

by **ROADMASTER**
BRAKEMASTERTM
 U.S. Patent 5,915,798
9000 **SERIES**



PROPORTIONATE TOWED CAR BRAKING SYSTEM

BRAKEMASTER 9000 & 9060
INSTALLATION INSTRUCTIONS
 For Motorhomes with Hydraulic Brakes



U.S. Patent 5,915,798

WARNING: FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN DEATH, PERSONAL INJURY, FIRE OR PROPERTY DAMAGE.

WARRANTY PROCEDURES

If you have any problems with this product, immediately contact ROADMASTER at 1-800-669-9690. If necessary, we can direct you to your nearest warranty service center for repairs or replacements. While under warranty, ROADMASTER will make arrangements for your product to be repaired or replaced. **Do not purchase replacement parts or pay for labor. You will not be reimbursed.** See section titled: "Limited Warranty" in the Owner's Manual for specific details.

CAUTION:

As equipped, the **BRAKEMASTER** will only function properly on towed vehicles with power brakes. **Do not use the BRAKEMASTER on vehicles without power brakes.** Doing so will cause the towed vehicle's brakes to lock up resulting in tire damage, brake damage or property damage. There is an optional regulator Part # 900002 which will adapt a non-power brake towed vehicle for use with the **BRAKEMASTER** system. For more information about the regulator please call customer service at 1-800-669-9690.

INSTALLATION MUSTS FOR SAFETY

- Before drilling any holes, check to be sure that there is nothing in the way such as wiring, fuel lines, etc.
- Cut the end of the airlines smooth and square - **DO NOT KINK OR BEND ENDS!**
- When securing air line, keep away from sharp metal, moving parts (example: slideouts, sliding generators, sliding battery trays, etc.) and heat sources. Route air lines at least 2 feet away from any heat source. Failure to do so can result in airline failure. This is **NOT COVERED** by warranty. **NEVER KINK OR PINCH AIR LINE!**
- After completing the installation, check all air fittings for air leaks using appropriate leak check solution. If you see an air leak around connections or fittings, retighten and then recheck using leak check solution again.
- When working on any pressurized air system use appropriate eye protection to avoid injury.
- When working on your coach's braking system, always block the wheels so that it cannot move before getting under the vehicle.
- **Coach must be on a hoist or safely and securely supported while working on the braking system. Most coaches with air brakes utilize an air suspension system. If you inadvertently open an airline to the suspension system, or if the coach's air system is turned off, the coach will lower to the ground. Failure to block or hoist the coach may result in property damage, personal injury or death.**

WARNING:

Failure to release emergency brake on towed vehicle before towing will result in severe brake damage or brake fire and is not covered by warranty. It is important to remember that the Brakemaster monitor light on your dash will not illuminate when the towed vehicle emergency brake is on.

WARNING:

If for any reason you must have the towed vehicle running while being towed, it is imperative that you disconnect the BRAKEMASTER system. Otherwise, the power brakes will cause severe over braking of the towed vehicle. Failure to do so can result in severe brake and tire damage.

WARNING:

Failure to follow the installation and operation instructions may result in BRAKEMASTER malfunction, loss and damage to your vehicle, property damage, fire, personal injury or death.

1. Installation of the Air Cylinder

NOTE:

READ ALL OF THE INSTRUCTIONS THOROUGHLY BEFORE BEGINNING THE INSTALLATION.

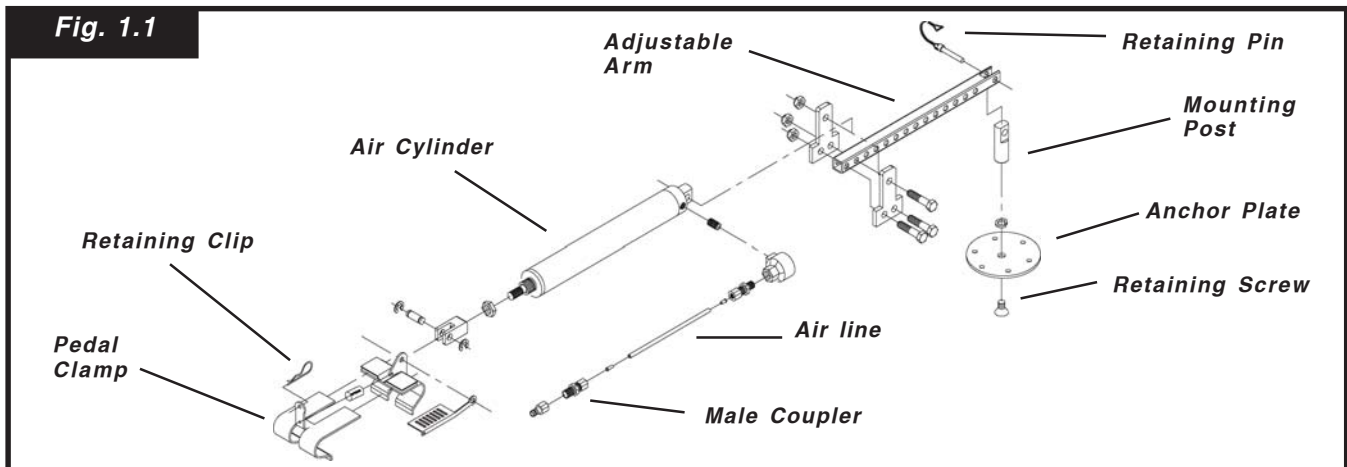
This installation is for the towed vehicle

1. Move the driver's seat to the rear most position. Attach the Air Cylinder to the brake pedal. Adjust the Pedal Clamp to most closely match the size of the brake pedal and secure in place with the Retaining Clip.
2. Adjust the overall length of the BRAKEMASTER so that the Anchor Plate and Mounting Post are just exposed when the driver's seat is in its furthest back position. (NOTE: ROADMASTER manufactures Seat Adapter brackets for some vehicles that replace the Anchor Plate. Where available, the Seat Adapters are custom fit for each vehicle and utilize the seat channel bolts to secure the adapter. They are primarily used on vehicles that have obstructions under the seat, making it difficult to install the Anchor Plate. See separate sheet titled, "Seat Adapter Application Guide" to determine if one is available for your vehicle. Seat Adapters are an option and sold separately). Ideally, the Anchor Plate should be concealed whenever the seat is moved forward. In addition, the BRAKEMASTER must be mounted directly in line with the pedal. The BRAKEMASTER could become jammed in the extended position if it is mounted at an angle (left to right) to the brake pedal. If necessary, the Anchor Plate may be rotated as shown in Fig.1.1 to clear any obstructions underneath the driver's seat.

CAUTION:

The Air Cylinder naturally angles upward toward the brake pedal but **MUST** be straight in front of the brake pedal, **NOT** at an angle from side to side!

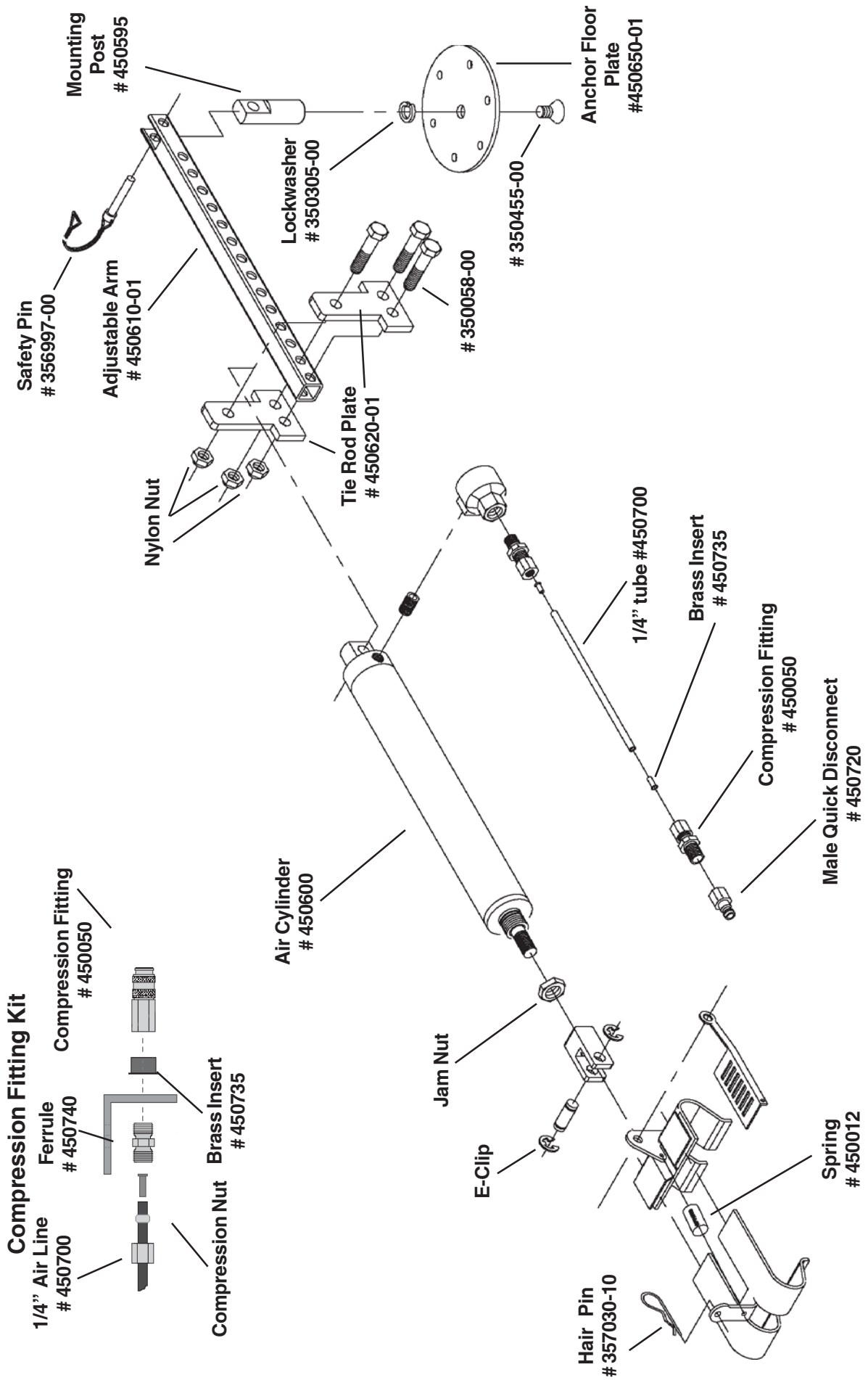
Fig. 1.1



3. With the BRAKEMASTER and Anchor Plate assembled and in position as described above, double check the following:
 - A. The brake pedal is is being up, and is not being depressed.
 - B. The brake lights are off on the towed vehicle.
 - C. The Air Cylinder needs to be pulled toward the anchor plate in order for the retaining pin to be inserted through the mounting post.
 - D. The Pedal Clamp is flat against the brake pedal and properly secured with the Retaining Clip.
 - E. There is sufficient clearance for the seat to slide properly without interference.

Once the above conditions are met, use the Anchor Plate as a template and mark the holes. It may be helpful to remove the driver's seat to facilitate the rest of the installation.

BRAKEMASTER™ 9000 Illustrated Parts & Part Numbers



CAUTION:

Before drilling any holes, check to be sure that there is nothing under the panel such as brake or fuel lines, wiring, etc. Before continuing, make sure that the Retaining Screw is fully tight, securing the Mounting Post onto the Anchor Plate.

- If mounting the Anchor Plate on top of the carpet, use the Anchor Plate as a template, mark and drill 1/4" holes through the carpet and floor panel. Use caution to prevent the carpet from catching on the drill bit causing the carpet to unravel. The Anchor Plate can also be mounted underneath the carpet by removing any necessary trim and rolling the carpet back. If you mount the Anchor Plate under the carpet, you will have to cut a small flap in the carpet to allow the mounting post to protrude.
- Install the Anchor Plate as shown in Figure 1.2, with the 1/4" bolts and self locking flange nuts provided. If you find that you have drilled a hole in a location where you can't get at the bolt to install a nut (due to a sub-panel tube or channel), use the Jack Nuts provided (see Figure 1.3). **NOTE:** When using Jack Nuts, the Anchor Plate cannot mount on top of the carpet.

Fig. 1.2 Standard Installation

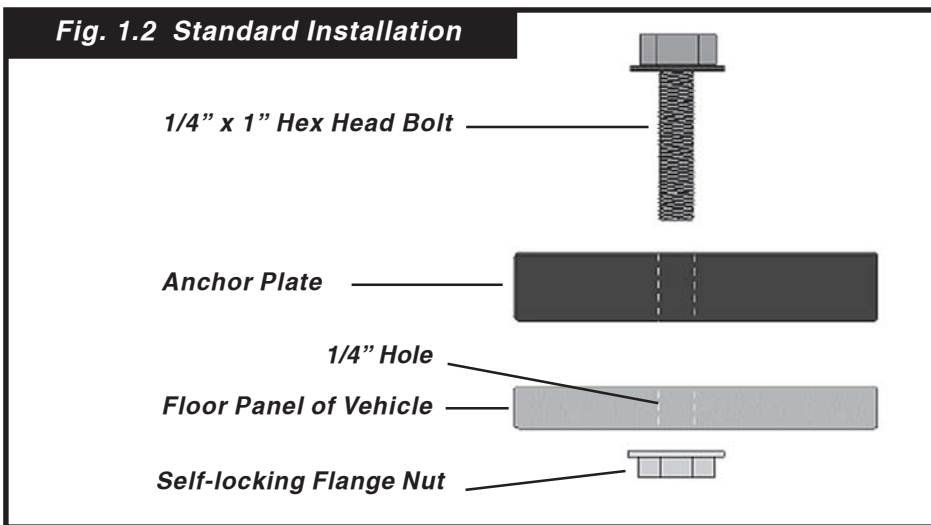


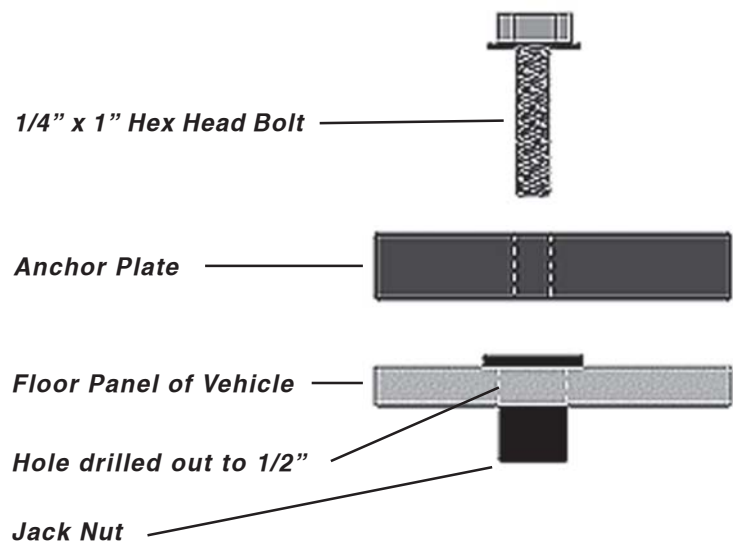
Fig. 1.3 Jack Nut Installation

NOTE

To use the Jack Nut you must drill out the hole in the floor panel to 1/2".

DO NOT DRILL OUT THE HOLE IN THE ANCHOR PLATE!

Insert the rubber body of the Jack Nut into the hole and bolt through the anchor plate using the 1/4" Hex Head bolt.



- Remove the Air Cylinder assembly from the Anchor Plate and Brake Pedal and set aside for now. The only remaining part will be the Anchor Plate and Mounting Post.

2. Installation of the BRAKEAWAY

READ ALL THESE INSTRUCTIONS FIRST BEFORE BEGINNING INSTALLATION OF ROADMASTER BRAKEAWAY SYSTEM.

When installing the BRAKEAWAY, keep the following in mind:

The Drain Valve must be pointed downward. The tank does not have to be perfectly straight up and down, but the drain must be the lowest part of the reservoir assembly.

- *The Breakaway switch must be in a horizontal position pointing toward the motorhome. Be sure the install location allows the Breakaway pin to pull freely away from the car without any obstruction.*

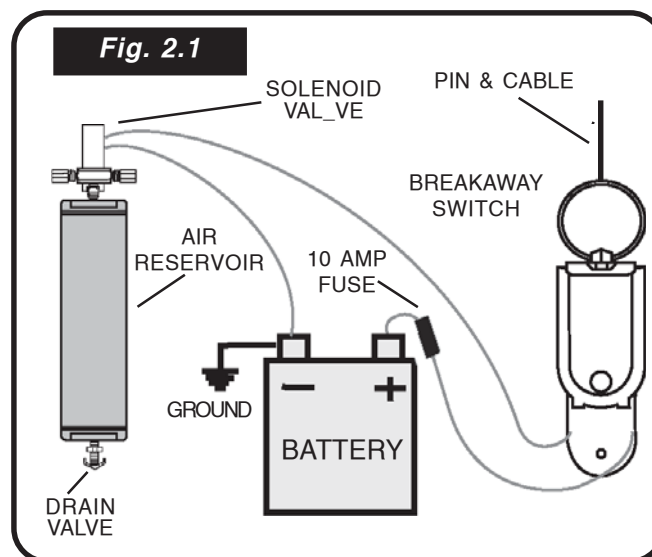
- 1 *Mount the BRAKEAWAY where you can easily access it for connecting air lines and for draining the tank. You will not be installing the airlines yet, they will be connected later. Do not mount the BRAKEAWAY in the passenger compartment. It can be mounted anywhere else that you can route an airline. The best place is normally under the hood. Make sure that the location will not cause interference or prevent the proper operation of any of the car's components or systems. Also make sure that the airline is shielded from any heat source.*

- 2 *Mount the Breakaway switch to a metal surface (not plastic) on the car near the center front of the vehicle. **CAUTION: DO NOT ATTACH THE BREAKAWAY SWITCH TO THE BRACKETS OR THE TOW BAR. IF THE TOW BAR OR BRACKET FAILS, THE BRAKEAWAY WILL SEPARATE WITH THE BAR OR BRACKET PREVENTING THE BREAKAWAY SWITCH FROM ACTIVATING.** The Breakaway Pin must be in a horizontal position pointing toward the motorhome. Be sure the install location allows the Breakaway pin to pull freely away from the car without any obstruction.*

WARNING:

The length of the Breakaway cable when installed must exceed the safety cable length. If the Breakaway cable is shorter than the safety cables, then the towed vehicle will be braking while still connected to your motorhome by the safety cables. This can result in severe brake wear or brake fire. The Breakaway cable must be longer than the safety cables so that your BRAKEAWAY system will only engage if the towed vehicle separates from the motorhome. **FAILURE TO FOLLOW INSTRUCTIONS MAY RESULT IN PROPERTY DAMAGE, FIRE, PERSONAL INJURY OR DEATH.**

- 3 *Connect one wire from the Breakaway switch (doesn't matter which one) to the positive battery terminal. Be sure to install the 10 amp fuse within **6 inches of the battery**. Then connect the second wire to either side of the solenoid valve. Connect the remaining wire on the solenoid valve to chassis ground. (See Fig. 2.1).*



BRAKEAWAY Wiring Diagram

2. Installation of the BRAKEAWAY (continued)

- 4 For the **BRAKEAWAY** system to operate properly, be sure to connect cable to ring on Breakaway switch and other end of cable to a secure place on the motorhome. **DO NOT TWIST, WRAP OR OBSTRUCT THE CABLE BETWEEN TOWED VEHICLE AND MOTORHOME.**
- 5 For simple and easy hook-up of the **ROADMASTER BRAKEAWAY**, just clip the steel cable to the large ring on the Breakaway switch (located on the towed car). Then clip the other end of steel cable to the motorhome. When hooking up the cable, check the following:
- Connect the cable close to the center of the rear of the motorhome. Connecting the cable towards the sides of the motorhome will cause the cable to activate the **BRAKEAWAY** system when turning a sharp corner.
 - Be sure there are no obstructions that would prevent the cable from freely pulling away from the Breakaway switch. **DO NOT WRAP THE CABLE AROUND ANY COMPONENT. DOING SO COULD KEEP THE CABLE FROM PULLING THE PIN PREVENTING THE BRAKEAWAY FROM ACTIVATING.**
 - Make sure the cable is long enough to prevent the Breakaway pin from being pulled out. If the cable is too short, the **BRAKEAWAY** system will engage even though the car has not broken free from the motorhome.
 - Be sure the cable is not hanging down or dragging on the ground. This much slack in the cable could get caught going through dips or low spots. This will pull the pin out causing the **BRAKEAWAY** to activate.
- 6 **DO NOT REMOVE THE BREAKAWAY PIN!** Removal of this pin will activate the **BRAKEAWAY** system and will also result in a dead battery if the pin is left out. Remove pin **ONLY** to test system.
- 7 Tank must be drained regularly. Too much moisture will prevent the proper operation of the **BRAKEAWAY** system.

WARNING:

Failure to install and operate the ROADMASTER BRAKEAWAY properly may result in BRAKEAWAY malfunction, loss and damage to your vehicle, property damage, personal injury or death.

3. Installation of the Air Lines

This installation is for the towed vehicle.

1. Find a suitable location on the front of the towed vehicle and use the $\frac{1}{4}$ " bolts and nuts to install the pre-assembled Male Quick Coupler and mounting bracket (See Figure 3.1). Tape one end of the air line to avoid getting dirt and debris in the line. Plan out the shortest, safest route and install the airline from the Male Quick Coupler to the **BRAKEAWAY** installed in section 2. (If you do not have the **BRAKEAWAY**, just route the air line to the driver's seat area). Connect the airline to the "AIR IN" (See Figure 3.2). If necessary, cut the air line so that the end is smooth and square. Install the compression nut and ferrule onto the air line leaving $\frac{1}{4}$ " of the air line exposed. Slide the insert into the end of the air line — **the insert must be used to avoid air leaks!** Push the air line into the compression fitting until it bottoms out. Slide the ferrule up against the compression fitting and snug the compression nut onto the compression fitting. Tighten nut, but do not over tighten as this will cause an air leak. Connect an airline to "AIR OUT" and run it from the **BRAKEAWAY** to the driver's seat area. Use a grommet (drill $\frac{1}{2}$ " hole) to route the airline through the floorboard or through the firewall. Do not attach the airline to the Quick Coupler yet!

CAUTION:

When routing the airline, always make sure the airline is properly secured away from sharp metal, moving components, and any heat sources. Routing the airline next to the exhaust pipe, engine or any other heat source will soften the plastic and cause it to rupture. Kinking or severely bending the airline will also cause failure. ROADMASTER does not warranty parts or labor for ruptured airline. Be certain that the airline which is routed under the car does not hang any lower than the lowest part of the floor pan.

Fig. 3.1 MUST be used on the front of the towed vehicle.

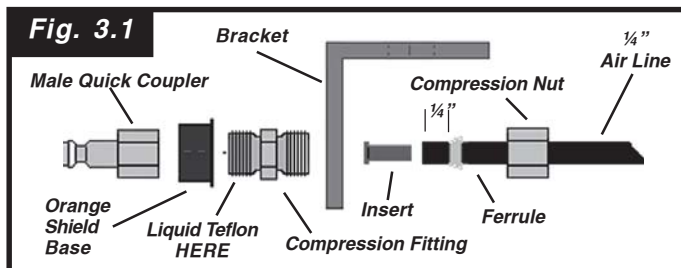
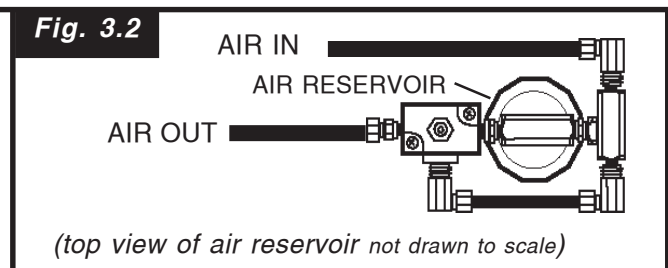


Fig. 3.2 TOP VIEW



2. Find the Female Quick Coupler Assembly that **does not** have an orange shield base (see Figure 3.3) and install it just underneath the front edge of the driver's seat (with the seat in its rear most position). Make certain that the airline from the BRAKEMASTER cylinder is within reach of the Female Coupler before drilling any holes. Also check that the seat is capable of normal adjustments.
3. Connect the airline under the driver's seat to the Female Coupler as shown in Figure 3.3
4. Now cut the air line to length at the front of the towed vehicle and connect the airline to the Male Quick Coupler.

3. Installation of the Air Lines (continued)

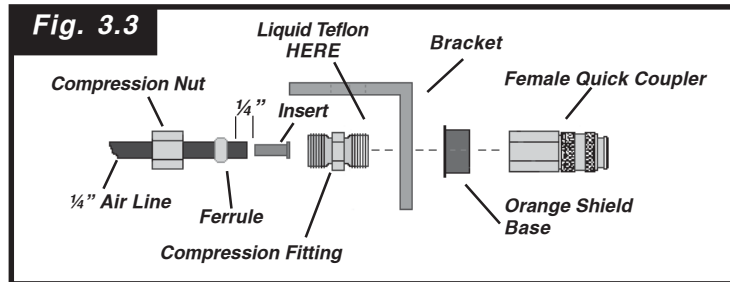


Fig. 3.3 MUST be used on the rear of the motorhome.

CAUTION:

It is imperative that a Male Quick Coupler be installed at the front of the towed vehicle. The Female Quick Coupler has an internal check valve that doesn't allow air from escaping if the patch cord disconnects while the air line is pressurized. This would prevent the BRAKEMASTER from releasing resulting in severe brake damage or brake fire on the towed vehicle.

5. Apply a sealer around the grommet, reinstall carpet, driver's seat and any trim removed earlier.
6. Find a suitable location at the center rear of the motorhome and use the 1/4" bolts and nuts to install the Female Quick Coupler, with the orange shield base (see Figure 3.3).

4. Installation of the Compressor

1. The air compressor should be installed in a clean, dry environment within 20' of the starting batteries in the motorhome. Ideally, install the air compressor in a storage compartment. Do **not** mount the compressor in the front grille area, in the engine compartment, in slideouts or near moving parts.

CAUTION:

THE COMPRESSOR MUST BE MOUNTED IN A CLEAN, DRY LOCATION. THE COMPRESSOR IS SHIPPED WITH THE PETCOCK OPEN. BE SURE TO CLOSE THE PETCOCK BEFORE USING. Close the petcock by turning the handle clockwise. The compressor will continually run if the petcock is not closed.

The compressor unit may be installed either horizontally or vertically. **Do not install compressor in the motorhome's slide-out or near any moving parts. However, you must install the compressor with the petcock facing downward** (see the sticker on the top of the compressor assembly). If the compressor is installed in any other orientation, water will not drain properly from the tank and will cause unwarrantable damage to the BRAKEMASTER system.

FAILURE TO FOLLOW THESE INSTRUCTIONS MAY CAUSE COMPRESSOR OR AIR CYLINDER FAILURE NOT COVERED BY WARRANTY.

2. Once you have found a mounting location that will provide adequate strength and support for the compressor assembly, use the compressor housing as a template to drill four pilot holes. Before drilling, verify that you will not be drilling into any wiring harnesses, fuel lines, or other obstructions. Do not secure the compressor yet. It will be much easier to connect the air lines and wiring with the compressor loose.
3. Route the bonded pair of **black and red 12 gauge wire** from the coach's starting battery to the compressor assembly.

At the compressor, use a small ring terminal to connect the red wire to the terminal block screw labeled "red" in Figure 4.1. Also, connect the black wire to the terminal block screw labeled "black".

At the starting battery, install the 25 Amp fuse assembly on the red wire as shown in Figure 4.2. Connect the large ring terminal to the positive terminal of the starting battery. Put a large ring terminal on the end of the black wire and connect it to the negative terminal of the starting battery.

Fig. 4.1

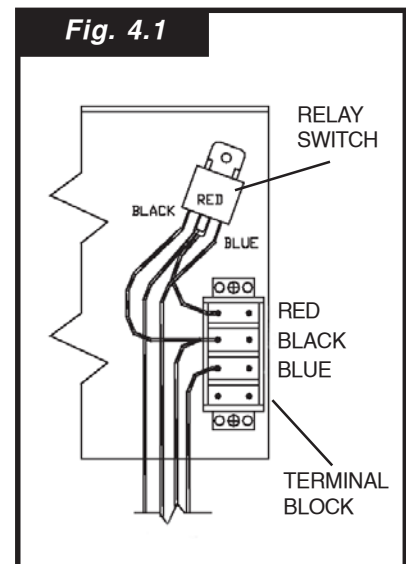
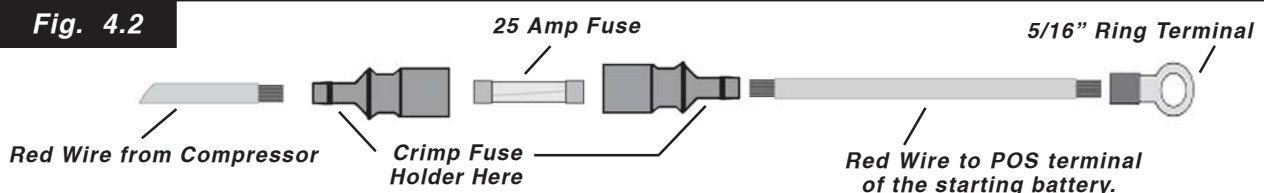


Fig. 4.2



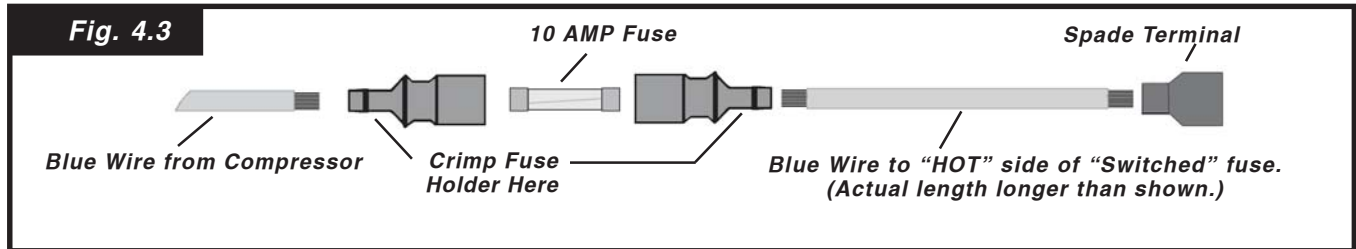
CAUTION:

Connecting the power wires to an auxillary battery may result in blown fuses. Always connect the compressor wires to the starting battery only.

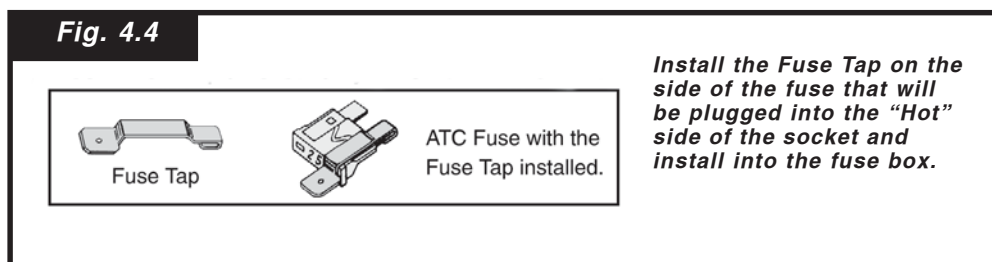
DO NOT COIL UP EXCESS WIRE AS THAT CAUSES OVERHEATING OF THE WIRING. ALWAYS TRIM TO LENGTH!

4. Before routing the following wire, see section 10 titled “Install Brake Monitor wire in Motorhome” and section 7 titled “Wiring the Proportioning Valve”. In both of these sections it is necessary to route another wire from the rear of the coach to the front of the motorhome. Depending on the coach and compressor location, you may wish to route all of these wires together to simplify the wiring process.

Route the blue wire with the 10 amp fuse assembly from the coach’s 12-volt fuse panel to the compressor assembly. Fuse holder should already be installed on wire from factory. If not, install as shown.



5. On the coach’s fuse panel, use a test light to locate an ATC type fuse that is on a “switched” circuit. A “switched” circuit is one that is only powered when the ignition key is turned on. **The compressor assembly will be powered whenever this circuit is energized, so it is imperative that you use a circuit that is only powered when the coach’s engine is running.**
6. Now pull the ATC fuse and use the test light to identify the “HOT” side of the fuse socket. The “HOT” side of the fuse socket is the side that lights the test light each time the ignition is turned on.
7. Install the fuse tap on the “HOT” side of the fuse as shown in Fig. 4.4. With the coach’s ignition off, replace the fuse into the socket.



WARNING:

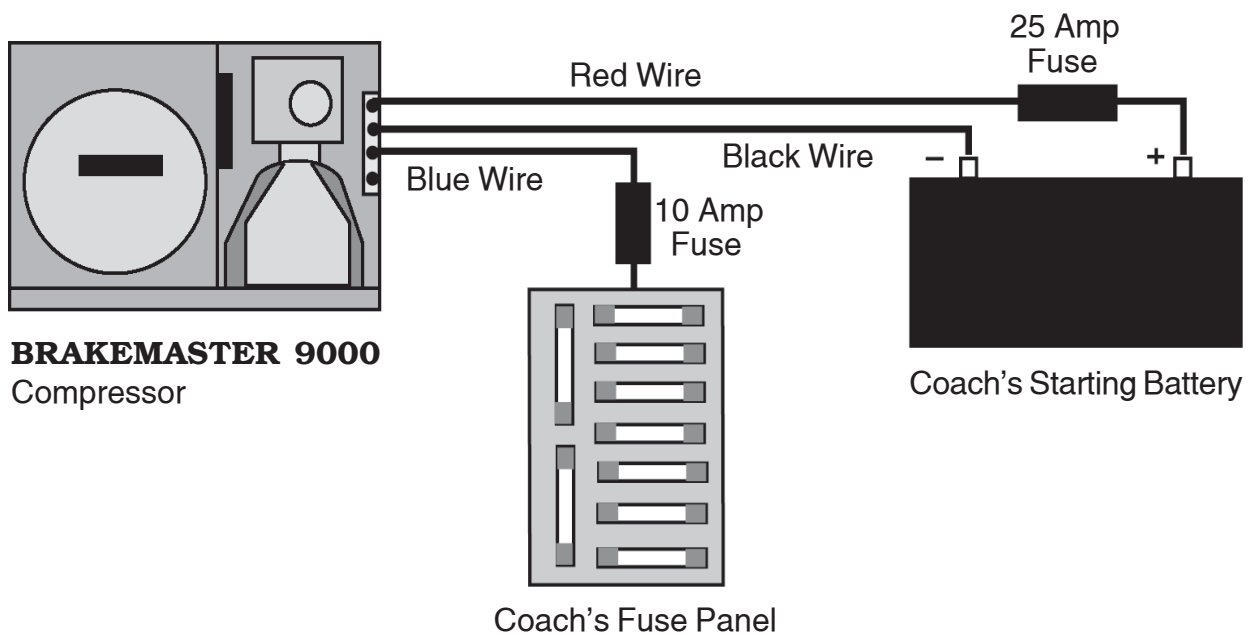
Do not connect the fuse tap to the cold side of the fuse socket. If the coach’s fuse blows, the BRAKEMASTER system will not function and you will have no brakes on the towed vehicle while towing.

8. Connect the blue wire to the fuse tap with the female spade connector. The inline fuse must be less than 6 inches from the panel connector. Assemble the fuse as shown in Fig. 4.3. At the compressor, use a small ring terminal to connect the blue wire to the terminal block.

9. Verify that you have made all of the wiring connections as shown in Figure 4.5. The compressor should not start until the coach's ignition is turned on.
10. Do not connect the air line to the compressor at this time. The air line will be connected to the compressor following the installation of the Proportioning Valve assembly.

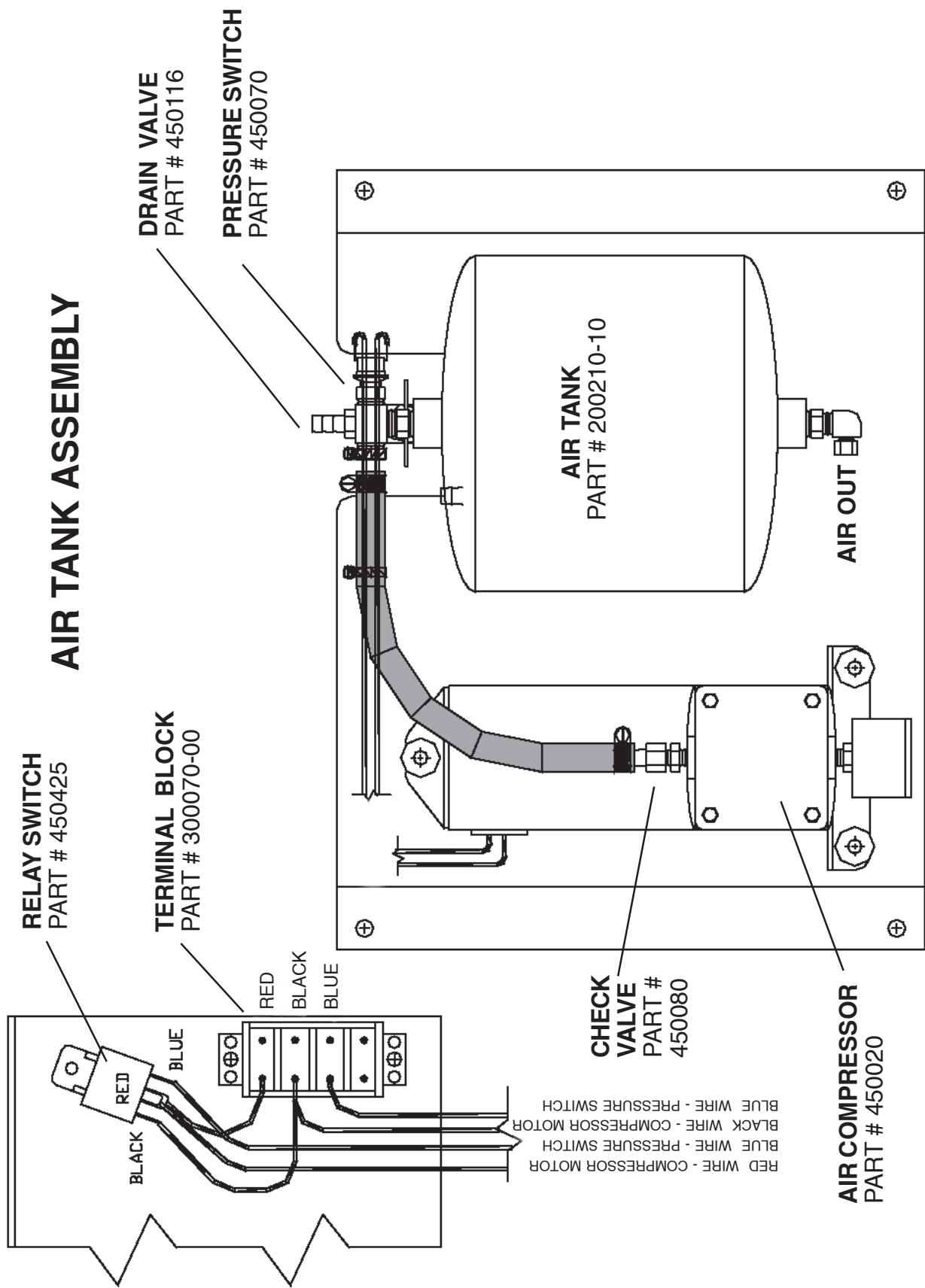
Fig. 4.5

WARNING: Fuse must be installed at positive battery terminal. Failure to do so may result in electrical fire, property damage, personal injury or death.



WARNING: Failure to install inline fuses as shown in Fig. 4.5 will result in electrical fire, property damage, personal injury or death.

9000 BRAKING SYSTEM™ Illustrated Parts & Part Numbers



RELAY SWITCH
PART # 450425

TERMINAL BLOCK
PART # 300070-00

DRAIN VALVE
PART # 450116

PRESSURE SWITCH
PART # 450070

AIR TANK ASSEMBLY

CHECK VALVE
PART # 450080

AIR COMPRESSOR
PART # 450020

AIR TANK
PART # 200210-10

AIR OUT

RED WIRE - COMPRESSOR MOTOR
BLUE WIRE - PRESSURE SWITCH
BLACK WIRE - COMPRESSOR MOTOR
BLUE WIRE - PRESSURE SWITCH

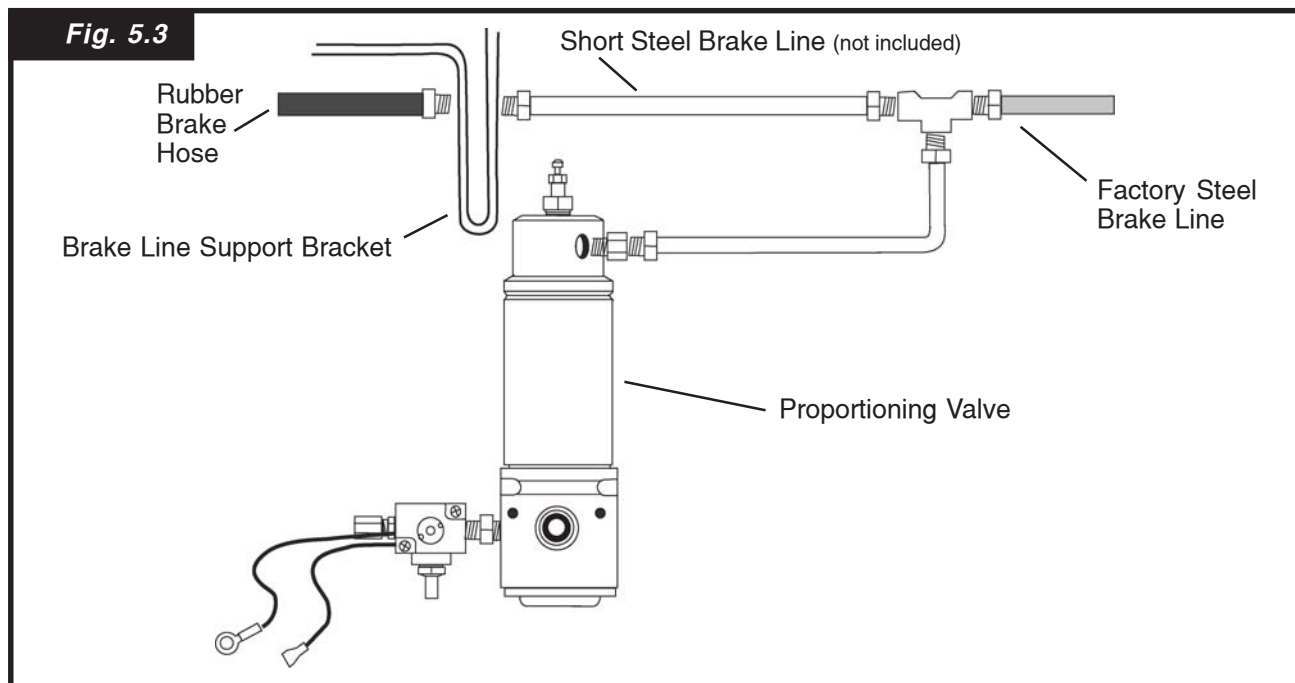
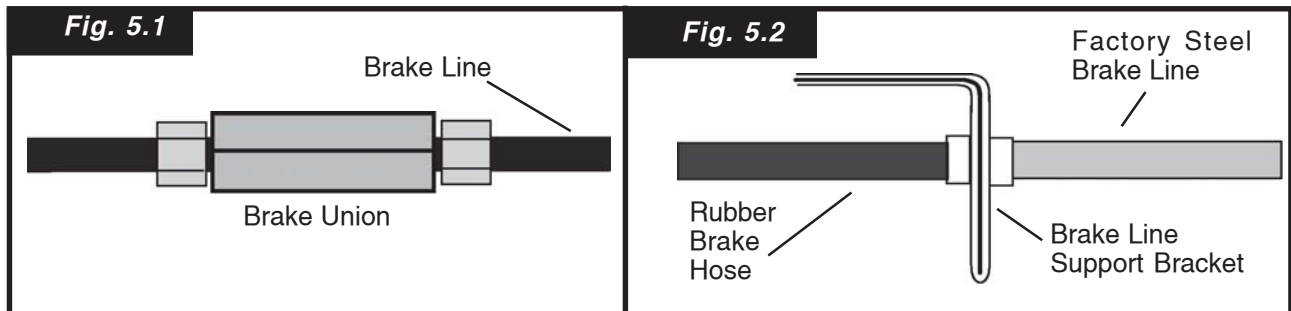
5. Install the Proportioning Valve

1. The Proportioning Valve (see Figure 5.3), is installed on the frame of the coach chassis. Locate the steel brake line that is routed along the frame. If the coach is a Class "A", every 10'-15' feet, you will find a brake union where two brake lines are connected (See Figure 5.1). The Proportioning Valve must be installed near one of these unions. A small number of Class A's utilize a one piece brake line and will not have a brake union. Most Class "C" coach's utilize a one piece steel brake line from the front to the rear as well. Accordingly, you will not find a brake union on these vehicles. In this event, or if you just can't access the brake union, you have two options:

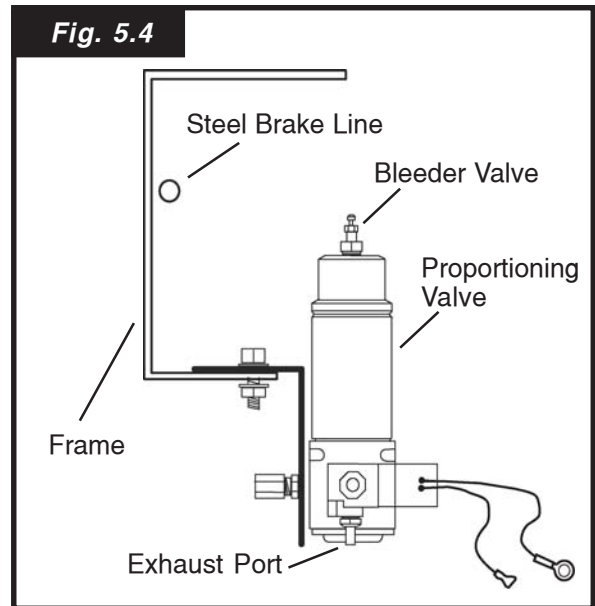
Option 1 - Follow the steel brake line forward until it joins with another fitting. This is where you will tee into the hydraulic brake line as described in the following steps.

Option 2 - Follow the steel brake line all the way back to the wheel until the steel brake line joins a rubber brake hose (this junction will be near the wheel assembly). The junction should look like Figure 5.2. The brake tee will not thread onto the rubber brake line so it will be necessary for you to purchase a short brake line and install the brake tee as shown in Figure 5.3. You can easily find a steel brake line at most auto parts stores.

IMPORTANT: If you are connecting the Brakemaster to a Ford Class C Motorhome, then you need to tee into the front hydraulic brake line. The rear hydraulic brake line does not supply sufficient hydraulic pressure to brake the towed vehicle properly.



2. Determine the best location to tee into based on the following criteria:
- There must be adequate room on the frame to mount the Proportioning Valve Assembly as shown Figure 5.4.
 - When installed, the bleeder valve on the Proportioning Valve must point up and the Exhaust Port must point down as shown in Figure 5.4.
 - The Proportioning Valve assembly must be close enough to allow the included brake line to reach the coach's brake union.
 - The closer you can mount the Proportioning Valve to the compressor the less air line you will have to route later.

**WARNING:**

The Proportioning Valve must be mounted with the Bleeder Valve pointed up. Failure to do so may prevent the proper bleeding of the braking system resulting in brake failure, property damage, personal injury or death.

WARNING:

Wear eye protection when working with any brake system. If brake fluid comes in contact with your eyes, immediately rinse them with water and seek medical attention. Never use old brake fluid. It contains moisture and contaminants, which will deteriorate the brake system components and could cause the fluid to boil when braking temperatures rise. This can lead to complete loss of pressure in the hydraulic system.

3. Before proceeding, remove any residual vacuum from the coach's brake power booster (if equipped) by applying the brake several times with the engine off. Remove the master cylinder reservoir cover and fill the reservoir with brake fluid. Reinstall the cover.

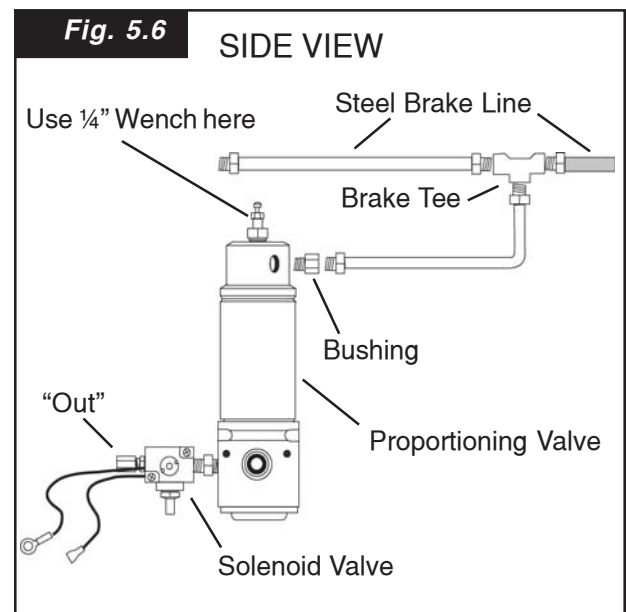
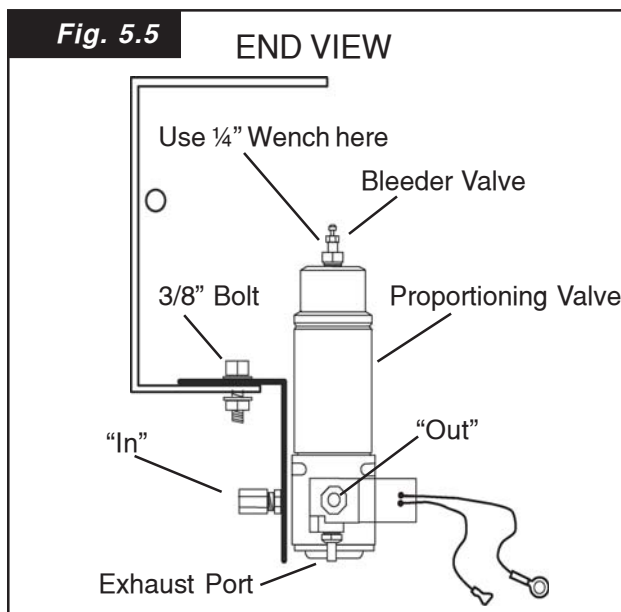
CAUTION:

Check the fluid level often during the bleeding operation. Add fluids as necessary to prevent the fluid level from falling low enough to allow air bubbles into the master cylinder. **If air has been allowed into the brake system from the master cylinder, all brakes must be bled.**

4. Put a bucket or pan under the brake union to catch any brake fluid. Clean the dirt away from the brake union and use two open end or line wrenches to disconnect both brake lines from the union. Be very careful not to bend the brake line or damage the threads. It may be necessary to soak the connections with penetrating oil to break them free. When disconnected, plug the brake line with the rubber plug (included in this kit). Plug the line going toward the master cylinder to prevent any further loss of fluid.

5. Place the Proportioning Valve where you intend to mount it and once again check for the following:
 - a. There is adequate room to bolt the Proportioning Valve securely in place.
 - b. The bleeder valve will point up
 - c. The exhaust port will point down
 - d. The steel brake line can reach the brake union
 - e. You will not interfere with the movement of any other chassis components
 - f. It is safe to drill through the frame in this location with out damaging any other lines, wiring harnesses or other components.

6. When the above conditions are met, use the Proportioning Valve's mounting bracket as a template to mark the holes on the frame. Drill the holes out to 3/8". Secure the Proportioning Valve to the frame utilizing two 3/8" bolts and nuts as shown in Figure 5.5. Use a ring terminal to ground the Solenoid Valve by connecting one of the black wires, to one of the 3/8" bolts or to a good chassis ground.



7. Determine the correct size of brake tee (two sizes are included) and reconnect the two steel brake lines as shown in Figure 5.6. Make sure that the brake tee points upward when the brake lines are fully tightened. This will help reduce the loss of brake fluid.

8. Apply liquid teflon sealer (not included) on **male threads** of Bushing before threading into Regulator. Thread the appropriate size of bushing into the port on the Proportioning Valve and use the correct size of brake line to connect between the bushing and the brake tee just installed. It will probably be necessary for you to bend the brake line. Use extreme care when bending the tubing. If kinked, it must be replaced to prevent brake failure. Check that all brake fittings have been properly tightened before continuing. Check all hydraulic fittings and the Bleeder Valve for leaks. Bleed the brakes **before testing** for leaks. To check for leaks, start the motorhome and have someone depress the brake pedal several times while you inspect all of the hydraulic fittings. If you find a leak, retighten the fitting and recheck for leaks.

DANGER:

Leaking brake fluid can cause brake failure resulting in property damage, personal injury or death. Always check for and seal all leaks before driving vehicle.

9. The coach's braking system should now be completely in tact. However, the process of installing the Proportioning Valve has allowed air to enter the system. The air must be bled out of the braking system before the vehicle is driven.

10. Bleed the air out of the Brakemaster Proportioning valve using a ¼” wrench at the Bleeder Valve (see Fig.5.5). Do not loosen the ½” fitting. Now you must bleed the brakes of every wheel that is down stream from the brake union that was teed into. It is not necessary to bleed any of the brakes upstream from the brake union unless air was allowed into the master cylinder (by not keeping it full). Read all instructions and warnings on how to properly bleed the air out of a brake system in the following section titled “Bleeding Brakes”.

DANGER!

The air must be bled out of the Proportioning Valve and out of the coach’s hydraulic brake system before driving the vehicle. Failure to bleed the brakes will cause brake failure resulting in property damage, personal injury or even death.

6. Bleeding Brakes

General Information About Bleeding Brakes

The following sections describe various methods of bleeding brakes. It is important to remember that only the BRAKEMASTER and all wheels downstream from the brake union will require bleeding. We have included instructions for bleeding all of the brake lines in case the fluid level is allowed to drop too low in the master cylinder.

CAUTION:

Check the fluid level often during the bleeding operation. Add fluids as necessary to prevent the fluid level from falling low enough to allow air bubbles into the master cylinder. If air has been allowed into the system from the master cylinder, all brakes must be bled.

WARNING:

*Regardless of the process used to bleed the brake line and braking system, **DO NOT DRIVE** the vehicle unless a satisfactory, firm brake pedal is obtained.*

How to Bleed brakes WITHOUT Anti-Lock Braking System (ABS)

Normal Bleeding Method (two Person)

1. This process will require an assistant, a supply of brake fluid, an empty clear plastic container, a wrench to open and close the Bleeder Valve, and a length of 3/16” clear plastic or vinyl tubing to fit over the bleeder valve.
2. Remove the cover for the master cylinder reservoir. Fill reservoir with brake fluid and replace cover. Recheck frequently during the bleeding process.
3. If bleeding all brake lines, the sequence is determined by the design of the braking system. In general, you always bleed the brake line furthest from the master cylinder first, then the other brake line that is in the same half of the circuit just bled.

Normal Bleeding Method (two Person) continued

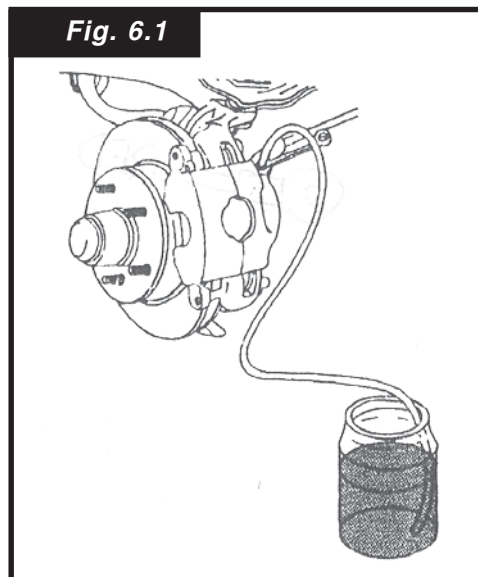
4. a.) If you know that the hydraulic system is split front to rear, as is the case with most rear wheel drive vehicles, then bleed the brakes in this order:

1st: Right Rear 2nd: Left Rear 3rd: Right Front 4th: Left Front

- b.) If you know that the hydraulic system is split diagonally as with most smaller front wheel drive vehicles, then bleed the brakes in the following order:

1st: Right Rear 2nd: Left Front 3rd: Left Rear 4th: Right Front

Begin the process at the first wheel cylinder or caliper to be bled. Loosen the Bleeder Valve and retighten just enough to keep the brake fluid from seeping. Stretch the hose over the Bleeder Valve and submerge the other end into the brake fluid inside the plastic container. See Figure 6.1. Have someone depress the brake pedal slowly to pressurize the hydraulic system until the pedal provides firm resistance. With the brake pedal depressed, loosen the Bleeder Valve just enough for a solid stream of fluid to flow through the clear tubing. Watch for bubbles to exit the tubing. As the flow diminishes, tighten the screw and have the assistant release the brake pedal. Repeat this procedure until the bubbles stop exiting the tube. Continue on to the next wheel cylinder or brake caliper and repeat this procedure until all of the brake lines have been bled. Be sure to check the fluid level in the master cylinder reservoir frequently.

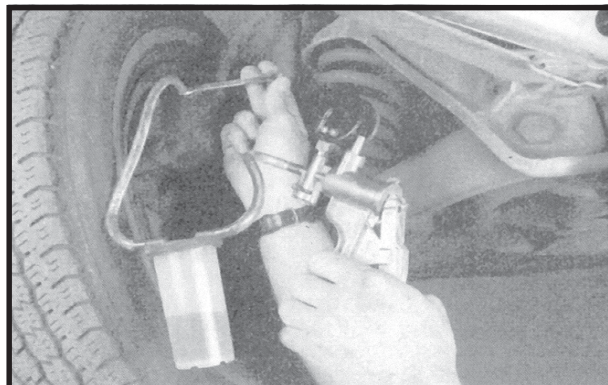
Fig. 6.1

When finished, refill the master cylinder reservoir and test the operation of the brake pedal. It should be firm and solid when depressed with no sponginess.

WARNING: **DO NOT DRIVE** the vehicle if there is any doubt about the functionality of the hydraulic braking system.

One Person Methods**Vacuum Bleeding Procedure**

There are a variety of commercially available brake bleeding products that allow a single person to bleed the brakes. Many of these are very simple systems costing only a few dollars that utilize a vacuum to suck the air out of the hydraulic system. Typically, a tube runs from the Bleeder Valve to a sealed container. Another tube runs from the container to a hand held pump. When the Bleeder Valve is opened, the pumping action sucks the fluid and air bubbles out of the brake line and into the container. See Figure 6.2. Utilize the same bleeding sequence as the Normal Bleeding Method.

Fig. 6.2

One Person Methods (continued)

Pressurized Bleeding Procedure

This is the method used by most professional mechanics. It is a quick and easy one person system that attaches to the top of the master cylinder reservoir. This device pressurizes the hydraulic fluid in your braking system. When activated, simply bleed each brake line until the hydraulic fluid is free of bubbles. Follow the instructions that came with your pressurized bleeding system.

WARNING: Always check for proper operation after working on the braking system. If the pedal is not firm or feels spongy, **DO NOT DRIVE THE VEHICLE.**

How to bleed brakes with Anti-Lock Braking System (ABS)

- 1. The front of an ABS system can be bled in the same fashion as a non ABS braking system. However, the rear brakes must be bled with a Pressurized Bleeder System **OR** the hydraulic accumulator must be fully charged. The accumulator can be charged by starting the engine (some systems can be charged by simply turning on the ignition switch, but starting the engine takes the guesswork out of it).*
- 2. Whether you are using a pressurized bleeder, or charging the accumulator you can now bleed the brakes according to the Normal Bleeding Procedure.*

WARNING: Always check for proper operation after working on the braking system. If the pedal is not firm or feels spongy, **DO NOT DRIVE THE VEHICLE.**

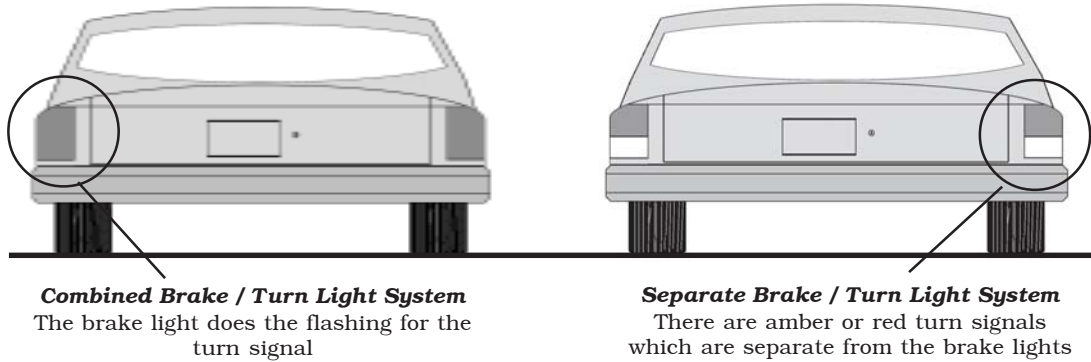
Troubleshooting Brake Bleeding

If you just can't seem to get all of the air out, there are a couple of things you can try. Remember that the air always rises to the highest points in the braking system.

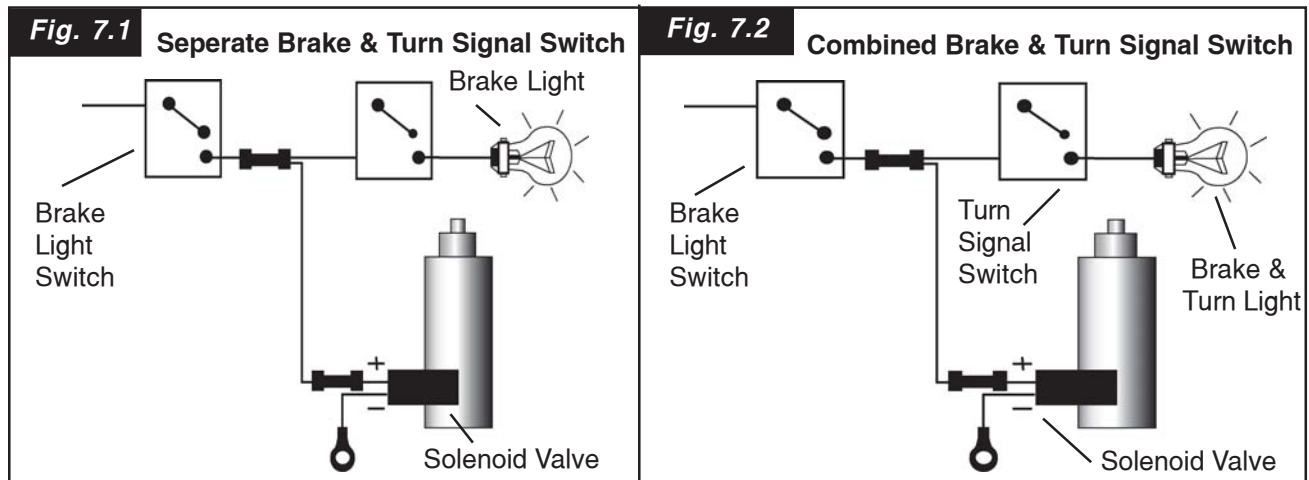
- 1. Verify that the master cylinder is free of air. Rebleed as necessary.*
- 2. Try raising the end of the vehicle being bled. This will force the air to the Bleeder Valve that is highest.*
- 3. Lightly tap the caliper or wheel cylinder with a soft blow hammer.*
- 4. Use one of the alternative bleeding methods.*

7. Wiring the Proportioning Valve

1. On the Proportioning Valve is a Solenoid Valve with two wires (see Figure 7.1). The Solenoid Valve allows air to pass into the BRAKEMASTER system each time the motorhome's brake pedal is depressed. The solenoid valve will only allow air to pass when it receives an electrical signal from the coach's brake light system. Where you tap into the brake signal depends on the kind of brake light system used by the coach. Compare the coach's lights to the illustration below.



2. **If your coach has a Separate Brake & Turn Signal system**, simply connect the remaining black wire from the Solenoid Valve to the coach's brake light wire as shown in Figure 7.1. This connection can be made anywhere that is easy and convenient. The Brake light wire can usually be located in the wiring harness that runs along the frame.



3. **If your coach has a Combined Brake & Turn Signal system**, you must route the black wire from the Solenoid Valve up to the brake light switch under the dash of the motorhome. You must connect the black wire to the cold side of the brake light switch before the wire goes into the turn signal switch in the steering column as shown in Figure 7.2. If you connect to the wire after the turn signal switch, the Brakemaster will not function properly.
4. If the short wire on the Solenoid Valve has not already been connected, use the ring terminal to ground it to the frame.

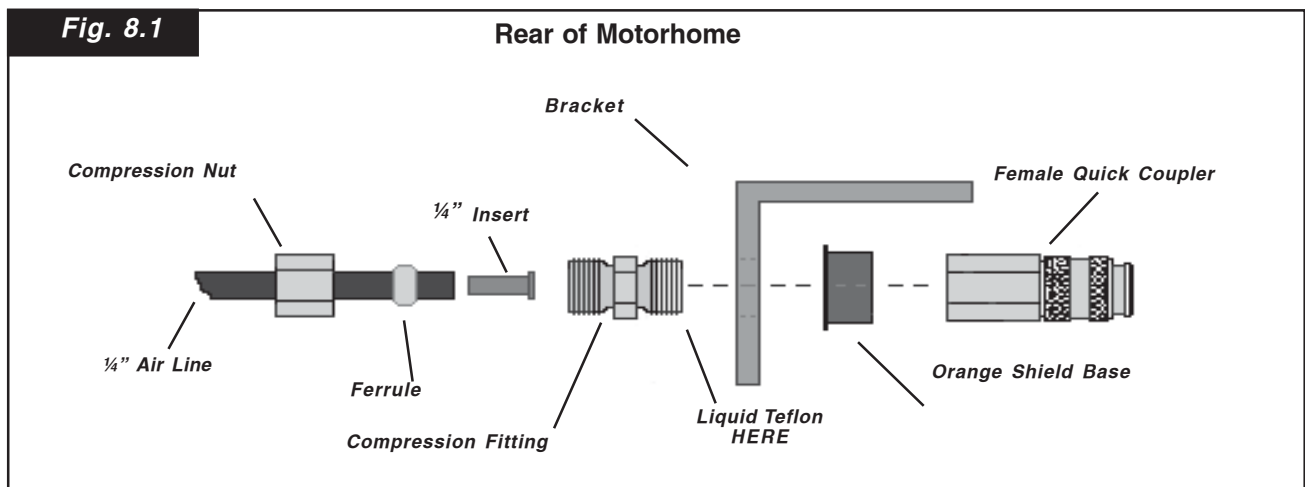
8. Routing Air Lines on the Coach

1. Tape the ends of the air lines to prevent dirt and debris from entering the tubing. When routing the air line, make sure that it is routed at least 2 feet away from any heat source. In addition, make sure the air line cannot rub or chafe against any sharp edges. Always secure it to the frame to prevent it from catching on any debris.
2. Now carefully route the air line from the compressor to the "IN" side of the Proportioning Valve (see Figure 5.5). Connect the air line at both ends using the same fittings and procedure as discussed in section 3 titled "Installation of the Air Lines".

CAUTION:

If you connect the air line to the "OUT" side of the Proportioning Valve, the "O" ring in the valve will be blown off its seat the first time you step on the motorhome's brakes. When this occurs no air can pass by the valve and the BRAKEMASTER system will not function. See **Troubleshooting** section 16 for instructions on how to correct this.

3. Next, route and connect an air line from the "OUT" side of the Proportioning Valve to the Female Quick Coupler installed in section 3 at the rear of the coach (see Figure 8.1). Again, use the same fittings and procedure to connect the air line at each end.



4. With the air line and wires attached, position the compressor over the 4 pilot holes drilled earlier and use the self tapping screws to secure the compressor in place. This kit includes a small length of rubber hose that can be used to drain the water out of the air tank. Drill a hole through the compartment in line with the Drain Valve to route the hose to the exterior. Use the hose clamp to secure. Seal the hole with an appropriate sealant.

IMPORTANT:

- A. Do not mount compressor in or route wires through slide-outs or any other moving components.
- B. Keep away from sharp corners or metal that may cut airlines or short wires. Kinking or severely bending the airline or wiring will also cause failure.
- C. Keep compressor, wires and airlines away from engines, exhaust pipes, mufflers or any other heat sources as excess heat can cause compressor failure, airline failure or wiring shorts.
- D. Make sure airline and wiring is properly secured to vehicle. Do not allow wires or airline to hang down where they may become snagged on road debris.

Roadmaster does not warranty parts or labor for kinked or ruptured airline.

9. Install Brake Monitor Wire on Towed Vehicle

WARNING:

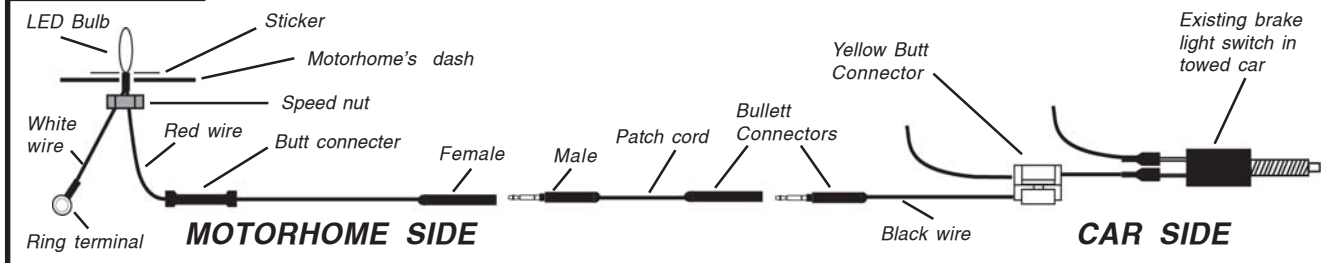
MUSTS FOR INSTALLATION SAFETY

When installing wires - take care so that the wires will not chaff, rub, pinch, crimp, or short out against the frame. If it does while connected to the towed vehicle, your brake light fuse will blow. Use included wire ties to properly secure the wires. In addition, wires must be routed at least 2' away from the engine and exhaust pipe, or any other components that generate heat.

Be certain not to route wire near moving parts, steering, suspension, slide outs, etc. Failure to comply with these instructions can result in electrical failure, fire, property damage, personal injury, or death.

Fig. 9.1

BRAKE LITE MONITOR WIRING DIAGRAM



Wiring Towed Vehicle

1. Plan out the shortest, safest route and install the short black Monitor Wire from the Air Quick Coupler (at the front of the towed vehicle) to the **cold side** of the brake light switch on the towed vehicle.
2. Use a large butt connector to join the Monitor Wire with the **cold side** of the brake light switch.
3. For proper operation of Monitor Light, towed vehicle brakes lights must be able to function with ignition key in towed position. Some vehicle's brake lights **ONLY** function with ignition system turned on or engine running. If this occurs a separate 2 prong Stop Light Switch and 10 Amp Fuse must be installed and custom fit to operate Monitor Light. This Stop Light Switch is **NOT** supplied and is available at local automotive parts stores.
4. Secure the Female Bullet Connector near the quick release at the front of the towed vehicle.

NOTE: Make sure you have left enough slack at the front of the towed vehicle to allow the Patch Cord to reach between the car and the motorhome. In addition, make sure that there is ample slack in the Patch Cord to allow the motorhome to turn sharply.

10. Install Brake Monitor Wire in Motorhome

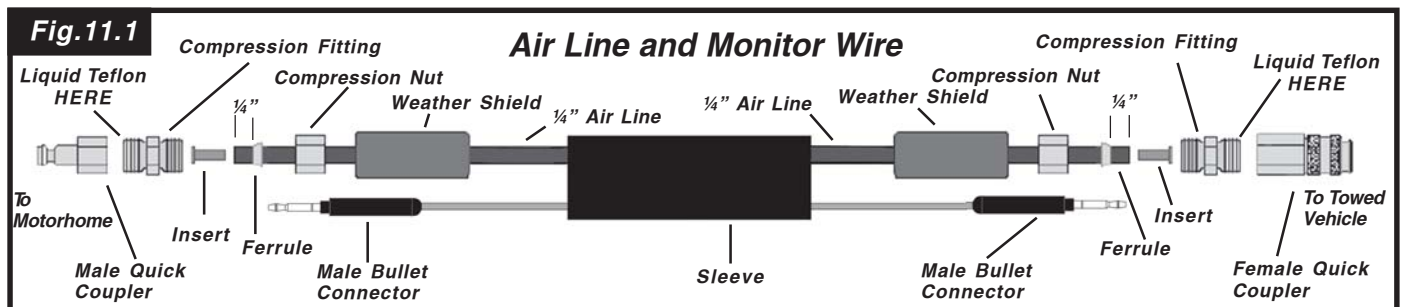
CAUTION:

The standard electrical cord (usually a 4 or 6 wire) must be connected between the car and motorhome in order for the Monitor Wire to function. It receives ground through the standard electrical cord.

Wiring Motorhome

1. Using the long black wire, position the Female Bullet Connector at the center rear of the motorhome near the Air Quick Coupler. Carefully route the wire from the rear of the motorhome to the underneath side of the dash.
2. Identify the location on the dash where the monitor light is to be installed. Make sure that this location is readily visible while driving, as well as easily accessible from the back. Also check that there are no wires or other components that could be damaged or interfere with the installation of the monitor light.
3. Drill a 5/16" hole into the dash of the motorhome. Center the BRAKEMASTER decal over the hole and adhere to the dash.
4. Route the LED bulb through the hole so that the two wires protrude out the underside of the dash.
5. Push the speed nut over the wires and base of the bulb, securing the bulb in position.
6. Place the black wire next to the LED wires and cut to length.
7. Now connect the black wire to the red wire with a butt connector.
8. Using the ring terminal, connect the white wire to any good ground source. (If necessary, use the excess black wire to extend the length of the white wire to a proper ground.)
9. At the back of the motorhome, secure the Female Bullet Connector near the BRAKEMASTER's quick release air fitting. Be sure the wire reaches the Patch Cord and allows an appropriate amount of slack for turning sharp corners.

11. Connect Patch Cord



1. Route the Patch Cord between the car and motorhome and connect both ends. This type of coupler is designed to securely latch by simply inserting the male connector. **Do not pull** back the housing of the female coupler when inserting the male end. This will prevent the proper locking of the coupler and may result in the couplers disconnecting during use of the braking system. **Attention installers: Be sure your customer understands the proper usage and operation of the Female Quick Coupler.**
2. Connect both ends of the monitor wire to the car and motorhome respectively.

12. Test the system

Upon completion of the installation. Perform the following tests:

1. Check for proper operation of Braking System

With the coach running and the BRAKEMASTER system fully connected, verify that the BRAKEMASTER depresses the towed vehicle's brakes each time the motorhome's brakes are applied.

CAUTION:

Before towing with the BRAKEMASTER, you must pump the brake pedal several times to deplete any residual vacuum left in your towed vehicle's braking system. If you do not remove the residual vacuum, your towed vehicle will brake excessively hard and may lock up the tires during the first stop or two.

2. Check for any leaks in the air system:

- a) Start up the motorhome and allow the air system to fully charge
- b) Connect the entire BRAKEMASTER system including the Patch Cord and Air Cylinder
- c) Have an assistant step on the brake pedal in the coach
- d) Cover each joint, fitting, and connection with a leak check solution
- e) Retighten all leaky fittings and repeat procedure

3. Check for proper operation of Monitor Light System

Start the coach and fully connect the BRAKEMASTER system. Verify that the monitor light illuminates each time the BRAKEMASTER depresses the towed vehicle's brakes and goes off each time the brake pedal is released. NOTE: If braking pressure is too light the monitor light may not illuminate.

Warranty Disclaimer

It is crucial that the monitor light be functioning properly whenever using the BRAKEMASTER system. If the monitor light is not coming on, there is no way to know if the brakes may be stuck on, or if you have no brakes. It is the customer's responsibility to verify that the monitor light is functioning before each trip. In addition, if the monitor light stops working, the customer must discontinue using the BRAKEMASTER immediately. The purpose of the monitor light is to notify you of any malfunction long before any damage can occur to your vehicle or its braking system. Accordingly, ROADMASTER expressly disallows any warranty claims related to any brake damage or brake failure.

4. Check for proper operation of the Brake Lights and Turn Signals

Connect your taillight wiring kit first. With the coach running and the Brakemaster system fully connected, test the functioning of the brake lights and turn signals of the towed vehicle. Now depress the coach's brake while the turn signal is still on. If the brake light overrides the turn signal on the towed vehicle, you must rewire the vehicle (see section 13).

DANGER!

Failure to rewire the vehicle may cause an accident resulting in property damage, personal injury or death.

5. Test the BRAKEAWAY system.

CAUTION: Car may roll. Set emergency brake before testing.

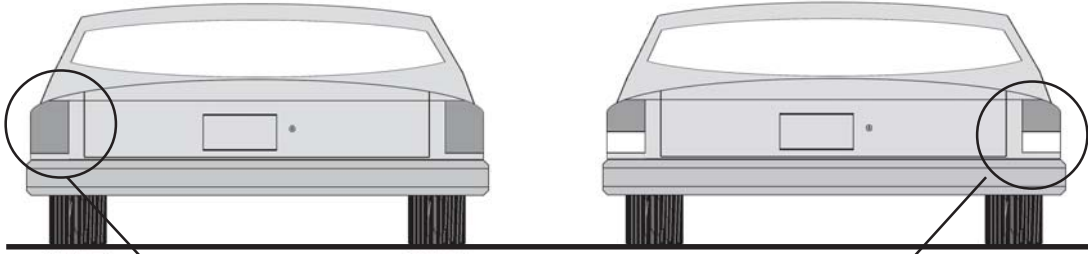
Charge the **ROADMASTER BRAKEAWAY** system every time the motorhome is hooked-up to the towed vehicle. First, start the motorhome engine and allow the compressor to run until the compressor shuts off. Now, apply the brakes firmly and hold down until you hear the air compressor shut off again (about 45 seconds). The air reservoir is now charged.

Test the **ROADMASTER BRAKEAWAY**. Note: Only test the **BRAKEAWAY** with the vehicle stopped. Test by removing the switch pin and verify that the braking system holds the brake pedal down in the towed vehicle. To release the **BRAKEAWAY**, reinsert the switch pin. You can also: Remove **BRAKEAWAY** fuse at battery. **CAUTION: Car may roll. Set emergency brake before removing fuse.** See Owner's Manual for cable hook-up instructions.

6. Read and follow all instructions in the BRAKEMASTER Owner's Manual before towing your vehicle with the BRAKEMASTER installed.

13. Brake Light Solutions

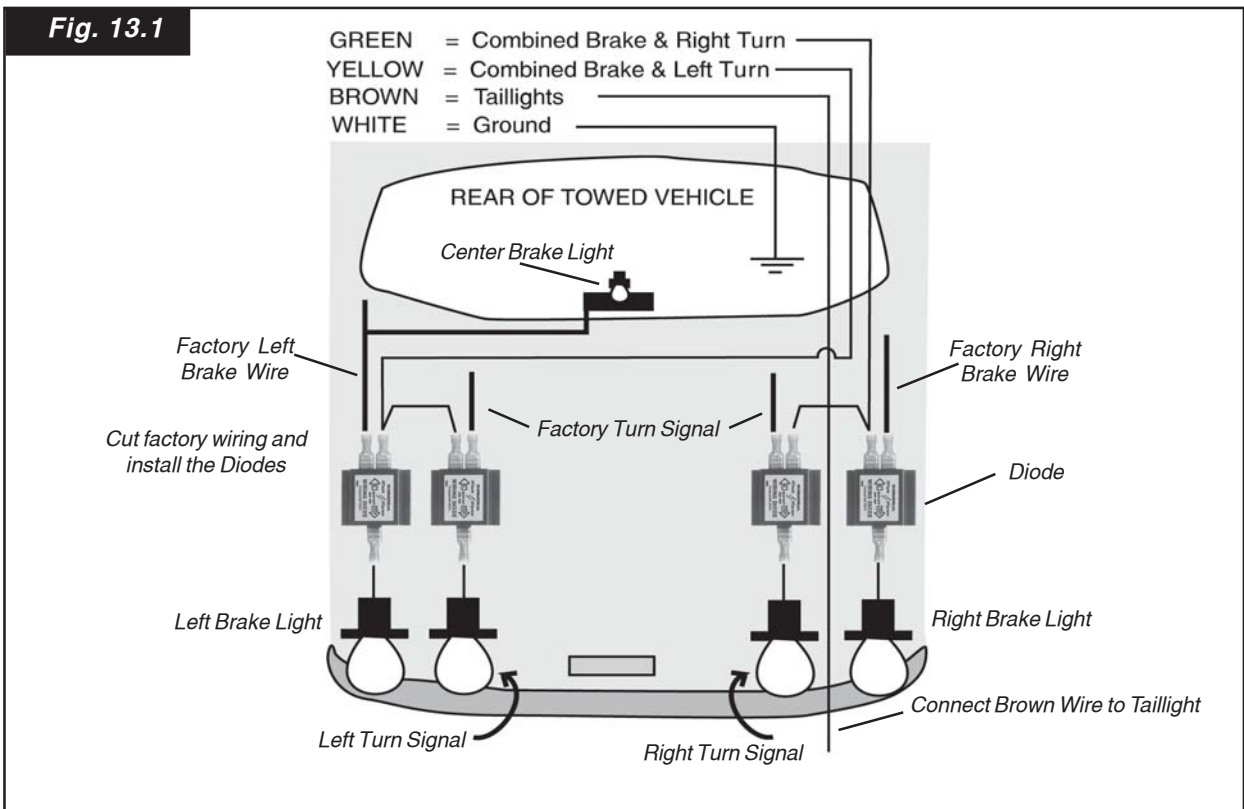
Use the following instructions **ONLY** if your Brake Light overrides the Turn Signal as tested in Section 12.



Combined Brake / Turn Light System
The brake light does the flashing for the turn signal

Separate Brake / Turn Light System
There are amber or red turn signals which are separate from the brake lights

If your Motorhome has **Combined Brake & Turn Signals** and your Towed Vehicle has **Separate Brake and Turn Signals** — use two optional diodes and wire as shown in Figure 13.1 This method allows the towed vehicle's turn signals to flash. When wired properly, both the turn signal and brake light will flash when the turn signal is on. However, when the brake and turn signal is on, the brake light will stay illuminated while the turn signal flashes.



13. Brakelight Solutions (continued)

Use the following instructions ONLY if your Brake Light overrides the Turn Signal as tested in Section 12.

If your Motorhome has Combined Brake & Turn Signals and your Towed Vehicle has Combined Brake & Turn Signals — Your options are:

- a. ROADMASTER's Optional Brake Light Relay (part number 88400) see section 14
- b. Install an ON-OFF toggle switch that disables power from the cold side of the brake light switch.

CAUTION:

If you use this option, you must install the switch after the connection to the monitor wire. Installing the switch upstream from the monitor wire will prevent the monitor light from functioning.

WARNING:

Failure to toggle the switch back after towing will prevent your lights from functioning while driving and may result in property damage, personal injury or death.

- c. Disconnect your existing light system (towing only) and install ROADMASTER's Taillight Wiring Kit with bulbs (part number 155).
- d. Disconnect your existing light system (towing only) and replace it with ROADMASTER's Magnetic Towing Lights (part number 2100 or 2120). NOTE: A separate ground wire will be needed for the dash monitor light to function.

If your Motorhome has Separate Brake & Turn Signals and your Towed Vehicle has Combined Brake & Turn Signals — same options as above

If your Motorhome has Separate Brake & Turn Signals and your Towed Vehicle has Separate Brake & Turn Signals - You should have no problem with the brake light overriding the turn signal.

NOTE: Diodes must be installed on the Brake Line Circuit to prevent feedback to the Regulator Assembly.

CAUTION:

The BRAKEMASTER Solenoid Valve utilizes power from the motorhome's brake light system to allow air to travel to the air cylinder. Therefore it is imperative that diodes are used to connect the brake light circuit of the motorhome to the brake light circuit of the car (See Figure 13.1). Failure to use diodes will allow power from the car to flow backwards into the motorhome energizing the Solenoid Valve. This can cause the brakes of the towed vehicle to be continually applied.

15. Completion of the BRAKEMASTER Installation

Upon completion of the installation, take a few minutes to demonstrate the proper operation of the Brakemaster to your customers. You will impress them with your thoroughness. Furthermore, the customer is bound to be more pleased with your service if they fully understand how the BRAKEMASTER system operates.

Be sure to provide these instructions and the Owner's Manual to the customer before leaving.

WARRANTY PROCEDURES

If you have any problems with this product, immediately contact ROADMASTER at 1-800-669-9690. If necessary, we can direct you to your nearest warranty service center for repairs or replacements. While under warranty, ROADMASTER will make arrangements for your product to be repaired or replaced. **Do not purchase replacement parts or pay for labor. You will not be reimbursed.** See section titled: "ROADMASTER Limited Warranty" in the Owner's Manual for specific details.

16. Troubleshooting

Symptom:

The monitor light is not coming on even though the brake is being depressed in the towed vehicle.

Solution:

- a. Make sure the patch cord for the monitor wire is connected between the car and motorhome.
- b. Your regular electrical cord must also be connected between your car and motorhome. The monitor system uses it for the ground wire.
- c. Verify that the towed car's brake light fuse is not blown. Check this by stepping on the brakes of the towed car. If they light up, the fuse is good. The monitor light uses power from the towed car's brake circuit. If the fuse is blown in the car, the monitor light will not function in the motorhome.
- d. Did you install the Brakelite Relay Kit #8400? If so, make sure that the monitor wire taps into the towed vehicles brake light wire after the brakelite switch, but before the Brakelite Relay. Connecting the wire anywhere else will prevent the monitor light from functioning. See Brakelite Relay installation instructions.
- e. Test the LED bulb. Remove the bulb from the dash and connect it directly to the battery. Red wire to positive and white to negative.
- f. Monitor light will not illuminate during very light braking.

Symptom:

I've completed the installation and hooked everything up, but nothing happens in the towed vehicle when I step on the motorhome's brakes.

Solution:

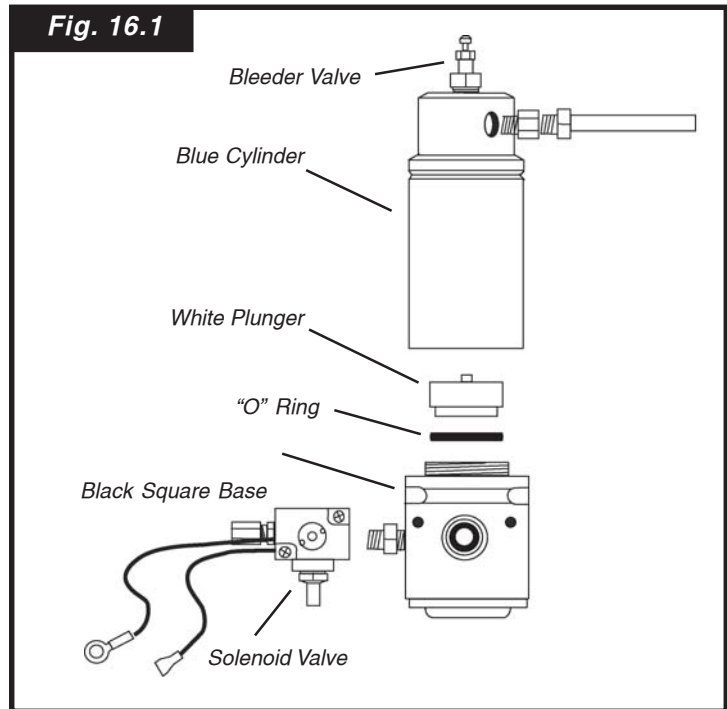
- a. Make sure the engine is running in the motorhome. With the engine off, the motorhome develops very little hydraulic pressure and requires substantial braking to activate the Brakemaster system.
- b. Make sure the air line is properly connected between the car and motorhome. Often times, the quick couplers are not properly connected, but they appear to be since the weather boots hold them together. Slide the boots back and gently tug on the airline to be sure they are secure. Also verify that the air cylinder is connected to the air line under the driver's seat.
- c. Verify that the solenoid valve (on the proportioning valve) is wired correctly. The short wire with the ring terminal must be connected to a good ground. You may have to scrape the paint away from the frame. Make sure the other wire is connected to the motorhome's brake wire downstream of the brake light switch. Use a test light to verify that you are getting power to the solenoid valve when the brakes are applied in the motorhome. If everything is connected properly, test the valve as follows:
 1. Start the motorhome.
 2. Have someone step on the brakes while you listen to the solenoid valve. If it is operating properly, you will hear a click each time the brakes are depressed. You should also be able to feel it click.
- d. Remove the air line at the "Out" side of the proportioning valve. Step on the motorhome's brakes and see if the proportioning valve releases air pressure each time the pedal is depressed. If not, see "e" below. If so, follow the airlines all the way to the air cylinder. Inspect for a melted air line or kinked air line that is blocking the air flow. If necessary, disconnect the air couplers to verify that they are allowing air to flow through them.

16. Troubleshooting (continued)

- e. Are the air lines hooked up backwards to the proportioning valve? If so, the air pressure would blow the internal “O” ring (see Figure 16.1) off of the white plunger. If this has occurred, you should be able to feel air pressure leaking around the blue cylinder each time the brakes are depressed. The Brakemaster system will not function until you have reseated the “O” ring. See instructions below titled, ‘How to Reseat the “O” Ring’.

How to Reseat the “O” Ring.

- Disconnect the hydraulic brakeline from the proportioning valve. Use the rubber plug to stop the fluid from leaking out the brake line.
- Unthread the blue cylinder from the black square base.
- Remove the white plunger. Use caution not to scratch or mark the plastic.
- Pull the “O” ring out of the black base. If you get dirt on the plunger or “O” ring, you must clean them thoroughly and coat lightly with grease. Now, reseal the “O” ring on the groove at the bottom of the white plunger. It will seem loose, but that is normal.
- Reinstall the plunger being careful that the “O” ring stays in place.
- Reassemble the proportioning valve and reconnect the hydraulic brake line. Bleed both the proportioning valve and all brakes downstream from the brake tee as described in the installation instructions.



Symptom:

The compressor runs continually or runs much more frequently than it should.

Solution:

- Use leak check solution to inspect for air leaks
- Make sure the drain petcock is closed on the compressor tank
- Make sure the Brakeaway’s drain petcock is closed.
- Make sure you’ve installed a female quick coupler at the rear of the motorhome. The male quick coupler does not have a check valve and will allow air to bleed through it.

16. Troubleshooting (continued)

Symptom:

It seems to require a significant amount of brake pressure in the motorhome before the air cylinder activates in the towed vehicle.

Solution:

- a. Make sure the engine is running in the motorhome. With the engine off, the motorhome develops very little hydraulic pressure and requires substantial braking to activate the Brakemaster system.
- b. Check the airlines for a kink that restricts the flow.
- c. Check the airlines. If routed too close to a heat source, they will melt and create a blockage restricting air flow.
- d. Inspect air lines and fittings for leaks. Substantial leaks will prevent most of the air from ever reaching the cylinder resulting in minimal braking.
- e. If you've checked all of the above, then it is likely that some air still remains in the hydraulic brake system. This air simply compresses and absorbs the hydraulic pressure preventing the Brakemaster from activating properly. It also prevents the motorhome's rear brakes from braking properly. Rebleed the proportioning valve and all brakes downstream from the brake tee. See Installation Instructions for proper directions on how to bleed brakes.
- f. If you are connecting to a Ford Class C Motorhome, then you need to tee into the front hydraulic brake line. The rear hydraulic brake line does not supply sufficient hydraulic pressure to brake the towed vehicle properly. See Section 5, "Install the Proportioning Valve".

Symptom:

The air cylinder has depressed the brake, however, it will not release even though the brakes have been released in the motorhome.

Solution:

- a. Make sure air cylinder is directly in line with brake pedal. If installed at an angle, it can cause the air cylinder to jam in the extended position.
- b. If teflon tape was used on the compression fittings during installation, pieces of it can be blown into the air cylinder's dump valve or the solenoid valve preventing them from dumping air out of the air cylinder.
- c. You must have a diode installed wherever the motorhome's brake light wire connects to the towed car's brake light wire. When the brakemaster steps on the towed car's brake pedal, it energizes the towed car's brake light wire. If there is no diode in the circuit, current can travel backwards into the motorhome's brake system. When the solenoid valve receives power from the motorhome's brake system it activates the solenoid. As long as the solenoid is activated, it will not allow the air to dump out of the Brakemaster system. This causes the air cylinder to remain extended even though the motorhome's brakes are off.
- d. Foreign material such as sand or dirt may enter into the blue patch cord when disconnected. Then when patch cord is connected the debris travels into the cylinder.

MUSTS FOR OWNER SAFETY

OWNER MUST READ AND FOLLOW ALL INSTRUCTIONS IN BRAKEMASTER OWNER'S MANUAL

IMPORTANT NOTES:

- *The air compressor tank and the BRAKEAWAY tank must be drained regularly. When operating in areas of high humidity it may be necessary to drain the water in the compressor's air tank every few days. NON-WARRANTY damage can result to the BRAKEMASTER's system if excessive water enters into the system.*
- *Always keep the weather covers on fittings when not in use. Check for and remove any foreign objects from the male and female coupler before every use to avoid damage to system components.*
- *Keep your extension air line that connects your coach to your towed vehicle in a clean, dry place when not in use. Always connect the male and female fittings together before storing to keep free from foreign objects.*
- *When coupling the air fittings on the extension air line for towing, simply insert the male connector into the female connector and push in until it snaps into the locked position. The only time you need to pull the collar back on the female connector is when disconnecting.*
- *After connecting the air quick couplers, gently tug on the coupling to insure that the fittings are securely engaged.*
- *To avoid damage and possible failure, the Air Cylinder must be stored in a clean, dry place when not in use.*
- **DO NOT REMOVE BRAKEAWAY PIN!** (See page 6).

CAUTION: Before towing with the BRAKEMASTER, you must pump the brake pedal several times to deplete any residual vacuum left in your towed vehicle's braking system. If you do not remove the residual vacuum, your towed vehicle will brake excessively hard and may lock up the tires during the first stop or two. Once the vacuum has been released, it is not necessary to pump the brakes again until the towed vehicle has been started (which will create vacuum in the vehicle's braking system).

- **Charge the ROADMASTER BRAKEAWAY system before first use (See Section 12). This only needs to be done once. It will only need to be recharged if the BRAKEAWAY has been activated.**

WARNING: Failure to release emergency brake on towed vehicle before towing will result in severe brake damage or brake fire and is not covered by warranty.

WARNING: If for any reason you must have the towed vehicle running while being towed, it is imperative that you disconnect the BRAKEMASTER system. Failure to do so can result in severe brake and tire damage.

CAUTION: As equipped, the BRAKEMASTER will only function properly on towed vehicles with power brakes. **Do Not use this version of the BRAKEMASTER on vehicles without power brakes.** Doing so will cause the towed vehicle's brakes to lock up resulting in tire damage, brake damage or property damage. There is an optional regulator Part # 900002 which will adapt a non-powerbrake towed vehicle for use with the BRAKEMASTER system. For more information about the regulator please call customer service at 1-800-669-9690.

Important Monitor Light Information

The monitor light is a tool designed to notify you of any malfunction with the BRAKEMASTER system.

Light ON = Your towed vehicle's brakes are on

Light OFF = Your towed vehicle's brakes are off.

If the light stays on even when you are not braking your motorhome, immediately stop and disconnect the patch cord between your car and your motorhome and remove the air cylinder from your towed vehicle. You must trouble shoot and repair the malfunction before using the BRAKEMASTER again. The light is indicating that the brakes are still on in your car even though you are not braking the motorhome. This will cause the brakes to overheat and cause significant brake damage or even a brake fire on your towed vehicle. Towing in this fashion voids ROADMASTER's Warranty. ROADMASTER will not warrant any brake damage caused in this fashion.

If the light stays off when you brake your motorhome, this means that your towed vehicles brakes are not being applied and you are not benefiting from the additional braking power of the BRAKEMASTER system. Towing in this condition will require additional stopping distance. You must trouble shoot and repair the malfunction before using the BRAKEMASTER again. **NOTE:** Very light braking will also cause the light not to activate this is normal.

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