



MVX-8X00 gauge kit Gauge kit for 1996-2003 Models

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 1996 – 2003. 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

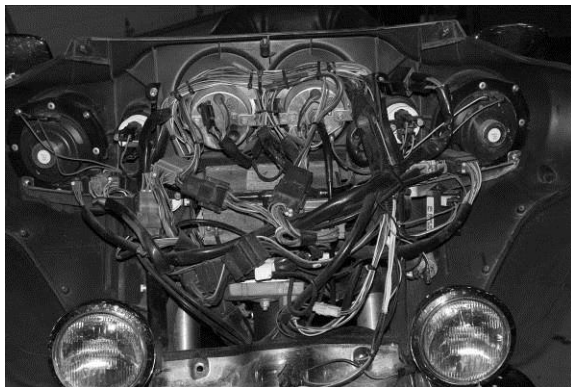
Volts – programmable warning point

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



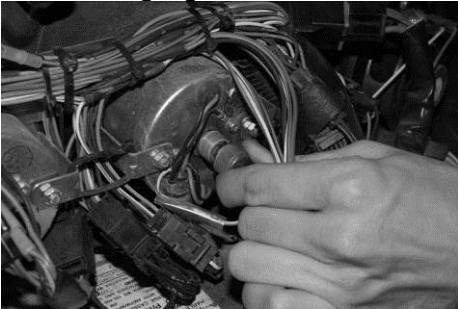
Pic of Road Glide with outer fairing removed

REMOVAL OF FACTORY GAUGES

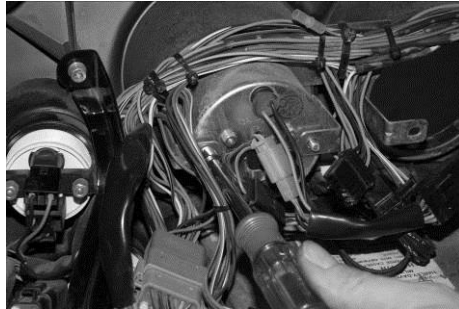
Now you are ready to start unplugging and removing the gauges. Start with the speedometer and tachometer gauge plugs and speedometer cable if you are working on a cable drive bike (1996-1999).

ULTRA FLHT & FLHX (batwing fairings)

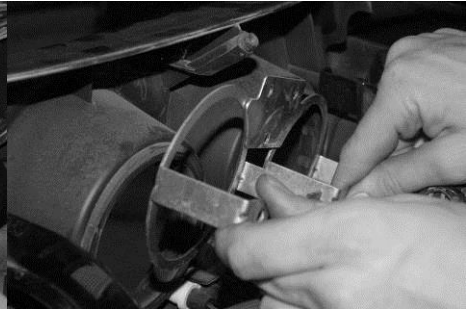
Remove the clamps that hold the Speed and Tach in place with a screw driver or wrench depending on application, and remove the gauges.



Remove speedo cable/unplug gauges



Remove nuts/screws and clamp to remove factory gauges



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.



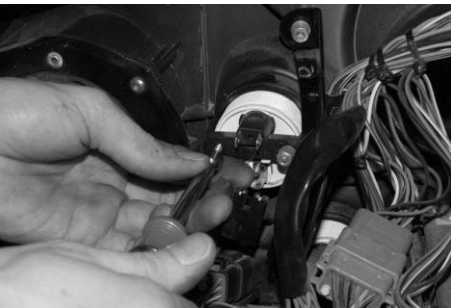
Picture of tab (switch cover removed)



Bezel removed



Gauges/Grommets removed



All of the stock small gauges (fuel, volts, oil, and air temp). 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 and NUTS FROM THE STEPS ABOVE AS THEY WILL BE USED TO SECURE THE NEW DAKOTA DIGITAL GAUGES ALONG WITH THE PROVIDED CLAMPS, GASKETS, and SCREWS



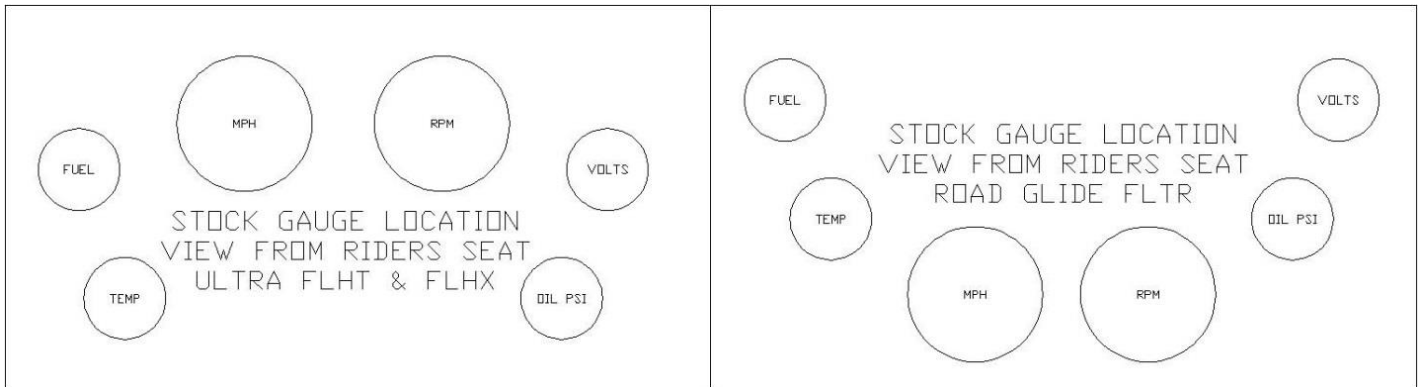
Next you are ready to install the new gauges into the fairing. Install the gauges and secure using the original hardware that was removed plus the provided clamps, gaskets, screws and nuts. Be sure the alignment tab on the clamp lines up with the notches in the fairing. Some fairings may only have one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



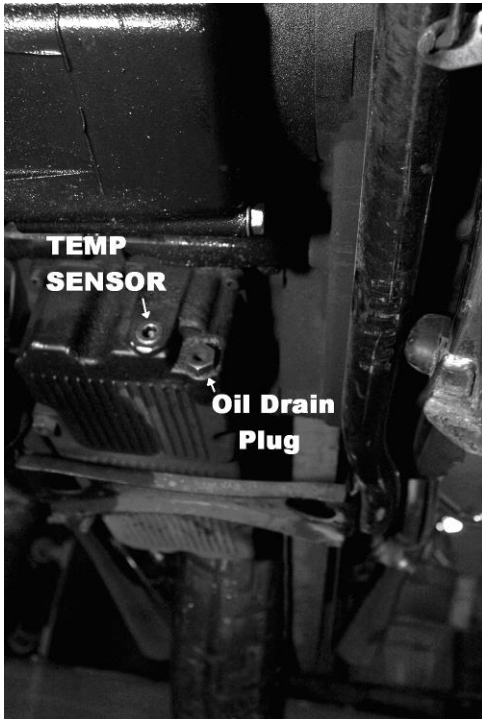
Oil PSI, Oil Temp, Voltmeter, and Fuel Level



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.

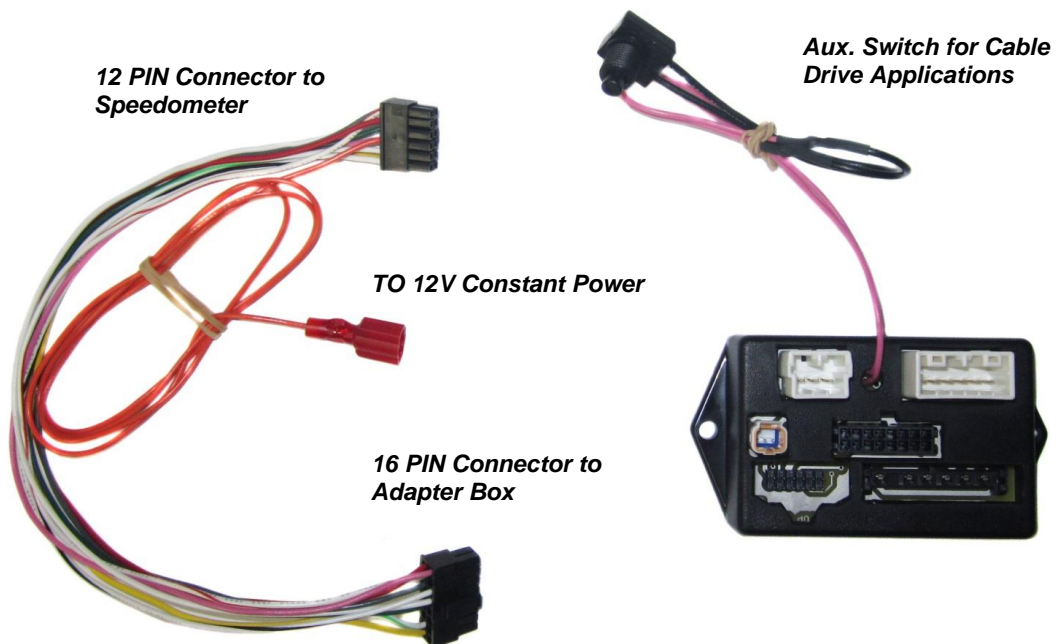


Installed oil temp sensor and harness plug



WIRING (plug in connections)

Now you are ready to make the gauge connections. Included in the kit is an adaptor 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 to prevent rattling.



12 PIN Connector to Speedometer

Aux. Switch for Cable Drive Applications

TO 12V Constant Power

16 PIN Connector to 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 adaptor 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 sender 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 adaptor box. The speed sensor pigtail should have a 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 if using the cable drive adaptor SEN-1011 since it is not used.

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

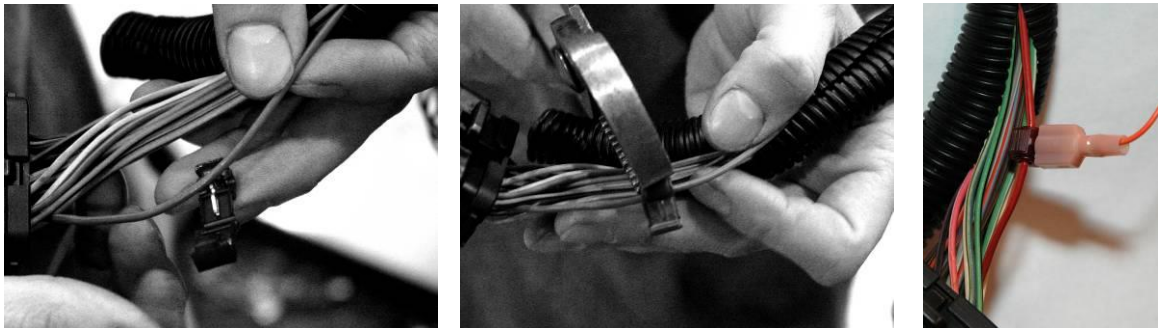
If you are using the cable driven adaptor you will also need to pull the speedometer cable from the front wheel and replace the cable nut with the supplied cable nut so your speedometer cable will thread onto the new sender. You have to take the cable off at the wheel so the nut can slide down and off 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 back to the wheel and also to the sender. Secure the sender with a zip tie and make sure there is no binding in the cable and that the cable has engaged fully into the sender.

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

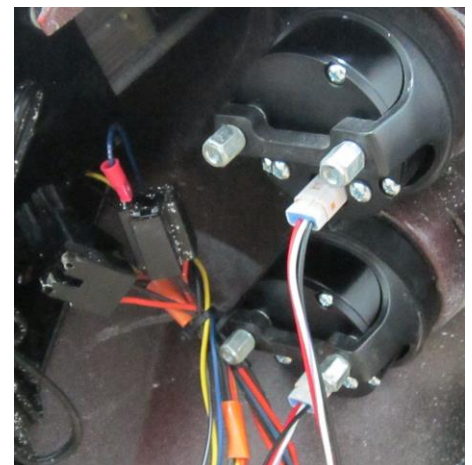
You will need to locate a fused, constant +12V battery power wire for the orange, clock memory wire. The long, orange, clock memory wire is located on the speedometer gauge plug. Check your service manual or use a voltmeter or test light to find and verify a constant power location. One common location 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.

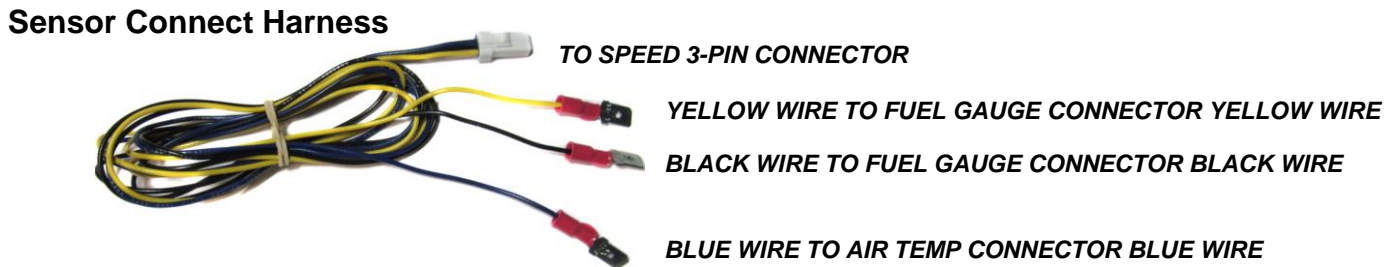


The 3-pin connectors on the back of the speed and tach provide the sender connections. The speed 3-pin connector provides ground, fuel level, and air temperature with spade connectors for easy connection to the factory plugs. The tach 3-pin connector provides oil temperature and oil pressure. Connect 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.

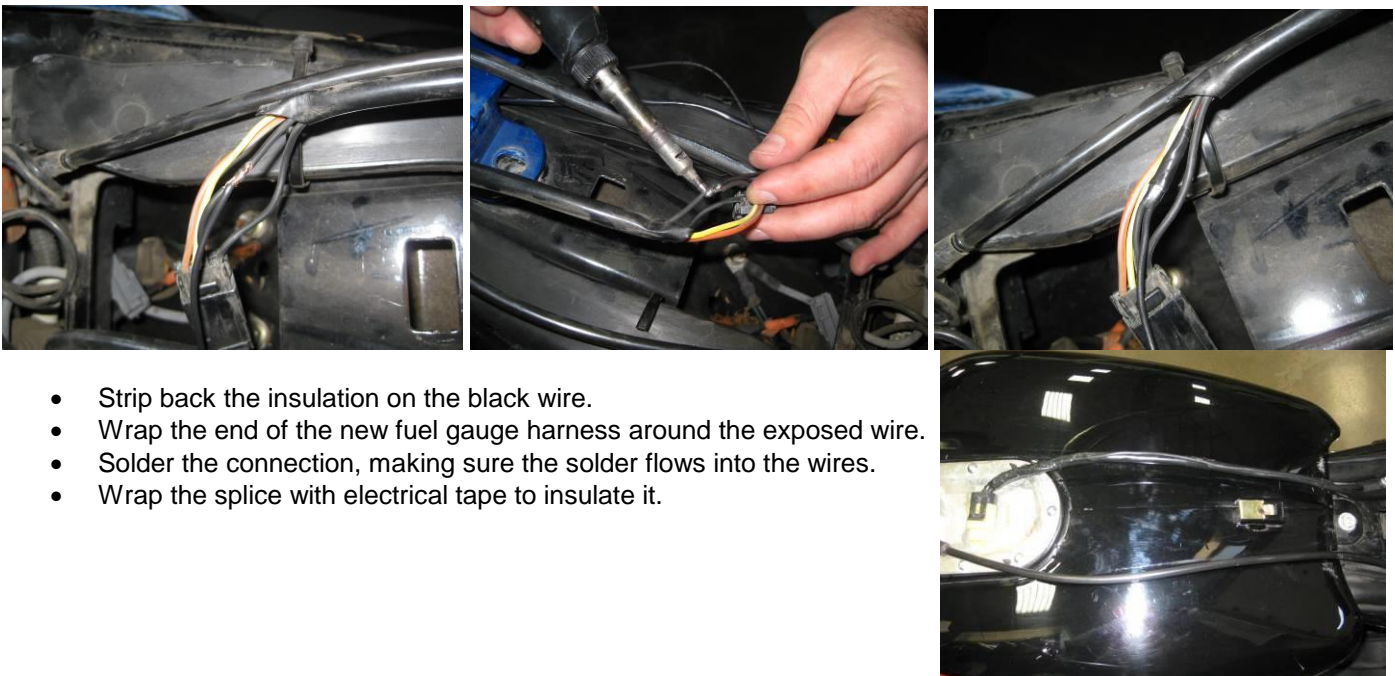
Use provided zip ties to secure connections and loose harnesses.





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 2007 and earlier 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 % (when gauge is not present)	Fuel level
AIR TEMP	Outside temperature from factory sensor

<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 % (when gauge is not present)	Fuel level
AIR TEMP	Outside temperature from factory sensor

<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
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CLOCK SETUP

To set the clock, the clock/gear display must be shown and active.

- If the tach message display does not have a small triangle in the upper right corner, press and hold the switch until the screen switches to a reverse image and then release.
- If the clock/gear display is not shown, press and release the switch until it is shown on the tach message display.
- To enter the clock setup, press and hold the switch until the hours begin flashing.
- Press and release the switch to change the hours.
- When the hours are correct, press and hold the switch until the minute 10's begin flashing.
- Press and release the switch to change the minute 10's.
- When the minute 10's are correct, press and hold the switch until the minute 1's begin flashing.
- Press and release the switch to change the minute 1's.
- When the minute 1's are correct, press and hold the switch until it stops flashing.

GAUGE SETUP AND CALIBRATION

The function switch is used to enter setup mode for all of the gauges. All of the setup is done from the speedometer message display. To get into setup; press and hold the function switch while turning the key on. Press and release the switch to advance through the menus below; when on the desired option press and hold the switch to select setup for that particular gauge/function.

SPEEDOMETER SETUP

Main Menu	Sub Menu	Description
COLOR	ALL	Set all colors and brightness the same
	BACKLIGHT	Set backlight color and brightness
	NEEDLE	Set needle color and brightness
	DISPLAY	Set message display color and brightness
SPEED	ADJUST	Adjust speed while driving
	AUTO CAL	Drive a measured mile (or km) to calibrate speed
	UNIT	Select MPH or km/h unit for message display
	SERVICE	Set miles to service reset value or turn off
	PPM INFO	Display current speed calibration pulses per mile
ODO PRESET	One time odometer preset (only available for the first 100 miles)	
TACH	WARN	Set high RPM warning point
	CYLINDER	Set engine cylinder count for tachometer calibration
	SIGNAL	Set tachometer signal type (this should be set to normal)
OIL TEMP	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	Set low volts warning point
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

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

To enter the speedometer setup, press and hold the switch while turning the key on and starting the engine. Once the engine is running release the switch. The speedometer will show the current revision code. Press and release the switch to move through the different setup menus. Press and hold the switch to select a menu option.

COLOR Display color setup menu

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

SPEED Speed setup menu

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

SPEED CALIBRATION

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

ADJUST Speed Calibration

- Press and release the switch until "ADJUST" is displayed, then press and hold the switch until the display blanks.
- Release the switch. The display will show the current calibration value.
- Release the switch. The display will switch to "unit" and light up the current speed unit (MPH or km/h).
- Press and hold the switch to keep the current unit or press and release the switch to change the unit.
- Next the system will restart with the current speed shown highlighted on the message display. The speedometer will show the speed reading. Begin driving at a known speed. When the switch is pressed, the speedometer reading will begin increasing until the switch is released. The next time the switch is pressed, the reading will begin decreasing until it is released. When the speedometer is correct you can release the switch. The new calibration will be saved if no adjustments are made for 10 seconds.

AUTO CAL Speed Calibration

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

PLEASE NOTE:

Common problems during calibration:

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

SPEED Speed setup menu (continued)

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 setup menu

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

WARN High RPM warning setup

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

CYLINDER Engine cylinder setup

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

SIGNAL Tachometer signal setup

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

OIL TEMP Engine oil temperature setup menu

- Press and release the switch until "OIL TEMP" is displayed, then press and hold the switch until the display blanks.
- Release the switch. The display will show "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" (2007 and earlier), "HD 08" or "HD 04". The stock fuel sender should use the "DD 04" setting for correct readings. 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 1st gear. The display should show "GEAR 1" and the "1" should be flashing. Drive at a steady speed around 2,700 RPM until the "1" goes steady and then changes to a flashing "2", it should only take about 20 seconds if the speed and RPMs are steady.
 - *Optional: If the gear does not stop flashing you can manually override and jump to the next gear by pressing and releasing the switch to store the gear position quicker.*
- Shift to 2nd gear and drive at a steady speed.
- Wait until the "2" goes steady and then changes to a flashing "3". Shift to 3rd gear.
 - *Optional: If the gears do not stop flashing you can manually override and jump to the next gear by pressing and releasing the switch to store the gear position quicker.*
- Repeat this through each gear. When you are done, come to a complete stop or press and hold the switch until the display shows "DONE" and then release it.
- Press and release the switch to restart the gauges in normal operation, verify the gear position by riding through each gear and seeing if positions agree.

Speedometer Troubleshooting guide.

Problem	Possible cause	Solution
Gauge will not light up	Red wire does not have power. Black wire is not getting a good ground. Gauge is damaged.	Check connection or move wire to a location that has power. Check connection or move wire to a ground location. 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).
PLEASE – SET – SPEED	Speedometer not calibrated	Gauge must be calibrated to your vehicle (see instructions)
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 "N-A OIL"	Interconnect harness between speedometer and tachometer is unplugged.	Check 3 wire 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.

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.
Clock will not keep time	Orange wire does not have constant power.	Connect to a location that has constant power.
Gauge lights up, but tach will only show zero.	Yellow wire is not connected properly. Ignition system not grounded properly. Gauge is not grounded properly. Tach signal type is not set correctly. Gauge is not calibrated	Check connection from yellow wire to tach signal wire. Check engine and ignition system grounds. Check gauge and engine grounds. Change the tach signal type (see instructions). Gauge must be recalibrated (see instructions).
Tach reading is erratic or jumps around.	Tach signal wire is loose or broken. Poor ground connection. Update rate is too fast.	Check all wire connections and inspect wire for breaks. Check ground connection on tachometer, engine, and ignition system. Reset display update speed slower.
Tach reading is incorrect.	Gauge is not calibrated correctly.	Gauge must be calibrated (see instructions).
Gear indicator is always -	Gears not programmed.	Program gear indicator in setup. (see instructions)
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. 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.

WIRING COLOR CODE FOR SPEEDOMETER AND TACHOMETER:

Color on GAUGE	Stock harness color	Function
WHITE/RED	varies with application	speed sensor power out (if required)*
WHITE/BLACK	BROWN/VIOLET	security system indicator
GREEN	connects to supplied harness	switch input
GRAY	see VSS section	speed signal input
WHITE	WHITE/GREEN	output speed signal
PINK	BLACK/YELLOW	engine indicator
BLACK	BLACK	ground for gauge
RED	ORANGE/WHITE	+12 volt power with key on
ORANGE	RED/ORANGE	+12V battery power for clock
YELLOW	PINK	tach signal input
WHITE/GREEN	GREEN/RED	cruise set indicator

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

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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