

Hydraulic Power Units

Tronair recommends performing preventative maintenance on Hydraulic Power Units.

Model Number _____ Serial Number _____

Maintenance Performed By _____ Date _____

MOTOR DRIVEN HYDRAULIC PUMP

The hydraulic pump does not require regular maintenance. Under normal operating conditions, the pump will perform for thousands of hours of use without rebuilding. See ***Pump Manual*** for further details.

HYDRAULIC FLUID

Any time an unusual color; smell or visual indicator is noticed with the hydraulic fluid, a sample analysis should be performed to determine the condition of the fluid. Refer to the manufacturer of the specific fluid for your unit to obtain additional information.

FILTERS

Pressure Filter -- Replace the filter element any time the clogged filter indicator light (*Option R*) is triggered or when the pop-up indicator located on the filter head changes to red during operation. Replace the filter element annually to ensure proper cleanliness of the hydraulic system. This is a minimum requirement. Standard filter changes depend on how frequently the HPU is used and the cleanliness of the fluid, along with the environment to which the HPU is exposed. Periodic fluid analysis is recommended to properly determine the optimum frequency of filter element changes.

Return Filter -- Replace the return filter element at the same time the pressure filter element is being replaced.

Hand Pump (*Option M*) Filter -- Replacement of the hand pump filter element is dictated by frequency of use and the cleanliness of the fluid, along with the environment to which the HPU is exposed. Changing the hand pump filter element at the same time as the pressure filter element will ensure a regular maintenance schedule.

Desiccant Air Filter -- Replace the desiccant/air filter whenever the material inside the element is pink or reddish in color (see Element Label for details).

HYDRAULIC HOSES

Hoses used on the HPU must be periodically inspected for damage, blisters, leaks, or hose end problems. Any damaged or defective hose should be replaced as soon as possible. Hoses used on Aviation Phosphate Ester, Type IV units have a shorter useful life than hoses used on Mineral Base units. Surface moisture is normal with Aviation Phosphate Ester, Type IV hoses as long as the fluid does not form into drops.

INSTRUMENT PANEL

Refer to Section **Hydraulic Hoses** concerning hose inspection for general maintenance on Hose Assembly.

Electric Panel -- The Electric Panel does not require regular general maintenance.

Hydraulic Panel -- Annual calibration of instrumentation is recommended. See **Calibration of Instrumentation** for details of calibration.

Control Block/Flowmeter - The Control Block components do not require regular general maintenance.

System Pressure Relief Valve -- The System Pressure Relief Valve does not require regular general maintenance. It is possible however, for a contaminant to hold the relief valve in a partially open condition. If service is required, the new or repaired relief valve must be reset 250 psig above maximum system operating pressure.

Check Valve -- The Check Valve does not require regular general maintenance.

Bypass Valve -- The Bypass Valve does not require regular general maintenance.

RESERVOIR ASSEMBLY

Replace the desiccant air filter whenever the material inside the element is pink or reddish in color (See Element label for details). The Reservoir Assembly does not require regular general maintenance. If periodic inspections for silt are desired, be certain to thoroughly clean the dome cover and surrounding area before removing the dome cover. The Selector Valve is not field serviceable.

RETURN MANIFOLD ASSEMBLY

Return Filter -- See information on changing filter element.

Return System Pressure Relief Valve -- **NOTE: DO NOT attempt to adjust the Return System Pressure Relief Valve.** The Return System Pressure Relief Valve can be purchased as a preset assembly. If the end user services the relief valve, the valve must be set to crack at 150+/-7 psig **before** being re-installed on the HPU.

ELECTRICAL COMPONENTS

Regularly inspect the external power cord for nicks, cuts, abrasion, and fluid damage. Replace power cord if damage is found. See **Provision of Spares** in your Operation and Technical Manual for recommended spare fuses.

HEAT EXCHANGER ASSEMBLY

The Heat Exchanger Assembly does not require regular general maintenance.

EXTERNAL COMPONENTS

Keep HPU clean and free from any contaminants and corrosion. Do not allow labels to become damaged; thusly illegible. Regularly inspect casters and floor locks to ensure safe working condition.

Crossover Check (Option D) -- Refer to **Hydraulic Hoses** concerning hose inspection. Annual calibration of instrumentation is recommended. See **Calibration of Instrumentation** for details of gauge calibration.

Hour Meter (Options E and F) -- The Hour Meter does not require regular general maintenance.

Voltage/Phase Monitor (Options G - J) -- The Voltage/Phase Monitor does not require regular general maintenance. The panel indicator light will illuminate if a tripped condition exists. If the Voltage/Phase Monitor is causing the HPU to shut off, verify the Phase Monitor settings shown. Continued tripping may indicate a serious electrical problem. See **Provision of Spares** in your Operation and Technical Manual for recommended spare fuses.

Pyrometer (Option K) -- Refer to **Analog Temperature Gauge** when calibration of the pyrometer is needed.

Electric Reservoir Level (Option L) -- The Electric Reservoir Level switch does not require regular general maintenance. Panel indicator lights will indicate low or high fluid level.

Hand Pump (Option M) -- Refer to **Hydraulic Hoses** concerning hose inspection for general maintenance on hose assemblies. Refer to **Hand Pump (Optional) Filter**.

Two Stage Pump with Relief -- The pump does not require regular maintenance.

Calibration Port (Option Q) -- Refer to **Hydraulic Hoses** concerning hose inspection.

Electric Filter Clogging Indicator (Option R) -- The Electric Filter Clogging Indicator does not require regular general maintenance. The panel light will illuminate when the clogging indicator senses a 98 psi differential pressure across the filter element. Installing a new filter element will eliminate the clogged condition. Pushing the illuminated button will reset the indicator light. **NOTE: Higher flow rates will result in higher differential pressures. (Example: The clogging indicator may sense a 98 psi differential pressure at a flow rate of 10 gpm but not show a clogged condition when the flow rate is reduced to 5 gpm.)**

Electric Over-Temperature (Option S) -- The Electric Over-Temperature switch does not require regular general maintenance. However, automatic shut down due to high fluid temperature is a indication that maintenance or training may be needed elsewhere.

Return Backpressure with Sight Gauge (Option T) -- Annual calibration of instrumentation is recommended. See **Calibration of Instrumentation** for details of gauge calibration. Refer to **Hydraulic Hoses**

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CALIBRATION OF INSTRUMENTATION

All gauges on the Hydraulic Power Unit can be either returned to Tronair for calibration or certified by the end user if proper calibration equipment is available. Gauges returned to Tronair for calibration will be tested with standards traceable to N.I.S.T. (National Institute of Standards and Technology). Tronair recommends calibration of instrumentation at yearly intervals, but actual calibration dates may be based upon frequency of use and the end users quality system.

System Pressure Gauge Self Calibration

An accurate pressure calibration gauge is required for calibration of the System Pressure gauge. There are two methods available. Method A can be used if the HPU is equipped with a calibration port (*Option Q*). Method B must be used if the HPU is **not** equipped with a calibration port. Follow the necessary steps below. **NOTE: Method A can only test the gauge up to the rated operating pressure of the HPU.**

Method A: Shut off HPU and disconnect from aircraft. Close the calibration port **Shut-off Valve** on the instrument panel of the HPU. Attach the “Master” calibration gauge to the **Calibration Port** on the instrument panel. Set up the HPU as follows:

Reservoir Selector Valve.....	Set to HPU Reservoir
Bypass Valve.....	Open
Pressure Ball Valves (at rear of unit).....	Close
Return Ball Valves (at rear of unit).....	Close
HPU.....	Start
Calibration Port Shut-off Valve.....	Open
Bypass Valve.....	Close the Bypass valve to build system pressure
Gauge Values.....	Record values at the designated increments
Bypass Valve.....	Open
HPU.....	Shut-Off
Calibration port Shut-off Valve.....	Close
“Master” Calibration Gauge.....	Disconnect

Method B: Shut off the HPU and disconnect it from the power source. Remove the **Hydraulic Panel** from the front instrument panel (four screws). Disconnect the hose from the System Pressure gauge (remove gauge from panel if necessary). Attach calibration test equipment to the gauge and record gauge values at the designated increments.

Analog Pressure Gauge (Hand Pump Pressure - *Option M Only*) Self Calibration

An accurate pressure calibration gauge is required for calibration of the Hand Pump Pressure gauge. Follow the necessary steps below. Shut off the HPU and disconnect it from the power source. Remove the **Hydraulic Panel** from the front instrument panel (four screws). Disconnect the hose from the Hand Pump Pressure gauge (remove gauge from panel if necessary). Attach calibration test equipment to the gauge and record gauge values at the designated increments.

Analog Pressure Gauge (Crossover Check- *Option D Only*) Self Calibration

An accurate pressure calibration gauge is required for calibration of the Crossover Check pressure gauges. See **Crossover Check** for location. Follow the necessary steps below.

1. Shut off the HPU and disconnect it from the power source.
2. Remove the Crossover Check pressure gauges from the rear pressure manifold.
3. Attach calibration test equipment to each gauge and record gauge values at the designated increments.

CALIBRATION OF INSTRUMENTATION *(continued)*

Analog Pressure Gauge (Back-Pressure Adjustment Manifold Gauge- *Option T Only*) Self Calibration

An accurate pressure calibration gauge is required for calibration of the Back-Pressure Adjustment Manifold gauge. See **Return Back-Pressure with Sight Gauge** for location. Follow the necessary steps below.

1. Shut off the HPU and disconnect it from the power source.
2. Remove the gauge from the back-pressure adjustment manifold.
3. Attach calibration test equipment to the gauge and record gauge values at the designated increments.

Analog Temperature Gauge (Pyrometer- *Option K Only*) Self Calibration

An accurate temperature calibration gauge is required for calibration of the Pyrometer. The pyrometer bulb is located in the return manifold (rear of unit) and can be accessed by removal of the HPU top panel. See **Pyrometer** for location. Follow the necessary steps below.

1. Remove the pyrometer bulb from the return manifold by removing the slotted brass nut that retains the bulb in the well.
2. Connect the temperature calibration gauge to the bulb of the pyrometer.

The Temperature Value Must Be:

Pyrometer Temperature Display.....	160 ° F
Minimum Acceptable.....	159° F
Maximum Acceptable	
161° F.....	Temperature
Calibration gauge.....	160° F