MODEL MVX-2011
TANK MOUNT SPEEDOMETER/TACHOMETER

optional MBM
Connector

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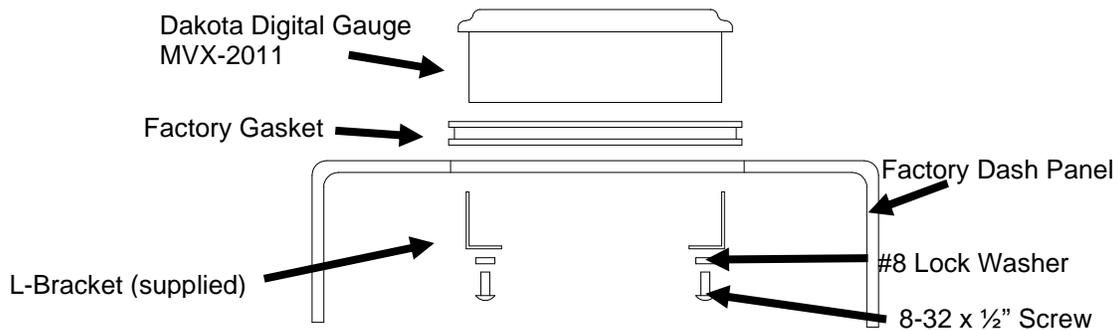
Stock Harness
Connector
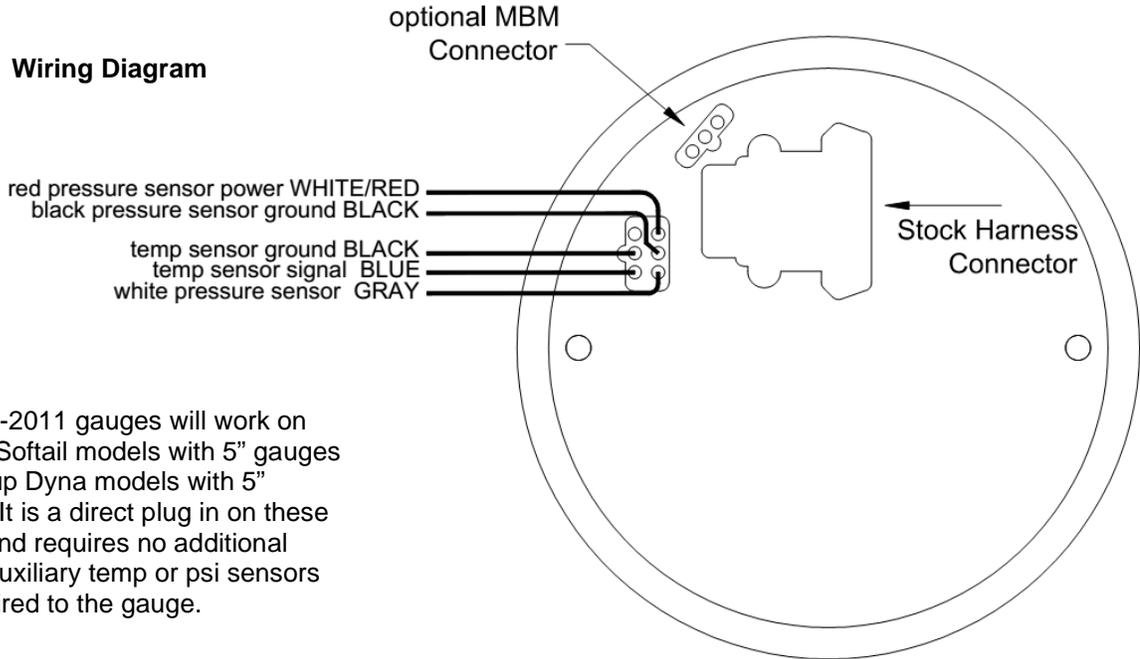
The MVX-2011 gauges will work on 2011-up Softail models with 5" gauges or 2012-up Dyna models with 5" gauges. It is a direct plug in on these models and requires no additional wiring. Auxiliary temp or psi sensors can be wired to the gauge.

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 MVX-2011 is designed to fit in the "Fat Bob" style five inch diameter dash mount gauge openings.

Dakota Digital Gauge
MVX-2011

Factory Gasket

Factory Dash Panel

L-Bracket (supplied)

#8 Lock Washer

8-32 x ½" Screw

- Remove the dash.
- Unclip and unplug the factory gauge.

- Ensure 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.
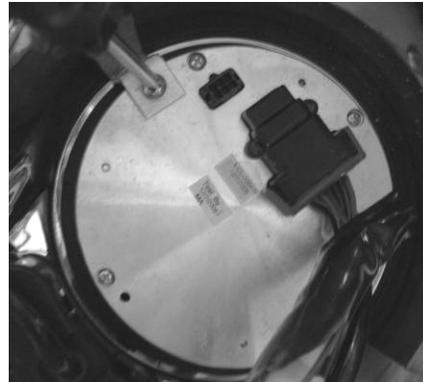
Wiring

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.

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).

OPTIONAL OIL TEMPERATURE

Dakota Digital part number SEN-1043 or SEN-1044 must be used. The SEN-1043 is a one-wire sender and grounds through its body. Connect the terminal on the end of the sender to the blue wire. Make sure the sender threads are able to make a metal-to-metal connection to complete the ground. The SEN-1044 is a two-wire sender. Connect the sender red wire to the gauge blue wire and connect the sender black wire to the gauge black wire.

MVX-2011	Sender
BLUE	SEN-1043 terminal or SEN-1044 sensor RED wire
BLACK	SEN-1044 sensor BLACK wire

OPTIONAL OIL PRESSURE

Dakota Digital part number SEN-1039 must be used. The sensor red wire connects to the gauge white/red wire, the sensor white wire connects to the gauge gray wire, and the sensor black wire connects to the gauge black wire.

MVX-2011	Sender
WHITE/RED	SEN-1039 sensor RED wire
GRAY	SEN-1039 sensor WHITE wire
BLACK	SEN-1039 sensor BLACK wire

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 tachometer needle displays RPM x1000 with a range of 350 – 8000 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.

MAN#650536:b
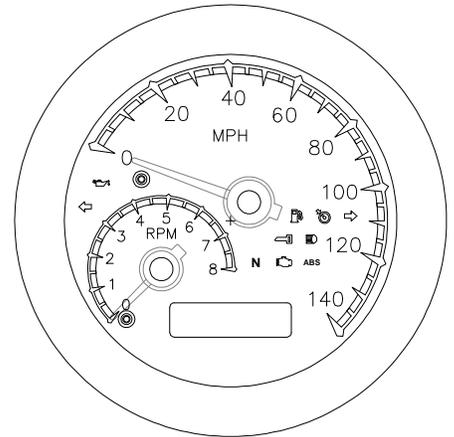
FUNCTION SWITCH

The factory speedometer push button switch is used as the main function switch. The function switch allows access to all of the mileage, RPM, and performance information. Pressing and releasing the function switch toggles through the different displays. Pressing and holding the switch for about four seconds will reset the current display. The display sequence for the speedometer is as follows:

Speed message displays	DESCRIPTION
ODOMETER	Odometer reading (0-999,999)
A MILES	Trip A odometer reading (0-9999.9)
B MILES	Trip B odometer reading (0-9999.9)
S MILES (when enabled)	Distance to next service (0-9,999,or ---- when past due)
HOURS	Hours gauge has been on with engine running (0-999.9)
MPH	Digital speed reading
KM/H	Alternate speed unit conversion
RPM	Digital RPM reading
OIL TEMP (with optional sender present)	Engine oil temperature
OIL PSI (with optional sender present)	Engine oil pressure
VOLTAGE	System voltage
E MILES (when enabled)	Distance to empty
FUEL % (with 2018+ fuel data)	Fuel level
HEAD TEMP	Head temperature from ECM if supported
CLOCK/GEAR	12 hour clock display and gear position

Performance readings	
HI SPEED	High speed recall
0-60 MPH	0-60 mph time in seconds
1/4 MI SPD	Speed at end of ¼ mile (trap speed)
1/4 MI TIME	Time to travel ¼ mile from standing start
HIGH RPM	High RPM recall
MBM displays (optional)	MBM (Motorcycle Bus interface Module) readings for connected modules

MAN#650536:b

GAUGE SETUP AND CALIBRATION

The function switch is used to enter setup mode. To get into setup, press and hold the function switch while turning the key on. Press and release the switch to advance through the menus below, when on the desired option press and hold the switch to select setup for that particular gauge/function.

SPEEDOMETER SETUP

Main Menu	Sub Menu	Description
DIAG CODE	ENGINE	Read diagnostic codes from engine module
	SECURE	Read diagnostic codes from security module
	ABS	Read diagnostic codes from ABS module
COLOR	ALL	Set all colors and brightness the same
	BACKLIGHT	Set backlight color and brightness
	NEEDLE	Set needle color and brightness
	DISPLAY	Set message display color and brightness
SPEED	ADJUST	Adjust speed calibration +/- 40%
	UNIT	Select MPH or km/h unit
	SERVICE	Set miles to service reset value or turn off
	ODO PRESET	One time odometer preset **(only available once for the first 100 miles)**
TACH	HI WARNING	Set high RPM warning point
OIL TEMP	ON/OFF	Enable/Disable option oil temperature reading
	SENDER	Select temperature sender type and unit
	WARNING	Set high warning point
	TEST	Display sender resistance for troubleshooting
OIL PSI	ON/OFF	Enable/Disable option oil pressure reading
	WARNING	Set low warning point
FUEL	SENDER	Select fuel sender
	RANGE	Enable/Disable/Reset distance to empty
	LIGHT	Enable/Disable/Adjust low fuel indicator
	TEST	Display sender reading for troubleshooting
VOLTAGE	LO WARNING	
DISPLAY	CONTRAST	Message center contrast adjustment
	PRFM DISP	Show/Hide performance readings
	INDICATORS	Show/Hide indicators on gauge face
	MBMS	Show MBM's connected to the speedometer and set warning points
GEAR	LEARN	Learn gears based on speed and RPM
	PRESET	Set gears based on factory setup
DONE		Exit

Press and hold the switch while turning the key on. The speedometer will show the current revision code. Release the switch. Press and release the switch to move through the different setup menus. Press and hold the switch to select a menu option.

DIAG CODE Diagnostics mode for checking/clearing trouble codes
- Press and release the switch until "DIAG CODE" is displayed, then press and hold the switch until the display blanks.
- Release the switch. The display will show "ENGINE", "SECURE", "ABS", or "DONE".
- Press and release the switch to change the selection, press and hold the switch until the display blanks to begin reading the stored codes for the particular system.
- Release the switch. The display will show the current codes, "NONE", or "NO RSP". 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.

COLOR Display color setup menu
- Press and release the switch until "COLOR" is displayed, then press and hold the switch until the display blanks.
- Release the switch. The display will show "SET COLOR" and "ALL", "BACKLIGHT", "NEEDLE", "DISPLAY", or "DONE".
- Press and release the switch to choose all three together or one individually to change the color.
- Once the desired display section is shown press and hold the switch until the display blanks.
- Release the switch. The display will show "SET COLOR". Press and release the switch to change the color, then press and hold the switch until the display blanks.
- Release the switch. The display will show "BRIGHTNESS" and a number from 0 – 7. 0 is the dimmest and 7 is the brightest. Press and hold the switch to change the brightness, then press and hold the switch until the display blanks.
- A different display section can be chosen, or "DONE" to exit.

SPEED Speed setup menu
- Press and release the switch until "SPEED" is displayed, then press and hold the switch until the display blanks.
- Release the switch. The display will show "ADJUST", "UNIT", "SERVICE", "ODO PRESET", or "DONE".
- Press and release the switch to change the selection, press and hold the switch to select it.
  ### ADJUST Speed Calibration
  The speedometer is calibrated by the engine computer, but the speedometer reading can be adjusted through the gauge. The adjustment is set a value from 60% – 140% with 100% being no change.
  - Press and release the switch until "ADJUST" is displayed, then press and hold the switch until the display blanks.
  - Release the switch. The display will show the current calibration value.
  - Press and release the switch to increase the value. Once it reaches 140 it will roll back over to 60. Press and hold the switch to save the currently displayed value.
  ### UNIT MPH/km/h Selection
  - Press and release the switch until "UNIT" is displayed, then press and hold the switch until the display blanks.
  - Release the switch. The display will show UNIT and MI for miles or KM for kilometers.
  - Press and release the switch until the desired setting is displayed.
  - Press and hold the switch to save the setting.
  ### SERVICE Miles or km 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 mile is enabled and it gets to 0 miles, it will display "SERVICE DUE" each time the key is turned on. If the push button switch is pressed and held while "S ----" is displayed, the service miles will be reset.
  - Press and release the switch until "SERVICE" 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 in increments of 500.)
  - Press and release the switch until the desired setting is displayed.
  - Press and hold the switch to save the setting.
  ### ODO PRESET 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. Once you have preset the miles you cannot change it again. **WARNING!!: *This only allows setting odometer to the <u>nearest mile</u>. <u>Do not use tenths!</u> 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 "ODO PRESET" is displayed, then press and hold the switch until the display blanks.
  - The current miles 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 display will show "SAVE? NO".
  - Press and hold the switch while "SAVE? 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 "SAVE? YES". Press and hold the switch while "SAVE? YES" is displayed to save the current odometer reading.

TACH Tachometer warning setup
- Press and release the switch until "TACH" is displayed, then press and hold the switch until the display blanks.
- Release the switch. The display will show "HI", the current rpm warning (2200 – 8200), and "WARNING".
- Press and release the switch to change the value, press and hold the switch to select it.

OIL TEMP Engine oil temperature setup menu
- Press and release the switch until "OIL TEMP" is displayed, then press and hold the switch until the display blanks.
- Release the switch. The display will show "ON" or "OFF" depending on whether the reading is currently enabled.
- Press and release the switch to change the selection, press and hold to save it.
- If ON is selected, the next option is "SENDER", "WARNING", "TEST", or "DONE".
- Press and release the switch to change the selection, press and hold the switch to select it.
SENDER Temperature sender and F/C selection
- Press and release the switch until "SENDER" is displayed, then press and hold the switch until the display blanks.
- Release the switch. The display will show SEN-1043 F, SEN-1043 C, SEN-1044 F, or SEN-1044 C.
- Press and release the switch until the desired setting is displayed.
- Press and hold the switch to save the setting.
WARNING High oil temperature warning setup
- Press and release the switch until "WARNING" is displayed, then press and hold the switch until the display blanks.
- Release the switch. The display will show "HI", the current warning (225F – 375F), and "WARNING".
- Press and release the switch to change the value, press and hold the switch to select it.
TEST Resistance test
- Press and release the switch until "TEST" is displayed, then press and hold the switch until the display blanks.
- Press and release the switch to change the gauge. Press and hold the switch to exit.

FUEL Fuel level setup menu
- Press and release the switch until "FUEL" is displayed, then press and hold the switch until the display blanks.
- Release the switch. The display will show "SENDER", "RANGE", "LIGHT", "TEST", or "DONE".
- Press and release the switch to change the selection, press and hold the switch to select it.
SENDER Fuel sender selection
- Press and release the switch until "SENDER" is displayed, then press and hold the switch until the display blanks.
- Release the switch. The display will show "HD 11" (2008-2017), "HD 18" (2018-up), or "CUSTOM".
- Press and release the switch until the desired setting is displayed.
- Press and hold the switch to save the setting. If CUSTOM is selected, you will be prompted to save the empty (SET 00) and full (SET 99) readings for your tank.
RANGE Distance to empty setup
  The range reading will initially show the word "RANGE" 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 "E" 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 LOW". 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 "RANGE" is displayed, then press and hold the switch until the display blanks.
- Release the switch. The display will show "OFF" or "ON" indicating whether the feature is active.
- Press and release the switch to change the value, press and hold the switch to select it.
- If ON is selected, the next option is "DONE" or "RESET" "LEARNING". To reset or start a new distance learning cycle, select "RESET LEARNING" and hold the switch.
LIGHT Low fuel light setup
  The low fuel indicator can be turned on or off, and the fuel level when it activates can be adjusted.
- Press and release the switch until "LIGHT" is displayed, then press and hold the switch until the display blanks.
- Release the switch. The display will show "OFF" or "ON" indicating whether the feature is active.
- Press and release the switch to change the value, press and hold the switch to select it.
- If ON is selected, the next option is "XX%", "RESET", or "ADJUST".
  - XX% is the current low fuel warning set point.
  - RESET will return the set point back to the default 25%
  - ADJUST will select the current fuel level as the low warning set point.
TEST Gauge reading test
- Press and release the switch until "TEST" is displayed, then press and hold the switch until the display blanks.
- The calculated fuel level from 0 – 99% will be shown. Press and hold the switch to exit.

VOLTAGE Low voltage warning setup
- Press and release the switch until "VOLT" is displayed, then press and hold the switch until the display blanks.
- Release the switch. The display will show "LO", the current warning (9.0 – 12.1), and "WARNING".
- Press and release the switch to change the value, press and hold the switch to select it.

OIL PSI Engine oil temperature setup menu
- Press and release the switch until "OIL PSI" is displayed, then press and hold the switch until the display blanks.
- Release the switch. The display will show "ON" or "OFF" depending on whether the reading is currently enabled.
- If ON is selected, the next option is "WARNING" or "DONE".
- Press and release the switch to change the selection, press and hold the switch to select it.
    ### WARNING Low oil pressure warning setup
    - Press and release the switch until "WARNING" is displayed, then press and hold the switch until the display blanks.
    - Release the switch. The display will show "LO", the current warning (0 – 30), and "WARNING".
    - Press and release the switch to change the value, press and hold the switch to select it.

DISPLAY Message display option menu
- Press and release the switch until "DISPLAY" is displayed, then press and hold the switch until the display blanks.
- Release the switch. The display will show "CONTRAST", "PRFM DISP", "INDICATORS", "MBMS", or "DONE".
- Press and release the switch to change the selection, press and hold the switch to select it.
    ### CONTRAST Message screen contrast adjust
    - Press and release the switch until "CONTRAST" is displayed, then press and hold the switch until the display blanks.
    - Press and hold the switch to adjust the contrast. Each time the switch is pressed it will alternate between increasing and decreasing the contrast. To exit, wait with no switch press for a few seconds.
    ### PRFM DISP Display performance readings
    The performance readings are high speed recall, high RPM recall, 0-60 time, ¼ mile speed, and ¼ mile time.
    - Press and release the switch until "PRFM DISP" is displayed with the current setting ("HIDE" or "SHOW"). To change the setting press and hold the switch until the display blanks.
    - Press and release the switch to change between the settings, press and hold the switch to select it.
    ### INDICATORS Display indicators on gauge face
    To display turn signal, high beam, low oil, and neutral indicators on the gauge face.
    - Press and release the switch until "INDICATORS" is displayed with the current setting ("HIDE" or "SHOW"). To change the setting press and hold the switch until the display blanks.
    ### MBMS Display which MBMs are connected and adjust warnings
    To troubleshoot MBM connections, the speedometer can indicate which senders it sees connected.
    - Press and release the switch until "MBMS" is displayed. The screen will show either a letter pair or a "--" for each module.
    - Press and hold the switch to toggle through the available warning settings. (see the separate MBM manual for additional details)

Gear indicator setup
This gauge has an indicator for gear position displayed next to the clock. 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. You can also program each gear position for aftermarket transmissions or if you've changed wheel size or sprocket 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 the display blanks.
- The display will show "PRESET", or "LEARN", or "DONE". "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 "LO TCH" if the engine RPM is below 1500, or "LO SPD" 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 around 2,700 RPM until the "1" goes steady and then changes to a flashing "2", it should only take about 20 seconds if the speed and RPMs are steady.
    - *Optional: 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.
- Wait until the "2" goes steady and then changes to a flashing "3". Shift to 3rd gear.
    - *Optional: 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 "DONE" and then release it.
- Press and release the switch to restart the gauges in normal operation, verify the gear position by riding through each gear and seeing if positions agree.

Troubleshooting guide.

Problem	Possible cause	Solution
Gauge will not light up	Red wire does not have power.	Connect to a location that has power.
	Black wire is not getting a good ground.	Connect ground to a different location.
	Gauge is damaged.	Return gauge for repair. (see instructions)
Gauge lights up, but speed will only show zero.	No data from ECM.	Check engine trouble codes.
	Speed sensor not grounded properly.	Move ground to different location, preferable close to the speedometer ground.
	Sensor is not sending a speed signal.	Check for a damaged or malfunctioning speed sensor.
Speed reading is erratic or jumps around.	Speed sensor wire is loose or broken.	Check all wire connections and inspect wire for breaks.
	Poor ground connection.	Check ground connection on speedometer and sensor.
	Ignition interference	Check for tachometer wires routed with VSS signal wires.
		Check for VSS signal wires routed near ignition coils
		Check for poor ignition system ground
		Use suppression spark plug wires
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.
Engine indicator does not work.	No data from ECM.	Check engine trouble codes.
Pressure reading does not show up.	Pressure sender is not enabled in setup menu.	Select "ON" under OIL PSI menu.
Oil Temperature reading does not show up.	Oil Temp sender is not enabled in setup menu.	Select "ON" under OIL TEMP menu.
Pressure or temperature reading shows "- -"	Sender is shorted to ground.	Inspect wire for bare insulation or pinching.
	Pressure power wire is not connected.	Connect sensor RED wire to gauge WHITE/RED wire.
Pressure or temperature reading shows "EE"	Sender wire is open or broken.	Inspect for breaks in wire connection.
	Sender is not grounded.	Check sender ground connection.
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 the value.
Low fuel light turning on too early/late.	Incorrect setting.	Verify setting or adjust value following FUEL menu adjust feature in setup.
Low fuel light always on.	Sensor damaged.	Check resistances following procedure in service manual.

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

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