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SERVICE MANUAL FOR HYDRASTAR™ HYDRAULIC BRAKE ACTUATORS

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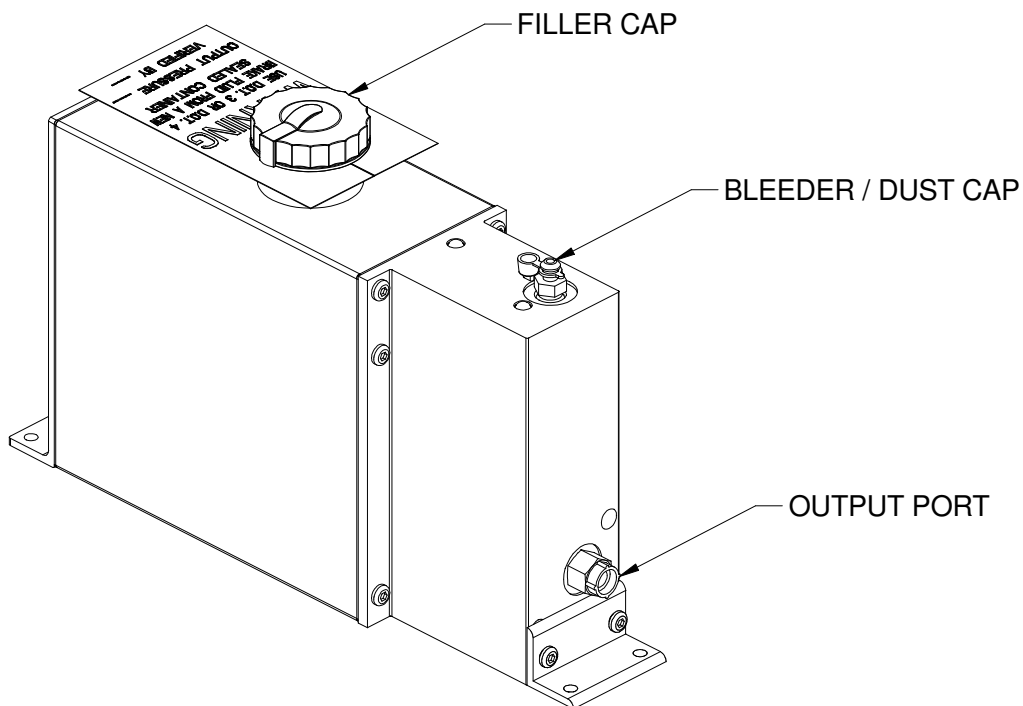
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MANUAL 440-1019

CARLISLE SERVICE MANUAL FOR HYDRASTAR™ HYDRAULIC BRAKE ACTUATORS

THIS DOCUMENT TO BE USED FOR
HBA-10, HBA-12, and HBA-16
ACTUATORS



WIRE COLORS – FUNCTION

SOLID BLACK – 25-40* amp 12 volt supply from tow vehicle

SOLID BLUE – Output from in-cab electronic brake controller

SOLID WHITE – Ground / must be directly connected to tow vehicle ground

SOLID YELLOW OR BLUE W/ WHITE STRIPE – Cold side of breakaway switch

* = Cold temperature (below 0° F) applications require 40 amp.

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A. WARNINGS

PROPER INSTALLATION REQUIRED - The HydraStar™ actuator must be installed by a qualified individual. Failure to properly install, protect, operate, and maintain the system can cause malfunction resulting in possible serious or fatal injuries and or property damage.

MUST BE PROPERLY SIZED TO THE TOWED VEHICLE - The HydraStar™ actuator is intended to provide flow and pressure to the brake system on the towed vehicle in accordance with applicable state and federal laws. It is the sole responsibility of the installer to see that the actuator is properly sized with the brake system on the towed vehicle so that the time required to build pressure in the towed vehicle brake system is not excessive.

SELECT THE CORRECT OUTPUT PRESSURE - Over pressurizing the brakes on the trailer can cause permanent damage to the trailer brake system. It is the sole responsibility of the installer to determine the appropriate model of HydraStar™ to insure that over pressurization of the trailer brake system does not occur.

NOT INTENDED TO BE USED AS A PARKING BRAKE - The HydraStar™ actuator and trailer brakes are intended only to supplement the service brake system on the towing vehicle. The HydraStar™ actuator and trailer brakes are not designed to function as a park brake. At no time should the towed vehicle brake system be used as the primary source of braking for the towing vehicle.

REQUIRES AN IN-CAB ELECTRONIC BRAKE CONTROL - The HydraStar™ actuator is intended to be used with an in-cab electronic brake controller. The unit will operate with a wide variety of controllers but provides optimum performance when used with a CARLISLE® electronic brake controller. Contact your dealer for a list of approved brake controllers. The list is also available online at www.carlislebrake.com. The in-cab controller must have an output capacity of at least 5 amps for proper operation of the HydraStar™ actuator.

FORD® AND TEKONSHA PRODIGY® CONTROLLER FIX - Carlisle® has introduced an add-on module that makes the Ford® OE in-dash controller compatible with the HydraStar™ line of trailer brake actuators. The “HydraStar™ Controller Adaptor Module” (model HBA-CAM) unit eliminates the false error messages* and HydraStar™ “clicking” generated by the Ford® Tow Command controller, an option on 2005 and later F250/350 pickups. The HBA-CAM does not effect the operation of the Ford® controller. Braking performance is unchanged. The HBA-CAM unit also eliminates false error messages generated by the Tekonsha Prodigy®. The HBA-CAM is for use with Carlisle® HydraStars™ only. It is not designed to be used with other manufacturer’s trailer brake actuators. The unit can be purchased online at www.carlislebrake.com, by contacting Carlisle® at (812) 336-3811, or by contacting your local HydraStar™ distributor.


* Under laboratory testing it was possible to make the Ford® Tow Command produce error codes even with the HBA-CAM installed. With the gain set at 2 or less, and rapidly cycling the manual braking switch for a minute or more, error codes could be seen. It is important to note that it is inconceivable that this condition would occur in normal vehicle and brake operation.

EXTENDED STOPS CAN GENERATE EXCESSIVE HEAT - When stopped for extended periods (i.e. such as at railroad crossings and traffic jams), apply the park brake on the towing vehicle and release the service brake pedal so that the HydraStar™ actuator does not run continuously. Failure to follow this guideline will cause the HydraStar™ unit to overheat and will damage the HydraStar™ unit.

EMERGENCY BREAKAWAY BATTERY MUST BE CHARGED - Do not attempt to tow the towed vehicle unless the emergency breakaway battery is fully charged.

DO NOT POWER WASH THE HYDRASTAR™ UNIT - Although the HydraStar™ unit is weather tight, it is not designed to withstand the direct high pressure spray from a power / car wash. Care should be taken to protect the HydraStar™ unit from direct spray when washing the trailer.

B. ACTUATOR INSTALLATION INSTRUCTIONS


 **CAUTION** – Wheels must be properly blocked to prevent the trailer and tow vehicle from rolling.

GETTING STARTED:

1. The following materials are required to properly install the HydraStar™ unit:
 - If your trailer is not already equipped with brake lines, you will need enough 3/16" diameter automotive brake line to connect the trailer brakes to the HydraStar™ unit. (Note that 1/4 " diameter brake line will improve response time.) Where possible, steel tubing is preferred.
 - 4 pieces of #10 mounting hardware to mount the HydraStar™ unit to the trailer
 - (1) quart of DOT 3 or DOT 4 brake fluid (from a new, sealed container)
 - (1) emergency breakaway kit - must include a 12 volt, 5 amp hour (minimum) battery
 - Wire (see Section C. ELECTRICAL INSTALLATION REQUIREMENTS for proper wire size)


LOCATION of the HydraStar™ actuator is at the discretion of the vehicle owner. When determining location, consideration should be given to the following:

1. The shorter the brake lines are between the HydraStar™ unit and the trailer brakes, the faster the brakes on the trailer will respond.
2. The unit should be located so that the electrical wiring and brake lines can be neatly routed directly to the towing vehicle and trailer brakes. Special care should be taken to minimize the number of bends and fittings in the brake line circuits.
3. An emergency breakaway kit must be located on the trailer so that the trailer breakaway cable can be easily attached to the towing vehicle.
4. The HydraStar™ actuator is powered from the electrical system on the tow vehicle. In order for the HydraStar™ unit to function properly, it must have adequate electrical power. (See Section C. ELECTRICAL INSTALLATION REQUIREMENTS)
5. The HydraStar™ unit should not be placed in an area where it is susceptible to damage from trailer loads, road debris, or from being stepped on. Failure to protect the HydraStar™ unit from damage can cause the unit to malfunction and void the HydraStar™ warranty.

 **CAUTION** – In stop and go traffic, the unit can get quite warm to the touch. This is normal and should not be of concern. Care should be taken to locate the unit in an area where your skin will not come in direct contact with the unit.

MOUNTING: Consideration should be given to the following:


1. The HydraStar™ unit must be level, with the filler neck up.
2. It is the responsibility of the customer to provide necessary fasteners for attachment of the HydraStar™ actuator to the trailer. 4 pieces of #10 mounting hardware required.

 **CAUTION** – The HydraStar™ unit contains sensitive electronics that must be protected. Drilling additional holes in the housing or electrostatically painting the HydraStar™, or welding anywhere on the HydraStar™ unit will damage the unit making it inoperable and will void the manufacturer's warranty. Always remove the HydraStar™ from the trailer before doing any welding repair or modifications to the trailer structure.


CONNECT the brake line on the towed vehicle to the HydraStar™ actuator.

1. Remove the red plastic plug from the brake port on the HydraStar™ unit. This will expose a 3/16" inverted flare fitting.
2. Brake line must be compatible with DOT 3 & DOT 4 brake fluid.
3. Flush existing brake system and lines with mineral spirits (not mineral oil), DOT 3 or DOT 4 brake fluid prior to connecting the HydraStar™ unit.
4. Connect the brake line from the trailer brakes to the 3/16" inverted flare fitting on the HydraStar™ actuator.

FILL the unit with DOT 3 or DOT 4 brake fluid to the bottom of the reservoir filler neck. When putting filler cap back on it should be turned clockwise until snug.

 **CAUTION** – Always use new, DOT 3 or DOT 4 brake fluid, from a sealed container. Never attempt to reuse old or dirty fluid. Do not overfill the unit. Take care to protect painted surfaces from contact with the brake fluid. Wash off any spilled brake fluid.

MOUNT the emergency breakaway switch and emergency breakaway battery on the trailer as detailed in the instruction sheets provided with the emergency breakaway kit.

 **CAUTION** – Do not attempt to tow the towed vehicle unit until the emergency breakaway battery is fully charged.

C. ELECTRICAL INSTALLATION REQUIREMENTS

WIRE SIZE IS CRITICAL / LOW VOLTAGE CONDITION – Failure to follow these guidelines will damage the HydraStar™ unit and void your warranty.

It is critical that the BLACK power lead and WHITE ground lead from the tow vehicle to the input of the HydraStar™ actuator are sized and terminated, (i.e. dedicated 25-40* amp circuit on the tow vehicle – 12 gauge wire minimum). 10 gauge wire is recommended to optimize performance. Consult the SAE wiring guidelines for proper trailer electrical harness design.

It is critical that the solid blue wire from the in-cab electronic brake control is connected to the solid blue wire on the HydraStar™ actuator. It is also critical that the yellow or blue w/ white striped wire from the HydraStar™ actuator is connected to the cold side of the trailer emergency breakaway switch. Under no circumstances should the solid blue wire and the yellow or blue w/ white stripe wire be connected together.

* = Cold temperature (below 0° F) applications require 40 amp.

REQUIRES AN IN-CAB ELECTRONIC CONTROL – The HydraStar™ actuator is intended to be used with an in-cab electronic brake controller. The unit will operate with a wide variety of controllers but provides optimum performance when used with a CARLISLE® electronic brake controller. Contact your dealer for a list of approved brake controllers. The list is also available online at www.carlislebrake.com. The in-cab controller must have an output capacity of at least 5 amps for proper operation of the HydraStar™ actuator.

FORD® AND TEKONSHA PRODIGY® CONTROLLER FIX – Carlisle® has introduced an add-on module that makes the Ford® OE in-dash controller compatible with the HydraStar™ line of trailer brake actuators. The “HydraStar™ Controller Adaptor Module” (model HBA-CAM) unit eliminates the false error messages* and HydraStar™ “clicking” generated by the Ford® Tow Command controller, an option on 2005 and later F250/350 pickups. The HBA-CAM does not effect the operation of the Ford® controller. Braking performance is unchanged. The HBA-CAM unit also eliminates false error messages generated by the Tekonsha Prodigy®. The HBA-CAM is for use with Carlisle® HydraStars™ only. It is not designed to be used with other manufacturer’s trailer brake actuators. The unit can be purchased online at www.carlislebrake.com, by contacting Carlisle® at (812) 336-3811, or by contacting your local HydraStar™ distributor.

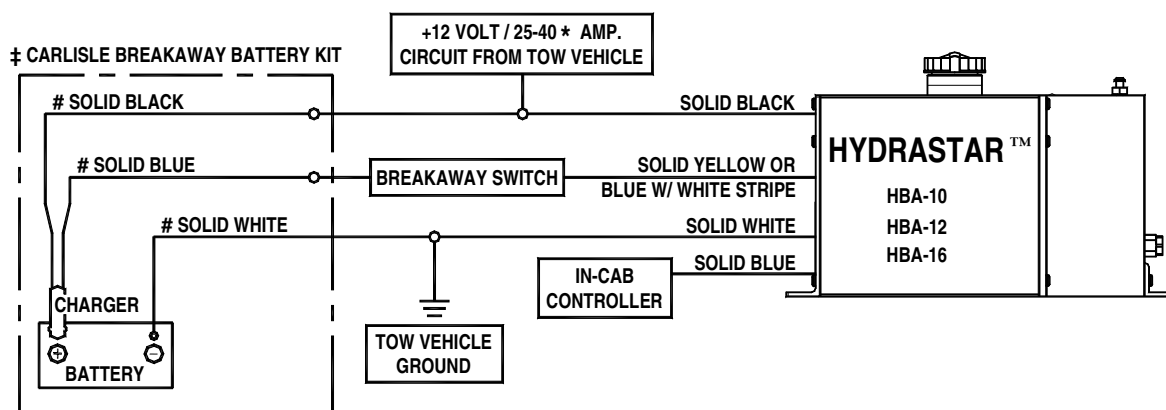
* Under laboratory testing it was possible to make the Ford® Tow Command produce error codes even with the HBA-CAM installed. With the gain set at 2 or less, and rapidly cycling the manual braking switch for a minute or more, error codes could be seen. It is important to note that it is inconceivable that this condition would occur in normal vehicle and brake operation.

ELECTRICAL CONNECTIONS – Make sure all electrical connections are clean, dry, weather tight, and secure to prevent damage to the wiring from dragging or becoming entangled with foreign objects. CARLISLE® highly recommends soldering all electrical connections. A dedicated ground connection between the tow vehicle and trailer is also required.

BREAKAWAY BATTERY REQUIREMENT - To comply with federal requirements, the trailer must be equipped with a breakaway switch and battery. The breakaway battery needs to have a minimum capacity of 5 amp hours and needs to be maintained in a fully charged condition at all times. The breakaway battery should be checked for proper charge level before every use. CARLISLE® offers a 17 amp hour battery as a means to provide additional insurance in the event that a trailer breakaway condition were to occur.

CHARGING THE BREAKAWAY BATTERY – A separate battery charger is included in the Carlisle® breakaway battery kit that draws power from the keyed accessory terminal on the tow vehicle. Attempting to charge the breakaway battery directly from the keyed accessory terminal without the appropriate charger will over heat and damage the trailer breakaway battery.

ELECTRICAL SCHEMATIC



* = COLD TEMPERATURE (BELOW 0° F) APPLICATIONS REQUIRE 40 AMP.

‡ = THIS ELECTRICAL SCHEMATIC REPRESENTS THE USE OF A CARLISLE BREAKAWAY BATTERY KIT. PLEASE NOTE THAT IF YOU ARE USING A DIFFERENT BREAKAWAY BATTERY KIT, THERE MAY BE A DIFFERENT NUMBER OF WIRES AND THE CHARGING +12VOLT, BREAKAWAY, AND GROUND CIRCUITS MAY BE IDENTIFIED BY COLORS OTHER THAN THOSE DEPICTED IN THIS SCHEMATIC. PLEASE CONSULT THE MANUFACTURER'S INSTRUCTIONS TO IDENTIFY THE AFOREMENTIONED CIRCUITS.

= CIRCUITS FOR THE CARLISLE BREAKAWAY BATTERY KITS WILL BE IDENTIFIED AS FOLLOWS:

CHARGING +12 VOLT CIRCUIT - BLACK
BREAKAWAY CIRCUIT - BLUE
GROUND CIRCUIT - WHITE

Note – The HydraStar™ actuator does not draw power from the tow vehicle accessory lead unless the brakes on the tow vehicle are actuated.

IMPORTANT – CONSULT YOUR VEHICLE OWNER'S MANUAL

Be sure to read your vehicle owner's manual to see what it says about vehicle to trailer wiring. More and more vehicle manufacturers are recommending special precautions be taken to protect the more sophisticated electronics on the newer vehicles.

D. TEST ELECTRICAL OPERATION

1. Attach trailer to towing vehicle.
2. Pull the breakaway switch. The HydraStar™ unit should run. If the unit does not run, check battery condition and system wiring. Reset the breakaway switch, which will turn the unit off.

Note: When the unit is running the motor will generate a “hum” that changes pitch as the unit builds pressure.

3. Turn the ignition switch on and turn the in cab electronic brake controller on. The HydraStar™ unit should run whenever the brake pedal is depressed. If the unit does not run, check system wiring.



CAUTION – Testing the HydraStar™ unit confirms that it is operating. It does not confirm that the brakes are operating properly. Regular inspection, adjustment, and maintenance of the brakes, lines, hoses, drums, discs, fluid, and other associated components is necessary to ensure proper brake operation.

E. BLEEDING AND ADJUSTING THE BRAKES

1. It typically is much easier to bleed the brakes with two people working together or use of a power bleeding device.
2. Special care must be taken to insure that the HydraStar™ unit does not run out of brake fluid. Check the fluid level frequently during the bleeding process.
3. Block the wheels on the trailer and towing vehicle.
4. If the trailer is equipped with drum brakes, check that the brake running clearances are properly adjusted consistent with the trailer manufacturer's recommendations. Even the slightest amount of brake drag will generate heat and will damage the trailer brake system voiding the manufacturer's warranty.



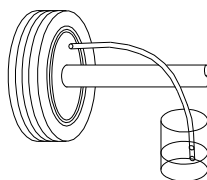
CAUTION – Failure to properly adjust the brakes on trailers equipped with drum brakes can result in sluggish operation of the HydraStar™ unit. Eye protection should be worn at all times while bleeding the HydraStar™ unit and trailer brake system.

5. Remove the dust cap from the bleed screw on the HydraStar™ unit and install plastic tubing onto the bleeder
6. Immerse the free end of the plastic tubing in a clean container partially filled with brake fluid.
7. With eye protection on, open the bleeder screw one half turn on the HydraStar™ unit. Take care to protect yourself and the trailer from brake fluid expelled from the bleeder.
8. Activate the HydraStar™ unit by turning on the ignition switch and pressing on the brake pedal or the manual control on the in-cab controller.
9. Watch the free end of the bleeder hose for air bubbles escaping into the container.
10. Continue to bleed until the fluid becomes clear and free of bubbles.
11. Tighten the bleeder screw, turn off the HydraStar™ unit, and remove the plastic tubing from the bleeder screw. Bleeding of the HydraStar™ unit is now complete.
12. Install plastic tubing onto the bleeder screw of the wheel cylinder/caliper.
13. Immerse the free end of the plastic tube in a clean container partially filled with brake fluid.
14. With eye protection on, open the bleeder screw one half turn on the wheel cylinder/caliper farthest from the HydraStar™ unit. (*If towed vehicle has multiple axles, always start with the rear axle first.*)
15. Activate the HydraStar™ unit. (*Turn the ignition switch on and press on the brake pedal.*)
16. Watch the free end of the bleeder hose for air bubbles escaping into the clear container. Continue to bleed the wheel cylinder/caliper until the fluid becomes clear and free of bubbles.



CAUTION – Do not run the HydraStar™ unit without adequate brake fluid in the reservoir as it will damage the unit and void the manufacturer's warranty. Check all bleeder screws to ensure that they are securely closed and do not leak.

17. Tighten the bleeder screw, turn off the HydraStar™ unit, and remove plastic tubing from the bleeder screw. Bleeding of the wheel cylinder/caliper is now complete.
18. Refill the HydraStar™ unit with brake fluid.
19. Continue the above process (steps 12 through 18) on the next farthest brake away from the HydraStar™ unit. Repeat these steps until all the brakes have been bled.



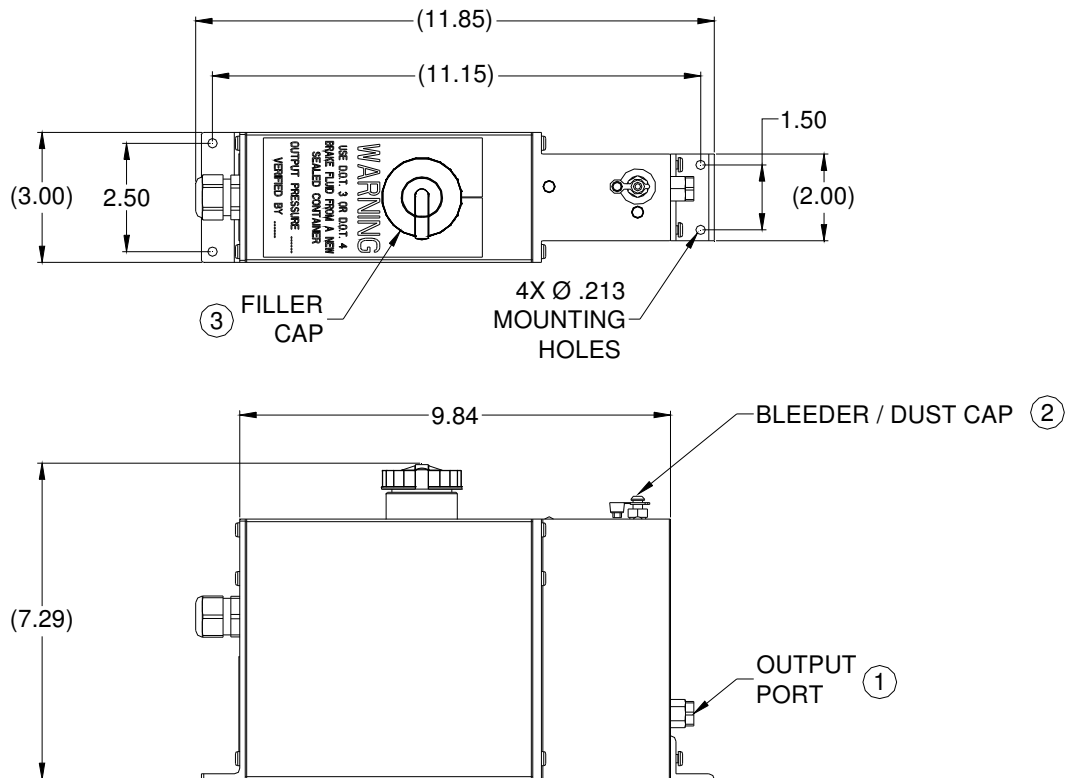
WARNING – Failure to properly adjust the trailer brakes and to properly fill and bleed the HydraStar™ unit and brakes may result in sluggish brake performance. This may result in serious or fatal injuries and/or property damage. As a precautionary measure, CARLISLE® recommends bleeding the brakes a second time after the trailer has been in service for 7 – 10 days. CARLISLE® also recommends checking the temperature of the hubs on a regular basis to insure that the trailer brakes are not dragging.

F. TESTING AND ADJUSTMENT OF ELECTRONIC CONTROLLER UNIT

1. Adjust the gain setting on the in-cab controller to a mid range setting and the sync setting to the maximum (most aggressive) setting.
2. Drive vehicle at 10 to 15 mph.
3. Apply the brakes. If braking is too severe, adjust the gain setting down to decrease pressure, and retest. If braking is inadequate, increase the gain setting on the in-cab electronic controller and retest.
4. Repeat this process until the brakes respond appropriately.

⚠ WARNING – The appropriate pressure setting will vary depending on the weight of the load being transported on the trailer, weather conditions, road conditions, brake lining wear, and brake displacement. The “TESTING AND ADJUSTMENT OF ELECTRONIC CONTROLLER UNIT” procedure should be repeated each time the trailer is used. Failure to properly adjust the HydraStar™ unit may result in poor brake performance which could result in serious or fatal injuries and/or property damage.

G. REPLACEMENT PARTS LIST / MOUNTING DIMENSIONS



REPLACEMENT PARTS LIST		
ITEM	PART NUMBER	DESCRIPTION
1	192-7089	OUTPUT PORT ADAPTER ASSEMBLY 3/16" INVERTED FLARE
1	304-7107	OUTPUT PORT ADAPTER ASSEMBLY 1/4" INVERTED FLARE KIT
2	381-7037	BLEEDER VALVE / TETHERED DUST CAP KIT
3	32-7640	FILLER CAP
NOT SHOWN	496-82	BREAKAWAY BATTERY KIT

H. TROUBLESHOOTING GUIDE

Brakes are slow to respond

- Re-bleed the trailer brakes and actuator.
- If the trailer is equipped with drum brakes, re-adjust the drum brakes to the trailer manufacture's recommended running clearance.
- Slow response can be caused by trailer wiring that is too small. See Section C. ELECTRICAL INSTALLATION REQUIREMENTS – WIRE SIZE IS CRITICAL / LOW VOLTAGE CONDITION.
- Slow response can be caused by brake lines that are too restrictive on the trailer (i.e. small diameter / long length restrictive fittings / routings).
 - The trailer brake lines must be at least 3/16 inches in diameter / steel tubing is preferred over flexible hoses.
 - If it is not practical to locate the HydraStar™ unit closer to the brakes, consider increasing the size of the trailer brake lines.

Unit will not run or the unit will not shut off

- Verify that the trailer and tow vehicle are wired according to the electrical schematic shown on page 5.
- Perform the following checks to determine if the unit is functioning properly:

Step 1

- With the unit running and brake pressure applied, determine that a minimum of 8.5 volts DC are reaching the HydraStar's™ black wire.
- Check to see if the white ground wire runs directly to the tow vehicle ground. IT MUST NOT BE GROUNDED TO THE TRAILER ONLY. IT IS IMPORTANT THAT THIS GROUND WIRE RUNS DIRECTLY TO THE TOW VEHICLE'S BATTERY GROUND. NO EXCEPTIONS.

Step 2

- Detach all wires from the HydraStar™ leaving only the blue, black, white, and yellow or blue w/ white striped wires. It is important that the unit is disconnected from any other wires going to the towing vehicle or breakaway switch and breakaway battery. Failure to do so may result in a faulty test.

Step 3

- Using a 12 volt battery, connect the white wire to the negative (-) terminal of the battery.
- Connect the black wire to the positive (+) terminal of the battery.
- The motor should not run.
- If the motor runs, the unit needs repaired.

Step 4

- Leave the white wire connected to the negative (-) terminal of the battery.
- Connect the blue and black wires together to the positive (+) terminal of the battery.
- The motor should run and the unit should pressurize.
- If this does not occur, the unit needs repaired.

Step 5

- Leave the white wire connected to the negative (-) terminal of the battery.
- Connect only the yellow or blue w/ white striped wire to the positive (+) terminal of the battery.
- The motor should run and the unit should pressurize.
- If this does not occur, the unit needs repaired.

Step 6

- If the unit checks OK, reconnect the wires leading to the trailer plug and repeat steps 2 through 4. If you do not get the same results as before, the problem is in the trailer wiring or the electronic brake controller.

Breakaway test procedure

- Pull the breakaway switch on the trailer.
 - If the unit runs and builds pressure, the problem most likely is a defective in-cab controller or defective wiring between the tow vehicle and HydraStar™ unit.
 - If the unit runs but will not build pressure, the problem most likely is a defective proportional valve in the HydraStar™ unit and the actuator should be returned for repair.

- ❑ If the unit still does not run after the breakaway battery is fully charged, verify that the voltage between the white wire and the yellow or blue w/ white stripe wire is at least 12 volts.
 - ◆ If the voltage is less than 12 volts, either the breakaway switch or the breakaway wiring is defective.
 - ◆ If the voltage is greater than 12 volts, the HydraStar™ actuator should be returned for repair.
 - ◆ After completing the above steps, reset the breakaway switch.

Trailer brakes too aggressive

- Reduce the gain setting on the in-cab electronic brake controller.
- Check brake adjustment.

Trailer brakes not aggressive enough

- Increase the gain setting on the in-cab electronic brake controller.

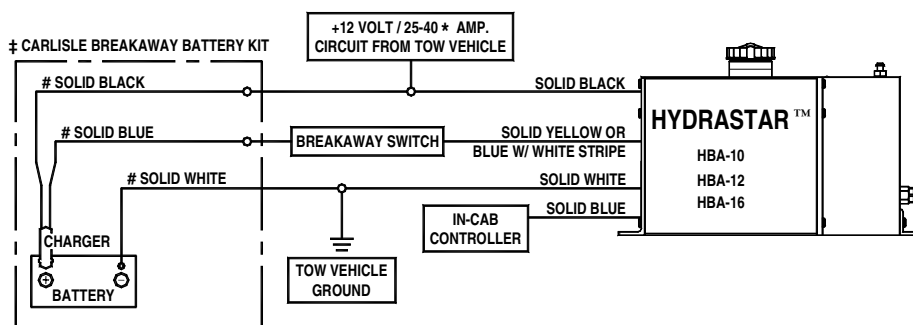
Clicking sound comes from unit on a repetitive basis

- Make sure the brake controller is on Carlisle's approved list. See Section C. ELECTRICAL INSTALLATION REQUIREMENTS – REQUIRES AN ELECTRONIC IN-CAB CONTROL.

Brakes will not release

- Loosen bleeder or brake line connection. If brakes remain locked, out-of-round drums, worn, jammed, or broken shoes or pads most likely cause the problem.
- Make sure the in-cab controller is on the "approved list". (See Section C. ELECTRICAL INSTALLATION REQUIREMENTS – REQUIRES AND ELECTRONIC IN-CAB CONTROLLER.) Check to see if the in-cab controller is putting out power when the brakes are not being used.
- Disconnect trailer plug and positive terminal on breakaway battery on the trailer. If the brakes release, the problem is electrical.
 - ❑ Check to see if an adapter plug is used. If an adapter plug is being used, make sure the pins from one plug go to the corresponding pins on the second plug. Make sure power is going to the HydraStar™ as shown in the service manual. (See ELECTRICAL SCHEMATIC below.) Try running current direct by using jumpers from a fully charged 12 volt battery, and from the in-cab controller output wire.
 - ❑ If the HydraStar™ works, reconnect the positive lead to the breakaway battery. If the HydraStar™ does not function correctly, the problem is in the wiring of the breakaway battery circuit, or if equipped with a trickle charger, the wiring of the charger may be incorrect. Do not rely on wire color codes. Use the schematic in the HydraStar™ service manual. (See ELECTRICAL SCHEMATIC below.)
 - ❑ In some cases, the problem is in the vehicle plug wiring. Make sure the plug pins go to the proper terminals on the trailer plug.

ELECTRICAL SCHEMATIC



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= CIRCUITS FOR THE CARLISLE BREAKAWAY BATTERY KITS WILL BE IDENTIFIED AS FOLLOWS:

CHARGING +12 VOLT CIRCUIT - BLACK
BREAKAWAY CIRCUIT - BLUE
GROUND CIRCUIT - WHITE



LIMITED WARRANTY and LIMITATION OF LIABILITY

Carlisle Industrial Brake & Friction (the "Company") warrants its trailer brake actuator products, including, but not limited to, HydraStar, HydraStar XL, and ElectraStar ("Products"), under normal use and service, to be free from defects in material and workmanship for a period not to exceed two years from the date of sale to the original consumer, or to the first retail purchaser, of a trailer or other towed device (the "Warranty"). Any receipts, proof of purchase, or other documents obtained at the time a Product manufactured by the Company is purchased from a dealer / distributor, should be retained. This Warranty is not transferable.

The obligations of the Company under this Warranty shall be limited to crediting the account of Carlisle's direct buying Distributor or OEM trailer manufacturer, replacing or repairing those Products which are determined, to the satisfaction of the Company, to be defective in material and/or workmanship, within sixty (60) days from the date of receipt of such products by the Company. Any replacements or repairs will be made at the Company's designated facility and at the Company's expense. Returned product found not to be defective will be returned at the sender's expense.

This Warranty shall not extend to any Products, or any parts thereof, which have been improperly installed, installed contrary to the provided instructions, altered, tampered with, or the engineering and design of which have been changed in any way, nor shall this Warranty extend to any defects arising from abuse, misuse, accident, improper wiring, or negligence of an installer or of the consumer. Refer to the instruction manual packed with your unit. Copies of the instruction manual are available on our website at www.carlislebrake.com. A hard copy can be ordered from Carlisle for \$15.00 by contacting customer service at 800-873-6361.

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

REGARDLESS OF WHETHER ANY REMEDY SET FORTH HEREIN FAILS OF ITS ESSENTIAL PURPOSE, IN NO EVENT SHALL THE COMPANY BE LIABLE TO PURCHASE OR ANY THIRD PARTY FOR ANY LOST PROFITS, CONSEQUENTIAL, EXEMPLARY, INDIRECT, PUNITIVE, INCIDENTAL, OR SPECIAL DAMAGES OR COSTS (INCLUDING ATTORNEYS' FEES) OR LOSS OF GOODWILL RESULTING FROM ANY CLAIM (INCLUDING BUT NOT LIMITED TO ANY CAUSE OF ACTION SOUNDING IN CONTRACT, TORT, NEGLIGENCE , STRICT LIABILITY OR PRODUCTS LIABILITY), REGARDING THIS AGREEMENT, EVEN IF THE COMPANY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

Certain jurisdictions do not permit limitations on the duration of a Warranty; accordingly, the limitations included herein may not apply. This Warranty is expressly in lieu of all other express or implied Warranties and any and all other obligations or liabilities on the part of the Company. There are no Warranties which extend beyond the description on the face hereof. No dealer / distributor, employee, or representative of the Company is authorized to modify this Warranty in any way or to grant any other Warranty.

If you have a problem with your Product, see the next page.

IF YOU EXPERIENCE A PROBLEM WITH YOUR CARLISLE TRAILER BRAKE ACTUATOR

1. Trouble shoot the unit as described in the owners manual. If a copy of the manual is unavailable contact your dealer/distributor or you can download the manual off our website at www.carlislebrake.com Additional hard copies of the manual can be ordered from Carlisle customer service for \$15.00 each, call 812-336-3811.
2. If, after trouble shooting, it is believed that a valid claim exists, contact the dealer/distributor, from which the Product was purchased.
3. If it is deemed that the Product should be returned to Carlisle for inspection and warranty consideration, the dealer/distributor will make the claim through their Carlisle supplier.
4. **Carlisle can not be responsible for units returned directly by consumers.**

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 purchaser, date of purchase.
 - Product model number and serial number. These are found on a label on the product.
 - Bills or receipts from a legitimate dealer or repair center itemizing labor charges for replacement.
2. All returns require a Return Merchandise Authorization number (RMA). Direct accounts can obtain an RMA by contacting Carlisle customer service at 812-336-3811. You will be asked to provide proof of purchase information per item #1 directly above.
3. The direct account will return the Product prepaid, and securely packed in proper packaging. The Product must be free of mud, dirt, sand, or other debris, with the brake fluid completely drained. The carton must be clearly marked with the RMA number when the Product is returned to the Company for inspection.
4. If the Company determines that the claim is valid, the Product will be repaired or replaced or credit issued to Carlisle's direct account. If a labor claim is made, Carlisle will issue credit to reimburse for up to one hour of labor, not to exceed \$70.00, to replace the defective unit. If a claim is deemed invalid and the Product is found to work properly the account will be notified and no credit will be issued for the unit or labor. Invalid Product will be returned to the submitter, freight collect, unless otherwise instructed.