



Instruction Booklet LP-1

**INSTALLER: GIVE THESE INSTRUCTIONS TO THE
OWNER AFTER INSTALLATION FOR THEIR FUTURE
REFERENCE**

NO WARRANTY IS EXPRESSED OR IMPLIED FOR LUBE
PUMP COMPONENTS OR VEHICLE'S TRANSMISSION
UNLESS WARRANTY CARD IS FILLED OUT, DATED AND
MAILED TO REMCO

LP-1 LUBE PUMP KIT



Limited Warranty – June 15, 2002

I. LIMITED WARRANTY ON AUTOMATIC TRANSMISSION:

REMCO – RECREATIONAL EQUIPMENT MANUFACTURING CORPORATION warrants under the terms stated here that there will be no abnormal wear or damage to the automatic transmission resulting from the use of the **REMCO LUBE-PUMP**.

- a. This warranty is for a period of one (1) year from the original date of purchase.
- b. This transmission warranty ceases under any condition when the vehicle's mileage exceeds 40,000 miles.
- c. This warranty is valid only on those vehicles that have been approved by **REMCO** in writing for the installation of the **LUBE PUMP**.
- d. The **LUBE-PUMP** system must be installed and operated in accordance with **REMCO'S** installation and operation procedures.
- e. This warranty applies only to the original user/purchaser of the **LUBE-PUMP**.

II. LIMITED WARRANTY ON LUBE-PUMP AND COMPONENT PARTS:

REMCO warrants their products to the original purchaser for a period of one (1) year from the original date of purchase.

REMCO WARRANTS THEIR PRODUCTS AGAINST DEFECTIVE MATERIALS AND WORKMANSHIP. THIS WARRANTY IS VOID IF THE PRODUCT IS DAMAGED BY ACCIDENT OR UNREASONABLE USE, NEGLIGENCE, IMPROPER SERVICE, OR OTHER CAUSES NOT ARISING OUT OF DEFECTS IN MATERIAL OR WORKMANSHIP. THIS WARRANTY IS NOT SUBJECT TO MISUSE, ABUSE, ASSIGN, OR TRANSFER.

REMCO will either repair or replace during the above one (1) year all defective parts. Defective parts must be delivered or shipped prepaid and insured to **REMCO**. Parts must be accompanied with proof of date and place of purchase. The exclusive remedy under any and all warranties and guarantees expressed or implied is limited to the repair and/or replacement as provided herein. In no event shall **REMCO** be liable for any indirect, incidental, special, exemplary, punitive, or consequential damages of any nature whatsoever, including, without limitation, any such damages for loss of profits, loss or delay or equipment use or other intangible damages.

III. INSTALLATION REQUIREMENTS AND WARRANTY REGISTRATION CARD:

The **REMCO LUBE-PUMP** must be installed in accordance with installation instructions provided by **REMCO**. A warranty registration card, included with the installation instructions, must be fully completed, signed and returned to **REMCO**. The purchaser is responsible to return the warranty registration card at the time of the installation to validate the warranty.

IV. WARRANTY SERVICE AND REPAIR:

- a. If the **LUBE-PUMP** system or the automatic transmission becomes unserviceable during the warranty period the purchaser should first, if possible, contact the installing dealer or mechanic for a determination of the problem. If the dealer or mechanic cannot be contacted then call **REMCO** at 1-800-228-2481 or 1-402-339-3398.
- b. Either the dealer or the purchaser must contact **REMCO** to obtain authorization before any warranty repair is performed.
- c. **REMCO** will pay no repair claims unless the **REMCO** personnel in Omaha, Nebraska authorize the repair.
- d. The purchaser will be responsible for arranging to obtain the labor to repair the **LUBE-PUMP** system and/or transmission.
- e. Material evidence of component part failures resulting from the use of the **LUBE-PUMP** must be delivered to **REMCO** in Omaha, Nebraska, or an appointed representative accompanied with Cooler Flow Test data and basic Line Pressure data.
- f. Certification of the origination of all returned parts (i.e.: vehicle VIN, vehicle mileage, date of removal, list of parts by number) must accompany delivery to **REMCO** or an appointed representative.
- g. After **REMCO** has inspected the material evidence indicating the failure resulting from the use of the **LUBE-PUMP**, **REMCO** will reimburse labor and material cost to the purchaser.

REMCO LUBE PUMP KIT

LP-1

The following make/model transmissions are approved and warranted for towing on the above date when equipped with a **LP-1 REMCO LUBE PUMP**. The **LP-1 LUBE PUMP Kit** **MUST** be installed with selector valve P/N 11010007.

See inside front and back cover for warranty statement.

LP-1 APPLICATION LIST

EFFECTIVE July 14, 2004

AMC/CHRYSLER					
30TH	A-404	(FWD)	30RH	A-904	(RWD)
31TH	A-413	(FWD)	31RH	A-998	(RWD)
	A-415	(FWD)	32RH	A-999	(RWD)
	A-470	(FWD)	36RH/46RH	A-518	(RWD)
41TE	A-604	(FWD)	40RH/42RH	A-500	(RWD)
41AE		(FWD)			
42LE	A-606	(FWD)			
	A-670	(FWD)			
FORD					
ATX	(FWD)	TYPE F/4EAT	(FWD)		
GENERAL MOTORS					
T-125	(FWD)	4T80E	(FWD)	T-350C	(RWD)
T-125C	(FWD)			T-400	(RWD)
T-325	(FWD)			700-R4	(RWD)
T-325-R2	(FWD)			4L60E	(RWD)
T-375	(FWD)	T-180	(RWD)	4L80E	(RWD)
T-475	(FWD)	T-180C	(RWD)	5L40E	(RWD)
440-T4	(FWD)	T-200	(RWD)	5L50E	(RWD)
4T60E	(FWD)	T-200C	(RWD)		
4T65E	(FWD)	T-350	(RWD)		
ISUZU					
THM-200	(FWD)				
MAZDA			MERCEDES BENZ		
ECAT	(FWD)		722.6 ML Series		
MITSUBISHI					
F3A21/KM171-5	(FWD)	F4A33-1	(FWD)	KM171-1	(FWD)
F4A21/KM176-5	(FWD)	F4A41	(FWD)	KM171-2	(FWD)
F4A22/KM175-5	(FWD)	F4A42	(FWD)	KM175-1	(FWD)
F4A23-1/KM177-8	(FWD)	F4A51	(FWD)	KM177-0	(FWD)
F4A23	(FWD)	F5M22	(FWD)		
NISSAN/INFINITI					
RL3F01	(FWD)	RE/LF03	(FWD)		
RE/L4F02	(FWD)	RE4F04	(FWD)		
TOYOTA					
A-55 (Tercel)					

THE REMCO LUBE PUMP

REMCO's Lube-Pump provides a proven, safe and reliable method of towing a front wheel drive automatic transmission vehicle behind your motor home with all four wheels on the ground. **REMCO** provides the pump system, tail light system and all electrical connections. **REMCO** can provide the tow bar and brackets for most vehicles.

A durable 1/8 horsepower self-priming pump provides effective lubrication of the towed vehicle's transmission while being towed. The pump is switched on and off from the control panel of an electronic monitor conveniently mounted under the dashboard of your motor home.

The motor home is connected to the towed vehicle with a single cable, which operates the pump, monitor, and the towed vehicle's taillights. When the cable is connected, the taillights, brake lights, and turn signals of the towed vehicle are automatically controlled from the motor home. When the cable is disconnected, the taillights, turn signals, and brake lights of the towed vehicle operate normally.

In addition, a fail-safe electronic alarm system is built into the monitor, giving you a visual and audible signal if for any reason your **LUBE-PUMP** is not delivering adequate lubrication. One more unique feature of the alarm system is when you plug your towed vehicle into your motor home, with the motor home ignition **ON**, the red light and alarm will operate until the monitor switch is turned **ON** and the pump begins operating so you don't drive down the road with the pump shut off and ruin your transmission.

The **REMCO LUBE-PUMP** has been designed to give you maximum convenience and safety when the system is properly installed. Please follow the installation instructions very carefully. If you have any questions or problems call **REMCO** at 1-800-228-2481.

NOTE: **AN INSTALLATION VIDEO IS AVAILABLE FOR \$10.00 + SHIPPING AND HANDLING**

**** WARNING ****

SAFETY FIRST – Use caution when working on a vehicle. Do not get hands into fan belts or other moving parts. Do not get under any vehicle that is supported by a jack only. Be sure vehicle is properly blocked and supported by jack stands before getting under it.

CAUTION – An improperly installed **LUBE-PUMP** system can cause failure of the towed vehicle's transmission and other system components. All motor home electrical power used for the monitor, pump, or towed vehicle's taillights must be 12 volts DC. Bus type chassis may have 24 volt DC electrical system and will need to be converted to 12 volts DC.

THE REMCO LUBE PUMP KIT

LP-1 PARTS LIST

40010075	LP- 1 Instruction Book	1
TOWED PARTS		
Part #	Description	Quantity
11010012	Pump Assembly	1
11010030	Generic HDWR Pack	1
11010007	LP- 1 Selector Valve	1
40010019	6' length of 3/8" hose	1
40010020	6' length of 5/16" hose	1
40010027	Tube Silicone Sealant	1
40010097	Pump Mounting Bracket	1
10010009	Towed Vehicle Harness w/6-cond. Socket/bkt	1
10040007	Coiled Cable Assembly w/2 6-conductor Plugs	1
40010033	LP,Diviter Pack Assy (4)	1
MOTOR COACH PARTS		
Part #	Description	Quantity
10010016	Electrical Monitor	1
10010005	Motorhome Harness w/6-conductor socket/bkt	1

• SELECTOR VALVE INSTALLATION

The selector valve is installed into the existing transmission/cooler lubrication line, which carries the fluid **from the transmission to the radiator (cooler)**. A second line (hose) normally runs alongside this line to carry the fluid from the radiator back to the transmission.

NOTE: Refer to **DIAGRAM 1, page 7**.

NOTE: Some orderly planning should be given to the location of the selector valve. Consider the following:

1. The selector valve can be mounted near the hose line between the transmission and the radiator. If the existing lines will permit, it is better to locate the valve higher in the engine compartment along the inner fender wall.
2. The valve and hoses should be located where they will not be damaged by road hazards, other moving parts, sharp edges, or hot exhaust parts. The valve can be secured by using plastic ties included in the kit.
3. Hoses should not be bent too sharply causing a restriction in the fluid flow.

WARNING: THE SELECTOR VALVE MUST BE CONNECTED INTO THE HOSE, WHICH CARRIES THE TRANSMISSION FLUID FROM THE TRANSMISSION TO THE RADIATOR WHEN THE VEHICLE'S ENGINE IS RUNNING.

TO DETERMINE WHICH HOSE MUST BE USED, FOLLOW THESE STEPS:

- Step 1. Disconnect one of the rubber radiator hoses from the steel transmission line at the transmission. Expect a small amount of fluid to drain from the line. (**Hint:** On most front wheel drive GM vehicles the line is steel at the cooler and transmission with a 6" section of rubber-type hose in the middle. On these transmissions, look at the bottom of the transmission. There are two steel lines coming out. The one that comes straight down toward the ground is the one used. Cut the section of rubber-type hose in this line. **Be sure you double check.** On rear wheel drive GM's you will be using the special GM T-fittings. The correct line is usually the bottom steel line on the passenger side of the radiator/cooler. **Again, be sure you double check that you have the correct line.**)

- Step 2. Attach the 3/8” hose provided in the kit to the steel transmission line and arrange the hoses in a container.
- Step 3. Have an assistant momentarily start the engine or crank the engine with the starter to cause fluid to flow from one or the other open ends of the hoses.
- Step 4. If the fluid flows from the transmission hose, you have disconnected the proper line; continue to Step 5. If the fluid flows from the rubber radiator hose you have disconnected the wrong hose, reconnect the hose, repeat Step 1.

REVIEW THE WARNING STATEMENT PAGE 6.

- Step 5. Connecting the proper hoses to the selector valve.
- Determine the appropriate length of hose for selector valve monitor.
 - Using one of the hose clamps, connect the rubber transmission hose (the hose that was used to pump fluid out of the trans. pan) to the **“Trans”** connection of the selector valve.
 - Using one of the hose clamps, connect the rubber hose coming from the radiator to the **“COOLER”** connection of the selector valve.

The **“PUMP”** connection of the selector valve will later be connected to the pump.

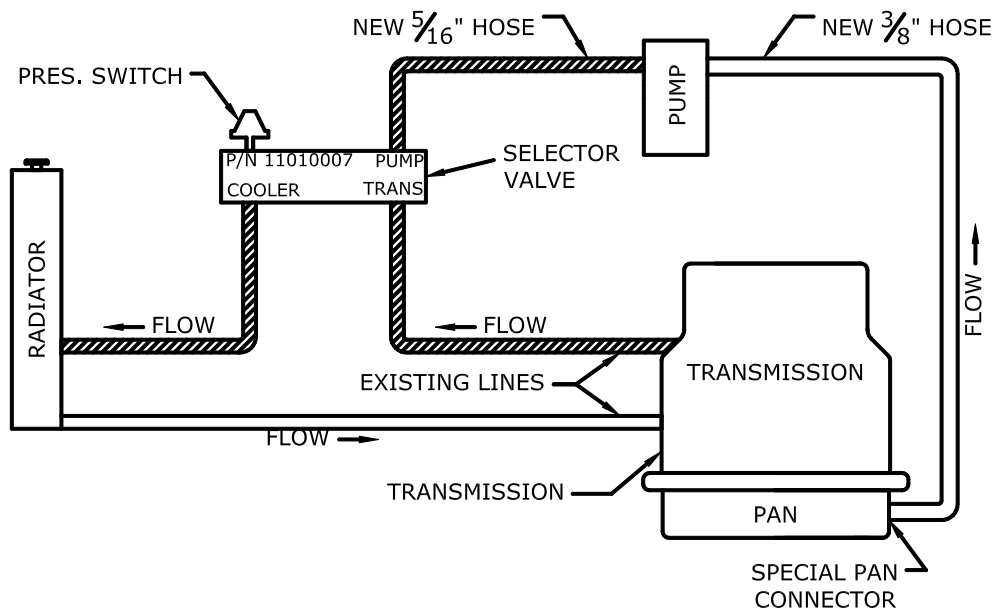


DIAGRAM 1
PUMP, SELECTOR VALVE, NEW HOSE, & FLUID FLOW

- **INSTALLATION OF THE PAN CONNECTOR:**

It is necessary to remove the transmission pan to install the pan connector. You will need a large container to catch the fluid when the pan is removed.

NOTE #1: Transmission fluid becomes contaminated during usage, and therefore should not be re-used after it is drained from the pan. Similarly, the transmission's oil filter should be changed every 25,000 to 40,000 driven miles. Use manufacturer's recommendation.

NOTE #2: Dispose of used transmission fluid properly.

Step 1. Remove the pan and discard the gasket if one is present. If RTV sealant was used, it must be removed from both the transmission and transmission pan. (Some auto manufacturers use an RTV sealant instead of a gasket.)

Step 2. Carefully examine the underside of the exposed transmission and the manner in which the pan fits around valve body and filter before deciding on a suitable location for the pan connector.

Note: Precautions to consider when determining the best location for the pan connector.

- a. It is NOT advisable to locate the connector on the bottom or the front surfaces of the pan because of the strong possibility of damage from road hazards.
- b. The connector should be located away from any exposed gears, which tend to cause fluid to foam when in motion.
- c. It is desirable to have the connector located as far as possible below the transmission fluid level, taking into consideration the changes in fluid level, which will occur.
- d. Generally, the connector can best be located in the right or left sidewalls or the rear portion of the pan, keeping in mind the above situations.
- e. Make certain the location of the connector will not interfere with reinstalling the pan bolts and also that it allows for an easy bend for the 3/8" hose which will extend from this connector up to the lube pump.

f. Finally, be sure the connector location provides sufficient flat surface area to permit tightening the hex nut on the inside of the pan.

Step 3. When you have determined the best location for the pan connector, locate the hole vertically by holding the hex connector nut on a vertical surface of the pan and marking its location. Drill a 17/32" diameter hole in the side of the pan.

Step 4. Apply a small amount of the silicone sealant (provided in the kit) to the back (grooved) side of the hex nut (which is already mounted on the connector) and to the threads on the connector, and also to the back (grooved) side of the separate hex nut. Then insert the connector into the 17/32" hole and secure on the inside of the pan with the separate hex nut.

Step 5. Before re-installing the transmission fluid pan, make sure the mating surfaces on both the pan and transmission housing are absolutely clean of all gasket material, oil or dirt. If the transmission was originally equipped with a gasket, replace with a new gasket. If silicone was originally used then carefully apply a 1/8" bead of silicone sealant (provided) around the bottom perimeter of the transmission housing using plastic nozzle provided. Make sure to encircle each bolt hole as shown (Refer to **DIAGRAM 2, below**). Allow the sealant to set up for about 1 hour. Assemble the pan to the transmission, installing the bolts finger tight only. Allow to set 45 more minutes. This allows the sealant to conform to two surfaces without squeezing it out. Tighten the bolts to the required torque specification. **Do not over tighten.** Refer to the vehicle service manual for torque specifications

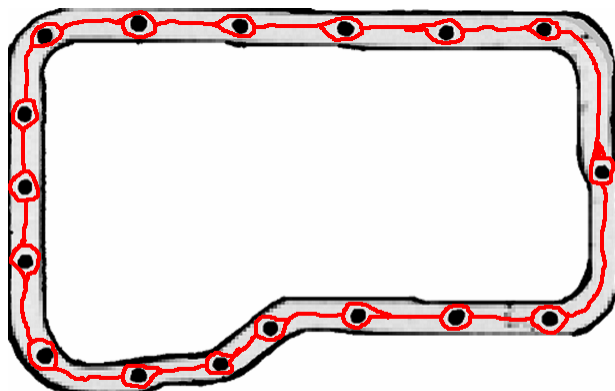


Diagram 2
PAN WITH SEALANT APPLIED

• LUBE PUMP INSTALLATION

WARNING: Failure to follow the procedures listed below will void the warranty on your pump.

LOCATION: It is important to determine a desirable place on the vehicle to locate the lube pump. The best location may vary from vehicle to vehicle.

NOTE: **Locate the pump in the upper part of the engine compartment, under the hood. This is important to keep the pump from being exposed to the weather and other harsh elements. .**

NOTE: **Mount the pump vertical or horizontal (motor down only) to help insure no water can collect and cause failure. Do not mount in the fender well or behind the bumper. This will void the warranty.**

Included in this kit is a pump mounting bracket assembly (p/n 10010047). This allows the pump to be installed on the strut tower, the firewall or the radiator support as examples.

INSTALLATION: (Refer to **DIAGRAM 1, page 11**)

NOTE: When routing the 3/8" & 5/16" hoses to the pump, selector valve and pan connector, be sure to route them where road hazards, other moving parts, sharp edges, or hot exhaust parts will not damage them.

Step 1. The pump is to be mounted in the engine compartment to any suitable flat metal surface. The pump mounting bracket may be used.

Use the four 1/4" x 1 1/4" self-tapping metal screws (provided) to mount the pump.

Step 2. Using a suitable length of 5/16" hose and one of the hose clamps, connect one end of the hose to the **output side** of the pump.

Step 3. Route the other end of the 5/16" hose to the selector valve and connect it to the **"PUMP"** connection of the selector valve.

WARNING: **THE LINE FROM THE PUMP MUST BE CONNECTED TO THE "PUMP" CONNECTION ON THE VALVE.**

- Step 4. Using one of the hose clamps (provided), connect one end of the 6-ft. length of the 3/8" hose to the **input side** of the lube pump. Carefully route 3/8" hose to the pan connector on the transmission pan. Cut the hose to a suitable length.
- Step 5. Using one of the hose clamps connect the 3/8" hose to the pan connector. Make sure hose clamps are securely tightened on all connections.
- Step 6. When all connections are completed and all hose clamps securely tightened, refill the transmission with new transmission fluid through the filler tube. Consult the vehicle Owner's Manual for the proper type fluid to use and for the recommended procedures to make sure the proper fluid level is restored. Proper fluid level is essential for trouble-free operation of the transmission as well as the lube pump.

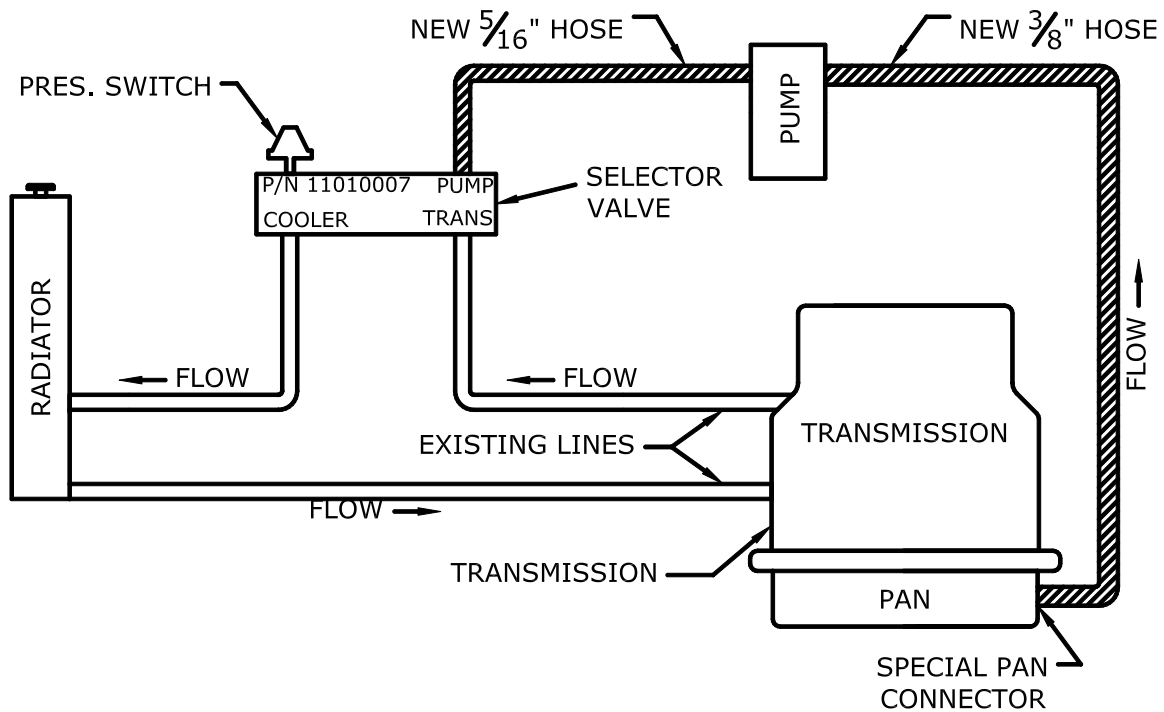


DIAGRAM 1
PUMP, SELECTOR VALVE, NEW HOSE, & FLUID FLOW

• **ELECTRICAL WIRING:**

The **REMCO LUBE PUMP KIT** includes all wiring and electrical hardware needed to connect on electronic monitor on the motor home dash panel and to the **LUBE PUMP** in the towed vehicle. The kit provides for the automatic control of the taillights and turn signals of the towed vehicle.

NOTE: Some motorhomes are equipped with separate turn signals and brake lights for which a special converter (not included in the **LUBE PUMP KIT**) will be required.

Check the parts in the kit against the parts list on **page 5** to familiarize yourself with each item and to make sure none are missing.

For proper installation it is necessary for you to have available the following tools which are not provided in the kit:

• 12 volt DC continuity tester
• Small wire cutter, wire stripper, wire terminal crimper
• Electrical tape
• Screw Driver
• Electric Drill

• **TOWED VEHICLE ELECTRICAL INSTALLATION:**

The following electrical parts are to be installed in the towed vehicle:	
1	6-conductor socket assembly complete with mounting bracket
18 ft.	3-conductor cable
5 ft.	2-conductor cable
2 ft.	14 ga. Wire (white)
4	Solid state taillight diverters
12	¼" female terminals
1	¼" male terminal
1	Seamed spade terminal for ground connection
1	Self-stripping wire tap connector
3 ft.	14 ga. Red wire for pump

NOTE 1: Carefully study the **electrical schematic diagram on Pages 32 and 33** to become acquainted with the overall wiring plan and the circuitry.

NOTE 2: The coiled cable should rest on the tow bar if the sockets on both vehicles are either opposite of each other or the sockets are mounted in the middle of both vehicles to allow the cable to rest on the tow bar. Whichever way is used, the result will be the same; to keep the cable from dragging on the ground. When the cable is not in use, it should be disconnected from both vehicles and stored. The cable will keep its coiled memory and last for many trips down the road.

Step 1. Two ¼” x ¾” self-tapping metal screws are provided to mount the socket bracket. Make sure the socket is located high enough to provide curb and roadway clearance.

Step 2. Connect the 2 ft. length of white wire from the socket to a suitable chassis ground at the front of the vehicle, not the frame. Normally, an existing screw or bolt can be loosened to make this connection near the socket mounting. Trim the white wire to a suitable length, strip back the insulation, and crimp a ring terminal to the end for fastening to the screw or bolt. Make certain the terminal is crimped securely. Moderately pull on the terminal to check. Check all terminals similarly when installed.

Step 3. Run the 5 ft. long 2-conductor cable (red & black) from the socket, to the monitor sensor, which is integral part of the selector valve you have already installed. Cut the 2-conductor cable to proper length, separate the wires back approximately 3 inches and crimp a ¼" female terminal onto each wire. Connect one wire to each of the two blade connections on the monitor sensor. **Since polarity is not critical, either wire can be connected to either terminal.**

Step 4. Attach one end of the 3 ft. long red wire provided in the kit to the red wire of the 2-conductor cable at the monitor sensor using one of the self-stripping wire tap connectors provided.

Step 5. Take the other end of the 3 ft. long red wire and cut to length. Strip back the insulation on red wire and crimp on the ¼” male terminal (provided). This will provide a ready connection with the female terminal already installed on the red wire extending from the pump, which you have already installed. Make sure the wires are kept clear of all moving parts and are not touching parts, which become hot when the vehicle is driven. It is usually best to follow the same paths as existing wiring under the vehicle’s hood.

Step 6. Connect the black wire extending from the pump to a nearby ground. Either loosen an existing bolt or drill a hole and fasten the wire using one of the 1/4" x 3/4" self-tapping metal screws provided in the kit.

- **INSTALLATION OF TAILLIGHT DIVERTERS**

NOTE: Prior to installation, determine which taillight wiring system you have on the towed vehicle: a 3- or 4-wire system. A 3-wire system has combined turn signals and brake lights (red turn signals). A 4-wire system has separate turn signals and brake lights (amber turn signals).

- **INSTALLATION OF DIVERTERS FOR 3-WIRE SYSTEMS**

NOTE: This system will use 3 of the 4 diverters provided in the kit. The preferred location for the solid-state diverters is as close to the taillight assembly kit as possible.

Step 1. Access the wires for the taillight assembly (usually through the trunk in a sedan and wagon).

Step 2. Turn **ON** the taillights.

Step 3. Ground the continuity tester to a suitable ground.

Step 4. Probe each wire to locate a "HOT" wire. Turn **OFF** and **ON** the taillight switch to verify the correct wire. Label the wire "TAILLIGHTS". Turn **OFF** the taillights.

Step 5. Turn **ON** the left turn signal. Probe each wire for a "HOT" wire. Watch for the continuity tester to blink with the turn signal to verify the correct wire. Label the wire "LEFT TURN". Follow the same procedure for the right turn signal, but label the wire "RIGHT TURN".

Note: Refer to **DIAGRAM 3, page 17** for the steps listed below.

Step 6. Turn **ON** the taillights. Locate the wire labeled "TAILLIGHTS". Cut the wire and confirm that the taillights have gone **OUT**. Turn **OFF** the taillights.

Step 7. Strip each wire 1/4". Crimp a 1/4" female terminal onto each wire.

- Step 8. Connect the wire that goes to the taillight bulb to the “OUT” of the diverter; connect the remaining wire to either “IN” terminal of the diverter.
- Step 9. Turn **ON** the left turn signal. Locate the wire labeled “LEFT TURN”. Cut the wire and confirm that the turn signal light has gone **OUT**.
- Step 10. Strip each wire ¼”. Crimp a ¼” female terminal onto each wire.
- Step 11. Connect the wire that goes to the turn signal bulb to the “OUT” terminal of the diverter; connect the remaining wire to either “IN” terminal of the diverter. Locate the wire labeled “RIGHT TURN” and follow the same procedure.

- **INSTALLATION OF CONDUCTOR CABLE FOR 3-WIRE SYSTEMS**

NOTE: Refer to **DIAGRAM 3, page 17** for the steps listed below.

- Step 1. Route the conductor cable from the socket to the diverters.
- Step 2. Separate the towed vehicle’s conductor cable sufficiently to attach to the diverters.
- Step 3. Strip each wire ¼”. Crimp a ¼” female terminal onto the yellow, green, and brown conductor wire.
- Step 4. Locate the “TAILLIGHT” diverter. Connect the brown conductor wire to the remaining “IN” terminal of the diverter.
- Step 5. Locate the “LEFT TURN” diverter. Connect the yellow conductor wire to the remaining “IN” terminal of the diverter.
- Step 6. Locate the “RIGHT TURN” diverter. Connect the green conductor wire to the remaining “IN” terminal of the diverter.

- **INSTALLATION OF DIVERTERS FOR 4-WIRE SYSTEMS**

NOTE #1 This system uses all 4 diverters supplied in this kit.

NOTE #2 With some vehicles, the taillight assembly must be removed to gain access to the taillight wires.

- NOTE #3** The amber turn signals are not used, instead, the brake lights become the turn signals and brake lights for towing only.
- NOTE #4** Refer to **DIAGRAM 4, page 17**, for steps listed below.
- Step 1. Start at the driver side taillight assembly. Access the wires for the taillight assembly.
- Step 2. Turn **ON** the taillights.
- Step 3. Ground the continuity tester to a suitable ground.
- Step 4. Probe each wire to locate a “HOT” wire. Turn **OFF** and **ON** the taillight switch to verify the correct wire. Label the wire “LEFT TAILLIGHT”. Follow the same procedure for the passenger side taillight assembly, but label the wire “RIGHT TAILLIGHT”. Turn **OFF** the taillights.
- Step 5. Have an assistant depress the brake pedal. Start at the driver side taillight assembly. Probe each wire for a “HOT” wire. Have the assistant depress the brake pedal **ON** and **OFF** to verify the correct wire. Label the wire “LEFT TURN/BRAKE”. For the passenger side taillight assembly, follow the same procedure, but label the wire “RIGHT TURN/BRAKE”.
- Step 6. Refer to **DIAGRAM 4, page 17**; return to the driver side taillight assembly. Turn **ON** the taillights; locate the wire labeled “LEFT TAILLIGHT”. Cut the wire. Confirm that the taillight goes **OUT**. Turn **OFF** taillights. Strip each wire $\frac{1}{4}$ ” crimp the $\frac{1}{4}$ ” female terminals onto each wire. Connect the wire that goes to the taillight bulb to the “OUT” terminal of the diverter. Connect the remaining wire to either “IN” terminal of the diverter. For the passenger side taillight assembly, locate the wire labeled “RIGHT TAILLIGHT” and follow the same procedure as above.
- Step 7. Return to the driver side taillight assembly. Have the assistant depress the brake pedal. Locate the wire labeled “LEFT TURN/BRAKE”. Cut the wire. Confirm that the brake light goes **OUT**. Strip each wire $\frac{1}{4}$ ”. Crimp the $\frac{1}{4}$ ” female terminals onto each wire. Connect the wire that goes to the brake light bulb to the “OUT” terminal of the diverter. Connect the remaining wire to either “IN” terminal of the diverter. For the passenger side taillight assembly, locate the wire labeled “RIGHT TURN/BRAKE” and follow the same procedure as above.
- Step 8. Install conductor cable.

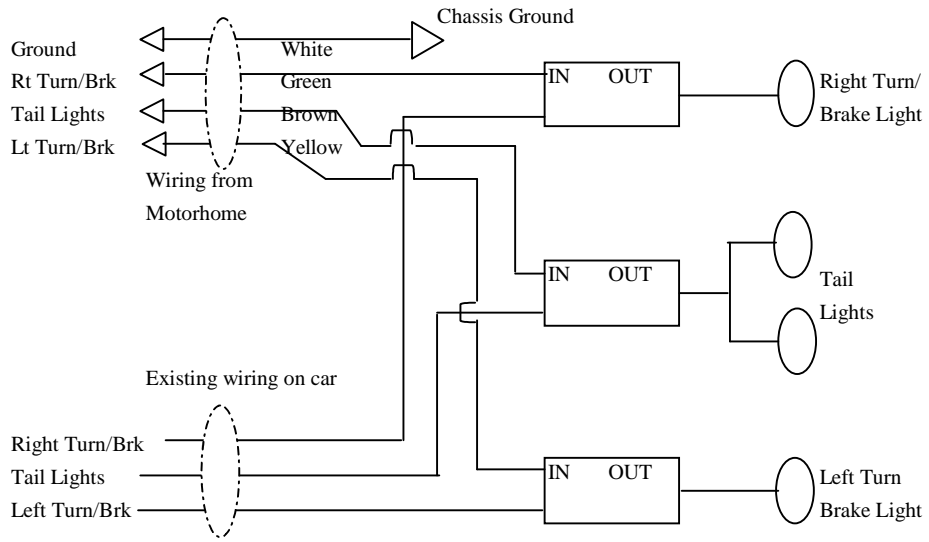


DIAGRAM 3
3-WIRE TAILLIGHT SYSTEM

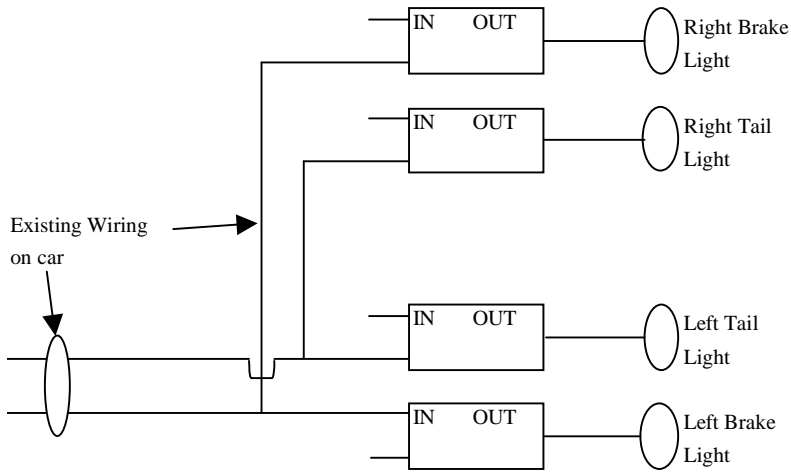


DIAGRAM 4
4-WIRE TAILLIGHT SYSTEM, EXISTING WIRING ON CAR
AMBER TURN SIGNALS NOT SHOWN BECAUSE THEY ARE NOT USED

INSTALLATION OF CONDUCTOR CABLE FOR 4-WIRE SYSTEMS DRIVER SIDE ROUTING OF CONDUCTOR CABLE

NOTE #1 Refer to **DIAGRAM 5, page 20** for the following steps.

NOTE #2 For driver and passenger side conductor cable installation, two separate wires will be routed between the driver side taillight assembly, either inside the trunk area or underneath the vehicle.

Step 1. Route the conductor cable from the socket underneath the vehicle along the driver side to the driver side taillight assembly.

Step 2. Separate the conductor cable wires sufficiently to attach the diverters; strip each wire $\frac{1}{4}$ ". Crimp a $\frac{1}{4}$ " female terminal onto the yellow conductor wire. Connect the yellow conductor wire to the remaining "IN" terminal of the "LEFT TURN/BRAKE" diverter.

Step 3. Crimp a yellow female terminal onto the red/brown two-conductor wire. Connect it to the remaining "IN" terminal of the "LEFT TAILLIGHT" diverter. Attach a separate wire onto the brown conductor wire and extend it to the "RIGHT TAILLIGHT" diverter. Strip the separate wire $\frac{1}{4}$ ". Crimp a $\frac{1}{4}$ " female terminal onto the wire. Connect the wire to the remaining "IN" terminal of the diverter.

Step 4. Attach a separate wire to the green conductor wire. Extend the separate wire to the passenger side taillight assembly. Locate the diverter labeled "RIGHT TURN/BRAKE". Strip the wire $\frac{1}{4}$ ". Crimp a $\frac{1}{4}$ " female terminal onto the wire. Connect the wire to the remaining "IN" terminal of the diverter.

Step 5. Test the lube pump, diverter, and conductor cable installation before starting the installation of the lube pump parts on the motor home.

INSTALLATION OF CONDUCTOR CABLE FOR 4-WIRE SYSTEMS PASSENGER SIDE ROUTING OF CONDUCTOR CABLE

NOTE Refer to **DIAGRAM 6, page 20** for the following steps.

Step 1. Route the conductor cable from the socket underneath the vehicle along the passenger side to the passenger side taillight assembly.

Step 2. Separate the conductor cable wires sufficiently to attach the diverters. Strip each wire $\frac{1}{4}$ ". Crimp a $\frac{1}{4}$ " female terminal onto the green conductor

wire. Connect the green conductor wire to the remaining “IN” terminal of the “RIGHT TURN/BRAKE” diverter.

- Step 3. Crimp a yellow female terminal onto the red/brown two-conductor wire. Connect it to the remaining “IN” terminal of the “RIGHT TAILLIGHT” diverter. Attach a separate wire onto the brown conductor wire. Attach a separate wire onto the brown conductor wire. Extend the separate wire to the driver’s side taillight assembly. Locate the diverter labeled “LEFT TAILLIGHT”. Strip the separate wire ¼” crimp a ¼” female terminal onto the wire. Connect the separate wire to the remaining “IN” terminal of the diverter.
- Step 4. Attach a separate wire to the yellow conductor wire. Extend the separate wire to the driver side taillight assembly. Locate the diverter labeled “LEFT TURN/BRAKE”. Strip the wire ¼”. Crimp a ¼” female terminal onto the wire. Connect the wire to the remaining “IN” terminal of the diverter.
- Step 5. Test the lube pump, diverter, and conductor cable installation before the installation of lube pump parts on the motor home.

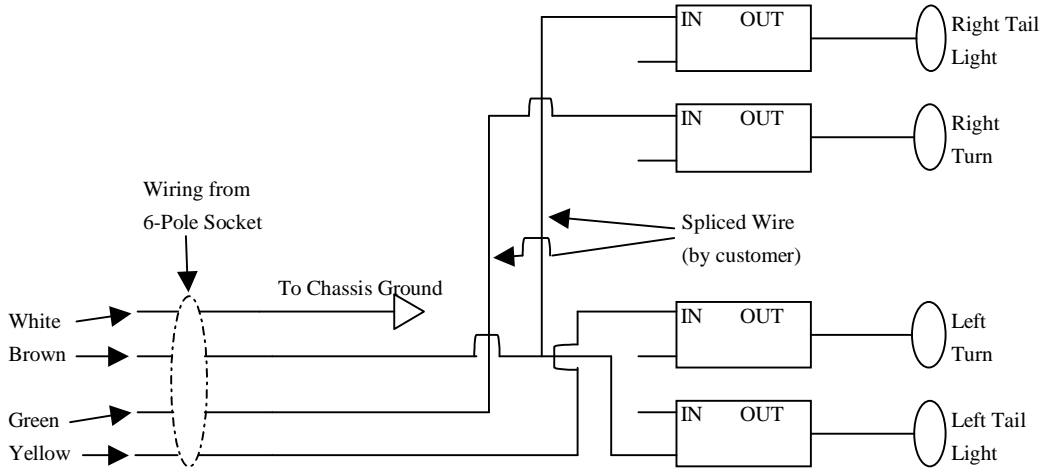


DIAGRAM 5
DRIVER SIDE ROUTING
 (NOTE: AMBER TURN SIGNALS ARE NOT USED)

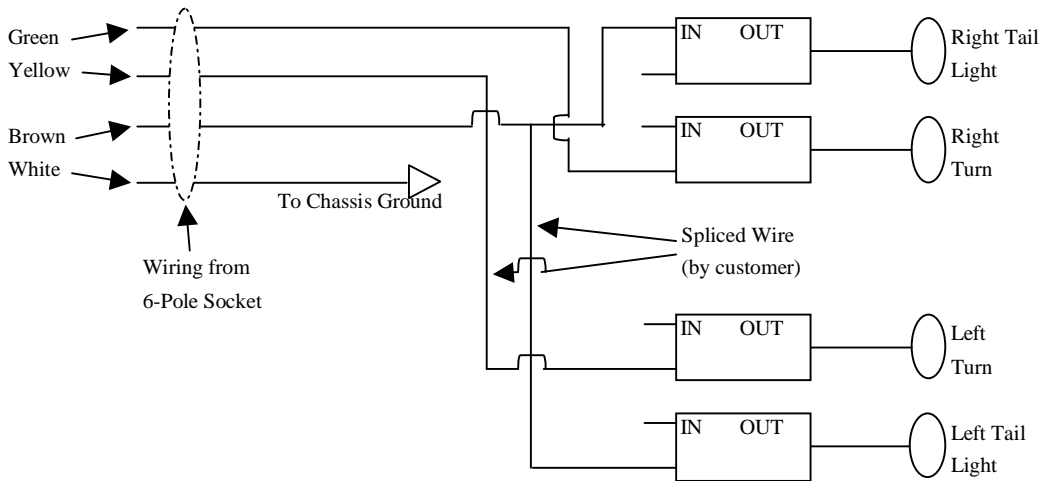


DIAGRAM 6
PASSENGER SIDE ROUTING
 (NOTE: AMBER TURN SIGNALS ARE NOT USED)

MOTORHOME ELECTRICAL INSTALLATION:

The following parts are to be installed on the motor home:

1	Electronic Monitor
1	Motorhome harness 6-conductor socket assembly complete with mounting bracket
40 ft.	2-conductor cable
3 ft.	3-conductor cable for taillights and turn signals
2 ft.	14 ga. White wire for ground
2	Seamed spade terminals
3	Seamed butt connectors
1	Maple slip on tab terminal
5	Self-stripping wire tap connectors
1	3/8" ring terminal
4	#6 self tapping screws

INSTALLATION OF ELECTRONIC MONITOR

NOTE: Quick-disconnect plug has been manufactured into the back of the Electronic Monitor. This allows for easy replacement of the unit should it become necessary. Simply unplug the harness from the back of the monitor.

- Step 1. Select a suitable location for the Electronic Monitor under the dashboard of the motorhome. The location should be conveniently located for the driver. Screws are provided for it's mounting (4 - #6 self tapping screws).
- Step 2. Turn the ignition key of the motorhome to the **ON** position. Use a 12 volt DC continuity lamp tester to identify an appropriate accessory ignition terminal connection at the motorhome chassis fuse box. Switch the ignition key **OFF** and **ON** to make certain that the terminal is "**HOT**" only when the ignition key is turned **ON**.
- Step 3. Cut the fused orange wire from the monitor to a appropriate length. Strip the end of the orange 1/4" and crimp a male tab terminal onto the wire. Connect the orange wire to the ignition terminal located in step 2.
- Step 4. Cut the white wire to an appropriate length, strip the end of the wire 1/4", crimp a seamed spade terminal onto the wire; attach the wire to a suitable ground as previously described.

Step 5. Cut the heavy blue wire from the monitor to a suitable length, strip the wire ¼”, crimp a 3/8” ring terminal onto the wire. Connect the terminal to the motorhome chassis battery or a battery solenoid only. **Do not** use fuse box or splice into a wire. (For 24-volt DC systems find a constant 12-volt DC source of power.)

Step 6. The red and black wires of the monitor will be connected to the red and black wires of the 2-conductor cable, after the 40-ft. conductor cable of the motorhome wiring harness has been routed to the front of the motorhome.

• INSTALLATION MOTORHOME WIRE HARNESS ASSEMBLY

NOTE #1 Some motorhomes have separate turn signal and brake lights; identified by amber turn signals and red brake lights (a 4-wire taillight system). This type of system will require the use of an additional taillight converter that converts the 4-wire system to a 3-wire system (combined turn signals and brake lights). The converter is not supplied in the kit but is available through **REMCO** or your local supply center.

NOTE #2 If necessary, refer to the alternate motorhome wiring **DIAGRAM 7, below.**

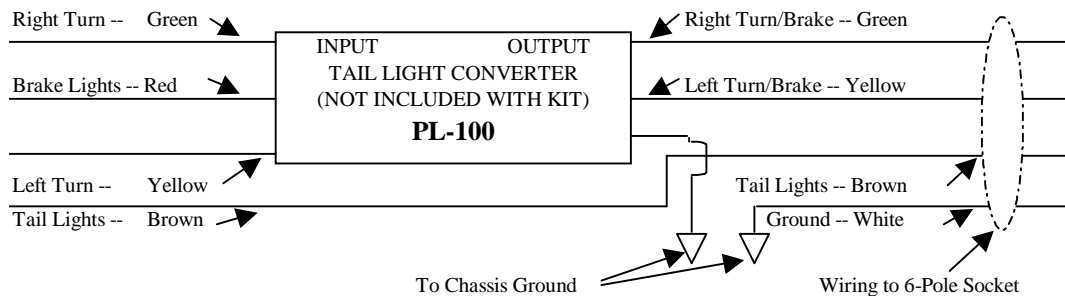


DIAGRAM 7
ALTERNATE MOTORHOME WIRING

NOTE #3 Carefully review the electrical schematic diagram to assure understanding of the circuitry.

NOTE #4 As in the installation of the socket on the towed vehicle, be aware of exposure of the socket to road damage. The coiled cable should rest on the tow bar if the sockets on both vehicles are either opposite each other or the sockets are mounted in the middle of both vehicles to allow the cable to rest on the tow bar. Whichever way is used, the result will be the same – to keep the cable from dragging on the ground.

- NOTE #5** Use normal precautions with all wiring in the motorhome to avoid sharp edges, moving parts, and surfaces that become very hot when vehicle is being driven.
- Step 1. Begin the installation by mounting the 6-conductor socket on or near the center of the rear bumper (next to the towing ball) using the socket bracket and 1/4" x 3/4" self-tapping metal screws provided.
- Step 2. Strip the end of the white wire extending from the socket 1/4" and crimp on a seamed spade terminal. Ground the white wire to a suitable nearby bolt or screw, or drill a hole in an adjacent metal surface and use one of the 1/4" x 3/4" self-tapping metal screws.
- Step 3. Find the motorhome taillight tow harness wires at the back of the motorhome underneath the bumper.
- Step 4. Have an assistant turn **ON** the taillights.
- Step 5. Connect the continuity tester to a ground.
- Step 6. Probe each wire for a "HOT" wire. Have an assistant turn OFF and ON the taillight switch to verify the correct wire. Label the wire "TAILLIGHTS". Turn OFF the taillights.
- Step 7. Have an assistant turn ON the left turn signal.
- Step 8. Probe each wire for a "HOT" wire, watch for the tester to blink with turn signal to verify the correct wire. Label the wire "LEFT TURN". Follow the same procedure for right turn signal and label the wire "RIGHT TURN".
- Step 9. If the motorhome has separate turn signal and brake lights, have the assistant depress the brake pedal, probe each of the remaining wires for a "HOT" wire. Label the wire "BRAKES".
- Step 10. Use a wire tap connector provided in the kit to attach the brown conductor wire onto the wire labeled "TAILLIGHTS".
- Step 11. Use a wire tap connector to attach the yellow conductor wire onto the wire labeled "LEFT TURN".
- Step 12. Use a wire tap connector to attach the green conductor to the wire labeled "RIGHT TURN".

- Step 13. Route the 40-ft. 2-conductor cable (black/red) under the motorhome (preferably along the driver side frame rail) from the socket to the front of the motorhome. Follow existing wires or other protected routes. Keep cable clear of parts, which are moving or become hot. Securely attach the cable under the motorhome to prevent damage from road hazards.
- Step 14. Using 2 of the butt connectors (provided) connect the red and black wires of the monitor to the red and black wires of the 2-conductor cable.

TESTING THE INSTALLATION

- Step 1. To test the wiring just completed, first turn **ON** the ignition switch in the motor home with towed vehicle connected. The monitor will go through a series of blinking lights and tones until the lube pump comes up to pressure (red-green-red-green) when the pump reaches pressure(10 to 15 seconds) the indicator light will stay on green indicating your system is ready to tow.
- Step 2. After you have completed step 1 above and found that the monitor blinks a pattern of (red-yellow) or (solid red) or (solid yellow) refer to the legend next to the lights. These will tell you what to look for to correct your problem.
- Step 3. To test the wiring completed in the towed vehicle to the rear socket of the motor home using the coiled cable provided. If the plug feels loose in the socket, the pins in the socket can be spread with a slotted screwdriver so contact is tight.
- Step 4. Turn **ON** the taillights and left and right turn signals to confirm that each respective light glows on the towed vehicle.
- Step 5. This completes the installation and testing of the LP-1 system.

NOTE: WHEN INSTALLATION HAS BEEN COMPLETED, THE INSTALLER NEEDS TO RETURN THE INSTALLATION INSTRUCTION BOOKLET TO THE CUSTOMER. ALSO, THE WARRANTY CARD INCLUDED IN THE BOOKLET NEEDS TO BE COMPLETED AND RETURNED TO REMCO MFG.

TOWING CHECKLIST:

1. Make sure the tow bar, ball coupler and safety chains are all secured.
2. Make sure the ends of the coiled connector cable are securely plugged into the motorhome socket and the towed car socket with the weight of the cable being supported by the tow bar. The pins in the sockets can be spread to make better contact.
3. Turn the ignition switch of the towed vehicle to the “**UNLOCKED**” position to release the steering wheel lock, if your vehicle has this feature.
4. Shift the transmission of the towed vehicle to neutral, “N,” and release the parking brake. Turn the ignition switch back as far as you can. The key is now in the correct position for towing. As long as the transmission is in “N,” the key cannot go into the locked position. This will allow the front wheels to track behind the motorhome while towing and allow no electricity to be drained from the battery. The only exceptions are in the NOTE below.
5. Lock the doors of the towed vehicle to prevent children or unauthorized persons from operating the controls. This may require having a second key.
6. Connect your towed vehicle and start the motor home engine. The “Green Light” indicates you are ready to travel. **Do not** tow unless the Green Light is illuminated.

NOTE: MANY 1996 & NEWER CHRYSLER AND 1997 & NEWER GM FRONT WHEEL DRIVE VEHICLES MAY HAVE TO GO THRU THIS PROCEDURE: To tow and unlock the steering wheel on your vehicle, you must put the ignition switch in the first position on the steering column. When you do this, the odometer and transmission indicator will light up on the dashboard and could drain the power from your battery while towing. To keep the battery from draining, open the hood and open the fuse box and find the “memory” or “hazard” switch/fuse. Then pull the switch/fuse out approx. ¼” to disable the lights on the dashboard. After you have finished towing, simply open the hood, open the fuse box, and push in the memory switch. Everything will be back to normal, with the exception that the radio clock and stations will need to be reset.

HAPPY MOTORING!

TROUBLE-SHOOTING TIPS

CONDITIONS:

- With the RV engine “ON”
- Tow vehicle connected to the motor home via the coiled cable.

PROBLEM: Red light/alarm comes ON

Pump is not running:

1. Check the 10-amp fuse in the blue wire at the fuse holder in the blue wire.
2. Check the connection of the blue wire at the motor home battery.
3. Check for tight connections of the coiled cable at both motor home and towed vehicle sockets.
4. Check with a continuity tester for power on the red wire at the socket of the motor home. Continue with the socket on the front of the towed vehicle. There should be 12 – 14 volts getting to the pump.
5. Call **REMCO** for more information.

Pump is running:

1. Check transmission fluid level in towed vehicle. See vehicle manual.
2. Check for damage of the socket wiring and lube pump hoses from road hazards.
3. Use a test light to check power across both terminals of the pressure sensor at the selector valve. Measured voltage should be the same on both terminals, 12 – 14 volts. Trace the black wire to the monitor. There should be at least 12 volts at the back of the monitor.
4. Check the flow of the transmission fluid from the pump. The lube pump should pump a quart of fluid in about 10 to 12 seconds.
5. Check for grounding/shorting of the red wire of the 2-conductor cable running back from the monitor to the socket of the motor home.
6. Call **REMCO** for information.

CONDITIONS:

RV “ON”

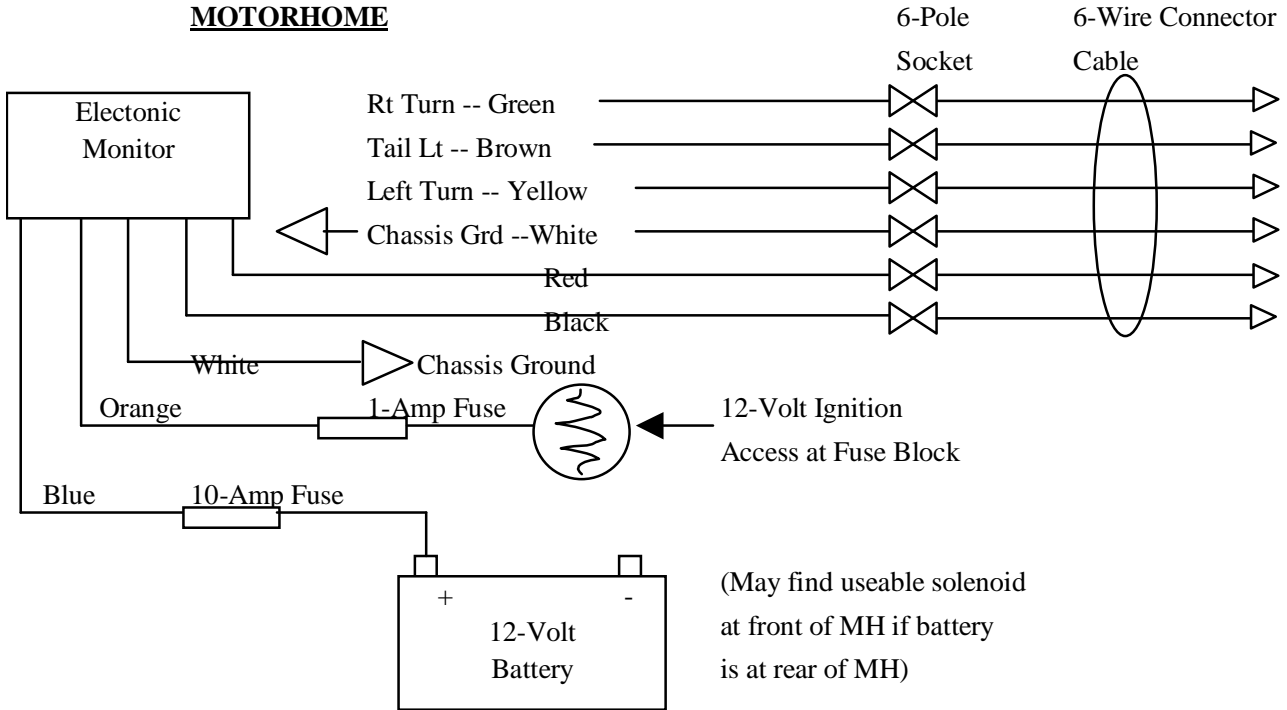
- With towed vehicle connected

PROBLEM: Only yellow light on monitor

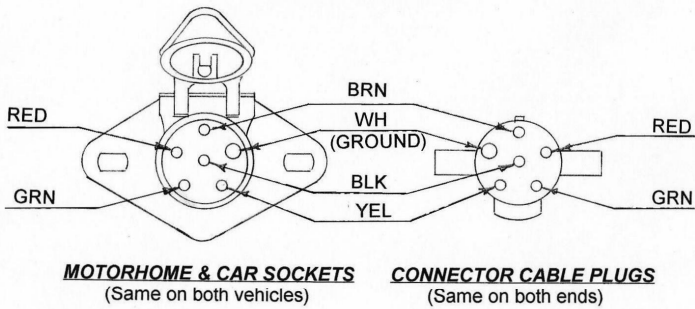
1. With the engine switch “ON”, check the fuse in the orange wire at the 1 AMP fuse holder in the orange wire.
2. Check connection to ignition accessory terminal. See INSTALLATION OF ELECTRONIC MONITOR, Step 2.
3. Check the white ground connection from the monitor.
4. If the above checks are OK, call **REMCO Mfg.**

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ELECTICAL SCHEMATIC ---

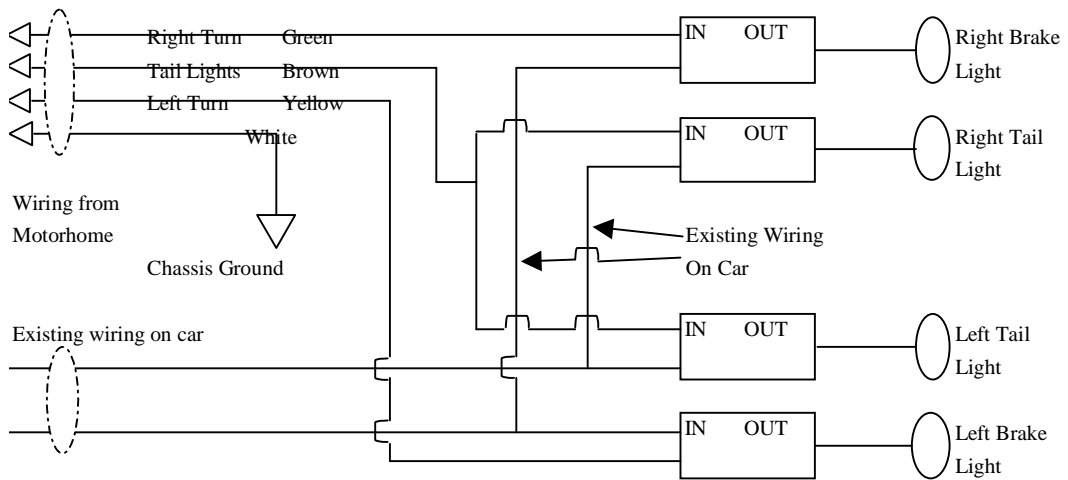
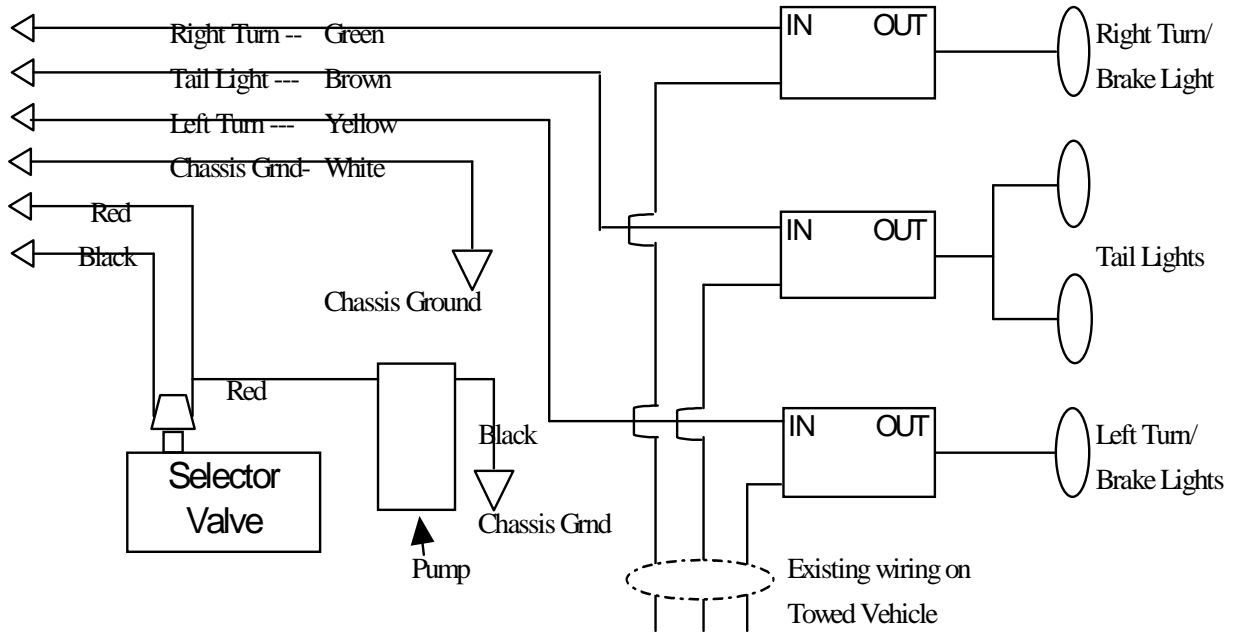


SOCKET & PLUG - DETAIL



---REMCO LUBE-PUMP ---LP-1

TOWED VEHICLE (with 3-Wire Tail Light System)



TOWED VEHICLE -- 4-WIRE TAIL LIGHT SYSTEM

(NOTE: AMBER TURN SIGNALS ARE NOT USED)

NOTES:

NOTES:

NOTES:

V. **LIMITATIONS:** The warranties stated above are not unconditional guarantees against all hazards and failures. **THE ABOVE WARRANTIES DO NOT COVER:**

- a. Any damage to parts caused by acts of nature or accidents of any kind.
- b. Abnormal usage such as high speed racing, heavy trailer towing or other abuse and neglect.
- c. Failure of parts or equipment not supplied by **REMCO**.
- d. Leaking gaskets or hoses.
- e. Failure due to use of improper or inadequate amounts of transmission and coolant fluids.
- f. Failure by third parties to properly install the **LUBE-PUMP** system. (This does not apply to systems installed by **REMCO**.)
- g. Unauthorized modifications to the **LUBE-PUMP** system.
- h. Towing of the vehicle in excess of the legal posted speed limits.
- i. Failure of the operator to follow operating procedures as printed in the installation Manual and Towing Checklist.
- j. Costs incurred by the purchaser for telephone, shipping, substitute transportation, or loss of time, earnings, profits or any other consequential damages. These warranties are valid only under the conditions and limitations herein stated to the original purchaser and are not transferable. Repairs or replacements during the warranty period do not extend the life of the warranties.

VI. **REMCO** reserves the right to make changes and/or improvements in the product at any time without notice. **REMCO** shall not be obligated to incorporate such changes and/or improvements in products previously sold, nor be obligated to replace previously sold products with products incorporating such changes and improvements.

VII. No person, agent, distributor, dealer, or company is authorized to change, modify, or extend the terms of these warranties in any manner whatsoever. Notwithstanding any maximum limitation periods set forth under any applicable law or statute, the time within which any action must be commenced to enforce any obligation of **REMCO** arising under the warranty or under any applicable statute or law is hereby limited to the duration of the warranty set forth above, commencing from the date of purchase.

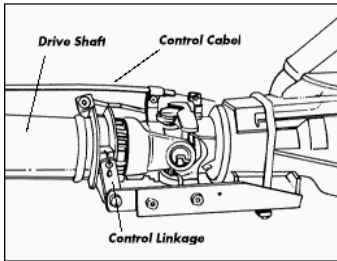
ALL WARRANTIES IMPLIED BY STATE LAW, INCLUDING THE IMPLIED WARRANTIES OF MECHANICABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE EXPRESSLY LIMITED TO THE DURATION OF THE LIMITED WARRANTIES SET FORTH ABOVE. WITH THE EXCEPTION OF ANY WARRANTIES IMPLIED BY STATE LAW AS HEREBY LIMITED, THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, GUARANTEES, AGREEMENTS AND SIMILAR OBLIGATIONS OF MANUFACTURER OR SELLER WITH RESPECT TO THE REPAIR OR REPLACEMENT OF ANY PRODUCTS OR PARTS.

VIII. This warranty gives you specific legal rights and you may also have other rights which may vary from state to state. Some states do not allow limitation on how long an implied warranty lasts, when an action may be brought, or the exclusion or limitation of implied warranties or incidental or consequential damages, so the above provisions may not apply to you.

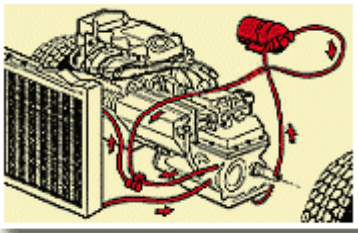
IX. In plain language, how does it all work? We sell you a quality product and then we stand behind it. If you have problems with our products we want to take care of it. Satisfied customers say good things to others and this is our objective. Call us toll free at 1-800-228-2481 or 1-402-339-3398 if we can be of any help or service.

X. The foregoing warranty and the sale of the **REMCO** products to you shall be governed by and construed in accordance with the laws of the State of Nebraska (U.S.A.), without regard to principles or conflicts of laws, and you irrevocably consent to and submit to the exclusive jurisdiction and venue of the state and federal courts in Omaha, Nebraska, for the purpose of all legal proceedings arising out of or relating to the foregoing warranty and the sale of the **REMCO** products to you.

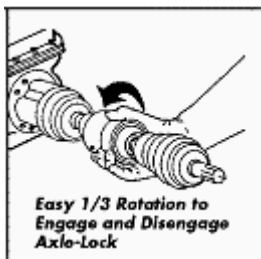
REMCO HAS THESE PRODUCTS FOR YOUR TOWING CONVENIENCE



REMCO'S Drive Shaft Coupling is for automatic transmissions with rear wheel drive.



REMCO'S Lube-Pump lubricates and cools the automatic transmission of a front wheel drive vehicle while towing.



REMCO'S Axle Lock is for disconnecting the automatic transmission of a front wheel drive vehicle.

REMCO'S Tail
signals for towing.



Light Wiring Kit is for easy hook up of your tail lights and turn

Remco
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