



XCITE ***Owner's Manual***

1001P FIELD TEST POWER SUPPLY

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1001P Field Test Power Supply



1. Introduction

The Xcite 1001P Field Test Hydraulic Power Supply is designed to fulfill the power requirements for Xcite Series Controlled Force hydraulic Exciters and other actuators that do not require an average flow of more than 1.2 GPM. This power supply is completely portable and can be used in a wide variety of test environments. It has been “human-engineered” for ease of operation and maintenance. All control functions can be handled by a Xcite Master Controller, enabling a single test operator to effectively run the entire operation.

2. Theory of Operation

2.1. Hydraulic System

A 1.2 GPM constant displacement gear pump is driven directly by a 3 HP 1800 RPM 115 VAC/ 230 VAC electric motor. At 1725 RPM the pump ports a nominal 1.2 GPM which is directed to the pressure quick disconnects through a 2 micron filter. A relief valve maintains a constant 3000 psi output pressure by bleeding flow to the reservoir.

The user must be aware that when more than 1.2 GPM is demanded by the exciter head (low frequency stroke or weak structure stiffness at higher frequencies), the pump pressure will drop. For maximum force capability from the system, the stroke must be limited to ranges which allow the pump to maintain 3000 psi pressure.

A time delayed cooling fan provides air flow across a heat exchanger which is in the return line to cool the hydraulic fluid returning from the exciter head.

For ease of filling and draining of the reservoir before transporting the power supply, a transfer pump is used. When the ball valve is in the *FILL* direction, fluid is pumped from the reservoir fill hose directly into the reservoir. **See Drawing B-30220 - Item #26** In the *EMPTY* direction, hydraulic fluid is pumped out of the quick disconnect nipple which is removed from the top of the reservoir for the emptying operation. (See photo below.)



2.2. Electrical Control System

The Electrical Control System for the 1001P Hydraulic Power Supply is packaged in two enclosures mounted inside the pump cabinet. The first enclosure is accessible from the front panel of the Power Supply by removing four screws and is called "Electrical Control Box #1". **See Drawing B-30223**

This enclosure contains the fuses for the system designated as:

- 107FU - 4.0 Amp (Fan Motor Fuse)
- 108AFU - 6.25 Amp (115 Volt Operation Fuse)
- 108BFU - 3.2 Amp (230 Volt Operation Fuse)

The second enclosure is mounted near the top of the Power Supply and is only accessible by removing the entire pump assembly from the cabinet. This enclosure is called "Electrical Control Box #2" and contains the motor starter, control relays and control transformer. **See Drawing B-30224**

During operation, either 115 VAC or 230 VAC single phase power is applied to the main contacts of the pump motor starter; the time delay relay of the cooling fan and transformer T1. The voltage selector switch (107PB) selects operation of the entire 1001P Hydraulic Power Supply from either 115 VAC or 230 VAC, 60 Hz. Drawing B-30222 and B-30224 depicts the voltage selector switch in the 230 Volt position. In this position, voltage is applied to the primary coil of transformer T-1 and is "stepped" down to 115 VAC for operation of all control relays and the Xcite Master Controller.

When the voltage selector switch 107PB is switched to the 115V position, 115 VAC power is applied directly to the control relays and the Xcite Master Controller. The Pump Motor (MTR1) and the Fan Motor (MTR2) are automatically converted to 115V operation by switching the windings of MTR1 and MTR2 with control relays 111CR and 112CR respectively.

The 1001P Hydraulic Power Supply is started when the *START* button on the Xcite Master Controller is depressed. 115V control voltage is applied back through J1-D to the "Remote Emergency Stop Connector" (RES); the "Emergency Stop" button and then to the coils of motor starter control relays 115M and 116M. In order for voltage to reach these control relays, the oil level/temperature and filter switches must all be closed. This means there is sufficient oil in the reservoir, the oil temperature is less than 150° F and the oil filter is clean. If these conditions are all met, the control relays 115M and 116M are energized and MTR1 and MTR2 are started.

Pressing the *STOP* button on the pump de-energizes the control relays 115M and 116M and the unit shuts down. Automatic shutdown will also occur if the oil level, temperature or filter switch is momentarily opened.

3. Description

The entire power supply is shock-mounted in a roto-molded plastic instrument style enclosure. Interconnections are easily identified by call-outs on the panels. A power cord is supplied as standard equipment. **See Drawing's B-30220, 30221, 30222, B-30223 and B-30224 at end of this section.** Major Components are:

- A 4-gallon oil reservoir
- Motor
- Constant displacement pump
- A 2-micron filter
- Air/ heat exchanger
- Oil transfer pump
- (2) Electrical control boxes

Along with these major components are a number of controls and condition indicators giving continuous monitoring of supply conditions.

3.1. Pressure Gauge

This gauge indicates the supply pressure at the pump outlet. With no flow, the gage should normally read 3000 to 3100 psi.

3.2. Power Indicator Lamp

This lamp is illuminated at all times when the electrical power cord is connected to the power outlet.

3.3. Emergency Stop Switch and Remote Emergency Stop Connector

This is a push to stop switch that de-energizes the pump motor starter when depressed. This switch may be used to halt the pump in place of the *STOP* button on the Xcite Master Controller, if necessary. **It should be noted that the Emergency Stop Switch **MUST** be pulled out for the 1001P Power Supply to operate. If it is depressed (stays depressed once pushed), the unit will **NOT** operate.**

A "Remote Emergency Stop" connector (RES) is also provided to allow the user to wire a remote SPST switch to stop the Power Supply. A mating connector for wiring the remote emergency stop is included.

3.4. Hydraulic Supply and Return Connectors

These are male and female quick-disconnect fittings. The female fitting goes to the supply line; the male fitting goes to the return line.

3.5. HPC Control Connector

This is a 6-pin Amphenol connector used to interface the pump to the Master Controller.

3.6. Oil Level/ Temperature Gauge

This gauge indicates the level of oil in the reservoir. It is mounted directly to the oil reservoir. The system should not be operated with less than 3.5 gallons of oil.

3.7. Voltage Selector Switch

This switch allows the 1001P Hydraulic Power Supply to be used with either 115 VAC or 230 VAC 60 Hz power, single phase. **See 2.2. and B-30224**

3.8. Fuses

All replaceable fuses are mounted in Electrical Box #1 on the front panel of the Power Supply. **See 2.2.** for appropriate ratings and **Drawing B-30223** for location.

3.9. Oil Level/ Temperature Switch

This switch is located inside the reservoir. It shuts down the unit if the oil level is too low or if the oil temperature exceeds 140° F. Indicator lamps are illuminated on the front panel of control box #1 if the oil level is too low or the Hydraulic Power Supply is over its temperature limit.

3.10. Filter Switch

The filter switch is mounted on the filter assembly, located at the output of the pump. If the differential pressure across the filter element exceeds 35 psi, the switch is momentarily activated, de-energizing the pump motor starter. If this occurs, it generally indicates that the filter element is dirty and needs replacement. An indicator lamp is illuminated when the filter needs replaced.

4. Preliminary to Operation

Several preparatory steps must be taken prior to operating the unit.

4.1. Remove the front and rear cabinet covers.

4.2. Turn the voltage selector switch to the correct position for the line voltage being used.

4.3. Connect the hydraulic supply and return lines to the front panel quick-disconnects.

- 4.4. Connect the power cord to the power source, making sure that the power indicator lamp is lit. **Use black and white wires for voltage, green for ground. The red wire is NOT used.**

NOTE: The unit should NEVER be operated with the hoses coiled, nor should anything be set on the hoses, nor should they be driven over.



Oils should not be mixed. If the type of oil is changed, purge the system.

- 4.5. Check the level of the oil using the sight gauge on the back of the reservoir. The oil reservoir should be completely filled with Mobil DTE-24 or DTE-25. If necessary fill the reservoir using the transfer pump. **See 2.1.**
- 4.6. Connect the Pump Control Cable (from the Master Controller) to the connector on the front panel.
- 4.7. Make sure the front and rear of the cabinet are not obstructed by anything that would restrict the flow of air into and out of the cabinet.
- 4.8. Press the *PUMP START* button on the Master Controller to start the pump. To stop the unit, press the *PUMP STOP* button on the Master Controller or the *EMERGENCY STOP* button on the pump's front panel.
- 4.9. Check the pressure gauge and verify the pump is operating at 3000 to 3200 psi. Failure to comply with the above can cause severe damage to the servovalve, exciter head, and pump. All warranties are invalidated if damage occurs due to overpressure.
- 4.10. In the event the hydraulic power supply will not start, check for oil over temperature, or low oil level; or if the power supply starts but will not run continuously, the filter element is clogged and needs replacement.

5. Care and Maintenance

5.1. General

The pump requires little regularly-scheduled maintenance. However, you should keep the unit reasonably clean and should observe the following precautions.

- 5.1.1. Keep the quick-disconnect dust covers installed whenever the unit is not in use.

5.1.2. Always clean the quick-disconnects before making any connections.

5.1.3. Make sure the heat exchanger fan is not blocked during operation.

The only periodic maintenance required is change the oil every 2000 hours and change the filter whenever it becomes clogged. The filter unit consists of a screw-off canister and replaceable filter element.

5.2. Field Test Reservoir Draining/ Refilling Procedure

This is a closed-loop system. If general cleanliness methods are followed, the filter should not require replacement for long periods of time. Oil should be changed every 2000 hours of pump operation.



If the supply is to be transported such that the cabinet could be tipped over, the oil should be drained from the reservoir. See draining and filling procedure in **Section 2.1.**

5.3. Change Oil Filter

Unscrew the bottom of the container and change the cartridge.
See Drawing B-30221 - Item #13 for filter model number

6. Troubleshooting

This section lists the most common problems encountered, as well as their probable causes. If the problem cannot be readily corrected, contact your Xcite Customer Service Representative.

Problem	Probable Cause
Power lamp is not lit when unit is plugged in.	Check power source.
Fuses blown.	Low line voltage or motor malfunction.
Unit shuts off 2-4 seconds after power is applied.	Dirty filter element.
Low hydraulic pressure (less than 3000 psi.)	Excessive flow beyond 1.2GPM. Defective relief valve

7. Specifications

Dimensions	
Height	33.5"
Width	27.25"
Depth	36.5"
Weight	250 lbs
Cooling	Air (heat exchanger w/ fan)
Maximum Ambient Air Temp	100° F
Power Requirements from Circuit Mains	115 VAC, 35 Amp, 50/60 Hz, single-phase 230 VAC, 20 Amp, 50/60 Hz, single-phase
Oil Type	Mobil DTE-24 or DTE-25 (DO NOT MIX OIL TYPES)
Operating Pressure	3000 psi + 5%
Pressure Control	Spring operated relief valve
Pump	1.2 GPM constant displacement at 1725 rpm
Motor (Full Load)	3 hp, single-phase; 115VAC@27 Amps; 230VAC@13.5 Amps; 1725 rpm; 184 TC frame size
Radiated Noise (at 3 ft. from cabinet)	Front - 72 db Side - 68 db Rear - 74 db

8. Drawings

Assembly Hydraulic Power Supply	B-30220
Hydraulic System Schematic	B-30221
Electrical Schematic	B-30222
Electrical Control Box #1	B-30223
Electrical Control Box #2	B-30224