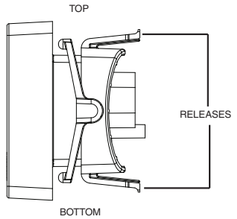
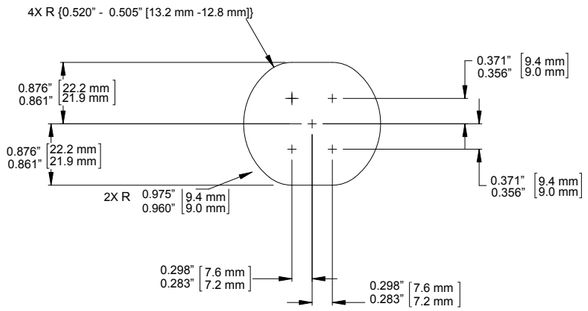
JDR Series
J1939 Diagnostic Reader

1 INSTALLATION

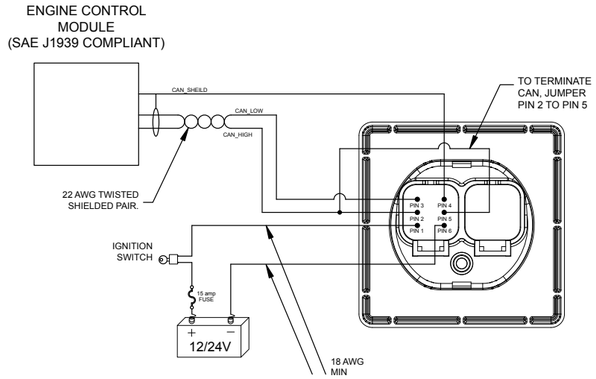
To mount the JDR to a panel:
1. Make sure power is turned off.
2. Cut mounting hole, per Panel Cutout Diagram.
3. Note the orientation of the retaining ring. The releases on the retaining ring are on the top and bottom.
4. With retaining ring off, slide JDR into hole. Make sure the JDR is facing upward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



Panel Cut-Out Diagram (not to scale)



2 BASIC WIRING



To Connect the JDR to a Panel:
1. Note the orientation of the connector from the engine. The release is on the bottom.
2. Plug the engine connector into the left connector on the rear of the JDR. This is the connector with the male pins.
3. Apply power and test the unit.

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

RECOMMENDATIONS
To terminate CAN, jumper PIN 2 to PIN 5

3 JDR MODELS & THEIR BUTTONS

JDR050

JDR050 IV

BUTTON DESCRIPTION						
Button	Definition	JDR050 Std	JDR050 IV	JDR100 Std	JDR100 IV	Description
i	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.
▮/▮▶ SPN	Pause / Resume / Next SPN	●	●	●	●	Used to switch the JDR into **Manual Mode**, when pressed and held it returns to **AUTO MODE**, and to examine the next **DTC** in the list (from **Manual Mode**).
DTC	Change Function of Reader			●	●	Alternates view between live engine parameters and diagnostic trouble codes.
	DPF Regen Control		●		●	Diesel particulate filter control button. Typically used to enable and disable regeneration. Also used in conjunction with **SPN** button to force manual regeneration.

JDR100

For a list of acronyms and their associated definitions that are used in this document, see the table below.

JDR100 IV

4 J1939 DEFINITIONS

J1939 DEFINITIONS	
Acronym	Definition
DTC	**Diagnostic Trouble Code** – ECU reported failure. **DTC**'s consists of several parts, an SPN, FMI, OC, SCR.
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 **DTC**s.
DM2	Stored **DTC**s (also referred to as "previously active codes").
DM3	J1939 message transmitted to clear stored codes.

DIAGNOSTIC TROUBLE CODES (DTCs)- J1939 **DTC**'s are divided into two categories, **active** and **stored** (also referred to as previously active). **Active codes** are present when a condition is present. **Stored codes** are a record that the condition occurred.

5 START-UP

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 showing the version number, the **JDR** will go into **Auto Mode.** For a list of descriptions for the LCD indicators, see section 6 LCD INDICATORS table.

JDR050 and **JDR050 IV**

Will cycle through all active **DTCs** when first powered on.

JDR100 and **JDR100 IV**

Will display live engine parameters when first powered on. 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 display the fuel rate. Should engine run hours not be supplied by the ECM, 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 DTC button.

6 LCD INDICATORS

LCD INDICATOR DESCRIPTION						
Indicator	Definition	JDR050 Std	JDR050 IV	JDR100 Std	JDR100 IV	Description
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 Indicator	●		●		Unit is performing a time consuming operation.
STOP	**J1939 Engine Stop indicator**	●	●	●	●	Lit and/or flashed by engine ECU. See engine manual for definition.
	J1939 Warning indicator	●	●	●	●	Lit and/or flashed by engine ECU. See engine manual for definition.
	J1939 Malfunction indicator	●		●		Lit and/or flashed by engine ECU. See engine manual for definition.
P	**J1939 Protection indicator**	●		●		Lit and/or flashed by engine ECU. See engine manual for definition.

LCD DESCRIPTION						
Indicator	Definition	JDR050 Std	JDR050 IV	JDR100 Std	JDR100 IV	Description
MEM	**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)

7 AUTO MODE

While in this 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.

While displaying **DTCs (JDR050 & 100)**, the **JDR** will first cycle through all of the active **DTCs**. 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. 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**.

8 MANUAL MODE

Switching between Auto Mode to Manual Mode:

Press i or ▮/▮▶. 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.

While looking at Live Engine Parameters:

Pressing the i button will display the text for the parameter being displayed.

While looking at DTCs:

Subsequent presses of the i button will reveal the underlying information for the **DTC.** The order in which this information is displayed: **SPN**, **FMI**, **OC**, and **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 begin displaying stored **DTCs** (should there be any). These will be indicated by the **MEM** indicator. When the last stored **DTCs** is reached, the **JDR** will restart displaying the active **DTCs** at the beginning of the list.

9 USER CONFIGURATION MODE

A **User Configuration Mode** is made available to adjust the behavior of the **JDR**.

To enter User Configuration Mode:

First enter **Manual Mode**. This is done by pressing either the i or the ▮/▮▶ button.

Next, simultaneously hold i and ▮/▮▶ for 3 seconds.

To cycle through the different configurable parameters:

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

To cycle a value of a configurable parameter:

Press the i button. The **JDR** will select the next valid parameter. **Care should be taken 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

CONFIGURABLE PARAMETERS				
ID	TEXT	Definition	Valid Range	Default
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 up to either engine parameters or DTCs.	0 = Engine Parameters 1 = DTCs	0
18	EDRT	Number of seconds to wait before switching to 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

10 CLEARING STORED DTCS

If the ECM allows the clearing of stored DTCs:
First, set the **JDR** to view **DTCs.**
Second, put the unit into **Manual Mode** by pressing either the ℹ or the ■/I▶ button.
Third, press and hold ℹ for 3 seconds - unit will then display **DM3**.
Fourth, press and hold ℹ for another 3 seconds, unit will then display SENT.

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 I**DLE User Configurable Parameter.**

11 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:
First, set the **JDR** to view live engine parameters.
Second, put the unit into **Manual Mode** by pressing either the ℹ or the ■/I▶ button.
Third, press and hold ℹ for 3 seconds - unit will then display **HRS**.
Fourth, press and hold ℹ for another 3 seconds, unit will then say DONE.

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.**

12 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.

13 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:
Press and hold the TIER IV button for 3 seconds.
The **JDR** will respond by displaying the word "SENT".

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 command the engine to perform a regeneration cycle:
Press and the TIER IV button while simultaneously pressing ■/I▶ .
The **JDR** will respond by displaying the word "SENT".

Note, if the **DPF** regeneration is disabled, the engine will not respond to this command.

14 SPECIFICATIONS

POWER INPUT	
Operating Voltage	8-32 VDC (0V 50ms transient condition)
Current Draw	0.25 Amp @ 12V, Reverse Polarity Protected
PHYSICAL	
Overall	2.75" x 2.75" x 2.123" (70mm x 70mm x 54mm)
Front to Back	2.75" x 2.75" x 0.7" (70mm x 70mm x 18mm)
Panel Opening	2" Round (51mm)
CAN bus	
J1939 SAE Compliant	(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	20G Peak
Vibration	10G, 200 - 2000Hz

ISO9001 CERTIFIED CE RoHS EGSA

ANOTHER QUALITY GAC PRODUCTS

ECA Series
Analog to CAN Adaptor

GAC's ECA Series of Analog to CAN Adapters allow for the simple integration of mechanically controlled engines into current CAN systems, converting analog inputs into J1939 CAN bus information. With this highly-affordable easy-to-use product, virtually any of your engine's vital signs can be monitored. The ECA050 and ECA100 adapters can also be retrofitted to older engines, allowing better monitoring and extending their useful life.

	MAG SPEED	+5VDC OUTPUT	4 RESISTIVE INPUTS	GROUND SENSE	VOLTAGE INPUT
ECA050			•	•	
ECA100	•	•	•	•	•

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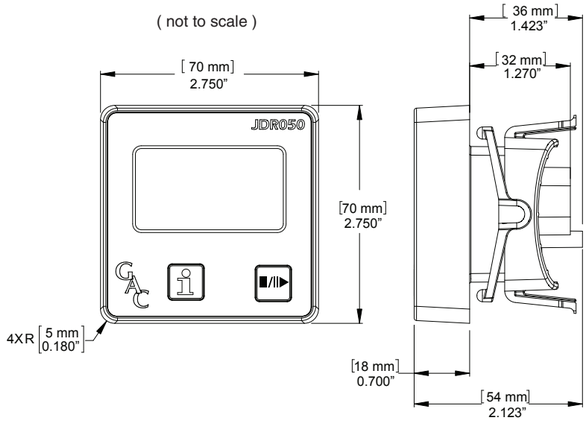
15 SYSTEM TROUBLESHOOTING

SYMPTOMS	POSSIBLE PROBLEMS
Unit not operating / Backlight not on	• Check DC power
Unit powers on but "J1939 CAN bus Traffic Detected" indicator is not on	• Make sure the ECU is enabled. • Check the polarity of CAN High and CAN Low. • 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.
"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	• The unit is not equipped to display the text of the SPN and FMI. • If the unit is equipped, in User Configuration Mode, make sure the TEXT parameter is not set to 0.
Live engine parameter not being displayed (e.g., RPM)	• Check that JDR100 user configuration for the parameter is not set to 0. • Verify that the engine ECU transmits the parameter. For example, some engines do not report fuel level or battery voltage.
JDR100 is not displaying the live parameters in the proper units	• 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.
On power up JDR100 is displaying DTCs	• Check the JDR100 "DISP" user configuration parameter (ID 17). It should be set to 0 to display live engine parameters on power up.

SYMPTOMS	POSSIBLE PROBLEMS
The JDR100 is not cycling through the live engine parameters	• 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. • 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.
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.
info@governors-america.com
413-786-5600

16 DIMENSIONS



GOVERNORS AMERICA CORP.®
720 Silver Street,
Agawam, MA 01001 USA
info@governors-america.com
www.governors-america.com