

## 1 OVERVIEW

The JDR Series is a J1939 diagnostic code reader designed to display the numeric value or the text translation of a trouble code being reported by an engine's electronic control unit (ECU). The unit can read both active and stored codes.

The JDR050 displays 6 digits and 4 alpha numeric characters. The 6 digits are used to display numbers such as the DTCs. The 4 alpha numeric characters are used to display text such as the DTC field identifier (DTC, FMI, OC, SRC), or, if text mode is enabled, the description of the field.

JDR100 provides the same code information as the JDR050, but also supports six live engine parameters: RPM, Oil Pressure, Coolant Temperature, Fuel Level, Battery Voltage, Engine Run Hours, as well as J1939 stop, warning, malfunction, and protection status messages.

JDR050-IV and JDR100-IV support Tier IV Diesel Particulate Filter (DPF) operations. The Tier-IV JDR's are designed to support Tier IV engine particulate filter regeneration functions. The DPF regeneration cycle can be enabled or disabled. The operator can use the JDR to manually force a regeneration cycle.

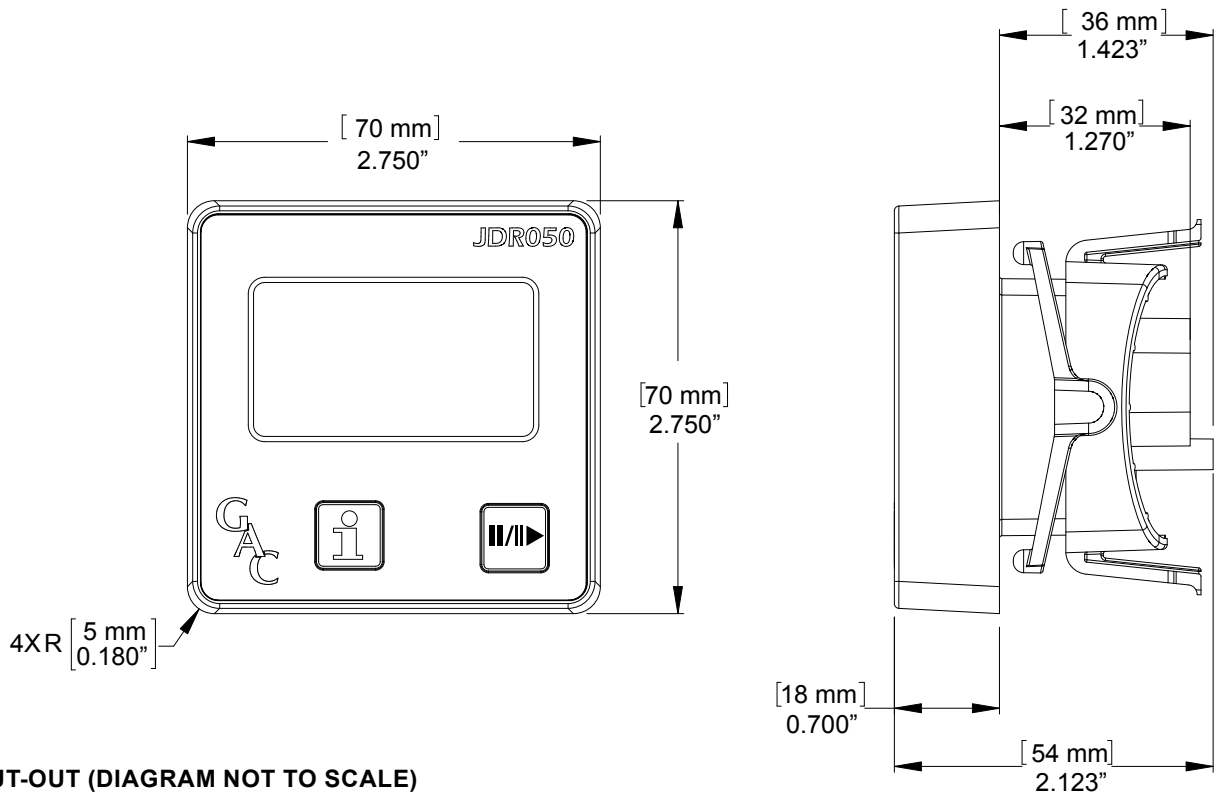


## 2 SPECIFICATIONS

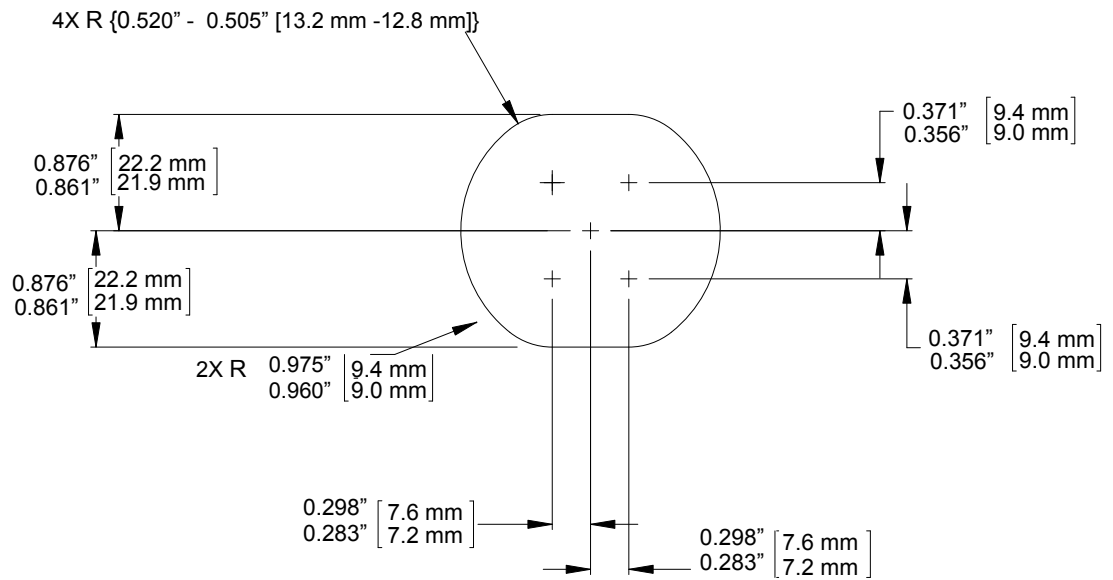
POWER INPUT		
Operating Voltage		8-32 V DC (0 V 50 ms transient condition)
Current Draw		0.25 A @ 12 V, Reverse polarity protected
PHYSICAL		
Overall		2.75 x 2.75 x 2.123 in [70 x 70 x 54 mm]
Front to Back		2.75 x 2.75 x 0.7 in [70 x 70 x 18 mm]
Panel Opening		2 in round [51 mm]
CAN BUS		
J1939 SAE Compliment		( V1 when CM = 1, V4 when CM = 0 ) 120 CANbus termination resistor included
ENVIRONMENTAL		
Ambient Temperature Range		-40° to +85 °C [-40° to +185 °F]
Relative Humidity		Up to 100 %
IP67 Front		Resistant Direct Spray
IP69K Rear (w. Deutsch Connector)		Sealed (no fogging)
Shock		20 g Peak
Vibration		10 g, 200 - 2000 Hz

### 3 INSTALLATION

The JDR is mounted using a retaining ring, and requires a hole be drilled in a selected location for optimal viewing of the J1939 codes.

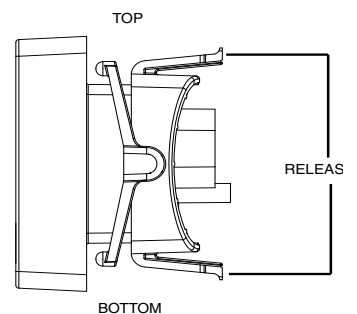


**PANEL CUT-OUT (DIAGRAM NOT TO SCALE)**

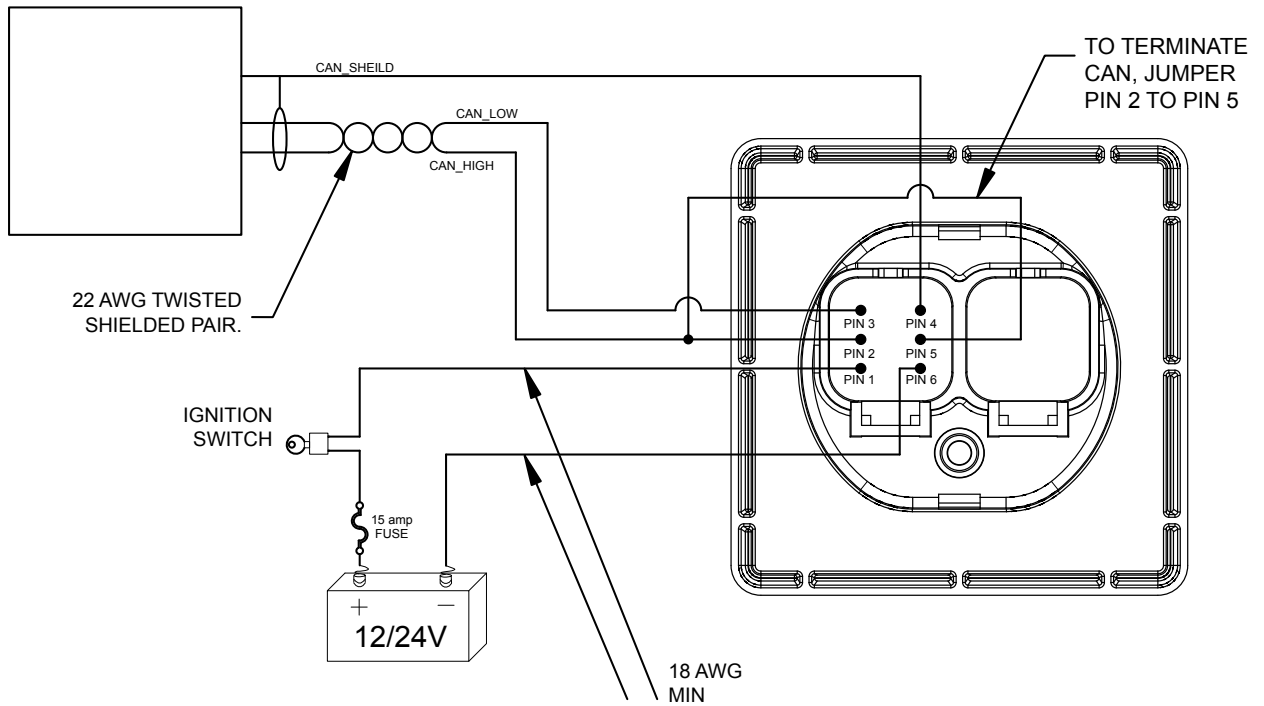


#### MOUNTING JDR TO A PANEL

1. Ensure power is turned off.
2. Cut mounting hole, per Panel Cutout diagram above.
3. Note the orientation of the retaining ring. The releases on the retaining ring are on the top and bottom.
4. With retaining ring off, slide JDR into mounting hole. Make sure the JDR is facing upward and outward.
5. While holding the front of the JDR, slide the retaining ring on back until snug. Do not over tighten.

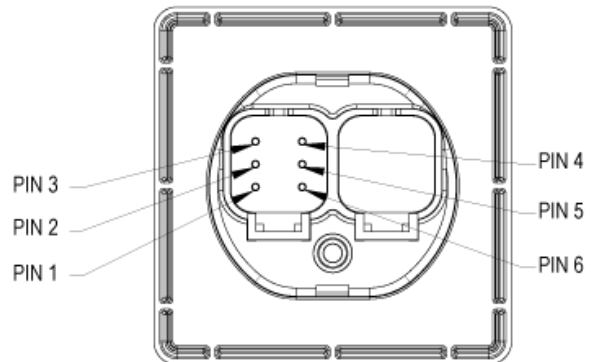


ENGINE CONTROL  
MODULE  
(SAE J1939 COMPLIANT)



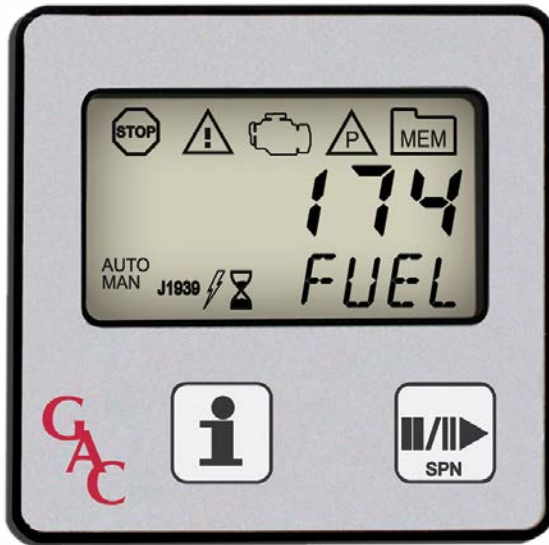
WIRING JDR TO PANEL

1. Remove power from engine.
2. Note the orientation of the connector to the engine. The JDR release is on the bottom.
3. Plug the engine connector (connection with male pins outs) into the left connection on the rear of the JDR.
4. To terminate CAN, jumper Pin 2 to Pin 5.

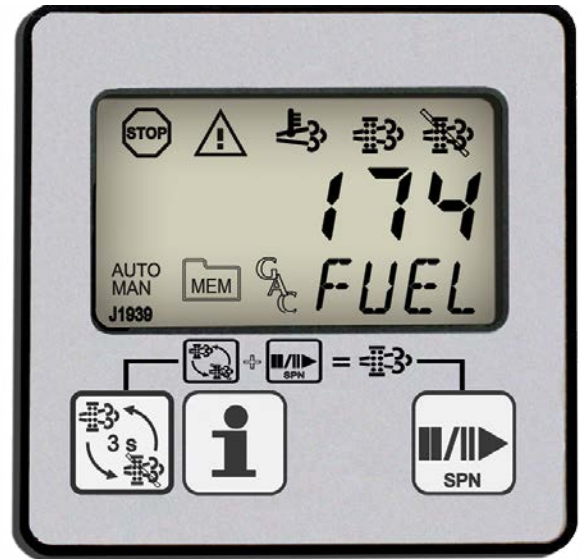


PIN	DEFINITION
1	V+
2	CAN H
3	CAN L
4	CAN SHIELD
5	CAN H TERMINATION
6	V-

JDR050



JDR050 IV



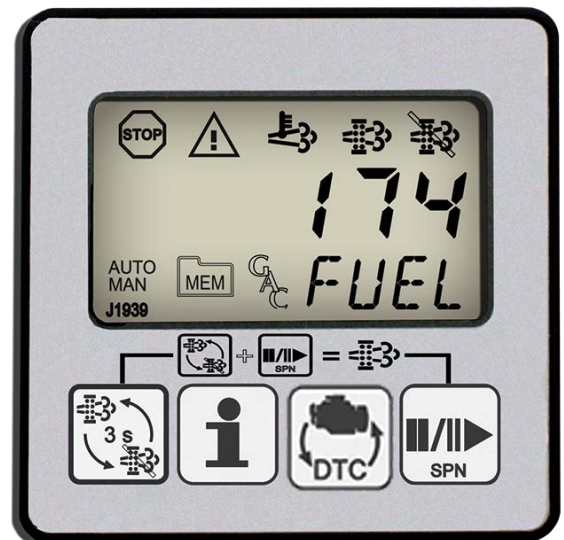
BUTTON	Definition	JDR050		JDR100		DESCRIPTION*
		Std	IV	Std	IV	
	Retrieve detailed information	•	•	•	•	Extracts the next part of the DTC. Cycles through DTC, FMI, OC, and SRC. Also used to switch the JDR into Manual Mode and to clear stored values.
	Pause / Resume / Next SPN	•	•	•	•	Used to switch the JDR into Manual Mode. Press and hold to return to AUTO MODE, and to examine the next DTC in the list (from Manual Mode).
	Change Function of Reader			•	•	Alternates view between live engine parameters and diagnostic trouble codes.
	DPF Regen Control		•		•	Diesel particulate filter control button. Used to enable and disable regeneration. Also used in conjunction with SPN button to force manual regeneration.

\* Acronym definitions are listed in Section 6, J1939 Definitions.

JDR100



JDR100 IV



## J1939 DEFINITIONS

ACRONYM	DEFINITION
DTC	Diagnostic Trouble Code – ECU reported failure. DTC's consists of several parts, an SPN, FMI, OC, SCR. J1939 DTC's are divided into two categories, active and stored (also referred to as <i>previously active codes</i> ). Active codes are present when a condition is present. Stored codes are a record that the condition occurred.
SPN	Suspect Parameter Number – Parameter being affected.
FMI	Failure Mode Indicator – Description of the failure.
OC	Occurrence Count – The number of times the failure has occurred.
SRC	Source – CAN Address of ECU reporting DTC.
DM1	Active DTCs.
DM2	Stored DTCs (also referred to as <i>previously active codes</i> ).
DM3	J1939 message transmitted to clear stored codes.











When powered on, the JDR will illuminate all segments of the LCD display, power on all LED indicators then display the current version of the software. This gives the user the opportunity to verify the validity of these components. After displaying the version number, the JDR will go into Auto Mode. For a list of descriptions for the LCD indicators, see Section 8, LCD INDICATORS.

The JDR050 and JDR050 IV will cycle through all active DTCs when first powered on.

The JDR100 and JDR100 IV will display live engine parameters. While performing the live engine parameter display function, the JDR accepts RPM, Oil Pressure, Coolant Temperature, Fuel Level, and Battery Voltage messages from the engine ECU. The Tier IV JDR can also display the fuel rate. The JDR has its own internal memory to maintain engine run hours.

**NOTE**

Not all engine ECUs supply Fuel Level and Battery Voltage. To switch to DTC display mode, press the  button.

INDICATOR	DEFINITION	JDR050		JDR100		DESCRIPTION
		Std	IV	Std	IV	
AUTO	Auto Mode	●	●	●	●	Unit is in Auto Mode.
MAN	Manual Mode	●	●	●	●	Unit is in Manual Mode.
	CANbus Traffic Detected	●	●	●	●	Valid CAN traffic is being received. Primarily used for troubleshooting. If indicator is not lit, the JDR is not properly connected to a CAN network, or is not detecting the engine ECU.
J1939	J1939 CANbus traffic detected	●		●		CAN traffic has been detected which qualifies as J1939. Primarily for troubleshooting. If the CAN traffic indicator is lit and the J1939 indicator is not lit, it is possible that the engine ECU is not communicating via SAE J1939.
	Busy	●		●		Unit is performing a time consuming operation.
	J1939 Engine Stop	●	●	●	●	Lit and/or flashed by engine ECU. See engine manual for definition.
	J1939 Warning	●	●	●	●	Lit and/or flashed by engine ECU. See engine manual for definition.
	J1939 Malfunction	●		●		Lit and/or flashed by engine ECU. See engine manual for definition.
	J1939 Protection	●		●		Lit and/or flashed by engine ECU. See engine manual for definition.
	Stored DTC	●	●	●	●	In Auto Mode, indicates stored codes are present; in Manual Mode indicates the information being displayed is for a stored code.
	High Exhaust Temperature		●		●	Indicates high exhaust temperature – typically HEST indicates regeneration in process.
	Diesel Particulate Filter		●		●	Indicated diesel particulate filter requires regeneration
	Regeneration Inhibit		●		●	Indicates regeneration is disabled (automatic and manual)

## 9 AUTO MODE

In AUTO mode the JDR will cycle through the parameters of the given function. For example, when displaying live engine parameters (JDR100 only) the JDR will cycle through the engine parameters which do not have a zero priority. The following cycle is followed:

1. While displaying DTCs (JDR050 % 100) the JDR will first cycle through all of the active DTCs.
2. When the JDR reaches the end of the active DTCs, the JDR will begin displaying stored DTCs (should there be any). These will be indicated by the MEM indicator.
3. When the last stored DTCs is reached, the JDR will restart displaying the active DTCs at the beginning of the list.

The detailed information about the active DTCs and stored DTCs can only be examined while in Manual Mode.

## 10 MANUAL MODE

### SWITCHING BETWEEN AUTO MODE TO MANUAL MODE

Press the information **i** or next **▶** button. The JDR will display the current active SPN. To return to Auto Mode, from Manual Mode, you can press and hold the SPN button for 3 seconds, or, the unit will automatically return to Auto Mode when the unit detects no user activity for the amount of time specified by the IDLE user configurable parameter.

### DISPLAYING TEXT OF PARAMETERS

While looking at LIVE engine parameters, press the **i** button to display the text for the parameter being displayed.

### VIEWING DETAILED INFORMATION

While looking at DTCs, each time you press the **i** button the JDR displays the underlying information for the DTC. The information is played in the following order:

1. SPN
2. FMI
3. OC
4. SRC

When displaying DTCs, the JDR will start displaying the information of the current active DTC. By pressing **▶** button, the JDR will go to the next active DTC. When the JDR reaches the end of the active DTCs, the JDR will restart displaying the active DTCs at the beginning of the list.

## 11 USER CONFIGURATION MODE

### USER CONFIGURATION MODE

To enter User Configuration mode:

1. Press the Information button **i** or the **▶** button and simultaneously hold **i** and **▶** for 3 seconds.

### CYCLE THROUGH CONFIGURABLE PARAMETERS

To cycle through all the configurable parameters:

1. Press the **▶** button.
2. When you reach the end of the list, the JDR will go back to the top of the list.

## 11 USER CONFIGURATION MODE (CONTINUED)

### SETTING A CONFIGURABLE PARAMETER VALUE

To set the value press the **i** button. The JDR will select the next valid parameter.



Take care when changing the engine ECU and JDR CAN bus addresses. If not properly set, the JDR may not appear to be functioning.

CONFIGURABLE PARAMETERS				
ID	TEXT	DEFINITION	VALID RANGE	DEFAULT
10	ECU	CAN Address of ECU (255 accepts any address)	0-255	255
11	JDR	CAN Address for JDR100	0-254	201
12	RATE	Length of time JDR will display DTC (in seconds)	1-10 s (1 second intervals)	2 s
13	IDLE	Amount of idle time before JDR returns to previous state	5-60 s (5 second intervals)	10 s
14	DTCS	Maximum number of DTCs the JDR will accept	10, 25, 50, 100, 200, 240	240
15	TEXT	Scroll rate for text display of SPNs and FMIs	0-5 (0=no text, 1=fast, 5=slow)	2
16	CONV	J1939 Conversion Method (for engines that do not support conversion method 4)	1, 2, 3	1
17	DISP	Set the display mode on power to either engine parameters or DTCs.	0 = Engine Parameters 1 = DTCs	0
18	EDRT	Number of seconds to wait before displaying next engine parameter.	0-10 Sec (Continuous 1 sec increments; set to 0 unit will stay on current parameter)	5
19	UNIT	Configures JDR100 to display engine parameters in standard or metric units.	0 = Standard (F° / PSI) 1=Metric (C° / Bars)	0
20	P:RPM	The priority number assigned to the engine speed parameter.	0-10 (0 = do not display)	1
21	P:OIL	The priority number assigned to the oil pressure parameter.	0-10 (0 = do not display)	2
22	P:TMP	The priority number assigned to the coolant temperature parameter.	0-10 (0 = do not display)	3
23	P:HRS	The priority number assigned to the engine hours parameter.	0-10 (0 = do not display)	4
24	P:BAT	The priority number assigned to the battery voltage parameter.	0-10 (0 = do not display)	5
25	P:RAT	The priority number assigned to the fuel rate.	0-10 (0 = do not display)	6
26	P:FUL	The priority number assigned to the fuel level parameter.	0-10 (0 = do not display)	0



## 12 CLEARING STORED DTCS

If the ECU allows clearing of stored DTCS:

1. Set the JDR to view DTCs.
2. Access Manual Mode by pressing either the **f** or the **■/▶** button.
3. Press and hold **f** for 3 seconds - unit will then display DM3.
4. Press and hold **f** for another 3 seconds, unit displays SENT.
5. From this screen, you can only return to Manual Mode. To do this, press and hold the SPN button for 3 seconds, or the unit will automatically return to Manual Mode when the unit detects no user activity for the amount of time specified by the IDLE User configurable parameter.

## 13 RESETTING ENGINE RUN HOURS (JDR100)

The JDR is equipped with a counter to record the number of hours an engine has run. If the engine ECU provides the hours, the JDR will record the value from the ECU. If hours are not provided by the ECU, the JDR will increment the counter, when it sees engine speed.

To reset the hour counter:

1. Set the JDR to view live engine parameters.
2. Select Manual Mode by pressing either the **f** or the **■/▶** button.
3. Press and hold **f** for 3 seconds - unit will then display HRS.
4. Press and hold **f** for another 3 seconds, unit will displays DONE.
5. From this screen, you can only return to Manual Mode. To do this, press and hold the SPN button for 3 seconds, or the unit will automatically return to Manual Mode when the unit detects no user activity for the amount of time specified by the IDLE User configurable parameter.


## 14 FMI TEXT

The JDR can only display 4 text characters at any one time. Because of this limitation, GAC has opted to shorten the text of the standard FMI text. For detailed information regarding the FMI definitions please consult the SAE J1939 specification.

## 15 TIER IV DIESEL PARTICULATE REGENERATION


The Tier-IV JDR's are specifically designed to support Tier IV engine particulate filter regeneration functions. The DPF regeneration cycle can be enabled or disabled. The operator can use the JDR to manually force a regeneration cycle.

### TO ENABLE OR DISABLE DPF REGENERATION CYCLES:

1. Press and hold the TIER IV  button for 3 seconds.
2. The JDR will respond by displaying the word SENT.
3. The engine will then command the JDR to turn on or off the regeneration inhibit indicator to confirm whether regeneration is enabled or disabled.

**NOTE** When DPF regeneration is disabled, both automatic and manual regenerations are disabled.

### TO PERFORM A REGENERATION CYCLE:

1. Press and the TIER IV  button while simultaneously pressing **■/▶** .
2. The JDR will respond by displaying the word SENT.

**NOTE** If the DPF regeneration is disabled, the engine will not respond to this command.



SYMPTOMS	POSSIBLE PROBLEMS
Unit not operating / Back light not on	Check DC power
Unit powers on but "J1939 CAN bus Traffic Detected" indicator is not on	<ul style="list-style-type: none"> <li>Make sure the ECU is enabled.</li> <li>Check the polarity of CAN High and CAN Low.</li> <li>Check to make sure the CAN network has the proper resistance of 60Ω between CAN High and CAN Low when all devices on the CAN network are powered off.</li> </ul>
"J1939 CAN bus Traffic Detected" indicator on but is not receiving J1939 messages	Check that ECU is a J1939 ECU.
SPNs, which an ECU shouldn't be reporting, are being displayed	Check the age of the engine. If it does not support J1939 Conversion Method 4, then configure the unit with either conversion methods 1, 2, and 3.
No text is being scrolled when examining the SPN or FMI	<ul style="list-style-type: none"> <li>The unit is not equipped to display the text of the SPN and FMI.</li> <li>If the unit is equipped, in User Configuration Mode, make sure the TEXT parameter is not set to 0.</li> </ul>
Live engine parameter not being displayed (e.g., RPM)	<ul style="list-style-type: none"> <li>Check that JDR100 user configuration for the parameter is not set to 0.</li> <li>Verify that the engine ECU transmits the parameter. For example, some engines do not report fuel level or battery voltage.</li> </ul>
JDR100 is not displaying the live parameters in the proper units	<ul style="list-style-type: none"> <li>Check the JDR100 "UNIT" user configuration parameter (ID 19). It should be set to 0 for F° / PSI, and should be set to 1 for C° / Bars.</li> </ul>
The JDR100 is not cycling through the live engine parameters	<ul style="list-style-type: none"> <li>Check the EDRT user configuration parameter (ID 18). If it is set to 0, the JDR100 requires the SPN button to be pressed to cycle through the parameters.</li> <li>Check the user configured priorities (ID's 20-25) of each of the live engine parameters. If priority is set to 0, then the parameter will not be viewed.</li> </ul>
The SPN and FMI text scrolls too fast or too slow	In User Configuration Mode, adjust the TEXT parameter up or down accordingly.
Clear Stored Codes key sequence does not work	Unit is not equipped with that function.
DM3 is sent to the engine, but the stored codes are not cleared	The engine manufacturer has secured the engine, and does not allow the DM3 message to be executed.

If unsuccessful in solving data issue, contact GAC for assistance at [GAC@governors-america.com](mailto:GAC@governors-america.com) 413-233-1888.