

# EVEN BRAKE

Portable *Proportional* Braking System

## Owner's Manual

Entire contents of manual must be read by owner



Part number 9400



Time Tested • Time Proven

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# Welcome to the ROADMASTER family!

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This manual has been prepared to acquaint you with the installation, operation, care and maintenance of your Even Brake, and to provide you with important safety information.

Read your owner's manual cover to cover. Understand how to install and operate your Even Brake, and carefully follow the instructions and safety precautions.

We thank you for your patronage and greatly appreciate your discerning taste.

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## 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.

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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 draw .....	10.8 amps
Idle amperage draw.....	47mA
Approximate maximum air pressure .....	60 psi
Maximum force extended on brake pedal.....	106 pounds
Minimum space Even Brake can fit.....	16 inches

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.

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### Save this manual

Save this manual for future reference. It contains important sections relative to safety, use, parts replacement and other information. Therefore, make sure this manual is always with you when you're towing.

You may download or print a copy of the most current manual at [www.roadmasterinc.com](http://www.roadmasterinc.com) (under 'Support').

### Even Brake serial number

Your Even Brake serial number is on a label on the underside of the unit. You will need this number when you fill out your product registration card.

Write down the serial number in the space below and retain for future reference...

Serial number: \_\_\_\_\_

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## IMPORTANT NOTICE!

### Safety Definitions

This manual contains 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.*

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### **WARNING**

**Read all instructions before installing or operating your 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 systems 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 supple-

mental brakes has an active braking system — refer to the owner's manual or call 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**

**If the towed vehicle has a keyless ignition system (a.k.a. 'push button start') AND a Brake-Lite Relay has been installed, the motorhome parking lights must be turned on when towing. This will supply current to the Brake-Lite Relay. If the parking lights are not turned on, the Brake-Lite Relay will not function, which will prevent the towed vehicle's brake lights from operating properly.**

### **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 the instructions in this manual.**

**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.**



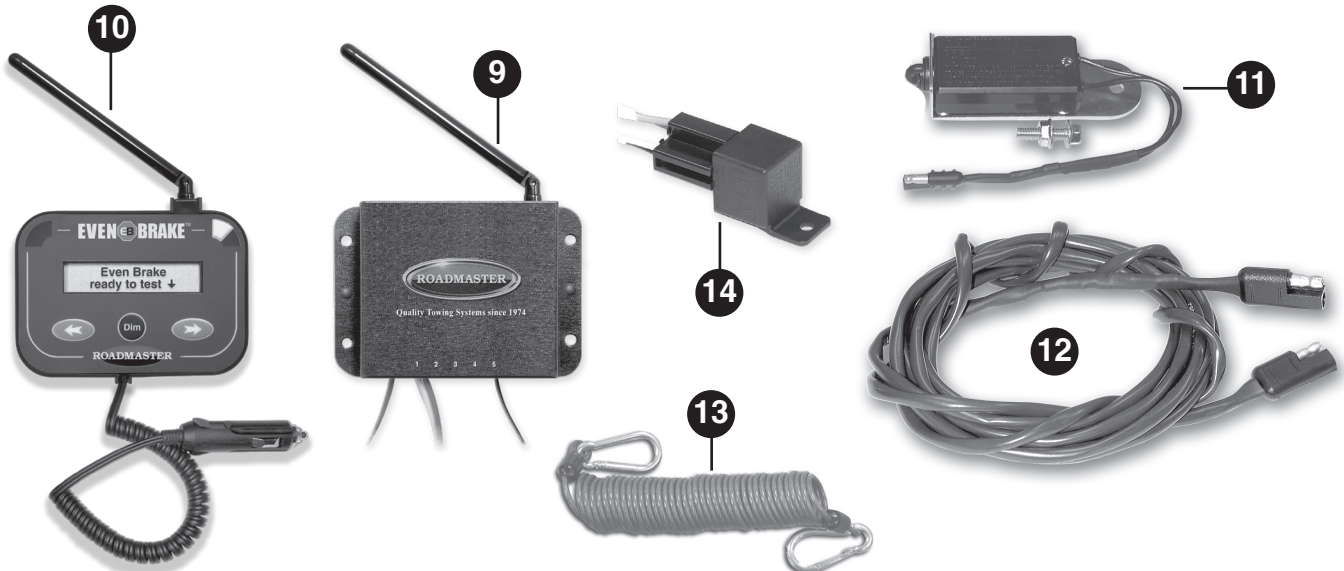
# Components

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

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



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



## CAUTION

### If the towed vehicle's engine must be started periodically...

Always deplete the vacuum in the vehicle's power brake system BEFORE YOU RESUME TOWING. If the vacuum is not released, Even Brake will apply excessive force when it is activated, which will cause severe tire and/or brake system damage to the towed vehicle. Refer to the caution statement on page 9 for further information.

## Operation

This section contains detailed operating instructions. Refer to this section until you become familiar with each step. (Before connecting or disconnecting Even Brake, also refer to the "Quick Reference Checklist" for additional warnings and cautions.)

### Step A

#### Attach the pedal clamp

1. First, connect the tow bar to the motorhome and the towed vehicle.

Then, according to the manufacturer, make all adjustments necessary to prepare the vehicle for towing.

These adjustments may include: turning the ignition key to the 'tow' position; pulling fuses; disconnecting the battery; and setting the transmission to a particular gear or in a particular sequence.

Refer to the owner's manual or call the dealership for vehicle-specific information.

### CAUTION

To prevent the towed vehicle from rolling, connect and attach the tow bar to both vehicles before shifting the towed vehicle's transmission into the proper gear for towing.

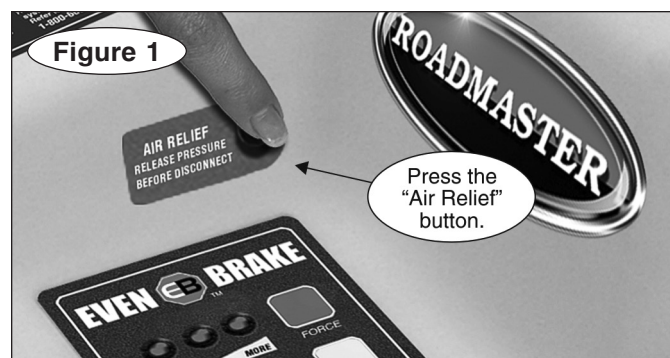
2. Remove Even Brake from the box, using the adjustable seat pad as a handle.

3. Slide the driver's seat back, as far as it will go.

4. Position Even Brake between the driver's seat and the brake pedal, at the approximate position it will sit when connected to the brake pedal.

*Note: if the towed vehicle has a steering wheel tilt latch, it may be easier to position Even Brake with the steering wheel tilted up.*

*Note: rubberized floor mats will cause Even Brake to "climb" the driver's seat. If the vehicle has a rubberized floor mat, remove it when towing.*



*Note: the adjustable seat pad at the back may be removed, if that provides the best fit.*

### WARNING

Seat and/or pedal positioning systems may affect the towed vehicle braking system.

Determine if the vehicle to be towed is equipped with pedal presets and/or automatic seat adjustments. Proper installation of the braking system may be affected by these presets; if the vehicle is so equipped, note the original installed position and return to that position before towing the vehicle.

If the seat and/or brake pedal are not at the original installed position when the vehicle is towed, the brake pedal may apply unnecessary braking force, which will damage the brake system and/or electrical system, causing brake system failure, electrical system failure or other non-warranty damage.

5. Press the air relief button (Figure 1) to make certain that all of the air in the Even Brake air reservoir has been released. If there is air in the reservoir, continue to hold the button down until the air is released – air in the reservoir will prevent the cylinder from extending when you connect the brake pedal clamp to the brake pedal.

6. Continue to hold the air relief button down and pull forward on the pedal clamp, to extend the air cylinder shaft. Release the air relief button.

7. Verify that the pedal clamp is right side up, as shown in Figure 2 – the arrow on the sticker will point "Up" when the pedal clamp is properly positioned.

8. Pull the hairpin clip (Figure 2) out, then lift the slotted arm (Figure 2) up and out of the way.

9. Move the pedal clamp over the brake pedal. Then, hold the clevis (Figure 3) and pull back on the spring post (Figure 3) until the tabs under the pedal clamp are wide enough to clear the brake pedal.

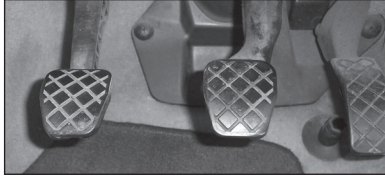
10. Fit the pedal clamp onto the brake pedal, so that all four tabs are hooked around it (Figure 4). Then, release the spring post.

*Note: the Even Brake pedal clamp will not fit the*  
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## Attach the pedal clamp

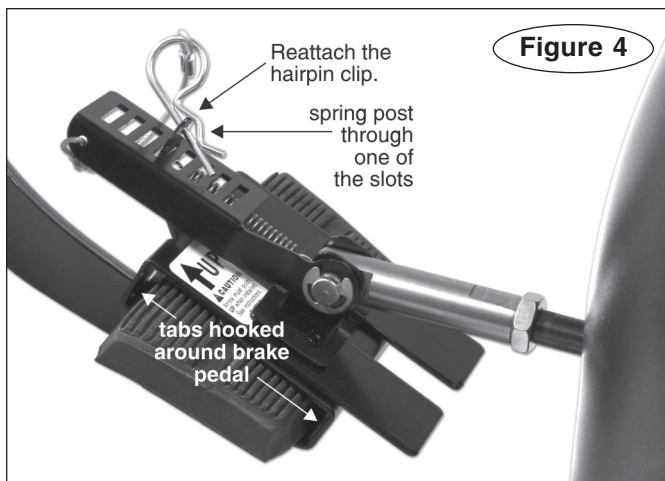
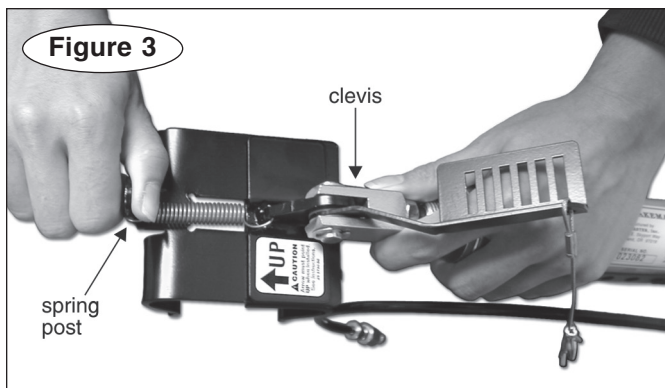
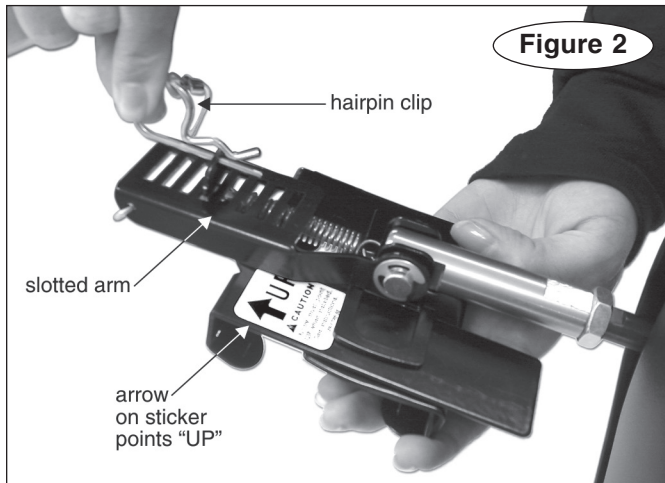
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brake pedals of a small number of late-model Volkswagen vehicles, such as the 2007 Volkswagen Golf. A photo of the 2007 Golf brake pedal is shown above.



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

Note: on the initial fitting, it may be necessary to adjust the tabs on the pedal clamp — use pliers to bend any or all of the tabs so that they hook around and under the towed vehicle's brake pedal.



Once the tabs have been adjusted to a specific brake pedal, no further adjustment to the pedal clamp is necessary for that vehicle.

For every subsequent vehicle, inspect the pedal clamp on the initial fitting. Verify that all four tabs are hooked around and under the brake pedal. If necessary, bend the tabs to fit, as described above.

## CAUTION

Make certain that all four tabs on the pedal clamp are securely hooked around the brake pedal (Figure 4). If the tabs are loose, the pedal clamp can rotate out of position and hold the brake pedal down, even when Even Brake is not activated, which will cause brake damage or other consequential, non-warranty damage.

11. Swing the slotted arm back over the spring post, fit the spring post through one of the slots, and reattach the hairpin clip (Figure 4).

Note: the spring post may be bent slightly with a pair of pliers, if necessary, in order to fit it through one of the slots.

## Step B

### Adjust the feet and the seat pad

1. Now that the pedal clamp is in place, move Even Brake forward, until the air cylinder shaft is fully retracted. (Figure 5). Make certain that Even Brake is not depressing the towed vehicle's brake pedal.

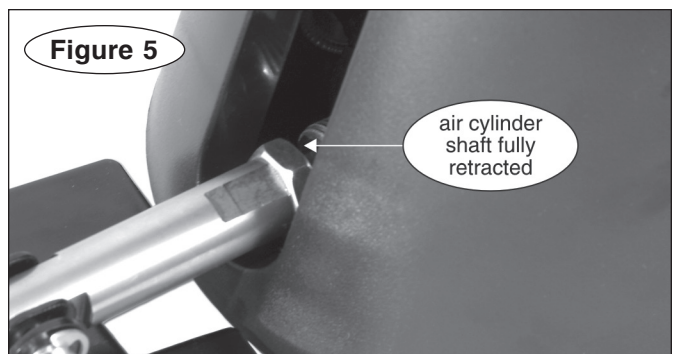
## ⚠ WARNING

Do not move Even Brake too far forward, to the extent that the pedal clamp is depressing the brake pedal. If the brake pedal is depressed, the brakes will be applied continuously, which will cause severe tire and/or brake system damage, as well as other consequential, non-warranty damage.

2. If necessary, adjust the feet on the bottom of Even Brake (one at each corner – Figure 6) up or down, by turning them clockwise or counterclockwise. Make certain that all four feet are making contact with the floor of the vehicle, and that Even Brake is stationary – it should not rock back and forth.

(It may be necessary to remove one or more of the

*continued on next page*





## Adjust the feet and the seat pad

*continued from preceding page*

feet for some vehicles, or it may be necessary to add one or more optional extensions – see the “Vehicle-Specific Components” section in this manual.)

3. With a wrench, tighten the lock nut at the top of each foot extension (Figure 6).

### CAUTION

Unless the lock nuts are tightened with a wrench, the feet may vibrate loose during towing, and Even Brake may shift from the installed position. Unless Even Brake is properly positioned, it will not function at full capacity — the pedal clamp will not apply the proper braking pressure against the brake pedal.

4. Find a bracing point on the front of the driver’s seat for the adjustable seat pad – the seat pad stabilizes Even Brake, keeping it down as it presses against the brake pedal. Press the front of the seat to find the firmest point for the seat pad.

*Note: do not brace the adjustable seat pad against plastic trim. The plastic will crack when Even Brake is activated.*

Now that you have selected a bracing point for the adjustable seat pad, loosen the adjustment knob (see “Components,” page two) at the back of the seat pad, and move the seat pad up or down until the top of the seat pad matches the height of the bracing point.

Once the height is adjusted, tighten the knob on the seat pad.

*Note: the seat pad may be rotated 180 degrees or removed entirely for a better fit. There are also two anchor holes that the knob on the seat pad may be threaded into, for additional fit options.*

5. Next, slide the driver’s seat forward, until it just touches the adjustable seat pad. If necessary, allow a small gap, rather than allowing Even Brake to depress the brake pedal.

Make certain that Even Brake is not depressing the towed vehicle’s brake pedal.

### ⚠ WARNING

The driver’s seat must not be too far forward, to the extent that the Even Brake pedal clamp is depressing the towed vehicle’s brake pedal.

If the brake pedal is depressed, the brakes will be applied continuously, which will cause severe tire and/or brake system damage, as well as other

consequential, non-warranty damage.

## Step C

### Connect Even Brake to the ICX transmitter

1. Connect the ICX transmitter cord from Even Brake to the ICX transmitter (Figure 7).

### CAUTION

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.

## Step D

### Plug in the power cord

### ⚠ 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.

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.

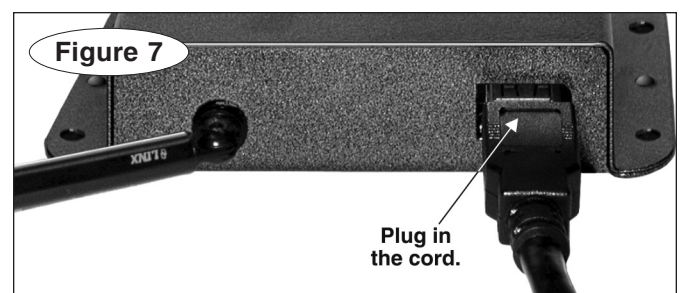
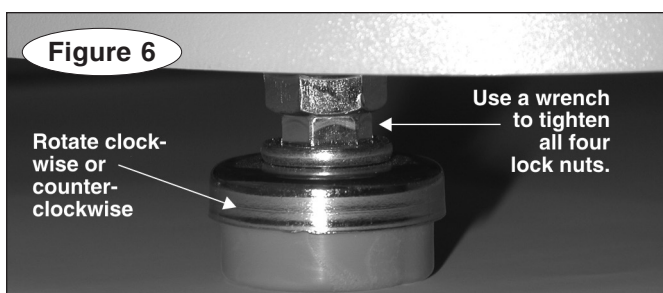
### CAUTION

Check the 12-volt outlet socket before plugging in the Even Brake 12-volt power cord, to 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.

If the 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.

1. Plug the 12-volt power cord into the 12-volt outlet and secure it by pressing the cord lock into the 12-volt outlet (Figures 8 and 9).

*continued on next page*



## Plug in the power cord

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### CAUTION

Push the cord lock forward, into the 12-volt outlet, to properly secure the 12-volt power cord. If the cord lock is not over the 12-volt outlet, the 12-volt power cord may vibrate loose, causing a loss of power or an intermittent power supply.

Even Brake will not function without a continuous power supply.

2. Now, the red light on the 12-volt power cord should illuminate. If not, there is no power.

Some vehicles only have power at the outlet when the engine is running.

If there is no power, you can install ROADMASTER's optional 12-volt outlet kit (part number 9332; refer to the "Vehicle-Specific Components" section). When installed, this outlet will provide power even when the engine is off.

3. When the power cord is plugged in, the air compressor will run, until the air reservoir is filled. Wait for the air reservoir to fill before pressing the "Test" button (Step F, "Test and adjust positioning; deplete the vacuum in the power brakes").

## Step E

### Plug in the motorhome monitor

### CAUTION

The motorhome monitor and the ICX transmitter 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. Now that the power cord is connected, plug the motorhome monitor power cord into the motorhome's 12-volt outlet.

*Note: press the cord lock on the motorhome monitor power cord into the motorhome's 12-volt outlet — follow the instructions in the preceding section (step one under "Plug in the power cord") to properly secure the 12-volt power cord.*

2. Start the motorhome engine.



The motorhome monitor LCD text display will read "Even Brake ready to test ↓" (Figure 10), and the yellow LED will be illuminated, to confirm that the monitor is receiving the signal.

### CAUTION

If the green LED is illuminated and the LCD text message reads "Even Brake," the motorhome monitor is not receiving a signal from the ICX transmitter. The motorhome monitor will not report braking activity or system status information.

Severe damage to the towed vehicle can occur if the driver of the motorhome is unaware of braking activity at the towed vehicle.

Follow the appropriate instructions in the "Troubleshooting" or "Communications" sections ("Overview" and "Reference Chart") in this manual, until the monitor LCD text display reads "Even Brake ready to test ↓."

## Step F

### Test and adjust positioning; deplete the vacuum in the power brakes

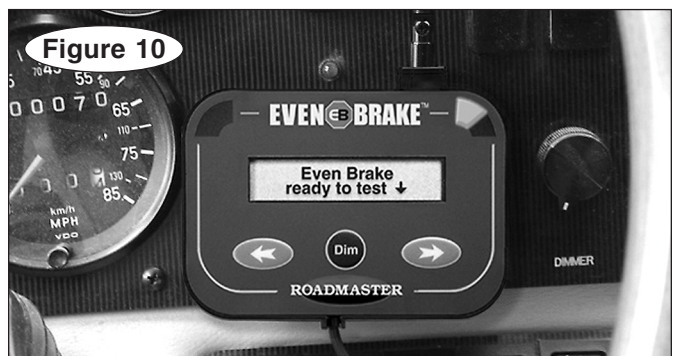
Before towing, always press the "Test" button down, then release it — Even Brake will cycle the pedal clamp up and down three times.

This test cycle is necessary for two reasons: 1) to ensure that Even Brake is positioned correctly; and 2) to deplete any stored vacuum in the towed vehicle's power brake system.

### CAUTION

Always deplete the stored vacuum in the towed vehicle's power brake system before towing — press the "Test" button down, then release it, to cycle the pedal clamp up and down three times.

*continued on next page*





## Test and adjust positioning; deplete the vacuum in the power brakes

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Depending on the make and model of the towed vehicle, it may be necessary to repeat the test cycle a second time.

If the vacuum is not released, Even Brake will apply excessive braking force when it is activated, which will cause severe tire and/or brake system damage to the towed vehicle.

1. Press the green “Test” button (Figure 11) on the touch pad control panel. Even Brake will begin a self-diagnostic test.

As part of the test, Even Brake will cycle the pedal clamp up and down three times.

If Even Brake moves excessively, or interferes with seat position controls, adjust its position. Check the adjustable seat pad and readjust it, if necessary.

*Note: rubberized floor mats will cause Even Brake to “climb” the driver’s seat. If the vehicle has a rubberized floor mat, remove it when towing.*

### CAUTION

If the adjustable seat pad is not properly positioned, Even Brake can “climb” up the driver’s seat. This will cause the rear of the box to rise up off the floor, making Even Brake more sensitive.

If this occurs, the towed vehicle will brake excessively and unnecessarily, which may cause non-warranty brake damage.

Check the adjustable seat pad after the pedal clamp has cycled during a test. If the rear of the box has “climbed” the driver’s seat, readjust the seat pad so that Even Brake cannot “climb.”

2. After Even Brake has completed the self-diagnostic test, the test light (Figure 11) will illuminate green to indicate the system is ready, or red to indicate the system is not ready.

If the test light is green, proceed to the next step – programming brake force and sensitivity.

If the test light is red, check the motorhome monitor LCD text display for detailed information. You can also refer to the “Communications” sections (“Overview” and “Reference Chart”) in this manual.

## Step G

### Set braking force and braking sensitivity preferences

(Even Brake is a proportional system, and will always brake the towed vehicle in tandem with the motorhome. The range of its response to the motorhome is virtually infinite. Setting braking preferences will program Even Brake to respond with the appropriate force and sensitivity within that range.)

It is not necessary to set braking force and sensitivity preferences – if no preferences are selected, Even Brake will revert to the “average” setting for both, which

is the default value.

It is also not necessary to select braking preferences every time you connect Even Brake. It will always revert to the last preferences selected (or the default values, if none were selected), when you connect it to the towed vehicle.

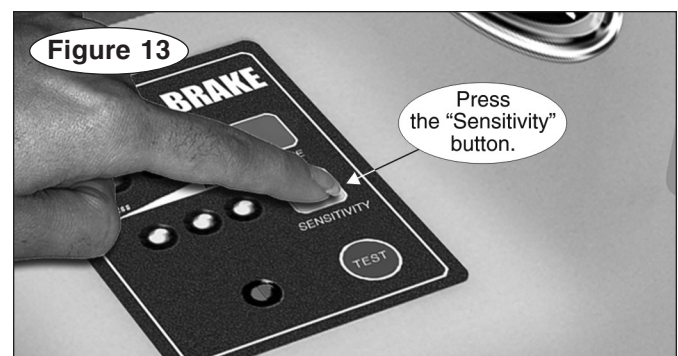
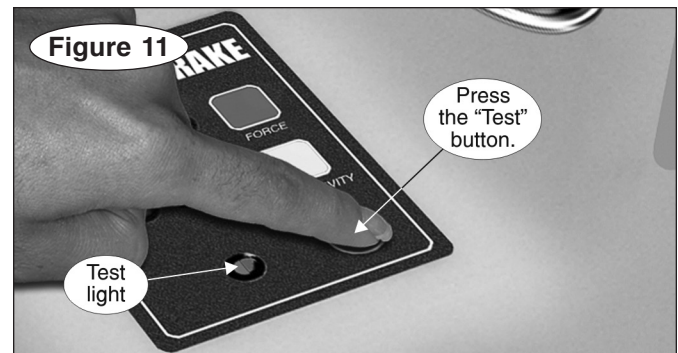
1. Set the braking force. This setting tells Even Brake how **hard** to apply the brakes. There are three choices: “less;” “average;” or “more” force.

Press the red “Force” button on the touch pad control panel (Figure 12). One of the three LEDs next to the “Force” button will illuminate. The LED furthest away from the “Force” button indicates “less” force; the center LED indicates “average” force; and the LED closest to the “Force” button indicates “more” force. Continue to press the “Force” button until the appropriate LED illuminates to confirm your choice.

If you are unsure which setting to select, set Even Brake to “average” and readjust it later, if you find that you prefer more or less braking force.

2. Set the braking sensitivity. This setting tells Even Brake **when** to apply the brakes. There are three choices: “less;” “average;” or “more” sensitivity. If Even Brake

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## Set braking preferences

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is “more” sensitive, it will brake more often; if Even Brake is “less” sensitive, it will brake less often.

Press the yellow “Sensitivity” button on the touch pad control panel (Figure 13). One of the three LEDs next to the “Sensitivity” button will illuminate. The LED farthest away from the “Sensitivity” button indicates “less” sensitivity; the center LED indicates “average” sensitivity; and the LED closest to the “Sensitivity” button indicates “more” sensitivity. Continue to press the “Sensitivity” button until the appropriate LED illuminates to confirm your choice.

If you are unsure which setting to select, set Even Brake to “average” and readjust it later, if you find that you prefer more or less braking sensitivity.

## Step H

### Connect the break away cable and test the break away system

1. Clip the steel break away cable (Figure 14) to the break away pin (Figure 14), then clip the other end of the steel cable to the rear of the motorhome, close to the center.

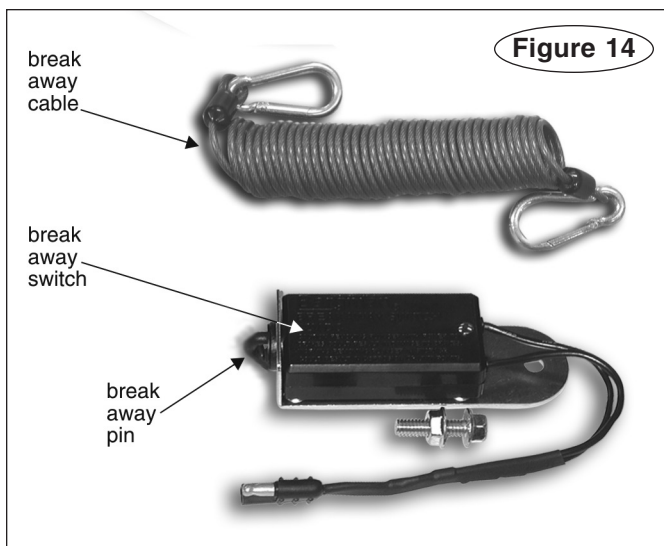
2. Periodically, test the break away system – pull the break away pin out of the break away switch. Even Brake should activate when the pin is pulled – the pedal clamp will extend. Insert the pin back into the switch. The Even Brake pedal clamp will retract.

To clear the break away message from the motorhome monitor, unplug the motorhome monitor, then plug it back in.

### WARNING

When connecting the break away system, always check the following:

- Connect the cable at the rear of the motorhome, close to the center. Connecting the cable toward either side of the motorhome may cause the break away pin to be pulled when the motorhome turns, activating the break away system.



- Be sure there are no obstructions which would prevent the cable from pulling freely away from the break away switch. Do not wrap the cable around anything — doing so could keep the cable from pulling the break away pin, preventing the system from activating in a break away.

- Make certain the cable is the correct length...
  - The cable must be long enough to prevent the break away pin from being pulled out during normal towing — make certain there is enough slack to allow for sharp turns. If the cable is not long enough, the break away system will activate even though the towed vehicle has not detached.
  - The break away cable must be longer than the safety cables. This will prevent the break away system from activating if a component of the towing system has separated, but the towed vehicle is still held by the safety cables.
  - Make certain that the cable is not too long — it should not hang down to the extent it may catch on obstructions, or drag on the ground. This much slack could allow the cable to be pulled inadvertently, activating the break away system.
  - If you have a telescoping tow bar, allow enough slack for the tow bar arms to be fully extended.
  - Except to test the break away system, leave the break away pin in place, even when the vehicle is not being towed. If Even Brake is connected and the break away pin is pulled, the break away system will be activated. The air cylinder will extend; it will not retract until the pin is replaced.

Additionally, the Even Brake compressor will run constantly, which will damage the compressor and drain the vehicle’s battery.

As long as the pin is removed, the ICX transmitter will send a break away signal. This signal may interfere with or disrupt keyless entry systems or other remote controlled devices.

Removing the pin will also expose the interior of the break away switch to damage from the elements. If the components of the switch are corroded, the switch may only function intermittently or not at all.

Additionally, Even Brake will not pass its diagnostics test if installed while the breakaway pin is removed.

# Quick reference checklist

## Connecting Even Brake

1. Slide the driver's seat back, as far as it will go.
2. Position Even Brake between the driver's seat and the brake pedal, at the approximate position it will sit when connected to the brake pedal. (The adjustable seat pad can be used as a handle.)
3. Press the air relief button (Figure 1) to make certain that all of the air in the Even Brake air reservoir has been released.
4. Attach the pedal clamp to the brake pedal.
5. Move Even Brake forward, until the air cylinder shaft is fully retracted (Figure 5).
6. Slide the driver's seat forward, until it just touches the Even Brake adjustable seat pad. If necessary, allow a small gap, rather than allowing Even Brake to depress the brake pedal.

### WARNING

**The driver's seat must not be too far forward, to the extent that the Even Brake pedal clamp is depressing the towed vehicle's brake pedal.**

**If the brake pedal is depressed, the brakes will be applied continuously, which will cause severe tire and/or brake system damage, as well as other consequential, non-warranty damage.**

7. Connect the ICX transmitter cord.
8. Connect the 12-volt power cord, and secure it with the cord lock.
9. Plug in the motorhome monitor, and secure it with the cord lock.
10. Release the stored vacuum in the towed vehicle's power brake system by pressing the "Test" button (Figure 11) down. Then release it. Even Brake will cycle the pedal clamp up and down three times.

Depending on the make and model of the towed vehicle, it may be necessary to repeat the test cycle multiple times.

After the pedal clamp has been cycled up and down three times, verify that the "Test" light is green.

11. Connect the break away cable (Figure 14) to the front of the towed vehicle and to the rear of the motor-

### CAUTION

**Always deplete the stored vacuum in the towed vehicle's power brake system before towing — press the "Test" button down, then release it, to cycle the pedal clamp up and down three times.**

**Depending on the make and model of the towed vehicle, it may be necessary to repeat the test cycle multiple times.**

**If the vacuum is not released in this manner, Even Brake will apply excessive braking force when it is activated, which will cause severe tire damage ("flat spotting") and/or brake system damage to the towed vehicle.**

home. Periodically, test the break away system.

12. Make certain that the towed vehicle's emergency brake is released.

### WARNING

**Failure to release the towed vehicle's emergency brake before towing will result in severe brake damage or a brake system fire.**

**Damage caused by neglecting to release the emergency brake before towing is not covered under warranty.**

### CAUTION

**Even Brake is designed to work with a 'dead' brake pedal. Do not leave the vehicle's engine running while towing, as this will allow the power brakes to function. The power brakes will cause excessive braking in the towed vehicle, resulting in non-warranty tire and/or brake system damage.**

**Disconnect Even Brake if, for any reason, you must tow with the engine running.**

### CAUTION

**If the towed vehicle's engine must be started periodically (according to the manufacturer's instructions), and Even Brake is installed, stop the motorhome while the towed vehicle's engine is running.**

**Once the engine is turned off, press the "Test" button on the Even Brake control pad. During the test, Even Brake will extend and retract the brake pedal clamp, which will release the vacuum in the towed vehicle's power brake system.**

**Depending on the make and model of the towed vehicle, it may be necessary to repeat the test cycle multiple times.**

**If the vacuum is not released in this manner, Even Brake will apply excessive braking force when it is activated, which will cause severe tire damage ("flat spotting") and/or brake system damage to the towed vehicle.**

## Disconnecting Even Brake

1. Pull on the cord lock (Figure 8 and 9) to release it, and unplug the Even Brake 12-volt power cord. Then, unplug the ICX transmitter cord.

### CAUTION

**Always unplug the 12-volt power cord *before* unplugging the ICX transmitter cord. Otherwise, the transmitter may send a continuous RF signal. This may disrupt wireless components such as the door lock, trunk lock or security alarms.**

2. Move the driver's seat back, as far as it will go.

*continued on next page*



## Disconnecting Even Brake

*continued from preceding page*

3. Press and hold the air relief button (Figure 1) until all the air in the air reservoir is released. If necessary, continue to hold the air relief button and move Even Brake back, to allow easier access to the brake pedal.

4. Detach the pedal clamp from the brake pedal. Press and hold the air relief button and move the pedal clamp back, toward Even Brake, until the air cylinder shaft is fully retracted (Figure 5).

5. Wrap the 12-volt power cord and the ICX transmitter cord around the cord holder, and lift Even Brake out of the vehicle. (The adjustable seat pad can be used as a handle.)

6. Disconnect the break away cable (Figure 14) from the front of the towed vehicle and the motorhome. Do not remove the pin from the break away switch.

### CAUTION

**Leave the break away pin in place, even when the vehicle is not being towed...**

- **If the pin is not in place when Even Brake is connected, the break away system will be activated — the air cylinder will extend and will not retract.**
- **Additionally, as long as the pin is removed, the ICX transmitter will send a break away signal. This signal may interfere with or disrupt keyless entry systems or other remote controlled devices.**

# Communications — Connection and braking

## Monitor messages

Even Brake will report system status at the motorhome monitor as you connect it to the towed vehicle and also when it applies the brakes. The chart below shows which color LED will illuminate for each condition or activity, the LCD text message(s) that will accompany it, and if there will be an audio alert.

The LED on the Even Brake control pad (next to the “Test” button) may also illuminate to indicate a certain activity or condition.

(Even Brake will also report conditions or activities which require an adjustment. See the Communications “Overview” and “Reference Chart” sections in this manual.)

The LCD text display will first report the activity or condition. (The “1st message” column in the chart below lists the initial messages.) If the first message ends with a flashing down-

ward pointing arrow (↓), a specific action is required. Press the button with the right-hand arrow (>) on the motorhome monitor to scroll to the second message (Figure 15), which will display the required action (the “2nd message” column in the chart below).

## Expanded descriptions

A description of the connection and braking messages follows.

### 1. System is ready to test

Even Brake has been installed, and the ICX transmitter cord and the power cord are connected. The LCD display will read “Even Brake ready to test ↓.” An audio alert at the motorhome monitor will accompany this message; it will stop when you press the button with the right-hand arrow (>) on the motorhome monitor to scroll to the second message, which will prompt you to

“Press (the) Even Brake Test button” on the Even Brake control pad.

### 2. Passed test — system ready

When the “Test” button is pressed, Even Brake will run a self-diagnostic test. To indicate that the braking system is operational and ready to brake the towed vehicle, the LCD display will read “Test is good — System ready.”

### 3. System is fully operational (no braking)

When towing, the green LED on the motorhome monitor will stay illuminated constantly, to indicate that Even Brake is fully operational and ready to brake.

### 4. Normal braking

When Even Brake is activated, the LCD display will read “Braking” and the red LED on the motorhome monitor will illuminate, to indicate that the towed vehicle’s brakes are being applied.

**E**ven Brake will report system status at the motorhome monitor as you connect it to the towed vehicle, and also when it applies the brakes. Refer to the section above for an expanded description of each message.

MOTORHOME LCD TEXT DISPLAY	MOTORHOME LED DISPLAY			AUDIO	REPORTED ACTIVITY OR CONDITION	EVEN BRAKE CONTROL PAD		
	RED	YELLOW	GREEN			RED	GREEN	RED/GREEN
1st MESSAGE								
2nd MESSAGE								
“Even Brake ready to test ↓”		•		•	1. System is ready to test (power and ICX transmitter cords connected)			•
“Test is good System ready”					2. Passed test — system ready		•	
					3. System is fully operational (no braking activity)		•	
“Braking”	•				4. Normal braking (Even Brake has activated)		•	

# Communications — Overview

## Responding to an LCD prompt

Even Brake will report braking activities or system conditions at the motorhome monitor, some of which require a specific action. The LCD text display will prompt you with a flashing downward-pointing arrow (↓) to indicate there is further information.

The LCD text display will first report the activity or condition. (The “1st message” column in the chart on page 14 lists the initial messages.) If the first message ends with a flashing downward-pointing arrow (↓), press the button with the right-hand arrow (>) on the motorhome monitor to scroll to the second message (Figure 15), which will display the required action or additional information (the “2nd message” column in the chart on page 14).

If the second message or a subsequent message ends with a flashing downward-pointing arrow (↓), press the button with the right-hand arrow (>) on the motorhome monitor to scroll to the next message.

After the first message, each subsequent message in that series will be displayed for 15 seconds after the button with the right-hand arrow is pressed. If the button is not pressed after that time, the LCD screen will revert to the first message in that series.

## To clear the monitor

After an adjustment in response to an LCD text message, unplug the Even Brake 12-volt power cord at the towed vehicle, then unplug the ICX transmitter cord. Then plug the cords back in and press the “Test” button. This will clear the current message.

*Note: after an adjustment, unless the Even Brake power cord and the ICX transmitter cord are unplugged and then plugged back in, and the “Test” button is pressed, the motorhome monitor will continue to display the same message.*

## Audio alerts

In addition to LED and LCD signals, an audio alert will accompany braking activities or conditions of immediate concern. The audio alerts will vary in intensity, depending on the activity or condition.

The audio alert will stop when either the button with the left-hand arrow (<) or the right-hand arrow (>) on the motorhome monitor is pressed.

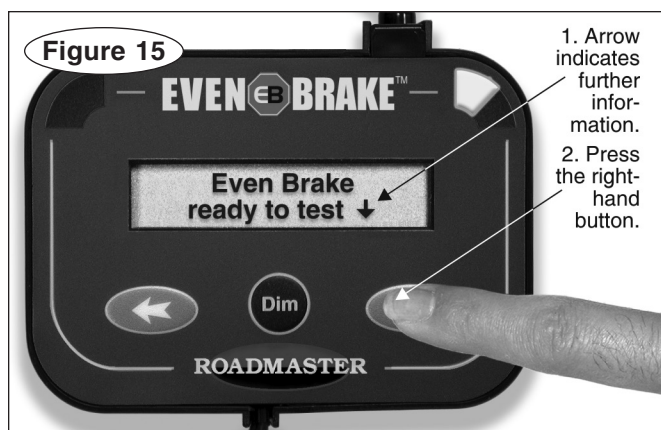
## Dimmer button

For night time driving, press the “Dim” button on the motorhome monitor to reduce the intensity of the LEDs and LCD display by 40 percent. Pressing the “Dim” button a second time will return the intensity of the LEDs and LCD display to 100 percent.

## Towed vehicle battery voltage check

The voltage in the towed vehicle’s battery can be checked after at least one braking activity. Press the button with the left-hand arrow (<) on the motorhome monitor once, and the voltage will be displayed on the LCD text display.

*(Note: it may take up to five minutes before the voltage data is available.)*



## Reference chart

The chart on page 14 shows which color LED(s) will illuminate for each condition or activity, the LCD text message(s) that will accompany it, and if there will be an audio alert.

The chart also shows if the LED on the Even Brake control pad (next to the “Test” button) will also illuminate to indicate a certain activity or condition.

## Expanded descriptions

A description of the motorhome monitor messages listed on page 14 follows.

### 1. The Even Brake power cord or ICX transmitter cord has been unplugged

If either the 12-volt power cord or the ICX transmitter cord has been unplugged, Even Brake will shut down until the cord is plugged back in.

The red LED on the motorhome monitor will illuminate, and the LCD text display will read “Even Brake is Turning Off.”

### 2. The break away wiring harness has a short circuit

As part of the self-diagnostic program, Even Brake checks the towed vehicle’s break away system electrical circuit. If the break away harness has a short circuit, the LCD text display on the motorhome monitor will read “Break Away Cable Not Operational ↓,” and the red and yellow LEDs on the monitor will illuminate. The second message in this series will instruct you to call the factory for further information.

### 3. Battery level is low on initial self-diagnostic test

In order to function, Even Brake draws power from the towed vehicle’s battery. If there is insufficient voltage in the towed vehicle’s battery to power Even Brake, it will not operate.

If the LCD text message at the motorhome monitor reads “Not operational – Low Battery ↓” during the initial self-diagnostic test, recharge the towed vehicle’s battery (with a battery charger or by running the engine) to increase the voltage.

### 4. Battery voltage check

The voltage in the towed vehicle’s battery can be checked after at least one braking activity. Press the button with the left-hand arrow (<) on the motorhome monitor once, and

*continued on next page*



## Communications — Overview

*continued from preceding page*

the voltage will be displayed on the LCD text display.

*(Note: it may take up to five minutes before the voltage data is available.)*

### 5. Insufficient voltage — low battery

In order to function, Even Brake draws power from the towed vehicle's battery. If the LCD text message reads "Low battery – Charge battery," there is insufficient voltage to power Even Brake.

Recharge the towed vehicle's battery (with a battery charger or by running the engine) to increase the voltage.

An audio alert accompanies this message.

### 6. 'Power Save' mode activated

Before the voltage in the towed vehicle's battery is completely depleted, Even Brake will revert to the 'Power Save' mode. In this mode, Even Brake will not draw power from the towed vehicle's battery, and will not function except in an emergency break away.

An audio alert accompanies this message.

To regain normal braking in the towed vehicle...

a. Unplug the Even Brake 12-volt power cord and the ICX power cord.

b. Charge the towed vehicle's battery (with a battery charger or by running the engine).

c. Plug the Even Brake ICX power cord back into the ICX transmitter, and the 12-volt power cord back into the towed vehicle's 12-volt outlet.

d. Press the "Test" button on the Even Brake control pad.

## CAUTION

**If the towed vehicle's engine has been turned on for any reason, press the "Test" button on the Even Brake control pad once the engine has been turned off and the vehicle is ready to be towed.**

**As part of the test, Even Brake will extend and retract the pedal clamp, which will deplete the residual vacuum in the vehicle's power brakes.**

**If the vacuum is not depleted, Even Brake will brake excessively, resulting in non-warranty tire and/or brake system damage.**

### 7. Compressor time limit exceeded

When Even Brake is connected to the towed vehicle, it will run a self-diagnostics test. As part of the test, Even Brake will measure the amount of time it takes to fill the air reservoir. If it takes an inordinate amount of time to fill the reservoir, Even Brake will instruct you to call the factory for further information.

### 8. Brake pedal depressed continuously

As part of the initial self-diagnostic test, Even Brake checks the towed vehicle's brake light switch. If the brake light switch remains on, indicating that the brake pedal is being depressed continuously, the LCD message will read "Not operational – more info. ↓." Press the button with the right-hand arrow (>) on the monitor to scroll to the second and subsequent messages, which will display the required action(s).

An audio alert accompanies this message.

### 9. Towed vehicle brake electronics are not connected to Even Brake

As part of the initial self-diagnostic test, Even Brake will check the towed vehicle's brake light switch. If there is no signal from the switch, indicating that the braking system electronics are not connected to Even Brake, the LCD message will read "Not operational – more info. ↓." Press the button with the right-hand arrow (>) on the monitor to scroll to the second and subsequent messages, which will display the required action(s).

An audio alert accompanies this message.

### 10. Towed vehicle brake pedal depressed; Even Brake has not been activated

If the LCD text display in the monitor reads, "Braking ↓," and the second message reads "Stop ASAP – Brakes are ON! ↓," stop the motorhome immediately – the towed vehicle's brakes may be damaged if you continue.

An audio alert accompanies this message.

After you have stopped, press the button with the right-hand arrow (>) on the monitor to scroll to the subsequent messages, which will display the required action(s).

### 11. Proportional regulator test

As part of the initial self-diagnostic test, Even Brake will check the proportional regulator. If the regulator is not functioning at full capacity, Even Brake will instruct you to call the factory for further information.

An audio alert accompanies this message.

### 12. Extended braking

After an extended period of continuous braking, the LCD text display will read, "Stop ASAP!! Brakes are ON ↓." Stop immediately – the towed vehicle's brakes may be damaged if you continue.

An audio alert accompanies this message.

After you have stopped, press the button with the right-hand arrow (>) on the monitor to scroll to the subsequent messages, which will display the required action(s).

### 13. Break away mode

The towed vehicle has separated from the motorhome. The LCD text display reads "TOW break away – Emergency STOP." Even Brake has applied maximum pressure to the towed vehicle's brakes to bring it to a stop.

An audio alert accompanies this message.

### 14. Communication link

A component of the communications system is not connected. Press the button with the right-hand arrow (>) on the monitor to scroll to the second and subsequent messages, which will display the required action(s).

An audio alert accompanies this message.

## WARNING

**Some motorhome monitor messages are intended to alert you to potentially dangerous conditions. Ignoring an LCD message to stop the motorhome or call the factory for further information may result in property damage, personal injury or even death.**

# Communications – Reference chart

The chart below shows the motorhome monitor and control pad response to the braking activities or conditions listed in the “Reported Activity or Condition” column – which color LED(s) will illuminate, the LCD text message(s) that will accompany them, and if there will be an audio alert. Refer to the “Communications – Overview” section for an expanded description of each message, how to access specific information, and how to clear the monitor after an adjustment in response to an LCD text message.

MOTORHOME LCD TEXT DISPLAY		MOTORHOME LED DISPLAY			AUDIO	REPORTED ACTIVITY OR CONDITION	EVEN BRAKE CONTROL PAD		
1st MESSAGE	2nd MESSAGE	RED	YELLOW	GREEN			RED	GREEN	RED/ GREEN
"Even Brake is Turning Off"		●				1. Even Brake power cord or ICX cord has been unplugged			
"Break Away Cable Not Operational ↓"	"Fault Detected Call Tech Dept ↓"	●	●			2. The break away harness has a short circuit to ground			●
"Not operational Low battery ↓"	"Low battery Charge required"		●			3. Battery level is low on initial self-diagnostic test	●		
"Battery Voltage (value)"						4. Battery voltage check – press the button with the left-hand arrow (<)			
"Low battery Charge battery"		●	●		●	5. Insufficient voltage – low battery		● (pulse red)	
"Not operational Power Save mode ↓"	"Low battery Charge battery"		●		●	6. Power Save mode activated			● (pulse)
"Not operational Call Tech Dept ↓"	"Diagnostic code #14 ↓"		●			7. Compressor time limit exceeded	●		
"Not operational more info. ↓"	"Brake pedal is depressed ↓"	●	●		●	8. Brake pedal depressed continuously	●		
"Not operational more info. ↓"	"No brake light switch detected ↓"		●		●	9. Towed vehicle brake electronics are not connected to Even Brake	●		
"Braking ↓"	"Stop ASAP Brakes are ON ↓"	●			●	10. Towed vehicle brake pedal depressed; Even Brake has not been activated	●		
"Not operational Call Tech Dept ↓"	"Diagnostic code #15 ↓"		●		●	11. Proportional regulator test	●		
"Stop ASAP!! brakes are ON! ↓"	"Brake Pedal is Depressed ↓"	●	●		●	12. Extended braking		●	
"TOW break away Emergency STOP"		● (strobe)	● (strobe)	● (strobe)	●	13. Break away mode		●	
"Check Even Brake stop ASAP! ↓"	"No communication with Even Brake ↓"	●			●	14. Communication link		●	

# Vehicle-specific components

## 12-volt extension cord

(part number 9331)

This extension cord will extend your 12-volt outlet by six feet.



## 12-volt outlet kit

(part number 9332)

Even Brake is powered through the 12-volt outlet, with the ignition key turned to the "tow" position. If your vehicle has no power to the outlet with the key in this position, use this kit.



BREAK AWAY SYSTEM

BRAKE-LITE RELAY

## Second vehicle kit

(part number 98400)

If you switch Even Brake between two vehicles, install this break away system, ICX transmitter and Brake-Lite Relay in the second vehicle.



ICX TRANSMITTER

## Automatic Battery Disconnect

(part number 766)

If you tow a Jeep Liberty, Jeep Wrangler or any other vehicle which must be towed with the battery cable disconnected, install the Automatic Battery Disconnect. After the initial installation, your vehicle can be towed and then driven without any further adjustment to the battery.



## Air cylinder shaft and foot extensions

Although Even Brake fits most vehicles as is, with no modifications needed, it may be necessary to gain additional clearance over obstructions on the floor, or to extend the reach of Even Brake to ensure a secure and stable fit.

The air cylinder shaft extensions increase the reach of Even Brake. Use an air cylinder shaft extension if the distance between the driver's seat and the brake pedal is too far to maintain a secure anchor point between the seat and the adjustable seat pad.

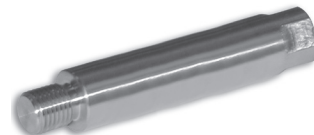
Use one or more foot extensions to elevate Even Brake over obstructions such as duct work, a door jamb or a center console that juts into the available space.



## 1.5" cylinder shaft extension

(part number 9336)

This option extends the reach of the air cylinder shaft by 1½ inches. It threads between the pedal clamp and the cylinder arm.



## 3.5" cylinder shaft extension

(part number 9336-3)

This option extends the reach of the air cylinder shaft by 3½ inches. It threads between the pedal clamp and the cylinder arm.



## Foot extensions

(one extension: part number 9337

four extensions: part number 9337-4)

This option allows Even Brake to sit up to one inch higher in the vehicle. Unscrew the included foot, screw the extension in, and then screw the original foot into the extension.



# Troubleshooting

Even Brake will report symptoms and solutions through the motorhome monitor's LED display, the LCD text display, and also, in some instances, with an audio alert. Refer to the "Communications" sections ("Overview" and "Reference Chart") in this manual for further information.

The solutions to other symptoms are listed below.

Symptom	Solution
	<h2>Positioning</h2>
Even Brake doesn't fit properly in the towed vehicle.	Use one or more foot extensions to elevate Even Brake over obstructions such as duct work, a door jamb or a center console that juts into the available space. Refer to the "Vehicle-Specific Components" section.
The pedal clamp doesn't fit the brake pedal securely.	Use a pair of pliers to bend the tabs of the pedal clamp for a better fit. If the pedal clamp still doesn't fit, contact ROADMASTER.
The air cylinder shaft will not extend to connect the pedal clamp to the brake pedal.	The air reservoir is full of air. Release the air by pressing the air relief button (Figure 1).
The pedal clamp does not extend to the brake pedal, when Even Brake is properly installed.	Use an optional air cylinder shaft extension to extend the reach of the air cylinder shaft. (Refer to the "Vehicle-Specific Components" section.)
The brake pedal clamp comes into contact with the Even Brake housing.	Brake pedals that are somewhat horizontal cause the pedal clamp to tilt, and to interfere with the Even Brake housing when it retracts. Use an optional air cylinder shaft extension to gain additional clearance. (Refer to the "Vehicle-Specific Components" section.)
The towed vehicle's seat moves after Even Brake depresses the brake pedal.	Readjust the seat and/or the adjustable seat pad. Refer to Step B in "Operation" – "Adjust the feet and the seat pad." After adjusting the seat, make certain that it is locked. Then, press the "Test" button (Figure 11) and watch the seat as the air cylinder shaft extends and retracts.
Even Brake "climbs" up the seat.	<ul style="list-style-type: none"><li>• If there is a rubberized floor mat under Even Brake, remove it during towing.</li><li>• Check the position of the adjustable seat pad. The seat pad serves as an anchor point, to keep Even Brake down as it presses the brake pedal. Adjust the seat pad up or down, if necessary.</li></ul>
	<h2>Brake pressure setting</h2>
The brakes are being applied before I want them to, or when I don't think they should.	Readjust the braking sensitivity preference to a lower setting. Refer to Step G in "Operation" – "Set braking force and braking sensitivity preferences."
A quick acceleration of the motorhome sometimes activates Even Brake, even though I have not applied the motorhome brakes.	Lower the braking sensitivity preference by one setting. Refer to Step G in "Operation" – "Set braking force and braking sensitivity preferences."
After towing, there is excessive brake dust on the wheels of the towed vehicle, or an unusual odor coming from the towed vehicle's brakes.	Readjust the braking sensitivity and/or force preference to a lower setting. Refer to Step G in "Operation" – "Set braking force and braking sensitivity preferences."

## Symptom

Even Brake does not pass the initial self-diagnostics test. The second motorhome monitor message is “No brake light switch detected.”

Nothing happens after proper installation.

The towed vehicle’s fuse for the 12-volt outlet keeps blowing.

The compressor comes on when Even Brake is plugged in, but not actually being used for braking.

Wireless components in the towed vehicle such as the door lock, alarm or tire pressure monitoring system do not function.

## Solution

### Electrical

- If fuse(s) must be removed from the vehicle before it can be towed, Even Brake may have been incorrectly installed. Check to see if Even Brake operates normally with the fuse(s) in place. If it does, refer to the Installation Instructions to re-wire the Brake Lite Relay so that it will function with the fuse(s) removed.
- If an aftermarket stop light switch was installed, check the physical installation of the stop light switch – make certain that the plunger is compressed when the brake pedal is fully released.
  - If the plunger is properly adjusted, check the brake light fuse.

- If the motorhome is stationary, Even Brake will not activate if the motorhome’s brake pedal is depressed. Even Brake responds to the deceleration of the motorhome, not to the brake pedal.
- Check the towed vehicle’s battery voltage. If the battery doesn’t have sufficient power, Even Brake will not operate.
- Check to make certain that the break away pin is in place.
- Check for a red light at the end of the 12-volt power cord. If there is no light, there is no power.
  - Check the fuse on the end of the 12-volt power cord. If the fuse is blown, polarity at the 12-volt outlet may be crossed, with positive connected to ground, and ground to positive. Correct the wiring, and replace the fuse in the 12-volt power cord.
- An optional 12-volt outlet kit may be required. Refer to “Before you begin the installation,” in the Installation Instructions.
- **The operating temperature range is between -2° and +150° F (-19° to +66° C). Even Brake will not operate at temperatures above or below this range.**

- Check the 12-volt outlet fuse size. It must be rated at 15 amps or higher. If the amperage is not sufficient, install the optional 12-volt outlet kit. (Refer to the “Vehicle-Specific Components” section.)
- If the fuse is of sufficient size, unplug the break away harness connection at the ICX transmitter. If the fuse stops blowing, you have a short in the break away wiring harness. Inspect the wire for possible grounding.

Even Brake’s compressor will activate about every 10 minutes due to normal air dissipation. If the compressor activates repeatedly within 10 minutes or less (when not braking), contact ROADMASTER – you may have an air leak in the air cylinder.

Always unplug the 12-volt power cord from Even Brake *before* unplugging the ICX transmitter cord. Otherwise, the transmitter may send a continuous RF signal. This signal may interfere with the vehicle’s wireless components.

In some instances, it may be necessary to install an on-off toggle switch to the red ICX power wire to prevent these transmissions (Refer to the installation instructions; the most current version of the instructions is available at [www.roadmasterinc.com](http://www.roadmasterinc.com)).

## Symptom

A monitor message – a red LED and a “Braking” LCD text message, or a green LED with an “Even Brake” LCD text message – stays on the screen (does not clear).

A few minutes after beginning to tow, the motorhome monitor indicates the towed vehicle has a low battery, even though the battery is charged.

After installation, the motorhome monitor does not report braking activity or system status. The LCD text message reads, “Even Brake.”

The first time Even Brake is activated, the towed vehicle brakes with excessive force, ‘flat-spotting’ the tires.

## Solution

### Communications

The motorhome monitor is not receiving a clear signal from the ICX transmitter.

- If possible, relocate the ICX transmitter to a higher position.
- Relocate the motorhome monitor.

Check the power and ground connections at the ICX transmitter – the red wire should be connected to 12 volts positive (power); the white wire should be connected to 12 volts negative (ground).

Also check the fuses.

The monitor is not programmed to the ICX transmitter. 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 has been installed, follow the instructions included in the kits.

### Installed in vehicle with ‘active’ brakes

The vehicle may have an ‘active’ braking system. Refer to the caution statement on page one for information.