



## MLX-8696/MLX-8496

Direct plug in instrument system for 1996-2003 Harley Davidson Touring models

### The MLX-8696 kit includes:

**MLX displays**  
(MLX-8496 features two small gauges)



Oil temperature  
sensor harness

Cable ties

Interconnect harness



Oil temperature sensor



Adapter box and harness

Sensor connect harness



### **IMPORTANT NOTE!**

This gauge has an odometer preset option that is only available for the first 100 miles (160km) of operation. See "preset odometer" on page 14 for instructions.

### **Features of the MLX-8696 instrument system:**

**Speed** - programmable speed calibration, performance menu, two trip meters, odometer, count down service miles, hours running, miles to empty, security and check engine indicators

**Tachometer** – programmable tach, clock, gear position, cruise control indicator, and high RPM recall

**Oil Pressure** – programmable warning point, uses stock sensor or Dakota Digital sensor for higher pressure

**Oil Temperature** – programmable warning point, complete with new sensor

**Volts** – programmable warning point

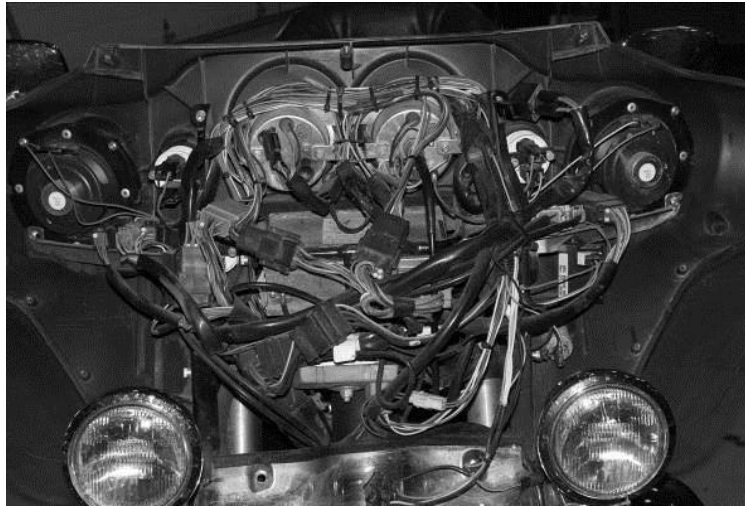
**Fuel Level** – low fuel warning, uses factory sensor

**Air Temperature** – uses factory sensor

**User selectable readings in each small gauge** – pick what you want displayed in each gauge, including MBM readings

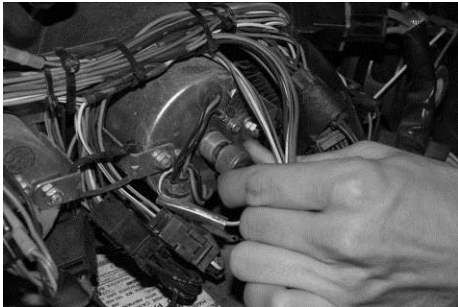
## Installation: Gauges (Street Glide/Ultra)

1. To gain access to the six gauges, you must remove the windshield and outer fairing; start with the windshield and set it aside. There are four T25 screws for the fairing; two on each side, one below the speaker and one toward the bottom, next to the neck. Carefully remove the fairing, unplug headlight and set aside in a safe place.



Street Glide/Ultra with outer fairing removed

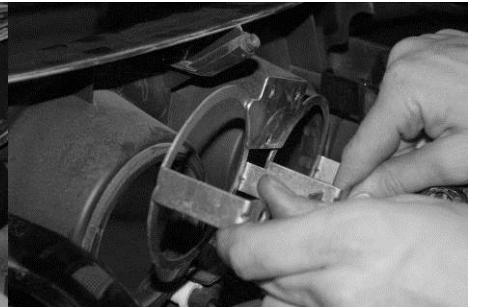
2. Remove the clamps that hold the Speed and Tach in place with a screw driver or wrench depending on application, and remove the gauges.



Remove speedo cable/unplug gauges



Remove nuts/screws and clamp to remove factory gauges



## Installation: Gauges (Road Glide)

1. Remove the Speed/Tach bezel by removing one T25 Torx screw on each side; retain all hardware for reassembly.
2. Lift up on the back of the bezel and slide the tab that is under the ignition switch out from under the switch cover (see photos below of ignition switch cover removed to show detail). Unplug the gauges, switches and indicator lights so the bezel can be completely removed. Remove the clamps (baskets) that hold the gauges to the bezel and remove the gauges and gaskets.
3. Install the new MLX-8696 speedometer and tach using the original hardware. Set assembly aside in a safe place.



**Tab (switch cover removed)**



**Bezel removed**

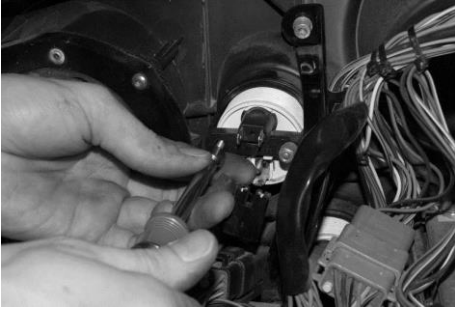


**Gauges and gaskets removed**

4. To gain access to the four satellite gauges, you must remove the outer fairing and turn signals. There are six T25 screws around the perimeter of the fairing, and each turn signal is secured by a pair of 1/2" bolts. With the fairing free of the bike, unplug the headlights and set the fairing aside in a safe place.



## Installation: Gauges (All)



All of the stock small gauges (fuel, volts, oil, and air temp) have two plugs. One is for illumination the other is for the gauge power, ground, and sensor. The 2-pin illumination harness (orange and black wires) will not be reused so remove the bulb. Unplug the 3-pin connectors and remove the two 5/16" nuts holding the clamps.



**IMPORTANT NOTE!**  
**SAVE ALL CLAMPS, GASKETS, and SCREWS FROM THE STEPS ABOVE AS THEY WILL BE USED TO SECURE THE NEW DAKOTA DIGITAL GAUGES**

Now you are ready to install the new gauges into the fairing. Place the gauges into the fairing from the front, and secure using the original hardware from disassembly: clamps, gaskets, screws and nuts.

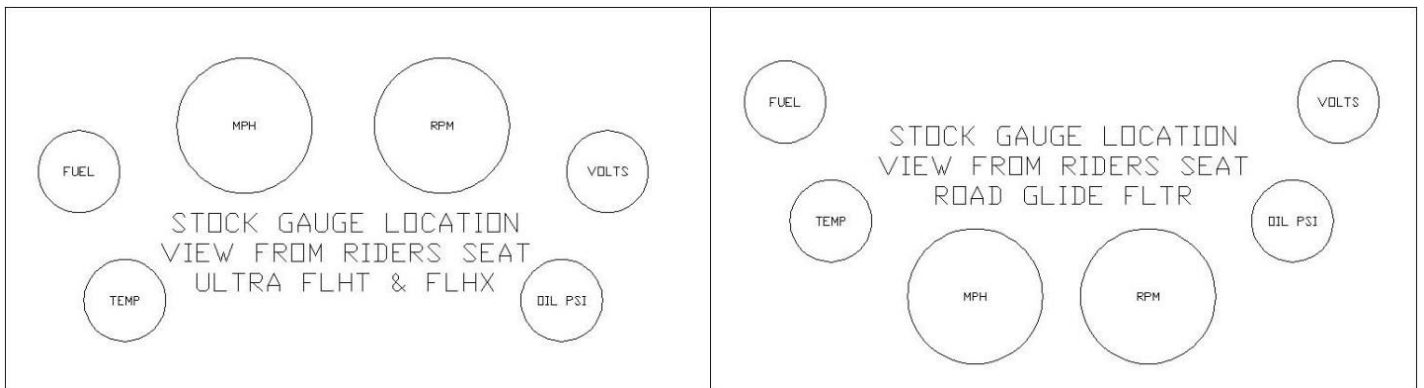
Be sure the alignment tab on the clamp lines up with the notches in the fairing. Some fairings may only have one notch; line up at least one tab on the clamp with the notch in the fairing, this will ensure the gauges are centered and aligned correctly. Be sure to check alignment from the front before final torquing.



**Speedometer and Tachometer**



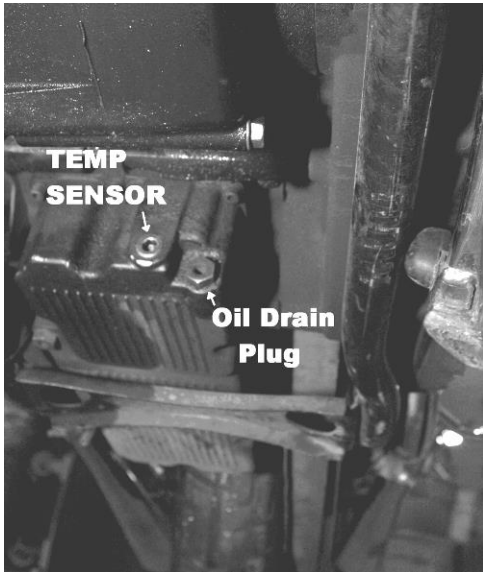
**Oil PSI, Oil Temp, Voltmeter, and Fuel Level**



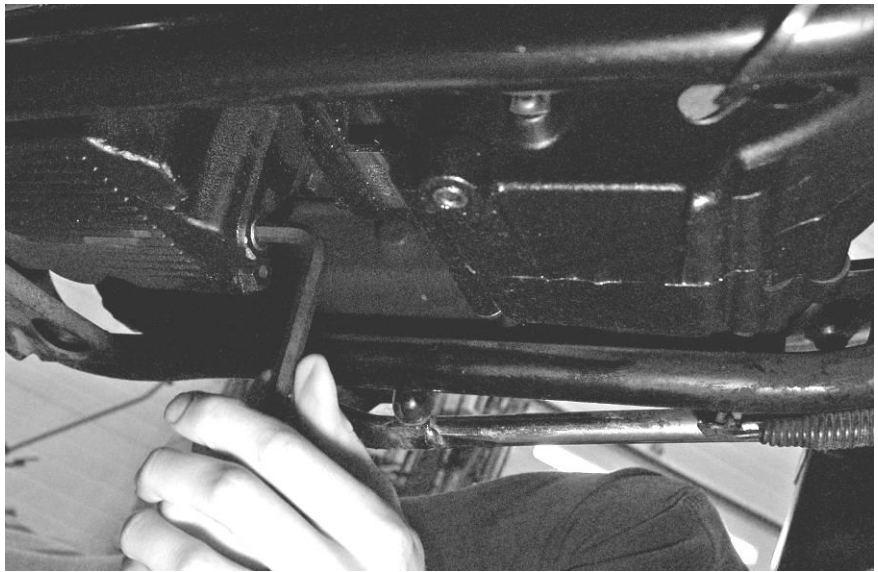
## Installation: Oil temperature sensor

The supplied oil temperature sensor replaces one of the oil pan plugs. You can do this during an oil change, but if you move quickly you should only lose a small amount of oil. First, wipe any road grime and oil from the area, then locate the appropriate plug on the front, bottom side of the oil pan. Remove the plug to the right of the main oil drain plug using a 3/8" allen wrench. See photo for the correct plug.

**NOTE: Check oil level after install of this sensor, refill oil as needed**



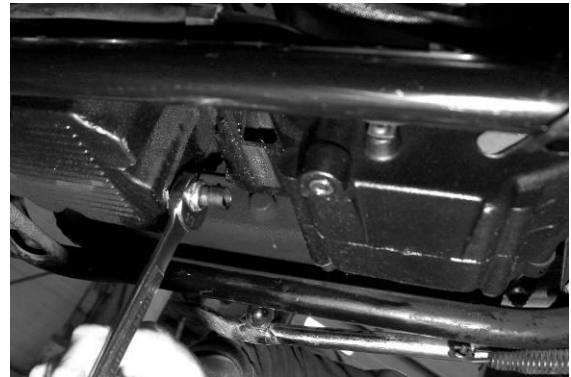
Bottom of oil pan, front view



Remove 3/8" NPT allen plug



Thread sender into oil pan

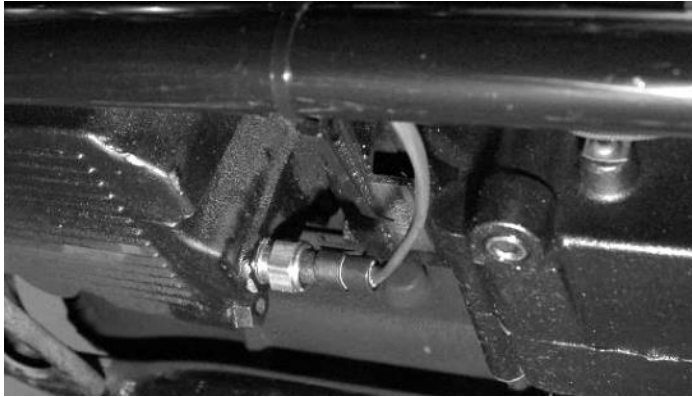


Tighten sensor with a 3/4" wrench



## Installation: Wiring

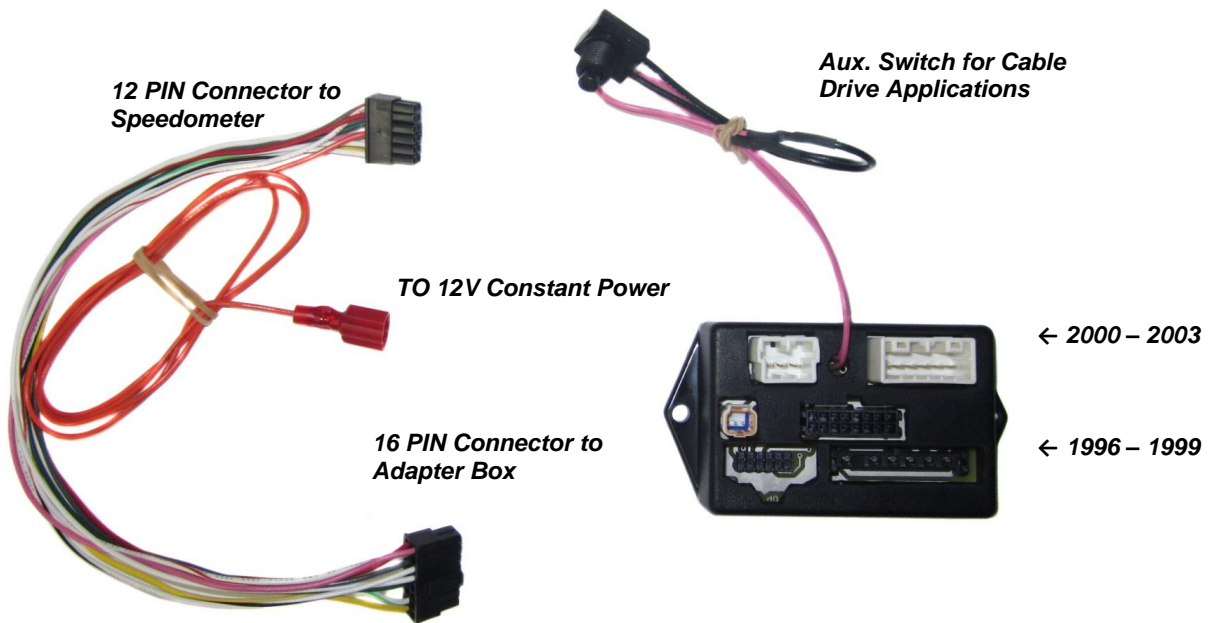
1. Plug in the sealed two pin connector, then route the wires over to the right side frame rail and up into the neck along with the clutch cable. Use cable ties to secure the wire harness along the frame.



**Installed oil temp sensor and harness plug**



2. Included in the kit is an adapter box that allows the kit to directly plug into the factory harness. The box has several connections which are explained here. The adapter box will lay inside the fairing behind the speed and tach. The box can be secured to the wiring or adhered to the top of the ratio to prevent rattling. If adhering to the top of the radio please use the double-sided adhesive tape which is adhered to the back of the connector adapter box.



First locate your speedometer and tachometer connectors in the factory wiring harness that were unplugged from the original speed and tach gauges. Plug these connectors into their correct locations on the adapter box. The adapter box has one set of connectors for 1996-1999 applications and another set for 2000-2003.

For cable driven speedometers, you will also need to wire in a speed sensor. If you have provisions for a transmission mounted sensor use Dakota Digital SEN-1017, if not use Dakota Digital SEN-1011; a cable driven speed sensor. Wiring of the speed sensor will be done using the supplied 3 wire pigtail that connects to the adapter box. The speed sensor pigtail should have Red, Black, and White wires with a 3 pin connector. The speed sensor will need to be connected to the pigtail following the table below. Cut the red wire back and tape it up if using the cable drive adapter SEN-1011 since it is not used.

Pigtail	SEN-1011	SEN-1017
Black	Black	Black
White	White	Green
Red		Red

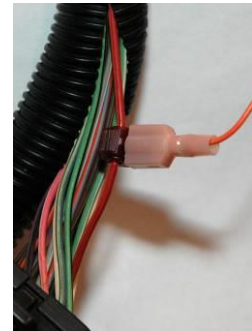
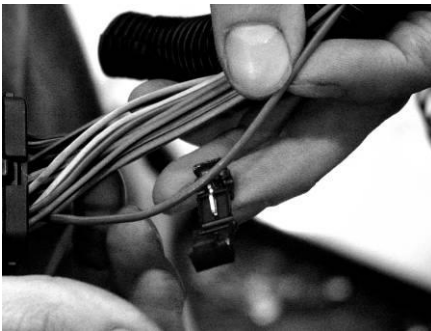
If you are using the cable driven adapter you will also need to pull the speedometer cable from the front wheel and replace the cable nut with the supplied cable nut so your speedometer cable will thread onto the new sensor. You have to take the cable off at the wheel so the nut can slide down and off the end of the cable and allow the new nut to slide on. After the nut has been replaced; the speedometer cable can be connected to the wheel and also to the sensor. Secure the sensor with a zip tie and make sure there is no binding in the cable and that the cable has engaged fully into the sensor.

### Speedometer connector

To connect the adapter box to the speedometer, you will need the supplied harness (this may already be connected to the adapter box). This harness has one 16 pin connector and one 12 pin connector. The adapter box will attach to the 16 pin connector. The speedometer will attach to the 12 pin connector.

### Clock Memory connection

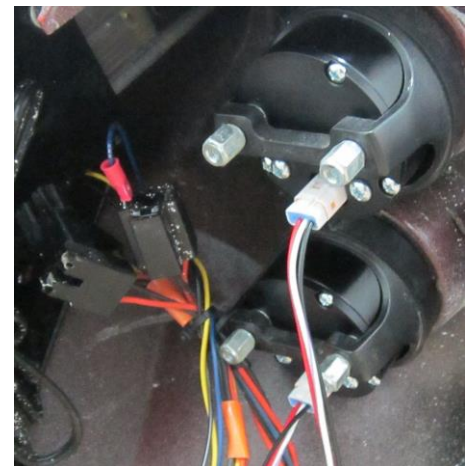
You will need to locate a fused, constant +12V battery power wire for the orange, clock memory wire. The long, orange, clock memory wire is located on the speedometer gauge plug. Check your service manual or use a voltmeter or test light to find and verify a constant power location. One common location to pick up the constant power is pin #10 on the radio. This should be a Red w/Orange wire that is fused to the battery.



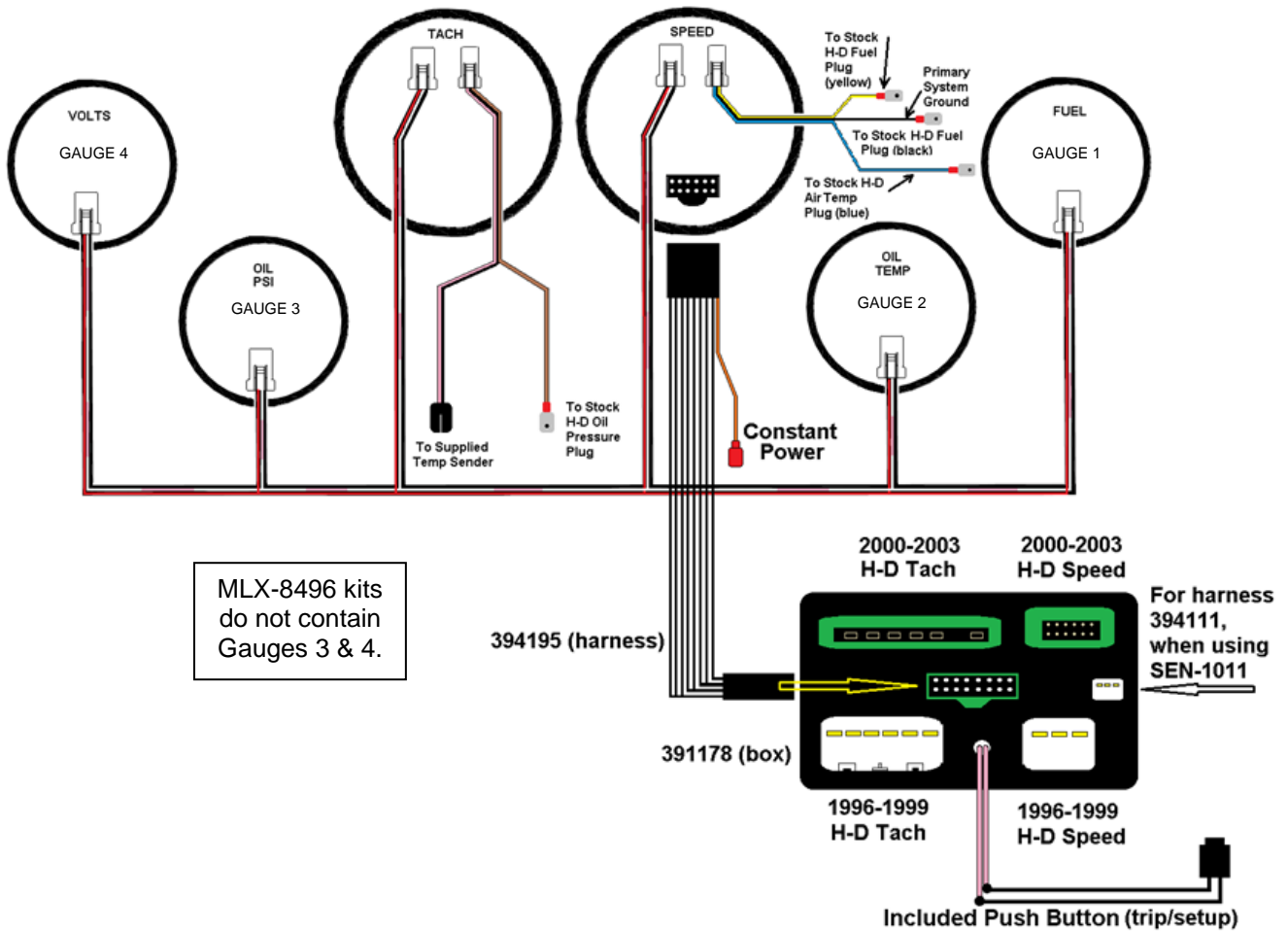
The 3-pin connectors on the back of the speed and tach provide the sender connections. The speed 3-pin connector provides ground, fuel level, and air temperature with spade connectors for easy connection to the factory plugs. The tach 3-pin connector provides oil temperature and oil pressure. Connect the speed 3-pin yellow wire to the factory fuel gauge connector yellow wire. The speed 3-pin black wire is the main system ground; connect it to the fuel gauge connector black wire. Connect the speed 3-pin blue wire to the air temperature gauge connector blue wire. Connect the tach, 3-pin, brown wire to the oil pressure gauge connector brown wire.

A 4-pin, three wire harness with six connectors is included. This will plug into the back of each gauge, these wires provide power, ground, and data. Route one of these harnesses to the back of each gauge and plug it in. It does not matter which connector goes to each gauge.

**Use provided zip ties to secure connections and loose harnesses.**



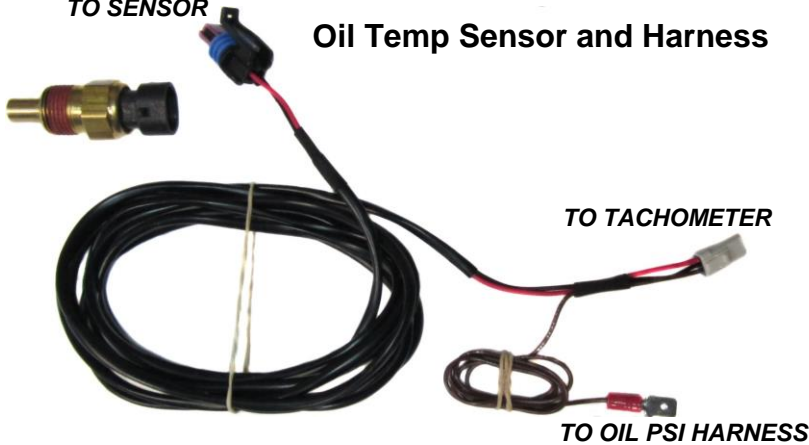
Normal Gauge Layout - looking at the gauges from the front of the bike, with the fairing removed



3. A 4-pin, three wire harness with six connectors is included. This will plug into the back of each gauge; these wires provide power, ground, and data. Route this harness to the back of each gauge and plug it in. It does not matter which connector goes to each gauge.

TO SENSOR

**Oil Temp Sensor and Harness**



**Interconnect Harness  
Connects to each gauge**



**Sensor Connect Harness**





## FUEL GAUGE GROUND UPDATE

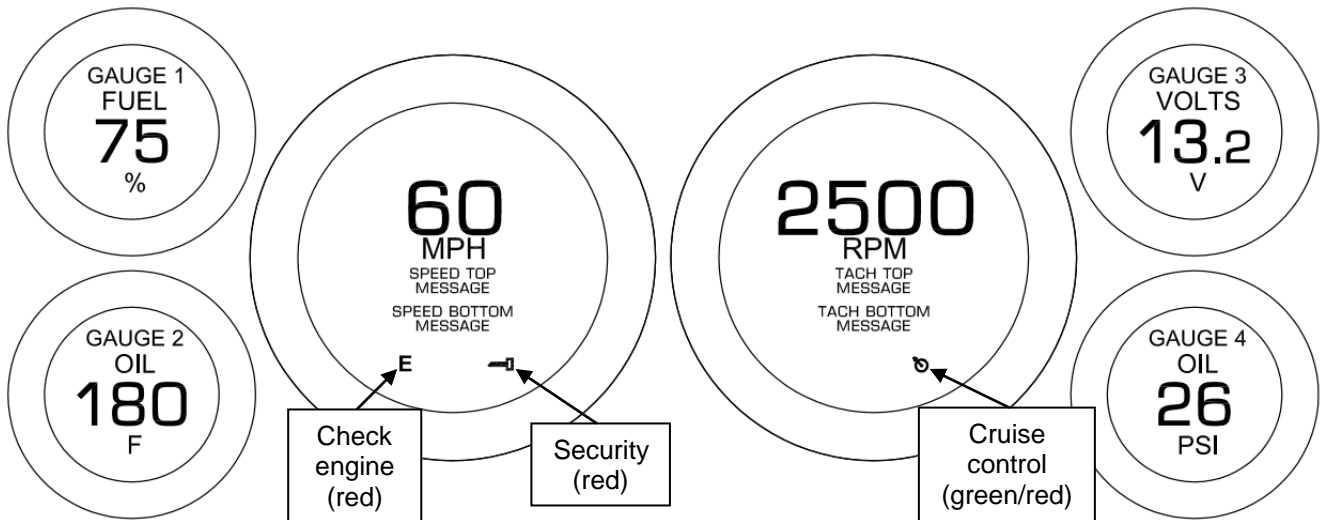
The gauge system ground (black wire from the three pin speed connector) will normally connect to the stock fuel gauge connector (middle spade socket). On some 2004-2007 motorcycles, the factory grounding can cause errors in the fuel gauge reading. In order to correct this, a ground extension harness is included in your kit. It has a long wire to go to the fuel sender with a spade connector on the other end. The speedometer ground wire will connect to this extension wire instead of going to the fuel gauge connector. The other end of the long ground wire should be routed under the tank and connect as close to the fuel pump connector as possible. Locate the three or four wire harness going to the fuel pump and fuel sender connector near the gas cap (shown below). The new fuel gauge ground should be attached to the black ground wires on this harness. Three wire harnesses will have one black wire and four wire harnesses will have two black wires, connect to the black ground wire in position C (3<sup>rd</sup> location). Soldering and covering with heat shrink is the preferred method for attaching the ground wire but a properly used butt connector will also work. Scotch lock style connectors are not recommended.



- Strip back the insulation on the black wire.
- Wrap the end of the new fuel gauge harness around the exposed wire.
- Solder the connection, making sure the solder flows into the wires.
- Wrap the splice with electrical tape to insulate it.

Reinstall the outer fairing. Road Glide applications: plug in and install speed/tach assembly to complete the physical installation.

## System features



### LOCATIONS

There are four message locations available to display additional information; two under the speedometer and two under the tach. They are labeled Speed top/bottom and Tach top/bottom respectively. You can program what you want in each location as well as turn readings off. Each location can have multiple readings assigned to it; simply tap the function switch to scroll to the next reading in that location.

Warning messages, such as low fuel, high temperature etc will appear in the speed message locations.

The displays in the large gauges will always be speedometer (0-250MPH/400km/H) and tachometer (0-9,990 RPM).

Gauges 1-4\*\* (satellites) can be programmed to your preferred reading, but cannot accommodate more than one piece of information. The following information can be displayed in the satellite gauges: voltage, fuel level, oil temperature, oil pressure\*, and air temperature\*.

\*When available. Some readings may not be available with all models.

\*\*MLX-8496 contains two satellite gauges

Information readings	Description
ODOMETER	Odometer reading (0-999,999)
TRIP A	Trip A odometer reading (0-9999.9)
TRIP B	Trip B odometer reading (0-9999.9)
SERVICE (when enabled)	Distance to next service (0-7,500, or "SERVICE DUE")
TRIP HR	Hours gauge has been on with engine running (0-999.9)
SPEED km/h	Alternate speed unit conversion
OIL TEMP (when gauge is not present)	Engine oil temperature
OIL PSI (when gauge is not present)	Engine oil temperature
VOLTS (when gauge is not present)	System voltage
FUEL (when gauge is not present)	Fuel level
DISTANCE TO E MI (km) (when enabled)	Distance to empty
GEAR/CLOCK	Gear position and 12 hour clock display
<b>Performance readings – (will display after SPEED km/h (SPEED MPH) when enabled)</b>	
HIGH MPH (km/h)	High speed recall
0-60 TIME	0-60 mph time in seconds
Quarter mile speed & time	Speed at end of ¼ mile (trap speed) and ¼ mile time from standing start
HIGH RPM	High RPM recall
<b>MBM (Motorcycle Bus interface Module)</b>	
MBM displays (optional)	MBM readings for connected modules

# Programming, clock set, service reset

## FUNCTION SWITCH

The factory trip reset switch is used as the main function switch. During normal operation, the function switch allows access to information including mileage, RPM, and performance information which is located within four message locations on the Speed/Tach gauge. The message locations have arrows indicating which message location is currently selected. Press and release the function switch to change the displayed information.

If you would like to change the information on the other message location press and hold the function switch. You'll see a scrolling bar titled "MOVE FOCUS" being filled while holding the switch. Once the scrolling bar is filled "RELEASE TO MOVE" will be displayed. Release the switch and the other message location will now be selected and have arrows indicating it's currently selected.

The focus arrows will move from top to bottom on the speedometer and then top to bottom on the tachometer.

To clear or reset information such as Trip A, Trip B or performance readings, press and hold the function switch until you see the scrolling bar filling. Once the scrolling bar is full continue to hold the switch and it will then start filling from the other direction and be titled "HOLD TO CLEAR". Hold until you see "RELEASE" displayed above the status bar. The information will now be reset. If the function switch is pressed while the key is in the off position, the clock and odometer will be displayed.

## SETTING THE CLOCK

The clock uses a 12 hour format and can be set by holding the function switch while the focus arrow is next to the clock. If the clock is not shown, tap the function switch until it appears. Keep in mind you may need to move to another message location.

Hold the switch until "RELEASE" is displayed; the hours will begin flashing. Momentarily pressing the switch will change the hours, holding the switch will move to the minute tens set and the tens digit will begin flashing. Momentarily pressing the switch will now change the minute tens, holding the switch will move to the minute ones set and the ones digit will begin flashing. Momentarily pressing the switch will now change the minute ones. Holding the switch will exit the clock set mode.

## SERVICE RESET

"SERVICE DUE" may appear at start up, indicating your preselected service time is due.

The screen will go back to the last display shown.

- To clear the service odometer, after your service was completed, press and release the function switch until the highlighted "SERVICE DUE" appears in either message location.
- When "SERVICE DUE" is displayed, hold the function switch until "RELEASE" is displayed.

## SETUP MENU

**\*To simplify setup and configuration, please download our IOS or Android app ‘Dakota Digital Motorcycle’\***

The function switch is used to enter setup mode.

To get into setup, press and hold the stock trip function switch while turning the key on.

- Press and **release** the switch to move through the different setup menus.
- Press and **hold** the switch to enter a setup menu.
- Press and **hold** to save an option, also.

Main Menu	Sub Menu	Description
BLUETOOTH	STATUS CHECK	Bluetooth ID and current connection status
	OFF	Disable Bluetooth connections
	SETUP ONLY	Allow Bluetooth connections only while in setup
	ALWAYS ON	Allow Bluetooth connections when key is on
	RESET	Resets Bluetooth options for pairing
LIGHTING	COLOR THEMES	Set factory defined color themes
	SET ALL COLOR	Set all areas to one color
	DISPLAY COLOR	Set speed digit color
	LABEL COLOR	Set speed label color
	MESSAGE COLOR	Set message location 1 and 2 color
	DIMMING	Set dimming method
	SUNLIGHT	Set sunlight brightness method
	RESET	Returns all colors and settings to factory default
SPEED	ADJUST	Adjust speed reading up or down while riding
	AUTO	Drive one mile (or km) to calibrate speed
	UNIT	Select MPH or km/h unit
	SERVICE RESET	Set miles to service reset value or turn off
	PRESET ODO	Odometer preset <b>(Can only be set within the first 100 miles)</b>
TACH	HIGH WARNING	Set high RPM warning point
OIL TEMP	UNIT	Select F or C for temperature unit
	SENDER	Turning sender on or off
	HIGH WARNING	Set high warning point
	TEST	Display sender resistance for troubleshooting
OIL PSI	SENDER	Select pressure sender
	LOW WARNING	Set low warning point
	TEST	Display sender resistance for troubleshooting
FUEL	SENDER	Select fuel sender
	RANGE TO EMPTY	Enable/Disable/Reset distance to empty
	TEST	Display sender reading for troubleshooting
VOLT	LOW WARNING	Set low warning point
DISPLAYS	SPEED TOP	Show/Hide performance readings in Speed top message location
	SPEED BTM	Show/Hide performance readings in Speed bottom message location
	TACH TOP	Show/Hide performance readings in Tach top message location
	TACH BTM	Show/Hide performance readings in Tach bottom message location
	GAUGE 1	Set Gauge 1 reading ( <i>dependent if physical gauge is installed</i> )
	GAUGE 2	Set Gauge 2 reading ( <i>dependent if physical gauge is installed</i> )
	GAUGE 3	Set Gauge 3 reading ( <i>dependent if physical gauge is installed</i> )
	GAUGE 4	Set Gauge 4 reading ( <i>dependent if physical gauge is installed</i> )
	MBMS	Show MBM's connected to the system and set warning points
GEAR	PRESET	Set gears based on factory setup
	LEARN	Learn gears based on speed and RPM
FACTORY RESET		Resets all settings except odometer to factory defaults
VERSION		Displays software codes of each controller
EXIT SETUP		Exit



## Programming procedure

**PRESS AND HOLD THE STOCK TRIP SWITCH WHILE TURNING IGNITION ON.** Release the switch.

**For speed calibration: HOLD THE STOCK TRIP SWITCH WHILE STARTING THE BIKE**

- Press and **release** the switch to move through the different setup menus.
- Press and **hold** the switch to enter a setup menu.
- Press and **hold** to save an option, also.

Current selections within a sub menu are denoted with an asterisk (\*)

Each small gauge installed will say GAUGE 1, 2, 3, or 4 on them. This will be useful in the DISPLAYS setup.

## Exiting Setup

At the end of most setup sections, steps must be taken to properly exit the setup and return to normal operation.

When a section in this manual says “**Exit setup**”, please refer to these steps.

- Press and release the function switch until you see “>BACK”.
- Press and hold the switch until you see “RELEASE”, and release the switch.
- Press and release the function switch until you see “>EXIT MENU”.
- Press and hold the function switch until you see “RELEASE”, then release the switch.

## **BLUETOOTH Bluetooth menu**

- This is diagnostic section when using the app for your smartphone or tablet.
- The app can aid in setup and also read real time data on your smartphone or tablet.
  - Gauges **MUST** be in setup mode prior to using setup section in the app.
- When “>BLUETOOTH” is displayed hold the trip switch until “RELEASE” is displayed, and release the switch.
  - Under the word SETUP BLUETOOTH, the Bluetooth ID will be shown.
  - For Android users, this is the ID that you pair to, in Settings/Bluetooth, prior to opening the app.
- The Bluetooth menu options are: “STATUS CHECK”, “OFF”, “SETUP ONLY”, “ALWAYS ON”, “RESET”, “BACK, and “EXIT”.
- Press and release the switch to the option wanted, then press and hold until “RELEASE”, then release the switch.
- STATUS CHECK: Shows the unit is either “WAITING” for connection or “CONNECTED” with the app.
- OFF: turns off the Bluetooth.
- SETUP ONLY: Bluetooth is only active in setup.
- ALWAYS ON: default mode, works for setup and for real time readings on your smartphone or tablet.
- RESET: resets the Bluetooth options to default, useful if pairing is a problem.
- Exit setup.

## **LIGHTING Lighting menu for color changes**

- When “>LIGHTING” is displayed, press and hold the switch until “RELEASE” is displayed, and release the switch.
- The color menu options are “COLOR THEMES”, “SET ALL COLOR”, “DISPLAY COLOR”, “LABEL COLOR”, “MESSAGE COLOR”, “DIMMING”, “SUNLIGHT”, “RESET” or “BACK”.
- Since the color menu options are so expansive the selection process is the same in all sections listed below.
  - Press and release the switch to change the selection.
  - Hold the function switch to enter the selected setup menu, until “RELEASE”, and release the switch.
  - The display will show the available options. Press and release the switch to move through the available options.
    - An asterisk\* will appear next to the option indicating it's set as the current setting.
  - Press and hold to select an option, until “RELEASE” is displayed.
  - Exit setup.
- COLOR THEMES: offers preset colors for the LCD color, label colors, message colors, tach bar, and tach warning.
- SET ALL COLOR: can set the entire gauge to one of 31 color choices.
- DISPLAY COLOR: independently sets the speed color to one of 31 color choices.
- LABEL COLOR: independently sets the MPH or km/h label color to one of 31 color choices.
- MESSAGE COLOR: independently sets the message area, (below the speed readout), color to one of 31 color choices.
- DIMMING: offers two options, AUTOMATIC night dimming, or “OFF”.
- SUNLIGHT: special feature to enhance viewing of the TFT LCD in *bright daylight* with a high contrast display.  
***This works independently from the night dimming***  
If enabled, this will temporarily override the color choices made to offer a visible display during the day. The color will revert back when the sunlight is less intense, (light overcast days can trigger this mode).
  - NORMAL: in daylight the background will stay black as the speed and messages will turn white.
  - INVERT: in daylight the background will turn white as the speed and messages will turn black.
  - OFF: your color choices will not change.
- RESET: This will reset all color choices and options back to original factory colors.
- BACK: Exits menu.

## **SPEED** Speed setup menu

- >> **Speed calibration requires holding the function switch, THEN starting the engine** <<
- When ">SPEED" is displayed, hold until "RELEASE" is displayed, and release the switch.
- The selectable options are "ADJUST", "AUTO", "UNIT", "SERVICE RESET", "ODO PRESET", or "BACK".
- Press and release the switch to change the selection. Press and hold the switch to select it.

### **ADJUST Selection**

- **This requires riding a known speed with a GPS, or following another vehicle at a known speed.**
- When ">ADJUST" is displayed, press and hold the switch until "RELEASE" is displayed - release the switch.
- The options will be "FASTER", and "SLOWER", to adjust the speed.
- Press and release the switch to choose "FASTER" to increase speed, or "SLOWER" to decrease speed.
- Press and hold the switch until "RELEASE" is displayed to begin adjusting.
- When riding a known speed, the speedometer will display a speed reading.
- While the display shows ">TAP TO INCREASE (DECREASE)", tap the switch to adjust speed.
- When your speed is correct, hold the switch until "RELEASE" is displayed, release the switch.
- If you go past your target speed, enter ">ADJUST" again and repeat the process until correct.
- Exit setup.

### **AUTO Selection**

- **This requires riding a one mile (or kilometer) distance, which must be determined before starting.**
- When ">AUTO" is displayed, hold until "RELEASE" is displayed, and release the switch.
- The display will show ">BEGIN". You should be at the beginning of your measured distance to ride.
- When ready, hold the switch until "RELEASE" is displayed, and release the switch.
- When you see "PPM", you may ride the distance at any speed, and may stop and start.
  - The PPM numbers will increase while riding. If they remain at 000000 please check your speed sensor wiring.
- When you reach the end of the distance, press and release the switch.
- Exit setup.

### **UNIT MPH/km/h Selection**

- **It is very important to set the speed unit PRIOR to setting the odometer!**
- When ">UNIT" is displayed, then press and hold the switch until "RELEASE" is displayed, release the switch.
- The display will show UNIT and ">\*MPH" for miles and "km/h" for kilometers.
- MPH is default. Press and release the switch to choose between MPH or km/h.
- Hold the switch until you see "RELEASE" and release the switch.

### **SERVICE RESET miles or km to next service setup**

Service is a countdown odometer. The service odometer display can be disabled or can be set to count down from 500 – 7500 miles, (800 to 12,000 kilometers). If the service odometer is enabled and reaches 0 miles/km, it will display "SERVICE DUE" each time the key is turned on.

- When ">SERVICE RESET" is displayed, press and hold the switch until "RELEASE" is displayed and release the switch.
- The current setting will be displayed. The default is ">\*OFF", but it could be a value in miles or kilometers.
- The miles begin at 500 and go up to 7,500 miles in 500MI increments.
- The kilometers begin at 800 and go up to 12,000km in 800km increments.
- To change the service odometer, press and release the switch until the desired setting is displayed.
- Hold the switch until you see "RELEASE", and release the switch.
- Exit setup.

### **PRESET ODO Odometer preset**

- ✓ The odometer starts at zero, but can be preset by the customer within the first 100 miles (161 km) of riding.
- ✓ After riding more than 100 miles (161 km), the menu option will no longer be displayed.
- ✓ Correctly select the units to be either MPH or km/h **FIRST**, as the odometer will be set in the selected units.
- ✓ The preset is in full miles or kilometers only, **no** tenths
- ✓ The odometer can be reset multiple times within the first 100 miles (161 km) of riding.
- When ">PRESET ODO" is displayed, press and hold the switch until "RELEASE" is displayed and release the switch.
- The current miles will be displayed with the left most digit flashing.
- To change the flashing number, press and release the switch to the desired number.
- Press and hold the switch until "RELEASE" is displayed, then release the switch.
- Repeat the process of until the right most digit has been set.
- With the far right number flashing, press and hold the switch and the display will show ">SAVE ODO? NO".
- Verify the small odometer at the bottom is what you want set.
  - If incorrect, hold the button until "RELEASE" is displayed, then release the switch.
  - You can now step through the process again and correct your readings.
  - Turning the key off at any time will discard any attempted odometer settings.
- If the odometer is correct at the ">SAVE ODO? NO" screen, press and release the switch to change the display to "SAVE ODO? YES".
- When ">SAVE ODO? YES" is displayed, press and hold the switch until "RELEASE" is displayed and release the switch.
- Exit setup.

## **TACH Tachometer warning setup**

- When ">TACH" is displayed, press and hold the switch until "RELEASE" is displayed, and release.
- The selectable options are "INPUT", "HIGH WARNING", and "BACK".
- Press and release the switch to change the selection; press and hold the switch to select it.

### **INPUT Signal input setup**

- This may be required to be changed for some low voltage ECM tach signals.
- When ">INPUT" is displayed, press and hold the switch until "RELEASE" is displayed, release the switch.
- The selections are "CYLINDER", "TYPE", and "BACK".
- Press and release the switch to change the selection: press and hold the switch to select it.

#### **CYLINDER Cylinder count setup**

- When ">CYLINDER" is displayed, press and hold the switch until "RELEASE" is displayed, and release.
- The cylinder options range from 1 to 16.
- Press and release the switch to change the cylinder count.
- Press and hold the switch until "RELEASE" is displayed, and release.
- Exit setup.

#### **TYPE Signal type setup**

- When ">TYPE" is displayed, press and hold the switch until "RELEASE" is displayed, and release.
- The options are ">\*12V HIGH", "5V LOW" and "BACK".
- Press and release the switch to change the voltage input range.
- Press and hold the switch until "RELEASE" is displayed, and release.
- Exit setup.

### **High warning (shift light) setup**

- When ">HIGH WARNING" is displayed, press and hold the switch until "RELEASE" is displayed, and release.
- The display will show the current high RPM warning with a \*.
- The default is 5,500 RPMs but is selectable from 2,200 to 8,200 RPMs.
- Press and release the switch to change the RPM warning point.
- Press and hold the switch until "RELEASE" is displayed, and release.
- Exit setup.

## **OIL TEMP Engine oil temperature setup menu**

- When ">OIL TEMP" is displayed, press and hold the switch until "RELEASE", then release the switch.
- The Oil Temp options are "UNIT", "SENDER", "HIGH WARNING", "TEST", and "BACK".
- Press and release the switch to choose and option.

### **UNIT Temperature unit selection**

- When ">UNIT" is displayed, press and hold until "RELEASE", then release the switch.
- The options are "F", "C", or "BACK".
- Press and release to select the unit.
  - **Setting this temperature unit will also change the ambient air temp unit.**
- Press and hold until "RELEASE", then release the switch.

### **SENDER Enable or disable temp sender**

- When ">SENDER" is displayed, press and hold until "RELEASE", then release the switch.
- The options are "ON" or "OFF" depending on whether the reading is currently enabled.
- Press and release the switch to select value.
- Press and hold until "RELEASE", then release the switch.

### **HIGH WARNING High oil temperature warning setup**

- When ">HIGH WARNING" is displayed, then press and hold the switch until "RELEASE", then release the switch.
- The low and high temperature warning points range from 225F – 375F (107 – 190C).
  - If a gauge displays OIL TEMP, a red band warning will appear on that gauge; otherwise it will be in SPEED TOP.
- Press and release the switch to select value.
- Press and hold until "RELEASE", then release the switch.

### **TEST Resistance test**

- A good troubleshooting tool if the pressure readings seem incorrect, and for aiding technical support.
- When ">TEST" is displayed, then press and hold the switch until "RELEASE", then release the switch.
- The display will show "OIL TEMP", "TEST", and "xxx OHMS".
  - The "xxx" should be a value in numbers.
  - If not connected "OPEN" will appear.
- Press and release the switch to exit.
- Exit setup.

## **OIL PSI Engine oil pressure setup menu**

- When ">OIL PSI" is displayed, then press and hold the switch until "RELEASE", then release the switch.
- The options will be "SENDER", "LOW WARNING", "TEST", or "BACK".

### **SENDER Oil pressure sender selection**

- When ">SENDER" is displayed, then press and hold the switch until "RELEASE", then release the switch.
- The options to select between are "HD 60", "DD 75", "OFF", and "BACK".
  - HD 60 – Using stock 60 PSI sender.
  - DD 75 – Using Dakota Digital SEN-1032, 75 PSI sender.
  - OFF – Turns off the option to read oil pressure.
- Press and release the switch to select sender option.
- Press and hold the switch to save selection.

### **LOW WARNING Low oil pressure warning setup**

- When ">LOW WARNING" is displayed, then press and hold the switch until "RELEASE", then release the switch.
- The low oil pressure warning points will range from 0 – 30 PSI.
  - If a gauge displays OIL PSI, a red band warning will appear on that gauge, otherwise it will be in SPEED TOP.
- Press and release the switch to change the low pressure warning point.
- Press and hold the switch until "RELEASE" is displayed, and release.

### **TEST Resistance test**

- A good troubleshooting tool if the pressure readings seem incorrect, and for aiding technical support.
- When ">TEST" is displayed, then press and hold the switch until "RELEASE", then release the switch.
- The display will show "OIL PSI", "TEST", and "xxx OHMS".
  - The "xxx" should be a value in numbers.
  - If not connected, "OPEN" will appear.
    - The stock HD sensor will typically show OPEN when there is no oil pressure. During normal operation, the gauge will not show an error for open since this is normal on the stock sender for 0 PSI.
- Press and release the switch to exit.
- Exit menu.

## **FUEL Fuel level setup menu**

*A low warning will be displayed on either the fuel gauge or Speed Top as a red band warning when fuel reaches 10%.*

- When ">FUEL" is displayed, then press and hold the switch until "RELEASE", then release the switch.
- The options to select between are "SENDER", "RANGE TO EMPTY", "TEST", and "BACK".
- Press and release the switch to change the selection, press and hold the switch to select it.

### **SENDER Fuel sender selection**

- When ">SENDER" is displayed, then press and hold the switch until "RELEASE", then release the switch.
- The options to select between are "HD STOCK", "HD 2008", "FAT BAGGER", "CUSTOM" and "BACK".
- Press and release the switch to change to the proper sender.
  - "FAT BAGGER" is only for the Fat Bagger Inc. fuel tanks.
- Press and hold the switch until "RELEASE", then release the switch

### **Exit fuel setup to confirm fuel selection**

- CUSTOM is only for rare occasions if a stock sender is not being used.
- If CUSTOM is selected, you will be prompted to Program.
- When ">PROGRAM" is displayed, press and hold until "RELEASE", then release the switch.
- The display will show "SET EMPTY" with an OHM reading.
- With an empty tank, press and hold until "RELEASE", then release the switch.
- The display will show "SET 1/3" with an OHM reading.
- Add fuel to 1/3 of a tank. The OHMs should change.
- Press and hold until "RELEASE", then release the switch.
- The display will show "SET 2/3" with an OHM reading.
- Add fuel to 2/3 of a tank. The OHMs should change.
- Press and hold until "RELEASE", then release the switch.
- The display will show "SET FULL" with an OHM reading.
- Top off the tank. The OHMs should change.
- Press and hold until "RELEASE", then release the switch.
- **Exit setup to confirm fuel selection.**



### **RANGE TO EMPTY Distance to empty (fuel) setup**

- ✓ The range to empty option will calculate an estimate of miles until empty.
- ✓ This will vary on riding conditions and will change as it continually monitors fuel usage and speeds.
- ✓ The process will begin with a full tank, and then enter into the FUEL menu, RANGE TO EMPTY, and LEARN RESET.
- ✓ Once the reset has been done, you may ride until the tank is below ¼.
- ✓ This can be done over multiple trips as long as no fuel is added until the level is less than 25%, then it must be filled.
- ✓ When the system is working, the DIST TO E screen will have a countdown odometer.
- ✓ When the DIST TO E odometer reaches 35 miles or 56km, it show a "RANGE LOW" warning.
- ✓ Once the RANGE TO EMPTY is working, you may fill your tank normally, when needed.
- When ">RANGE TO EMPTY" is displayed, then press and hold the switch until "RELEASE", and release the switch.
- The options to select are "ON", "OFF", and "BACK".
- Press and release the switch to select an option.
- Press and hold the switch until "RELEASE", then release the switch.
- If ON is selected, the next option is "LEARN RESET" and "BACK".
- "LEARN RESET" will tell the gauge to learn fuel usage while riding. It can be reset again if the process failed.
  - Once the fuel tank is full, you may select "LEARN PRESET".
  - Press and hold the switch until "RELEASE", then release the switch.
  - **Exit setup**
  - Cycle the ignition then you may ride until fuel is less than 25%.
  - Only then, you may refill the tank. Once full, the process will complete itself.
  - Filling and refilling must be done the same way, either both on kick stand or both upright.

### **TEST Gauge reading test**

- Press and release the switch until "TEST" is displayed, then press and hold the switch until "RELEASE" is displayed.
- The display will show "FUEL", "TEST", and "xxx OHMS".
  - The "xxx" should be a value in numbers.
  - If not connected "OPEN" will appear.
- Exit setup.

### **VOLT Low voltage warning setup**

- When ">VOLT" is displayed, press and hold the switch until "RELEASE", then release the switch.
- The low voltage warning points will range from 9.0 to 12.1 volts.
- Press and release the switch to change the low voltage warning point.
- Press and hold the switch until "RELEASE" is displayed, and release.
- Exit setup.

## **DISPLAYS Message display option menu**

- When ">DISPLAYS" is displayed, press and hold the switch until "RELEASE" is displayed, and release.
- The display options are "SPEED TOP", "SPEED BTM", "TACH TOP", "TACH BTM", "GAUGE 1", "GAUGE 2", "GAUGE 3", "GAUGE 4", "MBMS", or "BACK".
- The Speedometer and Tachometer have only two options: PERFORMANCE HIDE / SHOW.
  - If "PERFORMANCE SHOW" is selected, the options of "HIGH SPEED RECALL", "0-60 TIME", "¼ MILE TIME, with ¼ MILE SPEED", and "HIGH RPM RECALL" will be added to the display options available while riding.
  - These options will appear after "SPEED km/h", (or SPEED MPH if the speedometer is set to kilometers).

### **SPEED TOP Speed Top message screen information**

- When ">SPEED TOP" is displayed press and hold until "RELEASE", the release the switch.
- The options will be "PERFORMANCE HIDE", "PERFORMANCE SHOW", and "BACK"
- Press and release to select the option.
- Press and hold the switch to select your preference.

### **SPEED BTM Speed Bottom message screen information**

- When ">SPEED BTM" is displayed, then press and hold until "RELEASE", the release the switch.
- The options will be "PERFORMANCE HIDE", "PERFORMANCE SHOW", and "BACK".
- Press and release to select the option.
- Press and hold the switch to select your preference.

### **TACH TOP Tach Top message screen information**

- When ">TACH TOP" is displayed, then press and hold until "RELEASE", the release the switch.
- The options will be "PERFORMANCE HIDE", "PERFORMANCE SHOW", and "BACK".
- Press and release to select the option.
- Press and hold the switch to select your preference.

### **TACH BTM Tach Bottom message screen information**

- When ">TACH BTM" is displayed, then press and hold until "RELEASE", the release the switch.
- The options will be "PERFORMANCE HIDE", "PERFORMANCE SHOW", and "BACK".
- Press and release to select the option.
- Press and hold the switch to select your preference.

- Up to four small gauges can be installed, each labeled 1 through 4.
- Each gauge can be programed to the base options of FUEL, VOLTS, OIL PSI, and OIL TEMP.
- MBM-09 adds the BOOST option.
- MBM-17 adds the COMPASS and AIR TEMP options.
- MBM-19 adds the FRONT PSI, REAR PSI, and DUAL PSI options.
- As selections are being made, the gauge chosen will display that data.

### **GAUGE 1 Gauge 1 setup**

- When ">GAUGE 1" is displayed, press and hold until "RELEASE", then release the switch.
- Press and release the switch to scroll through the available selections.
- Press and hold the switch on the option you would like to display, until "RELEASE", then release the switch.

### **GAUGE 2 Gauge 2 setup**

- When ">GAUGE 2" is displayed, press and hold until "RELEASE", then release the switch.
- Press and release the switch to scroll through the available selections.
- Press and hold the switch on the option you would like to display, until "RELEASE", then release the switch.

### **GAUGE 3 Gauge 3 setup**

- When ">GAUGE 3" is displayed, press and hold until "RELEASE", then release the switch.
- Press and release the switch to scroll through the available selections.
- Press and hold the switch on the option you would like to display, until "RELEASE", then release the switch.

### **GAUGE 4 Gauge 4 setup**

- When ">GAUGE 4" is displayed, press and hold until "RELEASE", then release the switch.
- Press and release the switch to scroll through the available selections.
- Press and hold the switch on the option you would like to display, until "RELEASE", then release the switch.

### **MBMS Display which MBMs are connected and adjust warnings**

To troubleshoot MBM connections, the speedometer can indicate which senders it sees connected.

- When ">MBMS" is displayed, press and hold until "RELEASE", then release the switch.
- The screen will show "NONE" if there are no MBMs present.
- If MBMs are present you will see a list of the MBMs are connected.
- Press and release to scroll through the available MBMs that are connected.
- Press and hold the switch to enter warning setup (does not apply to all) for attached MBMs.
- Press and release the switch to scroll through available warning settings.
  - See the separate MBM manual for additional details.

## GEAR Gear indicator setup

Optional gear readout could be displayed to the left of the clock only. Nothing will show until programming is done.

The gear programming cannot take place until the speed is calibrated.

The gauge can 'learn' the gear ratios based on speed and RPM, no additional sensors are needed.

It will work with various transmissions up to seven speed models.

To program the gear positions, you will need a stretch of road to gradually reach highway speeds with no interruptions.

Each gear will need the speed to be held steady, until instructed to speed up and shift up.

- **>> Gear programming requires holding the function switch, THEN starting the engine to enter setup <<**
- Once the engine is running, release the switch.
- Press and release the switch until "GEAR" is displayed.
- Press and hold the switch until "RELEASE" is displayed, then release the switch.
- The display will show "PRESET", "LEARN", or "BACK".
  - "PRESET" turn the gear indicator off.
  - "LEARN" starts the learning process of speed and RPMs to calculate your gear reading.
- To reset the gear to not be displayed select ">PRESET".
  - Press and hold the switch until "RELEASE" is displayed, then release the switch.
  - Press and hold again to return to Gear menu.
- To start learning gears, press and release the switch until ">LEARN" is displayed, then press and hold the switch.
  - The message will show "NO RPM" if the engine RPM is below 1500.
  - The message could also say "LOW SPEED" if the vehicle speed is below 5 MPH.
- Begin riding in 1st gear. The display should show "WAIT 1".
- Ride at a steady speed and steady RPM until the message changes to "SHIFT TO 2".
- It should only take about 20 seconds if the speed and RPMs are steady.
  - *Optional: If the message continues to say "WAIT 2", you can manually override and jump to the next gear by pressing and releasing the switch to store the gear position quicker.*
- Upshift to 2nd gear and ride at a steady speed. The display should change to "WAIT 2".
- Ride until the message changes to "SHIFT TO 3". Shift to 3rd gear.
  - *Optional: If the message continues to say "WAIT 3", 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.
  - You may also press and hold the switch, while riding, until the display shows "MOVE FOCUS" and then release it.
- The gears will now show up to the left of the clock display only.

**\*When downshifting, the gear position may jump up momentarily as the RPM is higher than expected.**

**Also, the gear position reading may drop to "N" or a "0" when you pull the clutch in coming to a stop.**

**The position will begin reading as the bike begins to move in gear.**

## FACTORY RESET

- In the event you would like to start over with your settings, preferences and display locations, this will reset all settings back to the out-of-the-box configuration.
- This includes message locations, color selections and speedometer calibration but **DOES NOT** include the odometer.
- When you see ">FACTORY RESET", press and hold the switch until "RELEASE" then release the switch.
- The options will be "NO" and "YES".
- By pressing and holding on ">NO" it will exit the reset menu.
- When you select ">YES", press and hold the switch until "RELEASE" is displayed, then release the switch.
- The screen will "YES" and "RESET". Tap the switch once to return to the main menu.

## VERSION

- For technical support assistance, this screen can display the model number and the software versions loaded for the two processors.

## EXIT SETUP

- Exits the setup menu and returns to normal gauge operation.

## Speedometer troubleshooting guide

Problem	Possible cause	Solution
Gauge will not light up.	Brown/Gray wire does not have power. Orange/White wire does not have power. Orange wire does not have power. Black wire is not getting a good ground. Harness adapter box is not plugged in. 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 harness. Check all connections on harness adapter box. Inspect and repair stock switch or harness. Return gauge for repair. (see instructions)
Gauge lights up, but speed will only show zero.	Speed sensor is not connected properly. Speed sensor not grounded properly.  Speed sensor is not being turned by the cable. Sensor is not sending a speed signal. Gauge is not calibrated	Check connection from speed sensor to speed signal wire. Move ground to different location, preferable close to the speedometer ground.  Check cable connection between sensor and front wheel. Sensor can be tested by spinning the cable with a drill. Check for a damaged or malfunctioning speed sensor. Gauge must be recalibrated (see instructions).
<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).
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.	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.
Speed message center shows "NO DATA"	Interconnect harness between speedometer and tachometer is unplugged.	Check interconnect harness on the back of the gauges.

**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 voltmeter and not a test light. Checks for the 3-wire sensor should be made between each individual wire and ground.

3-wire sensor: Red wire should have 9-11 volts dc, slightly less than battery voltage, (sometimes +5V if supplied by factory harness)  
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, or a steel object passes by the sensor. Aluminum and Stainless Steel will not work with a Hall-effect sensor. This can be checked with the sensor mounted and spinning the rear tire slowly, or by removing the sensor and moving a steel object pass the face of 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).



## Tachometer troubleshooting guide

<b>Problem</b>	<b>Possible cause</b>	<b>Solution</b>
Gauge will not light up	Interconnect harness between speedometer and tachometer is unplugged.	Check interconnect harness on the back of the gauges.
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.	Check all wire connections and inspect wire for breaks. Check ground connection on tachometer, engine, and ignition system.
Tach reading is incorrect.	Gauge is not calibrated correctly.	Gauge must be calibrated (see instructions).
Cruise Engage 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.

## Small gauge troubleshooting guide

<b>Problem</b>	<b>Possible cause</b>	<b>Solution</b>
Gauge will not light up	Interconnect harness between speedometer and gauge is unplugged.	Check interconnect harness on the back of the gauges.
Gauge reading is erratic or jumps around.	Gauge signal wire is loose or broken. Poor ground connection.	Check all wire connections and inspect wire for breaks. Check ground connection on gauge, engine, and sensor.
Gauge reading is incorrect.	Gauge is set up for wrong sensor type. Poor gauge grounding.	Change sensor setting in setup. (see instructions). Repair or replace ground wire.
Oil Temp or Oil PSI gauge shows "NO DATA"	Interconnect harness between speedometer and tachometer is unplugged.	Check interconnect harness on the back of the gauges.
Gauge shows "OPEN"	Loose or broken sensor wire.	Check sensor wire for damaged or disconnected wire.
Gauge shows "SHORT"	Pinched or bare sensor wire.	Check sensor wire for damaged or pinched wire.

## **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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