

Precision Planting®



Control Modes:

Manual Mode

Compressor: 12V - will run with the planter raised or lowered
Hyd - will run only with the planter lowered
(assuming standard plumbing of hydraulic lines)

Solenoids: Activates only when the planter is lowered

Automatic Modes

(Standard, Light, Heavy, or Custom)

Compressor: 12V - will run with the planter raised or lowered
Hyd - will run only with the planter lowered
(assuming standard plumbing of hydraulic lines)

Solenoids: Activates only when actually planting. This requires the system to recognize:

- 1) **LOWERED** position (Lift Switch)
- 2) **SPEED/GPS** information (forward movement)
- 3) **SEED TUBE DATA**

Normal operating ranges:

Down Pressure Bags: 8 psi to 120 psi
Lift Pressure Bags: 8 psi to 120 psi
(The Lift Circuit may spike in pressure at the end rows as the planter is lifted.)
Pressure < 8 psi in either circuit indicates a LEAK.

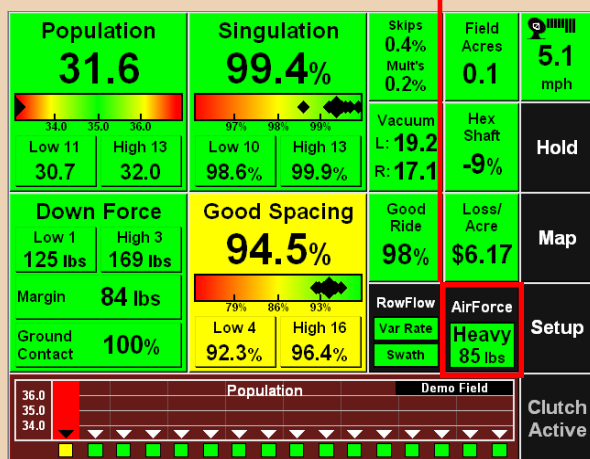
Tank Pressure: 0 psi to 150 psi
Pressure consistently < 120 psi indicate one or more **LEAKS** or poor compressor performance. Check for leaks/Run Health Check.
The tank has a high pressure relief valve that will activate at 165 psi.

Compressor Head Temperature: Ambient to 350°F
Warning message at 350°F
Disables at 400°F.

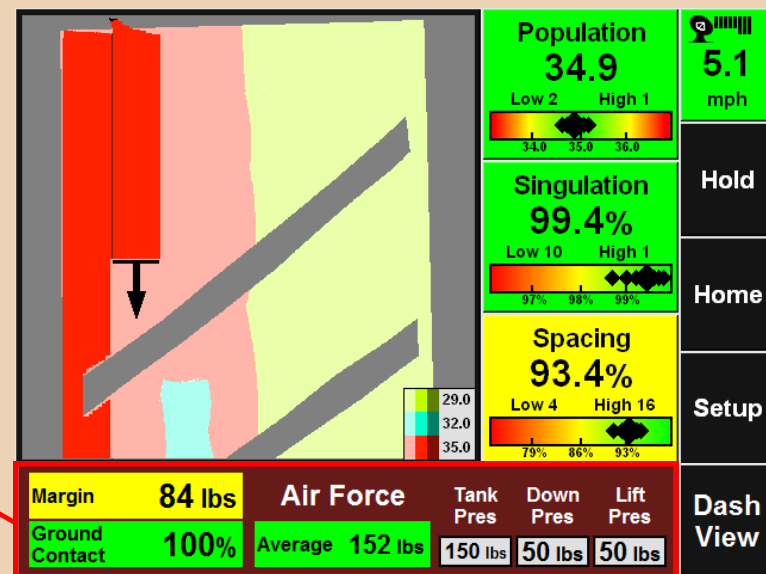
AirForce Control Module (AFM) Voltage: 11.5 to 14.0 Volts
12V Compressor Voltage: 11.5 to 14.0 Volts
Compressor Duty Cycle: 0-80%
Hydraulic Compressor Requirements: 4 gpm at >1800 psi

CLOSED CENTER CIRCUITS ONLY!!

When **AirForce** is plugged into the system, the AirForce button will display. By pressing the AirForce button, you will be taken to the AirForce Control center to make adjustments to your system. If this button is not present, navigate: **SETUP - SYSTEMS - DISPLAY - DASHBOARD BUTTONS** and choose the 4X4 option.



An AirForce specific Dashboard Mini-chart can be selected from the Dash View page. This will provide AirForce specific information in greater detail when viewing in the **Full Map** view. Pressing the Dashboard Mini-chart will take you to the AirForce Control Center.



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The AirForce Control Center is the heart of the AirForce system. This is where you will Enable/Disable Control the system, select control modes, and monitor the functionality and performance of the system.

Hold button commands the system to ignore Margin and Ground Contact for a period of time. Time periods can be changed under *SETUP*. AirForce Hold may be needed in waterways or ditches in the field.

** See Below

Standard Automatic: This is the most common and default setting for AirForce. The target range for this mode is set for 10-60 lbs of Margin with 100% Ground Contact.

Light Automatic: This control mode moves the target range from 20 lbs of Margin with 60% Ground Contact.

Note: This control mode will sacrifice Ground Contact and seeding depth to ensure a minimum Margin! Use this mode when uniform seeding depth and/or moisture are not as yield limiting as potential row compaction. Rarely used over an entire field, most commonly used for spot controlling small wet areas.

Heavy Automatic: This control mode moves the target range from 60-100 lbs of Margin with 100% Ground Contact. Use this control mode when extra down force is required. (dry conditions or cloddy seed-bed)

Note: crushing clods and minimizing Margin are opposing ideas! Commonly used on end rows.

Custom Automatic: This control mode allows the user to create their own target zone within an automatic control. Once this mode is selected you will notice the addition of four buttons surrounding the target zone graph. To the upper right hand side are Right/Left buttons, used to move the zone back and forth across the graph. To the lower left hand side are Stretch/Squeeze buttons; used to control the size of the target zone.

Manual Mode: This control mode allows the user to designate a pressure or desired force for the system to maintain. This is a static setting that will not fluctuate throughout the field in response to soil-type or tillage changes. The units are selectable under the *SETUP* button to view Pounds or Psi.

****ENABLE CONTROL:** This button toggles on and off AirForce Control. The default state for AirForce is disabled for safety reasons. Enabling control must be done after installation.

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Compressor Hours: accumulated running time of compressor.

Compressor Duty Cycle: run-time of compressor as a percentage of time. **Long periods of duty cycles ≥ 80% indicates lower performance and/or leaks.** Check for leaks and run the compressor Health Check within AirForce Diagnostics. A detailed progression of the Health Check is provided below.

Compressor Air Temp: compressor head temperature (can be displayed in degrees Fahrenheit or Celsius). **Normal operating temperatures are up to 350°F.** The system will disable itself at 400°F.

Compressor Voltage: displays volts being drawn by 12V compressor. This box will be 'grayed out' -as shown-when a hydraulic compressor is installed. Normal operating values should be:

Compressor Idle: 11.5-14 volts
Compressor Running: 11-13 volts

Tank, Down Circuit, & Lift Circuit Status:

Each box displays **Actual value** in green bar and **Target value** in black arrow. Units are in psi. Systems with only one direction of control installed, the inactive circuit should be 'grayed out.'

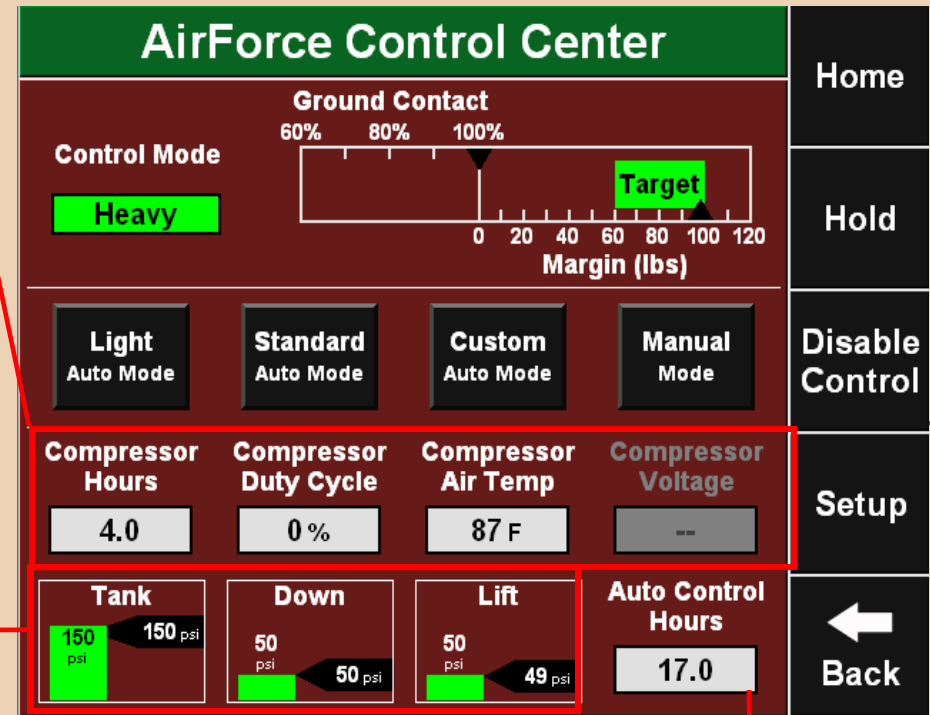
Down & Lift Circuits:

Values below 8 psi is a clear warning of a leak in the system or a failure to charge. Inability of Actual values to meet Target values indicates insufficient supply (Tank Circuit) or a leak.

Tank Circuit:

Below 120 psi the system will become less or unresponsive to Margin & Ground Contact as it attempts to conserve air.

Consistent values below 120 psi most likely indicate leaks. Possible locations include the tank, lift circuit, and down circuit.



Auto Control Hours: accumulated hours that AirForce has operated in any Automatic Control Mode.

NOTE: In a healthy system, no individual step or check should take longer than 7 minutes. If this happens, Cancel Health Check and press Reset Modules prior to a second attempt.

Health Check - Step by Step Process

Step	Compressor Check	Setting up Compressor Check	Tank Pressure will drop to, or below 100 psi
Step 1		Setting up Compressor Check	Tank Pressure will drop to, or below 100 psi
Step 2		Building Tank Pressure to 130 psi	System will verify build rate to 130 psi
Step 3	Wiring and Plumbing Check - Down	Checking Down Circuit	System will build and release pressure between 20 & 100 psi
Step 4	Wiring and Plumbing Check - Lift	Checking Lift Circuit	System will build and release pressure between 20 & 100 psi
Step 5	Leak Check Tank	Checking Tank pressure	System will build pressure >120 psi, hold, & measure decay
Step 6	Leak Check Down Circuit	Checking Down Circuit Pressure	System will build pressure >100 psi, hold, & measure decay
Step 7	Leak Check Lift Circuit	Checking Lift Circuit Pressure	System will build pressure >100 psi, hold, & measure decay
Step 8	Verify Gauges	System will prompt user to verify that Display Unit and Analog Gauges are within 5 psi of each other	

This page displays a visual representation of the AirForce components, utilizing a color scheme to show the individual components status. This will be the primary location for troubleshooting AirForce Systems.

H2O:

Number of hours since water separator has been checked and cleared. If not green, check/clear separator then clear prompt under *Hour Counter* at bottom right of screen.

Temperature:

Temperature of compressor head in degrees Fahrenheit or Celsius.

Normal Operation: Up to 350°F
Conserve Mode: 350-400°F
Disable: Above 400°F

12V:

Voltage to the compressor through the tractor battery power cable, measured at the 80 A contactor.

Compressor Idle: 11.5-14 volts
Compressor Running: 11-13 volts

Not present on Hydraulic Compressors.

Compressor:

The compressor status displays performance data on *Run time* and *Fill rate* in a color scheme.

Tank:

Tank circuit health indicator using color scheme, performance data on *Use* and *Leaks*.

Log Files and Hour Counters:

The Log Files give a historical view of the system components and functionality by planting hour. This can be useful by noticing trends to plan maintenance or fix chronic issues. The Hour Counters page provides summary information on run time of system components.

Tank Pressure:

Current tank pressure. Should be **within 5 lbs from that displayed on analog gauge** on front of enclosure.

Lift Switch:

current status, (raised/lowered) of lift switch.

Down Pressure:

Current pressure in Down Circuit. Should be **within 5 lbs from that displayed on analog gauge** on front of enclosure.

AirForce Control Module (AFM): Voltage at the AFM. **Operating values should be 11.5v-14.0v.**

Health Check:

Contains automated programs by which the system can verify the status of individual components and the entire system. **This should be run at the completion of initial install and as a preseason test.** Refer to the Health Check table on the previous page for further details on the Health Check Process.

Event Log:

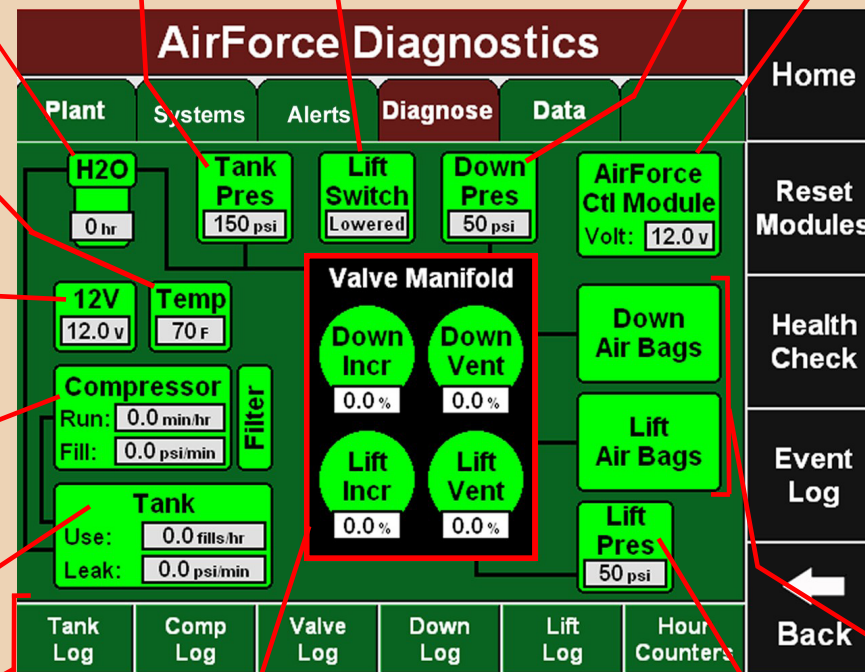
This page logs and displays all AirForce system events and faults/codes. Recommended actions and specific code faults will be noted for referral to AirForce Troubleshooting within the Owners Manual. **Excellent location to begin troubleshooting process and/or locate faults within the system.**

Down Air Bags & Lift Air Bags:

Health status of each circuit. Monitors inputs, outputs, and static values of circuits and tests against expected values.

Lift Pressure:

Current pressure in Lift Circuit. Should be **within 5 lbs from that displayed on analog gauge** on front of compressor enclosure.



Valve Manifold:

Shows solenoid health using color scheme, also shows duty cycle of each solenoid. Typical values should range between 0.1% - 5.0%.

Leak Indicator:

If **EITHER** Increase solenoid (DOWN INCR or LIFT INCR) shows a value $\geq 4.0\%$ and a Vent Solenoid (DOWN VENT or LIFT VENT) value of 0%.