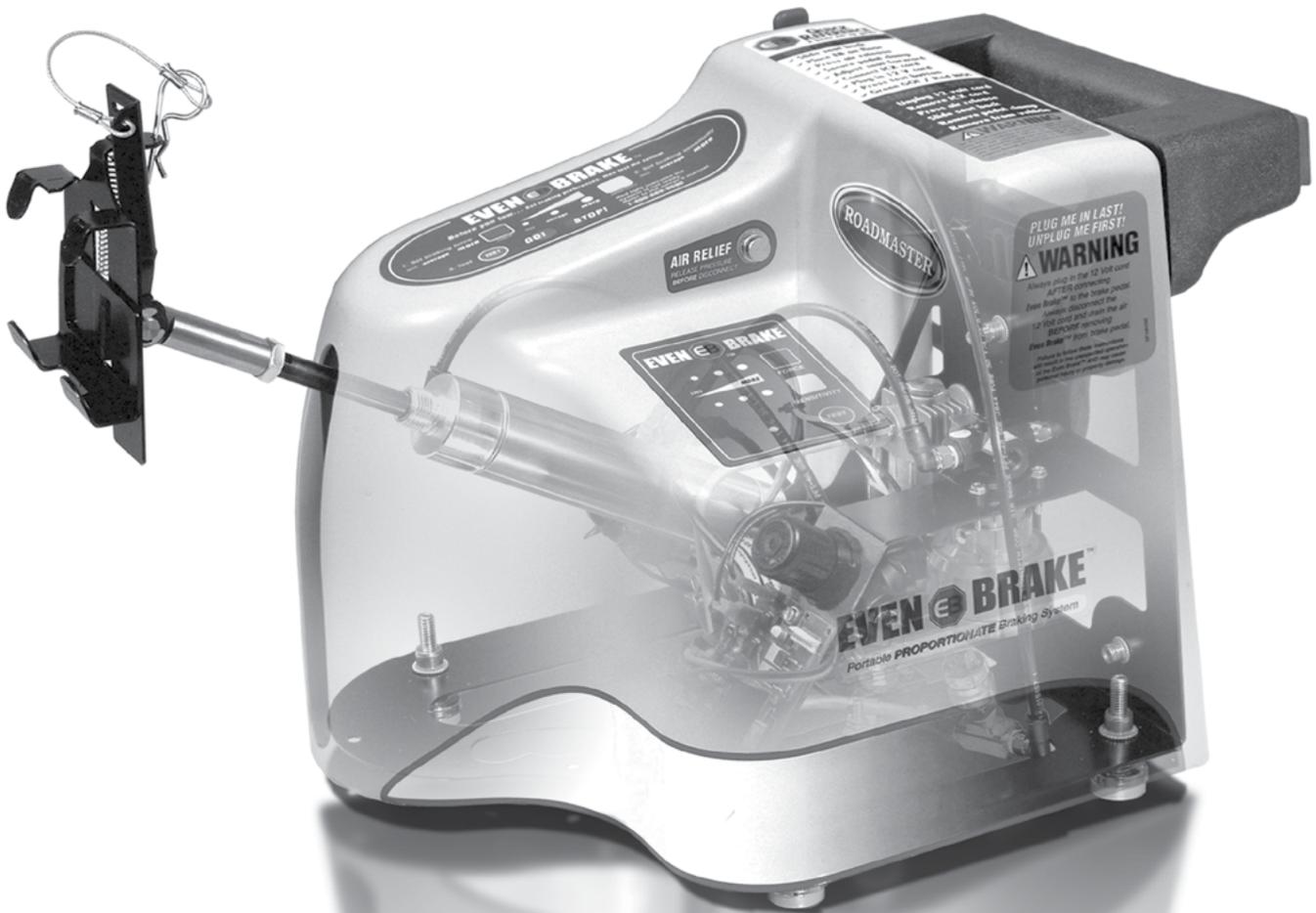


EVEN BRAKE

Portable Proportional Braking System

Installation Instructions



Part number 9400



Time Tested • Time Proven

ROADMASTER, Inc. • 6110 NE 127th Ave. • Vancouver, WA 98682
800-669-9690 • Fax 360-735-9300 • roadmasterinc.com
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Even Brake specifications

Height 12 inches
Width..... 11.25 inches
Length..... 16 inches
Weight.....17.5 pounds
Voltage.....12 volts DC
Operating temperature range
.....-2° to +150° F (-19° to +66° C)
Length of standard power cord.....42 inches
Maximum amperage draw10.8 amps
Idle amperage draw..... 47mA
Approximate maximum air pressure60 psi
Maximum force extended on brake pedal106 pounds
Minimum space Even Brake can fit..... 16 inches

Statement of FCC compliance

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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.

WARNING

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



CAUTION

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

CAUTION

Do not install Even Brake 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. There are two supplemental braking system that ROADMASTER manufactures for these vehicles: InvisiBrake (recommended) and BrakeMaster, with the addition of a Brake Pressure Reducer (part number 900002).

If any ROADMASTER supplemental braking system

other than an InvisiBrake or a BrakeMaster with a Brake Pressure Reducer 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

The Even Brake 12-volt power cord is always "last in, first out." Never plug in the power cord until Even Brake is completely installed, according to these instructions. Once it receives power, any movement of the box could cause Even Brake to activate unexpectedly. Similarly, never disconnect Even Brake without first unplugging the 12-volt power cord.

Failure to install and operate Even Brake as instructed may cause property damage, personal injury or even death.

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.

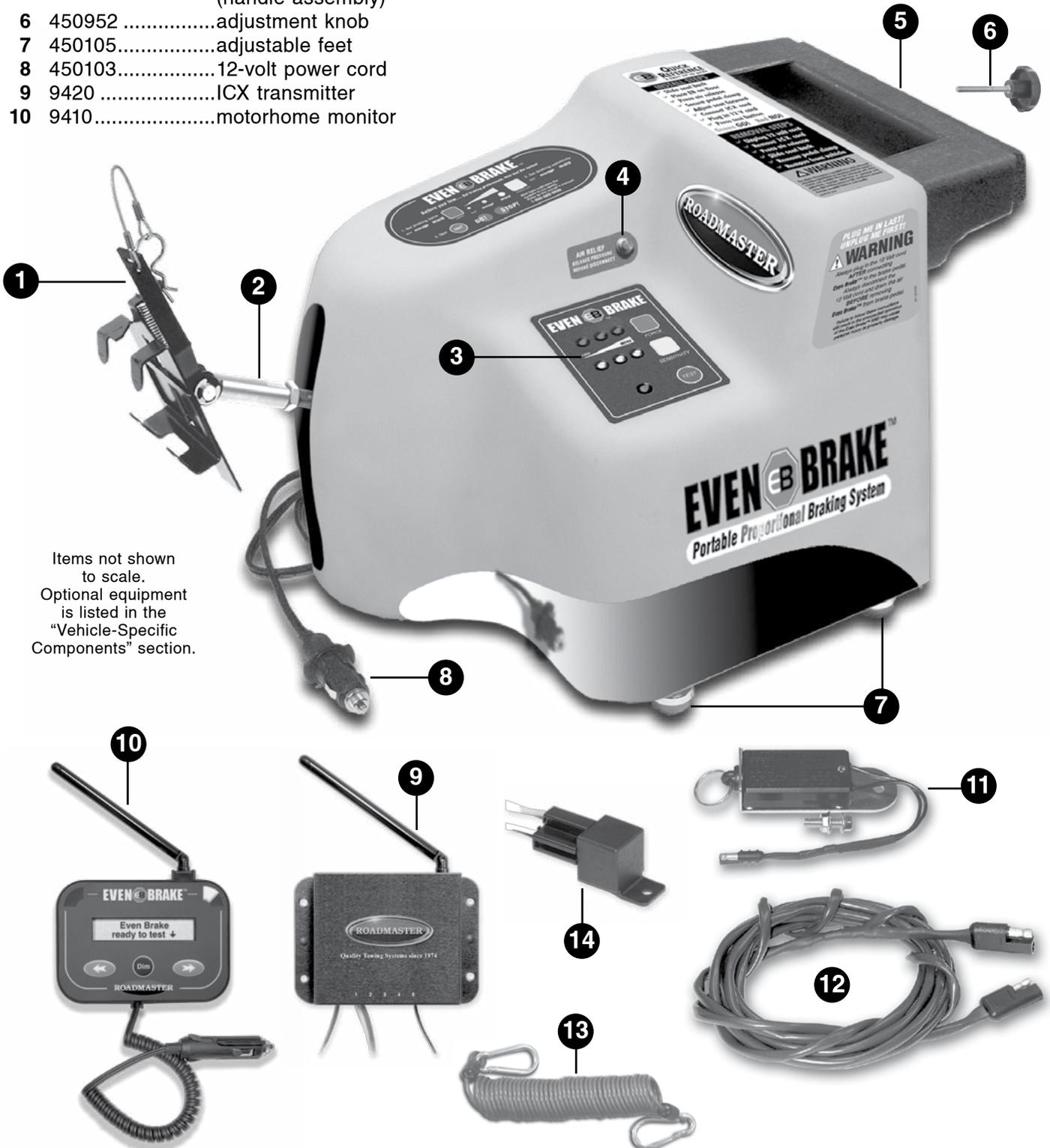
NOTE

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

Components

part number	description
1	9329brake pedal clamp
2	n/aair cylinder shaft
3	n/atouch pad control panel
4	450098air relief button
5	650996adjustable seat pad (handle assembly)
6	450952adjustment knob
7	450105.....adjustable feet
8	450103.....12-volt power cord
9	9420ICX transmitter
10	9410.....motorhome monitor

part number	description
11	650898break away switch
12	650900break away wiring harness
13	8602break away cable
14	88400Brake-Lite Relay



Items not shown to scale. Optional equipment is listed in the "Vehicle-Specific Components" section.

Before you begin the installation...

1. Always check the ROADMASTER web site – 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 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 Even Brake or the ICX transmitter, or otherwise affect the installation or operation.

4. Check the towed vehicle’s 12-volt outlet for correct power – Even Brake 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 Even Brake 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 Even Brake, which may cause intermittent operation or disrupt the Even Brake diagnostic program, causing false alerts.

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 Even Brake.

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 Even Brake 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 Even Brake power source – Even Brake 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 Even Brake. Check the fuse at the outlet – if the fuse is rated at 15 amps or higher, the circuit is adequate to power Even Brake. 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 Even Brake.

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, Even Brake 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 – Even Brake 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 and select ‘Supplemental Braking Systems’ under ‘Vehicle Specific Info.’ Enter the vehicle’s make, model and year and scroll down the page.

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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.

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 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 Inter Connect transmitter ("ICX transmitter") will be attached in a later step; however, since the break away wiring harness will be connected to it, choose a location for the ICX transmitter now. Look for a mounting point on the driver's side of the towed vehicle, on the lower portion of the dashboard, where the end of the transmitter with the antenna and socket will be visible and accessible.

Choose an area away from pre-existing components or electronics, and where the transmitter will not present an obstruction or hazard to the driver of the vehicle or interfere with the operation of the vehicle. The mounting surface must be of sufficient strength to hold the transmitter firmly in place, so that an electrical connector can be plugged into and out of the transmitter.

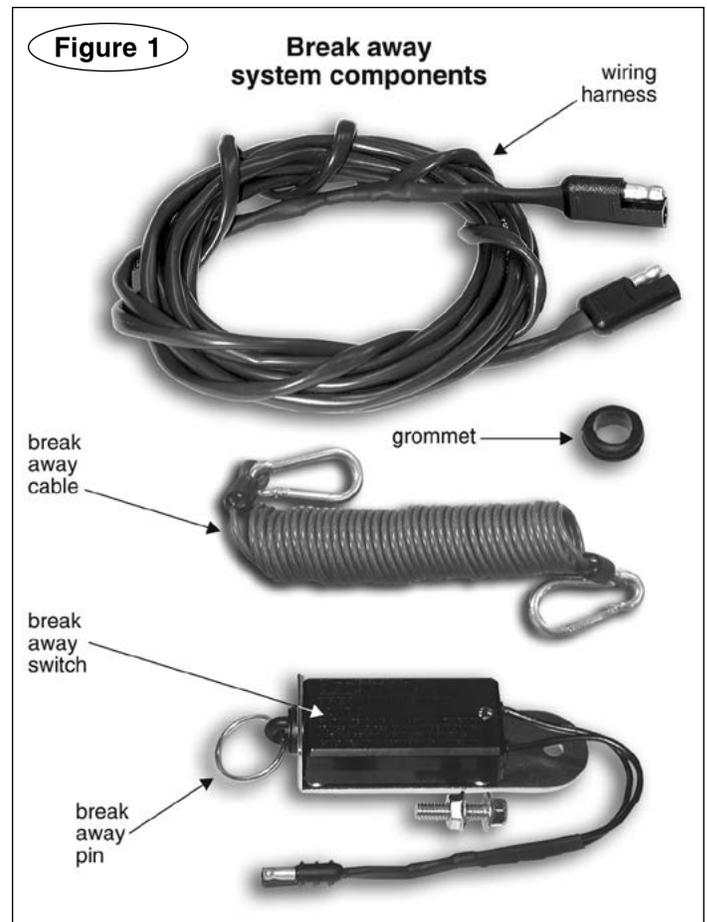
3. Once you have found a location for the ICX transmitter, look for a pre-existing hole in the firewall (or, if there is sufficient space, a pre-existing grommet with other wiring) close to where you will mount the ICX transmitter, to

route the break away wiring harness through the firewall.

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.

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4. Route the wiring harness (Figure 1) 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.

5. Cut through the included grommet (Figure 1) on one side, slide it over the wiring harness and fit the grommet into the hole in the firewall. Feed the remaining length of the wiring harness through the grommet. Then, seal the grommet with a silicone sealant.

You will connect the wiring harness to the ICX transmitter in a later step.

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.

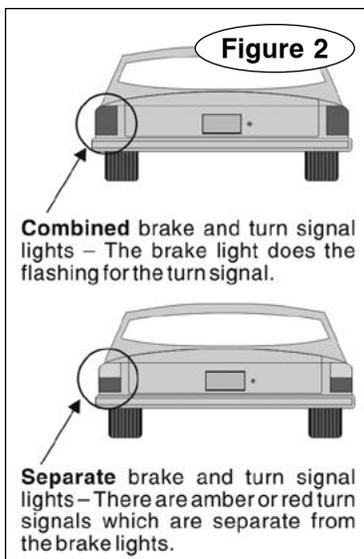
2. Next, test to see if the towed vehicle's brake lights will illuminate with the engine off – with the ignition key at the "tow" position, press the brake pedal and check the brake lights.

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 or magnetic tow lights, complete in-



stallation instructions and wiring diagrams are included with the kits; this information is also available online at www.roadmasterinc.com. Installation instructions for the Brake-Lite Relay are included in the literature packet.)

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. See Step C – "If required, install the Brake-Lite Relay."
- 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. See Step C – "If required, install the Brake-Lite Relay."
- 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 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

If required, install the Brake-Lite Relay

Note: do not install the Brake-Lite Relay unless it is required. Refer to Step B – "Modifications to the towed vehicle's lighting system."

If the Brake-Lite Relay is required, install it now. The instructions are included in the literature packet. After the Brake-Lite Relay is installed, proceed to Step D, "Wire and attach the ICX transmitter."

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

...proceed to Step D, "Wire and attach the ICX transmitter."

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Step D

Wire and attach the ICX transmitter

Once installed, the ICX transmitter will transmit braking activity and system status information from Even Brake to the motorhome monitor.

1. Before attaching the ICX transmitter, first connect the break away system harness and the towed vehicle's brake switch wire to the ICX transmitter. Then, connect the ICX transmitter to a 12-volt power source, as well as a suitable ground...

a. Connect the break away system – plug the end of the break away wiring harness, which you routed through the vehicle's firewall in Step A, into the flat, two-prong molded plug in the ICX transmitter (Figure 3).

b. Connect the brake switch wire...

- If the Brake-Lite Relay **was** installed – push the female spade connector at the end of the green wire into the terminal marked "1" on the ICX transmitter (Figure 3).

- If the Brake-Lite Relay **was not** installed – connect the "cold" side of the brake light switch to the terminal marked "1" on the ICX terminal (Figure 3).

c. Connect a power source – using one of the included fuse taps (Figure 4), connect the red wire from the ICX transmitter to the "cold" side of any fuse with a continuous source of power.

Note: determine which side of the fuse is "cold" – the "cold" side of the socket is the one that registers no voltage when the fuse is pulled.

Note: the fuse tap cannot be attached to a low-profile mini fuse. If necessary, replace a low-profile mini fuse with a standard mini fuse of the same amperage.

Note: unless the red (power) wire is connected to a fuse that provides 12 VDC+ at all times, the motorhome monitor will display error messages relating to low battery power, such as "Low Battery," when towing.

d. Connect to a suitable ground – connect the white wire from the ICX transmitter to any good chassis ground.

2. Once you have connected the break away system harness and the vehicle's brake switch wire to the ICX transmitter, and connected the ICX transmitter to a 12-volt power source and ground, attach the ICX transmitter to the driver's side dashboard, at the mounting point you chose in Step A.

Attach the transmitter so that the end of the transmitter with the antenna and socket will be facing the rear of the vehicle.

Use either the supplied screws (one at each corner) or the Velcro strips to mount the transmitter.

3. Ensure that the wiring for the break away system, the brake switch wire, and the power and ground connections 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 out of the way.

Step E

Install the motorhome monitor

CAUTION

The following instructions are for the initial installation only.

The ICX transmitter and the motorhome monitor are programmed as a set. If a replacement monitor, a replacement ICX transmitter or a second vehicle kit is to be installed, follow the instructions that are included with the kits.

If both units are not programmed as a set, the motorhome monitor will not receive the signal from the ICX transmitter.

1. Find a suitable location for the monitor, near the motorhome driver's seat, which will allow the driver to clearly see the monitor.

2. Before attaching the monitor, test the reception...

a. Connect Even Brake according to the instructions in the "Operation" section of the owner's manual.

b. With Even Brake installed and fully functional, plug the monitor power cord into the motorhome's 12-volt outlet (Figure 5 and 6).

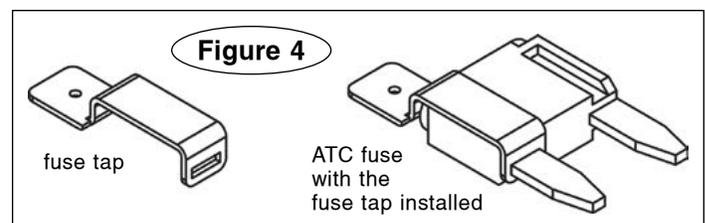
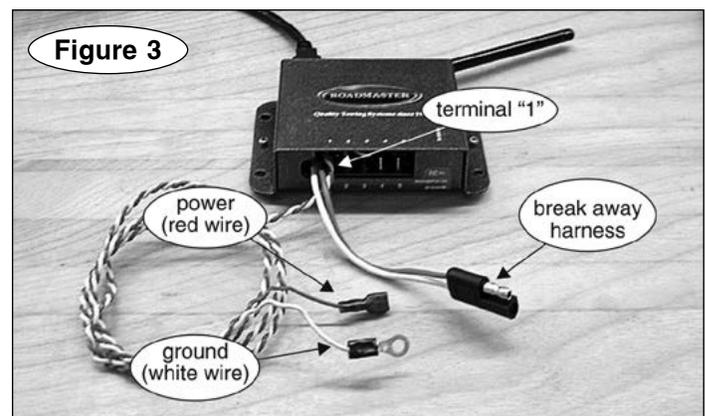
c. Start the motorhome engine.

d. Hold the monitor where you plan to attach it. The LCD text display will read "Even Brake ready to test ↓" (Figure 7) to confirm that the monitor is receiving the signal.

3. After you have confirmed that the monitor is receiving the signal, attach the monitor with the supplied Velcro – peel back the sticker on the Velcro strip, press it into place and attach the monitor to it by pressing the two pieces of Velcro together.

4. If you have unplugged the monitor power cord to attach the monitor, plug it back into the motorhome's 12-volt outlet and secure it with the cord lock.

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

As a final step, test Even Brake to ensure that it has been installed correctly.

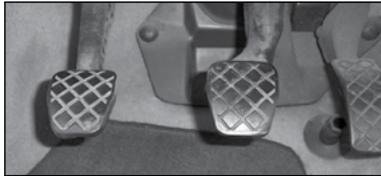
After you are certain Even Brake is functioning as it should, show the owner how to properly operate Even Brake. Demonstrate how to connect and disconnect Even Brake and how to adjust the settings, until the owner is comfortable with its operation.

Step F

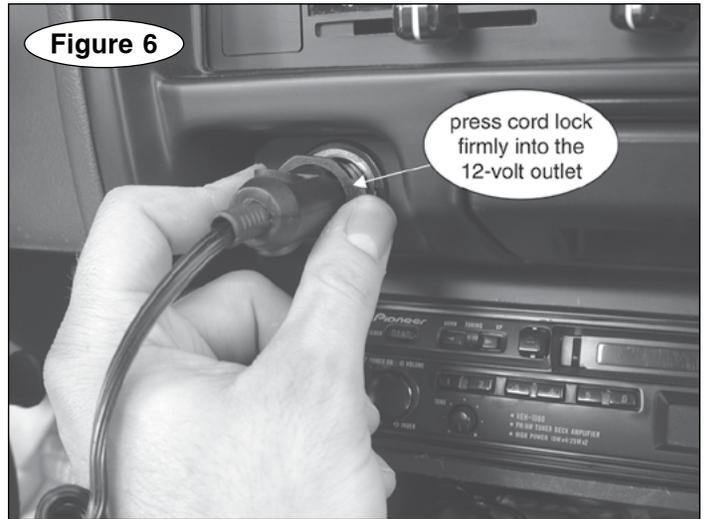
Test all functions

1. Follow the Even Brake owner's manual to connect and disconnect Even Brake, and to adjust its settings.

Note: the Even Brake 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 8 to wire the towed vehicle. If the motorhome has separate brake and turn signals, visit 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 8.

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 9. 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 8.

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.

