INSTALLATION MANUAL

TRIFLEX™ NEXT BRAKE CONTROLLER

51146

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CONTROLS & COMPONENTS

1. Main module with CURT quickplug
2. Mounting Bracket
3. Mounting Screws
4. Base plate adhesive pad
5. Cable ties

TOOLS LIST

1. Drill
2. Drill bit, 1/8"
3. Phillips screwdriver
4. Pry tool

BEFORE YOU BEGIN

One or more of the following may be needed to complete the installation:

- Brake control harness, supplied with the tow vehicle (if equipped)
- CURT quick plug harness - custom connector for specific vehicles (see the CURT catalog for availability)
- CURT #51515 / #51516 - quick plug with pigtails
- CURT #51500 - universal brake control wiring kit

IMPORTANT: Read and follow installation manual carefully. Failure to do so could result in damage to the brake control unit, loss of trailer brakes or poor brake performance.

Disconnect the electrical plug between the trailer and tow vehicle before testing a breakaway switch. Failure to disconnect may damage the brake control unit. Avoid mounting the brake control module near a CB radio or other RF transmitter.

WARNING The main module's positive (with 30-amp circuit breaker) and ground wires must be connected directly to the tow vehicle's battery using a minimum of 10-gauge stranded wire. Connecting to existing wiring or an alternate ground may damage the vehicle's circuits, lead to failure of the brake control module, loss of trailer brakes or vehicle fire.

Note: Removal of the factory quick plug can void the warranty.

NOTICE If product is to be installed in a vehicle with factory-equipped brake controller or (ITBC) integrated trailer brake control, see the vehicle owners manual for any necessary instructions for install.

CONTROLS

1. Display
2. + / - adjustment
3. Mode button
4. Manual Override

WIRING

Disconnect the tow vehicle's negative battery terminal from its battery post before beginning the installation process. Most trucks and utility vehicles are equipped with a plug from the factory that allows quick brake control installation. Check the vehicle owner's manual for plug availability, location and installation. If the mating plug supplied with the vehicle is no longer available, a CURT quick plug can be used. See the CURT catalog for application information. For tow vehicles not equipped with a factory brake control plug, we suggest purchasing the CURT universal brake control wiring kit #51500.

Mount the 30-amp, auto-reset circuit breaker as close to the battery as possible.

⚠ **IMPORTANT:** When passing wires through sheet metal, always go through an existing grommet. If there is no grommet, install one or use silicone sealant to protect the wires from sharp edges.

Insert two 10-gauge wires, one white and one black, from the mounted brake control to the battery area. Using a ring terminal, connect the black wire to the 'AUX' side of the 30-amp circuit breaker. Leave the white wire to be connected later. Using a 10/12-gauge butt connector, attach the black wire from the 'AUX' side of the 30-amp circuit breaker to the brake control's black wire. Again using a 10/12-gauge butt connector, attach the white wire from the battery area to the brake control's white wire. Run a 10-gauge blue wire from the tow vehicle's trailer plug 'BRAKE' terminal to the brake control. Using a 10/12-guage butt connector, connect this wire to the brake control's blue wire.

WIRING THE CONTROLLER

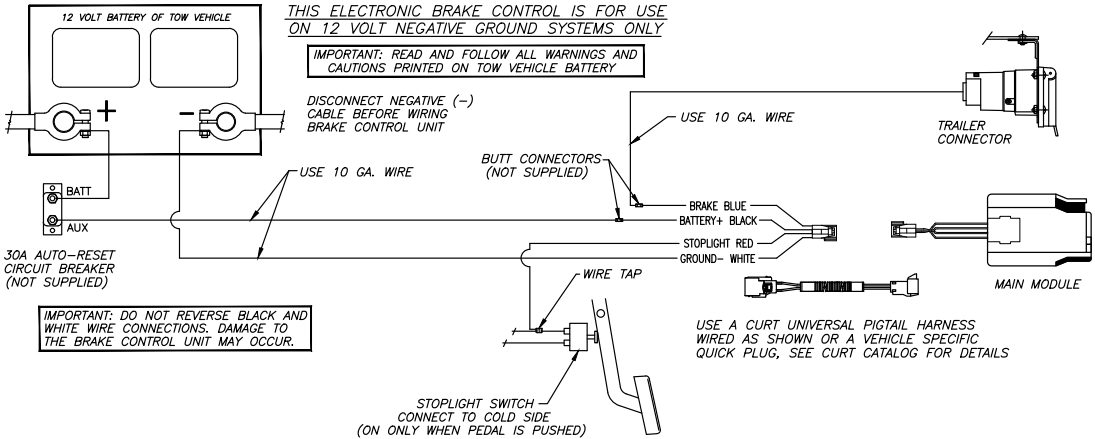
1. Determine the harness style needed (CURT custom vehicle harness or CURT universal splice-in pigtail harness)

   Note: Removal of factory-equipped brake controls may require a dealer to service the harness in order to function. Splice-in harnesses may void warranty. Check owners manual for harness information.

2. Locate the vehicle plug and remove any anti-rattle foam. Remove the dust cover and connect the CURT custom wiring harness. Route the harness into the dash area, making sure the harness is out of the way of any moving parts. Secure with the provided cable ties.
3. Check to see that your foot controls are un-obstructed by the harness.
4. Plug the harness into the brake controller.

   Note: Some controllers will start right away and others need to have the vehicle in the run position or running to power the brake controller.

WIRING DIAGRAM



MOUNTING THE BRAKE CONTROLLER

1. Mount the unit securely to a solid surface where it is easily accessible to the driver. The area behind the mounting location must be clear to prevent damage to vehicle if using screws. The angle at which it's mounted will not effect the operation or calibration of this controller (Fig 1).
2. Hold the mounting bracket in the position selected and mark the hole locations of the bracket on the mounting surface. Check that the mounting screws will not interfere with anything on the back side of the dash.
3. Peel off one of the release liners of the double-sided adhesive pad and stick onto the brake controller mount.
4. (Optional - screw installation) Using a 1/8" diameter bit, drill holes in the double-sided adhesive pad so you can see the marked locations on the dash.
5. Remove the second release liner holding the mount slightly back from the mounting surface and then firmly press the mount to the dash.
6. (Optional - screw installation) With a Phillips head screwdriver, start installing the screws to verify location of the holes. Tighten the screws to secure the bracket, being careful not to strip the holes by over-tightening.
7. Slide the controller onto the mount until it locks into place. You will hear a clicking noise if it is correctly installed. (Fig 2)

Figure 1

Figure 2

MODES & INDICATORS ON THE LED DISPLAY

The LED display shows the output setting when the control is activated. It is used to set up and monitor the brake controller and can be used when troubleshooting. There are six modes of operation and eight indicator sequences (shown below). See pages 8 through 11 for more information.

Press the mode button to switch between modes.

Day Mode

Night Mode

MODES

Manual - manual override output is active

Auto - output at brake pedal is active

Gain - output to trailer / gain adjustment

Load Sensitivity - trailer brake aggressiveness

Brightness - Adjust screen brightness

INDICATORS

Calibration

Overloaded

Low Voltage

Electrical Short

Disconnected

Connected

Not Connected

Reconnect

BRIGHTNESS CONTROL

Brightness

Adjust brightness by pressing the silver mode button (#3) to scroll through the controller options until you reach Brightness Level Mode. The screen will display the current setting stored on the controller. Adjust the level by pressing on black rocker switch (#2) to increase or decrease the brightness

DAY / NIGHT MODE

Day Mode

Night Mode

- Press the silver mode button (#3) to scroll through controller options until you reach day / night mode.
  - To set to day mode, press the black 'down' arrow button
  - To set to night mode, press the black 'up' arrow button

MANUAL CONTROL (PINCH TRIGGER - RIGHT SIDE OF DISPLAY)

Manual brake control activation is used in situations where a slow reduction in speed is desirable. As the manual control is pushed, the brake controller begins to apply the trailer brakes.

The manual control is set up to allow limited power to the output control, depending on the setup of the brake controller (pages 11 through 13).

The output will be shown on the display when the manual control is actuated. Brake light activation with the manual control is also intended to come on. Some tow vehicle circuits do not allow power for brake lights from a second source. In these applications, the CURT custom wiring harness has provision to prevent this. The brake light connection (red wire) is still required to activate the brake control.

Manual

- The LED screen will show an output proportional to the brake output on a scale from 0.5 to 9.9, based on how hard you are pressing the manual control pinch trigger (#4)
- The manual output functions are proportional when pressing the manual override. The controller is using information gathered from calibration, the gain / load selections from the controller set up and the location of the manual pinch trigger within its movable range.
- This is adjusted through gain and load adjustments only

GAIN CONTROL

The gain control establishes the maximum amount of power available to the trailer brakes when braking. The only exception would be when the manual control is set up for 100% braking.

The gain control can be adjusted during initial setup or anytime when trailer load changes and adjustment is needed for changing road or driving conditions.

Gain

- Press the silver mode button (#3) to scroll through controller options until you reach gain. The screen will display the current setting stored on the controller.
- Adjust the gain by pressing on the black rocker button with the up and down arrows (next to the silver button).
  - Upper side of button increases power level to the brakes
  - Lower side of button decreases power level to the brakes
- After 10 seconds of no user input, the interface will switch to sleep mode and the display will go to sleep

LOAD CONTROL (LEFT SIDE OF DISPLAY - RIGHT SWITCH)

The load control adjusts the trailer brake aggressiveness. Load adjustment has no effect on the manual control. The load control can be adjusted for individual driver preference, trailer load changes or changing road conditions.

Load Sensitivity - trailer brake aggressiveness

- Press the silver mode button (#3) to scroll through controller options until you reach load option. The screen will display the current setting stored on the controller.
- Adjust the gain by pressing on the black rocker button with the up and down arrows (next to the silver button).
  - Upper side of button increases power level to the brakes
  - Lower side of button decreases power level to the brakes

AUTO (SHOWS OUTPUT FROM CONTROL TO TRAILER BRAKES)

Auto - output power over time as brakes are applied

- Shows output power from 0.5 to 9.9 when the vehicles brakes are being applied
- After gain and load have been adjusted, this will show the amount of power to the trailer pending the force of the vehicle braking
  - The gain is an amount of power to the trailer based on the operator's settings
  - The load is the amount of force indicated by the sensors in the controller while stopping the vehicle and trailer based on the operator's settings

OVERLOAD INDICATORS

Overloaded

- Indicates when the brake controller is in an overload or short-circuit condition
- The screen shows brake overload or short condition
  - The trailer brake wire is grounded to the trailer and service needs to be completed

Electrical Short

- Indicates when the stop lamp is in an overload or short-circuit condition
- The screen shows brake overload or short condition
  - The stop lamp wire is grounded to the trailer or the bulb is burnt out and service needs to be completed

Low Voltage

- Indicates a low battery voltage condition
- The screen shows low battery voltage condition
  - The brake controller is not receiving enough voltage to provide the trailer with the needed voltage at the settings the controller is at. Service needs to be completed

START UP INDICATOR

Brake controller start up

- Indicates when the brake control is in calibration mode. this happens at vehicle start up and / or the connection of the brake controller to a power source.
- This proportional controller so it needs to be on a flat, level surface, and in its mounting location. The controller uses components that detect movement and angles to power the trailer brakes.
  - To recalibrate, turn off the vehicle and restart it or disconnect and reconnect the connector between the controller and the vehicle. **Be sure the controller is in its mounting location when restoring connection.**

CONNECTED INDICATOR

Connected

- Indicates when a trailer has been connected

NO TRAILER CONNECTION INDICATOR

- Indicates when the controller has recognized a trailer connection. This happen when brakes are applied and no trailer is connected

Not connected

DISCONNECTED INDICATOR

- Indicates when the trailer has been disconnected (flashing) or if the brakes are pressed with no trailer connected (icon is on as long as brake pedal is pushed)

Disconnected alert

RECONNECT INDICATOR

- Indicates when the trailer needs to be disconnected and reconnected to function correctly

Reconnect notice

INITIAL SETUP

Once all electrical connections are complete inside the vehicle, start the vehicle on a level surface, allowing the controller to calibrate. Plug the trailer electrical connector into the tow vehicle plug. The brake controller will sense the trailer upon connecting to the trailer after 10-15 seconds. Upon connecting to the trailer and applying the brakes, the brake controller will sense the trailer immediately. Every time the vehicle starts, power is applied to the brake controller and it will restart, displaying the start up icon on the display. Once the display becomes blank / black, the display will remain blank / black until the manual control is applied, the black adjustment rocker switches are pressed or the vehicle brake pedal is applied. To recalibrate the brake controller, restart the vehicle or disconnect the controller from the vehicle. The brake controller will retain the last settings applied upon restarting.

Make any preliminary gain and load adjustments with the trailer connected and engine running to ensure proper charge voltage. Adjust the output / gain by pressing the black rocker switches to the left of the display to the range desired. See next page for test drive and adjustment.

TEST DRIVE & ADJUSTMENT

Gain and load can be adjusted to achieve smooth, firm stops. These adjustments should only be made while stopped, with the transmission in park or neutral, parking brake applied, foot off the brake pedal and no manual override actuation. The screen will go into sleep mode 5 seconds after adjustments are made. Locate a vacant area. Starting with gain adjustment, drive forward on a dry and level paved surface. At approximately 25 mph, apply the vehicle brakes. If trailer braking is insufficient, adjust the gain by pressing the silver button until you are in gain mode. Use the black rocker button to adjust to desired setting. If the trailer brakes lock up, adjust the output control by pressing the lower black rocker button.

Repeat this process until stops are firm, just short of trailer wheel lock up. Once the gain is set, adjust the load by driving forward at approximately 25 mph and press the brake pedal. The vehicle and trailer should make a smooth stops. If the stop seems slow and more aggressive braking is desired, adjust the load level by pressing the silver button until you are in load mode. Use the black rocker button to adjust to desired setting, the upper rocker button for more aggressive and lower rocker button for less aggressive trailer braking. If the stop seems too aggressive, adjust the sensitivity level by pressing the lower left rocker button. Make several stops at various speeds and adjust the load until stops are smooth and firm. Slight adjustment to the gain control may also be needed as the load adjustments are being made or terrain changes.

⚠ WARNING This process should be repeated for any weather, weight or loading changes to the items in / on the vehicle or trailer.

Note: If any problems occur during setup, refer to the 'Troubleshooting Guide' on the last two pages of this manual.

BENCH TEST

Parts Needed:

1. Standard 1157 automotive bulb in a socket
2. Charged 12V battery
3. Alligator clip test leads OR wire and wire nuts
4. CURT #51515 / #51516 quick plug with pigtails OR push pins

Note: If a quick plug pigtail is not available, push pins can be used to make a direct connection to the female terminals of the TriFlex™ quick plug housing.

⚠ CAUTION Ensure that the brake control wires, quick plug wires, push pins and test leads do not make contact with each other or any other metal surface. Failure to do so may damage the brake controller.

Brake Control Setup

Connect the module to the quick plug to provide accessible wires for bench testing. Connect the white ground wire of the main module and the ground wire of the bulb to the negative terminal of the 12V battery. Leave the red brake input wire and blue output wire disconnected.

Connect the black battery wire of the module to the positive terminal of the 12V battery. If the brake controller is wired properly and the TriFlex™ is operational, the display will power on.

BENCH TEST (CONTINUED)

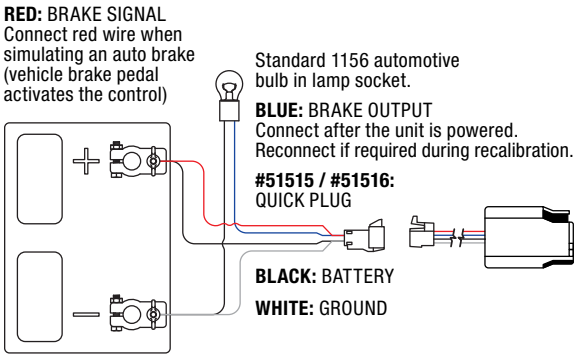
Ensure the TriFlex™ blue trailer brake signal wire is connected to the bulb. Once the CURT start up screen disappears or turns black, the control module is ready. Pressing the manual control lever will activate the controller to display and will ramp-up according to the pressure applied to the manual control level. This will also turn on the light in accordance to the amount of pressure applied to the manual lever. This visually shows power to the trailer brakes and you can proceed to test the manual control.

The TriFlex™ is a time-based brake controller so as the brake pedal is pushed, the controller ramps up to full power over time according to the gain and load setting of the controller. This can also be tested by attaching the red wire to the positive side of the 12v battery.

Manual Control Testing

Adjust the output setting to its maximum setting of 10.
Adjust the sensitivity settings to its most aggressive setting of 9.
In one hand, hold the controller and add power to the controller, allowing it to calibrate (be sure to hold the controller still). At the same time, tun the back of the controller to the ground and the screen to the sky. At the same time, activate the manual control. The faster the control moves the brighter the bulb will get. Release the manual control to deactivate and turn off the light.

IMPORTANT: Read and follow all warnings and cautions shown on the battery.



TROUBLESHOOTING GUIDE - NO TRAILER CONNECTED

Condition	Display	Problem Cause	Possible Solution
Display does not light up when brake pedal or manual control is used		No power to controller, no ground, reveresed black and white wires or circut breaker blown	Check and repair connections (see 'Wiring' section)
Display shows 'Not Connected'		Red wire connected to the wrong side of the stoplight switch or to the incorrect wire	Check and repair connections (see 'Wiring' section)
Display shows 'Low Volt' - Can occur with the trailer connected		Tow vehicle's system voltage is low	Check tow vehicle's battery and charging station
Display shows 'Short' - When manual control is applied		Red wire connected to ground side of stoplight switch or is shorted to ground	Check brake control wiring, may require change to switch setting (see 'Manual Control' section)
Display shows 'Overload' - When the brake pedal or manual override is used		Short in the blue wire output circut or trailer plug	Locate and correct short
Display shows nothing when battery power has been connected for a period of time and the engine is not being cranked		Inadequate battery or ground wiring to the brake controller	Check brake controller wiring

TROUBLESHOOTING GUIDE - WITH TRAILER CONNECTED

Condition	Display	Problem Cause	Possible Solution
Display shows 'not connected' when power is applied to controller. No trailer brakes when brake pedal or manual control is used		No connection between brake controller and trailer brakes – blue wire circuit	Confirm connection to trailer connected Confirm connector terminal positions Check trailer
No trailer brakes, pedal or manual		Short or overload in trailer brakes	Troubleshoot trailer brake circuit according to the brake manufacturer's instructions
Trailer brakes work but error shows		Miswired trailer, wiring shorted or bulb out	Check bulbs Check for possible shorts
No trailer brakes, pedal or manual		Short to trailer brakes in wiring or brake assembly	Check for shorts in wiring and in each electric brake. You may see or hear the wiring sparking
No trailer brakes, pedal or manual		Electrical connection failed	Check connector for fit and blockages
No trailer brakes, pedal or manual		Loss of trailer connection, unplugged or bad wiring	Stop and check trailer connector

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