

TROTTER CONTROLS FORT WORTH, TEXAS	PROCESS SPECIFICATION		NUMBER	REVISION
	REPORT ORDER		PS-0033	A
TITLE GEN II FRDS Hydraulic System Continuous Flush Process	BY	CHK'D	MODEL	
	Len Averyt	CG	FRDS Gen II	
	DATE		SERIAL	
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GEN II FRDS - Hydraulic System Continuous Flush Process

Overview

This process outlines recommended uses for the continuous hydraulic system flushing process built into the Gen II FRDS system.

References

Item	Document	Company
1	TS0005 - FRDS GEN 2 Maintenance System Tests	Trotter Controls, Inc.
2	9001-0011 GEN II FRDS Manual	Trotter Controls, Inc.

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Objectives

The objective of this Process specification is to outline the use for the following.

- Initial factory commissioning of the system.
- Seasonal preparation of the system
- Preventative Maintenance of the system.

Important notice!

This process will move the gatebox doors.
Make sure of the following prior to running this process.

- Hopper gates are clear of personnel
- Hopper is empty
- Hopper gates are adjusted properly

This process runs the pump at a high duty cycle. Connect an APU to the aircraft during this process to ensure the correct voltage is available.

Sequence of events

The following is a brief description of the events taking place and the order in which they occur.

- The operator starts the process by selecting 'Yes' at the prompt that asks if you want to "Perform Continuous Hyd System Flush?"
- Selecting "Yes" at the prompt will run the pump in an attempt to build up 3050 PSI in the system.
- Once the system reaches 3050 PSI the bleed valve is opened and pressure is dumped back to the tank.
- When pressure reaches 0 PSI the pump is then turned on with the bleed valve open (off) to circulate oil through the pump and return lines of the system. This helps flush debris and air from these sections of the system. The sequence will run for a few seconds in this manner.
- Next, the bleed valve is closed and all three of the gate open valves (V1 Open ~ V3 Open) are energized (opened) while E-Dump valves #1 and #2 are alternately turned on and off at 1 second intervals. This helps flush debris and air from this section of the system. The sequence will run for a few seconds in this manner.
- Next, the same sequence is run with the three valves used to close the gate (V1 Closed ~ V3 Closed).
- Once that sequence is completed the E-Dump valves are de-energized (closed) while the gate open valves are energized (opened) and fluid is pumped into the actuator. This will cause the actuator to move slowly towards full mechanical open.
- When the mechanical gate open limit is reached (Actuator mechanical hard stop), pressure starts to build.
- When the system detects 1600 PSI, the gate open valves are closed and the gate close valves are opened.

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- The actuator will jump with a quick jerk and then move slowly towards the full mechanical closed limit. Once again, when 1600 PSI is reached, the valves will switch states and the actuator will change direction.
- The quick jerk is beneficial at removing debris and stubborn air bubbles inside the actuator.
- After the actuator has been moved for awhile the pump is turned off for 3 minutes to allow some cooling and battery recovery time.
- Once the 3 minutes expires the process repeats by starting over and running the pump to build 3050 PSI.

Note=> The following items are the only things that can terminate this process.

- Holding the “NO” switch for a few seconds
- Failure to build 3050 PSI during the first step
- Pressure above 2800 PSI at any of the other steps (high pressure = dangerous)
- Power failure. Dead battery

Usage

The user of this process must understand how to navigate the menus and make selections with the Pilot Interface controls. This document will **not** go into detail on how to use the Pilot Interface controls. For detailed information on how to navigate the menus refer to the GEN II FRDS Manual (document no. 9001-0011).

Using the system for each of the different objectives is the same and is described below.

The hopper must be empty for this process. The gates will be moved during the process and all hopper contents will be lost.

Use the Pilot Interface controls to select the SysTest menu selection as shown in Figure 1 below. Answer ‘NO’ to the “Perform Panel Switch Test” option.



Figure 1 - Main Menu

If the prompt shown in Figure 2 is displayed, the user must answer ‘Yes’ to proceed with the process or ‘No’ to abort. This prompt is shown to alert the user to the possibility of contents inside the hopper and to prevent inadvertent loss.

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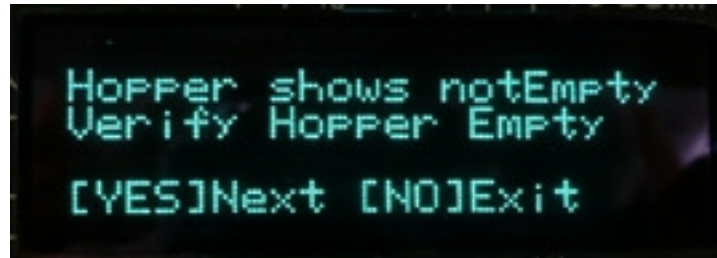


Figure 2 - Hopper contents warning

Answering 'Yes' to this screen allows the user to continue with the tests and or processes.

Continue to answer 'No' to the test prompts until "Perform Continuous Hyd System Flush?" is displayed. See Figure 3 below.

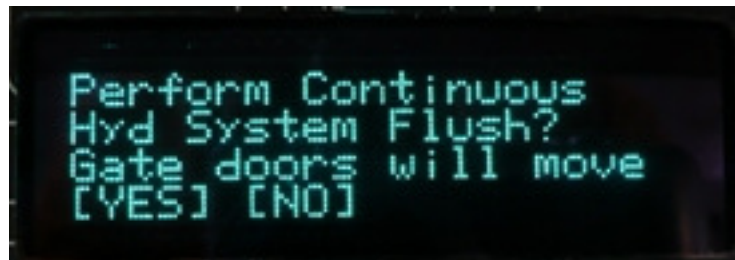


Figure 3 - Process prompt

At this point, before answering 'Yes', follow the recommended directions for the objective to achieve.

Selecting "Yes" at the prompt will cause the pump to attempt to build up to 3050 PSI in the system. A failure to build 3000 PSI may point to:

- Low fluid level. (pump sucking air)
- Improperly wired Bleed valve

Note=> The following items are the only things that can terminate this process.

- Holding the "NO" switch for a few seconds
- Failure to build 3000 PSI during the first step
- Pressure above 2800 PSI at any of the other steps (high pressure = dangerous)
- Power failure. Dead battery

Factory Commissioning of the System

This process is used to purge air and flush any debris from the system.

Before answering 'Yes' to the prompt, check the following;

- All hoses and fittings are installed and tight.
- All filters are installed and tight.
- Hydraulic reservoir is filled. May need to be overfilled if commissioning an empty system.
- All valve wiring is properly installed.
- Accumulator is properly charged.

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- Hopper is empty.
- Hopper gates are adjusted properly.
- Hopper gates are clear of personnel.

Selecting 'Yes' at this point will start the process. Refer to the Sequence of Events section of this document for a description of the events to take place.

Once the system has completed the initial 3000 PSI test and is running the other tests, check the fluid level in the reservoir. This can be done while the process is running but checking the fluid when the system is static (not moving) will give more accurate results.

Holding the "No" switch will abort the process. At this point additional fluid can be added and the process can be restarted.

- After the fluid level has been stabilized, run this process for a minimum of 3 hours.
- At this point, stop the process and replace both of the hydraulic system filters.
- Run the process for an additional 30minutes to purge any remaining air from the system and readjust reservoir fluid level.

Seasonal Preparation of the System

This process is used to exercise the valves and to help remove any varnish and debris from the system from extended storage or disuse. This is not used when changing oil or filters.

Before answering 'Yes' to the prompt, check the following;

- Hydraulic reservoir is filled.
- Accumulator is properly charged.
- Hopper is empty
- Hopper gates are adjusted properly
- Hopper gates are clear of personnel.

Selecting 'Yes' at this point will start the process. Refer to the Sequence of Events section of this document for a description of the events to take place.

Holding the "No" switch will abort the process at any time otherwise; the process will continue to repeat.

Run the process for 30 minutes and then check the reservoir level.

Preventative Maintenance of the System

This process is used when changing any of the following.

- Hydraulic fluid
- Hydraulic filters
- Bleed valve
- E-Dump valve(s)
- Gate directional valve(s)
- Hose replacement
- Pressure switch or sensor replacement

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- Opening the hydraulics for any reason

This process is used to purge air and flush any debris from the system.

Before answering 'Yes' to the prompt, check the following;

- All hoses and fittings are installed and tight.
- All filters are installed and tight.
- Accumulator is properly charged.
- Hydraulic reservoir is filled. May need to be overfilled at first due to empty system.
- All valve wiring is properly installed.
- Hopper is empty
- Hopper gates are adjusted properly
- Hopper gates are clear of personnel.

Selecting 'Yes' at this point will start the process. Refer to the Sequence of Events section of this document for a description of the events to take place.

Once the system has completed the initial 3000 PSI test and is running the other tests, check the fluid level in the reservoir. This can be done while the process is running but checking the fluid when the system is static (not moving) will give more accurate results.

Holding the "No" switch will abort the process. At this point additional fluid can be added and the process can be restarted.

After the fluid level has been stabilized, run this process for a minimum of 1 hour.

Support

If you have questions or comments regarding this document contact Trotter Controls, Inc. at the following numbers or the Customer Service Department at Air Tractor.

Main Office (USA)	(817)535-2243	(817)535-5515 fax
Service Line (USA)	(817)886-8662	(817)535-5515 fax
Valencia, Spain	91-8292744	
Madrid, Spain	96-3140390	
Carey Gray	(817)535-2243 Ext. 1#	(817)845-8303 cell Carey@trottercontrols.com
Victor Trotter	(817)535-2243 Ext. 2#	(817)939-3016 cell Victor@trottercontrols.com