GM6277M coolant or equivalent.
5. Replace the degas tank filler cap when finished.

HYDRAULIC OIL

The hydraulic oil level is monitored by a level switch located inside the hydraulic oil reservoir. The operator will be notified on the digital display when the hydraulic oil level is low.

However, it is recommended to always perform a visual inspection of the hydraulic oil level prior to operation.

1. Make sure the float is on a secure, level surface with the engine stopped and the hood open as shown in Figure 21.
2. Visually inspect the level of hydraulic oil in the hydraulic oil reservoir (Figure 25). Hydraulic oil should be visible between the **MIN** and **MAX** lines on the reservoir.

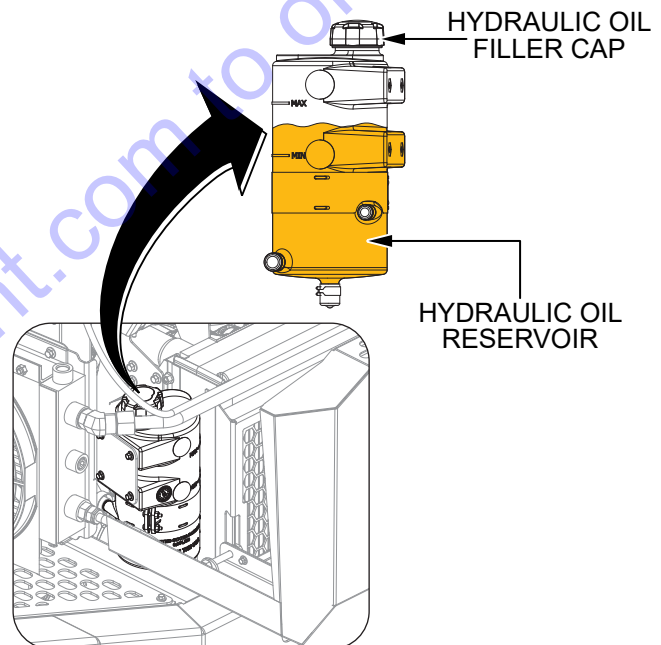


Figure 25. Hydraulic Oil Level Inspection

3. If the hydraulic oil level is low, remove the hydraulic oil filler cap (Figure 25) and add hydraulic oil up to a level midway between the **MIN** and **MAX** lines on the reservoir. **DO NOT** overfill. Replace the cap when finished.

CAUTION



Hydraulic oil can get **HOT!**

ALWAYS allow hydraulic oil to cool before removing the fill cap. **NEVER** remove the fill cap when the oil is hot or spillage will occur.

ELECTRIC DRIVE SYSTEM COOLANT (WATER GLYCOL)

The drive system coolant level is monitored by a level switch located inside the drive system coolant bottle. The operator will be notified on the digital display when the coolant level is low.

However, it is recommended to always perform a visual inspection of the coolant level prior to operation.

1. Make sure the float is on a secure, level surface with the engine stopped and the hood open as shown in Figure 21.
2. Visually inspect the level of drive system coolant in the coolant bottle (Figure 26).

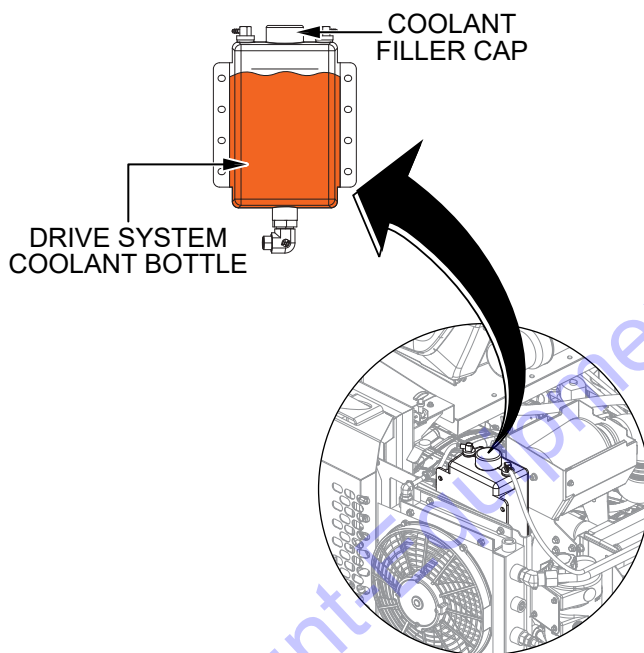


Figure 26. Drive System Coolant Bottle

3. If the coolant level is low, remove the coolant filler cap and add coolant up to the upper limit line on the bottle. Use only prediluted 50/50 coolant which meets the requirements of GM Dex-Cool specification GM6277M. Replace the cap when finished.
4. Close and secure the hood.

NOTICE

NEVER run the float without electric drive coolant (water glycol), even for a short time. Damage to the coolant pump and electric drive components will occur.

FUEL CHECK (GASOLINE)

⚠ DANGER

Gasoline fuel is **highly flammable** and can be dangerous if mishandled.

NEVER smoke while refueling. **NEVER** attempt to refuel while the engine is hot or running.

1. Make sure the float is on a secure, level surface with the engine stopped.
2. Insert the **ignition key** into the **ignition switch** (Figure 27).

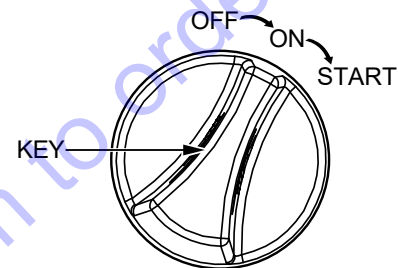


Figure 27. Ignition Key Switch

3. Turn the ignition key clockwise to the **ON** position (Figure 27). The **digital display** will turn on and the main screen (Figure 28) will appear on the display.

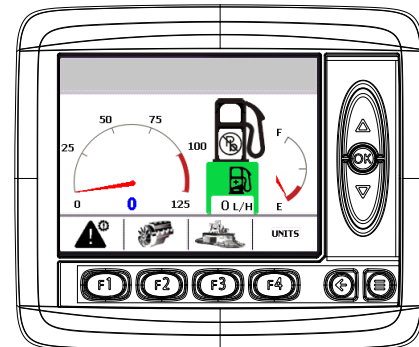


Figure 28. Digital Display (Main Screen)

INSPECTION

4. Press the **fuel selector button** (Figure 29) to select the gasoline fuel system. The selected fuel system is shown on the digital display (Figure 30).

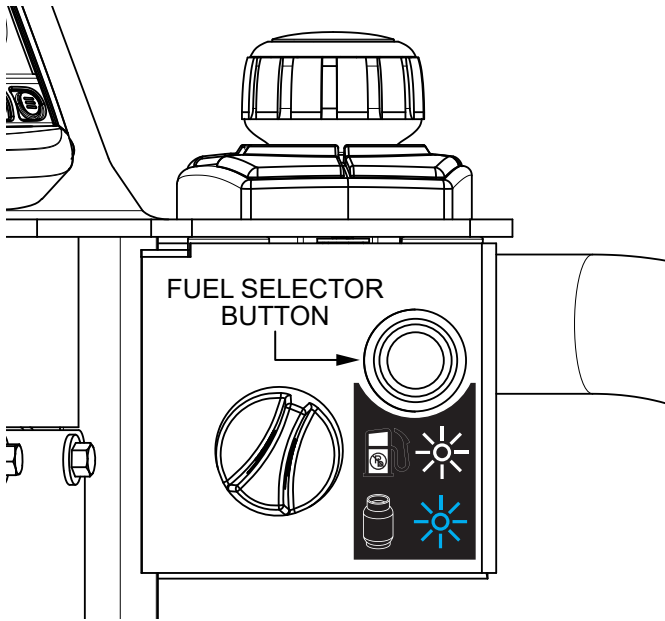


Figure 29. Fuel Selector Button

5. Read the fuel gauge on the digital display (Figure 30) to determine if the gasoline level is low.

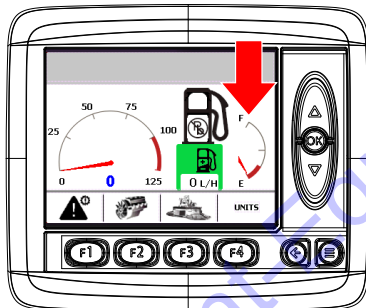


Figure 30. Fuel Check (Gasoline)

6. If fuel is low, remove the fuel filler cap (Figure 31) and fill the tank with unleaded 87 or 89 octane gasoline. **DO NOT** overfill. The fuel tank holds 35 gallons (132 liters) of gasoline.

⚠ DANGER

Fuel spillage on a **hot** engine can cause a **fire or explosion**. If a fuel spill occurs, wipe up the spilled fuel completely to prevent fire hazards. **NEVER** smoke around or near the float.

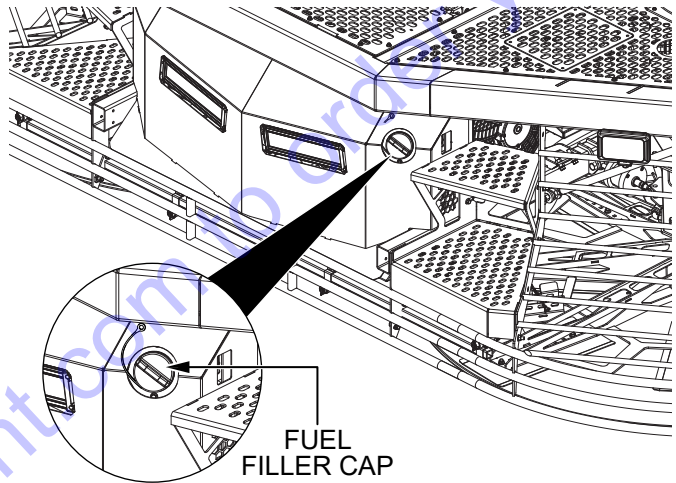


Figure 31. Fuel Filler Cap (Gasoline)

7. Replace the fuel filler cap when finished adding fuel.

FUEL CHECK (PROPANE)

1. Make sure the float is on a secure, level surface with the engine stopped.
2. Turn the LPG shutoff valve (Figure 32) clockwise until closed.

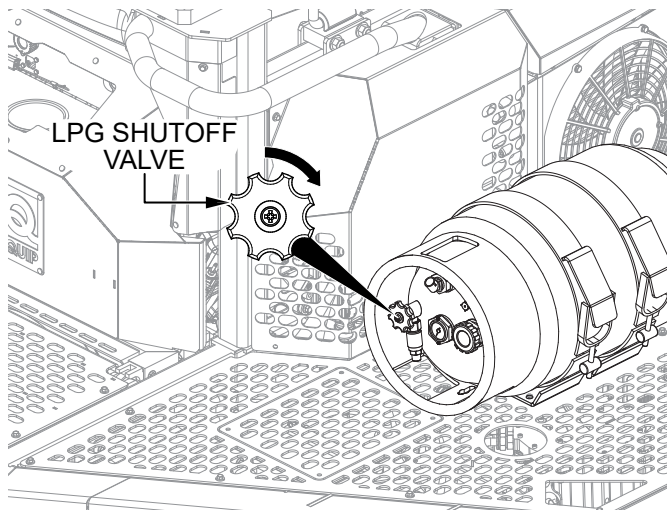


Figure 32. LPG Shutoff Valve

3. Read the fuel gauge (Figure 33) on the propane tank to determine if the propane level is low.

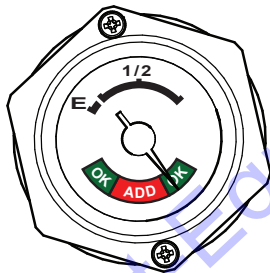


Figure 33. LPG Fuel Gauge

Propane Tank Replacement

The propane tank can either be refilled while installed on the float, or removed and replaced with a full tank. Refer to Figure 34 when removing and replacing the propane tank:

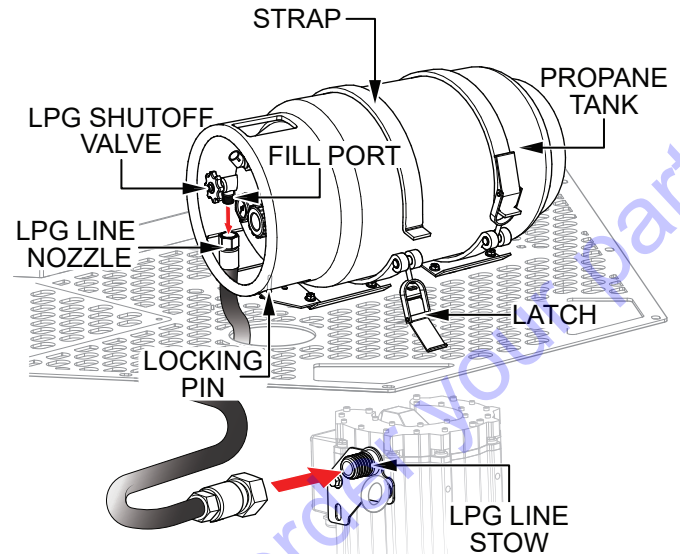


Figure 34. Propane Tank Removal

1. Make sure the float is on a secure, level surface with the engine stopped.
2. Turn the LPG shutoff valve clockwise until closed.
3. Disconnect the LPG line nozzle from the propane tank fill port.
4. Connect the LPG line nozzle to the LPG line stow.
5. Release the latches on the propane tank straps.
6. Push backward and lift upward to remove the propane tank.
7. Place the new propane tank onto the tank bracket. Align the locking slot with the locking pin on the tank bracket.
8. Secure the latches on the propane tank straps.
9. Reconnect the LPG line nozzle to the propane tank fill port.
10. Turn the LPG shutoff valve counterclockwise to open.

⚠ WARNING

Engines using LPG fuel should be operated only in areas with adequate ventilation. **NEVER** operate in confined areas or in areas where the free flow of air is restricted.


The following section is intended to assist the user with the operation of the PRX ride-on power float. **It is extremely important to read this section carefully** before attempting to use the float in the field. **DO NOT** operate the float until this section is thoroughly understood.

CAUTION



ALWAYS wear approved eye and hearing protection while operating the float.

WARNING



NEVER operate the float in a confined area or enclosed area structure that does not provide an ample, free flow of air.

NOTICE

This power float is equipped with a safety seat switch. The rotors will not turn unless an operator is sitting in the seat or the drive bypass function is enabled.

STARTING THE ENGINE

1. While standing in front of the float, grasp one of the grab bars and place a foot on one of the steps. Lift yourself onto the float platform and sit down in the operator's seat.

NOTICE

DO NOT grab the steering control joysticks to lift yourself onto the float. Damage to the joysticks may result. **ALWAYS** use the grab bars to lift yourself onto the float.

2. Insert the **ignition key** into the **ignition switch** (Figure 35).

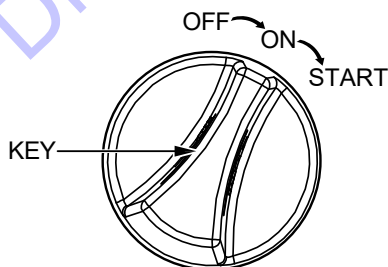


Figure 35. Ignition Key Switch

3. Turn the ignition key clockwise to the **ON** position (Figure 35). The **digital display** will turn on and the main screen (Figure 36) will appear on the display.

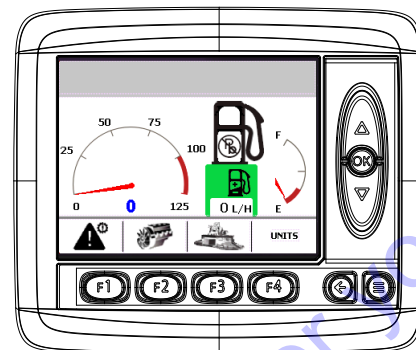


Figure 36. Digital Display (Main Screen)

4. Select **GAS** or **LPG** fuel mode. Press the **fuel selector button** (Figure 37) to toggle between gasoline and LPG fuel systems. The selected fuel system is shown on the digital display. The fuel selector button will illuminate when LPG is selected.

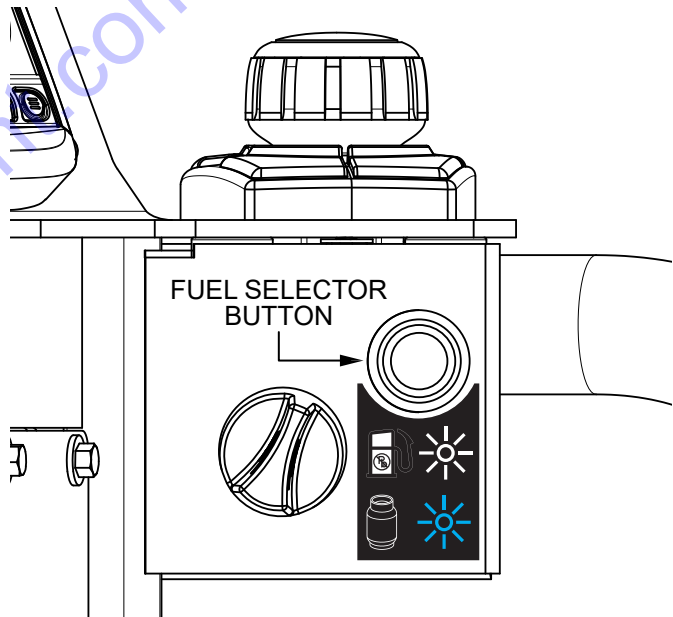


Figure 37. Fuel Selector Button

NOTICE

Fuel modes can be switched while the float is running. The engine does not need to be stopped when changing fuel modes.

- Press the **RPM button** to view the **maximum rotor speed adjustment screen** on the digital display (Figure 38).

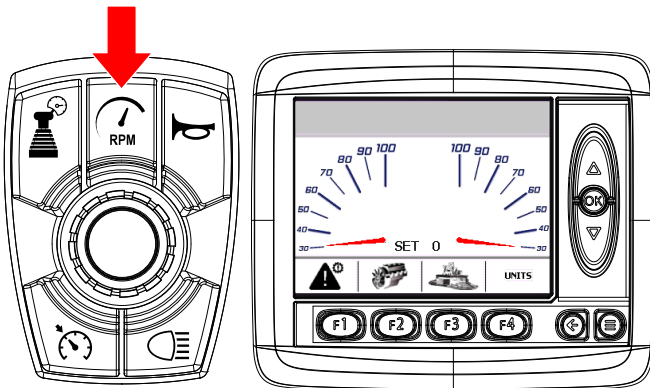


Figure 38. Digital Display (Rotor Speed)

- Turn the **control knob** until the desired maximum rotor speed (0–100 rpm) is displayed. During normal operation this will be the rotor speed when the foot pedal is fully depressed. See Figure 39.

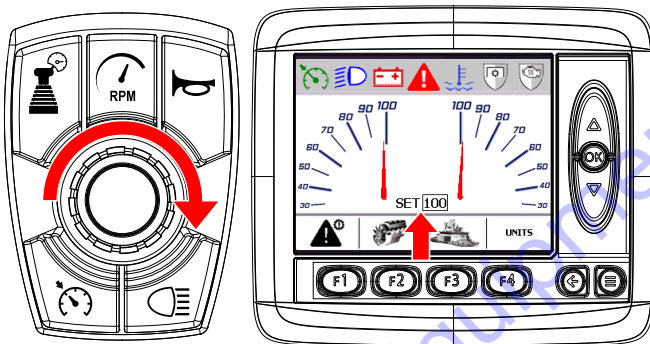


Figure 39. Rotor Speed Selection

- Turn the ignition key clockwise to the **START** position. Once the engine has started, release the ignition key. The throttle speed will default to idle to allow the engine to warm to operating temperature.

NOTICE

Engine Speed Safety Interlocks

Full engine speed is only possible when the operator is seated. Engine speed will decrease to idle whenever the operator leaves the seat or the foot pedal is released for more than 3 seconds.

- Let the engine idle for 2–3 minutes.

- If the fault icon (Figure 40) on the digital display turns on (**AMBER** or **RED**), shut down the engine and correct the problem. Press the **F1 button** to view active faults. The digital display will show a fault code and a description of the problem. See Table 12–Table 19 for a comprehensive list of active fault codes and countermeasures.

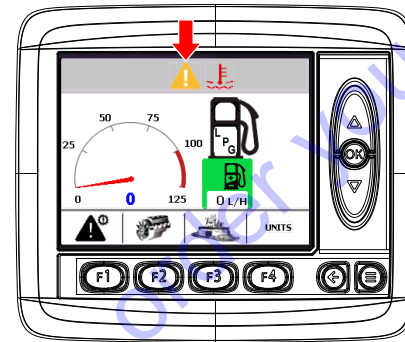


Figure 40. Fault Icon

TESTING THE SEAT SWITCH

Make sure the safety seat switch is operational prior to using the float each day.

- With the engine running, depress the foot pedal to start turning the rotors.
- Rise from the operator's seat and observe the rotors:
 - If the engine continues to run but the rotors have stopped turning, the seat switch is working properly.
 - If the rotors continue to turn, the seat switch is not working properly. Stop the engine immediately and correct the problem.

WARNING

NEVER disable or disconnect the seat switch. It is provided for operator safety. Injury may result if it is disabled, disconnected or improperly maintained.

CONTROLLING ENGINE SPEED

Do any of the following to **raise engine speed** to operating speed (3,200 rpm) from idle (900 rpm):

- Press the control knob while the digital display is on the main screen.
- Depress the foot pedal while sitting in the operator's seat.
- Press and hold a drive bypass switch.

Do any of the following to **lower engine speed** to idle (900 rpm) from operating speed (3,200 rpm):

- Press the control knob while the digital display is on the main screen and the foot pedal is released.
- Release the foot pedal and wait for 3 seconds.
- Rise from the operator's seat.
- Release a drive bypass switch.

STEERING

Two palm-grip joysticks (Figure 41) located to the left and right of the operator's seat provide directional control of the float.

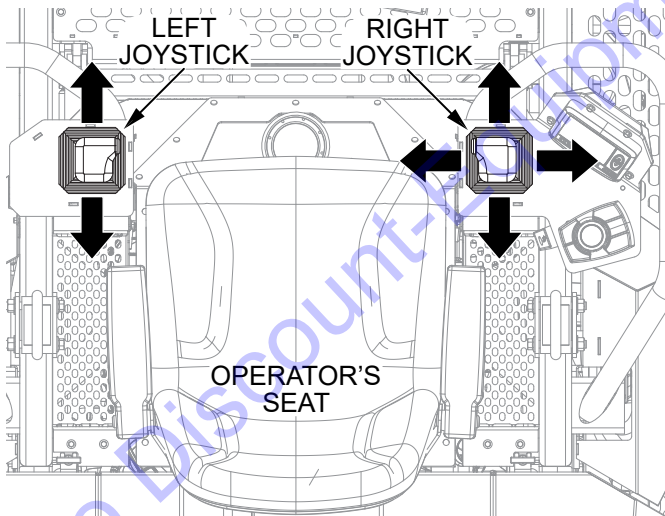


Figure 41. Steering Control Joysticks

Table 7 illustrates the various directional positions of the joysticks and their effect on the movement of the float.

NOTICE

All directional references with respect to the joysticks are from the operator's seated position.

Table 7. Joystick Directional Positioning	
CONTROL JOYSTICK & DIRECTION	RESULT
Move LEFT Joystick FORWARD ↑	Causes only the left side of the power float to move forward.
Move LEFT Joystick BACKWARD ↓	Causes only the left side of the power float to move backward.
Move RIGHT Joystick FORWARD ↑	Causes only the right side of the power float to move forward.
Move RIGHT Joystick BACKWARD ↓	Causes only the right side of the power float to move backward.
Move BOTH Joysticks FORWARD ↑ ↑	Causes the power float to move forward in a straight line.
Move BOTH Joysticks BACKWARD ↓ ↓	Causes the power float to move backward in a straight line.
Move RIGHT Joystick to the RIGHT →	Causes the power float to move to the right.
Move RIGHT Joystick to the LEFT ←	Causes the power float to move to the left.

The **foot pedal** (Figure 42) controls rotor speed. The position of the foot pedal determines the rotational speed of the rotors. Slow rotor speed is obtained by slightly depressing the foot pedal. Maximum rotor speed is obtained by fully depressing the foot pedal.

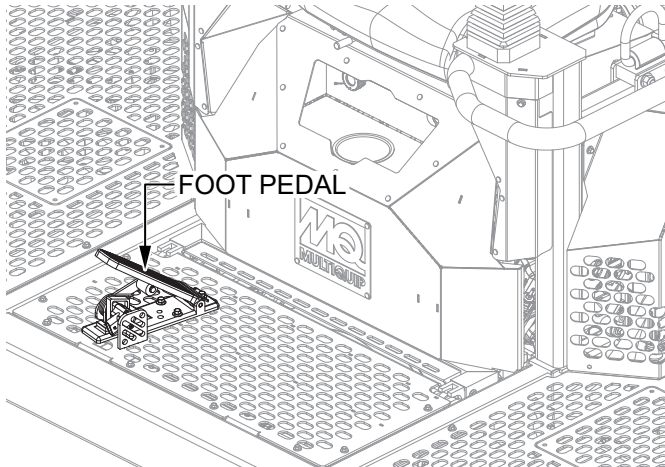


Figure 42. Foot Pedal

1. Push both the left and right joysticks forward (Figure 43).

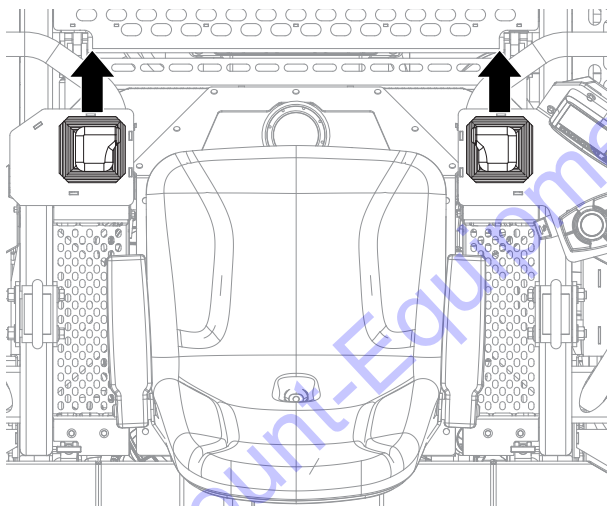


Figure 43. Joysticks (Forward)

2. With your right foot, slowly depress the foot pedal **halfway**. Notice that the float begins to move in a forward direction. Release both joystick controls to stop forward movement, then remove your right foot from the foot pedal.
3. Practice keeping the float in one place as you increase rotor speed. The float may be difficult to keep in place as rotor speed increases. Trying to keep the float stationary is good practice for operation.

4. Practice maneuvering the float using the information in Table 7. Practice controlled motions as if finishing a slab of concrete. Practice edging and covering a large area.
5. Pull both the left and right joysticks backward (Figure 44) and repeat step #2 while substituting the word *reverse* for *forward*.

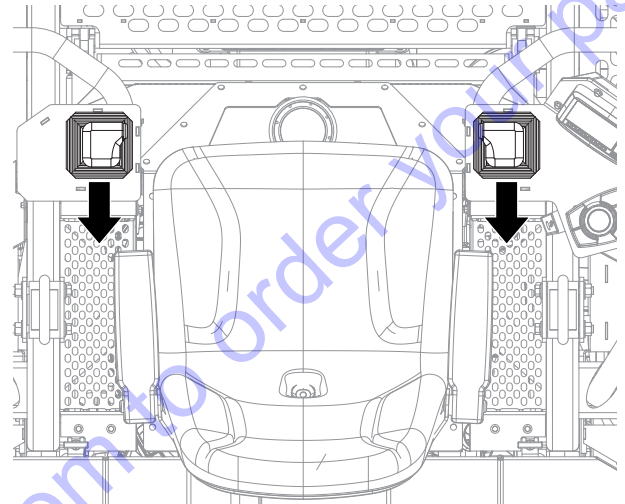


Figure 44. Joysticks (Reverse)

6. Test the operation of additional equipment such as retardant spray and lights.

Steering Sensitivity Adjustment

The sensitivity of the hydraulic steering valves can be adjusted to the operator's preference.

1. Press the **steering sensitivity button** (Figure 45) to view the **steering sensitivity adjustment screen** on the digital display.

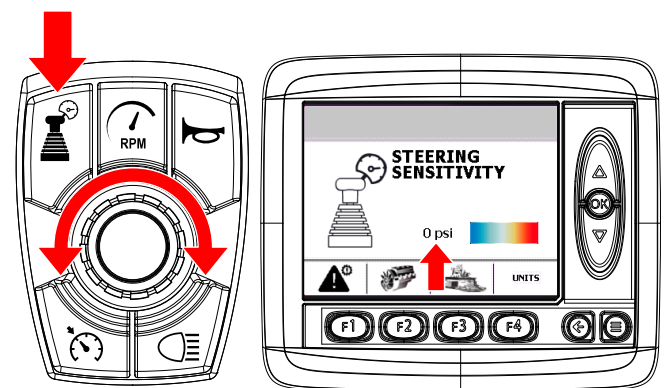


Figure 45. Steering Sensitivity Adjustment

2. Turn the control knob to adjust the steering sensitivity.

CRUISE CONTROL

Engaging **cruise control** will set and maintain rotor speed. The cruise control feature allows an operator to release the foot pedal during operation and adjust rotor speed using the digital controls.

1. Set the maximum rotor speed as described in the **Starting the Engine** section.
2. Depress the foot pedal (Figure 42) to raise the rotor speed to the set speed.
3. Press the **cruise control button** (Figure 46). The cruise control icon on the digital display will turn green to indicate cruise control is engaged.

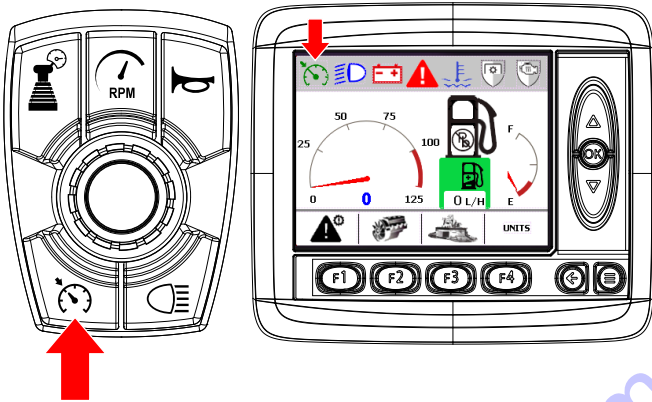


Figure 46. Cruise Control

4. Release the foot pedal. The rotors will maintain the set speed.
5. Rotor speed can now be changed without disengaging cruise control. Set a new rotor speed using the maximum rotor speed adjustment function or simply turn the control knob while the main display screen is active.
6. Disengage cruise control by doing any of the following:
 - Depress the foot pedal.
 - Stand up from the operator's seat.
 - Press the control knob to lower engine speed.
 - Press the cruise control button.

NOTICE

Cruise Control Safety Interlocks

Cruise control will be disabled if the following occurs:

- Operator presence is not detected (seat empty).
- An engine or machine fault code is active.
- A drive bypass switch is pressed.
- The foot pedal calibration process has been started.

POWER MANAGEMENT MODE

Power Management mode automatically reduces rotor speed in order to maintain steady engine speed under maximum load conditions.

Whenever maximum engine load is reached, Power Management mode will activate, and the system will reduce machine load by gradually slowing (derating) rotor speed.

The power management indicator (Figure 47) will turn on whenever Power Management mode is active.

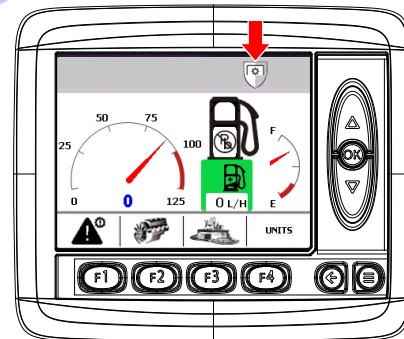


Figure 47. Power Management Indicator

SERVICE REMINDERS

After the initial 25 hours of operation, the digital display will show a warning message indicating that machine service is required (Figure 48).

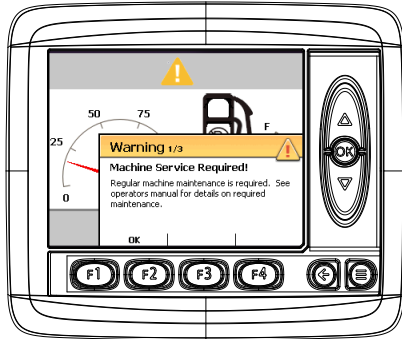


Figure 48. Warning Message (Machine Service Required)

If the hydraulic filter enters **Bypass mode**, the digital display will show a warning message indicating that hydraulic system service is required (Figure 49). Shut down the equipment and service the hydraulic system immediately.

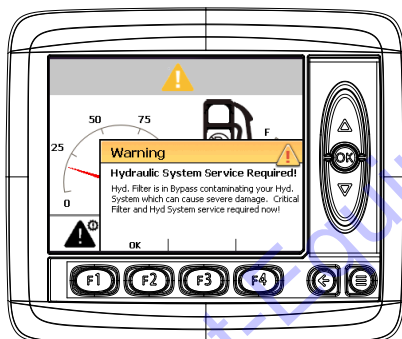


Figure 49. Warning Message (Hydraulic Filter Bypass Warning)

NOTICE

DO NOT operate the unit while in Bypass mode. This can result in severe damage to the hydraulic system.

Refer to the **Maintenance** section for service procedures and instructions on how to reset the service reminders.

THERMAL MANAGEMENT MODE

Thermal Management mode automatically reduces rotor speed if either the engine coolant or electric drive system coolant reaches a higher-than-normal temperature. The PRX will slowly reduce rotor speed until the temperature is stabilized.

Temperatures are monitored at several locations throughout the system: the engine, generator, generator controller, right-side motor and controller, and left-side motor and controller.

If any of these temperature readings exceed a preset limit, Thermal Management mode will activate, and the system will begin reducing machine load by gradually slowing (derating) rotor speed in two phases.

Table 8. Thermal Management Mode Temperature Limits (Phase 1)

Temperature	°F (°C)	Rotor Speed Derating Interval
Engine	216 (102)	Every 2 minutes
Controllers	57 (14)*	
Motors	327 (164)	

Table 9. Thermal Management Mode Temperature Limits (Phase 2)

Temperature	°F (°C)	Rotor Speed Derating Interval
Engine	220 (104)	Every 30 seconds
Controllers	46 (8)*	
Motors	338 (170)	

*Controller temperature values represent degrees remaining before overheat occurs, e.g. 46°F/8°C remaining before overheat occurs.

Phase 1

During Phase 1 of Thermal Management mode, the thermal management indicator (Figure 50) will blink once per second and rotor speed will derate every two minutes.

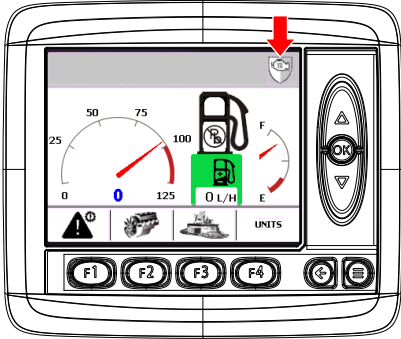


Figure 50. Thermal Management Indicator (Phase 1)

Phase 2

During Phase 2 of Thermal Management mode, the thermal management indicator will blink twice per second and the amber fault icon (Figure 51) will turn on. Cruise control will be disabled at this time and rotor speed will derate every 30 seconds.

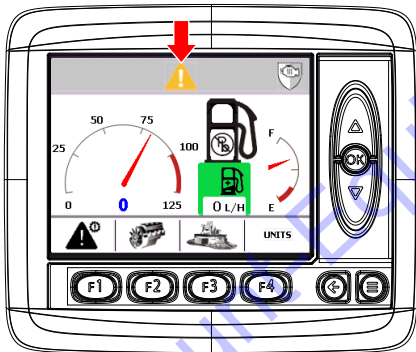


Figure 51. Thermal Management Indicator (Phase 2)

If the temperature does not stabilize and reaches a critical level, the red fault icon (Figure 52) will turn on, indicating immediate shutdown is necessary.

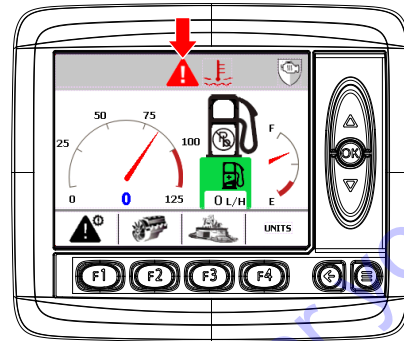


Figure 52. Thermal Management Indicator (Critical)

Limited Operator Control

While Thermal Management mode is actively reducing rotor speed, the operator will not be able to increase rotor speed using the maximum rotor speed setting control knob. The operator can still manually reduce rotor speed while Thermal Management mode is active.

Thermal Management Deactivation

As the system cools below the preset limits, the thermal management indicator will turn off, indicating that Thermal Management mode has been deactivated. Rotor speed will gradually return to the operator's preset maximum rotor speed setting.

REMOVING THE FLOAT FROM A CONCRETE PAD

Care should be taken to prevent damage to a concrete pad surface while removing the float from the pad. This procedure requires at least two people—one to operate the forklift and one to carefully rotate the pans.

WARNING

Removal of the float from concrete requires **two people**. **DO NOT** attempt to perform this procedure alone!

WARNING

DO NOT place any part of your body between the forklift and the float. **SERIOUS INJURY OR DEATH** may result.

1. With the engine running at idle, carefully attach the float to a forklift as shown in the *Lifting and Transporting* section of this manual.
2. **Without sitting in the operator's seat**, press and hold either one of the **drive bypass switches** (Figure 53) to enter **Drive Bypass mode**. Engine speed will rise to operating speed and **the lights will flash** to alert personnel to **exercise caution** during this procedure.

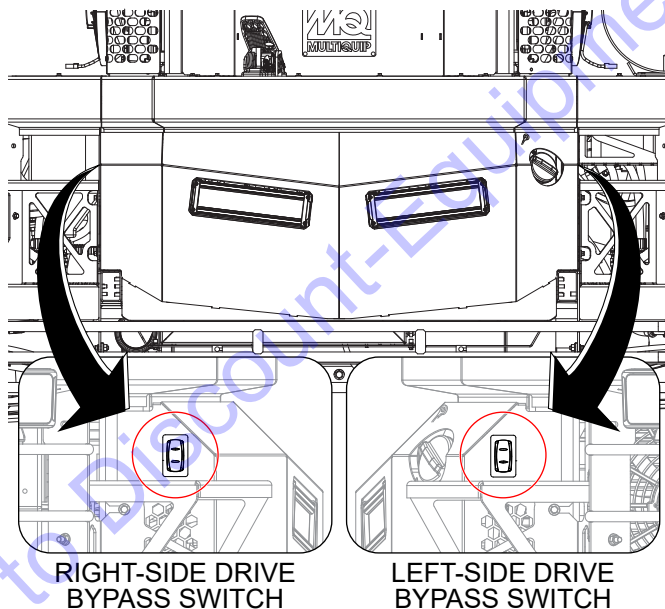


Figure 53. Drive Bypass Switches

NOTICE

DO NOT engage the seat switch by sitting in the operator's seat. The rotors will not turn if an operator is in the seat while a drive bypass switch is pressed. In drive bypass mode, the rotors can only be turned via drive bypass switch and foot pedal engagement.

3. While continuing to hold one of the drive bypass switches, depress the foot pedal (by hand) to slowly rotate the float pans.
4. With the pans slowly rotating, use the forklift to slowly lift the float until the pans are clear of the concrete pad surface. **Remember to keep all personnel out of the area between the forklift and the float.**
5. Release the drive bypass switch and foot pedal, and stand clear of the forklift and float.

ENGINE SHUTDOWN

1. Reduce engine speed and allow the engine to idle for 3–5 minutes.
2. Turn the ignition key counterclockwise to the **OFF** position, then remove the key.
3. If LPG mode was in use, turn the **propane shutoff valve** clockwise (Figure 54) until closed.

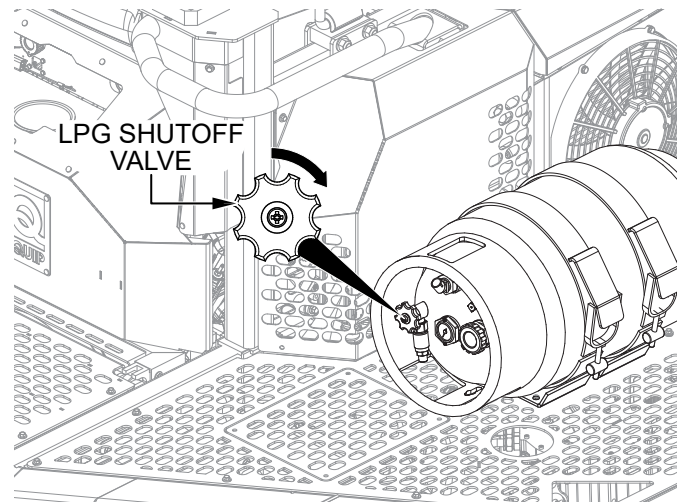


Figure 54. Propane Tank Shutoff Valve (Closed)

4. Clean and remove any debris from the float.

MAINTENANCE

Table 10. Maintenance Schedule

Check Item	Periodic Maintenance Interval						
	Daily	Every 200 Hours	Every 400 Hours	Every 800 Hours	Every 1,000 Hours	Every 1,500 Hours	Every 2,000 Hours
General Maintenance							
Visually inspect for fluid leaks	X						
Check engine oil level	X						
Check engine coolant level	X						
Change engine oil and filter ¹	After the first 25 machine hours, then every 400 engine hours ⁵						
Inspect air cleaner	Every 200 hours, or every 100 hours in a dusty environment						
Replace air cleaner	Every 800 hours, or every 400 hours in a dusty environment						
Change hydraulic oil and filter	After the first 25 machine hours, then every 400 engine hours ⁵						
Inspect LPG system for leaks	Prior to any service or maintenance activity						
Inspect drive belt for cracks, breaks, splits or glazing ²		X					
Inspect electrical wiring for cuts, abrasions or corrosion	After the first 50 hours, then every 100 hours						
Inspect all high-voltage cables for damage, breaks in insulation or fraying of shielding.	Every engine oil change						
Check all fasteners for tightness			X				
Electric Drive Cooling System							
Check coolant level	X						
Inspect cooling system for leaks	Every engine oil change						
Inspect coolant pump weep holes for debris ⁴	Every 3 months						
Inspect electrical wiring and connections ⁴	Every 3 months						
Engine Cooling System							
Clean debris from radiator core	Every 100 hours or 60 days of operation						
Change coolant ³						X	
Inspect coolant hoses for cracks, swelling or deterioration ²	After the first 50 hours, then every 100 hours						
Engine Ignition System							
Replace spark plugs			X				
Inspect battery case for damage					X		
Base Engine System							
Inspect PCV system				X			
<p>Note 1: Oil life is highly dependent on oil quality, operating environment, and engine use.</p> <p>Note 2: Item should be checked yearly, replaced as needed.</p> <p>Note 3: The use of Havoline Xtended Life Antifreeze/Coolant Premixed 50/50 is recommended.</p> <p>Note 4: Check more often in harsh conditions.</p> <p>Note 5: Engine hours = actual engine run time; machine hours = time spent with rotors turning.</p>							

MAINTENANCE

Table 11. Maintenance Schedule (Continued)

Check Item	Periodic Maintenance Interval						
	Daily	Every 200 Hours	Every 400 Hours	Every 800 Hours	Every 1,000 Hours	Every 1,500 Hours	Every 2,000 Hours
Fuel System Maintenance							
Check gasoline fuel filter		X					
Check LPG fuel filter		X					
Drain LPG vaporizer oil buildup		X					
Inspect fuel lines for leaks	After the first 50 hours, then every 100 hours						
Inspect air induction for leaks							
Inspect manifold for vacuum leaks							
Engine Exhaust System							
Inspect exhaust manifold for leaks	After the first 50 hours, then every 100 hours						
Inspect exhaust piping for leaks							
Inspect HEGO sensor(s) connector and wires for burns, cuts or damage							X
This maintenance schedule represents the manufacturer's recommended maintenance intervals to maintain proper engine/equipment function. Specified state and federal regulations may require equipment operators to conduct comprehensive engine/equipment inspections at shorter intervals than those specified above.							

CAUTION

Certain maintenance operations or machine adjustments require specialized knowledge and skill. Attempting to perform maintenance or adjustments without the proper knowledge, skills or training could result in equipment damage or injury to personnel. When in doubt, consult your dealer.

CLEANING

NEVER allow concrete to harden on the float. Wash any concrete off the float with water **immediately after use**. Be careful to not spray a hot engine or muffler. An old paint brush or broom may help loosen any concrete that has started to harden.

AIR CLEANER

The PRX is equipped with a K&N rechargeable air cleaner. Inspect the engine air cleaner every 200 hours of operation, or every 100 hours if operated in a dusty environment. Clean or replace the engine air cleaner every 400 hours of operation, or every 200 hours if operated in a dusty environment.

Air Cleaner Removal

1. Make sure the float is on a secure, level surface with the engine stopped.
2. Open the hood as shown in Figure 55.

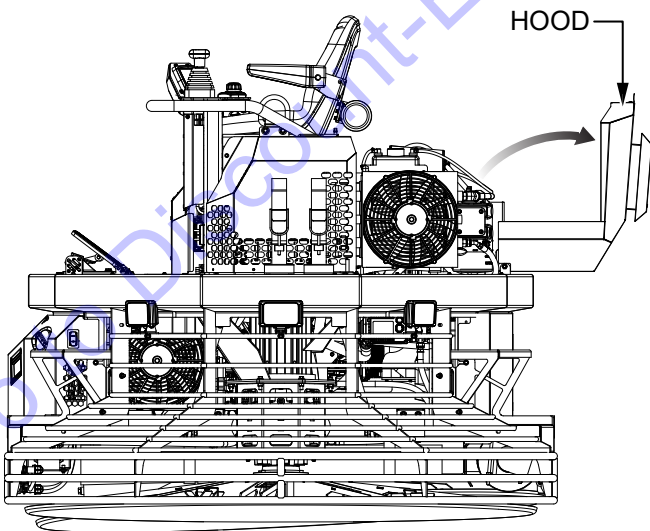


Figure 55. Float Hood (Open)

3. Remove and set aside the nyloc nut and flat washer securing the air cleaner to the air box (Figure 56).

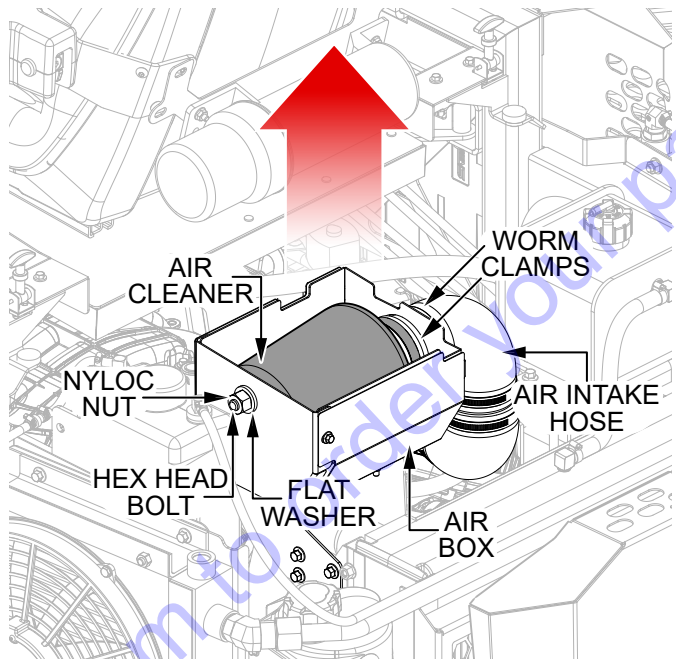


Figure 56. Air Cleaner Removal

4. Remove and set aside the two worm clamps securing the air cleaner to the air intake hose (Figure 56).
5. Remove the air cleaner.
6. Remove the hex head bolt from inside the air cleaner and set it aside.

Air Cleaner Cleaning

NOTICE

Use a K&N Filter Care Service Kit to clean the air cleaner.

1. Spray the exterior fibers of the air cleaner liberally with a coat of air filter cleaner.
2. Allow the cleaner to soak for 10 minutes, but **DO NOT** let the cleaner dry.
3. Thoroughly rinse the air cleaner from the inside out with cool, low-pressure water.
4. Gently shake off excess water and allow the air cleaner to air dry.
5. Once the air cleaner has completely dried, coat the air cleaner with a uniform layer of air filter oil. Wait at least 20 minutes for the air cleaner to wick the oil before reinstalling the air cleaner.

Air Cleaner Installation

1. Using a magnetic pick-up tool, insert the hex head bolt that was removed earlier through the hole in the air cleaner from the inside (Figure 57).

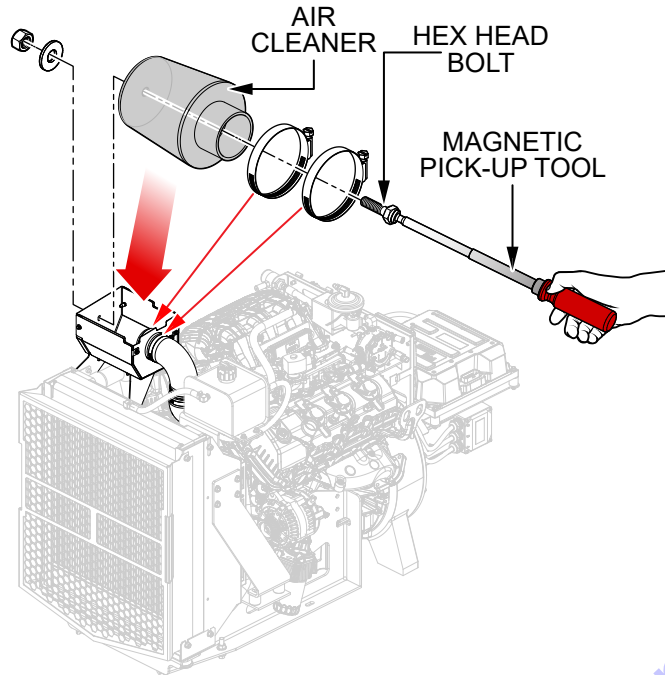


Figure 57. Air Cleaner Installation

2. Secure the air cleaner to the air box and air intake hose using the hex head bolt, flat washer, nyloc nut, and two worm clamps that were removed earlier. **DO NOT** overtighten the nut or damage to the air filter will occur.

NOTICE

DO NOT use a nut other than the self-locking style—if the nut falls off, the bolt could be sucked into the engine causing **severe engine damage**.

NOTICE

Operating the engine with a loose or damaged air cleaner could allow unfiltered air into the engine, causing premature wear and failure.

NOTICE

NEVER run the engine with the air cleaner removed.

RADIATOR

1. Check the radiator for leaks that would indicate corrosion or damage.
2. Check the coolant/antifreeze level daily and top off as necessary. Always mix coolant with clean, soft water and use the mixing ratios specified by the engine manufacturer. Replace coolant/antifreeze at least once a year.

NOTICE

The use of Havoline Xtended Life Antifreeze/Coolant Premixed 50/50 is recommended.

3. Check radiator hoses for fatigue or cracking and replace as necessary.
4. Check the radiator cap seal and replace as necessary.

CAUTION



Hot coolant can cause severe burns. **NEVER** remove the cap while the radiator is **HOT**.

Radiator Cleaning

1. Blow off dirt and dust from the radiator and shroud (Figure 58) with 28 psi (193 kPa) or less of compressed air. Be careful to not damage the fins with the compressed air.

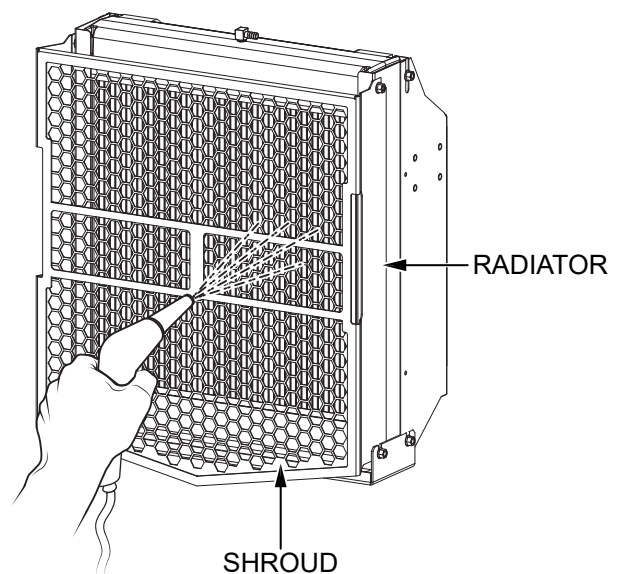


Figure 58. Radiator Cleaning

- If there is a large amount of contamination on the fins, clean and rinse them thoroughly with tap water and detergent.

NOTICE

Radiator fins damage easily. **NEVER** use high-pressure water, a wire brush, or compressed air at greater than 28 psi (193 kPa) to clean the radiator fins.

DRIVE BELT

WARNING



NEVER insert hands or tools into the drive belt area while the engine is running. Keep fingers, hands, hair and clothing away from all moving parts to prevent bodily injury.

WARNING



DO NOT attempt to access the drive belt until the muffler has cooled. Allow the entire float to cool down before performing this procedure.

The front end accessory drive belt should be changed as soon as it begins to show signs of excessive wear. **NEVER** reuse a worn belt under any circumstances. Indications of excessive belt wear include:

- Fraying
- Excessive noise
- Belt instability
- Constant or reoccurring squeal
- Smoke
- Smell of burning rubber

Drive Belt Inspection

Visually inspect the front end accessory drive belt (Figure 59) every 200 hours of use. Replace the belt if it is damaged or excessively worn.

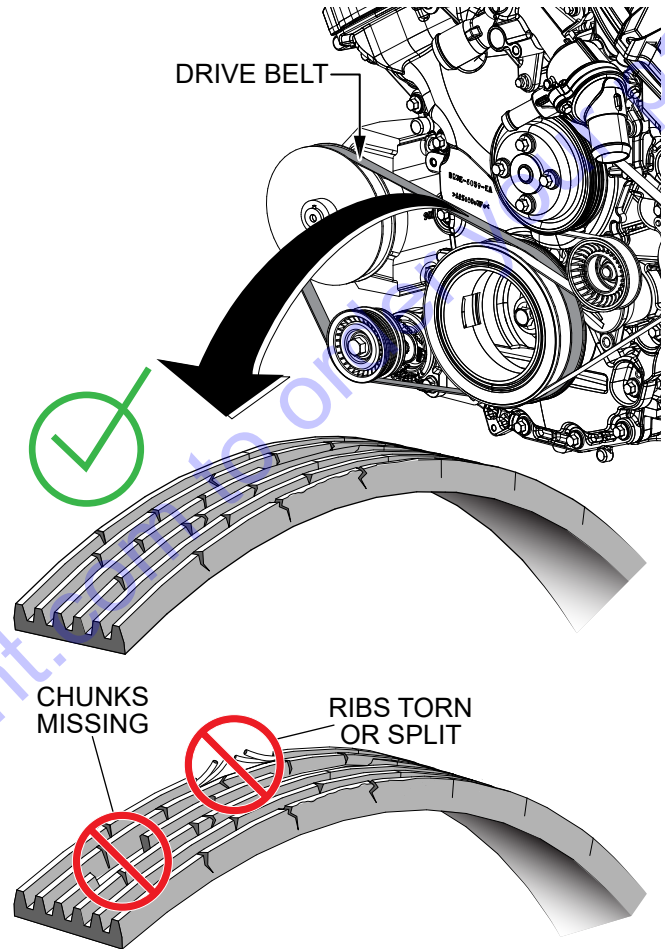


Figure 59. Drive Belt Inspection

Belt Tension

The fan belt (Figure 60) and front end accessory drive belt are both automatically tensioned and do not require adjustment.

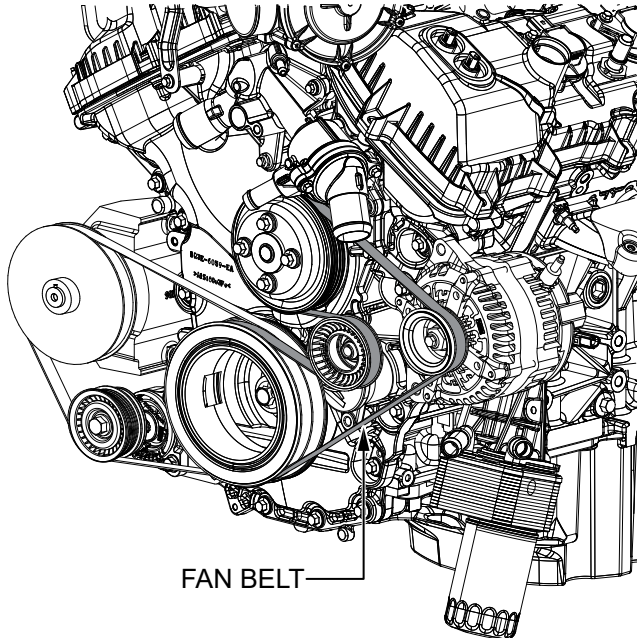


Figure 60. Fan Belt

ENGINE OIL

1. Make sure the float is on a secure, level surface with the engine stopped and the hood open as shown in Figure 55.
2. Pull the engine oil dipstick (Figure 61) out of its holder and wipe it with a clean rag.

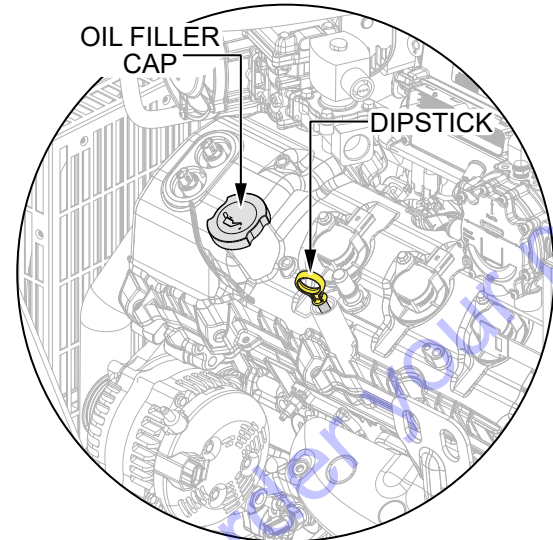


Figure 61. Engine Oil Components

3. Fully insert the dipstick then remove it again.
4. Determine if engine oil is low. Oil should be between the upper and lower marks (Figure 62) on the dipstick.

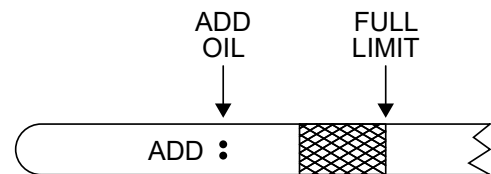


Figure 62. Engine Oil Level

5. If the oil is below the lower mark on the dipstick, remove the oil filler cap (Figure 61) and add engine oil up to the upper mark on the dipstick. Refer to Table 6 for recommended oil viscosity.

CAUTION

NEVER overfill the oil pan. **ALWAYS** allow time for any added oil to make its way to the oil pan before rechecking the level.

NOTICE

To maintain proper engine performance and durability, use only engine oils with an API classification of SJ or SH. **NEVER** use supplemental oil additives or other engine treatments.

6. When replacing the dipstick, make sure it is fully inserted into its holder to keep the crankcase sealed.

Changing Engine Oil and Filter

Change the engine oil and filter after the first 25 hours of operation (machine hours), then every 400 engine hours thereafter. Refer to Table 6 for recommended oil viscosity.

NOTICE

ALWAYS drain the engine oil while the oil is **warm**.

1. Loosen the two hex flange bolts securing the bottommost front left step (Figure 63) to the frame. Remove the step and set it aside.

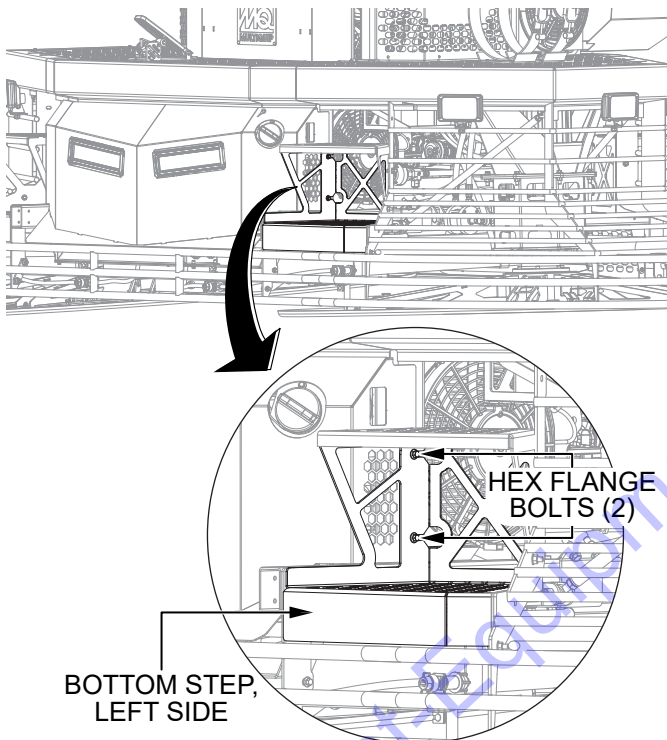


Figure 63. Step Removal

2. Remove the oil filler cap (Figure 61) to allow the oil to drain easily.
3. Place an appropriate container beneath the engine oil drain valve (Figure 64) to catch the oil as it drains.

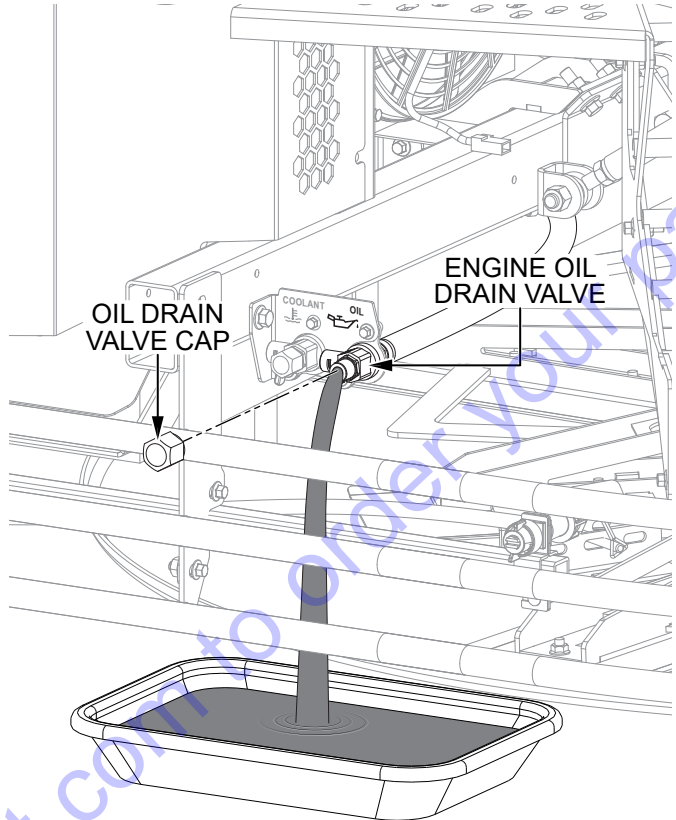


Figure 64. Draining Engine Oil

4. Remove the oil drain valve cap and open the valve to drain the engine oil (Figure 64).
5. After the oil has fully drained, close the oil drain valve and replace the oil filler cap.
6. Using a filter wrench (Figure 65), turn the oil filter counterclockwise to remove.

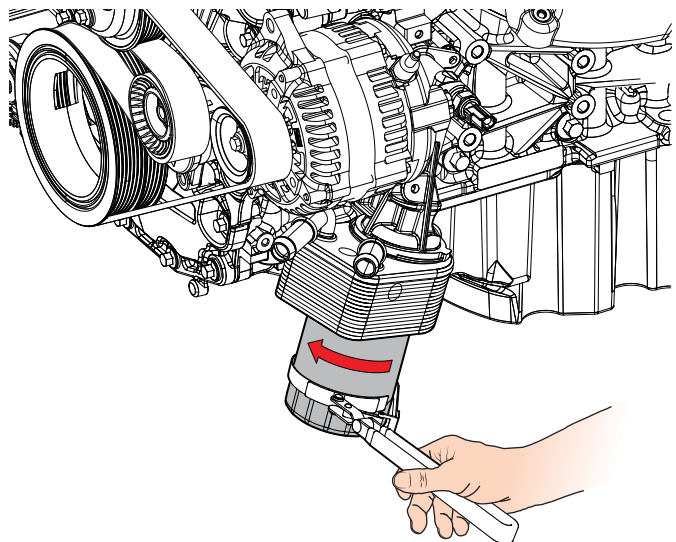


Figure 65. Oil Filter Removal

- Clean the sealing surface where the filter mounts onto the engine.
- Coat the seal of the new oil filter (Figure 66) with clean engine oil. Install the new filter **by hand** until it contacts the engine sealing surface, then tighten it another 1/2 turn. **DO NOT** use a strap wrench or any other tool to tighten the filter.

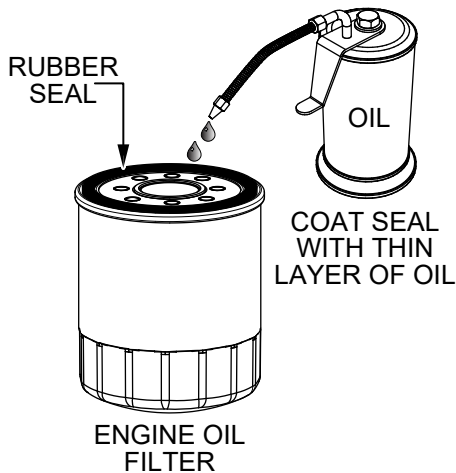


Figure 66. Engine Oil Filter

- Fill the engine with oil via the filler neck. Refer to Table 3 for engine oil capacity. **DO NOT** overfill.
- Replace the filler cap and run the engine for no more than 30 seconds. Recheck the oil level and top off as needed.

FUEL SYSTEM

- Inspect all nylon and rubber fuel hoses for signs of wear, deterioration or hardening.
- After prolonged use, water and other impurities will accumulate in the bottom of the fuel tank. Occasionally inspect the fuel tank for water contamination.
- If necessary, completely drain the fuel tank and use a spray washer to wash out any debris or deposits that have accumulated inside the tank.

The emptier the fuel tank, the easier it is for water to condense inside. This is especially true in cold weather. Keeping the tank filled with unleaded gasoline will reduce this effect.

NOTICE

NEVER store the float with fuel in the tank for an extended period of time. Completely drain the fuel system (tank, lines, etc.) if the unit is to be put into long-term storage.

Fuel Filter

Replace the engine fuel filter (Figure 67) every 200 hours of operation.

To access the fuel filter, loosen the four bolts securing the front cowling to the frame and slide off the front cowling.

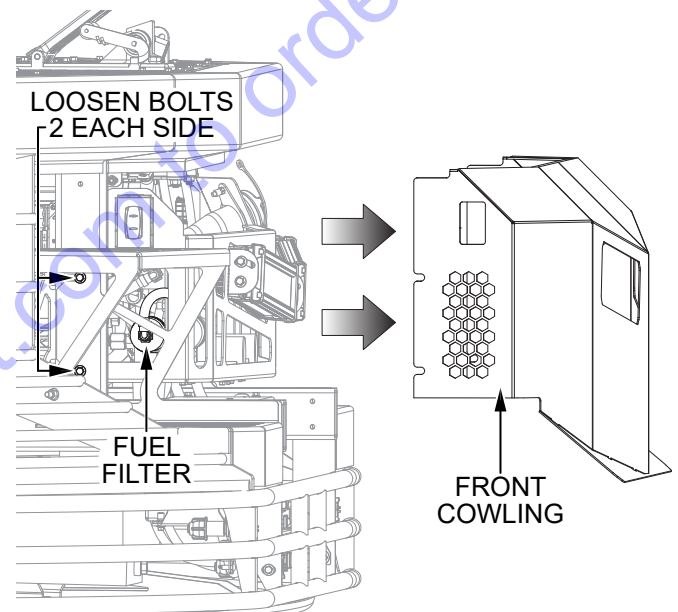


Figure 67. Fuel Filter Access

OIL AND FUEL LINES

- Check the oil and fuel lines and connections regularly for leaks or damage and replace as necessary.
- Replace the oil and fuel lines every two years to maintain flexibility and performance.

SPARK PLUGS

1. Make sure the engine is cool before servicing the spark plugs.
2. Loosen the spark plugs and remove any dirt from around the spark plug area.
3. Remove and inspect the spark plugs. Replace the spark plugs if they are damaged, the sealing washer is in poor condition, or the electrode is worn.
4. Measure the spark plug electrode gap (Figure 68) with a wire-type feeler gauge. If needed, adjust the gap to 0.049–0.053 in. (1.25–1.35 mm) by carefully bending the side electrode.

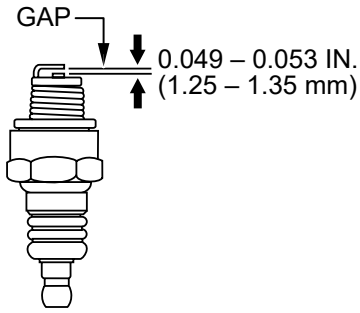


Figure 68. Spark Plug Gap Adjustment

5. Install the spark plug carefully, by hand, to avoid cross-threading.
6. After the spark plug is seated, tighten with a spark plug wrench to 11 lbf-ft. (15 N·m).

HYDRAULIC OIL AND FILTERS

The hydraulic oil and hydraulic oil filter (Figure 69) must be replaced after the first 25 hours of operation (machine hours), then every 400 engine hours thereafter.

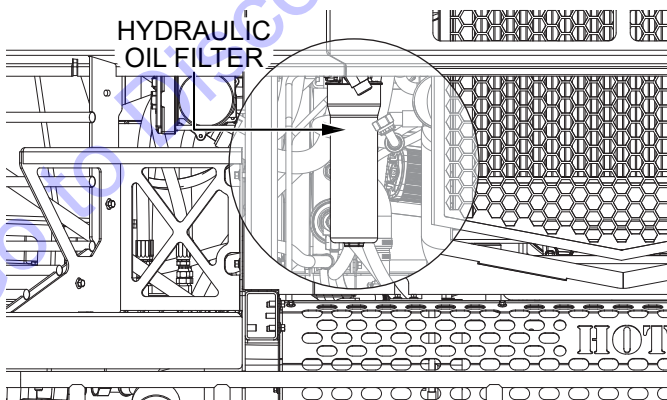


Figure 69. Hydraulic Oil Filter

NOTICE

Use 10-micron absolute synthetic media filters when replacing the hydraulic oil filter.

Draining the Hydraulic Oil

CAUTION



Hydraulic oil can get **HOT!**

ALWAYS allow hydraulic oil to cool before performing this procedure.

Drain the hydraulic oil by removing the drain cap on the bottom of the hydraulic oil reservoir (Figure 70).

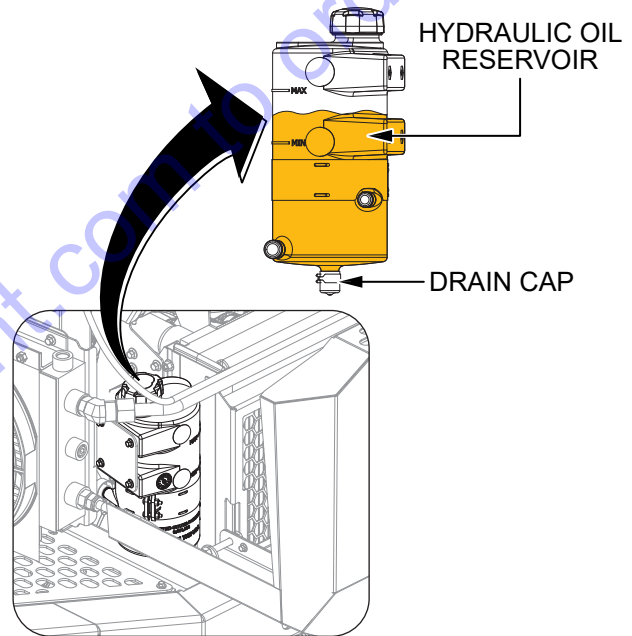


Figure 70. Hydraulic Oil Reservoir

NOTICE

Space is limited in the area of the hydraulic oil reservoir. Drain the oil into a small container that will hold up to 0.5 gallons (1.89 liters) of fluid.

Magnetic Filter

A serviceable magnetic filter (Figure 71) is connected directly to the inlet of the steering system hydraulic cooler. Be sure to clean the magnetic filter when servicing the hydraulic system.

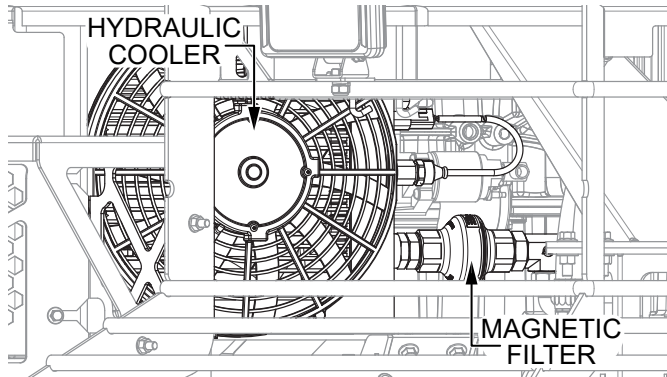


Figure 71. Magnetic Filter

1. Disconnect and remove the magnetic filter from the hydraulic cooler (Figure 71).
2. Disassemble the magnetic filter (Figure 72) and clean it thoroughly with compressed air.

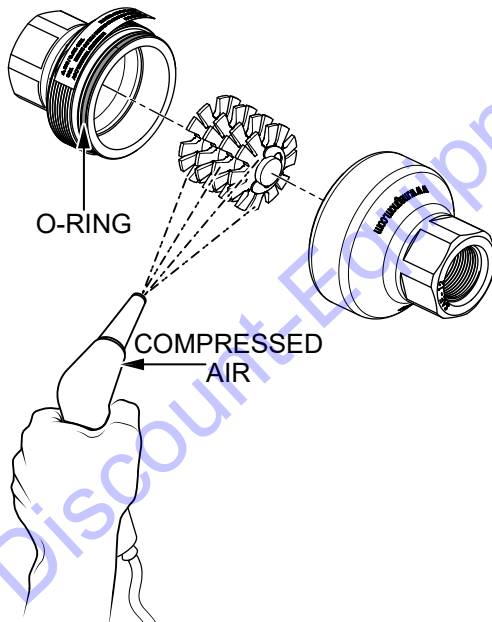


Figure 72. Magnetic Filter Cleaning

3. Inspect the O-ring (Figure 72) and clean it with a dry rag to remove debris if necessary. Replace the O-ring if it is damaged.

4. When replacing the O-ring, be sure to lightly coat the new O-ring with clean lubricating oil (Figure 73).

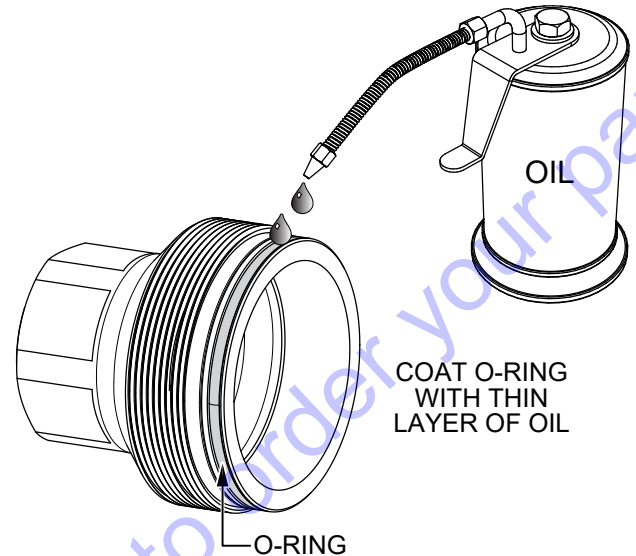


Figure 73. O-Ring Lubrication

Service Reminder Reset

After the initial 25 machine hour service for the hydraulic oil and engine oil has been completed, a **Service Reminder reset** must be performed. This records the service performed and starts the countdown to the next service interval.

1. Press the **Menu button** to view the **Menu screen** on the digital display (Figure 74).

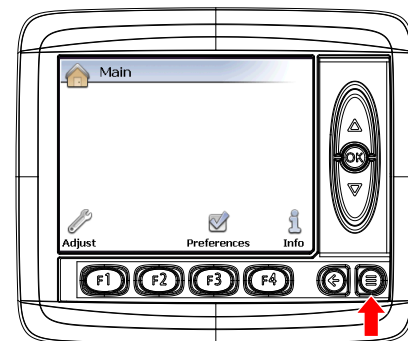


Figure 74. Menu Screen

2. Press the **F1** button (Figure 75A) to view the **Adjust** menu.

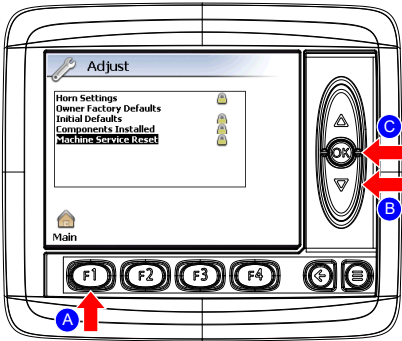


Figure 75. Digital Display (Adjust Menu)

3. Press the **Down Arrow** button (Figure 75B) until **Machine Service Reset** is highlighted, then press the **OK** button (Figure 75C).
4. Enter the service reset PIN code: **9563**. For each digit, press the Up and Down Arrow buttons to select a number, then press the OK button to confirm. When finished, press the OK button to submit the code. See Figure 76.

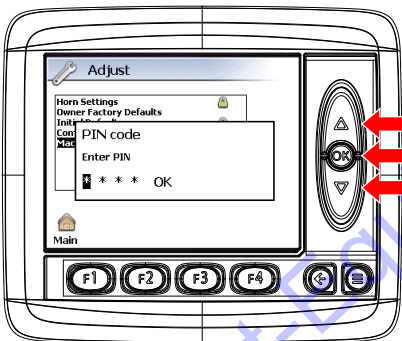


Figure 76. PIN Code Entry

5. Press the OK button again to select **Machine Service Reset** (Figure 77).

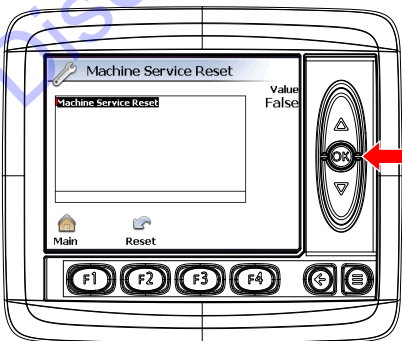


Figure 77. Machine Service Reset

6. Press the Down Arrow button (Figure 78A) to highlight **True**, then press the Up Arrow button (Figure 78B) to highlight **False**. Press the OK button (Figure 78C).

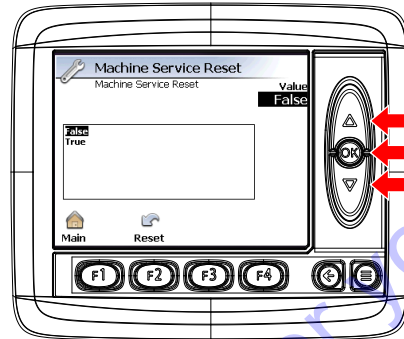


Figure 78. Service Reset Confirmation

7. The service reset has been completed. Press the F1 button to return to the Menu screen, then press the Back button to exit.

ELECTRIC DRIVE COOLING SYSTEM

ALWAYS ensure the coolant (water glycol) level is correct. Low coolant can cause a coolant pump seal failure. Inspect the cooling system for leaks every time the engine oil is changed.

NOTICE

ACCEPTABLE LEAKAGE: The coolant pump may show up to 10 cc of external leakage during the first 100 hours of operation. 10 cc of coolant will make a small puddle approximately 4 inches across on a flat surface.

Draining the Electric Drive Coolant

1. Loosen the two hex flange bolts securing the bottommost front left step (Figure 63) to the frame. Remove the step and set it aside.
2. Place an appropriate container beneath the coolant drain valve (Figure 79) to catch the coolant as it drains.

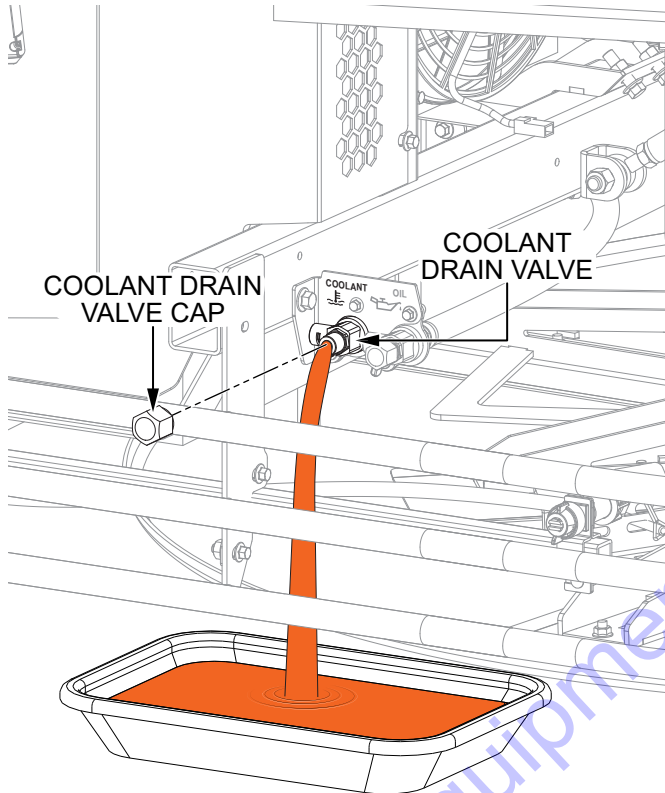


Figure 79. Draining Electric Drive Coolant

3. Remove the coolant drain valve cap and open the valve to drain the coolant (Figure 79).
4. After the coolant has fully drained, close the coolant drain valve and replace the cap.

5. Remove the coolant filler cap (Figure 80) and add coolant up to the upper limit line on the bottle. Use only prediluted 50/50 coolant which meets the requirements of GM Dex-Cool specification GM6277M. Replace the cap when finished.

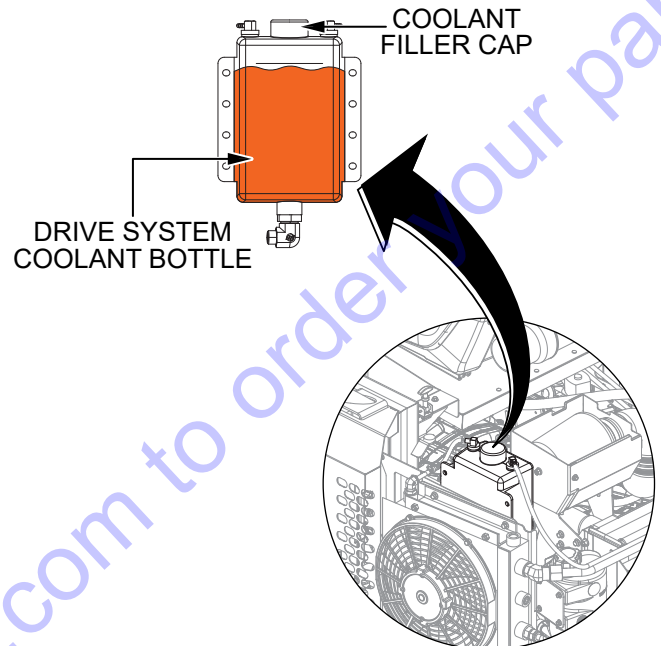


Figure 80. Drive System Coolant Bottle

NOTICE

NEVER run the float without electric drive coolant (water glycol), even for a short time. Damage to the coolant pump and electric drive components will occur.

FLOAT PANS

Float pans can be damaged by rough handling such as dropping the float on a pad, or by striking exposed plumbing, forms or rebar while in operation. Replace damaged float pans immediately. A damaged pan will prevent the PRX from properly floating concrete.

Float Pan Removal

1. Make sure the float is on a secure, level surface with the engine stopped.
2. Remove the four wire-lock hitch pins (Figure 81) securing the float pan to the spider.

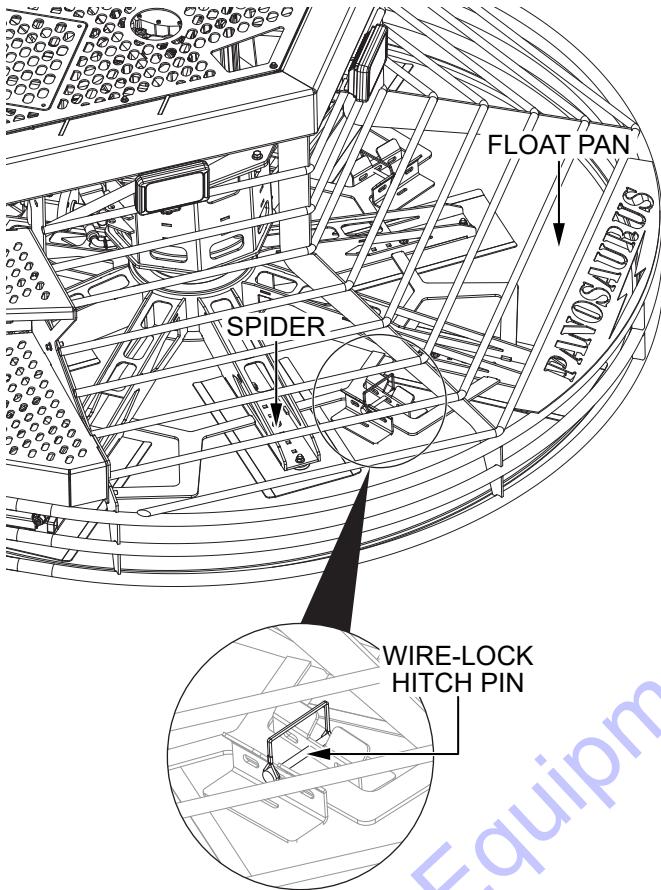


Figure 81. Float Pan Removal

3. Carefully lift the float using a forklift as shown in the *Lifting and Transporting* section of this manual. Lift the float just enough for a float pan to slide freely beneath the rotors.

NOTICE

DO NOT lift the float to unnecessary heights.

4. Remove the float pan from the spider.

Float Pan Installation

This procedure will require at least two people—one to operate the forklift and one to rotate and secure the pan to the spider.

1. With the float lifted off the ground, slide a float pan under the spider with the float pan drive mounts facing upward (Figure 82).

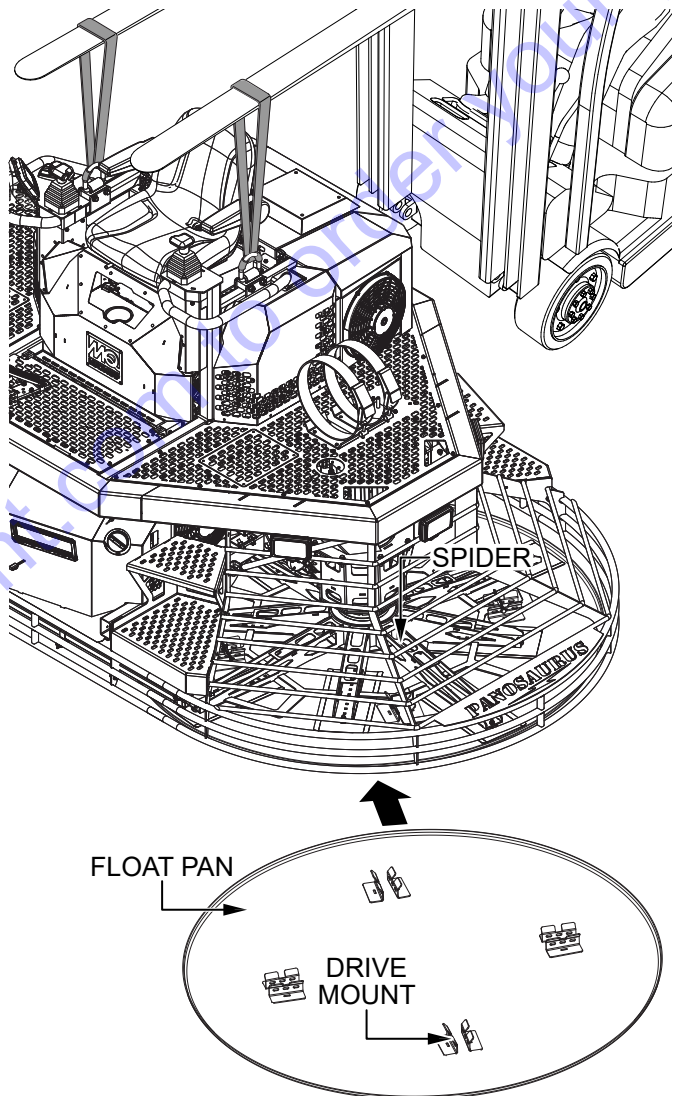


Figure 82. Lift and Slide

- Align the float pan drive mounts as close as possible with the spider drive bars (Figure 83). Lower the float slightly and check the alignment between the drive mounts and drive bars. Spin the rotor by hand and reposition the pan as needed to ensure proper alignment.

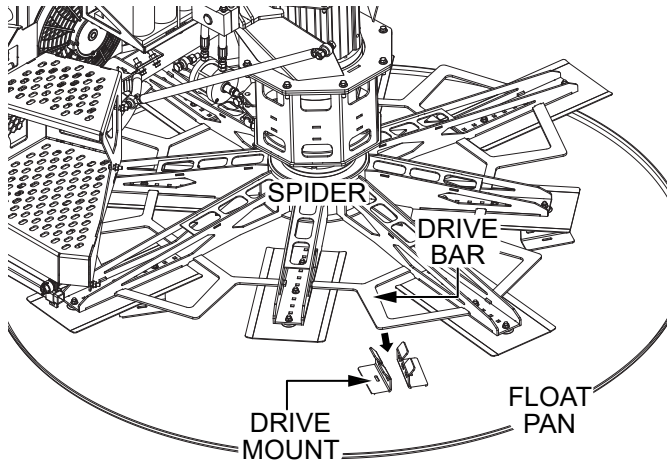


Figure 83. Float Pan Alignment

- Once they are properly aligned, lower the float completely onto the pan, making sure the spider drive bars fit securely into the pan drive mounts (Figure 84).

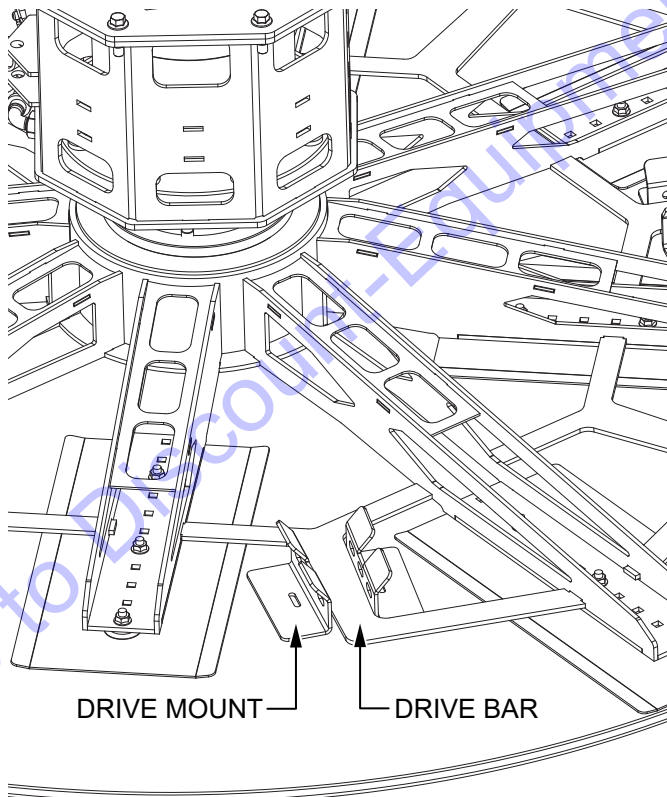


Figure 84. Float Pan Installation

- Secure the spider drive bars to the pan drive mounts using four wire-lock hitch pins (Figure 85).

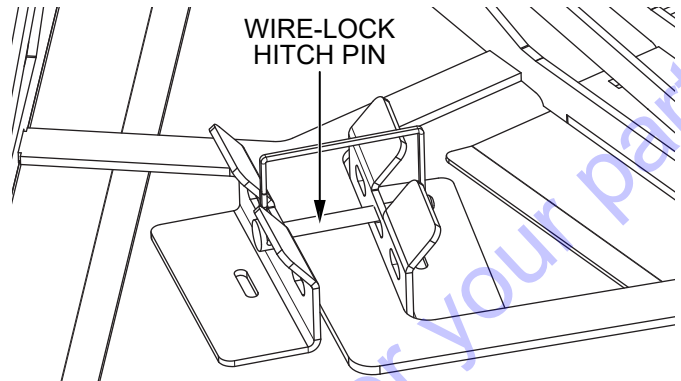


Figure 85. Lock Pin Installation

- Make sure the float pan is fully secured to the spider before the PRX is put into operation.

ROTOR PADS

The PRX rotor pads (Figure 86) can be repositioned to adjust float pan pressure as needed. They are factory set in the full outward position but can be moved inward to accommodate high engine load scenarios.

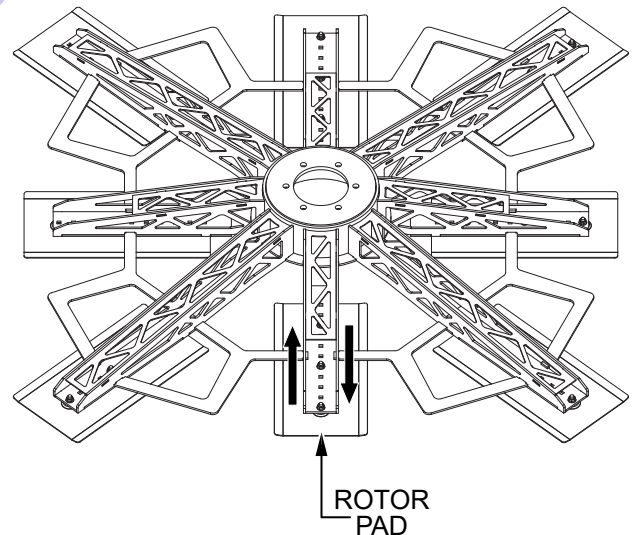


Figure 86. Rotor Pads

The rotor pads can also be used to drive the unit across a shop floor while the float pans are removed.

NOTICE

NEVER attempt to finish concrete with the rotor pads only. Float pans must be installed for proper finishing.

BATTERY

1. Check and clean the battery terminals for corrosion.
2. Check the manufacturer's recommendations for maintaining and charging the battery.
3. Disconnect all three negative (-) battery terminals when storing the unit. If the unit will be stored where the ambient temperature will drop to -15°C or less, remove and store the battery in a warm, dry location.

NOTICE

NEVER attempt to charge a battery that is frozen. **The battery can explode** unless first allowed to thaw.

PREPARATION FOR LONG-TERM STORAGE

1. Disconnect and remove the battery.
2. Drain all fuel from the fuel tank.
3. Clean the float exterior with a cloth soaked in clean oil.
4. Cover the float with a plastic sheet and store it out of direct sunlight in a moisture- and dust-free location.

DECOMMISSIONING

Decommissioning is a controlled process used to safely retire a piece of equipment that is no longer serviceable. If the equipment poses an unacceptable and unrepairable safety risk due to wear or damage, or is no longer cost effective to maintain (beyond life-cycle reliability), and is to be decommissioned (dismantled and/or demolished), the following procedure must be performed.

1. Drain all fluids completely. These may include oil, gasoline, hydraulic oil, and coolant. Dispose of all fluids properly in accordance with local and governmental regulations. **NEVER** pour fluids on the ground or down drains or sewers.
2. Remove the battery and bring it to an appropriate facility for lead reclamation. Use safety precautions when handling batteries that contain sulfuric acid.
3. The remainder can be brought to a salvage yard or metal reclamation facility for further dismantling.

TROUBLESHOOTING

Troubleshooting (Trowel)		
Symptom	Possible Problem	Solution
Seat switch is not functioning.	Other problems?	Check seat function with the electronic service tool.
	Loose wire connections?	Check wiring. Replace as necessary.
	Bad contacts?	Replace seat cushion (contains the switch).
Trowel bounces, rolls concrete, or makes uneven swirls in concrete.	Pans?	Make certain pans are undamaged and in good condition. Replace as necessary.
	Spiders?	Check the spiders for bent drive bars or other damage. Replace as necessary.
Steering is unresponsive.	Steering sensitivity?	See section on steering sensitivity adjustment.
Lights are not working.	Wiring?	Check all electrical connections, including the master ON/OFF switch, to see if wiring is in good condition with no shorts. Replace as necessary.
	Lights?	Check light bulbs. Replace as necessary.
Retardant spray is not working.	Retardant?	Check retardant level in tank. Fill tank as needed.
	Wiring?	Check all electrical connections, including the master ON/OFF switch connections. Replace components and wiring as necessary.
	Bad spray pump?	If a pump has a voltage present when the switch is turned on, but does not operate and electrical connections to the pump are good, replace the pump.
	Bad fuse?	Check fuses. Replace defective fuses.
Operating position is uncomfortable.	Seat adjusted for operator?	Adjust seat with lever located on the front of the seat.
Coolant pump is not running.	Electrical connections?	Check electrical connections and fuse. Check ignition wire and verify pin location.
Coolant pump is running but not pumping fluid.	Fluid level?	Check system coolant level. Fill tank as needed.
	Tubing?	Check coolant lines for restrictions (kinks). Check for collapsed inlet or outlet hose. Check pump inlet for trapped debris. Correct or replace as necessary.
	Pump primed?	Make sure pump is primed.
Coolant pump is not responding to CAN commands.	Harness?	Check harness wiring.
Coolant pump is leaking excessively while running.	Bad pump?	Replace pump. No action is required for pumps exhibiting acceptable leakage as described in the Maintenance section.

TROUBLESHOOTING

Troubleshooting (Engine)		
Symptom	Possible Problem	Solution
Difficult to start, fuel is available, but no spark at spark plug.	Spark plug bridging?	Check gap, insulation or replace spark plug.
	Carbon deposit on spark plug?	Clean or replace spark plug.
	Short circuit due to deficient spark plug insulation?	Check spark plug insulation, replace if worn.
	Improper spark plug gap?	Set to proper gap.
	Spark plug is red?	Check transistor ignition unit.
	Spark plug is bluish white?	If insufficient compression, repair or replace engine. If injected air leaking, correct leak. If carburetor jets clogged, clean carburetor.
	No spark present at tip of spark plug?	Check transistor ignition unit and replace if defective. Check voltage cord and replace if cracked or broken. Check spark plug and replace if fouled.
	No oil?	Add oil as required.
	Oil pressure alarm lamp blinks upon starting? (if applicable)	Check automatic shutdown circuit, oil sensor. (if applicable)
Difficult to start, fuel is available, and spark is present at the spark plug.	ON/OFF switch is shorted?	Check switch wiring, replace switch.
	Ignition coil defective?	Replace ignition coil.
	Improper spark gap, points dirty?	Set correct spark gap and clean points.
	Condenser insulation worn or short circuiting?	Replace condenser.
	Spark plug wire broken or short circuiting?	Replace defective spark plug wiring.
Difficult to start, fuel is available, spark is present and compression is normal.	Wrong fuel type?	Flush fuel system, replace with correct type of fuel.
	Water or dust in fuel system?	Flush fuel system.
	Air cleaner dirty?	Replace air cleaner.
Difficult to start, fuel is available, spark is present and compression is low.	Suction/exhaust valve stuck or protruded?	Reseat valves.
	Piston ring and/or cylinder worn?	Replace piston rings and/or piston.
	Cylinder head and/or spark plug not tightened properly?	Torque cylinder head bolts and spark plug.
	Head gasket and/or spark plug gasket damaged?	Replace head and spark plug gaskets.

TROUBLESHOOTING

FAULTS

The PRX is equipped with a digital control panel and display that communicates with the Engine Control Unit (ECU) and Machine Control Unit (MCU) using the SAE J1939 Controller Area Network (CAN) bus protocol. The Engine Control Unit (ECU) diagnoses engine faults and the Machine Control Unit (MCU) diagnoses machine faults.

The appearance of an **AMBER** fault icon (Figure 87) indicates that a minor fault has occurred. Shut down the float and correct the problem **as soon as possible**.

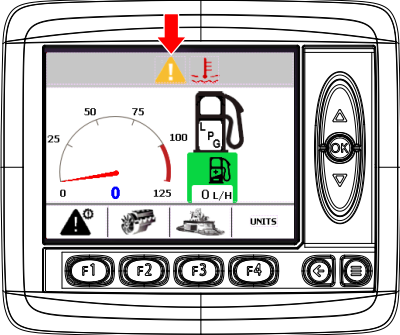


Figure 87. Fault Icon (AMBER)

The appearance of a **RED** fault icon (Figure 88) indicates that a major fault has occurred. Shut down the float and correct the problem **immediately**.

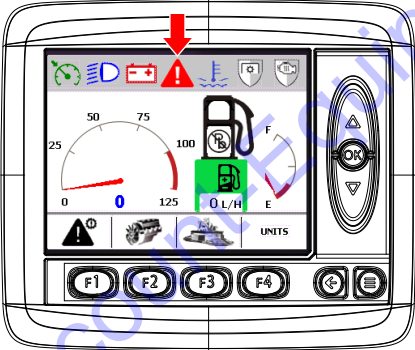


Figure 88. Fault Icon (RED)

Engine and machine faults can be viewed by pressing the **F1** button (Figure 89). See Table 12–Table 19 for a comprehensive list of active fault codes and countermeasures.

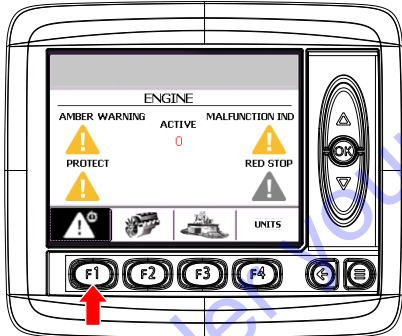


Figure 89. Fault Menu Button (F1)

TROUBLESHOOTING

Table 12. Engine Fault Codes

Fault Index	Description	SPN	FMI
0	DTC 108: MAP pressure high	106	16
1	DTC 107: MAP voltage low	106	4
2	DTC 118: ECT voltage high	110	3
3	DTC 117: ECT voltage low	110	4
4	DTC 116: ECT higher than expected stage 1	110	15
5	DTC 113: IAT voltage high	105	3
6	DTC 112: IAT voltage low	105	4
7	DTC 2229: BP pressure high	108	0
8	DTC 129: BP pressure low	108	1
9	DTC 563: Vbat voltage high	168	15
10	DTC 562: Vbat voltage low	168	17
11	DTC 643: Sensor supply voltage 1 high	1079	3
12	DTC 642: Sensor supply voltage 1 low	1079	4
13	DTC 123: TPS1 voltage high	51	3
14	DTC 122: TPS1 voltage low	51	4
15	DTC 223: TPS2 voltage high	3673	3
16	DTC 222: TPS2 voltage low	3673	4
17	DTC 221: TPS1-2 higher than expected	51	0
18	DTC 121: TPS1-2 lower than expected	51	1
19	DTC 2122: FPP1 voltage high	91	3
20	DTC 2123: FPP1 voltage low	91	4
21	DTC 2128: FPP2 voltage high	29	3
22	DTC 2127: FPP2 voltage low	29	4
23	DTC 2115: FPP1 higher than IVS	91	0
24	DTC 2139: FPP1 lower than IVS	91	1
25	DTC 2116: FPP2 higher than IVS	29	0
26	DTC 2140: FPP2 lower than IVS	29	1
27	DTC 2126: FPP1-2 higher than expected	91	16
28	DTC 2121: FPP1-2 lower than expected	91	18
29	DTC 524: Oil pressure low	100	1
30	DTC 171: Adaptive-learn gasoline bank1 high	4237	0
31	DTC 172: Adaptive-learn gasoline bank1 low	4237	1
32	DTC 1155: Closed-loop gasoline bank1 high	4236	0
33	DTC 1156: Closed-loop gasoline bank1 low	4236	1
34	DTC 1157: Closed-loop gasoline bank2 high	4238	0
35	DTC 1158: Closed-loop gasoline bank2 low	4238	1
36	DTC 1151: Closed-loop LPG high	4236	0
37	DTC 1152: Closed-loop LPG low	4236	1

TROUBLESHOOTING

Table 13. Engine Fault Codes (Continued)

Fault Index	Description	SPN	FMI
38	DTC 1153: Closed-loop NG high	4236	0
39	DTC 1154: Closed-loop NG low	4236	1
40	DTC 174: Adaptive-learn gasoline bank2 high	4239	0
41	DTC 175: Adaptive-learn gasoline bank2 low	4239	1
42	DTC 1161: Adaptive-learn LPG high	4237	0
43	DTC 1162: Adaptive-learn LPG low	4237	1
44	DTC 1163: Adaptive-learn NG high	4237	0
45	DTC 1164: Adaptive-learn NG low	4237	1
46	DTC 261: Injector 1 open or short to ground	651	5
47	DTC 264: Injector 2 open or short to ground	652	5
48	DTC 267: Injector 3 open or short to ground	653	5
49	DTC 270: Injector 4 open or short to ground	654	5
50	DTC 273: Injector 5 open or short to ground	655	5
51	DTC 276: Injector 6 open or short to ground	656	5
52	DTC 279: Injector 7 open or short to ground	657	5
53	DTC 282: Injector 8 open or short to ground	658	5
54	DTC 285: Injector 9 open or short to ground	659	5
55	DTC 288: Injector 10 open or short to ground	660	5
56	DTC 262: Injector 1 coil shorted	651	6
57	DTC 265: Injector 2 coil shorted	652	6
58	DTC 268: Injector 3 coil shorted	653	6
59	DTC 271: Injector 4 coil shorted	654	6
60	DTC 274: Injector 5 coil shorted	655	6
61	DTC 277: Injector 6 coil shorted	656	6
62	DTC 280: Injector 7 coil shorted	657	6
63	DTC 283: Injector 8 coil shorted	658	6
64	DTC 286: Injector 9 coil shorted	659	6
65	DTC 289: Injector 10 coil shorted	660	6
86	DTC 217: ECT higher than expected stage 2	110	0
87	DTC 111: IAT higher than expected stage 1	105	15
88	DTC 127: IAT higher than expected stage 2	105	0
89	DTC 327: Knock1 sensor open or not present	731	4
90	DTC 2112: Unable to reach higher TPS	51	7
91	DTC 2111: Unable to reach lower TPS	51	7
92	DTC 1531: Gov1/2/3 interlock failure	0	31
93	DTC 628: Fuel-pump high-side open or short to ground	1347	5
94	DTC 629: Fuel-pump high-side short to power	1347	6
95	DTC 342: Loss of CAM input signal	723	4

TROUBLESHOOTING

Table 14. Engine Fault Codes (Continued)

Fault Index	Description	SPN	FMI
96	DTC 341: CAM input signal noise	723	2
97	DTC 336: CRANK input signal noise	636	2
98	DTC 16: Crank and/or cam could not synchronize during start	636	8
99	DTC 606: Microprocessor failure - COP	629	31
100	DTC 1612: Microprocessor failure - RTI 1	629	31
101	DTC 1613: Microprocessor failure - RTI 2	629	31
102	DTC 1614: Microprocessor failure - RTI 3	629	31
103	DTC 1615: Microprocessor failure - A/D	629	31
104	DTC 1616: Microprocessor failure - Interrupt	629	31
105	DTC 601: Microprocessor failure - FLASH	628	13
106	DTC 604: Microprocessor failure - RAM	630	12
107	DTC 326: Knock1 excessive or erratic signal	731	2
108	DTC 219: RPM higher than max allowed govern speed	515	15
109	DTC 1111: RPM above fuel rev limit level	515	16
110	DTC 1112: RPM above spark rev limit level	515	0
111	DTC 134: EGO1 open / lazy	3217	5
112	DTC 154: EGO2 open / lazy	3227	5
113	DTC 140: EGO3 open / lazy	3256	5
114	DTC 1521: CHT higher than expected stage 1	110	16
115	DTC 1522: CHT higher than expected stage 2	110	0
116	DTC 1515: AUX analog Pull-Down 1 high voltage	710	3
117	DTC 1516: AUX analog Pull-Down 1 low voltage	710	4
118	DTC 1511: AUX analog Pull-Up 1 high voltage	701	3
119	DTC 1512: AUX analog Pull-Up 1 low voltage	701	4
120	DTC 1513: AUX analog Pull-Up 2 high voltage	702	3
121	DTC 1514: AUX analog Pull-Up 2 low voltage	702	4
126	DTC 238: TIP high voltage	102	3
127	DTC 237: TIP low voltage	102	4
128	DTC 92: FP high voltage	94	3
129	DTC 91: FP low voltage	94	4
130	DTC 420: Catalyst inactive on gasoline (Bank 1)	3050	11
131	DTC 1165: Catalyst inactive on LPG	3050	11
132	DTC 1166: Catalyst inactive on NG	3050	11
133	DTC 1171: MegaJector delivery pressure higher than expected	520260	0
134	DTC 1172: MegaJector delivery pressure lower than expected	520260	1
135	DTC 1173: MegaJector comm lost	520260	31
136	DTC 1174: MegaJector voltage supply high	520260	3
137	DTC 1175: MegaJector voltage supply low	520260	4

TROUBLESHOOTING

Table 15. Engine Fault Codes (Continued)

Fault Index	Description	SPN	FMI
138	DTC 1176: MegaJector internal actuator fault detection	520260	12
139	DTC 1177: MegaJector internal circuitry fault detection	520260	12
140	DTC 1178: MegaJector internal comm fault detection	520260	12
141	DTC 1131: WGP voltage high	1192	3
142	DTC 1132: WGP voltage low	1192	4
145	DTC 236: TIP active	102	2
146	DTC 183: FT high voltage	174	3
147	DTC 182: FT low voltage	174	4
152	DTC 337: Crank signal loss	636	4
153	DTC 1625: J1939 shutdown request	1110	31
158	DTC 686: Power relay ground short	1485	4
159	DTC 685: Power relay coil open	1485	5
160	DTC 687: Power relay coil short to power	1485	3
161	DTC 616: Start relay ground short	1321	4
162	DTC 615: Start relay coil open	1321	5
163	DTC 617: Start relay coil short to power	1321	3
167	DTC 628: Fuel pump relay control ground short	1348	4
168	DTC 627: Fuel pump relay coil open	1348	5
169	DTC 629: Fuel pump relay coil short to power	1348	3
170	DTC 1644: MIL control ground short	1213	4
171	DTC 650: MIL open	1213	5
172	DTC 1645: MIL control short to power	1213	3
175	DTC 2130: IVS stuck at-idle, FPP1/2 match	558	5
176	DTC 2131: IVS stuck off-idle, FPP1/2 match	558	6
177	DTC 1121: FPP1/2 simultaneous voltages out-of-range (redundancy lost)	91	31
178	DTC 2120: FPP1 invalid voltage and FPP2 disagrees with IVS (redundancy lost)	520199	11
179	DTC 2125: FPP2 invalid voltage and FPP1 disagrees with IVS (redundancy lost)	520199	11
180	DTC 1122: FPP1/2 do not match each other or IVS (redundancy lost)	520199	11
181	DTC 653: Sensor supply voltage 2 high	1080	3
182	DTC 652: Sensor supply voltage 2 low	1080	4
183	DTC 1611: Sensor supply voltage 1 and 2 out-of-range	1079	31
184	DTC 332: Knock2 sensor open or not present	520197	4
185	DTC 331: Knock2 excessive or erratic signal	520197	2
186	DTC 2135: TPS1/2 simultaneous voltages out-of-range	51	31
187	DTC 2428: EGT temperature high	173	0
188	DTC 1628: J1939 CAN address / engine-number conflict	639	13
189	DTC 1631: PWM1-Gauge1 open / ground short	697	5
190	DTC 1632: PWM1-Gauge1 short to power	697	3

TROUBLESHOOTING

Table 16. Engine Fault Codes (Continued)

Fault Index	Description	SPN	FMI
191	DTC 1633: PWM2-Gauge2 open / ground short	698	5
192	DTC 1634: PWM2-Gauge2 short to power	698	3
193	DTC 1635: PWM3-Gauge3 open / ground short	699	5
194	DTC 1636: PWM3-Gauge3 short to power	699	3
195	DTC 1637: PWM4 open / ground short	700	5
196	DTC 1638: PWM4 short to power	700	3
197	DTC 1639: PWM5 open / ground short	924	5
198	DTC 1640: PWM5 short to power	924	3
199	DTC 430: Catalyst inactive on gasoline (Bank 2)	3051	11
200	DTC 160: EGO4 open / lazy	3266	5
201	DTC 1517: AUX analog Pull-Up 3 high voltage	703	3
202	DTC 1518: AUX analog Pull-Up 3 low voltage	703	4
203	DTC 1541: AUX analog Pull-Up/Down 1 high voltage	704	3
204	DTC 1542: AUX analog Pull-Up/Down 1 low voltage	704	4
205	DTC 1543: AUX analog Pull-Up/Down 2 high voltage	705	3
206	DTC 1544: AUX analog Pull-Up/Down 2 low voltage	705	4
207	DTC 1545: AUX analog Pull-Up/Down 3 high voltage	706	3
208	DTC 1546: AUX analog Pull-Up/Down 3 low voltage	706	4
209	DTC 1551: AUX digital 1 high voltage	707	3
210	DTC 1552: AUX digital 1 low voltage	707	4
211	DTC 1553: AUX digital 2 high voltage	708	3
212	DTC 1554: AUX digital 2 low voltage	708	4
213	DTC 1555: AUX digital 3 high voltage	709	3
214	DTC 1556: AUX digital 3 low voltage	709	4
215	DTC 188: Gaseous fuel temperature sender high voltage	3468	3
216	DTC 187: Gaseous fuel temperature sender low voltage	3468	4
217	DTC 1629: J1939 TSC1 message receipt loss	695	9
218	DTC 359: Fuel run-out longer than expected	632	31
219	DTC 1630: J1939 ETC message receipt loss	91	19
229	DTC 1561: AUX analog Pull-Down 2 high voltage	711	3
230	DTC 1561: AUX analog Pull-Down 2 low voltage	711	4
231	DTC 1561: AUX analog Pull-Down 3 high voltage	712	3
232	DTC 1561: AUX analog Pull-Down 3 low voltage	712	4
275	DTC 1651: J1939 ETC message receipt loss while in-gear	91	9
276	DTC 1661: PWM6 open / ground short	925	5
277	DTC 1662: PWM6 short to power	925	3
278	DTC 1663: PWM7 open / ground short	926	5
279	DTC 1664: PWM7 short to power	926	3

TROUBLESHOOTING

Table 17. Engine Fault Codes (Continued)

Fault Index	Description	SPN	FMI
280	DTC 1547: AUX analog Pull-Up/Down 4 high voltage	713	3
281	DTC 1548: AUX analog Pull-Up/Down 4 low voltage	713	4
283	DTC 1665: PWM8 open / ground short	2646	5
284	DTC 1666: PWM8 short to power	2646	3
285	DTC 1669: PWM9 open / ground short	2647	5
286	DTC 1670: PWM9 short to power	2647	3
287	DTC 1183: MegaJector autozero / lockoff failure	520803	31
288	DTC 11: Intake cam / distributor position error	520800	7
290	DTC 88 Fuel pressure higher than expected	94	0
291	DTC 87 Fuel pressure lower than expected	94	1

TROUBLESHOOTING

Table 18. Machine Fault Codes

Parameter Name	SPN	FMI	Fault Conditions	Fault Reactions
MCU 5V Supply A	3509	3	Sensor voltage output > 4.5VDC	Red stop lamp, steering pressure high and fuel level high
		4	Sensor voltage output < 4VDC	Red stop lamp, steering pressure low and fuel level low
MCU Temperature	10761	3	MCU temperature > 85°C	Red stop lamp, cruise control disabled
		16	80°C < MCU temperature < 85°C	Amber warning lamp, cruise control disabled
Pedal Signal 1	521131	3	Sensor output > 4.75VDC	Amber warning lamp, cruise control disabled
		5	Sensor output < .25VDC	
Pedal Signal 2	521156	3	Sensor output > 4.96VDC	Amber warning lamp, cruise control disabled
		5	Sensor output < .05VDC	
		11	Signal 1 and Signal 2 out of range	Red stop, pedal signal set to 0, rotors disabled
Fuses (16 Total)	521198	5	Open load (blown fuse)	Amber warning lamp, cruise control disabled
Relays (6 Total)	521199	31	Relay fault	Amber warning lamp, cruise control disabled
Hydraulic Temperature	521100	16	Temperature ≥ 77°	Amber warning lamp, cruise control disabled
		3	Temperature ≥ 85°	Red stop lamp, cruise control disabled
Hydraulic Steering Pressure	521113	18	50 psi less than setpoint *	Amber warning lamp, cruise control disabled
		16	50 psi greater than setpoint *	
		3	Hydraulic pressure ≥ 500 psi	Red stop lamp, cruise control disabled
Hydraulic Filter	521106	5	Hydraulic filter in bypass	Amber warning lamp, cruise control disabled
Hydraulic Fluid Level	521216	5	Hydraulic fluid low	Amber warning lamp, cruise control disabled
Glycol Fluid Level	7549	5	Electronic coolant low	Amber warning lamp, cruise control disabled
GC Status		11	Code 13 (critical error)	All Sevcon controllers shut down, rotors disabled, key cycle required
GC Motor Temperature	9059	16	170° ≥ Temperature	Amber warning lamp, thermal mgmt. on high, cruise control disabled
		3	175° ≥ Temperature	Red stop lamp, cruise control disabled
GC Temperature Remaining	10216	16	Temperature < 8°C	Amber warning lamp, thermal mgmt. on high, cruise control disabled
		3	Temperature ≤ 1°C	Red stop lamp, cruise control disabled
GC Cap Voltage	9101	4	Voltage < 300VDC	Motor controllers disabled
RC Status		11	Code 13 (critical error)	All Sevcon controllers shut down, rotors disabled, key cycle required
RC Motor Temperature	9060	16	170° ≥ Temperature	Amber warning lamp, thermal mgmt. on high, cruise control disabled
		3	175° ≥ Temperature	Red stop lamp, cruise control disabled
RC Temperature Remaining	10282	16	Temperature < 8°C	Amber warning lamp, thermal mgmt. on high, cruise control disabled
		3	Temperature ≤ 1°C	Red stop lamp, cruise control disabled
RC Cap Voltage	9102	4	Voltage < 300VDC	Motor controllers disabled

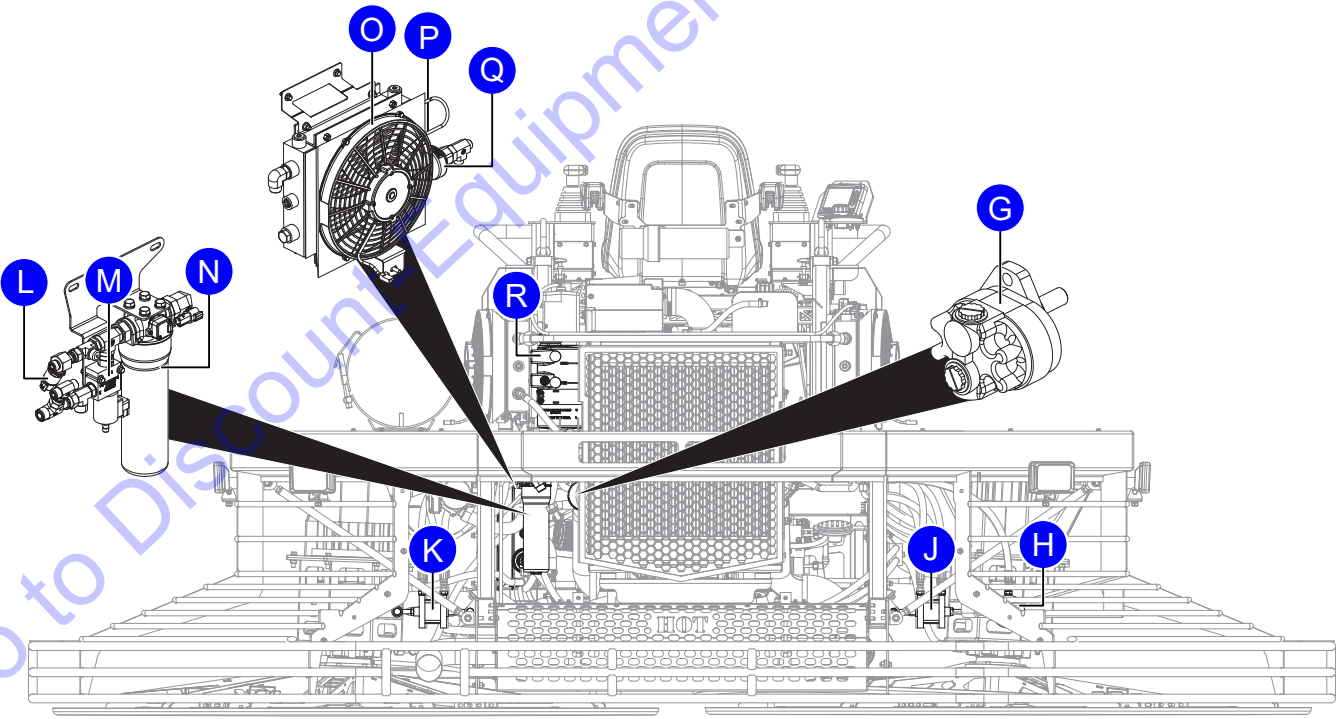
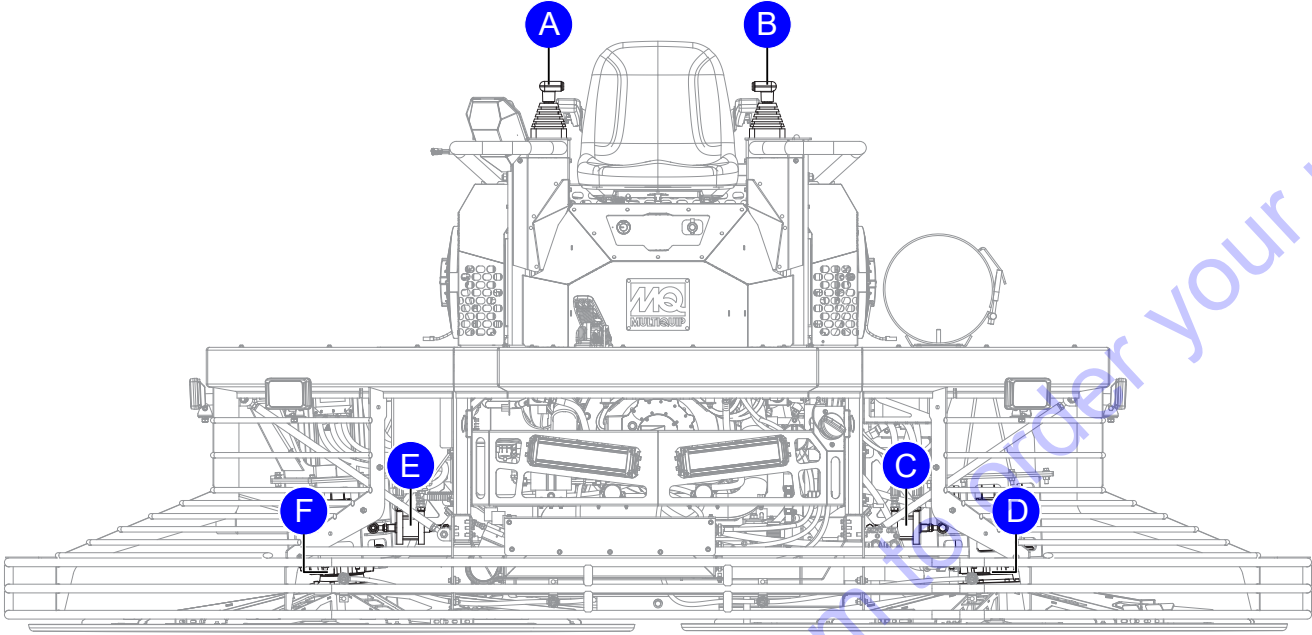
TROUBLESHOOTING

Table 19. Machine Fault Codes (Continued)

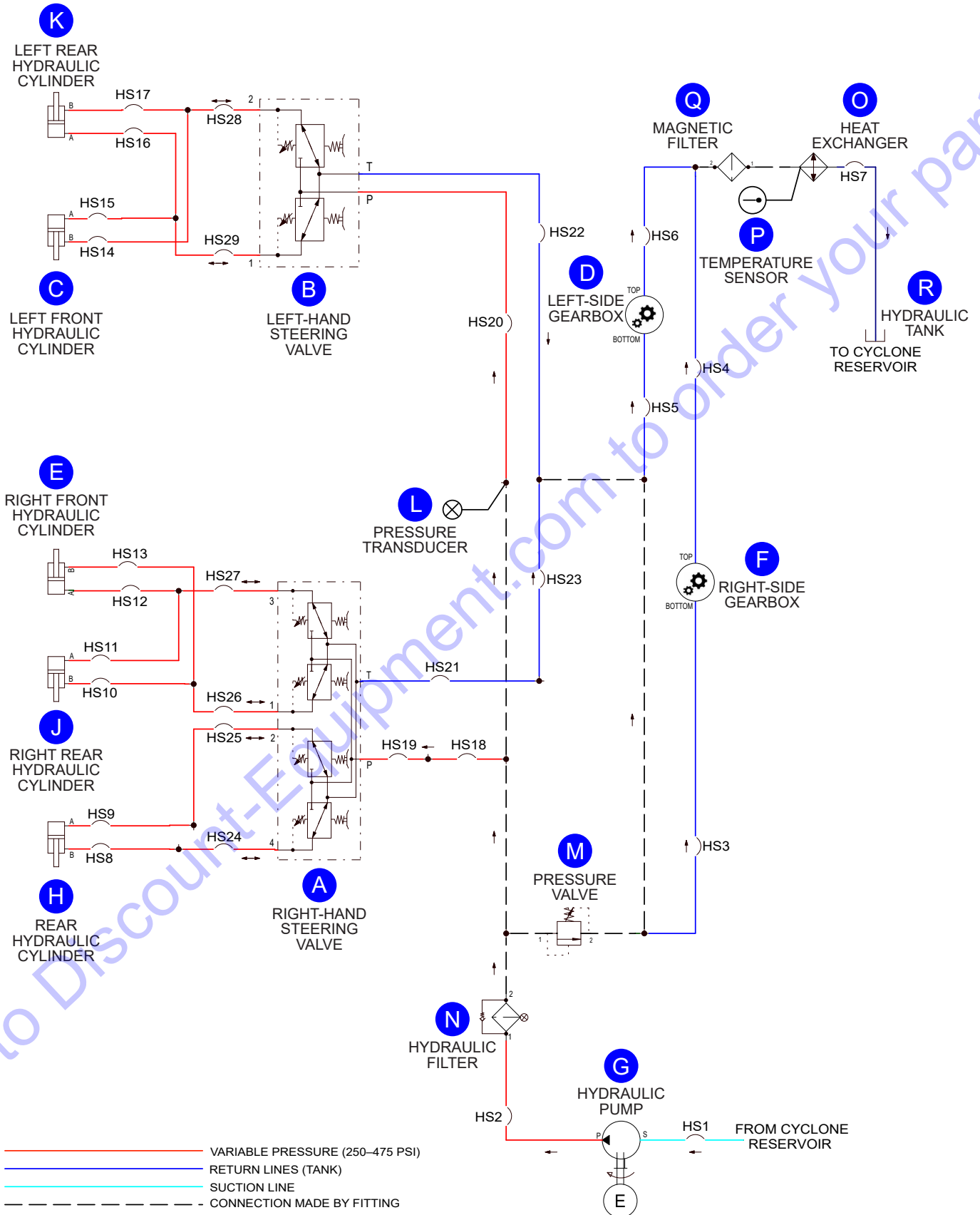
Parameter Name	SPN	FMI	Fault Conditions	Fault Reactions
LC Status		11	Code 13 (critical error)	All Sevcon controllers shut down, rotors disabled, key cycle required
LC Motor Temperature	11802	16	$170^{\circ} \geq$ Temperature	Amber warning lamp, thermal mgmt. on high, cruise control disabled
		3	$175^{\circ} \geq$ Temperature	Red stop lamp, cruise control disabled
LC Temperature Remaining	11867	16	Temperature $< 8^{\circ}\text{C}$	Amber warning lamp, thermal mgmt. on high, cruise control disabled
		3	Temperature $\leq 1^{\circ}\text{C}$	Red stop lamp, cruise control disabled
LC Cap Voltage	11804	4	Voltage $< 300\text{VDC}$	Motor controllers disabled

* Hydraulic setpoint can be between 350 psi and 450 psi

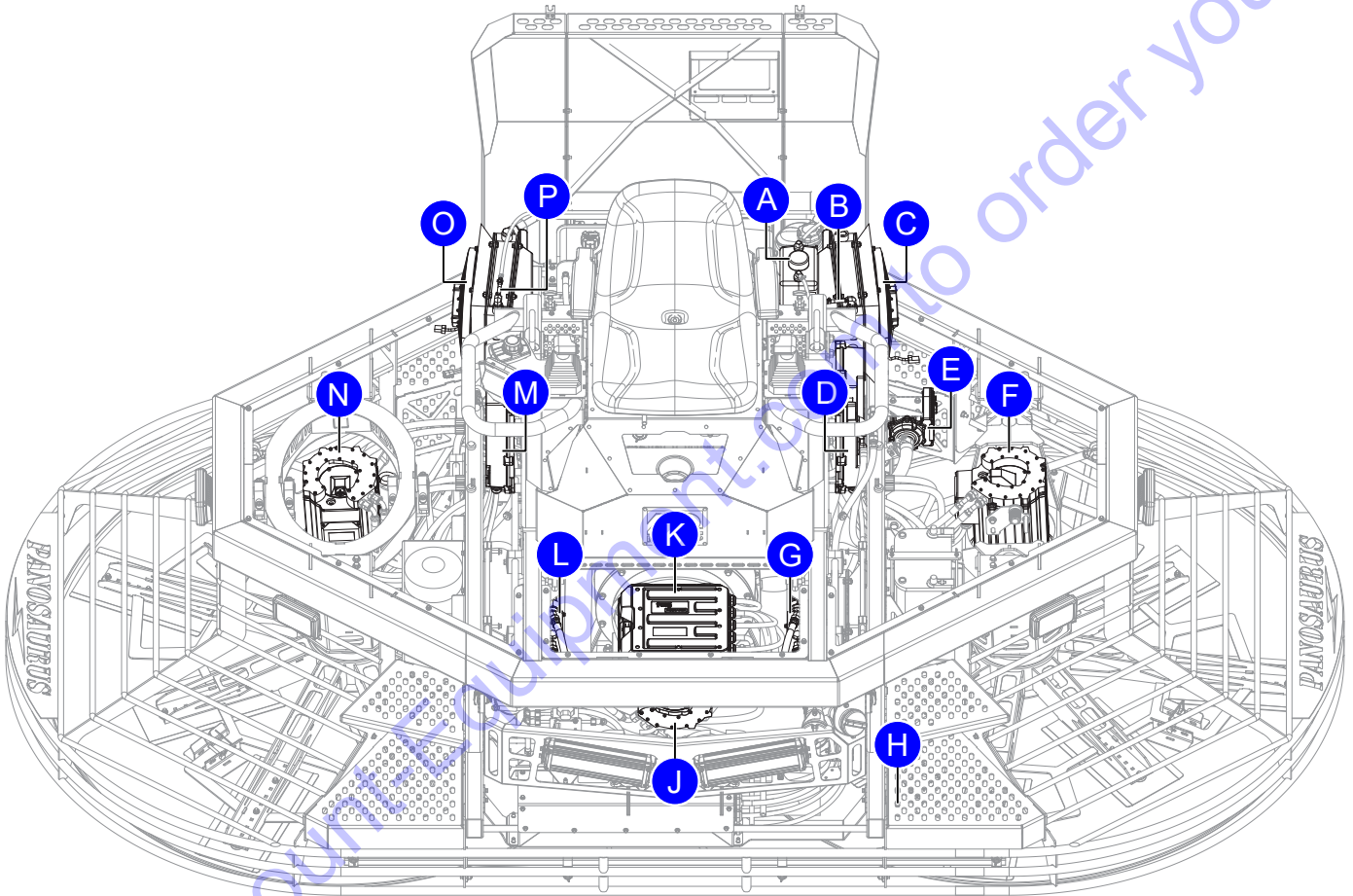
HYDRAULIC COMPONENT LOCATOR



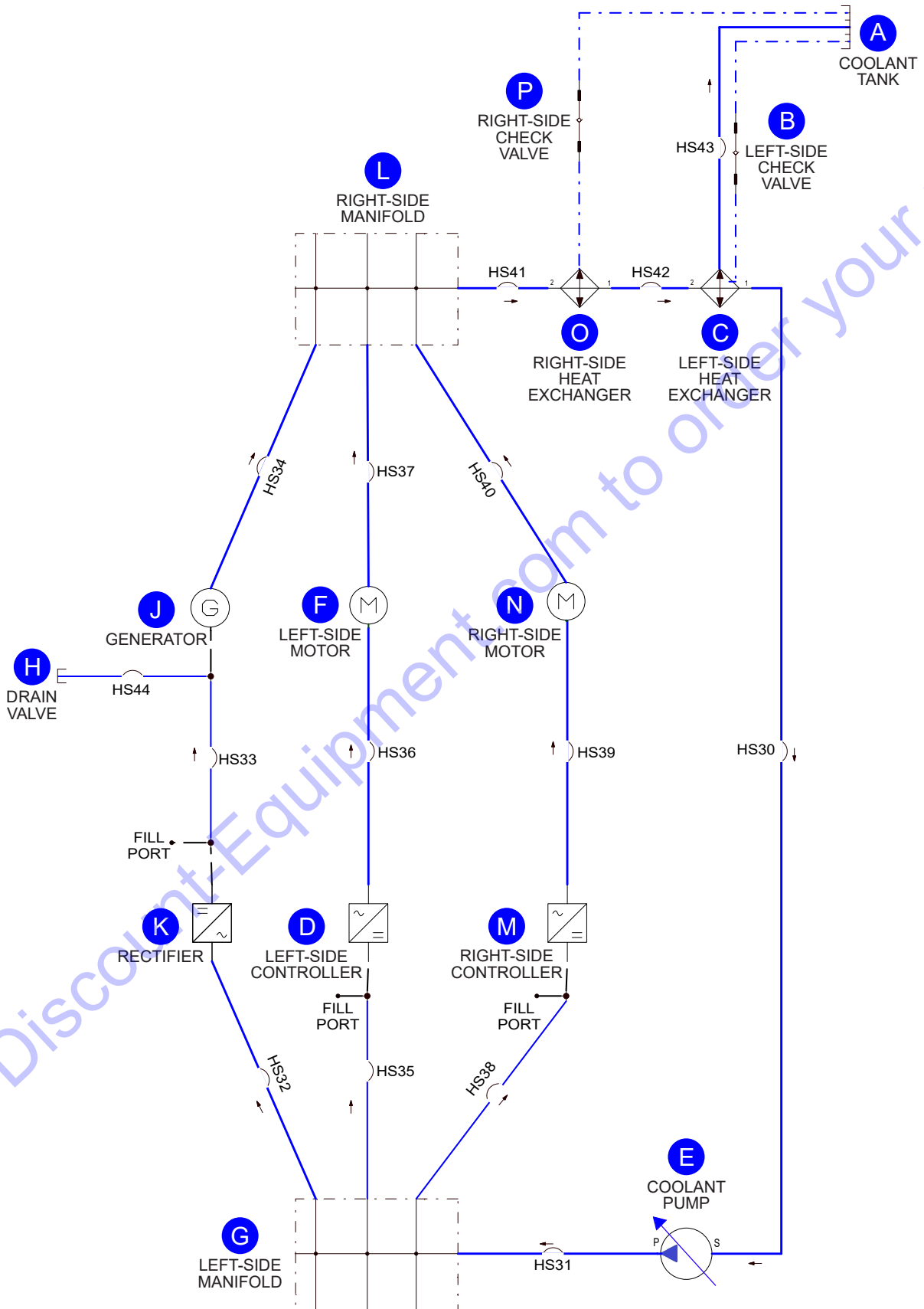
HYDRAULIC SYSTEM DIAGRAM



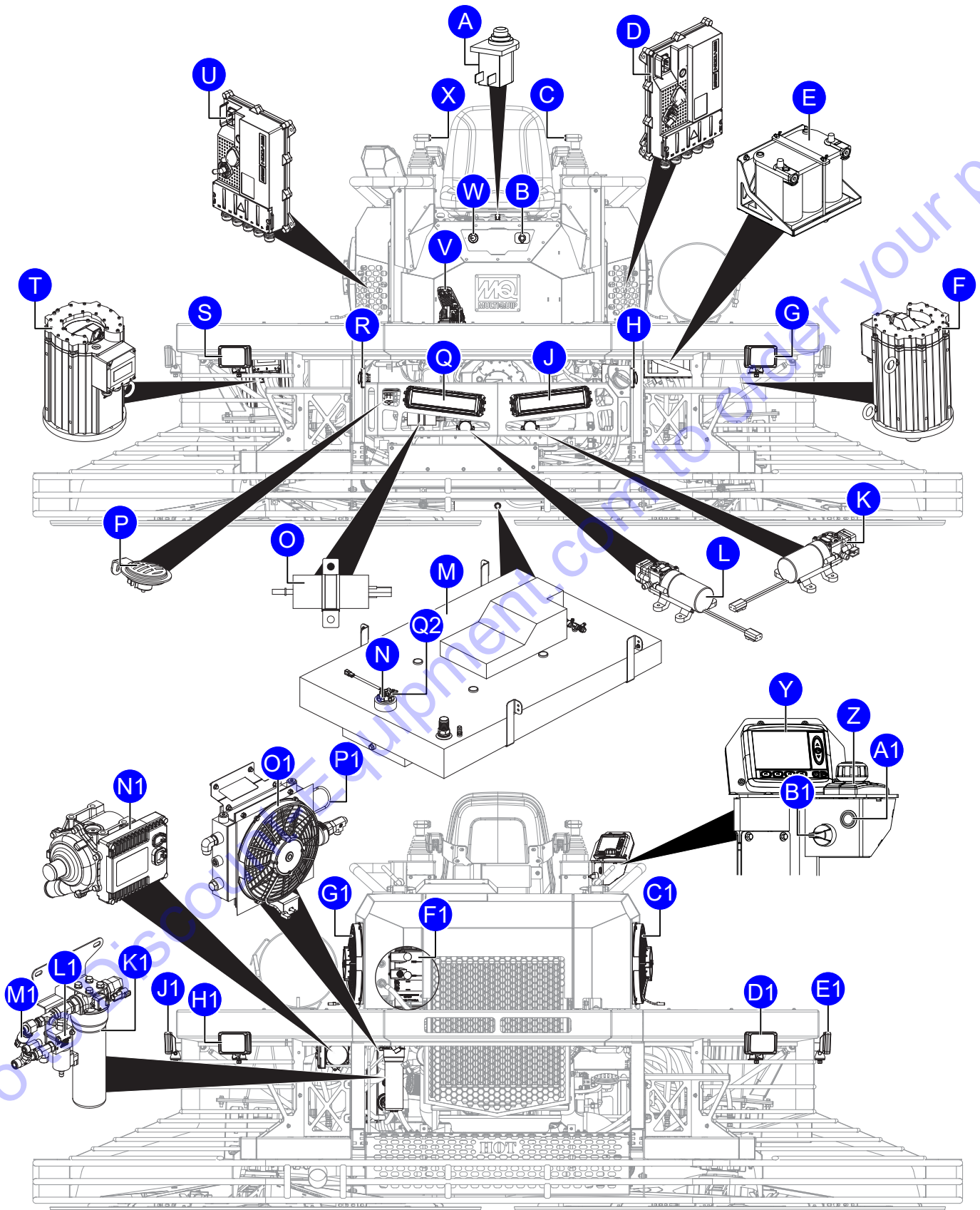
COOLING SYSTEM COMPONENT LOCATOR



COOLING SYSTEM DIAGRAM



ELECTRICAL COMPONENT LOCATOR



ELECTRICAL COMPONENT LOCATOR

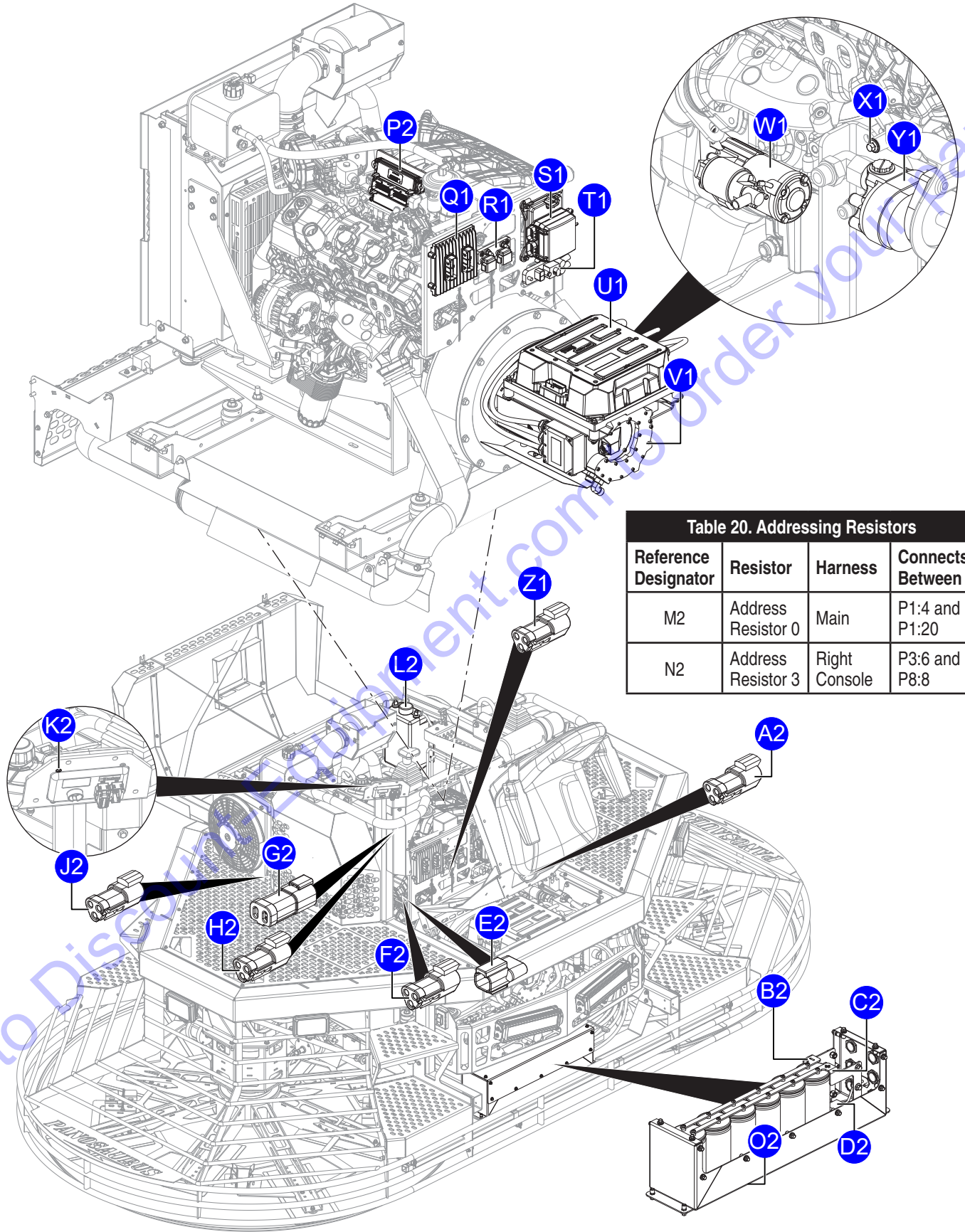


Table 20. Addressing Resistors

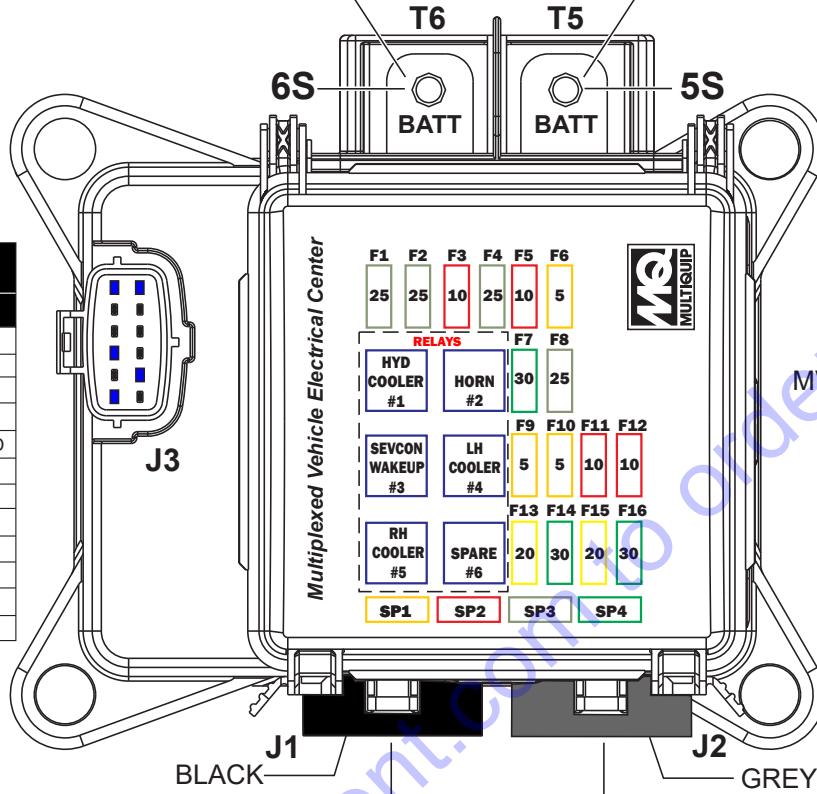
Reference Designator	Resistor	Harness	Connects Between
M2	Address Resistor 0	Main	P1:4 and P1:20
N2	Address Resistor 3	Right Console	P3:6 and P8:8

MVEC FUSE BOX LOCATOR

SWITCHED POWER REFERENCE POWER RELAY MODULE UN-SWITCHED POWER REFERENCE POWER RELAY MODULE

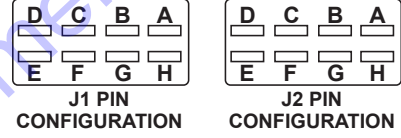
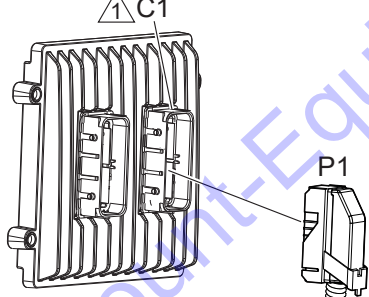
TABLE 2. CAN CONNECTOR PIN CALL-OUTS, FUSE BOX

J3 PIN NO	FUNCTION
1	VBATT
2	POWER REF.
3	VEHICLE GND.
4	ADDR 1
5	CAN BUS SHIELD
6	CAN_HI
7	IGNITION LOW
8	IGNITION HIGH
9	ADDRESS 2
10	ADDRESS 0
11	HS OUTPUT
12	CAN_LO



MVEC FUSE BOX S1

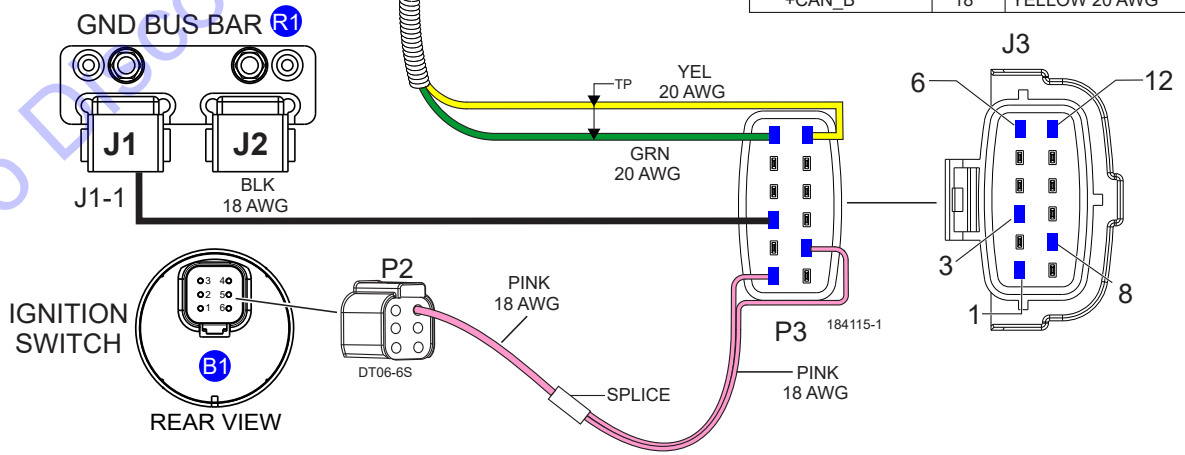
MC43 CONTROLLER Q1



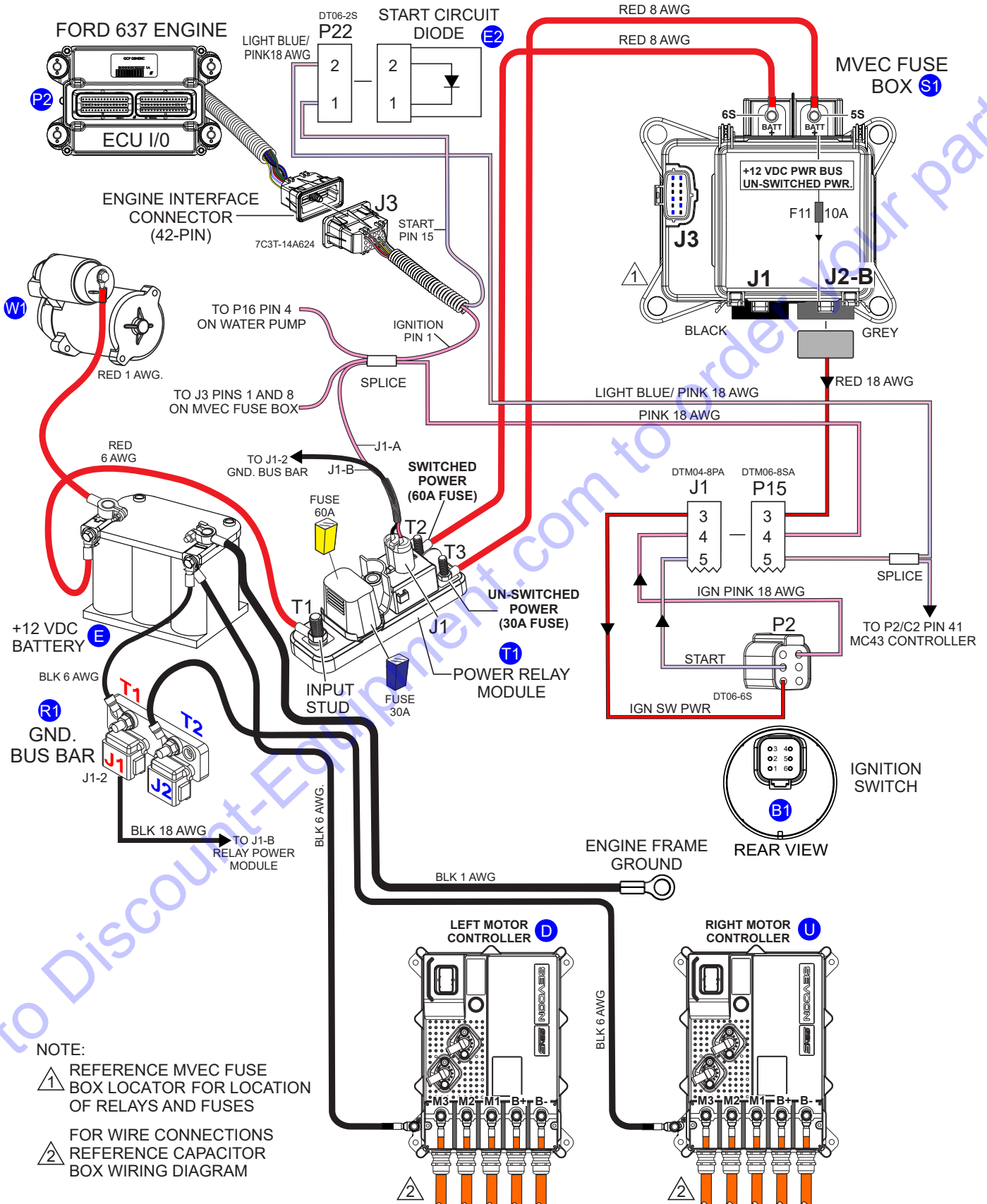
NOTE:
REFERENCE TABLE 1
FOR MC43 CONTROLLER
PIN CALL-OUTS

TABLE 1. CONTROLLER PIN CALL-OUTS

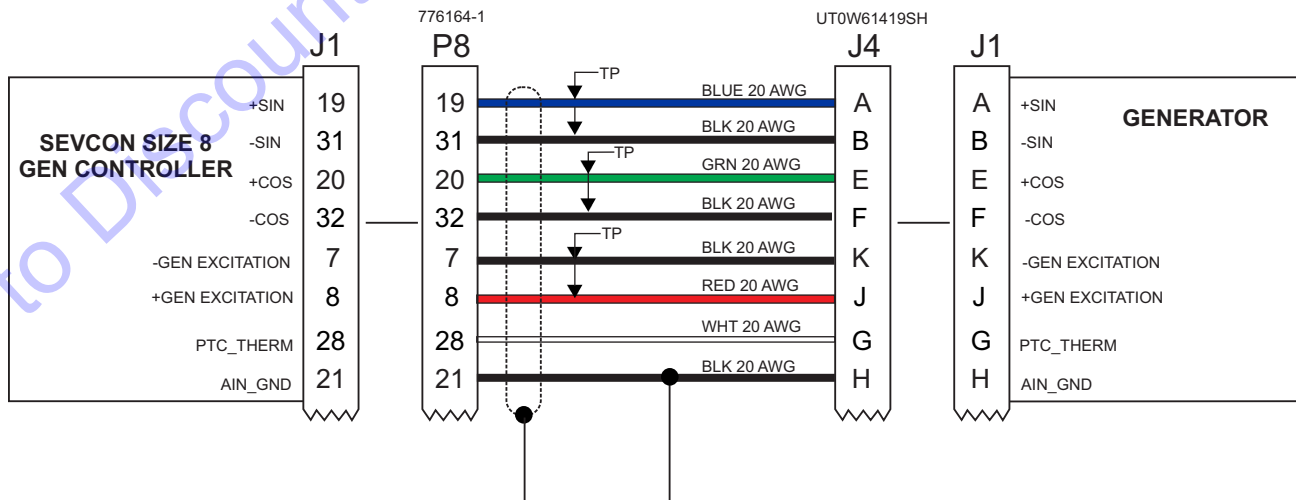
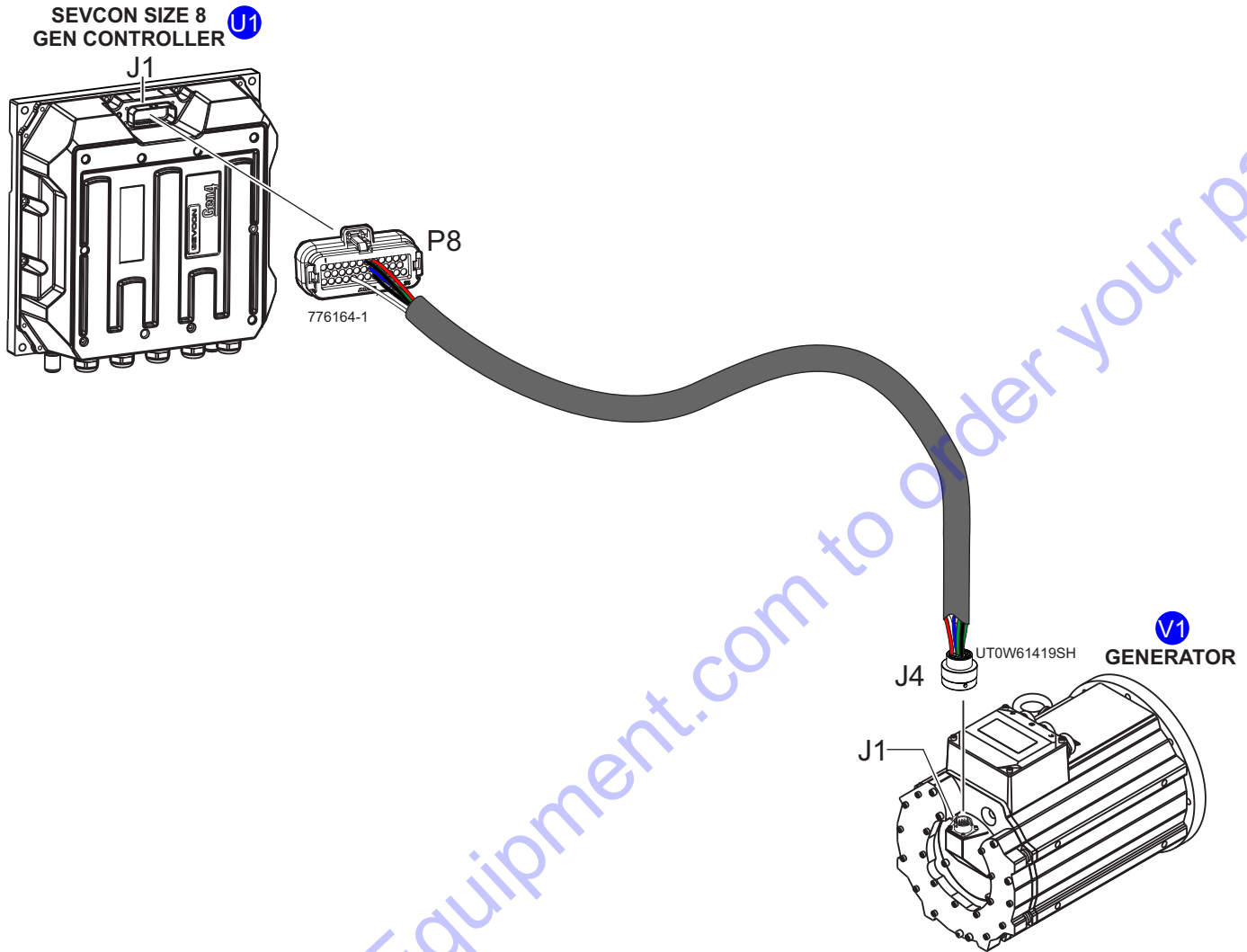
FUNCTION	C1/P1 PIN NO	COLOR/GAUGE
-CAN_B	2	GREEN 20 AWG
+CAN_B	18	YELLOW 20 AWG



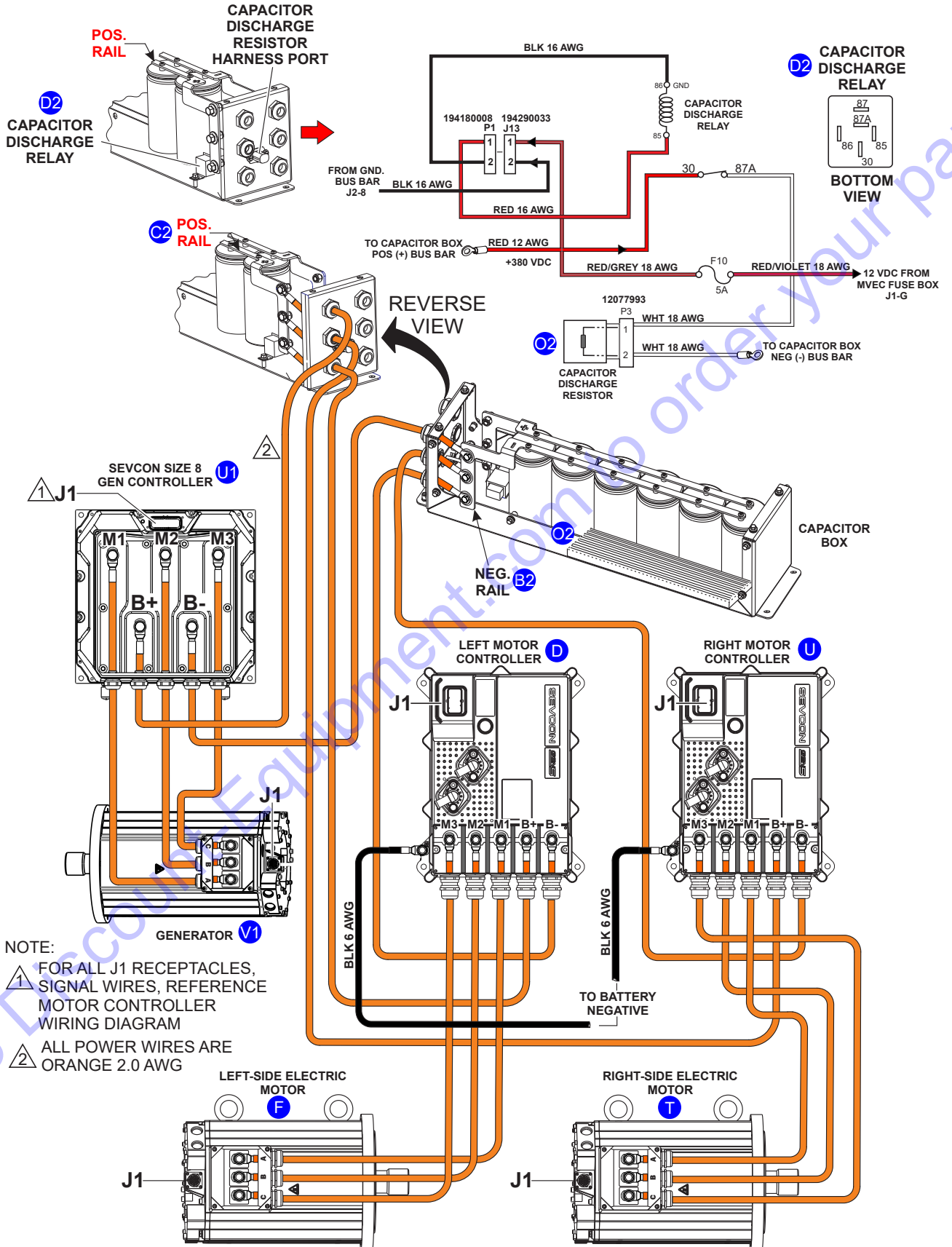
+12 VDC POWER/IGNITION WIRING DIAGRAM



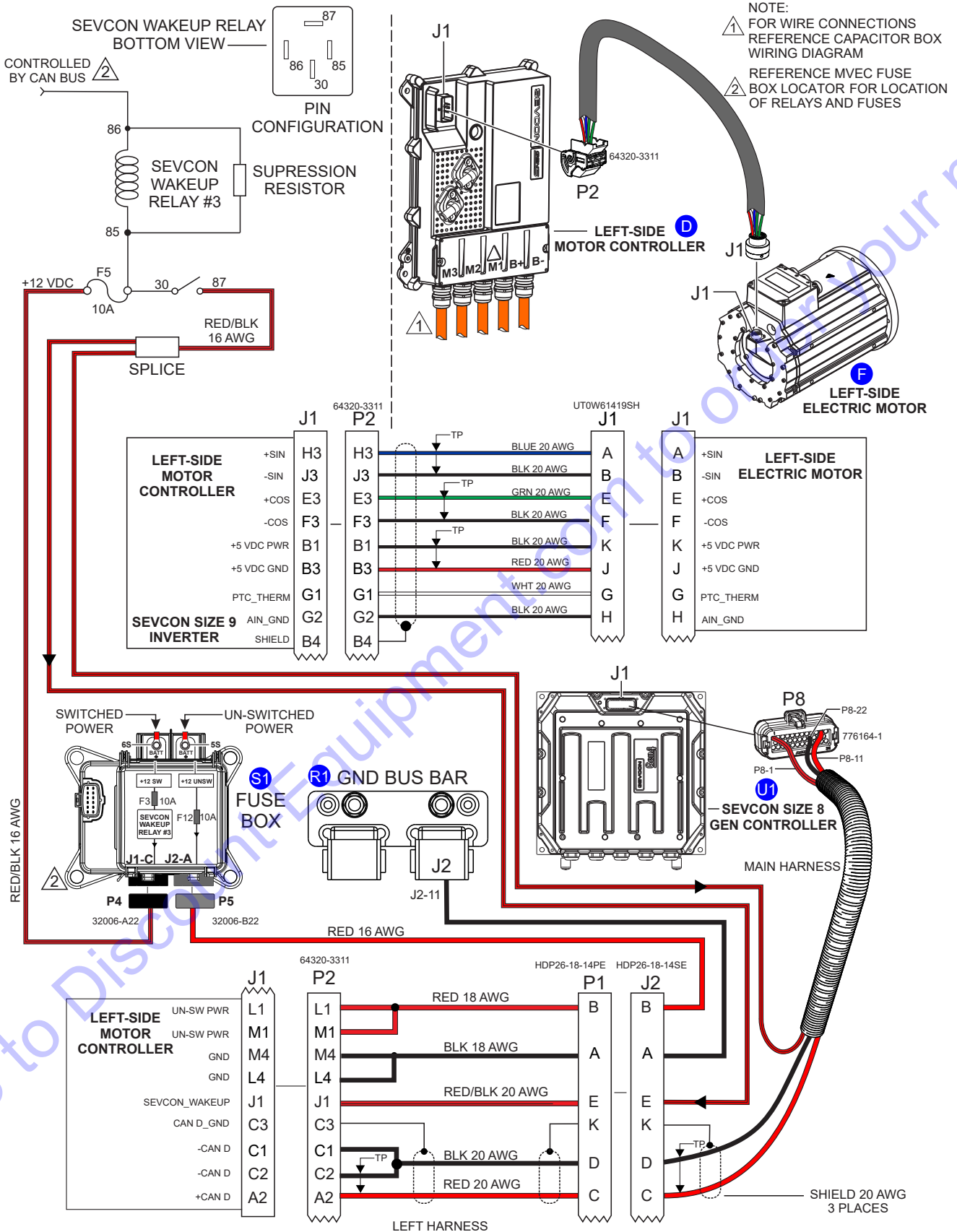
GENERATOR CONTROLLER WIRING DIAGRAM



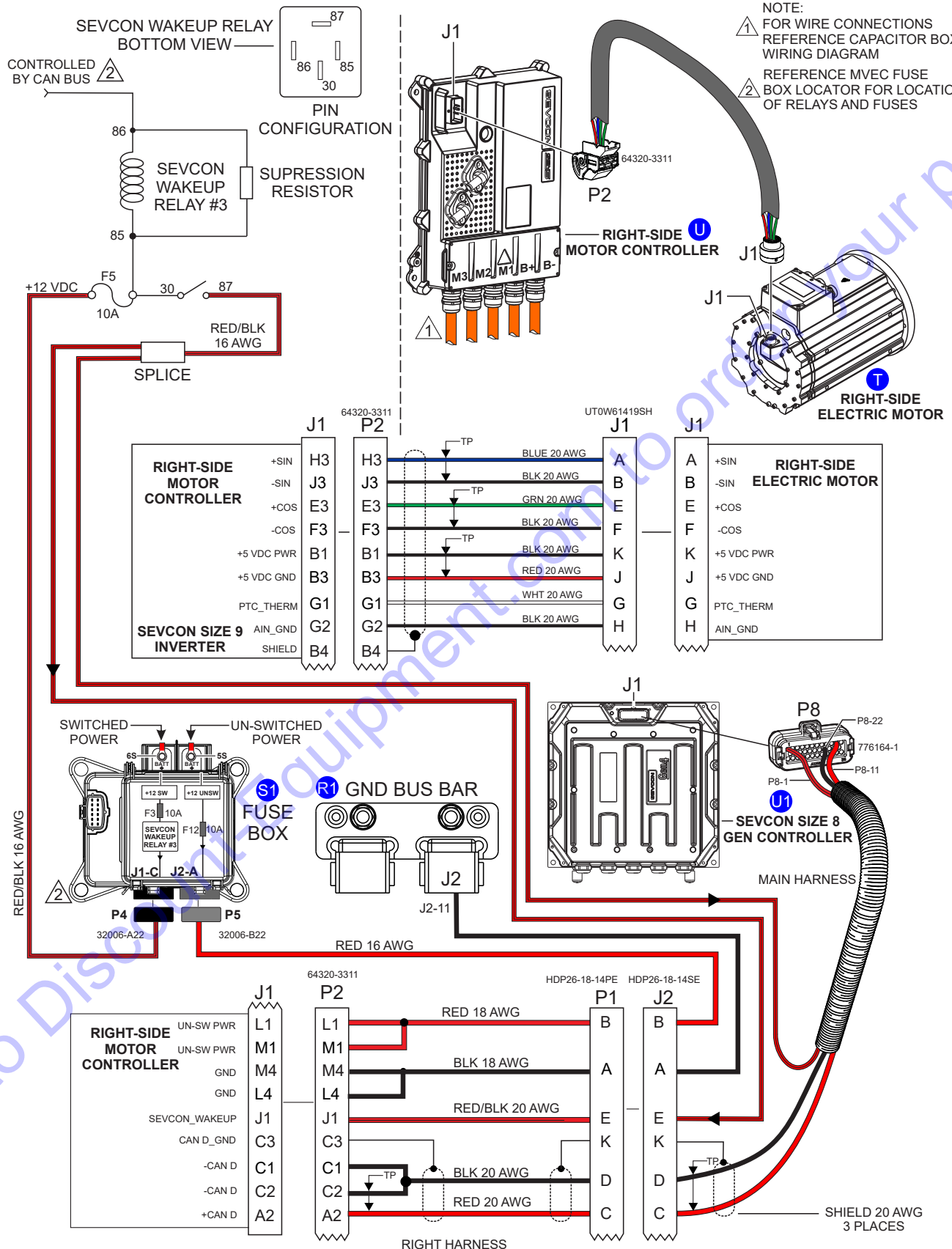
CAPACITOR BOX WIRING DIAGRAM



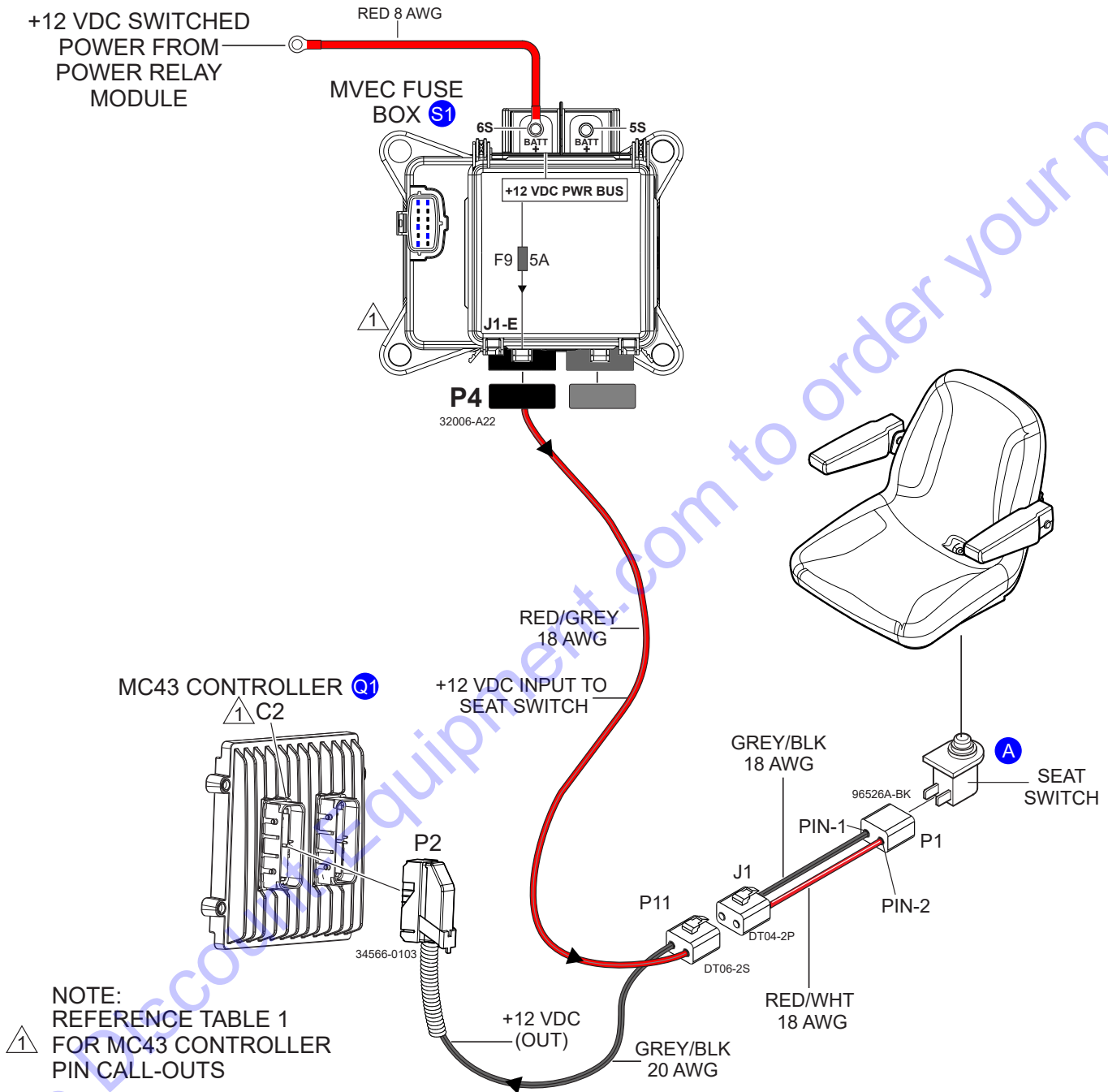
LEFT-SIDE MOTOR CONTROLLER WIRING DIAGRAM



RIGHT-SIDE MOTOR CONTROLLER WIRING DIAGRAM



SEAT SWITCH WIRING DIAGRAM

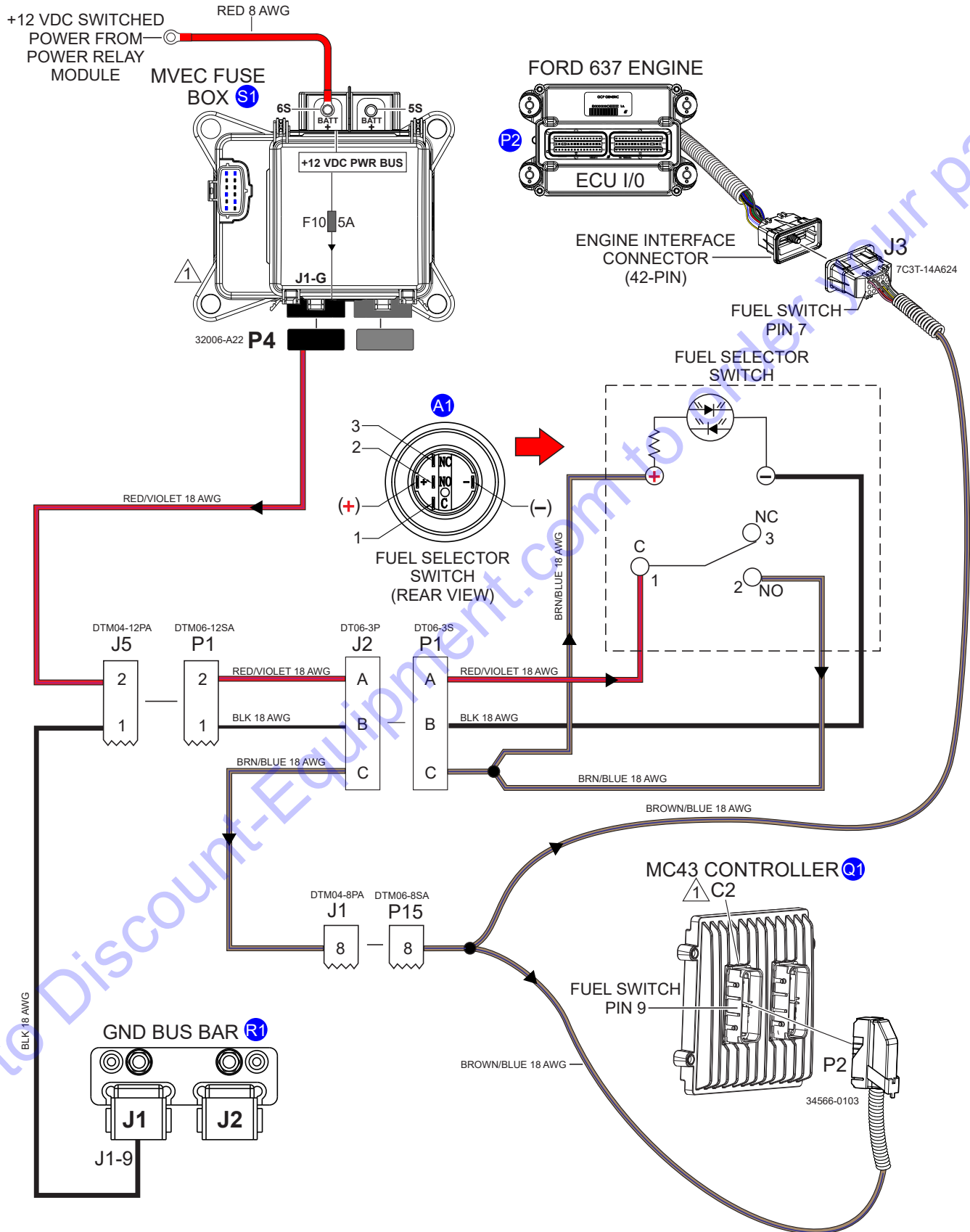


NOTE:
 REFERENCE TABLE 1
 FOR MC43 CONTROLLER
 PIN CALL-OUTS

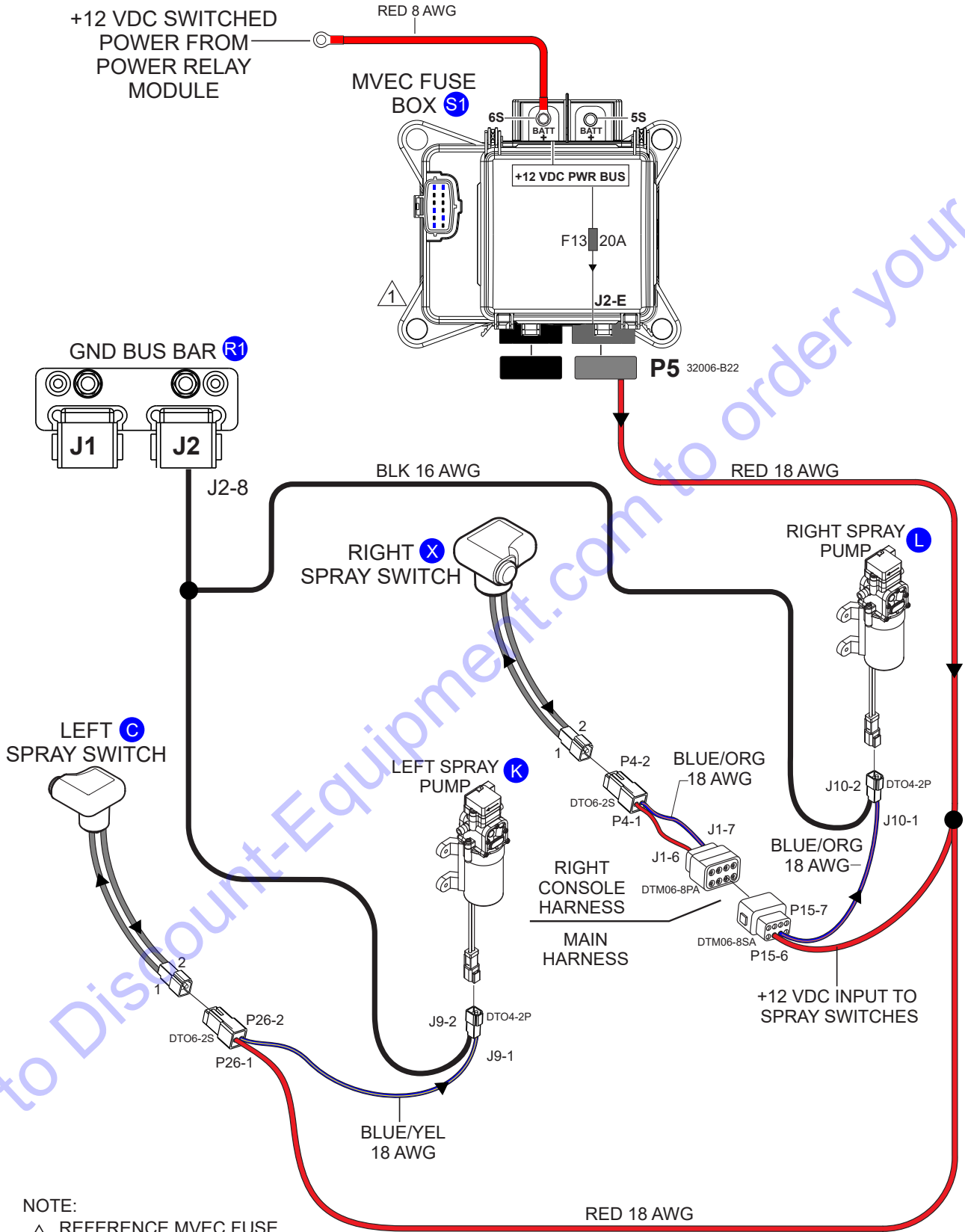
TABLE 1. CONTROLLER PIN CALL-OUTS		
FUNCTION	C2/P2 PIN NO	COLOR/GAUGE
SEAT SWITCH	10	GREY/BLACK 20 AWG

NOTE:
 REFERENCE MVEC FUSE
 BOX LOCATOR FOR LOCATION
 OF RELAYS AND FUSES

FUEL SELECTOR SWITCH WIRING DIAGRAM



SPRAY WIRING DIAGRAM



NOTE:
 ⚠ REFERENCE MVEC FUSE BOX LOCATOR FOR LOCATION OF RELAYS AND FUSES

LIGHTS WIRING DIAGRAM

- NOTE:
 1 REFERENCE TABLE 1 FOR MC43 CONTROLLER PIN CALL-OUTS
 2 REFERENCE MVEC FUSE BOX LOCATOR FOR LOCATION OF RELAYS AND FUSES

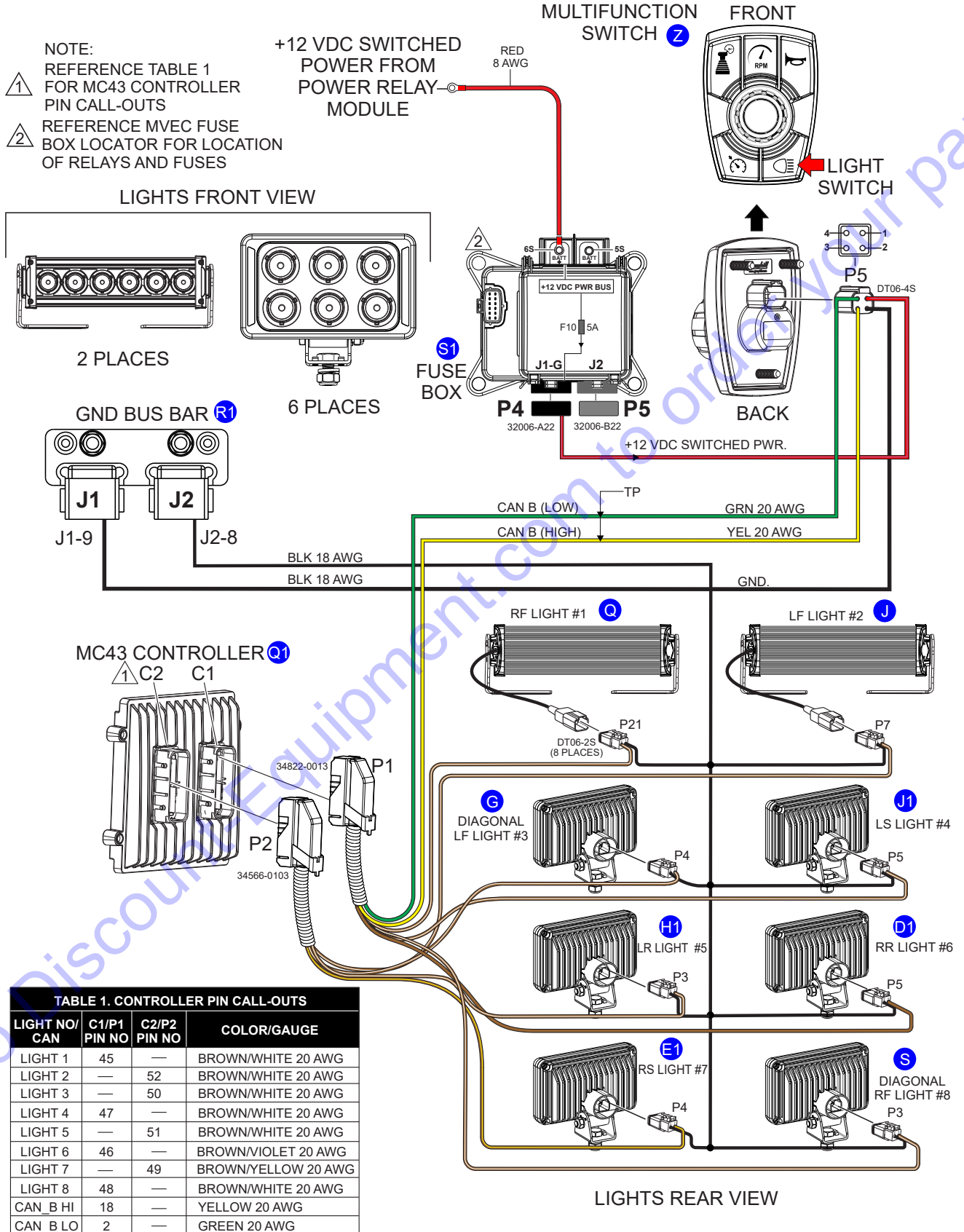


TABLE 1. CONTROLLER PIN CALL-OUTS

LIGHT NO/ CAN	C1/P1 PIN NO	C2/P2 PIN NO	COLOR/GAUGE
LIGHT 1	45	—	BROWN/WHITE 20 AWG
LIGHT 2	—	52	BROWN/WHITE 20 AWG
LIGHT 3	—	50	BROWN/WHITE 20 AWG
LIGHT 4	47	—	BROWN/WHITE 20 AWG
LIGHT 5	—	51	BROWN/WHITE 20 AWG
LIGHT 6	46	—	BROWN/VIOLET 20 AWG
LIGHT 7	—	49	BROWN/YELLOW 20 AWG
LIGHT 8	48	—	BROWN/WHITE 20 AWG
CAN_B HI	18	—	YELLOW 20 AWG
CAN_B LO	2	—	GREEN 20 AWG

STEERING PRESSURE VALVE WIRING DIAGRAM

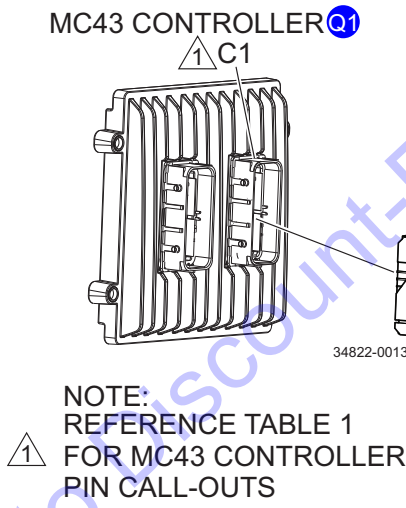
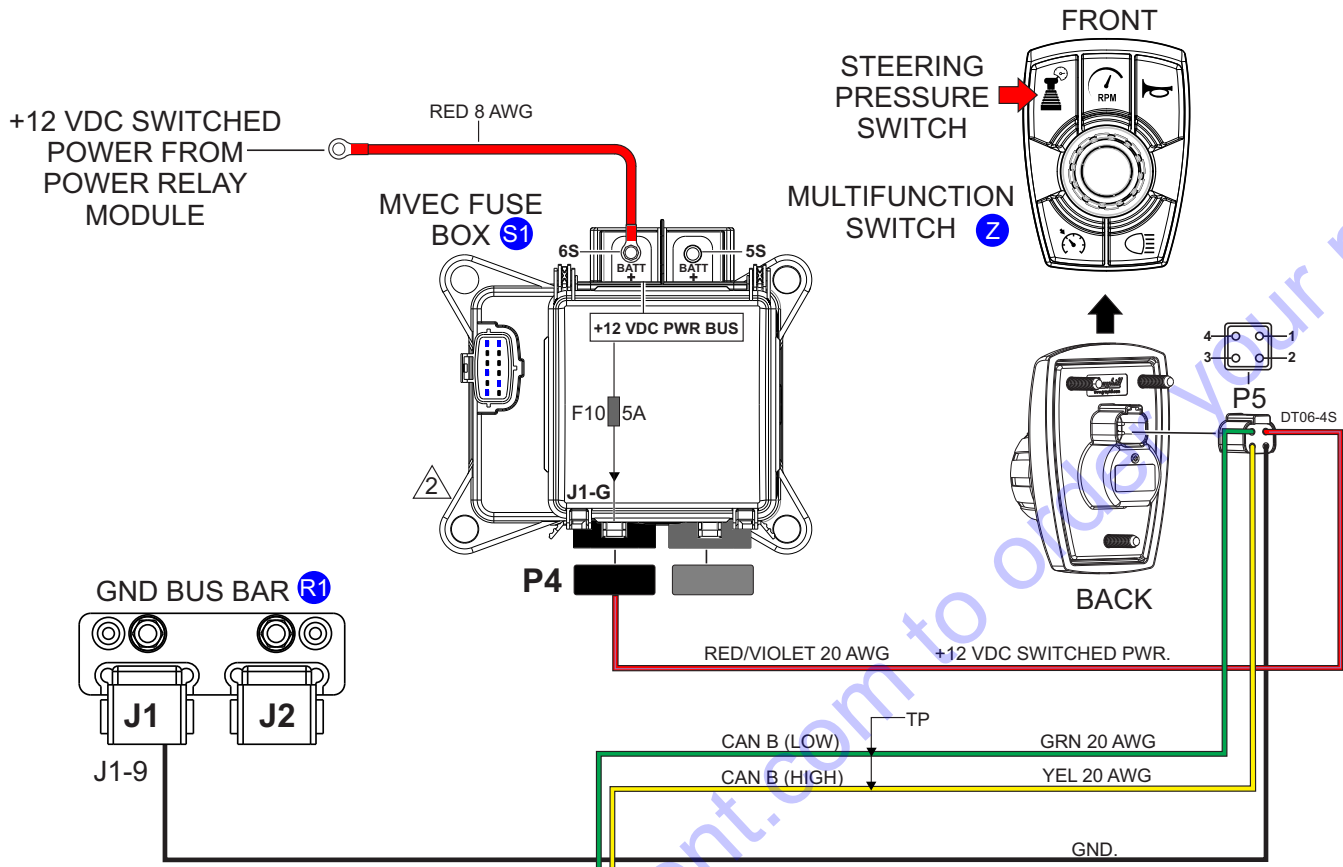
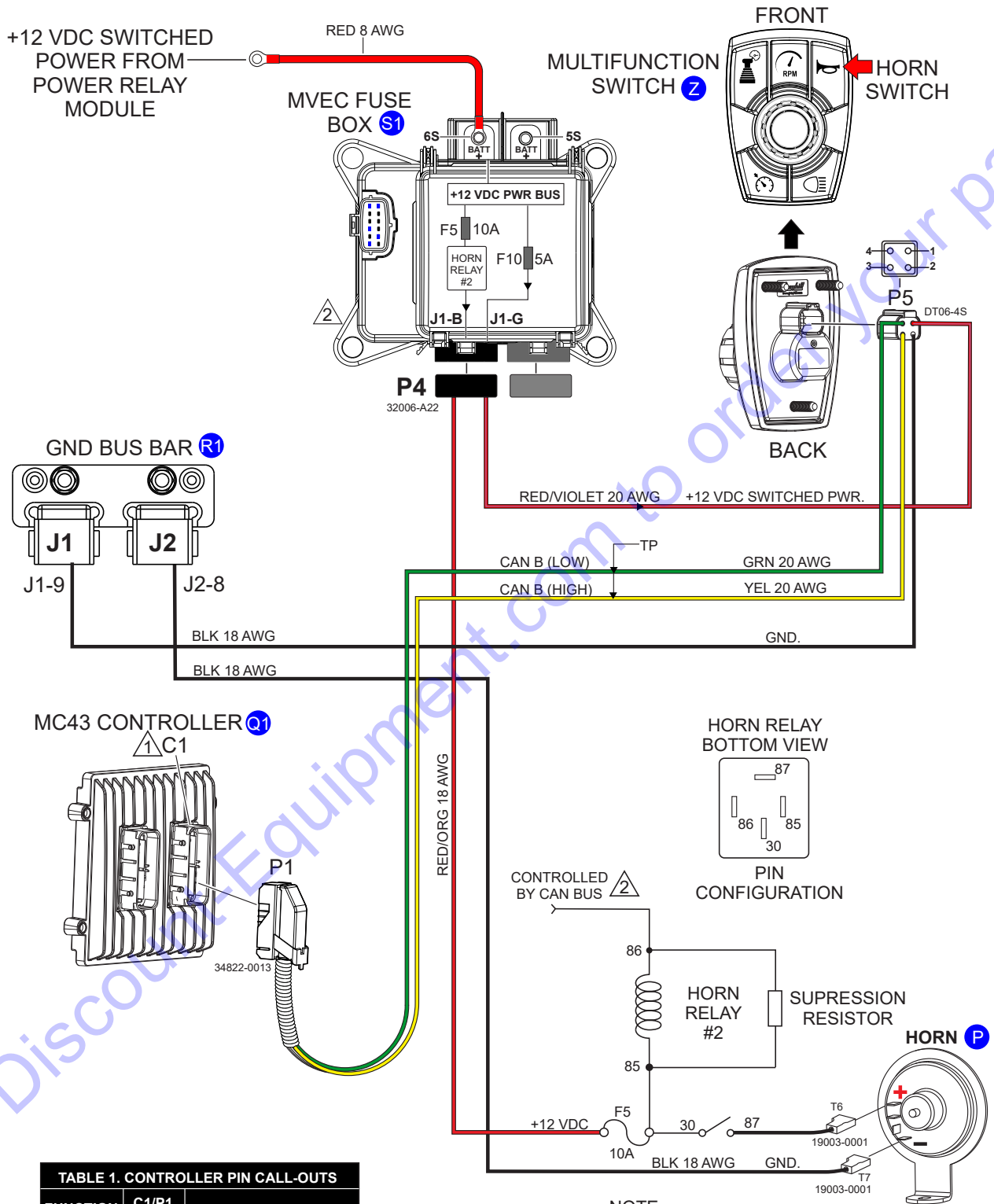


TABLE 1. CONTROLLER PIN CALL-OUTS		
FUNCTION	C1/P1 PIN NO	COLOR/GAUGE
CAN B LO	2	GREEN 20 AWG
CAN B HI	18	YELLOW 20 AWG
STEERING PRESSURE SIGNAL	30	BROWN/YELLOW 20 AWG
STEERING PRESSURE GND.	42	BLACK/YELLOW 20 AWG

HORN WIRING DIAGRAM



NOTE:
 REFERENCE TABLE 1 FOR MC43 CONTROLLER PIN CALL-OUTS
 REFERENCE MVEC FUSE BOX LOCATOR FOR LOCATION OF RELAYS AND FUSES

ELECTRICAL SCHEMATIC (MAIN 1)

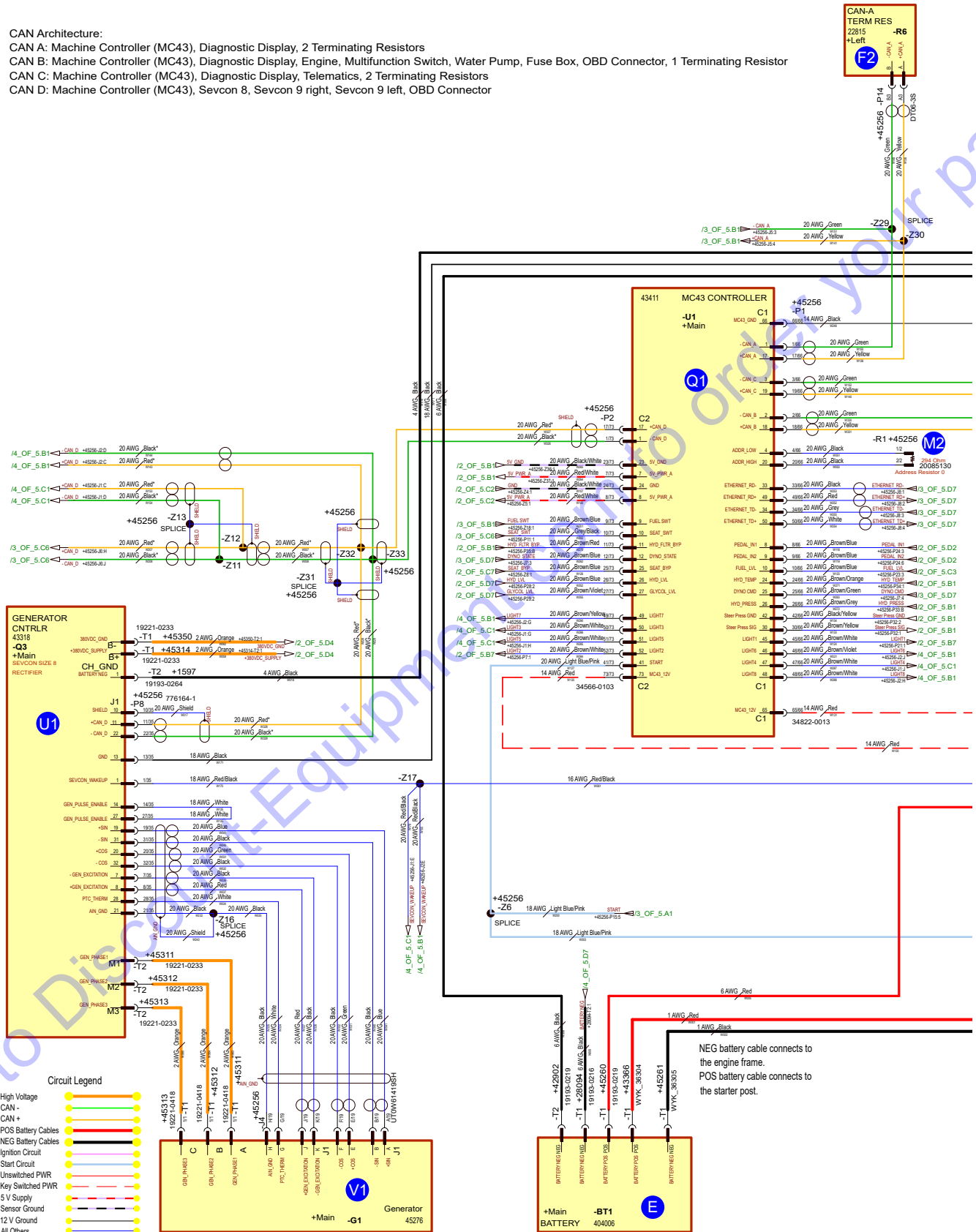
CAN Architecture:

CAN A: Machine Controller (MC43), Diagnostic Display, 2 Terminating Resistors

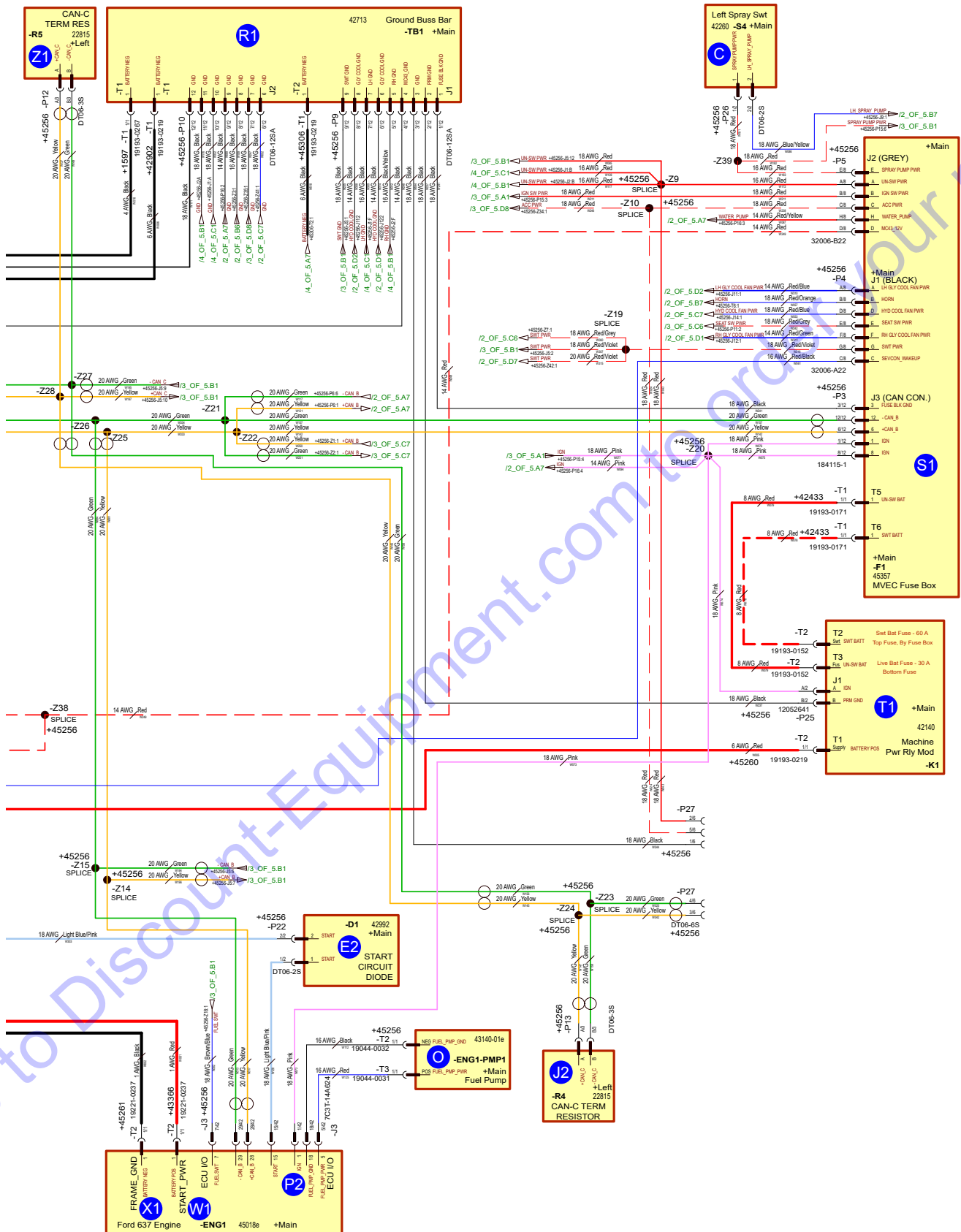
CAN B: Machine Controller (MC43), Diagnostic Display, Engine, Multifunction Switch, Water Pump, Fuse Box, OBD Connector, 1 Terminating Resistor

CAN C: Machine Controller (MC43), Diagnostic Display, Telematics, 2 Terminating Resistors

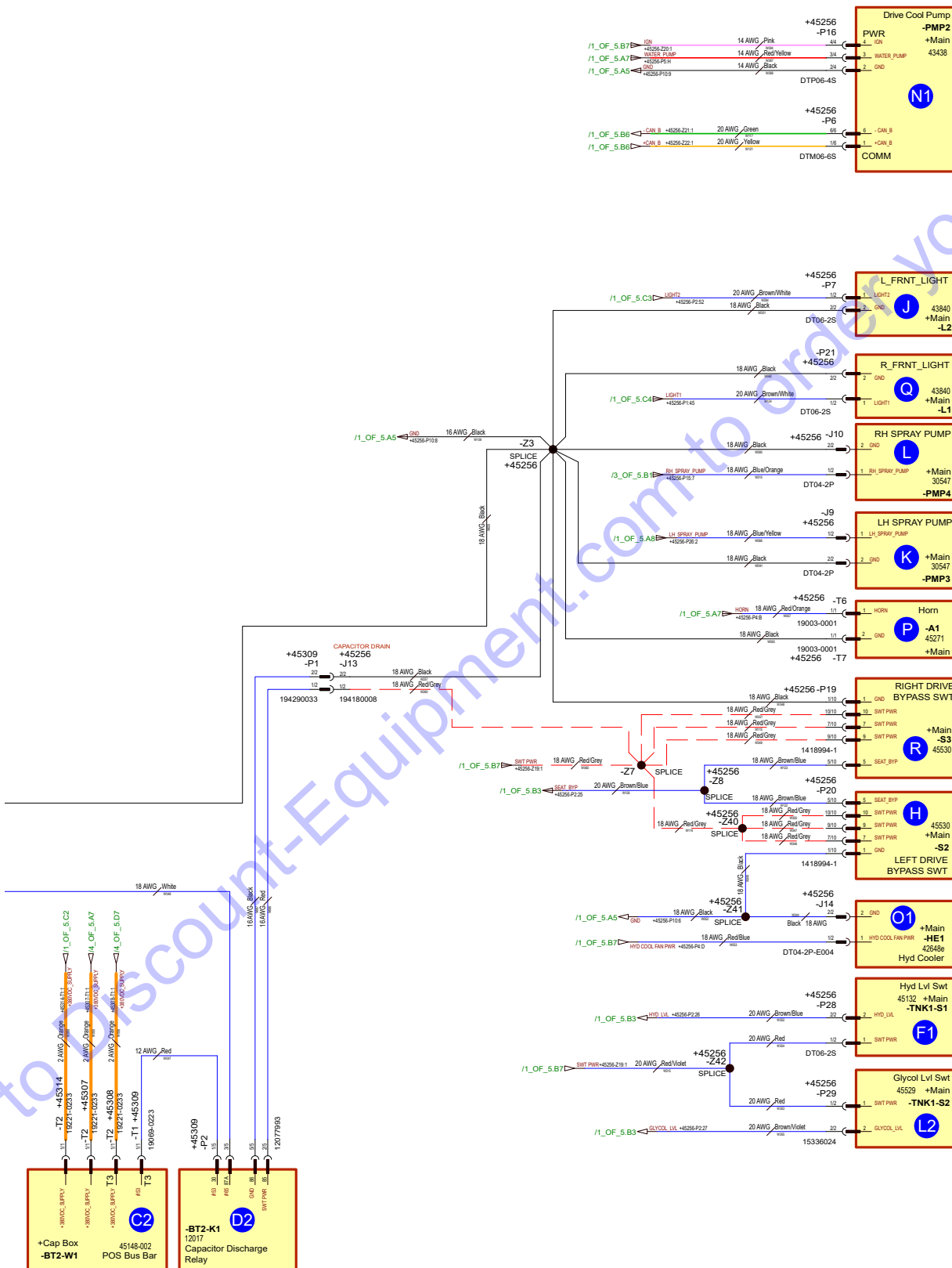
CAN D: Machine Controller (MC43), Sevcon 8, Sevcon 9 right, Sevcon 9 left, OBD Connector



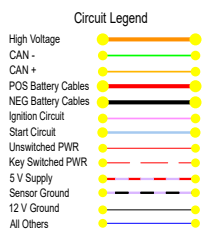
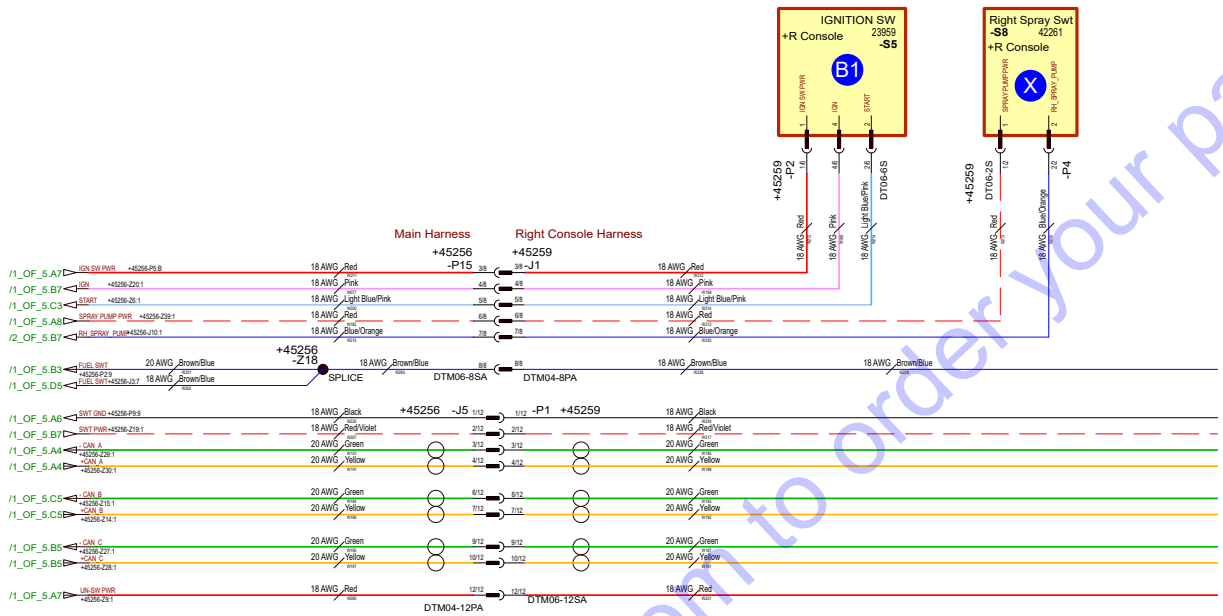
ELECTRICAL SCHEMATIC (MAIN 1)



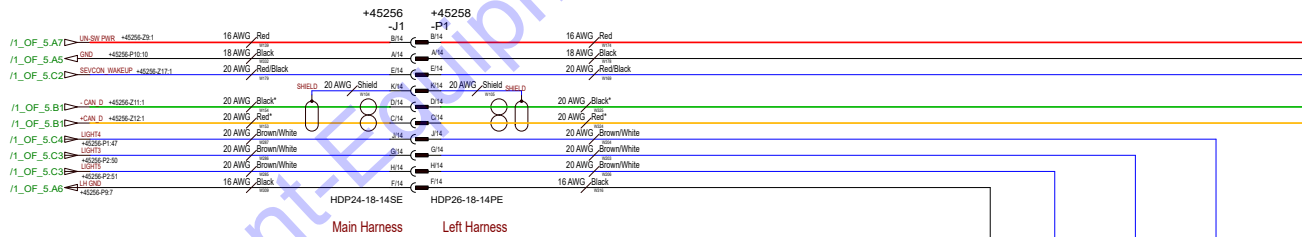
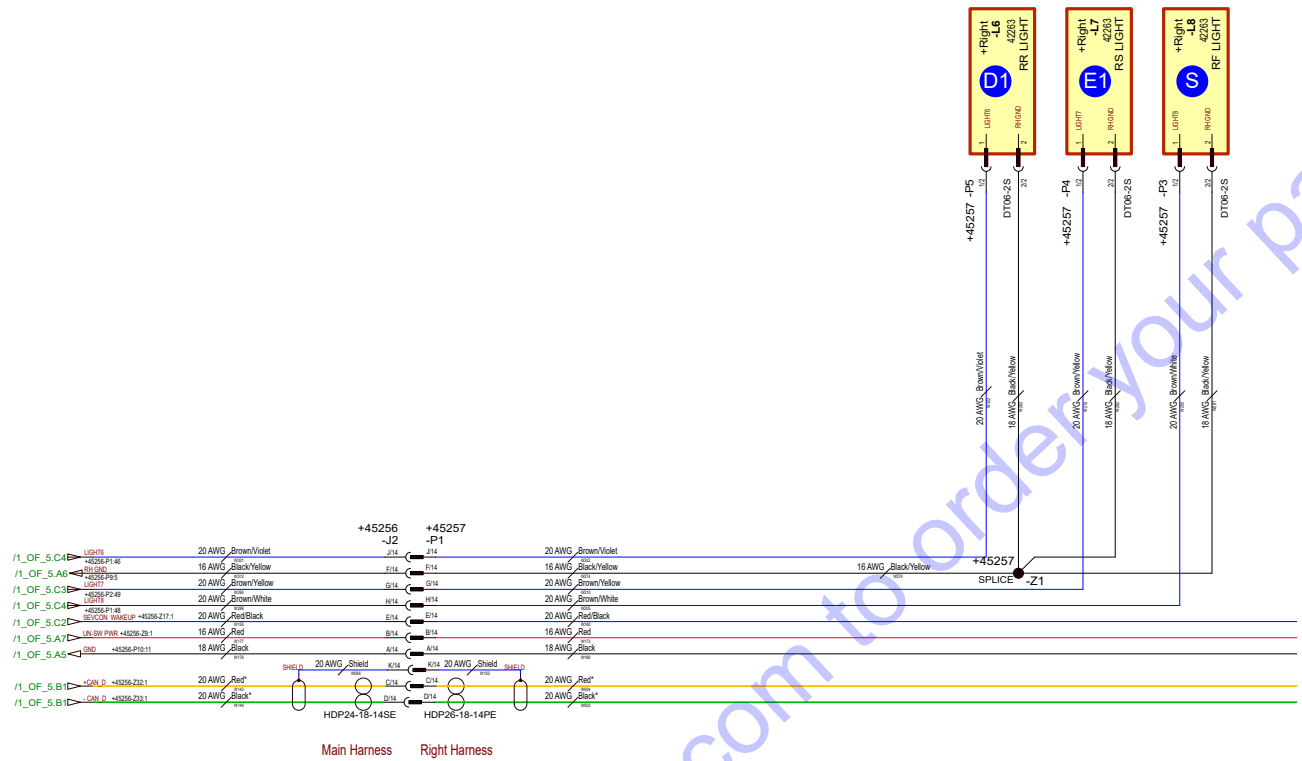
ELECTRICAL SCHEMATIC (MAIN 2)



ELECTRICAL SCHEMATIC (CONSOLE AND SEAT)

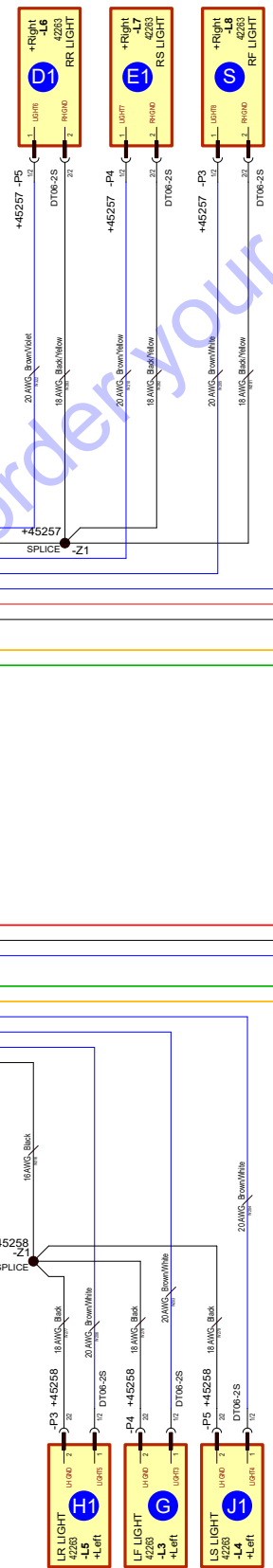


ELECTRICAL SCHEMATIC (SIDES)

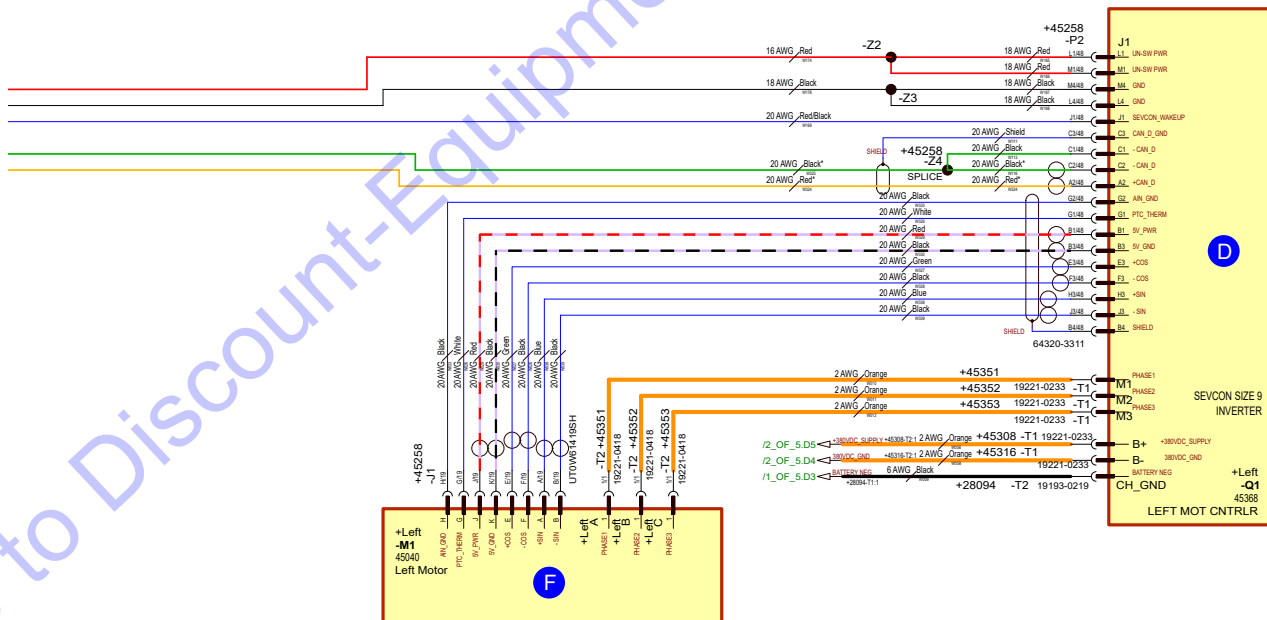
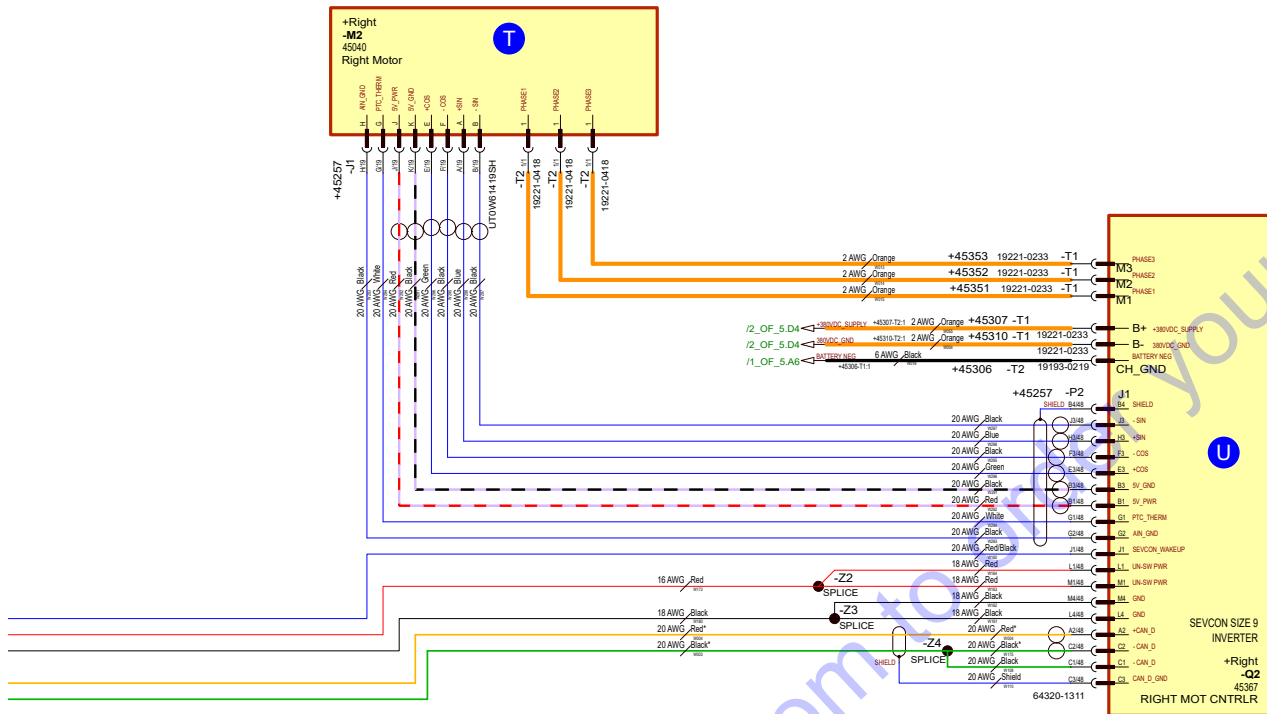


Circuit Legend

High Voltage	Orange
CAN -	Blue
CAN +	Green
POS Battery Cables	Red
NEG Battery Cables	Black
Ignition Circuit	Yellow
Start Circuit	Purple
Unswitched PWR	Light Blue
Key Switched PWR	Light Green
5 V Supply	Light Purple
Sensor Ground	Light Blue
12 V Ground	Light Green
All Others	Light Blue



ELECTRICAL SCHEMATIC (SIDES)



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OPERATION MANUAL

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