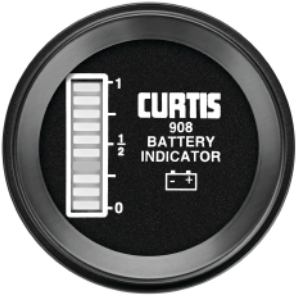
CURTIS® MODEL 908
"Fuel" Gauge



CURTIS

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53051 Rev C 9/15

Read Instructions Carefully!

SAFETY INSTRUCTIONS

This instrument was manufactured and tested according to the applicable technical standards. It complies with all the safety regulations as shipped from the factory.

Installation and startup must be performed by skilled personnel.

Failure to install and operate the unit in accordance with these instructions may result in damage or injury.

If safe operation of the instrument can no longer be ensured, stop and secure it against accidental operation.

If instrument failure or malfunction may cause personal injury or material damage, use additional safety measures such as limit switches, guards, etc.

Read the Operating Instructions carefully before startup.

Note the safety instructions marked with this warning symbol in this manual!

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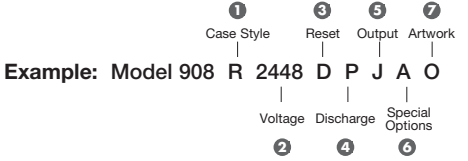
1. MODEL ENCODEMENT



1 **Case Style Options:**
R = Round (52mm)

2 **Voltage Options:**

Single	Dual
12	24/36
24	24/48
36	36/48
48	72/80
72	
80	

3 **Reset Profile Options**

Letter Code	Volts per Cell		
	Open Circuit Reset	Charge Tracking Reset Full	Charge Tracking Reset Empty
B	2.090	2.35	2.10
C	2.135	2.400	2.10
D	2.060	2.32	2.10
G	2.090	2.40	2.10
K	1.928	2.167	2.10
N	1.980	2.230	2.10
T	2.028	2.28	2.10
Y	2.083	2.167	2.10

4 Discharge Profile Options

Letter Code	Volts per Cell	
	Full	Empty
G	1.97	1.75
H	1.97	1.70
J	1.97	1.63
K	2.01	1.65
L	2.10	1.92
M	2.00	1.83
N	2.04	1.73
O	2.08	1.88
P	2.08	1.98
Q	2.10	1.88
R	2.02	1.90
S	2.08	1.85
T	2.03	1.90
V	1.98	1.85
W	2.02	1.85
X	1.95	1.75
Y	2.00	1.90
Z	2.04	1.82

5 Output Options

Letter Code	Relay	Contact Rating
J	Holding	3 Amps when continuously closed, 1 Amp when opening
K	N.C.	1 Amp
Y	N.O.	1 Amp

6 Special Options

A = (TBD)

7 Artwork Options

Letter Code	Logo
O	Curtis
N	None

2. TECHNICAL SPECIFICATIONS

2.1 Electrical Operating Voltage:

Operating Range: ±25% of nominal voltage.

Operating current at pin 7 (V+) or 8 (V++) for each nominal and maximum voltage is specified:

Rating V+/V++	Test Conditions V+ or V++ (Volts)		Operating Current (mA)		Notes
			Nominal	Maximum	
12	V+	12 (Nom)	17	—	For all test conditions: • V(Nom) is the rated value, e.g. 24 volts • V (Max) = V (Nom) +25% • J relay
		15 (Max)	—	29	
24/36	V+	24	26	—	
		30	—	39	
	V++	36	17	—	
		45	—	23	
36/48	V+	36	22	—	
		45	—	30	
	V++	48	16	—	
		60	—	22	

Rating V+/V++	Test Conditions V+ or V++ (Volts)		Operating Current (mA)		Notes
			Nominal	Maximum	
24/48	V+	24	26	—	For all test conditions: • V(Nom) is the rated value, e.g. 24 volts • V (Max) = V (Nom) +25% • J relay
		30	—	39	
	V++	48	15	—	
		60	—	21	
72/80	V+	72	22	—	
		90	—	28	
	V++	80	15	—	
		96	—	20	
96	V+	96	21	—	
		120	—	27	

2.2 Mechanical

Display
Battery state-of-charge: 10-bar, tri-color LED.

Hardware Kit
Mounting bracket, thumbnuts or M4 Hex nuts (2), lock washers (2).

Panel Cutout
52mm, 2 1/16" diameter

Mating Connector
Molex
Housing: 39-01-2085
Pins: 39-00-0039 (18-24 AWG)
39-00-0078 (16 AWG)

2.3 Environmental

Temperature
Operating: –40°C to +85°C
Storage: –50°C to +90°C

Humidity
95% RH (non-condensing) at 38°C

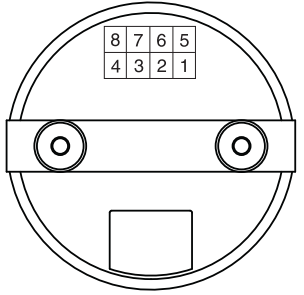
Shock and Vibration

Shock: per SAE J 1378 paragraph 5.6
12 shocks in each direction along each axis (72 shocks total). 44 to 55g amplitude, half sine of 9 to 13 ms.

Vibration: per SAE J 1378 paragraph 5.5
2 hours along each axis. Double amplitude of 1.52mm from 10-80-10 Hz (10g max) at intervals of 1 minute.

3. INSTALLATION

The Model 908 fits into a dash-panel cutout measuring 2 1/16" (52mm).



CURTIS Model 908 Rear View

Terminal Assignment (see diagram on page 14)

Pin 7 or 8 = Battery +

Single voltage models: Pin 7 to battery +; Pin 8, open.

Dual voltage models: When vehicle voltage is the higher voltage of the 2 operating voltages, Pin 8 connects to battery +; Pin 7, open. When vehicle voltage is the lower of the 2 operating voltages, Pin 7 connects to battery +, Pin 8, open.

The discharge indicator uses Pin 7 or 8 for its battery state-of-charge measurements. Connection are to be made as close as possible to battery to prevent voltage drops that will cause errors in discharge indicator readings. The connection is not to be switched by the vehicle's keyswitch.

Pin 5 = Battery –

Connect to battery ground as close to battery as possible.

Pin 2 = Keyswitch

The keyswitch turns on and off the LED display of the battery discharge indicator. Monitoring of the battery continues when Pin 2 is turned off and the display is not lit.

Pin 3 = Relay +

Pin 3 connects in series with the lift coil circuit (or the circuit to be switched at empty). For holding relay (J), Pin 3 must be electrically closer to battery + than Pin 4.

Pin 4 = Relay –

Pin 4 also connects in series with the circuit to be switched at empty.

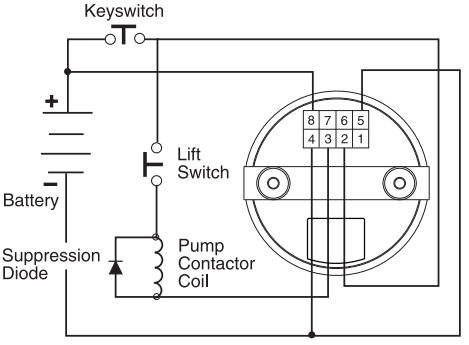
Pins 1 and 6 are not used.

NOTE: Fuses and Wires

Regulations may require that the Model 908 be fused. If installing a fuse, use a 10A fuse wired with 1.5mm or equivalent wire. The voltage drop across the fuse, its holder, and connectors must be less than 1% of the nominal system voltage.

Connections for Typical Model 908 Application

Vehicle system voltage is the higher of the two operating voltages of a dual voltage unit.

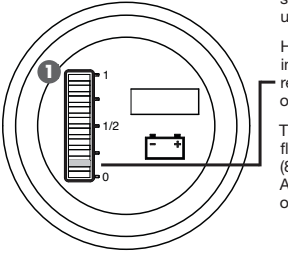


4. OPERATION

4.1 Display

The Curtis Model 908 combines in one instrument a completely solid state LED battery state-of-charge indicator and lift lockout.

The top LED 1 is lit only when the battery is properly charged. As the battery's state-of-charge decreases, successive LEDs light up one at a time.



Here, the LED flashes indicating "energy reserve" (70% depth of discharge).

The 2 bottom LEDs flash, indicating "empty" (80% depth of discharge). At this point, lift lockout occurs.

4.2 Reset Type/Level

(after or during recharge)

CTR (Charge Tracking Reset)

If the gauge is connected to the battery during recharge, the gauge will track battery charge levels.

OCR (Open Circuit Reset)

If the gauge is disconnected from the battery during recharge, the gauge will retain the last indication. It will advance to full when reconnected only of the battery voltage is above the OCR level. For standard (“B”) reset, OCR=2.09 VPC (Volts per cell).

5. TROUBLESHOOTING

The following checklist should help you troubleshoot any problem with Model 908.

Problem	Possible Cause
No display	Terminals not connected or improper voltage
Stays at FULL	Instrument voltage does not match battery voltage; B+ connected to the wrong terminal (see page 11)
Will not reset	Instrument voltage does not match battery voltage or battery not fully charged
Reset without charging battery	Not connected directly to battery terminals
EMPTY too soon	B+ connected to wrong terminal, or instrument voltage does not match battery voltage, or terminals not connected directly to battery

6. MAINTENANCE

Curtis Model 908 series is not field serviceable. Return defective units to your distributor for warranty coverage.

7. WARRANTY

Curtis Instruments' products and/or components are guaranteed against defects in workmanship and material for a period of one year, or as defined in the individual product literature, from date of shipment from our factory, when applied in a proper application within specified ratings. This guarantee is limited to repair or replacement F.O.B. our factory. There is no further warranty or implied representation, guarantee, promise or agreement as to any Curtis Instruments product and/or component. Curtis Instruments, Inc., cannot assume responsibility or accept invoices for unauthorized repairs to its products and/or components, even though defective. In no case will Curtis Instruments' responsibility extend to products, components or equipment not of its manufacture. Under no circumstances shall Curtis Instruments, Inc., be liable for any special or consequential damages or loss of profits or other damages. Returned goods will not be accepted unless identified by a Curtis Return Material Authorization (RMA).

All specifications are subject to change without notice.