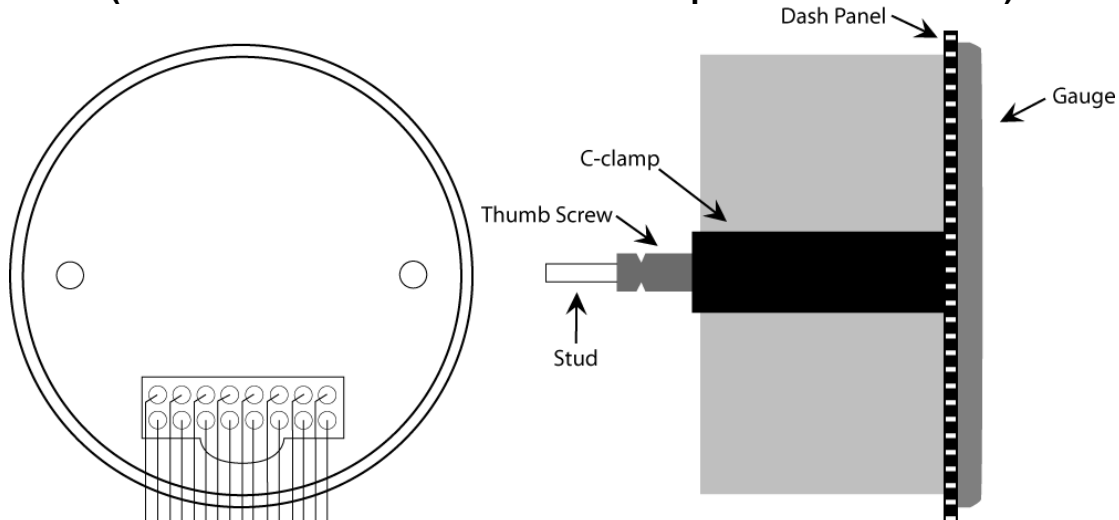


Dakota Digital

HLY-3021 rev C PERFORMANCE TACHOMETER (weather and vibration resistant for exposed environments)



HLY-3021*

WHITE/BLACK
YELLOW
WHITE/BLUE
ORANGE
PURPLE
GREEN
BLUE
PINK
BROWN
WHITE/GREEN
RED
BLACK
WHITE/RED
WHITE/PURPLE
GRAY
WHITE

2003 and older HD Stock harness color

BROWN/VIOLET**
PINK**
normally not used
VIOLET**
WHITE**
BROWN**
normally not used
BLACK/YELLOW**
GREEN/YELLOW**
TAN**
ORANGE/WHITE
BLACK
not used
see shift light output
HLY-3011 VSS output
not used

Function

security system indicator (-)
tach signal input
optional external switch input (+)
left turn indicator (+)
high beam indicator (+)
right turn indicator (+)
night dimming (+)
engine indicator (-)
low oil warning indicator (-)
neutral indicator (-)
+12 volt power with key on
ground for gauge
not used
shift light output
VSS for gear position
not used

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

The Check Engine indicator will not function using these gauges on **2004+ HD models due to the signal being fed through the 'data bus', however the HD diagnostic tool can still check and clear codes through the diagnostic connector. **2004+HD** Indicator wires match the above chart, but please read Tachometer section for proper wiring.

GAUGE SETUP AND CALIBRATION

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

Main Menu	Sub Menu	Description
TACH	ENGINE	set engine cylinder setting
	WARN	set rpm shift warning point
	UPDATE	set rpm update rate for digital readout
	SIGNAL	select normal or low voltage tach signal NORMAL LO VLT
INFO	MODEL	Gauge model number
	VER	Gauge revision code
	PPM	speed cal setting
GEAR		transmission gear display selection
	OFF PROGRM	
DONE		restart system with new settings

POWER

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

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

GROUND

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

STATUS AND WARNING INDICATORS

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

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

LOW VOLTAGE WARNING

When the voltage drops below 11 volts with the engine running, LO VLT will be displayed.

SECURITY SYSTEM INDICATOR

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

SHIFT LIGHT OUTPUT

The shift light output is a ground switch that turns on whenever the rpm exceeds the warning point. It can handle 0.25A, equivalent to a 3W 12V bulb. Connect a low current indicator as follows: One wire from the light will connect to 12 volts, the other wire will connect to the white/purple wire from the gauge.

If a large or high power light will be used, then a relay should be connected as follows: One of the coil wires should be connected to 12 volts and the other coil wire will connect to the white/purple wire from the gauge. The relay contacts will be used to switch power to the light. Any 12volt automotive relay can be used, such as Dakota Digital's RLY-1 30A relay.

TACHOMETER

The tachometer is used by connecting the yellow wire from the main harness to the negative side of the coil or to an ignition module tach output. The tachometer is adjustable for 1 – 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. The starting bar range is 250 – 6500. If the rpm exceeds 6500 the bar will automatically switch to a 500 – 13,000 bar readout and will remain there until the rpm drops below 2000.

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.

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 2200 – 14800. The tachometer will read from 350 – 17,500 rpm. The bar tach automatically switches between 6500 full scale and 13,000 full scale depending on the rpm.

Press and hold the 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", "UPDATE" 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.

Display update setup

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

The update setting will be displayed. (1=slow, 2=mid, 3=fast)

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 only when used in conjunction with an HLY-3011. The gauge can learn the positions based on speed and rpm. It will work with 3, 4, 5, or 6 speed transmissions. The speed signal must be fed from an HLY-3011 speedometer output. Connect the white wire from the HLY-3011 to the gray wire on the HLY-3021.
- To program the gear positions in, 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. 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.
- When "PROGRM" is displayed, press and hold the switch to begin the gear programming. 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 GEAR 1 and the "1" should be flashing. Drive at a steady speed then press and release the switch. The "1" should stop flashing for a few seconds and then switch to a flashing "2".
- Shift to 2nd gear and drive at a steady speed. Press and release the switch again.
- Repeat this through each gear. When you are done, press and hold the switch until the display shows "DONE".
- Press and release the switch to restart the gauge in normal operation.

INFO MENU

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

FUNCTION SWITCH

The function switch on the front of the speedometer allows access to all of the mileage, rpm, and performance information. Pressing and releasing the function switch toggles through the different displays. The display sequence is as follows:

<u>TACH MENU</u>			
HOURS	>	HR 0.0	re-settable hour meter
GEAR	>		current gear position (if programmed)
HI RPM	>	H 0000	high rpm recall
RPM	>	R 0000	rpm reading in alpha display
WARN	>	W 0000	current rpm warning or SHIFT if over set point
LO OIL	>		only visible if input is activated
LO VLT	>		only visible if warning is activated

NIGHT DIMMING

Your display system has a dimming feature that dims the display intensity. Normally the system is at full brightness for daytime viewing. When the blue wire has 12 volts the display intensity will be reduced. Connect this to a toggle switch if you wish to use this feature. To have the system at full brightness all of the time, leave the blue wire disconnected.

WIRING COLOR CODE FOR GAUGE:

HLY-3021*	2003 and older HD	Function
PIN # ON GAUGE	Stock harness color	
1- WHITE	NOT USED	NOT USED
2- WHITE/PURPLE	normally not used	tach warning output
3- BLACK	BLACK	ground for gauge
4- WHITE/GREEN	TAN**	neutral indicator
5- PINK	BLACK/YELLOW**	engine indicator
6- GREEN	BROWN**	right turn indicator
7- ORANGE	VIOLET**	left turn indicator
8- YELLOW	PINK**	tach signal input
9- GRAY	HLY-3011 VSS output	VSS for gear position
10- WHITE/RED	NOT USED	NOT USED
11- RED	ORANGE/WHITE	+12 volt power with key on
12- BROWN	GREEN/YELLOW**	low oil warning indicator
13- BLUE	normally not used	night dimming
14- PURPLE	WHITE**	high beam indicator
15- WHITE/BLUE	normally not used	optional external switch input
16- WHITE/BLACK	BROWN/VIOLET**	security system indicator

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

The Check Engine indicator will not function using these gauges on **2004+ HD models due to the signal being fed through the 'data bus', however the HD diagnostic tool can still check and clear codes through the diagnostic connector. **2004+HD** Indicator wires match the above chart, but please read Tachometer section for proper wiring.

MOUNTING:

The gauge requires a round hole 3-3/8" in diameter. It should be inserted into the opening from the front and the U-clamp will be installed from the back. Tighten the two nuts on the U-clamp so that the gauge is secure.

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 tach will only show zero.	Yellow wire is not connected properly. Ignition system not grounded properly. Gauge is not grounded properly. Tach signal type is not set correctly. Gauge is not calibrated	Check connection from yellow wire to tach signal wire. Check engine and ignition system grounds. Check gauge and engine grounds. Change the tach signal type (see instructions). Gauge must be recalibrated (see instructions).
Tach reading is erratic or jumps around.	Tach signal wire is loose or broken. Poor ground connection.	Check all wire connections and inspect wire for breaks. Check ground connection on tachometer, engine, and ignition system.
	Update rate is too fast.	Reset display update speed slower.
Tach reading is incorrect.	Gauge is not calibrated correctly.	Gauge must be calibrated (see instructions).
Gauge will not dim.	Blue wire is not connected correctly.	Check wiring connections. Blue wire should have 12 volts with headlights on.
Gauge remains dim at all times.	Blue wire is getting power all of the time.	Connect blue wire to location that only has power only when the headlights are on.
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.

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.



4510 W. 61ST St. N., Sioux Falls, SD 57107
Phone: (605) 332-6513 FAX: (605) 339-4106
www.dakotadigital.com
dakotasupport@dakotadigital.com

©Copyright 2004 Dakota Digital Inc.