

Universal Wiring Kit

part number 150

Installation Instructions

All specifications are subject to change without notice

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Wire the towed vehicle



WARNING

Read the instructions before installing the kit components. Failure to understand how to install the Universal Wiring Kit could result in property damage, personal injury or even death.

CAUTION

Do not install this kit in a 1999-2003 Ford Windstar, 2004 and newer Ford Freestar, or in any vehicle using a "low side switching" system. A low side switching system will prevent the taillights from functioning properly when they receive power from the motorhome.

Use either magnetic tow lights or a taillight bulb and socket kit to wire these vehicles for towing.

Step A

Identify the vehicles' lighting systems;
determine if additional components are required

1. The vehicle will be wired for towing according to the type of brake and turn signals in both vehicles. There are two types – combined or separate. In a **combined** system (Figure 1), the brake light does the flashing for the turn signal; in a **separate** system (Figure 1), there are amber or red turn signal lights which are separate from the brake lights.

Note: if the motorhome has a separate system, use a test light to see if a 3-to-2 converter has been installed – if the same circuit energizes both the turn signals and the brake lights, a converter has been installed.

The 3-to-2 converter will, in effect, change the brake and turn signals from separate to combined.

2. Based on the type of brake and turn signals, additional components may be required...



WARNING

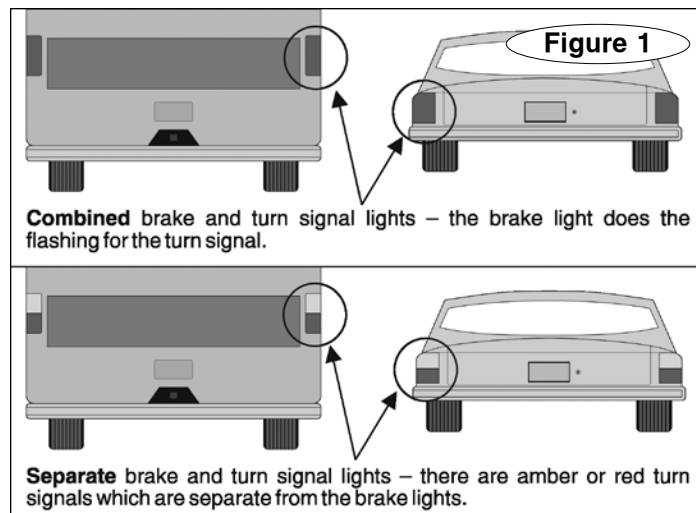
Two additional diodes are required to properly wire

all late model vehicles, regardless of the type of wiring system in the motorhome. Unless these additional diodes are attached, the towed vehicle's electrical system will be severely damaged. Other consequential damage may also occur.

Failure to install the additional diodes may cause property damage, personal injury or even death.

- If both the motorhome and the towed vehicle have combined lighting systems, no additional components are necessary.
- If the motorhome has a combined lighting system and the towed vehicle has a separate lighting system, no additional components are necessary.
- If the motorhome has a separate lighting system and the towed vehicle has a combined lighting system, a Brite-Lite™ 3-to-2 wiring converter (part number 732) is required. Installation instructions are included with the converter.

continued on next page



IMPORTANT NOTICE!

Safety Definitions

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



WARNING

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



CAUTION

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

CAUTION

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

NOTE

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

continued from preceding page

- If both the motorhome and the towed vehicle have separate lighting systems, two additional diodes (part number 792), one female spade connector and a six-wire electrical cord (straight: part number 98146; coiled: part number 146) are required. An electrical socket and mounting bracket for the towed vehicle (and another set for the motorhome, if it is not already equipped with a socket and bracket) is also required.

Note: an additional diode may be required to wire the vehicle's rear license plate light (if the vehicle is so equipped).

Step B

Attach and route the wiring harness

1. At the front of the towed vehicle, choose a suitable point to attach the four-wire electrical harness (the 30-foot length of four-wire cord). Look for a mounting point on the opposite side of the exhaust system, away from pre-existing components.

Note: this kit uses molded four-prong connectors to connect the electrical cord between the two vehicles. However, if you prefer, these connectors can be removed and replaced with sockets and brackets.

- **If you will install a socket mounting bracket at the towed vehicle** – attach the bracket to a surface of sufficient strength to hold it firmly in place. Cut the four-prong connectors from both ends of the wiring harness.

CAUTION

Attach the mounting bracket close to the center. If the bracket is attached too far to either side, the bracket and the electrical socket may be pulled away when the motorhome turns.

- **If you will omit the socket and bracket** – use one of the included wire ties to attach one end of the electrical harness. Allow enough slack so that the four-prong connector on the harness can be easily connected and disconnected from the matching connector on the electrical cord.

Cut the four-prong connector from the other end of the harness. Leave three feet of wire attached – the connector and wiring will be used at the motorhome.

2. Route the other end of the harness to the rear of the vehicle.

Note: depending on your preferences and the design of the vehicle, you can attach the ground wire at the front, or at any easily accessible point. Use the included ring terminal and self-tapping screw to attach the wire.

To avoid grounding problems, attach the wire to a good chassis ground, preferably directly to the frame.

If possible, follow the existing wiring harness and where appropriate, use a section of the included split loom to protect the wires; use the included wire ties to secure the wiring in place.



WARNING

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

Wiring exposed by moving parts, sharp edges or hot

components may cause a short circuit, which can result in damage to the vehicle's electrical system as well as other, consequential damage.

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

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

3. At the rear of the vehicle, find a suitable point to gain access to the vehicle's taillights, on the opposite side of the exhaust system. If it is necessary to drill a hole, seal it with silicone sealant after you have routed the wires through.

4. Route the electrical harness from the taillight assembly opposite the exhaust system to the other taillight assembly.

Trim any excess wiring. Then separate the bonded wires in the harness and, depending on the lighting systems in both vehicles, peel back the appropriate wire to the other side (see Figure 2 or 3).

Step C

Wire the vehicle for towing

1. Expose the wires in both taillight assemblies. (It may be necessary to remove the taillight assemblies from the exterior of the vehicle to gain access to the wiring.)

2. With a test light, identify the ground, brake light, taillight and turn signal wiring.

3. If you have not already attached the ground wire, use the included ring terminal and self-tapping screw to attach it now.

Note: to avoid grounding problems, attach the wire to a good chassis ground, preferably directly to the frame.

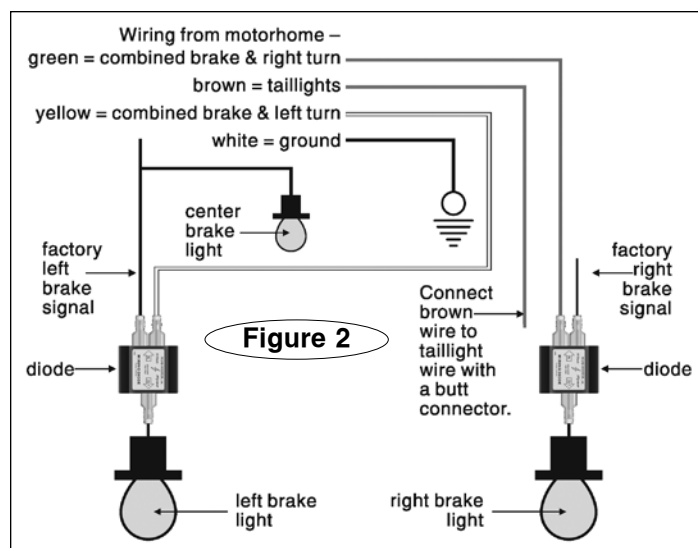
4. For early model vehicles, follow Figure 2 to wire the vehicle for towing. For all other vehicles, follow the steps below.



WARNING

Wire the towed vehicle according to the instructions, and the appropriate diagram. Improperly wiring the towed vehicle may cause electrical malfunction or other consequential damage, which may result in property damage, personal injury or even death.

continued on page four

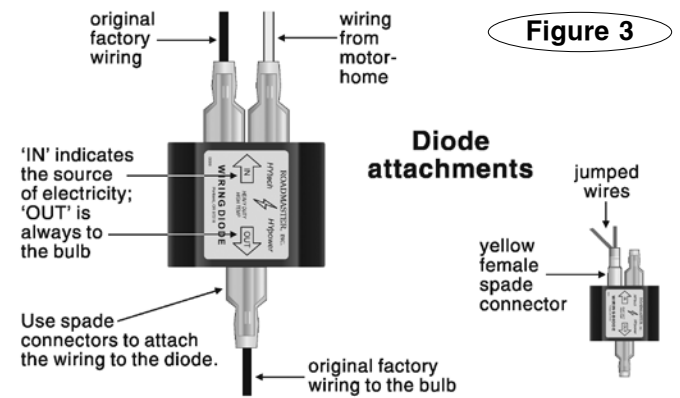


CAUTION

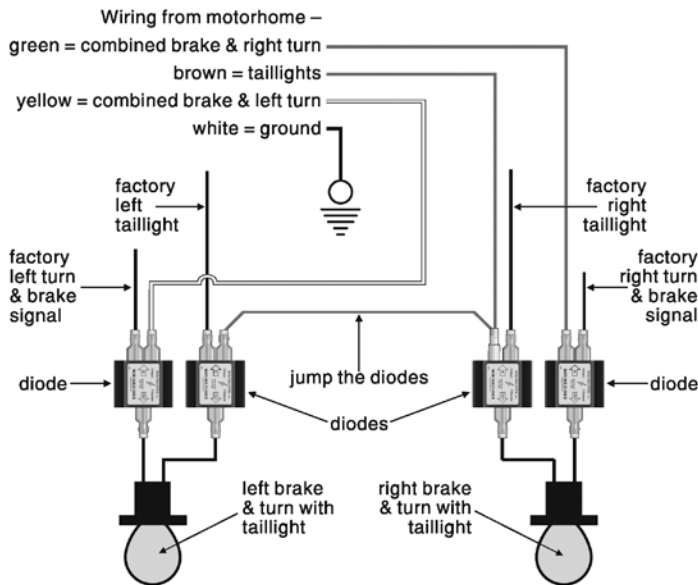
The color codes listed below are the most commonly used. However, color coding is not standard with all manufacturers.

Use the color codes for initial reference only; confirm the function of each wire with a test light.

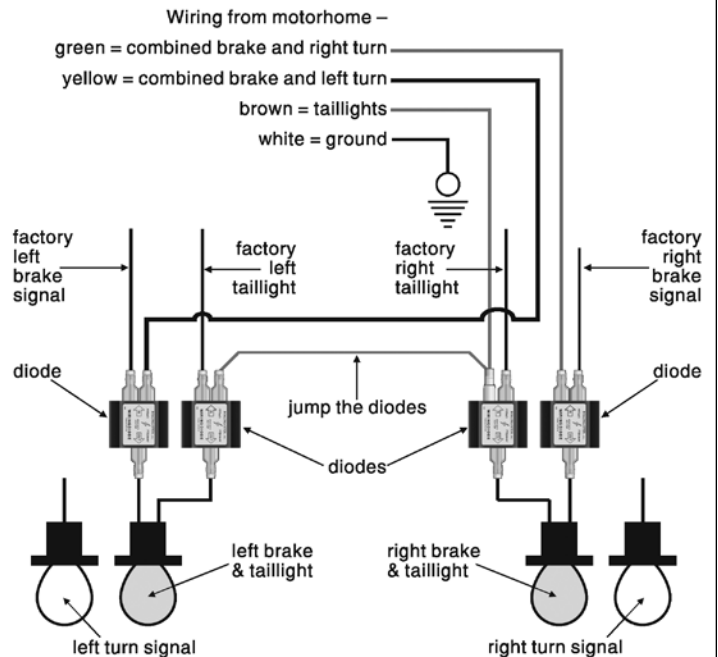
The towed vehicle's lighting system may not function, or function improperly, if the wires are not connected correctly. Cross-wiring may also cause a short circuit, a blown fuse or other electrical damage.



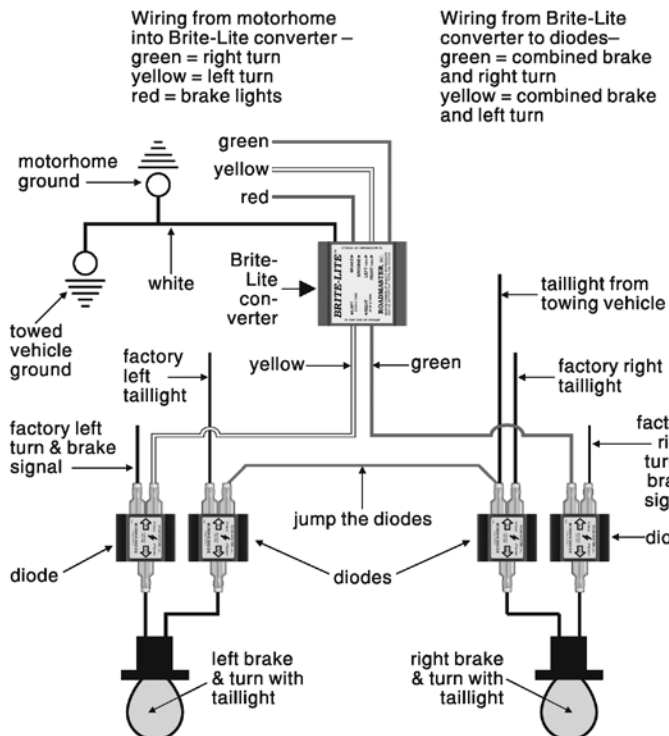
Combined towed vehicle to combined motorhome



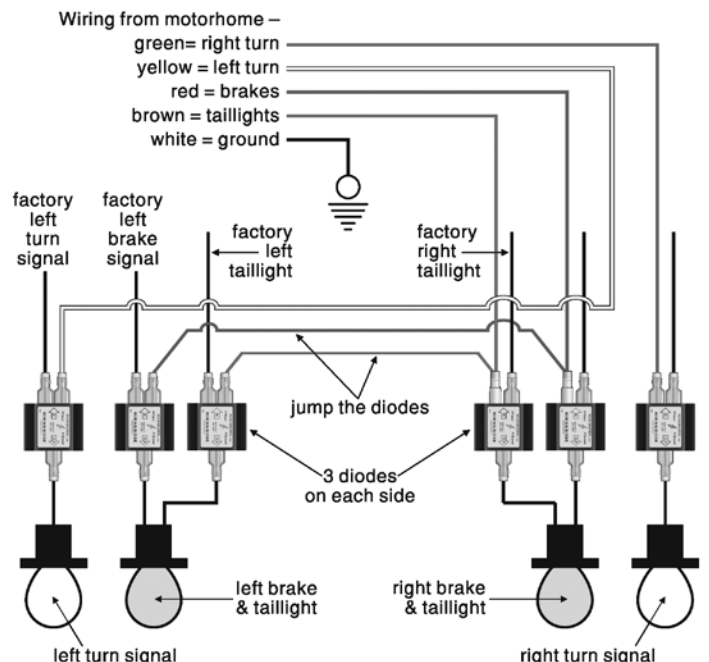
Separate towed vehicle to combined motorhome



Combined towed vehicle to separate motorhome



Separate towed vehicle to separate motorhome



CAUTION

Failure to attach diodes as indicated in the wiring diagrams will create a backfeed through the vehicle's electrical system, which will allow electrical current from the towed vehicle to disrupt one or both of the vehicles' electrical systems. Also, if a supplemental braking system is installed it may not operate, or may only operate intermittently.



WARNING

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

Attaching the diodes farther away may cause the towed vehicle's lights to work improperly, as well as

cause damage to other electrical components in the vehicle, which may result in property damage, personal injury or even death.

5. Use the brown wire to jump the diodes attached to the taillights, as shown in Figure 3.

To attach two wires to one terminal, use a female spade connector (not supplied).

6. Wire the vehicle according to the appropriate lighting system – combined to combined, separate to combined, combined to separate, or separate to separate – as shown in Figure 3.

Note: the wiring diagrams apply to the majority of vehicles. However, applications vary. Before wiring, refer to the owner's manual, or ask the dealership or manufacturer, for vehicle-specific information. (Wiring information for many vehicles is available at www.roadmasterinc.com, under 'Vehicle-Specific Information'.)

Wire the motorhome

Based on whether the motorhome has a four-, six- or seven-wire electrical system, follow the instructions below to attach the wiring for the connectors, or the sockets and plugs. (If the motorhome has a four-wire system and you will install a socket at the towed vehicle, see step B under "For motorhomes with four wire systems.")

CAUTION

The color codes listed for four-, six- and seven-wire systems are the most commonly used. However, color coding is not standard with all manufacturers.

Use the color codes for initial reference only; con-

firm the function of each wire with a test light.

The towed vehicle's lighting system may not function, or function improperly, if the wires are not connected correctly. Cross-wiring may also cause a short circuit, a blown fuse or other electrical damage.



WARNING

Wire the connectors, or sockets and plugs, according to the instructions below, and the appropriate diagram. Improperly wiring the lighting system may cause electrical malfunction or other damage, which may result in property damage, personal injury or even death.

For motorhomes with four-wire systems

A. If you will omit the socket and bracket – the electrical connection at the towed vehicle is complete – simply plug one of the four-prong connectors in the electrical cord to the connector on the towed vehicle.

Follow the instructions below to wire the motorhome electrical system to the remaining four-wire connector...

1. Attach the three feet of electrical harness and molded four-prong connector you removed in Step B, "Attach and route the wiring harness," to the motorhome's electrical system – choose an attachment point for the connector at the rear of the motorhome. Look for a mounting point away from pre-existing components, and close to the center.

CAUTION

Attach the connector close to the center of the motorhome. If the connector is attached too far to either side, it may be pulled away when the motorhome turns.

2. Attach the connector with one of the included wire ties. Allow enough slack so that the four-prong connector on the harness can be easily connected and disconnected from the matching connector on the electrical cord.

3. With a test light, identify the wires conducting the left turn/stop, ground, right turn/stop and taillight signals in the motorhome electrical system. (If the motorhome has a six- or seven-wire electrical system, the other wires are not used.)

4. If necessary, trim the three-foot length of wire from the molded connector. Then strip ¼" to 3/8" of insulation from the ends of all eight wires.

5. Using the four included butt connectors, attach the wires as follows:

Wire color from 4-prong connector	Motorhome wiring
Attach the yellow wire to.....	Left turn/Stop
Attach the white wire to	Ground
Attach the green wire to.....	Right turn/Stop
Attach the brown wire to	Taillights

B. If you will install a socket at the towed vehicle – follow the instructions below to wire the plug and socket. (If you will also install a socket at the motorhome, the instructions are identical.)

1. Use a test light to identify the wires conducting the

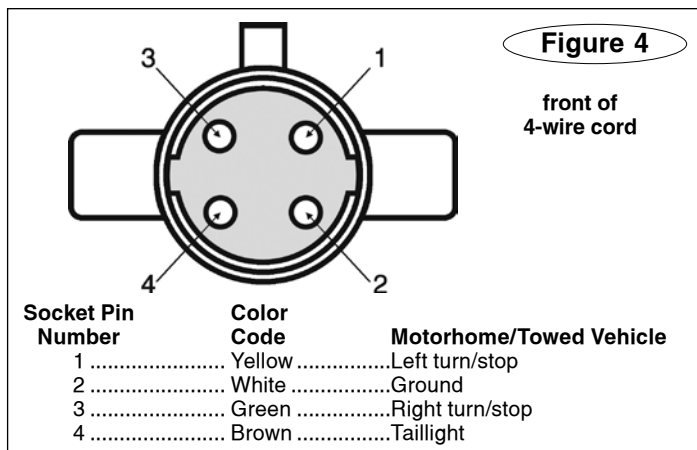
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left turn/stop, ground, right turn/stop and taillight signals. (If the motorhome has a six- or seven-wire electrical system, the other wires are not used.)

2. To wire the plug, first strip ¼" to 3/8" of insulation from the ends. Connect the wires according to Figure 4; apply a silicone sealant to the attachment points to help prevent damage from moisture and corrosion.

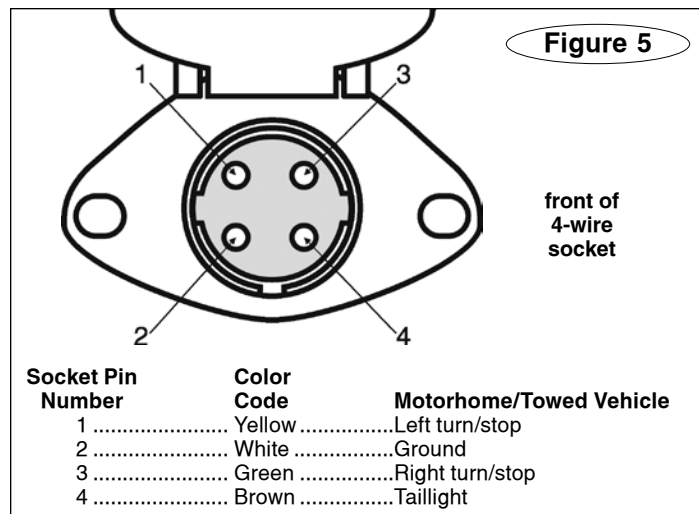
3. To wire the socket, first trim the wires to length and strip ¼" to 3/8" of insulation from the ends. Loosen the set screw at the back of the socket and push the inner connector out the front. Then run the four-wire cord through the back of the housing.



Loosen all of the set screws on the side of the socket and connect the wires to the back of the socket, as shown in Figure 5.

Tighten all the set screws, and check each wire to ensure that it is fastened securely. Apply a clear silicone sealant around each wire entry and set screw indentation to help weatherproof the socket and secure the set screws.

4. Connect the electrical cord to the motorhome and towed vehicle. Test the towed vehicle's turn signals, taillights and brake lights to ensure they operate in conjunction with those of the motorhome.

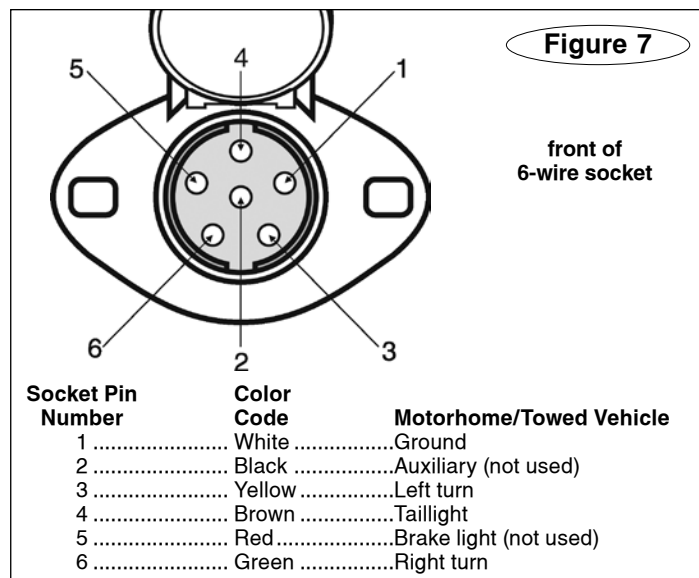
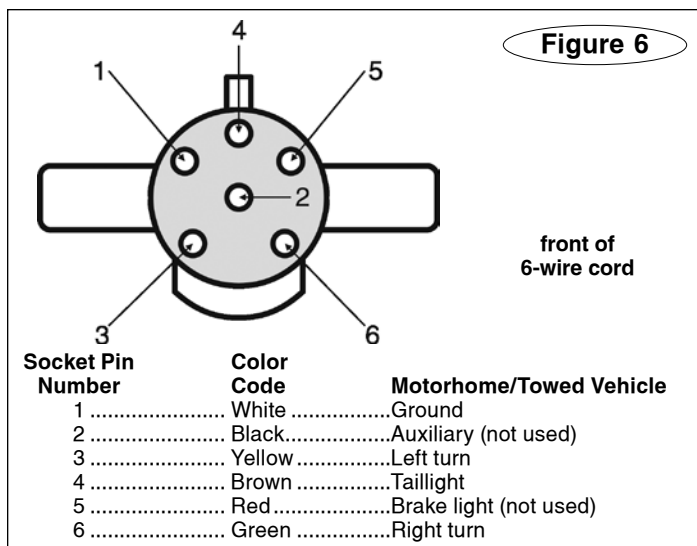


For motorhomes with six-wire systems

1. If the motorhome is not already equipped with an electrical socket, choose an attachment point for the socket mounting bracket. The bracket must be attached close to the center, and to a surface of sufficient strength to hold it firmly in place.

CAUTION

Attach the mounting bracket close to the center of the motorhome. If the bracket is attached too far to either side, the bracket and the electrical socket may be pulled away when the motorhome turns.



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the front. Then run the six-wire cord through the back of the housing.

Loosen all of the set screws on the side of the socket and connect the wires to the back of the socket, as shown in Figure 7.

Tighten all the set screws, and check each wire to

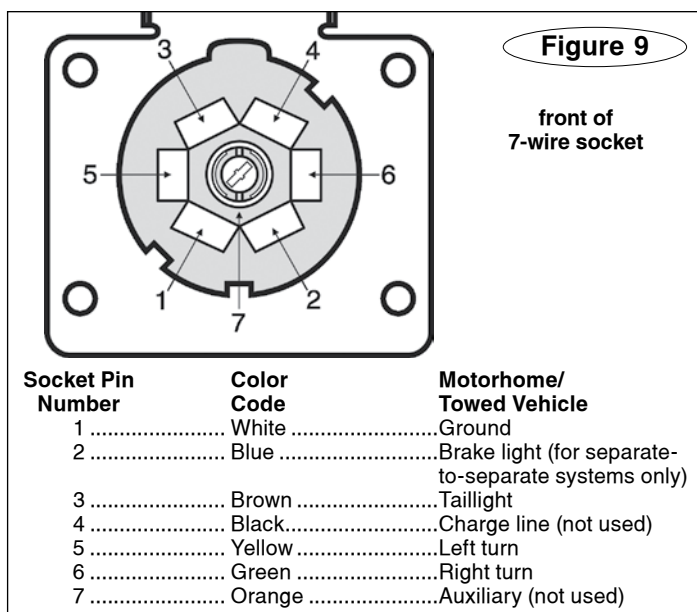
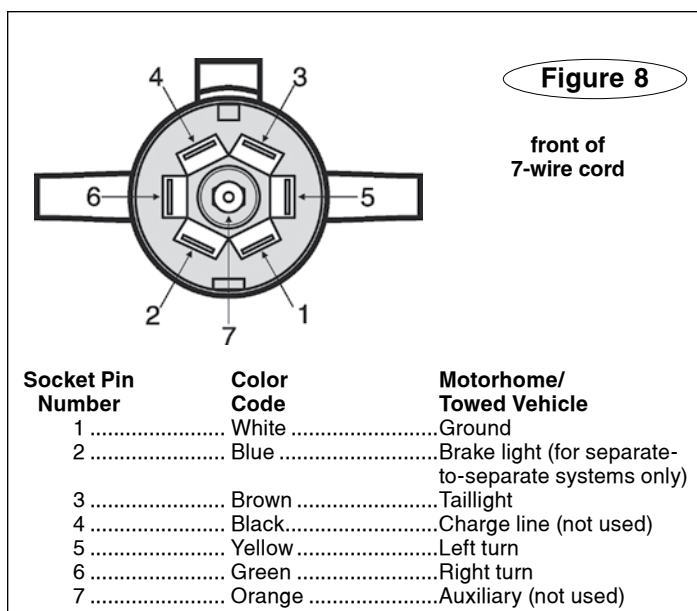
ensure that it is fastened securely. Apply a clear silicone sealant around each wire entry and set screw indentation to help weatherproof the socket and secure the set screws.

5. Connect the electrical cord to the motorhome and towed vehicle. Test the towed vehicle's turn signals, taillights and brake lights to ensure they operate in conjunction with those of the motorhome.

For motorhomes with seven-wire systems

Note: seven- to four-wire electrical cords are available from ROADMASTER in both straight (part number 98164-7) and coiled (146-7) styles. If you replace the four-wire electrical cord in the kit with a seven- to four-wire electrical cord, follow the instructions on pages four and five to install a four-wire socket at the towed vehicle.

1. If the motorhome is not already equipped with an electrical socket, choose an attachment point for the socket mounting bracket. The bracket must be attached close to the center, and to a surface of sufficient strength to hold it



firmly in place.

CAUTION

Attach the mounting bracket close to the center of the motorhome. If the bracket is attached too far to either side, the bracket and the electrical socket may be pulled away when the motorhome turns.

2. Use a test light to identify the wires conducting the left turn, ground, right turn and taillight signals. (For separate-to-separate systems only, also identify the wire conducting the brake light signal.)

3. To wire the plug, first loosen the set screw and remove the terminal assembly from the housing.

Run the wiring through the housing, then strip 1/4" to 3/8" of insulation from the ends. Connect the wires according to Figure 8. Tighten all the set screws, and check each wire to ensure that it is secure. Apply a clear silicone sealant around each wire entry and set screw indentation to help weatherproof the socket and secure the set screws.

Align the keyway at the top of the terminal assembly to the housing key and insert the assembly back into the housing; tighten the set screw.

4. To wire the socket, first loosen the set screws on the connector and remove the socket from the housing.

Run the wiring through the housing, then strip 1/4" to 3/8" of insulation from the ends. Connect the wires according to Figure 9.

Tighten all the set screws, and check each wire to ensure that it is fastened securely. Apply a clear silicone sealant around each wire entry and set screw indentation to help weatherproof the socket and secure the set screws.

Align the socket keyway to the housing key and insert the socket back into the housing; tighten the set screws.

5. Connect the electrical cord to the motorhome and towed vehicle. Test the towed vehicle's turn signals, taillights and brake lights to ensure they operate in conjunction with those of the motorhome.



Towing and Suspension Solutions

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