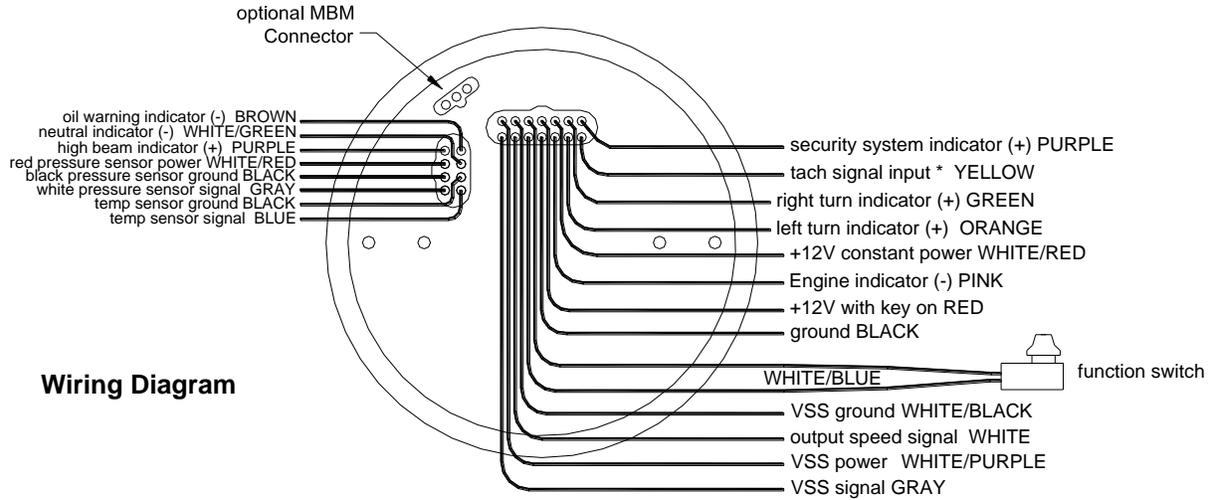




### MODEL MVX-2002 TANK MOUNT SPEEDOMETER/TACHOMETER



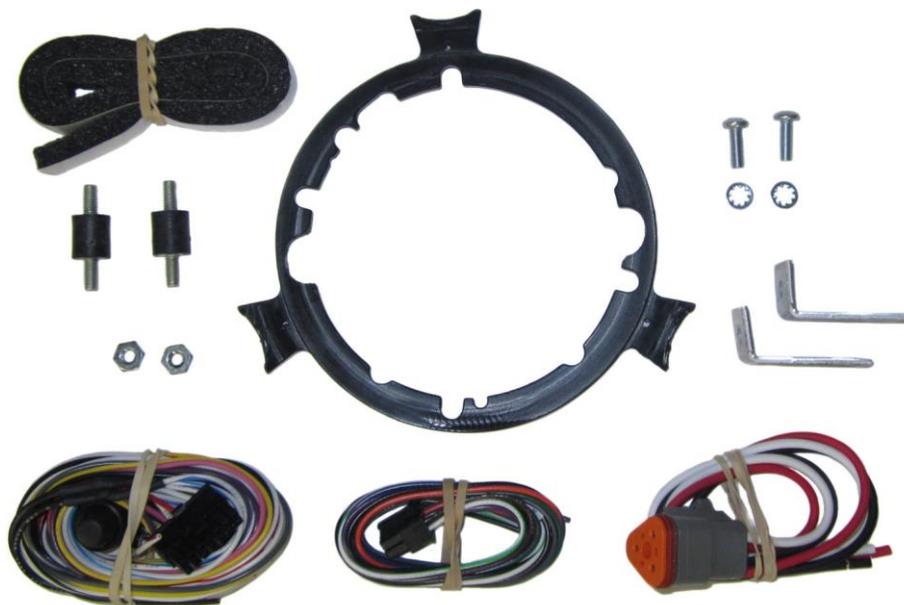
**\*To avoid damage to motorcycle**, please see Speedometer, Tachometer, and Status and Warning Indicators sections for details on locating VSS, Tachometer, and indicator wires for **most motorcycle applications**

**\*\*For 2004+ HD** utilizing the "Fat Bob" tank mount, please see our **MVX-2004**, it is designed as a direct plug-in gauge for these models. The Check Engine indicator will not function using this gauge on **2004+ HD** models due to the signal being fed through the 'data bus'.

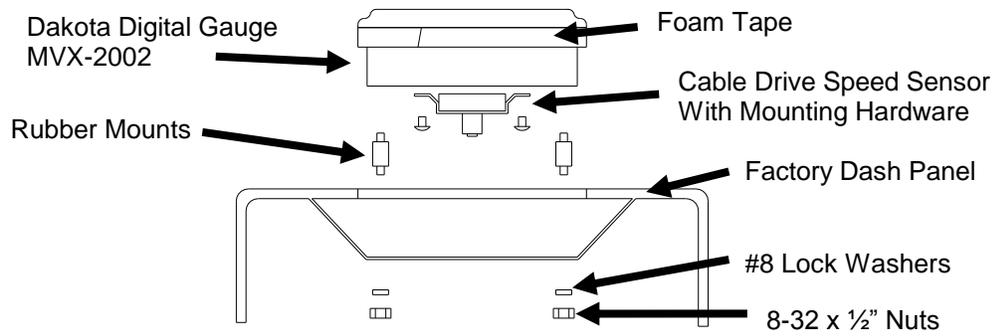
**IMPORTANT NOTE!** This gauge has an odometer preset option that is only available for the first 100 miles (160km) of operation. See "preset odometer" for instructions.

#### Mounting:

The base system is universal enough to fit in either a new-style, clip-in (1995 or newer) or into the older bolt in style. The rubber mounts with studs on both sides are used for the bolt-in style. The L-brackets are used for the clip in version. The mounting ring is used for Deuce models.



## Mounting in a Dash with Cable Drive speedometer and rubber mounts



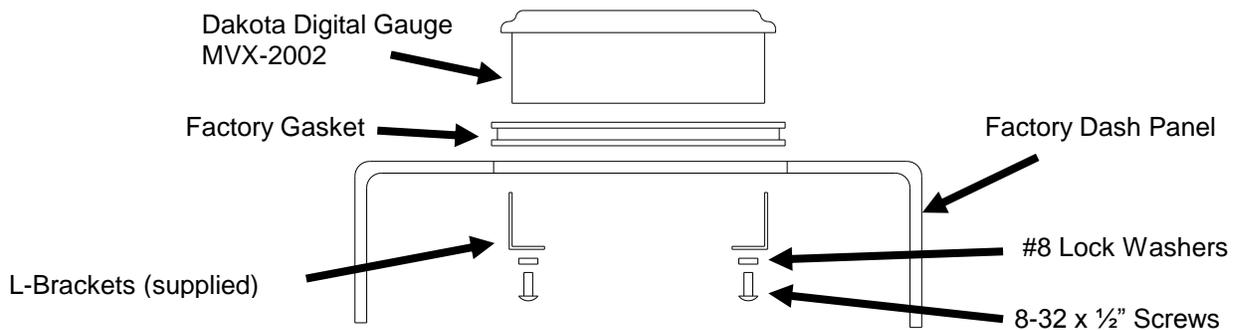
- Remove the dash
- Unbolt and unplug the factory gauge
- Install the rubber mounts and foam tape around the new Dakota Digital gauge. The tape should apply to the side of the gauge can and be against the bottom of the bezel; this just fills the opening in the dash.



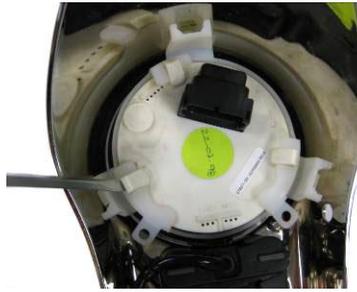
- Insert new gauge from front of dash
- Use supplied lock washers and nuts to attach the gauge to the factory dash
- Now install the cable drive sender, when required, as shown with the supplied bracket and screws
- Reinstall the dash



## Mounting in a dash with factory electronic speed sensor



- 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



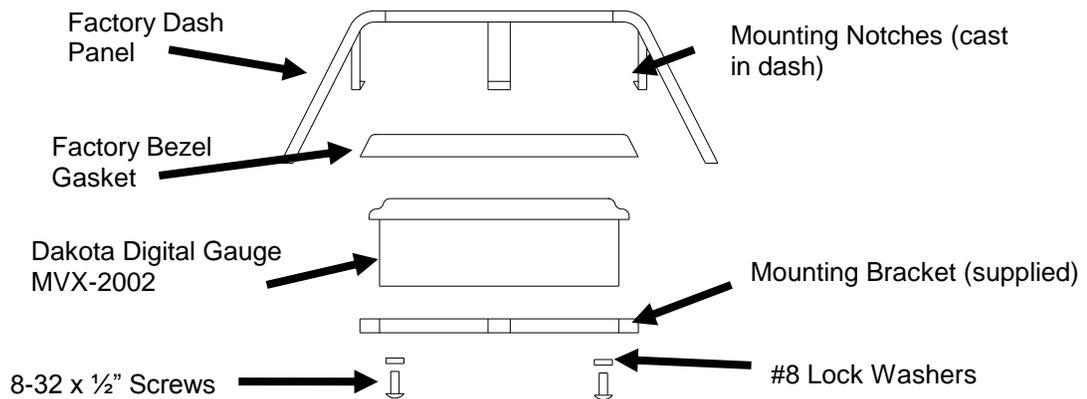
- Insert new gauge from front of dash
- Use supplied L-brackets along with the 8-32 screws and lock washers to secure the gauge
- Reinstall the dash



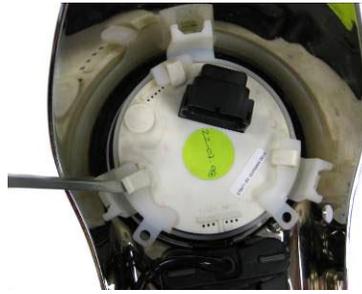
**Deuce mounting**

**NOTE: The supplied L-bracket mounting pieces are not used for this application and can be discarded**

Since the Deuce gauge mounts from under the dash mounting requires use of the supplied mounting ring.



- Remove the dash
- Unclip and unplug the factory gauge



- Remove the rubber gasket from the factory gauge bezel.



- Install gasket over the bezel of the Dakota Digital gauge. The gasket doesn't cover the entire bezel; there should be some of the bezel showing when the gasket is installed.



- Use the supplied mounting ring to secure the gauge to the dash. The ring has notches that align the gauge so it cannot be installed upside down.
- Snap the gauge into the dash starting with one tab in and then working in a clockwise direction snapping the other two tabs in one at a time. The tabs are tight so it takes a fair amount of pressure to snap them in. Make sure the tabs are seated in the notches of the dash once locked in.
- Reinstall the dash.



## Wiring

### POWER

Connect the red wire from the main harness to accessory power from the ignition switch.

Connect the white/red wire to constant battery power for the clock memory. The large red wire at the ignition switch can be used for this.

***\*Never connect this to a battery charger alone. It needs to have a 12 volt battery connected to it. Battery chargers have an unregulated voltage output that will cause the system to not operate properly.***

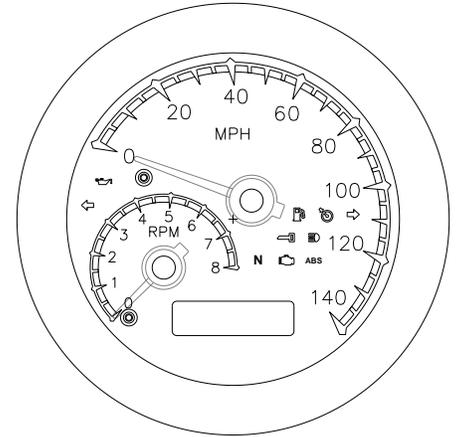
### GROUND

The black wire is the main ground for display system. A poor ground connection can cause improper or erratic operation.

## STATUS AND WARNING INDICATORS

The right turn, left turn, and high beam indicators are activated by 12 volts at their respective hook-up wires. The right turn signal wire is green, the left turn signal wire is orange, and the high beam wire is purple. These can be connected to the same wires that the indicator lights would be connected to. The display system wire colors may not match the wire colors in your electrical wire harness; consult a service manual to determine the color code and location of any wires you cannot locate.

The neutral, low oil, and check engine indicators are activated by ground at their respective hook-up wires. The check engine wire is pink, the low oil wire is brown, and the neutral wire is white/green.



## 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)

## SECURITY SYSTEM INDICATOR

The security system indicator is a red light that is activated by 12 volts to the purple wire. It will light up whether the gauge is powered or not.

## SPEEDOMETER

***Failure to calibrate the speedometer may cause your odometer mileage to increase very rapidly.***

The speed input connector plugs into the speed sensor to tell how fast you are traveling. On cable driven applications, the external sensor connects to the speedometer cable and provides the electric signal. The sensor is normally bolted directly to the bottom of the speedometer, but can also be remote mounted. The sensor has a 5/8" course thread fitting that accepts mid-80's and earlier cables directly. For newer cycles, the speedometer cable will need to be replaced with one having the correct fitting.

With transmissions having the built-in electric sensor, a three-wire harness adapter connects the transmission speed sensor to the speedometer. This system will also accept most aftermarket inductive, Hall-effect, or ground switch sensors.

For three wire Hall-effect sensors, refer to the installation instructions for the sensor to determine wire color code. Most three wire sensors use the following color code: RED – power, BLACK – ground, WHITE – speed signal. Connect the sensor signal wire to the MVX-2002 main harness gray wire, connect the sensor power wire to the white/purple wire, and connect the sensor ground wire to the white/black wire.

For a speed sensor integrated into a vehicle wiring harness, consult a service manual to determine the color code and location of the speedometer signal. **If the factory harness supplies +5V to the sensor, please utilize the factory connection in place of the white/purple power wire.**

The speedometer is fully adjustable and calibration is discussed in the **Speedometer Setup** section.

## TACHOMETER

The tachometer is used by connecting the yellow wire from the main harness to the negative side of the coil or to an ignition module tach output. The tachometer is adjustable for 1 - 16 cylinder settings. The one cylinder setting is used for single-fire ignition systems without a buffered tach output.

If there is not a pink wire attached to the stock gauge harness: for carbureted models connect to the pink wire at the coil and set the tach for 2 cylinder; for fuel injected models connect to either the blue/orange or yellow/blue under the seat in the harness along the right side frame rail and set the tach for a 1 cylinder. For tach signals integrated into a vehicle wiring harness, consult a service manual to determine the color code and location of the tachometer signal.

## 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.

## 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.

<b>MVX-2002</b>	<b>Sender</b>
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.

<b>MVX-2002</b>	<b>Sender</b>
WHITE/RED	SEN-1039 sensor RED wire
GRAY	SEN-1039 sensor WHITE wire
BLACK	SEN-1039 sensor BLACK wire

## 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 two seconds will switch the focus between the speed message display and tach message display. The screen with the current switch focus has an arrow in the upper right corner. When holding the switch, the screen without focus will switch to reverse image. Release the switch while this is shown to change screens. Pressing and holding the switch for about four seconds will reset the current display. The display sequence for the speedometer is as follows:

<u>Speed message displays</u>	<u>DESCRIPTION</u>
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
CLOCK/GEAR	12 hour clock display and gear position
<hr/>	
<u>Performance readings</u>	
HI SPEED	High speed recall
0-60 MPH	0-60 mph time in seconds
1/4 MI SPD	Speed at end of 1/4 mile (trap speed)
1/4 MI TIME	Time to travel 1/4 mile from standing start
HIGH RPM	High RPM recall
MBM displays (optional)	MBM (Motorcycle Bus interface Module) readings for connected modules

## GAUGE SETUP AND CALIBRATION

The function switch is used to enter setup mode for all of the gauges. All of the setup is done from the speedometer message display. 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
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 while driving
	AUTO CAL	Drive a measured mile (or km) to calibrate speed
	UNIT	Select MPH or km/h unit
	SERVICE	Set miles to service reset value or turn off
	PPM INFO ODO PRESET	Display current speed calibration pulses per mile One time odometer preset ( <b>only available for the first 100 miles</b> )
TACH	WARN	Set high rpm warning point
	CYLINDER	Set engine cylinder count for tachometer calibration
	SIGNAL	Set tachometer signal type (this should be set to normal)
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
VOLTAGE	LO WARNING	Set low volts warning point
DISPLAY	CONTRAST	Message center contrast adjustment
	PRFM DISP	Display performance readings
	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

Until the speedometer is calibrated, the odometer display will show "PLEASE" "SET" "SPEED". This message can be cleared temporarily by pressing and holding the switch.

To enter the speedometer setup, press and hold the switch while turning the key on and starting the engine. Once the engine is running, release the switch. 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.

#### 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", "AUTO CAL", "UNIT", "SERVICE", "ODO PRESET", "PPM INFO", or "DONE".
- Press and release the switch to change the selection, press and hold the switch to select it.

### **SPEED CALIBRATION**

There are two methods for calibrating the speedometer, auto cal and adjust. Either one can be used. Auto cal requires that you have one measured mile marked out (km for metric), this is the best method to start with if your speedometer needs a lot of correction. Adjust requires you to follow another vehicle going at a set speed, time yourself over a mile to determine your speed, or use a hand held GPS with speed indication.

#### **ADJUST Speed Calibration**

- 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.
- Release the switch. The display will switch to "unit" and 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.
- Next the system will restart with the current speed shown highlighted on the message display. The speedometer will show the speed reading. Begin driving at a known speed. When the switch is pressed, the speedometer reading will begin increasing until the switch is released. The next time the switch is pressed, the reading will begin decreasing until it is released. When the speedometer is correct you can release the switch. The new calibration will be saved if no adjustments are made for 10 seconds.

#### **AUTO CAL Speed Calibration**

- Press and release the switch until "AUTO CAL" is displayed, then press and hold the switch until the display blanks.
- Release the switch. The display will show the current calibration value.
- Release the switch. The display will switch to "unit" and 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.
- Next the message display will show "PULSE COUNT" and "000000". You should now begin driving the measured mile. The message display will count the number of pulses received from the sensor. The message display cannot be used to determine when a mile has been driven. Once you reach the end of your marked mile, press and release the switch again. The calibration is now done.

### **PLEASE NOTE:**

#### **Common problems during calibration:**

- VSS (vehicle speed sensor) wires should be isolated from the ignition system. Coils, plug wires, or tachometer signal wires routed near or with the VSS wire can cause many problems. If you are seeing **erratic speedometer operation, registering speed at a standstill, or speed changes with engine RPM**, please double-check your VSS wire and tachometer wire routing making sure the VSS wire is separated from any ignition system components.
- If your **speedometer registers '00'** all the time, the unit is not receiving a VSS signal, please double-check your sensor wiring and mounting. The speedometer cannot be properly calibrated until you are registering a stable, but incorrect speedometer reading.
- Please see **Speed sensor voltage checks** on the last page for assistance in checking your sensor.

#### **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 "5 ----" 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.

## **SPEED Speed setup menu (continued)**

### **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 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 "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 setup menu**

- 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 "WARNING", "CYLINDER", "SIGNAL", or "DONE".
- Press and release the switch to change the selection, press and hold the switch to select it.

### **WARN High rpm 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 rpm warning (2200 – 8200), and "WARNING".
- Press and release the switch to change the value, press and hold the switch to select it.

### **CYLINDER Engine cylinder setup**

- Press and release the switch until "CYLINDER" is displayed, then press and hold the switch until the display blanks.
- Release the switch. The display will show "ENGINE" and the current engine cylinder setting (1 – 16) followed by "CYLINDR".
- Press and release the switch to change the value, press and hold the switch to select it.

### **SIGNAL Tachometer signal setup**

- Press and release the switch until "SIGNAL" is displayed, then press and hold the switch until the display blanks.
- Release the switch. The display will show "NORMAL" or "LO VOLT". The normal setting should be used.
- 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.

## **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", "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.

### 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 1<sup>st</sup> 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 2<sup>nd</sup> 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.

## WIRING COLOR CODE FOR GAUGE:

<b>MVX-2002 14-pin*</b>	<b>2003 and older HD Stock harness color</b>	<b>Function</b>
YELLOW	PINK or YELLOW/BLUE*	tachometer signal
PINK	BLACK/YELLOW	“ENGINE” indicator (-)
BLACK	BLACK	ground (connect directly to battery negative)
WHITE/BLUE		connected to function switch
WHITE	WHITE/GREEN	output speed signal
GRAY	WHITE	VSS signal
PURPLE	BROWN/VIOLET	security system indicator
WHITE/RED		+12v constant power
RED	ORANGE/WHITE	+12 volt with key on
WHITE/BLUE		connected to function switch
WHITE/BLACK	BLACK	VSS ground
WHITE/PURPLE	RED	VSS power
ORANGE	VIOLET	left turn indicator(+)
GREEN	BROWN	right turn indicator(+)
<b>MVX-2002 8-pin*</b>	<b>2003 and older HD Stock harness color</b>	<b>Function</b>
BLUE		temperature sensor signal
BLACK		temperature sensor ground
PURPLE	WHITE	high beam indicator(+)
WHITE/GREEN	TAN	neutral indicator(-)
WHITE/RED	SEN-1039 RED	pressure sensor power
GRAY	SEN-1039 WHITE	pressure sensor signal
BLACK	SEN-1039 BLACK	pressure sensor ground
BROWN	GREEN/YELLOW	oil warning indicator(-)

\*To avoid damage to motorcycle, please see Speedometer, Tachometer, and Status and Warning Indicators sections for details on locating VSS, Tachometer, and indicator wires for **most motorcycle applications**

## TECHNICAL SPECIFICATIONS

Switched input voltage:	6.5 – 22V, 0.15A typical current draw
Battery input voltage:	6.3 – 22V, 0.0006A typical current draw
Speed input signal:	> 1.4Vp-p sine wave or square wave
Tach input, NORMAL:	low < 3.0V and high > 7.6V
Tach input, LO VOLT:	low < 1.0V and high > 4.0V
High beam, Left turn, or Right turn:	> 4.0V active, < 1.6V off
Neutral, Engine, or Low oil:	< 1.6V active, > 4.0V off

**Troubleshooting guide.**

<b>Problem</b>	<b>Possible cause</b>	<b>Solution</b>
Gauge will not light up	Red wire does not have power. Black wire is not getting a good ground. Gauge is damaged.	Connect to a location that has power. Connect ground to a different location. Return gauge for repair. (see instructions)
Gauge lights up, but speed will only show zero.	Speed sensor not grounded properly. Sensor is not sending a speed signal.	Move ground to different location, preferable close to the speedometer ground. Check for a damaged or malfunctioning speed sensor.
<b>PLEASE – SET – SPEED</b>	<b>Speedometer not calibrated</b>	<b>Gauge must be calibrated to your vehicle (see instructions)</b>
Speed reading is erratic or jumps around.	Speed sensor wire is loose or broken. Cable is loose or broken. Poor ground connection. Ignition Interference	Check all wire connections and inspect wire for breaks. Check cable between sensor and transmission. Check ground connection on speedometer and sensor. 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.	Yellow wire is not connected properly. Ignition system not grounded properly. Gauge is not grounded properly. Tach signal type is not set correctly. Gauge is not calibrated	Check connection from yellow wire to tach signal wire. Check engine and ignition system grounds. Check gauge and engine grounds. Change the tach signal type (see instructions). Gauge must be recalibrated (see instructions).
Tach reading is erratic or jumps around.	Tach signal wire is loose or broken. Poor ground connection. Update rate is too fast.	Check all wire connections and inspect wire for breaks. Check ground connection on tachometer, engine, and ignition system. Reset display update speed slower.
Tach reading is incorrect.	Gauge is not calibrated correctly.	Gauge must be calibrated (see instructions).
Gear indicator is always -	Gears not programmed.	Program gear indicator in setup. (see instructions)
High beam, turn signal, or Security indicator does not work.	Loose or incorrect connection to indicator wire.	Check that the appropriate indicator wire has about 0 volts when the indicator should be off and about 12 volts when the indicator should be on.
Engine indicator does not work.	No data from ECM.	Check engine trouble codes.
Neutral, Low Oil, or Engine indicator does not work.	Loose or incorrect connection to indicator wire.	Check that the appropriate indicator wire has about 12 volts when the indicator should be off and about 0 volts when the indicator should be on.
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. Pressure power wire is not connected.	Inspect wire for bare insulation or pinching. Connect sensor RED wire to gauge WHITE/RED wire.
Pressure or temperature reading shows "EE"	Sender wire is open or broken. Sender is not grounded.	Inspect for breaks in wire connection. Check sender ground connection.

**Speed sensor voltage checks.** All checks should be made with the sensor connected to the gauge and the key on. Checks should be done with a volt meter and not a test light.

3-wire sensor: Red wire should have 9-11 volts dc, slightly less than battery voltage.

Black wire should show ground, 0 volts dc at all times.

White wire should vary between 0 and 5 volts dc as the gear teeth pass by the sensor.

2-wire sensor: Measure the voltage between the two sensor wires. With the wheel spinning the voltage should be about 1-10 volts ac (make sure the meter is set to AC volts and not DC volts for this check).

### **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.

**⚠ WARNING:** This product can expose you to chemicals including lead, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)



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