

Installation Instructions And Owner's Manual

ActuLink ACT1000: Drum Brake Model*

ActuLink ACT1600: Disc Brake Model*

ActuLink ACT-ABS-300: Anti-Lock Brake Model

* The ActuLink ACT1000 and ACT1600 can both be upgraded to work with Tuson's hydraulic trailer anti-lock brake system.

Electric-Hydraulic Trailer Brake Actuators



Tuson RV Brakes, LLC
475 Bunker Court
Vernon Hills, IL 60061

www.tusonrvbrakes.com
www.direclink.com

Table of Contents

Page 1	Mounting the ActuLink Installation of Hydraulic Lines	Page 12	Complex Brake system Bleeding continued...
Page 2	Filling the ActuLink's Reservoir Electrical Installation	Page 13	Load Capacity and Use of Trailer Brakes Coupling Trailer Connector - Vehicle Connector
Page 3	Wiring Overview Diagram	Page 14	Brake Controller Signal Setting and Use of In-Cab Controllers Becoming Familiar - Braking the Coupled Tow Vehicle and Trailer
Page 4	Wiring Instructions	Page 15	DireLink NE
Page 5	Continued from page 4: Wiring Instructions	Page 16	Additional Approved Controllers
Page 6	Wiring Diagrams	Page 17	Service and Maintenance Always Work Safely Make Sure Breakaway Battery is Fully Charged
Page 7	Verifying the Operation of the ActuLink Battery Charging Voltage Transients	Page 18	Charge Battery When Necessary Check Brake Fluid Level
Page 8	Breakaway Protection ActuLink Breakaway System Test Bleeding Air from the Brake System	Page 19	Trouble Shooting
Page 9	Bleeding the ActuLink Unit Bleeding the Brake Lines	Page 20	Trouble Shooting
Page 10	Bleeding Brakes - Important Issues Brake Fluid Level Sensor	Page 21	Trouble Shooting - Isolating the ActuLink Unit
Page 11	Complex Brake System Bleeding	Page 22	Limited Warranty
		Page 23	Limited Warranty To Make A Claim

Step One

Mounting the ActuLink

The mounting location is at the discretion of the vehicle owner, but the guidelines listed below should be followed:

- Ensure the selected location is accessible for service and for brake line and wiring installation.
- The ActuLink must be mounted upright in a location where it will be protected from damage from trailer load and road debris.
- Be aware that electric-hydraulic actuators get hot when operating and should be mounted in a well ventilated location away from flammable materials and a location where it will not come into contact with skin.
- The ActuLink is weather sealed and water resistant, but should not be mounted in a location that will be submerged in water.
- The ActuLink should be mounted toward the front of the trailer to avoid the effects of voltage drop due to long spans of wire, wire splices, junction boxes, etc.

The ActuLink should be mounted using either the bottom mounting brackets or side mounting brackets which are included with the unit. To use the mounting brackets, remove the corresponding cap screws which secure the end plates of the ActuLink, position the mounting brackets over the corresponding holes and securely replace the cap screws. The customer is responsible for supplying the mounting bolts. Use four 1/4" threaded fasteners to mount the ActuLink to the trailer. It is recommended that lock washers be used and you must securely tighten the mounting bolts to prevent damage to the mounting brackets from vibration.

You can **NOT** drill holes in the ActuLink for any reason. Drilling holes or puncturing the unit **VOIDS YOUR WARRANTY**.



Warning!

DO NOT SPRAY HIGH PRESSURE WATER ON THE ActuLink. The ActuLink is a weather sealed, water resistant unit. But, it is not designed to withstand direct, high pressure spray from a power washer.

Step Two

Installation of Hydraulic Lines

The ActuLink has a brass 1/8" NPTF male fitting with #3 (3/16") female inverted flare tube seat adapter (for 1/8" brake line). DO NOT use Teflon pipe tape or other type of thread dope when connecting brake tubing or hose. **You must hold the ActuLink brass fitting securely in place with the appropriate size wrench when tightening the brake line fitting to the ActuLink. Failure to secure the brass fitting may cause damage to the brake line fitting.** When installing steel tubing, use care to avoid sharp kinks or bends, which can restrict brake fluid flow causing poor brake response. Double flare the ends of the steel tubing to ensure tight leak proof connections. All steel hydraulic lines should be anchored at two foot intervals to prevent vibration and chafing. Rubber hydraulic hose should be used at points where flexing may occur. Be sure hydraulic hose is positioned so it does not rub against any surface during trailering. Anchor ends of tubing to minimize stress. Follow the instructions of your brake manufacturer when connecting the brake lines to the brake caliper or wheel cylinder.

For installation with Tuson's ABS module: The lower fitting on the side of the ActuLink is the brake fluid output line that is routed to the input port of the ACT-MOD-400 ABS module (labeled PIN). The upper fitting on the side of the ActuLink is the brake fluid return line from the ABS Module (ACT-MOD-400) and is routed from the ActuLink ABS Actuator to the return line of the ABS Module (labeled RET). Improper installation of these lines will result in complete failure of the brake system.

Step Three

Filling the ActuLink's Reservoir

After all brake lines have been installed, connected, and properly tightened, fill the reservoir with NEW, CLEAN, "DOT 3" or "DOT 4" Brake Fluid. Never re-use brake fluid that has been salvaged or removed from another unit. Contaminated or dirty fluid can cause system failure and/or premature wear on the system components. DO NOT OVERFILL the reservoir. The fluid level should be approximately 3/4 inch from the top of the filler tube opening.



Warning!

Use only new, clean DOT 3 or DOT 4 brake fluid from a sealed container. Do not fill with previously used fluid. Used brake fluid may absorb water or other impurities which may cause corrosion, system malfunction and/or poor brake performance. This may result in serious or fatal injuries and/or property damage!

Step Four

Electrical Installation

There are 6 Steps Within the Electrical Installation Section.

The wiring instructions are very detailed. We advise you to review these thoroughly before you begin the electrical installation.

ActuLink Wiring Harness

The ActuLink wire harness has five wires. The function of each of these wires is explained clearly on the following pages. The ActuLink harness connector plugs into the ActuLink and has a bolt to securely attach it to the unit. Tighten the harness connector using a ¼ inch socket. Do NOT over-tighten.

The wires of the ActuLink wiring harness are approximately 18 inches long to allow for flexibility when mounting the unit. However, extensions may be required to connect unit to the trailer's electrical wiring. When making connections to the trailer's wiring harness, the desired termination is a solder joint. If the connection is not soldered, use the appropriate size and type of "crimp-type" heat-shrink connector, using the manufacturer's recommended crimping tools in accordance with their crimping instructions. Only weather sealed splices should be used.

Taking shortcuts when connecting any wires on your trailer only increases the likelihood that some part of your electrical system will fail. Make sure your splice connections are durable and sealed against exposure to water and corrosive elements. One loose wire connection can disable your entire trailer brake system.

When adding extension wires to the ActuLink wiring harness, you must use the correct gauge wire. These gauge sizes are outlined on page 3 of this manual. **To avoid significant voltage drop to the ActuLink, the total length of the wire extensions from the 7 way trailer vehicle connector to the ActuLink should not exceed 20 feet.**



Warning!

Failure to use the correct gauge wire may result in poor braking performance or brake failure. Improper wire gauge may also result in significant damage to your trailer or its components, or cause a fire, which may result in serious or fatal injury and/or property damage. Undersized wire will prevent electrical circuit protection devices such as fuses or circuit breakers from functioning properly. Undersized wire may melt or burn before these safety devices can be activated.

ActuLink Wires

12 ga. Orange - With 30 amp fuse - connect to "Charge Wire" from tow vehicle

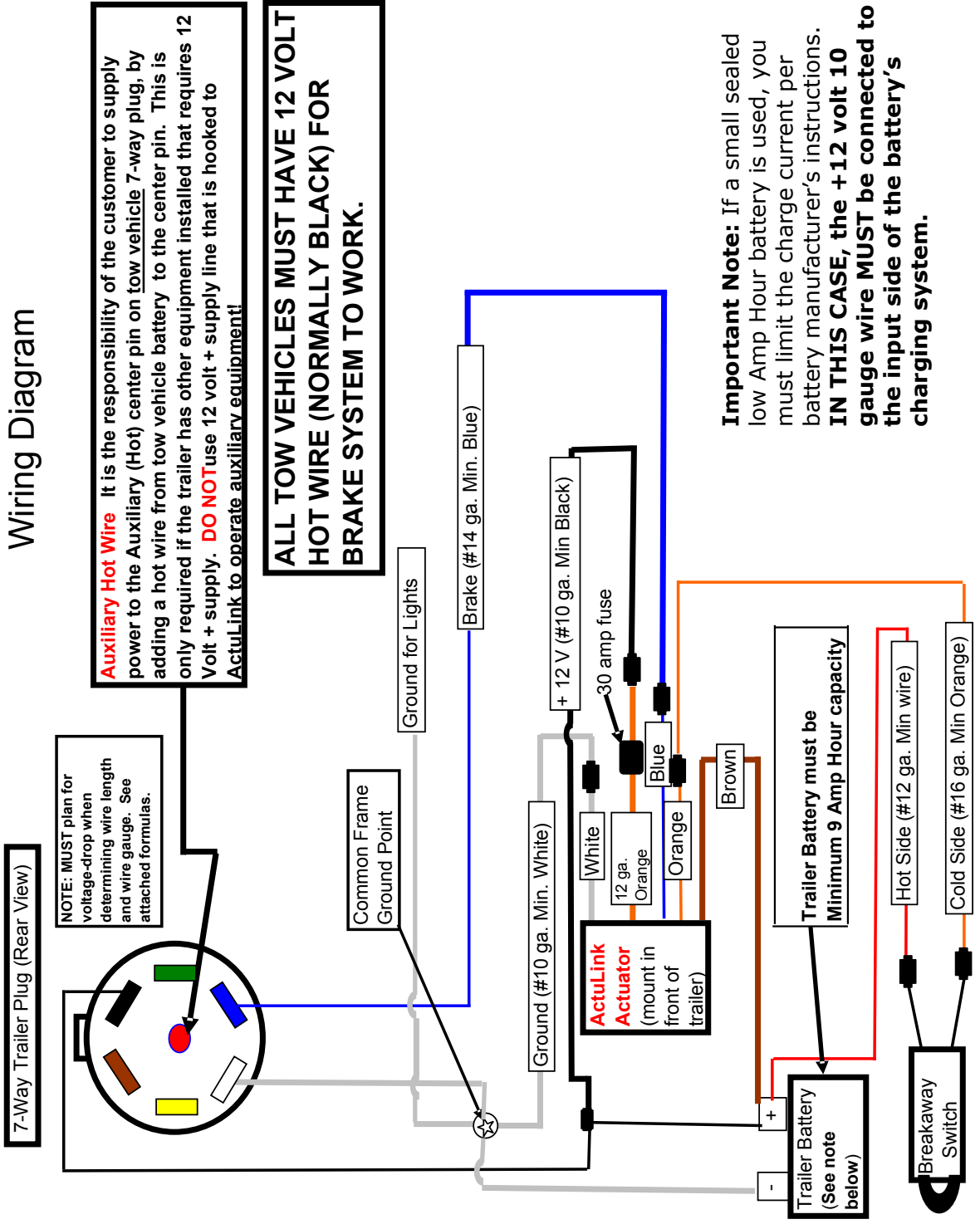
10 ga. White - Attach to common frame grounding point

10 ga. Brown - Attach directly to Positive terminal of trailer battery in installations with low Amp Hour batteries. (DO NOT SPLICE TO 12 GA. Black WIRE WITH 30 AMP FUSE.) In installations with deep cycle batteries, cap-off the Brown wire securely.

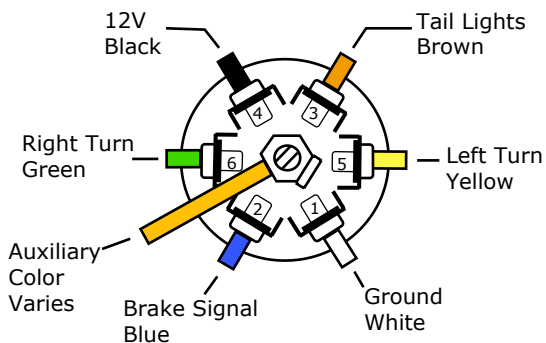
14 ga. Blue - Connect to Blue (brake signal) from tow vehicle.

16 ga. Orange - Connect to "Cold Side" of breakaway switch.

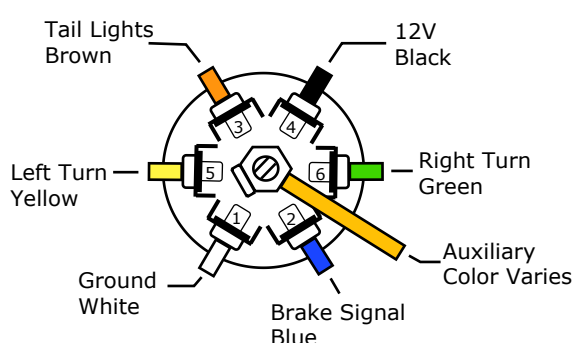
Wiring Diagram



Important Note: If a small sealed low Amp Hour battery is used, you must limit the charge current per battery manufacturer's instructions. **IN THIS CASE, the +12 volt 10 gauge wire MUST be connected to the input side of the battery's charging system.**



7 Way Connector - Trailer End
View - Looking Into the Front of the Connector



7 Way Connector - Tow Vehicle End
View - Looking Into the Front of the Connector

ActuLink Wiring Instructions

What type of breakaway battery do you have installed on your trailer? There are wiring variations for low Amp Hour rated batteries and deep cycle, high Amp Hour rated batteries. Please take note of the differences and follow the correct instructions for the type of breakaway battery you have installed. The wiring differences are clearly outlined in the wiring instructions for both types.

Step 1: It is essential that the ActuLink is properly grounded.

- The white wire from the ActuLink must be connected to the same common grounding point as the trailer battery ground wire, using minimum 10 gauge wire.
- The tow vehicle ground (via the trailer harness), must be connected to the same common grounding point as the ActuLink AND the trailer battery. NO EXCEPTIONS!
- This common grounding point should include: 1) the main connection to the trailer battery negative terminal, 2) the ground to the ActuLink, and 3) the tow vehicle ground wire, via the trailer harness (trailer plug). All three of these wires should be joined together (preferably soldered) and attached to a ground lug on the trailer frame. (The grounding lug must be attached to bare metal on the trailer frame.) By soldering all three of these wire connections securely together, when galvanic corrosion or rusting of the steel occurs between the ground lug and the trailer chassis, the ground path from the trailer battery, the ActuLink, and the tow vehicle will not be compromised.
- The wire gauge from the trailer battery to the common ground point must be sized to handle all of the current required by the trailer systems and for maximum battery charging current. If you don't know the correct gauge to use, ask a qualified trailer service center for assistance.
- All wire terminations and splices should be weather tight whether they are in an enclosure or not.

Step 2: Connect Breakaway Switch to ActuLink/Battery

Connect the 16 gauge orange wire from the ActuLink to the cold side of the breakaway switch. The hot side of the breakaway switch should be connected directly to the trailer battery positive (the hot side of the breakaway switch is whichever side that is connected to the positive terminal of the trailer battery as the switch itself has no polarity.) Use a weather tight wire termination at the battery connection due to the corrosive gases and liquids associated with batteries.

**Step 3: Option 1 - When using a low Amp Hour trailer battery.
(Wiring diagram #1, page 6 of this manual)**

Connect the Brown wire from the ActuLink wiring harness to the positive terminal of the low Amp Hour trailer battery. When using a low Amp Hour battery (9 Amp Hour minimum), you must attach the Brown wire from the ActuLink harness directly to the Positive terminal of the trailer battery. The Brown wire of the ActuLink wiring harness is required to supply power to operate the ActuLink in a breakaway condition and is also used for monitoring the condition of the battery when using the DirecLink NE trailer brake controller. (See page 13 of this manual for more information on DirecLink NE.) DO NOT attach the Brown wire to the trailer harness charge wire. The limiting device in the low amp hour battery's charging system (the ESCO WHPS100 battery charger is the only approved device) limits the amperage into and out of the battery, which would NOT allow sufficient amperage to power the ActuLink during a breakaway.

Step 3: Option 2 - When Using a Deep Cycle, High Amp Hour Battery. (Wiring diagram #2, page 6 of this manual)

Cap the Brown wire from the ActuLink harness when using a deep cycle trailer battery. The Brown wire from the ActuLink wiring harness must be capped with a weather sealed cap to prevent corrosion and to prevent an accidental short circuit.

**Step 4: Option 1 - When Using a low Amp Hour trailer battery.
(Wiring diagram #1, page 6 of this manual)**

Low amp hour batteries require the ESCO WHPS100 battery charger so that they are not damaged during charging. The 12 gauge Black (positive) wire with 30 amp fuse from the ActuLink should be connected to the charge line of the trailer harness ahead of this current limiting device so that the ESCO WHPS100 battery charger does NOT limit current to the ActuLink.

NOTE: The ActuLink is powered from the electrical system on the tow vehicle via the charge line (normally black).

Step 4: Option 2 - When Using a Deep Cycle, High Amp Hour Battery. (Wiring diagram #2, page 6 of this manual)

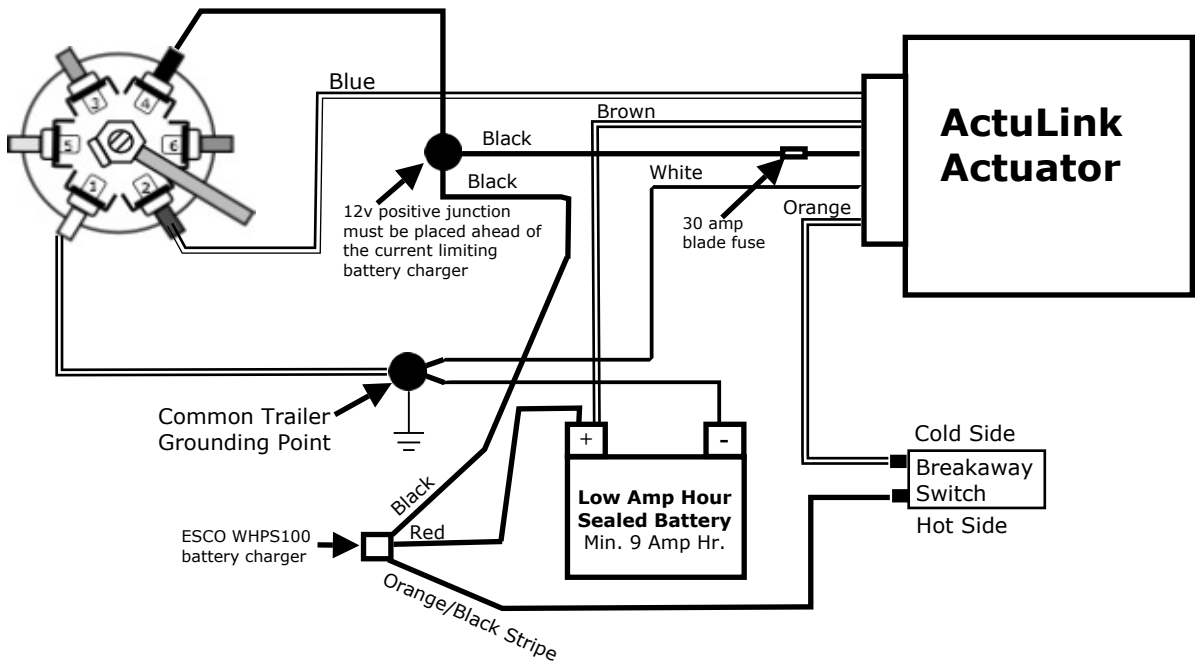
The 12 gauge black (positive) wire with 30 amp fuse from the ActuLink should be connected to the trailer battery positive terminal through a 30 amp circuit breaker using minimum 12 gauge wire. The tow vehicle charge wire should be connected to the battery side of the breaker. **NOTHING ELSE ON THE TRAILER SHOULD BE SPLICED INTO THE ACTULINK CIRCUIT OR SHARE THIS BREAKER.**

NOTE: The ActuLink is powered from the electrical system on the tow vehicle via the charge line (normally black).

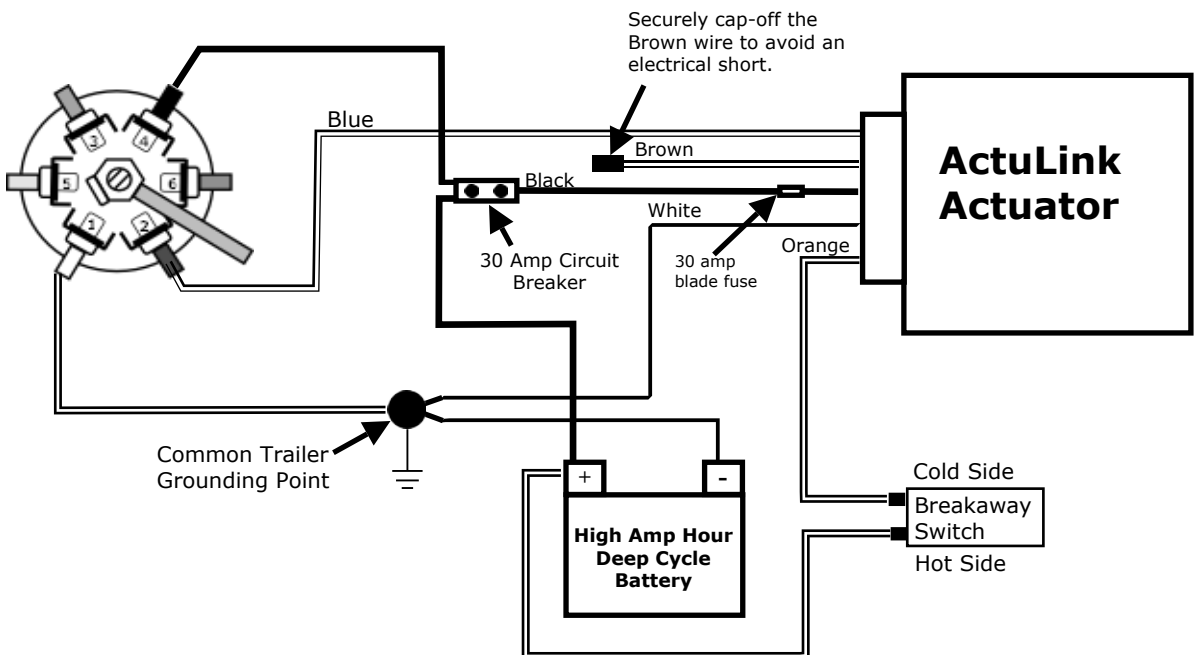
Step 5: Connect the Blue Wire Input from the In-Cab Brake Controller (via the trailer connector) to the Blue Wire of the ActuLink.

Unlike electric drum brakes, the ActuLink does not draw current from the blue wire to obtain its power. The ActuLink uses the PWM signal of the Blue Wire to set the level of trailer brake pressure. The Blue wire is a low current, voltage sensitive signal. Avoid running the Blue wire near inverters and/or chargers or any AC wires which can generate high levels of electrical noise.

Wiring Diagram 1: Applications that use a low Amp Hour battery require the use of the ESCO WHPS 100 Battery Charger.



Wiring Diagram 2: Applications that use a high Amp Hour battery that does not require a current limiting "trickle charger".



Step 6: Verify the Operation of the ActuLink.

When the installation is complete, pull the pin from the breakaway switch which will activate the ActuLink. After the ActuLink activates, replace the pin into the breakaway switch. Next, plug the trailer connector into the tow vehicle. With the tow vehicle ignition switch on, operate the ActuLink using the MANUAL OVER-RIDE on the in-cab brake controller. The ActuLink's operation should follow that of the controller's manual over-ride.

Battery Charging

For safety and braking performance, the trailer battery must be kept fully charged. The proper wire size from the tow vehicle battery (via trailer connector) (+ and -) to the trailer battery must be used to ensure adequate battery charging. Failure to supply enough current to the trailer under normal operating conditions will result in depleting the trailer battery's charge. This will cause poor braking performance or brake failure. Under normal operating conditions during towing, the voltage supplied to the trailer battery should not fall below 13.5V. Normal operating conditions include braking, use of trailer lights, and/or running appliances.

NOTE: The breakaway battery should be no less than a **9 Amp Hour battery**. If a gel cell or other type of small low Amp Hour breakaway battery is used, the charging current must be limited per the battery manufacturer's instructions. Do not store your trailer without some type of device to keep the battery charged. This will ensure long battery life and improve your trailer brake performance.

Voltage Transients

"Voltage transients" can occur when switches are used on inductive loads. Pressure switches driving compressor motors, manual switches driving pump motors, or relay coils can create voltage transients. These voltage spikes can exceed several hundred volts when the switch is opened (turned off). These transients can damage sensitive electronic devices that are connected to the same trailer power. Transient Voltage Suppression devices should be used when switching inductive loads on the trailer. Contact your compressor supplier, pump motor supplier, or supplier of any appliance or trailer component for the appropriate transient protection device.



Warning!

When you are installing the ActuLink, it is essential that you follow all set-up, wiring and test procedures to ensure that your ActuLink is properly installed and tested. Failure to follow these procedures may damage the ActuLink, and may result in serious or fatal injury and/or property damage.



Warning!

Do not connect the wires of the ActuLink by color but by their function! Failure to follow these instructions may damage the ActuLink and will void your warranty.



Warning!

Alternating Current (AC) and Direct Current (DC) wires must not come into contact with, or run closer than 6 inches of each other. AC wiring within close proximity to DC wiring can induce energy onto the DC circuits, which may result in damage or cause electronic devices to malfunction.



Warning!

Prior to welding or electrostatic painting on the trailer, the ActuLink wiring harness connector must be completely disconnected from the actuator and you must remove the brake line from the ActuLink fitting. Failure to remove the harness connector and brake line fitting prior to welding may cause damage to the ActuLink's electronics, which will void your warranty.



It is critical that you verify that your breakaway system functions properly. Failure to maintain a properly functioning trailer breakaway system can result in serious or fatal injury and/or property damage in the case of a trailer breakaway condition.

Breakaway Protection

A breakaway system (sold separately) is required to supply power to the ActuLink system in the event the trailer becomes uncoupled from the towing vehicle. A breakaway kit consists of a switch, battery and battery case. A cable attached to the breakaway switch must be securely attached to the towing vehicle during use. (Refer to instructions provided by the Breakaway Kit Manufacturer.) In the event of unplanned uncoupling, the breakaway cable must cause the breakaway switch to close, thus activating the trailer's brakes and holding the brakes on for a minimum of 15 minutes.



Failure to maintain adequate charge in the breakaway battery will result in the breakaway system not functioning properly. This may result in serious or fatal injury, and/or property damage in the event of a breakaway!

Step Five ActuLink Breakaway System Test

1. Ensure the ActuLink reservoir is filled with brake fluid according to the instructions on page 2 of this manual.
2. Ensure that the trailer is NOT connected to the towing vehicle via the trailer electrical connector.
3. Pull the pin from the breakaway system. The ActuLink should turn full-on immediately and run at full pressure for 20 seconds. After 20 seconds, the ActuLink should continue to operate but at a lower pressure (approximately 300 psi) that will hold and lock the trailer brakes.
4. Once you have verified that the breakaway system functions, replace the pin into the breakaway switch.

Step Six Bleeding Air From The Brake System

It is essential to bleed all air from your trailer brake system for it to operate optimally. You must bleed the system prior to towing your trailer. For best results, two people should perform these procedures.



Eye protection should be worn at all times when bleeding the ActuLink and brake lines. When activated, the ActuLink will generate high brake fluid pressure, so take care of protecting yourself and your trailer and ensure the plastic tubing is securely held in place during bleeding.

Step Six: continued...

When Bleeding the Brakes, Consider These Important Issues:

- Please be aware that the ActuLink will pump a large volume of brake fluid in a short period of time. Therefore, it is important to closely monitor the brake fluid level and re-fill the reservoir as needed. **IF THE BRAKE FLUID FALLS BELOW THE PUMP INLET (which is located at approximately 3/4 inch from the bottom of the tank): THE PUMP WILL CREATE A BUBBLY FROTH WHICH WILL ENTER THE BRAKE LINES. IF THIS HAPPENS, IT MAY TAKE UP TO 8 HOURS BEFORE THE BRAKE LINES CAN BE SUCCESSFULLY RE-BLED.**
- Do not bleed the brakes with the ActuLink's brake fluid reservoir cap on the unit. The bladder on this cap may be damaged if the cap remains on the unit during bleeding.
- Brake fluid can cause damage to painted surfaces. Clean up any spills on painted surfaces immediately.
- It is recommended that the entire brake system be re-bled after the first 100 miles of road travel. It is not uncommon for air pockets to remain in the system after the brake system has been bled. This air will normally work its way to the brakes during a short period of use. Re-bleeding the brakes should completely resolve this issue.

Bleeding the ActuLink Unit

1. Remove the dust cap from the bleed screw on the top of the ActuLink unit and place plastic tubing onto the bleeder.
2. Immerse the opposite end of the tubing in a clean clear container partially filled with brake fluid.
3. Activate the ActuLink by either pulling the breakaway switch, or if you have the trailer plugged into the tow vehicle and the ignition switch turned on, you can use the manual control of the brake controller - always use full pressure when bleeding the brake system. As the ActuLink is running, open the bleeder screw one half turn and brake fluid will be expelled through the plastic tubing into the container.
4. Watch the free end of the plastic tube for air bubbles emerging into the container of brake fluid.
5. Continue bleeding the ActuLink until the fluid is clear and free of air bubbles.
6. Tighten the bleeder screw and THEN turn off the ActuLink. Remove the plastic tubing and replace the dust cap. The ActuLink is fully bled.

Bleeding the ActuLink ABS System

When bleeding the ActuLink with Tuson's complete ABS system, the instructions for bleeding the brakes on pages 9 and 10 of this manual are valid with the following exceptions:

1. After bleeding the the ActuLink unit, as outlined above, use the same method to bleed the ABS Module (ACT-MOD-400).
2. Then bleed the brake lines as outlined on page 10. However, in this case the brake lines can be bled in any order because each is an independent channel originating at the ABS Module.

Step Six: continued...

Bleeding the Brake Lines

1. If you have a multiple axle trailer, bleed the brakes farthest from the ActuLink first.
2. Place plastic tubing on the first wheel cylinder bleeder screw (drum brakes) or caliper bleeder screw (disc brakes) to be bled.
3. Place the loose end of the plastic tubing into a clean clear container so that the end of the tubing is completely submerged in brake fluid to observe air bubbles being removed from the system during the bleeding process.
4. Activate the ActuLink by either pulling the breakaway switch, or if you have the trailer plugged into the tow vehicle and the ignition switch turned on, you can use the manual control of the brake controller - always use full pressure when bleeding the brake system.
5. As the ActuLink is running, loosen the bleeder screw located on the selected wheel cylinder (drum brakes) or the caliper (disc brakes) one half turn and brake fluid will be expelled through the plastic tubing into the container.
6. Bleeding is complete when bubbles are no longer observed. At that point, while the ActuLink still pumping fluid, close the bleeder screw securely.
7. Repeat this bleeding process for all wheel cylinders or calipers.
- 8. Periodically check and re-fill the ActuLink reservoir as needed during the bleeding process so that air does not enter the system. See page 9 for more information.**



Warning!

Failure to properly bleed the air from the ActuLink, brake lines and calipers (or wheel cylinders) will significantly diminish the performance of your trailer brake system which may result in serious or fatal injuries and/or property damage!



Warning!

You must monitor the level of brake fluid in the ActuLink. If a brake line fitting becomes loose, or the brake line is broken, the brake system can lose brake fluid rapidly. Before towing your trailer, verify that your ActuLink's brake fluid reservoir is full and that the system pressurizes without leaking at any point. If your brake system has a leak, repair it before towing your trailer. Failure to follow these instructions may result in serious or fatal injuries and/or property damage.

Brake Fluid Level Sensor

ActuLink actuators have a built-in brake fluid sensor which automatically monitors the amount of brake fluid in the ActuLink reservoir. It is important to note that this data can only be accessed by installing Tuson's DireLink NE brake controller. When installed in combination, the ActuLink's fluid level sensor automatically monitors the brake fluid level and sends the data to the DireLink NE. This system has three levels: OK, low and out. The DireLink color display will automatically warn the operator when brake fluid is low or out. It is also important to note that if the brake fluid reservoir is empty, the ActuLink disables itself so the hydraulic pump is not destroyed by running without fluid.

We encourage you to use the ActuLink in combination with the DireLink NE in-cab brake controller. See page 15 of this manual or www.direlink.com for more information about DireLink NE.

Complex Brake System Bleeding

Bleeding a triple axle, ABS system with Dexter Disc Brakes*

*** Because of their dual piston design and bleed screw arrangement, Dexter disc brakes have special bleeding requirements - see below.**

- 1) Fill the Actuator reservoir to the bottom of the filler cap neck with new DOT 3 or DOT 4 brake fluid from a sealed container.
- 2) Attach a clear plastic tube to the bleed screw on the Actuator (item 1 in figure 1)
- 3) Apply the manual override 100% and wait for the pressure to build in the system by listening for a load on the Actuator motor or viewing the pressure on the Command Module screen (above 1000 psi).
- 4) Crack the bleed screw on the Actuator and observe the fluid as it passes through the clear tubing. With the pressure at maximum, leave the bleed screw open for 2 seconds, then close it for 1 second, and repeat this process until the fluid stream is free of bubbles and foam.

IMPORTANT: Be sure that the Actuator pressure is at maximum and fluid is flowing out when the bleed screw is tightened. Do not remove pressure from the system prior to closing the bleed screw since that will allow air back into the system.

IMPORTANT: Be sure to watch the fluid level in the Actuator or view the Command Module screen to see when the "Fluid Level Low" warning comes on and add brake fluid to the Actuator as needed before continuing.

- 5) Repeat steps 1-4 for the ABS Module and the disc brakes following the sequence outlined in Figure 1, page 12 of this manual. Use the bleed screw on the disc brakes as shown in Figure 2, page 12 of this manual. When loosening the bleed screw on the disc brakes, be sure that the fitting is not loosening with the bleed screw. You may need to tighten the fitting into the caliper prior to loosening the bleed screw.
- 6) Locate the input line, tube nut and fitting on the inside of the disc brakes (see figure 2). Perform the following additional bleed process on the brakes in the sequence of 3 thru 8:

Apply full manual override and allow the system to get to max pressure. Loosen the tube nut on the #3 brake slowly until a stream of fluid is allowed to squirt out on the floor (or into a pan). Use the same method of opening for 2 seconds and closing for 1 second as described in step 4. Continue loosening and tightening the tube nut until the fluid stream is free of bubbles and foam. Repeat this same process for brakes 4 to 8.

- 7) Repeat the bleeding process once again using the bleed screws (see figure 2) and clear plastic tubing for brakes 3 thru 8 (in that sequence).

Complex Brake System Bleeding, continued

Hydraulic System Bleeding Sequence for Tuson Trailer ABS System on a Triple Axle Trailer

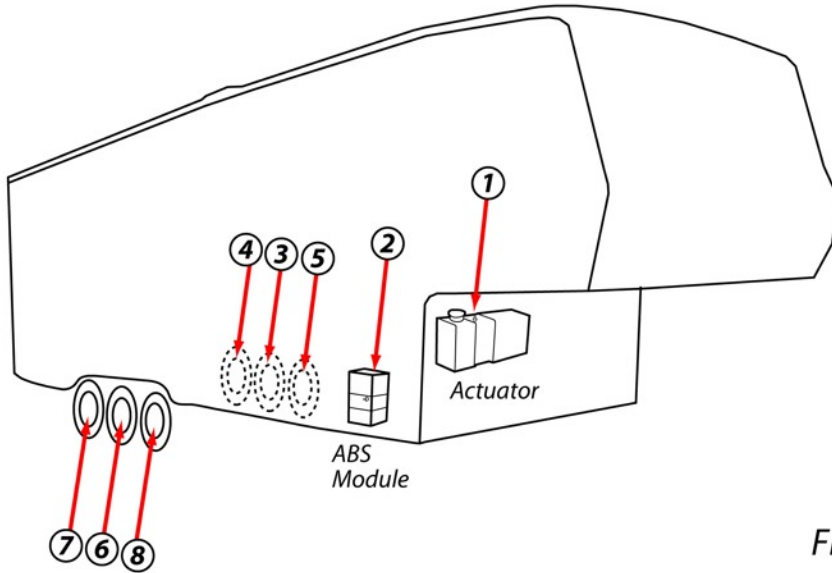


FIGURE #1

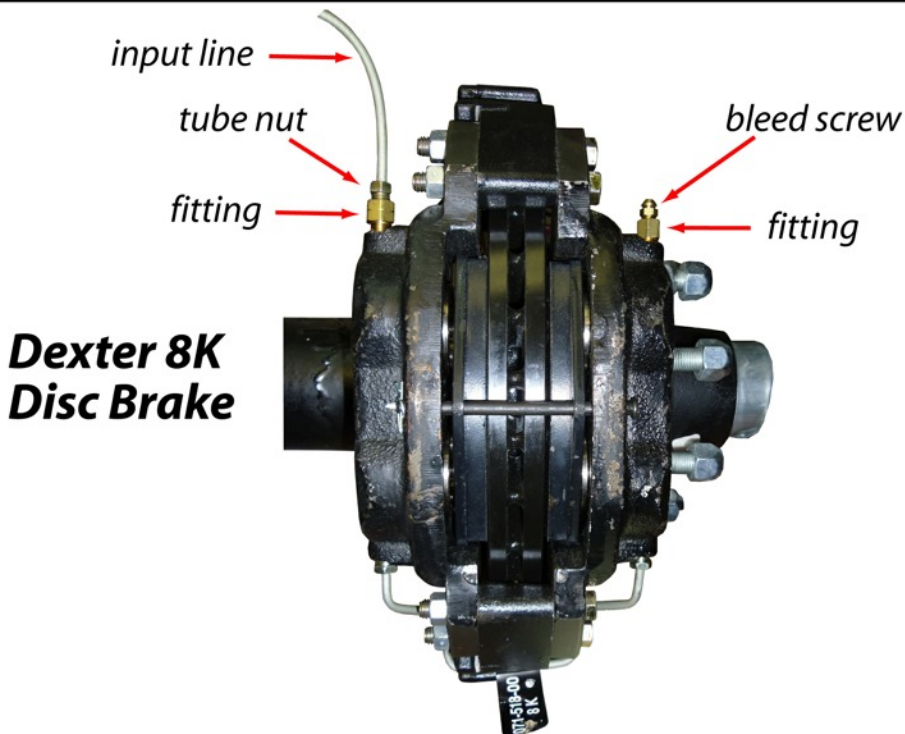


FIGURE #2

General Operation

Load Capacity and Use of Trailer Brakes

The brakes installed on the trailer determine the brake capacity of the trailer, not the ActuLink. Refer to the owner's manual from the trailer manufacturer and the towing vehicle owner's manual to determine maximum towing capacity. It is the sole responsibility of the installer to ensure that the actuator is properly sized with the brake system on the trailer so that the time to build brake line pressure in the trailer brake system is not excessive.

The trailer brakes are not to be used at any time as the primary source of braking for the towing vehicle. **The ActuLink is also not intended to be used as a parking brake.**

Coupling

When coupling the trailer to the towing vehicle, always ensure the two vehicles are properly coupled and latched, including the safety chains and breakaway switch cable, in accordance with the vehicle manufacturer's instructions and trailer manufacturer's instructions. All coupling devices and procedures must conform to State and Federal regulations.

Trailer Connector - Vehicle Connector

A towing vehicle equipped with an in-cab controller can be electrically connected to the ActuLink installed on a trailer using a conventional seven pin trailer connector-vehicle connector. However, the pins of the vehicle connector and the pins of the trailer connector must be wired exactly the same according to the function of each wire -- **NOT JUST BY WIRE COLOR**. If the functionality of the mating pins in the trailer connector and the vehicle connector do not correspond by the function of the attached wires, the ActuLink will not operate. It is IMPERATIVE that these connections are correct. See pages 3 and 4 of this manual for complete details.

After properly coupling the trailer to the towing vehicle, plug the trailer connector into the mating connector of the towing vehicle.

There are two checks to ensure proper connection has been made.

The first check is visual, as many in-cab brake controllers have a lighted display, refer to the controller manufacturer's instructions for details. If there is a problem with the connection, refer to your in-cab brake controller manual for complete details on verification of wiring continuity.

The second check requires using the manual override lever on the in-cab controller. Position a second person near the ActuLink. With the ignition switch turned on, the vehicle stationary and in Park, move the manual over-ride lever of the brake controller. The person near the ActuLink will hear the motor engage if the tow vehicle and trailer are properly connected. If the ActuLink does not function, immediately discontinue operation and correct the condition that is causing the ActuLink not to function.

Important: See the Trouble Shooting section of this manual, pages 19-20, if the ActuLink does not operate.

Determining and Setting Proper Trailer Braking Force

Brake Controller Signal Determines Trailer Brake Pressure.

Trailer braking pressure is controlled by the use of an in-cab brake controller. This allows the driver to select the level of trailer braking for the trailer, from the driver's position in the towing vehicle. Increasing or decreasing the "gain" or "scale" setting of the in-cab brake controller, will increase or decrease the level of brake force generated by the ActuLink unit. The ActuLink only applies the level of braking indicated by the brake controller's "blue wire" signal. Therefore, we urge you not to economize on a brake controller because it will only diminish the overall performance of ActuLink and your trailer braking system in general. Refer to brake controller manufacturer's manual for instructions to properly adjust the controller settings.

Settings and Use of In-Cab Controllers

The settings of the in-cab controller are set by the driver. When properly set, the braking force of the trailer will provide sufficient braking so the brakes of the towing vehicle are not required to provide any braking force for the trailer. Variations in the controller settings may be required for different road conditions and for changes in trailer load. It is essential to maintain sufficient braking on the trailer on wet or slippery road surfaces. More braking with the trailer may help prevent the possibility of a jack-knife situation or prevent the trailer from pushing the towing vehicle. The in-cab brake controller allows for manual activation of the trailer brakes independent of the tow vehicle, by using the manual override feature of the controller.

Become Familiar with Braking of the Coupled Tow Vehicle and Trailer.

After the system installation has been verified, the operator should take the trailer to an empty parking lot to become familiar with the operation of the braking action of the combined tow vehicle-trailer. Each driver has different driving habits, and each vehicle has unique braking characteristics. Each potential driver of the coupled tow vehicle and trailer should take some time to familiarize themselves with the response and handling of the trailer using various settings on the in-cab controller. Each driver must be familiar with the operation of the in-cab brake controller and understand how to make adjustments to achieve the most desirable braking force (see brake controller manufacturer's instructions).

The Brake Controller We Recommend

DirecLink NE Brake Controller

The ActuLink is designed to work with Tuson's DirecLink NE (see www.direclink.com for more information) brake controller and we strongly encourage you to use this brake controller. When you use the ActuLink together with the DirecLink NE, a two-way digital diagnostics network is established using the existing wiring of your tow vehicle and trailer. The DirecLink NE will constantly monitor the following parameters:



- Trailer connection
- Tow vehicle battery voltage
- Brake controller ground connection
- Brake controller power connection
- Brake switch voltage
- Blue wire voltage output
- Blue wire current output
- Blue wire short
- Ground connection to trailer
- Trailer battery voltage under load
- Trailer battery amp under load
- Trailer brake actuator temperature
- Engine RPM
- Transmission Temperature (Ford & GM)
- ActuLink brake fluid level
- Trailer ABS Sensors (4 sensors)*

***Only available with systems with ABS Module**

- **DirecLink NE is a network computer.** There is simply nothing else like it. But, you don't have to be a computer nerd to know how to use it.
- DirecLink NE plugs into the OBDII connector under your dashboard and **automatically determines what vehicle and network type you have.**
- The DirecLink NE only observes the data on your tow vehicle and **follows all industry standards in connecting to this network.**
- Once installed it constantly monitors the computer network of your tow vehicle. When you apply the brakes, DirecLink NE already has a **complete picture of what is happening** from all the data available on your tow vehicle's network.
- When you install DirecLink NE you can **fine tune the braking level to match your preference.** When controlling the trailer brakes, DirecLink NE takes your settings and the data from the tow vehicle to determine the proper level of trailer
- **DirecLink NE** monitors 30+ parameters to ensure the integrity of your trailer braking system.
- When you apply the brakes, DirecLink NE **uses multiple data points in a proprietary way** to determine the proportional level of trailer braking.
- There are **differences in the braking performance between drum brakes and disc brakes** and these are accounted for when DirecLink NE detects your brake type and allows you to further adjust for these differences with the low speed brake adjustment.
- Taking everything above into consideration, DirecLink NE creates an entire, non-linear braking curve resulting in **extremely smooth, responsive trailer braking.**
- On Ford and GM trucks and SUVs, you can also **monitor transmission temperature.** Aftermarket products for this can cost as much as \$600.

If any faults occur with the above parameters, a message is immediately displayed in the color display of the DirecLink NE. This pinpoints your problem and eliminates any guessing on your part as to the root cause. This provides peace of mind knowing that your trailer brake system is monitoring many crucial electrical connections. It also provides a powerful diagnostics tool to check out your system before departing on a trip.

Additionally, when you use the ActuLink in combination with the DirecLink NE brake controller, the braking data can be sent over the two-way network in a digital format. This data is confirmed with each exchange between the ActuLink and DirecLink NE. This provides the highest level of trailer braking data integrity available.

Additional Approved In-Cab Brake Controllers

The brake controllers approved for use with the ActuLink are:

Hayes:

- Genesis
- Energize XPC
- Endeavor
- Energize III

Tekonsha:

- Prodigy
- P3

Ford Super Duty In-Dash Brake Controller*

(*) Non-compatibility problems may occur with Ford model year 2005 and, less frequently with other model years. Non-compatibility will be manifested by the in-dash controller showing connected - not connected every few seconds or by the ActuLink attempting to start every 5 seconds. If this happens, there is a separate module available that can be wired into the circuit that will resolve this problem. Contact Tuson RV Brakes, LLC for more information.

The ActuLink may work with other controllers, but the operation of the ActuLink and trailer braking performance may NOT be optimized. (A brake system's operational quality can be no better than the operational quality of the in-cab controller!)



Warning!

If a non-approved in-cab controller is used, it is the sole responsibility of the end user to ensure that the in-cab brake controller they have installed is compatible with the ActuLink actuator. Tuson attempts to provide compatibility with most in-cab controllers, but is not able to anticipate design and functionality changes introduced by the manufacturers of brake controllers.

NOTE: The GM in-dash brake controller does not work with electric-hydraulic actuators.

NOTE: Tuson does not endorse the use of time-based in-cab controllers. The output of a time-based controller is not proportional to the deceleration of the towing vehicle. Therefore, when linked to a time-based in-cab controller, the ActuLink will not generate brake pressure proportional to that of the tow vehicle deceleration.

NOTE: DO NOT USE LED type controllers such as the **Voyager** as it may damage the ActuLink.

NOTE: Unlike electric drum brakes, the ActuLink does not receive its power through the "blue wire". The power to the ActuLink is provided through a +12 volt (normally black) wire from the tow vehicle connector.



Warning!

It is essential that each driver read and fully understand the in-cab brake controller operating manual provided by the manufacturer of the in-cab brake controller. Failure to fully understand the use and operation of the in-cab brake controller by each driver may cause loss of vehicle control.

This may result in serious or fatal injury and/or property damage!

Do Not Ride Your Brake Pedal

This will cause constant pressure from the ActuLink unit to the trailer brakes, resulting in premature wear and overheating. This may also cause damage to the ActuLink unit or cause damage to the internal components of the system, as well as damage to your hydraulic brakes.

In the event you are required to be stopped with the tow vehicle brake pedal depressed for an extended period (and if the brake controller installed in your tow vehicle continues to send a signal when your vehicle has stopped), the ActuLink unit's pressure relief feature is activated. This pressure relief feature reduces brake line pressure after 20 seconds of constant, and unchanging braking signal from the brake controller (and thereby reduces the wear on your actuator) and keeps your brake lines pressurized until the brake pedal in the towing vehicle is released.

Service and Maintenance

For optimum trailer braking, everything in the brake system must be in good working order. Periodically check the complete braking system, including the brakes lines and hoses, wiring and vehicle-trailer connector plugs for damage, corrosion or leaks. Ensure brake lines and wires are secured so they do not hang down, drag or get caught when the trailer is in motion. Inspect friction pads or linings for excessive wear according to the directions of the brake manufacturer.

Every 3,000 miles or annually, it is best to perform (or have a certified trailer service center perform) a complete inspection of the brake pads or linings, wheel bearings, races and seals, as well as the trailer battery.

Always Work Safely

Caution: Before removing any tires/wheels to work on the trailer brakes, certain safety procedures must be followed. The trailer needs to be parked on a hard flat level surface. The tires on the opposite side you plan to work on must be chocked to prevent any possible movement forward or backward. The trailer must be jacked up according to the manufacturer's instructions and properly rated jack stands installed to support the trailer's weight while the work is being performed.

If you don't feel comfortable performing this type of maintenance yourself, you should have an authorized service center do it for you.

Make Sure The Breakaway Battery Is Fully Charged

Always check the breakaway battery to verify it is fully charged when coupling your trailer for use. There is only one sure way to verify that your breakaway battery is fully charged: Use a voltmeter to check the voltage of your breakaway battery during current draw. To do this, pull the breakaway switch pin out of the breakaway switch assembly to activate the ActuLink unit, while simultaneously placing the positive probe of voltmeter to the positive terminal of the breakaway battery and the negative probe of the voltmeter to the negative terminal of the breakaway battery. If the reading of the voltmeter is less than 12 volts, charge the battery per the manufacturer's recommendation. See the operation manual of your voltmeter to ensure proper setup and usage of your voltmeter.

If you are using the DirecLink NE, there is a diagnostic feature in the trailer diagnostics section of the menu that will allow you to check your trailer battery under load with the readout on the color display of the DirecLink NE command module.



Failure to maintain proper charge on the breakaway battery will result in the breakaway system not functioning properly. This may result in serious or fatal injury and/or property damage in the event of a breakaway!



Warning!

Failure to use the proper size battery and to maintain proper charge on the breakaway battery will result in the breakaway system not functioning properly. This may result in serious or fatal injury and/or property damage in the event of a breakaway! Use no less than a **9 Amp Hour rated battery**.

Charge Battery When Necessary

If the battery's charge is low, or if the trailer has been parked for a prolonged period without a device to keep it charged, charge the battery per the manufacturer's recommendation. Use the procedure outlined above to determine if the breakaway battery is fully charged. Always follow battery manufacturer's maintenance instructions.

Testing the battery in the manner outlined above confirms that the battery is charged. However, it does NOT confirm the brakes are functioning properly. **Regular inspection, adjustment, and maintenance of the braking system is necessary to ensure proper brake operation.** You should have a comprehensive brake system inspection every 3000 miles and annually.

Check Brake Fluid Level

Verify brake fluid level before each use. The fluid level should be approximately 3/4 inch from the top of the filler tube opening. Use care to prevent contamination of the fluid with dirt, water, or other foreign material when removing the filler cap, checking the fluid level, or when adding fluid to the reservoir.



Warning!

The use of contaminated brake fluid may cause the ActuLink system to malfunction, which may result in serious or fatal injury and/or property damage!

Built-In Brake Fluid Level Sensor

The ActuLink has a built-in brake fluid sensor which automatically monitors the amount of brake fluid in the ActuLink reservoir. For complete information about this sensor and how it works, please see the Brake Fluid Level Sensor section on page 10 of this manual.

Trouble Shooting

Problem	Diagnostic Procedure(s)
Brake controller display does NOT light when brake pedal is applied.	<ol style="list-style-type: none"> 1. "Open circuit" indicated between the trailer and the tow vehicle - inspect circuit connections per instructions outlined in this manual. 2. Brake controller not programmed / set for electric-hydraulic mode.
Brake controller shows "open circuit" or does not show connection to trailer.	Verify tow vehicle charge line has at least 13.5 volts (alternator voltage) at connector when tow vehicle is running. If you don't have at least 13.5 volts, check the fuse for the charge line and inspect wires for possible damage. Note: The ActuLink will not operate using a brake controller without an active tow vehicle charge line.
ActuLink does not run when breakaway switch is pulled.	<ol style="list-style-type: none"> 1. Verify ALL electrical connections are correct and complete, especially ground to trailer frame AND the breakaway battery ground. 2. Make sure the correct gauge wire has been used for installation (See electrical connections on page 3 For gauge sizes.) 3. Charge breakaway battery and retest. See pages 17-18. 4. Connect white wire from ActuLink to a test battery ground. Connect the 16 ga. Orange and the 12 ga. Black wires directly to +12VDC test battery. If the ActuLink runs, replace the breakaway switch and/or breakaway battery as needed. 5. Breakaway battery is undersized. (use minimum 9 Amp Hour capacity battery.)
ActuLink does not operate using the manual over-ride lever of the in-cab brake controller.	<ol style="list-style-type: none"> 1. Verify that ALL electrical connections are correct and complete on the trailer AND the towing vehicle. The ground wire from the controller MUST be attached to the same ground point as the tow vehicle battery and the tow vehicle connector. 2. Make sure the correct wire gauge has been used for installation (See electrical connections on page 3 for gauge sizes.) 3. Inspect the trailer and tow vehicle connectors. Replace corroded or damaged connectors. Ensure all wires inside the connector are secure. 4. Verify trailer connector is securely attached to the tow vehicle connector. 5. Ensure that the brake controller is an approved controller (See page 15-16) and installed correctly per manufacturer's instructions. 6. Run "blue wire" from brake controller directly to ActuLink. If the ActuLink operates when the manual over-ride lever is depressed, check wiring between the brake controller and the ActuLink. 7. Connect voltmeter to blue wire and ground. With proper brake controller gain adjustment, the voltage should vary from zero to near full battery voltage when manual over-ride lever is depressed. If voltage is low, contact your brake control supplier. The Prodigy controller requires the trailer to be connected to the tow vehicle in order to obtain near full battery voltage when the manual lever is moved.
ActuLink takes too long to reach full pressure.	<ul style="list-style-type: none"> • Bleed the brake lines. • Check brake fluid level and check all electrical connections. • Check voltage at ActuLink connections WHILE the ActuLink is running (a minimum of +12 volts is required for the ActuLink to function properly). • Make sure the tow vehicle is delivering AT LEAST +12 volts. • Full pressure is only achieved if a 100% signal from the blue wire is applied.

<p>ActuLink operates, but the pressure relief feature does not activate after 20 seconds.</p>	<ol style="list-style-type: none"> 1. Verify that the blue wire of ActuLink is NOT connected to 12 volts positive. It should be connected to the blue wire of the brake controller. 2. ActuLink is sensing erratic blue wire signal from the in-cab controller. Verify the functionality of the in-cab controller and, if necessary replace it. It is best to use a top quality inertia based controller.
<p>Excessive trailer braking.</p>	<ol style="list-style-type: none"> 1. Reduce gain setting on in-cab controller. 2. Blue wire to ActuLink is connected to brake light circuit 3. Poor Ground - verify controller ground and tow vehicle ground are connected at the same grounding point as the negative terminal of the tow vehicle battery. 4. Verify proper ground through tow vehicle and trailer connector 5. Wrong ActuLink model number installed for trailer configuration 6. Brake controller not properly leveled and/or oriented in the tow vehicle.
<p>Insufficient trailer braking.</p>	<ol style="list-style-type: none"> 1. Increase gain setting on in-cab controller. 2. Verify that brake lines have been properly bled and each brake is properly adjusted. 3. Verify the functionality of the in-cab controller according to the manufacturer's instructions. DO NOT use a time-based brake controller or LED type controllers (see page 14) 4. Make certain the in-cab controller generates approximately 12VDC from the blue wire to ground when the manual over-ride lever is fully engaged. 5. Replace the in-cab controller if it is not functioning properly. 6. Poor Ground - verify controller ground and tow vehicle ground are connected at the same grounding point as the negative terminal of the tow vehicle battery. 7. Wrong ActuLink model number installed for trailer configuration 8. Make sure the tow vehicle is delivering AT LEAST +12 volts when the ActuLink is running. 9. Brake controller not properly leveled and/or oriented in the tow vehicle.
<p>ActuLink abruptly applies full braking force.</p>	<ol style="list-style-type: none"> 1. Inspect the breakaway switch to make certain the circuit remains held open when the pin is in place. 2. Check electrical connections to the breakaway switch and breakaway battery to make certain there are no exposed wires in contact with one another. 3. Replace the breakaway switch if there is any doubt about its reliability or if you have any question that it is functioning properly. 4. Blue wire to ActuLink is connected to brake light circuit 5. Poor Ground - verify controller ground and tow vehicle ground are connected at the same grounding point as the negative terminal of the tow vehicle battery. 6. Pendulum type brake controller is not properly leveled. Adjust leveling per controller manufacturer recommendations.

Trouble Shooting Did Not Resolve the Problem:

Follow these four steps to isolate the trouble shooting to the ActuLink:

1. Disconnect all five wires of the ActuLink wire harness, leaving 17 inches of wire length on the original ActuLink wire harness.
2. Using a fully charged 12V battery, connect the ActuLink White wire to the negative (-) terminal of the battery. Then, connect the 12 gauge Black and 14 gauge Blue wires together to the positive (+) terminal of the battery. The ActuLink should run and should pressurize to maximum pressure. (Using a battery charger is NOT acceptable for this test as they do not generate enough amperage to operate the ActuLink.)
3. Leave the White wire connected to the negative (-) terminal of the battery, and connect only the 12 gauge Black wire to the positive (+) terminal of the battery. The ActuLink should NOT run.
4. Leave the White wire connected to the negative (-) terminal of the battery, and connect the 16 gauge Orange wire and the Brown wire together on the positive (+) terminal of the battery. The ActuLink should run and pressurize to maximum pressure.

If the ActuLink passes all these tests, verify that components such as the brake controller, 30 amp breaker, and trailer battery are in good working order. Also inspect the trailer wiring to make sure all connections are clear of corrosion and that all splice connections are securely connected.

If the ActuLink fails any of these tests, contact Tuson customer service to determine if the unit can be repaired or if it needs to be returned to Tuson for inspection. In some cases, replacement parts can be shipped to you or your dealer for some simple repairs.

You must follow the procedure outlined on page 21 of this manual if the ActuLink needs to be returned.

Breaking The Tamper-Proof Seal Without Prior Written Authorization from Tuson Voids Your Warranty.

The ActuLink has a tamper-proof seal on the end plate with the wire harness connector. If written authorization has been given by Tuson to perform field service and thereby break this seal, Tuson's customer service will record this information in customer files by serial number. Your warranty is voided if you return an ActuLink to Tuson with the seal broken, without documentation of that serial numbered unit being authorized to have its seal broken and service performed by someone other than Tuson. The ActuLink contains an electronic control panel with sensitive component parts. The only access to the electronic control panel is by removing this sealed end plate. This requires special instructions to be followed to properly remove the end plate and the tamper proof seal in order to prevent damage to the electronics panel. If the electronics panel or any of the internal components of the ActuLink are damaged in any way, by the customer or any third party, even if authorization has been given by Tuson to break the tamper-proof seal, the warranty is voided.

(See page 21 of this manual for return authorization instructions.)

If you have performed the trouble shooting and the problem persists, you should contact Tuson customer service (M-F, 8:00 a.m. - 5:00 p.m. Central time) at 1-800-968-8766.

Limited Warranty

Tuson RV Brakes, LLC (Tuson) warrants the ActuLink electric-hydraulic trailer brake actuator to be free of defects in material and workmanship for a period not to exceed TWO (2) years from the date of sale to the original consumer, or to the first retail purchaser of a trailer on which the ActuLink is installed. Original receipt(s) or other acceptable proof of purchase should be retained by the customer for verification of warranty date. THIS WARRANTY IS NOT TRANSFERABLE.

Tuson's obligations under this warranty shall be limited to crediting the account of a direct buying distributor or OEM trailer manufacturer, replacing or repairing ActuLink products which are determined by Tuson to be defective in material or workmanship, within 60 days of receipt of such product by Tuson. Tuson reserves the right to request the product be returned intact, freight prepaid, PRIOR to processing any claim for warranty. Warranty claim must be received by Tuson within 30 days of the discovery of the alleged defect, or within 30 days of the expiration of the warranty, whichever is earlier. Covered repairs or replacements will be made at Tuson's expense. Shipment of replacement product or repaired product by Tuson will be via best available ground shipment carrier. Shipments other than by best available ground shipment carrier, must be requested in writing and must be paid for in advance by the customer. Returned product that is found not to be defective, will be returned at senders expense.

This Warranty shall not include any products which have been improperly installed, installed contrary to installation instructions provided with the product, altered, tampered with or changed in any way, or utilized in a manner not approved by Tuson. This Warranty shall not extend to any defects arising from abuse, misuse, accident, improper wiring, or negligence of the installer or the consumer. Refer to the ActuLink "Owner's Manual and Installation Instructions" that was shipped with the ActuLink.

EXCEPT AS EXPRESSLY SET FORTH ABOVE, NO OTHER WARRANTY, EXPRESS OR IMPLIED, AT LAW OR IN EQUITY, IS MADE BY TUSON IN RESPECT OF THE PRODUCT, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER WARRANTY, AND ANY SUCH WARRANTIES ARE EXPRESSLY DISCLAIMED.

IN NO EVENT SHALL TUSON BE LIABLE TO PURCHASER OR ANY THIRD PARTY FOR ANY LOST PROFITS, CONSEQUENTIAL, EXEMPLARY, INDIRECT, PUNITIVE, INCIDENTAL, OR SPECIAL DAMAGES OR COSTS (INCLUDING ATTORNEY FEES), OR LOSS OF GOOD WILL RESULTING FROM ANY CLAIM (INCLUDING BUT NOT LIMITED TO ANY CAUSE OF ACTION SOUNDING IN CONTRACT, TORT, NEGLIGENCE, STRICT LIABILITY OR PRODUCT LIABILITY) REGARDING THIS AGREEMENT, EVEN IF THE COMPANY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

Some states do not allow the exclusion or limitation of implied warranties, incidental or consequential damages, so the above limitations or exclusions may not apply to you. This Warranty gives you specific rights. You may have other rights, which vary from state to state.

If you have a problem with your ActuLink electric-hydraulic trailer brake actuator, take the following steps:

1. Trouble shoot the unit as described in this owner's manual. If a copy of the manual is not readable or is lost, contact your dealer/distributor for a copy. Additional copies of the manual can be ordered from Tuson Corporation for \$10.00 plus shipping. Call 1-800-968-8766 or copies are available for free online at www.tusonrvbrakes.com or www.direclink.com.
2. If you are still having problems after trouble shooting and you believe you have a valid warranty claim, contact the dealer or distributor where you purchased the product.

3. If it is deemed the ActuLink should be returned to Tuson for inspection and warranty consideration, the dealer or distributor will make the claim through the ActuLink supplier. If you purchased the ActuLink directly from Tuson's online store, contact customer service at 1-800-968-8766 to make a claim.

To Make A Claim

1. All claims must include proof of purchase information. The required information is: copy of receipt or itemized bill showing name and address of the purchaser, and date of purchase, product number, serial number.
2. All returns require a Returns Merchandise Authorization (RMA). An RMA number can be obtained by contacting Tuson customer service at 1-800-968-8766 or inforvbrakes@tuson.com. You will be asked to provide proof of purchase information per item #1 of this section.
3. The customer, direct account OEM or distributor will return the ActuLink prepaid, securely packed in appropriate packaging. The product must be free of mud, dirt, sand, grease, or other debris, with the brake fluid completely drained from the reservoir. The shipping box must be clearly marked with the RMA number when the unit is returned to Tuson for inspection.
4. If Tuson determines the claim is valid, the ActuLink will be repaired or replaced, or credit will be issued to a direct OEM account or direct distributor. If a labor claim is made, Tuson will issue credit to reimburse for up to one hour of labor, not to exceed \$70 to replace the defective unit.
5. If a claim is deemed invalid (See previous page) or the ActuLink is found to work properly, the direct account OEM or direct distributor will be notified and no credit will be issued for the returned ActuLink or for labor. An ActuLink with an invalid warranty claim will be returned to the sender, freight collect, unless otherwise instructed in writing.