



## MVX-8X04 gauge kit

Thank you for purchasing the Dakota Digital MVX gauge kit for your Harley Davidson Touring bike. This kit is designed to be a direct plug in replacement for all touring models from 2004 – 2013. The kit includes the following gauges and features:

**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. Take note of mileage if you wish to transfer mileage over to new gauges.

**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, ABS 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

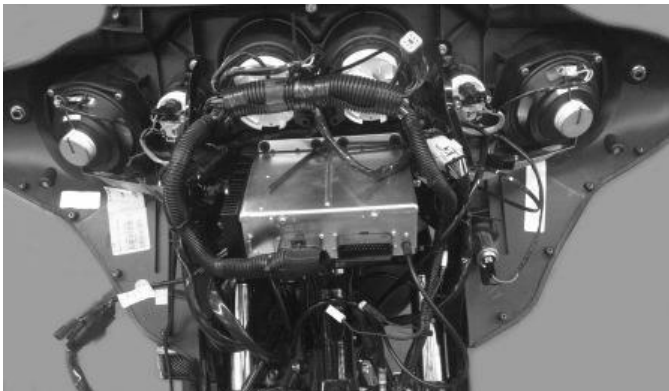
**Volts** – programmable warning point

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

**Air Temperature** – uses factory sensor

## INSTALLATION

Remove the outer fairing and factory gauges; this will vary by model, please follow the service manual to expose the wiring and gauges. Don't be alarmed by the amount of wires behind the fairing, this is a direct plug in kit and these detailed instructions will guide you through it.



Pic of Street Glide with outer fairing removed

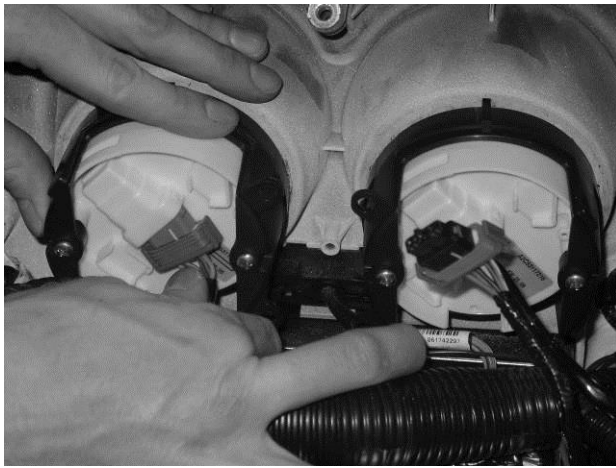


Pic of Road Glide with outer fairing removed

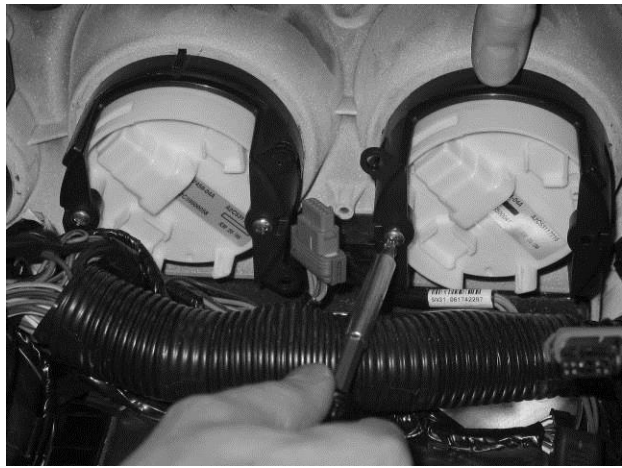
## REMOVAL OF FACTORY GAUGES

### ULTRA FLHT & FLHX (batwing fairings)

Unplug the speedometer and tachometer. Remove the screws securing the clamps that hold the gauges in place. Save the screws, gaskets, and clamps which will be reused when you install your new Dakota Digital gauges.



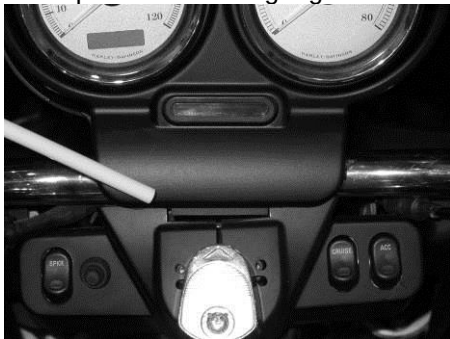
**Unplug the factory speed and tach**



**Unscrew the clamps and remove gauges**

### **ROAD GLIDE FLTR**

You will need to remove the speedometer and tachometer instrument bezel. To do this, remove two small screws on the left and right side of the bezel. 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 gauge connections and unplug the indicator lights so the bezel can be completely removed for easier installation of the new gauges. Remove the clamps that hold the gauges to the bezel and remove the gauges and gaskets.



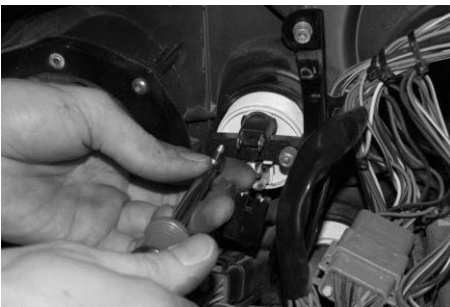
**Picture of tab (switch cover removed)**



**Bezel removed**



**Gauges/Grommets removed**



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 connector at the back of the four small gauges 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**

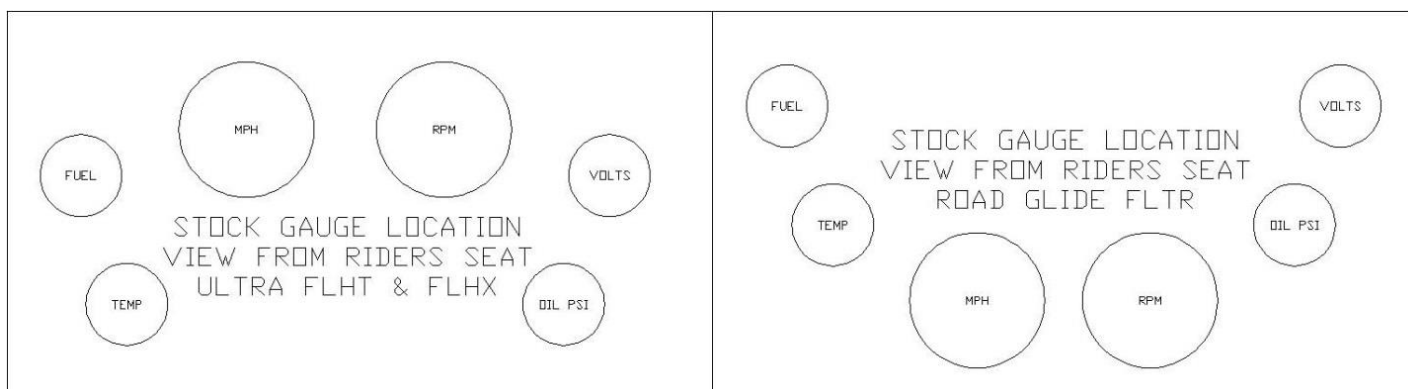
Next you are ready to install the new gauges into the fairing. Install the gauges and secure using the original hardware that was removed: clamps, gaskets, screws and nuts. Be sure the alignment tab on the clamp lines up with the notches in the fairing. Some fairings may only have one notch; line up 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 torqueing.



**Speedometer and Tachometer**



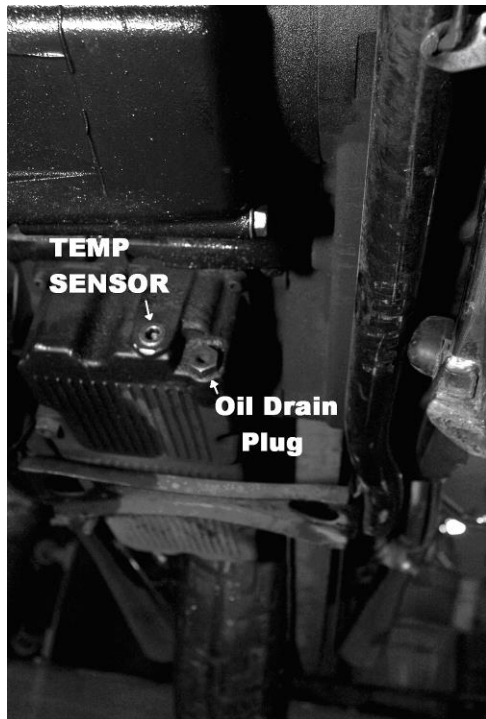
**Oil PSI, Oil Temp, Voltmeter, and Fuel Level**



### OIL TEMPERATURE SENSOR

The supplied oil temperature sensor replaces one of the oil pan plugs. You can do this at an oil change so you do not have to worry about losing oil, or be quick and you should only lose a small amount of oil. First locate the allen head plug on the front bottom side of the oil pan. The plug is on the right of the oil pan drain plug that is used to drain the engine oil for an oil change. It is a 3/8" NPT allen head plug that should be flush with the oil pan. See photo for the correct plug.

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



**Bottom of oil pan**



**Remove 3/8"npt allen plug**

Wipe any road grime and oil from around the plug so the area is clean. Use a 3/8" allen wrench to remove the plug. Have the sensor ready to thread in so minimal oil is lost. Tighten the new oil temp sensor with a 3/4" wrench.



**Thread sender into oil pan**



**Tighten temp sensor with a 3/4" wrench**

Plug in the sealed two pin connector and route the wires over to the bottom right side frame rail up towards the neck. Use zip-ties to secure the wire harness along the frame.



**Installed oil temp sensor and harness plug**

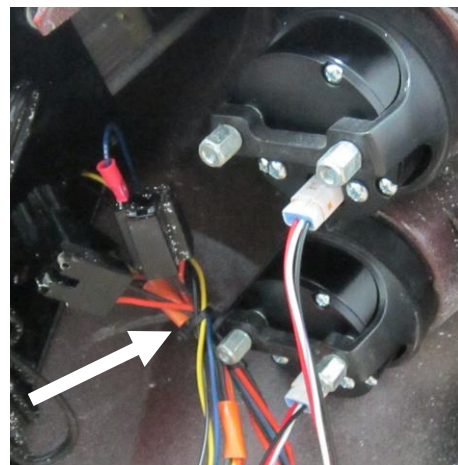
### **WIRING (plug in connections)**

Plug the original speed and tachometer connectors into the new gauges. 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.

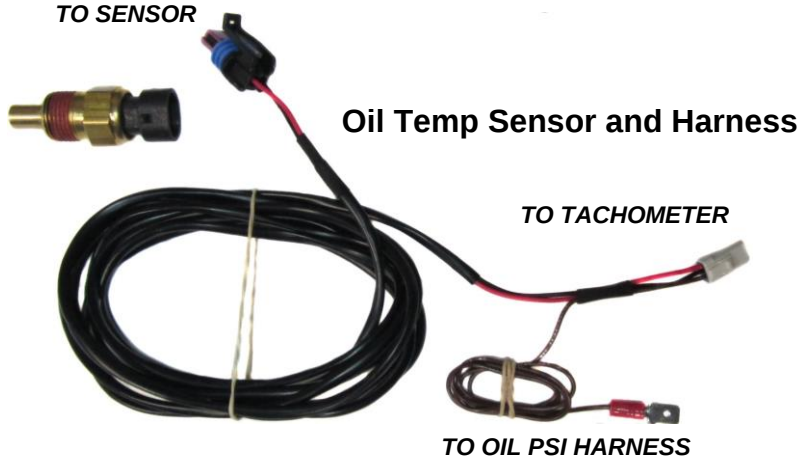


A 4-pin, three wire harness with six connectors is included. This will plug into the back of each gauge, these wires provide power, ground, and data. Route one of these harnesses to the back of each gauge and plug it in. It does not matter which connector goes to each gauge.

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



TO SENSOR



### Oil Temp Sensor and Harness

TO TACHOMETER

TO OIL PSI HARNESS

### Interconnect Harness Connects to each gauge



### Sensor Connect Harness



TO SPEED 3-PIN CONNECTOR

YELLOW WIRE TO FUEL GAUGE CONNECTOR YELLOW WIRE

BLACK WIRE TO FUEL GAUGE CONNECTOR BLACK WIRE

BLUE WIRE TO AIR TEMP CONNECTOR BLUE WIRE

### 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 model years 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. 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 one of the black ground wires on this harness. Three wire harnesses will have one ground wire and four wire harnesses will have two ground wires, either black ground wire on the four wire harness can be used. 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.



## 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)             |
| KM/H                                                           | Alternate speed unit conversion                                       |
| E MILES (when enabled)                                         | Distance to empty                                                     |
| OIL TEMP (when gauge is not present)                           | Engine oil temperature                                                |
| OIL PSI (when gauge is not present)                            | Engine oil pressure                                                   |
| VOLTAGE (when gauge is not present)                            | System voltage                                                        |
| FUEL $\frac{1}{2}$ (when gauge is not present)                 | Fuel level                                                            |
| AIR TEMP                                                       | Outside temperature from factory sensor.                              |
| HEAD TEMP                                                      | Head temperature from ECM if supported.                               |
| <u>Tach message displays</u>                                   | <u>DESCRIPTION</u>                                                    |
| CLOCK/GEAR                                                     | 12 hour clock display and gear position                               |
| HOURS                                                          | Hours gauge has been on with engine running (0-999.9)                 |
| OIL TEMP (when gauge is not present)                           | Engine oil temperature                                                |
| OIL PSI (when gauge is not present)                            | Engine oil pressure                                                   |
| VOLTAGE (when gauge is not present)                            | System voltage                                                        |
| FUEL $\frac{1}{2}$ (when gauge is not present)                 | Fuel level                                                            |
| AIR TEMP                                                       | Outside temperature from factory sensor.                              |
| HEAD TEMP                                                      | Head temperature from ECM if supported.                               |
| <u>Performance readings (can be enabled on either display)</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                                                                     |
|-----------|------------|---------------------------------------------------------------------------------|
| DIAG CODE | ENGINE     | Read diagnostic codes from engine module                                        |
|           | SECURE     | Read diagnostic codes from security module                                      |
|           | ABS        | Read diagnostic codes from ABS module                                           |
| COLOR     | ALL        | Set all colors and brightness the same                                          |
|           | BACKLIGHT  | Set backlight color and brightness                                              |
|           | NEEDLE     | Set needle color and brightness                                                 |
|           | DISPLAY    | Set message display color and brightness                                        |
| SPEED     | ADJUST     | Adjust speed calibration +/- 40%                                                |
|           | UNIT       | Select MPH or km/h unit                                                         |
|           | SERVICE    | Set miles to service reset value or turn off                                    |
|           | ODO PRESET | One time odometer preset ( <b>only available once for the first 100 miles</b> ) |
| TACH      | HI WARNING | Set high rpm warning point                                                      |
| OIL TEMP  | UNIT       | Select F or C temperature unit                                                  |
|           | WARNING    | Set high warning point                                                          |
|           | TEST       | Display sender resistance for troubleshooting                                   |
| OIL PSI   | SENDER     | Select stock or Dakota Digital sender                                           |
|           | WARNING    | Set low warning point                                                           |
|           | TEST       | Display sender resistance for troubleshooting                                   |
| FUEL      | SENDER     | Select fuel sender                                                              |
|           | RANGE      | Enable/Disable/Reset distance to empty                                          |
|           | TEST       | Display sender resistance for troubleshooting                                   |
| VOLTAGE   | LO WARNING |                                                                                 |
| DISPLAY   | CONTRAST   | Message center contrast adjustment for SPEED/TACH                               |
|           | PRFM DISP  | Display performance readings on SPEED or TACH                                   |
|           | DIGITAL    | Display digital readings for connected gauges on SPEED or TACH                  |
|           | WARN       | Display warning pop-ups on SPEED or TACH                                        |
|           | MBM DISP   | Display MBM gauges on SPEED or TACH                                             |
|           | GAUGES     | Show which gauges are connected to the speedometer                              |
|           | MBMS       | Show MBM's connected to the speedometer and set warning points                  |
| GEAR      | LEARN      | Learn gears based on speed and rpm                                              |
|           | PRESET     | Set gears based on factory setup                                                |
| DONE      |            | Exit                                                                            |

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

#### **DIAG CODE Diagnostics mode for checking/clearing trouble codes**

- Press and release the switch until "DIAG CODE" is displayed, then press and hold the switch until the display blanks.
- Release the switch. The display will show "ENGINE", "SECURE", "ABS", or "DONE".
- Press and release the switch to change the selection, press and hold the switch until the display blanks to begin reading the stored codes for the particular system.
- Release the switch. The display will show the current codes, "NONE", or "NO RSP". Press and release the switch to move to the next stored code. After all codes are displayed the module part number will be scrolled across the screen. To clear codes, press and hold the switch when "END" is displayed. Consult a service manual for trouble code descriptions.

#### **SPEED Speed setup menu**

- Press and release the switch until "SPEED" is displayed, then press and hold the switch until the display blanks.
- Release the switch. The display will show "ADJUST", "UNIT", "SERVICE", "ODO PRESET", or "DONE".
- Press and release the switch to change the selection, press and hold the switch to select it.

##### **ADJUST Speed Calibration**

The speedometer is calibrated by the engine computer, but the speedometer reading can be adjusted through the gauge. The adjustment is set a value from 60% – 140% with 100% being no change.

- Press and release the switch until "ADJUST" is displayed, then press and hold the switch until the display blanks.
- Release the switch. The display will show the current calibration value.
- Press and release the switch to increase the value. Once it reaches 140 it will roll back over to 60. Press and hold the switch to save the currently displayed value.

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

- Press and release the switch until "UNIT" is displayed, then press and hold the switch until the display blanks.
- Release the switch. The display will show UNIT and MI for miles or KM for kilometers.
- Press and release the switch until the desired setting is displayed.
- Press and hold the switch to save the setting.

##### **SERVICE Miles or km to Next Service setup**

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

##### **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 warning setup**

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

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

- Press and release the switch until "OIL TEMP" is displayed, then press and hold the switch until the display blanks.
- Release the switch. The display will show "UNIT", "WARNING", "TEST", or "DONE".
- Press and release the switch to change the selection, press and hold the switch to select it.

### **UNIT Temperature F/C 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 F for Fahrenheit or C for Celsius.
- 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.

## **OIL PSI Engine oil pressure 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 "SENDER", "WARNING", "TEST", or "DONE".
- Press and release the switch to change the selection, press and hold the switch to select it.

### **SENDER Pressure sender selection**

- Press and release the switch until "SENDER" is displayed, then press and hold the switch until the display blanks.
- Release the switch. The display will show "HD 60" or "DD 75".
- Press and release the switch until the desired setting is displayed.
- Press and hold the switch to save the setting.

### **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.

### **TEST Resistance test**

- Press and release the switch until "TEST" is displayed, then press and hold the switch until the display blanks.
- The resistance measured from 0 – 999 will be shown. Press and release the switch to exit.

## **FUEL Fuel level setup menu**

- Press and release the switch until "FUEL" is displayed, then press and hold the switch until the display blanks.
- Release the switch. The display will show "SENDER", "RANGE", "TEST", or "DONE".
- Press and release the switch to change the selection, press and hold the switch to select it.

### **SENDER Fuel sender selection**

- Press and release the switch until "SENDER" is displayed, then press and hold the switch until the display blanks.
- Release the switch. The display will show "DD 08" (2008-2013), "DD 04" (2004-2007), "HD 08" or "HD 04". The HD settings should only be used if a stock fuel gauge is being left connected and operating on the bike.
- Press and release the switch until the desired setting is displayed.
- Press and hold the switch to save the setting.

### **RANGE Distance to empty setup**

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

- Press and release the switch until "RANGE" is displayed, then press and hold the switch until the display blanks.
- Release the switch. The display will show "OFF" or "ON" indicating whether the feature is active.
- Press and release the switch to change the value, press and hold the switch to select it.
- If ON is selected, the next option is "DONE" or "RESET" "LEARNING". To reset or start a new distance learning cycle, select "RESET LEARNING" and hold the switch.

### **TEST Resistance test**

- Press and release the switch until "TEST" is displayed, then press and hold the switch until the display blanks.
- The resistance measured from 0 – 999 will be shown. Press and release 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.

## **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 SPEED", "CONTRAST TACH", "PRFM DISP", "DIGITAL", "WARN", "MBM DISP", "GAUGES", "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 with "SPEED" for the speedometer display or "TACH" for the tachometer display, 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", "SPEED", "TACH", or "BOTH"). 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.

### **DIGITAL Display digital readings for all senders**

The digital readings are automatically shown for any sender that does not have a gauge connected, but digital readings for all senders can be selected to be shown.

- Press and release the switch until "DIGITAL" is displayed with the current setting ("HIDE", "SPEED", "TACH", or "BOTH"). 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.

### **WARN Display gauge warning pop-ups**

When one of the analog gauges is indicating a warning, the digital reading will automatically be shown on either the speed or tach message display. The gauge it is displayed on is selectable.

- Press and release the switch until "WARN" is displayed with the current setting ("SPEED" or "TACH"). 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.

### **MBM DISP Display add-on MBM screens**

When an add-on module is connected to the system the digital reading will automatically be shown on either the speed or tach message display. The gauge it is displayed on is selectable.

- Press and release the switch until "MBM DISP" is displayed with the current setting ("SPEED", "TACH", or "BOTH"). 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.

### **GAUGES Display which analog gauges are connected**

To troubleshoot display connections, the speedometer can indicate which gauges it sees connected.

- Press and release the switch until "GAUGES" is displayed. The screen will show either a letter or a "--" for each gauge. "R" for RPM, "F" for fuel, "V" for volt, "P" for oil pressure, "T" for oil temperature, "B" for boost pressure, and "A" for air bag pressure.

### **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.

### Speedometer Troubleshooting guide.

| Problem                                         | Possible cause                                                                                        | Solution                                                                                                                                                                                                                                                                                                        |
|-------------------------------------------------|-------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Gauge will not light up                         | Red wire does not have power.<br>Black wire is not getting a good ground.<br>Gauge is damaged.        | Connect to a location that has power.<br>Connect ground to a different location.<br>Return gauge for repair. (see instructions)                                                                                                                                                                                 |
| Gauge lights up, but speed will only show zero. | No data from ECM.<br>Speed sensor not grounded properly.<br><br>Sensor is not sending a speed signal. | Check engine trouble codes.<br>Move ground to different location, preferable close to the speedometer ground.<br>Check for a damaged or malfunctioning speed sensor.                                                                                                                                            |
| Speed reading is erratic or jumps around.       | Speed sensor wire is loose or broken.<br>Poor ground connection.<br>Ignition interference             | Check all wire connections and inspect wire for breaks.<br>Check ground connection on speedometer and sensor.<br>Check for tachometer wires routed with VSS signal wires.<br>Check for VSS signal wires routed near ignition coils<br>Check for poor ignition system ground<br>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.                 | No data from ECM.                                                                                     | Check engine trouble codes.                                                                                                                                                                                                                                                                                     |
| ECM performance tune or reprogramming fails.    | Stock service tools look for all stock gauges.                                                        | Unplug MVX and reprogram ECM. MVX can be plugged back in as soon as reprogramming is complete.                                                                                                                                                                                                                  |
| Speed message center shows "N-A OIL"            | Interconnect harness between speedometer and tachometer is unplugged.                                 | Check 3 wire interconnect harness on the back of the gauges.                                                                                                                                                                                                                                                    |

### Tachometer Troubleshooting guide.

| Problem                                        | Possible cause                                                        | Solution                                                                                                                                         |
|------------------------------------------------|-----------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| Gauge will not light up                        | Interconnect harness between speedometer and tachometer is unplugged. | Check 3 wire interconnect harness on the back of the gauges.                                                                                     |
| Gauge lights up, but tach will only show zero. | No data from ECM.                                                     | Check engine trouble codes.                                                                                                                      |
| 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.

| Problem                                   | Possible cause                                                   | Solution                                                                                                         |
|-------------------------------------------|------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| Gauge will not light up                   | Interconnect harness between speedometer and gauge is unplugged. | Check 3 wire interconnect harness on the back of the gauges.                                                     |
| Gauge reading is erratic or jumps around. | Gauge signal wire is loose or broken.<br>Poor ground connection. | Check all wire connections and inspect wire for breaks.<br>Check ground connection on gauge, engine, and sensor. |
| Gauge reading is incorrect.               | Gauge is set up for wrong sensor type.<br>Poor gauge grounding.  | Change sensor setting in setup. (see instructions).<br>Repair or replace ground 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.



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