

12 Volt Utility Controller for 4, 6, or 8 Brakes No. 1300-76

P-1396
819-0301

Installation Instructions



Contents

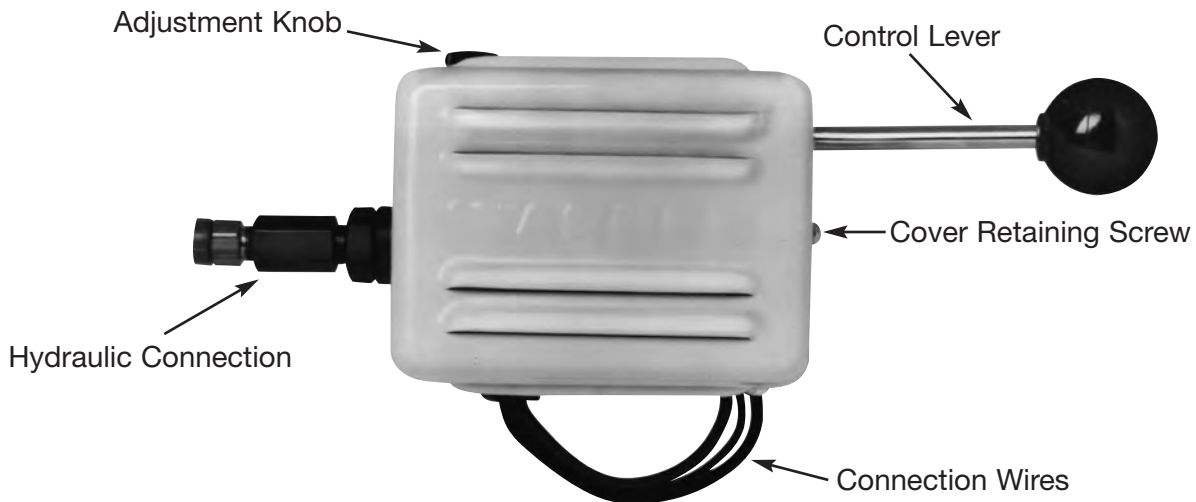
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⚠ WARNING Failure to follow these instructions may result in product damage, equipment damage, and serious or fatal injury to personnel.

Introduction

The Warner Electric hydraulic/manual Utility Controller combines manual and automatic (hydraulic) actuation for the operation of 4, 6, or 8 twelve volt electric wheel brakes. Some of the features of this controller are:

- Can be installed to operate automatically and/or manually.
- Permits manual over-ride of automatic operation.
- Brake pedal operated when connected into towing vehicle hydraulic system.
- Highly sensitive for accurate brake control.
- Wide range of adjustability to compensate for varying loads and changing road conditions.
- Rated at 30 amperes.
- Low hydraulic fluid displacement – less than .02 cu. in.



Installation

These instructions provide for ease of installation. Please follow them carefully. The basic installation steps are:

1. Mount the controller inside the towing vehicle.
2. Connect the controller into the towing vehicle's hydraulic system.
3. Connect the controller electrically.
4. Adjust the controller for synchronized braking.

Mounting Under Instrument Panel

1. Position the controller under the instrument panel to the left or right of the steering column, based on available space and driver preference.

Mount on Either Side

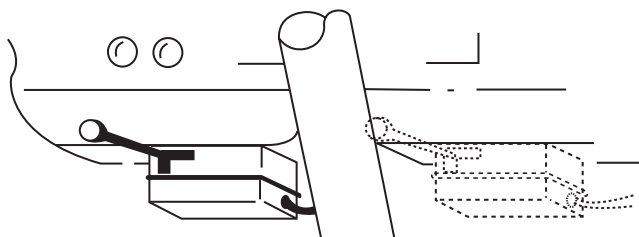


Figure 1

2. While sitting in a normal driving position, place the controller so its handle is within easy reach.
3. Remove the controller cover and, while holding the controller in place, select at least two holes through the case which best mount the controller. Mark the underside of the instrument panel through these holes.
4. Drill 3/16" diameter holes where marked, being careful not to damage anything under the instrument panel.
5. Attach the controller with 3/16" bolts, nuts and lock washers, and tighten securely. Bolt heads are to be inside the controller.

Mounting Holes

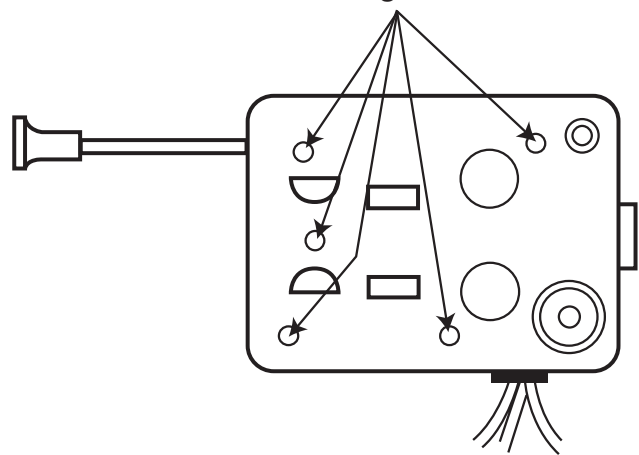


Figure 2

Hydraulic Connection

1. To provide for automatic actuation of the controller, a branch tee must be installed in the hydraulic brake system. Tees are not furnished with the controller kit because requirements vary with different makes and models of towing vehicles. To determine tee size, measure A and B dimensions from the towing vehicle's master cylinder as illustrated in Figure 3.

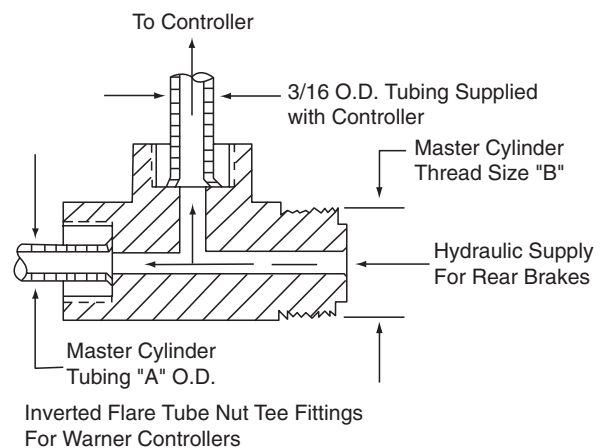
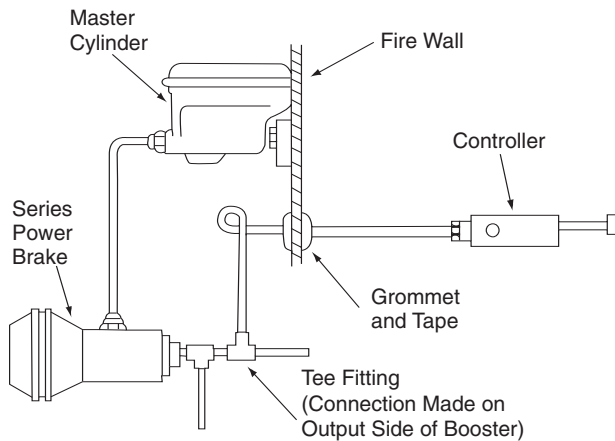


Figure 3

- On towing vehicles with dual brake systems (built since 1966) the controller must be connected to the rear brake portions of the system.

Note: The rear portion of a master cylinder does not always control the rear brakes. Trace the hydraulic tubing to be sure connections are made in the rear brake system.

- Controller Installation in Series Type Power Brake System. When installing a controller in a series type power brake system (typically used in trucks), the connection must be made on the output side (high pressure side) of the booster as shown in the figure below. Determine the correct Tow Craft tee fitting size by measurement of mating connections.



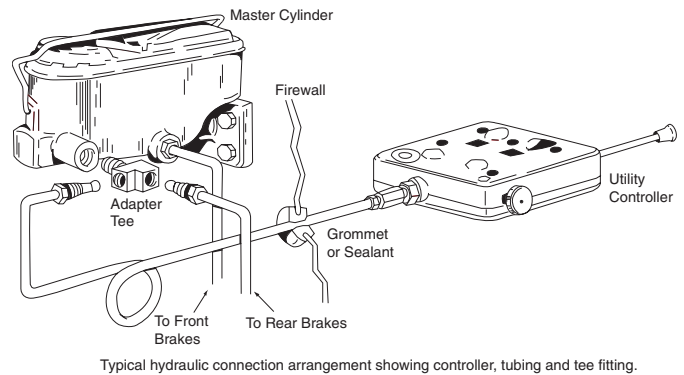
Typical Installation in Series Type Power Brake System

Figure 4

- Disconnect the rear supply line at the master cylinder (except where adapter fitting is used or when installation is made in a series type power brake system – see Figure 5) and install the tee fitting according to the towing vehicle manufacturer's recommendations.

CAUTION Avoid cross-threading and over-tightening at all connections.

- Uncoil the tubing provided. Avoid sharp bending which could cause kinks. Leave one or more loops of tubing on the engine side of the firewall to absorb vibration. To insure that the tubing remains clean, place a rag over the exposed end. Feed the tubing through a hole in the firewall, positioning it to avoid hot engine members or any surface which could damage it.
- Connect the tubing to the branch junction of the tee and tighten the tubing nut (to approximately 150 in. lbs.).



Typical hydraulic connection arrangement showing controller, tubing and tee fitting.

Figure 5

- Connect the other end, with male tubing nut, to the female fitting on the controller cylinder, but do not hand tighten completely. Take care not to deform the female thread of the fitting, which has been pre-tightened during assembly of the controller.
- To bleed the hydraulic system, wrap a rag around this connection and depress the brake pedal slowly and often enough to fill the tubing with fluid. All air must be bled from this line. When hydraulic fluid appears on the rag, remove it and tighten the tubing nut securely to stop all leakage (correct torque approximately 150 in. lbs.), while the pedal is depressed. The factory installed controller fitting should not be retightened.

CAUTION When the tubing nut is tightened, use a wrench to hold female fitting. Rocking the female fitting will cause leakage at the threads.

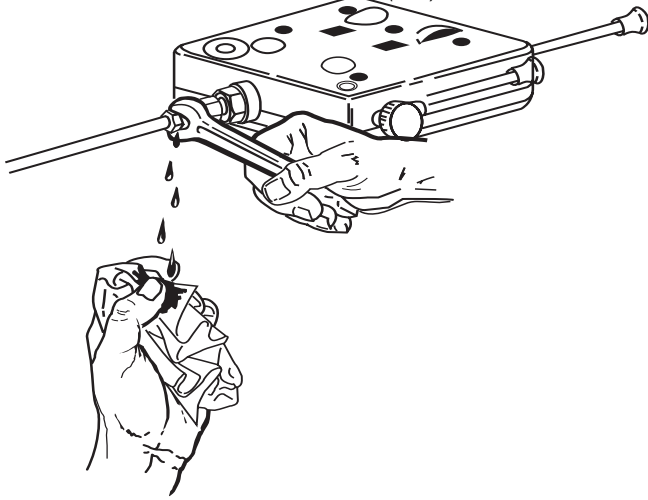


Figure 6

9. To test for sponginess and leaks, pump the brake pedal and hold it depressed for approximately one minute. If sponginess exists, the entire system should be bled at the wheel cylinders. Refill the master cylinder fluid reservoir as required.

Electrical Connection

1. Electrical connection is required for all installations. Approximately 25 ft. of automotive-type multistranded 12 gauge or heavier single wire with tough, thermoplastic insulation meeting SAE standard J558a is required.
Note: When towing a trailer which will carry variable loads, or which is light weight when compared with its brake capacity, a Warner Electric Load Control part No. 1300-78, may be required to properly proportion braking force between the trailer and the towing vehicle. See Optional Equipment.
2. An electrical socket which mates with the trailer power cable is to be installed in the rear of the towing vehicle. Strip one end of the hook-up wire and connect it to the brake terminal of this socket.
3. Secure a single length of wire from the brake connection of the socket to the underside of the towing vehicle and lead it to the engine firewall. Position the wire to insure maximum protection from scraping on the road surface in rough terrain, flying stones, spray, etc. Also avoid attaching wires near mufflers and exhaust pipes. Wires should be clamped at frequent intervals.

4. Remove a knock-out plug or cut a hole in the firewall near the mounted controller.
5. Cut the wire to a proper length for reaching the controller. Strip the wire and feed it through the firewall hole.
6. Connect this wire to the blue brake lead wire extending from the back of the controller.

Note: Solder or crimp clamp connections will be required when connecting all three controller lead wires. Wrap electrician's tape around all bare wire joints. Do NOT use twist-type connectors.

7. Making a chassis ground connection is the next installation step. Strip one end of the remaining length of hook-up wire and connect it securely to the ground terminal of the socket at the rear of the towing vehicle.
8. Feed the wire under the towing vehicle to a convenient chassis ground, such as a body or chassis nut and bolt, battery ground-post, etc. Cut and strip the wire and attach it securely to this ground. **A good ground connection is essential for proper operation.**
9. Two Utility Controllers leads are still to be connected. The red lead actuates the stoplights when the controller is operated manually. An interrupted stoplight circuit for turn signals is used on most towing vehicles. Connect the controller's red lead to the output side of the towing vehicle stoplight switch. (This switch could be a pressure in the brake line or a limit switch activated by the brake pedal.) Connect an inline fuse in series between the red lead and the stoplight switch. This fuse should be the same type and rating as recommended for the tow vehicle's existing stoplight circuit. Splice a short length of hook-up wire to the red lead to reach the stoplight switch output. If your towing vehicle has some other system, consult your automotive dealer.

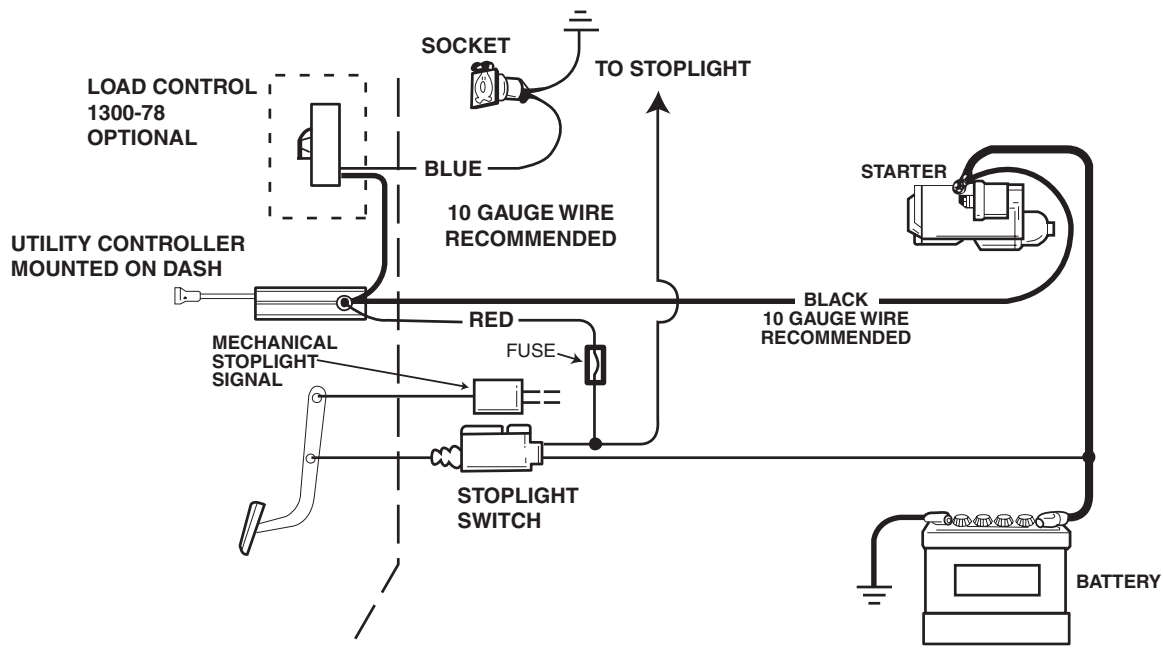


Figure 7

10. The black or power lead of the controller is last to be connected. Enough hook-up wire should remain to make this connection. Strip one end of this hook-up wire and feed it through a hole in the firewall from the engine side. Solder or crimp clamp this wire to the black controller lead.
11. Detach one of the power cables from the towing vehicle battery to prevent arcing.
12. Cut the hook-up wire to the proper length to attach it to the live terminal of the starter solenoid or relay, strip the wire and complete the connection. Attaching this lead completes your electrical connection. Reconnect the towing vehicle battery cable.
13. Tape together wires leading from the controller and secure them to the steering column or underside of the dash. Plug all holes in the fire wall with sealant or rubber gromets to prevent exhaust gases from entering through the holes and to protect the wires from abrasion.

Sensitivity Adjustment

After the entire controller system is installed and operating, the controller sensitivity must be adjusted to synchronize the towing vehicle and trailer braking systems. **Proper adjustment of your controller/braking system is important for safe automatic operation.**

Warner Electric's Utility Controller has an adjustment knob to control trailer brake sensitivity. This adjustment does not affect maximum braking capacity of the trailer brakes. Because of the wide variety of towing vehicles encountered, balancing towing vehicle brakes and trailer brakes is necessary for smooth, synchronized stops. To achieve this, the controller adjustment should be hand set to provide a slight lead in trailer braking over towing vehicle braking. Setting the adjustment in the "MORE" brake direction will increase the trailer brake rate of application, while setting in the "LESS" direction will decrease the trailer brake rate of application. When proper adjustment has been achieved, there should be no sensation of the trailer pushing or pulling the towing vehicle during a stop. When this setting has been reached, no further adjustment should be required. For operating with varying load weights, read the following section on "Optional Equipment."

Optional Equipment

When the trailer load is variable or less than trailer brake capacity, a Warner Electric Load Control, part no. 1300-78 should be added in series with the brake circuit. The Load Control provides the capability to properly proportion the braking power of the trailer brakes to the trailer weight. The Load Control is connected into the trailer brake wire connected to the blue lead from the controller. Its position is shown in the wiring diagram under “Electrical Connection.” The illustration shows the simplicity of adjusting this resistor to increase or decrease trailer brake torque. Contact your Warner Electric distributor or the factory if you require additional information.

Warranty

Warner Electric LLC warrants that it will repair or replace (whichever it deems advisable) any product manufactured and sold by it which proves to be defective in material or workmanship within a period of one (1) year from the date of original purchase for consumer, commercial or industrial use.

This warranty extends only to the original purchaser and is not transferable or assignable without Warner Electric LLC's prior consent.

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A purchase receipt or other proof of original purchase will be required before warranty service is rendered. If found defective under the terms of this warranty, repair or replacement will be made, without charge, together with a refund for transportation costs. If found not to be defective, you will be notified and, with your consent, the item will be repaired or replaced and returned to you at your expense.

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Warner Electric LLC
449 Gardner Street • South Beloit, IL 61080
815-389-3771 • Fax: 815-389-2582
www.warnerelectric.com