



BrakeRite EHB
ELECTRIC / HYDRAULIC
TOWED VEHICLE BRAKE
ACTUATOR
INSTRUCTION AND
INSTALLATION MANUAL

***TITAN* Trailer Brakes Pty Ltd**

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IMPORTANT!!!

All brake fluids are hygroscopic (absorbs water).

We recommend that you run your hydraulic brakes regularly by pulling out the Emergency Brake-Away switch for approximately 10 to 20 seconds every two weeks between use. This allows the hydraulic pump to remain free from any contaminants that may have built up. It also allows you to check that your emergency battery is fully charged.

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1.0 - WARNINGS

!!! WARNINGS !!!

Before using trailer always check:

- 1. Brake fluid level must be maintained between 8mm & 15mm below filler cap opening.**
- 2. Prior to towing check braking to ensure system is functioning properly.**
- 3. Prior to towing check BREAKAWAY PROTECTION. NEVER ATTEMPT TO MOVE/USE THE TRAILER if the Breakaway Battery is not fully charged.**
- 4. DO NOT RELY ON Towed Vehicle Brakes for entire unit braking. The Towed Vehicle Brake is only to supplement the Braking System on the Towing Vehicle, NOT TO STOP THE ENTIRE UNIT.**
- 5. ALWAYS operate unit within prudent parameters and obey all state laws.**

2.0 - SYSTEM DESCRIPTION

The BrakeRite Electric / Hydraulic Brake (EHB) System is an electric over hydraulic braking system using electric power from the towing vehicle electrical system. As the brake pedal of the towing vehicle is depressed and the brake lights come on, the BrakeRite EHB system is activated and the towed vehicle brakes are applied. The electronic control package inside the BrakeRite EHB is turned on by the signal used to control pressure as sent from the in-cab electronic brake controller (sold separately). This pressure is maintained on the towed vehicle brakes until the towing vehicle brake pedal is totally released. It is very important that the driver **NOT RIDE THE BRAKE PEDAL** as this causes constant drag on the towed vehicle brakes and will cause the towed vehicle brakes to prematurely wear or overheat and may also cause the BrakeRite EHB unit to overheat. (The actual pressure control process is the result of an electric motor driven piston pump and electronically controlled pressure relief valve, which are the heart of the system.)

2.1 - Brake pressure is controlled by the use of a standard in-cab *electronic brake controller*. Use of the electronic brake controller allows the operator to select the desired towed vehicle brake performance from the driver's position plus allowing *manual override* if the driver wishes to apply only the towed vehicle brakes. If the towing vehicle is already being used for a towed vehicle with electric brakes, the BrakeRite EHB can be *plugged* into the standard seven pin electrical connector (if the controller has been wired correctly). We recommend that the *TITAN* Trailer Brakes Power Kit is used. Insure that the BLACK positive wire and the WHITE negative wire are at least 6 mm size. Smaller wire will reduce braking performance.

DON'T FORGET – BLACK IS POSITIVE

2.0 - SYSTEM DESCRIPTION (Cont)

2.2 - A breakway kit (sold separately), to be mounted on the trailer, is also required to supply electrical power in the event that the towed vehicle becomes *uncoupled* from the towing vehicle. This kit consist of battery, battery case with mounting bracket, and a breakaway switch which is also connected to the towing vehicle during use. In the event of an unplanned *un-coupling* the cable actuates the breakaway switch causing the towed vehicle brakes to apply.

FULLY ENDORSED and APPROVED EMERGENCY BATTERY KIT

TITAN Trailer Brakes supplies a full legal Emergency Battery Kit that includes:

1. Increased battery size
 2. Battery condition indication
 3. Internal battery charger
- (optional) in-car battery condition indicator and alarm.

Brake Controllers

Your trailer braking system is like a chain. It is only as good as its weakest link. This is especially true regarding in-cab brake controllers. There are many marginal brake controllers on the market and the BrakeRite will only apply the level of braking indicated by the brake controller's "blue wire" signal. Therefore, we urge you not to economize on a low cost brake controller because it will only diminish the overall performance of the BrakeRite and your trailer braking system in general. See page 14 for a list of approved brake controllers. **Important:** unlike electric drum brakes, the BrakeRite does not receive its power through the "blue wire". The power to the BrakeRite is provided through a +12volt (normally black) wire from the tow vehicle connector via a very good trailer plug. See page 7 for recommended type.

Wire Connections

A common cause for trailer brake systems is improper wire connections. You must use the properly rated wire connectors (such as crimp-type, heat shrink connectors, or any high quality, sealed connector) or seal solder connection to ensure a reliable and lasting wire connection. Never use twist type connectors, tap splice connectors, electrical tape over a twisted connection or other such methods as they will eventually fail and create a wide array of operational problems. See page 11 for more information about proper wire connections.

2.0 - SYSTEM DESCRIPTION (Cont)

2.3 - Because this system relies on electrical power to produce the towed vehicle braking forces the electrical power source is very critical. The system has been designed to operate at 12 volts DC and has been factory set to operate at that level. Due to the current draw of the pump motor, power leads must be at least 6 mm copper automotive wire and the control leads 4 mm. **Undersized** electrical wiring will result in line losses and directly effect the function of the BrakeRite EHB. We recommend the **TITAN Trailer Brakes Power Kit** is used, ask your Dealer or call *TITAN* Trailer Brakes direct on 07 3286 1199.

2.4 - The BrakeRite EHB includes a **Surge Protection** circuit that is included to prevent a surge charge causing damage to the battery. A blocking diode has also been included in the circuit to prevent the towing vehicle from drawing power from the breakaway battery.

The Number One Installation Problem

is Improper Wiring of BrakeRite...

Follow the Set-up, wiring, testing procedures outlined in the pages of this manual.

3.0 - INSTALLATION

3.1 - Mounting location of the BrakeRite EHB unit is at the discretion of the installer, however things such as accessibility for service, protection from damage, and minimizing the length of hydraulic lines are factors to be considered. The BrakeRite EHB unit has two sets of mounting holes; one set is located on the bottom of the unit (4 - 1/4 20UNC x .63 Dp.), while the other set is located on the back (.3 - 5/16 18UNC x .63 Dp.)

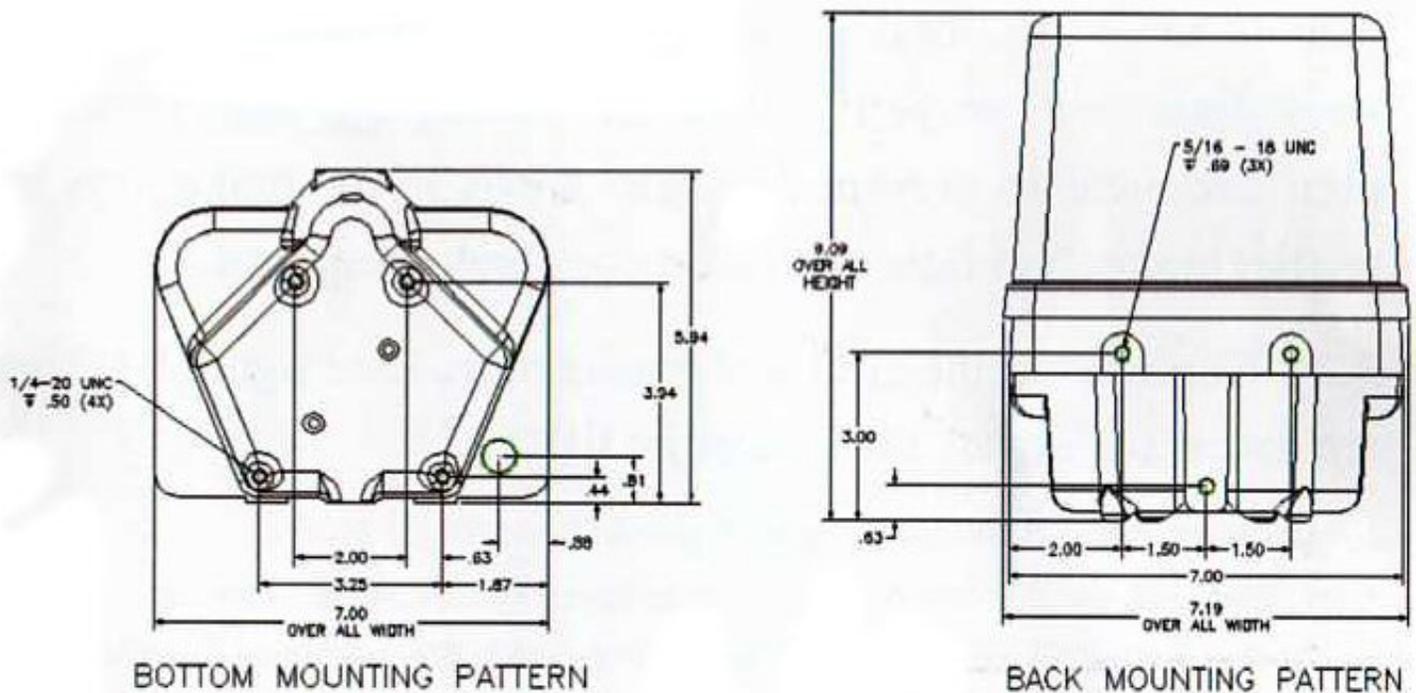


FIGURE A

3.0 INSTALLATION (Cont)

3.1 (Cont) - The BrakeRite EHB has a 1/8 NPTF brake port on the lower front area of the unit and a 1/8th NPTF male with #3 (3/16) female inverted tube seat adapter. Install the brass port connector to the unit, DO NOT USE Teflon pipe tape or some other type of thread dope. A brass to aluminium thread connection, when properly mated and installed DOES NOT require sealant.

Route steel line to the axle(s) and connect using proper fittings and flexible tubing per the instruction of the braking device manufacturer (disc brake / drum and shoe). Use caution that the steel lines are properly mounted (attached), and routed in protected areas to prevent damage. Kinks in the brake lines can restrict brake fluid flow and cause poor brake response.

3.2 - Connecting the electrical connections. (See figure B). There are five wires exiting the BrakeRite EHB:

1-6 mm **White**, 12 volts **Negative** (System Ground).

1-6 mm **Black**, 12 volts **Positive** (System Power from Towing Vehicle)

1-4 mm **Blue**, Electronic Brake Control Wire (from Electric Brake Controller)

1-4 mm **Brown**, Breakaway Switch

1-4 mm **Violet**, 12 Volt Positive (to Breakaway Battery)

The wires exiting the BrakeRite EHB are approximately 2m long or on later models, approx 50 cm long with sealed connector and adaptor loom to allow for flexibility in mounting the unit. **(Consult figure B, page 10, for proper wire connections).**

3.0 INSTALLATION (Cont)



Warning!

Do not connect these wires by colour but by function! Failure to follow these instructions may damage the BrakeRite unit and may void your warranty.

NOTE: Unlike electric drum brakes, the BrakeRite requires +12 volts from the tow vehicle through the tow vehicle's connector (normally black wire). The BrakeRite will not function properly without this + 12 volt source – **TITAN PowerKit P/N PK 201**.

BrakeRite Wires and Wire Connections

The wires on the BrakeRite system wiring harness are approximately 2 metres long (see page 9) 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. It is **EXTREMELY IMPORTANT** to connect the wires from the BrakeRite to the appropriate wire in the trailer's wiring harness, which corresponds precisely with their designated function.

3.2 (cont) - As the wire installation is carried out make certain all wires are properly routed, wrapped, anchored and protected to prevent damage. **Any damage to the wiring harness can result in failure of the BrakeRite EHB.** When making connections in the wiring harness the desirable termination is a solder joint. If the joint is not soldered use adequate sealed CRIMP-TYPE CONNECTORS, using connector manufacturers' recommended crimping tools in accordance with manufacturers' directions.

3.0 INSTALLATION (Cont)

3.3 - After all lines have been installed, connected, and properly tightened and the electrical connections have been completed, Fill the reservoir with **CLEAN / NEW DOT 3 or DOT 4 – DO NOT MIX-BRAKE FLUID. NEVER** reuse brake fluid that has been salvaged or removed from another unit. Contaminated or dirty brake fluid can cause premature wear on the brake system and components and may result in system failure. Do not over fill the reservoir; fill within 8mm of the filler opening. There are two (2) reservoir filler caps on the BrakeRite EHB. Either opening may be used for filling and/or checking fluid (see figure C, page 15)

IMPORTANT

99.9% of all operating problems are the failure of incorrect installation and incorrect wiring. **Always** follow the many references to how to connect according to written instructions in this manual.

4.0 OPERATION

3.4 - It is essential to bleed all air from the brake lines prior to operation. To **Bleed** the BrakeRite EHB system remove the pin from the breakaway switch. This will activate the BrakeRite EHB System. In turn open the **bleeder screw** at each brake assembly one at a time starting with the axle furthest away from the BrakeRite EHB System. Upon the initial opening of each bleeder screw air should be discharged from the screw. Allow some amount of fluid to flow from the screw after the air has been released to assure all air is bled from the system. To prevent brake fluid from spilling on the ground or on the equipment, a length of 6mm diameter polyethylene tubing can be slipped over the bleeder screw and routed to a container for collection. Place the loose end of the bleeder hose into a clear container so that the end of the tube is completely submerged in brake fluid to observe air bubbles being removed from the system during the bleeding process. Ensure one of the filler plugs is removed while bleeding. This allows the reservoir volume to move and prevents the 'stretching' of the diaphragm. Make sure the reservoir level is topped up during bleeding. If air is re-introduced, then the process has to be repeated.

4.0 OPERATION (Cont)

4.1 - When **coupling** the TOWED VEHICLE to the TOWING VEHICLE always ensure that the two vehicles are properly coupled in accordance with the manufacturers' instructions. ALL coupling devices and procedures must conform to State and Federal regulations.

4.2 - After installation of the electrical plug on the towed vehicle, into the electrical connector on the towing vehicle, check to ensure that proper electrical connection has been made. There are two checks to ensure that proper connection has been made. The first is visual as most in-cabin Electronic Brake Controllers have an indicator light. This "LED" will indicate if the installation is correct. Refer to the manufacturer's instructions for full installation details.

4.3 - If **NO BRAKING IS INDICATED FROM THE TOWED VEHICLE BRAKES** **discontinue operation immediately and review the installation and instructions in the chosen in-cabin controllers manual. Also review the trouble shooting section on page 16.** After the coupled unit system has been verified to ensure proper performance, it is desirable to take the coupled unit to a large empty parking lot to become familiar with the braking action of the coupled unit. Each vehicle has unique characteristics just as each driver has different driving habits. Take time to familiarize yourself with the response and handling of the coupled units while braking, using various settings on the in-cab brake controller. Likewise each driver, for a set of coupled units, will not always like the handling and response created by the settings of another driver. Therefore each individual must be familiar with the controller settings to achieve the most desirable results.

4.0 OPERATION (Cont)

4.4 - Settings of the in-cab electronic brake controller are adjusted by the driver. When set properly, the braking force of the towed vehicle is not required to provide braking force for the towing vehicle. Towed vehicle brakes are meant to assist the towing vehicle and not to provide all braking for the coupled unit. However, it is necessary that sufficient braking is performed by the towed vehicle so that the brakes of the towing vehicle are not required to provide braking force for the towed vehicle. Depending upon road conditions, variations in the controller setting will be needed. When driving on wet or slippery surfaces it is desirable to do more braking with the towed vehicle brakes to prevent the possibility of jack-knife situation. By maintaining sufficient braking on the towed vehicle, sway or a tendency for the towed vehicle to push the towing vehicle is eliminated.

Approved In-Cab Brake Controllers

The inertia based brake controllers which *TITAN* Trailer Brakes approves for use with the BrakeRite are:

Hayes Genesis, Hayes Energize XPC, Hayes Endeavour and Hayes Energize III.

5.0 - SERVICE AND MAINTAINANCE

5.1 - Periodically check all wiring, the plug connector, steel brake lines and hoses for the entire BrakeRite EHB System to ensure there are no abraded or bare wires or damaged areas. During inspections ensure that a line or wire will not drag or catch on objects during operation. Ensure all wire connectors are clean and where open, sprayed with a protective dispersant fluid. Each time the vehicles are coupled, check the breakaway battery to verify it is charged. Activate the breakaway switch by “pulling” the switch cable causing the brake system to activate. If the towed vehicle has been parked for a prolonged period of time, it is advisable to charge the breakaway battery prior to operation using the battery manufacturers recommended charging procedure. If the battery is allowed to discharge in a cooled environment there is the possibility of freezing.

5.0 - SERVICE AND MAINTAINANCE (cont)

5.1 (cont.) Check the fluid level each time the vehicle is used. Maintain a fluid level of 8mm to 12mm below filler opening. The unit has two filler openings, either one may be used for checking and/or adding the fluid (see figure C, below). Use caution to prevent the admission of dirt and/or contaminants into the fluid reservoir. When adding fluid, always use new, clean DOT 3 or DOT 4 – NEVER MIX brake fluid. Never reuse brake fluid that has been salvaged.

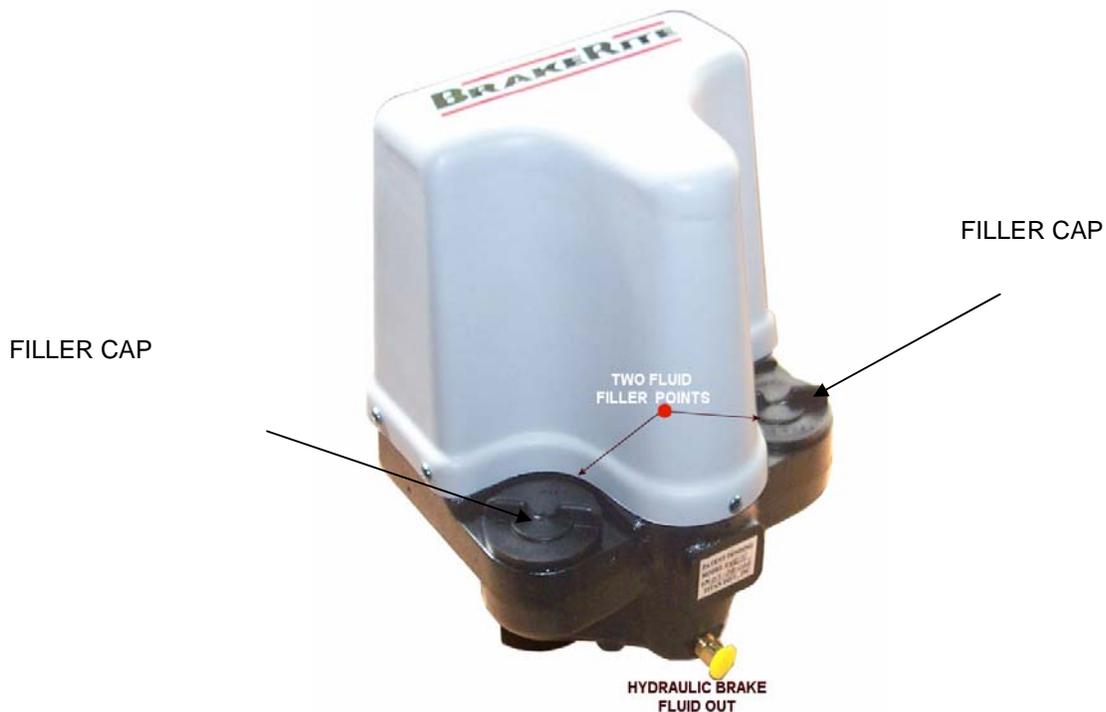


FIGURE C

5.0 - SERVICE AND MAINTAINANCE (cont)

5.2 - Trouble Shooting

<u>Issue</u>	<u>Solution</u>
Unit takes too long to come up to pressure	Bleed brake lines, check brake fluid levels, check electrical connections
Too much braking on empty trailer	Reduce gain setting on In-cab brake controller or boost setting on most controllers
Too much braking on loaded trailer	Reduce gain setting on in-cab brake controller
Not enough braking	Increase gain setting on in-cab controller, bleed brake lines, check brake fluid levels.

5.3 - Replacement Parts.

The BrakeRite EHB comes from the factory with a tamper seal on the cover. The warranty on the BrakeRite EHB may be voided if the cover seal is broken. Contact **TITAN Trailer Brakes** on **07 3286 1199** for information on where to obtain replacement parts such as breakaway switches, breakaway battery plug connectors and filler caps.

If the BrakeRite EHB requires repair and **IS** covered by warranty, follow the instructions on page 20, section 6.5.

6.0 - WARRANTY

6.1 - Eligibility. You are eligible for the benefits of this limited warranty if you are the original end-use purchaser of this BrakeRite EHB and if the unit has been used only on the vehicle in which it was first installed.

6.2 - What Is Covered. *TITAN* Trailer Brakes warrants this product to be free from defects in material and workmanship for 18 months after the date of manufacture or one year from the date of retail sale, whichever occurs first, when properly installed, used and maintained.

6.3 - What Is Not Covered. The warranty does not apply to damage or loss caused by any of the following circumstances or conditions:

- 1. Freight damage.**
- 2. Misapplication, misuse, modification, or failure to follow the directions or observe cautions and warnings on installation wiring, operation, application, inspection or maintenance specified in any *TITAN* specification sheet, instruction and installation manual;**
- 3. Using parts, accessories or components not specified in *TITAN*'s specification sheet, instruction and installation manual or approved by *TITAN* in writing.**

IMPORTANT SAFETY NOTICE

Appropriate installation, maintenance, and repair procedures are essential for the safe, reliable operation of vehicle brakes, as well as the safety of the individual doing the work. This booklet provides general information in this regard.

There are numerous variations in procedures, techniques, tools, and parts for servicing brakes, as well as in the skill of the individual doing the work. This booklet cannot possibly anticipate all such variations and provide advice and caution as to each. Accordingly, anyone who undertakes to Install, maintain, or repair a vehicle brake system or brake system components, must first establish that they neither compromise their personal safety nor the vehicle integrity by their choice of methods, tools or parts.

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6.0 - WARRANTY

6.4 - Conditions and Limitations. *TITAN* Trailer Brakes liability and purchaser's remedy are expressly limited, at *TITAN*'s sole option, to the repair or replacement of the defective product.

For the warranty to apply, *TITAN* Trailer Brakes must receive notice of the alleged defect within 30 days of i) the alleged defect or ii) the expiration of the warranty period, whichever is earlier. Any claim not made within this period shall conclusively be deemed void.

TITAN Trailer Brakes reserves the right to request that the product be returned to *TITAN* Trailer Brakes, intact and postage prepaid, prior to processing a warranty claim.

***TITAN* Trailer Brakes shall not be liable for loss of use of the unit, or any other incidental or consequential costs, expenses or damages incurred by the purchaser.**

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 legal rights. You may also have other rights which vary from state to state.

6.0 - WARRANTY (Cont)

6.5 - To Receive Benefits Under This Warranty.

Contact *TITAN* Trailer Brakes at the address or phone number below to obtain an authorisation for return.

***TITAN* Trailer Brakes Pty Ltd**

16/26-34 Weippin St

Cleveland Qld 4163

Ph 07 3286 1199

The product must be returned, shipping costs prepaid, insured to the factory for evaluation.

The following information should be available when contacting the factory and must accompany the return, legibly prepared:

i) name, address and telephone number of purchaser, ii) proof of purchase including date, iii) model and serial number of the unit, iv) name and address of the dealer where the unit was purchased, v) description of the alleged defect.

These terms and conditions represent the entire *TITAN* Trailer Brakes BrakeRite EHB warranty, and no terms or conditions in any way adding to, modifying or otherwise altering the provisions stated herein shall bind *TITAN* Trailer Brakes unless in writing signed by *TITAN* Trailer Brakes Pty Ltd.