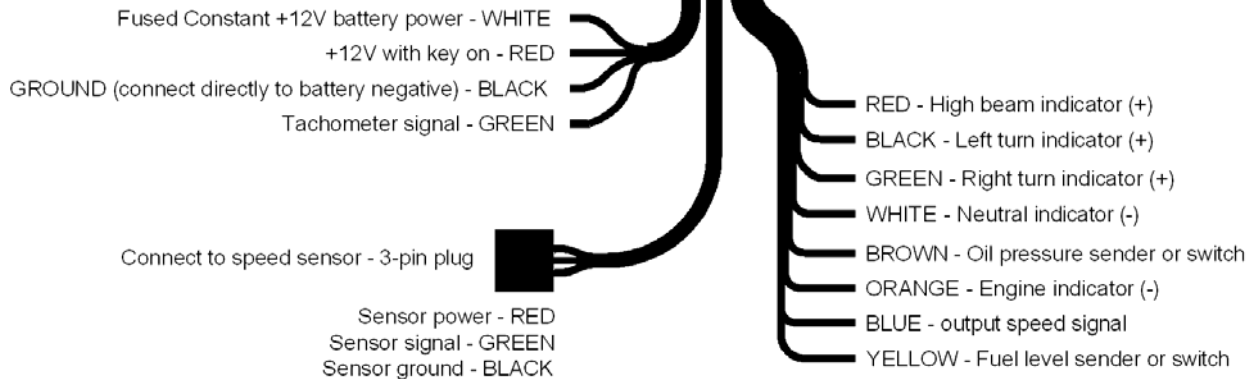
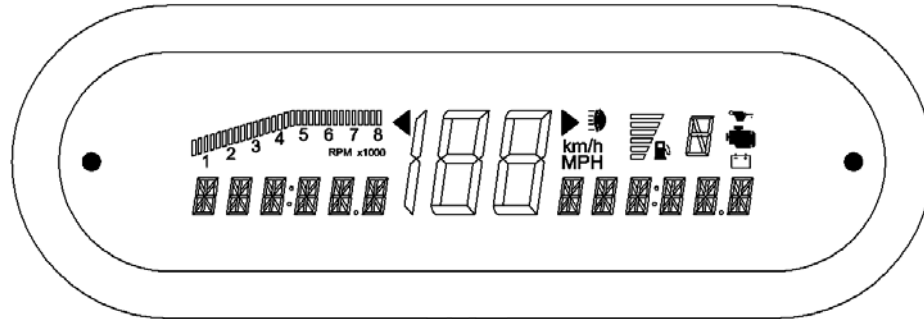


Dakota Digital

MODEL MCV-7000 series

SPEEDOMETER/TACHOMETER INFORMATION GAUGE

Please read this before beginning installation or wiring.



FUNCTION SWITCH

The switch on the left of the gauge changes the left side message display. The switch on the right of the gauge changes the right side message display. To zero or reset any of the readings, press and hold the corresponding switch for a couple seconds.

	<u>RIGHT: MILEAGE MENU</u>	
ODOMTR	> 000000	odometer mileage
TRIP A	> A 000.0	trip meter mileage A
TRIP B	> B 000.0	trip meter mileage B
SERVIC	> S 0000	miles since last service (if programmed)
KPH	> KPH 00	metric speed conversion (to mph if metric unit is selected)
PERFRM	>	switch to performance menu
	<u>RIGHT: PERFORMANCE MENU</u>	
HI RPM	> H 0000	high rpm recall
HI SPD	> HI 00	high speed recall
0-60 T	> 60 00.0	0-60mph time (0-100kph)
QUARTR	> QT 00.0	quarter mile time
QT MPH	> QT 00	quarter mile speed
MILES	>	switch to mileage menu
	<u>LEFT: INFORMATION MENU</u>	
CLOCK	> 12:00	12 hour clock
HOURS	> HR 0.0	re-settable hour meter
RPM	> R 0000	rpm reading in numeric display
OIL	> OIL 00	displays current oil pressure (eliminated in oil switch mode)
VOLTS	> V 00.0	displays voltage to gauge

Example: If the odometer mileage is currently displayed and you want to change to the 0-60 time, press and release the right switch until "PERFRM" is displayed. Wait until the display switches to "HI RPM". Press and release the switch until "60 TIM" is displayed. After a couple of seconds the display will show the current 0-60 time.

MOUNTING

A mounting bracket must be purchased for your application. Any BKT-50xx series bracket may be used. The bar mount brackets can be used for above-the-bar mounting or below-the-bar mounting. The 35° triple-tree mounts are only available for above-the-bar mounting. The MCV-7300 gauge can only be mounted above the bar.

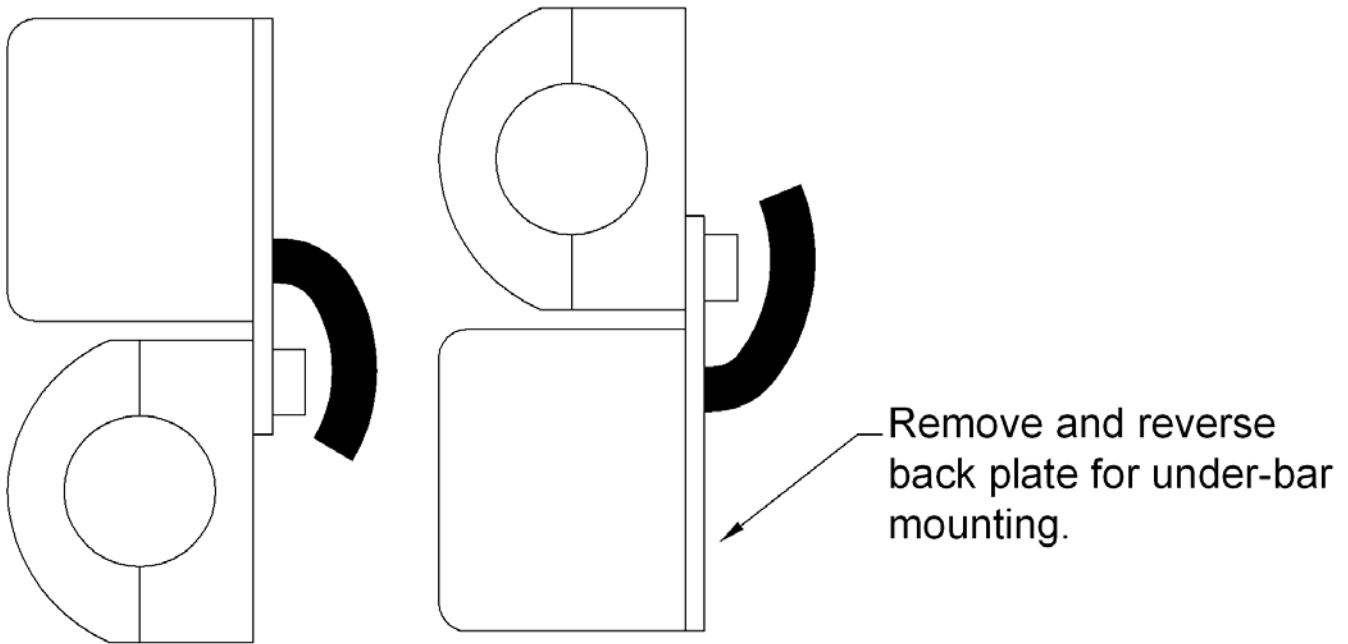
The triple-tree mounting bracket replaces the original handle bar mount. The gauge attaches to the back side of the bracket with the supplied screws.

The bar mount brackets have a curved front bracket and two rear brackets. The longer screws attach the gauge to the back side of the bracket and the shorter screws go into the recessed openings on the rear brackets. The mount fits tight and will need to be pulled together by the screws.

To mount the gauge under the bar:

1. Remove the rear plate by unscrewing the four screws.
2. Rotate the rear plate so the mounting tab is on the top.
3. Reattach the rear plate using the four screws.
4. Place bar mount bracket on the handle bars so that the recessed screw holes are on the top.
5. Using the long screws, secure the gauge to the bottom side of the bar mount bracket.

Drawings for using bar mount brackets above the bar and below the bar.
(MCV-7300 can only be mounted above the bar.)



POWER

Connect the red wire from the 4-wire main harness to accessory power from the ignition switch. Connect the white wire from the 4-wire main harness to constant battery power. The white wire keeps the clock time and the red wire lights up the gauge.

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

GROUND

The black wire from the 4-wire harness is the main ground for display system. A poor ground connection can cause improper or erratic operation.

SPEEDOMETER

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

The speed input connector plugs into the speed sensor to tell how fast you are traveling. On cable driven applications, the SEN-6011 (sold separately) connects to the speedometer cable and provides the electric signal. This sensor has a 5/8" coarse thread fitting that accepts mid-80's and earlier cables directly. For newer cycles the speedometer cable will need to be replaced with a cable having the correct fitting. Custom cables can be made, or stock cables can be modified for many of the Metric applications.

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

For 3 wire Hall-effect sensors, refer to the installation instructions for the sensor to determine wire color code. Most 3 wire sensors use the following color code: RED – power, BLACK – ground, WHITE – speed signal. Connect the sensor signal wire to the GREEN wire from the 3-wire harness, connect the sensor power wire to the red wire from the 3-wire harness, and connect the sensor ground wire to the black wire from the 3-wire harness.

For speed sensor integrated into a vehicle wiring harness (most **Metric Cruisers** w/factory VSS utilize a 3-wire Hall-effect sensor), consult a service manual to determine the color code and location of the speedometer signal. **If the factory harness supplies +5V to the sensor, please utilize the factory connection in place of the red power wire.**

For 2004+ Harley and 2003 V-Rod applications make sure to simply "Tee" into the white wire on the speed sensor to make certain the ECM will still receive its proper VSS signal from the sensor.

2006+ Sportsters utilize a black/blue wire for the VSS signal in place of the white wire on most big-twin models.

The speedometer is fully adjustable and calibration is described on page 5. VSS wires should be isolated from the ignition system. Coils, plug wires, or tachometer signal wires routed near or with the VSS wire can cause: erratic speedometer operation, speed reading at a standstill, incorrect or difficult calibration.

TACHOMETER

The tachometer is used by connecting the green wire from the main harness to the negative side of the coil or to an ignition module tach output. The tachometer is adjustable for 1 – 15 cylinder settings. The 1 cylinder setting is used for single-fire ignition systems without a buffered tach output.

For tach signals integrated into a vehicle wiring harness, consult a service manual to determine the color code and location of the tachometer signal. The bar displays rpm x1000 with a range of 350 – 8000 rpm.

For 2004+ Harley and 2003 V-Rod

The tachometer signal will come from the negative side of the ignition coil. Blue/Orange for the front cylinder, Yellow/Blue for the rear cylinder, connect the tachometer input to **only one** of these two wires, set the tachometer for a 1 cyl signal, see Tachometer Set-up for instructions.

STATUS AND WARNING INDICATORS

The right turn, left turn, and high beam indicators are activated by a 12 volt input signal connected to the 8-wire indicator harness. The right turn signal wire is GREEN, the left turn signal wire is BLACK, and the high beam wire is RED. The indicator harness can be connected to the same wires that the stock indicator lights would be connected to. The MCV-7000 wire colors may not match the wire colors in your electrical wire harness.

The neutral and check engine indicators are activated by a ground signal connected to the 8-wire indicator harness. The check engine wire is ORANGE and the neutral wire is WHITE.

LOW VOLTAGE WARNING

When the voltage drops below the warning limit with the engine running, the battery indicator will illuminate. (default warning limit is 11.0V)

OIL PRESSURE GAUGE

The oil pressure gauge uses the supplied oil pressure sender mounted in place of the original sender or switch. A 1/4" NPT to 1/8" NPT is included to fit most Twin Cam applications. Most other applications will require additional hardware. The BROWN wire from the 8-wire harness connects to the terminal on top of the sender. The sender grounds through its mount threads and uses a tapered, dry-seal thread. **(Pipe tape should not be used.)** When the oil pressure is below the warning limit the oil indicator will illuminate (default warning limit is 10psi). The gauge can also be set up to work with a stock oil pressure warning switch, **this must be changed to "SWITCH" if our oil sensor is not used.** See the OIL setup menu for instructions on changing this.

FUEL LEVEL GAUGE

An optional fuel level gauge is also available. It can be used with a fuel switch (default setting) or fuel sender. The fuel sender can be a 240-33 ohm sender, 73-10 ohm sender, or can be programmed for a custom sender range. The YELLOW wire from the 8-wire harness connects to the fuel level sender. When connected to a fuel sender, the fuel gauge lights up a series of bars next to the fuel pump symbol. When it is used with a fuel switch, the fuel pump symbol will normally be off and will illuminate to indicate low fuel. If a low fuel switch is used it may be necessary to connect a load resistor or bulb in order for the switch to operate correctly. One lead from the bulb connects to accessory power and the other lead splices into the wire to the fuel switch.

CLOCK

The gauge has a 12 hour clock on the left message display. To view the clock press and release the left switch until CLOCK is displayed. The clock is set by pressing and holding the left switch while the clock is displayed. The minutes will begin flashing. Every time the left switch is momentarily pressed the minutes will increase by one. Press and hold the left switch to change to the hours adjust. The hours will begin flashing and every time the left switch is momentarily pressed the hours will increase by one. Press and hold the left switch to exit the clock setting.

NIGHT DIMMING

Your display system has a dimming feature that dims the display intensity automatically at night. Normally the system is at full brightness for daytime viewing. To have the system at full brightness all of the time, go into the DIM setup menu and select OFF instead of AUTO.

GAUGE SETUP AND CALIBRATION

The setup menus are entered by holding the left switch in while turning the key on. The menus are as follows:

Main Menu	Sub Menu	Description	
SPEED	AUTO	auto calibrate speed	
	ADJ	adjust calibrate speed	
	UNIT	MPH	select mph or kph units
		KPH	
TACH	SERVICE	miles to service setting 500 – 7500 (in increments of 500), OFF	
	ENGINE	set engine cylinder setting 2 – 15	
	WARN SIGNAL	set rpm shift warning point select normal or low voltage tach signal NORMAL, LO VLT	
GEAR	PROGRM OFF	transmission gear display selection no gear display	
INFO	MODEL	Gauge model number	
	VER	Gauge revision code	
VOLT	SP CAL	speed cal setting	
	WARN	set low volt warning point 9.5V – 12.5V	
FUEL	SENDER	select sender type or switch input 75 – 10, 240 – 33, or SWITCH	
	CUSTOM WARN	program custom fuel sender curve set low oil pressure warning point or switch input selection 02 – 30 or SWITCH	
DIM	AUTO	automatic night dimming	
	OFF	no dimming	
CLOCK	CAL 0	set clock time adjustment	
DONE		resume normal operation	

SPEEDOMETER SETUP

Press and hold the left switch while turning the key on and starting the engine. Once the engine is running, release the switch. When "SPEED" is displayed, press the switch again and then release it. The message display should switch between "AUTO", "ADJUST", "UNIT", and "SERVIC".

METRIC SELECTION

If you are setting the system up for metric displays, press the switch when "UNIT" is displayed.

Press and release the switch until "KPH" is displayed.

Press and hold the switch until "DONE" is displayed.

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). Adjust requires you to follow another vehicle going at a set speed or timing your self over a mile to determine your speed.

Auto Cal

When "AUTO" is displayed press and release the switch. The speedometer will display "SEt" and the message display will show zeroes. 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 the switch again. The calibration is now done.

Adjust

When "ADJUST" is displayed press and release the switch. The system will restart with "ADJUST" on the message display. The speedometer will show the speed reading. Begin driving at a known speed. When the switch is pressed and held the speedometer reading will begin increasing until the switch is released. The next time the switch is pressed and held the reading will begin decreasing until it is released. The new calibration will be saved if no adjustments are made for 10 seconds.

MILES 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 0 miles remains the gauge will display "SERVIC DUE". If the right push button switch is pressed and held while "SERVIC DUE" is displayed, the service miles will be reset to the mileage value selected.

To change the service miles, enable, or disable the reading, go to the SPEED setup menu as described above and then select "SERVIC".

The current setting will be displayed. "OFF" or a mileage from 500 – 7500.

Press and release the switch until the desired setting is displayed.

Press and hold the switch until "DONE" is displayed.

TACHOMETER SETUP

The gauge can be set to read from 1-15 cylinder ignition signals. It can also be set to read either 12 volt tach signals or 5 volt tach signals found on some engine computers. The digital tachometer update rate can be adjusted between slow, mid, and fast. The rpm warning/shift point can be adjusted from 2000 – 8000. The tachometer will read from 350 – 8000 rpm.

Press and hold the left switch while turning the key on. Release the switch. When "TACH" is displayed, press the switch again and then release it. The message display should switch between "ENGINE", "WARN", and "SIGNAL".

Engine cylinder setup

When "ENGINE" is displayed press and release the switch.

The current cylinder setting will be displayed.

Press and release the switch until the desired setting is displayed.

Press and hold the switch until "DONE" is displayed.

Rpm warning setup

When "WARN" is displayed press and release the switch.

The current warning point will be displayed.

Press and release the switch until the desired setting is displayed.

Press and hold the switch until "DONE" is displayed.

Tach signal setup

When "SIGNAL" is displayed press and release the switch.

The setting will be displayed. (NORMAL or LO VOLT)

Press and release the switch until the desired setting is displayed.

Press and hold the switch until "DONE" is displayed.

GEAR INDICATOR SETUP

This gauge can optionally display the gear position. The gauge can learn the positions based on speed and rpm. It will work with 3, 4, 5, or 6 speed transmissions.

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 left switch while turning the key on and starting the engine. Once the engine is running, release the switch. When "GEAR" is displayed, press the switch again and then release it.

The display will show the current selection, "OFF" or "PROGRM". Press and release the switch to change the selection.

To begin programming, when "PROGRM" is displayed, press and hold the switch. The message will show "LO RPM" if the engine rpm is below 1500, or "LO SPD" if the vehicle speed is below 5.

Begin driving in 1st gear. The display should show "LEARN" and the "1" should be flashing. Drive at a steady speed until the "1" stops flashing and the display shows "SHIFT".

Shift to 2nd gear and drive at a steady speed. When the "2" stops flashing and the display shows "SHIFT", go on to 3rd gear.

Repeat this through each gear. After 3rd gear, if you stop or shift to neutral the gear settings will be saved and the display will show "DONE"

Press and release the left switch to restart the gauge in normal operation.

INFO MENU

The INFO menu is used to get the gauge model number, gauge revision code, and speed cal setting. This will normally only be used for diagnostic and troubleshooting.

VOLT MENU

The VOLT menu changes the low voltage warning point. Press and hold the left switch while turning the key on. Release the switch. When "VOLT" is displayed, press the switch again and then release it. The message display will show "WARN". Press and release the switch to view or change the current warning point. The display will show "LO 11.0". Press and release the switch to change the warning point, press and hold the switch to save the new warning point.

FUEL MENU

The FUEL menu changes the fuel gauge setup. Press and hold the left switch while turning the key on. Release the switch. When "FUEL" is displayed, press the switch again and then release it. The message display will switch between "SENDER", and "CUSTOM".

To change the fuel sender selection, press and release the switch when "SENDER" is displayed. The current setting will be displayed. The 4 settings are: "SWITCH", "CUSTOM", "75 – 10", "240 – 33". (SWITCH should be selected if this gauge is not being used.)

To program a custom fuel sender curve, press and release the switch when "CUSTOM" is displayed. You will either need the fuel sender out of the tank, or have the tank empty and add fuel during the programming procedure. The left display will "SET 00" and the right display will show the current sender resistance.

With the sender in the empty position, press and release the switch.

The display will show "SET 33". Move the sender to 1/3 tank position and press and release the switch.

The display will show "SET 66". Move the sender to 2/3 tank position and press and release the switch.

The display will show "SET 99". Move the sender to the full position and press and release the switch.

OIL MENU

The OIL menu changes the low oil pressure warning point. Press and hold the left switch while turning the key on. Release the switch. When "OIL" is displayed, press the switch again and then release it. The message display will show "WARN". Press and release the switch to view or change the current warning point. The display will show "LO 10" or "SWITCH". Press and release the switch to change the warning point, press and hold the switch to save the new warning point. Selecting "SWITCH" allows it to work with a stock pressure warning switch.

DIM MENU

The DIM menu selects whether the unit automatically dims at night or remains at full brightness all of the time. Press and hold the left switch while turning the key on. Release the switch. When "DIM" is displayed, press the switch again and then release it. The current setting will be displayed, "AUTO" or "OFF". Press and release the switch to change the setting, press and hold the switch to save the setting.

CLOCK MENU

The CLOCK menu sets the fine adjustment for clock calibration. The clock will typically be accurate to within ± 2 minutes a month. This setting allows the time to be fine tuned by ± 7 seconds/day. Press and hold the left switch while turning the key on. Release the switch. When "CLOCK" is displayed, press the switch again and then release it. The display will show "CAL 0". Press and release the switch to change the cal value, press and hold the switch to save the setting.

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.	Connect to a location that has power. Connect ground to a different location. Return gauge for repair. (see instructions)
Gauge lights up, but speed will only show zero.	Harness 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 harness to speed sensor and gauge. Move ground to different location, preferable close to the speedometer ground. Check cable connection between sensor and cable drive. Sensor can be tested by spinning the cable with a drill. See speed sensor voltage checks listed below. Gauge must be recalibrated (see instructions).
PLEASE – SET – SPEED	Speedometer is not calibrated.	Gauge must be calibrated to your bike (see instructions)
Speed reading is erratic or jumps around.	Speed sensor wire is loose or broken. Cable is loose or broken. Poor ground connection.	Check all wire connections and inspect wire for breaks. Check cable between sensor and transmission. Check ground connection on speedometer and sensor.
Speed reading is incorrect.	Gauge is not calibrated correctly.	Gauge must be calibrated (see instructions).
Gauge lights up, but tach will only show zero.	Tach 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 green wire to tach signal wire. Check engine and ignition system grounds. Check gauge and engine grounds. Change the signal type as described in the TACHOMETER SETUP. 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 and engine.
Tach reading is incorrect.	Gauge is not calibrated correctly.	Gauge must be calibrated (see instructions).
High beam, Left turn, or Right turn 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.
Neutral, low oil, or engine indicator does not work.	Loose or incorrect connection to indicator wire.	Check that the appropriate indicator wire has about 12 volts when the indicator should be off and about 0 volts when the indicator should be on.
Oil pressure gauge is incorrect or erratic.	Brown wire is not connected properly. Oil pressure sender is getting a poor ground connection.	Check connection from brown wire to pressure sender. The sender grounds through its mounting threads. Make sure the threads and fittings are clean.
Fuel level gauge is incorrect or erratic.	Yellow wire is not connected properly. Fuel sender is getting a poor ground. Gauge is not set correctly.	Check connection from yellow wire to fuel level sender. Check ground connections to fuel sender mounting plate and sender. Select a different fuel sender range or use the custom sender setup.
Low fuel indicator does not work.	Fuel switch requires additional load.	A stock low fuel switch may require a light bulb or load resistor connected to accessory power to work correctly.
Turn signals do not cancel automatically.	Output speed signal to stock cancel unit is loose or not connected properly. Speedometer is not calibrated. Speed sensor is not working. Turn signal cancel unit is not working.	Check the connections on the solid white wire coming from the gauge. Calibrate the speedometer. If the speedometer always shows zero, check speed sensor voltages. Test turn signal module according to the bike's service manual.

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

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

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

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

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

WIRING COLOR CODE FOR GAUGE:

MCV-7000 4-wire	Stock HD® harness color	Function
RED	ORANGE/WHITE	+12 volt with key on
WHITE		Constant fused +12V battery power
BLACK	BLACK	ground (connect directly to battery negative)
GREEN	PINK	tachometer signal
MCV-7000 8-wire	Stock HD® harness color	Function
RED	WHITE	High Beam indicator
BLACK	VIOLET	Left Turn indicator
GREEN	BROWN	Right Turn indicator
WHITE	TAN	Neutral indicator
BROWN	GREEN/YELLOW	Low Oil Pressure indicator
ORANGE	BLACK/YELLOW	"ENGINE" indicator
BLUE	WHITE/GREEN	output speed signal
YELLOW		fuel level sensor or switch
MCV-7000 3-wire	Stock HD® harness color	Function
RED	RED	+12 power to sensor
BLACK	BLACK	ground for sensor
GREEN	WHITE	speed signal

WARRANTY

All DAKOTA DIGITAL instruments are warranted free of defects in material and workmanship for 2 years from the date of purchase. In the event of a problem with one of our products within the warranty period, DAKOTA DIGITAL will replace or repair the instrument at no charge. (The decision to repair or replace is solely that of DAKOTA DIGITAL. DAKOTA DIGITAL is not responsible for shipping costs of products returned under warranty or for labor charges for product installation and removal.) This warranty becomes invalid if the product is misused, altered or installed incorrectly.

For warranty coverage, you must first call to receive an RMA#. Ship the product transportation prepaid via UPS or insured Parcel Post. A copy of the original invoice or dated bill of sale along with a description of the defect is also required. Make sure that the RMA number is clearly visible on the outside of the package as well as inside on the paper work. **A note or letter must be included describing the problem.**

The above warranties, both expressed and implied, do not cover damages caused by improper installation, misuse, abuse, fire, unauthorized modifications, floods or acts of God, or reimbursement of customer or shop time. The extent of the warranty is limited only to the product and does not cover any loss or damage to vehicle, equipment, or non-DAKOTA DIGITAL products.

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 units. You can contact our technicians at 605-332-6513 or by email at dakotasupport@dakotadigital.com.

Should you ever need to send the unit back for repairs, please 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 your RMA#, a complete description of the problem, your full name and address (street address preferred), and a telephone number where you can be reached during the day.** A return authorization number (RMA#) for products being return for repair is required. Do not send any money. We will bill you for the repair charges.

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