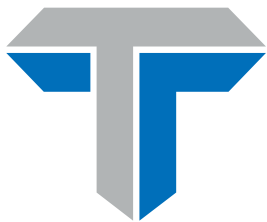


# Operation Manual

92-0306 Rev. 141107  
Model 765RVC Hydraulic Power Supply



**TRI TOOL**  
BUILDING PERFORMANCE

## **ABOUT TRI TOOL INC.**

Tri Tool's extensive experience in the design, development and manufacture of portable machine tools and welding equipment has resulted in machinery that is designed to meet the highest standards of quality, safety, and performance. Our products are backed by a company totally committed to service, integrity, and customer satisfaction.

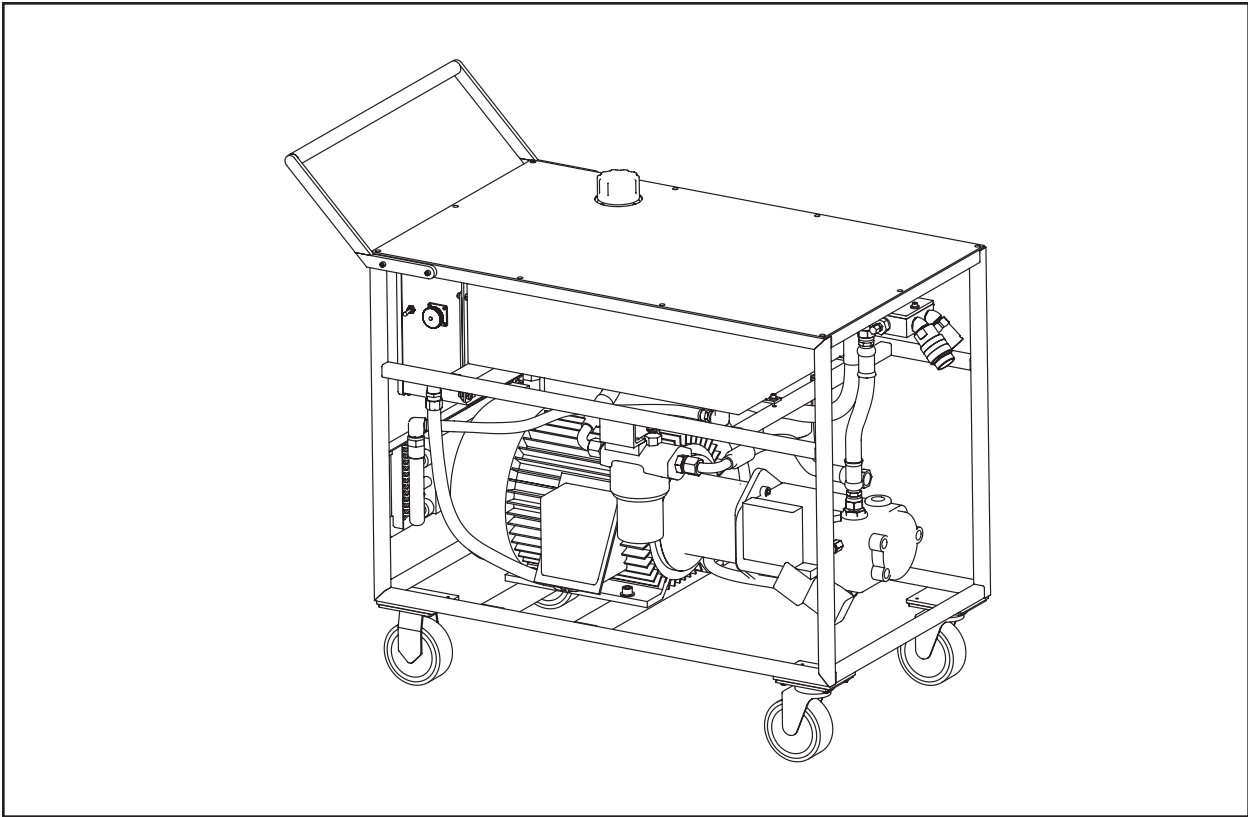
Tri Tool Services has developed a solid reputation as a trusted provider of dependable and cost-effective on-site service solutions including turnkey project management, machining services, and mechanized and manual code welding services using experienced and well-trained machinists and welders.

In addition to developing industry leading machining and welding equipment, Tri Tool's engineering team provides custom equipment design and manufacturing solutions to suit the most rigorous requirements of our customers' special applications.

Please contact us for more information on any of our products or services. Company representatives are available for demonstrations of most of our products at your facility.

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## TABLE OF CONTENTS

1.	ABOUT THE MANUAL	3
2.	SAFETY	3
3.	GENERAL DESCRIPTION	6
4.	SPECIFICATIONS	7
5.	SYSTEM SCHEMATICS	10
6.	MAINTENANCE	14
7.	RECOMMENDED HYDRAULIC FLUIDS	16
8.	PENDANT CHECK PROCEDURES	18
9.	OPERATION	20
10.	PHASE MONITORS	23
11.	CONVERSION PROCEDURE	26
12.	TROUBLESHOOTING	29
13.	ACCESSORIES	31
14.	ILLUSTRATED PART BREAKDOWN	32

## **TRI TOOL INC. Warranty**

All products manufactured by Tri Tool Inc., except for tool bits and for other consumable items, are warranted to the original purchaser to be free from defects in materials and workmanship under normal use for a period of one year from the date of purchase.

The purchaser shall bear all shipping, packing and insurance costs and all other costs to and from a designated repair service center. The product will be returned to the purchaser freight prepaid and billed to the purchaser.

The warranty will not apply to those products that have been misused, abused, or altered without the express permission in writing by Tri Tool Inc.

Neither this warranty nor any other warranty, expressed or implied, including implied warranties of mechanical ability, fitness for a particular use, or merchantability, shall extend beyond the warranty period. No responsibility is assumed for any incidental or consequential damages.

Some states do not allow limitations on how long an implied warranty lasts and some states do not allow the exclusion or limitations incidental or consequential damages, so the above limitation of exclusion does not apply to all purchasers. This warranty gives the purchaser specific legal rights. Other rights vary from state to state.

## **Tool Bit Resharpener Policy**

Tri Tool Inc. can not sharpen badly gouged, chipped, or broken tool bits. Check the tool bits before you send them and package them well. Within two working days of receipt, the tool bits are evaluated and the customer is contacted for authorization.

The customer will receive a price and a scheduled return shipment date. The price structure is available from your Tri Tool Inc. sales representative.

Tool bits that are not suitable for sharpening are returned with the tool bits that were sharpened, unless Tri Tool Inc. is instructed otherwise.

The customer is responsible for shipping charges to and from Tri Tool Inc.

This policy only covers tool bits manufactured by Tri Tool Inc.

## 1. ABOUT THE MANUAL

### 1.1 COPYRIGHT

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### 1.2 DISCLAIMER

The instructions and descriptions in this manual were accurate when the manual was written. However, the information in the manual is subject to change without notice. Check for updated information before you start any job. The Tri Tool Inc. web site has the most current information.

Do not operate or work on this equipment unless you have read and understood the instructions in this Manual. Failure to follow the instructions or follow the safety instructions could result in serious injury or death. This manual describes conditions and hazards that are common and anticipated during equipment operation. No manual can address all conditions which may occur.

## 2. SAFETY

### 2.1 SAFETY SYMBOLS

The manual may contain one or more safety symbols. These symbols and the associated text warn you of potentially hazardous conditions. Examples of the safety symbols and the associated text follow:



**DANGER**

**DANGER:** Indicates a hazardous situation which, if not avoided, will result in death or serious injury.



**WARNING**

**WARNING:** Indicates a hazardous situation which, if not avoided, could result in death or serious injury.



**CAUTION**

**CAUTION:** Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury, or cause property damage.

## **2.2 PERSONAL PROTECTIVE EQUIPMENT**

- Use standard safety equipment such as: hard hats, safety shoes, safety harnesses, protective clothes, and other safety devices when appropriate.
- Wear safety glasses.
- Do not wear loose clothing or jewelry.
- Wear nonskid footwear.
- Secure long hair.



**DANGER**

**DANGER: Do not wear gloves when you use operate the equipment. If you are using the index trip mechanism, a glove may be caught or pulled into the pinch point created by the equipment head. This will result in serious personal injury.**

## **2.3 PERSONNEL**

- Only personnel who are trained or are being trained may operate the equipment.
- Keep the operation manual available where the equipment is used.
- The operator must read the operation manual before using the equipment.
- The equipment must be operated in accordance with the manual information.
- The operator must follow the safety precautions in this manual and good engineering practices to reduce the risk of injury.
- Before using the equipment, the operator must ensure that all safety messages on the equipment are legible.

## **2.4 WORK AREA**

- Keep the work area clean.
- Keep the area well lit.
- Keep items such as; electrical cords, cables, rags, rigging straps, away from rotating equipment.
- Do not use power-cutting tools in the presence of flammable liquids and gasses.
- Do not let visitors or untrained personnel near tools that are in use.
- Ensure all observers wear eye protection.
- Keep proper footing at all times.

### 2.5 AREA EQUIPMENT

- Secure the pipe with clamps, vises, chains or straps.
- Ensure that both sides of the pipe at the cut site is fully supported so that the pipe will not move after the cut is completed. Long lengths of pipe may be under load and the separation of the pipe can release pressure. This pressure can cause both sides of the pipe to move.

### 2.6 TOOL CARE

- Keep tools in good operating condition. Sharp tool bits perform better and are safer than dull tool bits.
- Do not use damaged tools. Always check your tools for damage especially if a tool has malfunctioned, been dropped or hit, check it for damage.
- Before you start operating the equipment, do no-load tests and feed function checks.

### 2.7 TOOL USE

- Use the right tool and tool bit for the job. Contact Tri Tool to help with your application.
- Keep the tool bits fully engaged in the tool bit holders. Loose bits are sharp and can cause cuts or punctures.
- Disconnect power supply during setup and maintenance. Use all 'Stop' or Shut off' features available when changing or adjusting tool bits, maintaining the tool, or when the tool is not in use.
- Remove adjusting keys and wrenches before applying power to the equipment. Check the tool before turning it on to make sure that all keys and wrenches have been removed.
- Do not force tools. Tools and tool bits function better and safer when used at the recommended speeds.
- Do not reach into rotating equipment.
- Do not reach into the rotating head stock to remove chips, to make adjustments, or to check the surface finish.
- Handle chips with care. Chips have very sharp edges and are hot. Do not try to pull chips apart with bare hands.
- Store tools properly. Disconnect tools from the power source, remove the tool bits, and store in a safe place.



**DANGER**

**DANGER: Do not override the deadman switch on the power unit. Locking down, obstructing, or in any way defeating the deadman switch on the power drive unit may result in serious injury.**

### 3. GENERAL DESCRIPTION

The Model 765RVC (P/N 01-0765) Remote Volume Control Hydraulic Power Supply is a variable-volume, 0 (0 L/s) to 15 (.94 L/s) gpm, pressure-responsive, 0 (0 kPa) to 1800 psi (12410 kPa), reversible-flow power unit.

The Model 765RVC is used for supplying hydraulic power to cutting and weld end preparation pipe lathes with integral hydraulic motors.

Although the pump capacity is 0 gpm (0 L/s) to 22 gpm (10 L/s), operating pressure must be limited to 1000 psi (6895 kPa) at flows over 15 gpm (.94 L/s) to avoid overloading the motor.

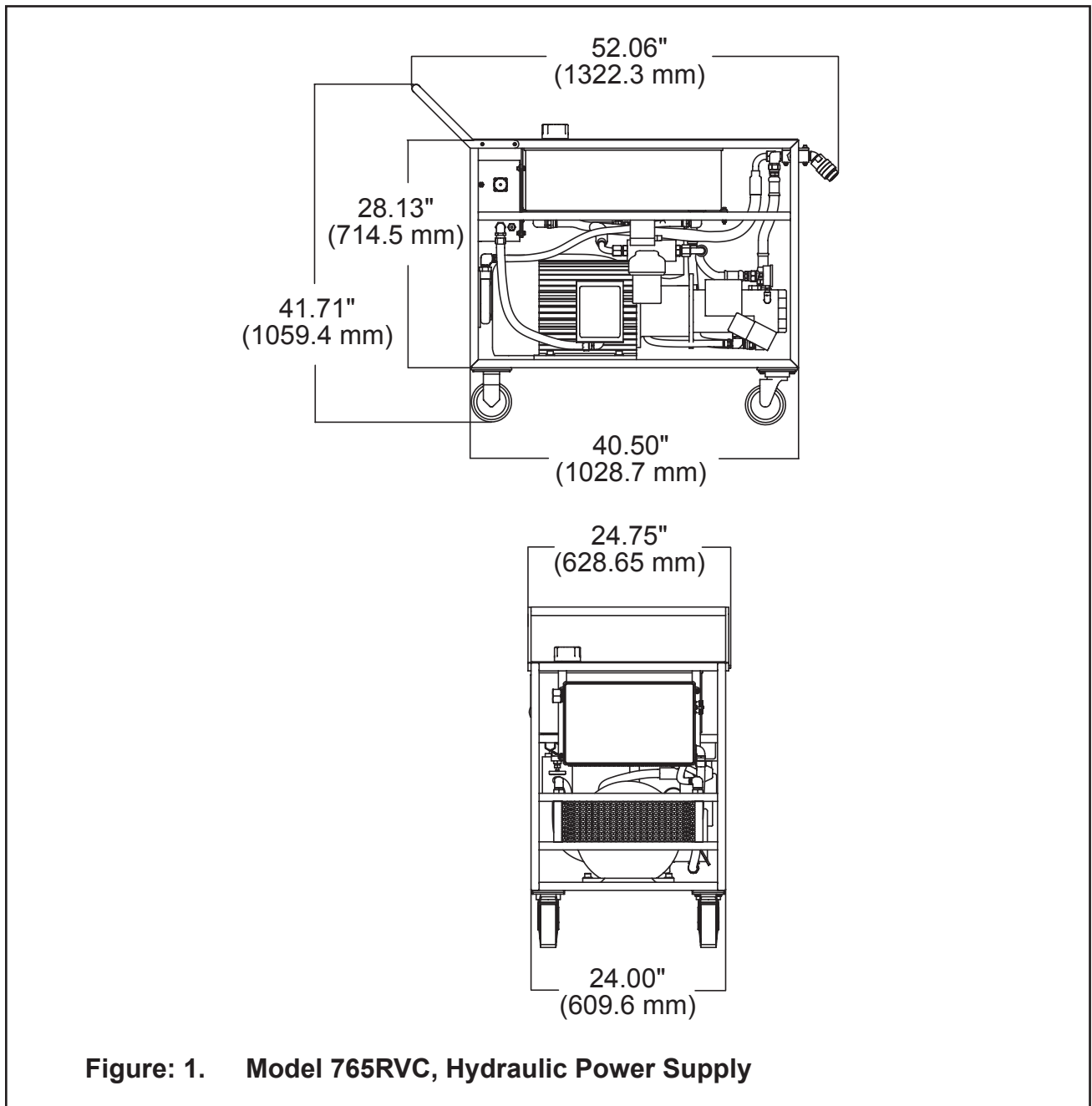
The Pendant provides stop, start, volume control, and forward/neutral/reverse flow direction control.

The Pendant allows operation up to 200' (61 m) away from the power supply by addition of a Pendant Extension Cable and Hydraulic Hoses.

For portability, the power supply is integrated into a cart frame with wheels and casters



## 4. SPECIFICATIONS



**Weight (Approx.)** 627 lbs. (284 kg) with oil

**Power Requirements:** 15 hp, 3 phase, 460 VAC, 50/60 Hz, 20 Amps  
15 hp, 3 phase, 240 VAC, 50/60 Hz, 40 Amps

---

P/N	Model Designations	
	with Kit No.	Input Voltage
01-0765RVC	05-0146	480 VAC
	05-0147	380 VAC
	05-0148	240 VAC

---

## Electrical Control Features

Magnetic starter with a 24 VAC starting coil and Overload Protection Circuit Breaker.

Phase sensor to prevent reverse rotation of the motor, which can damage the Hydraulic Pump.

The unit is controlled with a remote Pendant, which provides Stop/Start functions, Variable Volume Control, and a Forward/Neutral/Reverse Control.

- The Flow Direction Control is released in the neutral and forward position with reverse not released and restricted to only supply 25% of the forward flow.
- If the power supply has been shut-off with the Stop Button, the Variable Volume Control must be returned to the zero to start up.
- The Pendant is supplied with a 20' (6 m) cable that connects to the Control Box.
- The addition of extension cables will add up to 200' (61 m).

## Hydraulic Characteristics

**Variable Volume:** 0 gpm (0 L/s) to 15 gpm (.94 L/s)

Operation below 3 gpm (.2 L/s) is not recommended.

The pump capacity is actually 0 gpm (0 L/s) to 22 gpm (10 L/s), however, operating pressure must be limited to 1000 psi (6895 kPa) at flow over 15 gpm (.94 L/s) to avoid overloading the motor.

**Volume Control:** Pendant rheostat with the integrated Electric Displacement Control (EDC) Pump.

### **Pressure**

0 psi (0 kPa) to 1800 psi (12410 kPa) forward.

0 psi (0 kPa) to 1400 psi (9653 kPa) reverse.

Pilot-operated bypass (pressure limiting) valves (2) are included in the forward and reverse flow lines.

A closed loop system has been designed in for minimum heat generation.

A full flow return “loop” 10-micron filter is in the system to prevent contamination from circulating through the pump.

The Filter Assembly incorporates a visual Filter Clogging Indicator.

The tank suction line contains a 10-micron filter.

### **Cooling**

A heat exchanger is built into the reservoir return line.

### **Hydraulic Reservoir**

The reservoir has a capacity of 18 gal (68 Lt.).

The reservoir includes a level and a temperature gauge.

### **Hydraulic Fluid Compatibility**

The system requires a petroleum-based hydraulic fluid.

Ethylene glycol/water based fluids may also be used. However, it is recommended that you contact the factory regarding specifics of operation on those types of fluids.

# 5. SYSTEM SCHEMATICS

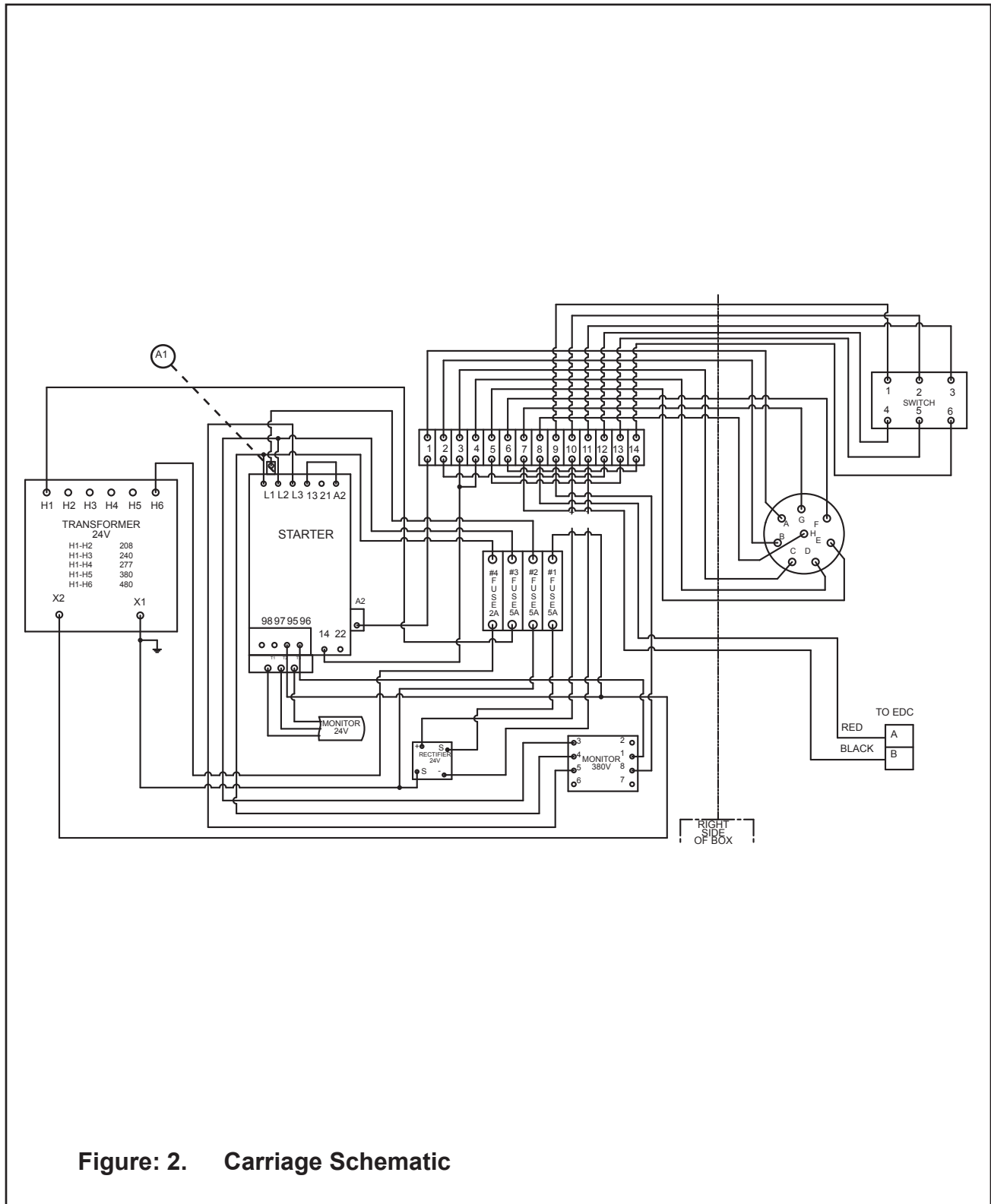


Figure: 2. Carriage Schematic

# Model 765 RVC Hydraulic Power Supply

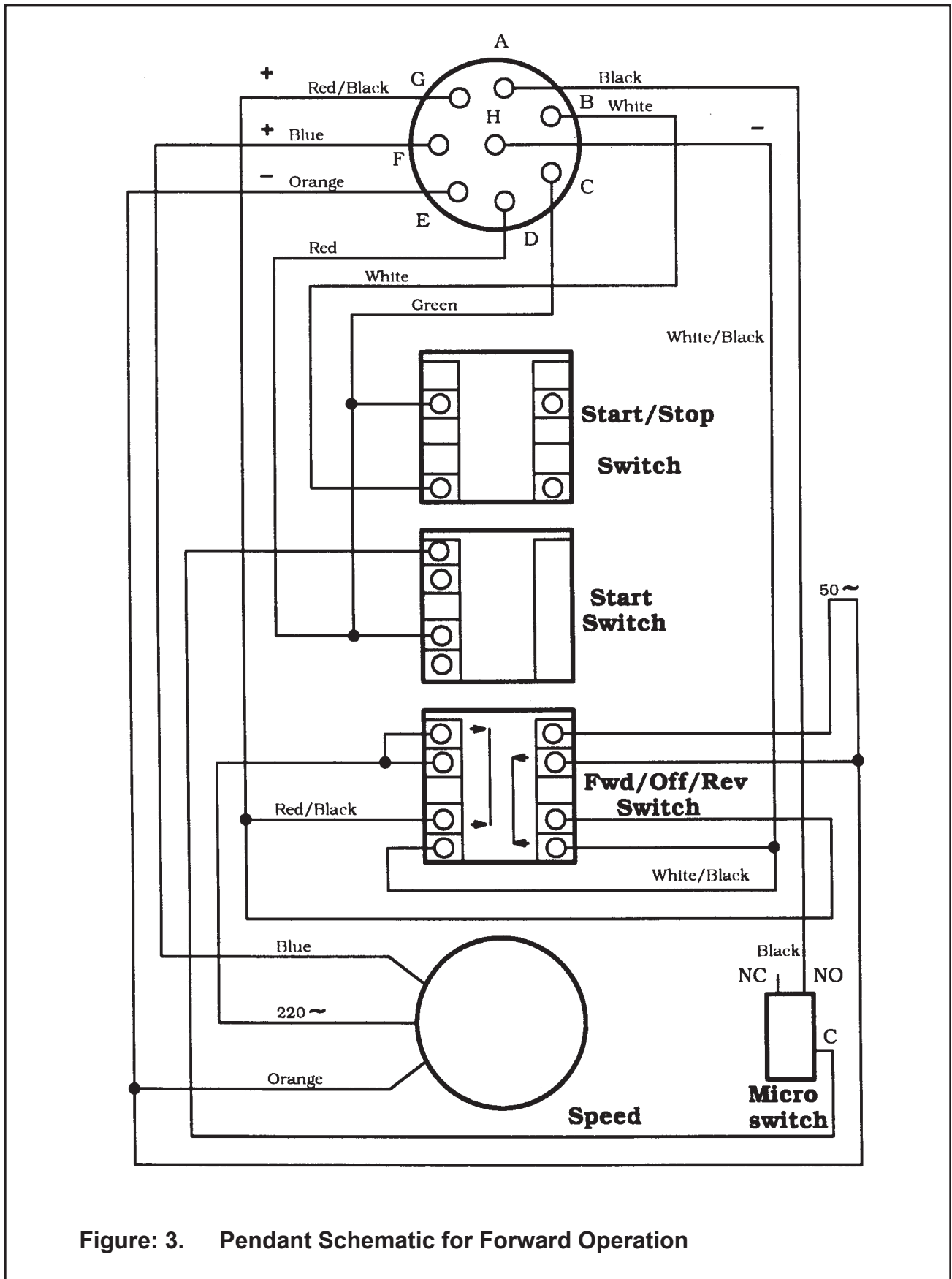


Figure: 3. Pendant Schematic for Forward Operation

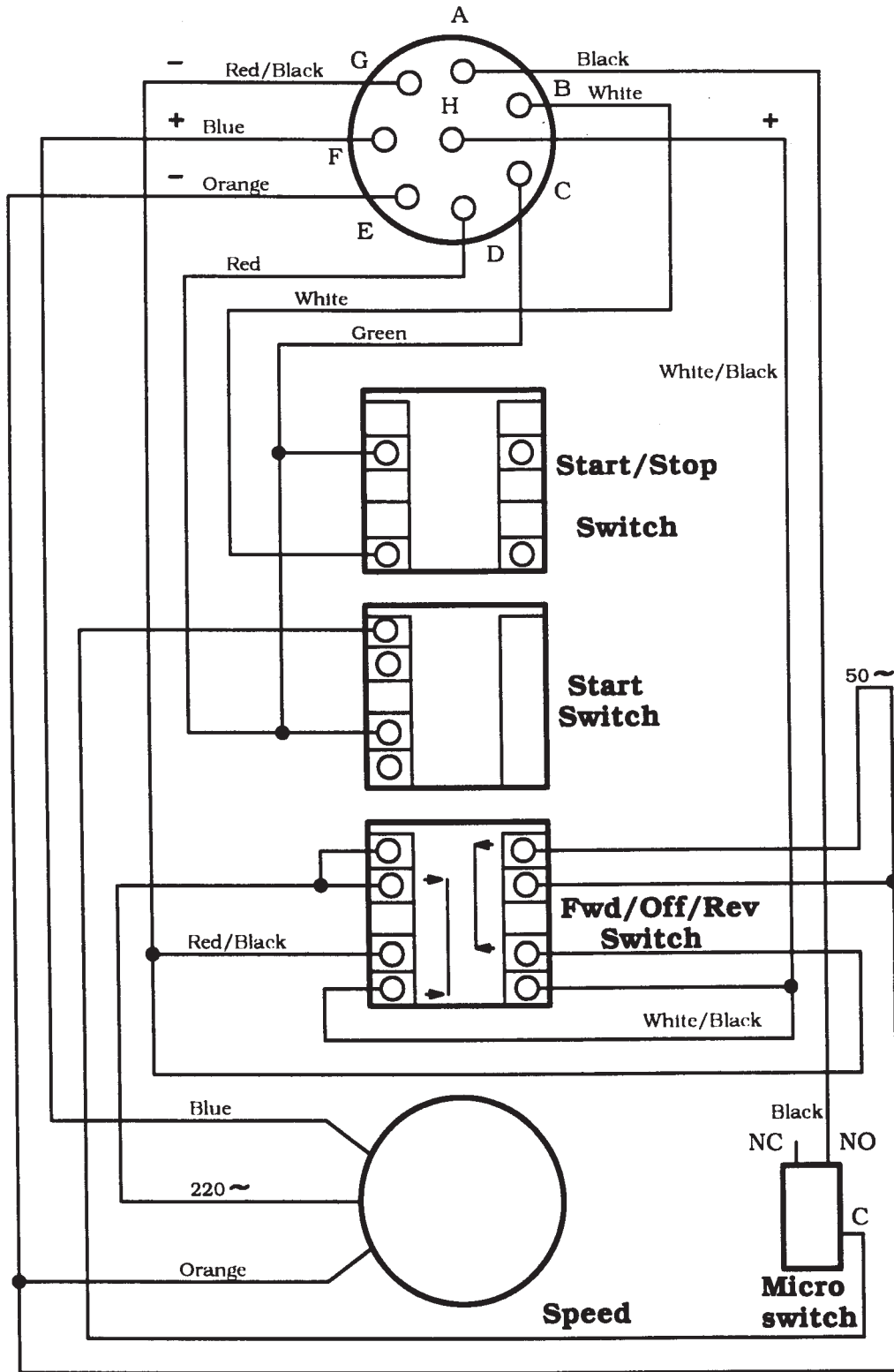


Figure: 4. Pendant Schematic for Reverse Operation

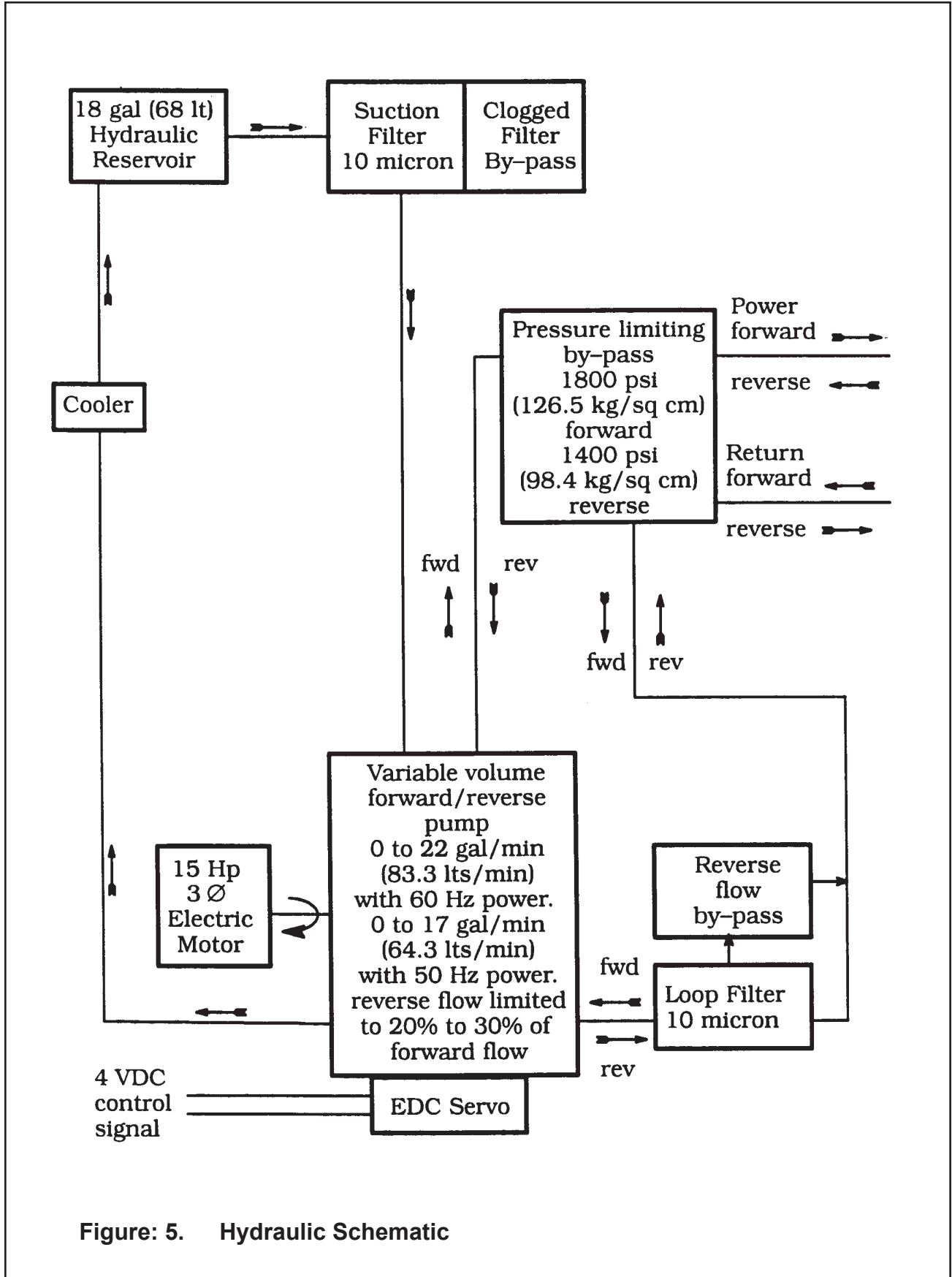


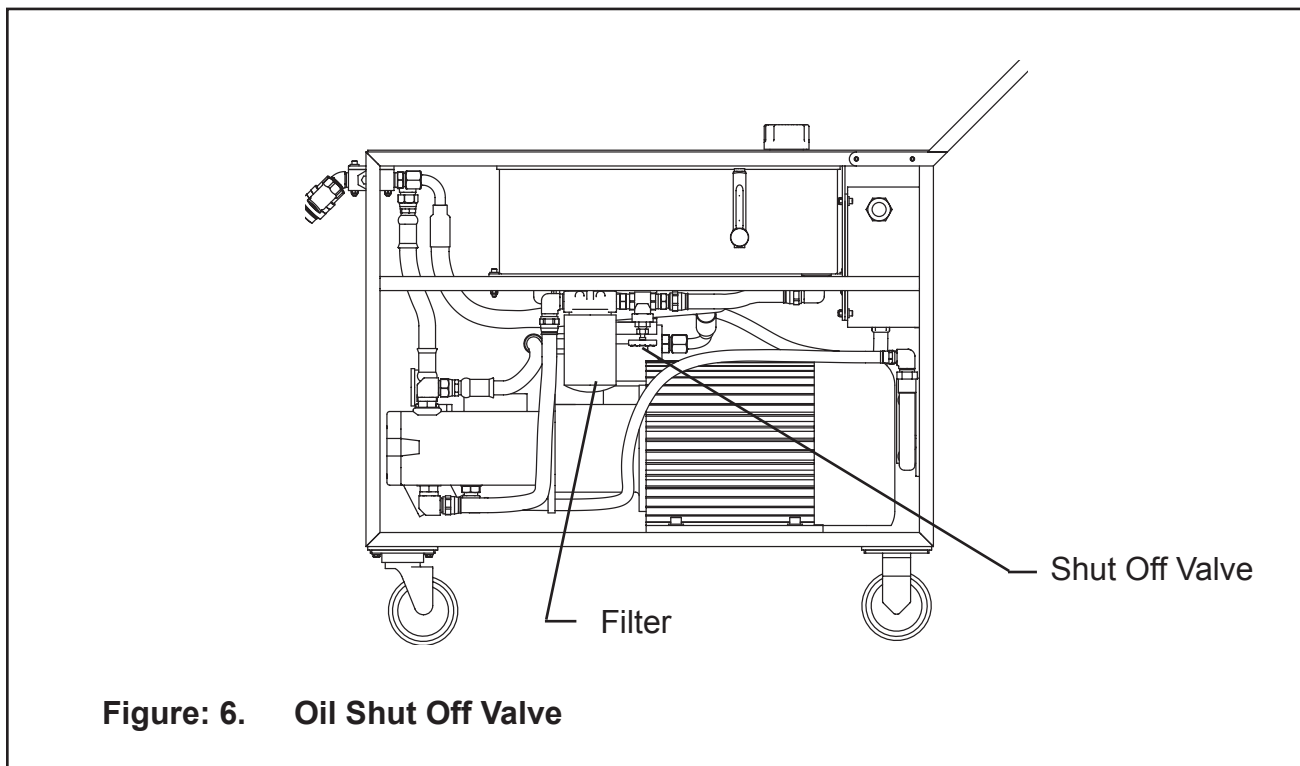
Figure: 5. Hydraulic Schematic

## 6. MAINTENANCE

### 6.1 HYDRAULIC FILTER

Change the Hydraulic Filter after every 1000 hours of use (max.) or when the visual clogging indicator on the full flow filter indicates contaminated filter.

- A small red plug 'pops up' when the pressure differential becomes excessive.
- Turn the Shut-Off Valve off before changing either filter.
- Place a drain pan under the filter before removing the old filter.
- Make sure that the Shut-Off Valve is open before starting the unit.
- Change the Hydraulic Filter more often if the working conditions are dusty.



**Figure: 6. Oil Shut Off Valve**



### 6.2 HYDRAULIC FLUID

Fill the hydraulic reservoir with the recommended fluid (Normally Automatic Transmission Fluid. ATF - Type F) to the indicated mark. Alternate fluids are listed in the 'Recommended Hydraulic Fluids' section.

If long lengths of new hydraulic hoses that are not filled with fluid are connected, then additional fluid will have to be added after the lines have been filled.

An additional 2.3 gallons (8.7 Lt.) of fluid is required for every 100' (50' [12.7 m] hose set) of 3/4" (19 mm) diameter hose connected to the power supply.

Drain and refill after every 2000 hours.

If the oil becomes contaminated drain and refill more frequently.

A visual observation through the sight glass level indicator is required.

### 6.3 HYDRAULIC HOSES

Visually inspect the Hydraulic Hoses and replace if damaged.

For detailed testing, use a test rig consisting of:

Male quick disconnect, 22 gpm (10 L/s) minimum capacity flow meter, 2000 psi (13790 kPa) pressure gauge, shut-off valve (rated at 2000 psi [13790 kPa]) and a female quick disconnect

May be coupled between the hoses.

Open the shut-off valve to full volume flow at low pressure which will be obtained with 'fill' actuation of the control knob.

By closing down the shut-off valve of the test rig, reduced flow at a higher pressure is obtained and full bypass pressure is obtained and indicated at zero flow.

## 7. RECOMMENDED HYDRAULIC FLUIDS

Any Automatic Transmission Fluid, Type F (ATF Type F) or as an alternate, one of the fluids listed below:

Any Automatic Transmission Fluid, Type F (ATF Type F) or as an alternate, one of the fluids listed below:

<b>HYDRAULIC FLUID</b>					
Manufacturer	Brand Name	Viscosity @ 40C (104F) (cSt)	Viscosity @ 100C (212F) (cSt)	Viscosity Index	API Gravity (degrees)
Chevron	ATF Type F	37.2	7.3	165	32.8
Citgo	Transgard ATF Type F	--	7.4	165	--
ConocoPhillips	ATF Type F	43.0	7.6	145	--
ConocoPhillips	Kendall ATF Type F	34.3	7.0	174	--
Exxon - Esso	ATF Type F	37.0	7.5	180	--
Mobil	ATF Type F	36.0	7.2	150	31.4
Pennzoil	ATF Type F	34.0	7.1	152	30.5
Shell	Donax TF	35.5	7.4	--	--
Shell	FormulaShell ATF Type F	39.0	7.4	165	30.5
Texaco	Havoline ATF Type F	37.2	7.3	165	32.8
Quaker State	ATF Type F	34.0	7.1	152	--
Valvoline	ATF Type F	35.8	7.3	178	--
Chevron	Rykon 32	32.0	6.0	153	33.0
Chevron	Rykon 46	46.0	8.0	157	32.0
ConocoPhillips	Super Hydraulic Oil 32	31.0	5.4	104	32.6
ConocoPhillips	Super Hydraulic Oil 46	46.0	6.8	100	31.6
Exxon	Nuto H 32	32.0	5.4	104	--
Exxon	Nuto H 46	46.0	6.7	104	--
Mobil	DTE 24	32.0	5.0	98	31.0
Mobil	DTE 25	44.0	7.0	98	30.0
Shell	Tellus 32	32.0	5.4	99	31.0
Shell	Tellus 46	46.0	6.7	98	30.0
Texaco	Rando HD 32	30.4	5.2	99	32.6
Texaco	Rando HD 46	43.7	6.5	97	31.8

Any Automatic Transmission Fluid, Type F (ATF Type F) or as an alternate, one of the fluids listed:

Any Automatic Transmission Fluid, Type F (ATF Type F) or as an alternate, one of the fluids listed:

In general, if a fluid that is not listed is to be used, select a high quality hydraulic fluid that has the following properties:

- Viscosity at 40° C of between 30 and 46 centistokes (cSt)
- Viscosity index of at least 95.
- API gravity of between 30 and 33°.

The viscosity index is a measure of how much the fluid's viscosity changes as its temperature changes. The higher the viscosity index number the less the fluid's viscosity is effected by temperature and the better it is for use in the system. Most ATF, Type F fluids have viscosity index numbers around 165 whereas, most standard hydraulic fluids have viscosity index numbers around 100.

API gravity, is a measure of the density a hydraulic fluid compared to water. If the API gravity is greater than 10, it is lighter and floats on water; if less than 10, it is heavier and sinks. API gravity is used to compare the relative densities of hydraulic fluids. For example, with two hydraulic fluids, the one with the higher API gravity will float on the one with the lower API gravity. Although mathematically API gravity has no units, it is referred to as being in "degrees".

## 8. PENDANT CHECK PROCEDURES

### 8.1 GENERAL COMMENTS

Field tests can also be made for all functions except for the volume control using a continuity test meter.

All tests are to be done with the Pendant disconnected from the power supply and through the pins of the connector.

Do Not Disconnect or Connect the Pendant from the power supply with the primary power connected. A fuse may blow.

### 8.2 VERIFY THE MOTOR 'START/STOP' FUNCTIONS

1. Either a Continuity or Ohm meter may be used for this series of checks.
2. Connect the meter to pins A and B.
3. Set the volume control to 'Zero' and the 'Start/Stop' switch to the 'Start' position. The meter will show an 'Open' circuit (infinite resistance).
4. Depress and hold the 'Start' switch (momentary contact switch) and the meter will change from an 'Open' circuit to a 'Closed' circuit (resistance less than 1 ohm).
  - While holding the 'Start' switch down rotate the volume control clockwise (off the 'Zero' setting). The meter will indicate a change from a 'closed' circuit to and 'open' circuit.
5. Return the Volume Control to the 'Zero' position and while still holding the 'Start' switch down, depress the 'Start/Stop' switch.
  - The meter will change from a 'Closed' circuit to an 'Open' circuit with the Start switch depressed.
6. Connect the meter to pins 'B' and 'C'.
7. Set the 'Start/Stop' switch in the 'Start' position. The meter should show a 'Closed' circuit.
8. Set the 'Start/Stop' switch in the 'Stop' position. The meter should show an 'Open' circuit.
9. Connect the meter to pins 'C' and 'D'. The meter should show a 'Closed' circuit.

### 8.3 VERIFY THE VOLUME CONTROL FUNCTIONS

Perform these checks using an Ohm meter.

Resistance reading given below are nominal, all resistances are  $\pm 10\%$ .

1. Connect the meter to pins E and F. The resistance reading should be 100 Ohms.
2. Connect the meter to pins 'G' and 'H'.
3. Set the 'Fwd/Off/Rev' to 'Off'. The resistance reading should show an 'Open' circuit (infinite resistance).
4. Set the 'Fwd/Off/Rev' switch to 'Fwd'. The resistance reading will vary from 220 to 320 Ohms as the 'Volume Control' dial is rotated from 'Zero' to 'Full Flow'.
5. Hold the 'Fwd/Off/Rev' switch in 'Rev'. The resistance reading will vary from 265 to 365 Ohms as the Volume Control dial is rotated from 'Zero' to 'Full Flow'.
6. The preceding will show if there is a fault in the Pendant and isolate the fault to a specific circuit.
  - To correct a fault it will require disassembly of the pendant to access the wiring, switches and/or controls.
  - Use a additional meter checks and the Pendant Schematic to further isolate the fault between the appropriate wiring, switch and/or control in the faulty circuit.

## 9. OPERATION



**DANGER**

**DANGER:** Keep the door of the control box closed. The system has high voltages and this decreases the risk of serious injury.

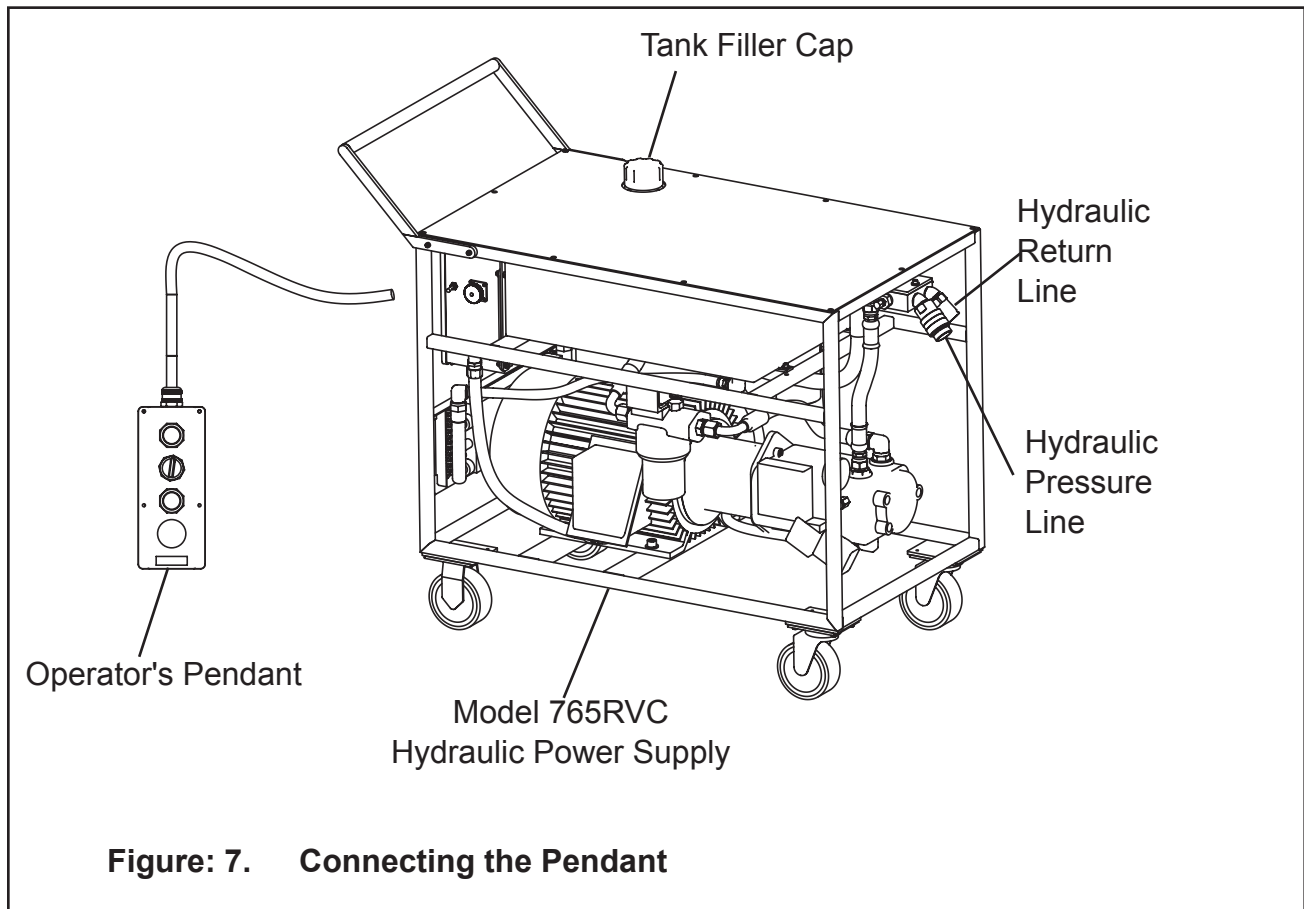
### 9.1 TO CONNECT THE OPERATOR'S PENDANT TO THE MODEL 765RVC



**CAUTION**

**CAUTION:** Be sure the electrical power has been disconnected from the Hydraulic Power Supply before connecting or disconnecting the Operator's Pendant. Failure to do so will cause the fuse in the electrical box to blow as well as possibly damage the connector to the Operator's Pendant.

- When you connect the hydraulic hoses, inspect the quick disconnects for contamination and clean if required
- Verify that the slide lock sleeves on the quick disconnects are fully engaged.



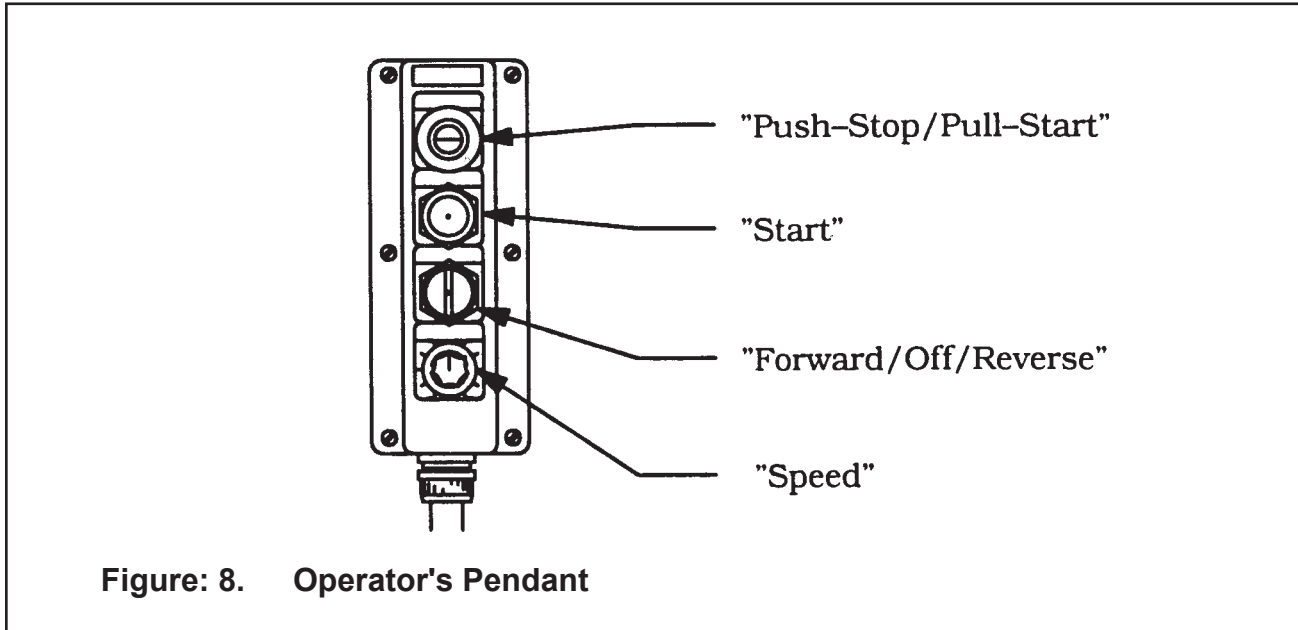
**Figure: 7. Connecting the Pendant**

### 9.2 TO CONNECT THE HYDRAULIC HOSES TO THE UNIT

The quick disconnects on the hydraulic supply are pre-installed to match the forward flow line on all TRI TOOL Inc. equipment with the female hose quick disconnect being the forward or high pressure line.

1. Connect the hoses to the machine.
2. Check the level of hydraulic fluid in the reservoir. There is a minimum of 15 gallons (56.8 liters) required.
3. For every 100' (50' [12.7 m] hose set) of 3/4" (19 mm) diameter hose connected to the power supply an additional 2.3 gallons (8.7 Lt.) of fluid
4. Connect the Unit to a Power Source
5. Check the motor rotation if any main power re-connections have been made since the initial setup checks. The unit is wired for 460 volts of power.
  - The green light on the top of the Phase Detector is 'lit' when the phase is correct.

- When the red light is 'lit' the phase monitor is tripped, which indicates one of the following:
  - Incorrect phasing for counterclockwise rotation.
  - Low voltage.
  - The unit will not start if phasing is not correct.
- 6. Turn the Speed knob to 'MIN'.
- 7. Turn the 'FOR/OFF/REV' knob to 'OFF'.
- 8. Pull up the 'PULL TO START' knob.



**CAUTION:** Do not drive the Hydraulic Pump backward, or it will be damaged.

- 9. Push down on the 'START' button to start the unit. The charge pump does not circulate oil if rotated in the reverse direction and overheats in about 10 seconds of continuous reverse running. The motor has a run direction arrow.
  - View the motor fan through a hole in the top of the housing.
  - View the pump to motor coupling through the adapter port.
- 10. If necessary, reverse the two (2) power leads to the starter as it is normally required to change the direction of a three (3) phase motor.
- 11. Proceed with the operation.



# 10. PHASE MONITORS

The Model 765RVC Power Supply has a Phase Monitor incorporated into the Motor Starting Circuit to protect the Hydraulic Pump from being run backward.

The Phase Monitor protects the Motor from operating under low voltage, phase loss or unbalanced voltage conditions.

## 10.1 TO OPERATE THE PHASE MONITOR

### 10.1.1 INDICATOR LIGHTS

A green light to indicate correct phasing and voltage conditions.

A red light to indicate a tripped condition, which will either shut the unit down or prevent it from starting.

### 10.1.2 VOLTAGE

Use the voltage adjustment to set the voltage sensitivity level so that the phase monitor will trip if the supplied voltage drops below the preset level.



**WARNING**

**WARNING: Observe safety procedures when you work with electrical circuits to decrease the risk of injury to yourself or damage to the equipment.**

### 10.1.3 PRELIMINARY CHECKS

Disconnect the main power line at the source before connecting power to the unit or changing the connections.

Before adjusting the Phase Monitor sensitivity level:

- Verify that the machine is set up for the Three (3) Phase Voltage Level to be connected to 575 VAC.
  - Power is connected to L1, L2, L3 terminals of the Magnetic Starter and the 'Ground Lead' to the 'Ground Lug'.
  - The Grounding Lug is located in the upper right hand corner of the Transformer.
- Check the Phase Monitor lights.
  - If the green light is lit the power phasing is correct and you may proceed with voltage sensitivity level adjustment.
  - If the red light is lit; either the sensitivity level is too low or the phasing is incorrect to provide clockwise rotation of the motor.

1. Rotate the sensitivity adjustment a full rotation counterclockwise (low voltage).
  - If the red light turns off and the green light turns on the phasing is correct for clockwise rotation of the motor.
  - If the red light does not turn off the phasing is incorrect.
2. Reverse two (2) of the power leads to the line connection terminals to change the motor rotation direction.
3. Verify that the green light is lit.

### **10.1.4 SENSITIVITY ADJUSTMENT**

1. Adjust the sensitivity by rotating the adjustment clockwise towards the 'high' setting until the green light turns off and the red light turns on.
2. Rotate the adjustment counterclockwise 1/8 of a turn or until the green light turns on.
  - If the line voltage is subject to frequent small voltage drops, it may be necessary to lower the sensitivity by an additional 1/8 turn to prevent random trips.
  - If any of the leads in the Phase Monitor circuit wires have been inadvertently disconnected, the rotation direction must be checked to ensure proper clockwise rotation.
3. Remove the inspection cover on the Motor to Pump Adapter to provide visual inspection of the shaft coupling.
4. Set the Flow Direction control to neutral, the Volume control to zero and pull the Stop button to the up position.
5. Observe the shaft rotation during the coast down to verify clockwise rotation.
6. If the rotation is not correct, the Phase Detector wires have not been reconnected correctly.
7. Check the wiring schematic and reconnect.

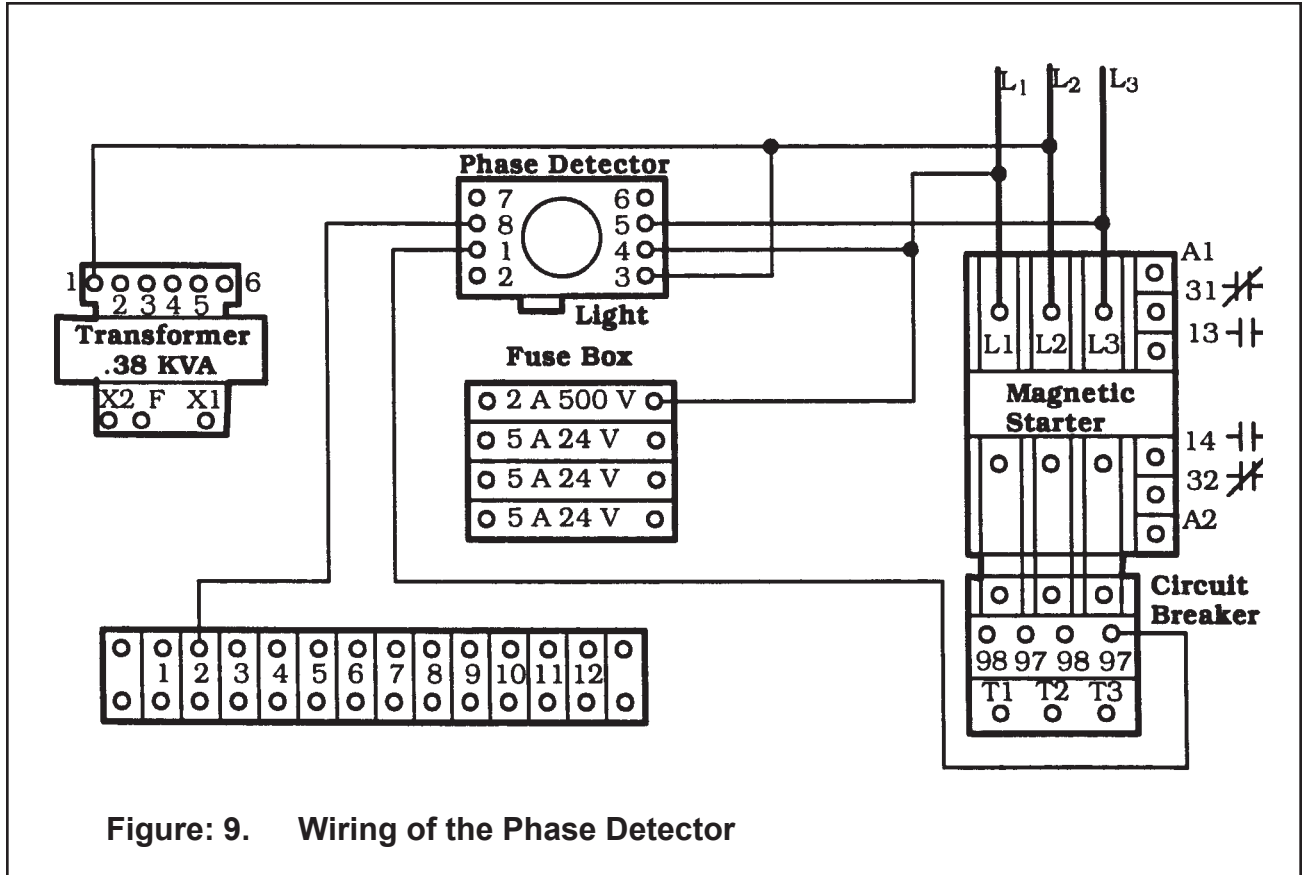


Figure: 9. Wiring of the Phase Detector

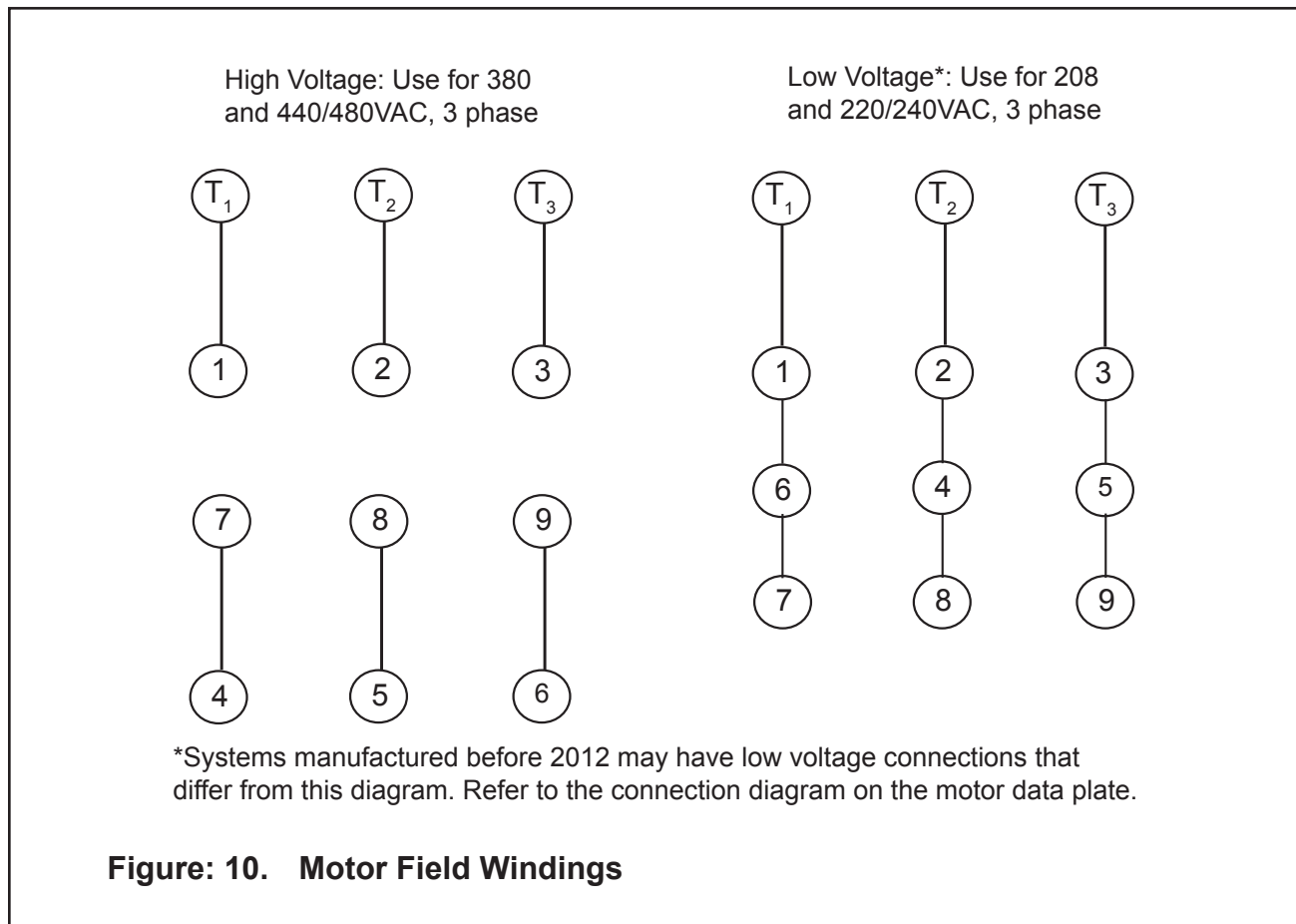
# 11. CONVERSION PROCEDURE

## 11.1 CONVERSION PROCEDURE FOR 230 VAC OR 460 VAC

Conversion of the Model 765RVC from 460 VAC Three (3) Phase Power to 230 VAC Three (3) Phase Power or the reverse requires three changes.

- Motor high/low Field winding hook-up.
- Overload circuit protection relay.
- Control voltage transformer primary winding hook-up.

## 11.2 MOTOR FIELD WINDINGS



Wire motor field windings for the appropriate voltage.

Ensure that the connections are solid and the nuts and bolts are well insulated.

At least four layers of electrical tape must cover the wire ends and connecting bolts.

The field winding ends are located in the small box on the side of the motor.

### 11.3 OVERLOAD RELAY

The overload relay is mounted directly to the magnetic starter in the control box.

The relay or circuit breaker provides over heat protection by killing the motor if it starts to draw excessive amperage.

Install a 40-ampere range relay for 240 VAC Three (3) Phase Power and set the variable amperage slide switch to 40 amps (P/N 70-0111).

Install a 20-ampere range relay (P/N 70-0690) for 460 VAC, Three (3) Phase power and set the amperage to 20 amps.

Verify motor T1, T2 and T3 connect to the correct terminals or motor reversal and subsequent pump damage can occur.

### 11.4 CONTROL VOLTAGE TRANSFORMER

Change the connection of the primary side of the step down transformer in the control box.

Do Not change the lead connectors to terminal strip point 1, only the lead connected to terminal strip point 6 or 3, depending on which way the voltage is being changed.

Control Transformer primary windings connections for 240, 415, or 460 VAC, 3 phase.

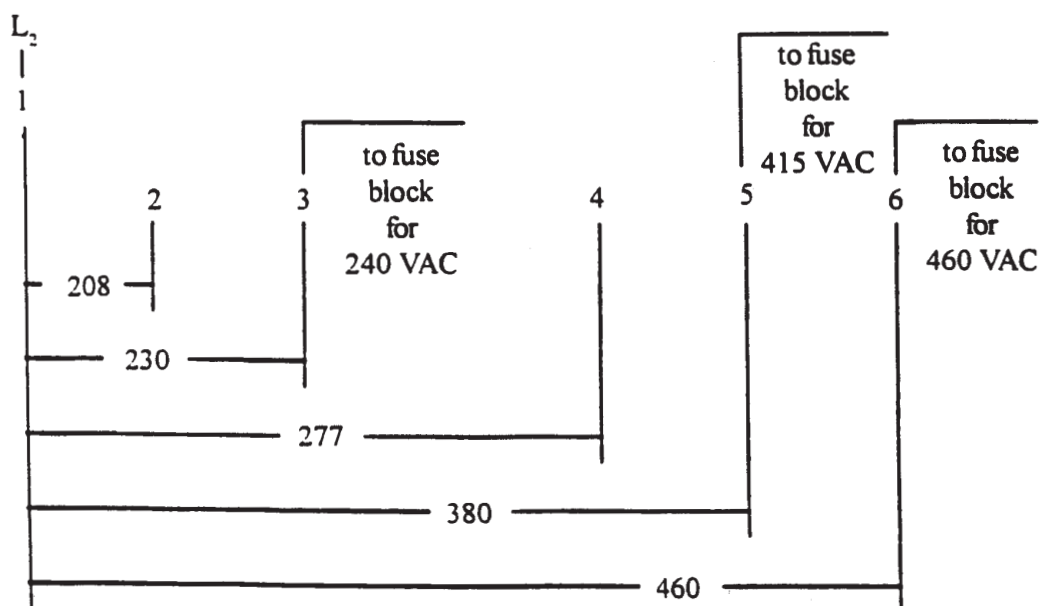
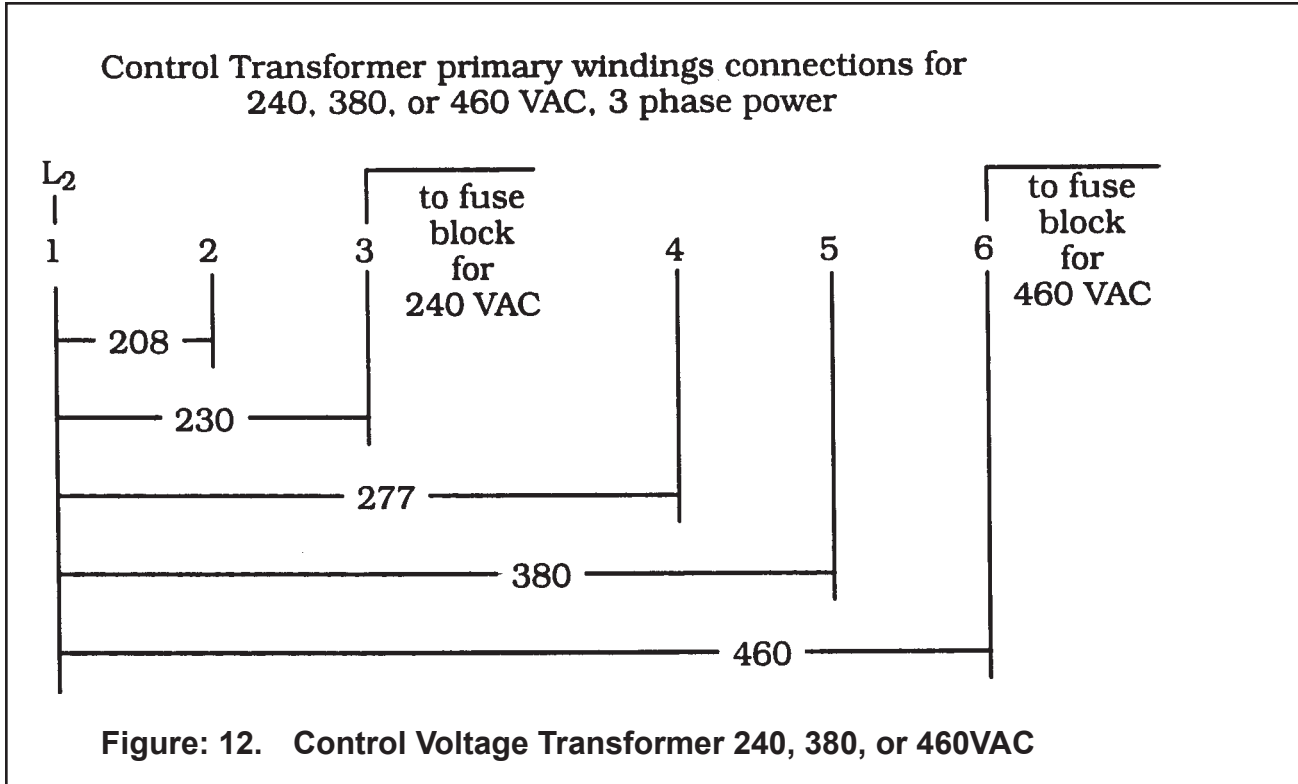


Figure: 11. Control Voltage Transformer 240, 415 or 460VAC



### 11.5 FINAL CHECK

Verify all of the changes that have been made.

Verify the pump rotation.

## 12. TROUBLESHOOTING

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**Problem: Tool Bit Chatters**

- The tool bit is loose or overextended.
  - The tool bit is damaged.
  - The tool holder is too loose in the slides.
  - The cutting speed is too fast.
  - The clamping pads are loose on the pipe or tube.
  - Cutting fluid is required.
  - The main bearing pre-load is loose.
- 

**Problem: Excessive Tool Bit Wear**

- The pipe or tube material is too hard or abrasive.
  - The cutting speed is too fast.
  - Cutting fluid is required.
  - A dull Tool Bit is causing surface hardening conditions (Stainless pipe or tubing).
  - There is scale or other foreign matter on the pipe or tube, which is dulling the tool bit at the start of the cut.
  - The tool bit is incorrect for the material being cut.
- 

**Problem: Rough Surface Finish**

- The tool bit is dull, chipped, etc.
  - Metal build-up on the cutting edge of the tool bit is creating a false cutting edge.
  - Cutting fluid is required.
  - The cutting speed is incorrect.
- 

**Problem: Tool Holder is not Feeding**

- The feed pin is broken or out of position.
  - The feed sprocket shear pin is broken.
  - The feed screw is stripped.
  - The feed nut is stripped.
  - The slide rails are too tight.
-

**Problem: Loss of Air Power**

- The air supply pressure is too low.
  - The air filter is plugged.
  - The air line size is insufficient.
  - The air line is too long.
- 

**Problem: Loss of Hydraulic Power**

- The hydraulic supply pressure is too low.
  - The hydraulic filter is plugged.
  - The hydraulic line size is insufficient.
  - The hydraulic line is too long.
- 

**Problem: Tool Bit does not Reach Work**

- Incorrect tool blocks are installed for the size of the pipe or tube being worked on.
  - Incorrect tool bit is installed.
- 

**Problem: Hydraulic Motor will not Start**

- The hydraulic power supply is shut off.
  - The hydraulic motor is damaged and will not run free.
-



### 13. ACCESSORIES

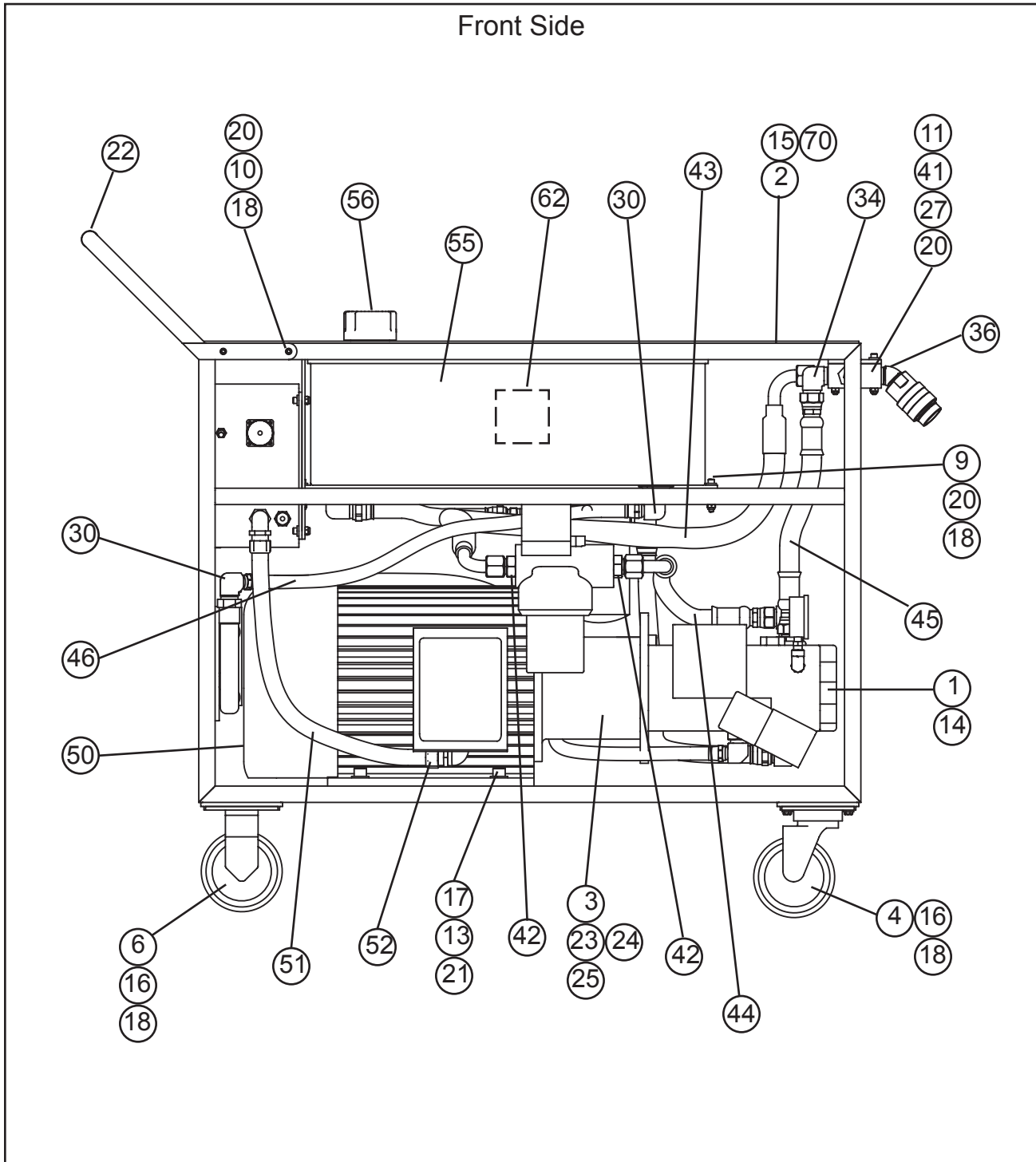
The following accessories are recommended for use with the Model 765RVC and are available from TRI TOOL INC.

- A Voltage Kit is required with each Model 765RVC
  - Voltage Kit for 240V/208V (P/N 05-0148)
  - Voltage Kit for 380V (P/N 05-0147)
  - Voltage Kit for 480V (P/N 05-0146)
- Pendant Cable Assembly, 50' (15.2 m) (P/N 70-0297)
- Pendant Cable Assembly, 100' (30.5 m) (P/N 70-0298)
- Hydraulic Hose Set, 50' (15.2 m) (P/N 55-0043)
  - 1 50' (15.2 m) x 3/4" (19 mm) Pressure Hose
  - 1 50' (15.2 m) x 3/4" (19 mm) Return Hose
- Hydraulic Hose Set, 100' (P/N 55-0043)
  - 2 50' (15.2 m) x 3/4" (19 mm) Pressure Hose
  - 2 50' (15.2 m) x 3/4" (19 mm) Return Hose
- Hydraulic Heat Exchanger Kit, (P/N 05-0730)

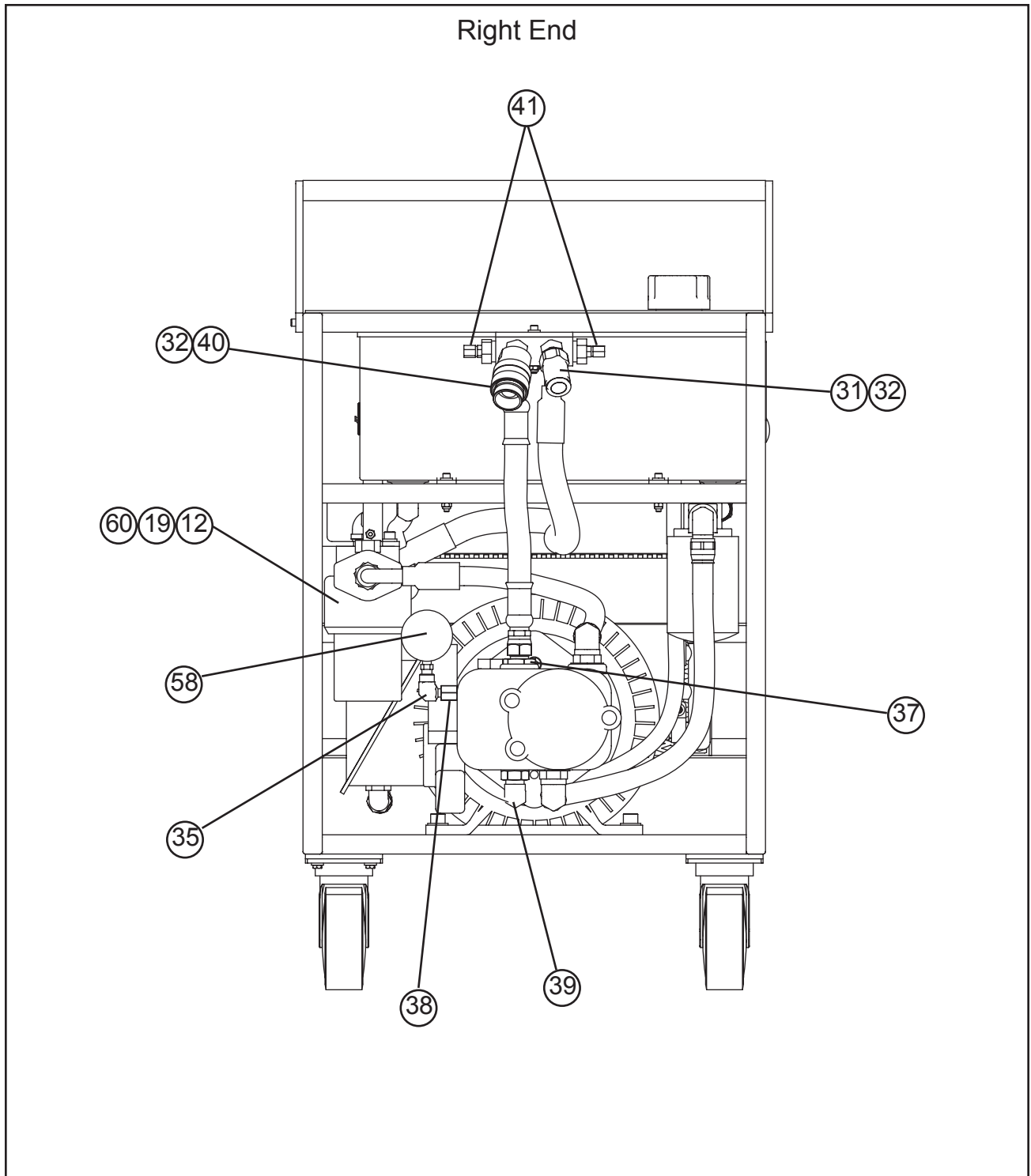
A portable Air Caddy (FRL) is required to protect the warranty on all TRI TOOL INC air driven tools.

# 14. ILLUSTRATED PART BREAKDOWN

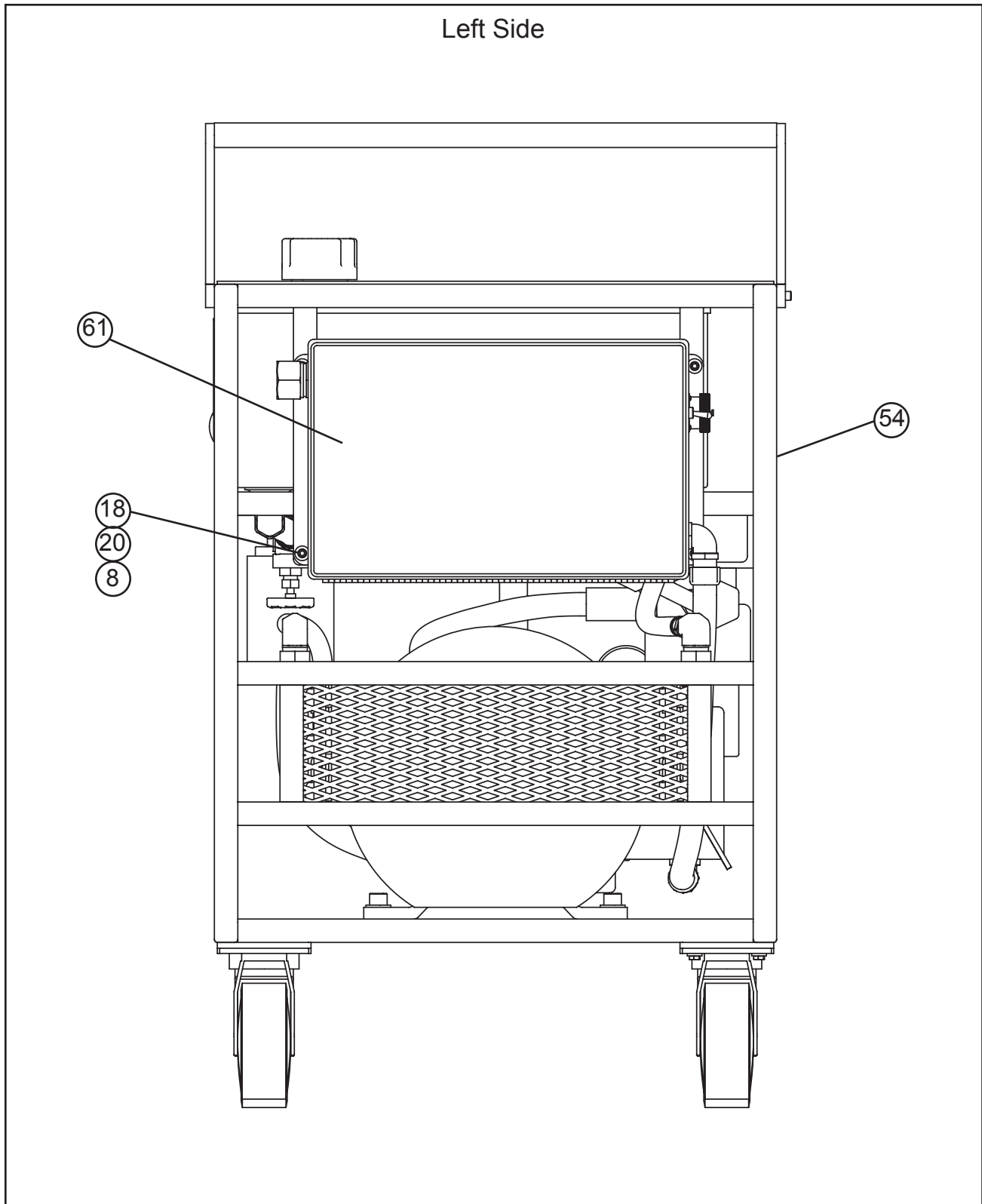
## MODEL 765RVC (P/N 01-0765)



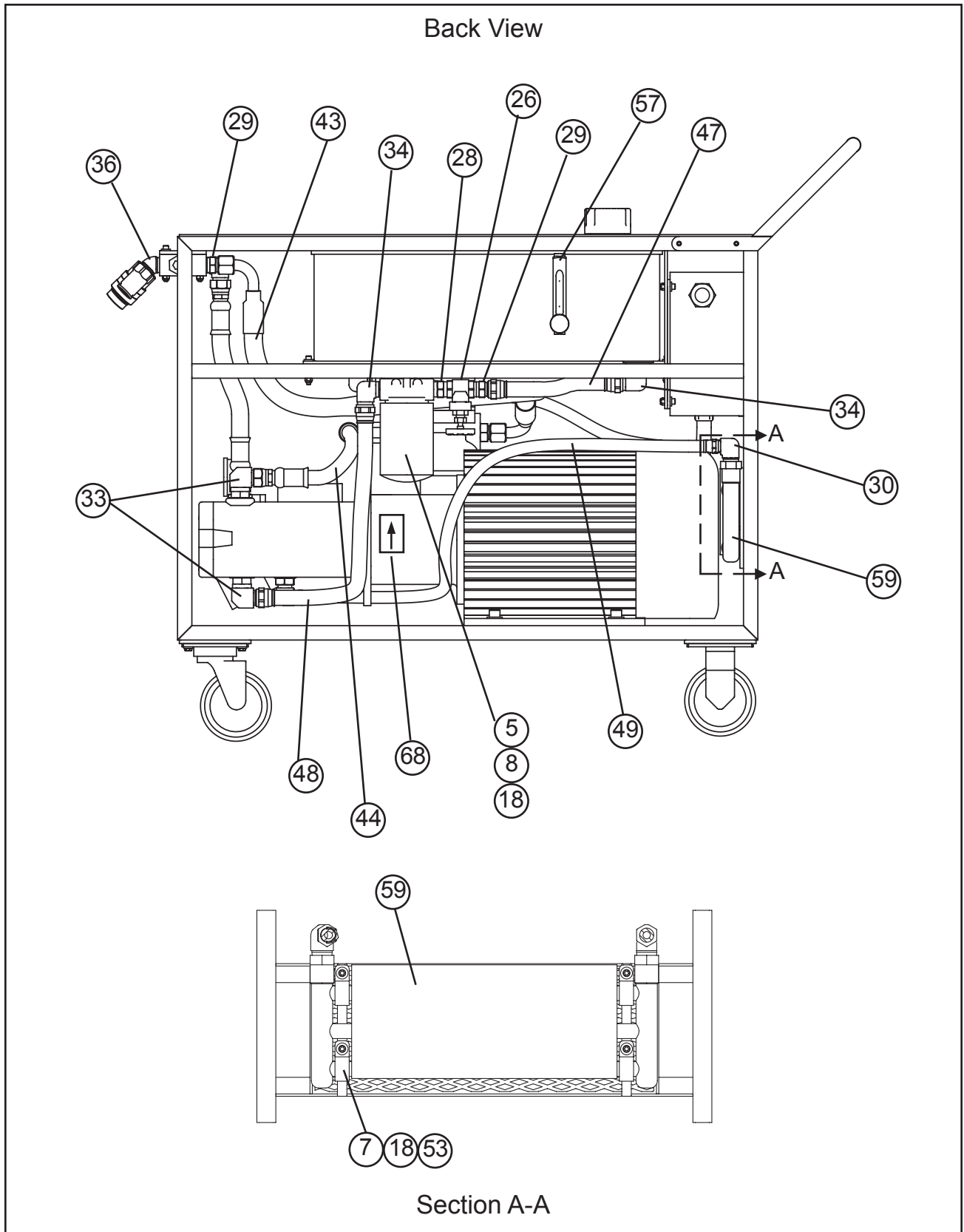
MODEL 765RVC (P/N 01-0765) Continued



MODEL 765RVC (P/N 01-0765) Continued



MODEL 765RVC (P/N 01-0765) Continued



# TRI TOOL INC.

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Parts List, Model 765RVC (P/N 01-0765)

Item No	Part No.	Description	Qty
1.	07-0015	PUMP, HYDRAULIC	1
2.	24-2237	PLATE, TOP, COVER	1
3.	27-0027	ADAPTER, PUMP MOTOR	1
4.	30-2772	CASTER, SWIVEL PLATE	2
5.	30-0058	FILTER ASSEMBLY	1
	75-0007	FILTER, CARTRIDGE	REF
6.	30-2771	CASTER, RIGID PLATE	2
7.	33-0038	SCREW, CAP, 1/4-20 X 1/2"	4
8.	33-0040	SCREW, CAP, 1/4-20 X 3/4"	6
9.	33-0045	SCREW, CAP, 1/4-20 X 1 3/4"	4
10.	33-0046	SCREW, CAP, 1/4-20 X 2"	4
11.	33-0047	SCREW, CAP, 1/4-20 X 2 1/4"	2
12.	33-0069	SCREW, CAP, 3/8-16 X 3/4"	4
13.	33-0107	SCREW, CAP, 1/2-13 X 1 1/2"	4
14.	33-0109	SCREW, CAP, 1/2-13 X 2"	2
15.	33-2662	SCREW, FLAT HEAD #10-24 X 3/8" SST	10
16.	33-1620	SCREW, CAP, HEX HD, 1/4-20 X 1/2"	16
17.	34-0020	WASHER, FLAT, SAE, ZINC, 1/2"	4
18.	34-0026	WASHER, FLAT, 1/4" X 5/8" X 7/64"	34
19.	34-0028	WASHER, FLAT, 3/8" X 3/4" X 1/8"	4
20.	35-0055	NUT, LOCK, 1/4-20 X 5/16"	19
21.	35-0254	NUT, LOCK, 1/2-13	4
22.	41-0071	HANDLE, WELDMENT	1
23.	51-0023	COUPLING, DRIVE, .88	1
24.	51-0024	COUPLING, DRIVE, 1.63	1
25.	51-0025	INSERT, COUPLING	1
26.	53-0014	VALVE, GATE	1
27.	53-0040	VALVE, RELIEF	1
28.	54-0030	NIPPLE, 3/4" EPIPE TO 3/4" EPIPE	1
29.	54-0047	ADAPTER, 3/4" EPIPE TO 3/4-37D	2
30.	54-0079	ELBOW, 90 DEG, 3/4" EPIPE TO 1/2-37D	3
31.	54-0334	NIPPLE, QD, HYD, DRIPLESS, MALE	1
32.	54-0335	CAP	2

## Model 765 RVC Hydraulic Power Supply

Parts List, Model 765RVC (P/N 01-0765)

Item No	Part No.	Description	Qty
33.	54-0134	ELBOW, 90 DEG, 1 5/16" O-RING TO 1 1/16"	2
34.	54-0137	ELBOW, 90 DEG, 3/4" EPIPE TO 3/4-37D	3
35.	54-0187	ELBOW, 90 DEG, 1/4" EPIPE TO 1/4" IPIPE	1
36.	54-0192	ELBOW, 45 DEG, 3/4" TO 3/4" EPIPE	2
37.	54-0206	ADAPTER, O-RING, 1 5/16" TO 3/4-37D	1
38.	54-0207	ADAPTER, O-RING, 9/16" TO 1/4"	1
39.	54-0208	ELBOW, 90 DEG, 1 1/16" O-RING TO 1/2D	1
40.	54-0333	COUPLING, MALE	1
41.	54-0305	FITTING, RELIEF VALVE	2
42.	54-0306	ADAPTER, 1 1/16" O-RING TO 3/4-37D	2
43.	55-0121	HOSE ASSEMBLY, 30"	1
44.	55-0122	HOSE ASSEMBLY, 12"	1
45.	55-0123	HOSE ASSEMBLY, 9"	1
46.	55-0158	HOSE, ASSEMBLY, 25"	1
47.	55-0160	HOSE ASSEMBLY, 6 1/2"	1
48.	55-0161	HOSE ASSEMBLY, 18"	1
49.	55-0177	HOSE ASSEMBLY, 37"	1
50.	58-0008	MOTOR, ELECTRIC	1
51.	70-0114	CONDUIT, STRAIGHT, .75"	16
52.	70-0116	CONDUIT CONNECTOR, .75" X 90 DEG	1
53.	70-0275	CLAMP, .75 CONDUIT	4
54.	71-0077	FRAME WELDMENT	1
55.	72-0004	TANK	1
56.	75-0012	CAP, FILTER	1
57.	75-0020	GAUGE, LIQUID LEVEL	1
58.	75-0039	GAUGE, PRESSURE	1
59.	75-0042	HEAT EXCHANGER	1
60.	75-0088	FILTER ASSEMBLY, HYDRAULIC	1
	75-0089	FILTER, ELEMENT	REF
61.	76-0035	PANEL, ELECTRIC, CONTROL	1
62.	30-0105	LABEL, 'ROTATION'	1
63.	30-0483	LABEL, LOGO, SMALL	1

# TRI TOOL INC.

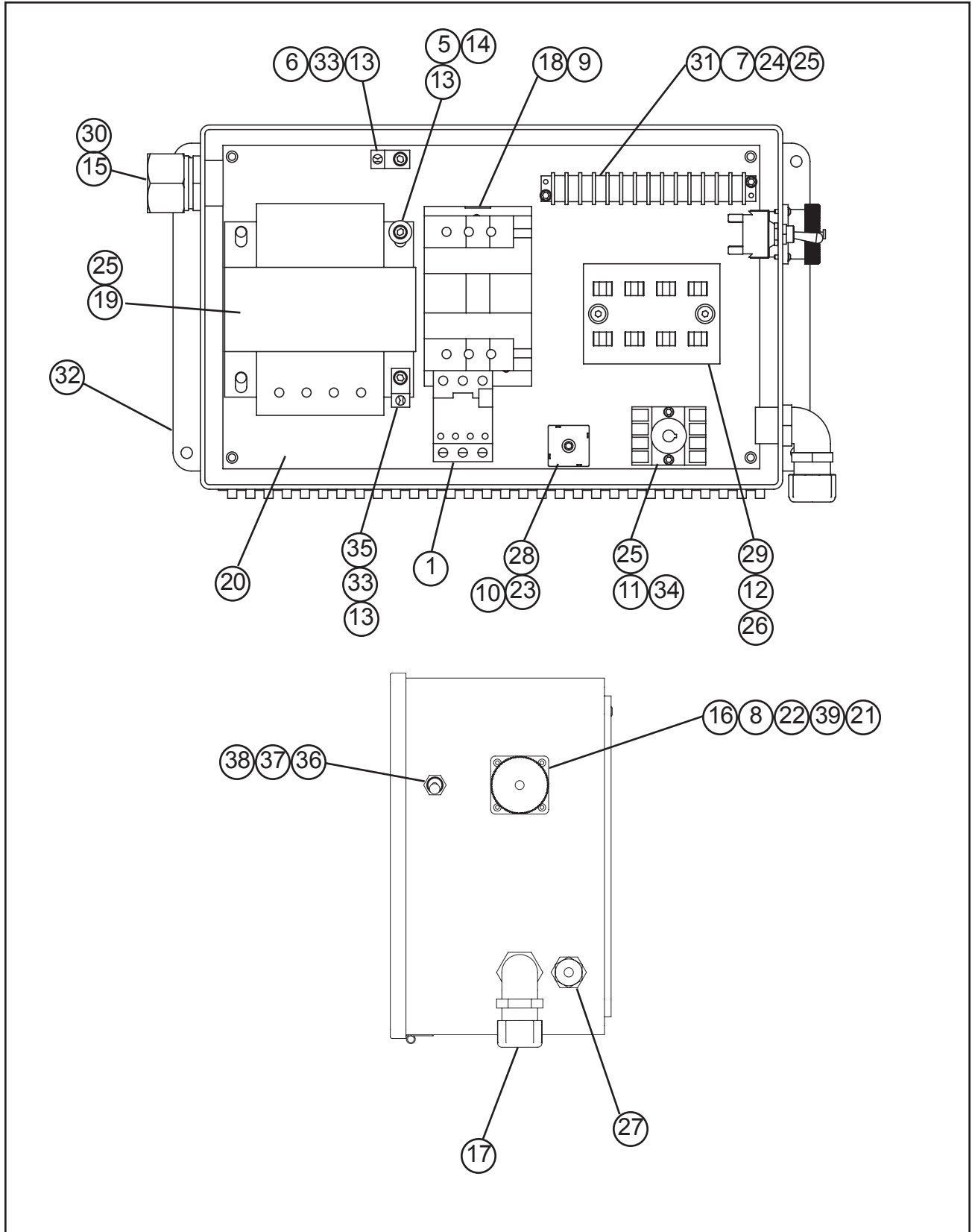
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Parts List, Model 765RVC (P/N 01-0765)

Item No	Part No.	Description	Qty
NOT SHOWN			
	30-0384	LABEL, HYD CIRCUIT CONTROL	1
	76-0030	PENDENT ASSEMBLY, CONTROL	1
	30-1169	FOAM ROLL, 1/2" W X 1/8" THK	11'
	70-0423	ELECTRIC, CONNECTOR, PIGTAIL	1
	30-2061	LABEL, TRI TOOL	1



PANEL, ELECTRICAL (P/N 76-0035)



## TRI TOOL INC.

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### Parts List, Panel, Electrical (P/N 76-0035)

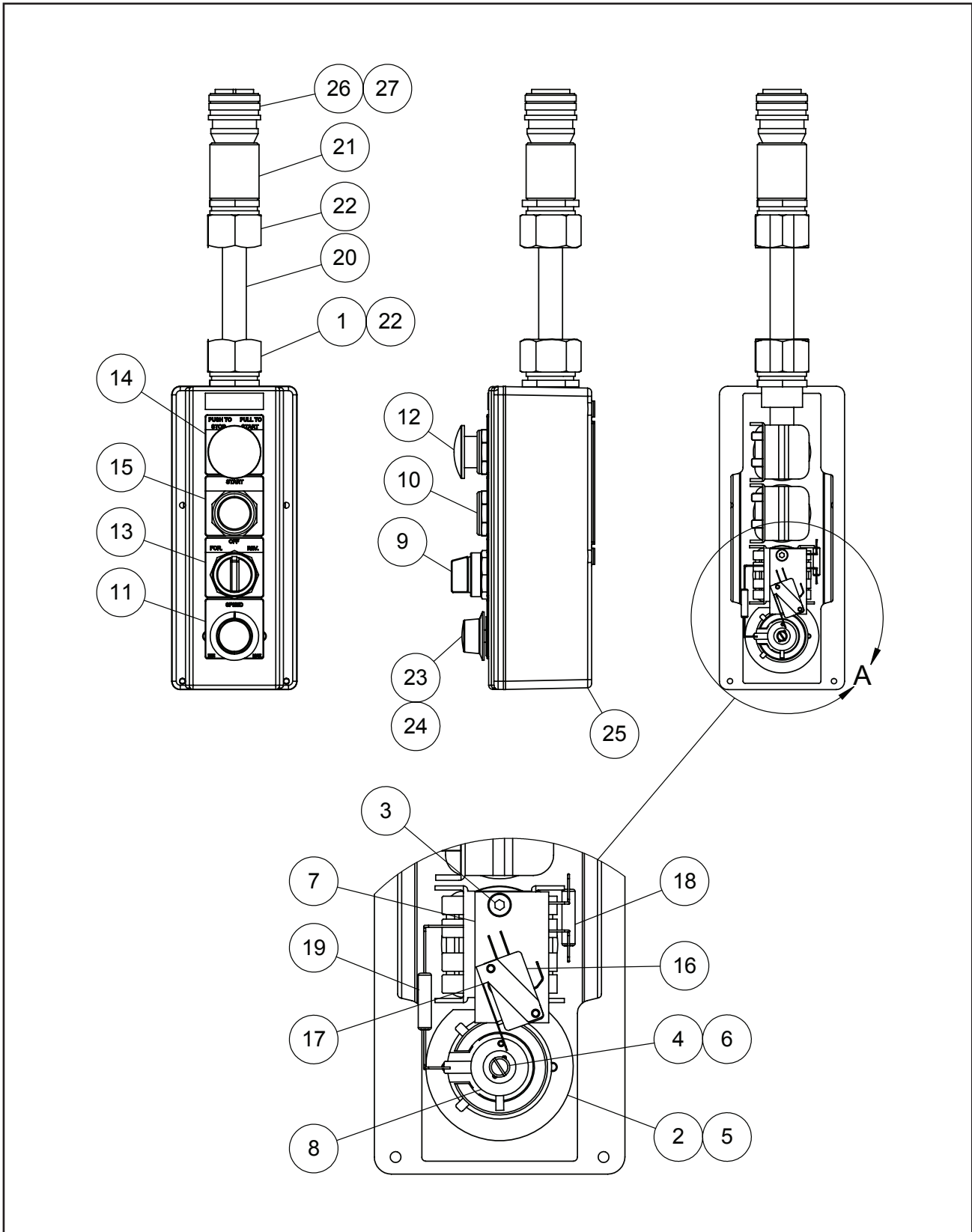
Item No	Part No.	Description	Qty
	05-0146	VOLTAGE KIT, 480V	1
1.	70-0066	RELAY, OVERLOAD	1
2.	70-0129	ADAPTER	1
3.	70-0182	FUSE, 2 AMP, 500V, SB	1
4.	70-0395	MONITOR, 480V	1
	05-0147	VOLTAGE KIT, 380V	1
1.	70-0066	RELAY, OVERLOAD	1
2.	70-0129	ADAPTER	1
3.	70-0398	FUSE, 3 AMP, 500V, SB	1
4.	70-0396	MONITOR, 380V	1
	05-0148	VOLTAGE KIT, 240V/208V	1
1.	70-0111	RELAY, OVERLOAD	1
2.	-----	ADAPTER (NOT REQUIRED FOR THIS KIT)	
3.	70-0398	FUSE, 3 AMP, 500V, SB	1
4.	70-0397	MONITOR, 240V/208V	1
5.	33-0039	SCREW, CAP, 1/4-20 x 5/8"	4
6.	33-0042	SCREW, CAP, 1/4-20 x 1"	1
7.	33-0200	SCREW, CAP, #10-32 x 1/2"	2
8.	33-0266	SCREW, BUTTON HEAD, #4-40 x 3/8"	4
9.	33-0311	SCREW, BUTTON HEAD, #10-32 x 3/8"	3
10.	33-0312	SCREW, BUTTON HEAD, #10-32 X 1/2"	1
11.	33-0022	SCREW, CAP, #8-32 X 3/4"	2
12.	33-0418	SCREW, FLATHEAD, #10-32 X 1/2"	2
13.	34-0026	WASHER, FLAT, SPECIAL	4
14.	35-0006	NUT, HEX	5
15.	35-0309	NUT, LOCK, 1" CONDUIT	1
16.	35-0253	NUT, LOCK	4
17.	70-0116	SEAL, CONNECTOR, CONDUIT, .75 X 90 DEG	1
18.	70-0126	STARTER	1
19.	70-0133	TRANSFORMER, 480V - 24V	1
20.	70-0691	PANEL, CONTROL BOX, MOD	1
21.	70-0404	CONNECTOR, 8 PIN	1
22.	70-0139	CAP, FEMALE	1

## Model 765 RVC Hydraulic Power Supply

Parts List, Panel, Electrical (P/N 76-0035)

Item No	Part No.	Description	Qty
23.	70-0151	TERMINAL, INSUL, #6 STUD	4
24.	70-0152	TERMINAL, INSUL, SPADE	2
25.	70-0153	TERMINAL, INSUL, SPADE	45
26.	70-0183	FUSE, TIME DELAY, 5 AMP, 600V	3
27.	70-0239	STRAIN RELIEF	1
28.	70-0240	RECTIFIER	1
29.	70-0264	BLOCK, FUSE	1
30.	70-0304	STRAIN RELIEF	1
31.	70-0658	BLOCKS, TERMINAL, 14 POLE	1
32.	70-0374	BOX, CONTROL	1
33.	70-0376	LUG, GROUND	2
34.	70-0394	BASE, MOUNTING	1
35.	70-0412	RING, TONGUE, TERMINAL	2
36.	70-0631	SWITCH, TOGGLE	1
37.	70-0632	BOOT, TOGGLE SWITCH	1
38.	70-0692	TERM, INSUL, 90 DEG, FLAG, FEMALE	6
39.	70-0405	RECEPTACLE	1
NOT SHOWN			
	70-0018	WIRE, 12/1, RED	180"
	70-0191	WIRE, 10/1, COPPER STRAND	108"
	70-0299	WIRE, 14/850	12"
	70-0317	CABLE, 18/4	36"
	70-0410	WIRE, 10/1, COPPER STRAND, GREEN	52"

PENDANT, OPERATOR'S (P/N 76-0030)



## Model 765 RVC Hydraulic Power Supply

Parts List, Pendant, Operator's (P/N 76-0030)

Item No	Part No.	Description	Qty
1	30-2857	CLAMP,HOSE,SS,5/16"-7/8"DIA	1
2	33-0342	SCREW,FLAT,#6-32 X 3/8	2
3	33-0346	SCREW,FLAT,#8-32 X 3/8	2
4	33-1488	SCREW,FILLISTER,8-32 X 5/8	1
5	34-0181	WASHER,SPCL,3/8 X 2 1/4 X13/16	1
6	34-0209	WASHER,LK,SPLIT,#8	1
7	47-0204	BRACKET MOUNT,SWITCH	1
8	62-0031	CAM ASSY,LIMIT SWITCH	1
9	70-0265	SWITCH,SELECTOR	1
10	70-0266	SWITCH,PUSH BUTTON	1
11	70-0268	PLATE,LEGEND,(SPEED)	1
12	70-0269	PUSH/PULL UNIT	1
13	70-0270	PLATE,LEGEND,(FORWARD,OFF,REV)	1
14	70-0271	PLATE,LEGEND,(STOP-START)	1
15	70-0272	PLATE,LEGEND,(START)	1
16	70-0276	MICRO SWITCH V7-2B17D8	1
17	70-0277	SWITCH,MICRO,LONG LEAF	1
18	70-0294	RESISTOR,5 W,50 OHM	1
19	70-0295	RESISTOR,5 W,220 OHM	1
20	70-0299	CABLE,14/8 TYPE SO	26
21	70-0303	COUPLING,CABLE	1
22	70-0304	CONNECTOR,STRAIN RELIEF	2
23	70-0309	RHEOSTAT,MOD	1
24	70-0312	KNOB	1
25	70-0375	ENCLOSURE,MOD,ELEC	1
26	70-0401	RECEPTACLE	1
27	70-0402	CONNECTOR, 8-PIN	1



# WARNING



Read the manual and be familiar with all safety precautions before operating equipment. The following are general warnings for industrial equipment with moving parts. Refer to the manual for specific warnings applicable to your equipment.



**EYE HAZARD** - Always wear appropriate eye protection while operating the equipment.



**PINCH HAZARD** - Keep your hands and clothing away from moving parts.



**CRUSH HAZARD** - The machinery, pipe, or work piece can shift, separate, lurch, or fall.



**CHIP HAZARD** - Metal chips may be hot and sharp. Be careful when you clear the tooling path or clean up chips.



**TIE DOWN HAZARD** - Deliberate overriding of safety triggers can result in serious injury. Never lock or tie down safety triggers on the machine.



**SHOCK HAZARD** - Ensure that the equipment is properly installed and grounded. Ensure that the equipment is not damaged and that the power cord is intact.

## OTHER HAZARDS

- Tool bits are sharp and can cause serious injury.
  - Do not defeat or modify safety features.
- Disconnect power sources before servicing or moving the equipment.
- Remove all loose articles of clothing and jewelry before operating the equipment.

***Be Safety Conscious!***



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