HP6500

Parts Manual

HOGG & DAVIS, Inc.

The information, specifications, and illustrations in this manual are on the basis of information available at the time it was written. The specifications, torque values, pressures of operation, measurements, adjustments, illustrations, and other items can change at any time. These changes can affect the service of the given product.
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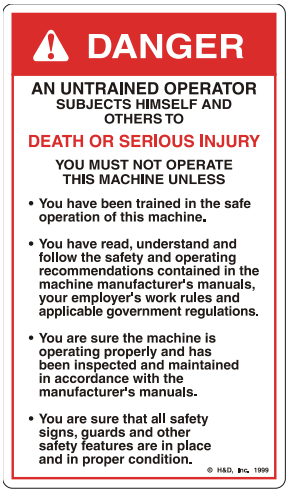
v 1.0

Contents

PRODUCT WARNINGS

These warning labels and others like it are placed in critical areas of the machine. The warnings are to be read and fully understood prior to operation of the unit.



OPERATIONS

INTRODUCTION

The Hogg & Davis, Inc **HP 6500** Cable Reel Unit is an advanced design cable pulling trailer that provides tremendous pulling forces in a compact vehicle. Its total design provides for easy operations and affords great savings in set-up and manpower. Full utilization of the **HP 6500** will greatly improve your cable installation and removal operations.

This manual is designed to make you familiar with the machine and its operation.

READ THIS MANUAL THOUROUGHLY BEFORE OPERATING THE MACHINE

DIESEL ENGINE SPECIFICATIONS

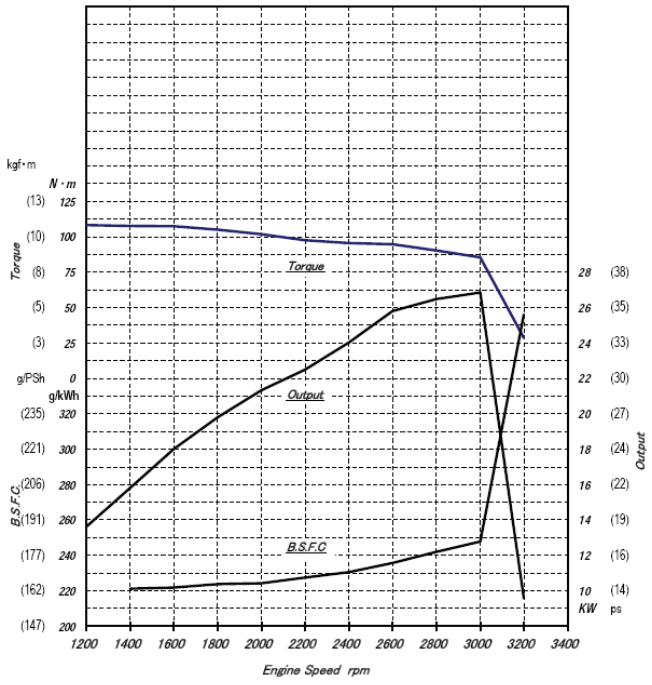
4TNV98-ZDSNA General Specification

67.7 HP (50.5 kW) @ 2500 rated rpm*

Type • • • 4 Cylinder, 4-Cycle, Liquid Cooled Diesel Engine
Bore • 98 mm
Stroke • 110 mm
Displacement • • • • • • • • • • • • • • • • • 3.319 L
Aspiration • • • • • • • • • • • • • Naturally Aspirated
Combustion System • • • • • • • • • • Direct Injection
Rotation (from flywheel end) • • • • • • Counterclockwise
Dry Weight • • • • • • • • • • • • • • 518 lbs (234 kg)

GENERAL SPECIFICATIONS.

- REEL CAPACITY; 108” dia X 56” wide
- HYDRAULIC REEL LIFITING CYLINDERS
- HYDRAULIC POWERED IDLER WHEEL
- HYDRASTATIC TRANMISSION POWER UNIT
- CADMIUM PLATED, QUICK RELEASE JACKSTANDS
- 20,000 STUB STPINDLE AXLE
- AIR BRAKES w/ABS
- 2.5” REEL MANDREL WITH TAPERED CENTERING CONES, LOCKING COLLARS, AND NYLATRON BEARINGS



"Rugged Dependability."

TRAILER ORIENTATION

The HP 6500 is made up of four (4) major working components (see Fig.1) they are:

A. MAIN FRAME AND AXLE
B. POWER UNIT
C. POWER IDLER WHEEL AND CONTROLS
D. REEL CARRYING RACKS

MAIN FRAME AND AXLE

The main frame and axle carry the entire weight of the trailer and its payload. Constructed of heavy steel, the main frame will provide many years of durable service and minimum maintenance. The fenders and tool compartments are incorporated as part of the main frame structure.

The axle is of the 20,000 lb capacity stub type. Heavy duty brakes, hubs and bearings provide many years of service over all highway types.

LUBRICATION SCHEDULE SHOULD BE FOLLOWED

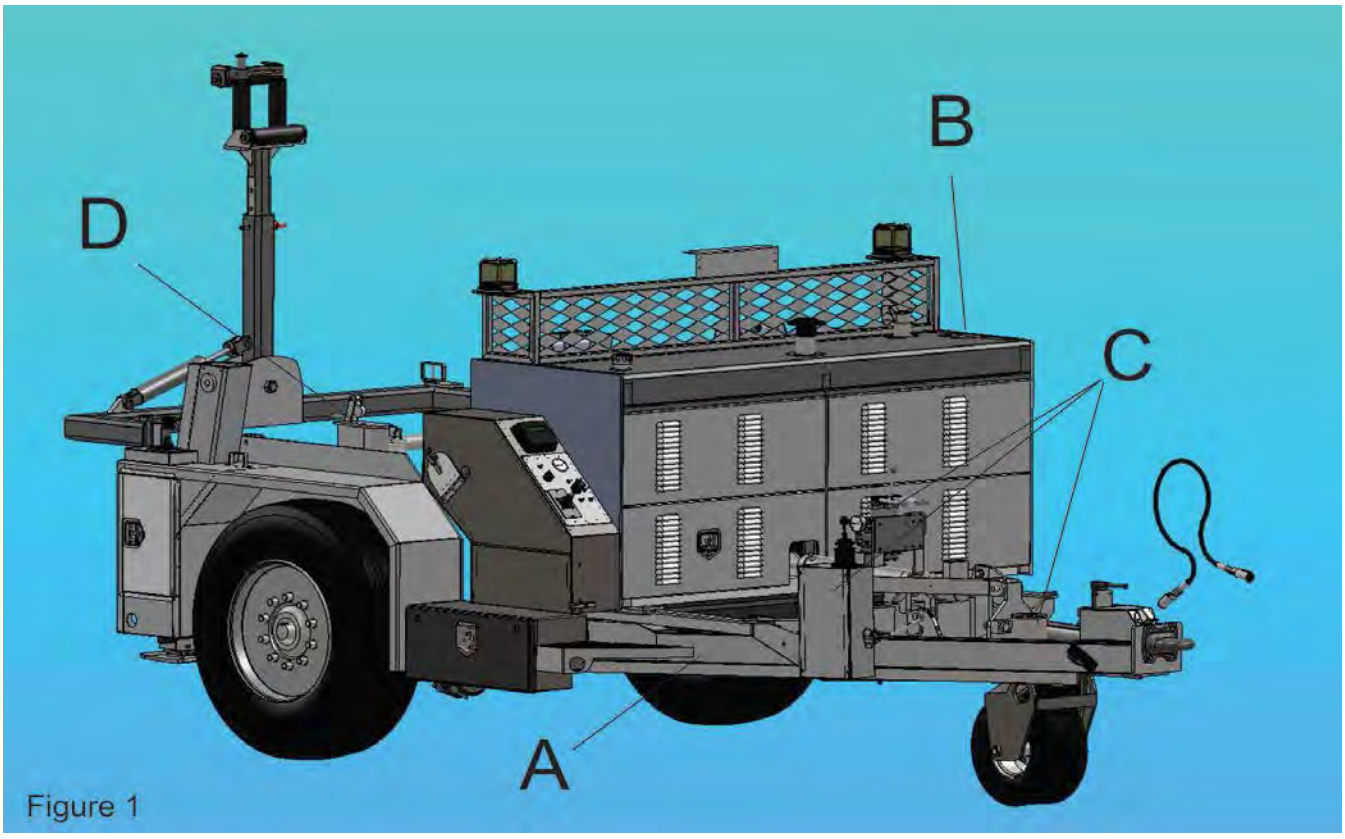


Figure 1

CONTROLS

The control panel has a variety of gauges and switches that control certain functions during the operation of the HP 6500. Here is a description of these controls. (Figure 2)

A. Engine Control Center: This panel controls engine throttle, as well as displaying fuel level, RPM's, coolant temperature, and oil pressure. Units equipped with a Remote Display Panel may have more functions.
B. Hydrostatic Pressure Gauge: This gauge alerts the operator to the system pressure at all times during operation. IT IS NOT A GUAGE TO ILLUSTRATE line pull.
C. Front / Rear Control: This switch isolates the front and rear controls of the unit during operation.
D. Ignition Switch
E. Switch Panel: This panel contains various switch to control functions of the unit. Depending on options installed the location of the switches may vary. They Include: Two speed on the fly shift to Hi or Low speed, maker beacons, level wind, auxiliary air compressor, work lights, auxiliary hydraulic tool circuit, etc.
F. Joystick: Spring return to Neutral control joystick for operating the Pay out or Take up feature of the puller. Proportional control allows for infinite speeds and pulling force during operation. An "OPERATOR PRESENT" switch may be installed on certain units. This provides security against payout under power. Unit will not pay out until the switch has been pressed and the joystick moved out of the neutral position

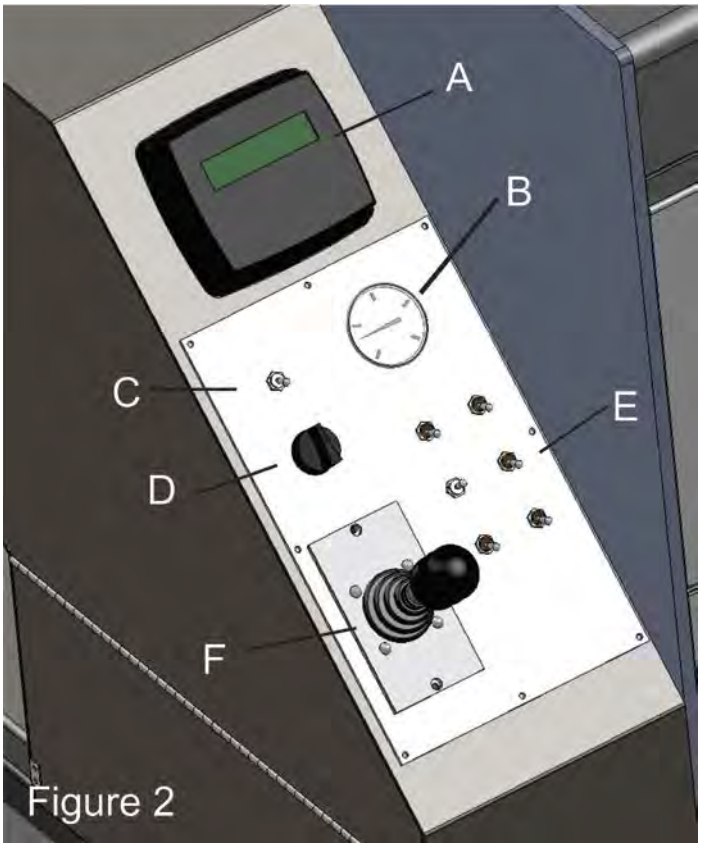
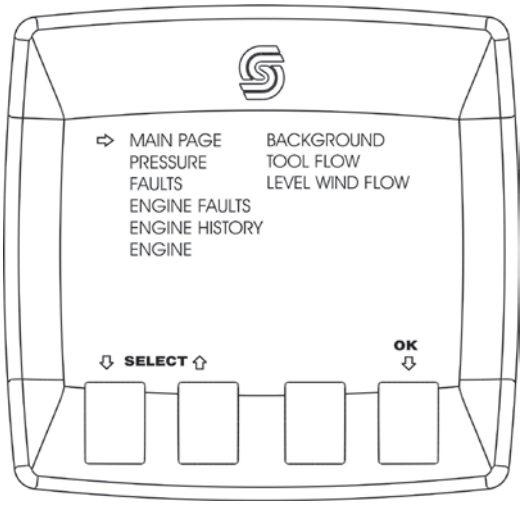


Figure 2

PLUS 1 CONTROL SCREEN SHOTS

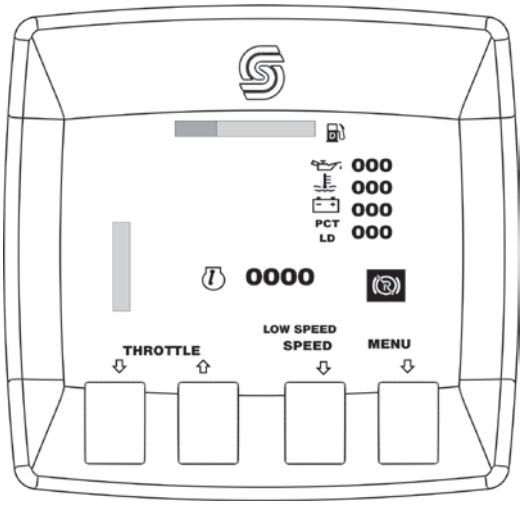
The following screenshots of the Plus 1 system installed on this unit will help you navigate and understand the various screens that are displayed throughout the panel.



Main Menu

This screen displays the various panels that are displayed throughout the Plus 1 system.

Using the [SELECT] buttons, move the arrow to the panel you wish to display and press [OK]



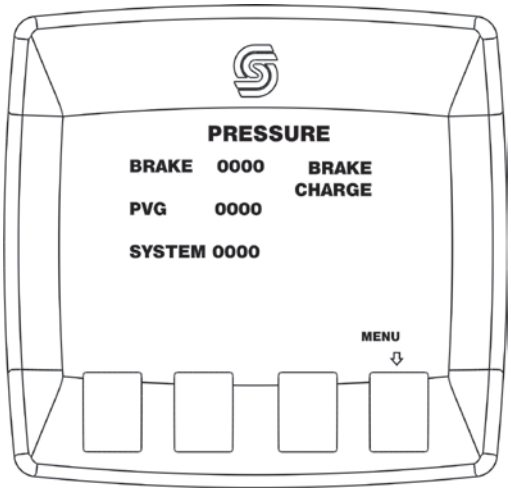
Main Display (OPERATION)

This panel displays the following items

- Engine RPM, Fuel Level, Oil Pressure, Engine Temp, Battery Voltage, Engine Load Percentage, Parking Brake (PULLER not Trailer), HI / LOW pulling speed, and a pulling percentage display bar

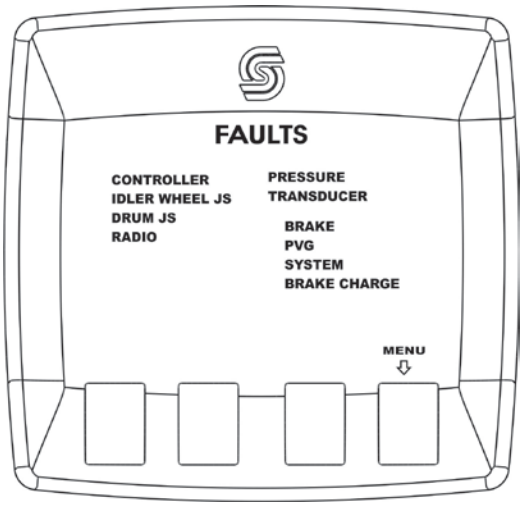
The throttle is adjusted by using the UP and Down Arrow buttons.

Hi / Low Speed is changed with the [SPEED] button. This can be shifted "on the fly" during take up or pay-out function



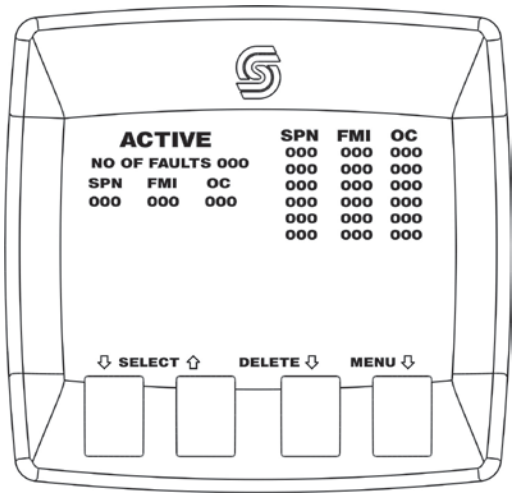
Pressure Display

This panel displays the pressure for the Drive Holding Brake, the PVG valve system (all functions other than pulling or payout), and the overall Hydrostatic System Pressure.



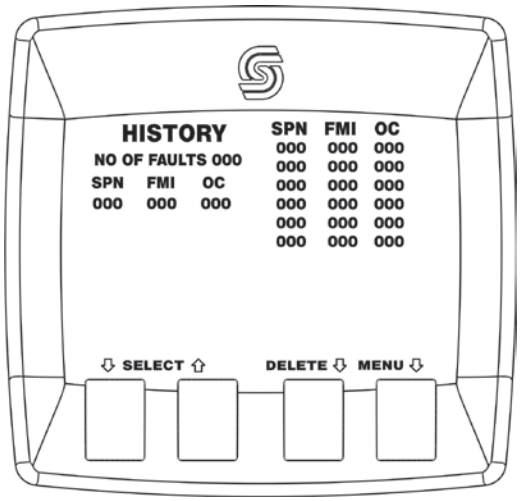
Faults Display

This panel displays information resulting from the malfunction of the electronic sensors or functioning components of the units system.



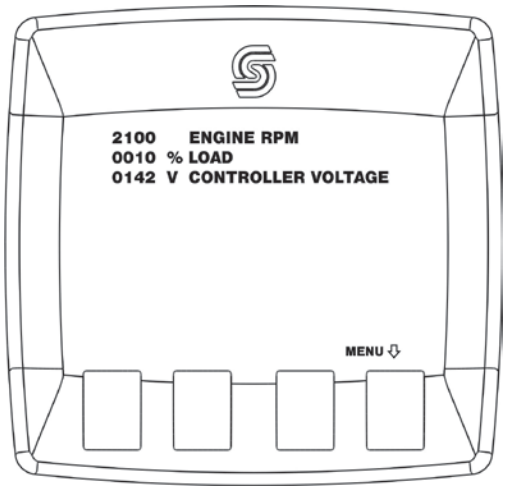
Engine Faults

This panel displays the current engine faults.



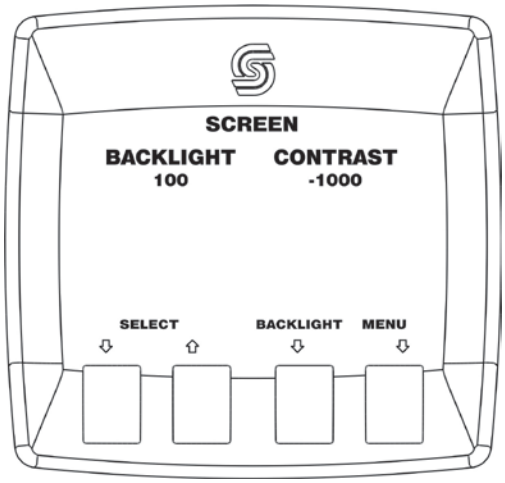
Engine History (Engine Faults)

This panel displays the faults that may occur with regard to the engine. Used for diagnostic purposes, this panel will keep a history of faults.



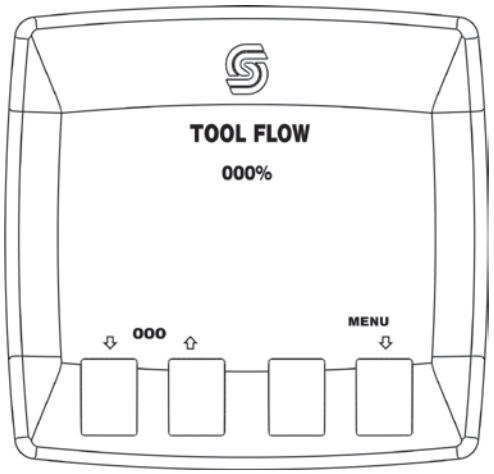
Engine

This panel displays the current engine RPM, percentage of load on the engine, and the voltage into the engine ECU.



Background

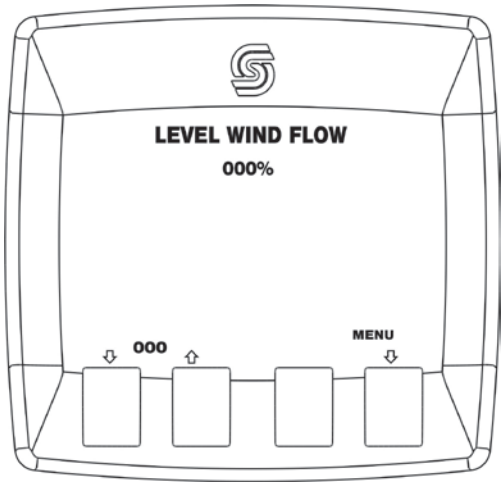
This panel displays the screen contrast settings. These settings can be configured by the operator to adjust for various lighting conditions.



Tool Flow

This panel displays the amount of flow through the tool circuit. At 100%, the tool circuit is set at 10 GPM at 2000 psi.

Press the up and down arrow buttons to adjust flow.



Level Wind Flow

This panel displays the Level Wind flow. By adjusting the percentage from 0-100% you can adjust the speed of the Level Wind.

Press the up and down arrow buttons to adjust flow.

NOTE: The SAME valve operates both the Level Wind Circuit and the Tool Circuit flow. The settings are different for both and the computer will only allow use for one at a time.

If operation of BOTH functions is needed at the same time, the unit must be equipped with a second vale.

REMOTE CONTROL

If this unit is equipped with a Remote Control unit that allows for the operation of the trailer using a remote belly pack. This remote can be either tethered or wireless. (3 'D' Batteries)

DANGER - USING THE REMOTE ALLOWS AN OPERATOR TO PUT THEMSELVES IN HARMS WAY. ALWAYS REMAIN FREE AND CLEAR OF THE TRAILER WHEN OPERATING WITH THE REMOTE. NEVER OPERATE THE PULLING TAKE-UP FEATURE WHILE POSITIONED IN THE "BITE OF THE LINE"

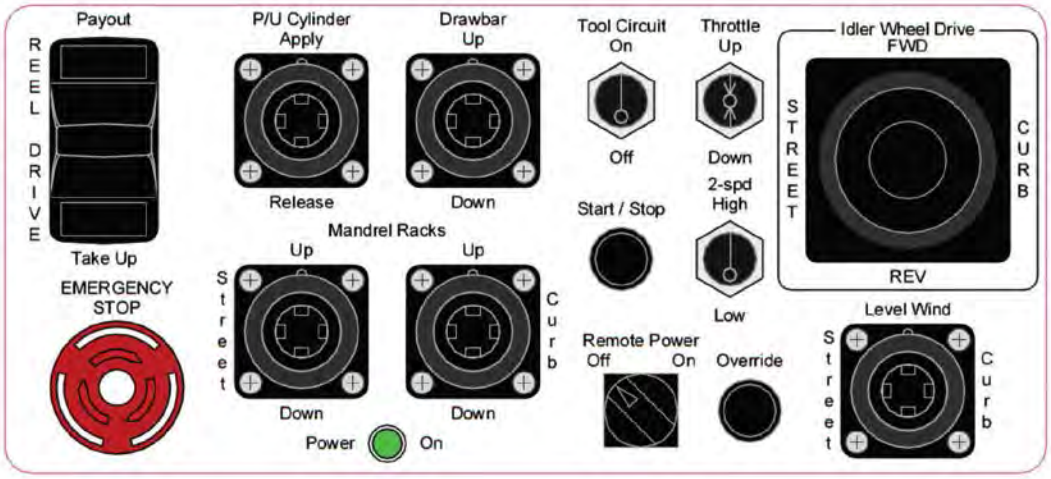
It is designed to operate most of the functions as they are controlled on the trailer itself. All switches are the same style in design, (i.e. spring return to neutral joystick and pay-out / take-up, momentary and detent switches). The remote also features an EMERGENCY STOP, Engine start/stop, Operator present / Override switch.

Operating with the remote disables all functions that are based on the trailer itself. This means there is not a possibility of someone controlling the trailer from the front or rear controls at the same time the remote is powered on.

To operate the HYDRA 985 with the Remote, you must do the following:

1. Turn the key switch located on the Main Control Panel to on.
2. Set the Remote Power switch to on. The "Power On" indicator light with illuminate.
3. Reset the EMERGENCY STOP switch.

All functions on the remote are now usable. Take a moment to familiarize yourself with the operation of the HYDRA 985 while using the remote BEFORE you get on the job. Although all the functions are the same, there is a slight difference in orientation of the operator with regards to where the trailer is. Take special care when maneuvering the HYDRA 985 with the remote. As all controls on the trailer operate something that moves in the same direction as the control (drawbar lever up = drawbar up), orientation of the joystick for the Steer Go Idler Wheel can change as the operator moves about the trailer.



LOADING INSTRUCTIONS

LOADING INSTRUCTIONS

IMPORTANT: This unit is designed to load a reel that is setting on the ground. DO NOT LOAD WITH FORKLIFT or other device as this causes cable damage and can effect the safe carrying procedures of this unit. FOLLOW DIRECTIONS.

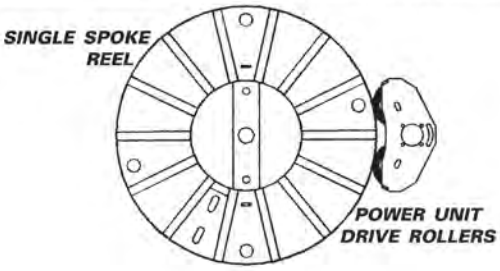
LOADING PROCEDURE

NOTE: This dolly will accept reels of 50" to 108" in diameter and 26" minimum to 56" maximum in width.

1. To load, make sure power driving unit is forward as far as possible.
2. Lower mandrel lifts to bottom
3. Pull out mandrel lock rods, remove mandrel and install in reel.
4. If reel bore is over 2-1/2" in diameter, use tapered cones for centering.
5. Always center mandrel in reel so that reel will be centered in dolly.
6. Install lock collar on each side of reel.
7. Place bearing on ends of mandrel.
8. Roll reel into unit or back unit astraddle reel into lifting racks. (Insert mandrel into lowest rack possible.)
9. Put bearing block in place on each end of mandrel to hold bearing.
10. Insert mandrel rack rods through rack and bearing block.
11. Set cylinder locks - one on each side. These are located at rear of fenders. Push handle down to engage.
12. Raise reel until locks snap in place.
13. Lower reel with both valves and hold for 30 seconds to take load off lifting cylinders. Racks should be setting on locks.
14. Adjust each set of drive wheels to center on reel flanges.
15. See instructions for adjusting rollers for proper reel diameter.
16. Move power unit against reel flange before towing this dolly.

BEFORE TOWING VEHICLE

NOTE: With reels that have a single spoke (note drawing following), have spoke in vertical position before moving power unit against flanges.



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HYDRAULIC CONTROLS

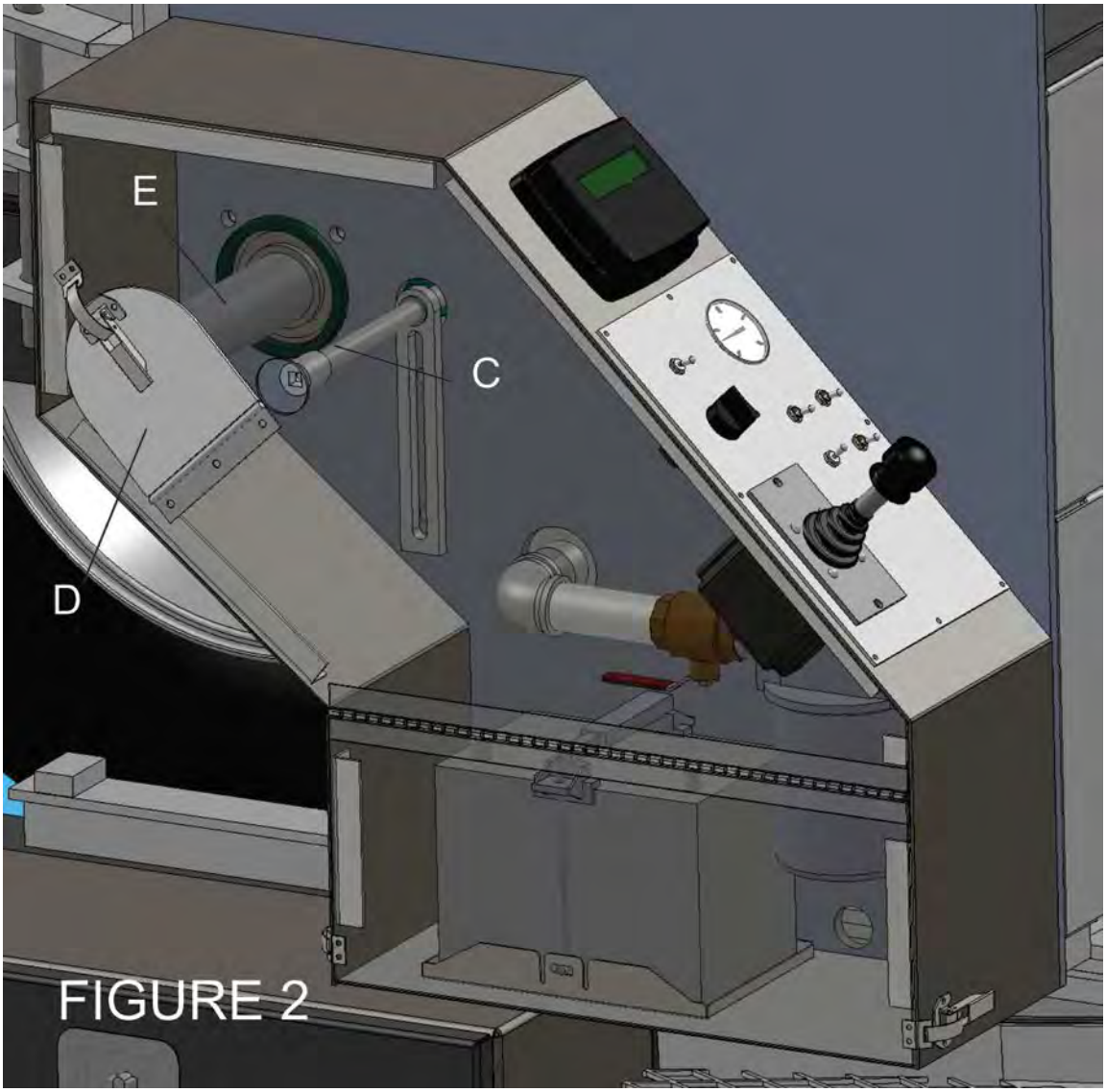


FIGURE 2

Power Unit Features

- C - ACME ADJUSTING SCRW
- D - EXTENDED SHAFT GUARD COVER
- E - POWER UNTI DRIVE SHAFT 2 7/16"

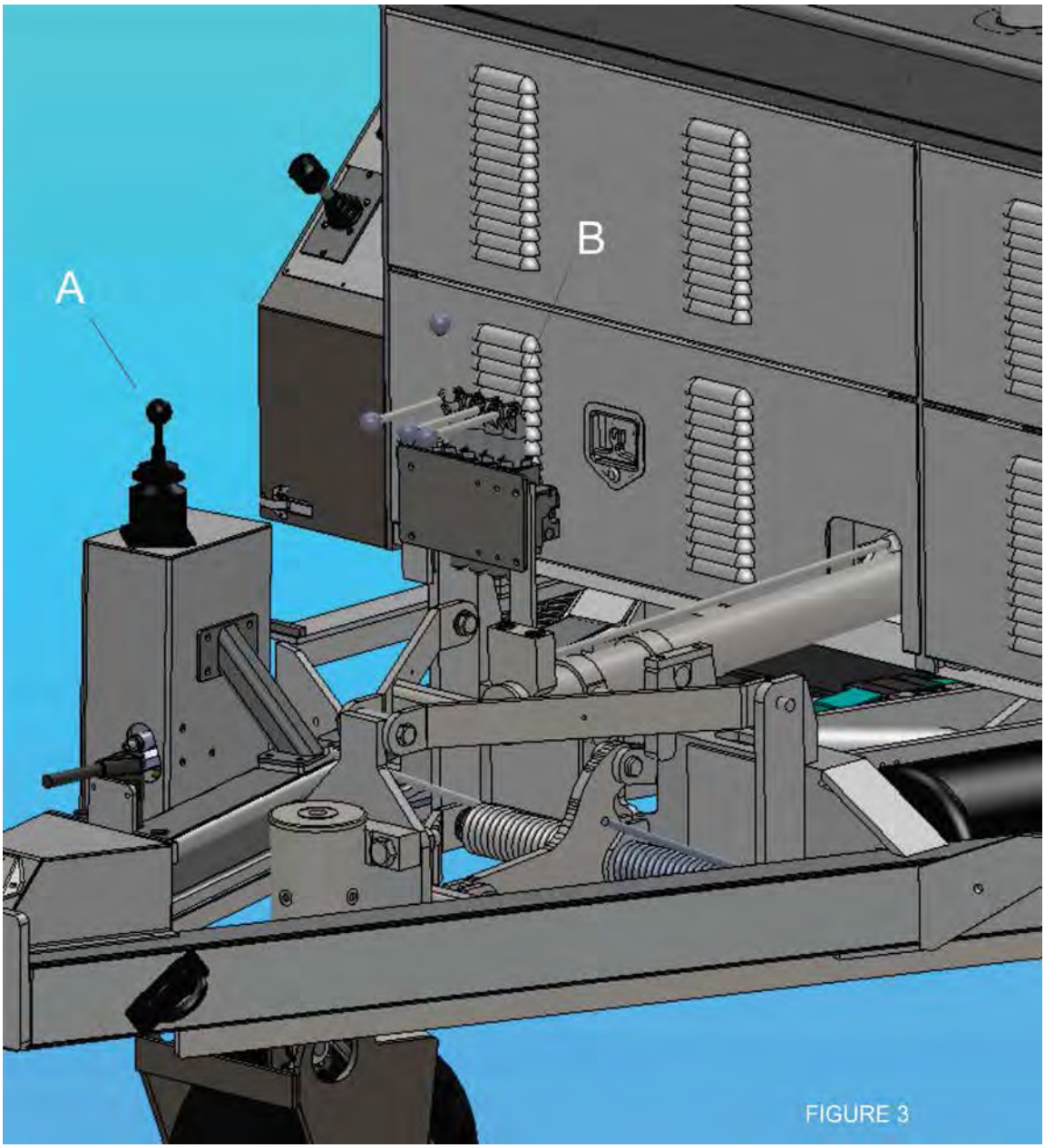
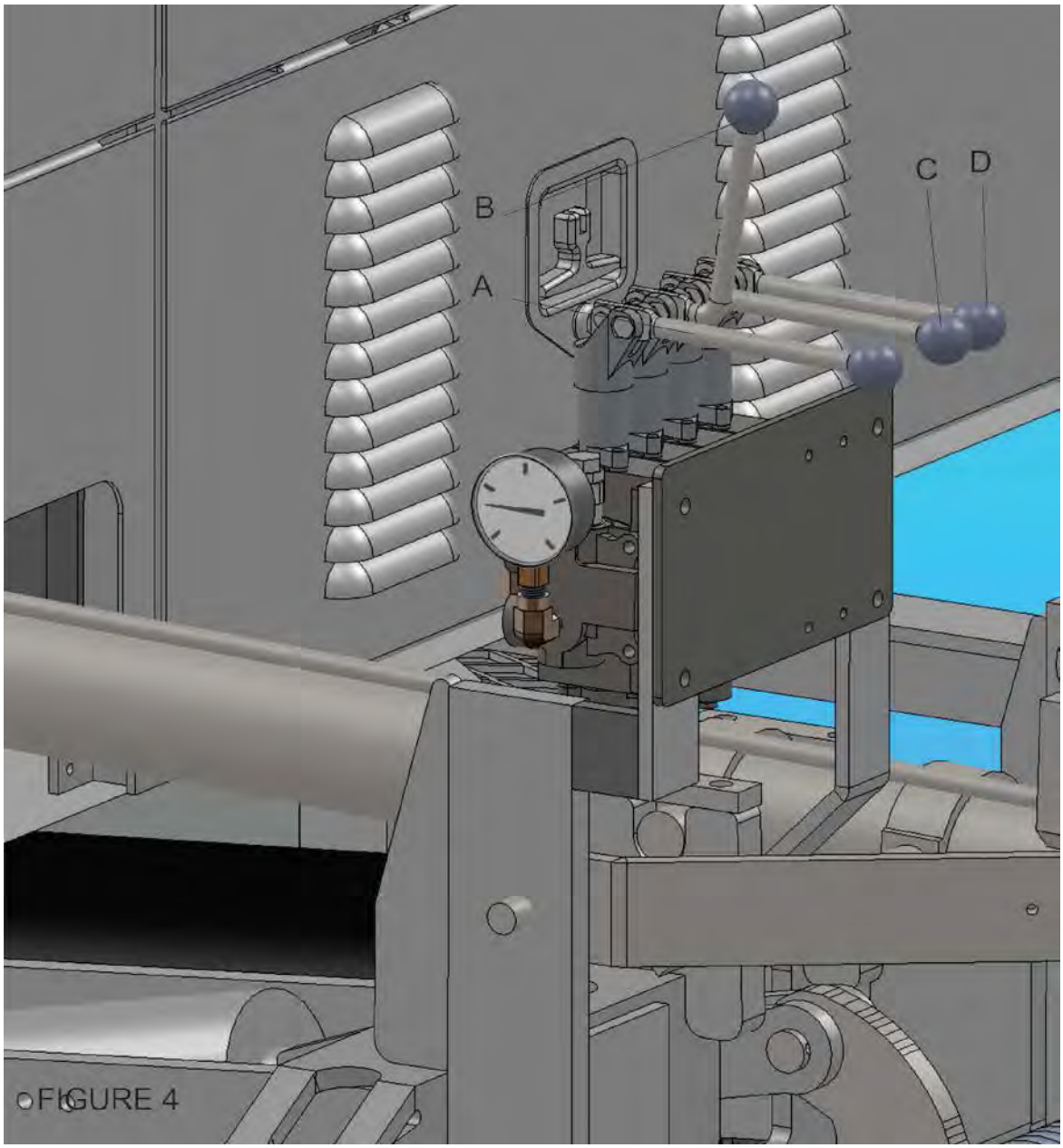


FIGURE 3

FRONT HYDRAULIC CONTROLS

- A - STEER GO SYSTEM
- B - FRONT HYDRAULIC CONTROLS (DRAWBAR, POWER UNIT, LEFT AND RIGHT MANDREL RACKS



FRONT CONTROL BANK

- A - DRAWBAR RAISE AND LOWER
- B - POWER UNIT FORWARD AND BACK
- C,D - RIGHT AND LEFT AND RIGHT MANDREL RACK RAISE AND LOWER

POWER UNIT

The Power Unit consists of the engine, Hydrostatic Transmission Drive Unit, Drive Rollers, Engine Controls, hydraulic reservoir and auxiliary power shaft. The power unit supplies power for all hydraulic functions and turns the reels to provide cable pulling. Pulling controls are located at the power unit, the rear curb side of the trailer, and the Remote Pendant box (if equipped). Electronic controls at the rear of the trailer control the direction of pull for cable take-up or pay-out and control the throttle, level wind, hydraulic tool circuit, and hi and low shift. All primary engine controls are located at the front of the power unit.

AUXILIARY POWER SHAFT

This shaft is located on the side of the power unit and is used for light duty winding operations. Attachments can be added to the shaft. The rotation of the shaft is controlled with the Joystick that controls the take up and pay out functions. When not in use, the shaft should be covered with the cover provided.

POWERED IDLER WHEELS AND HYDRAULIC CONTROLS

The powered idler wheel is located towards the front of the trailer. This wheel is hydraulically raised or lowered and hydraulically powered to provide maneuverability of the trailer when disconnected from the towing vehicle. The wheel is steered by means of a power steering control unit (figure 3). The joystick controls forward and reverses movement as well as left and right direction of the trailer. Refer to the Steer-Go Power Steering section. The hydraulic controls are located between the power unit and the idler wheel at the main drawbar cross member.

The four valves control the following functions:

- Drawbar Height: raise and lower
- Power Unit direction: fore and aft
- Right Mandrel Rack: raise and lower
- Left Mandrel Rack: raise and lower

REEL CARRYING RACKS (MANDREL RACKS)

The reel carrying racks (mandrel racks) are located in the reel carrying area at the rear of the trailer (fig 5A and 5B). These racks have several pockets to allow a variety of reel diameters to be picked from the ground. Follow the LOADING INSTRUCTIONS when loading the reel. The mandrel rack locks are indicated in Fig 5C. Also, Fig 5D shows the rear controls for the power unit and the Jack stands (FIg 5E and 5F)

JACKSTANDS

JACKSTANDS ARE STABILIZING LEGS LOCATED AT THE REAR OF THE TRAILER. THE JACKSTANDS SHOULD BE USED DURING ALL PULLING OPERATIONS

In Fig 5, the jack stand at the left is shown in the stowed or carried position. The jack stand at the right is shown in the down or pulling position. Each jack stand is positioned by the use of a ratchet locking in the notches. To release the jack stands from the carrying position, lift and rotate out of the carrier. To raise, rotate stand one quarter turn to release the ratchet from the notch and raise the stand to lock into the carrier.

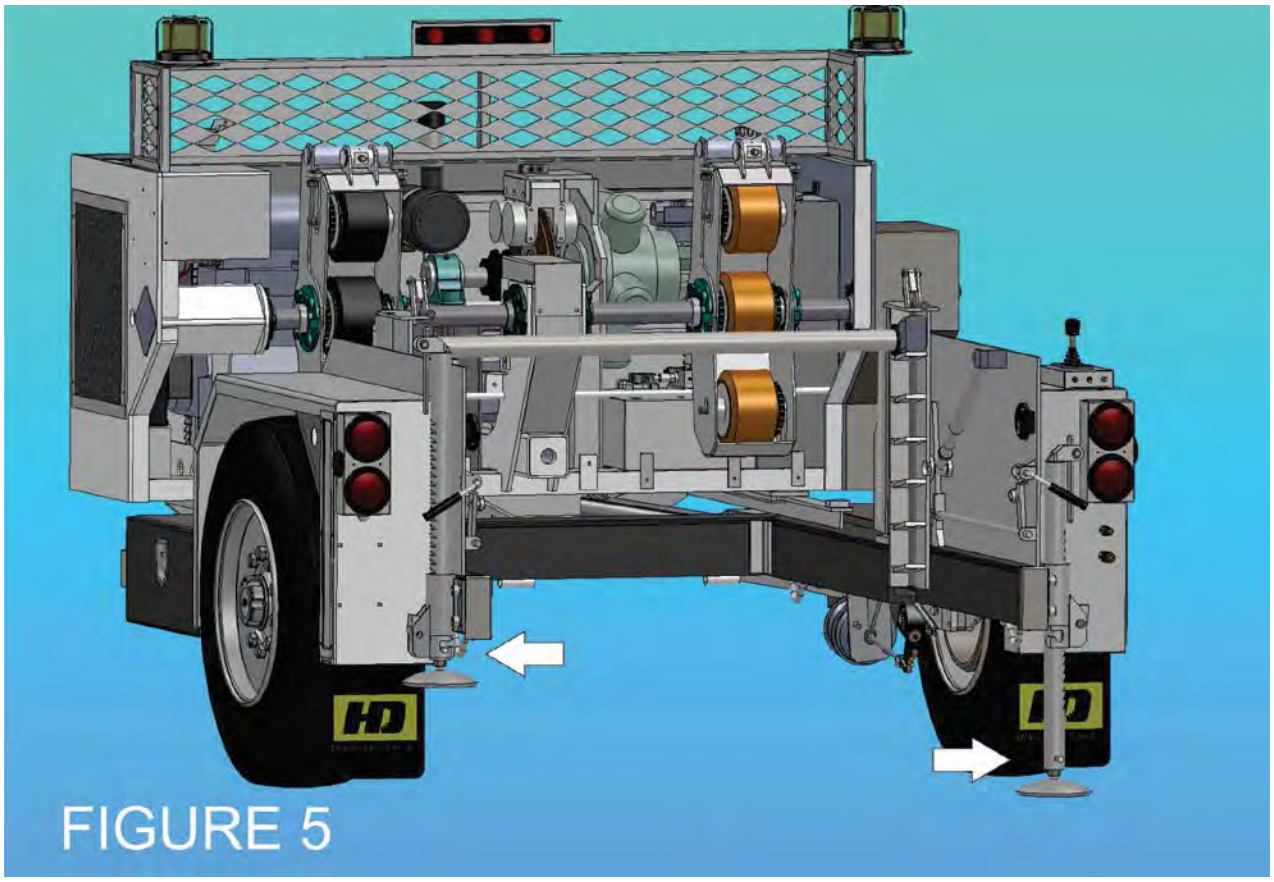


FIGURE 5

ADJUSTING ROLLERS FOR REEL DIAMETER

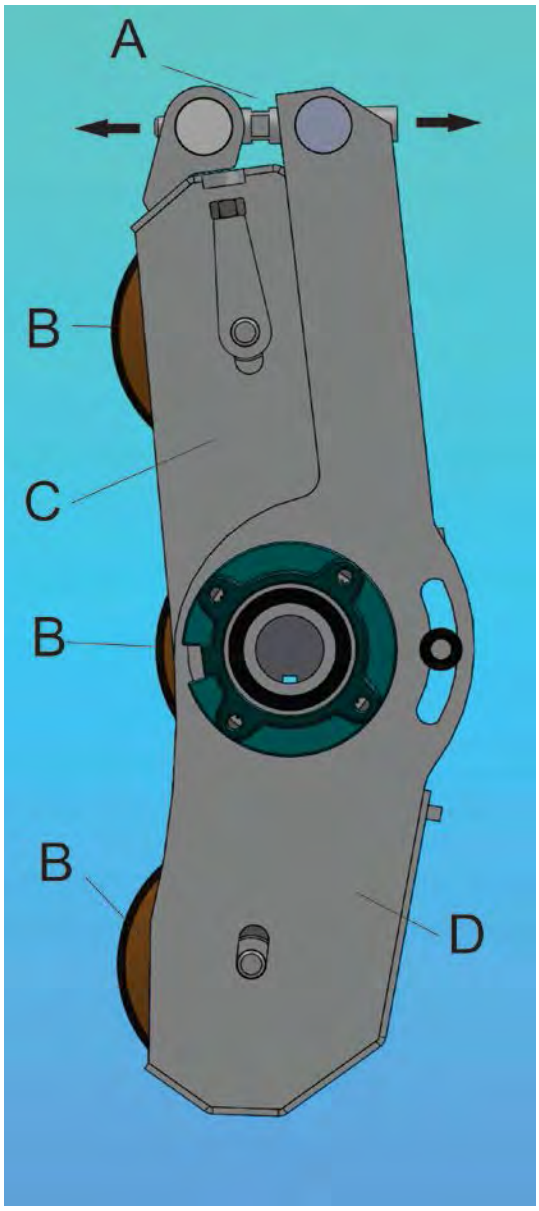
1. Open housing to maximum position. Use adjusting screw at top of housing.
2. Bring rollers to reel until center roller barely touches reel
3. close housing down, using adjusting screw, until all three roller barely touch the reel flange
4. Use power unit control to bring all rollers and power unit against reel

IF YOU FOLLOW THIS PROCEDURE, YOU SHOULD HAVE EQUAL PRESSURE ON EACH ROLLER AND PROVIDE MAXIMUM ROLLER LIFE.

ROLLER HOUSING COMPONENTS

A. Adjusting Mechanism
B. Driver Roller
C. Upper Housing
D. Lower Housing

IT IS IMPORTANT TO HAVE AN EQUAL VISIBLE INDENTATION IN THE DRIVE ROLLER FRICTION MATERIAL. FAILURE TO DO SO WILL RESULT IN UNEVEN PRESSURE AND PREMATURE FAILURE OF ONE OR ALL DRIVE ROLLERS.



MANUERVERING INSTRUCTIONS

One of the main features of the HP 6500 is its ability to maneuver under its own power by use of the Powered Idler Wheel and the Steer Go System.

The Power Steering Joystick is used to maneuver the unit into position

USE OF THE STICK WHICH CONTROLS THE IDLER WHEEL MOTOR AS A BRAKE SHOULD BE AVOIDED

STEER-GO OPERATION

There are two (2) main components in the system.

A. The Steer-Go Control Box mounted to the right hand (curb) side of the trailer drawbar.
B. The Rotary Actuator Assembly attached to the Idler Wheel Fork Assembly

Working together, these components allow the operator to easily steer and maneuver the trailer by merely moving the joystick control as desired. The actuator can move the wheel through a 180 degree arc, 90 degrees either side of center.

In the instructions that follow we will often refer to "steering" and "motion" For out purposes, "Steering" will always refer to the action of turning right or left. The word "motion" will always refer to forward or reverse direction of the idler wheel

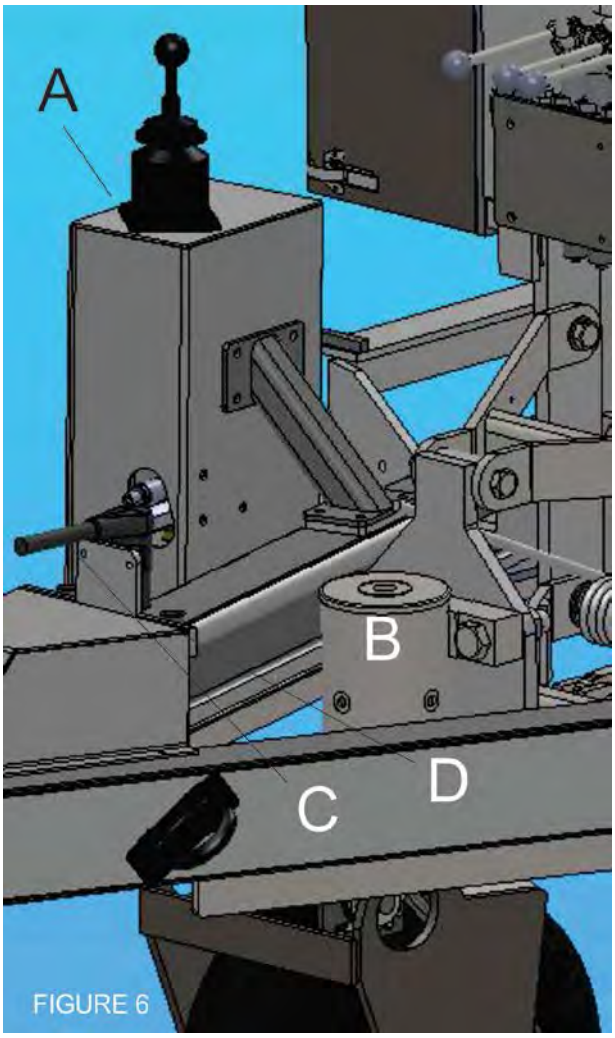


FIGURE 6

THE JOYSTICK

The joystick is a two-axis control that controls both steering and motion of the idler wheel functions. The joystick is either mechanically linked or electronically controlled (depending on options) to hydraulic control valves. Mechanical valves are spring return to neutral. Electronic joysticks are also spring return to neutral. Releasing the joystick will cause all movement to stop.

The linkage system, in the mechanical system, provides quick positive response to the operators action. Because the response is quick, steering right or left is usually accomplished by a series of short, momentary movements of the joystick in the desired left or right direction.

NOTE: Refer to the directional decal (Fig. 7) on the top of the control box prior to operating. Become familiar with the feel of the joystick with the engine running. Note the short movement required to move through the full range of direction

Figure 7

TO STEER AND MOVE

CAUTION: Note the direction the idler wheel is pointing before actuating the joystick. The trailer will move in the direction the wheel is pointing

Start the Engine. With the engine running at **IDLE SPEED**, move the joystick to the right or left. (NOTE*: Steering speed is NOT affected by engine RPM)*

Move the joystick to the FWD position. The trailer now travels forward. By holding the joystick in the forward position and moving it to the RIGHT, the trailer will turn RIGHT. Release the turning motion when the wheel has reached the angle of turn you desire. Trailer will continue to turn until you steer LEFT to straighten out the wheel.

To back the trailer, move the joystick to the REV position. When you turn to face the rear of the trailer as you are backing, the steering directions are reversed.

NOTE: *Idler wheel speed is a function of engine RPM*. Idle is enough to provide easy, smooth operation. The higher the RPM the faster the unit will move

BRAKE CONTROLLERS

Brake controllers on the HP 6500 are what is commonly used in an air brake trailer. Figure 6 shows us the location of the following:

C: The hand control located on the apex of the trailer
D: The Push-Pull Switch located at the apex of the trailer

ON BOARD AIR COMPRESSOR

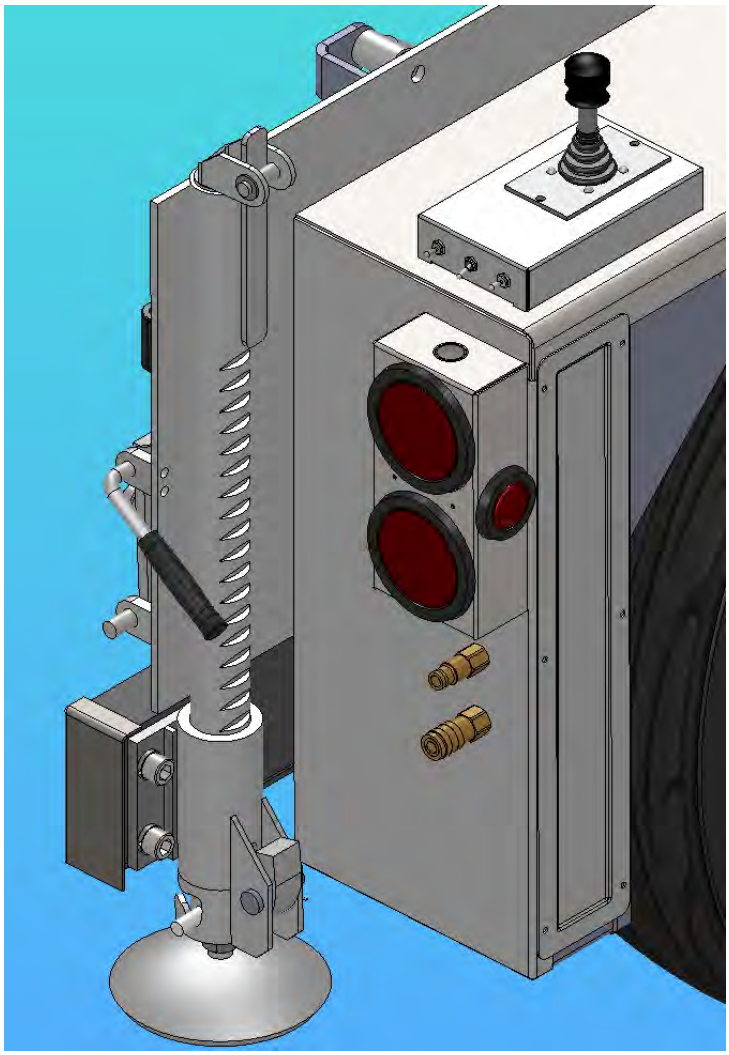
Each air brake unit that is equipped with an engine has an air compressor installed to charge the system while away from a tow vehicle. This compressor is located in the power unit and can be controlled by a switch on the main control panel. It is recommended that the unit engine be started with the switch in the OFF position to allow for maximum battery power for starting. After the engine is running, turn the compressor on to charge the system. Although the compressor has an automatic shut off when it reaches the pre determined pressure in the system, for extended life and better starting power, it is recommended that the compressor be switched OFF after the system pressure has been reached.

TOOL CIRCUIT (OPTIONAL)

Some trailers may be equipped with an optional hydraulic tool circuit. The circuit is designed for tools which are used intermittently or for short duration such as a pump or hydraulic cutters. It is NOT designed for uses of long or continuous duration such as hydraulic blowers or generators.

The tool circuit outlets are located in the rear curbside (Fig. 8) fender panels. Two quick disconnect fittings are provided. The tool circuit is actuated by an electric switch located on the main control panel, and the rear fender panel. This system is designed to provide 10 GPM at 2000 psi.

WARNING: WHEN NOT IN USE, THE SWITCH MUST BE IN THE OFF POSITION. IF THE SWITCH IS LEFT ON, WHEN TOOLS ARE DISCONNECTED, SEVERE BACKPRESSURE WILL OCCUR THAT COULD DAMAGE THE HYDRAULIC SYSTEM.



LEVELWIND OPERATIONS

Some units are equipped with a Level wind System. This system is hydraulically actuated boom style level wind located at the rear of the trailer (Fig. 9)

There are two switch locations to operate the level wind. They are at the main control panel and the rear control panel located at the curbside fender. Each switch is directional in relation with the travel of the level wind boom. That is, if you push the switch to the right, the boom travels right as you view the level wind. If you push the switch left, the boom travels left. The switches are momentary and as you release them, it comes to a neutral position and the boom stops.

The level wind does not operate automatically. The operator must activate the switch each time the rope or wire is to be moved on the reel. The top roller of the boom carriage is made with a swing away mounting to allow for insertion or removal of the line. By removing the pin located in the boom, the upper boom section can be extended or retracted as needed. **DO NOT OPERATE THE LEVELWIND WITHOUT THE PIN INSTALLED IN THE BOOM SECTIONS. THIS MAY CAUSE THE BOOM TO COME OUT OF THE LOWER SECTION DURING OPERATION.**

The level wind is most suitable for overhead pulls. Its use for underground is greatly restricted due to manhole size and amount of pull required. Do not use the level wind as a "breaker bar" for underground pulls.

To load with the level wind installed, pull the left hinge pin and swing the assembly out of the hinge and to the right. After the reel is loaded, swing assembly back into hinge and insert the lock pin.

The lower turnbuckle support is provided to allow for easy movement of the level wind arm during loading and unloading of reels. It may be necessary to adjust this turnbuckle if the unit becomes difficult to swing in and out of the hinge.

The unit can be easily removed from the trailer by disconnecting the hoses and pulling the hinge pins.

BE SURE TO USE A FORKLIFT OR OVERHEAD CRANE WHEN REMOVING AND INSTALLING THE LEVELWIND ASSEMBLY.

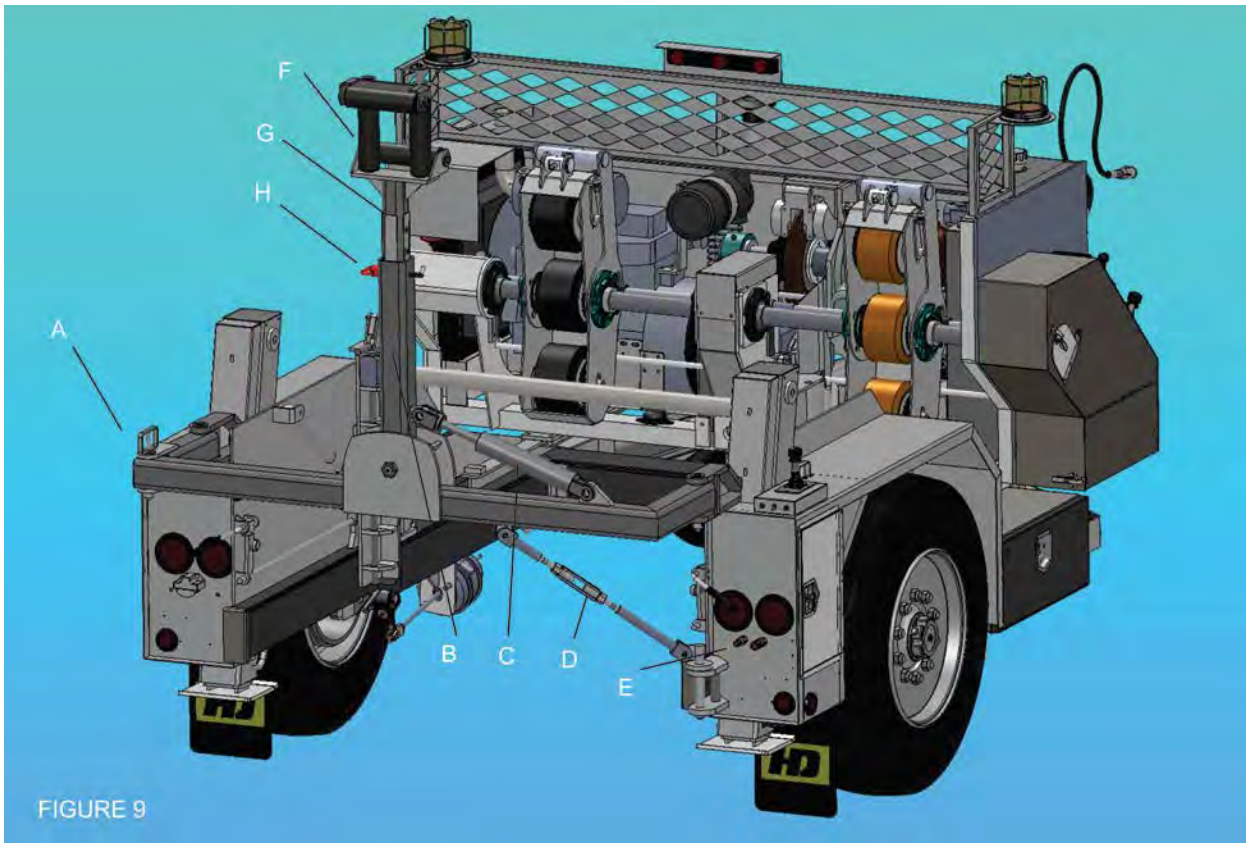


FIGURE 9

LEVELWIND COMPONENTS

The following are the main components in the LW Assembly

A. Hinge Pin
B. Lower Boom Assembly
C. Level wind cylinder
D. Turnbuckle
E. Hydraulic QD fittings
F. Carriage Assembly
G. Upper Boom Assembly
H. Lock pin for Boom Assemblies

PULLING PROCEDURES

Although all jobs will vary, below is a basic description of how to operate the HP 6500. Please consult your Employers rules and regulations and always consult and follow guidelines set for by the IEEE.

OVERHEAD WIRE

The following is a basic description of how to set up and pull overhead wire.

1. Set up the dolly with the longest lead possible with the axis of the trailer in line with the pull.
2. Lower the drawbar - set the jack stands - raise the drawbar to put pressure on the legs
3. Chock the wheels
4. Move the drive rollers against the flange of the reel until visible indentations are visible on the drive roller friction material. Apply more pressure to reel flange if drive wheels slip.
5. Select the desired Hi-Lo speed setting
6. Increase engine RPM to 2000
7. Move control lever to take-up position and start pulling.
8. To stop the pull, return the control lever to neutral.

DANGER

NEVER allow the Power Unit to become disengaged from the reel during an overhead pull. This will cause the reel to spin freely and may drop the rope or conductor. Doing so may cause the pulling line and or wire to drop onto other energized conductors causing serious injury or death

UNDERGROUND PULLING

1. Position the trailer over the manhole (vault opening, etc). The best position for maximum pulling power is to position the reel DIRECTLY over the pull.
2. Lower trailer drawbar
3. Set Jack stands
4. Raise trailer drawbar to set pressure on the jack stands. It is not advised to remove the tires from the ground when setting the jack stands. They are there to help stabilize the trailer and spread the load over the entire frame, stub axles and front idler wheel.
5. Chock the tires
6. Set the brakes - Air ABS systems ONLY
7. Move the drive rollers against the flange of the reel until visible indentations are visible on the drive roller friction material. Apply more pressure to reel flange if drive wheels slip.
8. Select the desired Hi-Lo speed setting
9. Set the engine RPM to IDLE. Increase engine RPM as needed.

NOTE: Most wreck out jobs can be broken loose with the RPM at idle. If slipping occurs during the pull, gently increase the pressure of the Power Unit against the reel flange.

Level wind on the reel.

After the pull has begun, it may be necessary to keep the pulling rope or wire level on the reel. To do so, stop the pull, lower the drawbar to release pressure on the jack stands, turn the Idler wheel perpendicular to the axis of the trailer and slight change the rear angle of the unit. This slight change with all for the rope to wind itself back towards the other flange. Set the pressure back to the jack stands and continue take-up operation.

SERVICE

HP 6500 Lubrication

The following lubrication instructions are offered as "rule of thumb". Precise lubrication instructions will vary with each usage of each unit. **CHECK ALL LUBRICATIONS BEFORE EACH USE**

ENGINE: Consult Engine Manual for precise instructions. Unit is delivered by Hogg & Davis, Inc. with 10W40 oil.

HYDRASTATIC DRIVE SYSTEM: This Drive System is practically maintenance- free, however the oil should be changed every six months with ISO 46 wt. or its equivalent. There are three oil filters that should be changed also at this time. (Refer to schematic) One of these filters is a high pressure filter and has a restriction gauge on it, this gauge should be checked daily, if it reaches the red line, this filter should be changed immediately.

WHEEL BEARINGS: Wheel bearings are of the oil bath style and should be inspected as part of the Drivers Pre-Trip Inspection.

IDLER WHEEL: Lubricate every 30 days. Zerk fittings are provided for proper application of lube. Lube all parts, including spindle housing, "A" frame supports, and hydraulic cylinder linkage.

LIFTING RACKS: Lubricate every 30 days.. Lube all parts, including rack and attached stabilizer bars. NOTE: If racks do not lower properly, it may be necessary to lift rack entirely off cylinder, and with solvent clean away caked grease and dirt build-up. Wipe thin coat of lube all around cylinder before replacing rack. The holes on the racks are NOT designed for Zerk fittings. They allow air to escape during the lowering process. It may be helpful to spray some light oil into the holes to aid with raising and lowering.

DRIVER ROLLERS: Sealed bearings.

SPROCKET ASSEMBLIES: Lubricate once each week. Zerk fittings are provided for proper lube application.

ROLLER CHAIN: Lubricate once each week. Use regular lube oil to oil all chain, including driver roller chain, main drive chain (oil cup provided), and power idler wheel chain.

DRIVE SHAFT BEARINGS: Lubricate as required. It is recommended that the track be kept clean of grease and dirt build up, and fresh lube be applied after each cleaning.

TOOL BOX DOORS: Lubricate as required. Hinges and locks should be lubricated with oil as needed for easy operation.

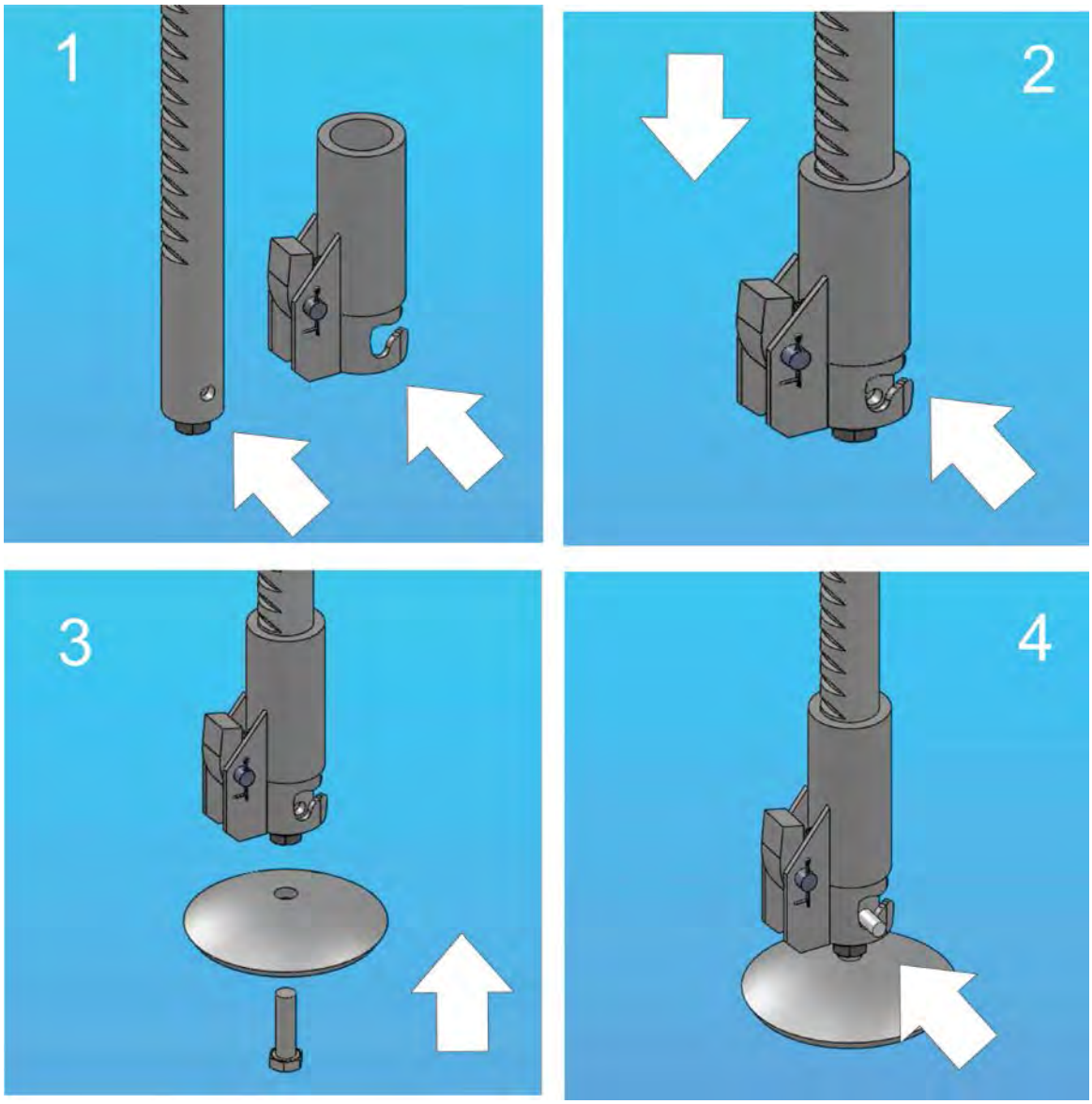
NOTE: All lubrication should be performed consistently to Insure proper operation and extended life of equipment.

CAUTION: OILS SHOULD NOT BE MIXED. IF BRAND OR TYPE IS CHANGED, OLD OIL MUST BE DRAINED, ALL FILTERS CHANGED, AND NEW OIL USED THROUGHOUT THE SYSTEM.

JACKSTAND INSTALLATION

When installing any model Hogg and Davis
Jack stand, the following procedure should be
Used.

1. Determine If stand Is left or right. Hole in side of stand should line up with holding lug on trailer when teeth of stand engage with spring loaded ratchet pawl.
2. Insert stand into sleeve.
3. Install pad with pad bolt. Screw bolt all the way in, leaving Just loose enough for pad to swivel.
4. Screw stud Into stand until it wedges against the pad bolt. Tighten stud HARD AGAINST pad bolt. This LOCK bolt and eliminates loss of pad from bolt vibrating loose.

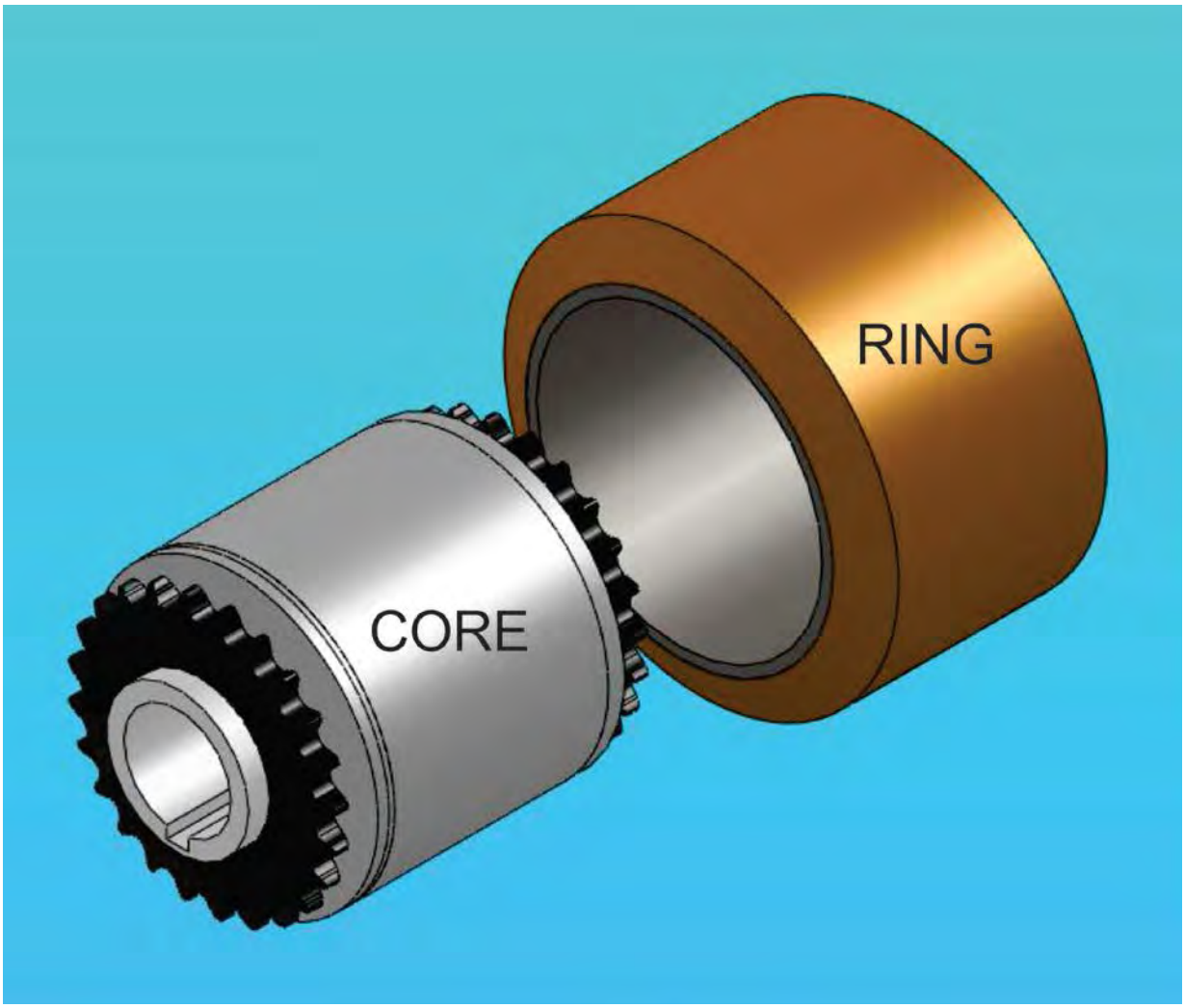


DRIVE ROLLER MAINTENANCE

The "heart" of any friction drive cable pulling machine is the rollers that transfers the power to the reel. This Is also usually the highest mortality Item on these units because they take the full brunt of all the pulling torque. The current production drive roller consists of two (2) pieces; a core and a ring.

The ring consists of a special composition neoprene rubber compound (or optional urethane) molded to a steel ring. The core is made of steel, has bearing seats and a 24-tooth #60 sprocket welded on one end. The core and the ring are machined for press fit tolerance. When repairing roller due to "dead" or torn rubber, the core is pressed out of the old ring and new rings are pressed on.

When replacing rollers, it is advised that they be replaced in horizontal pairs, i.e. both top rollers or both bottom rollers. This is so equal thickness of rubber is applied to each flange of the reel. If replaced in vertical pairs with new, thick rollers in one housing and old compressed rollers in the other housing, the power unit will have the tendency to cock under pressure. This tendency forces the rollers to be cut by the reel flange edges and can greatly reduce the expected life of the roller.



ACME ADJUSTING SCREW

Ninety to ninety-five percent of all damage to the acme adjusting screws on the above machine Is in the form of bending. Since it is nearly impossible to straighten them to work properly, it is necessary to replace them.

This damage can be prevented by employing one or more of the following simple precautions.

1. Instruct all operators, that after they have adjusted the drive roller housing to its proper position, by use of the screw, to back-off one-half turn. This relieves that binding pressure between the acme nut and the drive roller housing, allowing the housing to "dolly" freely with the shape of the reel flange.
2. Keep the acme screws and drive shaft well greased. This not only allows the drive roller housing to move laterally and "dolly" properly, but will also protect the parts from corrosion and rust.
3. Wipe grease on housing where acme nut makes contact. This will also allow housing to "dolly" easier without binding.
4. Be sure acme screw brackets are adjusted to maintain a level setting throughout the drive roller housings

DRAWDAR INSPECTION

1. Regularly inspect the drawbar for wear and damage. If wear exceeds 1/8", replace the drawbar.
2. Check all drawbar mounting fasteners for proper torque.
3. Do not modify or add to the product.
4. Do not weld on this product without written permission from the factory.
5. Be sure the drawbar size is compatible with the coupling device on the tow vehicle.
6. Do not damage the coupling components. Be particularly careful during coupling and uncoupling.
7. Inspect the coupling device on the tow vehicle for proper locking prior to use.
8. Consult OSHA and DOT regulations and AMERICAN TRUCKING ASSOCIATION GUIDELINES FOR COMPLETE OPERATING PROCEDURES.

MANDREL RACK STABILIZER INSTALLATION

The mandrel rack stabilizers are very critical to the proper operation of your trailer. One stabilizer Is attached to each mandrel rack. This stabilizer keeps the racks rigid and takes all the strain put against the racks when pressure Is applied by the power unit against the reel. Without the stabilizers, the power unit could apply enough pressure to bend or break the lifting cylinders upon which the mandrel racks ride. Therefore, it is Important that the stabilizers be properly installed and maintained.

When It becomes necessary to replace a stabilizer due to damage or loss, the new stabilizer will be sent with the stop nut loose on the male rod portion of the stabilizer (Fig. 1).

The stabilizer should be bolted in position between the mandrel rack and the anchor bracket on the fender panel. The rack should then be raised to Its locked position and settled on the lock. The stabilizer should now be at a right angle to the rack and parallel to the top of the fender panel. The stop nut should be screwed on the male shaft until it sits against the female portion of the stabilizer. (Fig.2).

Locktite® can be used to properly set the stop nut. Proper Installation will assure protection against damage to lifting cylinders and stability for rack and reel mandrel.

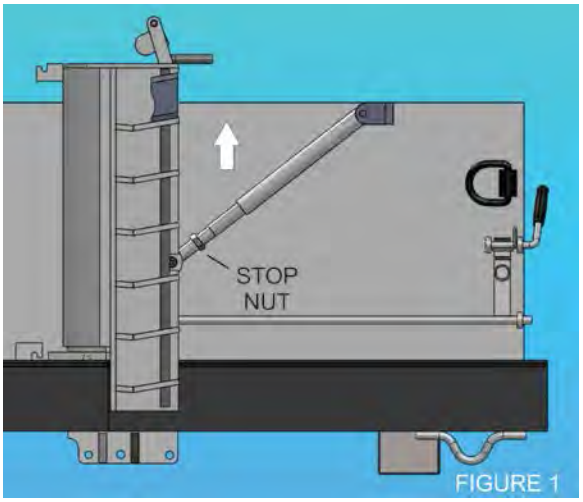


FIGURE 1

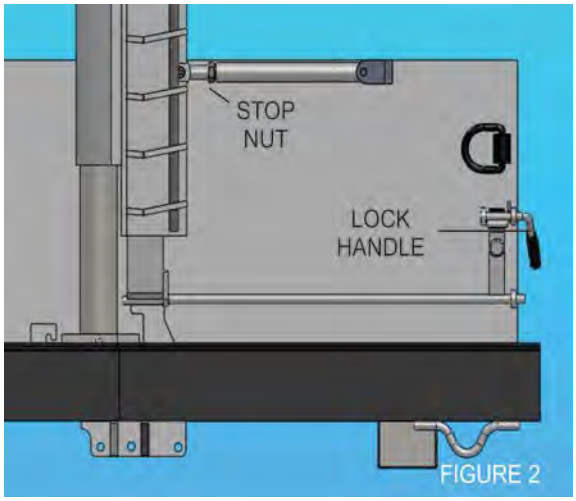


FIGURE 2

Section 2

YANMAR WARRANTIES

Page

YANMAR LIMITED WARRANTY

What is Covered by this Warranty?

YANMAR warrants to the original retail purchaser that a new YANMAR TNV series industrial engine will be free from defects in material and/or workmanship for the duration of the warranty period.

Note: YANMAR engines may be equipped with external components including, but not limited to: wiring harnesses, electrical devices, control panels, radiators, air filters, fuel filters, and/or exhaust systems that are supplied and/or installed by manufacturers other than YANMAR. For warranty information on such external components, please contact the machine or component manufacturer directly or see your authorized YANMAR dealer or distributor.

This warranty is provided in lieu of all other warranties, express or implied. YANMAR specifically disclaims any implied warranties of merchantability or fitness for a particular purpose, except where such disclaimer is prohibited by law. If such disclaimer is prohibited by law, then implied warranties shall be limited in duration to the life of the express warranty.

How Long is the Warranty Period?

The YANMAR standard limited warranty period runs for a period of **twenty-four (24) months or two-thousand (2000) engine operation hours**, whichever occurs first. An extended limited warranty of thirty-six (36) months or three thousand (3000) engine operating hours, whichever occurs first, is provided for these specific parts only: the cylinder block, cylinder head, crankshaft forging, connecting rods, flywheel, flywheel housing, camshaft, timing gear, and gear case. The warranty period for both the standard limited warranty and the extended limited warranty (by duration or operation hours) begins on the date of delivery to the original retail purchaser and is valid only until the applicable warranted duration has passed or the operation hours are exceeded, whichever comes first.

What the Engine Owner must Do:

If you believe your YANMAR engine has experienced a failure due to a defect in material and/or workmanship, you must contact an authorized YANMAR industrial engine dealer or distributor within thirty (30) days of discovering the failure. You must provide proof of ownership of the engine, proof of the date of the engine purchase and delivery, and documentation of the engine operation hours. Acceptable forms of proof of delivery date include, but are not limited to: the original warranty registration or sales receipts or other documents maintained in the ordinary course of business by YANMAR dealers and/or distributors, indicating the date of delivery of the YANMAR product to the original retail purchaser. This information is necessary to establish whether the YANMAR product is still within the warranty period. Thus, YANMAR strongly recommends you register your engine as soon as possible after purchase in order to facilitate any future warranty matters.

You are responsible for the transportation of the engine to and from the repair location as designated by YANMAR.

YANMAR limited warranty - continued

To Locate an Authorized YANMAR Industrial Engine Dealer or Distributor:

You can locate your nearest authorized YANMAR industrial engine dealer or distributor by visiting the YANMAR Co., Ltd. website at:

http://www.yanmar.co.jp (The Japanese language page will be displayed.) For English language “click” on “English Page.”)

- “Click” on “Network” in the website heading to view the “Yanmar Worldwide Network.”
- Choose and “Click” on the desired product group.
- “Click” on the Icon closest to your region.
- “Click” on the desired country or associate company to locate your nearest authorized YANMAR industrial engine dealer or distributor.
- You may also contact YANMAR by clicking on “Inquiry” in the website heading and typing in your question or comment.

What YANMAR will Do:

YANMAR warrants to the original retail purchaser of a new YANMAR engine that YANMAR will make such repairs and/or replacements at YANMAR’s option, of any part(s) of the YANMAR product covered by this warranty found to be defective in material and/or workmanship. Such repairs and/or replacements will be made at a location designated by YANMAR at no cost to the purchaser for parts or labor.

What is not Covered by this Warranty?

This warranty does not cover parts affected by or damaged by any reason other than defective materials or workmanship including, but not limited to, accident, misuse, abuse, “Acts of God,” neglect, improper installation, improper maintenance, improper storage, the use of unsuitable attachments or parts, the use of contaminated fuels, the use of fuels, oils, lubricants, or fluids other than those recommended in your YANMAR Operation Manual, unauthorized alterations or modifications, ordinary wear and tear, and rust or corrosion. This warranty does not cover the cost of parts and/or labor required to perform normal/scheduled maintenance on your YANMAR engine. This warranty does not cover consumable parts such as, but not limited to, filters, belts, hoses, fuel injector nozzles, lubricants and cleaning fluids. This warranty does not cover the cost of shipping the product to or from the warranty repair facility.

YANMAR limited warranty - continued

Warranty Limitations:

The foregoing is YANMAR's only obligation to you and your exclusive remedy for breach of warranty. Failure to follow the requirements for submitting a claim under this warranty may result in a waiver of all claims for damages and other relief. **In no event shall YANMAR or any authorized industrial engine dealer or distributor be liable for incidental, special or consequential damages.** Such consequential damages may include, but not be limited to, loss of revenue, loan payments, cost of rental of substitute equipment, insurance coverage, storage, lodging, transportation, fuel, mileage, and telephone costs. The limitations in this warranty apply regardless of whether your claims are based on breach of contract, tort (including negligence and strict liability) or any other theory. Any action arising hereunder must be brought within one (1) year after the cause of action accrues or it shall be barred. Some states and countries do not allow certain limitations on warranties or for breach of warranties. **This warranty gives you specific legal rights, and you may also have other rights which vary from state to state and country to country.** Limitations set forth in this paragraph shall not apply to the extent that they are prohibited by law.

Warranty Modifications:

Except as modified in writing and signed by the parties, this warranty is and shall remain the complete and exclusive agreement between the parties with respect to warranties, superseding all prior agreements, written and oral, and all other communications between the parties relating to warranties. **No person or entity is authorized to give any other warranty or to assume any other obligation on behalf of YANMAR, either orally or in writing.**

Questions:

If you have any questions or concerns regarding this warranty, please call or write to the nearest authorized YANMAR industrial engine dealer or distributor or other authorized facility.

EMISSION SYSTEM WARRANTY

YANMAR CO., LTD. LIMITED EMISSION CONTROL SYSTEM WARRANTY - USA ONLY

Your Warranty Rights and Obligations:

■ California

The California Air Resources Board (CARB), the Environmental Protection Agency (EPA) and YANMAR Co., Ltd. hereafter referred to as YANMAR, are pleased to explain the **emission control system warranty** on your industrial compression-ignition engine. In California, model year 2000 or later off-road compression-ignition engines must be designed, built and equipped to meet the state's stringent anti-smog standards. In all states, 1998 and later non-road compression-ignition engines must be designed, built and equipped to meet the United States EPA emissions standards. YANMAR warrants the emission control system on your engine for the periods of time listed below provided there has been no abuse, neglect or improper maintenance of your engine.

Your emission control system may include parts such as the fuel injection system, Electronic Control Unit, Exhaust Gas Recirculation (EGR) system, after treatment system (DPF) and the air induction system. Also included may be hoses, belts, connectors and other emission-related assemblies.

Where a warrantable condition exists, YANMAR will repair your non-road compression-ignition engine at no charge to you including diagnosis, parts and labor.

Manufacturer's Warranty Period:

The model year 1998 or later certified and labeled non-road compression-ignition engines are warranted for the periods listed below. If any emission-related part on your engine is found to be defective during the applicable warranty period, the part will be replaced by YANMAR.

If your engine is certified as	And its maximum power is	And its rated speed is	Then its warranty period is
Variable speed or constant speed	kW < 19	Any speed	1,500 hours or two (2) years whichever comes first. In the absence of a device to measure the hours of use, the engine has a warranty period of two (2) years.
Constant speed	19 ≤ kW < 37	3,000 rpm or higher	1,500 hours or two (2) years whichever comes first. In the absence of a device to measure the hours of use, the engine has a warranty period of two (2) years.
Constant speed	19 ≤ kW < 37	Less than 3,000 rpm	3,000 hours or five (5) years whichever comes first. In the absence of a device to measure the hours of use, the engine has a warranty period of five (5) years.
Variable speed	19 ≤ kW < 37	Any speed	3,000 hours or five (5) years whichever comes first. In the absence of a device to measure the hours of use, the engine has a warranty period of five (5) years.
Variable speed or constant speed	kW ≥ 37	Any speed	3,000 hours or five (5) years whichever comes first. In the absence of a device to measure the hours of use, the engine has a warranty period of five (5) years.

Limited emission control system warranty - USA only - continued

Warranty Coverage:

This warranty is transferable to each subsequent purchaser for the duration of the warranty period. Repair or replacement of any warranted part will be performed at an authorized YANMAR industrial engine dealer or distributor.

Warranted parts not scheduled for replacement as required maintenance in the operation manual shall be warranted for the warranty period. Warranted parts scheduled for replacement as required maintenance in the operation manual are warranted for the period of time prior to the first scheduled replacement. Any part repaired or replaced under warranty shall be warranted for the remaining warranty period.

During the warranty period, YANMAR is liable for damages to other engine components caused by the failure of any warranted part during the warranty period.

Any replacement part which is functionally identical to the original equipment part in all respects may be used in the maintenance or repair of your engine, and shall not reduce YANMAR's warranty obligations. Add-on or modified parts that are not exempted may not be used. The use of any non-exempted add-on or modified parts shall be grounds for disallowing a warranty.

Warranted Parts:

This warranty covers engine components that are a part of the emission control system of the engine as delivered by YANMAR to the original retail purchaser. Such components may include the following:

- Fuel injection system
- Electronic control system
- Cold start enrichment system
- Intake manifold
- Turbocharger systems
- Exhaust manifold
- EGR system
- Positive crankcase ventilation system
- After treatment system (Diesel Particulate Filter)
- Hoses, belts, connectors and assemblies associated with emission control systems

Since emissions-related parts may vary slightly between models, certain models may not contain all of these parts and other models may contain the functional equivalents.

Limited emission control system warranty - USA only - continued

Exclusions:

Failures other than those arising from defects in material and/or workmanship are not covered by this warranty. The warranty does not extend to the following: malfunctions caused by abuse, misuse, improper adjustment, modification, alteration, tampering, disconnection, improper or inadequate maintenance or use of non-recommended fuels and lubricating oils; accident-caused damage, and replacement of expendable items made in connection with scheduled maintenance. YANMAR disclaims any responsibility for incidental or consequential damages such as loss of time, inconvenience, loss of use of equipment/engine or commercial loss.

Owner's Warranty Responsibilities:

As the engine owner, you are responsible for the performance of the required maintenance listed in your owner's manual. YANMAR recommends that you retain all documentation, including receipts, covering maintenance on your non-road compression-ignition engine, but YANMAR cannot deny warranty solely for the lack of receipts, or for your failure to ensure the performance of all scheduled maintenance.

YANMAR may deny your warranty coverage of your non-road compression-ignition engine if a part has failed due to abuse, neglect, improper maintenance or unapproved modifications.

Your engine is designed to operate on diesel fuel only. Use of any other fuel may result in your engine no longer operating in compliance with applicable emissions requirements.

You are responsible for initiating the warranty process. You must present your engine to a YANMAR dealer as soon as a problem exists. The warranty repairs should be completed by the dealer as expeditiously as possible. If you have any questions regarding your warranty rights and responsibilities, or would like information on the nearest YANMAR dealer or authorized service center, you should contact YANMAR America Corporation.

Website: www.yanmar.com
E-mail: CS_support@yanmar.com
Toll free telephone number: 1-800-872-2867, 1-855-416-7091

JOHN DEERE NEW OFF-HIGHWAY ENGINE WARRANTY

Warranty Duration

Unless otherwise provided in writing, John Deere* makes the following warranty to the first retail purchaser and each subsequent purchaser (if purchase is made prior to expiration of applicable warranty) of each John Deere new off-highway engine marketed as part of a product manufactured by a company other than John Deere or its affiliates and on each John Deere engine used in an off-highway repower application:

- 12 months, unlimited hours of use, or
- 24 months and prior to the accumulation of 2000 hours of use

Note: In the absence of a functional hour meter, hours of use will be determined on the basis of 12 hours of use per calendar day.

Warranty Coverage

This warranty applies to the engine and to integral components and accessories sold by John Deere, and delivered to the first retail purchaser on or after 1 May 2010.

All John Deere-warranted parts and components of John Deere engines which, as delivered to the purchaser, are defective in materials and/or workmanship will be repaired or replaced, as John Deere elects, without charge for parts or engine repair labor, including reasonable costs of labor to remove and reinstall non-engine parts or components of the equipment in which the engine is installed, and, when required, reasonable costs of labor for engine removal and reinstallation, if such defect appears within the warranty period as measured from the date of delivery to the first retail purchaser.

Emissions Warranty

Emissions warranties appear in the Operator's Manual, that is furnished with the engine/machine.

Obtaining Warranty Service

Warranty service is to be performed by a local John Deere engine service outlet before the expiration of the warranty. An authorized service outlet is a John Deere engine distributor, a John Deere engine service dealer, or a John Deere equipment dealer selling and servicing equipment with an engine of the type covered by this warranty. Authorized service outlets will use only new or remanufactured parts or components furnished or approved by John Deere.

Authorized service locations can be found by using the dealer locator on www.johndeere.com, or by calling 1-800-JDENGINE (800-533-6446).

At the time of requesting warranty service, the purchaser must be prepared to present evidence of the engine's delivery date.

John Deere reimburses authorized service outlets for limited travel expenses incurred in making warranty service repairs in non-John Deere applications when travel is actually performed. Contact your local authorized service dealer for current travel reimbursement limits. If distances and travel times are greater than reimbursed by John Deere, the service outlet will charge the purchaser for the difference.

Purchaser's Responsibilities

The cost of normal maintenance and depreciation.

Periodic cleaning of the Diesel Exhaust Filter.

Consequences of negligence, misuse, or accident involving the engine, or improper application, installation, or storage of the engine.

Consequences of service performed by someone other than a party authorized to perform warranty service, if such service, in John Deere's judgment, has adversely affected the performance or reliability of the engine.

Consequences of any modification or alteration of the engine not approved by John Deere, including, but not limited to, tampering with fuel and air delivery systems.

Consequences of fuels, lubricants or coolant that fails to meet the specifications and requirements listed in the Operator's Manual.

* "John Deere" means John Deere Power Systems with respect to users in the United States, John Deere Limited with respect to users in Canada, and Deere & Company or its subsidiary responsible for marketing John Deere equipment in other countries where the user is located.

The effects of cooling system neglect as manifested in cylinder liner or block cavitation (“pitting”, “erosion”, “electrolysis”).

Any premium for overtime labor requested by the purchaser.

Costs of transporting the engine or the equipment in which it is installed to and from the location at which the warranty service is performed, if such costs are in excess of the maximum amount payable to the service location were the warranty service performed at the engine's location.

Costs incurred in gaining access to the engine; i.e., overcoming physical barriers such as walls, fences, floors, decks or similar structures impeding access to the engine, rental of cranes or similar, or construction of ramps or lifts or protective structures for engine removal and reinstallation.

Incidental travel costs including meals, lodging, and similar.

Service outlet costs incurred in solving or attempting to solve non-warrantable problems.

Services performed by a party other than an authorized John Deere engine service dealer, unless required by law.

Charges by dealers for initial engine start-up and inspection, deemed unnecessary by John Deere when operation and maintenance instructions supplied with the engine are followed.

Costs of interpretation or translation services.

Periodic cleaning of the Diesel Exhaust Filter.

John Deere will not be responsible for the cost of Exhaust Filter or Diesel Particulate Filter (DPF) cleaning unless:

- The need for cleaning resulted from the failure of a part that is covered by the engine’s Standard Product Warranty or Extended Warranty, or
- The engine is located in California and the need for cleaning was caused by a failure covered under applicable CARB emissions regulations.

No Representations or Implied Warranty

Where permitted by law, neither John Deere nor any company affiliated with it makes any guaranties, warranties, conditions, representations or promises, express or implied, oral or written, as to the nonoccurrence of any defect or the quality or performance of its engines other than those set forth herein, and DOES NOT MAKE ANY IMPLIED WARRANTY OR CONDITIONS OF MERCHANTABILITY OR FITNESS otherwise provided for in the Uniform Commercial Code or required by any Sale of Goods Act or any other statute. This exclusion includes fundamental terms. In no event will a John Deere engine distributor or engine service dealer, John Deere equipment dealer, John Deere or any company affiliated with John Deere be liable for incidental or consequential damages or injuries including, but not limited to, loss of profits, loss of crops, rental of substitute equipment or other commercial loss, damage to the equipment in which the engine is installed or for damage suffered by purchaser as a result of fundamental breaches of contract or breach of fundamental terms, unless such damages or injuries are caused by the gross negligence or intentional acts of the foregoing parties.

Remedy Limitation

The remedies set forth in this warranty are the purchaser’s exclusive remedies in connection with the performance of, or any breach of guaranty, condition, or warranty in respect of new John Deere engines. In the event the above warranty fails to correct purchaser’s performance problems caused by defects in workmanship and/or materials, purchaser’s exclusive remedy shall be limited to payment by John Deere of actual damages in an amount not to exceed the cost of the engine.

No Seller's Warranty

No person or entity, other than John Deere, who sells the engine or product in which the engine has been installed makes any guaranty or warranty of its own on any engine warranted by John Deere unless it delivers to the purchaser a separate written guaranty certificate specifically guaranteeing the engine, in which case John Deere shall have no obligation to the purchaser. Neither original equipment manufacturers, engine or equipment distributors, engine or equipment dealers, nor any other person or entity, has any authority to make any representation or promise on behalf of John Deere or to modify the terms or limitations of this warranty in any way.

Additional Information

For additional information concerning the John Deere New Off-Highway Engine Warranty, see the Operator’s Manual

CONTROLS INCORPORATED

Common SPN.FMI Codes

SPN	FMI	TEXT TRANSLATION
28	3	% Accelerator Position #3 (Throttle 2) Voltage Above Normal or Shorted to High Source H
28	4	Percent Accelerator Position #3 (Throttle 2) Voltage Below Normal or Shorted to Low Source
29	3	Percent Accelerator Position #2 (Throttle 1) Voltage Above Normal or Shorted to High Source
29	4	Percent Accelerator Position #2 (Throttle 1) Voltage Below Normal or Shorted to Low Source
91	3	Accelerator Pedal Position (Multi-State Throttle) Voltage Above Normal, or Shorted to High Source
91	4	Accelerator Pedal Position (Multi-State Throttle) Voltage Below Normal or Shorted to Low Source
91	9	Accelerator Pedal Position A valid throttle message is not being received or is late
91	14	Accelerator Pedal Position Throttle signal voltage is or has been out of range
94	1	Fuel Delivery Pressure Pressure Very low
94	3	Fuel Delivery Pressure Fuel Rail Pressure Voltage out of range high
94	4	Fuel Delivery Pressure Fuel Rail Pressure Voltage out of range low
94	10	Fuel Delivery Pressure Pressure dropping too fast
94	13	Fuel Delivery Pressure Out of calibration
94	16	Fuel Delivery Pressure High fuel pressure
94	17	Fuel Delivery Pressure No rail fuel pressure
94	18	Fuel Delivery Pressure Low fuel pressure
97	0	Water In Fuel Indicator Water In Fuel Detected
97	3	Water In Fuel Indicator Water In Fuel Voltage out of range high
97	4	Water In Fuel Indicator Water In Fuel Voltage out of range low
97	16	Water In Fuel Indicator Water In Fuel Detected
97	31	Water In Fuel Indicator Water In Fuel Detected
100	1	Engine Oil Pressure Low oil pressure
100	3	Engine Oil Pressure Voltage Above Normal or Shorted to High Source
100	4	Engine Oil Pressure Voltage Below Normal or Shorted to Low Source
100	16	Engine Oil Pressure Oil pressure reading incorrect
100	18	Engine Oil Pressure Low oil pressure
105	0	Intake Manifold 1 Temperature High manifold air temperature
105	3	Intake Manifold 1 Temperature Voltage Above Normal or Shorted to High Source
105	4	Intake Manifold 1 Temperature Voltage Below Normal or Shorted to Low Source
105	16	Intake Manifold 1 Temperature High manifold air temperature
107	0	Air Filter Differential Pressure Plugged air filter condition detected
107	31	Air Filter Differential Pressure Plugged air filter condition detected
110	0	Engine Coolant Temperature High coolant temperature
110	3	Engine Coolant Temperature Voltage Above Normal or Shorted to High Source
110	4	Engine Coolant Temperature Voltage Below Normal or Shorted to Low Source
110	15	Engine Coolant Temperature High coolant temperature
110	16	Engine Coolant Temperature High coolant temperature
111	1	Coolant Level Low coolant level
158	2	Keyswitch Intermittent
158	17	Keyswitch Circuit problem
174	0	Fuel Temperature High fuel temperature
174	3	Fuel Temperature Voltage Above Normal or Shorted to High Source
174	4	Fuel Temperature Voltage Below Normal or Shorted to Low Source
174	15	Fuel Temperature High fuel temperature
174	16	Fuel Temperature High fuel temperature
174	31	Fuel Temperature Voltage out of range
189	31	Rated Engine Speed Speed Derate Condition Exists due to fault
190	0	Engine Speed Engine overspeed
190	2	Engine Speed Data Erratic, Intermittent or Incorrect
190	3	Engine Speed Voltage Above Normal or Shorted to High Source
190	4	Engine Speed Voltage Below Normal or Shorted to Low Source
190	5	Engine Speed Circuit is open
190	16	Engine Speed Engine overspeed

SPN - Suspect Parameter Number
FMI - Failure Mode Identifier

SPN	FMI	TEXT TRANSLATION
611	3	Injector Wiring Shorted to battery
611	4	Injector Wiring Shorted to ground
620	3	Sensor Supply Voltage 1 (+5V DC) Voltage Above Normal or Shorted to High Source
620	4	Sensor Supply Voltage 1 (+5V DC) Voltage Below Normal or Shorted to Low Source
627	1	Power Supply Low voltage to injectors
627	4	Power Supply Power interruption
629	13	Reprogram Controller ECU problem
629	19	ECU to Pump Communications Error ECU not receiving messages from Pump
632	2	Fuel Shutoff Valve Fuel Shutoff Error Detected
632	5	Fuel Shutoff Valve Fuel Shutoff Non-Functional
632	11	Fuel Shutoff Valve Fuel Shutoff Solenoid circuit is open or shorted
636	2	Engine Position Sensor Timing signal error
636	8	Engine Position Sensor Timing signal error
636	10	Engine Position Sensor Timing signal error
637	2	Timing (Crank) Sensor Timing signal error
637	7	Timing (Crank) Sensor Timing signal error
637	8	Timing (Crank) Sensor Timing signal error
637	10	Timing (Crank) Sensor Timing signal error
639	13	CAN Bus The CAN bus failure
651	5	Injector Cylinder #1 The current to the injector is less than expected
651	6	Injector Cylinder #1 The current to the injector increases too rapidly
651	7	Injector Cylinder #1 The injector fuel flow is lower than expected
652	5	Injector Cylinder #2 The current to the injector is less than expected
652	6	Injector Cylinder #2 The current to the injector increases too rapidly
652	7	Injector Cylinder #2 The injector fuel flow is lower than expected
653	5	Injector Cylinder #3 The current to the injector is less than expected
653	6	Injector Cylinder #3 The current to the injector increases too rapidly
653	7	Injector Cylinder #3 The injector fuel flow is lower than expected
654	5	Injector Cylinder #4 The current to the injector is less than expected
654	6	Injector Cylinder #4 The current to the injector increases too rapidly
654	7	Injector Cylinder #4 The injector fuel flow is lower than expected
655	5	Injector Cylinder #5 The current to the injector is less than expected
655	6	Injector Cylinder #5 The current to the injector increases too rapidly
655	7	Injector Cylinder #5 The injector fuel flow is lower than expected
656	5	Injector Cylinder #6 The current to the injector is less than expected
656	6	Injector Cylinder #6 The current to the injector increases too rapidly
656	7	Injector Cylinder #6 The injector fuel flow is lower than expected
729	3	Inlet Air Heater Driver #1 Inlet air heater stuck on
729	5	Inlet Air Heater Driver #1 Inlet air heater will not turn on
833	2	Rack Position Sensor Error
833	3	Rack Position Sensor Rack Position Voltage above normal
833	4	Rack Position Sensor Rack Position Voltage below normal
834	2	Rack Actuator Rack Error
834	3	Rack Actuator Rack Actuator Circuit voltage above normal
834	5	Rack Actuator Rack Actuator Circuit open
834	6	Rack Actuator Rack Actuator Circuit grounded
834	7	Rack Actuator Rack Position Error
970	2	Auxiliary Engine Shutdown Switch External Engine Shutdown Switch intermittent
970	11	External Engine Protection Shutdown External Engine Protection Shutdown active
970	31	Auxiliary Engine Shutdown Switch External Engine Protection Shutdown active
971	31	Engine Derate Switch External Derate input has been activated
1041	2	Start Signal Indicator Start Signal Missing
1041	3	Start Signal Indicator Start Signal Always Active

SPN	FMI	TEXT TRANSLATION
1076	0	Fuel Injection Pump Fuel Control Value Error
1076	1	Fuel Injection Pump Fuel Control Value Error
1076	2	Fuel Injection Pump Fuel Control Valve Error
1076	3	Fuel Injection Pump Fuel Control Valve Error
1076	5	Fuel Injection Pump Fuel Control Valve Error
1076	6	Fuel Injection Pump Fuel Control Valve Error
1076	7	Fuel Injection Pump Fuel Control Valve Error
1076	10	Fuel Injection Pump Fuel Control Valve Error
1076	13	Fuel Injection Pump Fuel Control Valve Error
1077	7	Fuel Injection Pump Controller
1077	11	Fuel Injection Pump Controller
1077	12	Fuel Injection Pump Controller
1077	19	Fuel Injection Pump Controller
1077	31	Fuel Injection Pump Controller Power derated
1078	7	Fuel Injection Pump Speed/Position Sensor Error
1078	11	Fuel Injection Pump Speed/Position Sensor Error
1078	31	Fuel Injection Pump Speed/Position Sensor VP44 Unable to Achieve Desired Timing
1079	3	Sensor Supply Voltage 1 (+5V DC) Voltage Above Normal or Shorted to High Source
1079	4	Sensor Supply Voltage 1 (+5V DC) Voltage Below Normal or Shorted to Low Source
1080	3	Sensor Supply Voltage 2 (+5V DC) Voltage Above Normal or Shorted to High Source
1080	4	Sensor Supply Voltage 2 (+5V DC) Voltage Below Normal or Shorted to Low Source
1109	31	Engine Protection System Approaching Shutdown Approaching Shutdown
1110	31	Engine Protection System Engine has been shutdown
1347	5	Fuel Pump Assembly #1 The circuit is open, shorted to ground, or overloaded
1347	7	Fuel Pump Assembly #1 Rail pressure control mismatch
1347	10	Fuel Pump Assembly #1 Low fuel flow
1348	5	Fuel Pump Assembly #2 The circuit is open, shorted to ground, or overloaded
1348	10	Fuel Pump Assembly #2 Low fuel flow
1485	2	ECU Main Relay Pump power relay fault
1569	31	Engine Protection Torque Derate Fuel derate limit condition exists
2000	6	Fuel Injection Pump Fuel Control Valve Error
2000	13	Security Violation The proper controller has not been installed

SPN - Suspect Parameter Number
FMI - Failure Mode Identifier

2G-ECO Governor Controller DTC Table

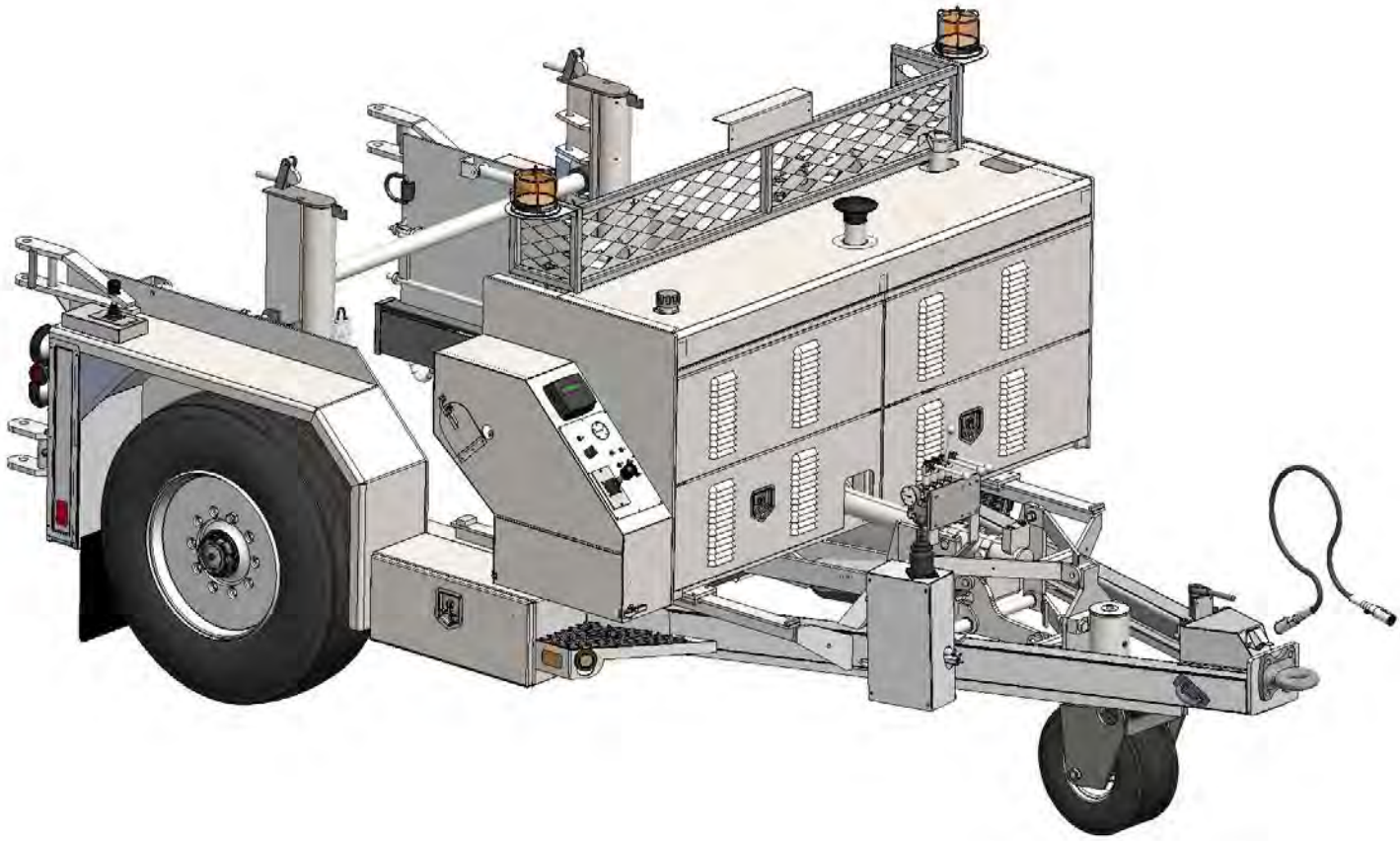
Ver. 3.8.1 2007/5/18

Remark	DTC J1939 Format SPN (Hex)	SPN (DEC)	FMI	Description	J1939 Lamp Status MIL	RSL	AWL	PL
	4BA	1210	4	Engine Fuel Rack Position Sensor : Shorted to low source			X	
			3	Engine Fuel Rack Position Sensor : Shorted to high source		X (Engine drive)	X (E-ECU start)	
	5B	91	4	Accelerator Pedal Position Sensor "A" : Shorted to low source			X	
			3	Accelerator Pedal Position Sensor "A" : Shorted to high source			X	
			2	Accelerator Pedal Position Sensor "A" : Intermittent fault				
			1	Accelerator Pedal Position Sensor "A" : Below normal operational range (SAE J1843)			X	
			0	Accelerator Pedal Position Sensor "A" : Above normal operational range (SAE J1843)			X	
			15	Accelerator Pedal Position Sensor "A" : Not available (SAE J1843)			X	
	1D	29	4	Accelerator Pedal Position Sensor "B" : Shorted to low source			X	
			3	Accelerator Pedal Position Sensor "B" : Shorted to high source			X	
			2	Accelerator Pedal Position Sensor "B" : Intermittent fault				
			1	Accelerator Pedal Position Sensor "B" : Below normal operational range (SAE J1843)			X	
			0	Accelerator Pedal Position Sensor "B" : Above normal operational range (SAE J1843)			X	
			8	Accelerator Pedal Position Sensor "B" : Communication fault			X	
			15	Accelerator Pedal Position Sensor "B" : Not available (SAE J1843)			X	
	6C	108	4	Barometric Pressure Sensor : Shorted to low source	X			
			3	Barometric Pressure Sensor : Shorted to high source	X			
			2	Barometric Pressure Sensor : Intermittent fault				
	470	1136	4	E-ECU Internal Temperature Sensor : Shorted to low source			X	
			3	E-ECU Internal Temperature Sensor : Shorted to high source			X	
			2	E-ECU Internal Temperature Sensor : Intermittent fault				
			0	E-ECU Internal Temperature : Too High				X
	6E	110	4	Engine Coolant Temperature Sensor : Shorted to low source			X	
			3	Engine Coolant Temperature Sensor : Shorted to high source			X	
			2	Engine Coolant Temperature Sensor : Intermittent fault				
			0	Engine Coolant Temperature : Too High				X
	437	1079	4	Sensor 5V : Shorted to low source			X	
			3	Sensor 5V : Shorted to high source (FUEL INJ PUMP SPEED SENSOR)				X
			2	Sensor 5V : Intermittent fault				
	9E	158	1	System Voltage : Too Low				X
			0	System Voltage : Too High				X
	436	1078	4	Engine Fuel Injection Pump Speed Sensor : Shorted to low source		X (Both)	X (Ether)	
*	7F8A2	522402	4	Auxiliary Speed Sensor : Shorted to low source				
*	7F801	522241	4	Engine Fuel Rack Actuator Relay : Circuit fault A		X		
			3	Engine Fuel Rack Actuator Relay : Circuit fault B		X		
			7	(Reserved)				
			2	Engine Fuel Rack Actuator Relay : Intermittent fault				
*	7F803	522243	4	Air Heater Relay : Circuit fault A	X			
			3	Air Heater Relay : Circuit fault B	X			
			2	Air Heater Relay : Intermittent fault				
*	7F802	522242	4	Cold Start Device : Circuit fault A	X			
			3	Cold Start Device : Circuit fault B	X			
			2	Cold Start Device : Intermittent fault				
*	7F80B	522251	4	EGR Stepping Motor "A" : Circuit fault A	X			
			3	EGR Stepping Motor "A" : Circuit fault B	X			
*	7F80C	522252	4	EGR Stepping Motor "B" : Circuit fault A	X			
			3	EGR Stepping Motor "B" : Circuit fault B	X			
*	7F80D	522253	4	EGR Stepping Motor "C" : Circuit fault A	X			
			3	EGR Stepping Motor "C" : Circuit fault B	X			
*	7F80E	522254	4	EGR Stepping Motor "D" : Circuit fault A	X			
			3	EGR Stepping Motor "D" : Circuit fault B	X			
	64	100	4	Oil Pressure Switch : Shorted to low source			X	
			1	Oil Pressure : Too Low				X
	A7	167	4	Battery Charge Switch : Shorted to low source			X	
			1	Charge warning				X
*	7F84A	522314	0	Engine Coolant Temperature : Abnormal temperature				X
*	7F853	522323	0	Air Cleaner : Mechanical Malfunction				X
*	7F859	522329	0	Oily Water Separator : Mechanical Malfunction				X
	BE	190	0	Engine speed : Over speed Condition		X		
	27E	638	4	Engine Fuel Rack Actuator : Shorted to low source		X		
			3	Engine Fuel Rack Actuator : Shorted to high source		X		
			7	Engine Fuel Rack Actuator : Mechanical Malfunction		X		
			2	Engine : Malfunction		X		
	27F	639	12	High Speed CAN Communication : Communication fault			X	
	276	630	2	E-ECU internal fault : EEPROM Check Sum Error (Data Set 2)		X		
			12	E-ECU internal fault : EEPROM ReadWrite fault			X	
	274	628	12	E-ECU internal fault : FlashROM Check Sum Error (Main Software)		X		
			2	E-ECU internal fault : FlashROM Check Sum Error (Data Set 1)		X		
			2	E-ECU internal fault : FlashROM Check Sum Error (Data Set 2)		X		
	5CD	1485	4	E-ECU Main Relay : Shorted to low source			X	
*	7F9E7	522727	12	E-ECU internal fault : Sub-CPU Error A			X	
			12	E-ECU internal fault : Sub-CPU Error B			X	
			12	E-ECU internal fault : Sub-CPU Error C			X	
*	7F9E8	522728	12	E-ECU internal fault : Engine Map Data Version Error		X		
*	**7F9EA**	**522730**	**12**	**Immobilizer : CAN Communication fault**			X	
			8	**Immobilizer : Pulse Communication fault**			X	
	4B2	**1202**	**2**	**Immobilizer : System fault**			X	

Remark : Yanmar original DTC

HP 6500

Parts Manual



HOGG & DAVIS, Inc.

The information, specifications, and illustrations in this manual are on the basis of information available at the time it was written. The specifications, torque values, pressures of operation, measurements, adjustments, illustrations, and other items can change at any time. These changes can affect the service of the given product.

For the complete and most current information, contact:

Hogg & Davis, Inc
P.O. Box 405 / 3800 Eagle Loop
Odell, OR 97044-0405
541-354-1001
541-354-1080 Fax
www.hoggdavis.com

"Rugged Dependability."

v 1.0

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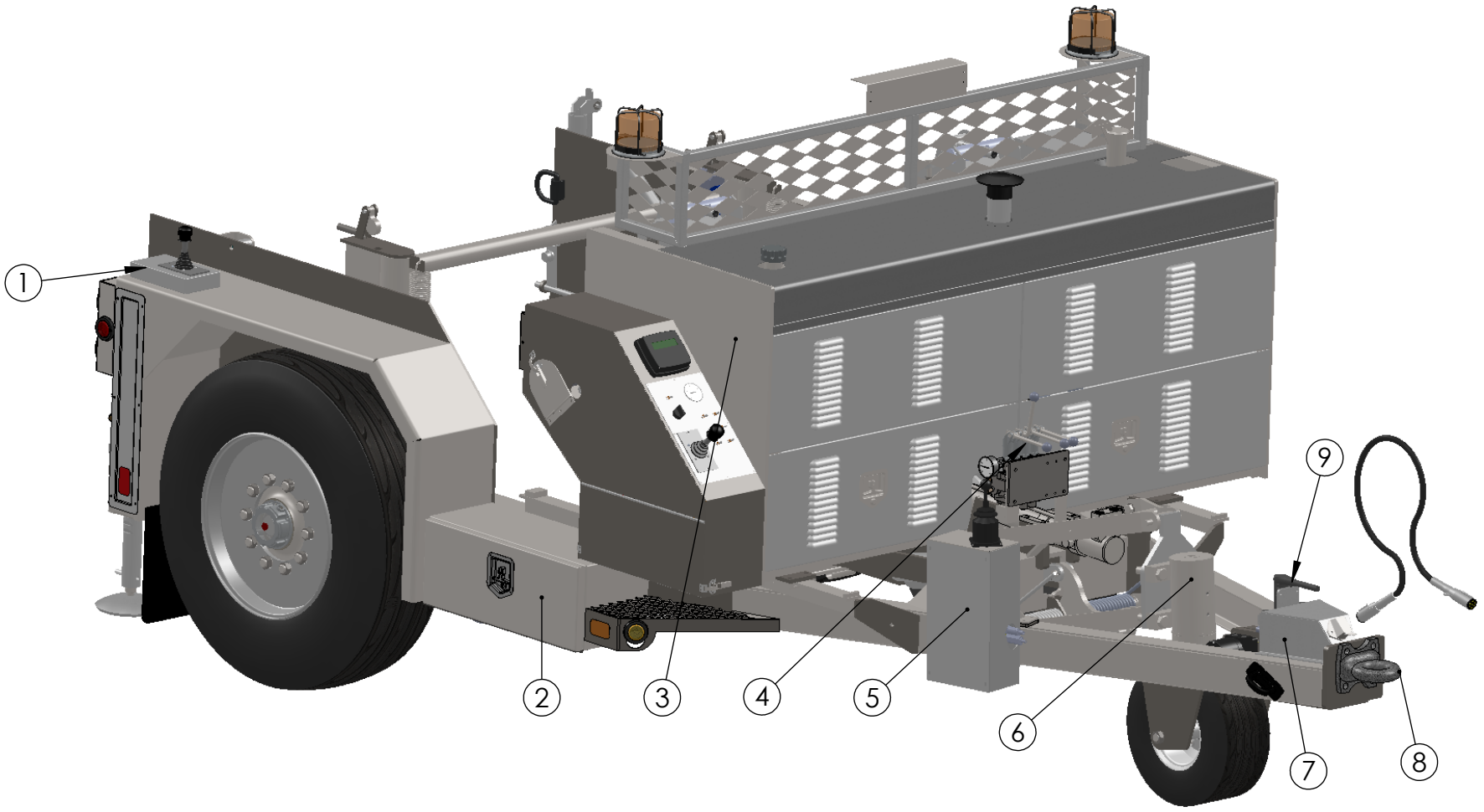
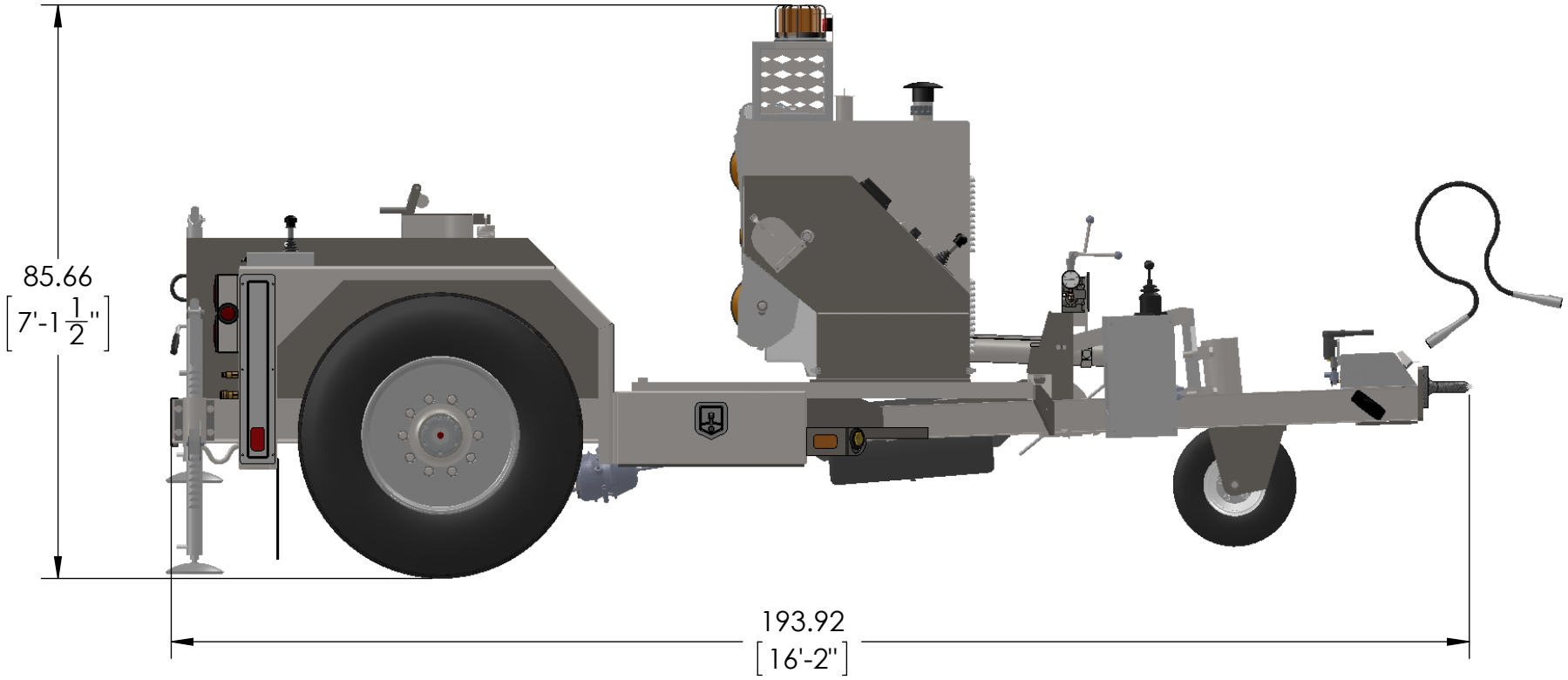


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	Rear controls	See Rear Controls Sheet	1
2	D05150	Toolbox Door	2
3	Power Unit	See Power Unit Sheet	1
4	Valve Bank	See Prince Valve Bank Sheet	1
5	HPPS2	See Steer-Go Controls Sheet	1
6	HPPS1	See Steer-Go Assembly Sheet	1
7	HPEC7	See Electrical Hood Sheet	1
8	E04017	Eye, Pintle	1
9	HPBA	See Air Brake Assembly Sheet	1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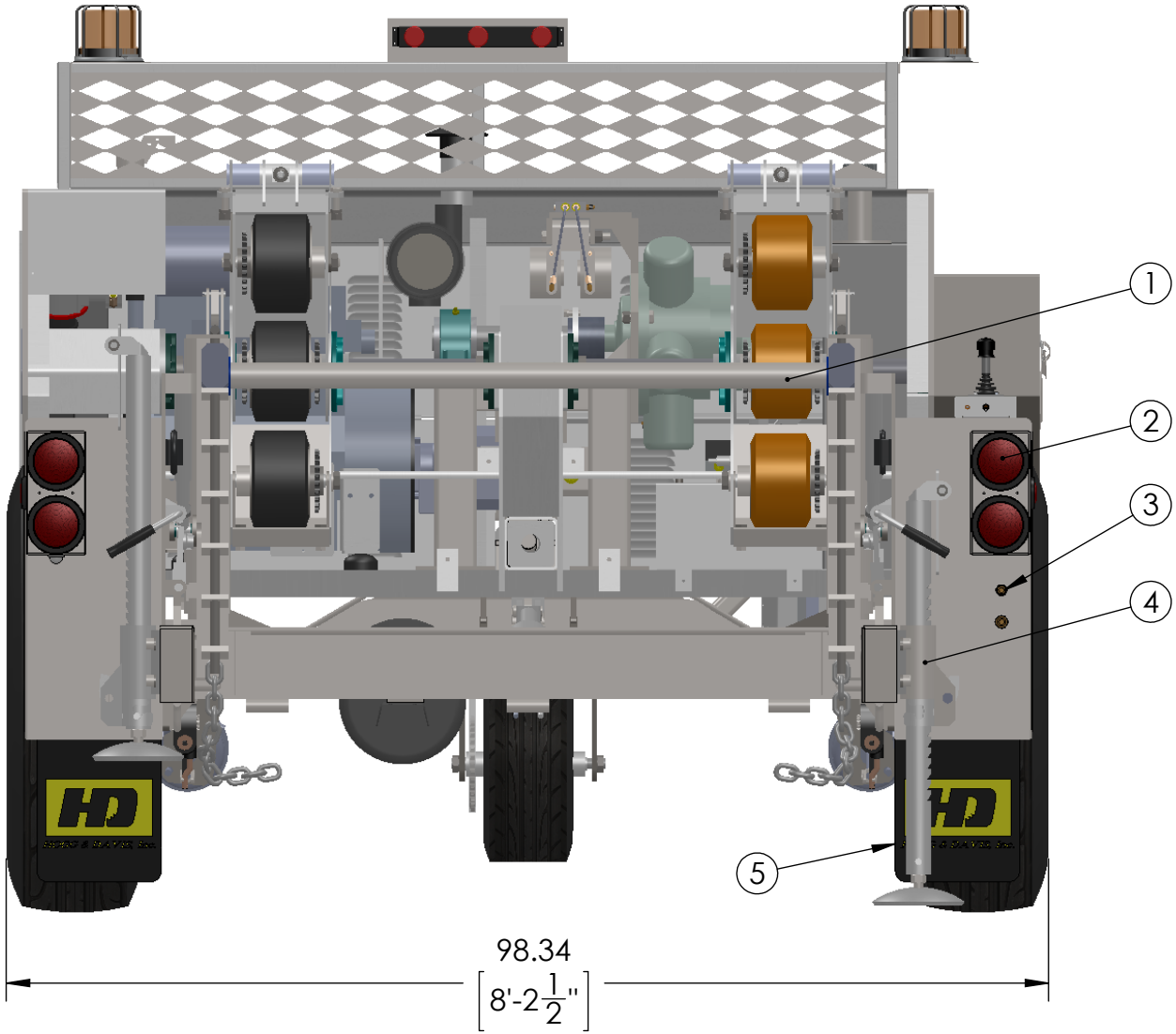
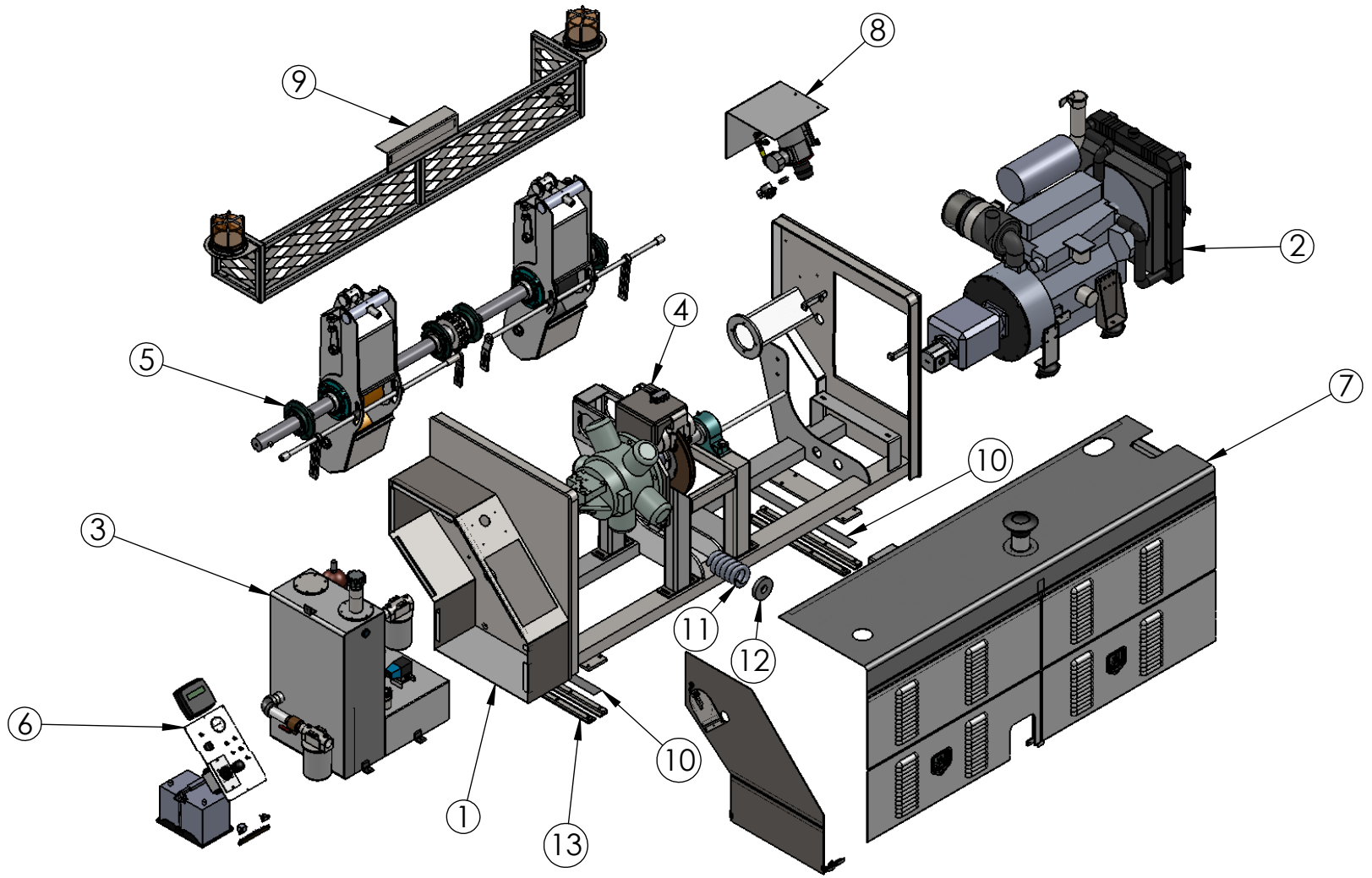
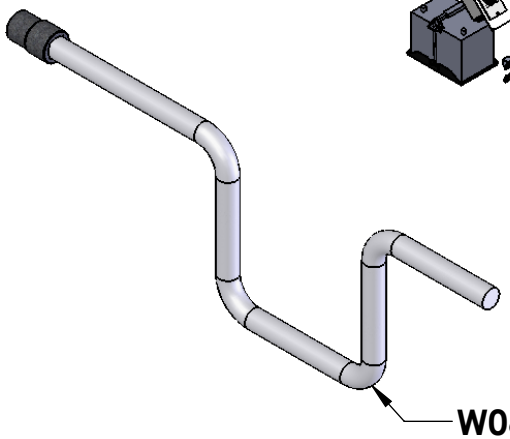


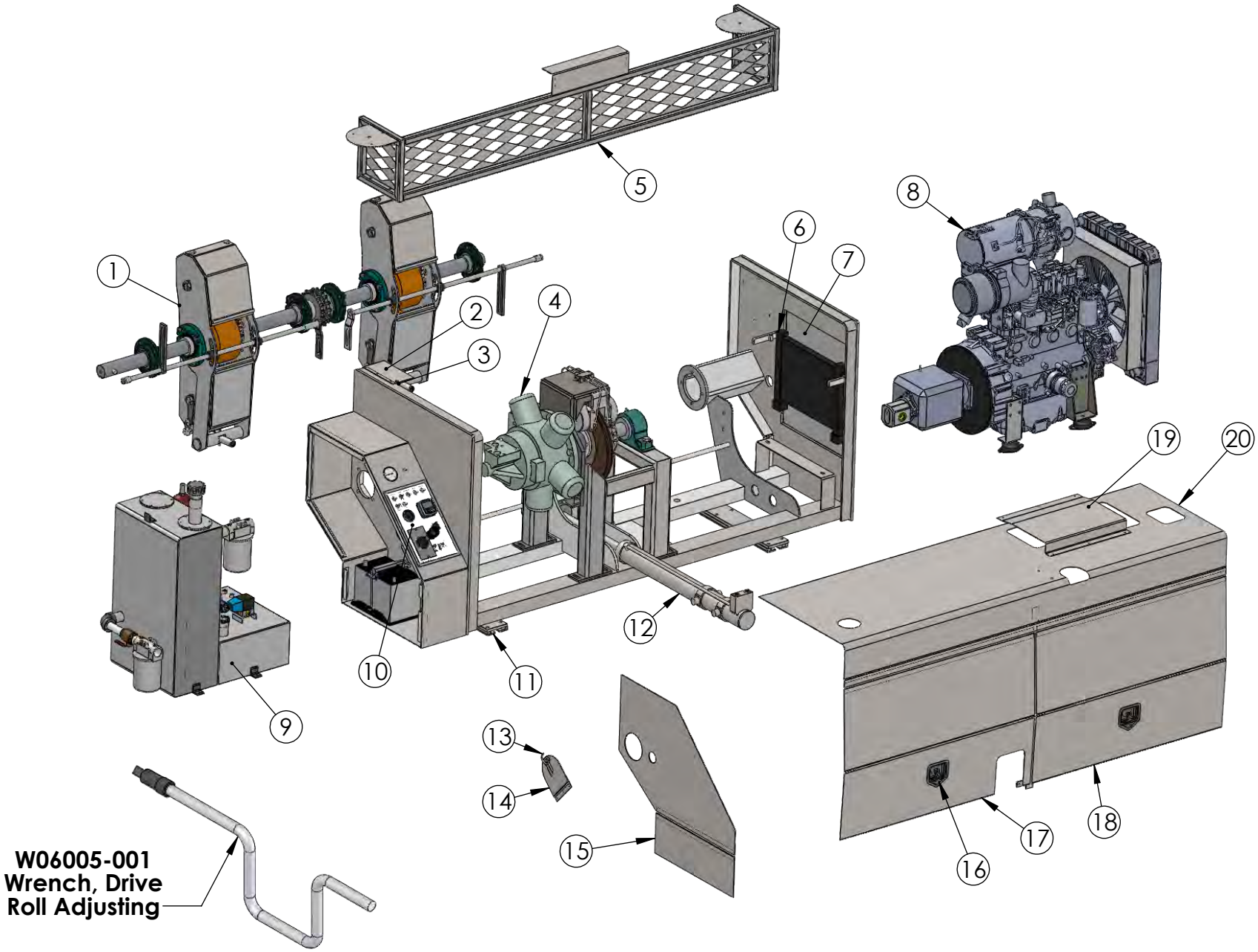
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	Mandrel Racks	See Mandrel Rack Sheet	1
2	Trailer Lighting	See Lighting Sheets	1
3	Quick connectors	See Quick Connector Sheet	1
4	Manual jackstands	See Jackstand Sheet	1
5	f10010	Mud Flap	2





W06005
Wrench, Drive Roll Adjust

ITEM	PART NUMBER	DESCRIPTION	QTY.
1	C41039	HP 6500 PU CHASSIS	1
2	Engine	see Engine Page	1
3	Tanks	see Tank Page	1
4	Staffa	see Staffa Page	1
5	Drive Assembly	see Drive Page	1
6	Front controls E	see Controls page	1
7	Hood and doors	see Sheetmetal page	1
8	HPBAC	see HPBAC page	1
9	HPHVG	see HPHVG page	1
10	T19020-6500	6500 UHMW	2
11	S28048	Spring, Power Unit	1
12	F06005	Flange, PowerUnit Spring	1
13	Slide Assembly	see Slide Page	1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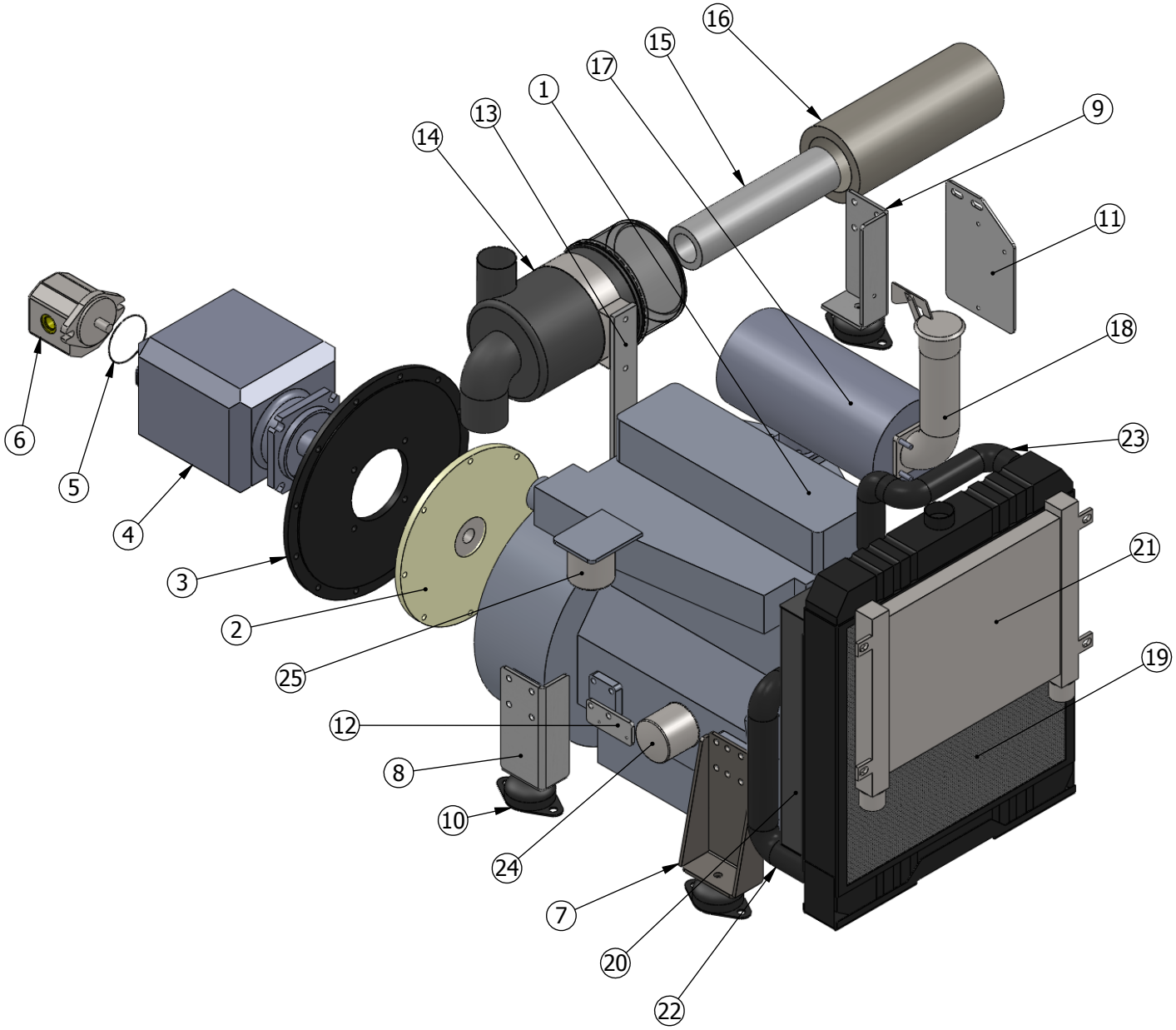
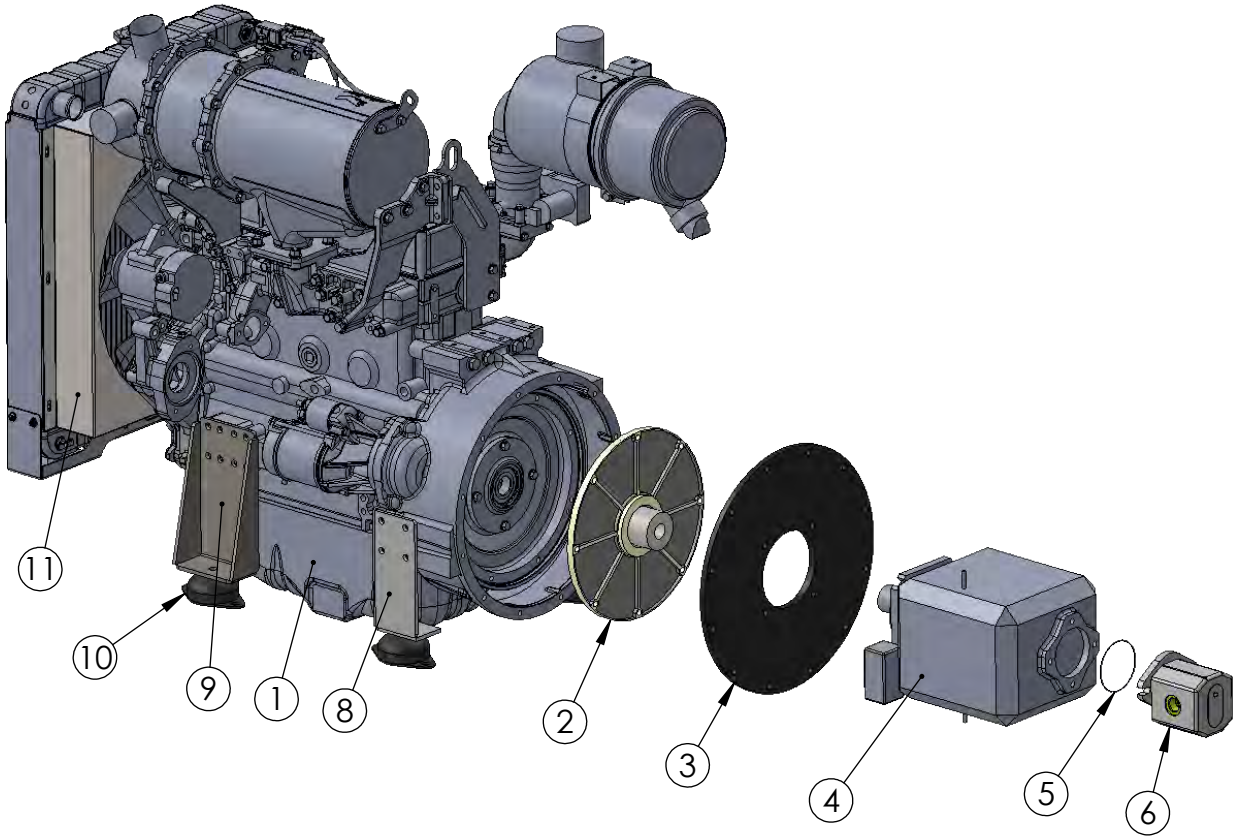
W06005-001
Wrench, Drive
Roll Adjusting

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	Drive Assembly T4f	See Drive Sheet	1
2	C29301	Cover, Air Compressor 6500T4f	1
3	HPBAC T4f	Extreme Air Compressor	1
4	Staffa	See Staffa Sheet	1
5	S08001	Screen, HP6500 Power Unit	1
6	C35010	Cooler, Oil	1
7	C29201	Cover, Radiator	1
8	Engine T4f	See Engine Sheet	1
9	Tanks	See Tank Sheet	1
10	Front Controls T4	See Controls Sheet	1
11	Slide Assembly	See Slide Sheet	1
12	C32050	Cylinder, PowerUnit	1
13	L01020	Latch, Over center	1
14	C29083	Cover, Driveshaft Capstan	1
15	C29053	Cover, Control Panel Side	1
16	L08025	Lock, T-Handle	2
17	D05170	Door, Engine Cover Curbside	1
18	D05171	Door, Engine Cover Streetside	1
19	C29170	Cover, Exhaust	1
20	H05008	Hood, Power Unit	1



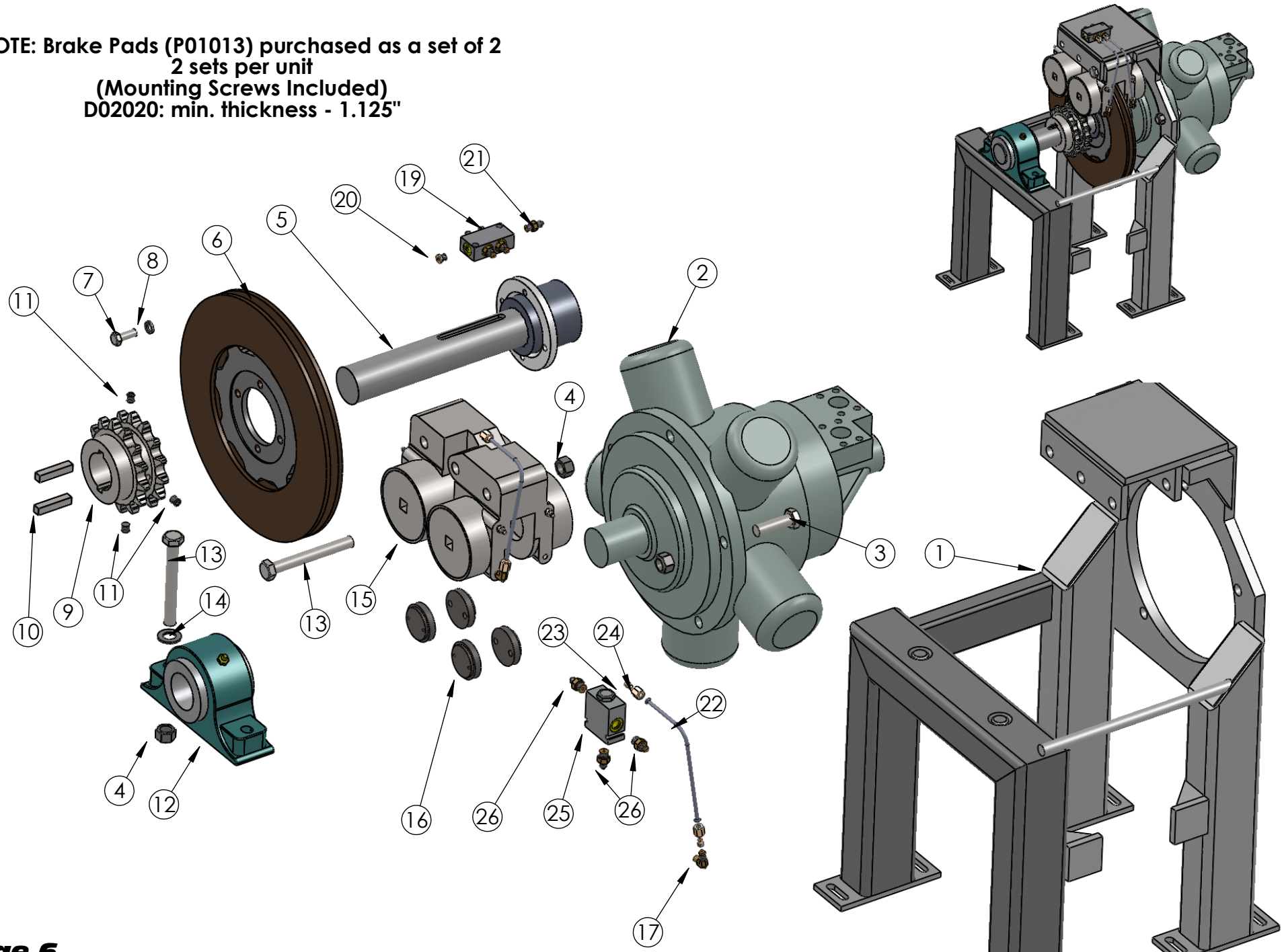
ITEM	PART NUMBER	DESCRIPTION	QTY.
1	E02021	4TNV98-ZDSNA	1
2	C28002	Coupler, Pump Adaptor	1
3	P09001	Pump mount plate	1
4	P20005	75cc Series 90 Pump	1
5	O01111	O-ring Small Gear Pump	1
6	P20103	Pump, 10gpm	1
7	M09005	Mount, Engine Front	2
8	M09004	Mount, Engine Right Rear	1
9	M09006	Mount, Engine Left Rear	1
10	I04000	Isolator, Engine	4
11	M09035	Mount, ECU	1
12	M09018	Mount, Fuel Pump	1
13	B15115	Bracket, Air Cleaner	1
14	E02021-2	Air Cleaner Assembly	1
15	E02021-4	Inner Air Filter	1
16	E02021-5	Outter Air Filter	1
17	E02021-1	Exhaust	1
18	P07402	6500 4TNV Exhaust	1
19	E02021-3	Radiator	1
20	R16020	Radiator Shroud	1
21	C35010	Cooler, Oil	1
22	E02021-8	Lower Radiator Hose	1
23	E02021-9	Upper Radiator Hose	1
24	E02021-6	Oil Filter	1
25	E02021-7	Fuel Filter	1



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	E02037	Yanmar 4TNV98C-NYEM	1
2	C28002	Coupler, Pump Adaptor	1
3	P09001	Pump mount plate	1
4	P20005	75cc Series 90 Pump	1
5	O01111	O-ring Small Gear Pump	1
6	P20103	Pump, 10gpm	1
7	M09004	Mount, Engine Right Rear	1
8	M09006	Mount, Engine Left Rear	1
9	M09005	Mount, Engine Front	2
10	I04000	Isolator, Engine	4
11	S16021	Shroud, Fan	1

Engine Assembly T4f

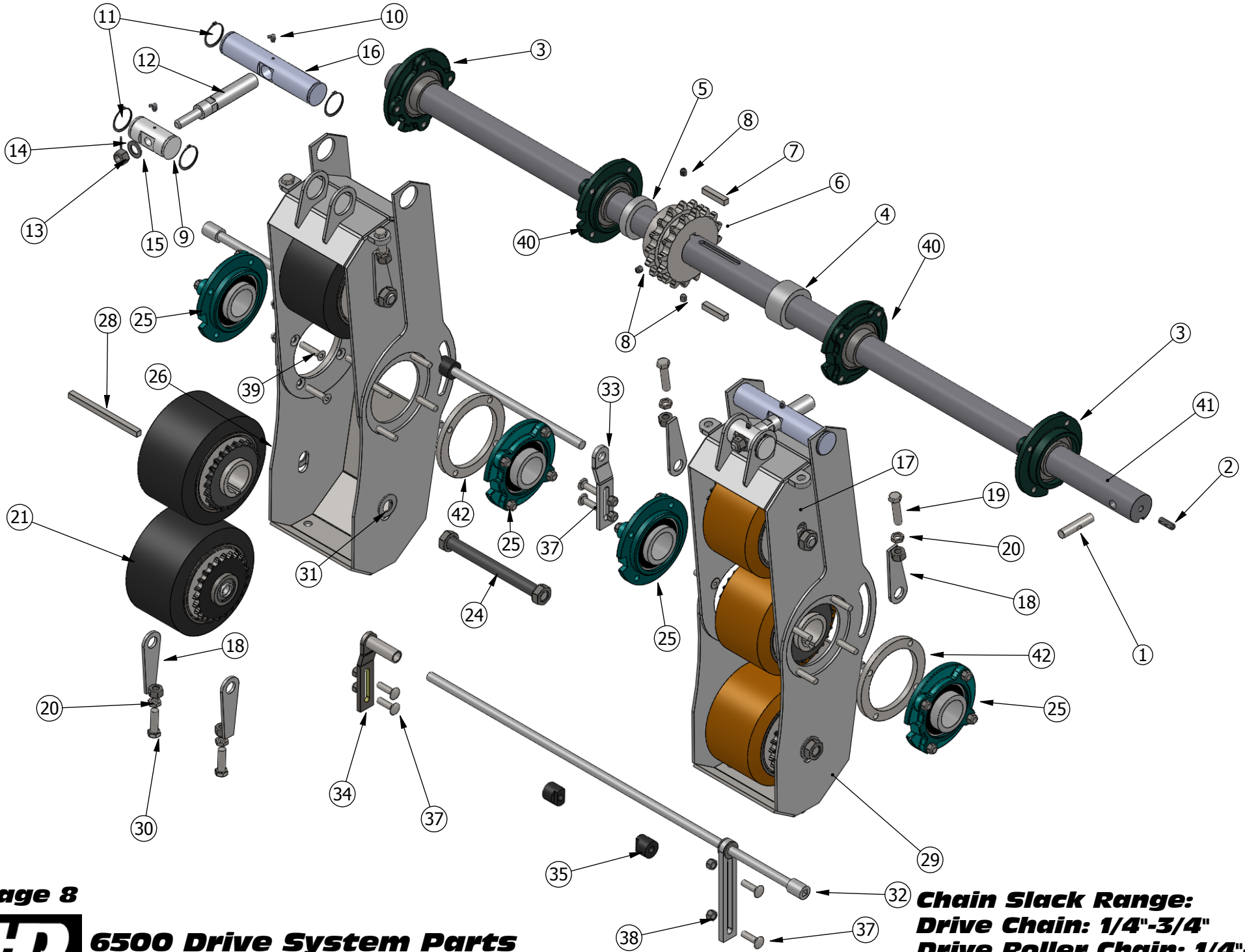
NOTE: Brake Pads (P01013) purchased as a set of 2
2 sets per unit
(Mounting Screws Included)
D02020: min. thickness - 1.125"



Staffa Motor Assembly

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	F09001	Frame, Staffa mount	1
2	M08001	Motor, Drive Staffa	1
3	B11490	Bolt, Hx Head 3/4"-16 x 3" Z8	5
4	N04586	Nut, Hx Nylock® 3/4"-16	10
5	S43003	Shaft, Drive 6500	1
6	D02020	Disc, Vented Brake	1
7	B11363	Bolt, Hx Head 1/2"-13 x 1-1/4"	4
8	W01565	Washer, Split Lock 1/2"zinc	4
9	S29006	Sprocket D100B14	1
10	K01010	Key, 1/2 x 1/2 x 2-1/2	2
11	S04261	Screw, Set 1/2"-13 x 1/2" CP	3
12	B07275	Bearing, 2-7/16 Pillow Block	1
13	B11007	Bolt, Hx Head 3/4"-16 x 6" Z8	5
14	W01285	Washer, Flat SAE 3/4"zinc	2
15	C04024	Caliper, Fail Safe	2
16	P01013	Pad, Brake	4
17	F05183	Fitting, -4 JIC to 1/8 NPT	4
18	B18000	Bleader, 1/8 NPT	4
19	M04050	Manifold, Distribution	1
20	F05377	Bleader, 1/8 NPT	1
21	F05042	Fitting, 4-4 Str SAE	5
22	T14090-6500	Tube, Brake 6500 Fail-Safe	4
23	F05113	Fitting, Sleeve -4	8
24	F05300	Fitting, -4 nut	8
25	S45005	Valve, Shuttle	1
26	F05754	Fitting, 4-6 Str SAE	3

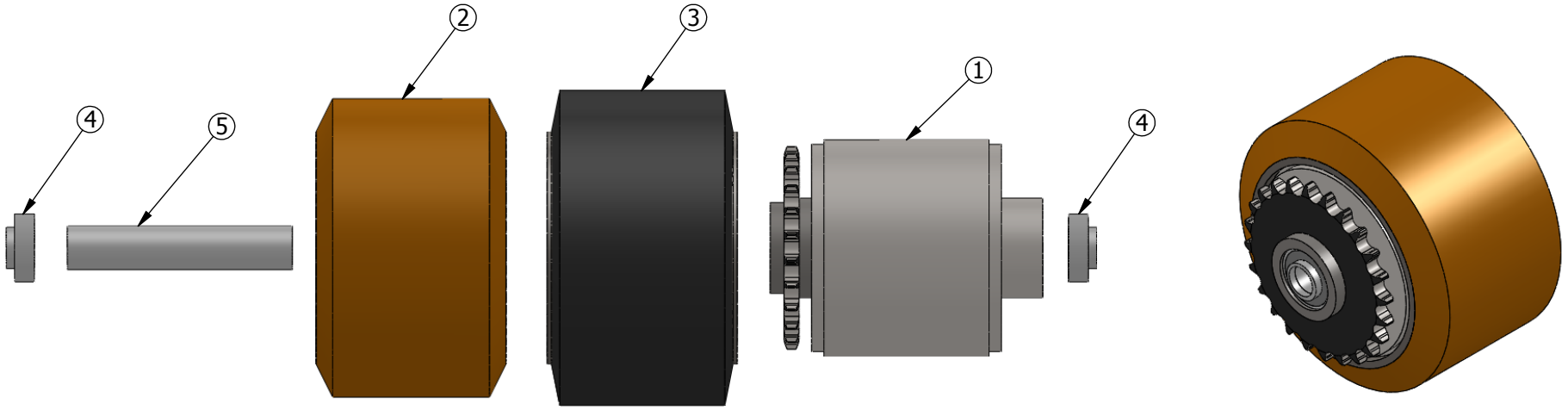
Staffa Motor Assembly



6500 Drive System Parts

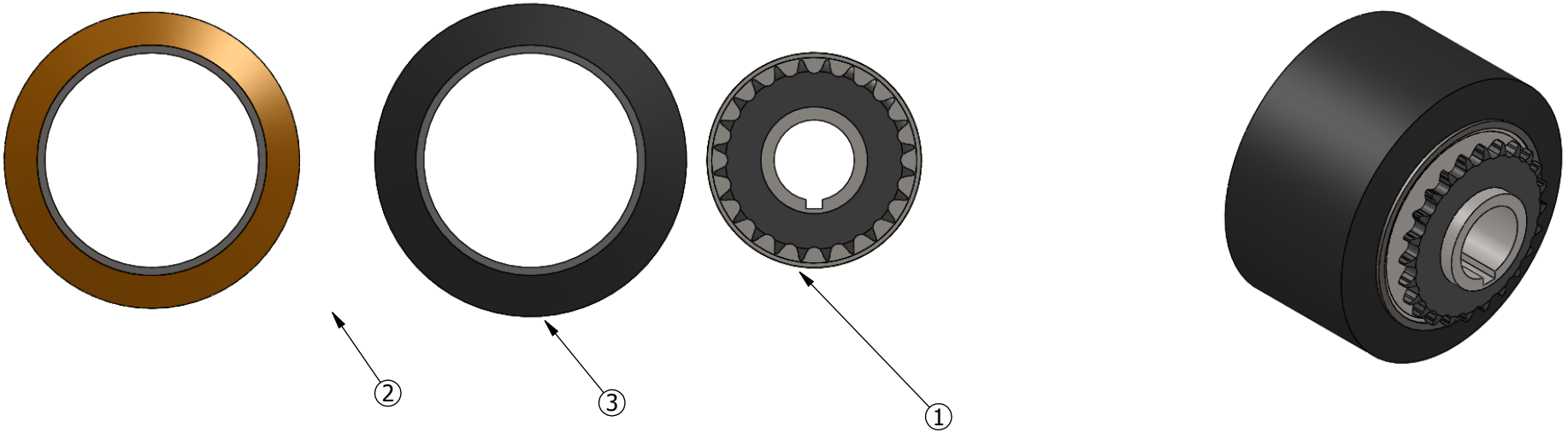
Chain Slack Range:
Drive Chain: 1/4"-3/4"
Drive Roller Chain: 1/4"-1/2"

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	P06103	Pin, Capstan drive HYDRA	1
2	S04476	Screw, Set 1/2"-13 x 1-1/2"	1
3	B07198	Bearing, SC Pilot Flange 2-7/16"	2
4	S24106	Spacer, 1-3/4"	1
5	S24105	Spacer, 3/4"	1
6	S29004	Sprocket D100B16	1
7	K01010	Key, 1/2 x 1/2 x 2-1/2	2
8	S04032	Screw, Set 1/2"-13 x 1/2"	3
9	B03063	Bar, Short Drive Roller Adjusting	2
10	F05785	Fitting, Zerk 1/4-28 90°	4
11	R18133	Ring, Snap	8
12	R19010	Rod, Adjusting Drive Rollers	2
13	N04586	Nut, Hx Nylock® 3/4"-16	2
14	P06187	Pin, Roll 1/8" x 1-1/4"	2
15	W01285	Washer, Flat SAE 3/4"zinc	2
16	B06045	Bar, Long Drive Roller Adjusting	2
17	H08038	Housing, Drive Roller Upper	2
18	B15968	Bracket, Drive Roller Adjusting	8
19	B11381	Bolt, Hx Head 5/8"-11 x 2-1/2"	4
20	N04474	Nut, Hx Jam 5/8"-11	8
21	Drive roller	Drive Roller Assembly	2
22	Drive roller	Drive Roller Assembly	2
23	A07055	Axle, Drive Roller Assembly	2
24	A07055	Axle, Drive Roller Assembly	2
25	B07030	Bearing, SCM Pilot Flange 2-7/16	4
26	Center drive roller	Center Drive Roller Assembly	1
27	Center drive roller	Center Drive Roller Assembly	1
28	K01020	Key, 1/2 x 1/2 x 7-3/4	2
29	H08048	Housing, Drive Roller Lower	2
30	B11376	Bolt, Hx Head 5/8"-11 x 2"	4
31	W01294	Washer, Flat SAE 1"zinc	4
32	S04153	Screw, Acme Long	2
33	B15980	Bracket, Acme Screw Adjust	1
34	B15043	Bracket, Acme Screw Adjust Long	1
35	N04098	Nut, Acme Screw	4
36	B11150	Bolt, Carriage 1/2"-13 x 1-1/2"	2
37	B11153	Bolt, Carriage 1/2"-13 x 1-3/4"	6
38	N04555	Nut, Hx Nylock® 1/2"-13	24
39	B11120	Bolt, FHSHCS 1/2"-13 x 2-1/4"	16
40	B07198	Bearing, SC Pilot Flange 2-7/16"	2
41	S43128	Shaft, 2-7/16 Keyed Chrome	1
42	R18034	Plate 1/2 A36	4



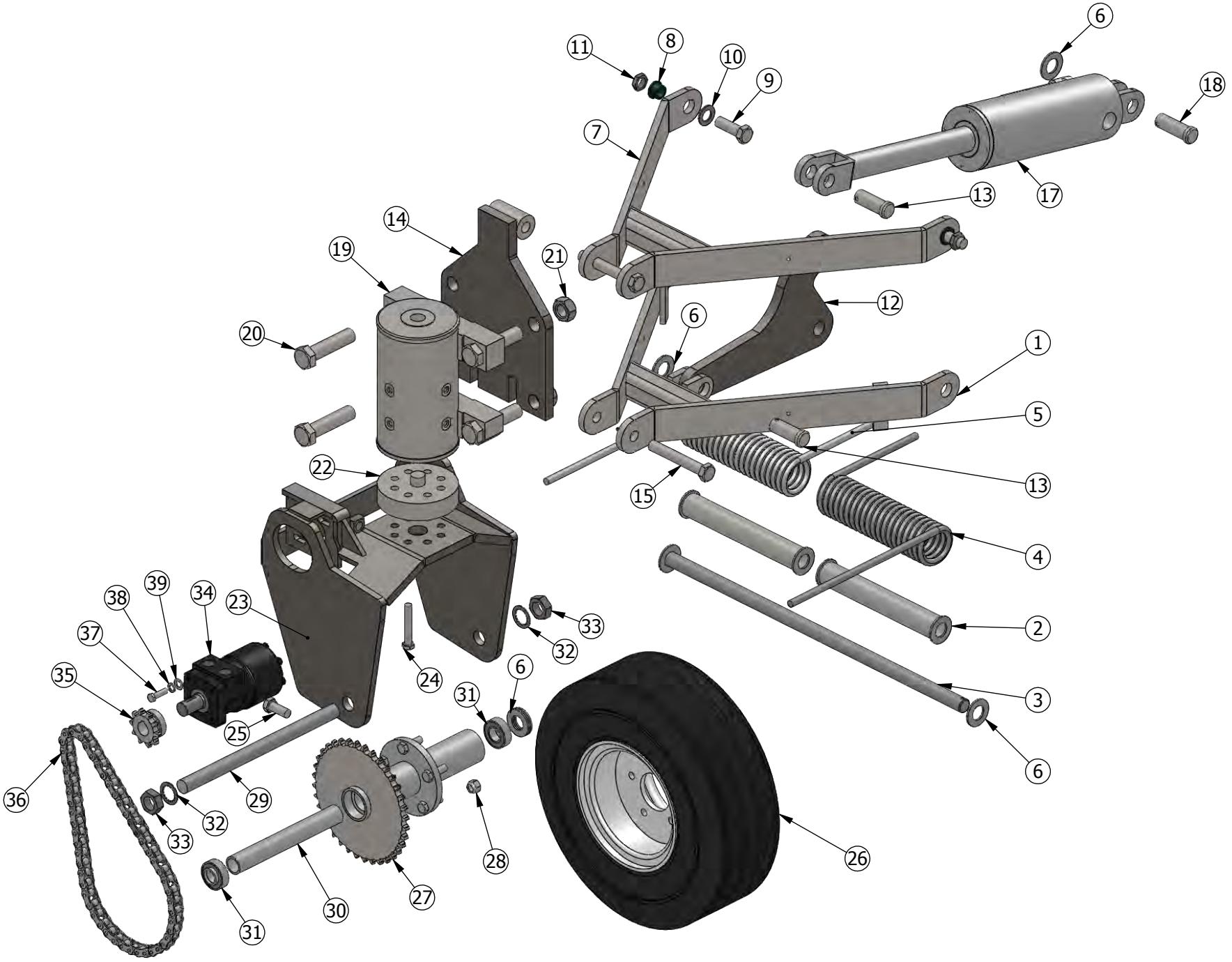
ITEM	PART NUMBER	DESCRIPTION	QTY.
1	C27005	Core, Drive Roller Standard	1
2	R18024	Roller, Drive Urethane	1
3	R18025	Roller, Drive Rubber	1
4	B07135	Bearing, 1" I.D.	2
5	S24010	Spacer, Drive Roller	1

Drive Rollers



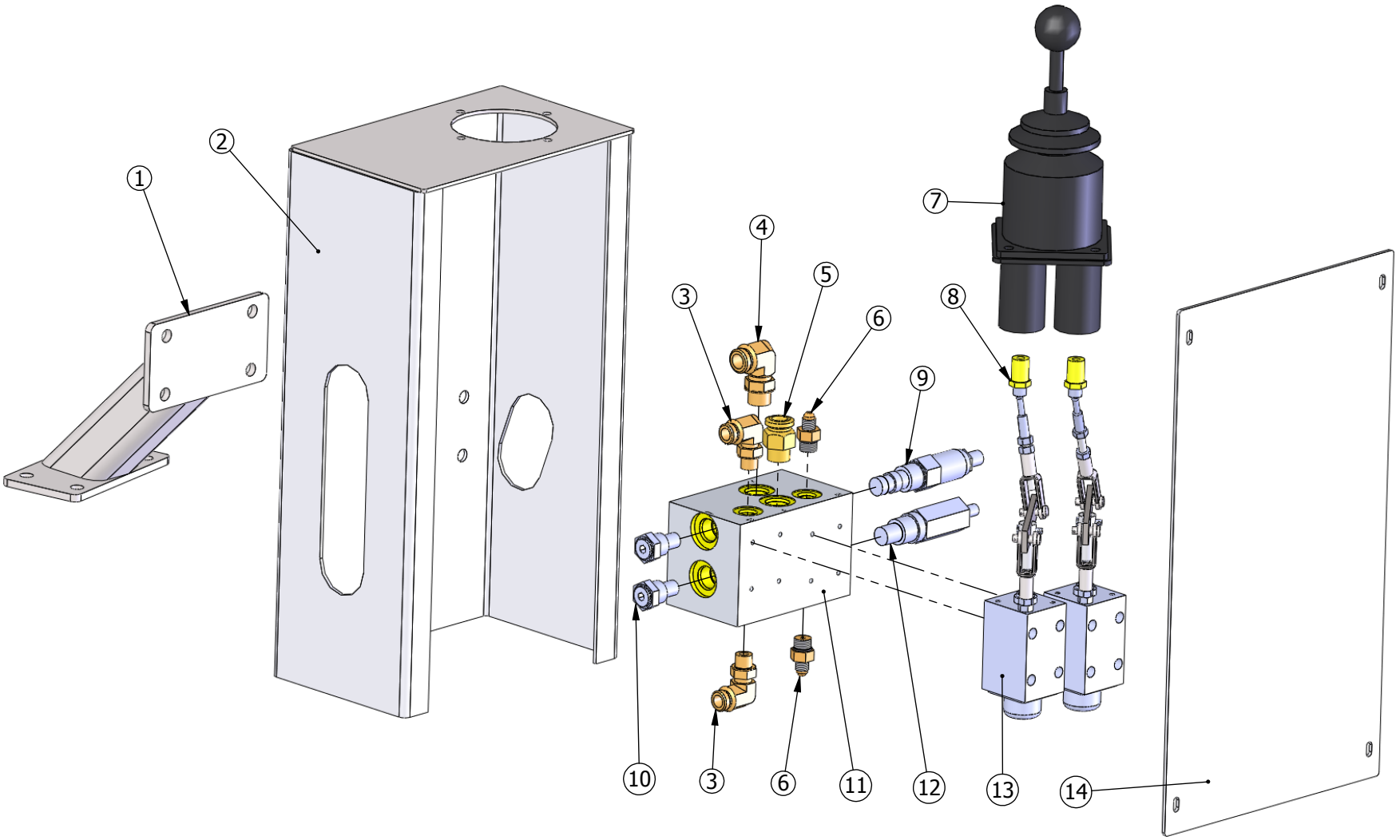
ITEM	PART NUMBER	DESCRIPTION	QTY.
1	R20050	Roller, Center Drive	1
2	R18024	Roller, Drive Urethane	1
3	R18025	Roller, Drive Rubber	1

Center Drive Rollers

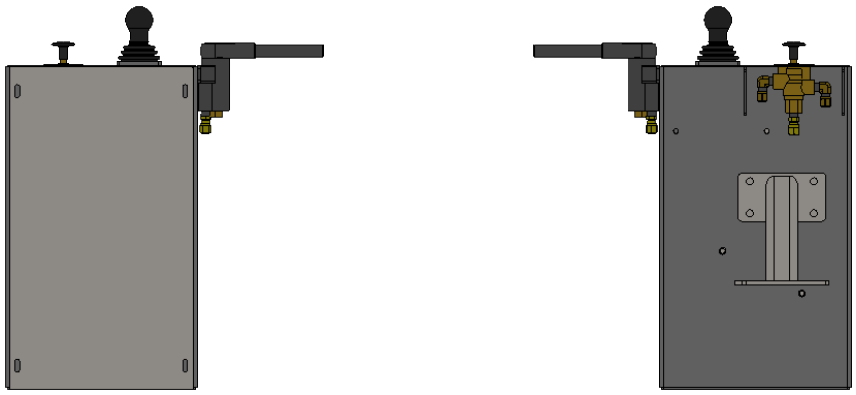


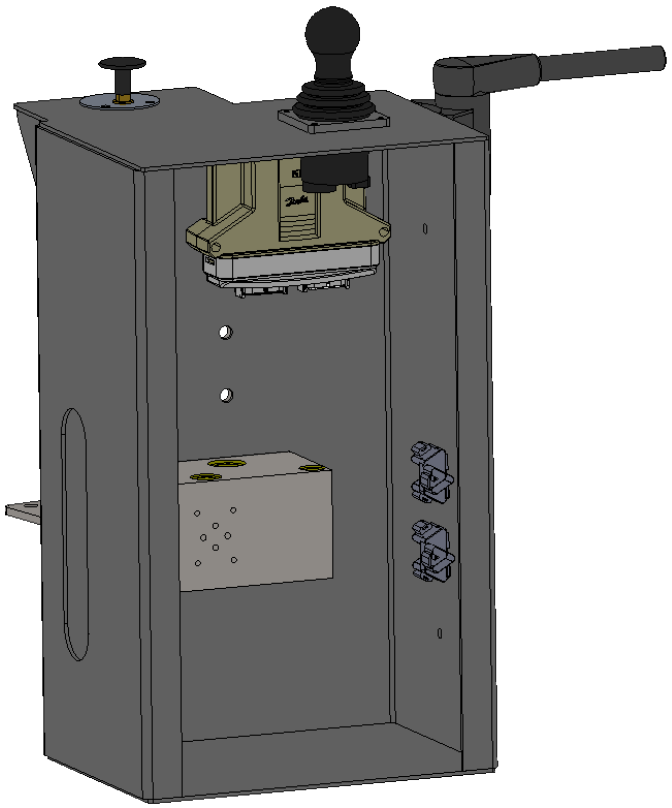
Steer-Go Assembly

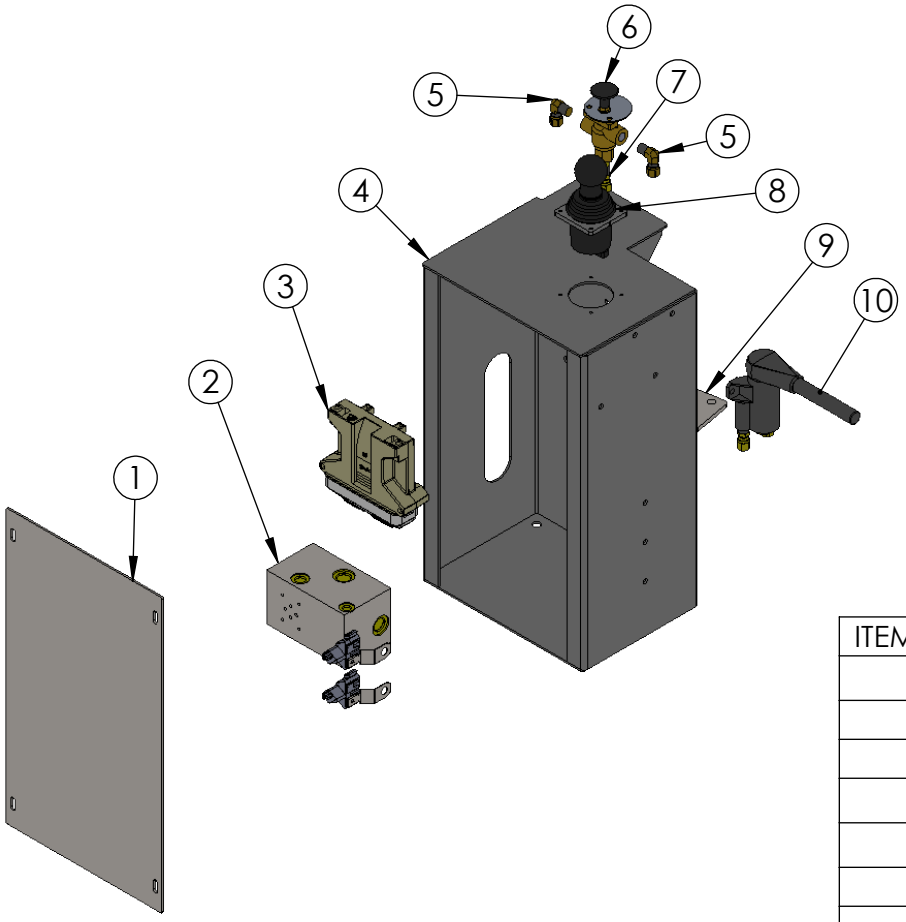
ITEM	PART NUMBER	DESCRIPTION	QTY.
1	F09020	Frame, Lower A-arm	1
2	S24070	Spacer, Torsion Spring	2
3	S43099	Shaft, Lower A-arm Pivot	1
4	S28101	Spring, 985 torsion, LH	1
5	S28102	Spring, 985 Torsion, RH	1
6	W01294	Washer, Flat SAE 1"zinc	7
7	F09005	Frame, Upper A-arm	1
8	B07365	Bearing, I-Glide 3/4x1x5/8	2
9	B11460	Bolt, Hx Head 3/4"-16 x 2-1/4" Z8	2
10	W01285	Washer, Flat SAE 3/4"zinc	2
11	N04587	Nut, Hx Jam Nylock® 3/4"-16	4
12	A08015	Plate 3/4" A36	1
13	P06070	Pin, 1x2-1/2	2
14	M09010	Mount, Actuator plate	1
15	B11449	Bolt, Hx Head 3/4"-16 x 5" Z8	2
16	F05630	Zerk, Grease 1/4"-28	2
17	C32030	Cylinder, Drawbar	1
18	P06073	Pin, 1x2-3/4	1
19	A01050	Actuator, Rotary	1
20	B11482	Bolt, Hx Head 1"-8 x 4" Z8	4
21	N11482	Nut, Hx Toplock 1"-8 Z8	4
22	S24009	Spacer, Actuator	1
23	F08912A	Fork, Hydra Idler Wheel	1
24	B11605-S	Bolt, Hx Head 1/2"-13 x 3" special	1
25	B11370	Bolt, Hx Head 5/8"-11 x 1-1/2"	1
26	W03907A	Wheel and Tire assy 18x7	1
27	S29905	Sprocket and Hub	1
28	N04040	Nut, Lug 1/2"-20 Z	1
29	A07015	Axle, Drive Wheel	1
30	S24053	Spacer, Hub and Sprocket	1
31	B07135	Bearing, 1" I.D.	2
32	W01090	Washer, Internal Lock 1"	2
33	N04095	Nut, Hx Jam 1"-14	2
34	M08050	Motor, Hydraulic Drive	1
35	S29005	Sprocket, Drive	1
36	C10060-26	Chain, #60 39"L	1
37	B11343	Bolt, Hx Head 3/8"-16 x 1-1/4"	1
38	W01545	Washer, Split Lock 3/8"zinc	1
39	W01002	Washer, Flat SAE 3/8"zinc	1



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	B15093	Bracket, Steer-Go Box	1
2	B13930	Box Steer-Go	1
3	F05324	Fitting, 6-6 90° STC	2
4	F05326	Fitting, 8-8 90° STC	1
5	F05322	Fitting, 8-8 STR STC	1
6	F05754	Fitting, 4-6 Str SAE	2
7	L03055	Lever, Steer-Go Joystick	1
8	K02500	Kit, Linkage	2
9	V02401	Valve, Priority Flow	1
10	V02185	Vavle, Check	2
11	M04015	Manifold Steer-Go	1
12	V02186	Valve, Relief	1
13	V02021	Valve, Directional	2
14	C29120	Cover, Steer-Go	1

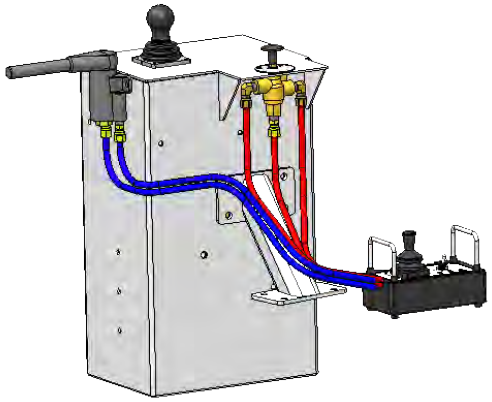


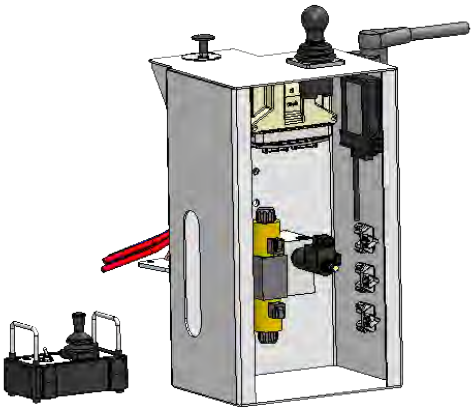


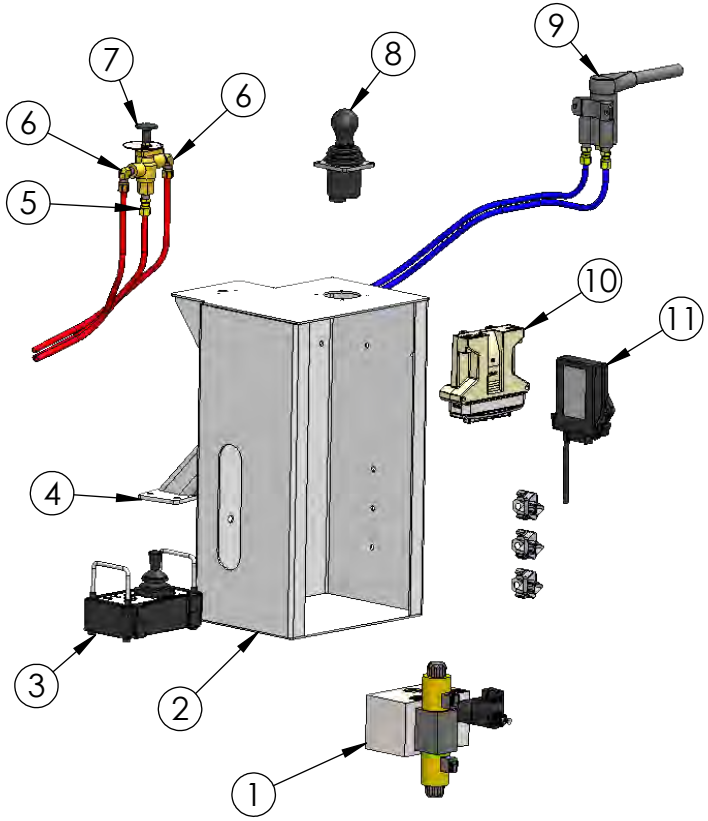


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	C29121	Cover, Electic Steergo	1
2	C34039	Manifold HYPS-E	1
3	C34101	Controler, 24 Pin	1
4	B13935	Box, Steergo Electric	1
5	F05438	Fitting, Air 90° 6-4	2
6	V02008	Valve, Cab control	1
7	F05413	Fitting Brass Str 68NTA-6-4	3
8	C34037	JS1000 Joystick Steer-Go	1
9	B15093	Bracket, Steer-Go Box	1
10	V02018	Valve, Trolley Air	1

HPPS-E Electric Steer-Go

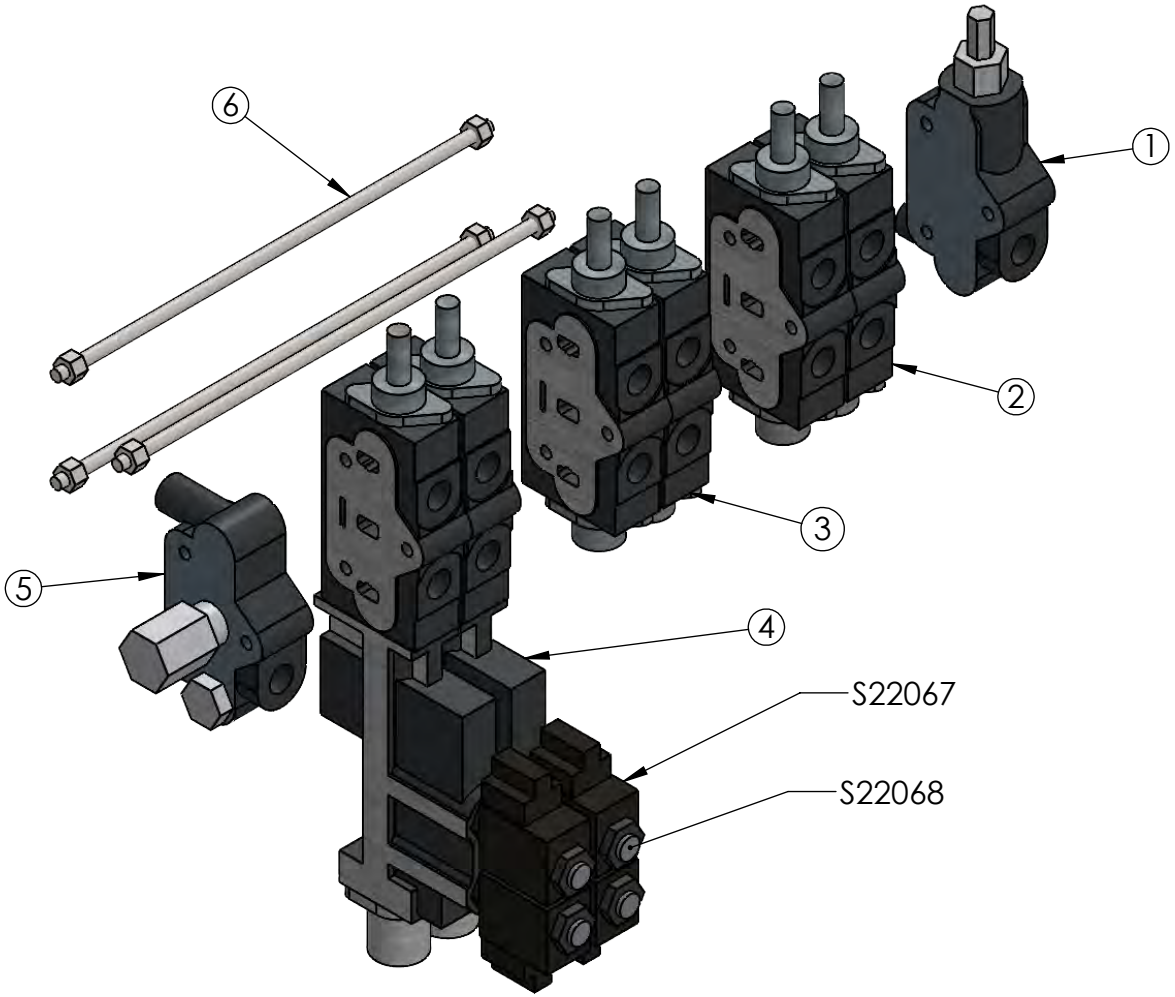


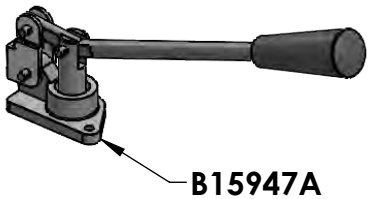




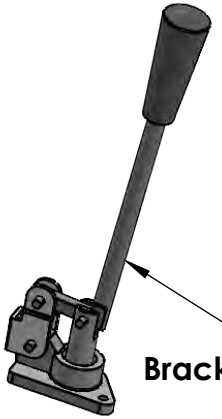
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	C34039	Manifold Steer-Go Electronic	1
2	B13935	Box, Steergo Electric	1
3	R13006	Remote, Control Box	1
4	B15093	Bracket, Steer-Go Box	1
5	F05413	Fitting Brass Str 68NTA-6-4	3
6	F05438	Fitting, Air 90° 6-4	2
7	V02008	Valve, Cab control	1
8	C34037	JS1000 Joystick Steer-Go	1
9	V02018	Valve, Trolley Air	1
10	C34101	Controler, 24 Pin	1
11	R13005	Remote, Reciever Kit	1

HPPS-ER
Electric Steer-Go w/ Remote





B15947A
Bracket, Straight Prince Lever



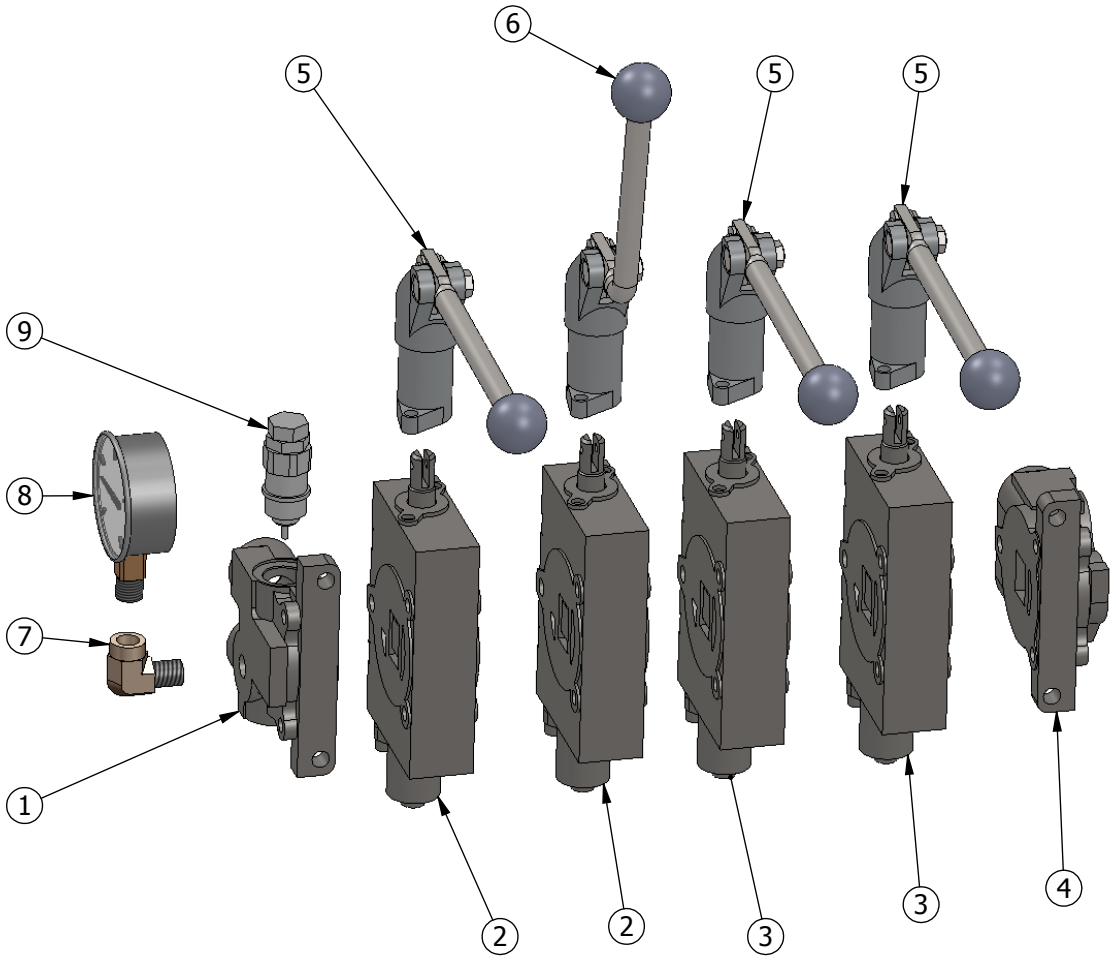
B15948A
Bracket, 90° Prince Lever

Parts available for replacement:

S22067 - Coil only for V02103
S22068 - Cartridge only for V02103
K02073 - Seal kit for S22068

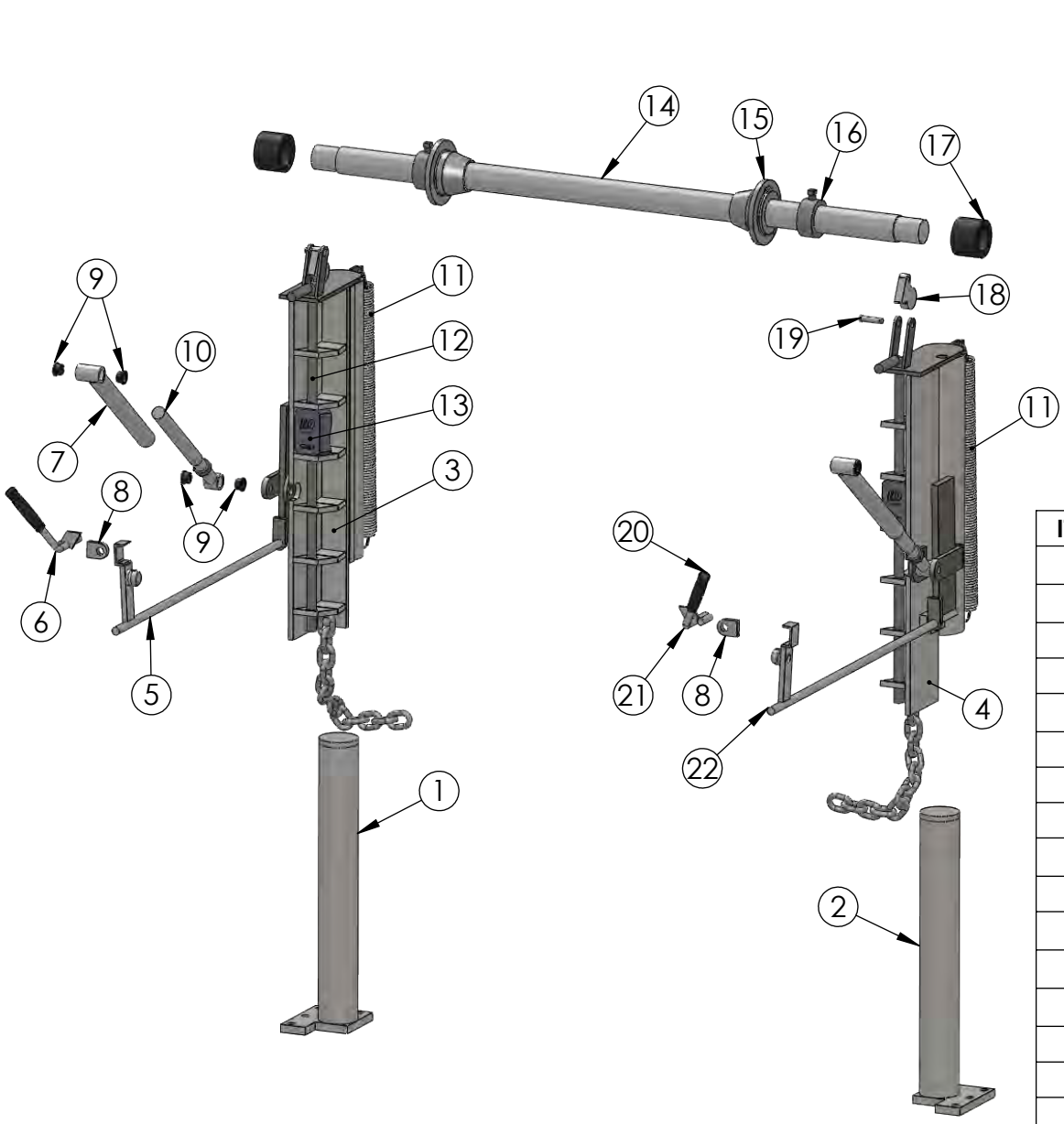
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	V02100	Valve Inlet w/relief Prince	1
2	V02101	Valve 4 Way Manual Prince	2
3	V02102	Valve 3 Way Manual Prince	2
4	V02103	Valve 4 Way Solenoid Prince	2
5	V02104	Valve Sec Outlet w/PB Prince	1
6	K02319	Kit, Rod 6-Bank Prince	1

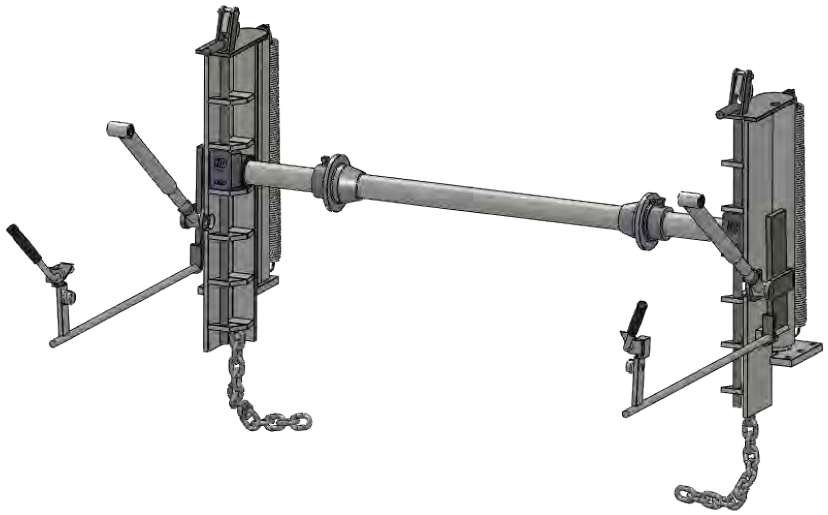
Prince Valve Bank



BOM Table			
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	V02138	Inlet w/o Relief	1
2	V02130	Double Acting	2
3	V02135	Single Acting	2
4	V02065	Outlet w/PB	1
5	B15910A	Handle, Straight	3
6	B15912A	90° lever assembly	1
7	F05150	Fitting, Street Elbow 4-4	1
8	G02055	3K bottom mount	1
9	V02150	relief valve	1

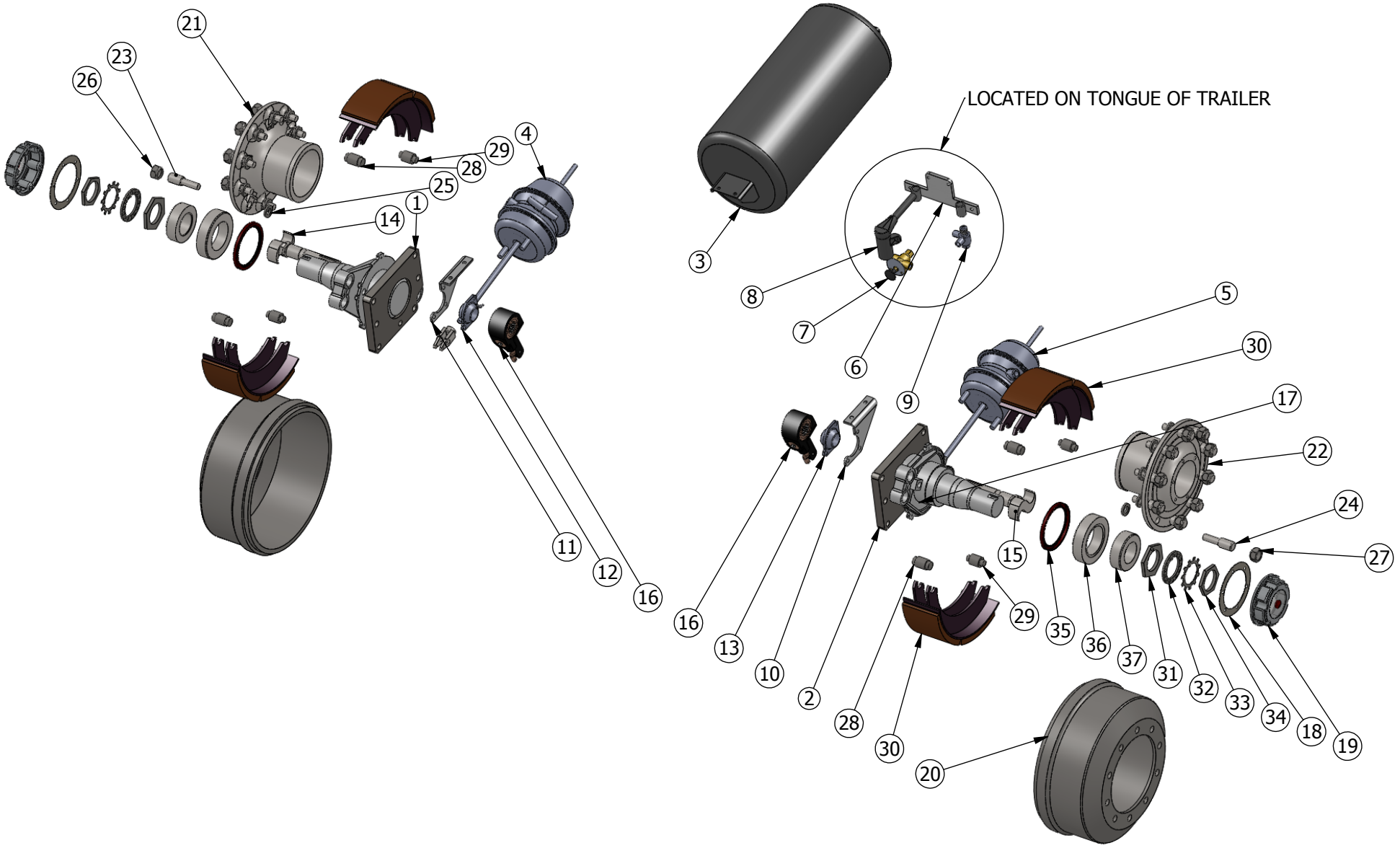
V02120
Valve Bank 4-Section





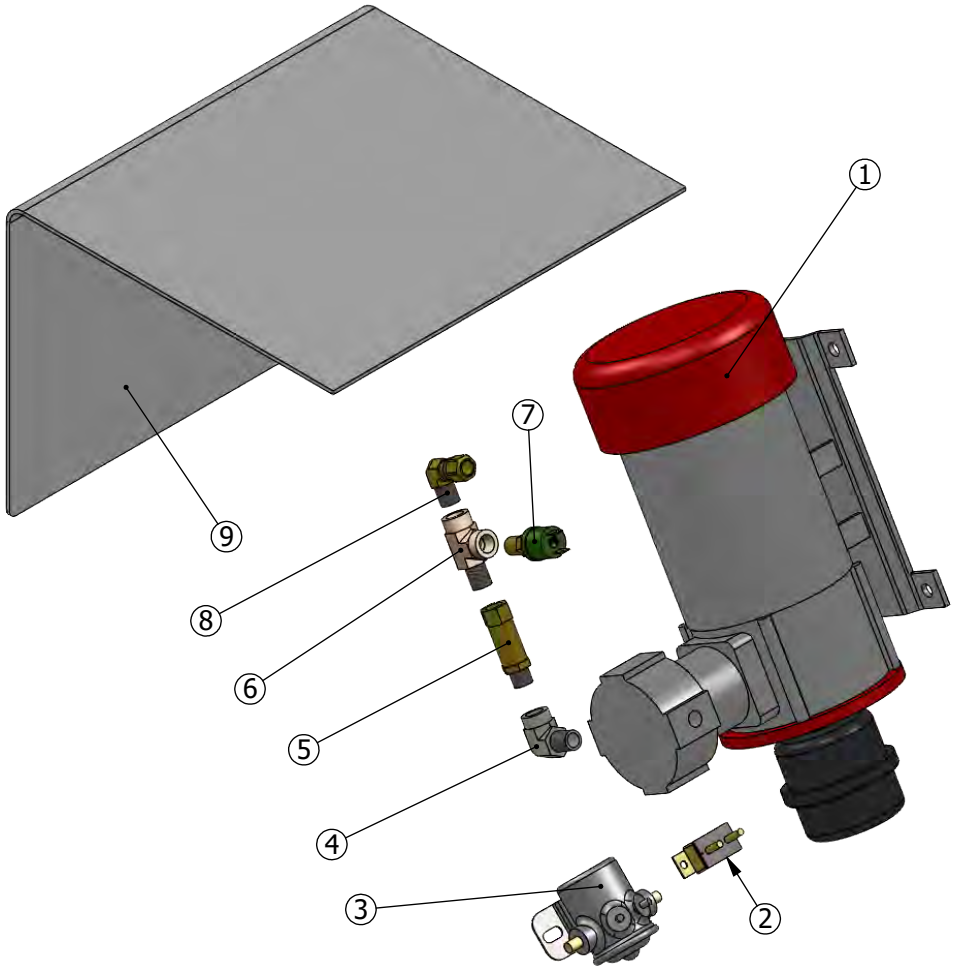
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	C32040	Mandrel Cylinder LH D3188	1
2	C32025	Mandrel Cylinder RH D3189	1
3	R01925	Rack, Mandrel LH	1
4	R01945	Rack, Mandrel RH	1
5	L08015A	Lock Assy, Mandrel Rack LH	1
6	H02045A	Handle, Mandrel Lock LH	1
7	S30021	Stabilizer, Outside	2
8	B15130	Bracket, Mandrel Lock Handle	2
9	B07365	Bearing, I-Glide 3/4x1x5/8	8
10	S30005	Stabilizer, Inner	2
11	S28030	Spring, Mandrel Return	2
12	P06035	Pin, Mandrel Locking	2
13	B22045	Block, Mandrel Bearing	2
14	S43115	Shaft, 2-1/2" Mandrel	1
15	C25020	4" Aluminum Cone	2
16	C20015	Collar, 2-1/2" w/ studs	2
17	B07075	Bearing, Nylatron Mandrel	2
18	P04020	Pawl, Mandrel Locking Pin	2
19	P06095	Pin, 1/2 x 2	2
20	G07010	Handle, Rubber Flapper lock	2
21	H02050A	Handle, Mandrel Lock RH	1
22	L08020A	Lock Assy, Mandrel Rack RH	1

Mandrel Rack Assembly

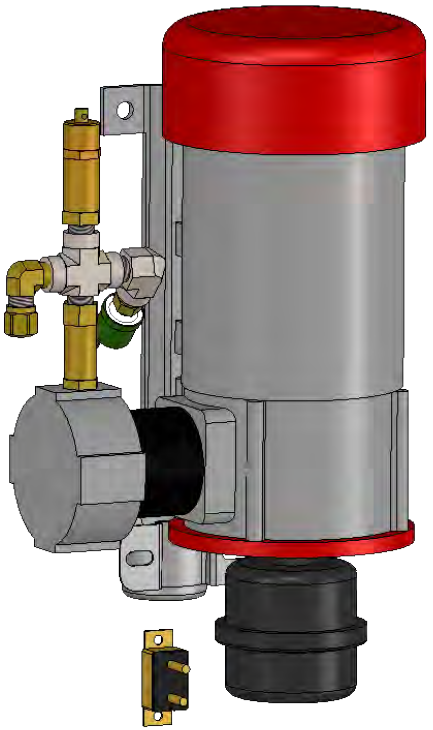


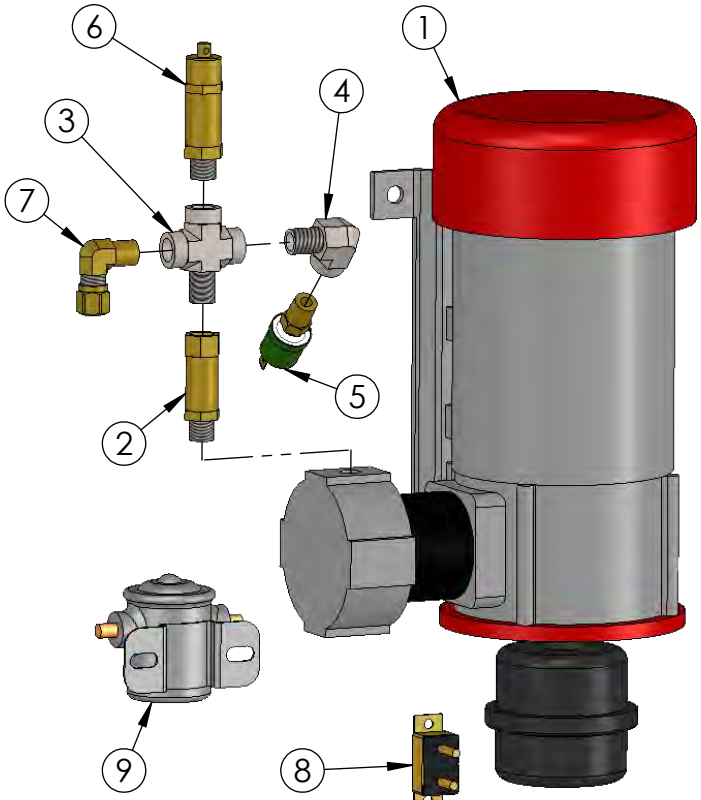
AIR BRAKE ASSEMBLY

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	S26945	Spindle, Air LH	1
2	S26953	Spindle Air RH	1
3	T01041	Tank, Air large	1
4	C32095	Can, Air 30/30 w/Long Rod	1
5	C32095	Can, Air 30/30 w/Long Rod	1
6	B12210	Bracket, Gladhand	1
7	V02008	Valve, Cab control	1
8	V02018	Valve, hand control	1
9	V02038	Valve, check 2-way	1
10	B15096	Bracket, S-Cam Bushing RH	1
11	B15097	Bracket, S-Cam Bushing LH	1
12	B15902	Bushing,S-Cam RH	1
13	B15903	Bushing S-Cam LH	1
14	C44015	Cam, Air brake LH	1
15	C44020	Cam, Air brake RH	1
16	A11030	Adjuster, Auto Slack 10 spline	2
17	Y01043	Yoke Midland Straight	2
18	G01010	Gasket, Hub acp 16-1/2x5	2
19	C06071	Cap, Hub 16-1/2 x 5	2
20	D08000	Drum Only, Air Brake 16-1/2x5	2
21	H09974	Hub Only, Air Brake LH	1
22	H09975	Hub Only, Air Brake RH	1
23	S37083	Stud, Air Brake 1-1/8-16 LH	10
24	S37082	Stud, Air Brake 1-1/8-16 RH	10
25	W01290	Washer, Thick Drum Assembly	20
26	N04058	Nut, Lug 1-1/8-16 LH	10
27	N04059	Nut, Lug 1-1/8-16 RH	10
28	P04002-1	Pin, Air Brake Large	4
29	P04002-2	Pin, Air Brake Small	4
30	S15030	Shoe, Air Brake 16-1/2x5	4
31	N04201	Nut, Hub Inner	2
32	W01202	Washer, Locking Air Brake	2
33	W01201	Washer, Lock Spindle Tab	2
34	N04202	Nut, Hub Outer	2
35	S05130	Seal, Grease Hub	2
36	B07140	Bearing, Inner	2
37	B07085	Bearing, Outter	2



ITEM	PART NUMBER	DESCRIPTION	QTY.
1	C21020	Compressor, Air	1
2	B36003	50amp Circuit Breaker	1
3	S22050	Cole Hersee HD Solenoid	1
4	F05150	Fitting, Street Elbow 4-4	1
5	V02220	Valve, check one way	1
6	F05728	Fitting, Street Tee 4-4-4	1
7	S40120	Extreme Air pressure switch	1
8	F05438	Fitting, Air 90° 6-4	1
9	C29300	Cover, Air Compressor	1

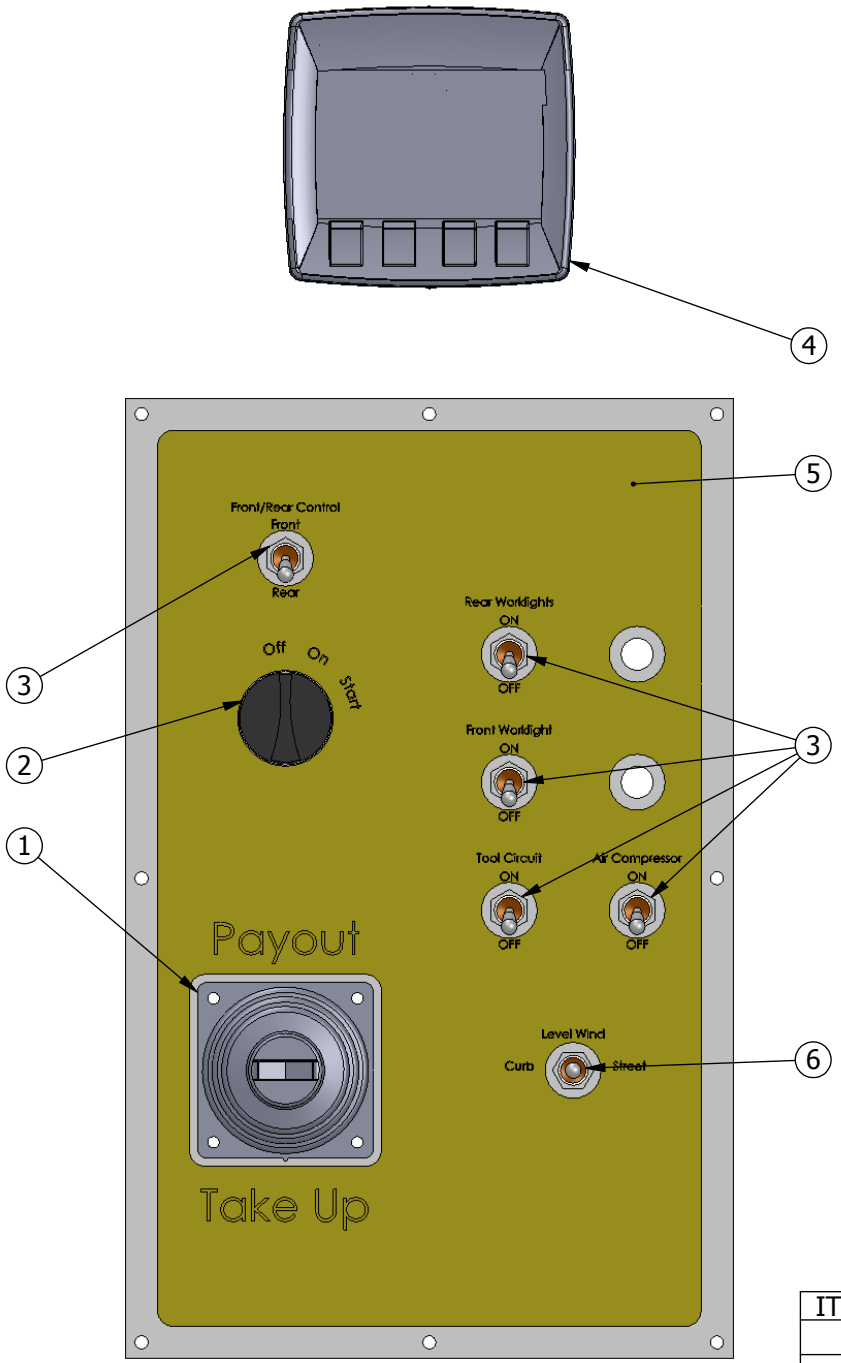




Located Inside
Control Panel

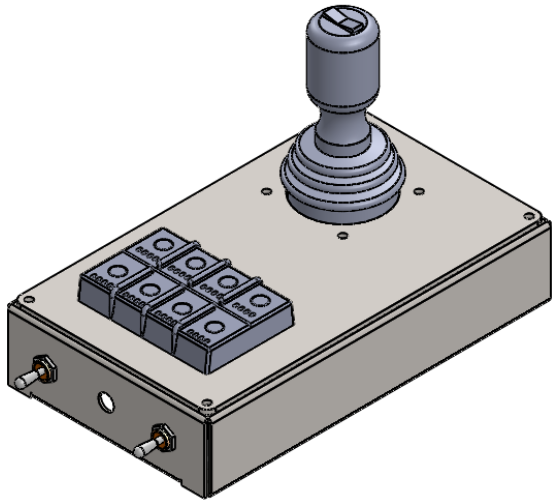
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	C21023	Compressor, Air	1
2	V02220	Valve, check one way	1
3	F05059	Fitting, Pipe Cross 4-4-S	1
4	F05150	Fitting, Street Elbow 4-4	1
5	S40120	Extreme Air pressure switch	1
6	V02012	Valve, pop-off 140psi	1
7	F05438	Fitting, Air 90° 6-4	1
8	B36003	50amp Circuit Breaker	1
9	S22050	Cole Hersee HD Solenoid	1

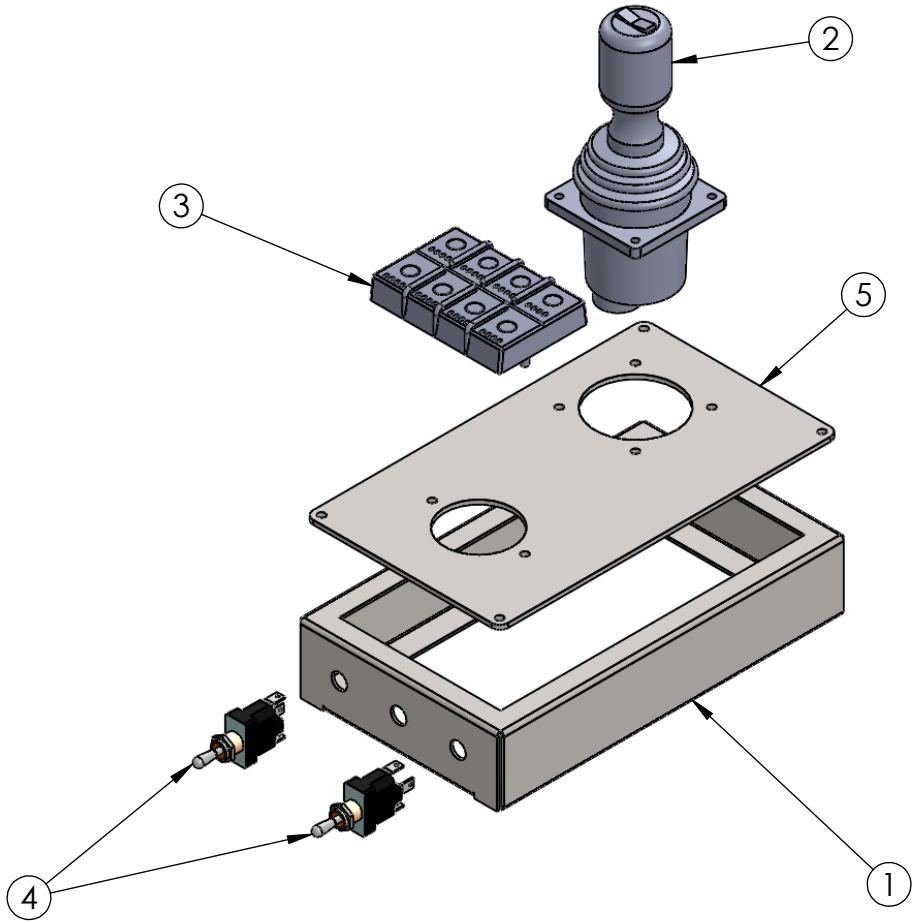
Air Compressor Tier IV



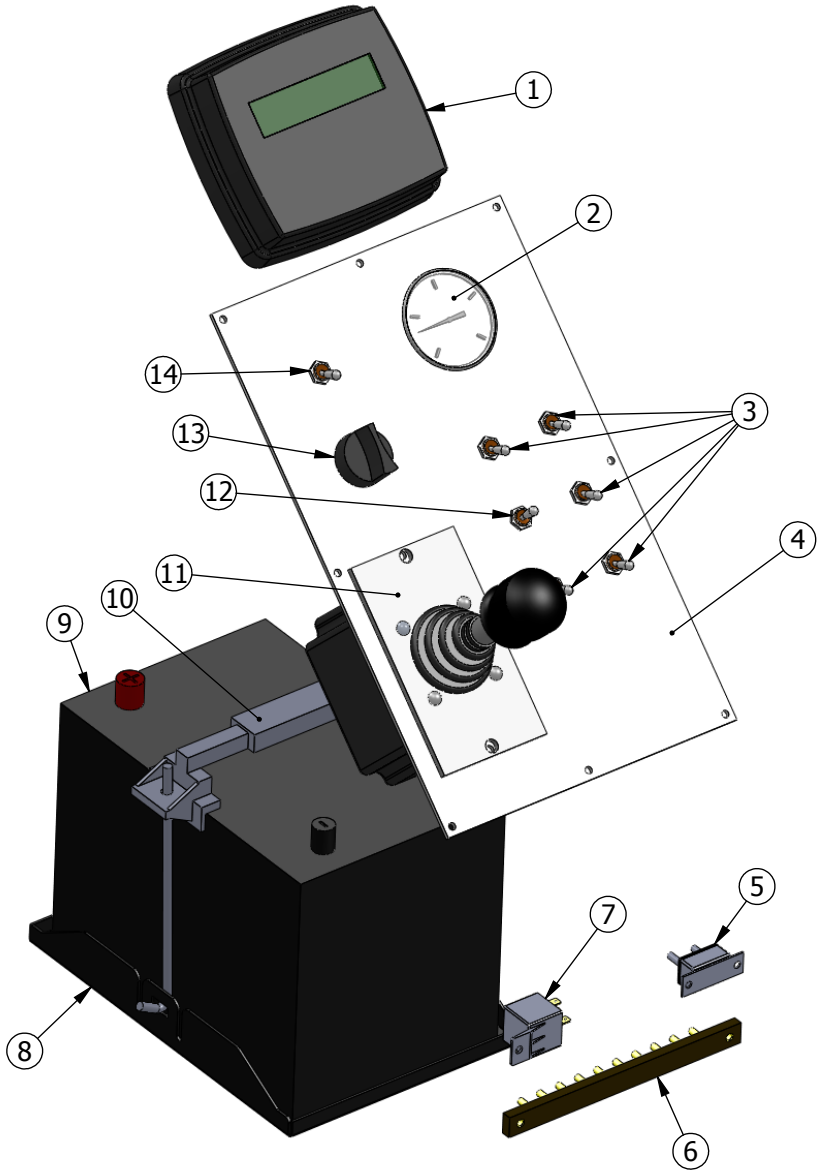
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	C34035	Controller, Joystick JS1000 Front	1
2	S40070	Switch, Key Cole Hersee	1
3	S40035	Switch, SP/ST Toggle	5
4	D09021	Display, DP250 +1	1
5	P03022	Panel, Control +1	1
6	S40100	Switch, SP/DT Momentary	1
7	Plus 1 Decal	Decal +1	1

Front Controls +1



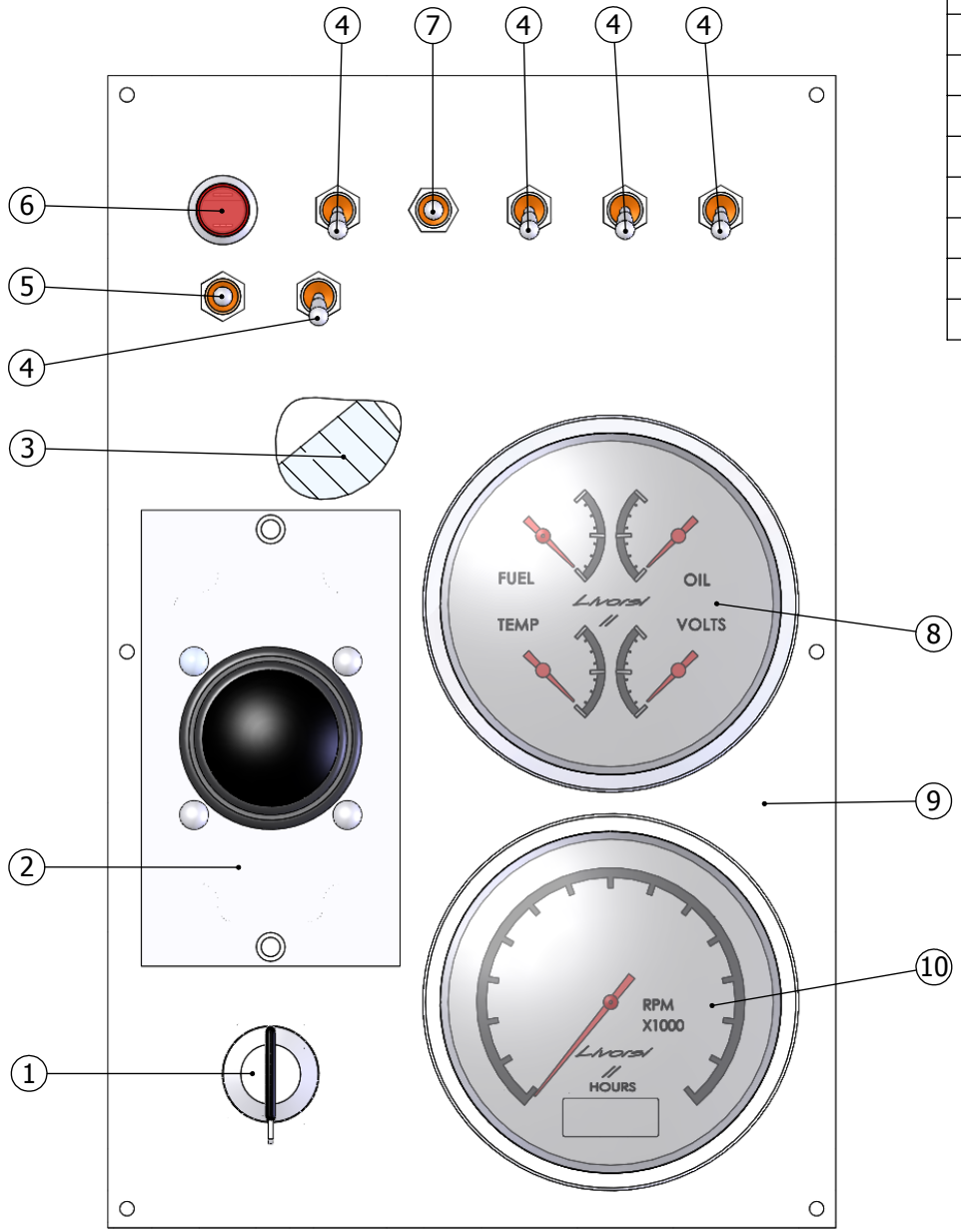


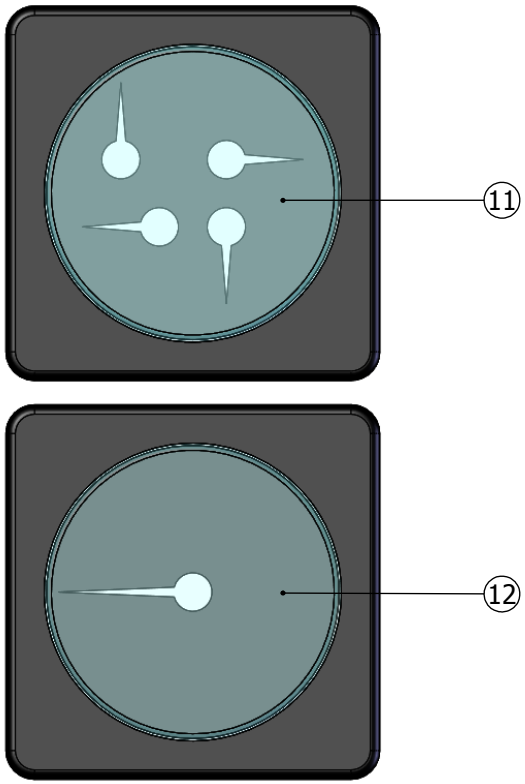
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	B13962	Box, Rear Control 6500 +1	1
2	C34036	Controller, Joystick JS1000	1
3	S40190	Switch, Multiplex +1	1
4	S40100	Switch, SP/DT Momentary	2
5	P03019	Panel, Rear Control 6500 +1	1



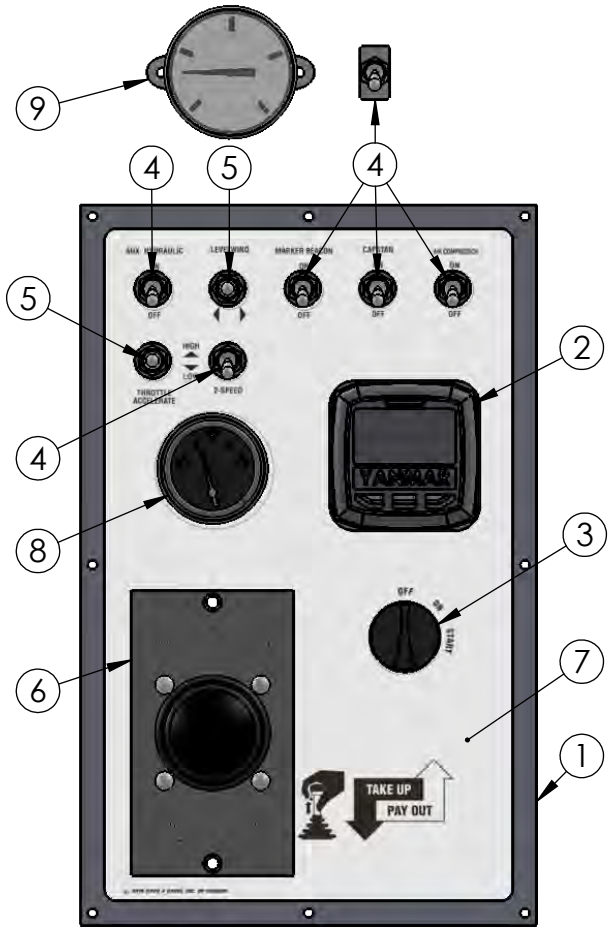
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	D09030	Display, Controls Inc.	1
2	G02075	5000 PSI GAUGE back mount	1
3	S40035	Switch, SP/ST Toggle	5
4	P03021	Panel, HP6500 Electronic Engine	1
5	B36003	50amp Circuit Breaker	1
6	B22075	10 Pole Terminal Strip	1
7	S40016	Bosch Relay	1
8	H10060	Tray, battery	1
9	B06012	Battery MTP-24	1
10	R19025	Battery hold down	1
11	C34030	Controller, Joystick MCH	1
12	S40100	Switch, SP/DT Momentary	1
13	S40070	Switch, Key Cole Hersee	1
14	S40008	Switch, SP/DT Maintained	1

ITEM	PART NUMBER	DESCRIPTION	QTY.
1	S41100	Switch Ignition JDD	1
2	C34030	Controller, Joystick MCH	1
3	S41001	JD Pre-Heat Timer	1
4	S40035	Switch, SP/ST Toggle	5
5	S40150	Switch, DP/DT Momentary	1
6	L04025	Light, Pilot	1
7	S40100	Switch, SP/DT Momentary	1
8	G02033	Gauge, Livorsi 4 in 1	1
9	P03020	Control Panel (Analog)	1
10	G02022	Livorsi Tachometer	1
11	G02003	Gauge, 4 Gauge Cluster	1
12	G02002	Gauge, Tachometer VDO	1



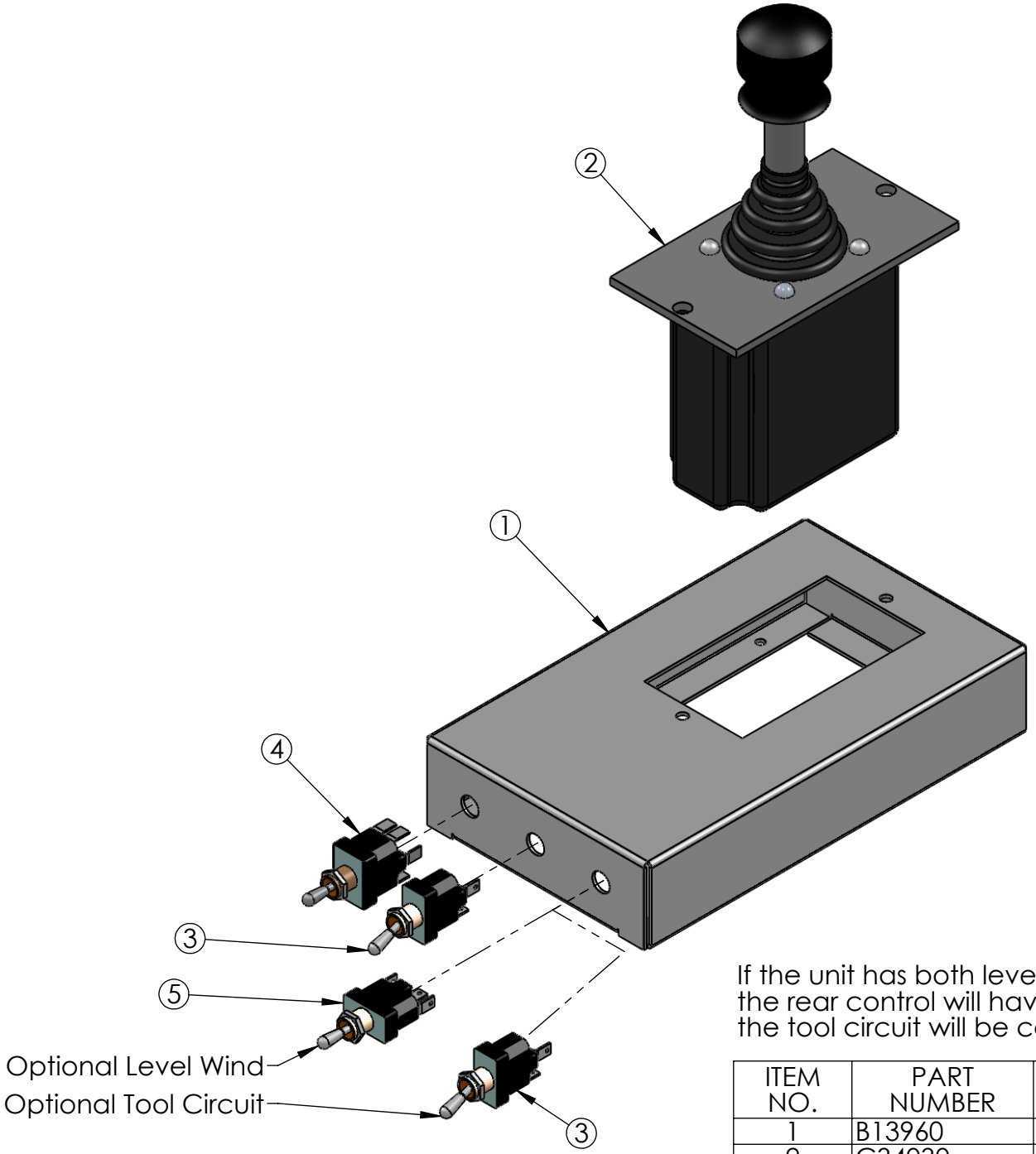


Front Controls Analog



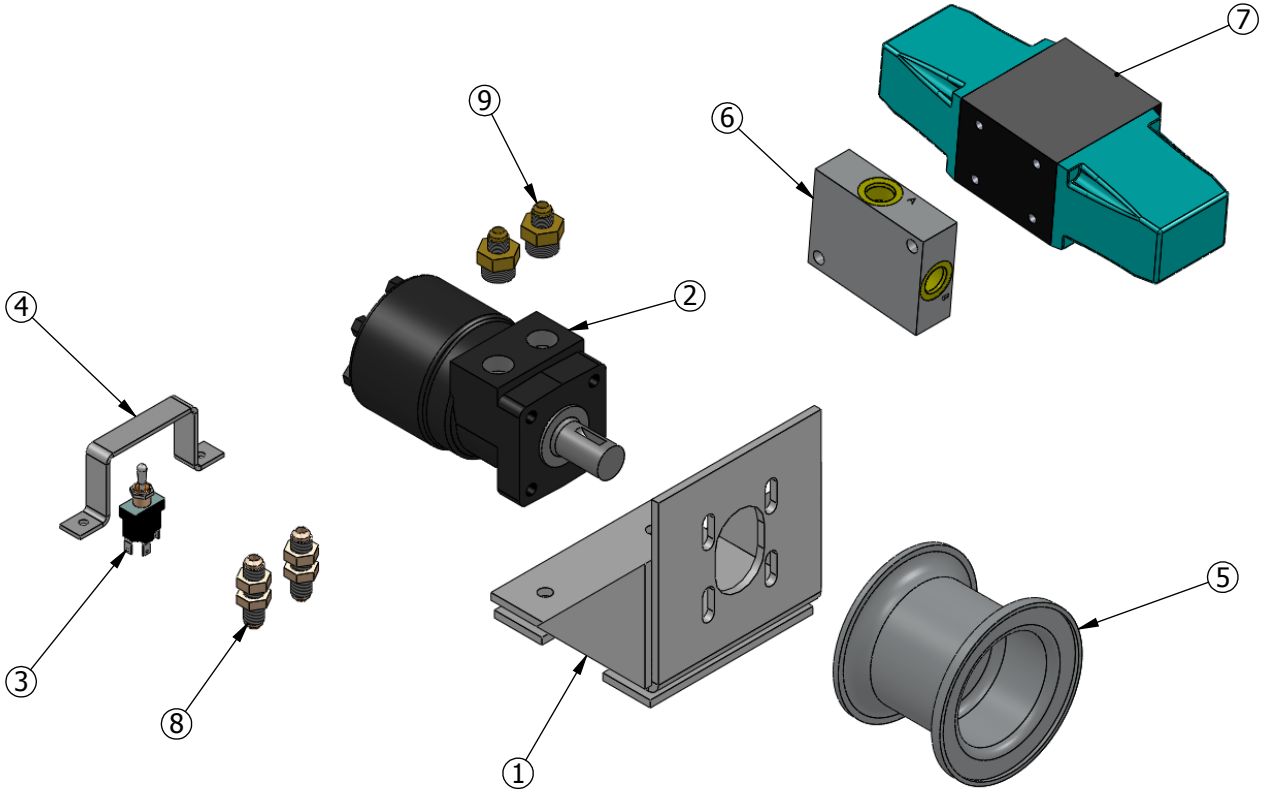
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	P03023	Panel, Control	1
2	D09022	Display, Yanmar T4 Final	1
3	S40070	Switch, Key Cole Hersee	1
4	S40035	Switch, SP/ST Toggle	6
5	S40100	Switch, SP/DT Momentary	2
6	C34030	Controller, Joystick MCH	1
7	D30150	Decal, Control Panel T4f	1
8	G02005	Gauge, Fuel Level	1
9	G02075	5000 PSI GAUGE back mount	1

Control Panel T4f

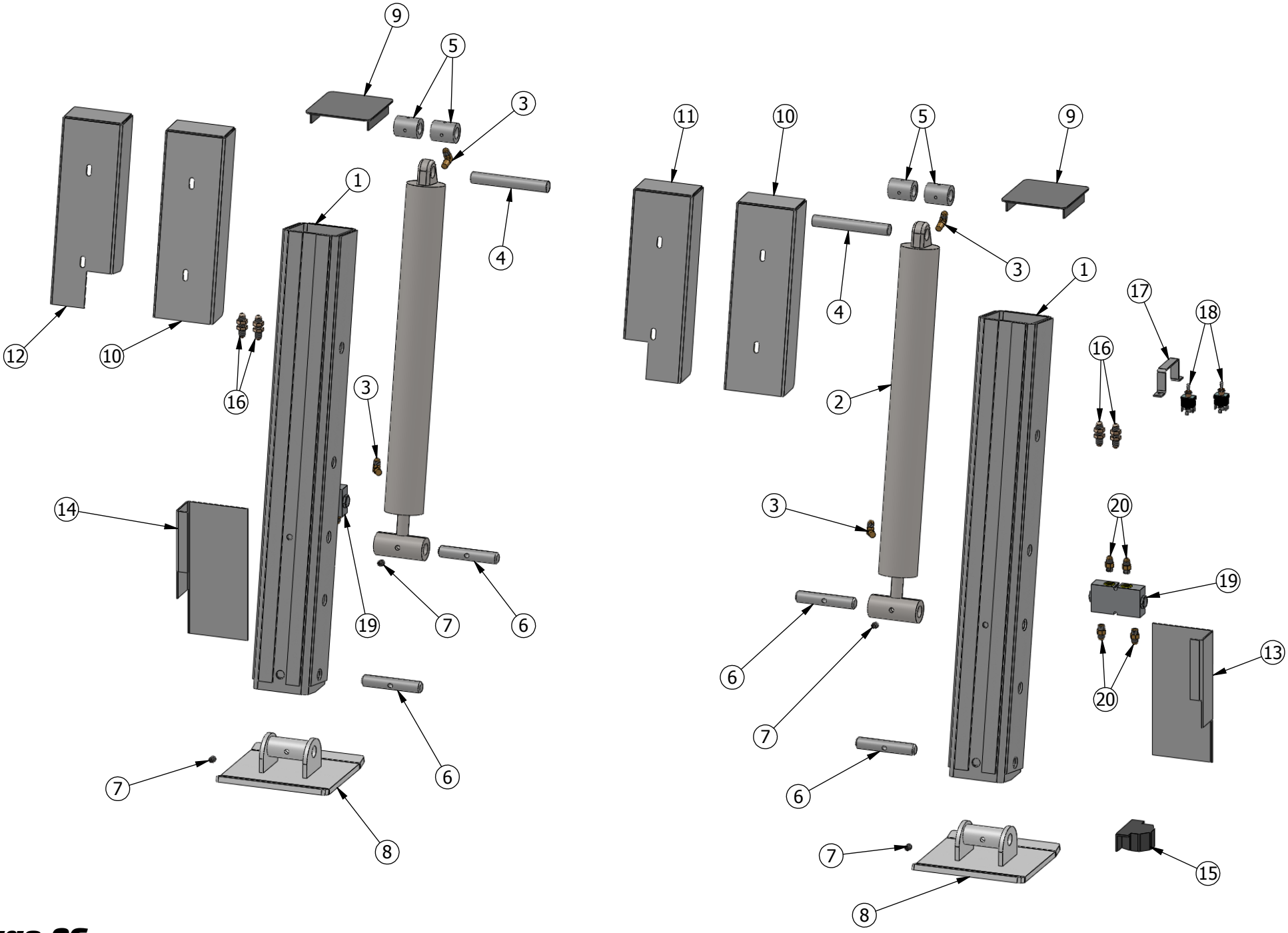


If the unit has both level wind and tool circuit,
the rear control will have the level wind switch
the tool circuit will be controlled by the front control

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	B13960	Rear Control Panel	1
2	C34030	Controller, Joystick MCH	1
3	S40035	Switch, SP/ST Toggle	2
4	S40150	Switch, DP/DT Momentary	1
5	S40100	Switch, SP/DT Momentary	1

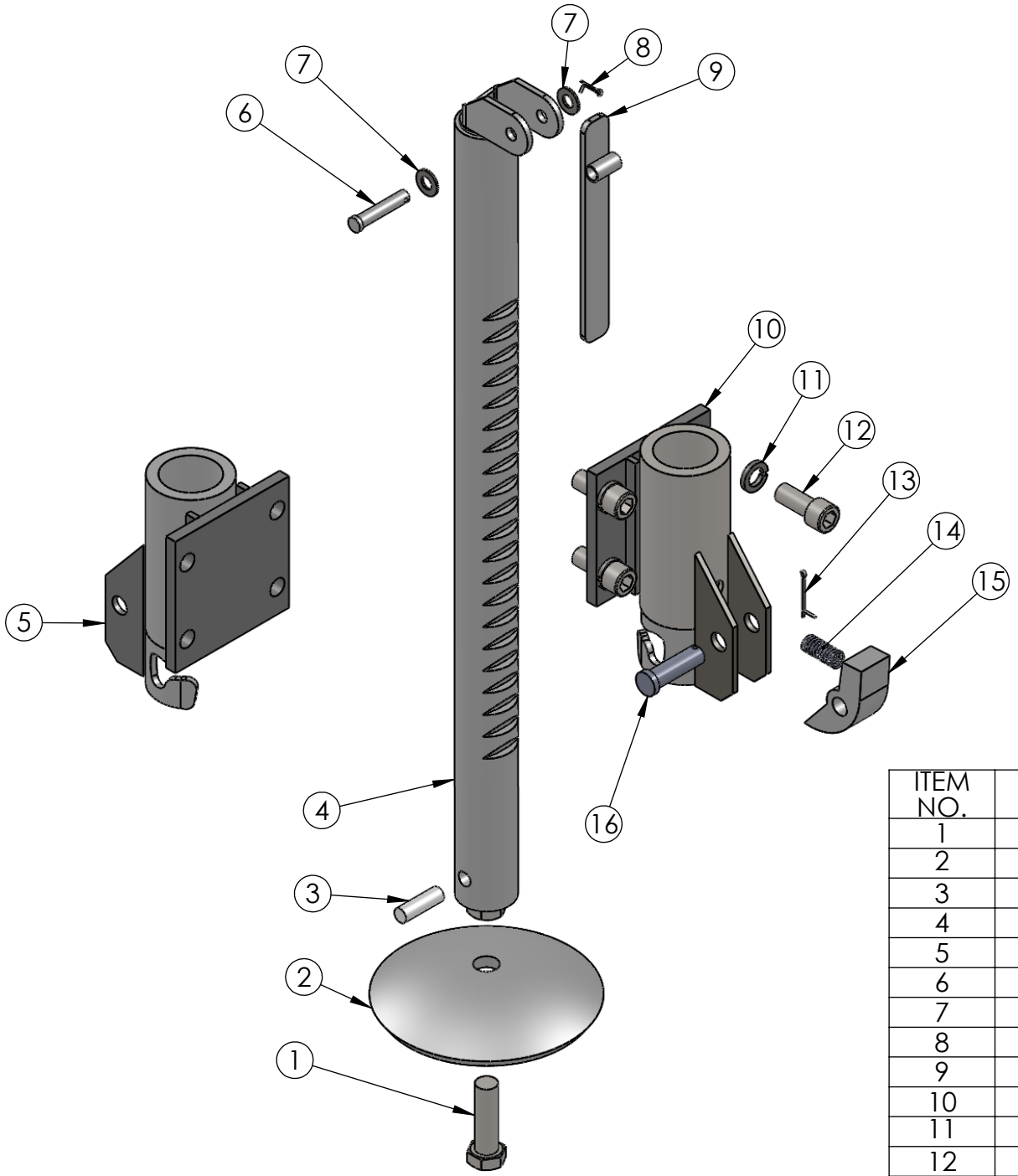


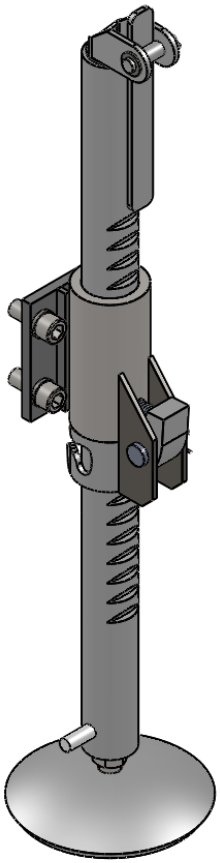
ITEM	PART NUMBER	DESCRIPTION	QTY.
1	B15998	Bracket, Capstan Mount	1
2	M08050	Motor, Hydraulic Drive	1
3	S40153	Switch, SP/DT Maintained w/center	1
4	G09021	Guard, Toggle Switch	1
5	C38905A	Cathead, Capstan	1
6	P09170	Plate, Sub	1
7	V02145	Valve Capstan/Levelwind	1
8	F05170	Fitting, -6 JIC bulkhead	2
9	F05762	Fitting, 6-10 Str SAE	2



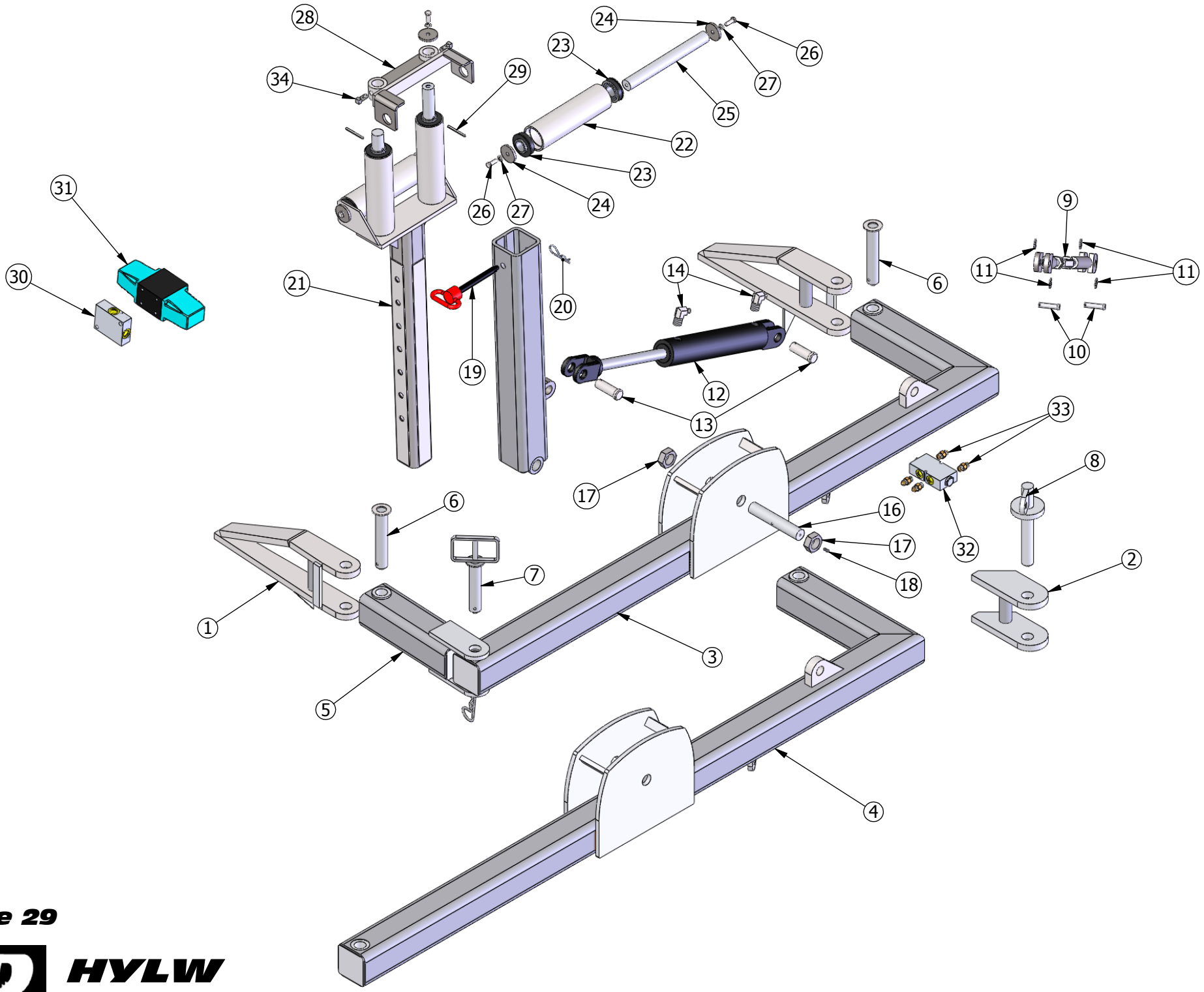
#11 + #12 are for Units with a Levelwind, Otherwise use (2) #10's

ITEM	PART NUMBER	DESCRIPTION	QTY.
1	J04005	Jack, Hydraulic Outriggers	2
2	C32015	Cylinder Outrigger	2
3	F05565	Fitting, 6-4 Elbow	4
4	P06200	Pin, Outrigger Cylinder Upper	2
5	C20040	Spacer, Outrigger Cylinder	4
6	P06165	Pin, Lower Outrigger	4
7	S04261	Screw, Set 1/2-13x1/2 CP	4
8	P01035	Pad, Hydraulic Outrigger	2
9	C29013	Cover, Outrigger Top	2
10	C29055	Cover, Outrigger Hoses	2
11	C29058	Cover, Outrigger Hoses RH	1
12	C29056	Cover, Outrigger Hoses LH	1
13	G09015	Guard, Fender Wiring	1
14	G09020	Guard, Fender Wiring	1
15	A03005	Alarm, motion	1
16	F05170	Fitting, -6 JIC bulkhead	4
17	G09021	Guard, Toggle Switch	1
18	S40150	Switch, DP/DT Momentary	2
19	V02075	Valve, Loadlock	2
20	F05755	Fitting, 6-6 Str SAE	8





ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	B11060	Bolt Hx head 7/8-9x3 Z8	2
2	P01020	Pad, Jackstand Large	2
3	S37010	5/8"-11 X 2" STUD	2
4	J01010	Jackstand, 985/6500	2
5	S17930	Sleeve, Jackstand bolt on LH	1
6	P06105	Pin, Clevis 1/2 x 2-1/2	2
7	W01005	Washer, Flat SAE 1/2"	4
8	P06933	Pin, Cotter 1/8x1 Z	2
9	H02015	Handle, Jackstand	2
10	S17935	Sleeve, Jackstand bolt on RH	1
11	W01585	Washer Split Lock 3/4	8
12	S04245	Screw SHCS 3/4-16x1-3/4	8
13	P06925	Pin, Cotter 1/8x2 Z	2
14	S28075	Spring, Jackstand / E.P.O.	2
15	P04005	Pawl, Jackstand 985/6500	2
16	P06104	Pin, Clevis 3/4 x 2-1/2	2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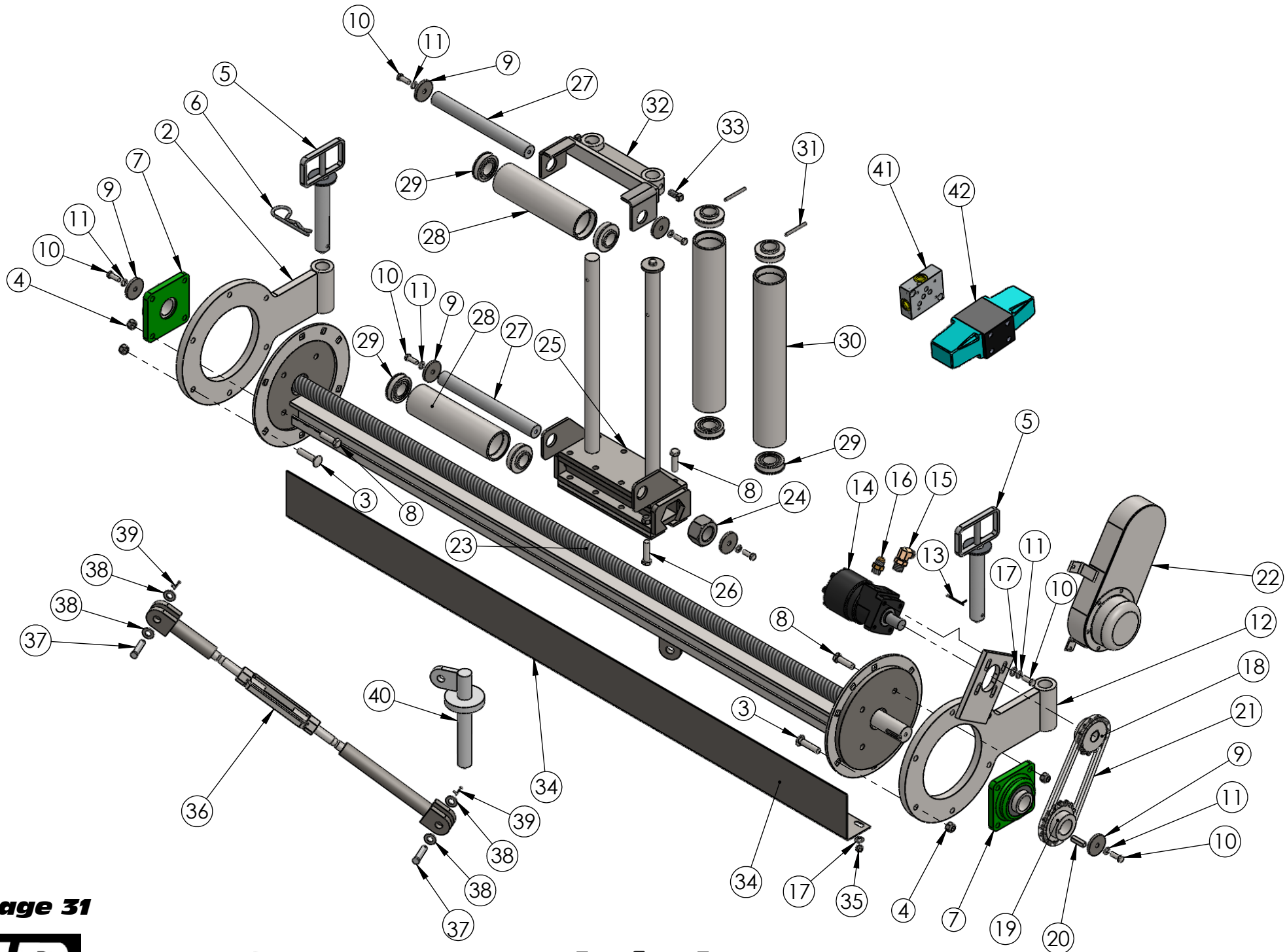
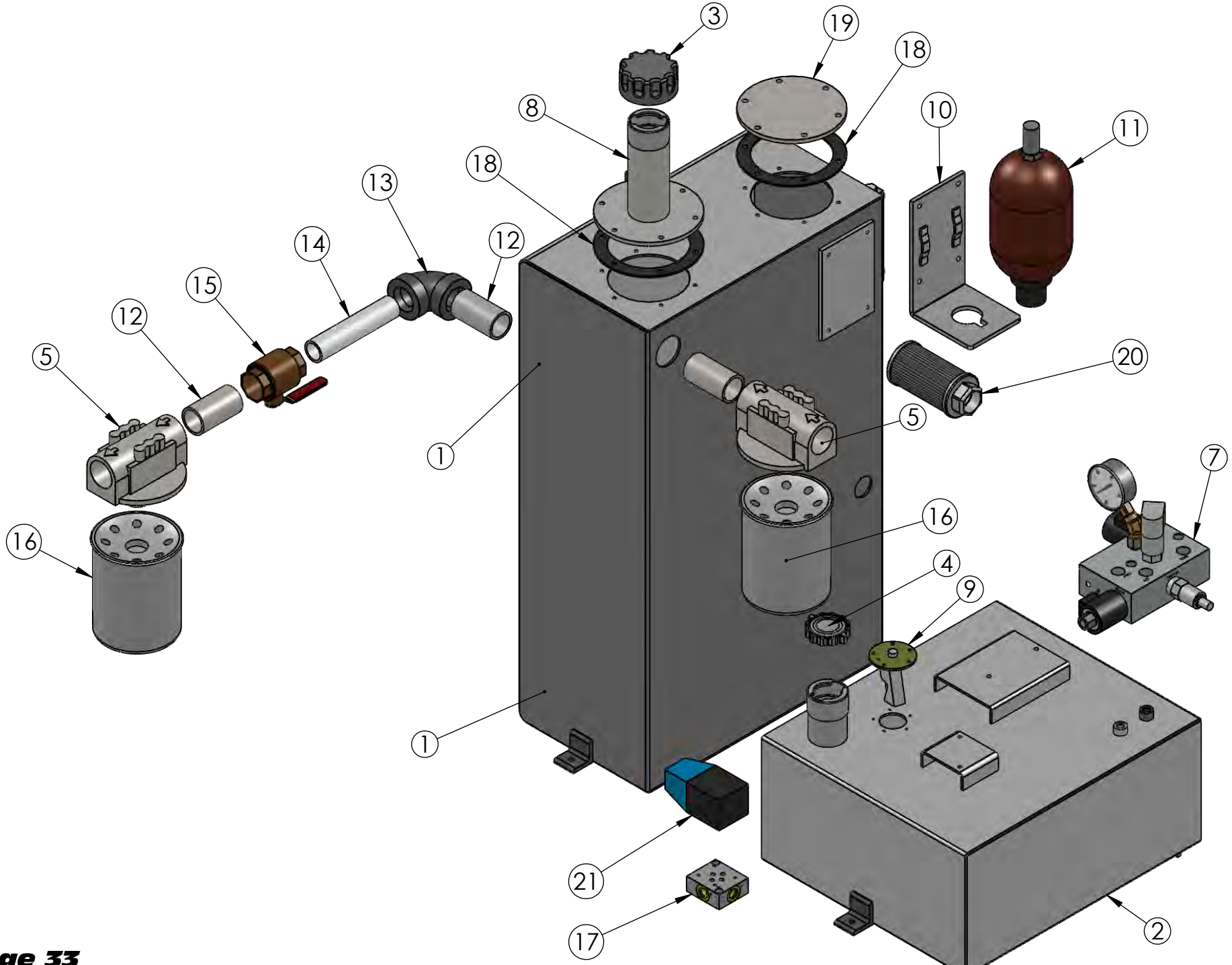
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	B15943	Bracket, Levelwind Std Fenders	1
2	B15230	Bracket, levelwind Lower	1
3	B15996	Levelwind Arm Standard	1
4	B15995	Levelwind Arm X/wide	1
5	B15997	Levelwind Short Arm	1
6	P06029	Pin, Levelwind Pivot	2
7	P06042	Pin, Levelwind	1
8	P06830	Pin Lower Pivot	1
9	T15905A	Turnbuckle Assembly	1
10	P06095	Pin, 1/2 x 2	2
11	W01005	Washer, Flat SAE 1/2"	4
12	C32020	Cylinder, Levelwind	1
13	P06073	Pin, 1x2-3/4	2
14	F05360	Fitting, 6-8 90° NPT	2
15	S17000	Sleeve, Levelwind	1
16	P06156	Pin, Levelwind Pivot	1
17	N04097	Nut Hex Jam 1-1/4-12	2
18	F05630	Fitting, 1/4-28 Zerk	1
19	P06027	Pin, 5/8 x 6 w/Handle	1
20	C17020	Clip, Hitch #20	1
21	A08089	Arm, Levelwind	1
22	R20044	Roller, Painted Steel	4
23	B07110	Bearing, Roller	8
24	C06041	Cap, End	5
25	S43129	Shaft, Roller	2
26	B11342	Bolt Hx head 3/8-16x1	5
27	W01545	Washer, Split Lock 3/8"	5
28	B15897	Bracket, Swing-away Fairlead	1
29	P06193	Pin, Roll 1/4 x 2-1/2	2
30	P09170	Plate, Sub	1
31	V02145	Valve Capstan/Levelwind	1
32	V02075	Valve, Loadlock	1
33	F05755	Fitting, 6-6 Str SAE	4
34	S04475	Screw, Set Sq Head 1/2 x 1	2
35	C17015	Clip, Hitch Pin 5"	1



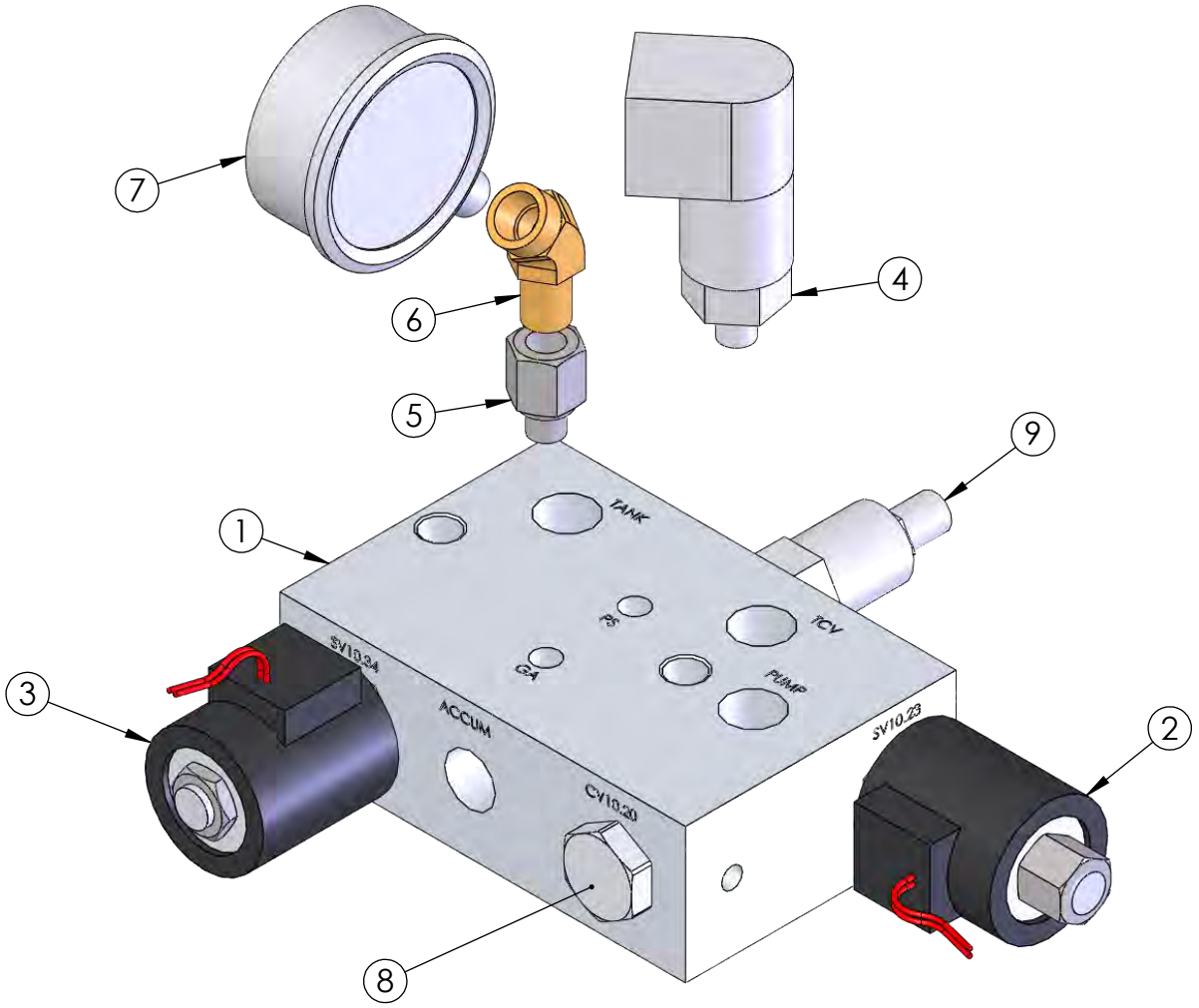
HPLW2 Screw Levelwind

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	F09060	Frame L/W Acme Screw	1
2	P09080	Plate L/W End	1
3	B11155	Bolt Carriage 1/2-13x2-1/4	12
4	N04555	Nut, Hex Nylock® 1/2"-13	36
5	P06155	Pin, Level Wind 7"	2
6	C17015	Clip, Hitch Pin 5"	1
7	B07130	Bearing	2
8	B11364	Bolt Hx head 1/2-13x1-3/4	16
9	C06041	Cap, End	7
10	B11342	Bolt Hx head 3/8-16x1	11
11	W01545	Washer, Split Lock 3/8"	11
12	P09078	Plate L/W end w/Motor	1
13	P06925	Pin, Cotter 1/8x2 Z	1
14	M08050	Motor, Hydraulic Drive	1
15	F05015	Fitting, 8 JIC to -8 SAE 90°	1
16	F05315	Fitting,8-8 Str SAE	1
17	W01002	Washer Flat SAE 3/8	10
18	S29080	Sprocket, 14 tooth #60	1
19	S29075	Sprocket, 16 tooth #60	1
20	K01028	Key, Drive LW2	1
21	C10155	Chain, Drive LW2	1
22	G09045	Guard, Chain HYLW2	1
23	S04115	Bar, Round 1-1/2 CD 1018	1
24	N04905	Nut, Hex 1-1/2-6	2
25	C37905A	Carrier, HYLW2	1
26	B11446	Bolt Hx head 1/2-13x2 Z8	8
27	S43129	Shaft, Roller	2
28	R20044	Roller, Painted Steel	2
29	B07110	Bearing, Roller	8
30	R20005	Roller, Vertical HYLW2	2
31	P06193	Pin, Roll 1/4 x 2-1/2	2
32	B15897	Bracket, Swing-away Fairlead	1
33	S04475	Screw, Set Sq Head 1/2 x 1	2
34	G09000	Guard, HYLW2	1
35	N04545	Nut, Hex Nylock® 3/8"-16	6
36	T15905A	Turnbuckle Assembly	1
37	P06095	Pin, 1/2 x 2	2
38	W01005	Washer, Flat SAE 1/2"	4
39	P06933	Pin, Cotter 1/8x1 Z	2
40	P06830	Pin Lower Pivot	1
41	P09170	Plate, Sub	1
42	V02145	Valve Capstan/Levelwind	1



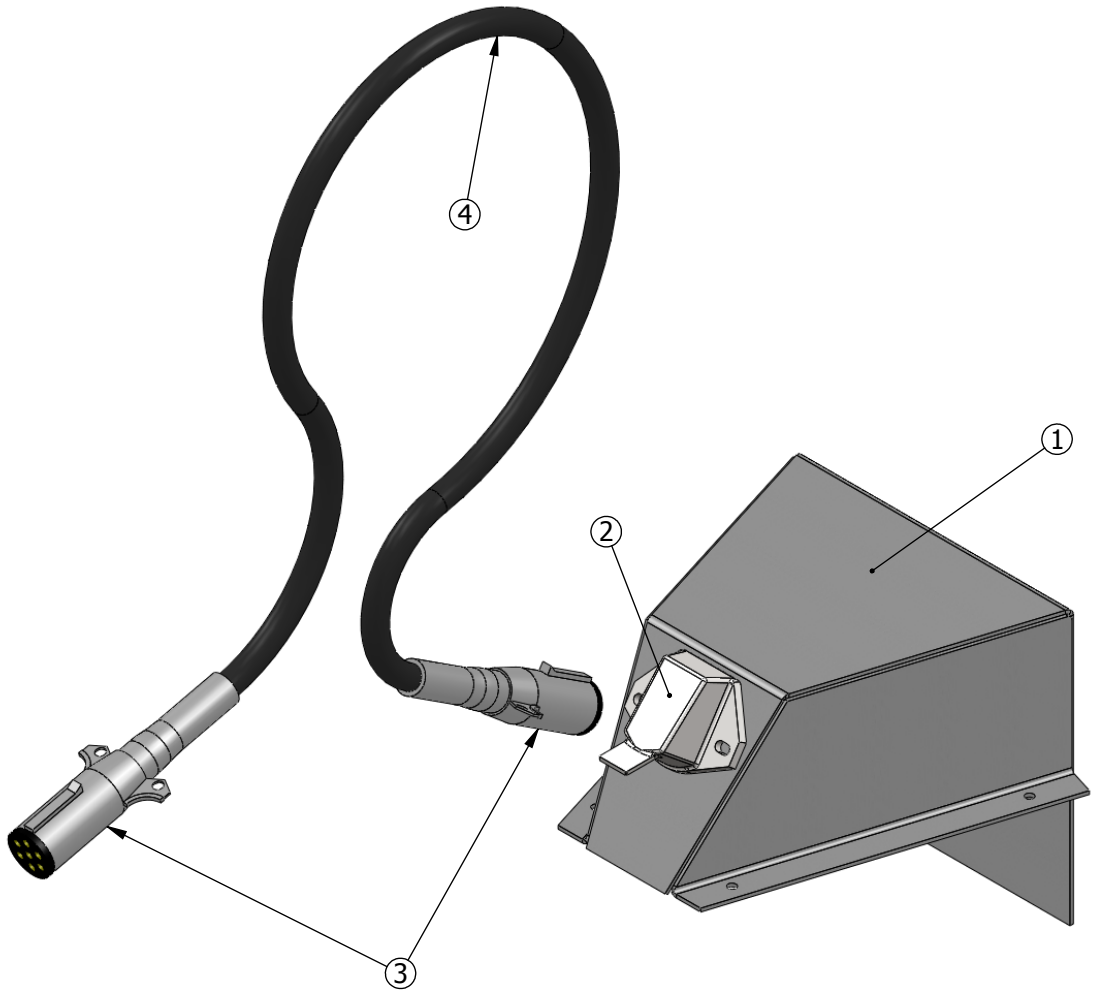
Tank Assembly

ITEM	PART NUMBER	DESCRIPTION	QTY.
1	T01002	Tank, Hydraulic 6500	1
2	T01001	Tank, Fuel 6500	1
3	C06155A	Cap, Hydraulic	1
4	C06205	Cap, Fuel	1
5	F04021	Filter Head	2
6	G02046	Gauge, Hyd oil level	1
7	Brake Manifold	Brake Manifold Assembly	1
8	N06200	Neck, Hydraulic Fill	1
9	S46015	Sender, Fuel Level	1
10	B15004	Bracket, Accumulator Mount	1
11	A12001	Accumulator, 1 gallon	1
12	N02001	Nipple, 1-1/4" x 3"LG	3
13	E01002	Elbow, 1-1/4" FNPT 90°	1
14	N02002	Nipple, 1-1/4" x 6"LG	1
15	V02001	Valve, Ball 1-1/4" NPT	1
16	F04020	Filter 10 micron	2
17	P09171	Plate, Sub shift	1
18	G01165	Gasket, Neck Fill	2
19	C29203	Cover, Tank Access	1
20	F04040	Filter, Suction Strainer	1
21	S40002	Switch, Hi-Low Shift	1



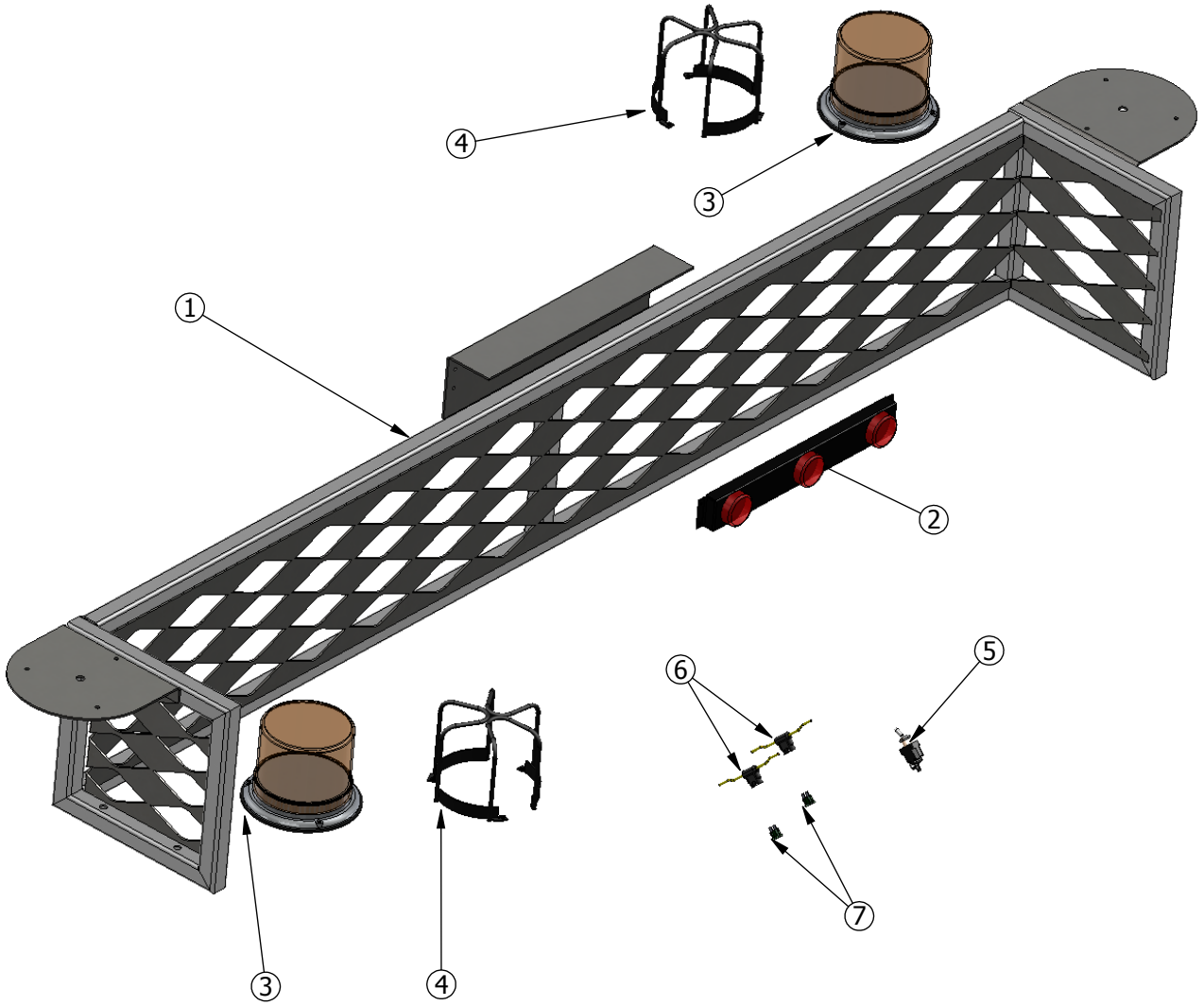
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	M04001	Manifold, Brake	1
2	V02066	Valve, 2Way Solenoid Cartridge	1
3	V02069	Valve, 3Way Solenoid Cartridge	1
4	S40001	PDI Switch	1
5	F05706	Fitting, 4-4 FNPT-SAE	1
6	F05018	-4 FNPT to -4 NPT 45°	1
7	G02035	0-5k psi bottom mount	1
8	V02067	Valve, check	1
9	V02068	Valve, relief	1

HD Brake Manifold



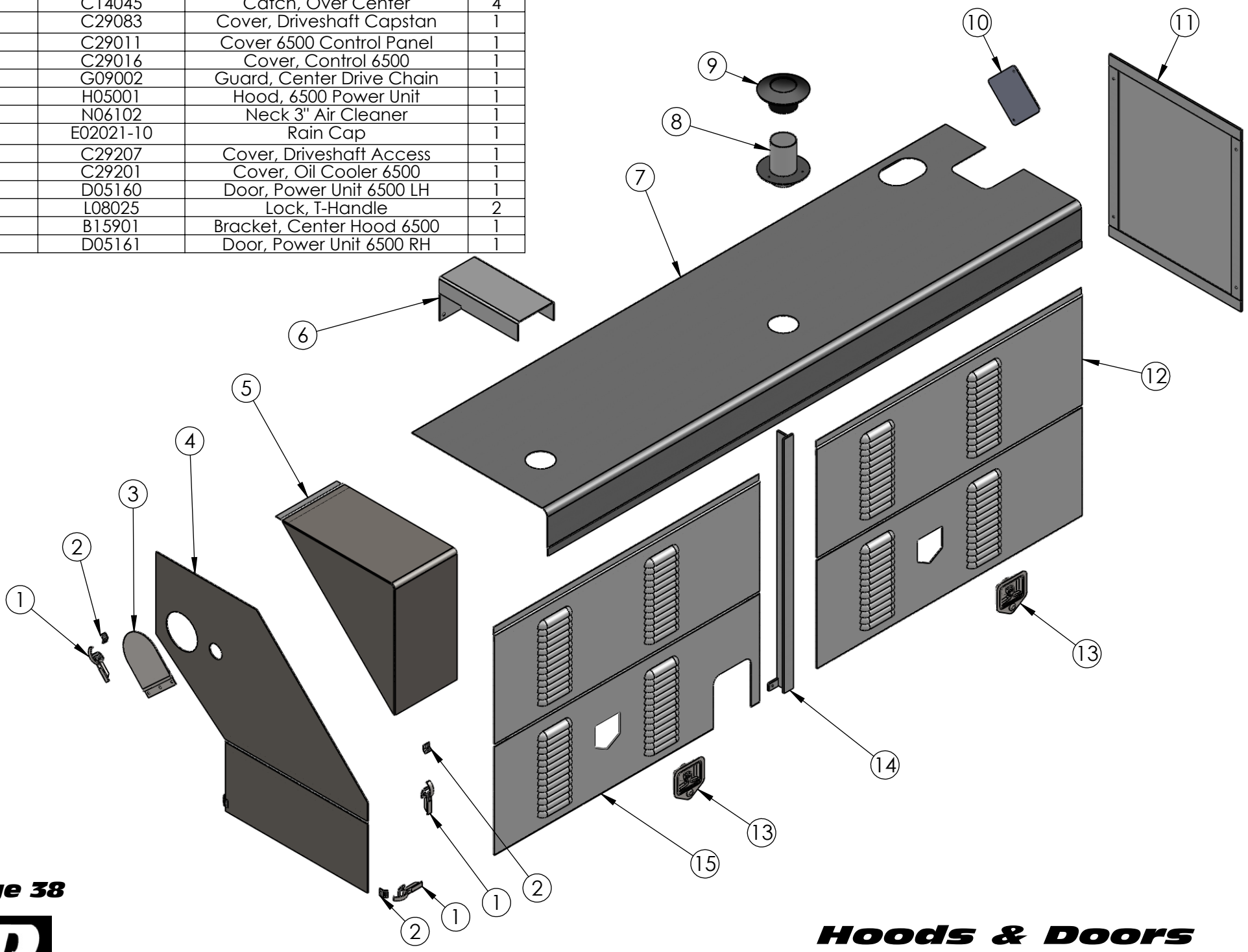
ITEM	PART NUMBER	DESCRIPTION	QTY.
1	H05070	Hood, Electrical 7 wire	1
2	S21035	Socket 7-wire Pollak	1
3	P10025	Plug, 7-Wire w/Spring	2
4	C02038-1	Cable	1

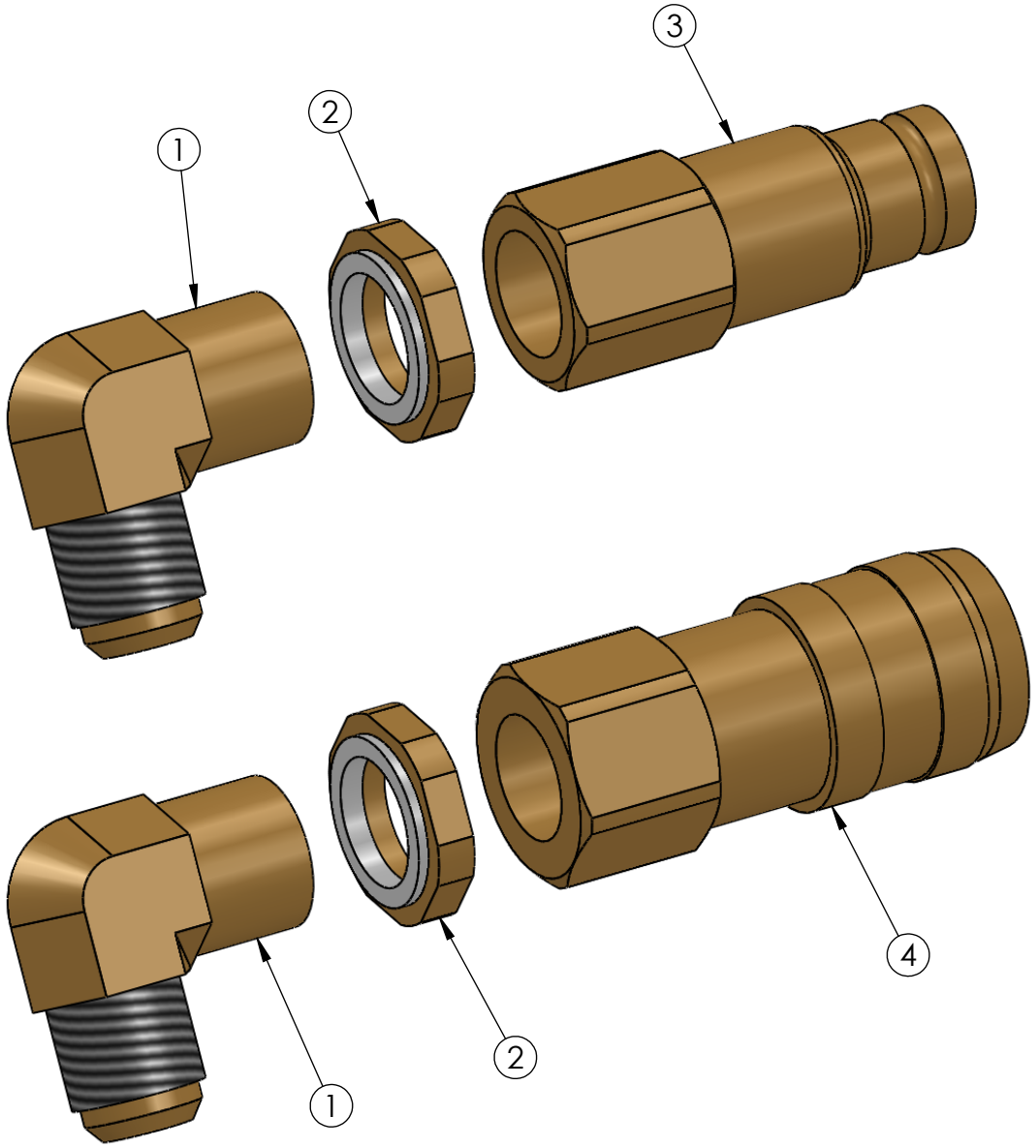
Electrical Hood



ITEM	PART NUMBER	DESCRIPTION	QTY.
1	S08001	Screen, HP6500 Power Unit	1
2	L04060	Light Bar, 3 light	1
3	L04105	Light, Amber Strobe	2
4	G09019	Guard, strobe	2
5	S40035	Switch, SP/ST Toggle	1
6	H10002	Holder, Fuse	2
7	F01002	Fuse, 30amp	2

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	L01020	Latch, Over center	4
2	C14045	Catch, Over Center	4
3	C29083	Cover, Driveshaft Capstan	1
4	C29011	Cover 6500 Control Panel	1
5	C29016	Cover, Control 6500	1
6	G09002	Guard, Center Drive Chain	1
7	H05001	Hood, 6500 Power Unit	1
8	N06102	Neck 3" Air Cleaner	1
9	E02021-10	Rain Cap	1
10	C29207	Cover, Driveshaft Access	1
11	C29201	Cover, Oil Cooler 6500	1
12	D05160	Door, Power Unit 6500 LH	1
13	L08025	Lock, T-Handle	2
14	B15901	Bracket, Center Hood 6500	1
15	D05161	Door, Power Unit 6500 RH	1

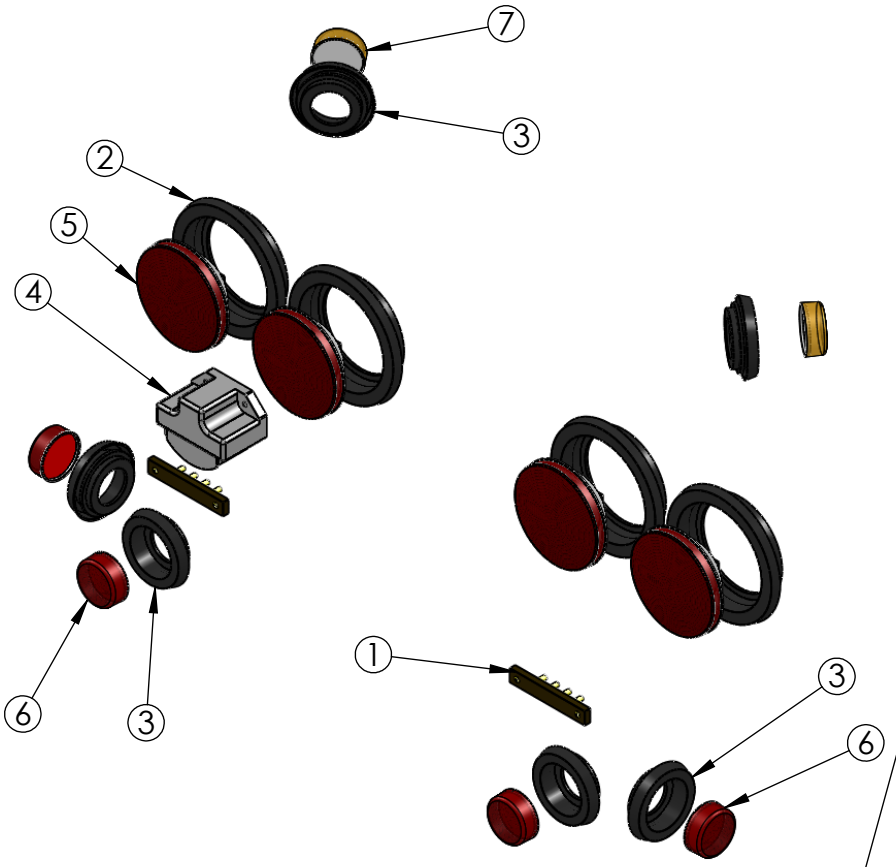


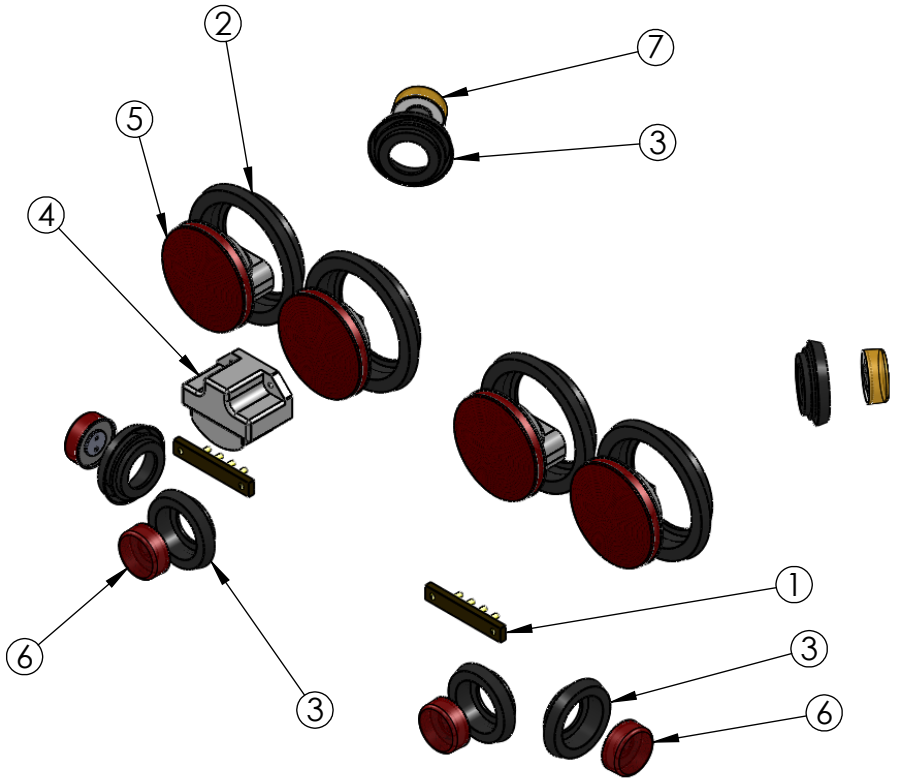


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	F05215	Fitting, 8-8 90° NPT	2
2	F05393	Fitting 1/2 NPT Jam nut	2
3	C28062	Coupler, M quick 1/2 NPT	1
4	C28061	Coupler, F quick 1/2 NPT	1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	B22050	Block, 4 Pole Terminal Strip	2
2	G08010	Grommet, 4" Tail/Stop/Turn	4
3	G08005	Grommet 2" Light	6
4	L04055	Light, License plate	1
5	L04030	Light, 4" Tail Stop Turn	4
6	L04070	Light, 2" Red	4
7	L04035	Light, 2" Amber	2

Standard Lights

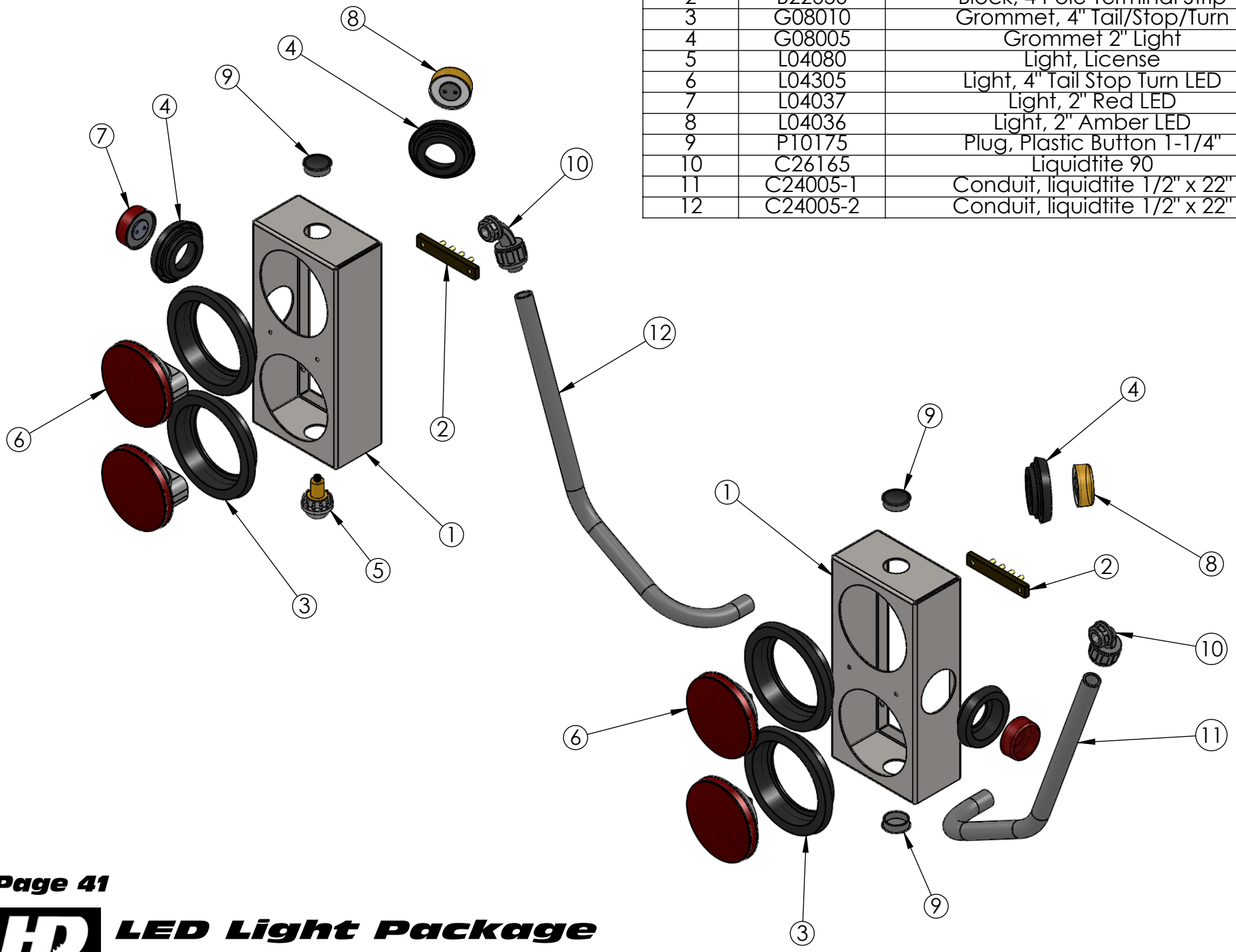




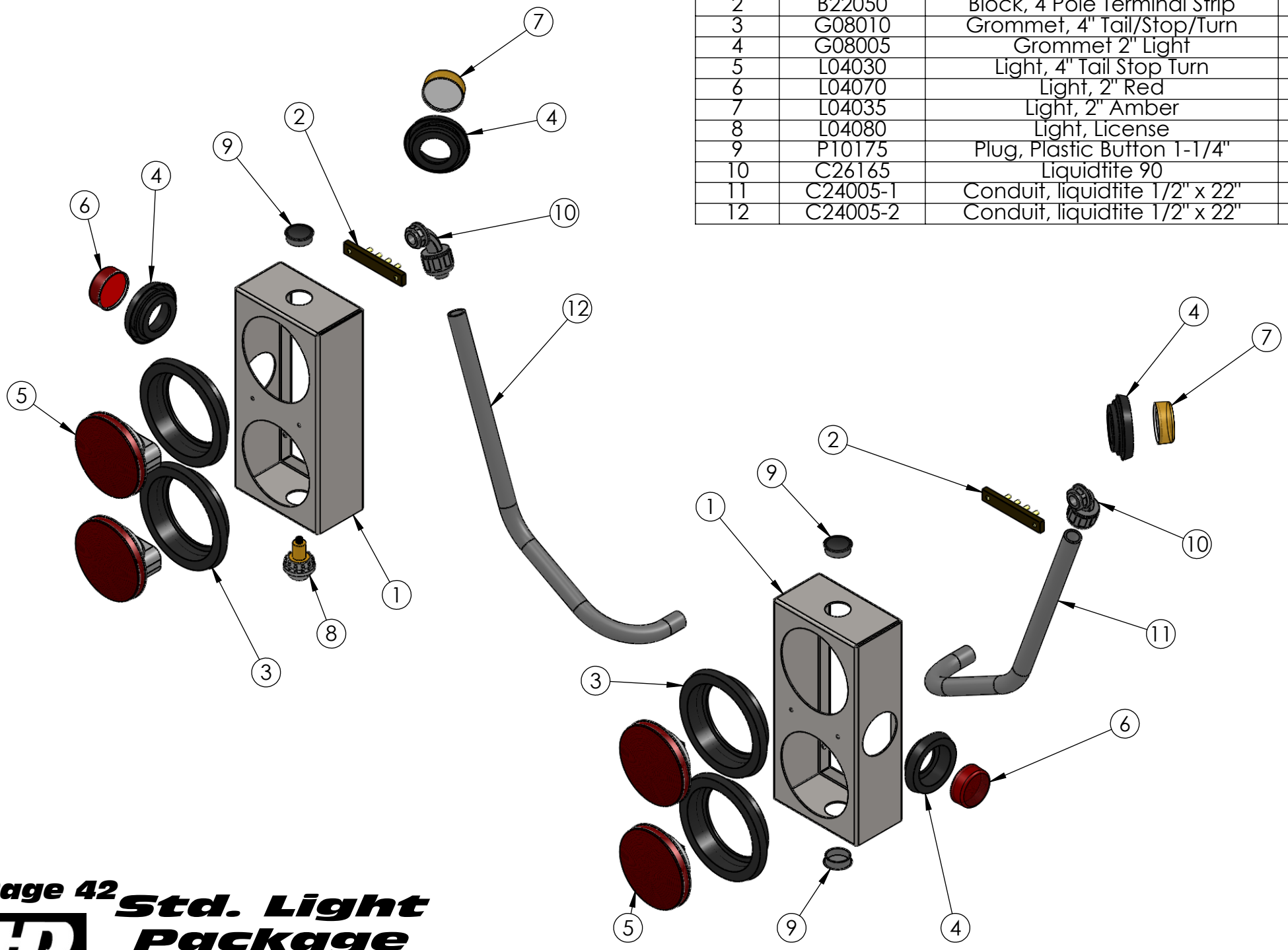
LED Lights

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	B22050	Block, 4 Pole Terminal Strip	2
2	G08010	Grommet, 4" Tail/Stop/Turn	4
3	G08005	Grommet 2" Light	6
4	L04055	Light, License plate	1
5	L04305	Light, 4" Tail Stop Turn LED	4
6	L04037	Light, 2" Red LED	4
7	L04036	Light, 2" Amber LED	2

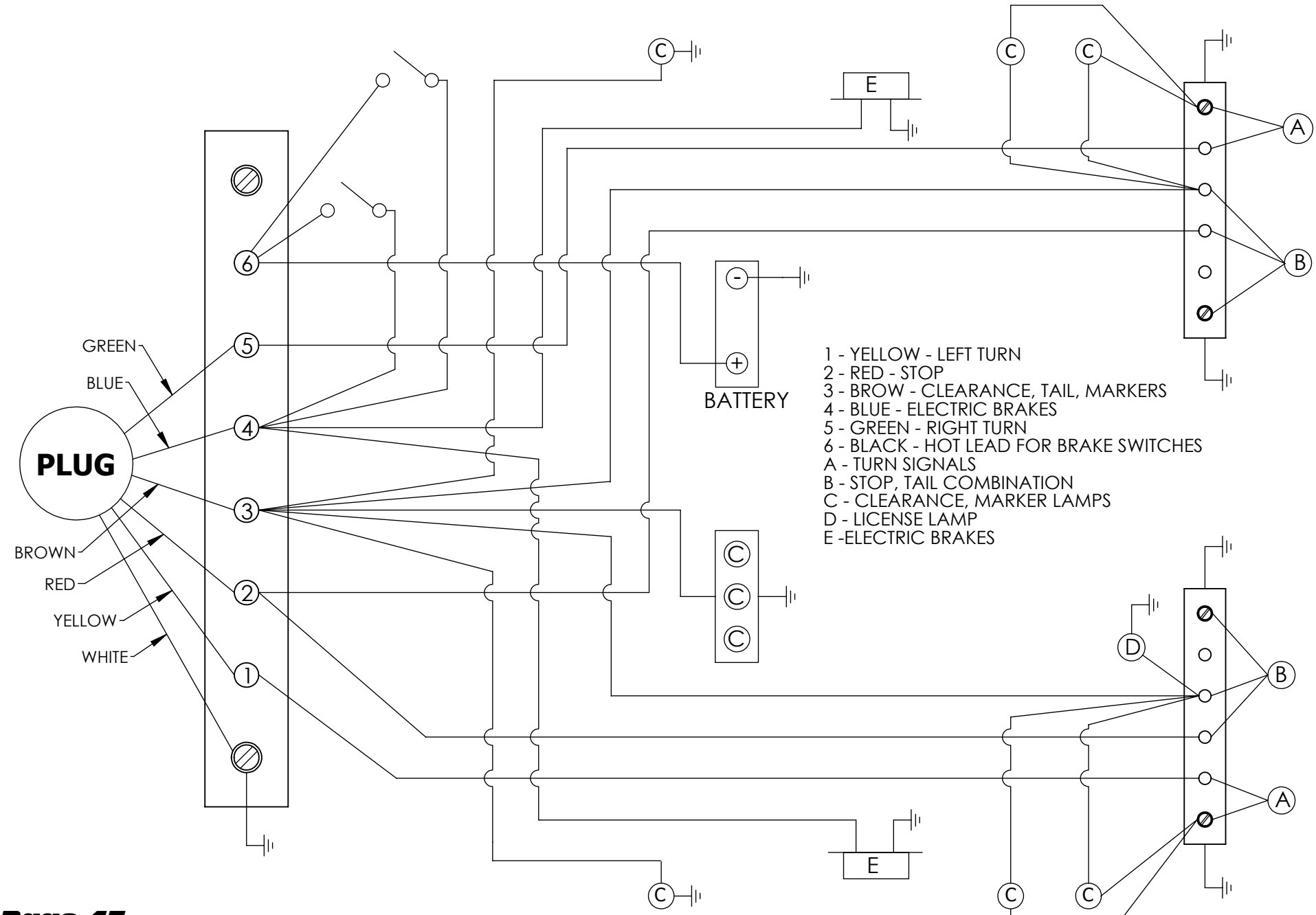
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	B13048	Box, light Vertical	2
2	B22050	Block, 4 Pole Terminal Strip	2
3	G08010	Grommet, 4" Tail/Stop/Turn	4
4	G08005	Grommet 2" Light	4
5	L04080	Light, License	1
6	L04305	Light, 4" Tail Stop Turn LED	4
7	L04037	Light, 2" Red LED	2
8	L04036	Light, 2" Amber LED	2
9	P10175	Plug, Plastic Button 1-1/4"	3
10	C26165	Liquidtite 90	2
11	C24005-1	Conduit, liquidtite 1/2" x 22"	1
12	C24005-2	Conduit, liquidtite 1/2" x 22"	1



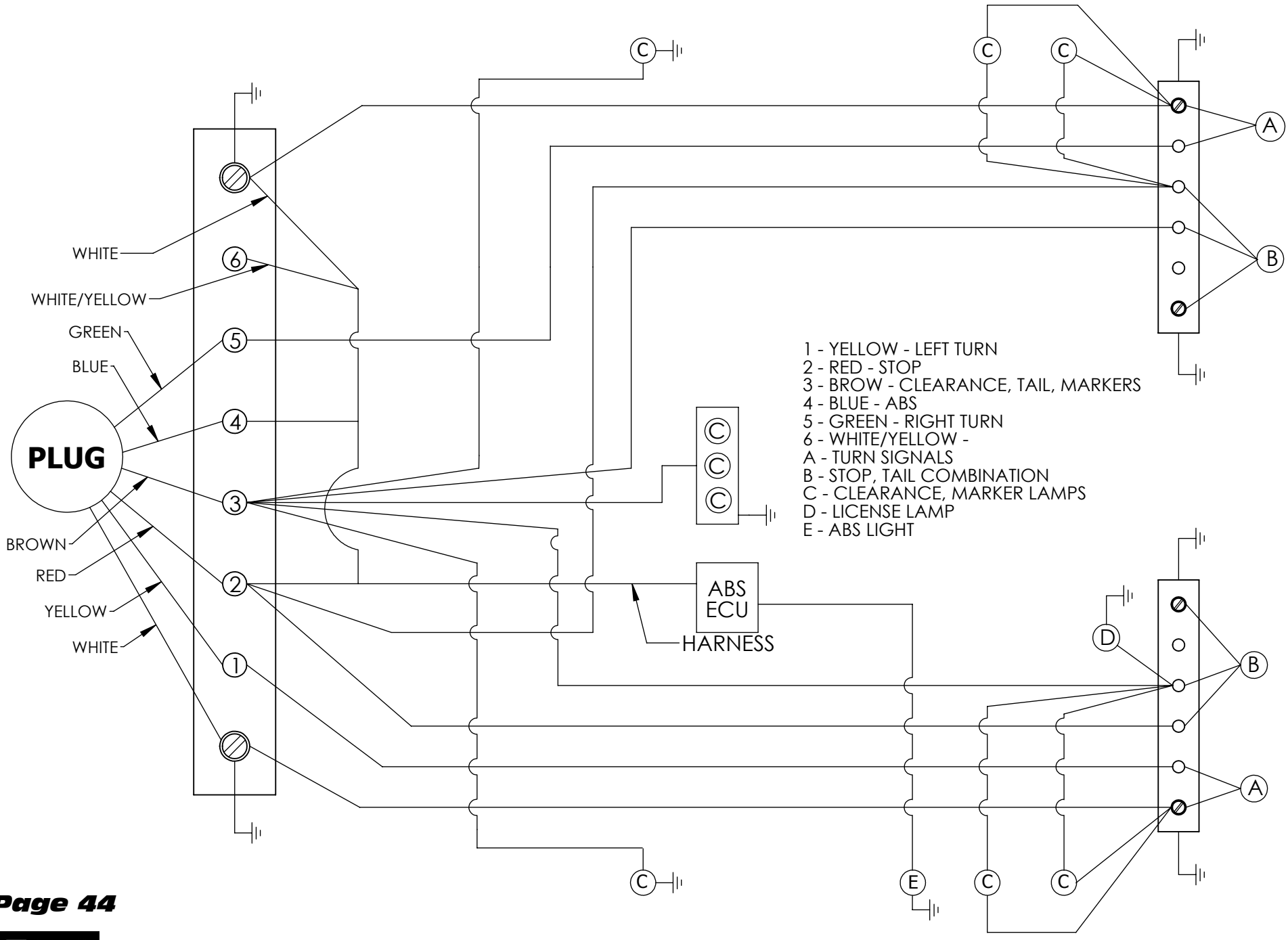
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	B13048	Box, light Vertical	2
2	B22050	Block, 4 Pole Terminal Strip	2
3	G08010	Grommet, 4" Tail/Stop/Turn	4
4	G08005	Grommet 2" Light	4
5	L04030	Light, 4" Tail Stop Turn	4
6	L04070	Light, 2" Red	2
7	L04035	Light, 2" Amber	2
8	L04080	Light, License	1
9	P10175	Plug, Plastic Button 1-1/4"	3
10	C26165	Liquidtite 90	2
11	C24005-1	Conduit, liquidtite 1/2" x 22"	1
12	C24005-2	Conduit, liquidtite 1/2" x 22"	1



Std. Light Package



HP6500 Trailer Wiring
With Electric Brakes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WHITE/YELLOW
GREEN
BLUE
PLUG
BROWN
RED
YELLOW
WHITE
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A
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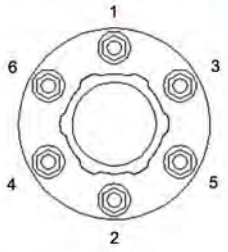
B
A
D
E
ABS
ECU
HARNESS
1 - YELLOW - LEFT TURN
2 - RED - STOP
3 - BROW - CLEARANCE, TAIL, MARKERS
4 - BLUE - ABS
5 - GREEN - RIGHT TURN
6 - WHITE/YELLOW -
A - TURN SIGNALS
B - STOP, TAIL COMBINATION
C - CLEARANCE, MARKER LAMPS
D - LICENSE LAMP
E - ABS LIGHT

Torque Specifications

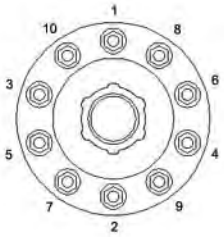
HUBS (For Ball Seat Mounted Disc Wheels)
6 and 10 Stud Hubs
Applies to 3/4-16 and 1 1/8-16 Fastener Sizes
RECOMMENDED TORQUE DRY: 450-500 ft. lbs.

INNER CAP NUTS - First tighten cap nuts to 50 ft. lbs. using sequence shown. Then tighten cap nuts to recommended torque (450-500 ft. lbs. DRY) using sequence shown.

OUTER CAP NUTS - First tighten cap nuts to 50 ft. lbs. using sequence shown. Then tighten cap nuts to recommended torque (450-500 ft. lbs. DRY) using sequence shown.



6-STUD



10-STUD

Recheck torque after first 50 to 100 miles of service and retorque as required to recommended torque specifications.
NOTE: In all applications where an aluminum disc wheel is to be installed, a special inner cap nut must be substituted for the standard inner cap nut.

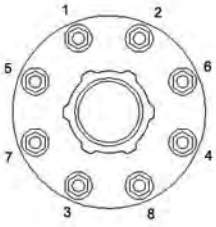
HUBS (For Pilot Mounted Disc Wheels)
8 and 10 Stud Hubs
Applies to M22 x 1.5 studs/two piece flange nuts
RECOMMENDED TORQUE: 450-500 ft.lbs.

All threads are right hand metric.

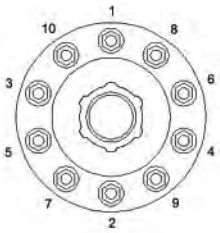
First tighten flange nuts to 50 ft. lbs. using sequence shown.

Check disc-wheels for proper positioning on pilots and proper seating against flange.

Then tighten flange nuts to recommended torque (450-500 ft. lbs.) using sequence shown.



8-STUD



10-STUD

Recheck torque after first 50 to 100 miles of service and retorque as required to recommended torque specifications.

SPOKE WHEELS

Applies to 3/4-10 Fastener Sizes

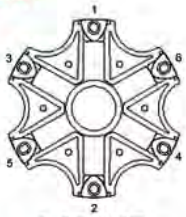
RECOMMENDED TORQUE DRY: 200-260 ft. lbs.

TIGHTEN CLAMPS EVENLY IN THIS ORDER

3 SPOKE

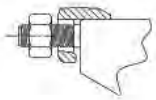
TIGHTEN CLAMPS EVENLY IN THIS ORDER

5 SPOKE



6 SPOKE

Recheck rim nut torque after first 50 to 100 miles of service and retorque as required to recommended torque specifications.



Heel-less clamps do not depend on a fulcrum at the bottom of the clamp to produce the force to wedge the rims.

Heel of clamp does not touch wheel.

HEEL-LESS CLAMP

Gap permissible but not required - if gap exceeds 1/4" or if clamp bottoms out before reaching 80% of recommended torque, check to insure that the proper clamps and spacer are being used.

HEEL TYPE CLAMP

IMPORTANT: Do not overtorque! Rim clamp does not have to heel. Overtorquing can deform rim spacer and damage back flange.

BRAKE DRUM or ROTOR ASSEMBLY TORQUE SPECIFICATIONS for Mounting Bolts (Grade 8 Fasteners)

		Torque Requirements Foot Pounds				Torque Requirements Foot Pounds	
Thread Size		Minimum	Maximum	Thread Size		Minimum	Maximum
5/8-18 (Tapped Holes)	Rotate Bolt	150	200	3/4-16 (Wheels)	Rotate Nut	275	300
5/8-18 (Through Holes)	Rotate Nut	150	175	3/4-16 (Hubs)	Rotate Nut	100	225
3/4-10	Rotate Nut	250	275	1-14	Rotate Nut	175	225

Note: All fastener parts must be clean and dry.

WARNING

This brochure contains information taken from our Installation, Service and Safety Instructions Manual. Copies of the complete manual can be obtained at no cost by contacting our Sales Department at the address shown below.

Read and Understand the Installation, Service and Safety Instructions Manual before installing or servicing the hub. Failure to do so may result in personal injury or death, and may result in a compromise of your vehicle's safety through loss or failure of a wheel or compromise of the braking system.

The symbol shown above is used to call your attention to instructions concerning your personal safety and the safety of others. Watch for this symbol. It points out important safety precautions. It means "ATTENTION! Become Alert! Your personal safety is involved!" Read the message that follows and be alert to the risk of personal injury or death.

"The employer shall instruct each employee in the recognition and avoidance of unsafe conditions and the regulations applicable to his work environment to control or eliminate any hazards or other exposure to illness or injury." Ref: 29CFR 1926.20 (b) (4) (a) (2)

It is understood that safety rules within individual companies vary. If a conflict exists between the material contained in the manual and the rules of a using company, the more stringent rules should take precedence.

Webb Wheel Products, Inc. Aftermarket Business Unit www.webbwheel.com

The following lubrication instructions are offered as a “rule of thumb”. Precise lubrication instructions will vary with each usage of each unit. **CHECK ALL LUBRICATION POINTS BEFORE EACH USE.**

ENGINE: Consult engine manual for precise instructions. Units are delivered by Hogg & Davis, inc. with 10W-40 oil.

HYDRASTATIC DRIVE SYSTEM: This drive system is practically maintenance free, however the oil should be changed every six months with **ISO 46** or its equivalent. There are two oil filters that should be changed at this time. (Refer to schematic) One is a high pressure filter and has a restriction gauge on it. (Located inside control panel) This gauge should be checked daily, if it reaches the red line the filter should be changed immediately.

DO NOT USE ANY LUBRICANT HEAVIER THAN RECOMMENDED

WHEEL BEARINGS: Should be checked and adjusted after **FIRST 30 DAYS OF USE.** Bearings should be repacked yearly or as per company specifications.

IDLER WHEEL: Lubricate every 30 days. Zerk fittings are provided for proper application of grease. Lubricate all parts, including spindle housing, “A” frame supports and hydraulic cylinder linkage. Spindle bearings are packed at the factory and need not to be checked for 5 years.

DRIVE ROLLERS: Sealed bearings

SPROCKET ASSEMBLIES: Lubricate once a week. Zerk fittings are provided for proper grease application.

ROLLER CHAIN: Lubricate roller chains weekly. Use regular lube oil to oil all chains. Including drive roller chains, main drive chain (Oil cup provided) and power idler wheel chain.

DRIVE SHAFT BEARINGS: Lubricate as required. It is recommended that the track be kept clean of grease and dirt buildup, and fresh lube be applied after each cleaning.

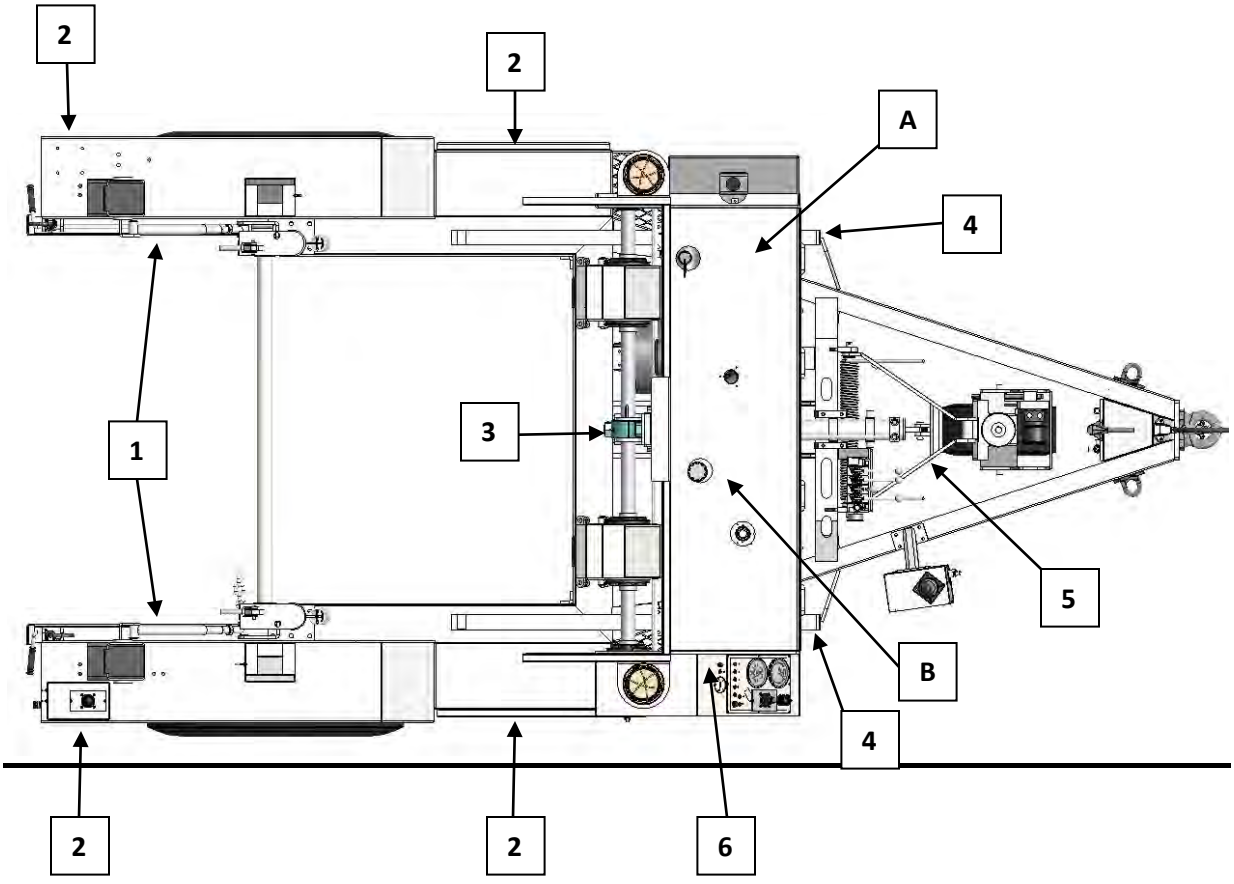
TOOL BOX DOORS: Lubricate as required. Hinges and locks should be lubricated with oil as needed for easy operation.

CAUTION: OILS SHOULD NOT BE MIXED. IF BRAND OR TYPE IS CHANGED, OLD OIL MUST BE DRAINED AND ALL FILTERS MUST BE CHANGED AND NEW OIL REPLACED THROUGHOUT THE SYSTEM.

HYDRAULIC OIL: Machine is delivered with **ISO 46** oil.

DO NOT USE AIRCRAFT TYPE HYDRAULIC FLUID.

ITEM		CHECK	LUBE TYPE	PERIOD
A	ENGINE	DIPSTICK	10W-40	DAILY
B	HYD. RESERVOIR	SIGHT GAUGE	ISO 46	DAILY
1	MANDREL STABILIZER	ZERKS (3)	MULTI-PURPOSE GREASE	WEEKLY
2	DOORS, HINGES	OPEN	LUBE OIL	AS NEEDED
3	REEL DRIVE	ZERKS (7)	MULTI-PURPOSE GREASE	WEEKLY
4	SLIDE RAILS	OPEN (2)	MULTI-PURPOSE GREASE	AS NEEDED
5	IDLER WHEEL	ZERKS (6)	MULTI-PURPOSE GREASE	WEEKLY
6	DRIVE CHAIN	OIL CUP	LUBE OIL	CHECK DAILY



D30001
(1)

D30009
(1)

Tier 4

D30027
(1)

D30010
(1)

D30015
(1)

D30023
(2)

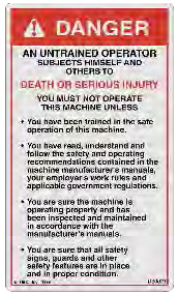
D30032
(1)

D30018
(1)

D30053
(2)

D30034
(2)

D30022
(1)



D30021
(1)

D30026
(2)

D30028
(5)

D30036
(3)

D30037
(1)

D30042
(8)

D30069
(1)

R09043
(4)

R09044
(2)

D30002
(1)

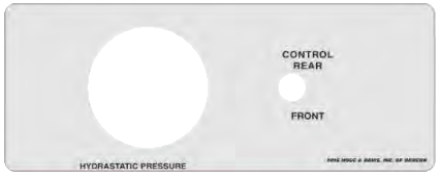
D30111
(1)

D30020
(1)

D30024
(1)

D30030
(1)

Tier 4



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(1)

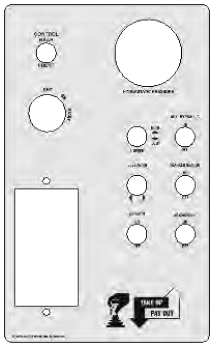
D30029
(1)

D30025
(1)

D30128
(1)

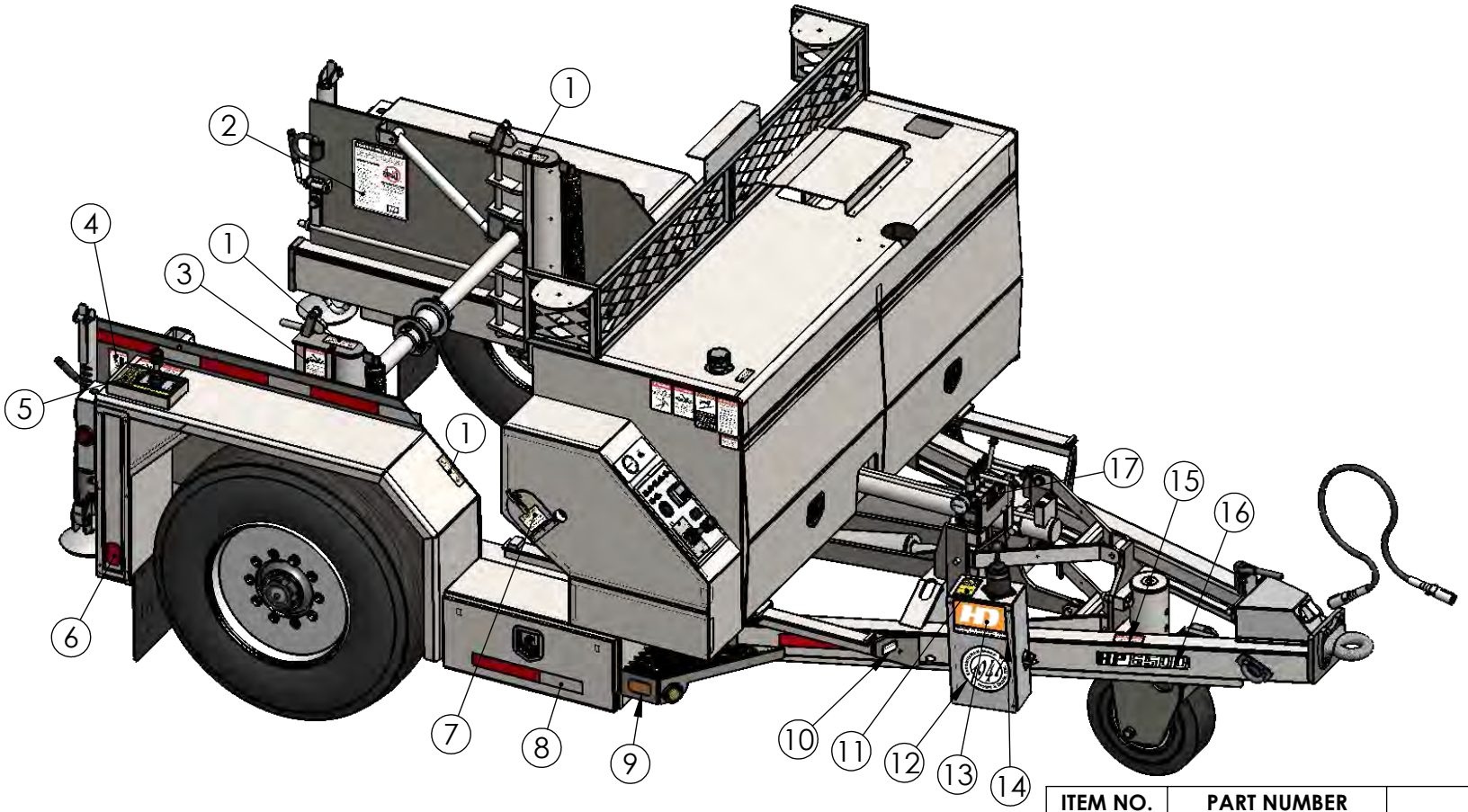
D01013
(1)

Tier 4



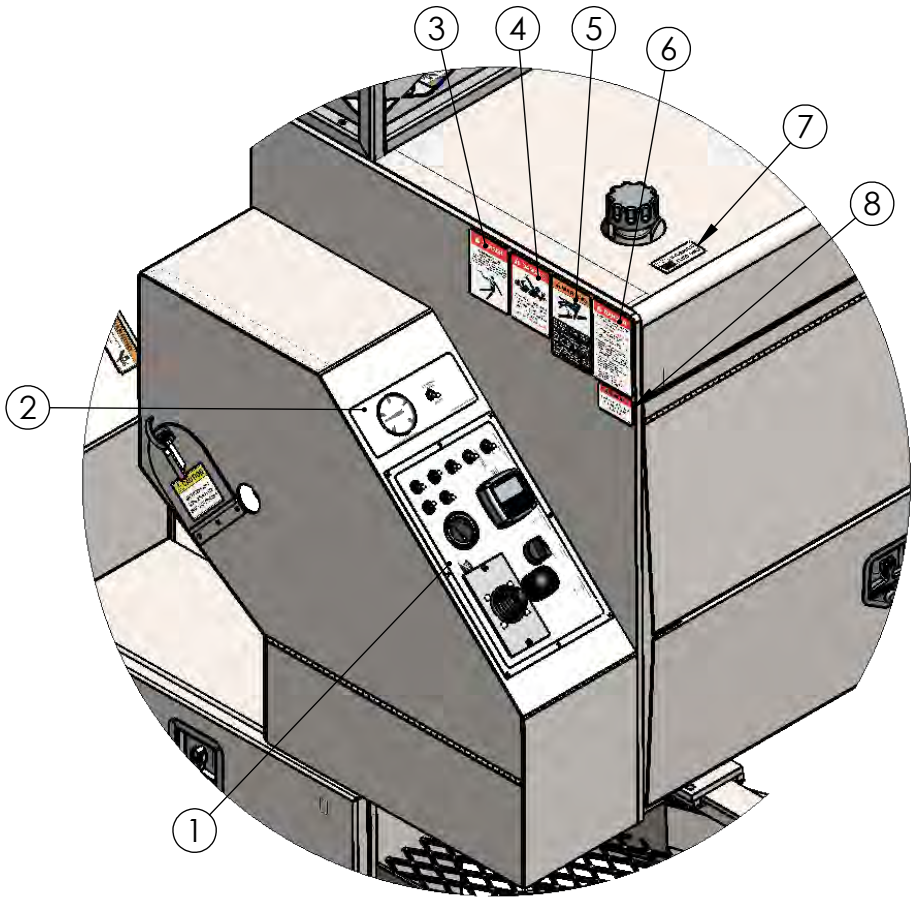
D30057
(1)

D30150
(1)



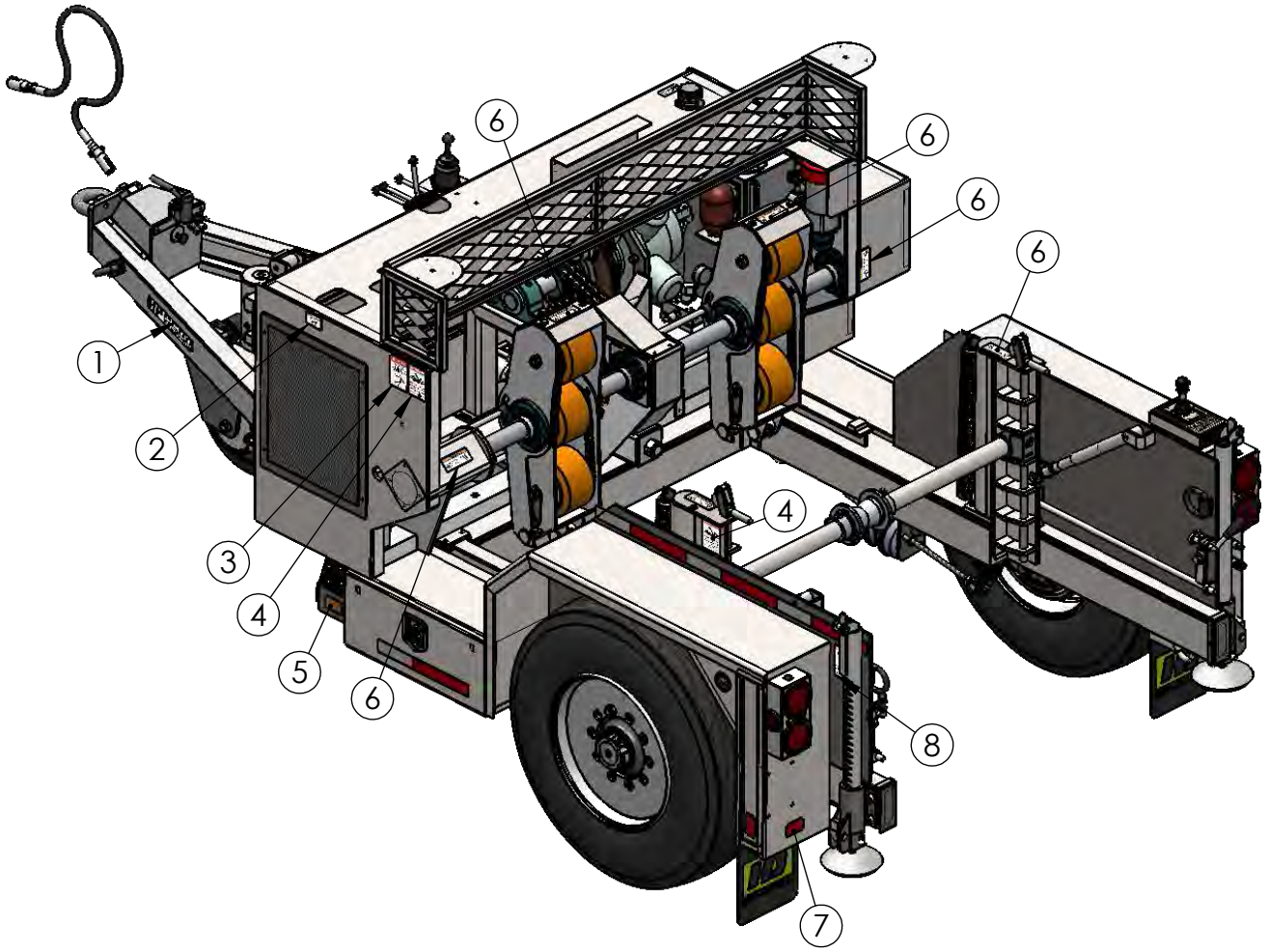
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	D30042	Decal, Keep Hands Clear	8
2	D30002	Decal, Loading Instructions	1
3	D30028	Decal, Danger Twisty Man	5
4	D30026	Decal, Danger Stand Clear	2
5	D30111	Decal, Rear Control	1
6	R09043	Reflector, Red 2x3-1/2	4
7	D30023	Decal, Caution Extended Shaft	1
8	T19001	Red/White Reflective tape	10
9	R09044	Reflector, Amber 2x3-1/2	2
10	D30034	Decal, Grounding Lug	2
11	D30025	Decal, Steer-Go Directions	1
12	D30128	Established 1947	1
13	D30001	HD Logo 6x9	1
14	D30018	Decal, HD 1/2" x 9"	1
15	D30037	Decal, Important - Idler Wheel	1
16	D30053	Decal, Hydra 985 Tongue	2
17	D01013	Decal, 4 Bank Valve	1

Decal Locations



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	D30150	Decal, Control Panel T4f	1
2	D30151	Decal, Control Panel Hydrostatic	1
3	D30036	Decal, Electrocution Hazard	3
4	D30028	Decal, Danger Twisty Man	5
5	D30022	Decal, Danger Fluid Pressure	1
6	D30021	Decal, Untrained Operator	1
7	D30010	Decal, Hydraulic Fluid Only	1
8	D30032	Decal, Check Oil Daily	1

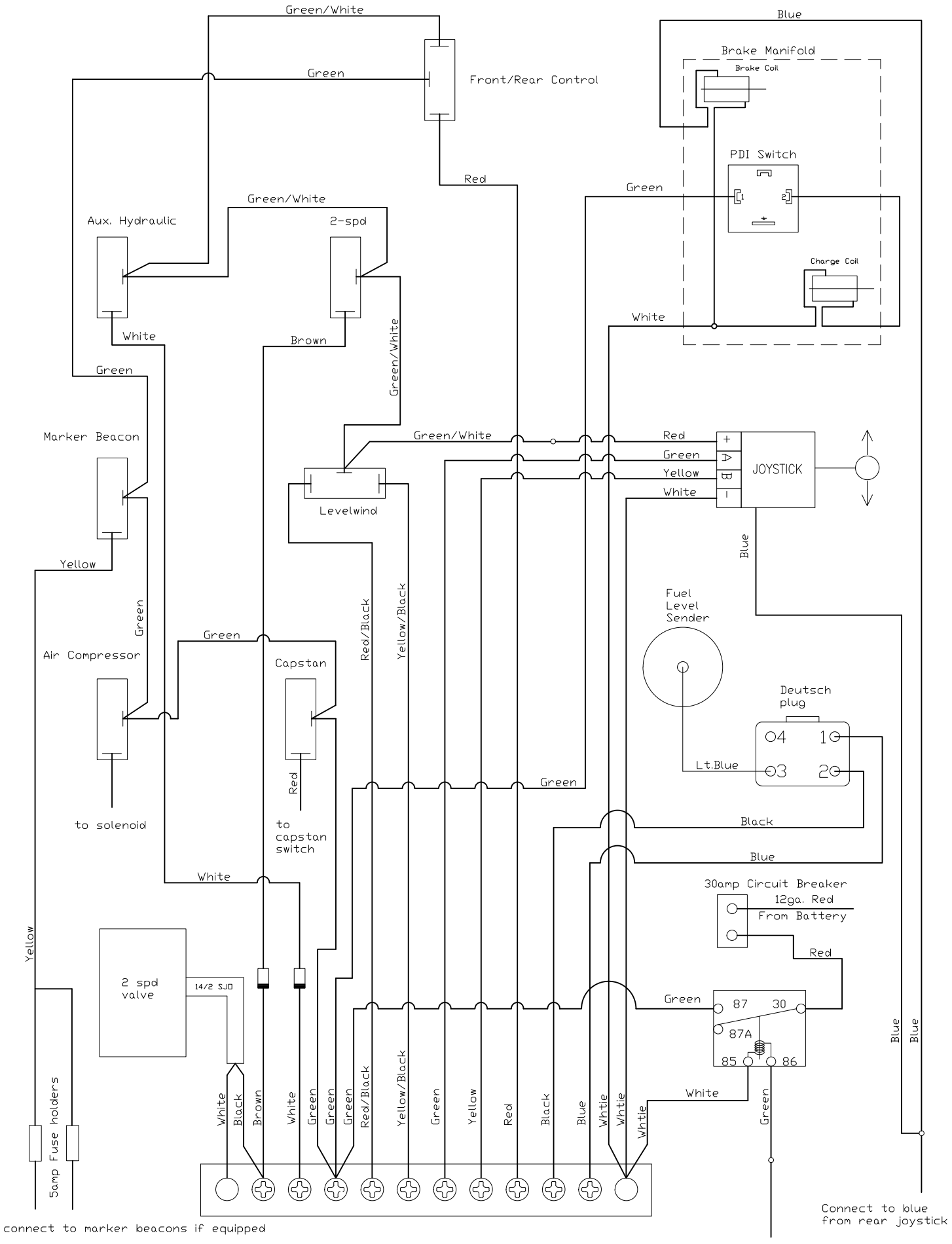
Decal Locations

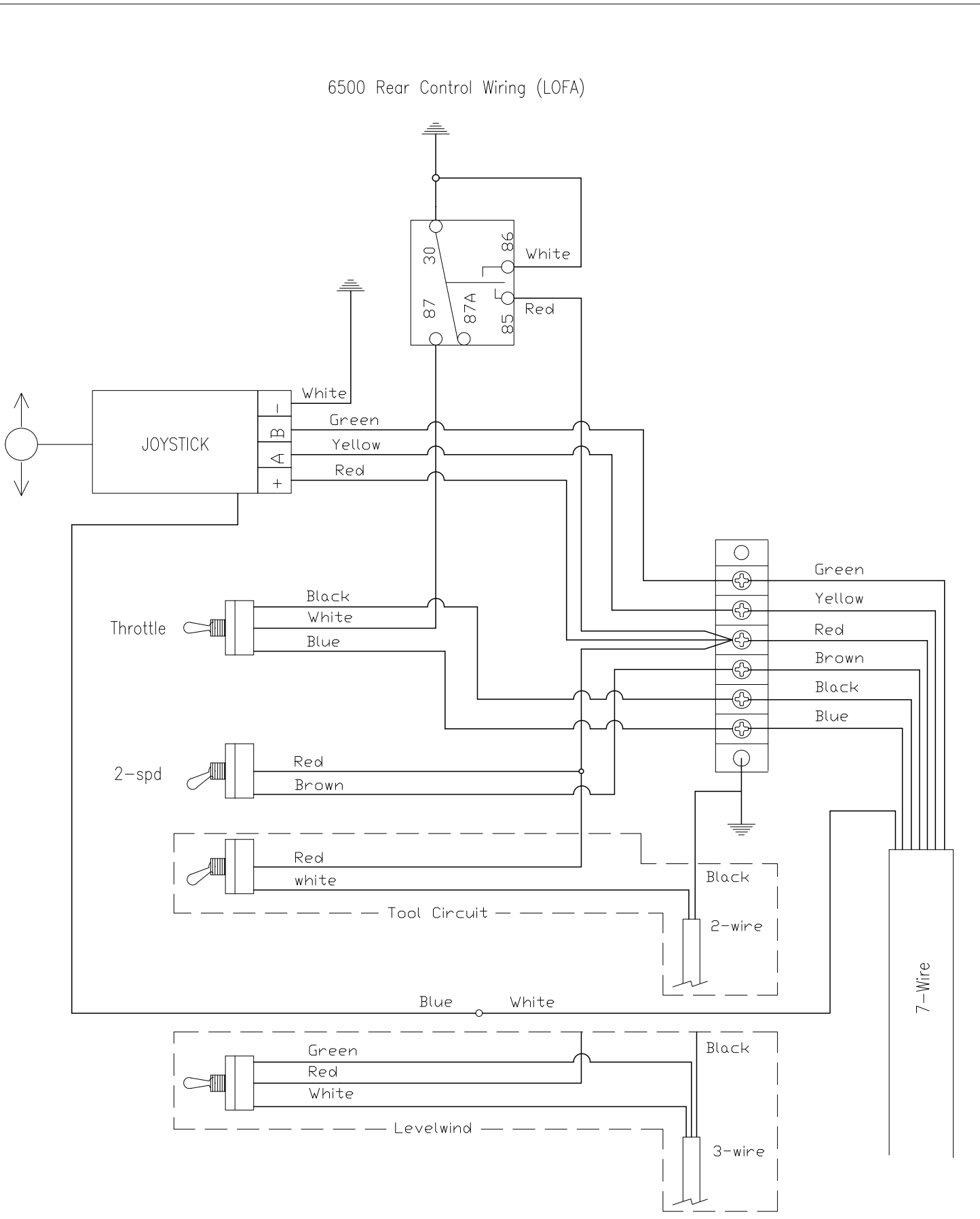


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	D30053	Decal, Hydra 985 Tongue	2
2	D30015	Decal, Hot Surface	1
3	D30036	Decal, Electrocution Hazard	3
4	D30028	Decal, Danger Twisty Man	5
5	R09044	Reflector, Amber 2x3-1/2	2
6	D30042	Decal, Keep Hands Clear	8
7	R09043	Reflector, Red 2x3-1/2	4
8	D30026	Decal, Danger Stand Clear	2

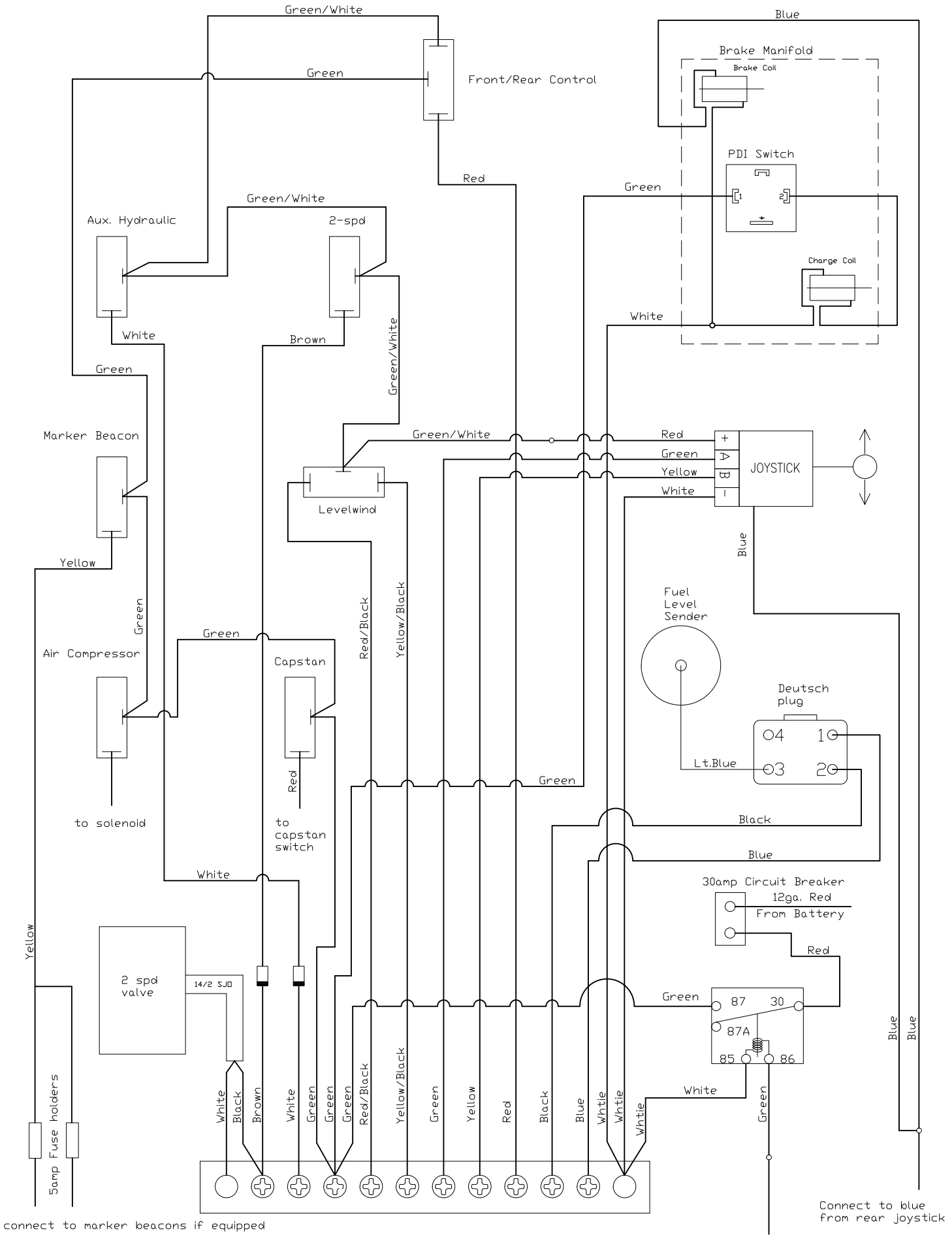
Decal Locations

6500 Control Panel LOFA

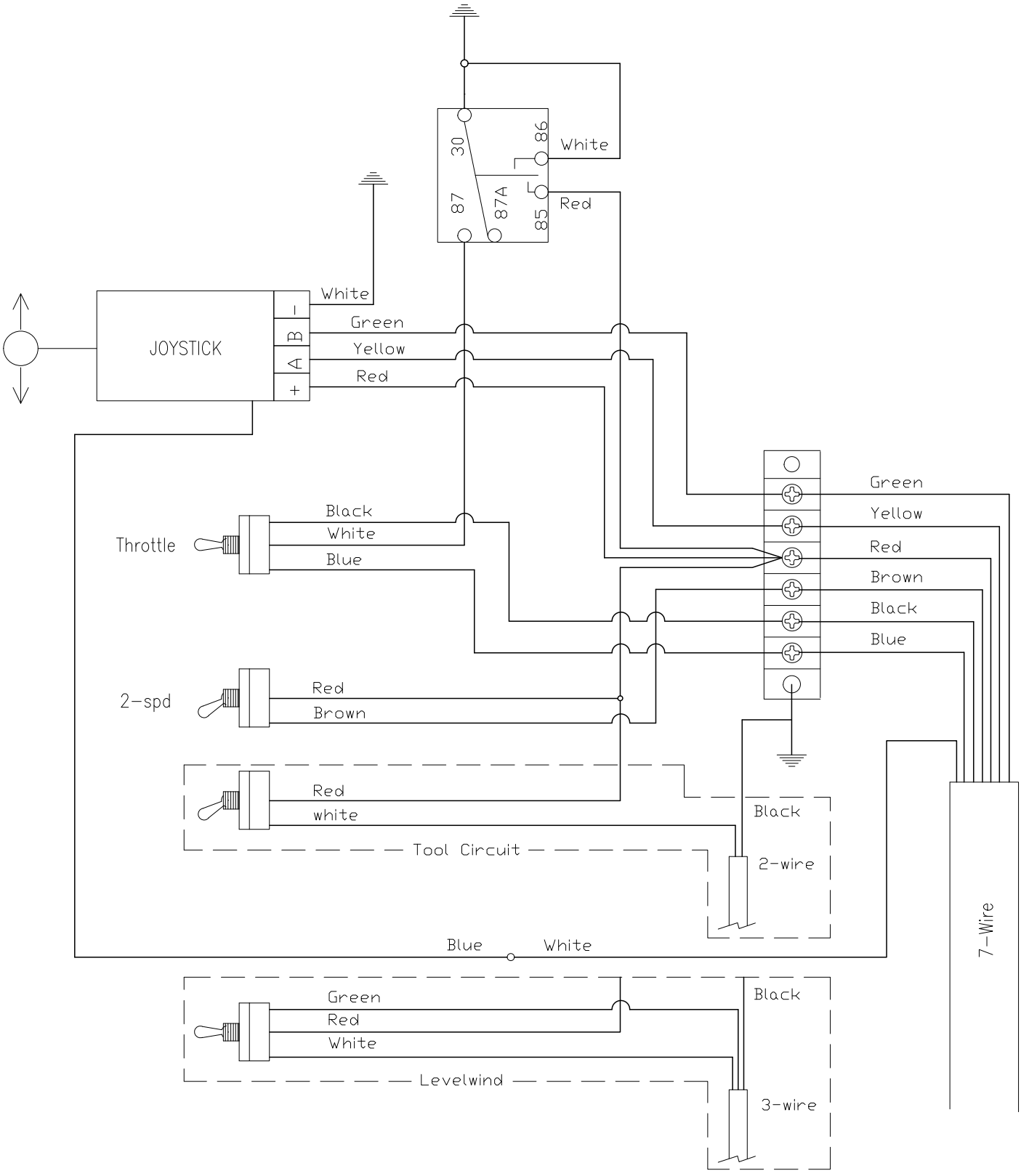



6500 Rear Control Wiring (LOFA)
30
86
87
87A
85
White
Red
JOYSTICK
-
B
A
+
White
Green
Yellow
Red
Throttle
Black
White
Blue
2-spd
Red
Brown
Red
white
Tool Circuit
Black
2-wire
Blue
White
Green
Red
White
Levelwind
Black
3-wire
Green
Yellow
Red
Brown
Black
Blue
7-Wire

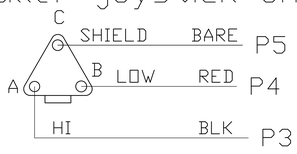
6500 Control Panel LOFA



6500 Rear Control Wiring (LOFA)

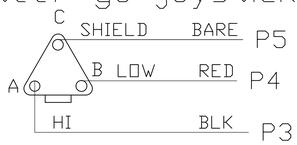


Puller joystick CANBUS

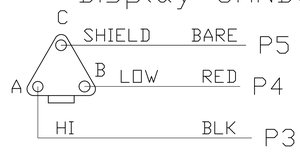


Engine CANBUS

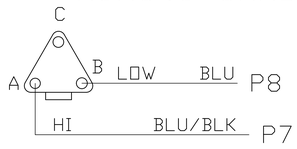
Steer-go joystick CANBUS



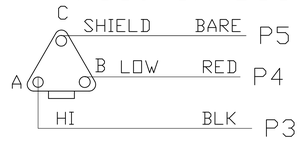
Display CANBUS



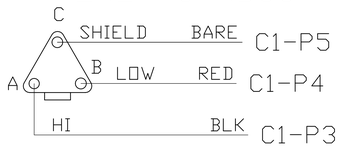
Remote CANBUS



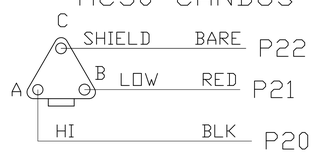
MC50 CANBUS 0

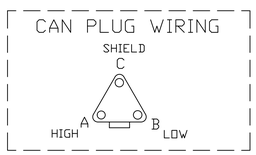


OX24 CANBUS

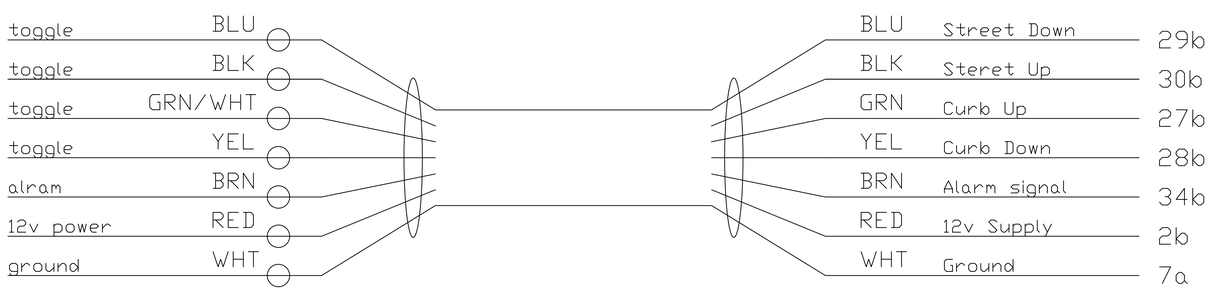


MC50 CANBUS 1





Rear Toggels



MC050-010 Controller

C1-P1	BLK - ground	- 16a
C1-P2	RED - 12v power	- 5a
C1-P3	CLR - CAN 0 HI +	- A
C1-P4	CLR - CAN 0 LOW -	- B
C1-P5	CLR - CAN 0 SHIELD	- C
C1-P6	-	
C1-P7	-	
C1-P8	RED - 5v sensor power +	- 20b
C1-P9	BLK - 5v sensor gound -	- 22b
C1-P10	WHT - level wind switch curb	- 24a
C1-P11	YEL - level wind switch street	- 25a
C1-P12	BLK - tool circuit switch	- 26a
C1-P13	GRN - outrigger switch curb up	- 27a
C1-P14	YEL - outrigger switch curb down	- 28a
C1-P15	RED - outrigger switch street up	- 30a
C1-P16	BLK - outrigger switch street down	- 29a
C1-P17	-	
C1-P18	-	
C1-P19	-	
C1-P20	BLK - CAN 1 HIGH +	
C1-P21	RED - VAN 1 LOW -	
C1-P22	BARE - CAN 1 SHIELD	
C1-P23	-	
C1-P24	-	
C1-P25	-	
C1-P26	WHT - brake psi transducer	- 31a
C1-P27	GRN - system psi transducer	- 32a
C1-P28	YEL - pvg psi transducer	- 33a
C1-P29	-	
C1-P30	WHT - fuel level input	- 41a
C1-P31	BLK - 2 spd solenoid	- 35a
C1-P32	WHT - alarm signal	- 34a
C1-P33	YEL - yanmar start signal	- 39a
C1-P34	RED - yanmar ECU power signal	- 40a
C1-P35	BLK - brake solenoid	- 38a
C1-P36	-	
C1-P37	-	
C1-P38	BRN - flow control	- 50a
C1-P39	BRN - pump EDC D	- 37a
C1-P40	RED - pump EDC A	- 36a
C1-P41	-	
C1-P42	RED - A2 valve	- 48a
C1-P43	YEL - B2 valve	- 44a
C1-P44	GRN - B1 valve	- 45a
C1-P45	YEL - A1 valve	- 49a
C1-P46	-	
C1-P47	-	
C1-P48	-	
C1-P49	-	
C1-P50	-	

remote 1	- WHT -	P1	14/2 SJO		remote 1	- RED/BLK - P1
remote 2	- WHT -	P2			remote 2	- WHT - P2
remote 3	- BLK -	P3	14/2 SJO		remote 3	- GRN - P3
remote 4	- BLK -	P4			remote 4	- BLK/WHT - P4
					carrier detect [N.C.]	- WHT/BLK - P5
					E-stop [N.C.]	- GRN/BLK - P6
				A -	CAN 1 HI +	- BLU/BLK - P7
				B -	CAN 1 LOW -	- BLU - P8
						- OR/BLK - P9
				5a -	power +	- RED - P10
				17a -	ground -	- BLK - P11
						- OR - P12

Miratron ECU

Black plug

C1-P1	- BLK - ground	- 16b
C1-P2	- RED - 12v +	- 4b
C1-P3	- BLK - CAN HIGH +	- A
C1-P4	- RED - CAN LOW -	- B
C1-P5	- BARE - CAN shield	- C
C1-P6	- WHT - ROE valve	- 46a
C1-P7	- GRN - ROR valve	- 42a
C1-P8	- YEL - LOE valve	- 47a
C1-P9	- BLK - LOR valve	- 43a
C1-P10	- OR - PVG supply voltage (mandrels, drawbar, P/U cyl)	- 51a
C1-P11	- RED - PVG supply voltage (L/W, tool circuit)	- 54a
C1-P12	- GRY - PVG drawbar	- 58a

OX024-
Output module

Gray plug

C2-P1	- YEL/BLK - PVG P/U cyl	- 59a
C2-P2	- Lt.BRN - PVG curb mandrel	- 60a
C2-P3	- Lt.BLU - PVG street mandrel	- 61a
C2-P4	-	
C2-P5	- YEL/BLU - PVG levelwind/toolcircuit	- 62a
C2-P6	-	
C2-P7	-	
C2-P8	-	
C2-P9	- GRN - charge coil, brake circuit	- WHT
C2-P10	-	
C2-P11	-	
C2-P12	-	

17b -					ground -	BLK - P1
5b -					12v +	- RED - P2
A -					CAN HIGH +	- BLK - P3
B -					CAN LOW -	- RED - P4
C -					CAN shield	- BARE - P5
						- P6
						- P7
						- P8
						- P9
Pin P	- oil pressure sender	- YEL	- P10			
			- P11			
			- P12			

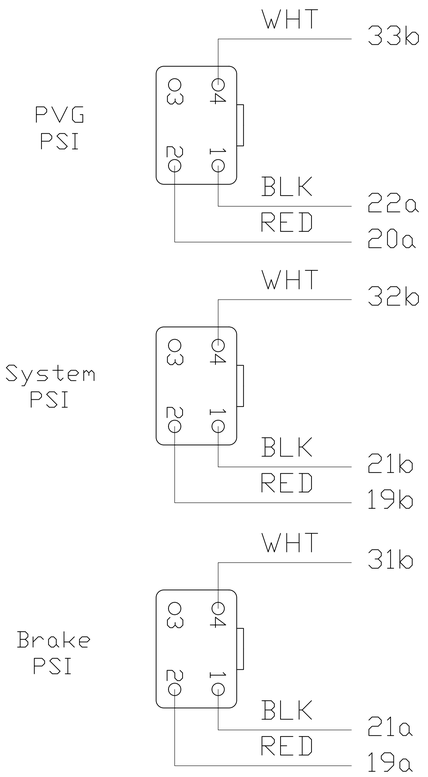
Display

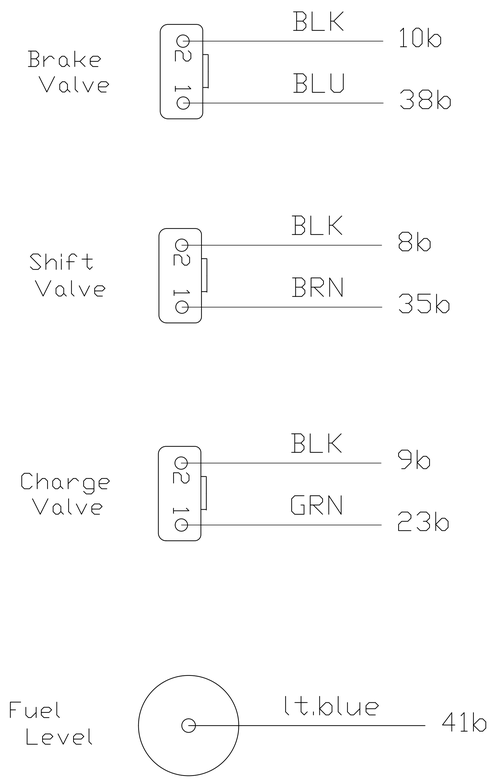
18b -					ground -	BLK - P1
6b -					12v +	- RED - P2
A -					CAN HIGH +	- BLK - P3
B -					CAN LOW -	- RED - P4
C -					CAN shield	- BARE - P5
						- P6

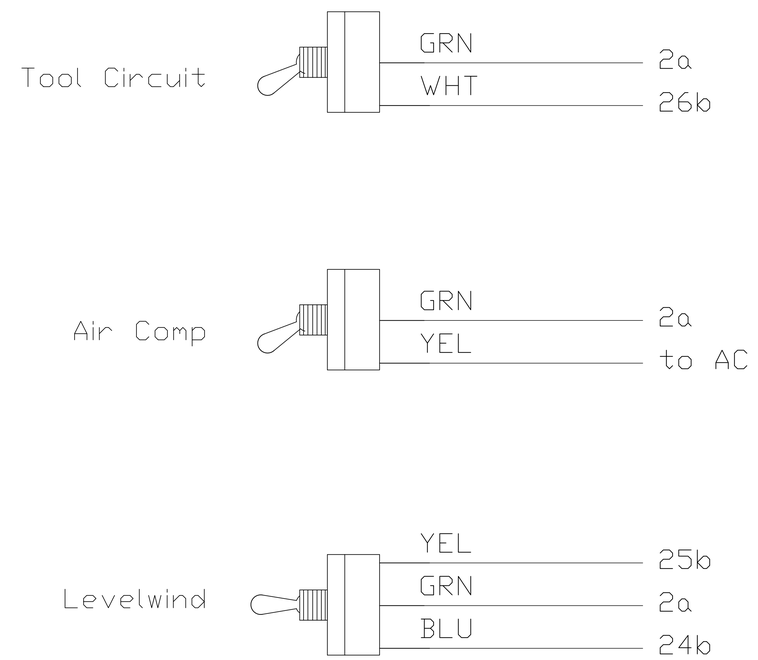
PowerUnit
joystick

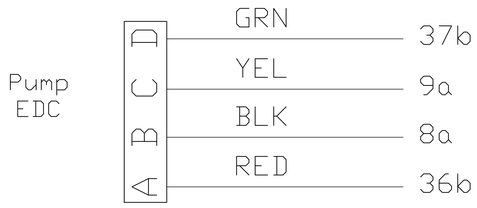
Steer-go
joystick

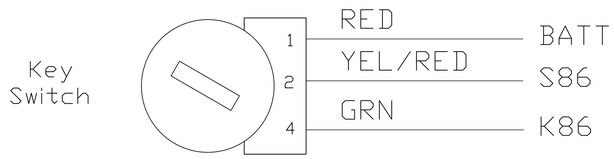
P1	- BLK - ground	- 7b
P2	- RED - 12v +	- 1b
P3	- BLK - CAN HIGH +	- A
P4	- RED - CAN LOW -	- B
P5	- BARE - CAN shield	- C
P6	-	

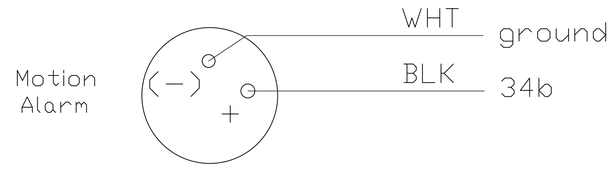

PVG
PSI
WHT
33b
04
03
01
02
BLK
22a
RED
20a
System
PSI
WHT
32b
BLK
21b
RED
19b
Brake
PSI
WHT
31b
BLK
21a
RED
19a

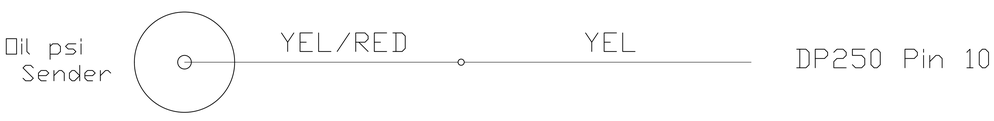

Brake
Valve
BLK
10b
02
01
BLU
38b
Shift
Valve
BLK
8b
BRN
35b
Charge
Valve
BLK
9b
GRN
23b
Fuel
Level
lt.blue
41b

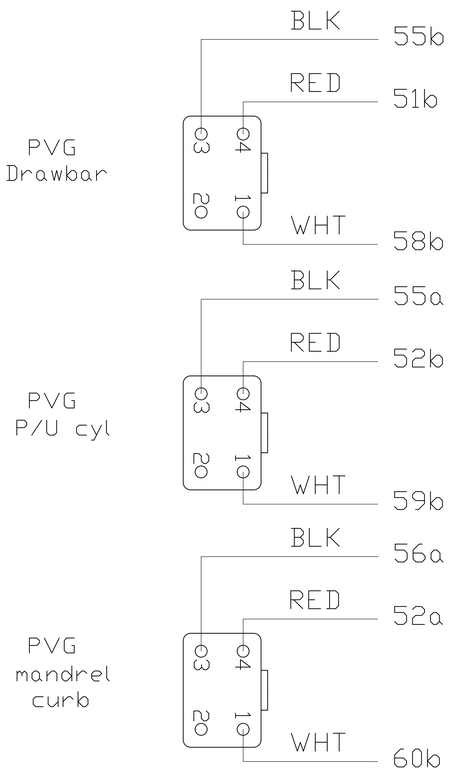

Tool Circuit
GRN
2a
WHT
26b
Air Comp
GRN
2a
YEL
to AC
Levelwind
YEL
25b
GRN
2a
BLU
24b

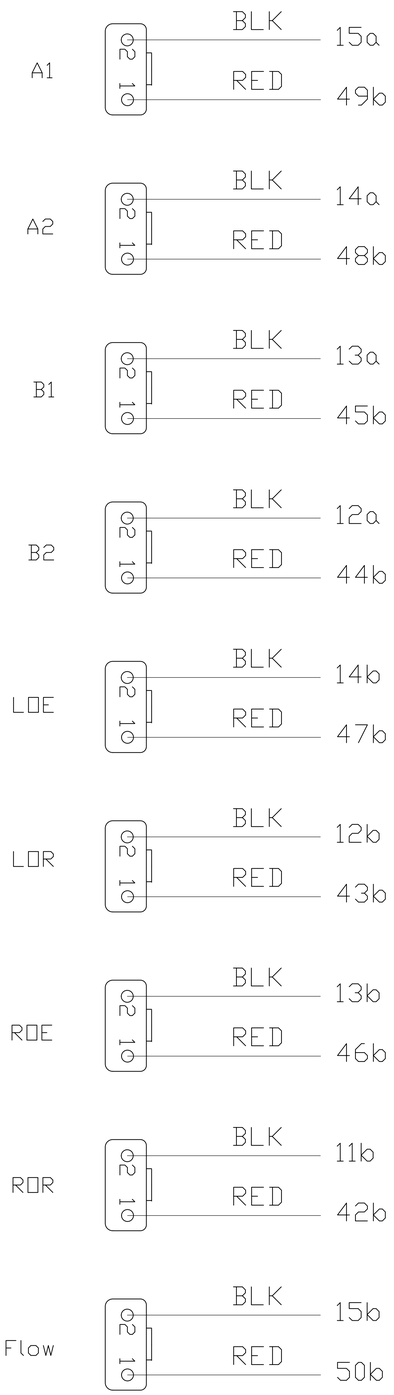

Pump
EDC
GRN
37b
A
B
C
D
YEL
9a
BLK
8a
RED
36b

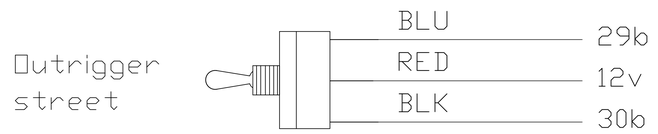

Key
Switch
RED
BATT
1
YEL/RED
2
S86
GRN
4
K86

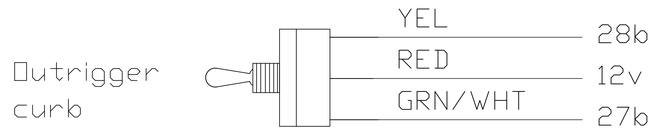

Motion
Alarm
WHT
ground
(–)
+
BLK
34b

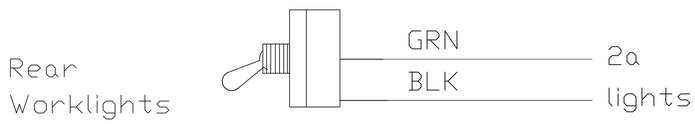

Oil psi
Sender
YEL/RED
YEL
DP250 Pin 10

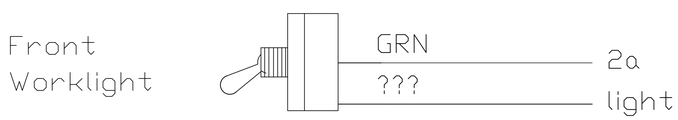

PVG
Drawbar
BLK
55b
RED
51b
WHT
58b
03
04
20
10
PVG
P/U cyl
BLK
55a
RED
52b
WHT
59b
PVG
mandrel
curb
BLK
56a
RED
52a
WHT
60b
PVG
mandrel
street
BLK
56b
RED
53b
WHT
61b
PVG
L/W, TOOL
BLK
57b
RED
51b
WHT
62b


A1
BLK
15a
RED
49b
02
10
A2
BLK
14a
RED
48b
B1
BLK
13a
RED
45b
B2
BLK
12a
RED
44b
LOE
BLK
14b
RED
47b
LOR
BLK
12b
RED
43b
ROE
BLK
13b
RED
46b
ROR
BLK
11b
RED
42b
Flow
BLK
15b
RED
50b

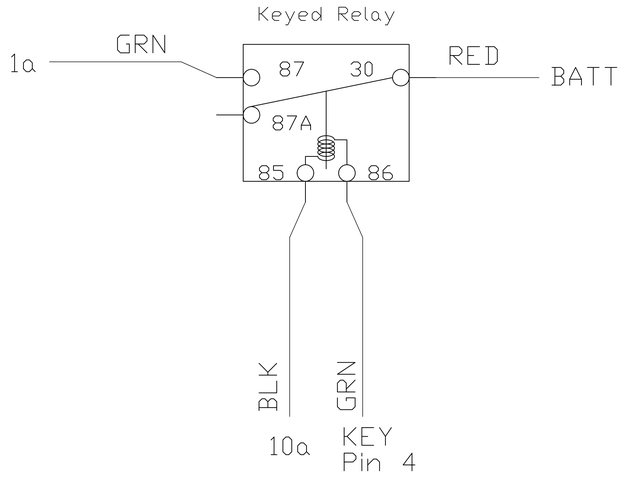

Outrigger
street
BLU
29b
RED
12v
BLK
30b

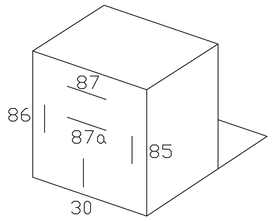

Outrigger
curb
YEL
28b
RED
12v
GRN/WHT
27b

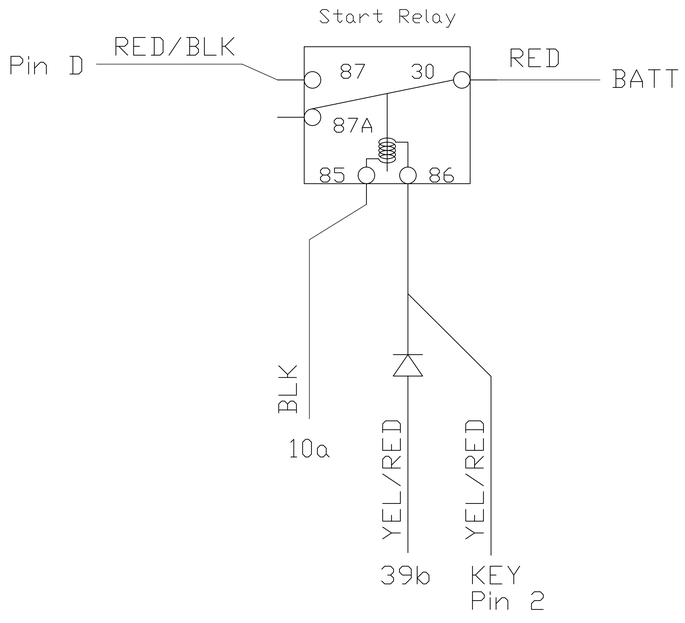

Rear
Worklights
GRN
2a
BLK
lights

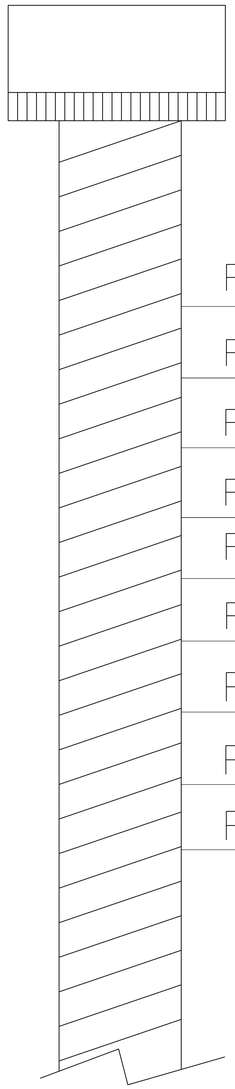

Front
Worklight
GRN
2a
???
light

YANMAR extension wiring









Pin B - RED - Battery — Keyswitch P1

Pin D - RED/BLK - Start — S Relay 87

Pin E - BLK - Ground — 11a

Pin F - BLK - CAN SHIELD — Pin C

Pin G - RED - ECU power / engine kill — 5a

Pin J - RED - Alt excite 12v — 3a

Pin P - YEL/RED - Oil psi sender — Display P10

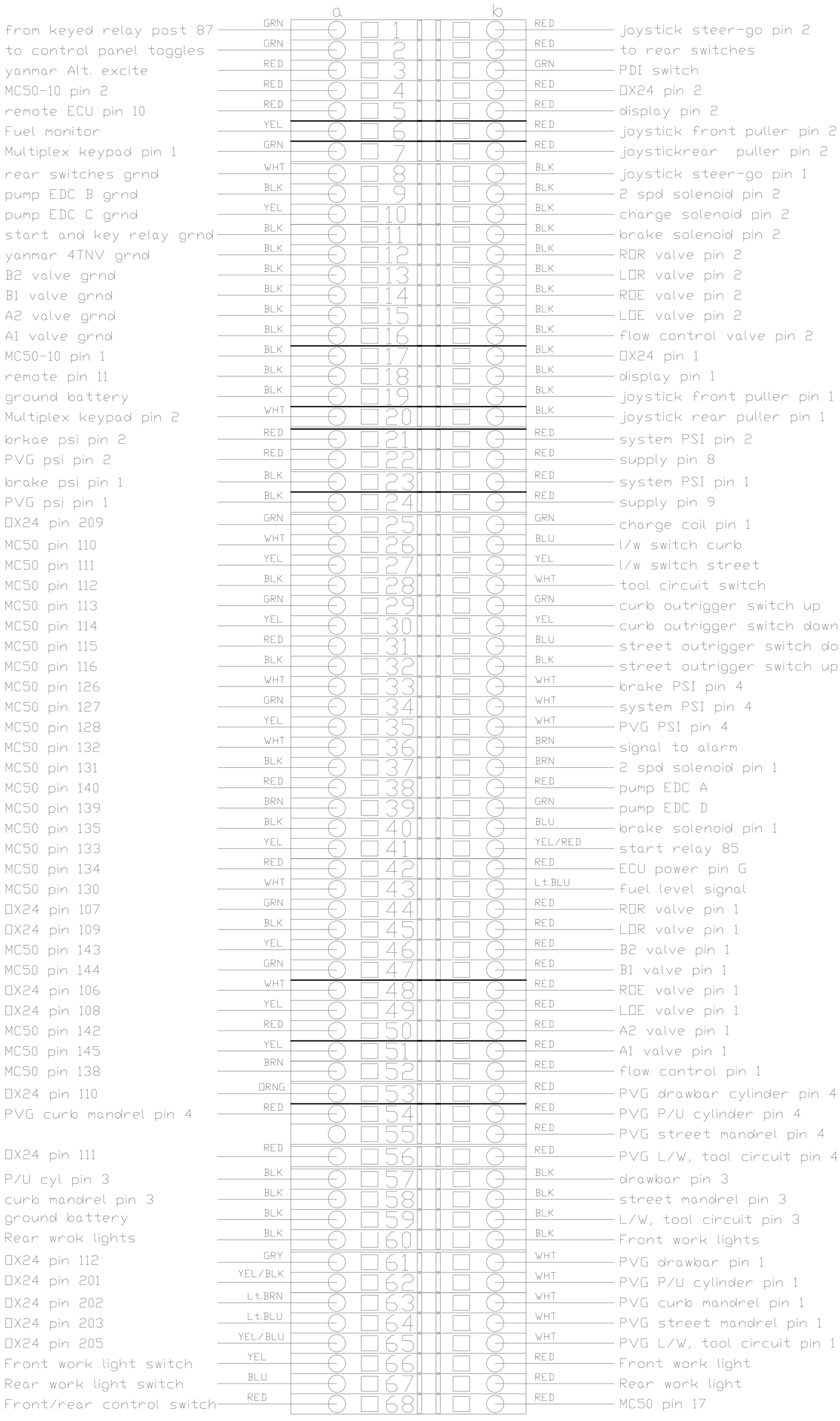
Pin U - GRN - CAN LOW - — Pin B

Pin V - YEL - CAN HI + — Pin A

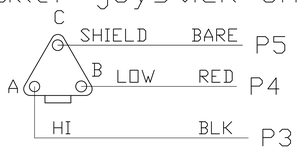
CAN HI - Yellow pin V

CAN LO - Green pin U

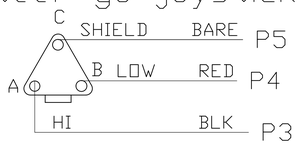
CAN shield - Black pin F


a
b
from keyed relay post 87 GRN 1 RED joystick steer-go pin 2
to control panel toggles GRN 2 RED to rear switches
yanmar Alt. excite RED 3 GRN PDI switch
MC50-10 pin 2 RED 4 RED □X24 pin 2
remote ECU pin 10 RED 5 RED display pin 2
Fuel monitor YEL 6 RED joystick front puller pin 2
Multiplex keypad pin 1 GRN 7 RED joystickrear puller pin 2
rear switches grnd WHT 8 BLK joystick steer-go pin 1
pump EDC B grnd BLK 9 BLK 2 spd solenoid pin 2
pump EDC C grnd YEL 10 BLK charge solenoid pin 2
start and key relay grnd BLK 11 BLK brake solenoid pin 2
yanmar 4TNV grnd BLK 12 BLK R□R valve pin 2
B2 valve grnd BLK 13 BLK L□R valve pin 2
B1 valve grnd BLK 14 BLK R□E valve pin 2
A2 valve grnd BLK 15 BLK L□E valve pin 2
A1 valve grnd BLK 16 BLK flow control valve pin 2
MC50-10 pin 1 BLK 17 BLK □X24 pin 1
remote pin 11 BLK 18 BLK display pin 1
ground battery BLK 19 BLK joystick front puller pin 1
Multiplex keypad pin 2 WHT 20 BLK joystick rear puller pin 1
brkae psi pin 2 RED 21 RED system PSI pin 2
PVG psi pin 2 RED 22 RED supply pin 8
brake psi pin 1 BLK 23 RED system PSI pin 1
PVG psi pin 1 BLK 24 RED supply pin 9
□X24 pin 209 GRN 25 GRN charge coil pin 1
MC50 pin 110 WHT 26 BLU l/w switch curb
MC50 pin 111 YEL 27 YEL l/w switch street
MC50 pin 112 BLK 28 WHT tool circuit switch
MC50 pin 113 GRN 29 GRN curb outrigger switch up
MC50 pin 114 YEL 30 YEL curb outrigger switch down
MC50 pin 115 RED 31 BLU street outrigger switch down
MC50 pin 116 BLK 32 BLK street outrigger switch up
MC50 pin 126 WHT 33 WHT brake PSI pin 4
MC50 pin 127 GRN 34 WHT system PSI pin 4
MC50 pin 128 YEL 35 WHT PVG PSI pin 4
MC50 pin 132 WHT 36 BRN signal to alarm
MC50 pin 131 BLK 37 BRN 2 spd solenoid pin 1
MC50 pin 140 RED 38 RED pump EDC A
MC50 pin 139 BRN 39 GRN pump EDC D
MC50 pin 135 BLK 40 BLU brake solenoid pin 1
MC50 pin 133 YEL 41 YEL/RED start relay 85
MC50 pin 134 RED 42 RED ECU power pin G
MC50 pin 130 WHT 43 Lt.BLU fuel level signal
□X24 pin 107 GRN 44 RED R□R valve pin 1
□X24 pin 109 BLK 45 RED L□R valve pin 1
MC50 pin 143 YEL 46 RED B2 valve pin 1
MC50 pin 144 GRN 47 RED B1 valve pin 1
□X24 pin 106 WHT 48 RED R□E valve pin 1
□X24 pin 108 YEL 49 RED L□E valve pin 1
MC50 pin 142 RED 50 RED A2 valve pin 1
MC50 pin 145 YEL 51 RED A1 valve pin 1
MC50 pin 138 BRN 52 RED flow control pin 1
□X24 pin 110 □RNG 53 RED PVG drawbar cylinder pin 4
PVG curb mandrel pin 4 RED 54 RED PVG P/U cylinder pin 4
55 RED PVG street mandrel pin 4
□X24 pin 111 RED 56 RED PVG L/W, tool circuit pin 4
P/U cyl pin 3 BLK 57 BLK drawbar pin 3
curb mandrel pin 3 BLK 58 BLK street mandrel pin 3
ground battery BLK 59 BLK L/W, tool circuit pin 3
Rear wrok lights BLK 60 BLK Front work lights
□X24 pin 112 GRY 61 WHT PVG drawbar pin 1
□X24 pin 201 YEL/BLK 62 WHT PVG P/U cylinder pin 1
□X24 pin 202 Lt.BRN 63 WHT PVG curb mandrel pin 1
□X24 pin 203 Lt.BLU 64 WHT PVG street mandrel pin 1
□X24 pin 205 YEL/BLU 65 WHT PVG L/W, tool circuit pin 1
Front work light switch YEL 66 RED Front work light
Rear work light switch BLU 67 RED Rear work light
Front/rear control switch RED 68 RED MC50 pin 17

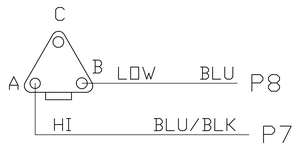
Puller joystick CANBUS



Steer-go joystick CANBUS



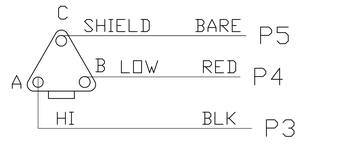
Remote CANBUS



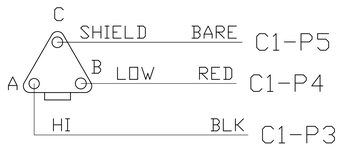
Engine CANBUS

Display CANBUS

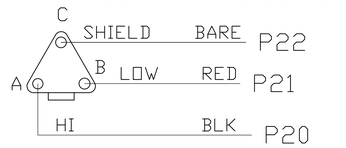
MC50 CANBUS 0

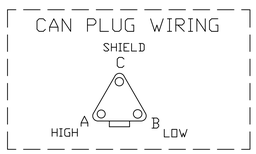


OX24 CANBUS

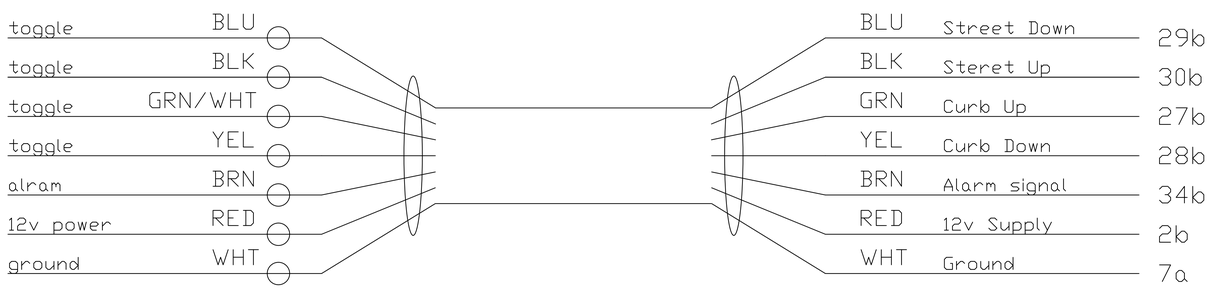


MC50 CANBUS 1





Rear Toggels



MC050-010 Controller

C1-P1	BLK	ground	16a
C1-P2	RED	12v power	5a
C1-P3	CLR	CAN 0 HI +	A
C1-P4	CLR	CAN 0 LOW -	B
C1-P5	CLR	CAN 0 SHIELD	C
C1-P6			
C1-P7			
C1-P8	RED	5v sensor power +	20b
C1-P9	BLK	5v sensor gound -	22b
C1-P10	WHT	level wind switch curb	24a
C1-P11	YEL	level wind switch street	25a
C1-P12	BLK	tool circuit switch	26a
C1-P13	GRN	outrigger switch curb up	27a
C1-P14	YEL	outrigger switch curb down	28a
C1-P15	RED	outrigger switch street up	30a
C1-P16	BLK	outrigger switch street down	29a
C1-P17			
C1-P18			
C1-P19			
C1-P20	BLK	CAN 1 HIGH +	
C1-P21	RED	VAN 1 LOW -	
C1-P22	BARE	CAN 1 SHIELD	
C1-P23			
C1-P24			
C1-P25			
C1-P26	WHT	brake psi transducer	31a
C1-P27	GRN	system psi transducer	32a
C1-P28	YEL	pvg psi transducer	33a
C1-P29			
C1-P30	WHT	fuel level input	41a
C1-P31	BLK	2 spd solenoid	35a
C1-P32	WHT	alarm signal	34a
C1-P33	YEL	yanmar start signal	39a
C1-P34	RED	yanmar ECU power signal	40a
C1-P35	BLK	brake solenoid	38a
C1-P36			
C1-P37			
C1-P38	BRN	flow control	50a
C1-P39	BRN	pump EDC D	37a
C1-P40	RED	pump EDC A	36a
C1-P41			
C1-P42	RED	A2 valve	48a
C1-P43	YEL	B2 valve	44a
C1-P44	GRN	B1 valve	45a
C1-P45	YEL	A1 valve	49a
C1-P46			
C1-P47			
C1-P48			
C1-P49			
C1-P50			

remote 1	- WHT -	P1	14/2 SJO		remote 1	- RED/BLK - P1
remote 2	- WHT -	P2			remote 2	- WHT - P2
remote 3	- BLK -	P3	14/2 SJO		remote 3	- GRN - P3
remote 4	- BLK -	P4			remote 4	- BLK/WHT - P4
					carrier detect [N.C.]	- WHT/BLK - P5
					E-stop [N.C.]	- GRN/BLK - P6
				A -	CAN 1 HI +	- BLU/BLK - P7
				B -	CAN 1 LOW -	- BLU - P8
						- OR/BLK - P9
				5a -	power +	- RED - P10
				17a -	ground -	- BLK - P11
						- OR - P12

Miratron ECU

Black plug

C1-P1	- BLK - ground	- 16b
C1-P2	- RED - 12v +	- 4b
C1-P3	- BLK - CAN HIGH +	- A
C1-P4	- RED - CAN LOW -	- B
C1-P5	- BARE - CAN shield	- C
C1-P6	- WHT - ROE valve	- 46a
C1-P7	- GRN - ROR valve	- 42a
C1-P8	- YEL - LOE valve	- 47a
C1-P9	- BLK - LOR valve	- 43a
C1-P10	- OR - PVG supply voltage (mandrels, drawbar, P/U cyl)	- 51a
C1-P11	- RED - PVG supply voltage (L/W, tool circuit)	- 54a
C1-P12	- GRY - PVG drawbar	- 58a

OX024-
Output module

Gray plug

C2-P1	- YEL/BLK - PVG P/U cyl	- 59a
C2-P2	- Lt.BRN - PVG curb mandrel	- 60a
C2-P3	- Lt.BLU - PVG street mandrel	- 61a
C2-P4	-	
C2-P5	- YEL/BLU - PVG levelwind/toolcircuit	- 62a
C2-P6	-	
C2-P7	-	
C2-P8	-	
C2-P9	- GRN - charge coil, brake circuit	- WHT
C2-P10	-	
C2-P11	-	
C2-P12	-	

17b -					ground -	BLK - P1
5b -					12v +	- RED - P2
A -					CAN HIGH +	- BLK - P3
B -					CAN LOW -	- RED - P4
C -					CAN shield	- BARE - P5
						- P6
						- P7
						- P8
						- P9
Pin P	-	oil pressure sender	-	YEL		- P10
						- P11
						- P12

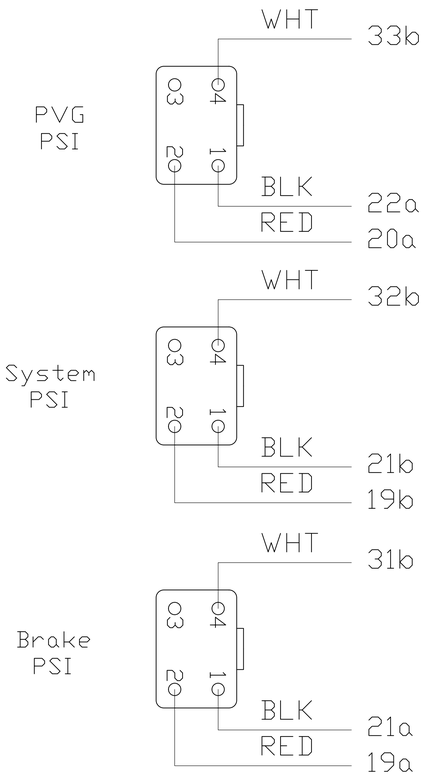
Display

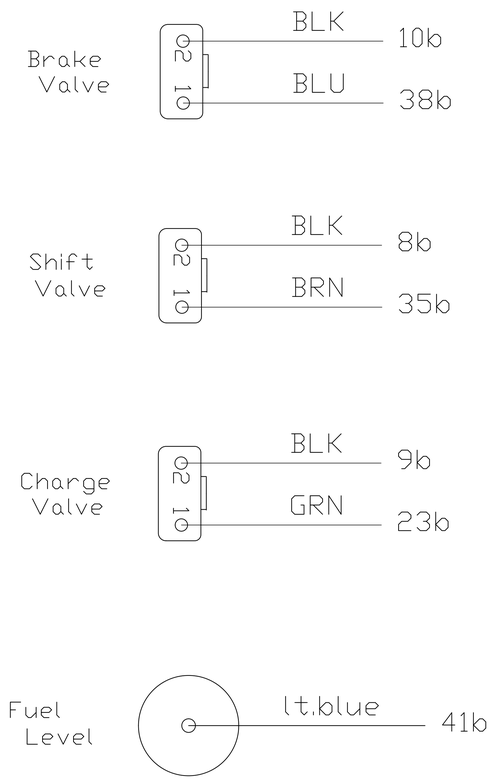
18b	-				ground -	BLK - P1
6b	-				12v +	- RED - P2
A	-				CAN HIGH +	- BLK - P3
B	-				CAN LOW -	- RED - P4
C	-				CAN shield	- BARE - P5
						- P6

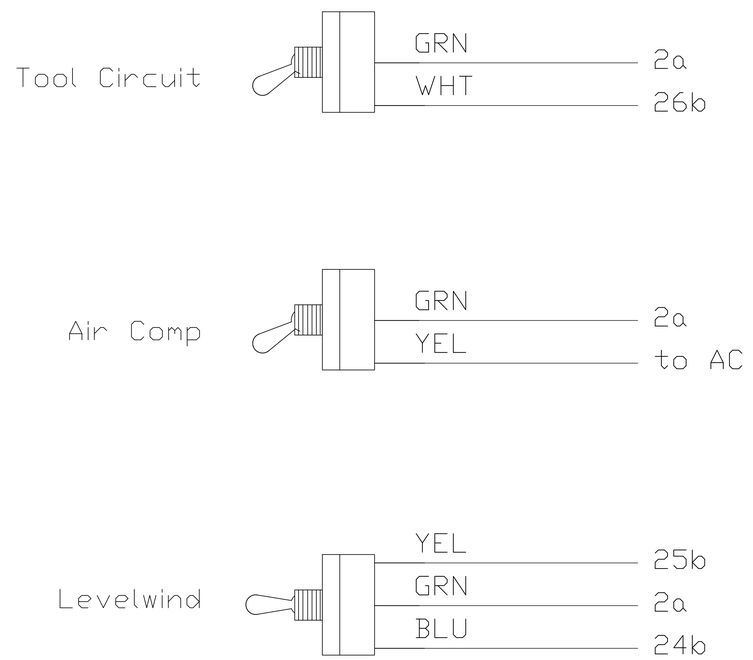
PowerUnit
joystick

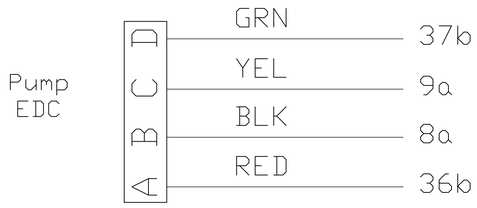
Steer-go
joystick

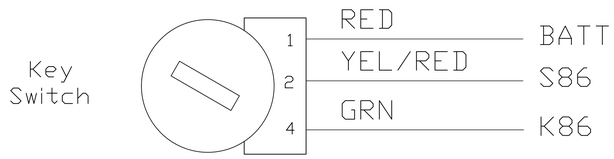
P1	- BLK - ground		- 7b
P2	- RED - 12v +		- 1b
P3	- BLK - CAN HIGH +		- A
P4	- RED - CAN LOW -		- B
P5	- BARE - CAN shield		- C
P6	-		

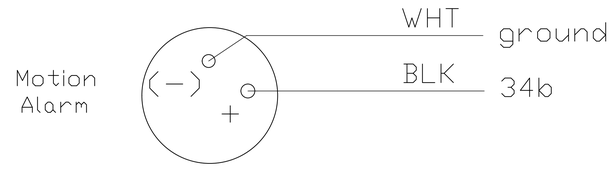

PVG
PSI
WHT
33b
04
03
01
02
BLK
22a
RED
20a
System
PSI
WHT
32b
BLK
21b
RED
19b
Brake
PSI
WHT
31b
BLK
21a
RED
19a

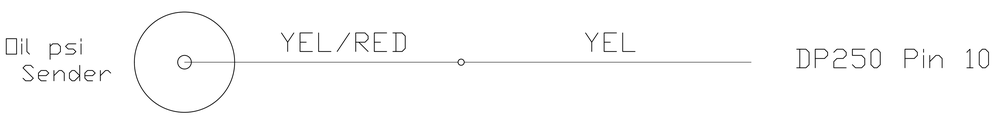

Brake
Valve
BLK
10b
02
01
BLU
38b
Shift
Valve
BLK
8b
BRN
35b
Charge
Valve
BLK
9b
GRN
23b
Fuel
Level
lt.blue
41b

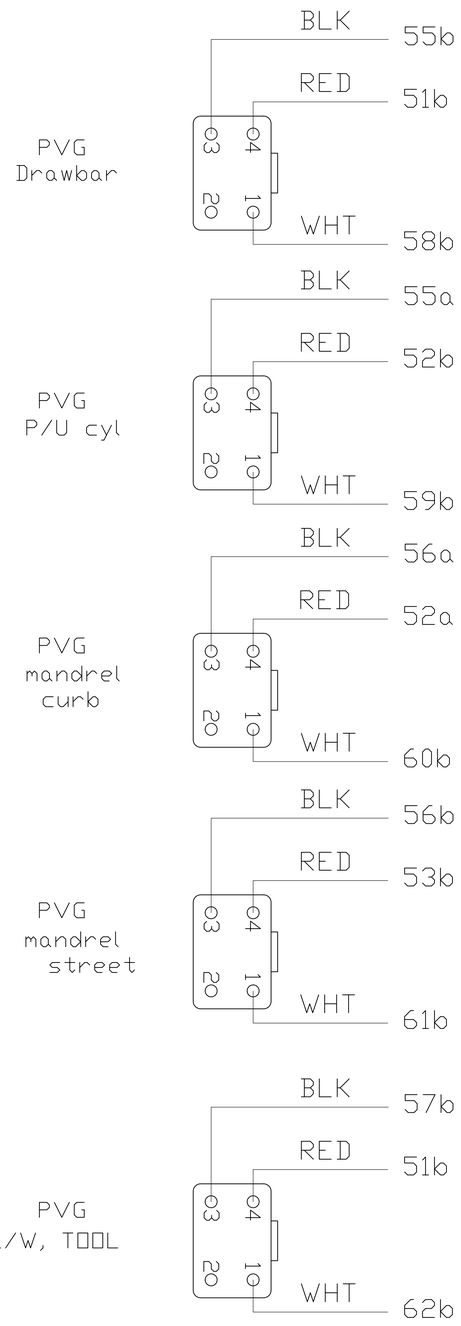

Tool Circuit
GRN
2a
WHT
26b
Air Comp
GRN
2a
YEL
to AC
Levelwind
YEL
25b
GRN
2a
BLU
24b

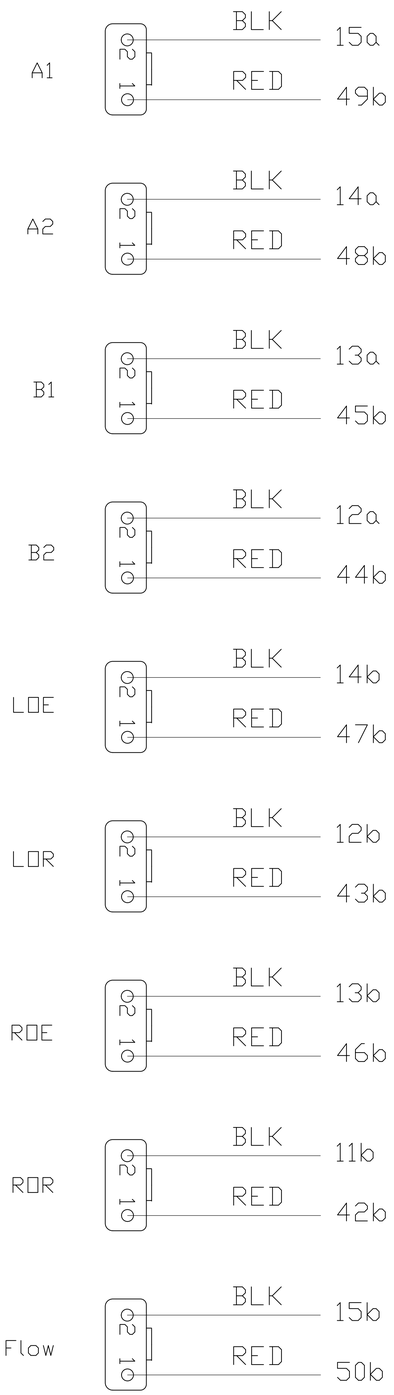

Pump
EDC
GRN
37b
A
B
C
D
YEL
9a
BLK
8a
RED
36b

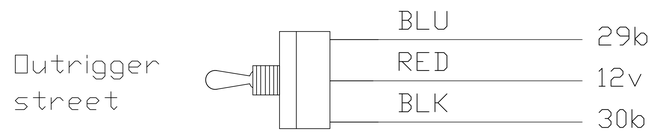

Key
Switch
RED
BATT
1
YEL/RED
2
S86
GRN
4
K86

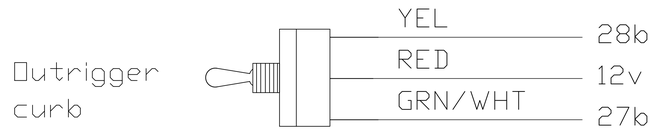

Motion
Alarm
WHT
ground
(–)
+
BLK
34b

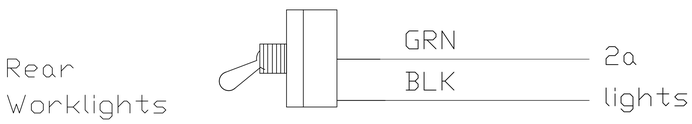

Oil psi
Sender
YEL/RED
YEL
DP250 Pin 10

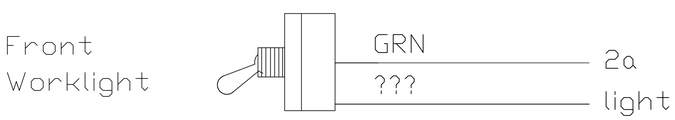

PVG
Drawbar
BLK
55b
RED
51b
WHT
58b
PVG
P/U cyl
BLK
55a
RED
52b
WHT
59b
PVG
mandrel
curb
BLK
56a
RED
52a
WHT
60b
PVG
mandrel
street
BLK
56b
RED
53b
WHT
61b
PVG
L/W, TOOL
BLK
57b
RED
51b
WHT
62b
03
04
20
10


A1
BLK
15a
RED
49b
A2
BLK
14a
RED
48b
B1
BLK
13a
RED
45b
B2
BLK
12a
RED
44b
LOE
BLK
14b
RED
47b
LOR
BLK
12b
RED
43b
ROE
BLK
13b
RED
46b
ROR
BLK
11b
RED
42b
Flow
BLK
15b
RED
50b
02
10

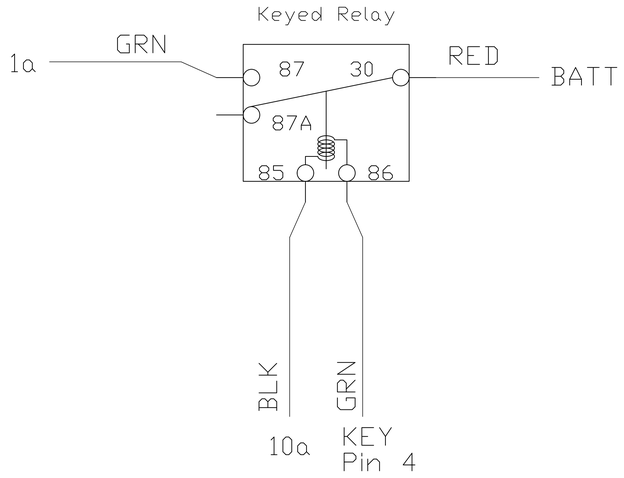

Outrigger
street
BLU
29b
RED
12v
BLK
30b

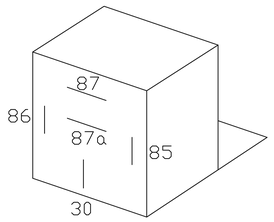

Outrigger
curb
YEL
28b
RED
12v
GRN/WHT
27b

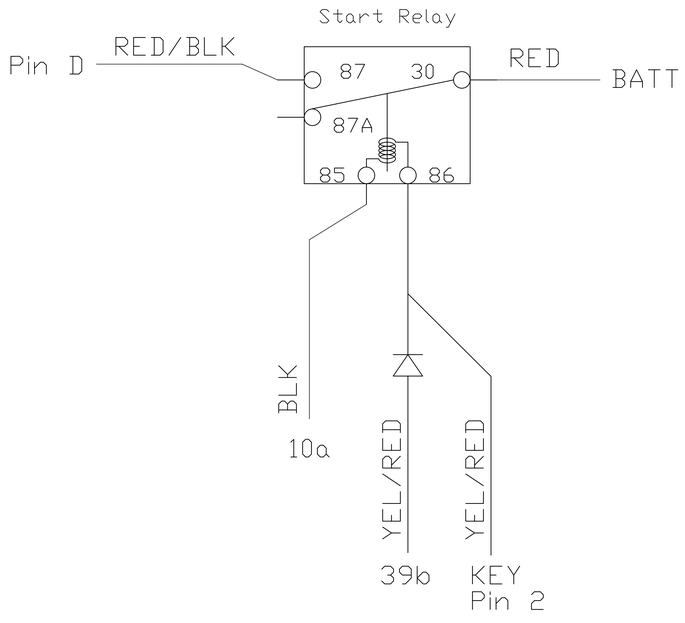

Rear
Worklights
GRN
2a
BLK
lights

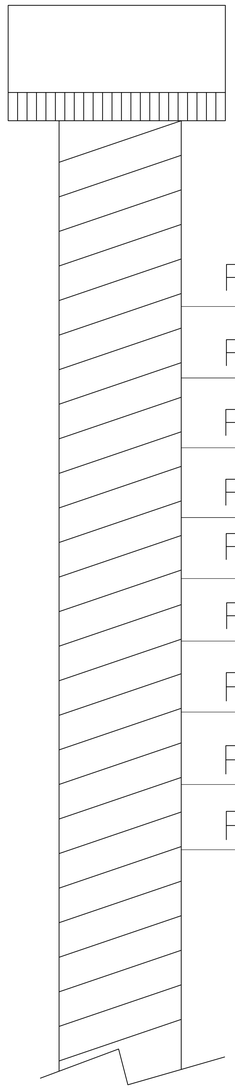

Front
Worklight
GRN
2a
???
light

YANMAR extension wiring









Pin B - RED - Battery — Keyswitch P1

Pin D - RED/BLK - Start — S Relay 87

Pin E - BLK - Ground — 11a

Pin F - BLK - CAN SHIELD — Pin C

Pin G - RED - ECU power / engine kill — 5a

Pin J - RED - Alt excite 12v — 3a

Pin P - YEL/RED - Oil psi sender — Display P10

Pin U - GRN - CAN LOW - — Pin B

Pin V - YEL - CAN HI + — Pin A

CAN HI - Yellow pin V

CAN LO - Green pin U

CAN shield - Black pin F

Payout

REEL DRIVE

Take Up

P/U Cylinder
Apply

Release

Drawbar
Up

Down

Tool Circuit
On

Off

Throttle
Up

Down

Idler Wheel Drive

FWD

STREET

CURB

REV

Start / Stop

2-spd
High

Low

Mandrel Racks

Up

Street

Down

Up

Curb

Down

Level Wind

Street

Curb

EMERGENCY
STOP

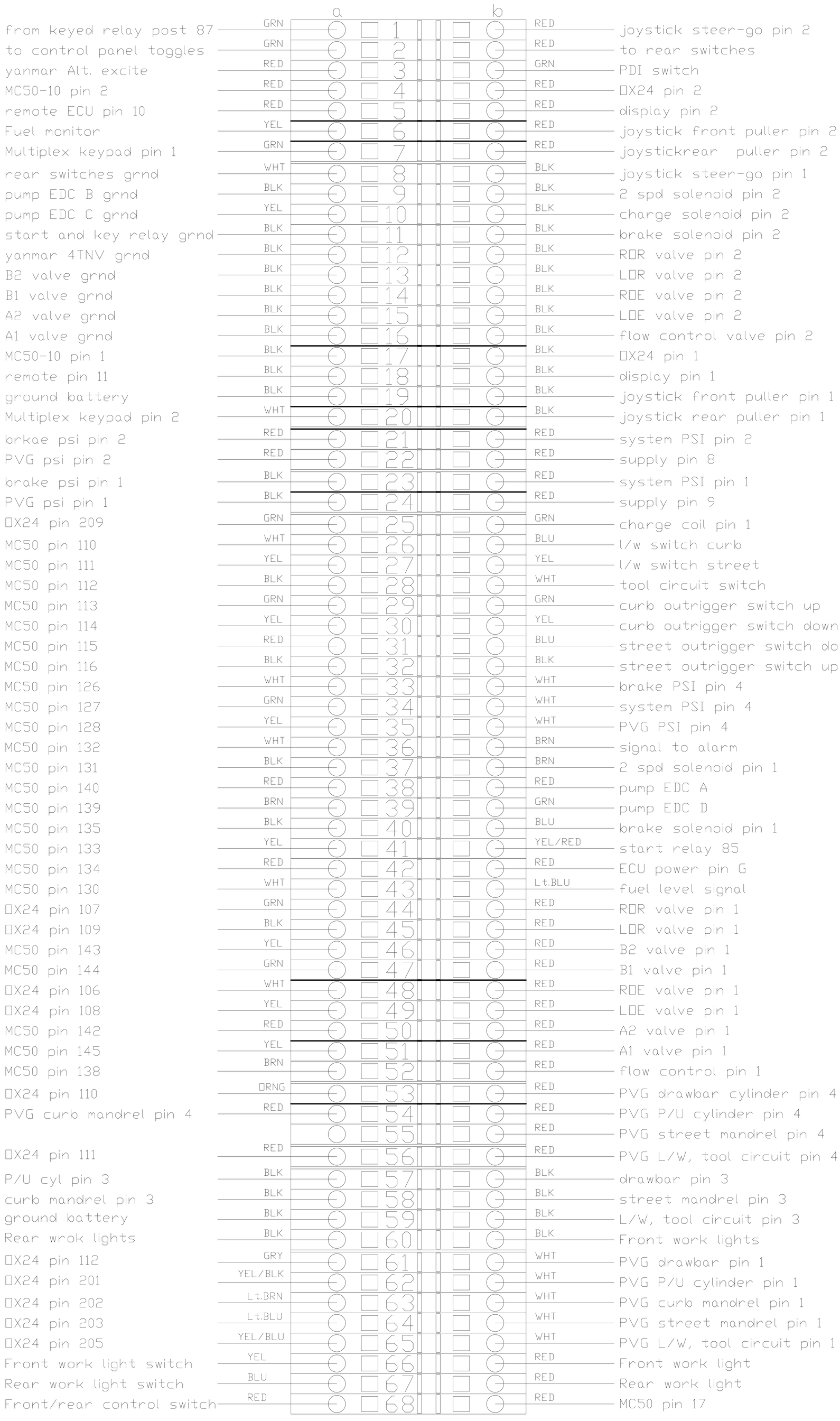
Power

On

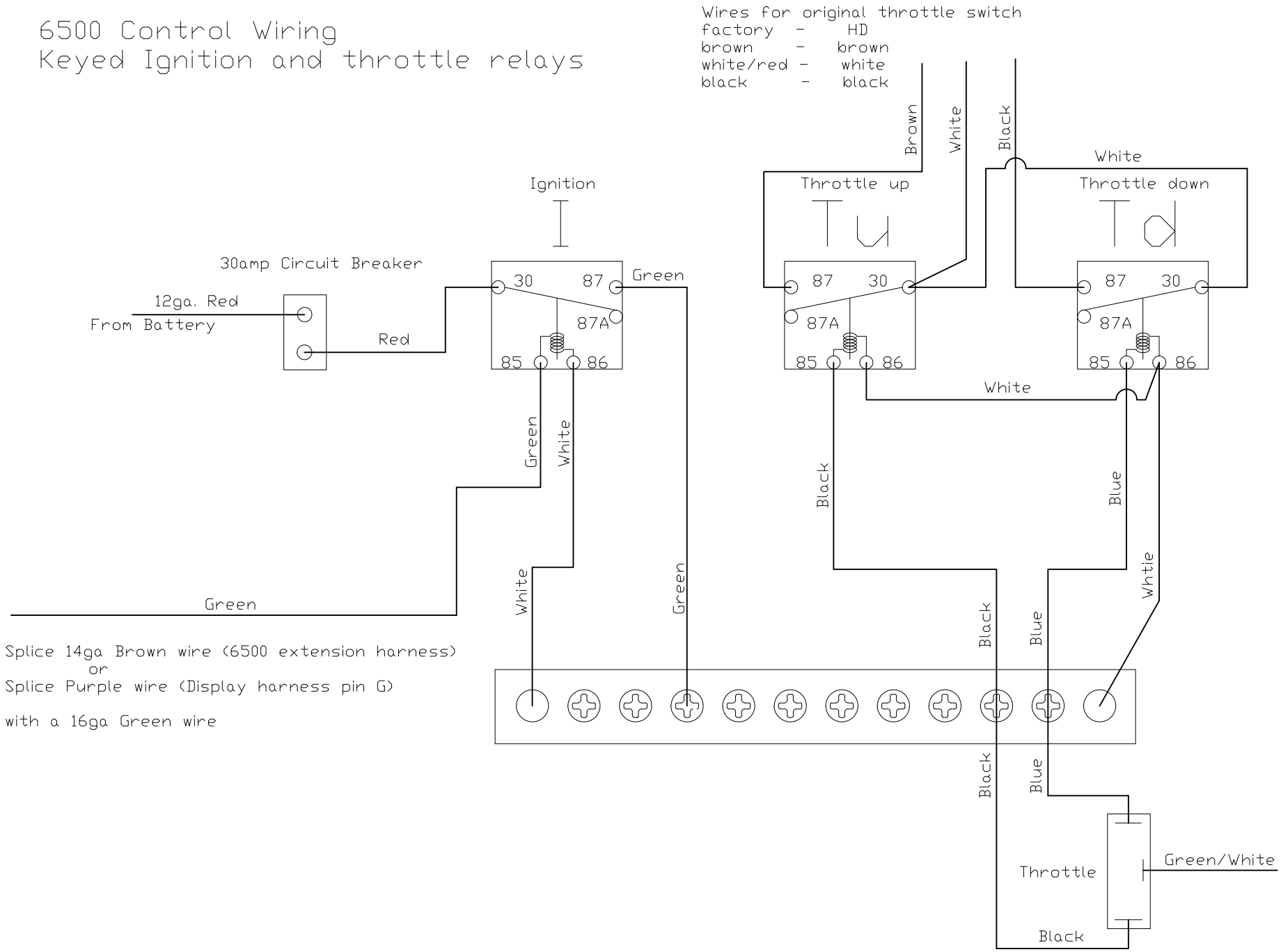
Remote Power
Off

On

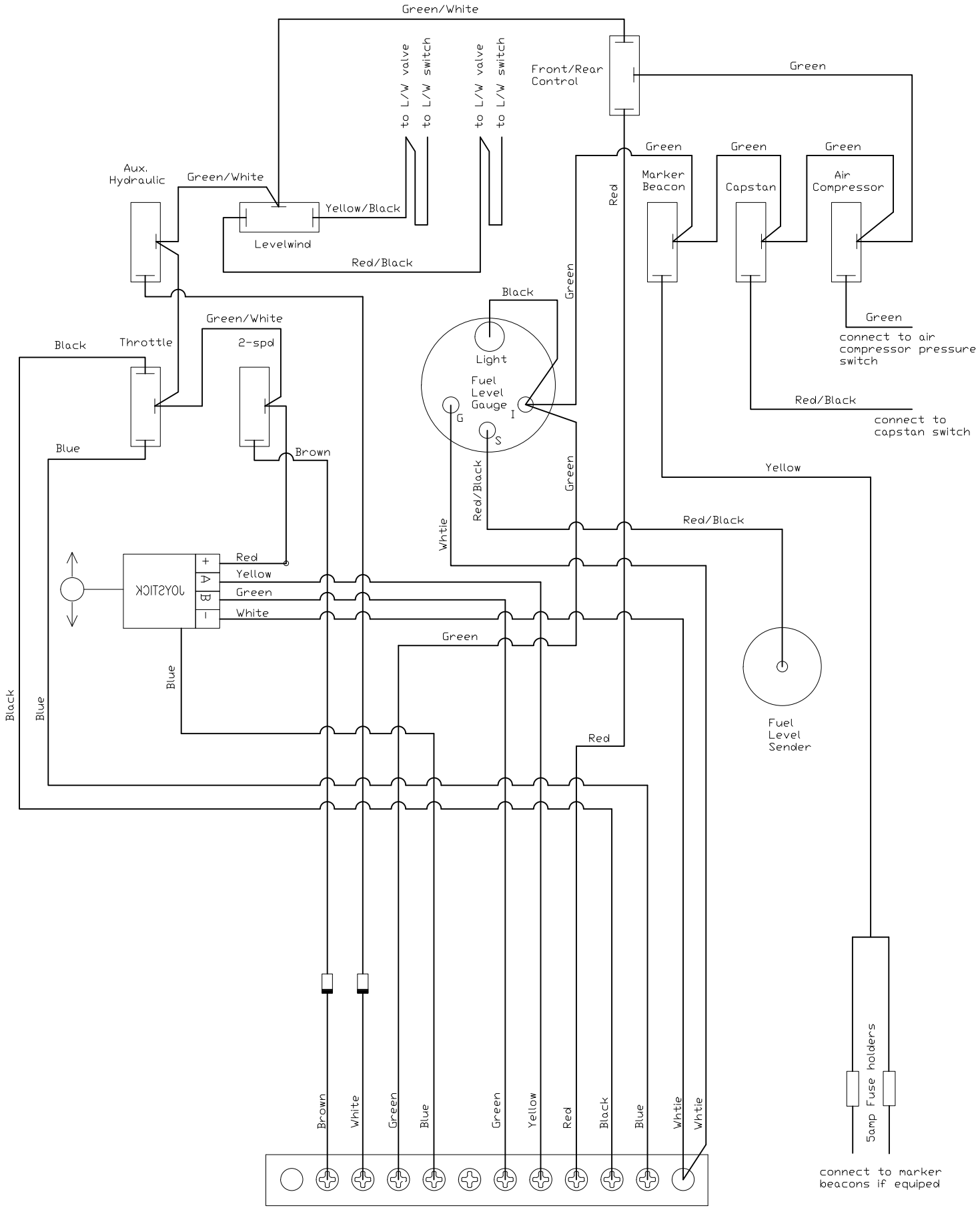
Override


a
b
from keyed relay post 87 GRN 1 RED joystick steer-go pin 2
to control panel toggles GRN 2 RED to rear switches
yanmar Alt. excite RED 3 GRN PDI switch
MC50-10 pin 2 RED 4 RED □X24 pin 2
remote ECU pin 10 RED 5 RED display pin 2
Fuel monitor YEL 6 RED joystick front puller pin 2
Multiplex keypad pin 1 GRN 7 RED joystickrear puller pin 2
rear switches grnd WHT 8 BLK joystick steer-go pin 1
pump EDC B grnd BLK 9 BLK 2 spd solenoid pin 2
pump EDC C grnd YEL 10 BLK charge solenoid pin 2
start and key relay grnd BLK 11 BLK brake solenoid pin 2
yanmar 4TNV grnd BLK 12 BLK R□R valve pin 2
B2 valve grnd BLK 13 BLK L□R valve pin 2
B1 valve grnd BLK 14 BLK R□E valve pin 2
A2 valve grnd BLK 15 BLK L□E valve pin 2
A1 valve grnd BLK 16 BLK flow control valve pin 2
MC50-10 pin 1 BLK 17 BLK □X24 pin 1
remote pin 11 BLK 18 BLK display pin 1
ground battery BLK 19 BLK joystick front puller pin 1
Multiplex keypad pin 2 WHT 20 BLK joystick rear puller pin 1
brkae psi pin 2 RED 21 RED system PSI pin 2
PVG psi pin 2 RED 22 RED supply pin 8
brake psi pin 1 BLK 23 RED system PSI pin 1
PVG psi pin 1 BLK 24 RED supply pin 9
□X24 pin 209 GRN 25 GRN charge coil pin 1
MC50 pin 110 WHT 26 BLU l/w switch curb
MC50 pin 111 YEL 27 YEL l/w switch street
MC50 pin 112 BLK 28 WHT tool circuit switch
MC50 pin 113 GRN 29 GRN curb outrigger switch up
MC50 pin 114 YEL 30 YEL curb outrigger switch down
MC50 pin 115 RED 31 BLU street outrigger switch down
MC50 pin 116 BLK 32 BLK street outrigger switch up
MC50 pin 126 WHT 33 WHT brake PSI pin 4
MC50 pin 127 GRN 34 WHT system PSI pin 4
MC50 pin 128 YEL 35 WHT PVG PSI pin 4
MC50 pin 132 WHT 36 BRN signal to alarm
MC50 pin 131 BLK 37 BRN 2 spd solenoid pin 1
MC50 pin 140 RED 38 RED pump EDC A
MC50 pin 139 BRN 39 GRN pump EDC D
MC50 pin 135 BLK 40 BLU brake solenoid pin 1
MC50 pin 133 YEL 41 YEL/RED start relay 85
MC50 pin 134 RED 42 RED ECU power pin G
MC50 pin 130 WHT 43 Lt.BLU fuel level signal
□X24 pin 107 GRN 44 RED R□R valve pin 1
□X24 pin 109 BLK 45 RED L□R valve pin 1
MC50 pin 143 YEL 46 RED B2 valve pin 1
MC50 pin 144 GRN 47 RED B1 valve pin 1
□X24 pin 106 WHT 48 RED R□E valve pin 1
□X24 pin 108 YEL 49 RED L□E valve pin 1
MC50 pin 142 RED 50 RED A2 valve pin 1
MC50 pin 145 YEL 51 RED A1 valve pin 1
MC50 pin 138 BRN 52 RED flow control pin 1
□X24 pin 110 □RNG 53 RED PVG drawbar cylinder pin 4
PVG curb mandrel pin 4 RED 54 RED PVG P/U cylinder pin 4
55 RED PVG street mandrel pin 4
□X24 pin 111 RED 56 RED PVG L/W, tool circuit pin 4
P/U cyl pin 3 BLK 57 BLK drawbar pin 3
curb mandrel pin 3 BLK 58 BLK street mandrel pin 3
ground battery BLK 59 BLK L/W, tool circuit pin 3
Rear wrok lights BLK 60 BLK Front work lights
□X24 pin 112 GRY 61 WHT PVG drawbar pin 1
□X24 pin 201 YEL/BLK 62 WHT PVG P/U cylinder pin 1
□X24 pin 202 Lt.BRN 63 WHT PVG curb mandrel pin 1
□X24 pin 203 Lt.BLU 64 WHT PVG street mandrel pin 1
□X24 pin 205 YEL/BLU 65 WHT PVG L/W, tool circuit pin 1
Front work light switch YEL 66 RED Front work light
Rear work light switch BLU 67 RED Rear work light
Front/rear control switch RED 68 RED MC50 pin 17

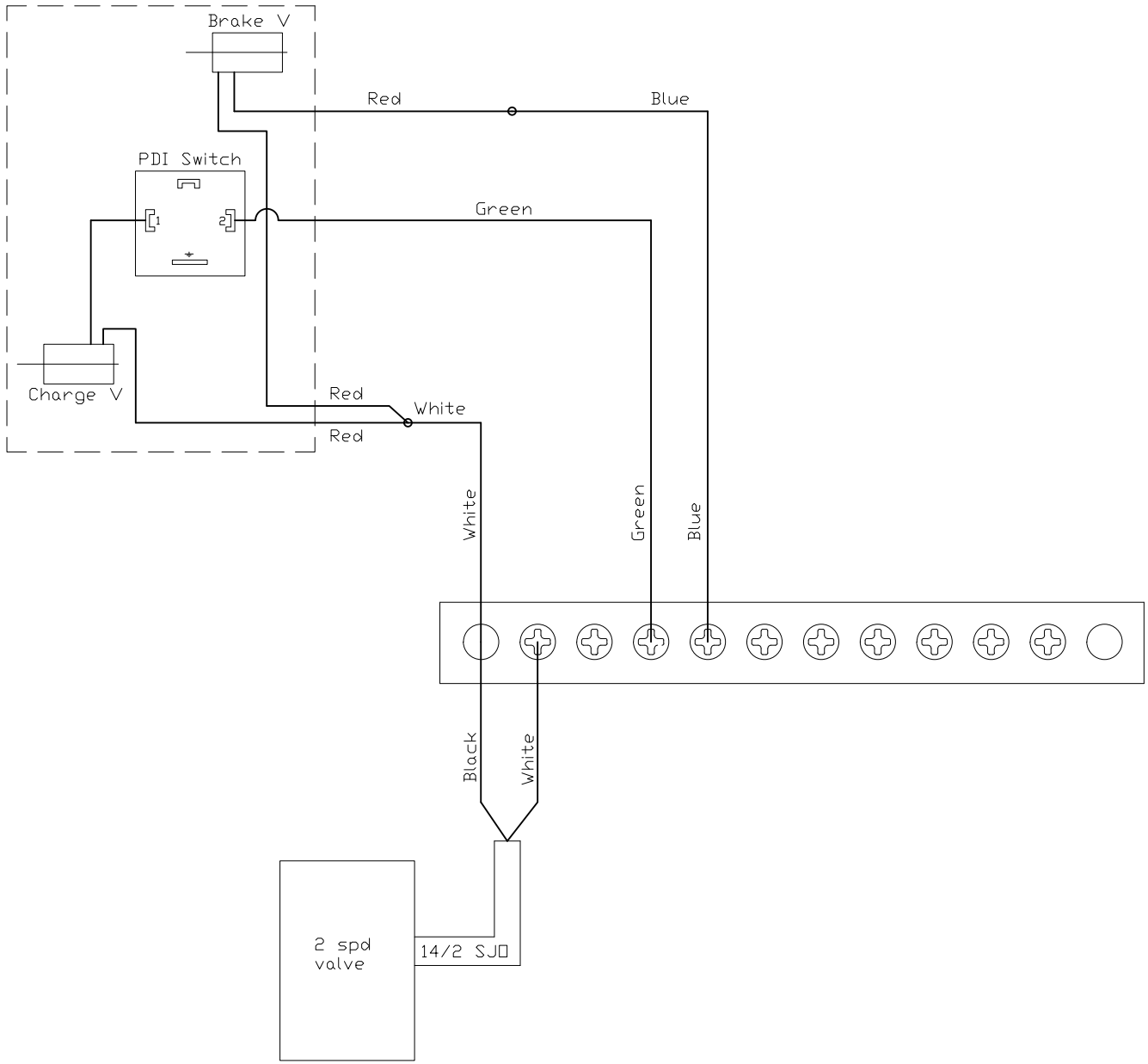
6500 Control Wiring
Keyed Ignition and throttle relays



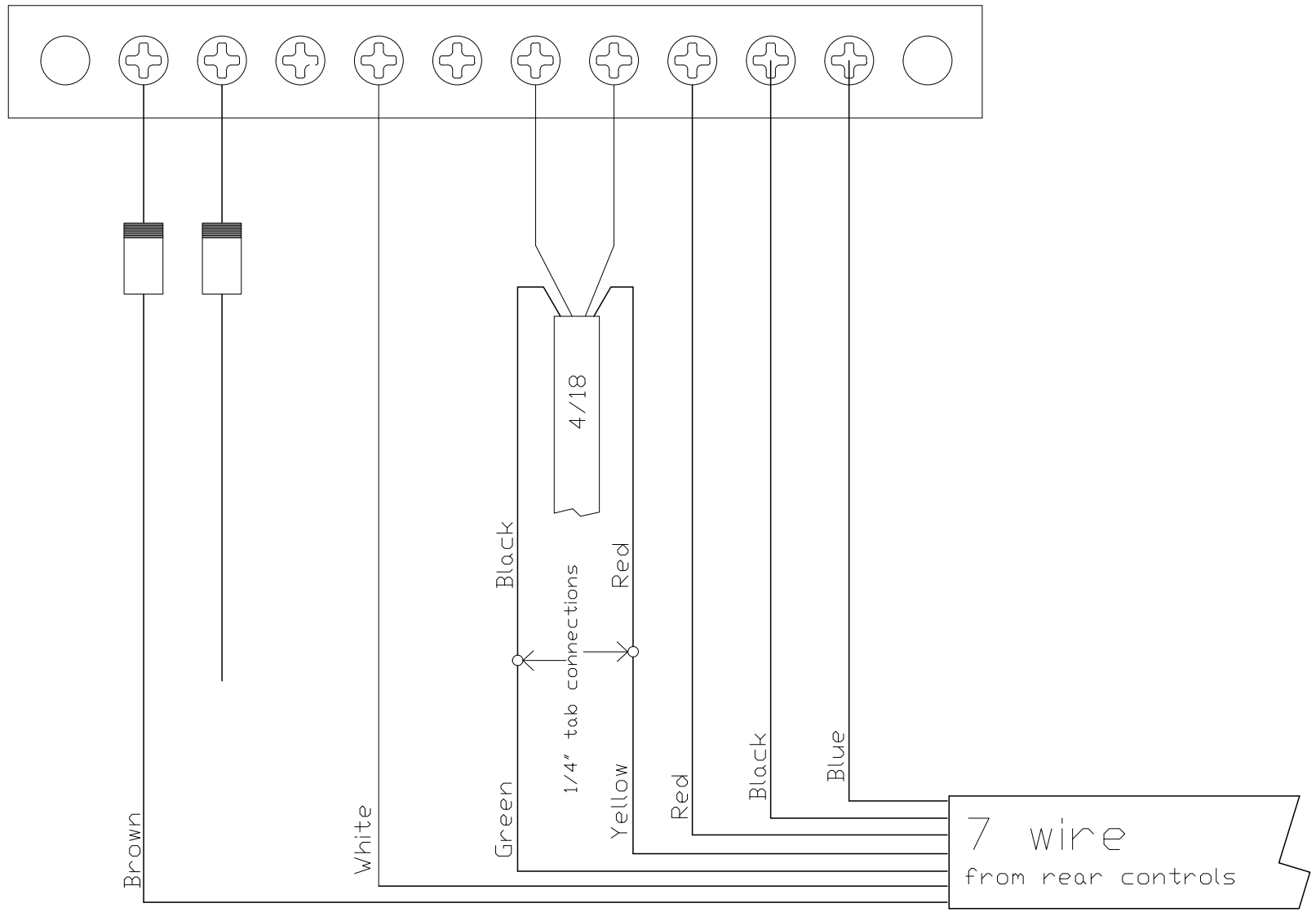
6500 Control Panel T4f
Switches



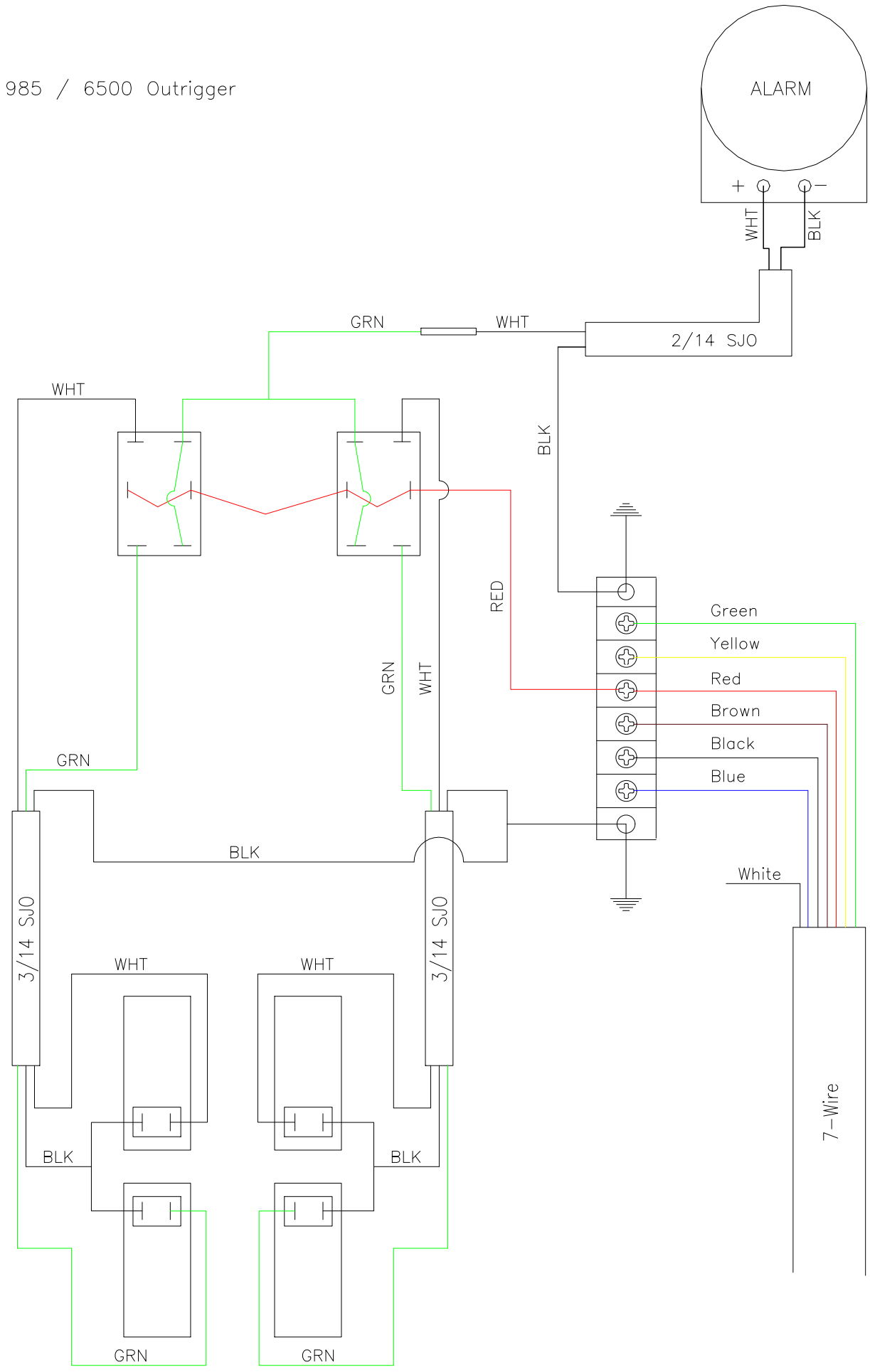
6500 Control Panel Valves T4f



6500 Lower Control Panel T4f

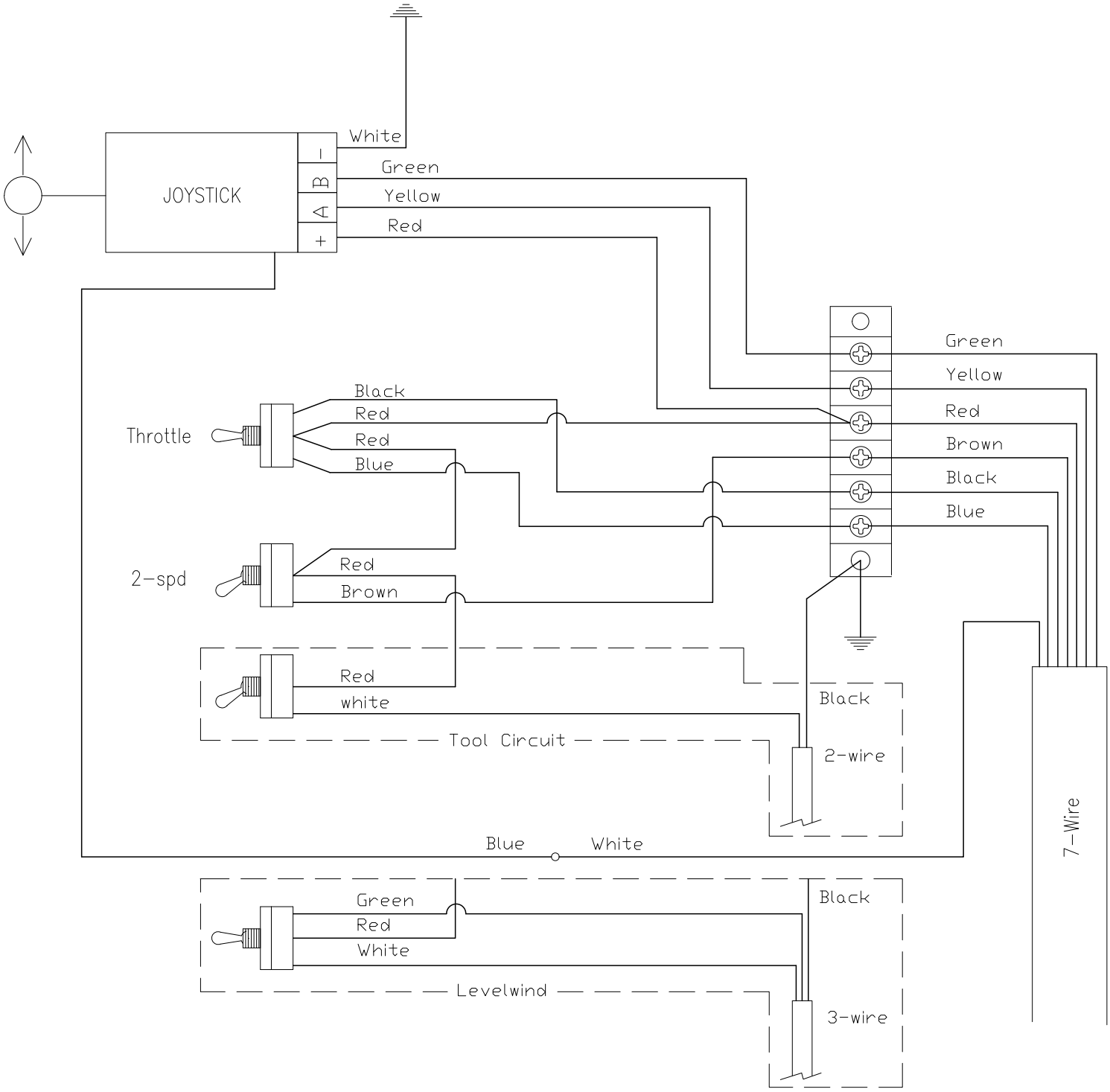


Tool Cirsuit equiped units require a 14/2 SJ□ to be run along with the 7 wire
Level Wind equiped units require a 14/3 SJ□ to be run along with the 7 wire

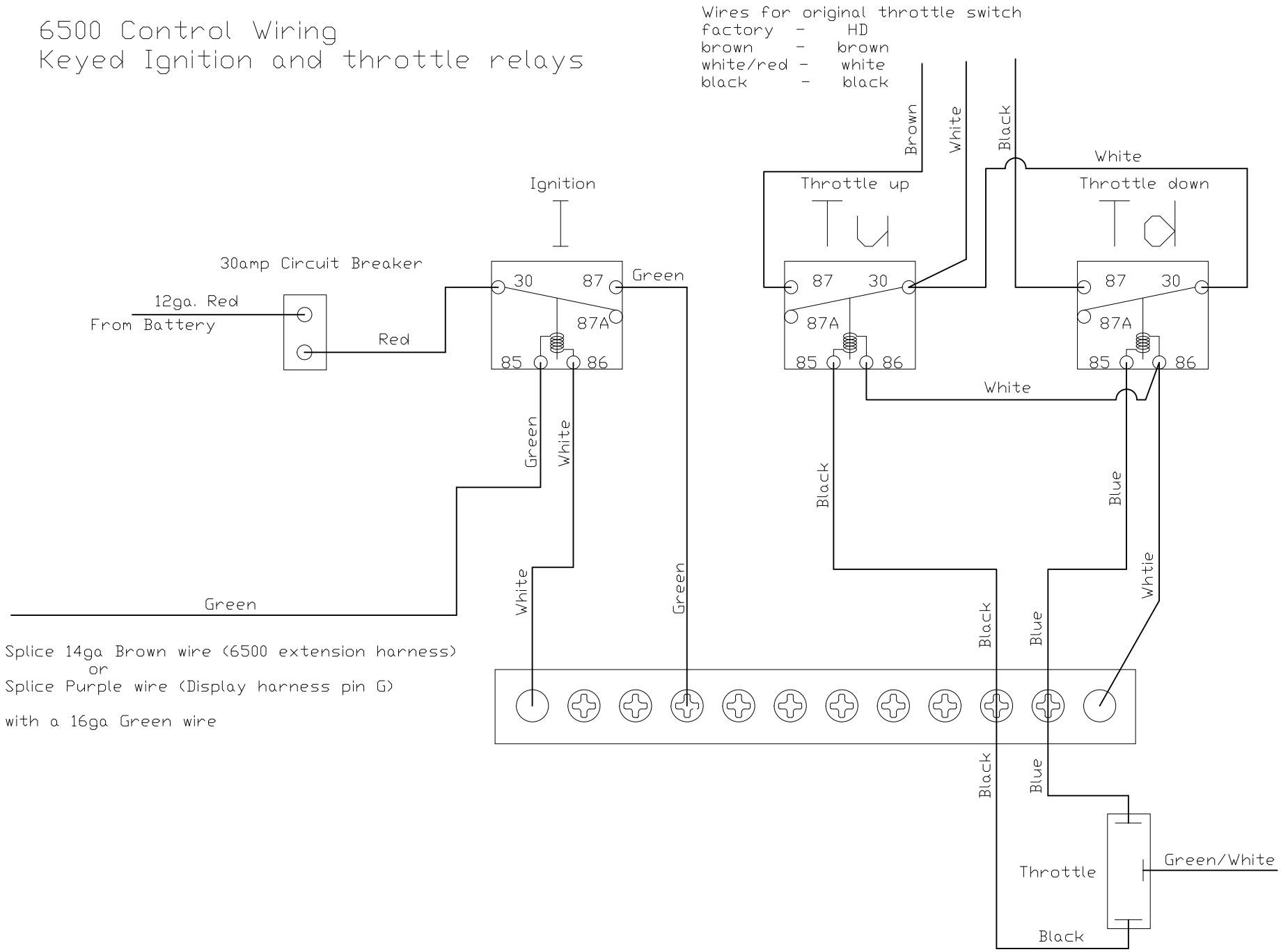

985 / 6500 Outrigger
ALARM
+
–
WHT
BLK
GRN
WHT
2/14 SJO
WHT
BLK
RED
GRN
WHT
Green
Yellow
Red
Brown
Black
Blue
White
GRN
BLK
3/14 SJO
3/14 SJO
WHT
WHT
BLK
BLK
GRN
GRN
7-Wire

6500 Rear Control Wiring T4f

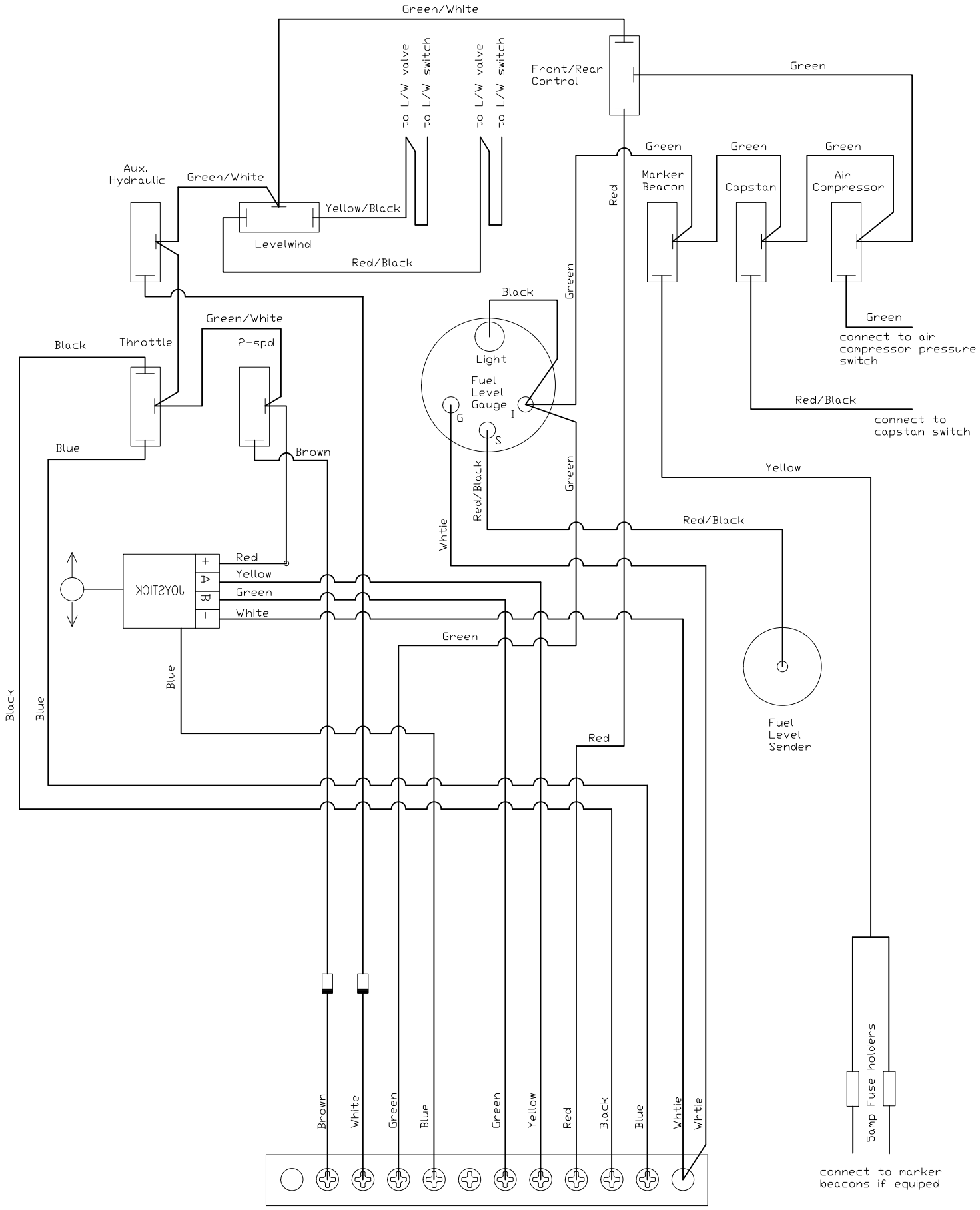
if the unit has a tool circuit you must run a 14/2 SJ□
if the unit has a level wind you must run a 14/3 SJ□



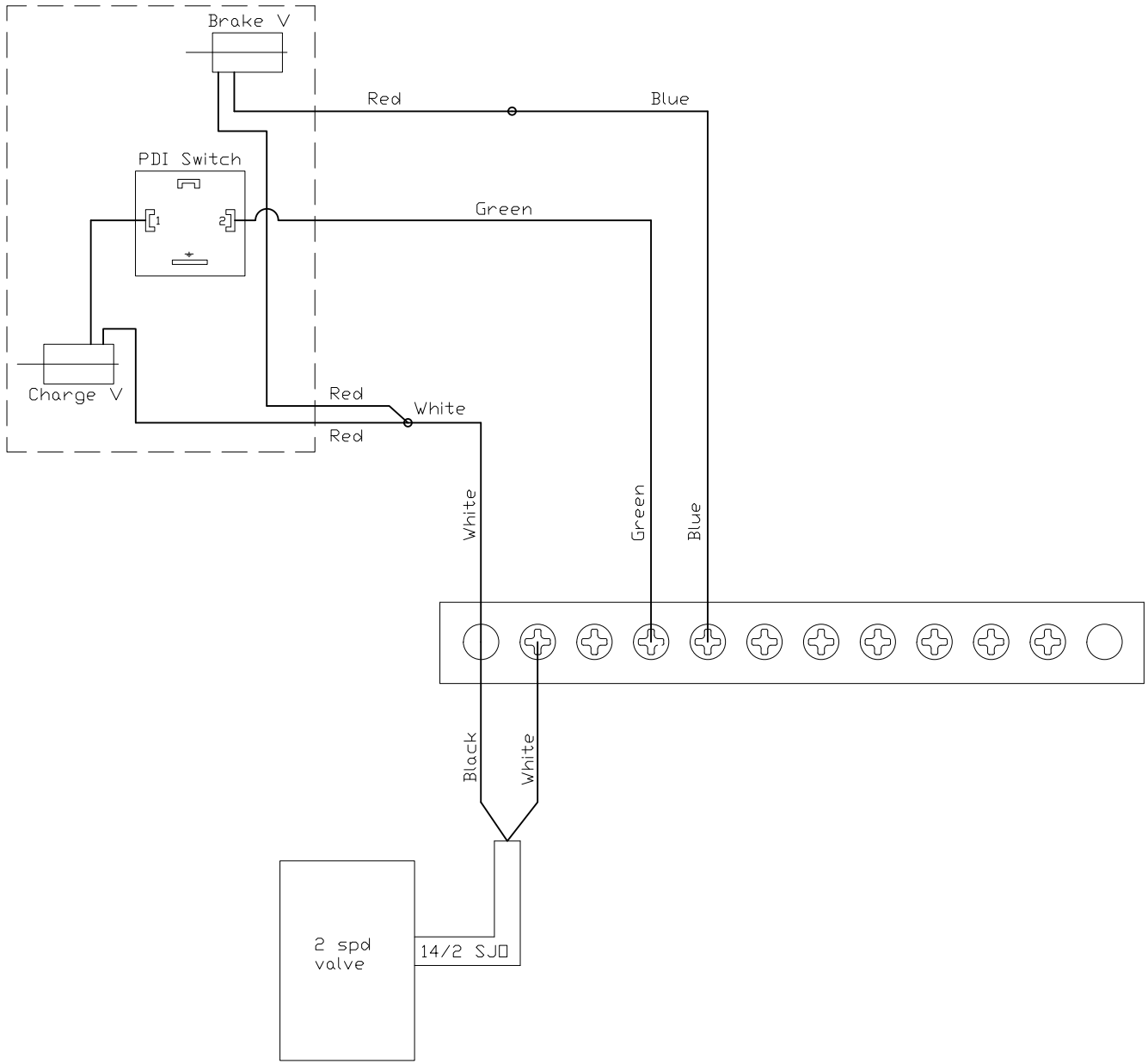
6500 Control Wiring
Keyed Ignition and throttle relays



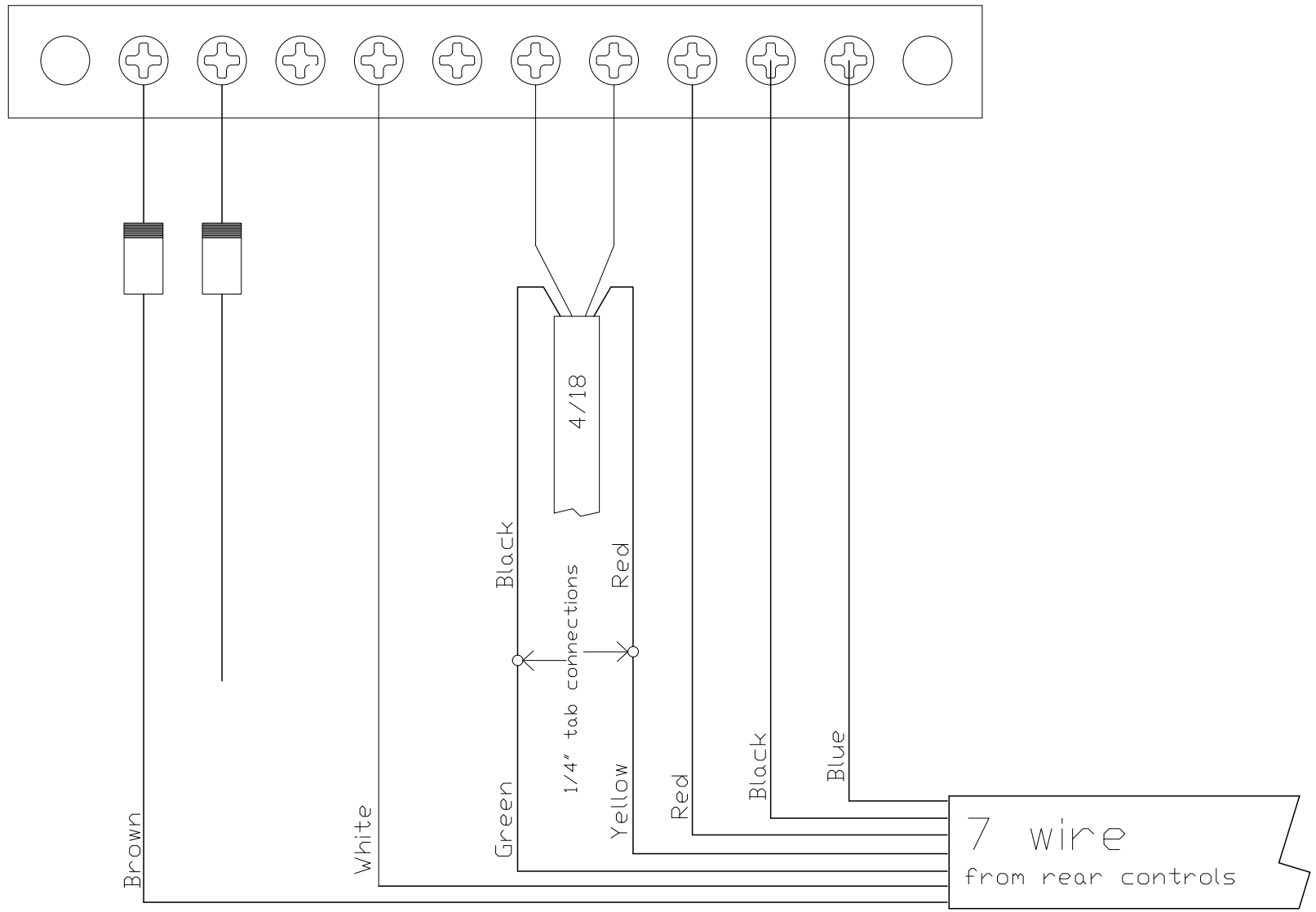
6500 Control Panel T4f
Switches



6500 Control Panel Valves T4f



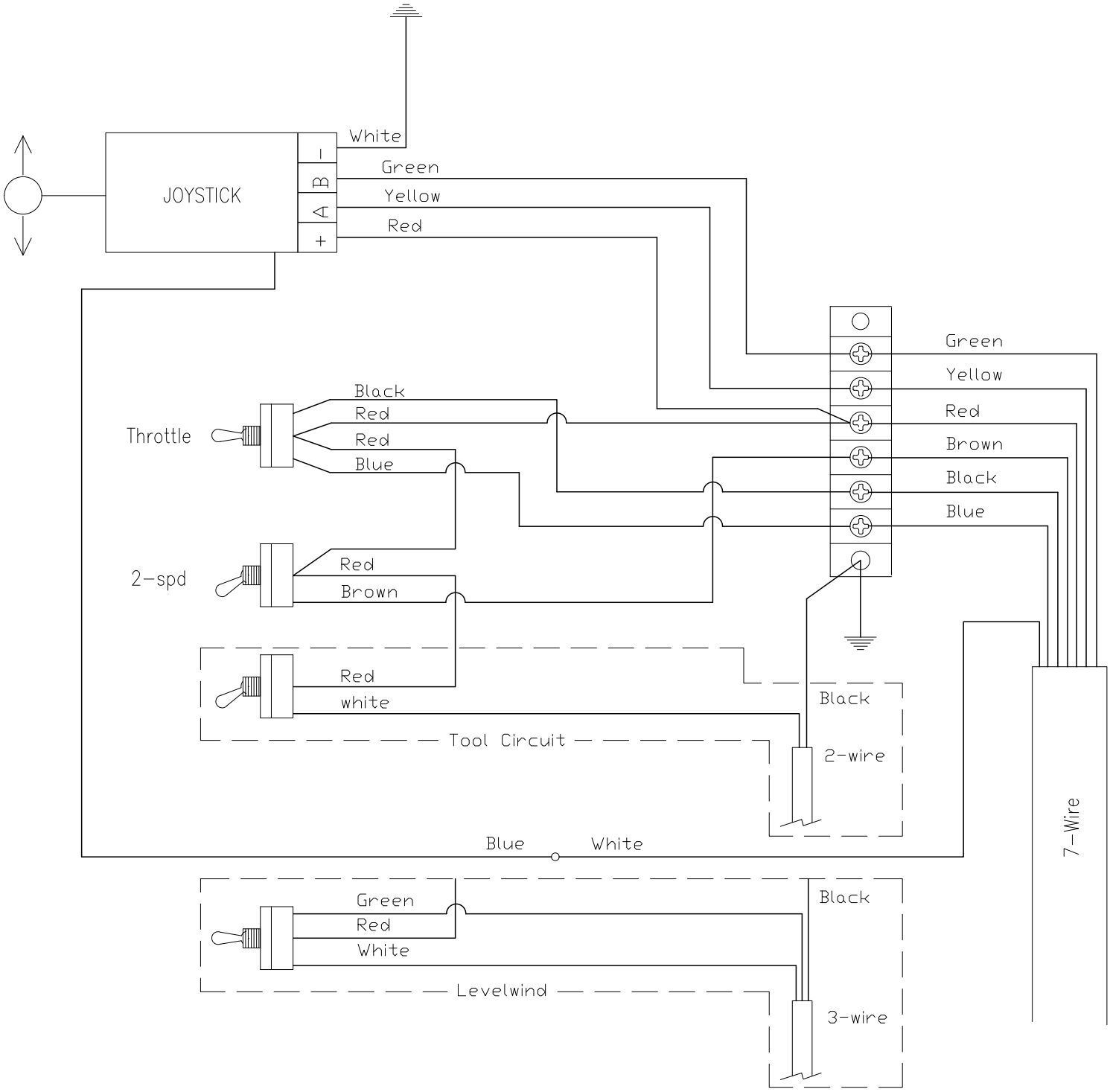
6500 Lower Control Panel T4f



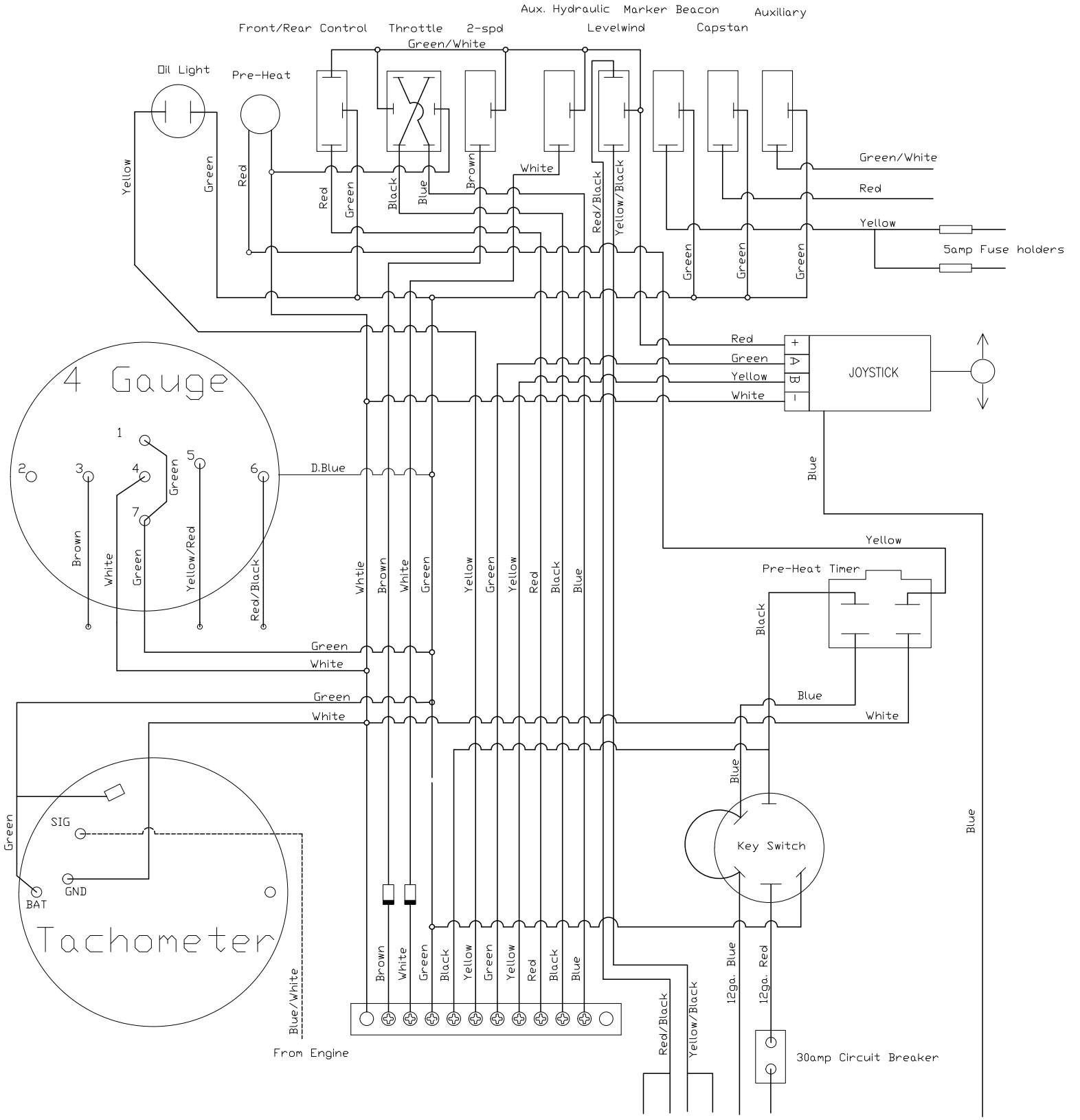
Tool Cirsuit equiped units require a 14/2 SJ□ to be run along with the 7 wire
Level Wind equiped units require a 14/3 SJ□ to be run along with the 7 wire

6500 Rear Control Wiring T4f

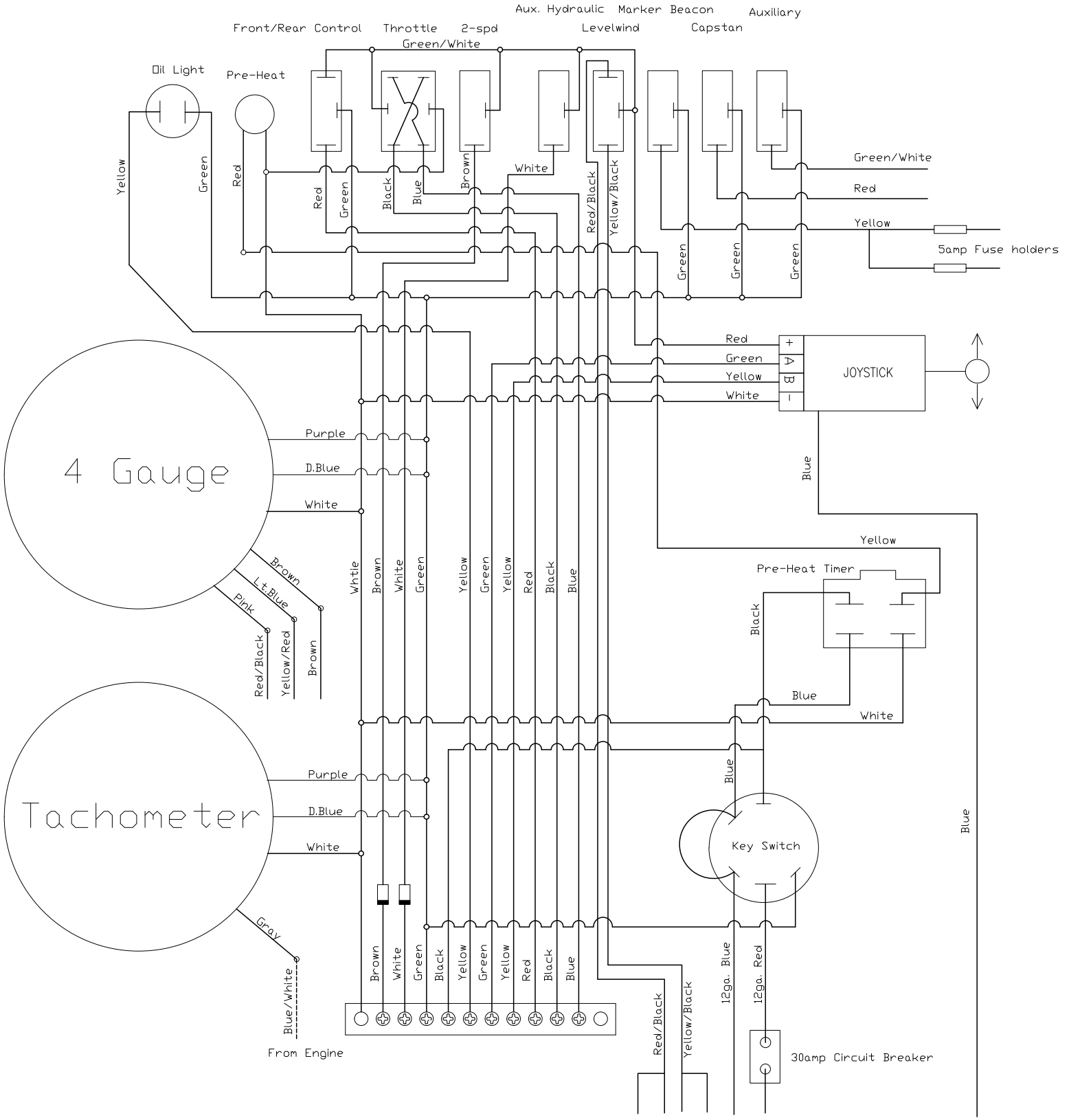
if the unit has a tool circuit you must run a 14/2 SJ□
if the unit has a level wind you must run a 14/3 SJ□



6500 Contol Panel Faria



6500 Contol Panel

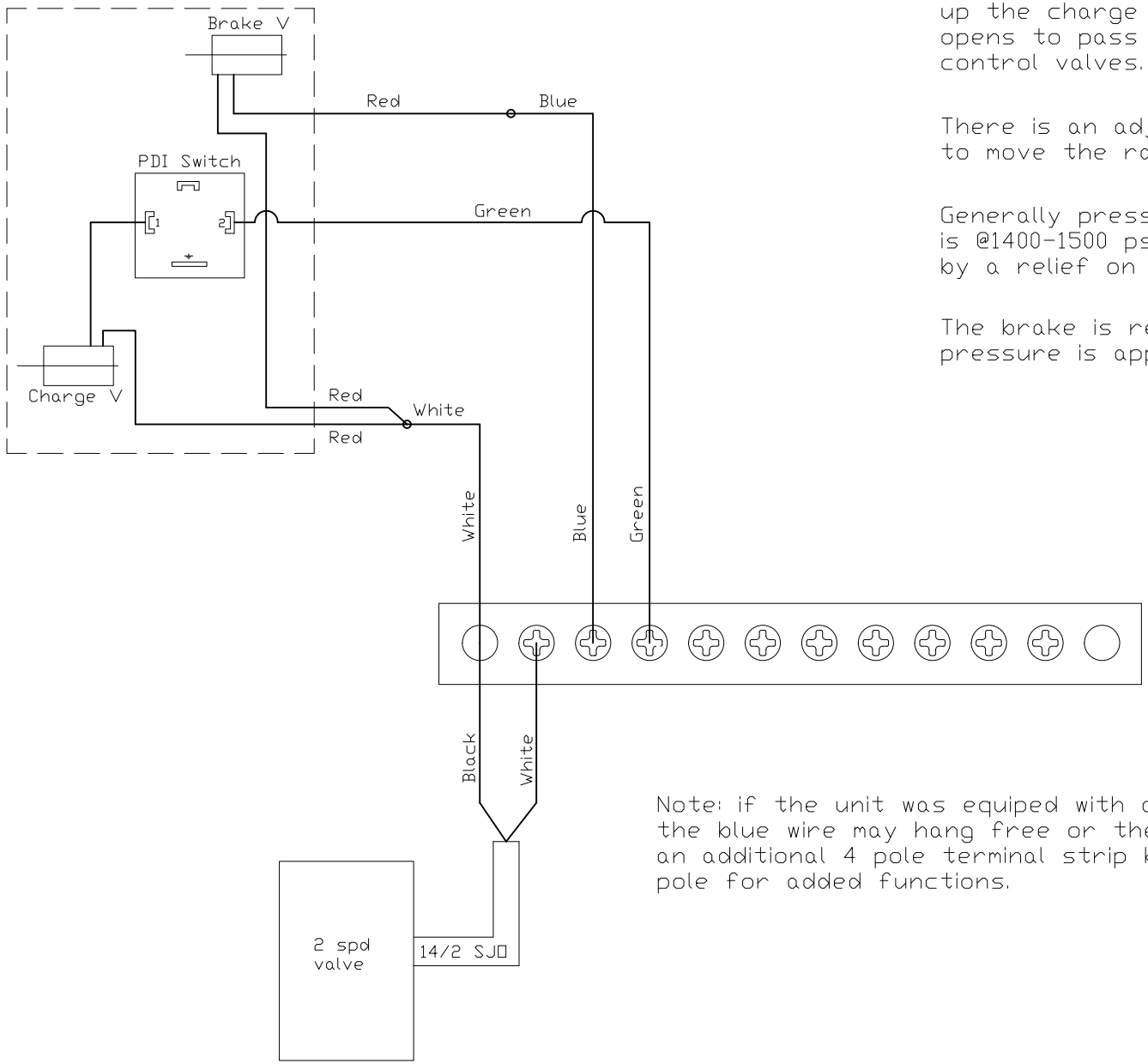


Livorsi gauges shown. If replaceing VDO gauges see below.

VDO gauges - green wire is power - white wire is ground.

the green wire jumped from the keyswitch to each gauge then up the the switches that are powered up with the key.

6500 Brake Manifold and 2 Spd



The PDI switch contols the operation of the charge valve. The PDI has about a 400psi range. Below that range is closes to power up the charge vavle. Above that range it opens to pass flow along to the trailer control valves.

There is an adjuster in the top of the PDI to move the range up or down.

Generally pressure in the the brake manifold is @1400-1500 psi. Max is 2000, which is contoled by a relief on the manifold.

The brake is released when hydraulic pressure is applied to it.

Note: if the unit was equiped with a tool circuit, the blue wire may hang free or there may be an additional 4 pole terminal strip below the 10 pole for added functions.

JOHN DEERE keyswitch pinout