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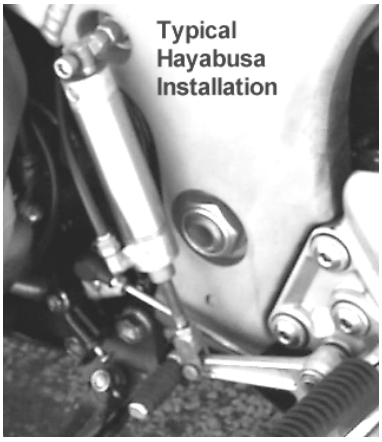
Innovative Racing Electronics

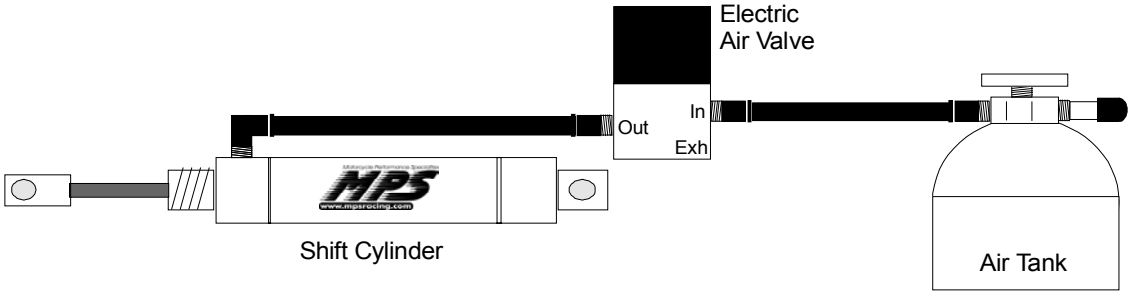
MPS Sport Bike Electric Air Shifter Installation Instructions

The first thing to do is remove the seat, fuel tank, and possibly the front fairing if equipped. You will need plenty of room to work.



Mount the Shift Cylinder – There are so many ways to mount an air shift cylinder we cannot cover them all. Basically you want the cylinder mounted so it will pivot freely at the pivot mount without binding. The shift cylinder clevis should be connected to the shifter itself or a bracket attached to the shifter with the provided pin. The clevis should pivot freely at the shift lever. At rest the shift cylinder should be extended to ½ of its total travel. This allows the shift lever to travel both up and down. The shift cylinder should be as close to 90 degrees with the shift lever as possible. The shift cylinder clevis should be attached 2 to 3 inches from the pivot point of the shift lever. Make sure the shift cylinder is in the same vertical plane as the shift lever. The photo should give you a pretty good idea of how things need to be. Remember nothing should bind and the shifter should go through its normal travel just like without the shift cylinder connected. There are some model specific bracket kits available. Check out our web site for available models.

Mount Air Bottle, Electronic Kill & Electric Air Valve – Every brand and model bike is different, so you will need to fabricate your own bottle mounting. Make sure they are fastened securely. The Electronic Engine Kill & Electric Air Valve can be mounted anywhere using zip ties, double sided tape, or Velcro strips. Generally the best spot for both components is in the tail section. We offer a remote air gauge mount kit to mount the gauge away from the tank if desired.



Plumbing – Cut one end of the provided ¼" O.D. poly line square with a razor blade. Push the line as far into the fitting as it will go. Pull out to lock the line in place. To remove the line from the fitting, push down on the retaining ring on the fitting and the line. While holding down the retaining ring pull the line out of the fitting. The first line is the supply line and has pressure equal to that of the air tank at all times. It runs from the air tank outlet to the "in" port of the electric air valve. The "exhaust" port on the electric air valve must remain free. The second line is the work line and only has pressure during the shift when the air valve is open. It runs from the electric air valve "out" port to the shift cylinder. To determine which air cylinder port to use shift the non-running bike from 1st to 2nd gear noting which direction the shift cylinder moved. If it pulled, put the fitting in the port nearest the cylinder clevis. If it pushed, put the fitting in the port closest to the pivot mount. Make sure nothing is in the port that is not used. It must remain free and unobstructed. Careful to route the air lines away from high temperatures. Avoid sharp bends to prevent kinks and pinches in the air lines.

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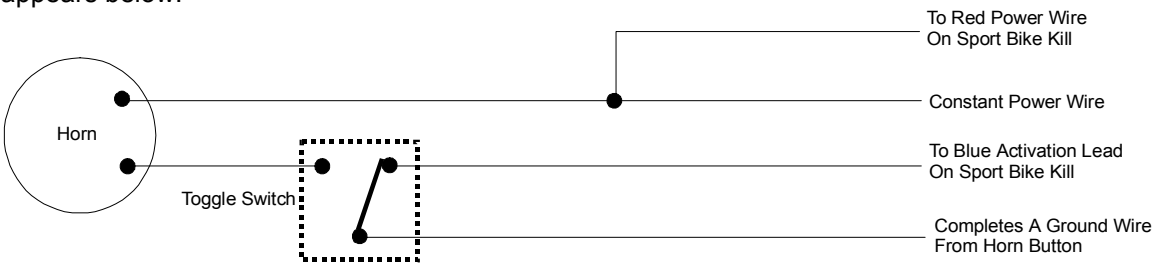
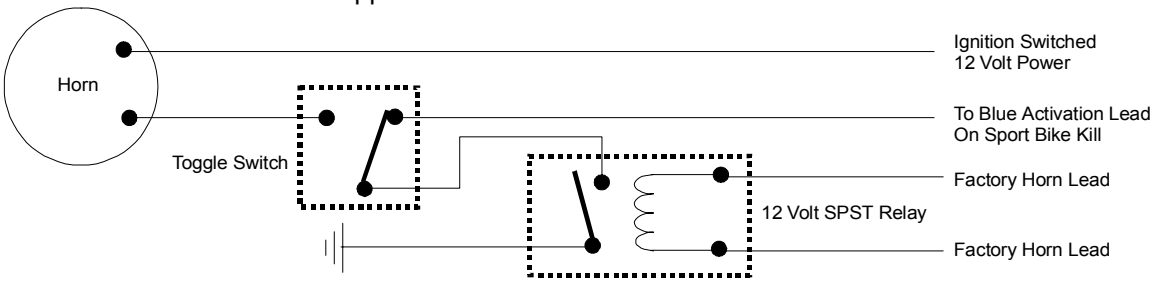
Electrical Connections – You will need to locate and test a few things on your bike before you start wiring. A good ground, a ignition switched 12 volt power source, the horns, and the ignition coils. We have plug n play style harnesses available for some bikes. Check the web site for specific models.

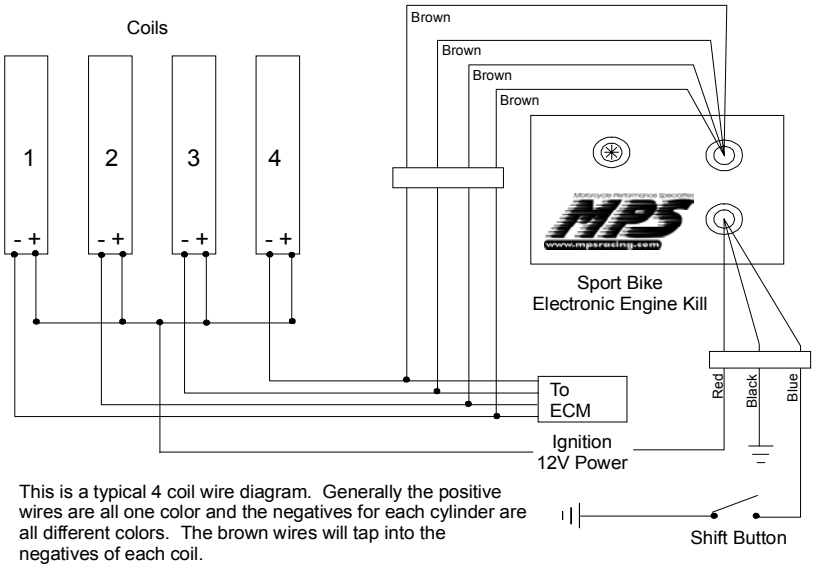
Horn Test - Unplug both your horn leads from the horn(s). Turn the key on. Using a test light, check each horn wire for power. If one of the wires has continuous power the horn button circuit completes a ground circuit to operate. This is the typical Kawasaki and Suzuki horn system. A wiring diagram showing how to wire a switch to select the shifter or the horn appears below.



If no wires have continuous power, check them each with the horn button depressed. One of the two should have power with the horn button depressed. This system completes a power circuit to operate. This is the typical Honda and Yamaha horn system. This system requires a SPST relay to be added to the system. A wiring diagram showing how to wire a switch to select the shifter or the horn appears below.



If you would like to skip all the horn/relay stuff we have a nice kit to eliminate all the work of wiring the relays. It works with either system and is a snap to wire. (P/N 1-0317 Air Shifter To Horn Control Harness)



This is a typical 4 coil wire diagram. Generally the positive wires are all one color and the negatives for each cylinder are all different colors. The brown wires will tap into the negatives of each coil.

Control Box Wiring Coils –Most four cylinder motorcycles use either a individual firing system or a waste spark system. Waste spark is by far the most common. All four cylinder bikes with only two coils use a waste spark system. Most late model four cylinder sport bikes use waste spark systems even though they have four individual coils. Some of the newest fuel

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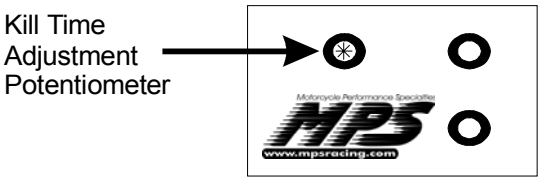
injected bikes (Hayabusa, GSXR1000, ZX12) that have cam sync sensors are individual firing. The Sport Bike Engine Kill has four brown wire leads that are connected to the negative of each individual coil on a four coil system. On a two coil system you will use only two brown wires. Some two coil systems will not have enough kill time. If you experience a kill time that is to short you can ground the remaining two brown wires. This will increase the kill time. You can either solder the brown wires to the coil leads (recommended) or use the provided scotchlok splices. Race bikes with Dyna Pro 4000 Ignitions can use one brown wire connected to the orange kill wire with the other three brown leads grounded. MSD Ignitions with a brown kill wire can use one brown lead connected to it with the other three brown leads grounded.

Power, Ground, and Activation Lead – The red wire is connected to a ignition switched 12 volt power source. Do not attach direct to battery! The black wire is connected to a good ground. Preferably, the battery negative post. The blue wire is the activation lead. When a ground is applied to this wire the unit kills the motor for the specified time period. The horn wiring diagrams will show you how to wire it.

Electric Air Valve – The Electric Air Valve has two wires. These wires are interchangeable. One needs an ignition switched 12 volt power source. The other needs a ground signal when the shift button is depressed. The easiest way to do this is to locate the red and blue wires in the Sport Bike Engine Kill wire harness. Splice one Electric Air Valve wire into the red wire and splice the other Electric Air Valve wire into the blue. Once again soldering is the preferred method but you can use schotchlok splices.

Setting Kill Time – Kill time is the amount of time the engine stays dead between gears during a shift. Generally the shorter the kill time the quicker the shift. The proper kill time will vary from bike to bike. Its generally better to start with to much kill time and work your way quicker. We generally start at around 75 ms. of kill time. The Kill Time is adjusted via a small potentiometer accessed through the grommet on the front of the unit. Using a small screwdriver Carefully turn the pot clockwise to the end of its travel. This is 100 ms of kill time. Now, carefully turn the pot screw counterclockwise to the end of its travel. This is 50 ms of kill time. Halfway in between is 75 ms. The pot only goes from 7 oclock to 5 oclock so don't force it, they break easily!



Testing The System – With no air in the system start the bike. Bring the rpm up to around 3000 rpm and push the shift button. You should hear a slight hesitation in the engine each time you depress the shift button. If you don't hear a hesitation and the horn sounds the arm switch is in the horn position. If you just hear no hesitation the brown wires are probably not hooked up correctly. Once you establish that you have a engine kill when pushing the shift button remove the clevis pin from the shift cylinder and extend the shaft to the end of its travel. Air up the shifter to 120 psi. We also have onboard compressor kits available to conveniently fill the air tank on the fly or high pressure CO2 systems that can shift hundreds of times without refilling. With the engine off and the key on push the shift button. The shift cylinder shaft should snap into position. With these preliminary tests done you can put the bike back together and go for a ride! Shift it at lower rpms first to make sure it is in fact operating properly. If you have any more questions we have a Frequently Asked Questions page at our web site as well as the telephone tech support. Thank you for your purchase of this MPS product. All products sold by MPS are for use at closed course competition events and not for use on public streets or highways.

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