Husqvarna

(GB) Operator's manual

Read these instructions carefully and make sure you understand them before using the FS 6600 D / FS 8400 D.

(ES) Manual del operador

Lea cuidadosamente estas instrucciones y asegúrese de que las comprende bien antes de usar el FS 6600 D / FS 8400 D.

(FR) Manuel d'utilisation

Veuillez lire attentivement ces instructions et assurez-vous de bien les comprendre avant d'utiliser la machine modèle FS 6600 D / FS 8400 D.

FS 6600 D, FS 6800 D, FS 8400 D, FS 9900 D

Electronic Controls / LCD Display

HUSQVARNA CONSTRUCTION PRODUCTS

Tier 3 Engine with Electronic Controls, LCD Display and Self Diagnostics

Tier 3/IT4 Engine

In order to comply with the US EPA Tier 3/Interim Tier 4 and European Stage IIIA and Stage IIIB exhaust emissions regulations governing Off Road Industrial Combustion Ignition engines, it has become necessary for engine manufacturers to make significant design changes to their diesel engine products. Husqvarna Construction Products uses the John Deere PE4024 HF 295 and PE5030 HF 285 Diesel engines on it large Flat Saw products.

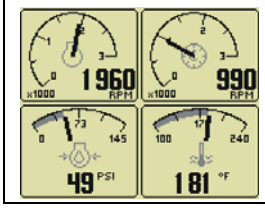
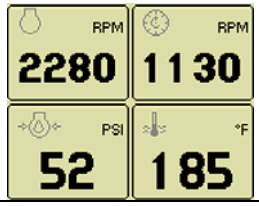
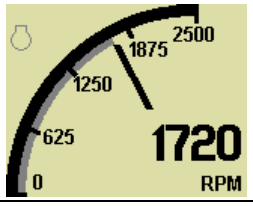
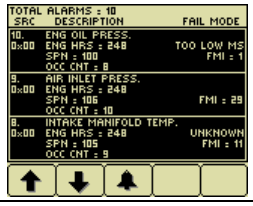
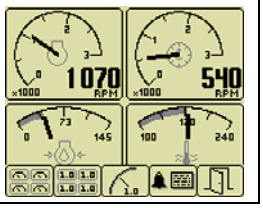
The most notable changes to the engines from the previous Tier 2 Engines are the Charge Air Cooling (CAC) which cools the charge air after it leaves the turbo charger but before it enters the engine intake manifold. The CAC is essentially another section on the radiator. Operation of the Flat Saw is not affected by the CAC but it dramatically reduces the Nitrous Oxide Emissions from the diesel exhaust.

The other major design change is the Full Authority Electronic Engine Control. Engine performance is governed and monitored by an Electronic Control Unit (ECU). The diesel injector timing and duration is directly controlled electronically. The engine has no throttle cable or linkage. It has no mechanical governor. Electronic Engine data is collected and processed in the ECU and broadcast onto the Control Area Network Bus. (aka CANBus). The CANBus broadcast is to the SAE J1939 standard.

On the control panel of the saw is the CANplus™ 600 (CP600™) (1F) display panel to monitor the electronically governed diesel engines. Graphical gauge pages or a single large analog gauge are displayed on the 4.25” diagonal LCD. Virtually any SAE J1939 parameter reported by the ECU (Engine Control Unit) can be displayed including RPM, coolant temperature, oil pressure, engine hours, voltage and alarms, diagnostic codes and saw service indicators. The backlit display is clearly readable in both bright sunlight as well as total darkness and housed in a rugged IP67 rated housing. The engine RPM is controlled by the rocker switch (1E). It broadcasts a CANBus signal back to the ECU which then controls engine RPM.

Current alarm conditions are displayed in plain language on popup messages and can be viewed in the alarm list. Various diagnostic screens allow detailed investigation of the CANbus data stream. By accessing the ***Configuration Menu***, users can customize displayed data to show metric or US units, display language and various other parameters such as the full-scale reading of gauges.

Five buttons access a context dependent ***button bar*** when any button from 1 to 4 is pressed. The graphical menu structure uses easily understood icons to indicate the button’s current function. After 5 seconds of inactivity the button bar disappears.

Button 1	Button 2	Button 3	Button 4	Button 5
Analog Gauge Pages Repeated presses cycle through two pages of analog gauges (6 total).	**Digital Gauge Pages** Repeated presses cycle through two pages of digital gauges (6 total).	**Single Analog Gauge** Repeated presses cycle through two analog gauges. Blade RPM and engine RPM.	**Active Alarm Page** Displays active alarms codes a plain language description.	**Exit Return Enter** Allows fast return to previous screen or exiting menu or access to higher level functions.
				

Note

Most problems with electronically controlled engines can be pinpointed via ECU diagnostic messages. Use the display or ECU diagnostic tool to view fault codes.

All engine state information and diagnostic codes displayed by the CANplus display are provided via the CANbus.

Throttle Control

The standard ramp throttle uses a momentary rocker switch (1E) to adjust the integral throttle control. All throttle commands are sent directly to the engine using CANbus throttle control.

Service Timers

The CP600 panel provides sixteen (16) service timers to alert the operator to needed maintenance. The time interval for each of the timers can be adjusted in 10 hour increments. A popup message is displayed after the display self test if a timer has expired alerting the user that service is required. The popup message continues to be displayed at power up until the timer is disabled or reset. To reset service timers, you must access higher level function by entering a Personal Identification Number (PIN). See Pin Entry section.

Important Safety Information

The warnings in this publication are not all inclusive.

Husqvarna cannot anticipate every potential hazard.

Appropriate safety rules and precautions should be followed with any tool, work method or operating procedure.

Improper procedures, tools and materials may cause damage or make the equipment unsafe to operate.

Only persons with appropriate training, skills and tools should perform these functions.

Improper operation, maintenance or repair of this product can be dangerous and may result in injury or death.

Do not operate or perform any maintenance or repair on this product until all operation, maintenance and repair information is read and understood.

The information, specifications and illustrations in this publication are based on information available at the time of publication.

All items are subject to change at any time without notice.

Operation

Turning the control system key (1C) to the run position energizes the ECU and displays a start-up screen while the display performs a self test. If the display beeps for longer than 1 second, it indicates a self test fault. Users can attempt to rectify the fault by restoring factory defaults (see ***Configuration Menu*** for details). Contact LOFA Industries for assistance if the fault persists.

After the start-up screen disappears, the display shows readings on its virtual gauges. Initially the analog gauges are displayed but the display uses the screen last displayed on subsequent startups (see **Preferred Screen Store** for details).

If the ECU is preheating the engine when the key switch is turned to the run position, the ENGINE PREHEATING popup message will display. Preheat time varies with atmospheric and engine conditions. After waiting for the Preheat message to expire, the engine is cranked by turning and holding the key switch (1C) in the start position until the engine starts. The engine exhaust will be virtually smoke free.

Note

The ECU will not preheat unless conditions warrant. If necessary, starting the engine may be attempted by turning the key to the start position without waiting for preheat to expire.

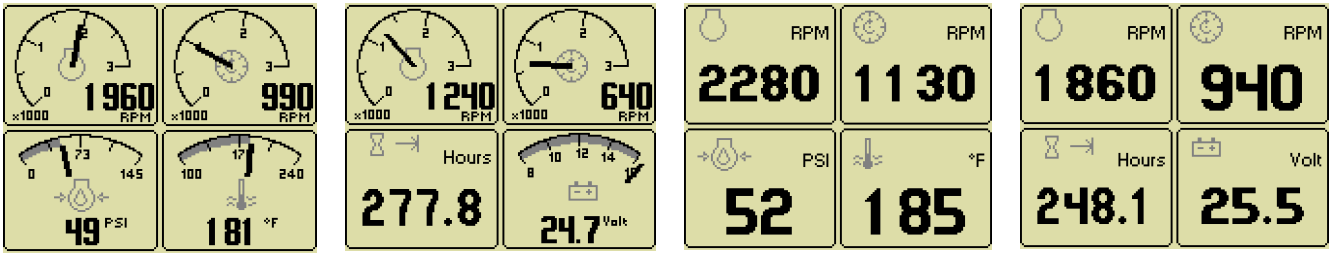
The key switch is spring loaded to return automatically to the run position when released. The key switch is equipped with a mechanical start locking device. An attempt to re-crank the engine can only be made by turning the key switch to the **off** position to reset the start locking mechanism.

CANplus Display (1F) CP600

Soft buttons simplify the operator interface by displaying a **button bar** above the buttons when any of the first 4 buttons (buttons 1 to 4, starting from the left) are pressed. Icons on the button bar representing the current function of each button. The button bar disappears after 5 seconds if no further buttons are pressed.

Analog Gauge and Digital Gauge Pages

Analog Gauge Pages provide two independent pages of analog gauges. To enable Analog Gauge Pages, press any of the first 4 buttons to show the top level button bar and then press button 1  . Alternate pages are selected by repeated pressing of button 1. The two standard gauge pages are shown below left. **Digital Gauge Pages** display the same data as the Analog Gauge Pages but in digital format. To enable Digital Gauge Pages, press any of the first 4 buttons to show the top level button bar and then press button 2  . Alternate pages are selected by repeated pressing of button 2. The two standard gauge pages are shown below right.

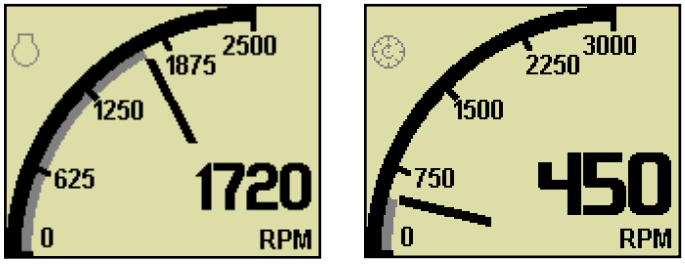


Note

Engine Hours are displayed as a digital value even on Analog Gauge Pages.
The Top Left Gauge will always display Engine RPM.
The Top Right gauge will always display Blade RPM.

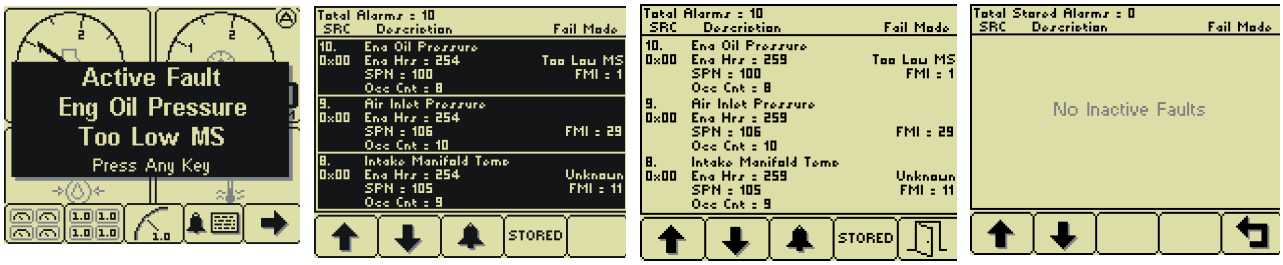
Single Analog Gauge

Single Analog Gauge uses the entire display for a single large analog gauge. This mode is enabled by pressing any of the first 4 buttons to show the top level button bar and then press button 3  . The gauge displayed is selectable by repeatedly pressing button 3 while in the Single Analog Gauge mode while the menu bar is visible. Engine RPM and Blade RPM are the only Parameters available in this mode.



Active Alarms, Faults and Diagnostic Trouble Codes (DTC)

In addition to the quad gauges monitoring critical engine parameters, a flashing popup window is overlaid on the current screen when an active alarm is received from the ECU. The popup includes a plain language description in addition to the standard F**ault Codes** known as SPN-FMI (Suspect Parameter Number- Fault Mode Indicator)) number pair defined by the SAE J1939 standard. Additionally the beeper sounds as an audible cue. Depending on the severity of the fault, the engine may shut down or go to a low idle mode or a de-rated power mode. Most Faults are minor and operation may continue after the fault is acknowledged and cleared from the screen. Severe Faults Must Be Fixed. See Diagnostic Trouble Code List Page __



Pop Up Alarm Alarm List with SPN _ FMI Acknowledged Alarm List Stored Faults

After acknowledgement, the exit button becomes active.

Note

Standard J1939 abbreviations are used for alarms.
MS = Most Severe, **MOD**= Moderately Severe, **LS** = Least Severe.

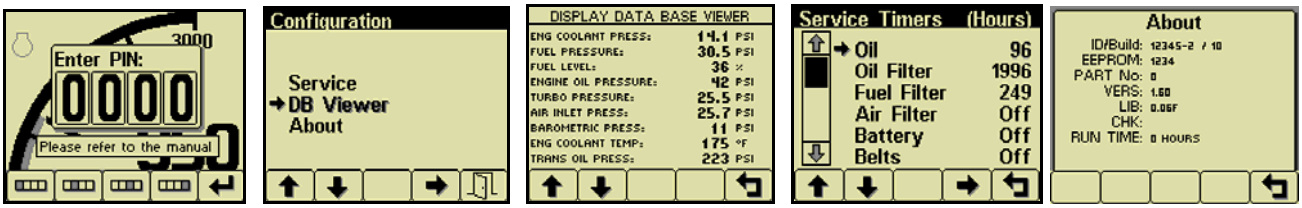
Read and Clear Alarm List

The Alarm List is accessed by pressing any button while an Popup Alarm is displayed or by pressing any of the first 4 buttons to show the button bar and then button 4. Alarms not yet acknowledged are shown in grey on black while acknowledged alarms are shown in black on grey. The list also indicates when the alarm occurred if engine hours. The most recent alarm is displayed at the top of the list. The list can be scrolled using buttons 1 and 2 and alarms acknowledged by pressing button 3. Past inactive Stored Faults can be viewed by pressing button 4. STORED The Alarm List can be closed by pressing Button 5 once the alarms are acknowledged. An alarm indicator is displayed near the upper right corner of the display as long as alarms are active. The indicator and alarm messages in the list are automatically removed when the alarm is no longer received for a few seconds.

Alarms monitor engine parameters but are also used to self diagnose electrical problems with sensor and wires batteries and the ECU itself. See the Listing of **Diagnostic Trouble Codes (DTCs**). When contacting John Deere or Husqvarna Service, it is necessary to provide Engine Serial Number, SPN and FMI Codes. This information is vital to receive prompt assistance.

Other Functions

The CP600 Display has more functions to read all the data broadcast on the CANBus and custom configure the display as the operator prefers. To Access the higher level functions, press and hold button 5 for 3 seconds and the following screen will display. To view the view the Service Timer and DB Viewer, a Personal Identification Number (PIN) is not needed. Press button 5 to see the Configuration Page.

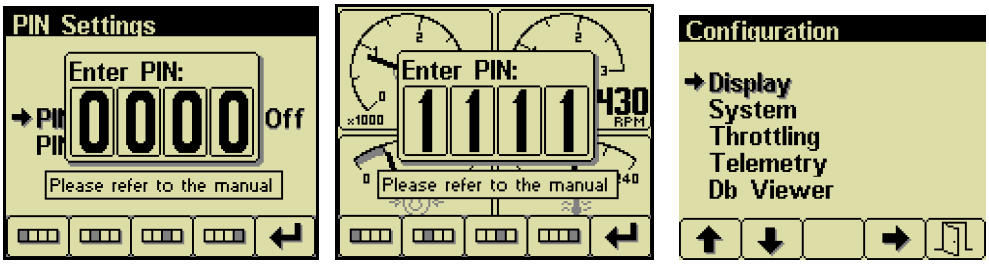


Press button 1 and 2 allow you to choose from **Service** or **Db Viewer or About.** Pressing button 4 selects the chosen menu item indicated in bold and the arrow. Data Base Viewer displays every parameter broadcast on the CANBus. Most Parameters listed are not broadcast and will display____ instead of a number. Service Timers will display the number of hours until a required service is due. Only 4 parameters are factory preset. When a Service Timer expires, the screen will display a Pop Up Alarm "**SERVICE REQUIRED**". A PIN will be needed to reset Service Timers. See Section On PIN and Servicer Timer. About screen is the software and hardware Version of the CP600 Display.

Personal Identification Number (PIN)

This Configuration Menu allows the user to set various operating parameters such as US or metric units, scale limits for tachometer and service timers. The configuration menu is entered by pressing and holding button 5 (the right hand button) in any mode for at least 3 seconds. The PIN entry is enabled and the correct PIN must be entered to access the configuration menu.

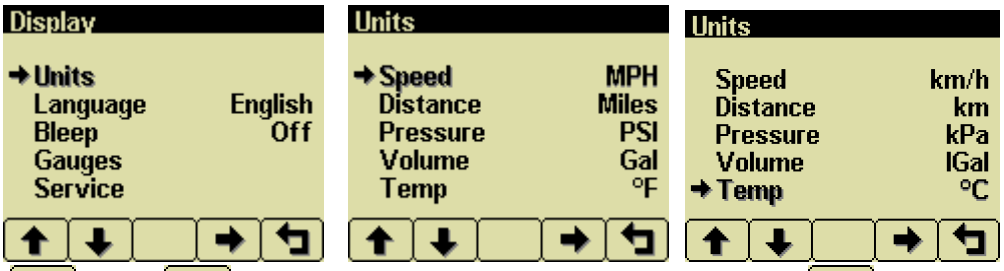
The factory preset PIN must be entered (default is **1111**) as a security feature. The digits of the PIN are entered by using the buttons corresponding to the digits of the PIN. Button 1 adjusts the first digit of the PIN. Button 2 adjusts the second digit, button 3 the third digit and button 4 the fourth digit. The PIN is entered using button 5.



The top level configuration menu is displayed as shown. Buttons 1 and 2 allow you to choose from **Display**, **System**, **Throttling, Telemetry** or **Db Viewer.** Pressing button 4 selects the chosen menu item indicated in bold and the arrow. Each item is described in detail on the following pages. Settings are automatically stored when exiting the current menu even when power is removed.

Units Menu

This menu allows the user to set the units used for pressure, volume and temperature independently. Distance and speed are not used. . Use Buttons 1 ⬆ and 2 ⬇ to select Units. Press button 4 ➡ to display Units Screen.



Use Buttons 1 ⬆ and 2 ⬇ to select the unit to change. Press Button 4 ➡ to change the selected value. Press Button 5 ↵ to return to Display menu.

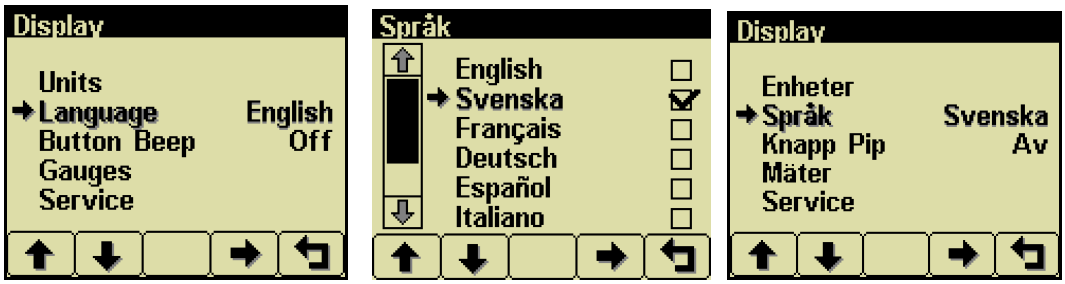
Temperature °F (Fahrenheit)
°C (Celsius).

Pressure PSI (pounds per square inch)
bar (barometric units)
kPa (kilopascals)

Volume Gal (US gallons)
lGal (Imperial gallons)
Liters

Language Menu

From the display menu using button 1 and 2 select Language. Press Button 4. This menu allows the user to choose between English, Swedish, French, German, Spanish, Italian, Dutch and Portuguese. The currently selected value is indicated by the check mark ☑. Button 4 ➡ selects the highlighted value. Press Button 5 and all menus will be in the selected language as seen on the right below.



Display Menu

The **Display Menu** allows the user to configure items affecting how information is displayed.

Beep

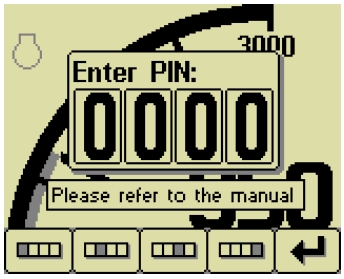
The soft buttons emit an audible beep when this item is On. Button beep is disabled by setting this item to Off. The audible beep still sounds when an alarm occurs.

Popup Messages and Alerts

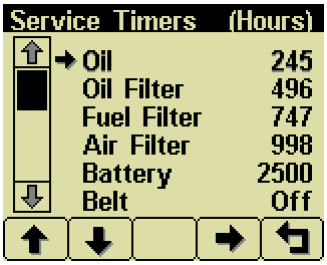
Service Required

Users can set up to sixteen service timers in hours in the Configuration menu. The SERVICE REQUIRED popup is displayed at power up when one or more service timers has expired. Pressing any button removes the popup. If no button is pressed the Pop Up closes in approximately 5 seconds.

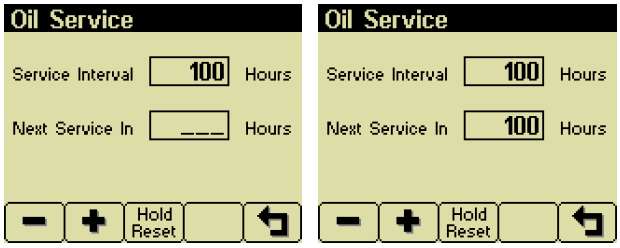
Pop-up warnings of **SERVICE REQUIRED**.



When service popup alarms occur, perform required service. Then access the service interval resets function. From any gauge screen, Press and Hold Button 5 for 3 seconds for the PIN Pop Up. Enter Current PIN. (1111 factory default) Select **Display**. From the **Display** Menu, use Buttons 1 and 2 to select Service. Press button 4 to display the sixteen (16) service intervals in hours and reset the service timers. Use Buttons 1 and 2 to select the desired Service Timer.



Pressing Button 4 allows adjusting the selected service timer.



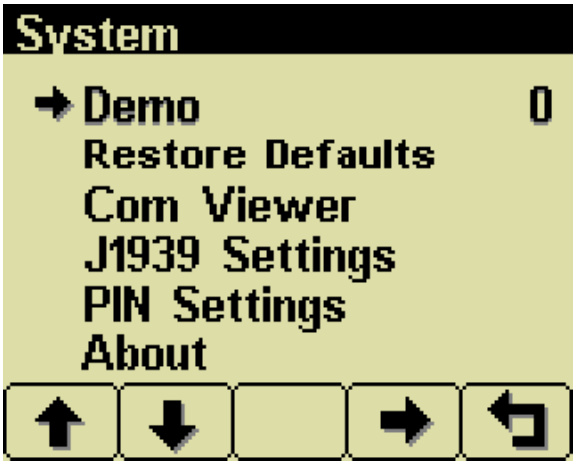
Button 1 decreases the service interval time while Button 2 increases the service interval time in 10 hour increments. Holding Button 3 Hold Reset for approximately 3 seconds resets **Next Service In** to the current **Service Interval**. Only 4 service timers are preset at the factory. Operators and service technicians can set more alarms as needed. Setting the service interval to 0 disables the timer and the word **Off** is displayed.

Note

PIN number is needed to reset to reset service timers.

System Menu

The ***System Menu*** allows the user to configure items affecting how the system functions. The user is locked out of changing any function except the PIN settings.

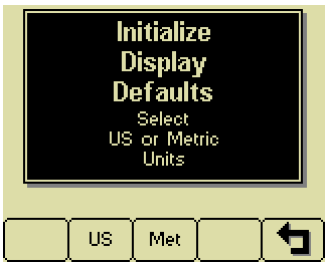


Demo

Mode 0 disables Demo Mode. Demo is automatically set to 0 (Off) if live data is received.

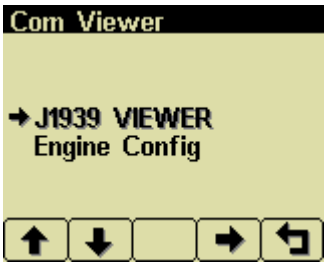
Restore Defaults

This allows resetting all configuration information to default US [US] or Metric [Met] units. Additionally the display is reset to the initial configuration.



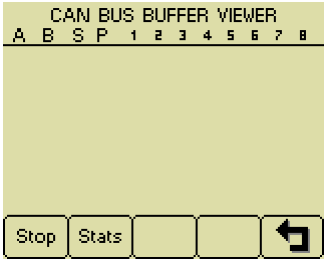
Com Viewer

Displays last CANbus messages received and engine configuration transmitted by the ECU.

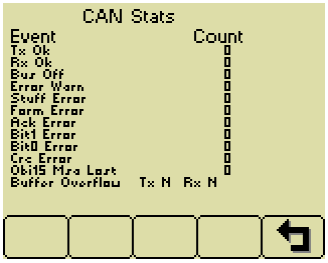


J1939 Viewer

This screen provides a hexadecimal dump of the last messages received on the CANbus. This viewer displays the raw data. To see the decoded data use the **Db Viewer**.

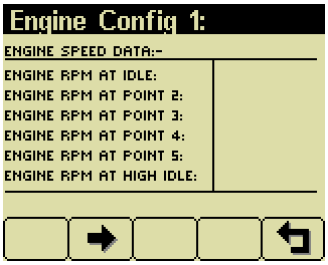


Button 1 [Stop] freezes the display while button 2 [Stats] shows CANbus data statistics screen.



Engine Config

This screen displays the engine configuration information received from the ECU.



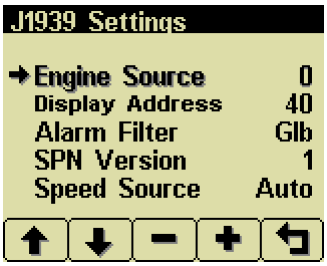
Button 2 [→] selects the next page of engine configuration while button 1 [←] select the previous page.

J1939 Settings

Note

All J1939 settings are preset. No adjustments are needed. Incorrectly configuring the Engine Source address will result in no data available for display.

This screen allows adjustments specific to the J1939 data link. Factory Preset. Do not change.



Engine Source

Factory Preset, Do Not change. Engine Source is set at address 0.

Display Address

Factory Preset 40. Do Not Change

Warning

Incorrectly configuring the Display Address can result in data collisions on the CANbus.

Alarm Filter

This setting specifies whether the display will display alarms from all sources (Glb or global) or only the source address specified in the ***Engine Source*** setting (Src or source).

SPN Version

Selects the default SPN (Suspect Parameter Number) Version 4 is automatically detected.

Speed Source

Factory Preset to Auto.

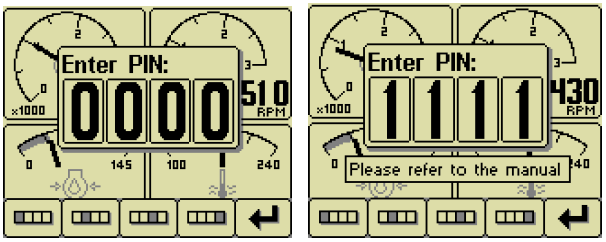
Changing PIN Number

By default, the PIN security is enabled. The user is prompted to enter a PIN every time the **Configuration Menu** is accessed since this feature is enabled.

PIN Entry

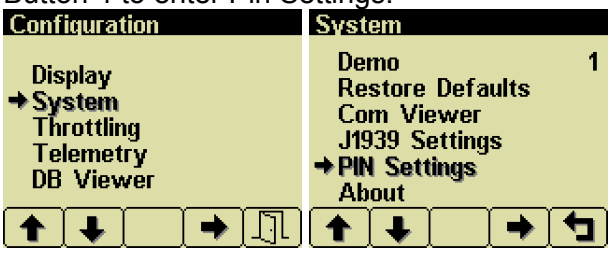
PIN Entry is set to **On** to prevent unauthorized users from accessing system settings and resetting service timers. An authorized maintenance technician may want to prevent operators from accessing the service minders.

The PIN number can be changed as needed. From any gauge screen, Press and Hold Button 5 for 3 seconds until the Enter Pin Pop UP appears. The current pin must be entered (default is **1111**) as a security feature.

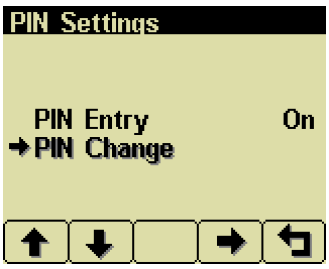


The digits of the PIN are entered by using the buttons corresponding to the digits of the PIN. Button 1 adjusts the first digit of the PIN. Button 2 adjusts the second digit, button 3 the third digit and button 4 the fourth digit. The PIN is entered by pressing button 5.

Once the PIN has been entered Configuration menu is displayed. Using buttons 1 and 2 select System and Press Button 4. Again use Buttons 1 and 2 to select PIN Settings. Press Button 4 to enter Pin Settings.

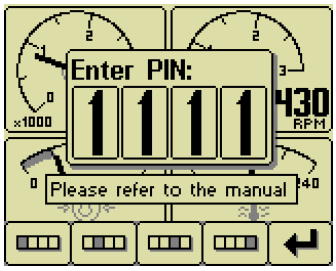


Select PIN Change and press button 4.

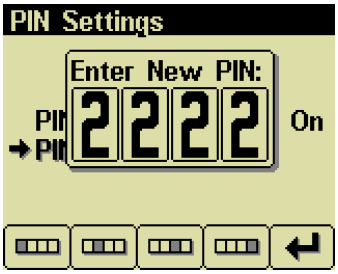


PIN Change

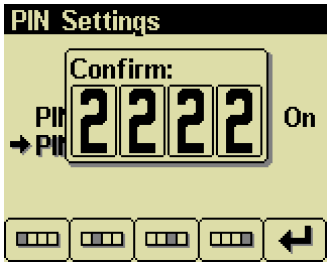
This allows changing the PIN. The user is prompted for the current PIN



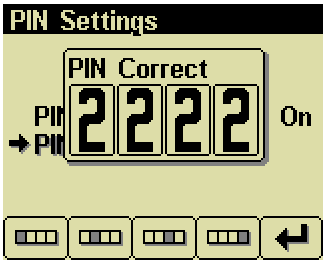
The user is prompted for the new PIN.



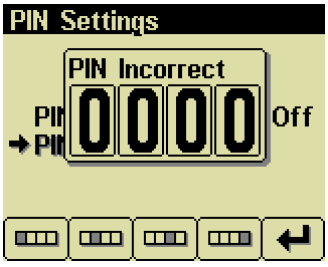
The new PIN must be confirmed before the PIN is changed.



If the new PINs match a confirmation screen is displayed.



If the two PINs entered do not match an error message is displayed and the PIN is unchanged.



Note

Cannot Remember or Lost PIN number. Call Husqvarna Construction Products Technical Services for assistance.

About

Displays the following product information:

ID/Build	Serial number of the display
EEPROM	Number of writes on EEPROM
PART No	Unit part number
VERS	Software version number
CHK	Flash memory checksum
SOURCE	The source of received data
LIB1	Low level system library version
LIB2	Low level Graphical Display Interface library version (if used)

Note

This screen can not be exited until the checksum calculation is complete. Checksum calculation takes approximately 10 seconds and is complete when the checksum value changes from “Calculating…” to a hexadecimal value such as “0x704E – OK”

Throttling Menu

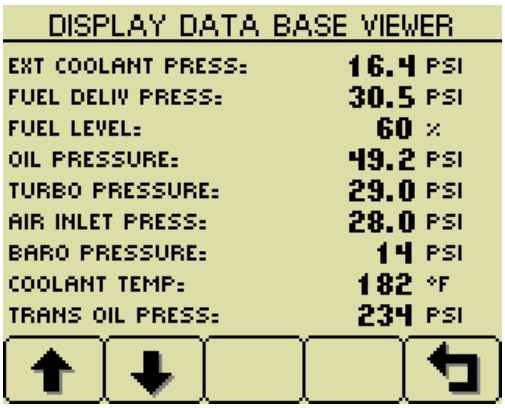
Not used

Telemetry Menu

Not Used

Db Viewer

The Database Viewer displays and decodes all data monitored by the display. This diagnostic tool allows viewing data not normally displayed. PIN is not needed to View Data Base Viewer.



The list can be scrolled using buttons 1 and 2 and closed by pressing Button 5.

Note

The Database Viewer is always in English regardless of language selected.

Preferred Screen Store

The display automatically stores the current screen as the preferred page after a delay of approximately 15 seconds. The display will use the last stored screen on the next power-up.

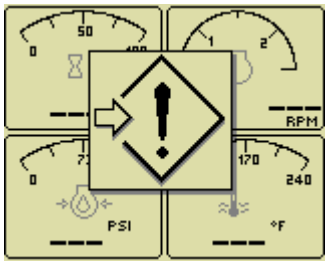
Note

Selecting ***Restore Defaults*** restores the Analog Gauge Pages and default gauges.

.

Data Communications Failure

The data communications failure popup icon flashes if the display does not detect data. The warning disappears and normal operation resumes once data is detected.



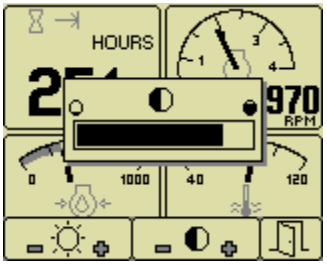
Note

Incorrectly configuring the Engine Source address will result in no data available for display.

Data Not Available

Gauges and the Db Viewer will display `---` if the desired data is not available. The display value returns to normal when parameter data is received.

Adjusting Lighting and Contrast



Pressing button 5 (the right-hand button) when there is no menu bar opens the lighting and contrast menu bar. The display has a number of back-lighting levels that allow the display to be read in the dark. The level is adjusted by pressing buttons 1 decrease or button 2 to increase illumination. Contrast is adjusted in the same manner using buttons 3 and 4 .

Note

The display adjusts the contrast with ambient temperature.
Manual contrast adjustments are only necessary with extreme climate change.

The menu is exited by pressing button 5 . The lighting and contrast settings are retained after the unit is switched off.

Note

If the contrast has been adjusted poorly, the factory setting is restored by pressing buttons 1 thru 4 simultaneously. This action does not change other user-configured settings.

Note

The CANplus display only reports when the ECU is requesting preheat..

Note

ECU programming determines the response to warnings and failures.
The ECU is programmed to shutdown, derate or run to failure.
The CANplus display only reports CANbus conditions.

Battery Circuit Requirements

Warning

Do not reverse the battery polarity. Attempting to crank the engine when the polarity of the battery connections is reversed may damage the control system.

Warning

Disconnecting the battery while the engine is running may damage electrical components.

Voltage Drop

If control system voltage drops below 6 volts for more than one tenth of a second, the control system may reset causing the self test to reactivate. Resetting the control system is equivalent to quickly turning the key switch to off and back to run without starting the engine. Voltage drops can be caused by a discharged battery. If battery becomes old and weak, replace battery.

Welding on Equipment with Electronic Controls

Proper welding procedures are required to avoid damage to electronic controls, sensors and associated components. The component should be removed for welding if possible.

The following procedure must be followed if the component must be welded while installed on equipment with electronic controls. This procedure will minimize the risk of component damage.

Warning

Do not ground the welder to electrical components such as the control ground or sensors!
Improper grounding can cause damage to electrical components!

Clamp the ground cable from the welder to the component being welded.
Place the clamp as close as possible to the weld to reduce the possibility of damage.

1. Stop the engine. Turn the key switch to the OFF position.
2. Disconnect the negative battery cable from the battery.
3. Open any installed battery disconnect switch.
4. Unplug the control system if possible.
5. Connect the welding ground cable as close as possible to the area to be welded.
6. Protect the wiring harness from welding debris and spatter.
7. Use standard welding methods to weld the materials.

General Troubleshooting

For additional information, refer to engine manufacturer troubleshooting guide.

No response from starter motor

Possible Cause	Possible Remedy
No battery voltage to starter	Verify wiring and battery connection (power and ground)
Battery discharged	Charge or replace battery, verify alternator charging
Tripped over current protection	Correct fault, replace FUSE
No signal from ECU	No power to ECU, CHECK ECU and Fuses
Defective starter solenoid	Replace starter solenoid
Defective starter motor	Replace starter motor

Engine will crank but not start

Possible Cause	Possible Remedy
Engine not getting fuel	Check fuel level, filter, fuel pump, verify no air in fuel lines
ECU is not functioning	See ***Engine Troubleshooting***
Blown Fuse	Correct fault, replace fuse.
No preheat (cold condition)	Check Relay Check ECU

Engine runs and shuts down

Possible Cause	Possible Remedy
ECU shutdown	Use display to view ECU diagnostic codes, use ECU diagnostic tool for more detailed information
Circuit overload protection tripped	Correct overload, keep control system from overheating (over 167° F or 75° C)

Alternator not charging battery

Possible Cause	Possible Remedy
Broken or slipping alternator drive belt	Adjust or replace alternator drive belt
Alternator not excited	Verify excitation circuit connected, replace faulty regulator
Alternator output not connected	Install charge wire
Alternator not grounded	Clean or add ground connection
Alternator faulty	Replace faulty alternator

Engine Troubleshooting

Note

Most problems with ECU controlled engines can be pinpointed via the ECU diagnostic messages. Use the display or ECU diagnostic tool to view fault codes.

All engine state information and diagnostic codes shown by the CP600 display are broadcast via the CANbus.

ECU does not power-up

Possible Cause	Possible Remedy
No power to ECU	Locate reason for lack of power and correct (Circuit overloaded? Faulty wiring?)
Blown Fuse	Correct fault, replace Fuse
Faulty ECU	Replace ECU
Emergency-Stop engaged	Disengage Emergency-Stop

Engine not getting fuel

Possible Cause	Possible Remedy
Empty fuel tank	Fill Fuel Tank with #2 Diesel Fuel. Low Sulfur Only
Clogged Fuel Filter	Replace Fuel Filter
Air in fuel lines	Bleed fuel lines
Low fuel pressure	Replace faulty fuel pump and/or clogged filter
Faulty fuel pump	Replace fuel pump.

Preheat Troubleshooting

Engine is hard to start in cold conditions

Possible Cause	Possible Remedy
Start attempt before preheat complete	Wait for preheat time to elapse, crank as soon as time elapses
Heater faulty	Replace heater
Heater relay faulty	Replace relay
Preheat control not functioning	Correct wiring, correct ECU configuration
Faulty control system	Repair or replace ECU

Engine produces excessive white smoke after starting

Possible Cause	Possible Remedy
Afterglow not enabled	Reconfigure ECU
Heater faulty	Replace heater
Heater relay faulty	Replace relay
Preheat control not functioning	Correct wiring, correct ECU configuration
Faulty control system	Repair or replace ECU

Control System Troubleshooting

Control system does not perform self test

Possible Cause	Possible Remedy
Blown Fuse	Correct fault, replace Fuse
Faulty connection to battery	Correct battery connections (see **Battery Circuit Requirements**)
Faulty control system	Repair or replace control system

Display does not display data

Possible Cause	Possible Remedy
Display lost power	Turn on key, verify display plugged into harness
Engine Source address incorrect	Change Engine Address in Configuration
Display Address incorrect	Change Display Address to 40 (default)
Display configuration problem	Reset display using **Restore Defaults**
CANbus failure	Check CANbus (see **Testing CANbus**)
ECU not sending data	Repair or replace ECU

Testing CANbus

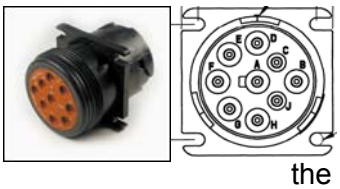
Most information provided to the CP600 display is sent by the ECU via the CANbus. CANbus is an international data bus used to support SAE J1939. If this connection is broken or improperly terminated, the CP600 display cannot show ECU parameters such as engine hours, oil pressure and diagnostic codes. This test procedure helps identify the problem location.

1. Disconnect the battery.

Warning

This test should be completed with the battery disconnected! Failure to disconnect the battery may cause ECU, panel or test equipment damage!

2. Identify the engine diagnostic plug. Plug is on right side of engine near the Oil filter. Remove Cap. Connect an ohmmeter across the CANbus pins of the diagnostic plug. Pin # C and D. Wires are green and Yellow



3. A reading of 60Ω indicates both ends of the bus are terminated and the bus is intact.

4. A reading of 120Ω indicates only one end of the bus is terminated. Identify the CANbus terminator on the engine harness and remove and remove plug.

   a. An ohmmeter reading of 120Ω indicates the bus to the terminator in the panel is complete and the problem is between the panel and the engine terminator.

   b. An open circuit ohmmeter reading indicates the bus to the engine terminator is complete and the problem is between the panel and the diagnostic plug.

5. Reinstall the terminator resistor and reconnect the battery.

    a. If the ECU diagnostic tool (John Deere Service Advisor)is available, use it to verify the ECU is transmitting CANbus data. Refer to ECU documentation to identify and correct the error.

    b. If another panel is available for testing, replace the panel to determine if the error is in the panel.

Diagnostic Trouble Codes (DTC) List

CANbus Diagnostic Trouble Codes are a pair of numbers; the Suspect Parameter Number (SPN) and Failure Mode Identifier (FMI). The SPN indicates the faulting subsystem and the FMI identifies the type of failure. Provide SPN and FMI numbers when contacting service dealers.

Standard SPN and FMI codes are defined by SAE J1939-71. Not all standard codes are used by this ECU. Manufacturers may add additional SPN codes beyond the codes identified in J1939-71. Refer to ECU documentation for supported SPN and FMI codes.

Diagnostic Trouble Code (DTC) Group Location Index Use By Deere Engines

SPN	.FMI	Description	Group	**Corrective Action**	Engine Group Ref
029	.03	Throttle #2 Signal Out of Range High		Not Used	
029	.04	Throttle #2 Signal Out of Range Low		Not Used	
091	.03	Throttle #1 Signal Out of Range High		Not Used , Contact Service	167
091	.04	Throttle #1 Signal Out of Range Low		Not Used , Contact Service	167
091	.07	Throttle #1 Not Responding		Not Used , Contact Service	167
091	.13	Throttle #1 Out of Calibration		Not Used , Contact Service	167
094	.03	Low Pressure Fuel Signal Out of Range High		Check Fuel Pressure Sender/Wiring	165
094	.04	Low Pressure Fuel Signal Out of Range Low		Check Fuel Pressure Sender/Wiring	165
094	.17	Low Pressure Fuel Signal Slightly Low		Contact Deere Service	165
097	.00	Water in Fuel (WIF) Detected		Drain Fuel and water from Fuel Filter	165
097	.03	WIF Indicator Voltage High		Check WIF Sender/Wiring	165
097	.04	WIF Indicator Voltage Low		Check WIF Sender/Wiring	165
097	16	Water in Fuel (WIF) Detected		Drain Fuel and Water from Fuel Filter	165
097	16	Water in Fuel (WIF) Detected		Drain Fuel and Water from Fuel Filter	165
100	.01	Engine Oil Pressure Signal Extremely Low		Check Engine Oil Level	164
100	04	Engine Oil Pressure Signal Out of Range Low		Check Oil Pressure Sender/Wiring	164
105	.00	Intake Manifold Air Temperature Signal Extremely High *		Check Air Cleaner After Cooler Air Temp	162
105	.03	Intake Manifold Air Temperature Signal Out of Range High		Check intake Manifold Sensor and Wiring	162
105	.04	Intake Manifold Air Temperature Signal Out of Range Low		Check intake Manifold Sensor and Wiring	162
105	.15	Intake Manifold Air Temperature Signal Slightly High		Check Air Cleaner After Cooler Air Temp	162
105	.16	Intake Manifold Air Temperature Signal Moderately High		Check Air Cleaner After Cooler Air Temp	162
108	.02	Barometric Pressure Signal Invalid		Contact Deere Service	166
110	.00	Engine Coolant Temperature Signal Extremely High **		Check Cooling System Reduce Power	163
110	.03	Engine Coolant Temperature Signal Out of Range High		Check Cooling Sensor and Wiring	163
110	.04	Engine Coolant Temperature Signal Out of Range Low		Check Cooling Sensor and Wiring	163
110	.15	Engine Coolant Temperature Signal Slightly High		Check Cooling System Reduce Power	163
110	.16	Engine Coolant Temperature Signal Moderately High *		Check Cooling System Reduce Power	163
111	.16	Blade Coolant Flow to Low **		Set Water Safety Switch, Check water	163
158	.17	ECU Power Down Error		Contact Deere Service	166
174	.00	Fuel Temperature High **		Check/Clean Fuel Cooler, Add Fuel	165
174	.02	Fuel Temperature Sensor Defective		Replace Fuel Temp Sensor	165
174	.03	Fuel Temperature Signal Out of Range High		Check Fuel Temp Sensor /Wiring	165
174	.04	Fuel Temperature Signal Out of Range Low		Check Fuel Temp Sensor /Wiring	165
189	.00	Engine Speed De-rate Condition Exists		Check Fault Codes /Contact Service	166
611	.03	Injector Shorted to Power		Check Wiring	165
611	.04	Injector Shorted to Ground		Check Wiring	165
627	.01	All Injector Circuits Have High Resistance		Check Battery Voltage and Wiring	165
627	.18	Battery Voltage Moderately Low		Charge Battery Contact Service	166
629	.12	ECU EEPROM Error		Contact Deere Service	166

629 .13 ECU Boot Block Error	Contact Deere Service	166
636 .02 Camshaft Sensor Signal Invalid	Check Camshaft Sensor and Wiring	161
636 .05 Camshaft Sensor Circuit Has High Resistance	Contact Deere Service	161
636 .06 Camshaft Sensor Circuit Has Low Resistance	Contact Deere Service	161
636 .08 Camshaft Sensor Signal Missing	Check Camshaft Sensor and Wiring	161
636 .10 Camshaft Sensor Signal Rate of Change Abnormal	Check Camshaft Sensor and Wiring	161
637 .02 Engine Timing Sensor Signal Invalid	Check Crankshaft Sensor and Wiring	161
637 .05 Engine Position Sensor Circuit Has High Resistance	Contact Deere Service	161
637 .06 Engine Position Sensor Circuit Has Low Resistance	Contact Deere Service	161
637 .07 Engine Timing and Position Signals Out of Sync	Check Crankshaft Sensor and Wiring	161
637 .08 Engine Timing Sensor Signal Missing	Check Crankshaft Sensor and Wiring	161
637 .10 Engine Timing Signal Rate of Change Abnormal	Check Crankshaft Sensor and Wiring	161
651 .05 Injector #1 Circuit Has High Resistance	Check Injector Wiring and Solenoid	165
651 .06 Injector #1 Circuit Has Low Resistance	Check Injector Wiring and Solenoid	165
651 .13 Injector #1 Calibration Fault	Contact Deere Service	165
652 .05 Injector #2 Circuit Has High Resistance	Check Injector Wiring and Solenoid	165
652 .06 Injector #2 Circuit Has Low Resistance	Check Injector Wiring and Solenoid	165
652 .13 Injector #2 Calibration Fault	Contact Deere Service	165
653 .05 Injector #3 Circuit Has High Resistance	Check Injector Wiring and Solenoid	165
653 .06 Injector #3 Circuit Has Low Resistance	Check Injector Wiring and Solenoid	165
653 13 Injector #3 Calibration Fault	Contact Deere Service	165
654 .05 Injector #4 Circuit Has High Resistance	Check Injector Wiring and Solenoid	165
654 .06 Injector #4 Circuit Has Low Resistance	Check Injector Wiring and Solenoid	165
654 .13 Injector #4 Calibration Fault	Contact Deere Service	165
655 .05 Injector #5 Circuit Has High Resistance	Check Injector Wiring and Solenoid	165
655 .06 Injector #5 Circuit Has Low Resistance	Check Injector Wiring and Solenoid	165
655 .13 Injector #5 Calibration Fault	Contact Deere Service	165
676 .03 Glow Plugs Signal Received When Not Expected	Contact Deere Service	165
676 .05 Glow Plugs Signal Not Received When Expected	Contact Deere Service	165
676 .05 Glow Plugs Signal Not Received When Expected	Contact Deere Service	165
970 .31 Auxiliary Shut Down Low Fuel **	Check /Add Fuel	166
1110 .00 Engine Protection Shutdown	Check Fault Codes	166
1136 .00 ECU Temperature High, Most Severe	Contact Deere Service	166
1136 .16 ECU Temperature High Moderately Severe	Contact Deere Service	166
1569 .31 Engine in De-rate Condition (reduced Power)	Check Fault Codes	166
2003 .09 No CAN Message Received From Source Address 17 Within Time Out Period	Contact Deere Service	168
2023 .09 Message ETCP 1 from ICC is timed out	Contact Deere Service	168
3509 .03 Sensor Supply #1 Voltage Out of Range High	Contact Deere Service	166
3509 .04 Sensor Supply #1 Voltage Out of Range Low	Contact Deere Service	166
3510 .03 Sensor Supply #2 Voltage Out of Range High	Contact Deere Service	166
3510 .04 Sensor Supply #2 Voltage Out of Range Low	Contact Deere Service	166
3511 .03 Sensor Supply #3 Voltage Out of Range High	Contact Deere Service	166
3511 .04 Sensor Supply #3 Voltage Out of Range Low	Contact Deere Service	166
3597 .01 Injector Power Supply Voltage Extremely Low	Check Battery Contact Deere Service	168
3597 .18 Injector Power Supply Voltage Moderately Low	Check Battery Contact Deere Service	168
524037 .02 MFWD Switch Circuit Fault	Contact Deere Service	168
524223 .03 Rear Axle Differential Lock Circuit Fault	Contact Deere Service	168
524225 .31 Engine Start Protection Bypass Detected	Contact Deere Service	168
524235 .03 MFWD Solenoid Circuit Voltage High	Contact Deere Service	168
524235 .04 MFWD Solenoid Circuit Voltage Low	Contact Deere Service	168

Data Parameters Monitored

This table lists the engine parameters that are monitored via the CANbus on this John Deere Engine. The parameters are displayed on gauge pages or the single analog gauge or the Data Base Viewer. The complete database can be accessed on the display via the Configuration menu DB Viewer .

Icon	Parameter	Gauge Pages	Single Analog	Database
Electrical (Volts or Amps)				
	Battery Potential Switched	●	●	●
Fuel (L, Gal, IGal) or (L/h, Gal/h IGal/h) or (km/L, MPG or IMPG)				
	Fuel Rate	●	●	●
	Total Fuel Used	●	●	●
Pressure (kPa, PSI or bar)				
	Fuel Delivery Pressure	●	●	●
	Engine Oil Pressure	●	●	●
Temperature (ºC or ºF)				
	Engine Coolant Temperature	●	●	●
	Fuel Temperature	●	●	●
	Intake Manifold 1 Temperature	●	●	●
Percentage (%)				
	Drivers Demand Percent Torque	●		●
	Actual Engine Percent Torque	●	●	●
	Torque Use at RPM	●	●	●
Speed (RPM)				
	Output Shaft Speed			●
	Engine Speed	●	●	●
	Engine Desired Operating Speed			●
Time (h)				
	Total Engine Hours	●		●
	Service Hours			●

Abbreviations

The units *MPG* and *Gal* denote US gallons. For non-US US gallons (UK, Canada, etc) the units are denoted as *IMPG* or *IGal*.

Note

If a parameter is not available it will not be possible to select it.
If a parameter becomes unavailable while in view **---** is displayed.

Glossary

CAN Controller Area Network (also referred to as CANbus); serial communications protocol for electronic engines use

DTC Diagnostic Trouble Code; the combination of SPN and FMI that identifies a specific error

ECU Engine Control Unit; electronic device responsible for controlling and monitoring engine operation

FMI Failure Mode Identifier; defines the type of failure detected in the subsystem identified by the SPN

ISO	International Standard Organization; an international organization working with the United Nations that maintains technology standards for global industry
J1939	SAE engine data protocol using CAN 2.0B
LCD	Liquid Crystal Display; a display technology that uses electric current to align crystals in a special liquid. When current is applied the crystals change their orientation creating a darker area.
RS-232	Standard electrical interface for serial communications
RS-485	Standard differential electrical interface for serial communications
SAE	Society of Automotive Engineers; professional association of transportation industry engineers that sets most auto-industry standards for the testing, measuring, and designing of automobiles and their components
Soft buttons	Push buttons whose function changes according to use
SPN	Suspect Parameter Number; a number used to identify a particular element, component or parameter associated with an ECU

Note

The messages, icons and error codes displayed
conform to J1939 standards wherever possible.

A copy of the relevant standards documents may be accessed and purchased at:
http://www.sae.org/standardsdev/groundvehicle/j1939a.htm

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