

# *Supplemental braking system*

## *Second Vehicle Kit Installation Instructions*

Part number 98800

**ROADMASTER**

**Time Tested • Time Proven**

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 **WARNING**

Read all instructions before installing or operating the supplemental braking system. Failure to understand how to install or operate it could result in property damage, personal injury or even death.



**CAUTION**

Not for use on older vehicles without power brakes. The supplemental braking system is designed to work with vehicles that have a power brake system (even though the power brakes are not activated while towing). Using it on vehicles that do not have power brakes will result in over-braking and severe non-warranty brake damage.

**CAUTION**

Do not install this supplemental braking system in a vehicle with an 'active' braking system.

'Active' (or, 'continuous power assist') braking systems are a safety feature on some new vehicles. This feature allows the brakes to always have power, even with the ignition off. The only supplemental braking systems that ROADMASTER manufactures for these vehicles are InvisiBrake and BrakeMaster. A Brake Pressure Reducer (part number 900002) must also be used with BrakeMaster.

If any ROADMASTER supplemental braking system other than these two is installed, the vehicle will brake with excessive force, which will damage the tires. Other non-warranty damage may also occur.

It is the owner's responsibility (or if professionally installed, the installer's responsibility) to determine if the vehicle being equipped with supplemental brakes has an active braking system — refer to the vehicle owner's manual or the dealership. ROADMASTER expressly disallows any and all claims relating to tire damage, brake damage, or any other damage to vehicles with 'active' braking systems caused by: 1) installation of any ROADMASTER supplemental braking system other than InvisiBrake or BrakeMaster; or 2) failure to install a Brake Pressure Reducer with the BrakeMaster.

 **WARNING**

These instructions pertain to the initial installation of the second vehicle components only. Operating instructions, as well as installation instructions for the complete system, are contained in the owner's manual.

For the most recent version of the owner's manual, visit [www.roadmasterinc.com](http://www.roadmasterinc.com).

Read all instructions before installing or operating the supplemental braking system. Failure to understand how to install or operate the supplemental braking system could result in property damage, personal injury or even death.

 **WARNING**

If a charge line kit is installed in the towed vehicle, apply a silicone sealant to the socket terminals where the wires are connected. Otherwise, stray voltage may energize the turn signal wiring. This will cause inadvertent activation of the supplemental braking system. Severe brake system damage, loss of vehicular control and other consequential damage may occur.

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**IMPORTANT NOTICE!**

**Safety Definitions**

These instructions contain information that is very important to know and understand. This information is provided for **safety** and to **prevent equipment problems**. To help recognize this information, observe the following symbols.

 **WARNING**

**WARNING** indicates a potentially hazardous situation which, if not avoided, could result in property damage, serious personal injury or even death.

 **CAUTION**

**CAUTION** indicates a potentially hazardous situation which, if not avoided, may result in property damage, or minor or moderate personal injury.

**CAUTION**

**CAUTION** used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.

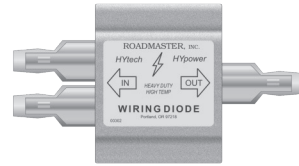
**NOTE**

*Refers to important information and is placed in italic type. It is recommended that you take special notice of these items.*

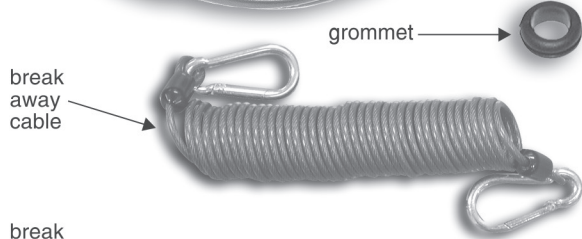
# Components



break away wiring harness

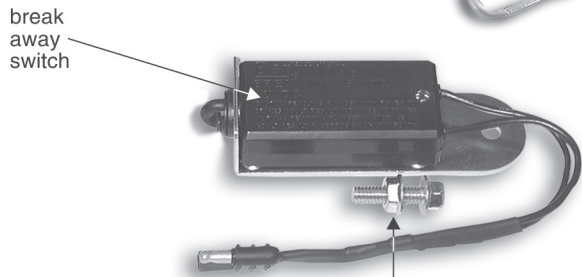


Hy-Power™ diode



grommet

break away cable



break away switch

1" hex bolt and 1/4" nut



brake signal wire

Items not shown to scale; connectors, wire tires and misc. wire not shown.

part number	description
790.....	Hy-Power diode
650906-01.....	brake signal wire
650898.....	break away switch
8602.....	break away cable
650900.....	break away wiring harness
350318-00.....	rubber grommet
350400-20.....	1" hex bolt
350251-20.....	1/4" nut
450782-1 .....	Fuse tap (1)
300036-00.....	ring terminal, blue
300115-22.....	insulated female terminal, red



# Before you begin the installation...

**1. Always check the ROADMASTER web site** – [www.roadmasterinc.com](http://www.roadmasterinc.com) – for vehicle-specific information. Select ‘Supplemental Braking Systems’ under ‘Vehicle Specific Info’ and enter the vehicle’s make, model and year.

**2. If the battery must be disconnected** for towing, a 12-volt outlet kit (part number 9332) and a stop light switch must be installed. ROADMASTER manufactures stop light switch kits for a number of vehicles; to see if one is available for any specific vehicle, visit [www.roadmasterinc.com](http://www.roadmasterinc.com) and select ‘Supplemental Braking Systems’ under ‘Vehicle Specific Info.’ Enter the vehicle’s make, model and year and scroll down the page.

*Note: if a stop light switch kit is listed on the web site for any particular vehicle, it is required.*

*Note: an Automatic Battery Disconnect (part number 765) is available for vehicles which must be towed with the battery disconnected.*

*If you choose to install the Automatic Battery Disconnect, a 12-volt outlet kit and a stop light switch are still required; the Brake-Lite Relay is not required.*

**3. If fuse(s) must be removed from the vehicle before it can be towed** – verify that removing the fuse(s) will not disrupt power to the supplemental braking system, or otherwise affect the installation or operation.

**4. Check the towed vehicle’s 12-volt outlet for correct power** – the supplemental braking system is powered through the 12-volt outlet, with the ignition key turned to the “tow” position. However, some vehicles only have power at the 12-volt outlet when the engine is running. Before you begin the installation, verify that you have power in the towed vehicle’s 12-volt outlet with the ignition key turned to the “tow” position.

If there is no power, you can install ROADMASTER’s optional 12-volt outlet kit (part number 9332). When installed, this kit will provide power to the 12-volt outlet even when the engine is off.

**5. Check the 12-volt outlet socket** to make certain that: a) the socket has been wired correctly; and b) the socket is not corroded.

**a. Make certain that the socket has been wired correctly** – the contact point at the bottom of the socket should be positive, and the outer shell around the top of the socket should be negative.

## CAUTION

**If the socket’s positive and negative connections have been reversed, the fuse in the supplemental braking system power cord will blow when the cord is plugged into the 12-volt outlet.**

**b. Make certain that the socket is not corroded or otherwise damaged** – a corroded socket may not provide constant power to the supplemental braking system, which may cause intermittent operation.

If the socket is corroded or damaged, you can install ROADMASTER’s optional 12-volt outlet kit (part number 9332). When installed, this kit will provide constant power

to the supplemental braking system.

## CAUTION

**If the towed vehicle has a single 12-volt outlet which has been used to heat a cigarette lighter plug, install the optional 12-volt outlet kit for the supplemental braking system power supply.**

**Using a cigarette lighter plug in a 12-volt socket will corrode the contact points. The socket will not supply sufficient voltage to be used as the supplemental braking system power source — the braking system may not operate, or may only operate intermittently.**

**6. The circuit at the towed vehicle’s 12-volt outlet must be rated at NO LESS THAN 15 AMPS** to power the supplemental braking system. Check the fuse at the outlet – if the fuse is rated at 15 amps or higher, the circuit is adequate to power the supplemental braking system. If the fuse is rated at less than 15 amps, install the optional 12-volt outlet kit (part number 9332). When installed, this kit will provide adequate power to the supplemental braking system.

## CAUTION

**If the circuit at the 12-volt outlet is rated at less than 15 amperes, install the optional 12-volt outlet kit. Depending on the available current during towing, the supplemental braking system may not function, or may function incorrectly, without at least 15 amps.**

## WARNING

**If the circuit is rated at less than 15 amps, do not simply replace the outlet’s fuse with a higher-ampere fuse. This will cause the wiring to overheat, which can cause wiring damage, an electrical fire or other consequential, non-warranty damage.**

**Failure to follow these instructions may cause property damage, personal injury or even death.**

**7. Check the towed vehicle’s brake lights** – the supplemental braking system must function with the ignition key turned to the “tow” position; however, some vehicles’ brake lights only operate with the key turned to the “on” position. Check to see if this is the case: turn the ignition key to the “tow” position, apply the brakes, and check to see if the brake lights illuminate. If the brake lights do not illuminate, a two-prong stop light switch and 10-amp fuse must be installed.

*Note: check the owner’s manual to see if the vehicle is equipped with an “automatic shut down” feature. If this is the case, ensure that the vehicle is not in automatic shut down mode before performing this test.*

ROADMASTER manufactures stop light switch kits for a number of vehicles; to see if one is available for any specific vehicle, visit [www.roadmasterinc.com](http://www.roadmasterinc.com) and select ‘Supplemental Braking Systems’ under ‘Vehicle Specific Info.’ Enter the vehicle’s make, model and year and scroll

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down the page.

8. Route all wiring to avoid the possibility of a short circuit or other damage to the vehicle.

**⚠ WARNING**

**Route all wiring to avoid moving parts, sharp edges, the fuel lines or hot components such as the engine or exhaust system.**

**Wiring exposed by moving parts, sharp edges or hot components may cause a short circuit, which can result in damage to the vehicle's electrical system as well as other, consequential damage.**

**Wiring which is attached in close proximity to the fuel lines may ignite the fuel.**

**Failure to follow these instructions may cause property damage, personal injury or even death.**

9. If you are a professional installer, return these instructions to the owner of the vehicle after the installation, for the owner's future reference.

10. An open terminal on the motorhome's electrical socket may have been used to connect the monitor wiring from the motorhome to a previous towed vehicle. If this is the case, check the electrical socket on the vehicle to be wired with this second vehicle kit. If an open terminal is not available, order an optional patch cord (part number 450008).

## Installation instructions

### Step A

#### Install the break away system

1. Mount the break away switch (Figure 1) at the front of the vehicle, on the driver's side. Choose an area you can easily reach, with a surface of sufficient strength to hold the switch firmly in place, so that the break away pin (Figure 1) will pull freely from the switch. Mount the switch in a horizontal position, with the break away pin facing toward the motorhome.

Ensure that the break away pin can be pulled freely away from the towed vehicle, without any obstructions.

**⚠ WARNING**

**Do not attach the break away switch to the tow bar. In the unlikely event that the tow bar should separate, the break away switch will separate with it, preventing the break away system from activating. The towed vehicle's brakes will not be applied, which may cause property damage, personal injury or even death.**

2. Look for a pre-existing hole in the firewall (or, if there is sufficient space, a pre-existing grommet with other wiring) close to the floor on the driver's side, to route the break away wiring harness (Figure 1) through the firewall.

*Note: the motorhome monitor wiring harness and the brake signal wire will also be routed through this hole.*

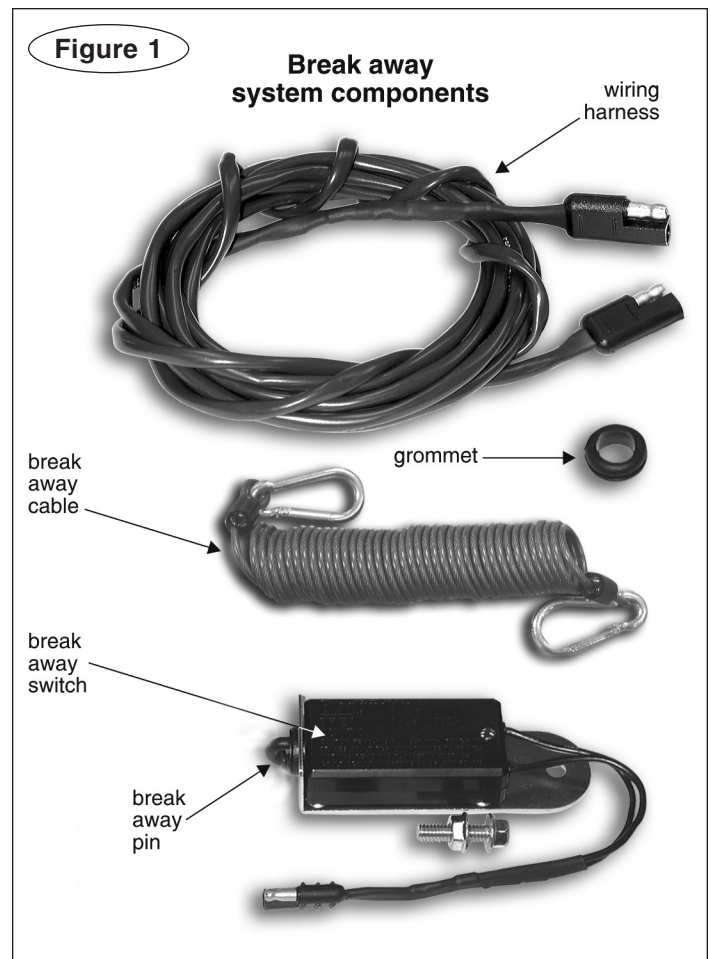
If there is no pre-existing hole or grommet with sufficient space, drill a 1/2-inch hole through the firewall.

Drill from the engine compartment or from the interior of the vehicle, whichever is more convenient. Before drilling, make certain you will not damage any components on the other side of the firewall.

3. Route the wiring harness from the break away switch to the firewall (or, from the firewall to the break away switch, whichever is more convenient), avoiding moving parts, sharp edges, the fuel lines or hot components such as the engine or exhaust system. Where appropriate, use wire ties to secure the break away wiring harness.

Connect the wiring harness to the break away switch. Before towing, the two-prong connector at the open end of the break away wiring harness will be attached to the two-prong connector on the supplemental braking system.

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## Step B

### Modifications to the towed vehicle's lighting system

A supplemental braking system will affect the operation of the vehicle's tow lighting system. Use the information below to determine if optional components must be installed in a vehicle which has been wired for towing – or, if no lighting system has been installed, which systems are appropriate.

1. First, identify the type of brake and turn signals in the vehicle. There are two types – combined or separate.

In a **combined** system (Figure 2), the brake light does the flashing for the turn signal; in a **separate** system (Figure 2), there are amber or red turn signal lights which are separate from the brake lights.

2. Next, test to see if the towed vehicle's brake lights will illuminate with the engine off – with the ignition key at the "tow" position, press the brake pedal and check the brake lights.

3. Based on whether or not the brake lights illuminate, and the type of brake and turn signals, there are three possibilities:

- the brake lights illuminate and the towed vehicle has combined lighting;
- the brake lights illuminate and the towed vehicle has separate lighting; or
- the brake lights do not illuminate.

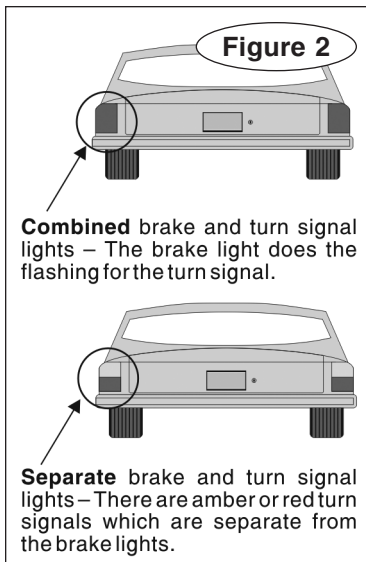
There are a number of lighting methods available for each of these three possibilities; they are described below.

(If you choose to install a Universal Wiring Kit, a Taillight Wiring Kit, a Brake-Lite Relay or magnetic tow lights, complete installation instructions and wiring diagrams are included with the kits; this information is also available online at [www.roadmasterinc.com](http://www.roadmasterinc.com).)

#### If the brake lights illuminate and the towed vehicle has combined lighting...

...one of the three alternatives below is required:

- A Universal Wiring Kit (part number 154) **with** a Brake-Lite Relay – a system of diodes is installed to rewire the vehicle's turn signals, taillights and brake lights for towing.
- Install an optional "bulb and socket set" (also called a "taillight wiring kit," part number 155).
- Install an optional magnetic tow light system (part number 2100 or 2120).



#### If the brake lights illuminate and the towed vehicle has separate lighting...

...one of the four alternatives below is required:

- A Universal Wiring Kit (part number 154) **with** a Brake-Lite Relay – a system of diodes is installed to rewire the vehicle's turn signals, taillights and brake lights for towing.
- Install six diodes, and jump the diodes. See page 8.
- Install an optional "bulb and socket set" (also called a "taillight wiring kit," part number 155).
- Install an optional magnetic tow light system (part number 2100 or 2120).

#### If the brake lights do not illuminate...

...an optional stop light switch **must** be installed. Stop light switch kits for many vehicles are available through ROADMASTER; visit [www.roadmasterinc.com](http://www.roadmasterinc.com) for the most current list.

Any one of the following tow lighting systems must also be installed with the stop light switch:

- A Universal Wiring Kit (part number 154) – a system of diodes is installed to rewire the vehicle's turn signals, taillights and brake lights for towing.
- An optional "bulb and socket set" (also called a "taillight wiring kit," part number 155)
- An optional magnetic tow light system (part number 2100 or 2120)

## Step C

### Install the motorhome monitor wiring harness in the towed vehicle

*Note: There are two lengths of wire in this kit, each with a female bullet connector at one end. Use the length of black wire in this step.*

1. Choose a mounting point at the front of the vehicle, near the electrical socket, for the end of the harness with the female bullet connector. Attach the connector with one or more of the included wire ties. Allow enough slack so that a male bullet connector can be plugged into and out of it.

*Note: for an earlier installation, open terminals on the electrical sockets may have been used to connect the monitor wiring between the two vehicles. This method eliminates a separate patch cord, included with the supplemental braking system for the same purpose. Check to see if this is the case: the motorhome monitor LED wiring will be connected to a terminal on the motorhome electrical socket.*

*If the LED wiring is connected to a terminal on the motorhome electrical socket, check to see if there is an open terminal on the towed vehicle's electrical socket. If there is, cut the female bullet connector off, and attach the monitor wire to the matching terminal on the towed vehicle's electrical socket.*

*You must apply a silicone sealant (not provided) to weatherproof the attachment point. Otherwise, moisture and/or corrosion may cause unintended activation.*

*If an open terminal is not available, disconnect the motorhome monitor wire from the electrical socket, and attach a female bullet connector to the end.*

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An optional patch cord, part number 450008 (or the patch cord that was included with the supplemental braking system, if it is available) must be used to connect the monitor wiring between the vehicles.

2. Once the female bullet connector is attached, route the monitor wiring harness through the engine compartment, to the driver's side of the firewall. Use the same route as the break away wiring harness, if that is convenient. As before, avoid lines, hoses, moving parts or "hot" components such as exhaust systems. Where appropriate, use wire ties to secure the wiring harness in place.

3. Route the motorhome monitor wiring harness through the same hole as the break away wiring harness (Step A).

4. Before connecting the motorhome monitor wiring harness to the brake light wire, determine if the optional Brake-Lite Relay must be installed:

a. Without starting the towed vehicle, press the towed vehicle's brake pedal.

b. If the brake lights illuminate, you must install the Brake-Lite Relay, unless: 1) the towed vehicle has a "bulb and socket set" (also called a "taillight kit"), or magnetic lights, or 2) the towed vehicle has separate brake and turn signals (Figure 2).

5. Next, locate the towed vehicle's brake light switch and, with a test light, find the "cold" side of the brake light switch. (The "cold" side of the switch does not register voltage unless the brakes are applied.) Then, remove the vehicle's brake light fuse, located in the vehicle's fuse panel.

### CAUTION

**Failure to remove the brake light fuse from the vehicle's fuse panel may cause the vehicle's theft deterrent system, or other electrical system indicators, to be activated if the brake pedal is depressed during the installation. This may require non-warranty repair to the vehicle.**

6. Cut the brake light wire, a few inches downstream from the "cold" side of the brake light switch.

#### If the Brake-Lite Relay is required...

(see step 4, above)

Install the Brake-Lite Relay now. The installation instructions are included with the relay. After the Brake-Lite Relay is installed, proceed to Step D – "Attach the brake signal wire."

#### If the Brake-Lite Relay is not required...

(see step 4, above)

7. If necessary, trim the monitor wiring harness, then attach the monitor wire to the brake light wire, using one of the supplied yellow butt connectors.

8. Ensure that the monitor wiring harness will not present an obstacle or hazard to the driver of the vehicle, or interfere with the operation of the vehicle. Use one or more of the included wire ties, if necessary, to secure the wiring harness out of the way.

9. Reinstall the brake light fuse, which you removed in step 5.

## Step D Attach the brake signal wire

*Note: the brake signal wire is a six-foot length of green wire, with a female bullet connector at one end.*

1. Choose a convenient point on the towed vehicle's tow light harness to attach the brake signal wire, and remove the protective loom covering that section of the harness.

2a. If the towed vehicle has **combined** brake and turn signal lights (Figure 2)...

- Cut the yellow wire (left turn/brake) on the harness, and attach the ends with one of the supplied yellow butt connectors (Figure 3). Repeat for the green wire (right turn/brake).

- Then, run a small length of the supplied wire from both butt connectors (Figure 3), and attach both wires to the inputs of the included diode (Figure 3) with two of the supplied spade connectors.

2b. If the towed vehicle has **separate** brake and turn signal lights (Figure 2) the connection is the same as above, except that only one wire (the brake light wire) is attached to the diode...

- With a test light, determine which of the wires in the tow light harness is the brake light wire – when the test light is connected to the brake light wire, the test light will illuminate when the motorhome's brake pedal is depressed.

- Cut the brake light wire, and connect the ends with one of the included yellow butt connectors.

- Then, run a small length of the supplied wire from the butt connector, and attach the wire to the diode with another spade connector. Use either one of the two inputs; leave the other input empty.

2c. If the towed vehicle has a **magnetic** tow light system...

*Note: additional connectors and, depending on the application, additional wiring will be necessary to wire a magnetic tow light system.*

- Peel back a section of the protective covering near the plug on the electrical cable – enough to use a test light on the wiring and, later, to attach two butt connectors. Then, using a test light, find the left and right combined brake and turn signal wires.

- Cut one of the combined brake and turn signal wires, and attach the ends with a butt connector. Run a small length of wire from the butt connector, and attach a female bullet connector to the end of the wire.

Attach a male bullet connector to another small length of wire. Using one of the included spade connectors, attach the other end of the wire to one of the inputs on the diode.

Repeat for the other brake and turn signal wire.

Before towing, connect the male and female bullet connectors.

- Trim the protective covering over the electrical cable; wrap any exposed wiring with electrical tape.

- Connect to ground – at both vehicles, connect a wire to any good chassis ground. Before towing, connect the ground wires with a separate cable.

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**2d. If the towed vehicle has a taillight (“bulb and socket”) wiring kit...**

- Make certain that a ground connection exists between the towed vehicle and the motorhome. Otherwise, the wiring is identical to the combined brake and turn signal light method (2a, above).

3. Using another of the supplied spade connectors, attach the bare end of the brake signal wire to the output of the diode (Figure 3).

4. Route the brake signal wire through the engine compartment, to the driver’s side of the firewall. Use the same route as the break away wiring harness and the motorhome monitor wiring harness, if that is convenient. As before, avoid lines, hoses, moving parts or “hot” components such as exhaust systems. Where appropriate, use wire ties to secure the brake signal wire in place.

5. Route the brake signal wire through the same hole in the firewall as the break away wiring harness and the motorhome monitor wiring harness.

6. Replace the protective loom, which you removed in step one.

## Step E

### Attach the firewall grommet; attach the wiring connectors

1. Cut through the included firewall grommet (Figure 1) on one side, and slide it over the break away wiring harness, the brake signal wire, and the motorhome monitor wiring harness.

Fit the grommet into the hole in the firewall. Feed the remaining lengths of the brake signal wire and the break away wiring harness through the grommet. Then, seal the grommet with a silicone sealant.

2. When the supplemental braking system is connected and disconnected, the supplemental braking system’s wiring harness will be plugged into and out of the connectors on the break away wiring harness and the brake signal

wire.

With this in mind, choose a suitable location for the end of the break away harness and the end of the brake signal wire – both connectors must be within easy reach, but must not present an obstacle or hazard to the driver of the vehicle, or otherwise interfere with the operation of the vehicle.

If necessary, coil the break away harness and/or the brake signal wire. Then, attach them at the point you have selected, using one or more of the included wire ties to secure them in place.

Before towing, connect the supplemental braking system wiring harness to the break away wiring harness (two-prong connectors) and the brake signal wire (bullet connectors).

7. Before towing, read the owner’s manual, cover to cover. Understand how to install and operate the supplemental braking system, and carefully follow the instructions and safety precautions.

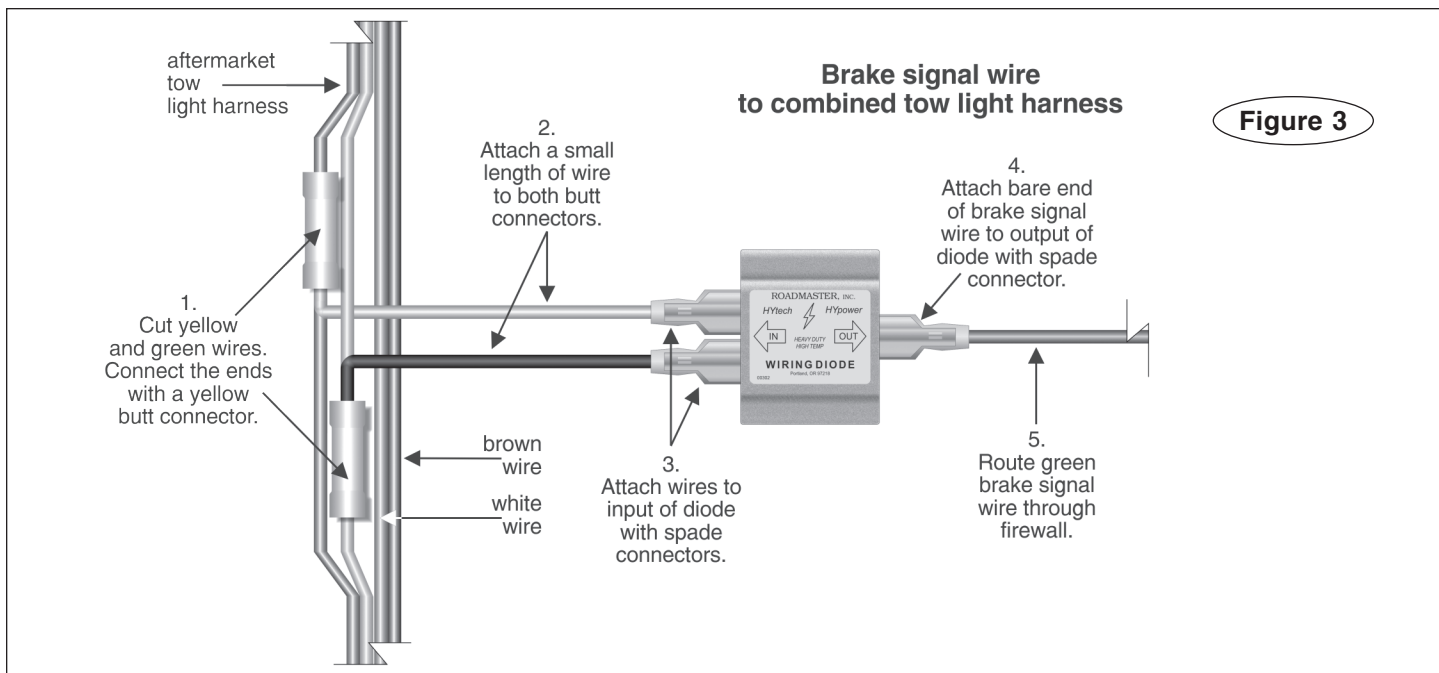
### **WARNING**

**Read all instructions before installing or operating the supplemental braking system. Failure to understand how to install or operate the supplemental braking system could result in property damage, personal injury or even death.**

The installation is complete. The remaining page describes an alternative wiring method.

As a final step, test the supplemental braking system to ensure that it has been installed correctly.

After you are certain the supplemental braking system is functioning as it should, show the owner how to properly operate it. Demonstrate how to connect and disconnect the supplemental braking system, and how to adjust its settings, until the owner is comfortable with its operation.



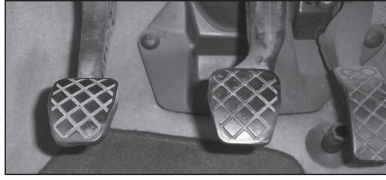


## Step F

### Test all functions

1. Follow the supplemental braking system owner's manual to connect and disconnect it, and to adjust its settings.

*Note: the supplemental braking system pedal clamp will not fit the brake pedals of a small number of late-model Volkswagen*



*vehicles, such as the 2007 Volkswagen Golf. A photo of the 2007 Golf brake pedal is shown to the right.*

*Use the optional 9329-VW replacement pedal clamp for these vehicles.*

# Install six diodes

Note: this wiring method can only be used if the brake lights illuminate with the engine off and the towed vehicle has separate lighting. See page 4.

Note: if the motorhome has combined brake and turn signals, use Figure 4 to wire the towed vehicle. If the motorhome has separate brake and turn signals, visit [www.roadmasterinc.com](http://www.roadmasterinc.com). Use the 'Separate towed vehicle to separate' motorhome wiring diagram under 'Support.'

Note: if a 3-to-2 converter has been installed in a motorhome with separate brake and turn signals, wire the towed vehicle according to Figure 4.

To test for a 3-to-2 converter, use a test light to find the turn signal and brake light circuits on the motorhome electrical socket. If the same circuit energizes both the turn signals and the brake lights, a 3-to-2 converter has been installed. If the turn signal and brake lights have separate circuits, a 3-to-2 converter has not been installed.

1. Cut the factory turn signal, taillight and brake light wires, as close to the lights as possible.

2. Install the six diodes in line, as shown in Figure 4. Install the diodes as close to the lights as possible.

## CAUTION

Attach the diodes as close to the vehicle's lights as possible, to avoid interaction with other circuits which may be tied into the center brake light, the running lights, the turn signals or the brake light wires.

Attaching the diodes further away may cause the towed vehicle's lights to work improperly and may also cause damage to other electrical components in the vehicle.

3. On each side, jump the brake and turn signal diodes, as shown in Figure 4.

## CAUTION

Unless the brake and turn signal diodes are jumped, the towed vehicle's brake light circuits will override the motorhome's turn signals — the towed vehicle's turn signals will not operate in conjunction with the motorhome's turn signals, as required by law.

4. Test the installation...

A. If the motorhome has a combined lighting system (Figure 2)...

1. The towed vehicle's turn signals and brake lights will both flash (each side) when the motorhome's turn signal is on; and

2. When the motorhome's turn signal and brake signal are both on (each side), the towed vehicle's brake lights will stay illuminated, while the turn signal flashes.

B. If the motorhome has a separate lighting system (Figure 2), the towed vehicle's turn signals and brake lights will illuminate identically to the motorhome's.

