

Rugby Manufacturing Electric Power Unit Manual

INSTALLATION AND OPERATOR'S MANUAL



IMPORTANT!!

Read this manual thoroughly prior to installation and operation. This manual is an outline of a manual by Rugby Manufacturing Co. This manual should be kept readily accessible for any engineer at all times. Should you have any questions or concerns, please contact your supervisor or a Rugby Manufacturing engineer service representative before use.

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Visit www.rugbymfg.com for further information.

Serial Number: _____

In Service Date: _____

Rugby Manufacturing Electric Power Unit Manual

Table of Contents

How to Use This Manual	1
Labels	1
Reference Information	2
Serial Number	2
Special Designations.....	2
Torque Specifications	3
Specifications	4
Installation	4
Mounting & Hydraulics	4
Electrical – Single Acting Pump Units	5
Electrical – Double Acting Pump Units.....	6
Electrical – Lockdown Double Acting Pump Units	8
Operation	10
Priming Single and Double Acting Pump Units	10
Using Single and Double Acting Pump Units	11
Maintenance	11
Power Unit/Cylinder Ports.....	12
Hydraulic Component Diagrams	13

Rugby Manufacturing Electric Power Unit Manual

How to Use This Manual

This manual provides guidelines, and instructions for correctly operating and maintaining your Rugby Manufacturing product. Any and all people that own and operate a Rugby Manufacturing dump trailer are recommended to read and fully understand each section in this manual. Throughout this manual, the three following types of labels will be used: danger, warning, and caution. It is imperative that all labels are obeyed, for the safety of the operator.

Labels

Throughout this manual, the three following types of labels will be used: **danger**, **warning**, and **caution**. For the safety of the operator, it is imperative that all labels are obeyed.



Danger: Indicate[s] a hazardous situation which, if not avoided, will result in death or serious injury.



Warning: Indicate[s] a hazardous situation which, if not avoided, could result in death or serious injury.



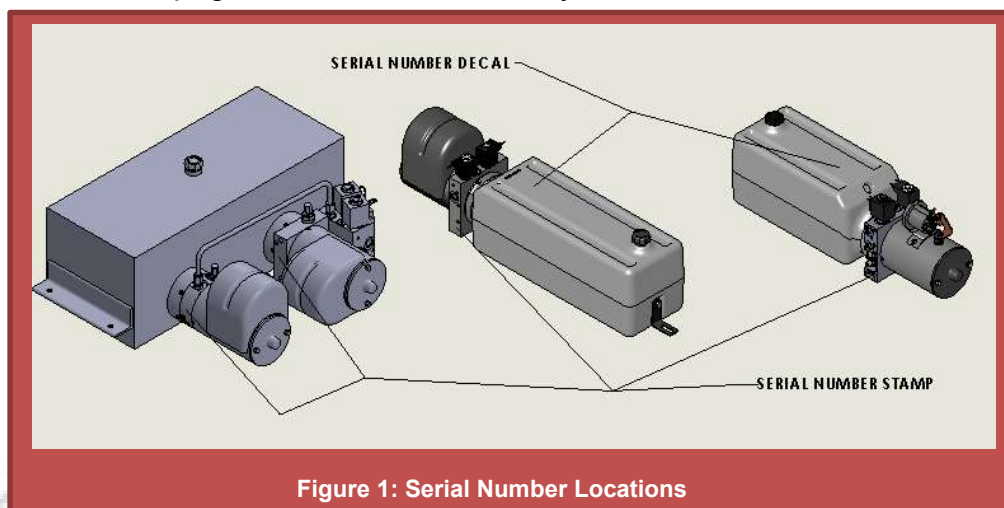
Caution: Indicate[s] a hazardous situation which, if not avoided, could result in minor or moderate injury.

Rugby Manufacturing Electric Power Unit Manual

Reference Information

Serial Number

This information is required for any warranty or service inquiries and should be recorded on the front page of this manual for easy reference.



The serial number is stamped on the base assembly of the pump(s). It is also located on a decal on top of the reservoir tank (**Figure 1**).

Special Designations

This manual contains descriptions of hydraulic fittings. In describing these fittings, special designations are used. These designations and their meanings are as follows:

Special Designation		Fitting Designations	
MB	Male O-Ring Boss	4 MB/FB/MJ/FJ	7/16" - 20
FB	Female O-Ring Boss	6 MB/FB/MJ/FJ	9/16" - 18
MJ	Male JIC	8 MB/FB/MJ/FJ	3/4" - 16
FJ	Female JIC	4 MP	1/4" NPT
FJX	Female JIC Swivel	12 MP	3/4" NPT
FJX90	Female JIC Swivel Elbow		
MP	Male Pipe Thread (NPT)		

The type of fittings that are included will vary depending on the model of the hoist being installed. A restricted fitting is supplied in each kit and must be installed at the base end of the hoist cylinder.

Rugby Manufacturing Electric Power Unit Manual

Torque Specifications

JIC 37° FLARE FITTINGS (SAE J514)				
SIZE			STEEL	
DASH	TUBE O.D. (INCHES)	THREAD SIZE (UNF)	FT. - LBS	
			MIN	MAX
-4	1/4"	7/16"-20	10	11
-6	3/8"	9/16"-18	17	19
-8	1/2"	3/4"-16	34	38
-10	5/8"	7/8"-14	50	56
-12	3/4"	1-1/16" - 12	70	78
-16	1"	1-5/16" - 12	94	104

O-RING BOSS (SAE J1926)				
SIZE			STEEL	
DASH	TUBE O.D. (INCHES)	THREAD SIZE (UNF)	FT. - LBS	
			MIN	MAX
-4	1/4"	7/16"-20	13	15
-6	3/8"	9/16"-18	22	26
-8	1/2"	3/4"-16	40	47
-10	5/8"	7/8"-14	55	65
-12	3/4"	1-1/16" - 12	80	95
-16	1"	1-5/16" - 12	115	135

Rugby Manufacturing Electric Power Unit Manual

Specifications

The fluid type specifications below are recommended by the power unit manufacturer, Bucher Hydraulics:

- A. Fluid must be compatible with Buna-N sealing compounds.
- B. The pour point must be below the lowest anticipated temperature that will be encountered.
- C. It should contain Rust and Oxidation as well as other detergent type inhibitors.
- D. The Viscosity (SUS) should lie between 80 as a minimum and 375 as a maximum in the operating range, with ideal viscosity near 200 SUS.
- E. The viscosity index should be as high as possible. As an example, automatic transmission fluid has the following specifications as listed by most oil manufacturers:

Viscosity (SUS)	
100°F	185 to 205
210°F	45 to 55

Pour Point-45°F to -35°F

Viscosity Index145 to 165

NOTE: Be sure not to mix fluids that are not compatible with one another. Rugby Manufacturing uses Dexron II compatible fluid in quick install applications.

Installation

Mounting & Hydraulics

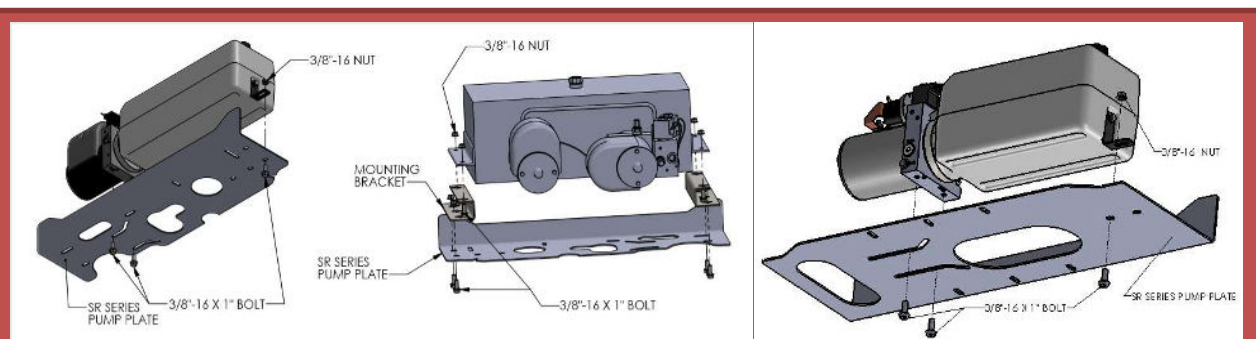


Figure 2: Power Unit Mounting

1. Mount the power unit to the location of choice using the supplied hardware as shown in **Figure 2**. The power unit must be mounted horizontally to allow for use of full reservoir oil capacity.

Rugby Manufacturing Electric Power Unit Manual

2. Connect the hoses and fittings as shown in the section, **Hydraulic Component Diagrams**, leaving the connection between the base end of the cylinder and the supply hose loose. This connection will be tightened after the system has been primed.

NOTE: The power unit should be mounted in a protected area near the hoist. For longevity of the unit and related components, do not mount the power unit near exhaust system components or in the path of road splash from the vehicle's tires.

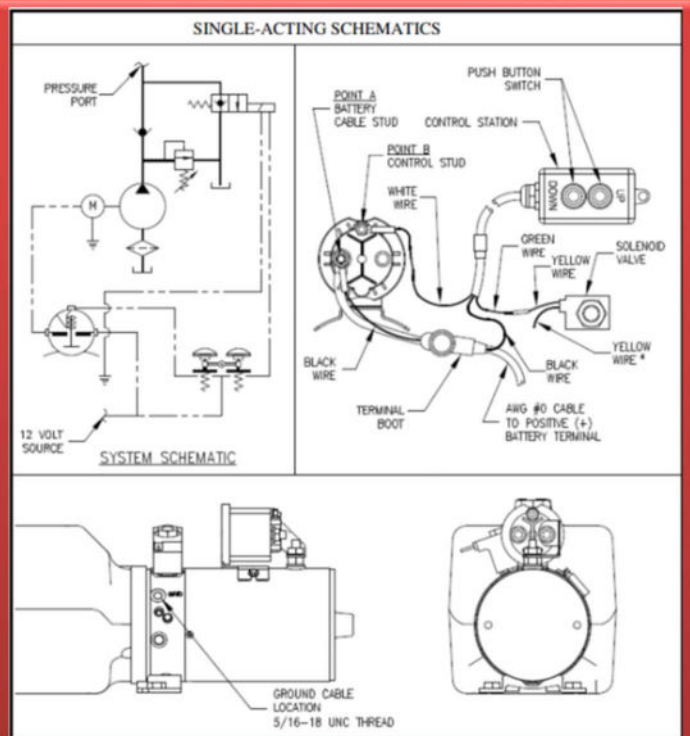
NOTE: All hydraulic connections rely on O-ring or flare/face sealing methods, therefore thread sealant is not required. Do not use Teflon tape on hydraulic connections as this can cause damage to valves and filters within the power unit.

! DANGER

Remove jewelry and other objects that may conduct electricity before working with electrical systems.

Electrical – Single Acting Pump Units

1. Route a negative #0 AWG cable from the battery to the power unit. Connect one end of the cable to the negative battery terminal. Connect the other end of the cable to the power unit's aluminum valve block with a 5/16"-18 x 3/4" hex cap screw as shown in **Figure 3**.
2. Route a positive #0 AWG cable from the battery to the power unit. **Do not connect the cable to the power unit until the system is ready to be primed.**
3. Install the supplied 250 amp in line fuse no further than 12" from the battery.
4. At the power unit, insert the supplied rubber terminal boot over the end of the cable and the black wire as shown in **Figure 3**.
5. Fasten the cable end and black wire to "Point A" on the solenoid start switch. Tighten to 35in/lbs. of torque. Snap the rubber terminal boot over the stud (Figure 3).
6. Make sure all connections on the solenoid start switch are secure.
7. Locate the hoist control station in a safe place.



Rugby Manufacturing Electric Power Unit Manual

NOTE: The high current demands of the power unit require a direct connection between the negative post of the battery and the power unit. Do not rely on the vehicle's ground circuit.

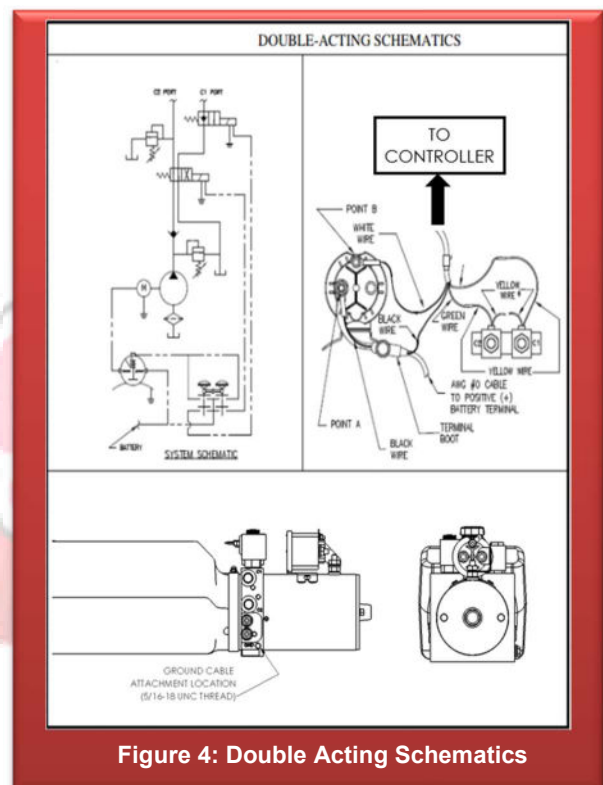
NOTE: Avoid routing power cables near sharp edges, pinch points, or high heat areas. Install approved sheathing over each power cable where required.

NOTE: The battery cable stud (Point A) should not be tightened over 35in/lbs., and the control stud (Point B) should not be tightened over 15in/lbs. Exceeding the torque ratings for either stud can cause the unit to malfunction, leading to property damage, serious injury, or death. See Figure 3.

Electrical – Double Acting Pump Units

NOTE: The Hy-Flo™ electric power unit has two motors/pumps mounted in a single tank. Each motor can draw up to 250 amps, so each motor must be connected to its own battery. To prevent batteries from being drained, it is recommended that the engine be running while power unit is operated.

1. Route a negative #0 AWG cable from one battery to the power unit. Connect one end of the cable to the negative battery terminal. Connect the other end of the cable to the power unit's aluminum valve block with a 5/16"-18 x 3/4" hex cap screw as shown in **Figure 4**. Repeat this step for the second motor using a second battery and cable.
2. Route a positive #0 AWG cable from the battery to the power unit. Do not connect the cable to the power unit until the system is ready to be primed. Repeat this step for the second motor using a second battery and cable.
3. Locate the short black wire located on the back side of the Deutsch connector of the push-button control. Connect the black wire to a 12 VDC power source in the fuse panel that is hot only when the engine is running (**Figure 5**).
4. Install a supplied 250 amp in line fuse on each positive cable no further than 12" from each battery



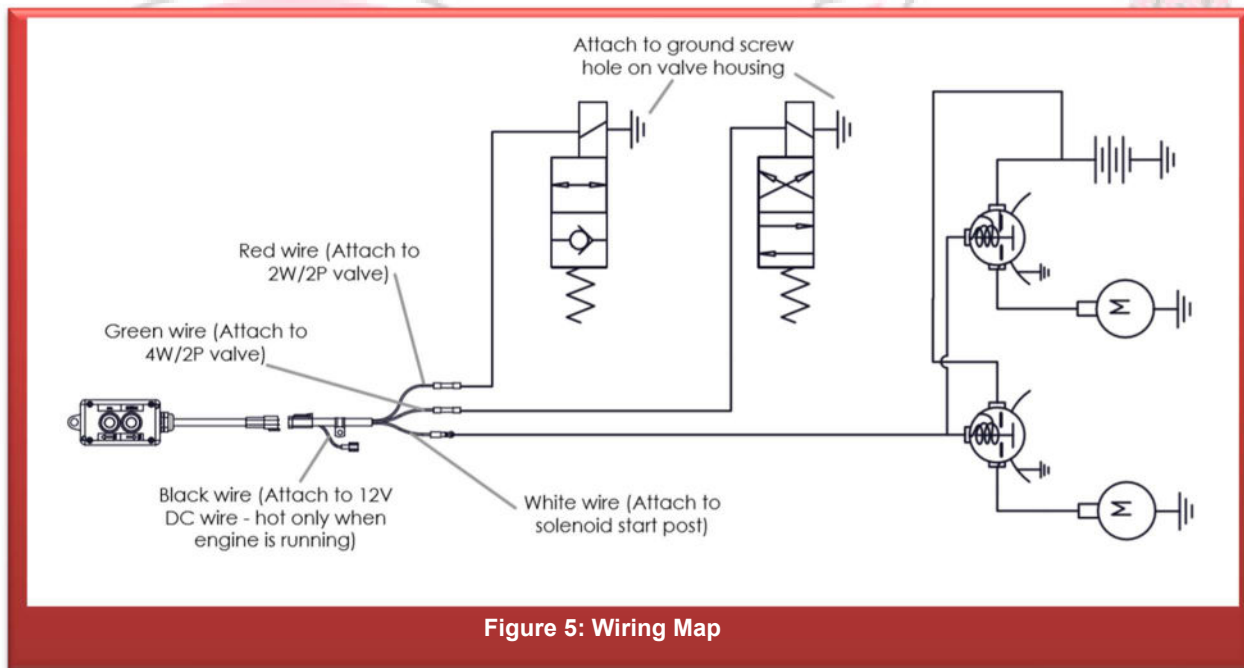
Rugby Manufacturing Electric Power Unit Manual

5. At the power unit, insert the supplied rubber terminal boot over the end of the cable and the black wire as shown in **Figure 4**.
6. Fasten the cable end and black wire to “Point A” on the solenoid start switch. Tighten to 35in/lbs. of torque. Snap the rubber terminal boot over the stud (**Figure 4**). Repeat for the second battery cable and motor.
7. Make sure all connections on the solenoid start switch are secure.
8. Locate the hoist control station in a safe place.

NOTE: The high current demands of the power unit require a direct connection between the negative post of the battery and the power unit. Do not rely on the vehicle's ground circuit.

NOTE: Avoid routing power cables near sharp edges, pinch points, or high heat areas. Install approved sheathing over each power cable where required.

NOTE: The battery cable stud (Point A) should not be tightened over 35in/lbs., and the control stud (Point B) should not be tightened over 15in/lbs. Exceeding the torque ratings for either stud can cause the unit to malfunction, leading to property damage, serious injury, or death. See Figure 4.



Rugby Manufacturing Electric Power Unit Manual

Electrical – Lockdown Double Acting Pump Unit

1. Route a negative #0 AWG cable from one battery to the power unit. Connect one end of the cable to the negative battery terminal. Connect the other end of the cable to the power unit's aluminum valve block with a 5/16"-18 x 3/4" hex cap screw as shown in **Figure 4**.
2. Route a positive #0 AWG cable from the battery to the power unit. Do not connect the cable to the power unit until the system is ready to be primed. Repeat this step for the second motor using a second battery and cable.
3. Locate the short black wire located on the back side of the Deutsch connector of the push-button control. Connect the black wire to a 12 VDC power source in the fuse panel that is hot only when the engine is running (**Figure 5**).
4. Install a supplied 250 amp in line fuse on each positive cable no further than 12" from each battery
5. At the power unit, insert the supplied rubber terminal boot over the end of the cable and the black wire as shown in **Figure 4**.
6. Fasten the cable end and black wire to "Point A" on the solenoid start switch. Tighten to 35in/lbs. of torque. Snap the rubber terminal boot over the stud(**Figure 4**). Repeat for the second battery cable and motor.
7. Make sure all connections on the solenoid start switch are secure.
8. Place the solenoid cover over the solenoid and secure in place with the supplied tie strap.
9. Locate the hoist control station in a safe place.

NOTE: *The high current demand of the power unit require a direct connection between the negative post of the battery and the power unit. Do not rely on the vehicle's ground circuit.*

NOTE: *Avoid routing power cables near sharp edges, pinch points, or high heat areas. Install approved sheathing over each power cable where required.*

NOTE: *The battery cable stud (Point A) should not be tightened over 35in/lbs., and the control stud (Point B) should not be tightened over 15in/lbs. Exceeding the torque ratings for either stud can cause the unit to malfunction, leading to property damage, serious injury, or death. See Figure 4.*

Rugby Manufacturing Electric Power Unit Manual

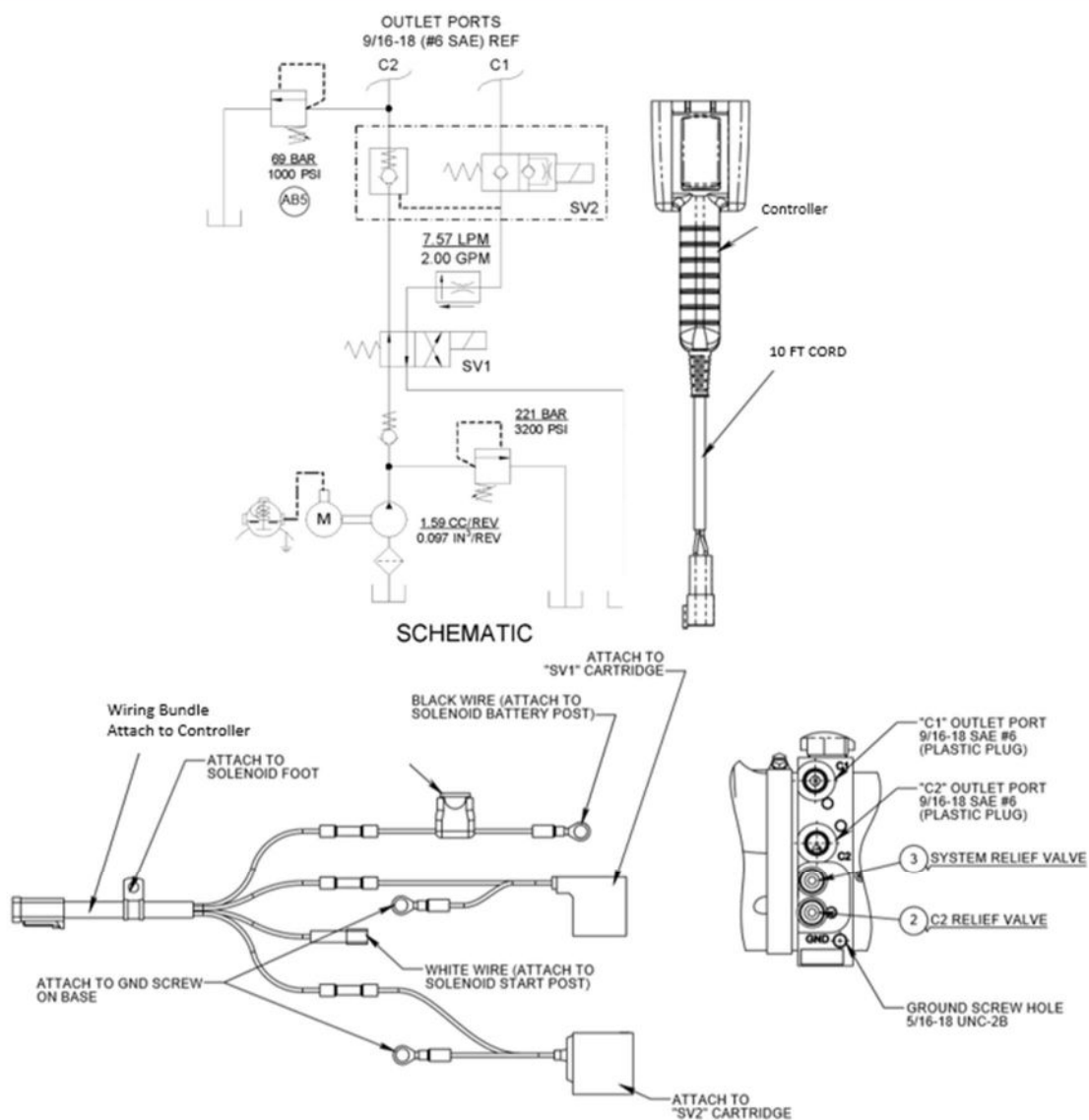


Figure 6: Lockdown Pump Schematics

Rugby Manufacturing Electric Power Unit Manual

Operation

Priming Single and Double Acting Pump Units



Fluid under pressure can pierce the skin and enter the bloodstream, causing serious injury or death. Always wear eye protection and protective clothing when working around hydraulic systems.

1. Fill the reservoir with automatic transmission fluid (ATF Dexron II or equivalent. See "Specifications").
2. Secure the unit's power cable(s) to the positive battery terminal(s) to complete the electrical installation and allow operation of the unit.
3. Place a drip pan or other suitable container beneath the loose hose fitting at the base of the cylinder.
4. Press the "UP" button on the control station to begin priming the power unit. Once oil flows steadily from the loose fitting, release the "UP" button and tighten the fitting.
5. Operate the power unit several times starting with short cylinder strokes and increasing length with each successive stroke.
6. Recheck oil level often and add as necessary to keep pump from picking up air. With the hoist down, the reservoir should be full within 1.5" of the top. **DO NOT OVERFILL.**
7. Install filler/breather cap in the reservoir fill hole.

NOTE: Do not use a solid plug or a filler cap without a breather element, as this will cause damage to the power unit and/or reservoir.



- During dumping operations, no one must be allowed to stand in or move through the area where the body and hoist operate or into an area where an upset load might fall.
- Controls must be in a safe location, and it must not be possible for the operator to be under body during dumping operation.
- Damaged or malfunctioning equipment may cause injury or death. Repair or replace any damaged or malfunctioning equipment before continuing its use.

Rugby Manufacturing Electric Power Unit Manual

Using Single and Double Acting Pump Units

1. To raise the hoist, press and hold the “UP” pushbutton on the control station. This will activate the power unit and direct oil to the base end of the cylinder. Releasing the pushbutton will stop raising the hoist & will hold its position.
2. To lower the hoist, press and hold the “DOWN” pushbutton on the control station. In Single-Acting units, this will activate the solenoid valve and direct oil from the cylinder back to the power unit’s reservoir, lowering the hoist (gravity down). In Double-Acting units, the power unit will activate and direct oil to the top-side of the hoist cylinder, lowering the hoist (power down).

NOTE: The power unit is equipped with a factory-set hydraulic relief valve that will bypass at 3200PSI. When the hoist reaches a fully raised position or if the load being lifted exceeds lifting capacity, the pump will bypass. Do not let the pump bypass for long periods of time, as this puts stress on the entire hydraulic & electrical system. Releasing the “UP” button on the control station will stop the pump from bypassing. DO NOT TAMPER WITH RELIEF VALVES.

NOTE: The power unit is equipped with a factory-set hydraulic relief valve that will bypass at 1000PSI. When the hoist reaches a fully lowered position or if the load being dropped exceeds capacity, the pump will bypass. Do not let the pump bypass for long periods of time, as this puts stress on the entire hydraulic & electrical system. Releasing the “DOWN” button on the control station will stop the pump from bypassing. DO NOT TAMPER WITH RELIEF VALVES.

NOTE: Failure to fully depress control station buttons can result in the hydraulic system to not operate correctly.

Maintenance

Check the following monthly to ensure proper operation:

1. Wiring, electrical connectors, power cables (positive & ground), valves, and coils for any corrosion, rust or loose hardware. Electrical components must be kept free of corrosion and rust to function properly.
2. Hoses & fittings for cracks, leaks or any other exterior damage. Tighten all fittings as needed.
3. Plastic reservoir for leaks or other damage.
4. Vent cap for any dirt or debris.
5. Oil level should be at fill line/1.5” from the top. Change fluid annually to remove condensation and entrapped debris.

NOTE: Always use clean automatic transmission fluid in the power unit. Refer to “Specifications” for fluid type recommendations.

Rugby Manufacturing Electric Power Unit Manual

POWER UNIT/CYLINDER PORTS

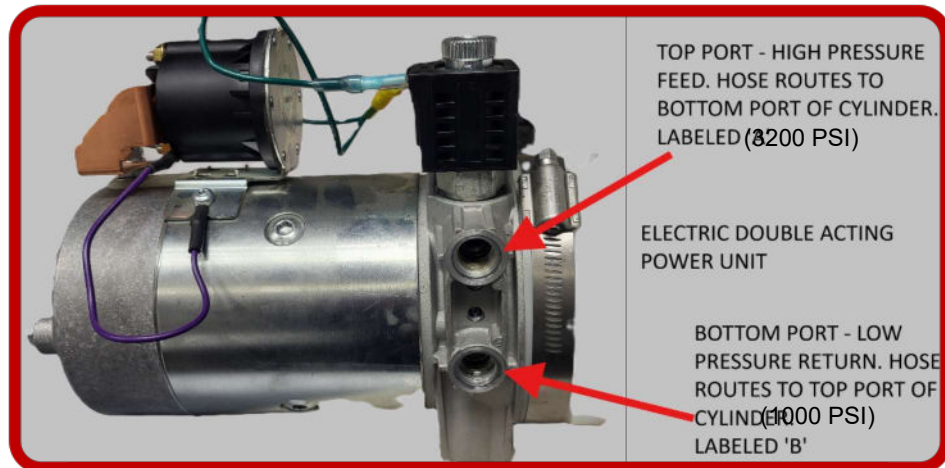


FIGURE 7: ED POWER UNIT PORTS

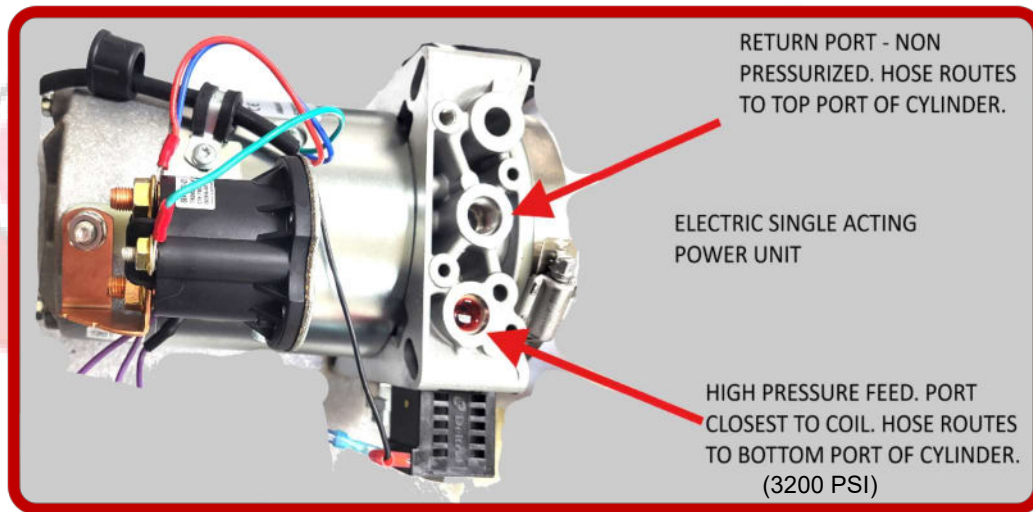


FIGURE 8: ES POWER UNIT PORTS



FIGURE 9: CYLINDER PORTS

Rugby Manufacturing Electric Power Unit Manual

Hydraulic Component Diagrams

Hose "A" 1/4" 6FJX-4FJX90	
Part Number	Length
1654546	5'
1654547	6'
1654548	8'
1654576	9'

Hose "B" 1/4" 6FJX-6FJX	
Part Number	Length
1654514	4'
1654515	5'
1654516	6'
1654518	8'
1654564	9'
1654575	10'

Hose "C" 3/8" 6FJX-6FJX	
Part Number	Length
1654520	4'
1654521	5'
1654522	6'
1654523	7'
1654524	8'
1654569	9'
1654574	10'

Figure 10: Hose References

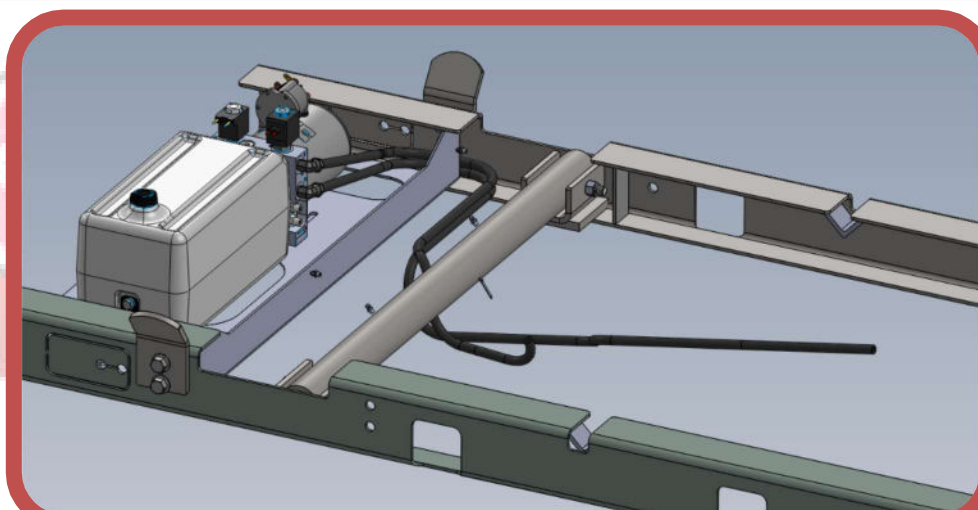


Figure 11: Hose Routing w/ Sub Frame

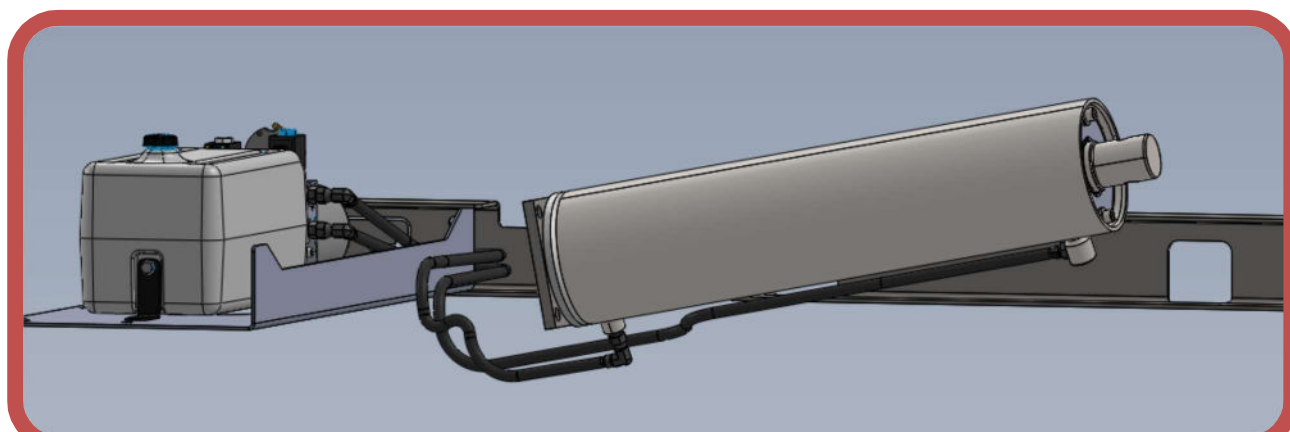
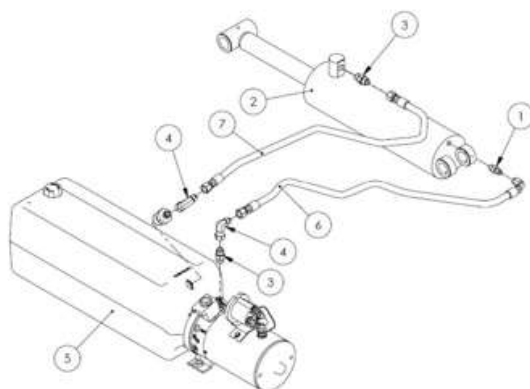


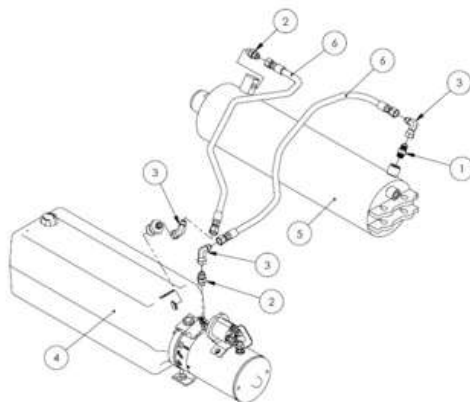
Figure 12: Hose Routing w/ Cylinder

Rugby Manufacturing Electric Power Unit Manual



4" Cylinder			
ITEM	PART #	DESCRIPTION	QTY
1	2626030	FLOW CONTROL, 8MB-6MJ	1
2	-	CYLINDER 4X10	1
3	1667897	ADAPTER, 6MB-6MJ	2
4	1667414	ADAPTER, 6MJ-6FJX90	3
5	2580130	UNIT, ES 634CI GPP POWER	1
6	HOSE "B"	HOSE, 1/4" 6FJX-6FJX SAE 100R17	1
7	HOSE "B"	HOSE, 1/4" 6FJX-6FJX SAE 100R17	1

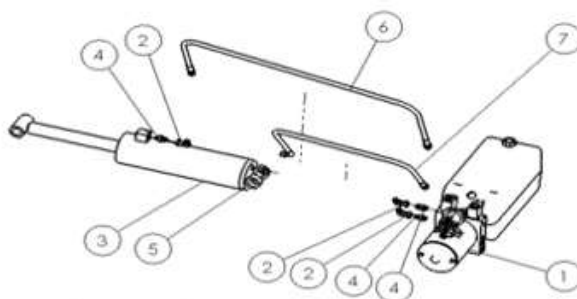
Figure 13: Single Acting 4" Cylinder



4"/5" Cylinder			
ITEM	PART #	DESCRIPTION	QTY
1	2626030	FLOW CONTROL, 8MB-6MJ	1
2	1667897	ADAPTER, 6MB-6MJ	2
3	1667414	ADAPTER, 6MJ-6FJX90	3
4	2580130	UNIT, ES 634CI GPP POWER	1
5	-	CYLINDER, 4/5X16	1
6	HOSE "B"	HOSE, 1/4" 6FJX-6FJX SAE 100R17	1
7	HOSE "B"	HOSE, 1/4" 6FJX-6FJX SAE 100R17	1

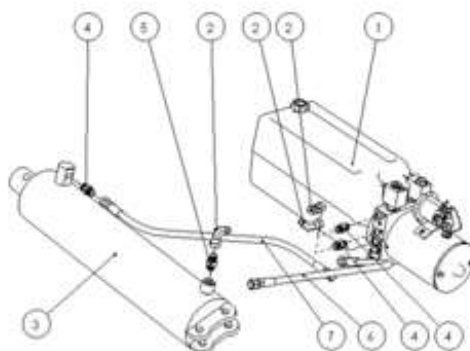
Figure 14: Single Acting 4"/5" Cylinder

Rugby Manufacturing Electric Power Unit Manual



4" Cylinder			
ITEM	PART #	DESCRIPTION	QTY
1	2580132	UNIT, ED 388CI GPP POWER	1
2	1667414	ADAPTER, 6MB-6FJX90	3
3	-	CYLINDER, 4X10	1
4	1667897	ADAPTER, 6MB-6MJ	3
5	2626030	FLOW CONTROL, 8MB-6MJ	1
6	HOSE "B"	HOSE, 1/4" 6FJX-6FJX SAE 100R17	1
7	HOSE "B"	HOSE, 1/4" 6FJX-6FJX SAE 100R17	1

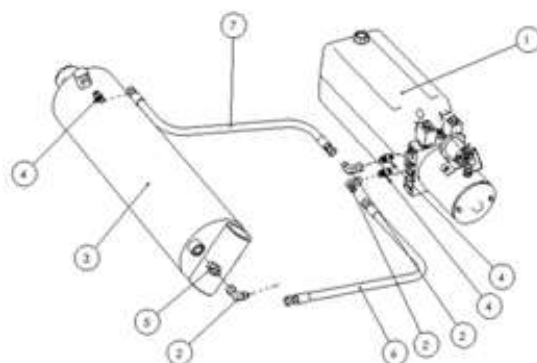
Figure 15: Double Acting 4" Cylinder



4"/5" Cylinder			
ITEM	PART #	DESCRIPTION	QTY
1	2580132	UNIT, ED 388CI GPP POWER	1
2	1667414	ADAPTER, 6MB-6FJX90	3
3	-	CYLINDER, 4/5X16	1
4	1667897	ADAPTER, 6MB-6MJ	3
5	2626030	FLOW CONTROL, 8MB-6MJ	1
6	HOSE "B"	HOSE, 1/4" 6FJX-6FJX SAE 100R17	1
7	HOSE "B"	HOSE, 1/4" 6FJX-6FJX SAE 100R17	1

Figure 16: Double Acting 4"/5" Cylinder

Rugby Manufacturing Electric Power Unit Manual



6" Cylinder			
ITEM	PART #	DESCRIPTION	QTY
1	2580132	UNIT, ED 388CI GPP POWER	1
2	1667414	ADAPTER, 6MB-6FJX90	3
3	-	CYLINDER, 6X19	1
4	1667897	ADAPTER, 6MB-6MJ	3
5	2626030	FLOW CONTROL, 8MB-6MJ	1
6	HOSE "C"	HOSE, 3/8" 6FJX-6FJX SAE 100R17	1
7	HOSE "C"	HOSE, 3/8" 6FJX-6FJX SAE 100R17	1

Figure 17: Double Acting 6" Cylinder