

Supplemental Braking System Second Vehicle Kit Installation Instructions

Part number 98800



Quality Towing Systems since 1974

ROADMASTER, Inc. • 5602 N.E. Skyport Way • Portland, OR 97218 • 800-669-9690 • Fax 503-288-8900 • roadmasterinc.com

85-3600-00 12-06 © 2006 ROADMASTER, Inc.

IMPORTANT NOTICE!

Safety Definitions

Statements in these instructions identified as follows are of special significance:

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.

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.

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 the supplemental braking system on vehicles that do not have power brakes will result in over-braking and severe non-warranty brake damage.

All illustrations and specifications contained herein are based on the latest information available at the time of publication. ROADMASTER, Inc. reserves the right to make changes, at any time, without notice, in material, specifications and models, or to discontinue models.

COMPONENTS



BREAK AWAY
WIRING HARNESS



'HY-POWER'
DIODE



BREAK SIGNAL
WIRE

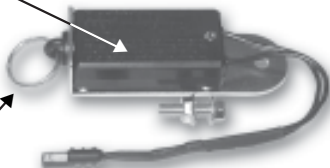
FIREWALL
GROMMET



BREAK
AWAY
CABLE



BREAK AWAY
SWITCH



BREAK AWAY
PIN

part number	description
650898	break away switch
8602	break away cable
650900	break away wiring harness
790	'Hy-Power' diode
650906-01	brake signal wire

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

BEFORE YOU BEGIN...

1. Check online at the ROADMASTER website (www.roadmasterinc.com) for vehicle-specific information which may not have been available when these instructions were published. This information is listed in the “Tech Support” section, under “Braking Systems.” Refer to the specific model number.

2. 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.

3. 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 initial installation, verify that you have power at the towed vehicle’s 12-volt outlet with the ignition key turned to the “tow” position. If there is no power, you can install the 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.

4. 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’s 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 the optional 12-volt outlet kit (part number 9332). When installed, this kit will provide constant power to the supplemental braking system.

5. Check the circuit at the towed vehicle’s 12-volt outlet – The circuit must be rated at no less than

continued on next page

Before you begin the installation...

continued from preceding page

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, you can install the optional 12-volt outlet kit (part number 9332). When installed, this kit will provide power to the supplemental braking system.

WARNING

If the circuit is rated at less than 15 amps, do not simply replace the fuse with a higher-amperage 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.

6. 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. ROADMASTER manufactures stop light switch kits for a number of vehicles; call the ROADMASTER customer service department to order a kit.

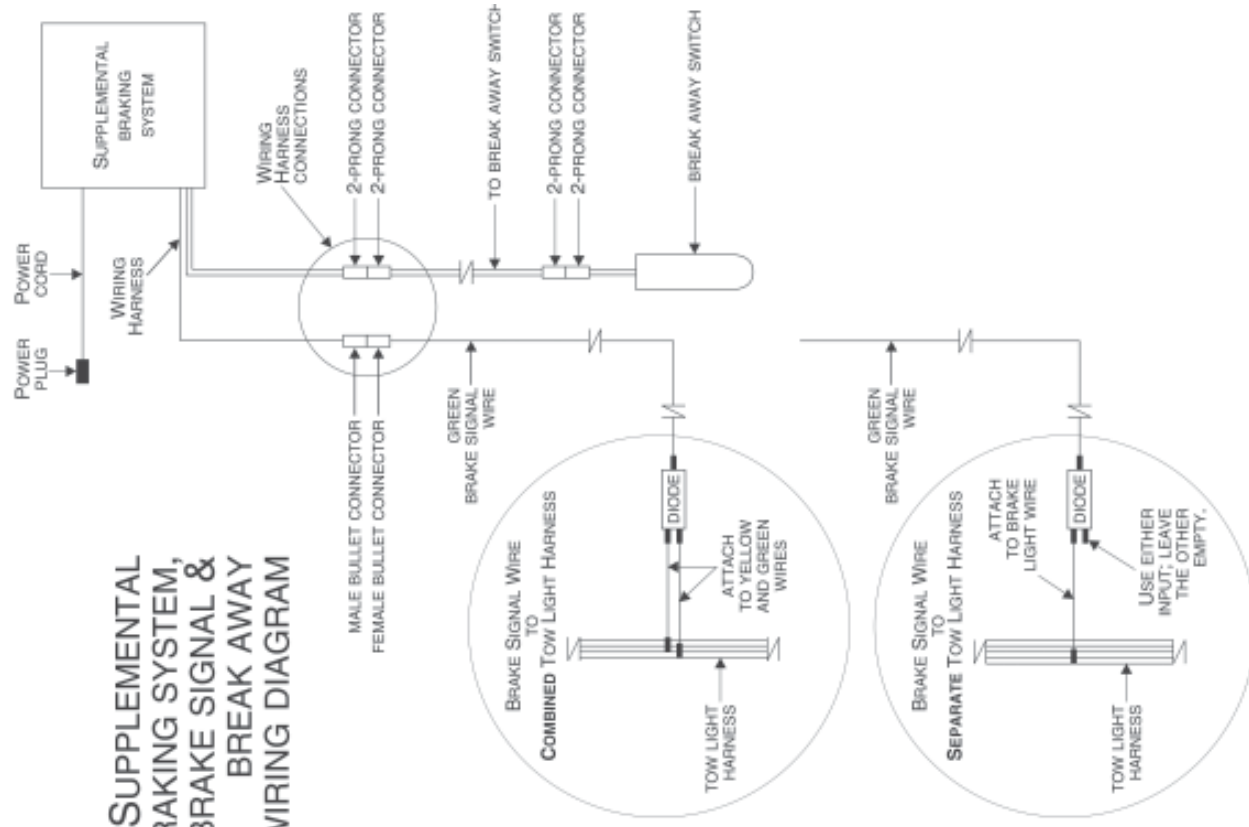
Note: check the owner's manual to see if the vehicle is equipped with an “automatic shut down” feature. If this is the case, ensure that the vehicle is not in automatic shut down mode before performing this test.

7. If the towed vehicle has a magnetic tow light system – modifications will be necessary, in order to permanently attach the brake signal wire. See step 2c under “Attach the brake signal wire.”

8. 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).

9. An optional Brake-Lite Relay may be required. See page 7 for instructions on how to determine if the relay must be installed.

SUPPLEMENTAL BRAKING SYSTEM, BRAKE SIGNAL & BREAK AWAY WIRING DIAGRAM



INSTALLATION

Step One

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 or the tow bar bracket. If the tow bar or bracket fails, the break away switch will separate with it, preventing the break away system from activating. If the towed vehicle separates, the brakes will not be applied, which may cause property damage, personal injury or even death.

2. The break away wiring harness (Figure 1) connects the break away switch to the supplemental braking system. It will be routed through the firewall,

on the driver's side.

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 through the firewall.

Note: the motorhome monitor wiring harness (Step Two) and the brake signal wire (Step Three) will also be routed through this hole.

If there is no pre-existing hole or grommet with sufficient space, drill a 1/2" 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 lines, hoses, moving parts or "hot" components such as exhaust systems. Where appropriate, use wire ties to secure the break away wiring harness.

At the front of the vehicle, connect the wiring

continued on next page

Install the break away system

continued from preceding page

harness to the break away switch.

Connect the break away wiring harness to the supplemental braking system by following the instructions in the owner's manual.

Step Two

Install the motorhome monitor wiring harness in the towed vehicle

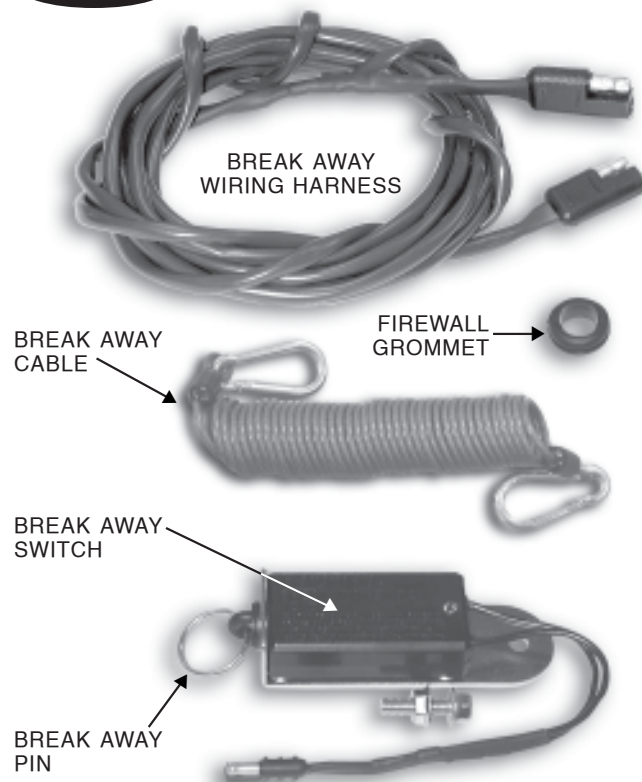
Note: There are two lengths of wire in this kit, each with a female bullet connector at one end. Use the length of black wire in this step.

1. Chose 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

continued on next page

Figure 1



Install the motorhome monitor wiring harness in the towed vehicle

continued from preceding page

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. 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.

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 One).

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 indi-

continued on next page

Install the motorhome monitor wiring harness in the towed vehicle

continued from preceding page

cators, 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 Three – “Attach the brake signal wire.”

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

(see step 4, above)

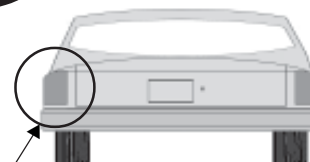
7. If necessary, trim the monitor wiring harness, then attach the monitor wire to the brake light wire, using one of the supplied yellow butt connectors.

8. Ensure that the monitor wiring harness will not present an obstacle or hazard to the driver of the

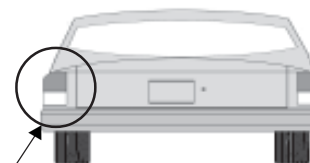
vehicle, or interfere with the operation of the vehicle. Use one or more of the included wire ties, if necessary, to secure the wiring harness out of the way.

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

Figure 2



COMBINED BRAKE AND TURN SIGNAL LIGHTS –
The brake light does the flashing for the turn signal.



SEPARATE BRAKE AND TURN SIGNAL LIGHTS –
There are amber or red turn signals which are separate from the brake lights.

Step Three

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.

_____ continued on next page

Attach the brake signal wire

continued from preceding page

Repeat for the other brake and turn signal wire.

Before towing, connect the male and female bullet connectors.

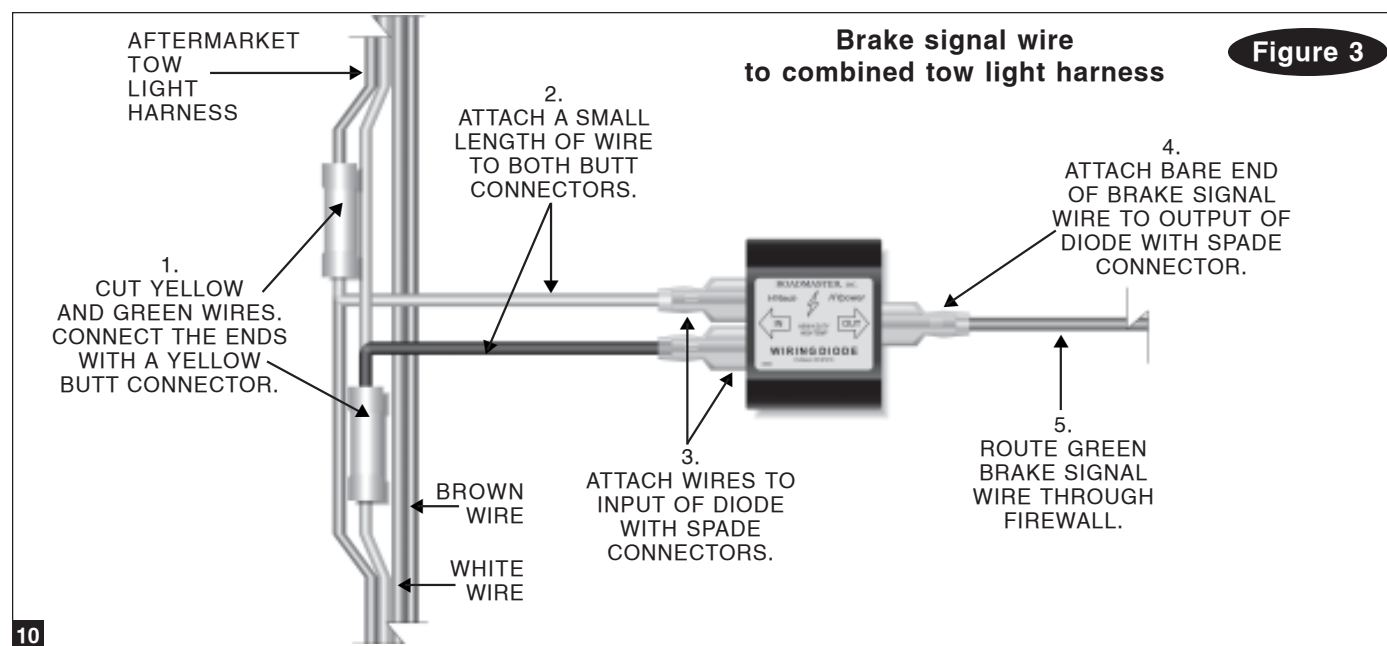
- Trim the protective covering over the electrical

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.

2d. If the towed vehicle has a **taillight** ("bulb and sock-

continued on next page



Attach the brake signal wire

continued from preceding page

et") 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 Four

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, chose 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

continued on next page

Attach the firewall grommet; attach the wiring connectors

continued from preceding page

point you have selected, using one or more of the included wire ties to secure them in place.

Refer to the supplemental braking system owner's manual to connect the break away harness and the brake signal wire to the supplemental braking system.

Step Five Test the system

Note: the motorhome and towed vehicle must be stationary for the system test, and ready for towing – all components of the braking system must be properly connected and receiving power, and the towed vehicle's ignition key must be in the "tow" position.

1. Connect the supplemental braking system according to the instructions in the owner's manual.

2. Confirm the proper operation of the supplemental braking system: depress and hold the motorhome's brake pedal down. The supplemental braking system air cylinder shaft and pedal clamp will extend (after approximately two seconds). Then, re-

lease the brake pedal. At the towed vehicle, the supplemental braking system air cylinder shaft and pedal clamp will retract.

3. Confirm that the motorhome monitor is functioning: the LED will illuminate after the motorhome's brake pedal is depressed (after approximately two seconds), and stop illuminating when the brake pedal is released.



WARNING

If the LED does not illuminate...

...it may indicate that the supplemental braking system is wired incorrectly. If the supplemental braking system is wired incorrectly, it will not brake the towed vehicle in tandem with the motorhome. Insufficient braking pressure will lengthen stopping distance, and may also cause a loss of vehicular control. Refer to the 'Troubleshooting' section in the owner's manual for possible causes. If the supplemental braking system has been incorrectly wired, identify and correct the mistake, then test to ensure that the supplemental braking system functions properly.

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

continued on next page

Test the system

continued from preceding page

4. Confirm the proper operation of the extended braking mode: depress and hold the motorhome's brake pedal down. The supplemental braking system air cylinder shaft and pedal clamp will extend. After approximately 15 seconds, the air cylinder shaft and pedal clamp will retract.

5. Confirm the proper operation of the audio alert: depress and hold the towed vehicle's brake pedal down. After approximately 20 seconds, the motorhome monitor will activate the audio alert. (To cancel the audio alert, release the towed vehicle's brake pedal.)

6. Confirm that the motorhome turn signals do not activate the supplemental braking system.

WARNING

An incorrect flasher speed may activate the supplemental braking system unnecessarily, causing excessive brake wear or other consequential, non-warranty damage. If the turn signals activate the supplemental braking system, check the turn signal flasher rating – it may be inadequate for the motorhome-towed vehicle combination. If this is the case, replace the flasher with one rated at or above the number of bulbs in the

motorhome-towed vehicle combination.

WARNING

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

Failure to understand how to install or operate the supplemental braking system could cause property damage, personal injury or even death.

LIMITED WARRANTY

1. WARRANTY

1a. WARRANTY OF CONFORMITY AT TIME OF SALE

ROADMASTER, Inc. warrants that at the time of sale of this product it will be free from defects in material and manufacture and will conform to ROADMASTER'S specifications for the product.

1b. CONDITIONAL ONE-YEAR WARRANTY

In addition to the preceding time-of-sale warranty, if the product registration card is completely and accurately filled out and mailed to ROADMASTER within thirty (30) days of purchase, ROADMASTER will provide an additional warranty that for a period of one year after sale the product will remain in good working order, PROVIDED THAT the product is installed and maintained in accordance with ROADMASTER'S instructions and is not subjected to: (a) alteration or unauthorized repairs or repairs by anyone other than ROADMASTER or a ROADMASTER-authorized service center, (b) misuse, abuse, commercial use, or improper maintenance, (c) Acts of God (including without limitation hurricanes, tornadoes, floods, or other severe weather or natural phenomena), (d) failures due to products not supplied by ROADMASTER, or (e) other treatments, uses, or installations for which the product was not intended. This warranty extends only to the first retail purchaser-consumer of the product and is not transferable.

2. DISCLAIMER OF OTHER WARRANTIES

The preceding warranties are the exclusive and sole express warranties given by ROADMASTER. They supersede any prior, contrary or additional representations, whether oral or written. No agent, representative, dealer or employee has the authority to alter or increase the obligations or limitations of this warranty. Any implied warranties, including the WARRANTY OF MERCHANTABILITY and any WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, are limited in duration to thirty days or the term of the applicable express warranty provided above, whichever is longer.

Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

3. EXCLUSIVE REMEDY FOR ANY NONCONFORMITIES

If during the applicable Warranty Period, the product does not conform to the preceding Warranties, notify ROADMASTER as provided below, and within a reasonable time ROADMASTER will provide, at its option, one of the following: (1) replacement components for any nonconforming or defective product or components or (2) the percentage of the purchase price for the nonconforming product equal to the percentage of the Warranty Period remaining when ROADMASTER is notified of the nonconformity. ROADMASTER will, at its option, (a) use new and/or reconditioned parts in performing warranty repairs and making replacement products, (b) use parts or products of original or improved design in the repair or replacement. If ROADMASTER repairs or replaces a product, its warranty continues for the remaining portion of the original Warranty Period or 60 days from the date of the return shipment to the customer, whichever is greater. All replaced products and all parts removed from repaired products become the

property of ROADMASTER. ROADMASTER will not provide, and will not be liable for, labor, costs of removal or reinstallation of components, disposal, shipping, freight, taxes, or other incidental charges.

THESE REMEDIES ARE THE EXCLUSIVE AND SOLE REMEDIES FOR ANY BREACH OF WARRANTY.

For any breach of warranty, the Owner must telephone ROADMASTER at 1-800-669-9690 within thirty (30) days after discovering the nonconformity. Do not return any product without first calling ROADMASTER and getting a return authorization number. Returned products must include the return authorization number and a copy of the original invoice, bill or other proof of the date of purchase. The date of purchase must coincide with the original warranty registration card on file. ROADMASTER will authorize (a) shipment of the product to ROADMASTER or (b) repair or replacement at the nearest warranty service center—in both cases with shipping at your expense. Do not purchase replacement parts or pay for repair labor—you will not be reimbursed. Compliance with the requirements of this paragraph is a condition to coverage under the Warranty: if these requirements are not complied with, ROADMASTER will have no obligation to provide any remedy for any breach of warranty.

4. DISCLAIMER OF INCIDENTAL AND CONSEQUENTIAL DAMAGES

IN NO EVENT SHALL ROADMASTER BE LIABLE FOR ANY INCIDENTAL, SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES, WHETHER RESULTING FROM NONDELIVERY OR FROM THE USE, MISUSE OR INABILITY TO USE THE PRODUCT OR FROM DEFECTS IN THE PRODUCT.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation may not apply to you.

5. APPLICABLE LAW

This Warranty will be interpreted, construed, and enforced in all respects in accordance with the laws of the State of Oregon, without reference to its choice of law rules. The U.N. Convention on Contracts for the International Sale of Goods will not apply to this Warranty.

6. SEVERABILITY

If any provision of this warranty is found to be invalid or unenforceable, then the remainder shall have full force and effect, and the invalid provision shall be partially enforced to the maximum extent permitted by law to effectuate the purpose of the agreement.

7. ADDRESS FOR NOTICES TO ROADMASTER

ROADMASTER, Inc., 5602 N.E. Skyport Way, Portland, OR 97218

This warranty gives you specific legal rights, and you may also have other rights which vary from State to State.