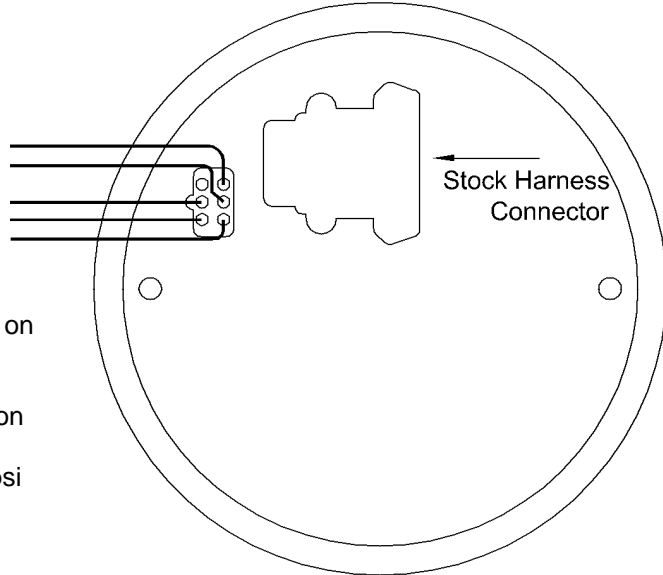




MODEL MCL-2011(-R)
TANK MOUNT SPEEDOMETER/TACHOMETER FOR 5" CAN BUS APPLICATIONS

Wiring Diagram

red pressure sensor power WHITE/RED
black pressure sensor ground BLACK
temp sensor ground BLACK
temp sensor signal BLUE
white pressure sensor GRAY

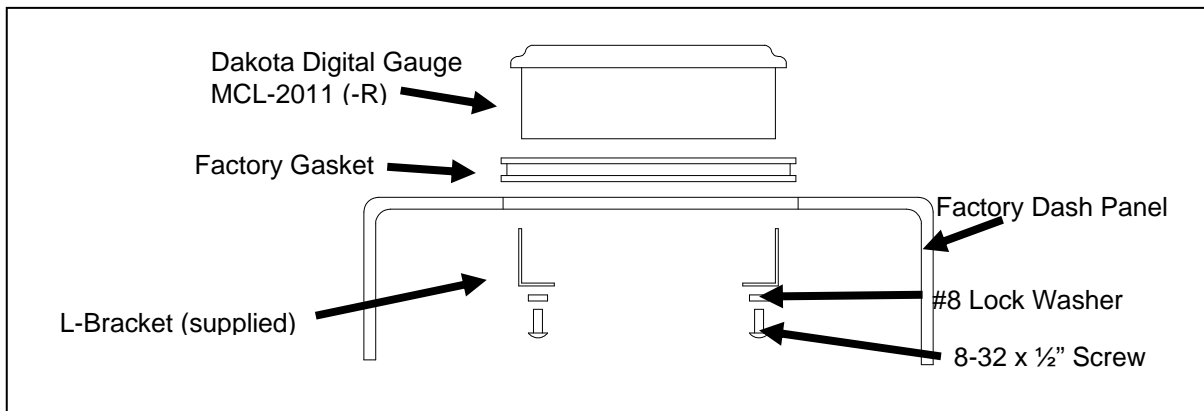


The MCL-2011(-R) gauges will work on 2011 - up Softail models with 5" gauges and 2012 - up Dyna models with 5" gauges. It is a direct plug in on these models and requires no additional wiring. Auxiliary temp or psi sensors can be wired to the gauge.

IMPORTANT NOTE! This gauge has an odometer preset option that is only available for the first 100 miles (160km) of operation. See "preset odometer" for instructions.

Mounting:

The MCL-2011(-R) is designed to fit in the "Fat Bob" style five-inch diameter dash-mount gauge openings.



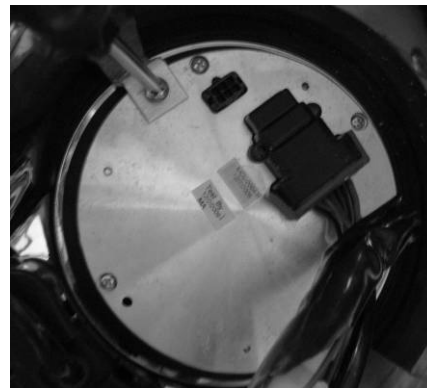
- Remove the dash
- Unclip and unplug the factory gauge



- Insure that the rubber gasket is still in the dash or remove from factory gauge and place back on dash



- Insert new gauge from front of dash
- Plug in and turn on so you can straighten the gauge in the dash
- Use supplied L-brackets along with the 8-32 screws and lock washers to secure the gauge
- Reinstall the dash



Wiring

The gauge is a direct plug in on 2011 or newer Softail and 2012 or newer Dyna. The only wiring, which is optional, is for the auxiliary pressure/temp gauges if you choose.

WIRING COLOR CODE FOR AUXILARY TEMPERATURE OR PRESSURE GAUGE:

MCL-2011	Function
BLUE	SEN-1043 or SEN-1044 temperature sensor signal
BLACK	SEN-1044 temperature sensor ground
WHITE/RED	SEN-1039 pressure sensor RED wire
GRAY	SEN-1039 pressure sensor WHITE wire
BLACK	SEN-1039 pressure sensor BLACK wire

POWER

Constant battery power is supplied by the stock harness.

GROUND

Ground is supplied by the stock harness.

STATUS AND WARNING INDICATORS

The high beam, turn signals, low oil, and neutral indicators are powered by the gauge and are activated by the stock wiring harness.

Several indicators are supplied on the stock wiring harness. Some of these may not be active on your motorcycle. These include the security (red key symbol), engine (red 'E'), ABS (red 'ABS'), low fuel (amber fuel pump symbol), and cruise control (green arrow and circle symbol).



LOW VOLTAGE WARNING

When the voltage drops below the warning limit with the engine running, "LO" and your current voltage will be displayed. (default warning limit is 11.0V)

SPEEDOMETER

The speedometer is read from the engine control module (ECM) data bus. This can be calibrated to allow for differences in tires or gearing. Calibration is discussed in a later section.

TACHOMETER

The tachometer is read from the ECM data bus.

The bar displays rpm x1000 with a range of 350 – 7000 rpm. The rpm can also optionally be shown on the message display.

CLOCK

The clock uses a 12 hour format and can be set by pressing and holding the switch while the clock is displayed. After the switch is held for a few seconds the hours will begin flashing. Momentarily pressing the switch will change the hours, holding the switch will move to the minute set and the minutes will begin flashing. Momentarily pressing the switch will now change the minutes. Holding the switch will exit the clock set mode.

GAUGE SETUP AND CALIBRATION

The setup menus are entered by holding the switch in while turning the key on. The menus are as follows:

<u>Menu</u>	<u>Description</u>
<i>dIAG</i> (EnG InE, SEcUrE, AbS, dOnE)	read diagnostic codes
<i>AdJUsT</i> (FRStEr, SLdUeR) (75 - 125)	adjust calibrate speed
<i>uNIt</i> (MPH, km/h)	select speed unit
<i>S SEt</i> (OFF, 500 - 7500)	miles to service setting
<i>PERF</i> (On, OFF)	turn on/off performance displays
<i>L IghTs</i> (On, OFF)	turn on/off left, right, high, oil, neutral gauge face indicators
<i>n IghT</i> (On, OFF)	turn on/off automatic night dimming
<i>UPdAtE</i> (1, 2, 3)	set digital rpm update rate
<i>uARn</i> ^{RPM} (shown on bar graph)	set rpm shift warning point
<i>COLOr</i> ^{RPM} (shown on bar graph)	select rpm bar graph color, red or green
<i>uARn</i> ^V (9.0- 12.1)	set low volt warning point
<i>uARn</i> ^P (LO 5 - 36) (H 150 - 300)	set pressure warning points
<i>SEt FC</i> (HEAd F, HEAd C, 400F, 200C, 302F, 151C)	select temperature sensor and unit
<i>HIF-C</i> (200F - 420F or 93C - 215C)	set temperature warning point
<i>GEAR</i> (dOnE, PrESEt, LEARn)	transmission gear display selection
<i>FUEL</i> (dOnE, tESt, rESEt, AdJUsT)	low fuel light setup
<i>rAnGE</i> (On, OFF)	Enable distance to empty reading
<i>InfO</i> (donE, SEndEr, rESEt)	Reset initial range learn or setup fuel gauge
<i>odOmT</i>	display gauge revision code on speedometer
	one-time odometer preset

SPEEDOMETER SETUP

Press and hold the switch while turning the key on and starting the engine. Once the engine is running, release the switch. Press and release the switch to change the menu selection.

d I99 Diagnostics mode for checking/clearing trouble codes

- Press and release the switch until "d I99" is displayed, then press and hold the switch until " - " is displayed.
- Release the switch. The display will show "En9 InE", "SECLurE", "Ab5", or "donE".
- Press and release the switch to change the selection, press and hold the switch until " - " is displayed to begin reading the stored codes for the particular system.
- Release the switch. The display will show the current codes, "nonE", or "no r5P". Press and release the switch to move to the next stored code. After all codes are displayed the module part number will be scrolled across the screen. To clear codes, press and hold the switch when "end" is displayed. Consult a service manual for trouble code descriptions.

SPEED CALIBRATION

The speed calibration is not required unless you have changed out the rear pulley, sprocket, stock transmission, or stock tires.

Adj5t Adjust speedometer calibration

- Press and release the switch until "Adj5t" is displayed, then press and hold the switch until " - " is displayed.
- Release the switch. The display will show "FASTER" or "SLOWER". Faster will allow you to increase the speedometer reading, slow will allow you to decrease the speedometer reading.
- Press and release the switch to change, press and hold the switch to continue. The display will change to "CL" and a number from 75 to 125. This is the calibration ratio that is applied to the reading that the ECM is providing. 110 will be 10% faster, 90 will be 10% slower. Think of the number displayed as a percentage.
$$\frac{\text{Actual speed}}{\text{speedometer reading}} \times \text{current Cal ratio (100 by default)} = \text{new Cal ratio}$$
- Press and release the switch to change the cal ratio. When the desired cal ratio is shown, press and hold the switch to save it.

un lt Speed unit

- Press and release the switch until "un lt" is displayed, then press and hold the switch until " - " is displayed.
- Release the switch. The display will light up the current speed unit (MPH or km/h).
- Press and hold the switch to keep the current unit or press and release the switch to change the unit.

5 5Et Miles to Next Service setup

The service mileage is a countdown mile meter. The service mile display can be disabled or can be set to count down from 500 – 7500 miles. If the service mileage is enabled and it gets to 0 miles it will display "5 - duE" each time the key is turned on. If the push button switch is pressed and held while "5 - duE" or "5" and a mileage is displayed, the service miles will be reset to your preset value.

- Press and release the switch until "5 5Et" is displayed, then press and hold the switch until " - " is displayed.
- Release the switch. The current setting will be displayed, "OFF" or a mileage from 500 - 7500.
- Press and release the switch until the desired setting is displayed.
- Press and hold the switch until " - " is displayed.

PERF Performance menu setup

The performance readings can be turned on or off. When they are turned off the message display will only toggle through the mileage readings.

- Press and release the switch until "PERF" is displayed, then press and hold the switch until " - " is displayed.
- Release the switch. The current setting will be displayed (on or off).
- Press and release the switch until the desired setting is displayed.
- Press and hold the switch until " - " is displayed.

n I9Ht Night Dimming

Your display system has a dimming feature that dims the display intensity automatically at night. Normally the system is at full brightness for daytime viewing. To have the system at full brightness all of the time, go into the setup menu as described above and select "n9t" (night). Press and release the trip switch to select "OFF" instead of "on". Press and hold the trip switch to save the new setting.

- Press and release the switch until "n I9Ht" is displayed, then press and hold the switch until " - " is displayed.
- Release the switch. The current setting will be displayed. (on, off).
- Press and release the switch until the desired setting is displayed.
- Press and hold the switch until " - " is displayed to save the setting.

TACHOMETER SETUP

The digital tachometer update rate can be adjusted between slow, mid, and fast. The rpm warning/shift point can be adjusted from 2000 – 7500 RPM. The bar graph color can also be changed from green with a red warning to red with a green warning.

UDATE Display update setup

The display update will select how quickly the digital tachometer reading will respond.

- Press and release the switch until “UDATE” is displayed, then press and hold the switch until “ - ” is displayed.
- Release the switch. The update setting will be displayed. (1=slow, 2=mid, 3=fast).
- Press and release the switch until the desired setting is displayed.
- Press and hold the switch until “ - ” is displayed to save the setting.

UDRN^{RPM} Rpm warning setup

- Press and release the switch until “UDRN^{RPM}” is displayed, then press and hold the switch until “ - ” is displayed.
- Release the switch. The current warning point will be displayed on the bar graph.
- Press and release the switch until the desired setting is displayed.
- Press and hold the switch until “ - ” is displayed to save the setting.

Col or^{RPM} Bar graph color selection

- Press and release the switch until “Col or^{RPM}” is displayed, then press and hold the switch until “ - ” is displayed.
- Release the switch. The tach bar will light up in the current color (green or red).
- Press and release the switch until the desired color is displayed.
- Press and hold the switch until “ - ” is displayed to save the setting.

UDRN^V Voltage warning setup

- Press and release the switch until “UDRN^V” is displayed, then press and hold the switch until “ - ” is displayed.
- Release the switch. The current warning point will be displayed (9.0 – 12.1).
- Press and release the switch until the desired setting is displayed.
- Press and hold the switch until “ - ” is displayed to save the setting.

UDRN^P Pressure warning setup

The oil pressure can be monitored by connecting a Dakota Digital SEN-1039 300 psi solid state pressure sensor.

- Press and release the switch until “UDRN^P” is displayed, then press and hold the switch until “ - ” is displayed.
- Release the switch. Lo and number from 5-36 will be displayed for the low pressure warning point.
- Press and release the switch until the desired value is displayed.
- Press and hold the switch until “ - ” is displayed to go on to the high warning.
- Release the switch. Hi and number from 150-300 will be displayed for the high pressure warning point.
- Press and release the switch until the desired value is displayed.
- Press and hold the switch until “ - ” is displayed to save the setting.

5EE FC Temperature sender setup

The temperature gauge can read the stock head temperature sensor from the ECM or it can use the following Dakota Digital temperature sensors: SEN-1043 (400F/200C) or SEN-1044(302F/151C)

- Press and release the switch until “5EE FC” is displayed, then press and hold the switch until “ - ” is displayed.
- Release the switch. The current sender type will be shown with its unit. (HEAD F, HEAD C, 400F, 200C, 302F, or 151C).
- Press and release the switch until the desired setting is displayed.
- Press and hold the switch until “ - ” is displayed to save the setting.

HIF-C Temperature warning setup

- Press and release the switch until “HIF-C” is displayed, then press and hold the switch until “ - ” is displayed.
- Release the switch. H and number from 200F – 420F or 93C – 215C will be displayed.
- Press and release the switch until the desired value is displayed.
- Press and hold the switch until “ - ” is displayed to save the setting.

GEAR- Gear Indicator setup

This gauge has a single digit display for gear position. The gauge can learn the gear ratios based on speed and rpm so no sensors are needed, just what you've already connected. It will work with 4, 5, 6, or 7 speed transmissions. The factory preset option will preset the indicator to work with a stock 5 or 6 speed drive train. With a stock 6 speed, there will be a slight delay the first time you shift to sixth gear as the system verifies the gear. Subsequent shifts to sixth gear will not have the delay. You can also program each gear position for aftermarket transmissions or if you've changed wheel size or pulley/gearing size. To program the gear positions, begin at a section of road where you can gradually shift through all of the gears. Press and hold the switch while turning the key on and starting the engine. Once the engine is running, release the switch.

- Press and release the switch until "GEAR" is displayed, press and hold the switch until "-" is displayed.
- The display will show "dOnE", "PrESEt", or "LEARn". "dOnE" will exit the menu. "PrESEt" will set the indicator for an original factory transmission. "LEARn" allows it to work with virtually any transmission option.
- To program each gear individually, press and release the switch until "LEARn" is displayed, then press and hold the switch.
- The message will show "LD tCH" if the engine rpm is below 1500, or "LD 5Pd" if the vehicle speed is below 5 mph.
- Begin driving in 1st gear. The display should show GEAR 1 and the "1" should be flashing. Drive at a steady speed until the "1" stops flashing, it should only take about 20 seconds if the speed and RPMs are steady.
 - *Optionally: If the gear does not stop flashing you can manually override and jump to the next gear by pressing and releasing the switch to store the gear position quicker.*
- Shift to 2nd gear and drive at a steady speed. The display will change to a flashing "2".
- Wait until the "2" stops flashing. Shift to the next gear and a "3" should start flashing.
 - *Optionally: If the gears do not stop flashing you can manually override and jump to the next gear by pressing and releasing the switch to store the gear position quicker.*
- Repeat this through each gear. When you are done, come to a complete stop or press and hold the switch until the display shows "SEtUP" and then release it.
- Turn the key off and then on again to restart the gauges in normal operation, verify the gear position by riding through each gear and checking if positions agree.

L I9Ht5 Gauge indicator lights setup

The left turn, right turn, high beam, low oil pressure, and neutral indicators in the gauge face can be turned on or off. If the factory indicator lights are being used, these can be turned off to avoid having duplicate indicators lighting up.

- Press and release the switch until "L I9Ht5" is displayed, then press and hold the switch until "-" is displayed.
- Release the switch. The current setting will be displayed (On or OFF). The gauge indicators will light when On is selected.
- Press and release the switch until the desired setting is displayed.
- Press and hold the switch until "-" is displayed.

FUEL Low fuel light setup

- Press and release the switch until "FUEL" is displayed, then press and hold the switch until "-" is displayed.
- The display will show "OFF" or "On". Press and release the switch to change to the desired setting.
- Press and hold the switch until "-" is displayed to select the setting.
- OFF turns the low fuel function off and disables the low fuel light on the Dakota Digital gauge so it will never turn on.
- Turning the function On will access the following menus
 - dOnE (exits the setup and also displays current desired turn-on ratio)
 - tESEt (displays the ratio of the fuel level sender voltage to battery voltage)
 - rESEt (changes setting to the default of most stock gauges approximately 25% or ¼ tank)
 - AdJUSt (used to set a custom level from 00% - 50%)
- Press and release the switch to select the desired fuel setup menu, then press and hold it to select it until "-" is displayed, then release the switch to view or go on.
- A press and hold will save the setting or exit back to the menu.
- dOnE is the first menu displayed, a press and hold will exit fuel set up at this point. The number displayed on the speedometer is what the desired turn-on ratio is currently set at. 25 is default; 00-50 is a custom setting.
- tESEt will display the current fuel sender value as a percentage of fuel (00 is empty, 99 if full). If this number is greater than the number displayed in the done menu, the low fuel light will be on.
- rESEt will save the value back to factory default setting of 25%(1/4 tank of fuel).
- AdJUSt should only be done with the desired amount of low fuel in the tank. Once the level is where you would like the low fuel light to turn on, press and hold the switch to save the value. It must be between 00-50, or the value will not save.

rRn9E Distance to Empty setup

The range reading will initially show the word *rRn9E* until a tank of gas has been driven to allow the gauge to complete its setup based on your driving. Begin with a full tank of gas and do not refill it until it gets below ¼ tank of gas. This can be done on multiple trips as long as no fuel is added before it gets low enough. After the initial setup the display will show *r* followed by the calculated distance to empty. This will count down, making adjustments as necessary, until the range is 35 miles (56km) or less and then it will show *r L0*. The gauge will continue to make adjustments to match your driving habits with each fill up. After the initial setup you are not required to wait for the fuel to get below ¼ tank before refilling.

- Press and release the switch until "*rRn9E*" is displayed, then press and hold the switch until " - " is displayed.
- The display will show "*oFF*" or "*on*". Press and release the switch to change to the desired setting.
- Press and hold the switch until " - " is displayed to select the setting.
- *oFF* turns the range display off.
- Turning the function *on* will access the following menus
 - *donE* (exits the setup)
 - *rESEt* (resets the gauge to beginning of the initial range learning)
 - *SEndEr* (used to change or reset the fuel gauge readings)
 - *Hd* (set to factory default sending unit)
 - *ESt* (set to a custom fuel curve)
 - *SEt 00* (set new empty reading, *donE* indicates it was stored, *Error* indicates the signal is out of range)
 - *SEt 99* (set new full reading)
- Press and release the switch to select the desired fuel setup menu, press and hold it until " - " is displayed, and then release the switch to view or go on.
- A press and hold will save the setting or exit back to the menu.
- *donE* is the first menu displayed, a press and hold will exit fuel set up at this point.
- *rESEt* will begin the initial range learning again. You must begin with a full tank of gas and then ride it down to less than ¼ tank. This can be done in multiple trips as long as the tank is not filled in between. The range display will show *rRn9E* until this is completed and then begin showing the distance to empty.
- *FUL - rESEt* This will set the fuel gauge setup points back to stock values.
- *FUL - SEt 99* This will set a new full reading for the fuel gauge to allow for customization or improved range accuracy. *donE* indicates it was stored, *Error* indicates the signal is out of range
- *FUL - SEt 00* This will set a new empty reading for the fuel gauge to allow for customization or improved range accuracy. *donE* indicates it was stored, *Error* indicates the signal is out of range

Info Info menu

Displays the current software revision on the speedometer display. (no changes can be done in this menu)

odometer Odometer preset

The odometer can be preset by the customer within the first 100 miles. Once the odometer has more than 100 miles, the menu option will no longer be displayed. Make sure you have correctly selected the units to be either MPH or km/h first. The odometer will be set in the selected units. The reading shown when entering the preset menu will be the value obtained from the ECM. Once you have preset the miles you cannot change it again.

WARNING!!: This only allows setting odometer to the nearest mile. Do not use tenths! For example a mileage of 65432.1 should be set to "065432" using this method. If the tenths digit is used, the odometer will read 10 times too high.

- Press and release the switch until "*-odometer*" is displayed, then press and hold the switch until " - " is displayed.
- The current ECM odometer reading will be displayed with the left most digit flashing.
- Press and release the switch to increment the digit. Press and hold the switch to move to the next digit to the right.
- Continue until the right most digit has been set. Press and hold the switch and the speed display will show "*no*".
- Press and hold the switch while "*no*" is displayed to go back and continue changing the odometer display. Turn the key off to cancel any changes.
- Press and release the switch to change to speed display to "*SE5*". Press and hold the switch while "*SE5*" is displayed to save the current odometer reading.

TRIP SWITCH

The trip switch on the handle bar allows access to all of the mileage, rpm, and performance information. Pressing and releasing the trip switch toggles through the different displays. Press and holding the switch will reset the current display. If the switch is pressed while the key is off the clock and odometer can be displayed.

The display sequence is as follows:

CLOCK	>	12:00	12 hour clock
ODOMTR	>	000000	odometer mileage
TRIP A	>	^A 000.0	trip meter mileage A
TRIP B	>	_B 000.0	trip meter mileage B
SERVIC	>	5 0000	miles since last service (if programmed)
KPH	>	≡≡≡≡≡	metric speed conversion (to mph if metric unit is selected)
* HI SPD	>	H I 00	high speed recall
* 0-60 T	>	60 00.0	0-60mph time (0-100kph)
* QUARTR	>	25 00.0	quarter mile time
* QT MPH	>	25 00	quarter mile speed
RPM	>	0000 ^{RPM}	rpm reading in alpha display
* HI RPM	>	H 0000	high rpm recall
VOLTS	>	00.0 ^V	displays voltage to gauge
PRESSURE	>	00 _p	pressure reading (only shown if sender is connected)
TEMP	>	000 ^F	temperature reading, "C" if metric (only show if sender is connected)
* HOURS	>	Hr 0.0	re-settable hour meter
RANGE	>	r 250.0 or rRNGE	distance to empty (if turned on)

The 0-60 and ¼ mile timers are zeroed by pressing and holding the switch while that timer is displayed. The timer will not restart until the speed reaches zero and then you start driving again.

Display functions with a "*" in front of them are only shown with performance readings turned on.

Troubleshooting guide

Problem	Possible cause	Solution
Gauge will not light up.	Red/Orange wire does not have power. Black/Green wire is not getting a good ground. CAN bus wiring open or short. Ignition switch not connected or damaged. Gauge is damaged.	Inspect and repair stock harness. Inspect and repair stock harness. Inspect and repair stock harness. Inspect and repair stock switch or harness. Return gauge for repair (see instructions).
Gauge lights up, but speed will only show zero.	No data from ECM. Sensor is not sending a speed signal.	Check engine trouble codes. Check wiring and test sensor.
Speed reading is incorrect.	Gauge is not calibrated correctly.	Gauge must be calibrated (see instructions).
Gauge lights up, but tach will only show zero.	No data from ECM.	Check engine trouble codes.
Gauge will not dim.	Auto dimming is disabled.	Check setting under "night" menu.
Gauge remains dim at all times.	Light sensor is covered.	Make sure the bottom center of the gauge lens is clean and not obstructed.
Pressure reading does not show up.	Pressure sender is not connected. Sender wire is loose or broken. Sender is not powered.	Sender must be connected before the reading will be displayed. Check all wire connections and inspect wire for breaks. Check all wire connections and inspect wire for breaks.
Temperature reading does not show up.	Temperature sender is not connected. Wrong temp sender is selected. 'Run' switch is not on. Sender wire is loose or broken. Sender is not grounded (SEN-1043).	Sender must be connected before the reading will be displayed. Check setting under "SET FC" menu. 'Run' switch must be on to get temperature data from ECM. Check all wire connections and inspect wire for breaks. The sender grounds through its mounting threads. Make sure the threads are clean and tight.
Pressure or temperature reading shows "-".	Sender is shorted to ground.	Inspect wire for bare insulation or pinching.
Low Fuel Light not turning on.	Incorrect setting or turned off.	Verify function is "ON" in FUEL setup menu and that the set up is correct or adjust value.
Low Fuel Light turning on too early/late.	Incorrect setting.	Verify setting or adjust the value following FUEL menu adjust feature in setup.
Low Fuel Light always on.	Sensor damaged.	Check resistances following procedure in service manual.
Low Fuel Light flashing.	Wiring short or open.	Check gauge and fuel sender connections.

SERVICE AND REPAIR

DAKOTA DIGITAL offers complete service and repair of its product line. In addition, technical consultation is available to help you work through any questions or problems you may be having installing one of our products. Please read through the Troubleshooting Guide. There, you will find the solution to most problems. **Should you ever need to send the unit back for repairs, please call our technical support line, (605) 332-6513, to request a Return Merchandise Authorization number.** Package the product in a good quality box along with plenty of packing material. Ship the product by UPS or insured Parcel Post. Be sure to include the RMA number on the package, and include a complete description of the problem with RMA number, your full name and address (street address preferred), and a telephone number where you can be reached during the day. Any returns for warranty work must include a copy of the dated sales receipt from your place of purchase. Send no money. We will bill you after repair.

Dakota Digital 24 Month Warranty

DAKOTA DIGITAL warrants to the ORIGINAL PURCHASER of this product that should it, under normal use and condition, be proven defective in material or workmanship within 24 MONTHS FROM THE DATE OF PURCHASE, such defect(s) will be repaired or replaced at Dakota Digital's option.

This warranty does not cover nor extend to damage to the vehicle's systems, and does not cover removal or reinstallation of the product. This Warranty does not apply to any product or part thereof which in the opinion of the Company has been damaged through alteration, improper installation, mishandling, misuse, neglect, or accident.

This Warranty is in lieu of all other expressed warranties or liabilities. Any implied warranties, including any implied warranty of merchantability, shall be limited to the duration of this written warranty. Any action for breach of any warranty hereunder, including any implied warranty of merchantability, must be brought within a period of 24 months from date of original purchase. No person or representative is authorized to assume, for Dakota Digital, any liability other than expressed herein in connection with the sale of this product.



4510 W. 61st St. North
Sioux Falls, SD 57107
www.dakotadigital.com

Phone (605) 332-6513
Fax (605) 339-4106

dakotasupport@dakotadigital.com Copyright 2011 - Dakota Digital, Inc.