Pingel Enterprise, Inc
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www.pingelonline.com
Phone (608) 339-7999 Fax (608) 339-9164

Since 1967

Pingel® Electric Speed Shifter Kit for 2007 - 2008 POLARIS OUTLAW 450/525 WITH SOLID REAR AXLE #76801 Installation Instructions

Read <u>all</u> instructions thoroughly, look at photos and all components before attempting installation.
This product is not designed or intended to be used as an assistive device for any particular disability.

All the components of this Electric Speed Shifter Kit have been assembled and tested as a unit before leaving our factory and have been found to be in working order at the time of shipping. **We strongly recommend that you bench test this unit following the directions included on the separate page.** Installation of this kit requires detailed knowledge of the ATV model, its electronics and mechanics. It is assumed that the installer has access to the proper tools and a working knowledge of them, test equipment (such as a voltmeter), and factory service manuals. The following instructions must be read in their entirety and any questions should be answered prior to attempting installation. Incorrect installation will result in damage to Electric Speed Shifter components. If after reading the instructions you do not feel comfortable installing the kit, please find a qualified technician to do the installation. Installation time is 2-3 hours.

Disconnect negative battery cable before attempting any work on ATV.

INSTALLATION OF DUAL BUTTON HANDLEBAR CONTROL:
Loosen the clutch perch and slide it toward the steering shaft so there is at least 5/8" between the switch housing and the clutch perch. Disassemble the switch housing. Remove the left handgrip. Note: WD-40 sprayed inside grip will aid in removal. This is also easiest done with the switch housing removed and swung out of the way.

Slide the Pingel dual button handlebar control on to the handlebar far enough to allow room for the reinstallation of the handgrip. Reinstall the handgrip back onto the ATV securing it with some type of grip glue. Slide the Pingel dual button handlebar control as close to the handgrip as possible and tighten the setscrew located on the backside. Reassemble the switch housing moving it as close to the dual button handlebar control as possible. Slide the clutch perch as close to the switch housing as possible and retighten it.

Route the cable from the dual button handlebar control neatly along the handlebar and down under the fuel tank. Wait to secure the cable as another cable will be run in this area further along in the instructions. Loosening and lifting the fuel tank will aid in cable routing. The final location of this cable assembly will be under the seat, see figure 1.

INSTALLATION OF CONTROL MODULE AND FUSED WIRE HARNESS:
The mounting location of the control module is under the seat, see figure 1. The control module is supplied with Velcro to install on the bottom of the box to secure it. The wire assembly previously run from the handlebar control will now be connected to the control module. The handlebar connector has 4 pins and should be connected to the appropriate receptacle from the control module.

The large 4-pin connector coming from the control module should be connected to the large 4-pin connector from the fused wire harness. The small 3-pin connector on the fused harness is used for the electronic engine kill module. There are three loose wires coming from the fused wire harness; the black (negative) and large red (positive) go directly to the battery, the small red is for switched 12v power. The large red and black wires should be cut to the shortest length needed to reach the battery posts which will give maximum power for the Electric Speed Shifter kit. Note: leave the small red wire as long as possible until the next step. Solder the ring terminals provided onto the cut ends of the large red and black wires then attach the red to the positive battery post, the black will be connected to the negative at the end of the installation. The small red lead can be connected to the black with red striped wire which is located in the key switch harness. See figure 2. Cut the small red wire to proper length and use a blue quick tab connector provided to make this connection (soldering is preferred).

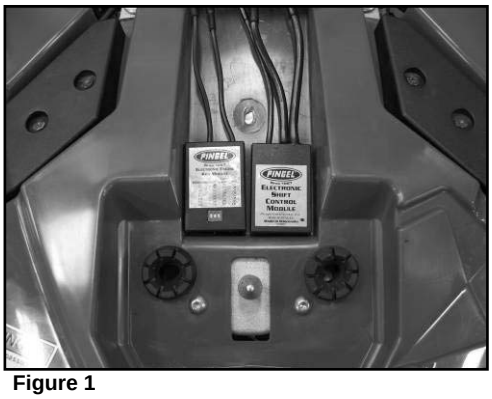

Figure 1

Figure 2

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INSTALLATION OF ELECTRONIC ENGINE KILL MODULE:
The electronic engine kill module is also mounted under the seat and may be secured with the supplied Velcro to install on the bottom of the box, see figure 1. Insert the small male plug of the electronic engine kill module into the small female plug located on the fused wiring harness. Plug in the cable (included loose in kit) which has a two pin male rubber plug on one end and is blank on the other end into the small female plug of the electronic engine kill module. Locate the red with a white striped wire that runs to the ignition module. Cut this wire in two. Route the loose end (has no rubber plug) of the cable which was just plugged into the electronic engine kill module to the cut wire, securing the red wire of the Pingel cable to the cut red with white striped wire that goes back into the stock wiring harness. Secure the remaining yellow wire in the Pingel cable to the other end of the red with white striped wire which was cut in two and goes to the ignition module. See figure 3. You can use the blue quick tab connectors provided to make these connections but soldering them is preferred. Secure this cable and the cable run from the handlebar switch with the wire ties provided.

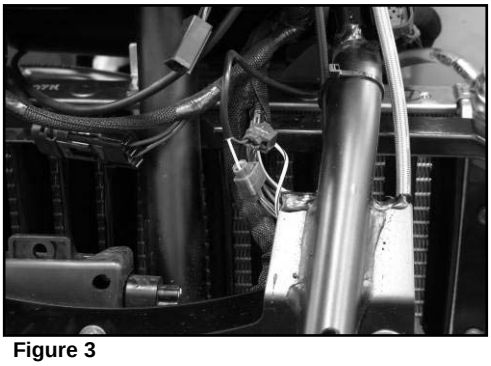

Figure 3

INSTALLATION OF SHIFT ARM BRACKET:
Remove the bolt that holds on the shift lever to the splined shaft. Mark the rotated location and remove the shift lever from the splined shaft. Place the Pingel shift lever bracket over the backside of the stock shift lever and measure 1-1/2" from the outside of the peg to the center of the closest hole. See figure 4. Use a 3/16" drill to make 2 small point marks on the back of the stock shift lever by twisting the drill bit with your fingers through the mounting holes, as shown in figure 4.

Using the top back of a vise, anvil or other stable surface, center punch the two small points marked on the backside of the stock shift lever, as shown in figure 5. Use a 3/16" drill bit and drill the 2 points that were center punched.

Put the two 10-24 x 1" bhscs through the stock shift arm and the Pingel shift arm bracket and tighten the 10-24 locknuts onto the assembly.

Reassemble the shift lever onto the ATV splined shaft.

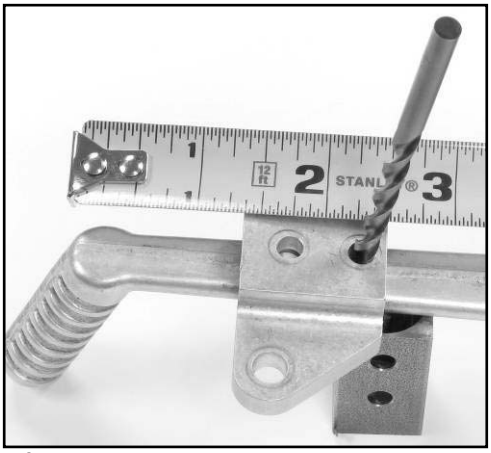

Figure 4

INSTALLATION OF ELECTRIC SHIFT CYLINDER BRACKET:
Remove the two bolts that hold the left foot peg, see Figure 6. Install the Pingel cylinder support bracket by applying thread locker to the 10mm x 35mm hhcs with washers and inserting them through the holes on the left foot peg, the cylinder support bracket and tighten them into the frame, see figure 6. Note: You may need to file the backside of the stock footpeg bracket which will remove any weld splatter, burrs, ect. Torque all bolts according to the service manual.

INSTALLATION OF ELECTRIC SHIFT CYLINDER AND UP/DOWN ADJUSTMENT:
Install the shift cylinder onto the shift cylinder support bracket using the Pingel clamp and (2) ¼-20 x ¾" shcs. Leave these bolts loose for now, as adjustment will be needed next. Note: The next procedure may require two people. Pull and hold the shift lever to the full up shift position and while holding the rod end in its most inward position move the shift cylinder in the clamp until the hole in the rod end aligns with the hole in the shift arm bracket, then tighten the two bolts of the Pingel clamp. Note: You may need to roll the ATV back and forth to be certain that it is fully in gear.

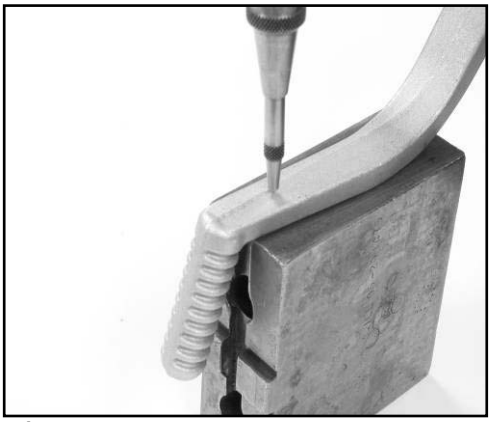

Figure 5

ADJUSTMENT OF ELECTRIC SHIFT CYLINDER FOR NO SHAFT BIND:
To adjust the shift cylinder shaft and rod end for no side bind you must retract the rod end and shaft all the way into the shift cylinder and hold in place. Now move the shift peg so the Pingel shift lever bracket rod end hole lines up with the hole in the rod end. Making sure the flat of the rod end is parallel with the flat on the Pingel shift lever bracket, without putting left or right pressure (as viewed from above) on the rod end gauge the gap between the two to determine the correct amount of washer(s) and/or spacer provided. Once this is established apply thread locker to the ¼-28 x 1-1/4 bhscs and install it through the rod end of the shift cylinder, the ¼" washer(s) and/or spacer and into the Pingel shift lever bracket on the shift lever, retaining it with the ¼-28 locknut, See Figure #7. This step is important because if there is any bind in the linkage system the shifter will not work correctly. Note: On some ATV models you may be able to get more sideways adjustment by moving the foot shifter on its splined shaft.

ROUTING SHIFT CYLINDER CABLE:
Route the electric cable from the shift cylinder to the control module located under the seat. Attach the cable by pushing the connector into the receptacle on the control module. Secure all wires away from heat and moving parts with the supplied wire ties.

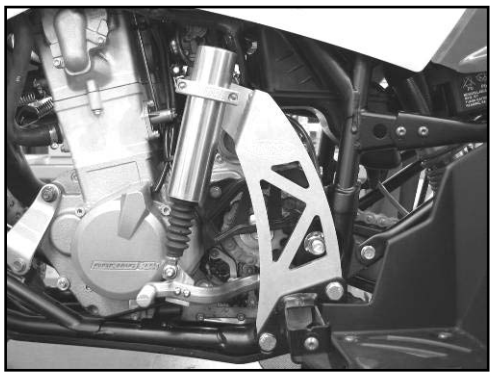

Figure 6

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COMPLETING INSTALLATION:
Your Electric Speed Shifter kit installation should now be complete. Reconnect negative battery cable and the shifter ground cable. In the interest of safety this is the recommended starting procedure: To arm the electric shifter, make sure the ATV is in neutral and pull in the clutch lever, then start the engine. With the clutch lever pulled in, push either button on the handlebar control and **hold it for five seconds**; release the clutch lever slowly (in case the ATV is accidentally in gear). The system is now turned on and will shift when either button is pressed. When the key is turned off, the power to the control module is disengaged so this procedure must be performed every time the ATV is turned back on. Pull in the clutch lever and check shifter movement by pushing either button on the handlebar control. It will only be necessary to use the clutch when starting, stopping and finding neutral. Upshifting and downshifting will not require the use of the clutch. The operator may use the clutch and foot shifter manually without harm to any components.

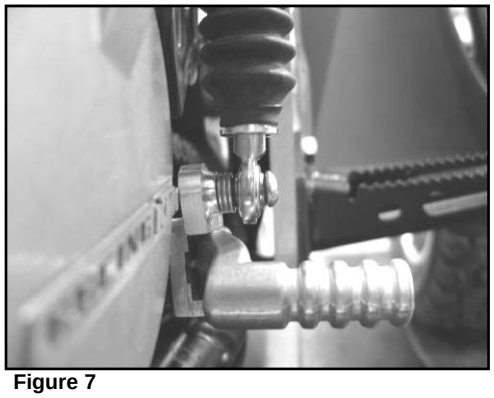
Figure 7

TESTING ENGINE KILL MODULE:
Unplug the electric shift cylinder from the control module. Take note of the positions of the dipswitches on the electronic engine kill module. Position all three of the dipswitches to the off position. Pull in the clutch lever (hold it in until the end of the test), start the ATV and put it into neutral. Arm the system by holding one of the buttons for five seconds as explained in the previous instructions. Rev the engine to approximately 1500-2000 rpm and hold it there, push either button and listen for the engine to miss as one of the buttons is pushed. If the miss is not present, your kill is not correctly installed. Recheck your connections, making certain all wires are properly connected per the wiring instructions. Reconnect the shift module after verifying the kill module is working properly. Return the dipswitches on the kill module to the position noted before the test was started.

Be certain that all of the round connectors are properly coupled and tight. If the ATV is not shifting or the kill module is not working, check that these plugs are properly seated and that the internal connector pins are making good contact with their sockets (i.e. no pins are bent). Also check that one of the pins has not moved off to the side of their respective sockets when pushing the plug together.

ADJUSTING KILL TIME AND ADJUSTING CYLINDER:
The factory preset kill time may not be correct for every application. Kill adjustment is set by moving the dipswitches on the electronic engine kill module to the desired time on the chart.

If a more aggressive shift is desired, you can go shorter one setting at a time until the shift is missed, then back to the last setting that allowed the ATV to shift. If you desire a more low performance, smoother shift or if the ATV goes into a false neutral or stays in the same gear, you can adjust the kill time by going longer one setting at a time until the desired shift is achieved.

The preset kill time should be acceptable for most trail riding conditions.

For performance riding or racing it may require a shorter kill time setting then the preset time.

WARNING: You may want to take caution shifting at wide open throttle in the first two or three gears so the ATV does not flip over backwards.

If shifting up or down is not achieved, you may need to readjust the up/down positioning of the cylinder and/or readjust the cylinder for no bind as explained earlier in the instructions.

Note: A shift light is available for your ATV, Pingel part #89631 which will help you with performance shifting.

After fine adjustment has been made remove each clamp bolt and apply thread locker to the end threads, but remove only one clamp bolt at a time so as not to lose your adjustment of the shift cylinder location.

Note: in the wire harness we have installed one 40-amp fuse for constant power. A spare 40-amp fuse is also supplied. In the event of an electronic engine kill module failure, a yellow jumper plug has been supplied to put on the lead attached to the module allowing the ATV to start and run.

Prolonged repeated operation of the shifter (actuating the shifter repeatedly in rapid succession beyond normal use) can discharge the ATV battery and damage the shift cylinder and/or the control module and cause missed shifts. The normal battery takes 30-60 minutes to recharge after starting the ATV so use the shifter sparingly in this time.

If using this product in conjunction with nitrous oxide, the nitrous system must be killed with the ignition in order to prevent engine damage.

This unit is not waterproof. Do not subject it to pressure washing or extreme moisture.

Installation of Electric Speed Shifter Kit still maintains OEM Shifting.

If you have any questions please call 608-339-7999

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Items Included: 2007 - 2008 POLARIS OUTLAW 450/525 WITH SOLID REAR AXLE

- 1 - Shift cylinder support bracket with cylinder clamp (threaded)
- 1 - Cylinder clamp (through-holes)
- 1 - Shift cylinder
- 2 - 10mm x 1.25mm x 35mm HHCS
- 2 - 10mm Washers
- 1 - Fused wiring harness
- 1 - 7/8" handlebar dual button control assembly
- 1 - Pingel shift arm bracket
- 2 - 10-24 x 1" BHSCS
- 2 - 10-24 locknuts
- 1 - ¼-20 x 1" BHSCS
- 4 - ¼" washers
- 2 - Ring terminals
- 3 - Blue quick tab connector
- 10 - Wire ties
- 1 - Tube torque-thread locker
- 1 - Spare 40-amp fuse
- 1 - Spare yellow jumper plug
- 1 - Control module
- 1 - Electronic engine kill module
- 1 - Electronic engine kill module wire leads

Thank you for purchasing a Pingel Enterprise, Inc. product.

Dear Valued Customer,

Pingel Enterprise, Inc. would like to take this opportunity to thank you for purchasing one of our Electric Speed Shifter Kits.

We would also like to know what you think of the product and how your installation went. Your assistance can help us overcome any technical issues that other installers may experience. You can reach us toll free at 1-888-474-6435 or email us at info@pingelonline.com.

We are also requesting photos of your installation. Your photos may be selected for publication in the Pingel catalog or at www.pingelonline.com. Photos may be submitted by emailing them to info@pingelonline.com. When submitting a photo, please include the ATV model and year.

LIMITED WARRANTIES/LIABILITIES

Pingel Enterprise, Inc. assume s no responsibilit y or liability for damage or injury of any kind arising out of the use or misus e of any products. Pingel Enterprise, Inc.'s sole responsibilities with respect to products sold are to provide the following limited warranty:

Pingel Products: Pingel Enterprise, Inc. warran ts to the ori ginal purchaser that the product shal l be free from d efects in parts a nd workmanship under normal use f or 30 days fro m date of pu rchase. Pingel Enterprise, Inc's obli gation under this warranty is limited to the repair or rep lacement of an y part found to b e defective when returned postpaid to the fa ctory. The product must be returned with evidence of dat e and place of purchase, and det ailed description of the proble m. The warranty will not appl y if the product has been installed incorrectly, repaired, or damaged by m odification, misuse, negligence o r accident. The r epair or replacement of such part, as needed, is your sole and exclusive remedy. No refunds will be g iven. Pingel Enterprise, Inc. ma kes no other warrant y, expressed or implied with respect to its produ cts and specifi cally disclaims any implied warran ties of merchantability or fitness of any pro duct for a particular purpose and except as herewith stated assumes no liability with respect to the product.

Dispute Resolution: All disputes, claims or controversies of an y kind that ma y arise between you and Pingel Enterprise, Inc. shall be brought in the state court located in Adams County, Wisconsin. You agree that the sole venue and jurisdiction for such disputes shall be the above named court and hereby submit to the jurisdiction of that court.

THANK YOU for purchasing a PINGEL ENTERPRISE, INC., product. View our entire product line at www.pingelonline.com

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