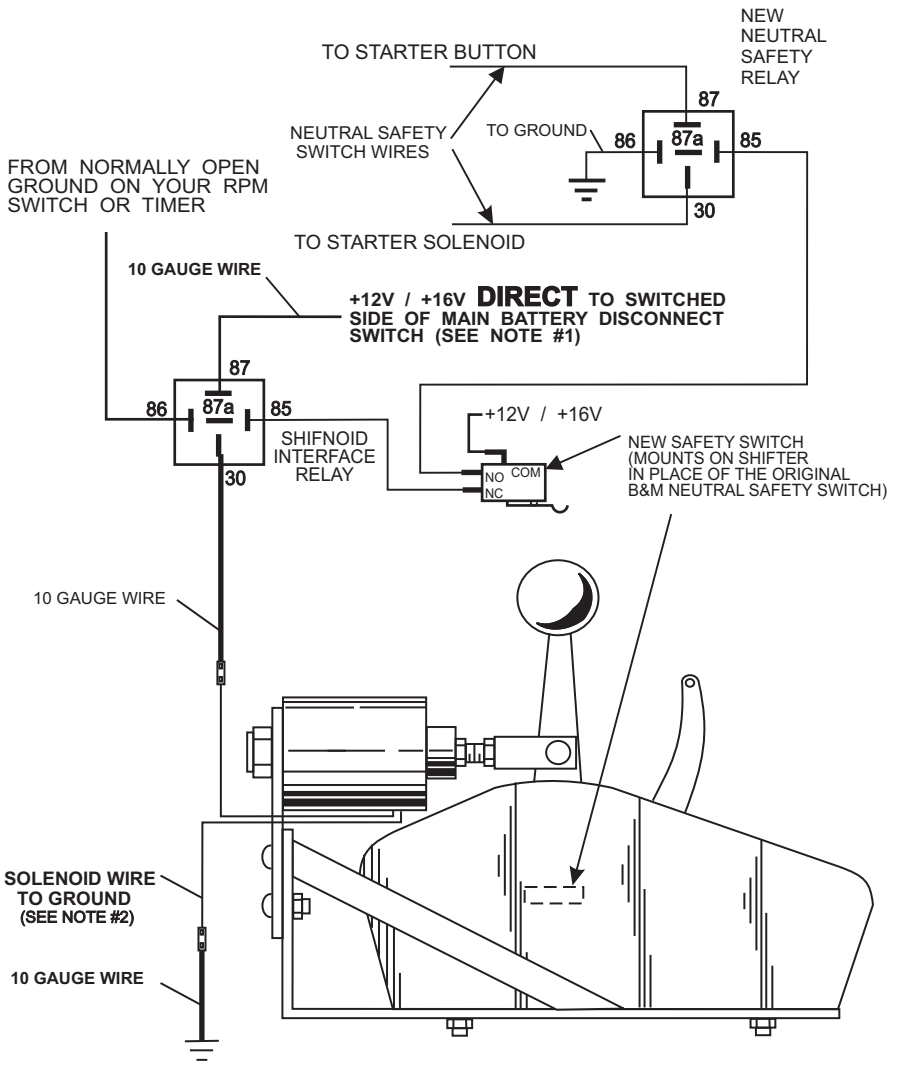
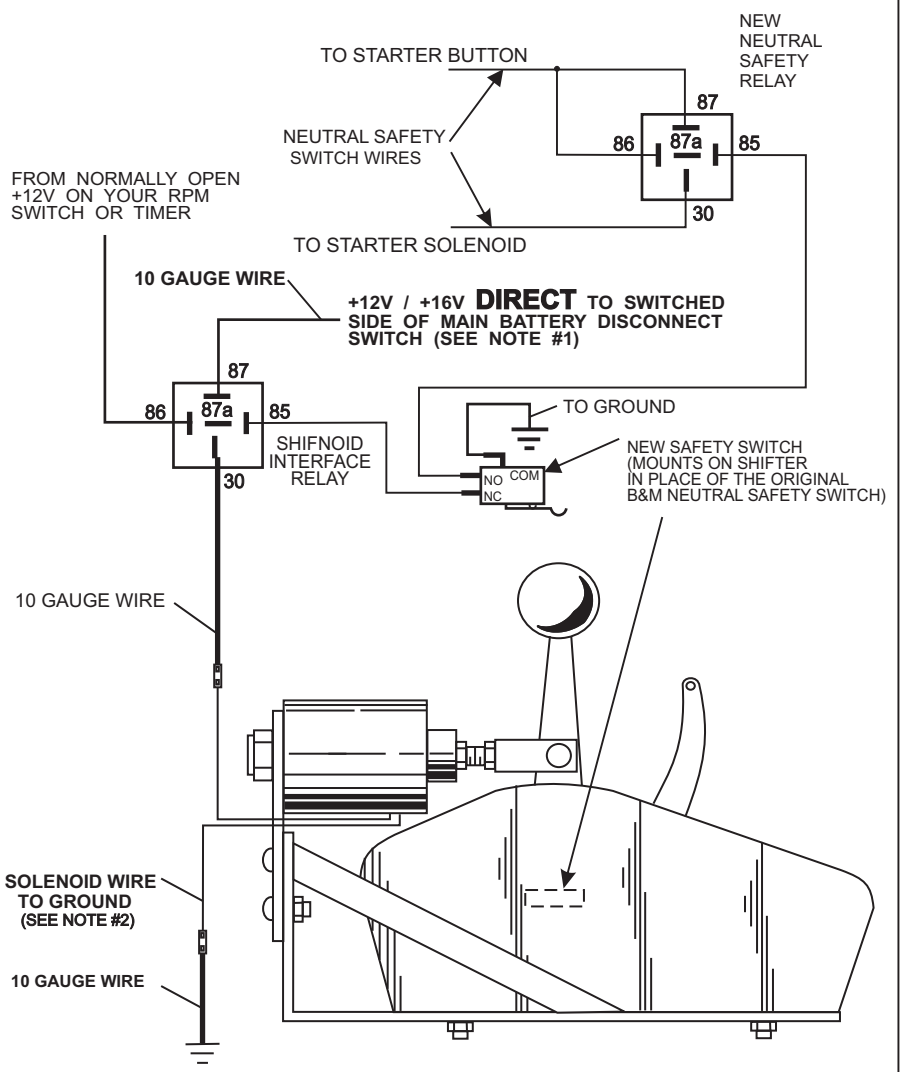
SHIFNOID WIRING DIAGRAM

FOR a B&M PRO RATCHET REVERSE PATTERN with SN5072 SOLENOID KIT

IF YOUR RPM SWITCH OR TIMER SUPPLIES "NORMALLY OPEN GROUND" (SHIFNOID OR MSD) USE THIS DIAGRAM



IF YOUR RPM SWITCH OR TIMER SUPPLIES "NORMALLY OPEN +12V" (DEDENBEAR OR DIGITAL DELAY) USE THIS DIAGRAM



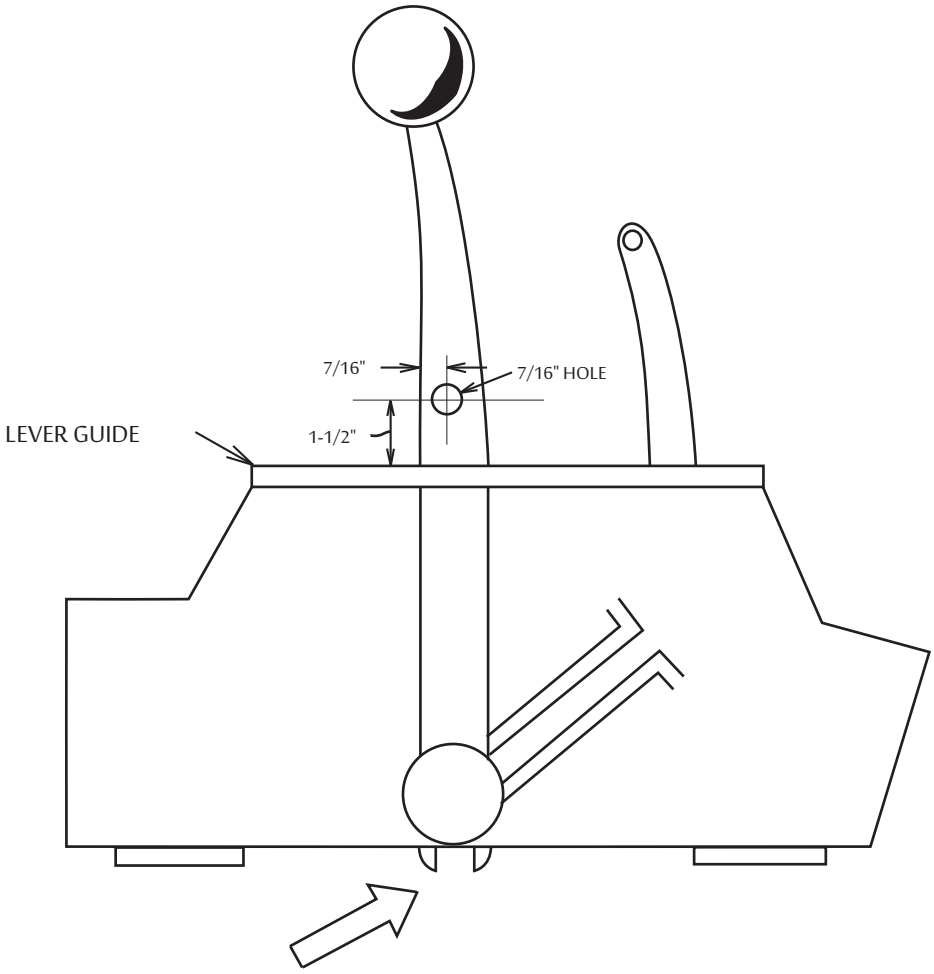
WARNING **DO NOT CONNECT THE SOLENOID DIRECTLY TO A RPM SWITCH. YOU MUST USE THE INCLUDED RELAYS AND SAFETY SWITCH. FAILURE TO FOLLOW THE WIRING DIAGRAM PROPERLY CAN RESULT IN THE SHIFTER SHIFTING INTO GEAR FROM PARK OR NEUTRAL IF YOU REV YOUR ENGINE TO THE POINT THAT YOUR RPM SWITCH ACTIVATES THE SHIFTER.**

MODIFYING YOUR "B&M" 80842 PRO RATCHET SHIFTER

TO INSTALL SHIFNOID SN5072 SHIFT KIT

Drill a 7/16" hole, 7/16" from the back edge of the shifter lever, 1/1/2" above the lever guide as shown. This hole is oversize to allow for an arc accommodation. The correct placement of this hole is critical to the operation of the solenoid. Please be precise. Dimensions shown are with cover removed. It is recommended you center punch the correct spot and start with a small drill bit and work up to the final size.

Depending on the date of manufacture of your shifter, this step may not be necessary. The handle of the shifter extends below the base of the shifter housing. It is common to have the chrome handle rub against the SHIFNOID base plate. This is only noticeable when you shift the shifter lever toward the front or rear. Before installing the shifter, please check for this condition. If it exists, sand or grind a small amount off of the shifter lever so that it clears the SHIFNOID base plate when the shifter is in **ALL** positions.



INSTALLATION INSTRUCTIONS
"SHIFNOID" PART #SN5072

REVERSE PATTERN 3 SPEED KIT FOR B & M PRO RATCHET® SHIFTER

MODIFYING YOUR "B&M SHIFTER

Before installing this unit on your "B&M Pro Ratchet", the shifter has to be modified according to the Modifying Diagram provided. This consists of drilling a 7/16" hole in the shifter lever 1 1/2" above the lever guide and 7/16" from the back edge of the lever, and possibly sanding the shifter handle base for clearance. (See diagram)

MOUNTING THE UNIT

The SHIFNOID mounting bracket is designed for the "B & M Pro Ratchet" # 80842, three speed shifter only. The holes in the base of the bracket align with the holes in the base of the shifter. Mount the main bracket between the shifter and floor or mounting surface, with the bolts supplied with your shifter. Stop at this point to wire the switches that go under the aluminum cover. Please read "WIRING THE UNIT" before installing the aluminum cover. After wiring, install the shifter cover supplied with your shifter. Mount the SHIFNOID solenoid and bracket it came attached to, to the main bracket with the bolts provided, through the two holes provided in each bracket. Slip the plunger inside the solenoid and temporarily install the clevis on the handle of the shifter. Align the solenoid by adjusting the position of the two main brackets in relationship to one another and tighten nuts. The solenoid must be aligned so that there is no binding when the shifter is moved through its complete cycle. This alignment is important for the smooth operation of this kit. **To adjust the length of the plunger and clevis assembly, the object is to adjust the assembly to it's longest possible length, while still allowing the shifter to travel far enough to complete each shift. If the hole placement in the handle is accurate, the plunger and clevis assembly will have an overall length of 5.25". The goal is for the plunger to bottom out inside the solenoid when the shifter handle is pulled back all the way. Verify that the handle will travel all the way back to confirm you are fully completing the shift. If the hole placement in the handle is misplaced, the plunger and clevis assembly length can be adjusted as needed.**

WIRING THE UNIT

Follow the wiring diagram supplied. If your RPM switch or Timer supplies Normally Open Ground" connect the trigger wire from your device to post 86 on the SHIFNOID interface relay. **Supply post 87 with 12V+, through a 10 gauge wire coming directly from the switched side of your master battery disconnect switch.** Connect post 85 to the N.C. terminal on the new safety switch. Connect post 30 to the solenoid through a 10 gauge wire.

If your RPM switch or Timer supplies a "Normally Open 12 V+" connect the trigger wire from your device to post 86 on the SHIFNOID interface relay. **Supply post 87 with 12V+, through a 10 gauge wire coming directly from the switched side of your master battery disconnect switch.** Connect post 85 to the N.C. terminal on the new safety switch. Connect post 30 to the solenoid through a 10 gauge wire

There is a new safety switch supplied with this unit. Install this switch in place of the original B & M Neutral safety switch. This switch **MUST** be used so the shifter cannot be electrically activated while in Park or Neutral. This switch must be correctly adjusted before you install your aluminum cover. This switch must make and brake contact as the shifter moves between Park and Neutral and any Forward or Reverse gear. Do NOT over tighten this switch. If you already had the B&M shifter installed in your car, you had two wires going to the original neutral safety switch. Remove these wires from that switch and move them to the new “neutral safety relay”, post 87 and 30, as shown. If you are installing the shifter and shift kit for the first time, you will create a neutral safety circuit by interrupting the wire that runs between your starter button and your starter solenoid. The new neutral safety relay is placed in that line, one wire going to post 87, the other to post 30, as shown

DO NOT CONNECT THE SOLENOID DIRECTLY TO AN RPM SWITCH. ALWAYS USE THE SAFETY SWITCH AND THE INTERFACE RELAY. AN UNINTENTIONAL SHIFT COULD INJURE SOMEONE AND THE RPM SWITCH MAY BE DAMAGED.

****Note #1: This wire must go direct to the switch side of the main battery disconnect switch. Do NOT connect to the main power line feeding the balance of the car. Connecting to the main power line feeding the balance of the car can cause a destructive voltage drop when the other components are drawing current, resulting in a weak and damaged solenoid.**

****Note #2: The quality of the ground is critical. Verify the ground wire is grounded well to the car. If extending the wire, use 10 gauge wire. A “weak” ground will result in a weak and damaged solenoid.**

WARNING

Be Prepared! If you are using an RPM switch or Timer, you must be aware that at any time RFI (Radio Frequency Interference) could stop your RPM switch or Timer from activating. This in turn could cause your automatic shifter to not activate and you will need to shift manually. Always pay attention to your car and be prepared to manually shift or lift off of the accelerator to prevent the over revving of your engine. One of the best ways to protect your engine under these conditions is to also install some type of over rev control so that the engine cannot reach an RPM beyond it’s safe limits. Please read the enclosed information on RFI included with this kit.

QUESTIONS?

If you have questions or concerns on the installation or use of this product, do NOT contact the retailer where you purchased the kit. Most retailers are not equipped to help you with in depth tech questions.

SHIFNOID LTD. has arranged for all tech and warranty to be handled by it’s distributor:
CONTENDER PERFORMANCE PRODUCTS INC. Phone: 740-927-0060
www.contenderperformance.com

TROUBLESHOOTING AND TECHNICAL SUPPORT
SHIFNOID ® SN5072 ELECTRIC SHIFT KIT

IMPORTANT INFORMATION: The most common reason for a solenoid to fail, weaken, or burn up is the inability to draw the required amperage. This is caused by incorrect wire size, insufficient power source, or poor grounding. Leaving the solenoid on for an excessive amount of time will also cause failure. Also note that as voltage goes up, so does the amperage the solenoid requires. This is especially important to cars with alternators and / or 16 volt electrical systems.

PROBLEM: SOLENOID WILL NOT ACTIVATE

SOLUTION: To test the system, turn all power on. There is no need to run the engine. Place the shifter in 1st gear. Locate Post 86 on the INTERFACE relay.

IF YOUR RPM SWITCH SUPPLIES NORMALLY OPEN GROUND - Carefully and momentarily, touch a wire from a good chassis GROUND to Post 86. This should activate the solenoid and the shifter should pull into 2nd gear. The solenoid should activate anytime you GROUND Post 86 on the INTERFACE relay IF the shifter is in gear.

IF YOUR RPM SWITCH SUPPLIES NORMALLY OPEN POWER (12 volts) - Carefully and momentarily touch a wire from 12 volts to Post 86. This should activate the solenoid and the shifter should pull into 2nd gear. The solenoid should activate anytime you POWER Post 86 on the INTERFACE relay IF the shifter is in gear. If this test is OK, the SHIFNOID system is functioning properly and you will need to look at the activating system. (RPM Switch, timer, or push button).

If the solenoid tries to pull, but cannot pull all the way into 2nd gear, see next Problem.

If the solenoid still does not activate at all and you have a RPM Switch that supplies NORMALLY OPEN GROUND your next step is to check for power at Post 86 on the INTERFACE relay. The shifter must be in 1st, 2nd, or 3rd gear for this test. If power is not at Post 85 when the shifter is in gear, the 3-prong safety switch needs adjusted or the power to the common on the 3-prong safety switch is not there. (Anytime the shifter is in Park or Neutral, Post 85 on the interface relay should be dead, no voltage. Anytime the shifter is in gear, Post 85 should be hot).

If you have a RPM switch that supplies NORMALLY OPEN POWER your next step is to check for ground at Post 85 on the INTERFACE relay. The shifter must be in 1st, 2nd, or 3rd gear for this test. If a ground is not at Post 85 when the shifter is in gear, the 3-prong safety switch needs adjusted or the ground to the common on the 3-prong safety switch is not there. (Anytime the shifter in on Park or Neutral, Post 85 on the interface relay should be dead (not grounded). Anytime the shifter is in gear, Post 85 should be grounded).

PROBLEM: THERE ISN'T ENOUGH POWER TO PULL THE SHIFTER HANDLE ALL THE WAY BACK

SOLUTION: To determine why the solenoid can't pull the shifter handle fully into the next gear, you must first determine if the solenoid cannot pull the handle or if the load on the solenoid is too great. Without proper testing equipment, the only way to determine this is by process of elimination. Many times, there are multiple problems that total up to an inoperable system. You must verify and fix them all to correct this condition. Rarely, is this problem caused by only one thing. Please follow all steps listed below.

STEP ONE: To confirm that the solenoid has all it's power, verify that the wire connected to post 87 on the interface relay is 10 gauge or larger, and runs directly to a suitable power source, (i.e. master battery disconnect switch). This power source must be sufficient to supply a 60 + amp draw. (Depending on voltage). Do not connect this wire to any terminal or point that supplies other electrical devices. Confirm that the wire from Post 30 on the interface relay to the solenoid is 12 gauge at 12 volt or 10 gauge at 16 volt.

STEP TWO: Verify your solenoid ground wire is connected to a SUFFICIENT ground. Often paint, powder coat or poor connections such as being grounded to a bolted or pinned in shifter pedestal can create a weak ground that will cause a solenoid to be weak and have a very short life.

STEP THREE: Alignment of the Plunger and Clevis Assembly

The plunger (the gold barrel shaped piece), must slide in and out of the solenoid smoothly; regardless of the shifter handle position. Any binding between the plunger and the solenoid will cause excessive drag. To correct this problem, loosen the 2 5/8" bracket bolts that hold the solenoid bracket to the main bracket. Then, align the solenoid and retighten the bolts. A common problem of plunger binding is drilling the hole in the shifter handle in the wrong place or too small. It should be a full 7/16" to allow for arc accommodation.

STEP FIVE: The Length of the Plunger and Clevis Assembly

To achieve maximum power, the object is to adjust the plunger and clevis assembly to its longest possible length, yet still allow the shifter to travel far enough to complete each shift. The plunger should bottom out inside the solenoid when the shifter handle is pulled back. When doing this adjustment, verify that the shifter handle is all the way back. If the handle is not all the way back when the plunger bottoms out, you will not complete the shift. This could cause possible transmission damage.

The preceding five steps will verify that the SHIFNOID system is up to full power.

Next, you must check for an excessive load beyond what the SHIFNOID is capable of activating. If the SHIFNOID system is producing full power and the handle still will not move correctly, follow the steps listed below.

STEP ONE: Verify that the bottom of the B & M shifter handle is not hitting the SHIFNOID bracket when the shifter handle is being moved forward or back. Some B & M Pro Ratchet shifters must have the bottom of the shifter handle shortened to avoid this. See “Modifying your B & M Shifter” in your instructions.

STEP TWO: The B & M Pro Ratchet shifter cable routing is critical. The Pro Ratchet is prone to a cable bind directly in front of the shifter, where the cable typically goes through the floor. There must be no bend or pressure on the first or last several inches of the cable. See “B & M Instructions” for cable mount attachment warning. Cable routing must include large gradual bends. Any tight bends or kinks will create a load greater that the SHIFNOID can pull.

STEP THREE: Transmission Detent Spring
Many transmission builders install aggressive detent springs. Alone, this is rarely a problem, but it can aggravate other problems. If all other methods have been exhausted, it is possible that you may have to compensate for this. Unless you are an experienced transmission mechanic, we do not suggest that you alter the detent spring. Instead, we suggest an external “helper spring”. A simple “hardware store” spring attached to the shift arm of the transmission, pulling toward third gear, will solve the problem. This spring must stretch all the way to park, yet still be pulling on the shift arm from 1st to 2nd and 2nd to 3rd, helping the transmission in the critical areas. This step is rarely required, but handy when all other solutions have been exhausted. IT IS commonly used in unique applications, such as excessively long shifter cables.

PROBLEM: THE SOLENOID WILL ONLY SHIFT FROM 1ST TO 2ND

SOLUTION: The solenoid is a simple electrical appliance. It can only be turned on and off if is is activated or deactivated. It cannot stay on or turn off without your RPM switch or timer activating it. There are two possible reasons for this problem.

STEP ONE: The most common scenario is a car who’s RPMs do not drop sufficiently between shift points. Most RPM switches require a drop of 400 to 500 rpms to turn off. Example: this means that if you shift at 6000 rpms, and because of clutch wear, tire spin, or your converter not locked up, the drive train (everything from the flex plate back), cannot drag the engine down because of slippage. The rpms do not drop below 5500 and your RPM switch, in effect, tells the solenoid to stay on. This will result in the solenoid pulling the shifter handle from 1st to 2nd and locking back. Shifting before your converter is locked up is the most common problem. Converter stall speed is rarely where advertised. The following simple test may confirm this. Raise your shift point as high as you safely can. If this solves the problem, consider tightening the converter. If the problem persists, raising your shift point may cause transmission clutch slippage to worsen, if they are worn, and may even increase the problem. Some types of racing, such as mud, dirt or sand drags, result in tire spin that cannot be eliminated. When this is the case, special electronic controllers are available to solve the problem. Please ask your SHIFNOID dealer for assistance.

STEP TWO: Another common problem is the electrical solenoid shifting from 1st to 2nd, the engine dropping the required rpms to turn the solenoid off, and the rpms returning to the shift point so fast that, although the solenoid technically was turned off, there was insufficient time for the shifter to re-cock itself for the next gear. The solution to this problem is the same as Step One.

PROBLEM: THE SOLENOID SHIFTS FROM 1ST DIRECTLY INTO 3RD

SOLUTION: First, verify that this is not a shifter problem. (Cable adjustment or improper shifter for the job). If the shifter is correct and the solenoid is shifting from 1st to 3rd, it is only doing it because it is told to. This would result from drive train slippage (see above), that allows the engine rpms to tell the RPM switch to turn on-off and on-off so fast, that you perceive it as a shift from 1st directly to 3rd. Solutions to this problem are the same as above. See Step #2.

FOR ADDITIONAL TECHNICAL SUPPORT CONTACT SHIFNOID’S DISTRIBUTOR:
Contender Performance Products, Inc. PH: 740-927-0060

SUPPLEMENT FOR SHIFNOID SN5070, SN5072, SA4070 & SA4075 3 SPEED ELECTRIC AND CO2 SHIFTER ACTIVATORS

It has come to our attention that some older B&M Pro Ratchet models have different dimensions in the 4 base mounting holes on the shifter, than the current models. In this case, two of the holes in the Shifnoid base bracket needing to be redrilled.

Since proper alignment is critical, if the 4 holes in the bracket do not appear to line up, stop installation and call Shifnoid’s distributor and Tech department at:

740-281-0136

7 AM – 7 PM Eastern time.