

# XCITE Owner's Manual

# 1301B HYDRAULIC POWER SUPPLY

XCITE Preface

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# 1301B Hydraulic Power Supply



## 1. Introduction

The XCITE Hydraulic Power Supplies are designed to fulfill the power requirements of exciter heads using the most energy-efficient and maintenance free components available. All units use a highly reliable, variable volume, pressure compensated, axial-piston pump to deliver only the energy demanded by the load, thus reducing power consumption.

# 2. Theory of Operation

The purpose of the XCITE Hydraulic Power Supply is to supply clean hydraulic oil at a constant pressure under the varying flow demands of the force exciter head. The system was designed to do this is the most efficient manner, considering power requirements, reliability, safety, ease of maintenance, and operator convenience.

# 2.1. Circuit Description (Hydraulic)

An oil reservoir provides storage for all necessary supply oil and provides some oil cooling. Mounted on the reservoir are oil level and oil temperature gauges, a temperature sensitive switch, and a reservoir fluid level detector switch for motor shut down. A 3000 psi pressure is achieved by a variable volume, pressure-compensated pump that has a factory set delivery rate.

Fluid from the pump first passes through a five-micron (absolute) filter. Should this filter become clogged, a pressure drop builds up across the sensor, causing a switch to trip. This causes the FILTER light to illuminate. The system should not be operated until the filter element is changed. After passing through the filter, oil flows to the pressure output disconnect.

# 2.2. Circuit Description (Electric)

The electrical input is specified at the time of purchase as either 200-230 or 380-460 volt, 50/60 Hz, three phase. The fourth wire (green) is a ground wire and must be tied to earth ground to prevent floating grounds due to an unbalanced load.

The pump motor uses the high voltage three-phase power, while the remaining loads derive 120 volt, single-phase from the step-down Transformer T-1 (designated 14), appropriately connected to the incoming power to provide 120 VAC on the secondary of the transformer.

Two-way protection of the three-phase power is provided. A magnetic circuit protector provides over current protection. It is also connected to the electrical box operating handle to disconnect power in the electrical box.

Pump motor overload protection is provided by thermal overload heaters in the motor starter, which were specifically designed for the pump motor. A *RESET* button is conveniently located inside the electrical box, should be thermal overload trip. The pump start relay (1CR), (designated 10), is a latch-up design so that momentary switches may be used for pump start and pump stop operations.

A phase sequence relay 1PM (designated 1) is connected to and monitors the 3-phase incoming line to determine if the phasing is connected correctly to provide proper motor rotation. If the START light is off, any two legs of the incoming lines should be reversed.

If the phase is incorrect, 1PM (1) remains de-energized, thus preventing the system from being energized. If the phasing is correct, 1PM (1) energizes, allowing 120 VAC from T-1 (14) to be applied to the pump unit.

The T-1(14) Transformer is fused by 4FU and 5FU (designated 17). The system POWER switch connects power to the control circuits. If oil temperature is normal, relay 2CR (designated 10) is not energized. Momentarily, pressing the START button will energize 1CR (designated 10) if oil level, temperature, filter, and pressure selection are correct.

Relay 1CR (10) energizes the motor starter 3. Auxiliary contact 1M closes, latching 1CR. A normally closed CR1(10) contact opens, turning off the STOP light.

Momentarily pressing the STOP button breaks the latch-up circuit and deenergize 1CR (10) and the pressure relief solenoid. After a short delay, an *OFF DELAY* contact on 1CR opens, de-energizing the motor-starter coil and causing the pump to stop.

Relay 3CR (designated 10) is normally not energized unless the oil level drops. If the *RED OIL LEVEL LOW* light illuminates, the system must be reset by pushing the pump *STOP BUTTON* on the Master Controller and oil must be added to the reservoir. When a low oil level is detected, the pump is turned off.

Relay 2CR (10) is normally not energized unless the oil temperature exceeds 160 degrees F. If the *RED OIL OVERTEMP* light is illuminated, the system must be reset by pushing the pump *STOP BUTTON* on the Master Controller after the system cools down.

Under normal operating conditions, 4CR turns on the fan motor when the oil temperature exceeds 120 degrees F. The fan motor turns off when the oil temperature drops below 110 degrees F. (During this normal operation, the *OIL OVERTEMP* light does **NOT** light.)

If the differential pressure drop across the filter exceeds approximately 50 psi, the *RED FILTER* restriction light will illuminate, the Power Supply will **NOT** shut off, however the filter should be changed when the filter light is illuminated.

## 3. Description

Included on the hydraulic power supply are an oil supply line pressure gauge and a timer which records actual pump running time. Mounted on the side of the reservoir is an oil level sight gauge with an integral oil temperature thermometer. A reservoir drain is also located on the reservoir. All motor controls and associated electrical equipment are located in the electrical control box. Connections for pressure and return hoses are attached with quick disconnect style connectors.

# 3.1. Major Components

- Oil Reservoir
- Motor
- Variable volume pressure-compensated Pump
- Three-micron Filter Assembly
- · Heat Exchanger
- Motor Control Box
- Hydraulic Hoses

# 3.2. Control Components

# 3.2.1. Emergency Stop Switch

This switch de-energizes the motor-starter relay, bypassing all shutdown logic; thus causing the motor to stop. Use it only in an emergency situation.

WARNING

Some operating conditions cause the system to shutdown.

#### 3.3. Monitoring Devices

# 3.3.1. Phase Sequence Relay (PHASE Indicator)

A phase sequence relay monitors the three-phase power applied to the unit. If the phasing of the wires is incorrect, the relay will prevent the pump from being energized, and the *PHASE CORRECT* lamp will illuminate.

# 3.3.2. Filter Pressure Drop Sensor (FILTER Indicator)

This sensor sends a signal if the differential pressure across the filter element is excessive. This occurs when the differential pressure drop across the replaceable filter element exceeds 50 psi. Excessive differential pressure occurs when the filter element is clogging, fluid viscosity is too high, fluid temperature is too low, or any combination. At that time, the *FILTER* light illuminates and the filter should be replaced.

**Note:** There may be times when the system is first started and the oil is cold that the filter light will illuminate. Allow 10 to 20 minutes of operation and if the filter light goes off, then the filter is not dirty and does not need replaced.

#### 3.3.3. OIL OVERTEMP Indicator

The temperature sensor monitors the oil temperature of the reservoir and prevents the pump from running if the oil temperature exceeds 160 degrees F. The *OIL OVERTEMP* light illuminates, indicating that the maximum allowable oil temperature has been exceeded.

#### 3.3.4. LOW OIL Indicator

The level sensor monitors the oil level in the oil reservoir and prevents the pump from running if the oil level is low. The pump will shut down or fail to start until additional oil is added. The red *LOW OIL* indicator lamp illuminates during this condition.

#### 4. Care and Maintenance



Electrocution or severe electrical shock may occur.

When the MAIN power is plugged in, the line side of the motor starter is at line voltage.

The XCITE Hydraulic Power Supply was designed so that no periodic lubrication on mechanical parts is required. Cleanliness is very important when using sophisticated hydraulic systems, and although a clean room environment is far from necessary, general cleanliness is recommended. Routine maintenance on the overall system should include the following.

## 4.1. Operating Care

- **4.1.1.** Wipe off all cables after each use.
- **4.1.2.** Never drag cables across the floor.
- **4.1.3.** Immediately after the hydraulic hoses are disconnected, cover all hydraulic connectors with the covers provided.
- **4.1.4.** During operation, the oil temperature should never rise above 150 degrees F. (The oil temperature thermal relay shuts down the system at 155 degrees F.)
- **4.1.5.** Before each test, check the oil pressure to make sure it is at 3000 psi. A flow screw adjustment is located on the top of the pump compensator assembly. This control is preset at the factory and should not be adjusted (slotted screw with locknut).
- **4.1.6.** Before each test, check to make sure that the air heat exchanger blower is operational above an oil temperature of 120 degrees F, that pump maintenance warning lights are not illuminated, and that the phase sequence indicator shows proper motor phasing.

If for some reason the system has overloaded, the pump motor started thermal overload will trip. Reset it by opening the access door, and pushing the reset button located on the motor starter.

#### 4.2. Maintenance

- **4.2.1.** To keep the system operating within the specified limits, it is necessary to periodically check the oil level by observing the oil level gauge. Fluid should fill the gauge.
- **4.2.2.** Oil should be changed after every 1000 hours of pump operation.
- **4.2.3.** The condition of the filter is displayed by the light on the electrical control box inside the cabinet. The filter requires replacement only when the *FILTER* light is illuminated.
- **4.2.4.** Oil should be drained from the reservoir during transportation.

# 5. Troubleshooting

Listed below are some of the common problems which may be experienced with a Power Supply.

#### 5.1. Unit Overheats

Overheating may be caused by a clogged heat exchanger, restricted air flow, malfunction of the check valves, or failure of the heat exchanger fan.

The efficiency of an oil/ air heat exchanger decreases as the ambient temperature increases. The maximum ambient temperature at which the heat exchange can effectively maintain the oil temperature below 160 degrees F is approximately 100 degrees F. If continuous operation in ambient temperature above 100 degrees F is desired, it is recommended that an oil/ water heat exchanger be added externally to cool the return line oil before it is returned to the oil reservoir.

## 5.2. Pump de-energizes

A pump de-energizes for no apparent reason can be caused by a noisy 3-phase power line at which the 3-phase voltage drops below 380 VAC (50 Hz) for more than 10 milliseconds. This results in the phase monitor relay 1PM momentarily de-energizing, shutting off the system.

# 6. Specifications

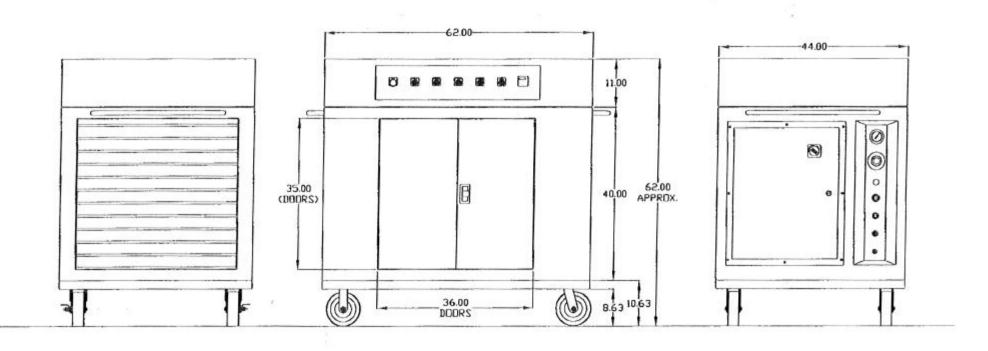
<u>Item</u>	<u>Specifications</u>
Dimensions Height Width Depth Weight	62.00" 62.00" 44.00" 2000 lb (without oil)
Hydraulic Oil Filter Pump Pressure-compensated variable flow axial piston	Mobil DTE-24 5 Micron 15 GPM
Motor, 380, 3-Phase, 50 Hz	30 HP
Reservoir Cooling	40 gallon Air (Maximum ambient room temperature 100 degrees F)

# 7. Drawings

Model 1301B

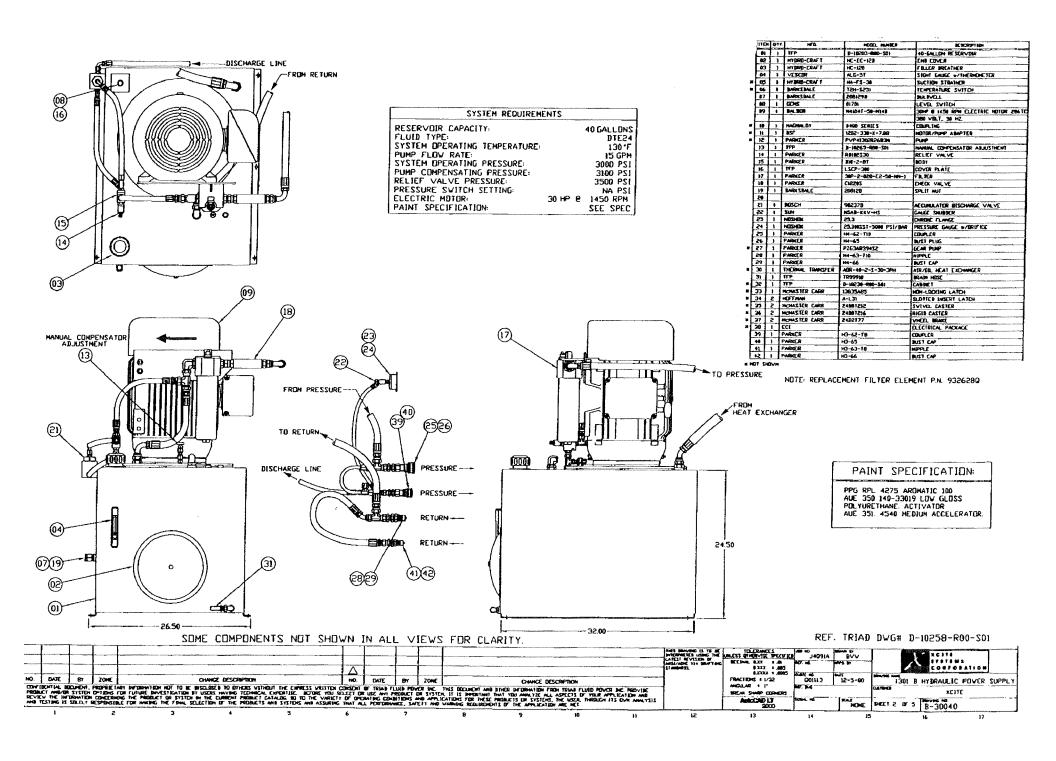
Outline Dimensions	B-30039
Pump/Reservoir	B-30040
Hydraulic Schematic	B-30041
Electrical Schematic 380 VAC, 50 Hz	B-30042
Electrical Box Layout	B-30043

# 1301 B HYDRAULIC POWER SUPPLY



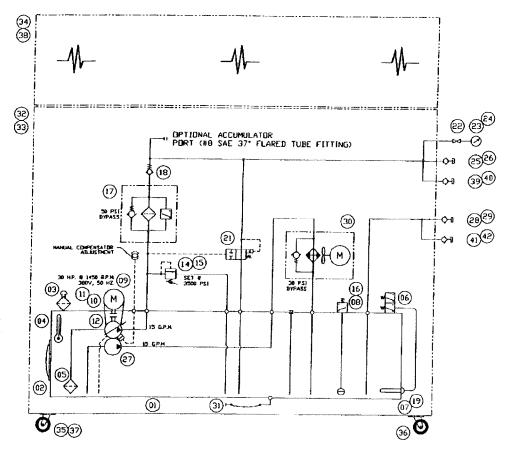
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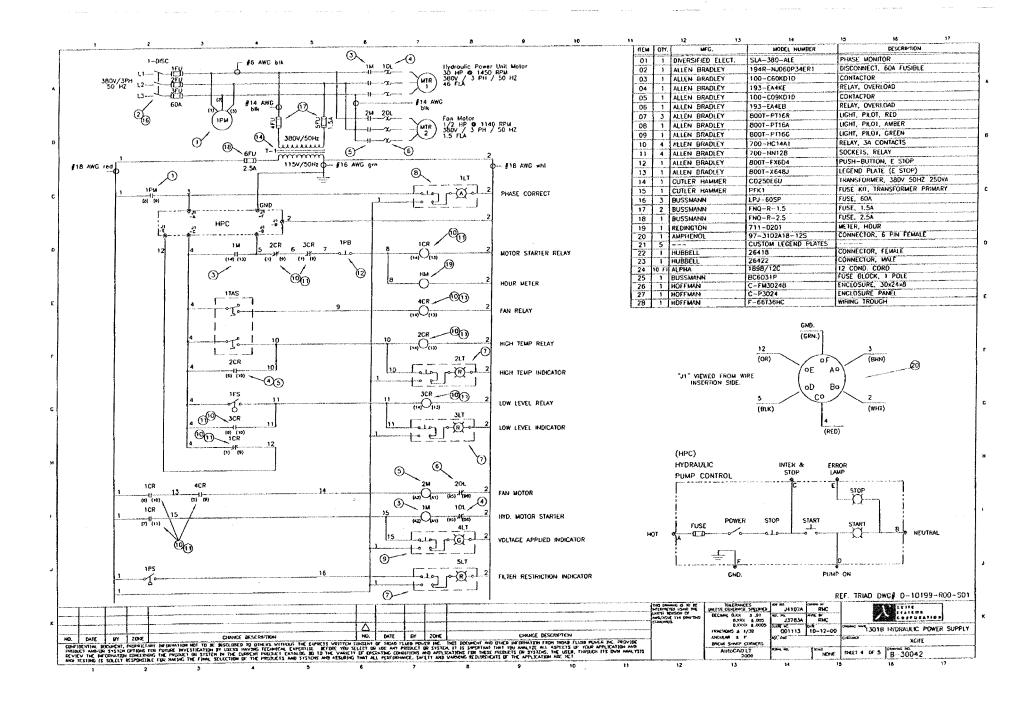


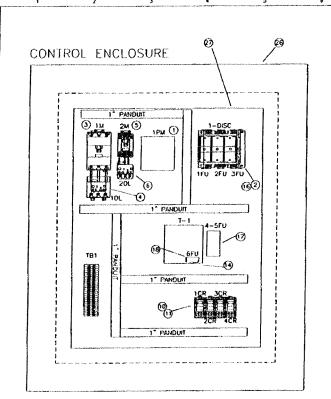
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01	1	TEP		
SQ	<del>  ; </del>	HYDRD-CRAFT	D-10203-R00-S01	40-GALLON RESERVOIR END COVER
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04	i	VESCOR	ALG-ST	FILLER BREATHER SIGHT GAUGE W/THERHEHETER
5	-	HYDRO-CRAFT	HA-FS-30	SUCTION STRAINER
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• 1	<del></del>	BALBER	N4104T50-NI4B	
		B-C PLA	1441041-30-AI48	30HP @ 1450 RPH ELECTRIC MOTOR 286TO
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<u>.</u>	-!	PARKER	1202-330-X-7.88	HOTOR/PUMP ADAPTER
5	+	TEP	PVP41302R2693H	PUNP
-	;	PARKER	D-19265-R00-S0)	THENTEULDA ROTAZHEMOD JAUNAM
4		PARKER	0622S0IGR	RELIEF VALVE
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5	-	TTP	L 2CP-300	CDVER PLATE
-	-	PARKER	39P-2-850-E2-50-NN-1	FILTER
4	1	PARKER	C15502	CHECK VALVE
1	-1-1	3_AG2XSAB	508158	SPLIT NUT
+				
	, ,	BOSCH	982378	ACCUMULATOR DISCHARGE VALVE
4		SUM	2H-VXX-EAZM	GAUGE SNUBBER
4		MOSHOK	25.3	CHROME FLANGE
_	-	MOSHOX	RAB/129 0002-12201C.25	PRESSURE GAUGE */ORIFICE
1		PARKER	H4-62-T10	COUPLER
1		PARKER	H4-65	DUST PLUG
1		PARKER	PZG3AR394\$2	GEAR PUMP
1		PARKER	H4-63-TIO	NIPPLE
1	1	PARKER	H4-66	BUST CAP
1		THERNAL TRANSFER	H9C-0C-2-S-0A-9DA	ATR/DIL HEAT EXCHANGER
1		TFP	1R99910	DRAIN HOSE
		TEP	D-10230-R00-Sei	CABINET
1	1	MCMASTER CARR	13835A95	NON-LOCKING LATCH
	2 1	HOFF MAN	A-L3)	SLOTTED INSERT LATCH
	5 1	ACHASTER CARR	2406T2I2	SVIVEL CASTER
	5 1	HCHASTER CARR	24DET216	RIGID CASTER
	2   1	CHASTER CARR	2422177	WHEEL BRAKE
L	) [E	.C1		ELECTRICAL PACKAGE
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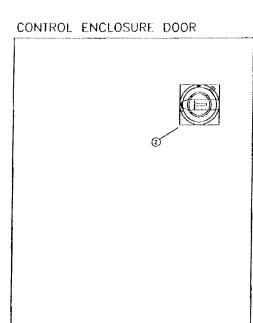
NOTE: REPLACEMENT FILTER ELEMENT P.N. 9326290

SYSTEM REQUIREM	ENTS
RESERVOIR CAPACITY:	40 GALLONS
FLUID TYPE:	DTE24
SYSTEM DPERATING TEMPERATURE:	130 °F
PUMP FLOW RATE:	15 GPM
SYSTEM OPERATING PRESSURE:	129 000E
PUMP COMPENSATING PRESSURE:	3100 PS1
RELIEF VALVE PRESSURE:	3500 PSI
PRESSURE SWITCH SETTING	129 AM
ELECTRIC MOTOR:	30 HP @ 1450 RPM
PAINT SPECIFICATION	SEE ABOVE

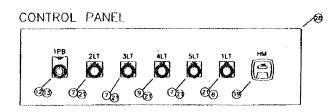
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ITEM	OTY.	MFG.	MODEL NUMBER	DESCRIPTION
01	1	DMERSIFIED ELECT.	SLA-380-ALE	PHASE MONITOR
02	1	ALLEN BRADLEY	194R-NJ060P34ER1	DISCONNECT, 60A FUSIBLE
03	1	ALLEN BRADLEY	100-C60KD10	CONTACTOR
04	1	ALLEN BRADLEY	193-EA4KE	RELAY, OVERLOAD
05	1	ALLEN BRADLEY	100-C09KD10	CONTACTOR
06	1.	ALLEN BRADLEY	193-EA4EB	RELAY, OVERLOAD
07	3	ALLEN BRADLEY	800T-P116R	LIGHT, PILOT, RED
08	1	ALLEN BRADLEY	800T-PT16A	LIGHT, PILOT, AMBER
09	,	ALLEN BRADLEY	800T-PT16C	LICHT, PILOT, GREEN
10	4	ALLEN BRADLEY	700-HC14A1	RELAY, 3A CONTACTS
11	4	ALLEN BRADLEY	700-HN128	SOCKETS, RELAY
12	1	ALLEN BRADLEY	800T - FX604	PUSH-BUTTON, E STOP
13	1	ALLEN BRADLEY	8007X648J	LEGEND PLATE (E STOP)
14	1	CUTLER HAMMER	CO250E6U	TRANSFORMER, 380V 50HZ 250VA
15	1	CUTLER HAMMER	PFK1	FUSE KIT, TRANSFORMER PRIMARY
16	3	BUSSMANN	LPJ-605P	FUSE, GOA
17	2	BUSSMANN	FNQ-R-1.5	FUSE, 1.5A
18	1	BUSSMANN	FN0-R-2.5	FUSE, 2.5A
19	1	REDINGTON	7110193	METER, HOUR
20	1	AMPHENOL	97-3102A18-125	CONNECTOR, 6 PIN FEMALE
21	5		CUSTOM LEGEND PLATES	
22	1	HUBBELL	26418	CONNECTOR, FEMALE
23	1	HUBBELL	26422	CONNECTOR, MALE
24	A PROPERTY OF	ALPHA	1898/12C	12 COND. CORD
25	1	BUSSMANN	BC6031P	FUSE BLDCK, 1 POLE
26	1	HOFFMAN	C-FM30248	ENCLOSURE, 30x24x8
27	1	HOFFMAN	C-P3024	ENCLOSURE PANEL
28	11	HOFFMAN	F 66136HC	WIRING TROUGH



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