

TROTTER CONTROLS FORT WORTH, TEXAS	PROCESS SPECIFICATION		NUMBER	REVISION
	REPORT ORDER	<input checked="" type="checkbox"/>	PS-0031	A
TITLE FRDS GENII - Sensor Calibration	BY	CHK'D	MODEL	
	Victor Trotter	CG	FRDS GEN II	
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## FRDS Gen2 - Gatebox and Hopper Sensor Calibration Procedure

### Overview

This document provides detailed instructions for setting the gatebox door-angle sensor and the hopper float system on aircraft fitted with the GEN II fire retardant dispersal system (FRDS).

### Objectives

To provide a procedure for calibrating the sensors used on the GEN II FRDS installed on Air Tractor firefighting aircraft.

### Background

The basic sensing element used to measure the gatebox actuator angle and hopper float shaft angle electrically senses the position of a magnet that is rotated in front of the sensor face. The sensors used are identical and interchangeable for the two angle measurements and have the following basic characteristic.

- 0.5 Volts = 0 degrees
- 4.5 Volts = 359.99 degrees

Note that voltage decreases as the gatebox angle increases and as the hoppers gallonage increases.

The mechanical position of the rotary magnet must be adjusted to read the proper voltage in the conditions shown below:

- Gatebox actuator in the full closed position: 4.00 Volts
- Hopper Float at lowest position in the hopper: 4.00 Volts

### Prerequisite Conditions

The following items must be performed before mechanically setting the sensor offset for the two sensors:

1. The pilot interface and relay enclosure are properly installed and all cables are properly connected.
2. All voltages are present and no fuses are blown.
3. The mechanical installation of each sensor is correct per appropriate drawings.

### Procedure (Gate angle)

1. Power-up the system. (Turn on the master power to the aircraft)
2. Wait for the system to boot up.
3. Set the "MODE" switch to "AUTO"
4. Use the "CLOSE GATE" switch to fully close the gatebox doors. Verify that the doors do not "creep" off of the actuators' internal stop when the close gate switch is released.
5. Press the "MENU" panel switch to enter the main system menu.
6. Use the rotary knob to Select "Maint" and push the selector knob to enter the maintenance menu.

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7. Select "Analog Inputs" and push the selector knob to view the analog inputs for the aircraft.
8. Rotate the rotary knob as required to view "**GateboxAngle**" from the menu to view the gatebox actuator sensors voltage.
9. Adjust the position of the rotary magnet used on the gatebox angle sensing assembly until the displayed voltage is  $4.00 \pm 0.01$  Volts. Note, that the gatebox doors must be fully closed before setting this value.
10. Verify that the door angle displayed is 0.0 degrees  $\pm 1$  degree.
11. Tighten set screws on the sensor shaft as required to lock the rotary magnet assembly in place on the shaft.

### Procedure A (Hopper)

1. Rotate the rotary knob as required to view "**HopperGal**" from the menu to view the hopper sensors voltage.
2. Adjust the position of the rotary magnet used on the hopper contents sensing assembly until the displayed voltage is  $4.00 \pm 0.01$  Volts.
3. Tighten set screws on the sensor shaft as required to lock the rotary magnet assembly in place on the shaft.

### Procedure B (Hopper)

1. Fill the hopper till fluid begins to drain out the overflow line. Let flow stop draining
2. While viewing the "**HopperGal**" in the tank.
3. Adjust the position of the rotary magnet used on the hopper contents sensing assembly until the displayed gallons is  $820 \pm 3$  gallons.
4. Tighten set screws on the sensor shaft as required to lock the rotary magnet assembly in place on the shaft.

### Post Calibration Verification

1. Open the gatebox doors fully using the "OPEN GATE" switch on the pilot interface.
2. The displayed angle from the analog inputs menu for the gate angle should be 274 degrees  $\pm 5$  degrees.
3. Close the gatebox doors fully using the "CLOSE GATE" switch on the pilot interface.
4. The displayed angle should be 0 degrees  $\pm 1$  degrees.
5. Empty the hoppers.
6. The displayed gallons should be approximately 45 ~ 47 gallons.
7. Fill the hoppers with water until the overflow vent just starts to leak water out.
8. The indicated gallons should be 815 ~ 823 gallons.