

# ***TECHNICAL MANUAL***

## **DIESEL DRIVEN HYDRAULIC POWER UNIT**



**Front View**



**Rear View**

Photos represent  
Model DPU660-05

### **MODEL NUMBERS**

#### **DPU660-05 & -06**

**114 HP, 6 CYL., 60 GPM, 3000 PSI  
WITH HIGH/LOW GEAR PUMP**





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**This manual is not a controlled document and is subject to revision without notice. To receive updates and insure you have access to the latest information concerning the SUPERIOR Power Unit, we request you complete this form and return the lower half to SUPERIOR Manufacturing and Hydraulics by mail or facsimile.**

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**Address:** \_\_\_\_\_  
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**City:** \_\_\_\_\_ **State:** \_\_\_\_\_  
**Postal Code:** \_\_\_\_\_ **Country:** \_\_\_\_\_  
**Telephone:** \_\_\_\_\_ **Fax:** \_\_\_\_\_

**Power Unit Model No.:** \_\_\_\_\_ **Serial No.:** \_\_\_\_\_  
**Assembly Date:** \_\_\_\_\_

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**SUPERIOR Power Unit Technical Manual Registration Form**

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**Telephone:** \_\_\_\_\_ **Fax:** \_\_\_\_\_  
  
**Power Unit Model No.:** \_\_\_\_\_ **Serial No.:** \_\_\_\_\_  
**Assembly Date:** \_\_\_\_\_

**Return To:**

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# SUPERIOR DIESEL DRIVEN HYDRAULIC POWER UNIT

## REVISION TABLE

<i>Section</i>	<i>Page</i>	<i>Date</i>	<i>Description</i>
Cover Title Pg. 2	Cover Title Pg. 1	11/07	Added Model DPU660-06. Changed illustration to photo's. Corrected HP from 90 to 114.
	2	11/07	Removed description for DPU440. Corrected HP, RPM, hydraulic reservoir gallons, & diesel tank gallons. Removed model numbers for hyd. reservoir & diesel tank. Corrected Specs.
3	1	11/07	Removed 4 cyl. specs & gal. qty. from Diesel Reservoir & Hyd. Oil Reservoir.
	2		Corrected PN for Item 4 Dual Gear Pump & 30 GPM to 60 GPM, Item 9 PN 1441 to 1440 Male to Female, Item 10 PN 1446 to 1445 Male to Female, Item 12 Reservoir from 150 Gal. to 140, & Item 13 Diesel Tank from 45 Gal. to 42.
6	1	11/07	Corrected Parts List Hyd. Reservoir 150 Gal. to 140 Gal., Diesel Engine from 90 HP to 114, Diesel Tank from 45 Gal. to 42, & Dual Pump from 30 GPM to 60.
	2		Corrected Spare Parts List Dual Gear Pump 30GPM to 60.
7	1-8	11/07	Revised Illustrations DPU660-05 sht.1 & 2. Replaced Photo's 1 – 6. Added Photo's 7 & 8.
8	N/A	11/07	Replaced Dump Valve info with current information. Added Sentinel Diesel Engine Protection System Installation Guide. Added info. for PN's HRES-150, 1205, 1508, DPU660-S1 & DPU660-S2, Supertrapp Muffler & Lubricator 4108M. Numbered pages.



# SUPERIOR Diesel Driven Hydraulic Power Unit

## **HAZARD WARNING**

Nomenclature used in this manual:

**WARNING** concerns an operating procedure or practice that, if not strictly observed, can result in injury to personnel or loss of life.

**Caution** concerns an operating procedure or practice that, if not strictly observed, can result in damage to or destruction of equipment.

**Note** concerns an operating procedure or practice that needs highlighting.

**WARNING:** Hydraulic Power Unit must be maintained and operated by trained personnel. Personnel with diminished physical or mental capacity must not operate this equipment.

SUPERIOR Hydraulic Power Units utilize high pressure hydraulic fluids. Portions of the unit, control valves, hydraulic lines and cylinders may contain high pressure fluid even when the Power Unit is de-energized and the fluid supply hoses are disconnected. During normal operation the temperature of the hydraulic fluids as well as hoses, piping, valves, etc., can rise to a level which can cause burns.

**WARNING:** Personal protective gear including safety glasses, face shields, protective gloves and protective clothing must be worn to guard against the hazards of high pressure fluids. Tight fitting clothing is required to prevent entanglement in rotating components. These units should be serviced by thoroughly trained and qualified hydraulic technicians using procedures to safely insure hydraulic pressure is bled from these circuits.

No attempt should be made to operate the SUPERIOR Hydraulic Power Unit for any purpose other than which it is intended.



### HYDRAULIC PRODUCT SAFETY



**WARNING:** Valve lever (spool) may "stick" (not center) under certain conditions allowing the hydraulic equipment to continue to operate and could cause serious injury, death or equipment failure.

**VALVE SAFETY:** Read and follow instructions carefully. Failure to observe instructions and guidelines may cause serious injury, death or equipment failure. A sticking valve (spool bind) may be caused by one or more of the following factors:

**DIRTY OIL:** Oil must be filtered to a minimum of 25 microns. Filters should be changed regularly - spin-on types after 50 hours of initial use and then after every two hundred fifty hours of use. Use of a condition indicator is recommended. Consult your tractor or implement owner's manual for filtration and changing recommendations for internal systems.

**OIL REQUIREMENTS:** Premium quality anti-wear type oil with a viscosity between 100 and 200 SSU at operating temperatures. Certain synthetic oils may cause spool seals to swell and the valve to stick. If in doubt, call CROSS Engineering.

**IMPROPER HOOK UP OR MOUNTING:** Always use the proper size fittings. Hook up "in" & "out" as noted on the valve body. Do not overtorque pipe fittings. Mounting surfaces should be flat and care should be used when tightening mounting bolts. Over-tightened bolts can cause spool bind and casting breakage. When hooking a valve in series, always use a power beyond sleeve. Consult your tractor or implement manual to make sure you have the proper quick disconnect line connected to the inlet of the remote valve.

**MISAPPLICATION:** Always use the proper valve for the job. CONVERTA, CD, CS or CA valves should never be used for metered heavy load lifting - loaders or similar applications. Use an open center valve for open center applications and a closed center valve for closed applications. If in doubt, check with your tractor dealer. Contact CROSS if the valve allows the hydraulic equipment to creep excessively.

**MAINTENANCE:** Make sure all bolts are tightened and torqued to the recommended specification. Bent or broken parts should not be used. Replace immediately. Always use exact replacements. Always protect valve spool from paint overspray. Faulty quick disconnects can cause high back pressures and sticking spools. Check quick disconnects periodically to make sure they are functioning properly. If valve spool does not center or appears to stick, do not use!

#### **PUMPS & MOTORS SAFETY:**



A relief or bypass in your hydraulic system is necessary to prevent pump from breakage due to overpressurization. Use correct fittings and proper oil as noted in the technical service manual packed with each unit. Change oil as recommended by your implement or tractor manufacturer.

#### **CYLINDER SAFETY:**



Check clevis clearances before, during and after extending the cylinder and before using the cylinder under pressure to avoid possible injury, or bent or broken rods caused by binding. Never operate a cylinder above recommended pressures. Never use a cylinder as a safety device when transporting equipment.

#### **PINHOLE LEAKS:**



If you observe a pinhole leak, discontinue use of the component. If oil has penetrated your skin or contacted your eye, seek medical attention immediately!

## **DESCRIPTION**

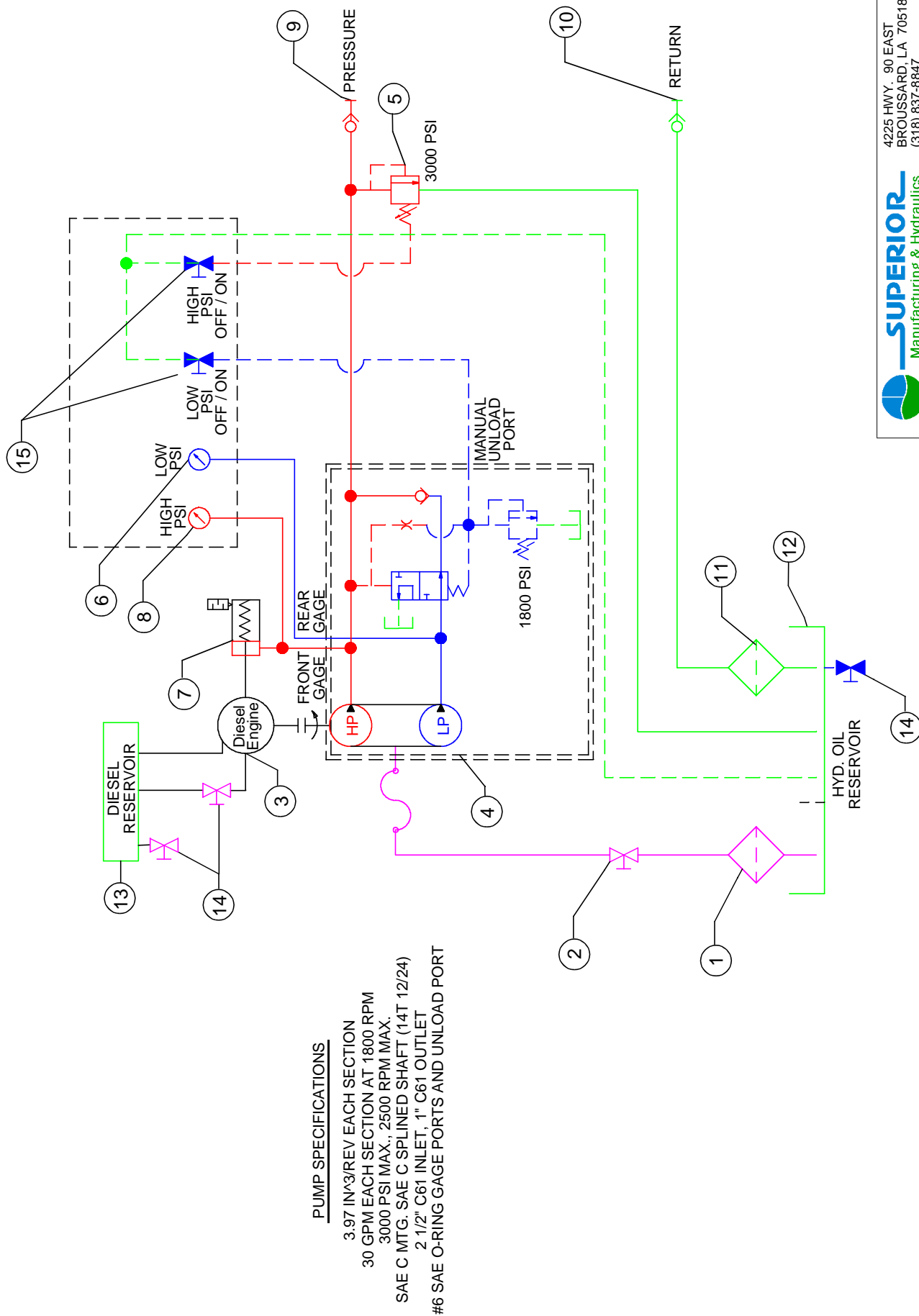
Superior Manufacturing & Hydraulics Power Units can be used to run many types of hydraulic tools. They are most frequently used to run hydraulic power tongs and backups.

The DPU660 is a diesel driven hydraulic power unit. It uses a 6 cylinder Deutz engine capable of delivering up to 114 HP @ 2300 RPM. (See manufacturing literature for engine technical information.) The engine drives a dual gear pump with an integral high/low valve. The pump can deliver 60 GPM at pressures up to 1500 psi (low pressure, high flow). From 1500 psi to 3000 psi the pump will deliver 30 GPM (high pressure, low flow).

The hydraulic reservoir will hold 140 US gallons of premium hydraulic oil (ISO 68 recommended). The diesel tank will hold 42 US gallons of diesel. Other items in the unit include a system relief valve, return filter and gauge control panel. The entire system is mounted on a skid with a detachable crash frame which incorporates a hose basket for easy transportation.

## **SPECIFICATIONS**

<b>6 Cylinder Diesel Engine / Deutz F6L914</b>	114 HP @ 2300 RPM
<b>Maximum Flow / Pressure</b>	58-60 GPM @ 1400 PSI 28-30 GPM @ 2900 PSI
<b>Dimensions</b>	102" L x 48" W x 62 3/4" H 259 cm L x 122 cm W x 159 cm H
<b>Weight</b>	7000 lbs. / 3175 kg
<b>Hydraulic Oil Capacity / HRES-150</b>	140 US Gal. / 530 L
<b>Diesel Capacity</b>	42 US Gal. / 159 L



#### PUMP SPECIFICATIONS

3.97 IN<sup>3</sup>/REV EACH SECTION  
 30 GPM EACH SECTION AT 1800 RPM  
 3000 PSI MAX., 2500 RPM MAX.  
 SAE C MTG. SAE C SPLINED SHAFT (14T 12/24)  
 2 1/2" C61 INLET, 1" C61 OUTLET  
 #6 SAE O-RING GAGE PORTS AND UNLOAD PORT

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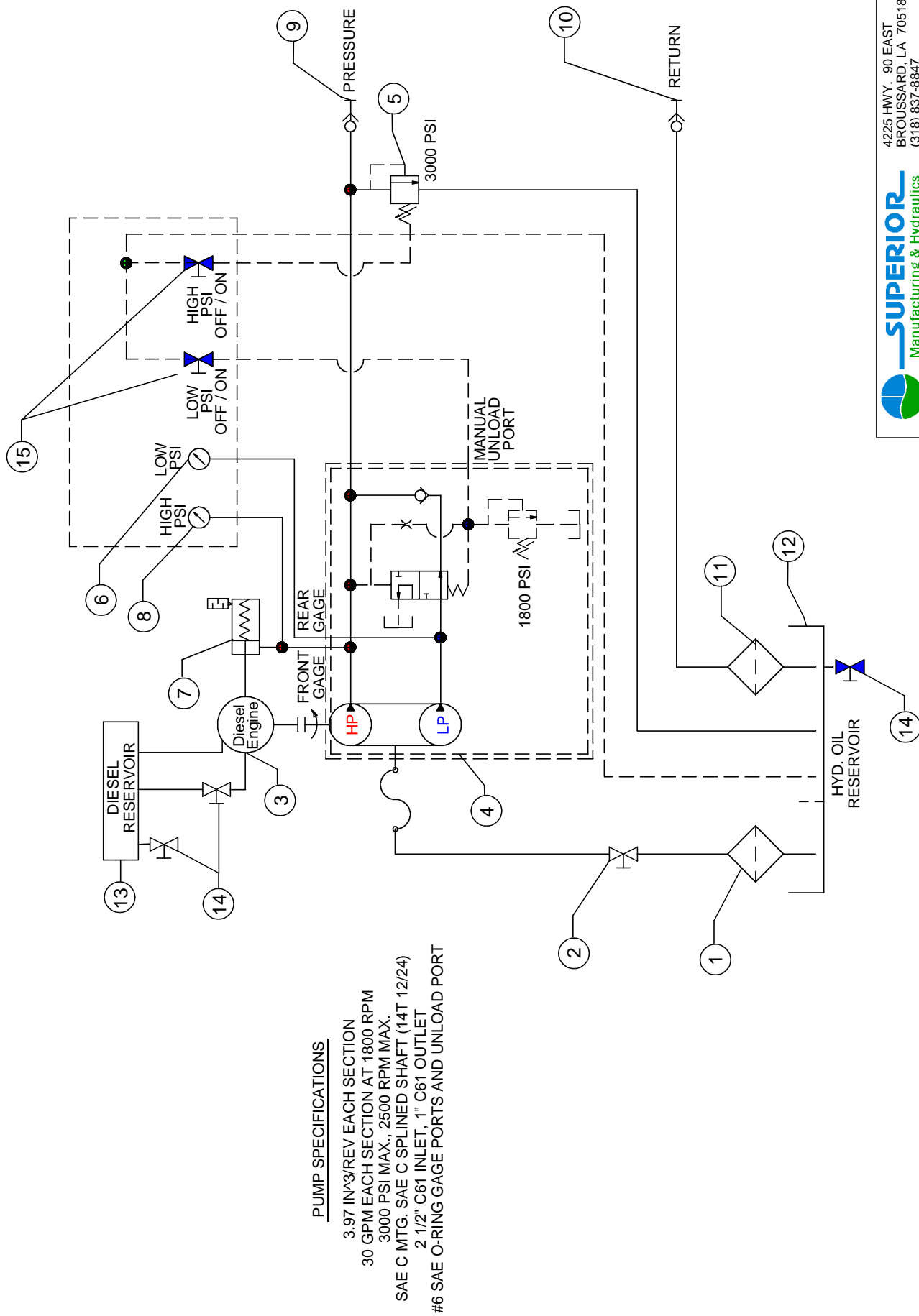
## HYDRAULIC SCHEMATIC

**HYDRAULIC SCHEMATIC  
DIAGRAMA ESQUEMÁTICO HIDRÁULICO**

**BILL OF MATERIALS  
CUENTA DE MATERIALES**

<i>Item Artículo</i>	<i>Quantity Cantidad</i>	<i>Part Number Parte Número</i>	<i>English Description Inglés Descripción</i>	<i>Spanish Description Español Descripción</i>
1	1	2.5 STRAINER	Suction Strainer	Succión Tamiz
2	1	1458	Suction Ball Valve, 2 1/2" NPT	Succión Bola Válvula, 2 1/2" NPT
3	1	F6L914	6 Cylinder Diesel Engine with Pump Drive	6 Cilindro Motor diesel con la impulsión de la bomba
4	1	GNSH20-20	Dual Gear Pump with Hi / Lo Valve 60 GPM	Dual Engranaje Bomba con Alto / Bajo Válvula 60 GPM
5	1	2070	System Relief Valve	Sistema Relevación Válvula
6	1	BAC-3M25RCFF	Pressure Gauge, 0-3000	Presión Galga, 0-3000
7	1	7040HL-011	Throttle Cylinder Assembly	Válvula Reguladora Cilindro Asamblea
8	1	BAC-5M25RCFF	Pressure Gauge, 0-5000	Presión Galga, 0-5000
9	1	1440	1" Quick Disconnect – Female	1" Aprisa Desconexión – Hembra
10	1	1445	1 1/4" Quick Disconnect – Female	1 1/4" Aprisa Desconexión – Hembra
11	1	HAK050017	Return Filter	Vuelta Filtro
12	1	HRES-150	Reservoir, 140 Gallons	Depósito, 140 Galones
13	1	DT-45G	Diesel Tank 42 Gallon	Diesel Tanque 42 Galón
14	3	1205	1/2" Ball Valve, NPT, Low PSI	1/2" Bola Válvula, NPT, Bajo PSI
15	2	1508	1/4" Stainless Ball Valve, High PSI	1/4" Inoxidable Bola Válvula, Alto PSI





### PUMP SPECIFICATIONS

3.97 IN<sup>3</sup>/REV EACH SECTION  
 30 GPM EACH SECTION AT 1800 RPM  
 3000 PSI MAX., 2500 RPM MAX.  
 SAE C MTG. SAE C SPLINED SHAFT (14T 12/24)  
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DIAGRAMA ESQUEMÁTICO HIDRÁULICO**

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5	1	2070	System Relief Valve	Sistema Relevación Válvula
6	1	BAC-3M25RCFF	Pressure Gauge, 0-3000	Presión Galga, 0-3000
7	1	7040HL-011	Throttle Cylinder Assembly	Válvula Reguladora Cilindro Asamblea
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15	2	1508	1/4" Stainless Ball Valve, High PSI	1/4" Inoxidable Bola Válvula, Alto PSI

# **OPERATIONAL INSTRUCTIONS**

## **HYDRAULIC POWER UNIT STARTUP CHECKLIST**

1. Hydraulic oil level OK
2. Diesel oil level OK
3. Engine oil level OK
4. Suction valve is open
5. Connect return hose to HPU and Tong
6. Connect pressure hose to HPU and Tong
7. Connect air line
8. Position High and Low PSI switches to “OFF”
9. Position Diesel Engine Shut Down valve to Run position
10. Push air shut valve and idle for 5 minutes
11. Position High and Low PSI switches to “ON” to operate tong.



# MAINTENANCE INSTRUCTIONS

Superior recommends that owners of Hydraulic Power Unit and accessories adapt a regularly scheduled maintenance program. Implementation of this type of program offers several benefits. First you increase the life of your equipment, secondly, you may find a problem before it escalates to a costly repair or down time on the job, and most importantly, prevent injury to operating personnel.

A major inspection should be carried out if equipment is suspected to have been damaged during transit or is to be mobilized to a remote location where maintenance operations are difficult to carry out.

## **Routine Maintenance**

Cleaning:

- A) Pre-wash unit to remove majority of dirt and grease build up as to allow inspection of overall condition of unit.
- B) Clean and inspect for damage or excessive wear (cracks, breakage, and uneven wear patterns).
- C) Inspect all hoses for wear, replace as necessary.
- D) While maintaining pressure visually inspect hoses, stainless steel lines, fittings, etc., for seepage of hydraulic fluid. Repair or replace parts causing leaks.
- E) Test. Re-inspect hydraulic system for leaks.
- F) Replace return filter elements every 6 months or as required.
- G) Sample oil for contamination every 6 months, replace as required.

# TROUBLE SHOOTING

## HYDRAULIC SYSTEM

### Hydraulic Pump Making Excessive Noise:

<u>Problem</u>	<u>Solution</u>
A) Restricted or clogged intake line	Clean line, check for contamination.
B) Contaminated fluid	Flush system, change fluid.
C) Restricted vent	Clean or replace air vent.
D) Air in fluid	Check for leaks and be certain fluid suction in tank is well below hydraulic fluid in reservoir.
E) Damaged or worn parts	Repair or replace damaged parts, check fluid for contamination.
F) Excessive RPM	Check PTO, gears, and recommended speed to assure proper pump is installed for operation.
G) Increased friction	Make sure pump has been assembled using correct torque valves.
H) Damaged or worn relief valve.	Replace relief valve.
I) Damaged or worn check valve.	Replace check valve.
J) Restricted discharge	Check to make sure relief valve is set to proper pressure.
K) Valve system restricted	Inspect and repair or replace defective parts, check system for contamination.

### Excessive Wear to Hydraulic Components:

<u>Problem</u>	<u>Solution</u>
A) Fluid contamination	Flush fluid system, replace with new fluid.
B) Components misaligned	Inspect and realign.
C) High operating pressures	Gauge and set to proper pressure.
D) Exhausted fluid (depletion of additives)	Flush fluid system, replace with new fluid.
E) Air in fluid	Check for leaks, and be certain fluid suction in tank is well below hydraulic fluid in reservoir.
F) Shortened bearing life	Check alignment, insure proper lubrication to non-sealed bearings.

## SECTION 6 PARTS LIST

### **DPU660 Diesel Driven Hydraulic Power Unit** **114 HP, 60 GPM, 3,000 PSI Power Unit with High/Low Gear Pump**

<i>Description</i>	<i>Manufacturer</i>	<i>Model Number</i>
140 Gallon Hydraulic Reservoir	Superior	HRES-150
114 HP Diesel Engine with Pump Drive	Deutz	Superior P/N F6L914
42 Gallon Diesel Tank	Superior	DT-45G
60 GPM Dual Gear Pump with Integral High/Low Valve	Geartek	Superior P/N GNSH20-20
Suction Strainer	Flow-Ezy	Superior P/N 2.5 STRAINER
Relief Valve	Denison	Superior P/N 2070
Return Filter	Donaldson	Superior P/N HAK050017
Throttle Cylinder Assembly	Superior	7040HL-011

*Note:* Standard industrial hydraulic system components including hydraulic hoses, pipe fittings, and low pressure suction isolation valve components are not specifically identified.

*Note:* This Power Unit features a dual gear pump with an integral high/low valve. The 114 HP Engine pump will deliver a maximum of 60 gpm below pressures of 1500 psi. Above 1500 psi, the flow is decreased as not to overdraw the diesel engine. The maximum relief valve setting is set to 3000 psi.

$$\text{Hyd HP} = (\text{max flow (gpm)} \times \text{max pressure (psi)}) / 1714$$

## RECOMMENDED SPARE PARTS LIST

<b><u>Part Number</u></b>	<b><u>Quantity</u></b>	<b><u>Description</u></b>
GNSH20-20	1	Dual Gear Pump 60 GPM
P164697	2	Filter Elements
2.5 STRAINER	1	Suction Strainer
1441	1	1" Male Quick Disconnect
1440	1	1" Female Quick Disconnect
1446	1	1-1/4" Male Quick Disconnect
1445	1	1-1/4" Female Quick Disconnect

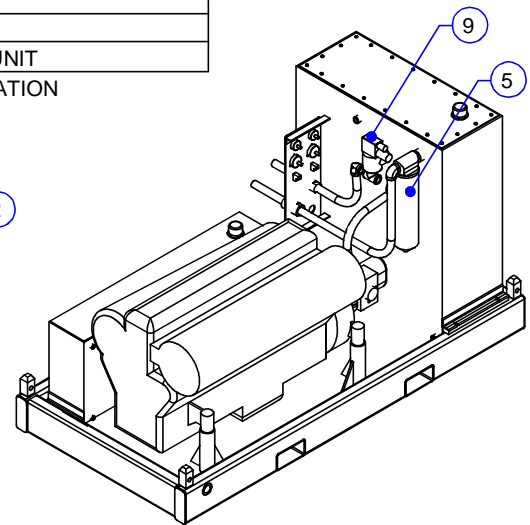
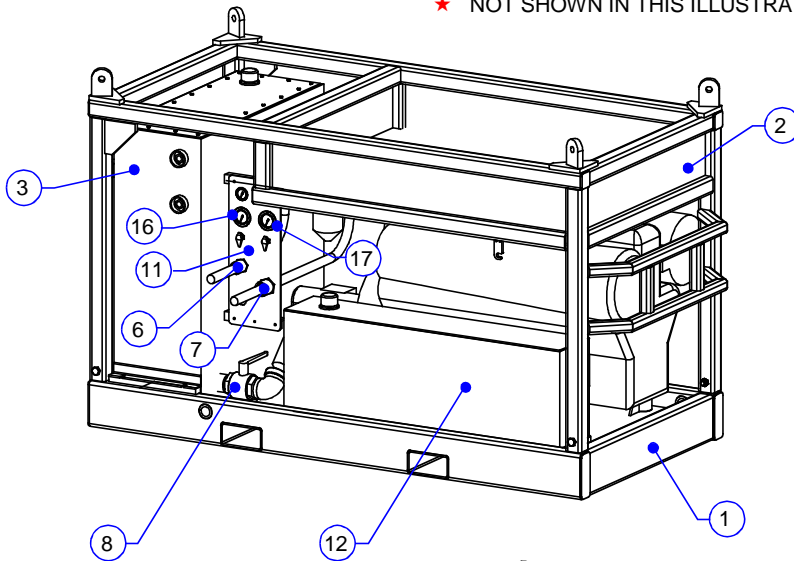


## SECTION 7    POWER UNIT ILLUSTRATIONS

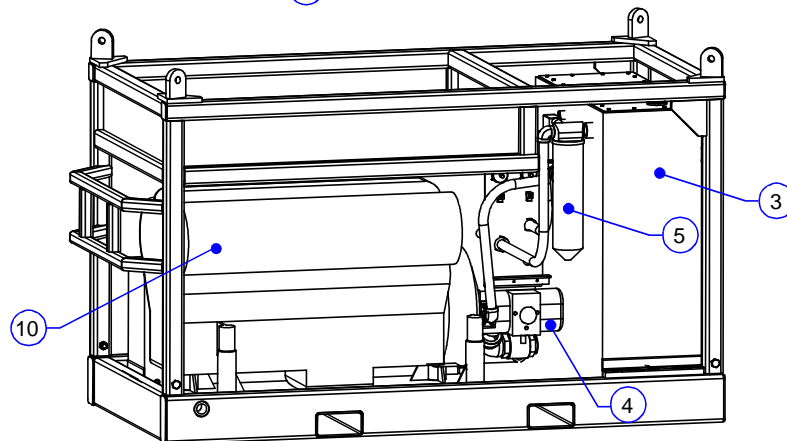
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 THROTTLE CYLINDER ASSEMBLY ( <i>Assembly No. 7040HL-011</i> ) .....	 7 - 9
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Item	DPU660-05 Quantity	DPU660-06 Quantity	Part Number	Description
1	1	1	DSKD-02	SKID FOR 6 CYL. DIESEL POWER UNIT
2	1	1	DBSKT-02	HOSE BASKET FRAME FOR DIESEL POWER UNIT
3	1	1	HRES-150	HYDRAULIC RESERVOIR - 140 GALLONS
4	1	1	GNSH20-20	DOUBLE GEAR PUMP W/ HI/LOW VALVE
				60 GPM / 60 GPM, 3000 PSI
5	1	1	HAK050017	RETURN FILTER
6	1	1	1440	1" FEMALE QUICK DISCONNECT
7	1	1	1445	1-1/4" FEMALE QUICK DISCONNECT
8	1	1	1458	BALL VALVE, 2-1/2" L/P
9	1	1	2070	1-1/4" NPT RELIEF VALVE (DUMP VALVE)
10	1	1	F6L914	6 CYL. DIESEL ENGINE W/ PUMP DRIVE
11	1	1	7042HL-013	GAUGE / BULKHEAD PANEL ASSEMBLY
12	1	1	DT-45G	DIESEL TANK - 42 GALLON
13	1	1	2.5 STRAINER	★ SUCTION STRAINER
14	1	1	7040HL-011	★ THROTTLE CYLINDER ASSEMBLY
15	1	1	7042HL-015	★ EMERGENCY STOP LABEL
16	1	1	BAC-3M25RCFF	GAUGE, 0-3000 PSI
17	1	1	BAC-5M25RCFF	GAUGE, 0-5000 PSI
18	3	3	1205	★ 1/2" BRASS BALL VALVE L.P.
19	2	2	1508	★ 1/4" SS H.P. VALVE
20	0	1	DPU660-S1	★ BLOCK FILTER
21	0	1	DPU660-S2	★ KILL FROST LUBRICATOR
22	1	1	KITFIT-DPU660	★ FITTING KIT F/6 CYL. POWER UNIT
				★ NOT SHOWN IN THIS ILLUSTRATION



POWER UNIT WITHOUT  
HOSE BASKET FRAME



APPROX. WEIGHT (LBS.) = 7,000

## **DIESEL POWER UNIT** **DPU660-05 & -06**

Sheet 1

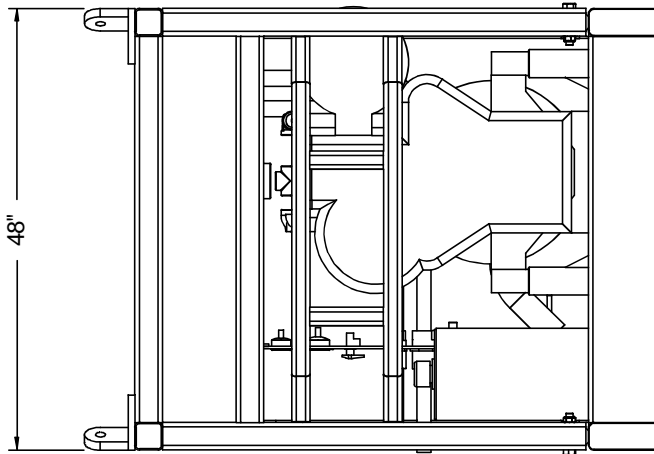
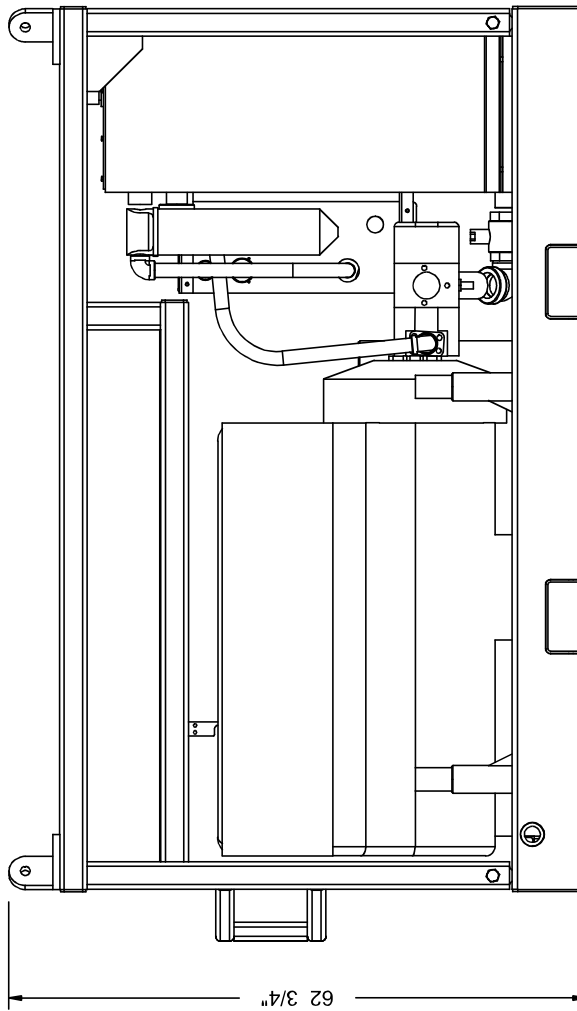
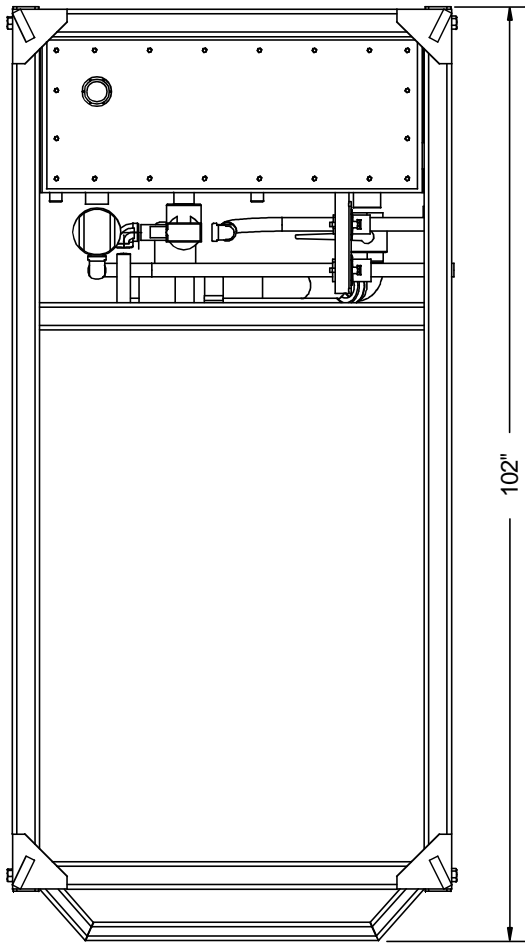
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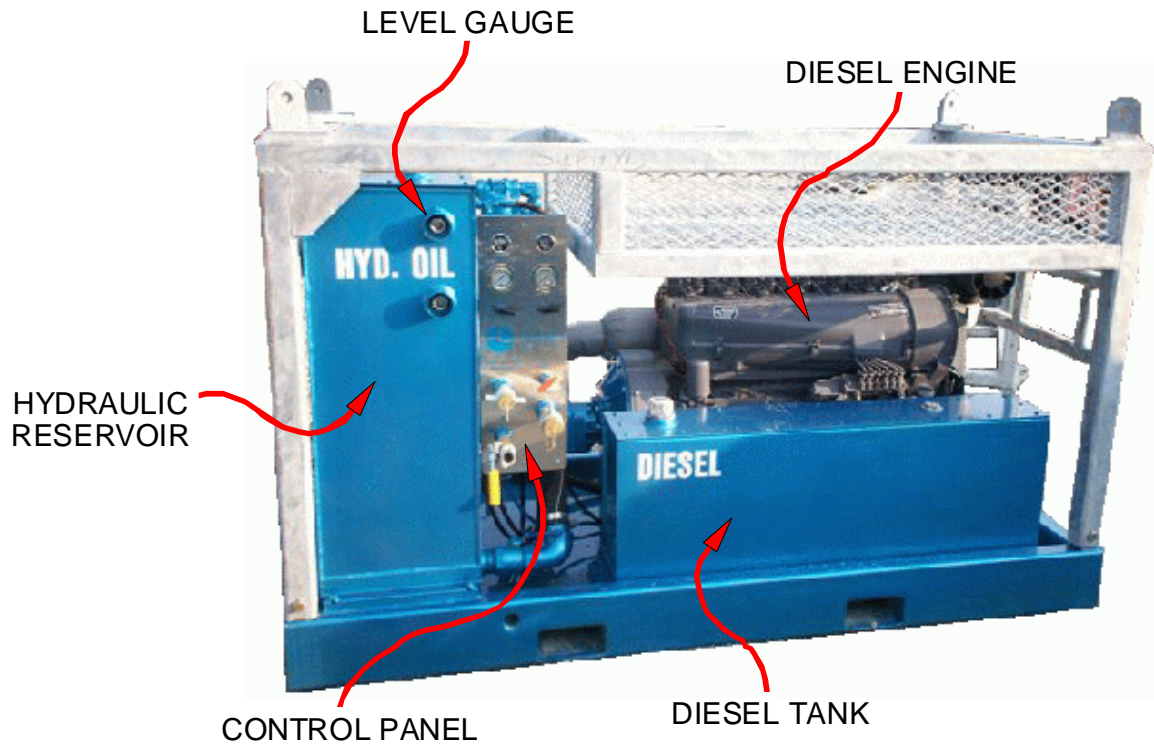
# **DIESEL POWER UNIT** **DPU660-05 & -06** Sheet 2



4225 HWY. 90 EAST  
 BROUSSARD, LA 70518  
 (318) 837-8847

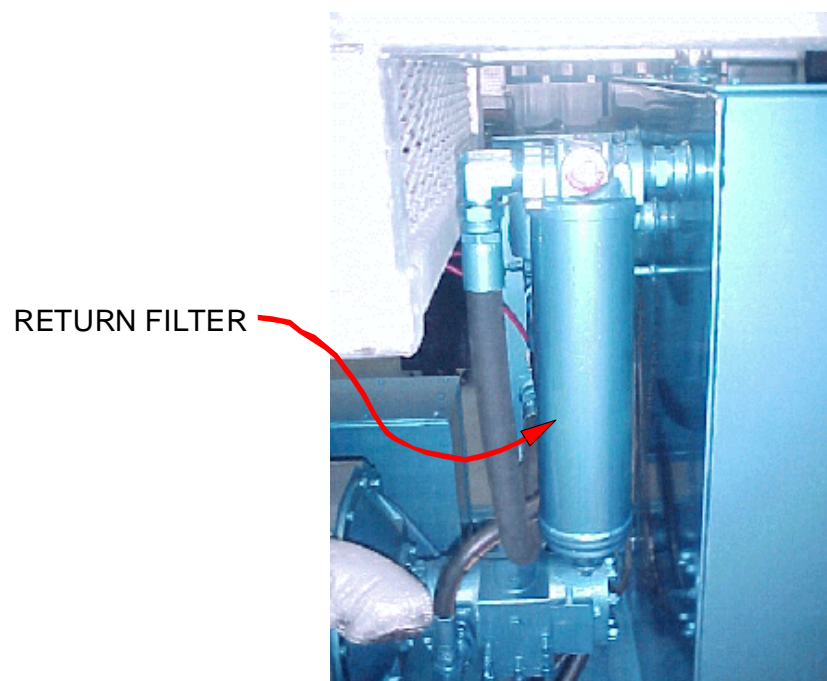
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<small>REF: P:\Manuals\Equip Manuals\Dsigs\ DPU660\DPU660-05 sf2 rev1.mpg</small>		





**Photo 1**

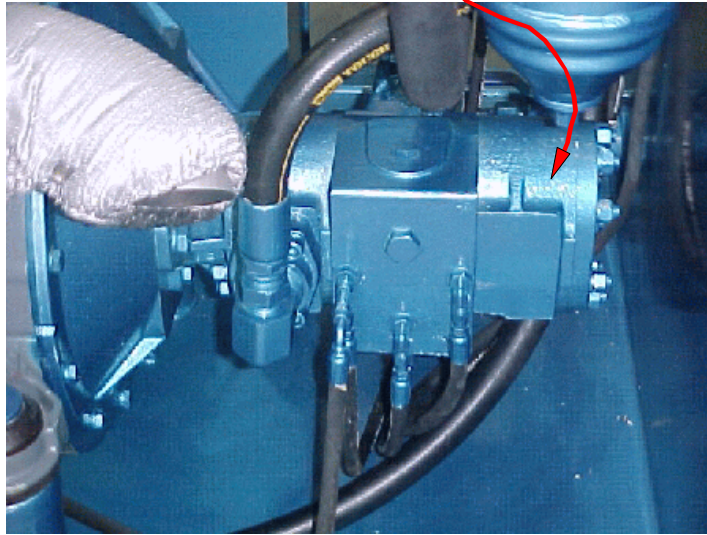
**DIESEL DRIVEN HYDRAULIC POWER UNIT**



**Photo 2**

**HYDRAULIC POWER UNIT COMPONENTS**

HYDRAULIC PUMP



**Photo 3**

DIESEL TANK FILL CAP

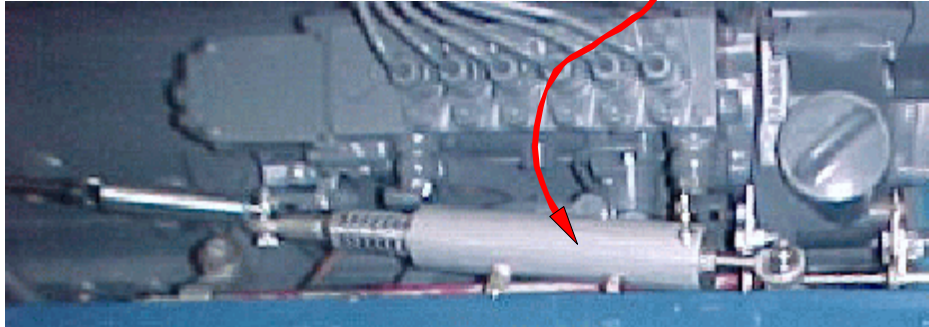


**Photo 4**

## **HYDRAULIC POWER UNIT COMPONENTS**

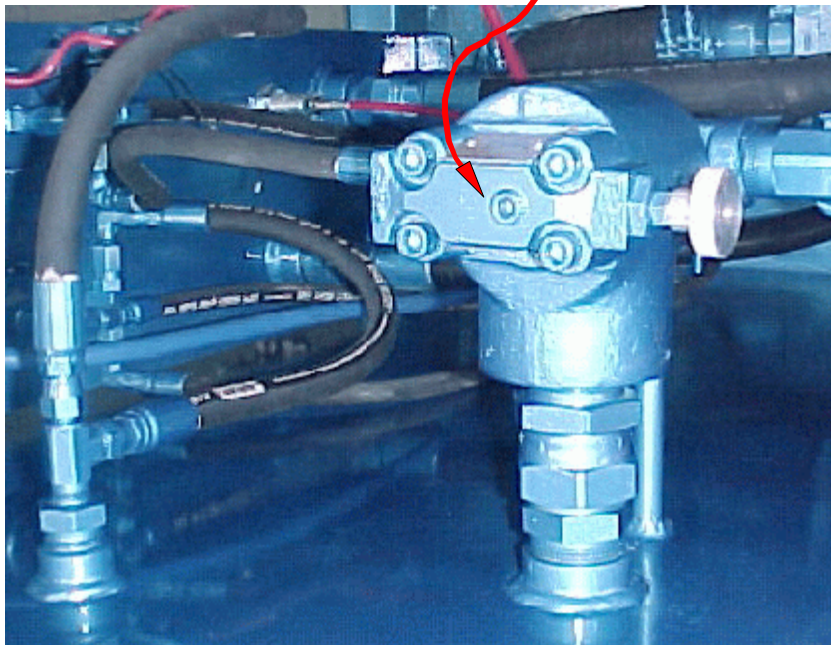


THROTTLE CYLINDER



**Photo 5**

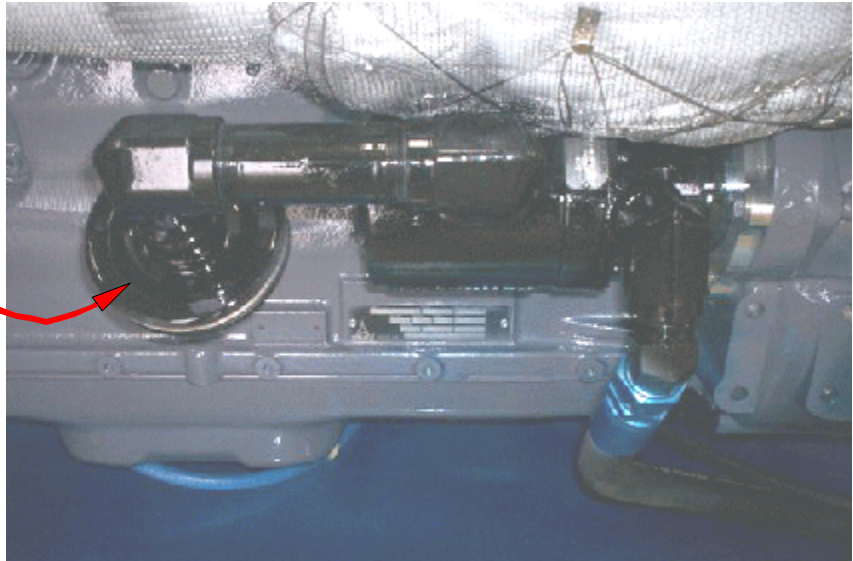
RELIEF VALVE



**Photo 6**

## **HYDRAULIC POWER UNIT COMPONENTS**

MUFFLER ON  
DIESEL ENGINE  
F6L914



**Photo 7**

KILL FROST  
LUBRICATOR  
P/N: DPU660-S2

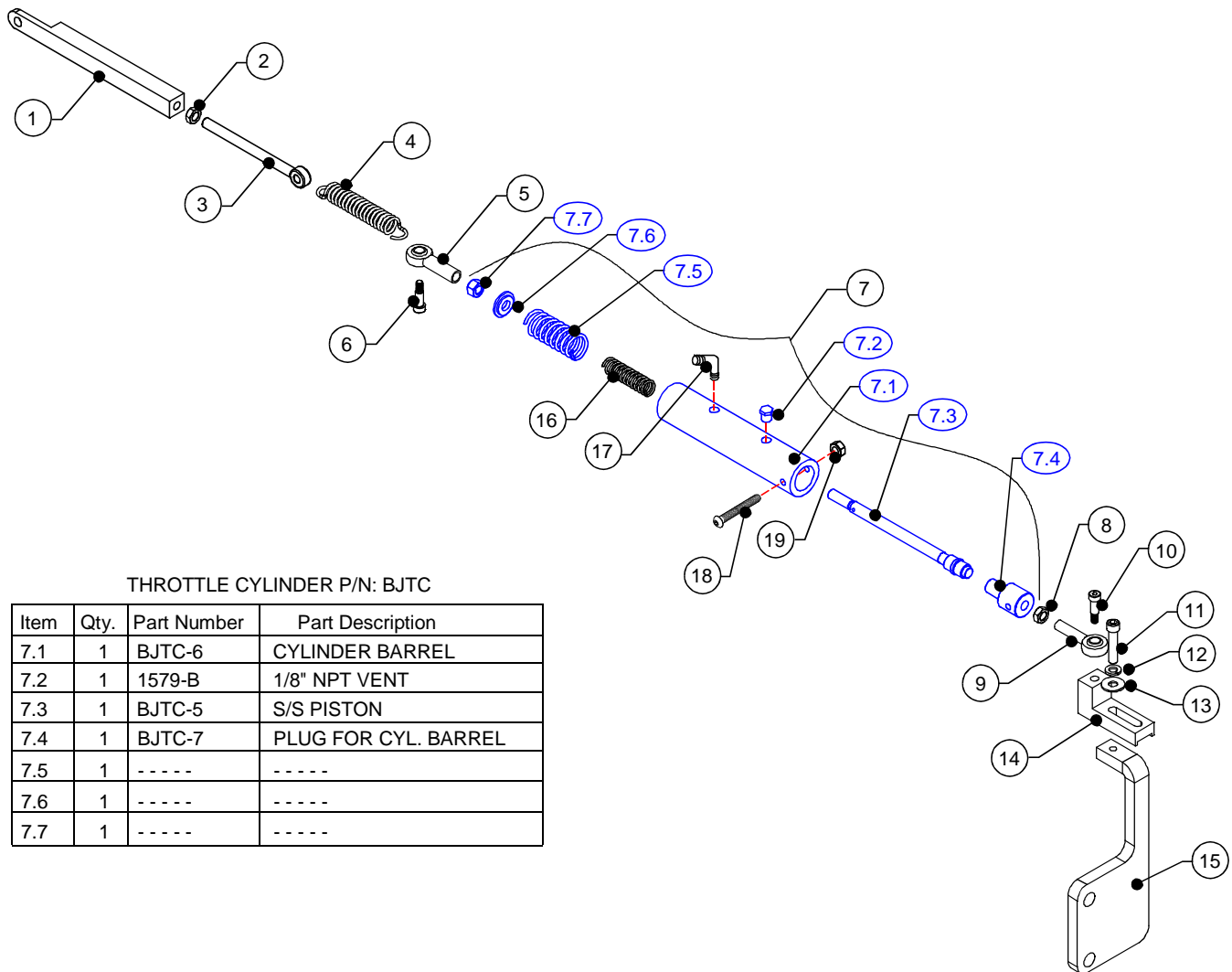


**Photo 8**

## **HYDRAULIC POWER UNIT COMPONENTS**



Item	Quantity	Part Number	Description
1	1	BJTC-14-6	SPRING ANCHOR
2	2	BJTC138	3/8"-24 S/S JAM NUT
3	1	58229	3/8"-16 x 5" EYEBOLT
4	1	71017	EXTENSION SPRING
5	1	BJTC-9SS	3/8"-24 S/S FEMALE BALL JOINT
6	2	BJTC-11SS	3/8" S/S SHOULDER BOLT W/ 5/8" SHOULDER L.
7	1	BJTC	THROTTLE CYLINDER
8	1	BJTC-10SS	3/8"-24 S/S MALE BALL JOINT
9	1	1743	5/16"-18 x 1 1/2" S/S FLAT SHCS
10	1	1734	5/16" S/S LOCK WASHER
11	1	1735	5/16" S/S FLAT WASHER
12	1	BJTC-12	THROTTLE CYLINDER ADJUSTMENT BRACKET
13	1	PU4060-S26	THROTTLE LINKAGE BRACKET
14	1	BJTC-4	SECONDARY THROTTLE RETURN SPRING
15	1	1588-L	1/8" MNPT x 1/4" MJIC 90° EL
16	1	1094	1/4"-20 x 2" S/S BHCS
17	1	SST-10	1/4"-20 S/S NYLOCK NUT



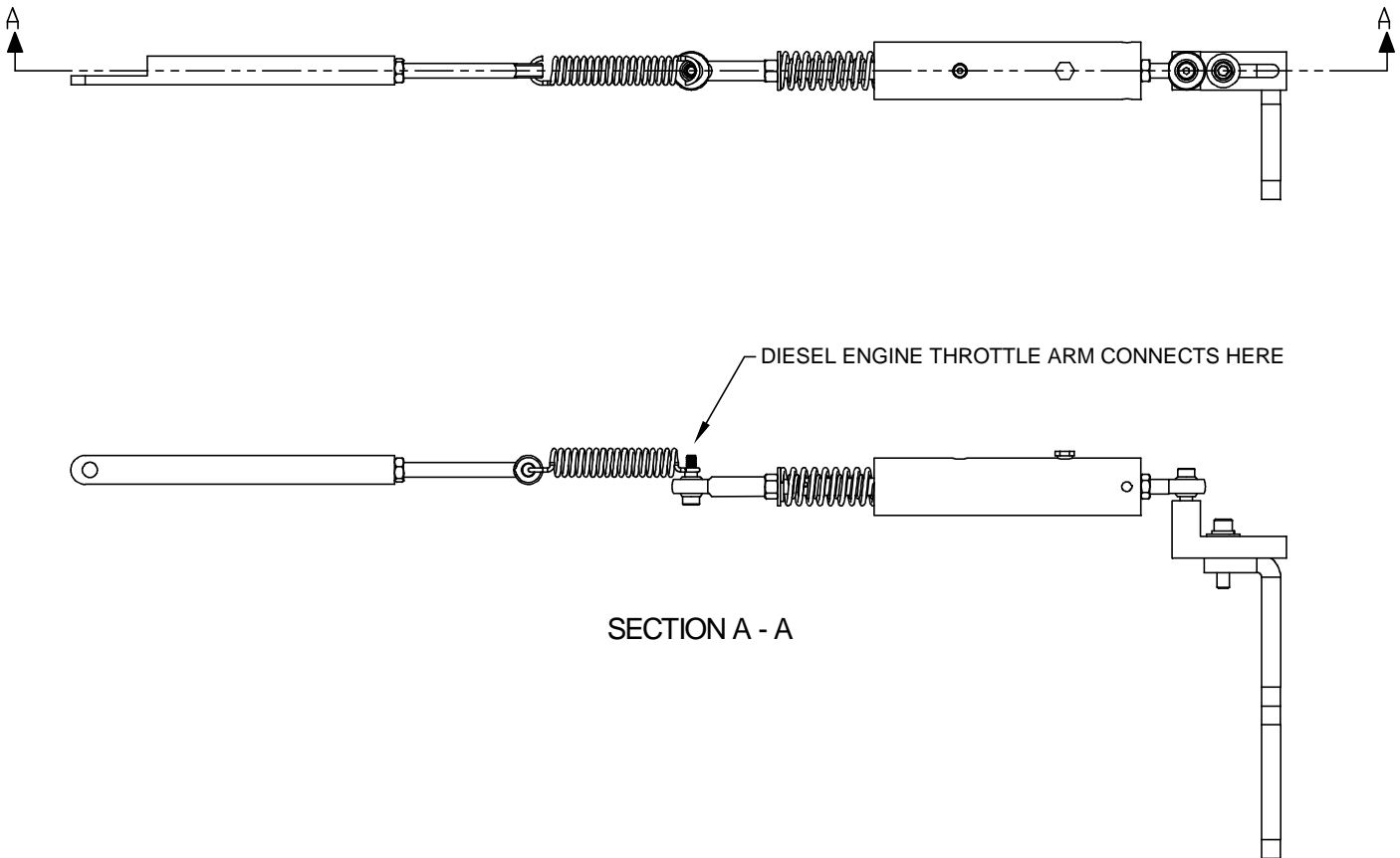
THROTTLE CYLINDER P/N: BJTC

Item	Qty.	Part Number	Part Description
7.1	1	BJTC-6	CYLINDER BARREL
7.2	1	1579-B	1/8" NPT VENT
7.3	1	BJTC-5	S/S PISTON
7.4	1	BJTC-7	PLUG FOR CYL. BARREL
7.5	1	-----	-----
7.6	1	-----	-----
7.7	1	-----	-----

# **THROTTLE CYLINDER ASSEMBLY**

ASSEMBLY NO. 7040HL-011

 <b>SUPERIOR</b> Manufacturing & Hydraulics		4225 HWY. 90 EAST BROUSSARD, LA 70518 (318) 837-8847	
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# **TYPICAL** **THROTTLE INSTALLATION**

ASSEMBLY NO. 7040HL-011

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## **SECTION 8    COMPONENT TECHNICAL DATA**

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To request copy of Component  
Technical Data, please contact:

Superior Manufacturing & Hydraulics

4225 Hwy. 90 East

Broussard, LA 70518

Phone: 337-837-8847

Fax: 337-837-8839

[www.superior-manf.com](http://www.superior-manf.com)

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