

# Installation Instructions

SMARTBOX™ BRAKING CONTROL



**STAY-IN-PLAY**  
**DUO**

SMI Manufacturing, Inc.  
7457 W. State Route 66  
Newburgh, IN 47630  
800-893-3763  
[www.smibrake.com](http://www.smibrake.com)

Model: SI0807  
Rev: 0512

# SMI Stay-IN-Play Duo Supplemental Braking System

Thank you for purchasing Stay-IN-Play Duo: the most advanced inertia-based braking system. When installed correctly, this system will provide years of maintenance-free service. These installation instructions are designed to guide you through the installation of your new braking system. Although the installation is not difficult, it is imperative that these instructions be read in their entirety before any part of the installation is attempted. This will allow for a proper understanding of the system as a whole, and will consequentially result in a much neater, professional installation. These instructions are a compilation of feedback from our technicians, certified installers, and individual customers and we believe them to be complete and thorough. However, if, for any reason, clarification is needed; feel to contact us at 800-893-3763.

**SMARTBOX™ BRAKING CONTROL**



***Vacuum-Assisted Braking***

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# Inventory of Parts

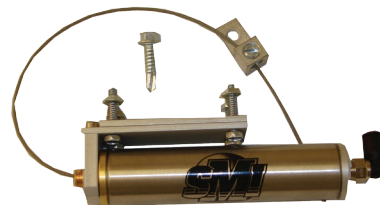
## Towed Vehicle Installation Bag

- 1 Length of white wire
- 1 Bag of wire ties
- 1 Coiled Breakaway Cable
- 1 Breakaway switch with Plug
- 1 Breakaway hardware bag
  - 1 1/4"-20 locking nut
  - 1 1/4"-20 bolt
  - 1 Flat washer
- 1 Small parts bag
  - 1 Fuse holder
  - 1 Barbed vacuum tee (nylon)
  - 2 Barb vacuum adapters (nylon)
  - 1 Check valve (green/black)
  - 2 Hose clamps
  - 1 20 amp fuse
  - 5 Scotchlock tap-in connectors
  - 5 Butt connectors
  - 2 1/4" ring terminal
  - 1 Three-way connector



## Cylinder Bag

- 1 SMI Air Cylinder
- 1 Floor anchor for cable
- 1 Self-drilling screw



## 10' – 1/4" DOT Air Line



## G-Force Controller Bag

- 1 G-Force Controller II
- 2 #8 x 1/2" Sheet metal screw



### Coach Notification Bag:

- 1 Monitor Light
- 3 Blue Butt Connectors
- 1 Two-Lead 48" Loop
- 1 1/4" Ring Terminal
- 2 Wire Ties
- 5 Feet of Wire
- 1 Flip-Over T-Tap Connector
- 1 Length of Flex Wrap



### Operating Unit



# Things to Know Before You Get Started

- 1) Keep the notification light in your line of sight. If it illuminates when not needed, or fails to extinguish when appropriate, stop immediately. It indicates that the towed vehicle's brakes are engaged, which could cause serious damage! *Note: As an option a wire may be run to the front of the coach for a monitor light. The wire may even be connected to an extra terminal in the tow wiring plug to avoid an extra connection between the vehicles. Any 12v light can be used.*
- 2) Stay-IN-Play Duo is designed to provide progressive braking effort based on the brake lights of the coach AND inertia (stopping G-force). **Duo should not activate while the coach is not moving.** If you find that DUO does active while stationary, adjust the G-Force Controller II accordingly.
- 3) The SMI Stay-IN-Play Duo's brake actuator uses an internal spring to retract the brake pedal, thereby assuring there is no drag on the towed vehicle's brakes. Before towing, check the operation of the air cylinder with the breakaway and observe the operation of the brake pedal. Verify total release of the towed vehicle's brakes before towing.
- 4) The wiring installation utilizes the brake lights of the RV to activate the SMI system in combination with "G-force." If the coach is equipped with an exhaust brake that illuminates the brake lights of the coach, extra attention must be given to the activation light. On steep grades all G-force sensors will sense inertia faster and more quickly due to the angle of the grade. You may need to adjust it slightly closer to the "less sensitive" (upper) position. This has very little effect in the activation of the SMI on level terrain because of the difference in g-force with two wheels braking (as in an exhaust brake) and with four (or more) wheels braking when the service brakes are applied. The G-Force Sensor will likely not need to be re-adjusted.





# Towed-Vehicle Installation

## Step 1: Check the Towed Vehicle's Wiring

Note: Improper tow wiring will result in problems with the Stay-IN-Play Duo Operating Unit.

1. Place the car in tow position behind the motor home.
2. Connect the tow-wiring umbilical cord to the towed vehicle. Do NOT connect the tow bar.
3. Test the running lights, turn signal lights, and the brakes lights on the towed vehicle. (Now is the time to repair any inoperable signals.) If the lights appear dim the cause is likely a poor ground in the coach or towed vehicle.
4. While someone is holding the brake pedal down in the motor home, use a test light to determine the color of the brake-light wire (there may be one [normally red] or two [normally yellow and green] brake light wires) in the wiring harness from the coach under the hood of the towed vehicle.

## Step 2: Mount the Operating Unit

1. Select a suitable location for the operating unit in the engine compartment. It must be away from any extreme heat source and the connections must be easily accessible. The unit can often be installed behind the grill provided it doesn't restrict air flow to the radiator. Moisture will not harm the unit, but it should not be in the direct path of rainwater or road spray.
2. Secure the box with either screws or wire ties through the mounting flanges on the box.



## Step 3: Mount the G-Force Controller II

1. Find an appropriate location to mount the G-Force Controller within the passenger compartment of the vehicle. Bear in mind, the G-Force Controller is not weather proof, and it **MUST** be mounted in a specific orientation. The SMI logo **must face towards the passenger side of the vehicle**, and the toggle switch must face toward the rear of the vehicle. The tow-kick



2. panel and the B-pillar (beside the driver's seat) are acceptable locations provided there is ample room.
3. Use the provided screws to secure the box in this location making sure that the area behind is clear

### **Step 4: Install the Monitor Light**

Note: If the vehicle has a "dead" brake-light switch (the brake lights are inoperable with the key in the tow position), contact the Help Line for special instruction.

*The following instructions are written with a labor-saving installation method of the monitor light. At the customer's preference the monitor light may be installed on the dash of the coach. Contact the Help Line for specifics.*

*\*All parts needed for this step are located in the "Coach Notification Bag"*

1. Locate the cold side of the brake-light switch (BLS). This is the wire that is normally cold, but has 12 volts (+) when the brake pedal is depressed.
2. Connect the spade to the length of wire and then place the spade into the flip-over connector
3. Clip the flip-over connector onto the cold side of the brake-light switch wire.
4. Cut the two-lead loop approximately in the middle. Locate the end that has the Brown wire shielded (female). This end will be positioned in an accessible location under the dash (tilt lever, etc.).
5. Attach the Brown wire to the wire from the BLS. Connect the Red wire to a frame ground. Note: Be sure to select the side of the jumper that has the Brown wire in the protected-female plug. This will prevent shorting against the frame during normal driving.
6. On the other side of the jumper, attach the Brown wire on the plug to the Black wire on the light. Attach the Red wire on the plug to the Red wire on the light.
7. Secure the light using the provided Velcro to the rear view mirror of the towed vehicle aimed towards the backup camera of the towed vehicle.



*\* The on/off toggle switch will enable/disable the light. The light may be permanently routed (behind a-pillar) or temporarily mounted and removed after towing (use provided flex wrap to conceal wires). In either case, careful attention must be given to disabling the light before driving the towed vehicle on public streets.*

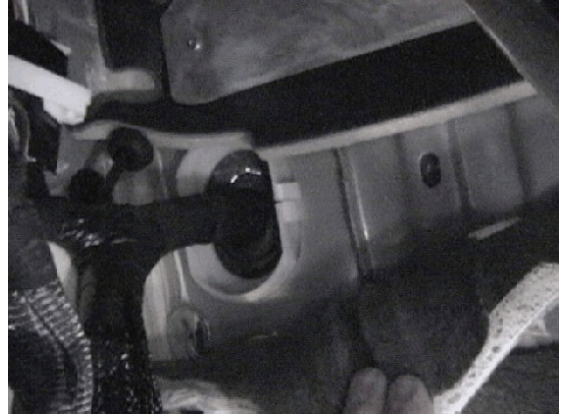


## Step 5: Go Through the Firewall

### Concerns:

- Exercise extreme care if you make an additional hole in the firewall.
- Stay clear of any existing wiring, heat source, sharp edges, etc.
- Any openings made in the firewall must be plugged with an appropriate sealant to ensure that no fuel or exhaust fumes can enter the passenger area of the towed vehicle.

1. Locate an existing access of sufficient size through the firewall to accommodate the G-Force Controller wire and the air hose. Almost all towed vehicles will have such an access available, but, if not, you may need to drill a hole. In many cases, if an existing grommet hole is not available, a small opening may be made in the car's main wire harness grommet. Be sure to stay clear of the car's wiring.
2. Pass a straightened coat hanger into the passenger's compartment from the engine side. In the passenger's compartment, insert the coat hanger two to three inches into the air line and wrap it, along with the G-Force Controller wiring, with electrical tape so that the assembly is as streamlined as possible. Apply spray silicone or dish soap and gently pull it into the engine compartment through the opening.
3. Pull out excess slack.
4. Route the airline to the Operating Unit and connected it to the air bulkhead.
  - A. Cut the air hose using an appropriate hose cutter. Make sure the cut is straight. Air leaks can exist if the air hose is not cut straightly.
  - B. Push the air hose in all the way. These fittings are tight, and the hose will snap into place with two "clicks."



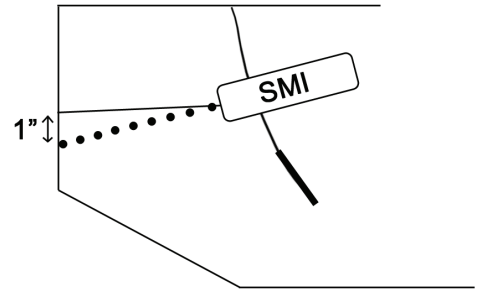
Note: Should you find it necessary to remove an air hose, push the air hose in with one hand, push on the outside ring of the pushlock connector with the other hand, and then pull the air hose out. The ring will release the air hose.

## Step 6: Mount the Cylinder

- *Special attention must be given to vehicles with moveable pedals. Check for proper clearance in all positions. When adjusting the cable, be sure that the pedals are positioned closest to the driver's seat. This will allow normal operation of the adjustable pedals. Be sure to return the pedals closest to the driver's seat when preparing to tow, or the braking system will not function properly. As an option, the pedals may be moved to*

- *the desired position and disabled. Do not depend on the fact that “no one moves them.”*

1. Find a location on the brake arm that will position the cylinder as low as possible but as high as necessary not to interfere with normal driving. The higher the cylinder is mounted, the less effective it is. *Note: Some vehicles are equipped with a “hush panel” under the dash which may need to be removed or modified.*



*The cylinder should be about 1-2” above the driver’s foot location while operating the vehicle. Remember, during normal operation the brake pedal is depressed with the ball of the foot.*



2. Hold the cylinder in place and mark the firewall location. The cylinder should be mounted so that when the brake pedal is depressed about two inches the cylinder is perpendicular to the firewall. This equates to about 1” above straight-in line. Cut away any sound deadening material before attempting to mount the clamp.
3. Use the provided self-drilling screw to mount the clamp to the firewall. Visually verify from the engine side that the chosen location is acceptable for the self-drilling screw. Often a small pilot hole is helpful in verifying the location. Mount the clamp. If the firewall is found to be too thin to properly secure the mounting clamp, a nut and bolt may be needed to firmly secure the clamp. Mount the cylinder. The cable should be fed through the inside (closest to the mounting hole) of the clamp. Feeding from the outside may result in cable breakage. Be sure to “double loop” the cable through the clamp by putting the cable through, pulling the slack out, and then looping it back through. Tighten but do not over tighten leaving approximately ¼”- ½” of slack in the cable. The amount of slack has no effect on the amount of pressure or proportionality. It only reduces the available stroke of the cylinder. Excessive slack will result in premature wear of the cylinder and cable.

*\*Cable breakage can only occur if there is an improper angle or if the cable is not properly secured in the clamp. Review this step carefully after the cylinder is mounted to ensure proper installation.*



## Step 7: Mount the Breakaway Switch

1. Mount the breakaway switch to the front of the towed vehicle as close to the center of the towed vehicle as possible using the provided hardware. In many cases it can be mounted to the front fascia in a manner that allows it to turn 90\* when not in tow.
2. Insert the plug into the switch. This will prevent dirt and water from getting into the switch.



## Step 8: Making the Electrical Connections

*Note: Pull on each wire after the connector is applied to be certain it is secure.*

1. Connect the red fuse holder to the battery or a hot terminal in the fuse block. **DO NOT PUT THE FUSE IN.**
2. The brown wire from the Operating Unit and the orange/black wire from the breakaway switch attach to the red fuse holder using the three-way connector.
3. The blue wire from the Operating Unit attaches to the blue wire from the breakaway switch.
4. The white wire from the G-Force Controller II attaches to the white wire of the tow wiring **AND** to a suitable ground (not the battery). **Correct Grounding Is Essential.**
5. The red wire from the Operating Unit attaches to the red wire from the G-Force Controller II.
6. The black wire from the Operating Unit attaches to the black wire from the G-Force Controller II and the Red wire from the light harness.

### ***Note for #7 & 8***

*This installation assumes your tow wiring is based on a standard 4-wire connection from the motor home. If you have a separate wire for the brake signal from the motor home (amber turns on the towed and coach), find the wire that receives 12v (+) when the brake pedal of the coach is depressed. That is the wire that the green and yellow wires are to be attached to.*

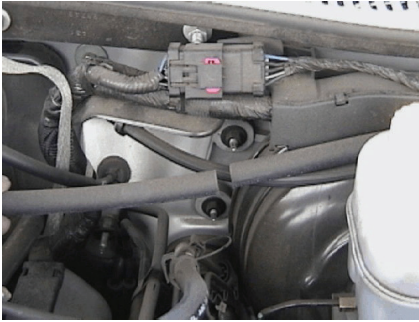
7. The green wire from the G-Force Controller attaches to the green wire of the tow wiring. (See note above)
8. The yellow wire from the G-Force Controller attaches to the yellow wire of the tow wiring. (See note above)
8. Insert the 20 amp fuse into the fuse holder.

## Step 9: Connect the Cylinder Air Line

Connect the cylinder air line to the Operating Unit using the same method found in “Step 5-4.”

## Step 10: Making the Vacuum Connection

First, locate the vacuum line coming from the brake booster and determine its size. Then,



select from one of the following options.

***Note: This portion of the installation is for vehicles with vacuum-assisted brakes ONLY. If you have hydra-boost brakes or are uncertain of your vehicle's braking configuration, call the Help Line for assistance.***

Some newer Ford products incorporate two vacuum lines from the booster and require an addition check valve. Contact the Help Line for details.

### Special Concerns:

1. Special care must be given to installing the check valve in the proper orientation. (Motor, Check Valve [black/green], Tee, Booster).
2. Exercise care in routing the hose so that no kinks, sharp edges, heat, etc., will effect the operation of the system.
3. Lubricate the check valve and tee with dish soap or silicone spray. This will help them slide easily into the vacuum hose.

### 11/32-3/8 I.D. HOSE SIZE (*does not require hose clamps*)

1. Locate the existing vacuum hose and determine where the check valve and the tee will be inserted into the hose.
2. Route the hose coming from the operating unit to the location where the tee will be installed. (Stay away from sharp edges, heat sources and kinks).
3. Cut the existing hose where the check valve will be inserted and install the check valve. Take care not to cut too close to a bend in the hose that will not allow the check valve to be inserted fully into the hose. (Black end toward the motor).
4. Cut the hose where the tee will be inserted and install the tee. Take care not to cut too close to a bend in the hose that will not allow the tee to be inserted fully into the hose.
5. Cut the hose coming from the SMI unit to the proper length and slide onto the tee. Make sure enough excess is left to avoid kinks.



## HARD PLASTIC VACUUM LINES

1. Cut a length of hose from the end of the operating unit and slide one end onto the green end of the check valve. Insert the tee into the other end.
2. Cut another length of hose and insert the open end of the tee into it. (The open end of the hose will slip over the smaller hard plastic tubing). Cut another length of hose and insert the open (black end) of the check valve.
3. Cut out a portion of the existing hard plastic tubing and slip the open ends of the hose and hose clamps over the plastic tubing. Make sure the black end of the check valve is toward the motor.
4. Put the enclosed clamps on the hose that the hard plastic tubing is inserted into (do not overtighten).
5. Cut the hose coming from the SMI unit to the proper length and slide onto the tee. Make sure enough excess is left to avoid kinks.



## 1/2-5/8 I.D. VACUUM LINES

1. Cut a length of hose from the end of the operating unit and slide one end onto the green end of the check valve. Insert the tee into the other end.
2. Cut another length of hose and insert the open (black) end of the check valve. Slide the hose adaptor into the other end.
3. Cut another length of hose and insert the open end of the tee into it. Slide the other hose adaptor into the other end.
4. Cut out a portion of the existing larger vacuum hose out and slip adaptors and hose clamps into the open ends of the hose. Make sure the black end of the check valve is toward the motor.
5. Cut the hose coming from the SMI unit to the proper length and slide onto the tee. Make sure enough excess is left to avoid kinks.



## Step 11: Testing the Install

1. Turn on the toggle switch.
2. Push the brake pedal down in the towed vehicle. The notification light will illuminate. If not, check the brake-light switch connection and the ground connection.
3. Remove the breakaway pin and observe the operation of the cylinder. Note the cable attached to the firewall. It should be as close to an inch above being straight with the cylinder as possible (see Step #6-B). When it is in this location, the cable will be straight with the cylinder when the brake pedal is in the down position. The vacuum pump will run continuously, and apply the brakes of the towed vehicle. As the pump runs, more brake effort is applied to the towed vehicle until the maximum effort is reached. Let the pump



4. run for about 10 seconds and replace the breakaway pin. Verify that the brakes in the towed vehicle are fully released. Inspect the cable clamp and verify the cable has not slipped in the clamp.
5. Tape all electrical connections with a high quality electrical tape, and use cable ties to secure the wires.
6. With the G-Force Controller knob at the bottom of the slot, go to the coach and press on the brake pedal. The tow wiring must be connected. **Do not connect the tow bar.** Confirm the activation of the system by checking the light in the back-up monitor. If the system fails to activate, refer to Step #12-1 and retest.

## Step 12: Adjusting the G-Force Controller

*Note: The Stay-IN-Play Duo's activation is progressive in nature. It is designed to activate briefly in normal stopping and longer in harder/panic stopping.*

1. Locate the vehicles on level ground and turn the switch to "ON." Place the black knob on the G-Force Controller at the bottom of the slot and have an assistant step on the brake pedal of the coach. At this point the system should activate. If it does not, remove the front screw from the G-force Controller and lower it until the unit activates and then re-secure it in this location. Slowly raise the knob up. The system may begin chattering, keep raising the knob. As soon as the pump shuts off completely and then go up another 1/16". Tighten down the black knob to ensure it does not move.
2. Test drive the coach while pulling the towed. Drive and stop **NORMALLY** as these are the conditions for which you want to configure the braking system.
3. If while traveling the system activates too often, raise the knob 1/16". Repeat step 2.
4. If while traveling the system doesn't activate often enough, lower the knob 1/16". Repeat step 2.

## Step 13: The Breakaway Cable

Clip the breakaway cable to the hitch-receiver tow-cable holes on the coach and clip the lanyard to the loop on the breakaway plug. The length of the cable should be long enough that it will not pull out on the tightest possible turns made in either direction. Also route the cable so that it will not get caught on the tow bar. It should be short enough that it will pull out before the towed reaches the end of the safety cables.

# Troubleshooting

We at SMI exercise great care in building and packaging your unit. All operating units are thoroughly bench tested before being shipped. We encourage you to contact our Help Line any time you have questions about the installation or operation of your SMI Vacuum-Assisted Brake.

## VACUUM/AIR

### **Vacuum Pump will not shut off:**

1. Check to see that the breakaway pin is secure!
2. If the pump continues to run call the Help Line.

## WIRING

Check the fuse and the holder at the battery and the WHITE wire connection. Also, be sure you installed the 20-amp fuse in the fuse holder.

### **Unit failed to operate when the RV brakes were applied:**

1. Be sure the toggle switch is in the on position. Using a voltmeter or a test light, determine if there is 12v (+) between the brown wire and the black ground wire at the Operating Unit. There should be 12v (+) between these two wires at all times, when the switch is on.
2. Check the orientation of the G-Force Controller. It may need to be tipped slightly forward.
3. Check continuity from the white to the frame. If there isn't continuity, reground the white wire to the frame of the towed vehicle.
4. With the RV brakes applied, check for 12v (+) between the SMI GREEN wire and the SMI black wire. If no voltage is present, check the scotch lock connection to the towed vehicle's tow wiring. Remember the 12v (+) for this is coming from the coach. Check to see that the coach is grounded properly to the car in the tow wiring.
5. Apply the RV's brakes with the tow wiring connected. Lower the knob on the G-Force Controller. If you checked the voltage and the unit still does not operate, call the Help Line.

### **Breakaway failed to operate the brakes:**

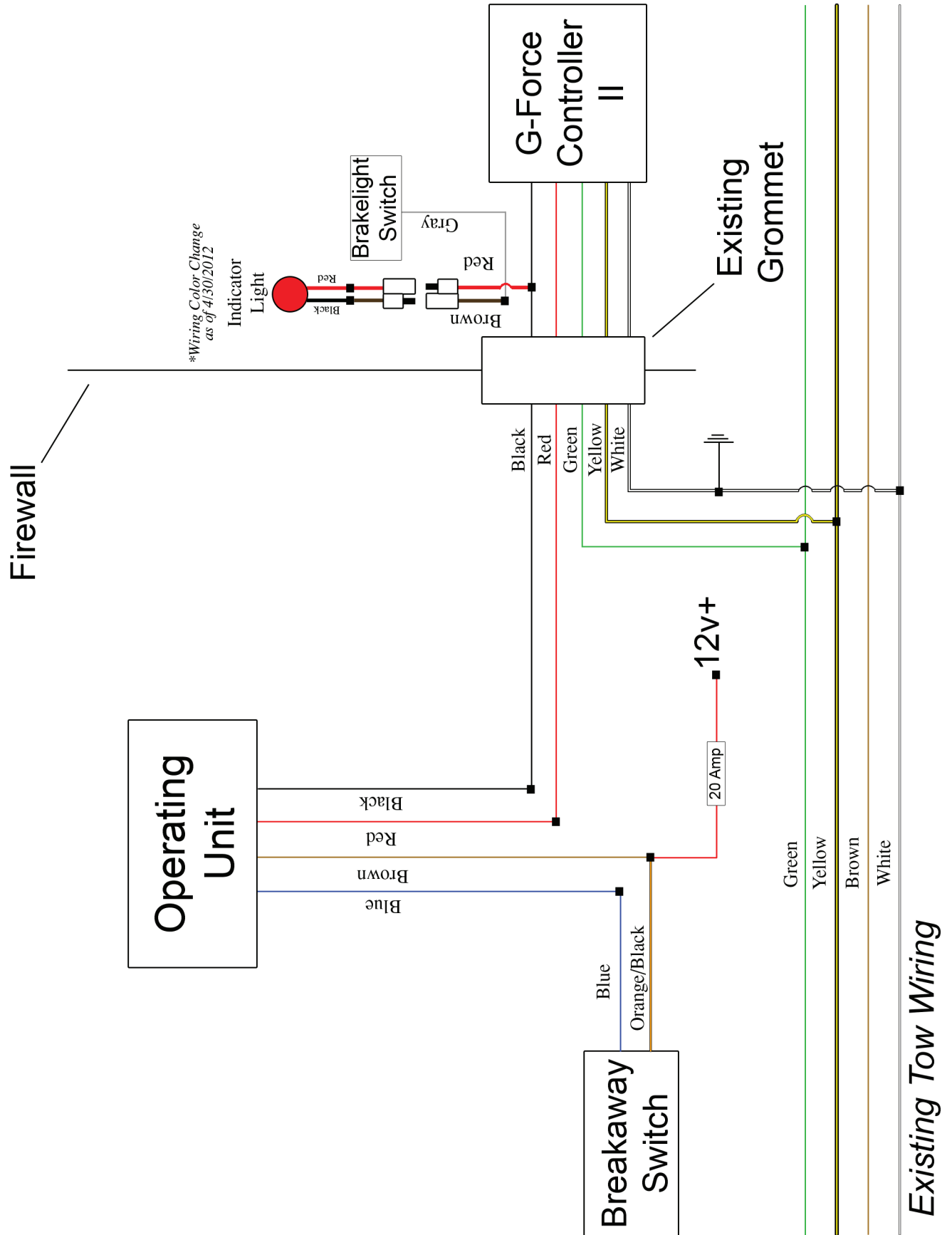
1. Make sure the toggle switch is turned on.
2. Remove the breakaway plug from the front of the towed vehicle. Test for 12v (+) between the blue wire and the black wire. There should be a 12v (+) at that time, and ONLY then. If not, check continuity to ground with the black wire. Check the connection at the battery and the fuse. Check the connection of the blue wire.

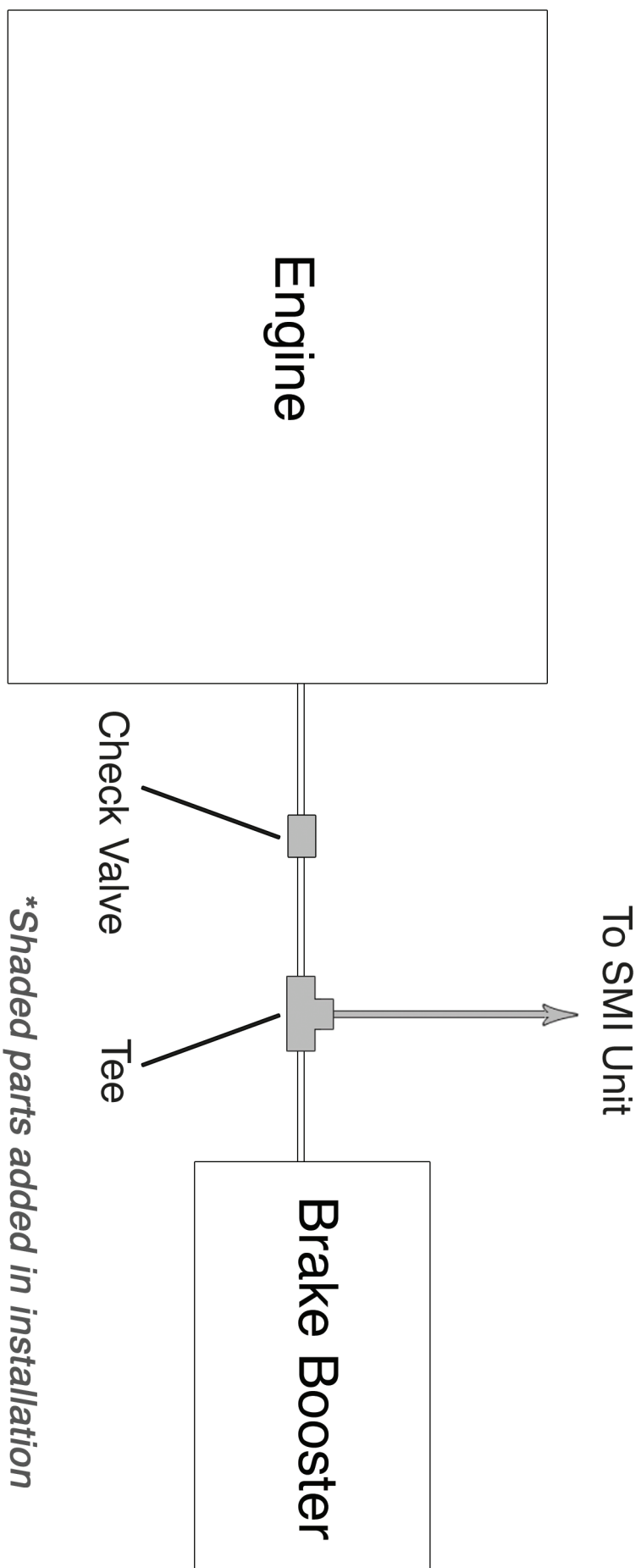
**Unit pulsates with turn signals:**

1. Unit sensitivity is too low. Refer to Step 12 to set the sensitivity.

**What now?**

If the voltage is correct and the unit still does not operate properly, you will need technical assistance from SMI Manufacturing, Inc. Call us at 1-800-893-3763, or e-mail at [info@smibrake.com](mailto:info@smibrake.com).







# Warranty Information

## Refund Policy

If, for any reason, you should decide to return your SMI product to your SMI dealer (including Rally or Trade show purchases) within 30 days, the SMI dealer will refund the purchase price of your product. Product must be complete, in the original carton, and in marketable condition. All returns are subject to a variable restocking fee not to exceed 20%.

## Limited Five (5) Year Warranty

We are confident that our product will perform well and therefore warrant you, as the original purchaser, that your new product will be free from mechanical and electrical defects in material and workmanship during the warranty period. The Warranty period begins on the original purchase date. The warranty is for current production models and the original purchaser only. SMI does not warrant any part of the installation nor failure related to improper installation. Cable breakage can only occur if there is an improper angle or if the cable is not properly secured in the clamp. As a courtesy, SMI, at their sole discretion, will replace the cable as a non-warranty procedure on the originally described one time during the warranty period, and also evaluate the exact cause of breakage so that the installation problem can be fixed.

## The Warranty Period

### 1st Year

If, during the first 12 months of the warranty period, your SMI product should be found defective, SMI will repair or replace the product at its discretion. SMI will refund to the original purchaser freight charges incurred in returning the product to the factory during this portion of the warranty period. (This does not include repackaging charges incurred to a third party) All warranty shipping & freight charges are for normal delivery, expedited freight charges are not included.

### 2nd - 3rd Year

If, during the 2nd through the 3rd year of the Warranty Period, your SMI product should be found defective, SMI will, upon receipt of post prepaid SMI product, repair or replace the product at its discretion. Your SMI product will be returned free of charge in the shipping manner of SMI's choosing.

**RETURN THIS CARD BY MAIL OR REGISTER ONLINE.**

**SMI MANUFACTURING INC.**

**MODEL: S10807**

Title: \_\_\_\_\_

Name: \_\_\_\_\_

Street: \_\_\_\_\_ Apt.No.: \_\_\_\_\_

City: \_\_\_\_\_ St.: \_\_\_\_\_ Zip Code: \_\_\_\_\_

E-mail: \_\_\_\_\_

Home Phone: \_\_\_\_\_ Mobile Phone: \_\_\_\_\_

Date of Birth: \_\_\_\_\_ Use of RV (circle one) Full-time-Part-time

Motor Home-Make: \_\_\_\_\_ Model: \_\_\_\_\_

Length: \_\_\_\_\_ ft. Year: \_\_\_\_\_ Engine Type (circle one) Gas-Diesel

Towed Vehicle-Make: \_\_\_\_\_ Model: \_\_\_\_\_ Year: \_\_\_\_\_

### Place of Purchase

Name: \_\_\_\_\_ City: \_\_\_\_\_ St.: \_\_\_\_\_

Date Purchased: \_\_\_\_\_ Price Paid: \_\_\_\_\_

### Installer

Name: \_\_\_\_\_ City: \_\_\_\_\_ St.: \_\_\_\_\_

Date Installed: \_\_\_\_\_ Price Paid: \_\_\_\_\_

#### 4th - 5th Year

If, during the 4th and 5th years of the Warranty period, your SMI product should be found defective, SMI will, upon receipt of post prepaid SMI product, repair or replace the product at its discretion. SMI reserves the right to charge for labor on required repairs of the SMI product depending on condition of the product received. Customer will be responsible for return shipping during this portion of the Warranty period.

#### What is Not Covered

Our warranty for your product will not cover damage resulting from set-up for towing, installation, neglect or misuse, use contrary to operating instructions, charges associated with removal/replacement of components, distortion and/or damage caused by weather or heat, or disassembly, repair, or alteration by any person other than an authorized service center. Any implied warranty of merchantability or fitness for a particular purpose of your product is limited to the duration of this written warranty. We shall not be liable for any incidental or consequential damages for breach of any express or implied warranty.

#### Your State Laws

Some states do not allow limitation on how long an implied warranty lasts or the exclusion or limitations of incidental or consequential damages, so the above may not apply to you. This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state.



MODEL: S10807

First-Class  
Postage  
Required  
Post Office will  
not deliver  
without proper  
postage.

**SMI Manufacturing, Inc.  
Warranty Registration  
7457 W. State Route 66  
Newburgh, IN 47630**