

**Part Number 35-9009**  
**VHM Speed Shifter Kit For**  
**Harley-Davidson V-Rod Models**

Congratulations, you have purchased the finest system available for your motorcycle. Your Vance & Hines Motorsports Speed Shifter Kit is designed and crafted for maximum performance. Please follow the instructions below, check for missing or damaged parts and if you need any assistance please contact our technical support line (317) 852-9057.

**Items List**

Quantity	Item No.	Item Description
2	80511	M8 x 1.25 x 20 mm Bolt SHCS
1	35-0073	V-Rod Shifter Motor
1	35-0075	Shifter ECM
1	35-0067	Shifter ECM Bracket
1	35-0056	Button Head Bolt M8 x 1.25 x 25 mm (Tapped Linkage Bolt)
2	92095A214	Button Head Bolt M5 x .8 x 20 mm (Shifter Motor)
1	92095A211	Button Head Bolt M5 x .8 x 14 mm (Shifter Motor Mounting Bolt)
2	91290A017	SHCS M2 x .4 x 10 mm (Clutch Switch Mounting Bolts)
1	35-0077	Shifter Button Assembly with Button Bracket
1	35-0070	Handle Bar Bracket
1	91255A248	Button Head Bolt 10 - 24 x 1 1/4 Bolt (Handle Bar Bracket Bolt)
2	91290A103	SHCS M2 1/2 x .45 x 10 mm (Button Assembly to Button Mount)
2	91290A115	SHCS M3 x .5 x 10 mm (Clutch Bracket to Button Assembly)
1	35-0076	Shifter 2 Step Cable Assembly
1	35-9072	Shifter 2 Step Mount Bracket
1	35-0069	Shifter Mount Bracket - Long Offset
1	35-0096	Shifter Mount Bracket - Short Offset
1	35-0095	Shifter Mount Bracket Spacer - For Short Offset

**ECM Installation**

- » Remove tank cover by lifting up seat and twisting the tab on the tank. Lift tank cover up in the rear and wiggle backwards to remove tank cover from rubber grommets in the front of the tank cover.
- » Remove IAT connector (*Figure 1*).
- » Remove airbox by popping the eight metal tabs outward with a flathead screwdriver (note one is located under snorkel on front of cover). Remove the filter by turning wingnut counterclockwise.
- » Remove hose going to oil separator. Remove six allen head screws securing velocity stacks. Lift airbox assembly away from bike and pull out rear crankcase breather hose with slight force (*Figure 2*).
- » Remove horn by removing 13 mm acorn nut and washer. Push horn in towards bike and pull down to clear stud from frame. Remove two wires on backside.
- » Disconnect engine harness deutsch connector by squeezing in tabs and pull apart (*Figure 3*).



*Figure 1*



*Figure 2*



*Figure 3*

- » Remove protective covering from the three wires going to the injectors (yellow/green, white/yellow, green) (*Figure 4*).
- » Cut the green wire and the white/yellow wire about ¾" and 1" away from deutsch connector (cut one ¾" and the other 1" to stagger the connections) (*Figure 5*).
- » Strip approximately ½" of coating off of the orange, purple, green, and brown wire coming from the shifter ECU. Also strip approximately ½" of coating off of both ends of the green and white/yellow wires previously cut.
- » Slip a piece of heat shrink on each of the 4 wires coming from the shifter ECM and twist the wires according to *Table 1* and solder, followed by heating shrink wrap over connections. Place wires back in protective covering and wrap with a piece of electrical tape (*Figure 6*).
- » Plug deutsch connector back in.



*Figure 4*



*Figure 5*



*Figure 6*

*Table 1*

Wire Color from Shifter ECM	Wire Color on Bike
Orange	Green going to Injector
Purple	White/Yellow going to Injector
Green	Green/Gray going to Deutsch Connector
Brown	White/Yellow going to Deutsch Connector

- » Install Shifter ECM Bracket to backside of horn by attaching big end of the bracket to the backside of the Shifter ECM allen bolt. Attach other end of bracket to backside of horn 10 mm bolt (*Figure 7*).
- » Install horn
- » Position as desired and tighten bolts. Ziptie wires to bracket if desired.
- » Route the clutch switch connector and other bundle of wires including power, ground, and thin gauge purple and black wire along factory bike harness towards front of bike (*Figure 8*). Remove left side cover. Route clutch switch connector behind left side cover and leave for now (*Figure 9*). Attach power (red) to battery positive. Attach black wire to battery ground.



*Figure 7*



*Figure 8*



*Figure 9*

- » Unplug front coil connector
- » Strip back protective covering on front coil plug approximately 3" to allow room to solder wires (*Figure 10*).
- » Strip off a small section of coating on the yellow/green and blue/orange wire going to the coil. Stagger the sections to

keep the connections away from each other.

- » Twist the purple wire with the yellow/green and twist the black wire with the blue/orange and solder both connections (Figure 11). Wrap both connections with tape and put protective covering back in place. Plug connector back in (Figure 12).

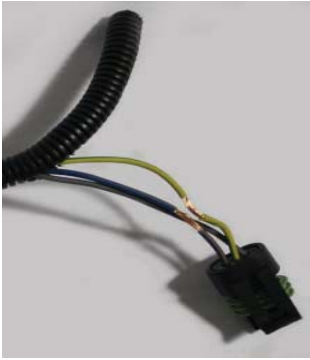


Figure 10



Figure 11



Figure 12

### **Shifter Button/Clutch Switch Installation**

- » Remove Torx T-25 screw from bottom of left hand switch housing (Figure 13).
- » Install button assembly by using supplied allen bolt (Figure 14).
- » Route wires along clutch master cylinder hose down through opening in triple tree. Route wires and connectors down factory harness to the four pin connector from the shifter ECM, two pin connector for clutch switch and connect. (Figure 14).
- » Note: Be sure not to pull hard on the wires as they may break out of the connector.



Figure 13



Figure 14

### **Shifter Motor Installation**

- » Remove stock M8x1.25 bolt on shift linkage and replace with supplied M8x1.25 bolt with M5x.8 tapped in center (Figure 16).
- » Remove two plastic plugs from frame bosses near fuel tank (Figure 16).
- » Due to the difference on offsets in frames from model to model, two brackets have been supplied (Figure 15). Identify the proper bracket for your frame application by checking the clearances from the bracket to the frame. The shorter offset requires supplied spacer (Figure 15).
- » Install bracket with M5 tapped hole to the rear of the motorcycle using two M8x1.25x20 bolts and tighten. Install shifter by mounting with the two M5x.8 bolts, the long offset bracket uses one long and one short bolt shown in (Figure 16). The short offset bracket uses two long bolts and provided spacer.

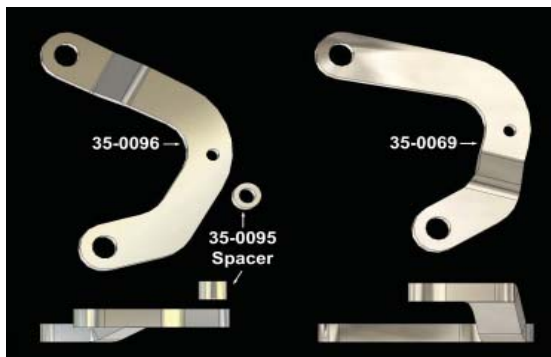


Figure 15



Figure 16

- » Before applying loctite be sure you have approximately 12-14 mm of shaft exposed at standstill. Be sure to check that the linkage makes a full upshift and downshift by either getting the rear wheel off the ground or rocking the bike forwards and backwards while manually shifting the linkage. If adjustment is needed, loosen the 10 mm locknut on the shaft (*Figure 17*). If the unit will upshift, but not downshift you will need to adjust the endlink on the shifter outward away from the shifter one turn at a time. If the unit will downshift, but will not upshift you will need to turn the end link inwards towards the shifter one turn at a time. Once you are satisfied with the shifting tighten the 10 mm locknut and apply loctite to the mounting bolts and tighten.
- » Route wires behind shifter mounting bracket and follow the lower frame tube going behind the side stand. Continue behind the left radiator cover along with the charging system wires and up through the frame between the regulator/rectifier and the frame. Route the wires behind the left side cover and to the six pin connector from the shifter ECM (*Figure 18*). Zipties are not provided.



*Figure 17*



*Figure 18*

### **Shift Light Installation**

- » Mount shift light on brake or clutch master cylinder by removing one of the cover screws. Loosen the shift light from the bracket by unscrewing the back piece of the shift light from the front piece. Tighten bracket using existing screw. Install shift light back into bracket and hand tighten.
- » Route connector down through triple tree and behind the left side cover to the 2 pin (white & red) connector from the shifter ECM.

### **Final Installation**

- » After all components have been installed and wires routed, be sure to neatly ziptie all wires and that none of the connectors or wires are in a bind or in the way of the airbox being reinstalled.
- » Install the airbox opposite of removal and be sure that the rubber grommet on the bottom of the airbox is positioned on the "rifle shell" looking breather.
- » Install the left side cover.
- » Install tank cover being sure to get the front pins back in the rubber grommets
- » You should now be ready to enjoy easy, fast shifting.

### **Shiftlight/Auto-upshift Adjustment**

**Note:** When entering `tuner' mode you first enter the shiftlight/auto-shift part and then you can either switch off the engine to save your adjustments or you can then move onto the 2 stage launch section.

- » To get into `tuner' mode you press and hold both shifter buttons at the same time - start the engine and then release the 2 shifter buttons - you will see that in the factory default setting the status LED will have changed to a solid color orange, this indicates that you are now in `tuner' mode.

### **Once you have entered `tuner' mode;**

**Note:** Be certain you are in tuner mode or the bike will shift.

- » If you want to move the shiftlight/auto-shift point up simply press the green button once, the solid orange LED will now change to a momentary flashing once green LED, this indicates that you have raised the shiftlight point up 100 RPM (approx.) If you then press the green button once again the green LED will flash momentarily twice to indicate a 200

RPM rise and so on to a maximum of 15 flashes (1500 RPM increase approx.) If you want to lower the shiftlight/auto-shift simply press the red button once and you will bring the shiftlight/auto-shift point down 100 RPM (approx.) .

- » If you bring the shiftlight/auto-shift point back down to the factory default setting the LED will revert back to a solid color orange. If you want to lower the shiftlight/auto-shift below the default factory setting press the red button once, the solid orange LED will now change to a momentary flashing once red LED, this indicates that you have lowered the shiftlight point down 100 RPM (approx.) If you then press the red button once again the red LED will flash momentarily twice to indicate a 200 RPM drop and so on to a maximum of 15 flashes (1500 RPM drop approx.) If you want to increase the shiftlight/auto-shift again simply press the green button once and you will bring the shiftlight/auto-shift point up 100 RPM (approx.)

### **Saving the shiftlight/auto-shift setting;**

- » If you only want to make a change to the shiftlight/auto-shift point and do not want to proceed to the 2 stage rev limit point section then switch off the engine to save and authenticate the settings.

### **2 Stage Launch Control Adjustment**

**Note 1:** If you are continuing from the shiftlight/auto-shift adjustment then you must now press and hold both the red and green shift buttons for 3 seconds to move to the 2 stage tuning section, you will notice that the status LED will change to a flashing color orange for 3 seconds to indicate that you are now in the 2 stage adjustment section.

**Note 2:** If you are not continuing from the shiftlight/auto-shift section and you are wishing to make an adjustment to the 2 stage settings without affecting the shiftlight/auto-shift settings then you should enter `tuner' mode like this; Press and hold both shifter buttons at the same time - start the engine and then release the 2 shifter buttons - you will see that the status LED will have changed to a solid color orange for a period of 3 seconds, this indicates that you are now in `tuner' mode, if you have made any previous adjustments then these will then be indicated by either the status LED flashing green or red. To move onto the 2 stage section press and hold both the red and green buttons for a period of 3 seconds, the status LED will change to a flashing color orange for 3 seconds to indicate you have entered the 2 stage adjustment section.

- » If you want to move the 2 stage rev limit point up simply press the green button once, the solid orange LED will now change to a momentary flashing once green LED, this indicates that you have raised the 2 stage point up 100 RPM (approx.) If you then press the green button once again the green LED will flash momentarily twice to indicate a 200 RPM rise and so on to a maximum of 10 flashes (1000 RPM increase approx.) If you want to lower the 2 stage rev limit point simply press the red button once and you will bring the 2 stage rev limit point down 100 RPM (approx.)
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- » If you bring the 2 stage rev limit point back down to the factory default setting the LED will revert back to a flashing color orange. If you want to lower the 2 stage rev limit point below the default factory setting press the red button once, the flashing orange LED will now change to a momentary flashing once red LED, this indicates that you have lowered the 2 stage rev limit point down 100 RPM (approx.) If you then press the red button once again the red LED will flash momentarily twice to indicate a 200 RPM drop and so on to a maximum of 10 flashes (1000 RPM drop approx.) If you want to increase the 2 stage rev limit point again simply press the green button once and you will bring the 2 stage rev limit point up 100 RPM (approx.) and so on.

### **Saving the 2 stage rev limit setting;**

- » After carrying out your adjustments simply switch off the engine to save and authenticate the settings.