



TITAN



TITAN BRAKERITE AND BRAKERITE II

ELECTRIC HYDRAULIC BRAKE ACTUATION SYSTEMS




BRAKE RITE
ELECTRIC/HYDRAULIC ACTUATOR


BRAKE RITE II
ELECTRIC/HYDRAULIC ACTUATOR

INSTALLATION, INSTRUCTION AND SERVICE MANUAL

Actuator/Trailer Dealer – Please provide to consumer.

Consumer – Read and follow instructions. Keep with trailer for reference.



A Titan Company 2345 East Market Street Des Moines, IA 50317 PHONE: 800-USA-BEAR or 800-872-2327 FAX: 515-265-9212

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Introduction

Thank you for purchasing a TITAN *BrakeRite* Actuator system. TITAN has been a pioneer in development of brake actuation and brakes. Titan's *BrakeRite* & *BrakeRite II* are *state of the art* ELECTRIC over HYDRAULIC BRAKE (EHB) systems.

TITAN's *BrakeRite* systems use electric power from towing vehicle to drive hydraulic power source. In breakaway situations, electric power is supplied by a battery if trailer is completely separated from tow vehicle. This battery is charged by built in control circuitry in TITAN's *BrakeRite*. All *BrakeRite* systems are actuated one of three ways; by brake pedal of tow vehicle being depressed, manual over-ride switch on in-cab brake controller, or during breakaway situation when breakaway switch is activated. Both manual over-ride and breakaway systems are required by Federal Law.

General Information

TITAN *BrakeRite* EHB & *BrakeRite II* SD systems require in-cab electric brake controller which is not provided by TITAN in these systems. These actuators will operate from "most" electric brake controllers **WHEN PROPERLY INSTALLED**. TITAN's *BrakeRite II* RF system has its own in-cab controller provided.

WARNING

- Verify wire connections are correct before energizing or powering *BrakeRite* system. Improper wiring can damage actuation system causing system failure.
- Failure to use proper gauge wire can result in improper operation or failure of components and braking ability. For runs of wire more than twenty (20) feet, larger gauge wire should be used.
- Proper grounding must be observed. Grounding to trailer frame is not acceptable. See provided diagrams for proper wiring.

Proper electrical wiring is critical for performance of any *BrakeRite* system. Improper wiring can damage actuation system causing system failure. A "pure ground" and direct power (+12 VCD) with fuse or circuit breaker (30 amp) are necessary for proper performance. Adequate wire size, 12 Gauge Stranded Automotive or heavier, is required as long runs increase "line loss". Line loss and poor grounding will result in poor performance or total loss of braking. Connection for *BrakeRite II* SD & RF systems are provided by 'Pre-wired' harnesses and plug connectors are "keyed" so they cannot be connected wrong, however, if plug between tow vehicle and trailer is not wired properly, unit will not function properly, or at all. See proper wiring diagram for assistance.

Maintenance

1. Before each towing, perform these steps:
 - Check brake fluid reservoir is within 3/8 inch from filler opening of fresh, clean DOT3 or DOT4 brake fluid. Check for leaks. Service as required.
 - Examine actuator for wear, or other damage. Have affected components serviced. Verify actuator mounting bolts are tight.
 - Test actuator and brake function before transport. Failure to properly adjust brakes will result in loss of braking.
2. There are no adjustments on *BrakeRite* actuators. *BrakeRites* are shipped with "tamper proof" seals between cover and casting. Warranty is void if seals are broke.
3. Contact TITAN for information on where to obtain related service parts such as; breakaway switches, breakaway batteries, electrical plugs, filler caps.



Safety Information

- 1) BrakeRite installation, maintenance, or repair should ONLY be performed by qualified persons who have training or knowledge of BrakeRite brake systems.
- 2) When installing, maintaining, or repairing TITAN equipment, wear eye protection as well as other necessary personal protective equipment.
- 3) TITAN equipment must be maintained in safe working order at all times. Trailer equipment should be inspected before, during, and after use for wear and damage.
- 4) Perform frequent and regular inspection of trailer and equipment.
 - a. Brake Fluid – Check for proper brake fluid level. Must be within 3/8 inch from filler opening.
 - b. Breakaway Switch – Verify breakaway protection is working properly.
 - c. Breakaway Battery – Confirm breakaway battery is charged properly.
- 5) Confirm brake actuator being used can supply enough hydraulic pressure and volume to actuate disc brakes. As a common rule, disc brakes require more pressure and larger volume of fluid than drum brakes of same size.
- 6) Use DOT3 or DOT4 brake fluid. Failure to use correct brake fluid may result in brake failure.
- 7) Be familiar with state laws in operation of towed vehicles, especially with regard to brake and braking requirements. Towing a trailer may require additional braking time and distance. Allow for this in driving habits while towing.
- 8) Make certain equipped trailer is safely supported at all times during installation, maintenance or repair.
- 9) After every hookup, test and confirm trailer brake system is operating correctly and adequately before transportation on roads.

System Overview

BrakeRite EHB & BrakeRite II units are similar, differences are with electronics. BrakeRite EHB has an ECB (electronic control board) built within unit and has five wires exiting. Termination of these five wires is performed by installer per wiring diagram. If not properly connected, unit will not perform properly or at all. BrakeRite II has no ECB and has a three-wire cable with Female Weather Pack plug; therefore it requires a control module. With BrakeRite II, either SD (Severe Duty) or RF (Radio Frequency) control modules are used.

BrakeRite EHB & BrakeRite II use same electric motor driven piston pump and electronic controlled pressure relief valve. Exterior appearance between them is very similar, only wires exiting housing, control board, and distinct Model Markings are different.

“SD” Control Kit for BrakeRite II is same control circuitry as BrakeRite EHB. However efforts to improve installation efficiencies and reliability “SD” Control kit consists of; one SD control module, one I/O harness with 7 pin RV plug 7 pin RV receptacle with three wiretap with Weather Pack plug, and one battery cable with Weather Pack plug. All electrical circuitry is “plug-in”, individual circuits are keyed so wires cannot be connected improperly. Great importance must be placed upon proper wiring in tow vehicle plug.

“RF” Control Kit for BrakeRite II is designed to make BrakeRite II “RF” a ‘stand-alone’ brake actuation system. System requires only a 4 pin flat connector between tow vehicle and trailer. Normal activation is achieved by brake/signal light circuit. Brake pressure is ‘modulated’ by accelerometer output in control module. This system does not require a ‘hard wired in-cab’ controller as it has its own controller.



System Overview (cont.)

RF in-cab controllers have a radio link between controller and control module. Each component has a programmable code so each controller will only communicate with intended control modules. This in-cab controller uses towing vehicles power source (cigarette lighter socket) and does not have to be 'hard wired' into tow vehicle. Control module must be mounted facing forward and should not be totally surrounded in metal. RF Control Kit consists of; one I/O Cable, Control Module, Breakaway Switch, and Battery Cable. All cables and module leads have Weather Pack plugs to insure proper connection.

Brake pressure for BrakeRite EHB & BrakeRite II SD is controlled by most in-cab electronic brake controllers. BrakeRite II RF has an in-cab controller provided. Brake performance is selected by driver. Manual override can also be applied if driver wishes to apply only trailer brakes.

Federal law requires ALL trailers with brakes have ability to apply brakes in event trailer become uncoupled from tow vehicle. This requires a breakaway switch and power source (battery) on trailer. BrakeRite EHB & BrakeRite II control has circuitry for breakaway, however, breakaway switches are provided only with "SD" & "RF" control kits and no breakaway batteries is supplied with any kits.

Electrical

All BrakeRite models are 12 Volt DC with negative ground. Improper connections and grounding may result in system damage. For both BrakeRite EHB & BrakeRite II SD, 12 gauge or larger wire must be run from tow vehicle battery to BrakeRite with a fuse or circuit breaker for protection. Control leads for BrakeRite EHB & BrakeRite II SD and all leads for BrakeRite II RF require 16 gauge or larger wires be used. If undersized wiring is used for power leads, low voltages may occur with slow response times and poor performance of brake system.

For both BrakeRite EHB & BrakeRite II SD a BREAKAWAY BATTERY OF AT LEAST 10 AMP HOURS must be used and for BrakeRite II RF AT LEAST 20 AMP HOUR BATTERY must be used. For RV applications, the house battery may be used as the breakaway battery as long as the above conditions are met at all times. Breakaway battery serves to operate both BrakeRite EHB & BrakeRite II SD as a peaking battery for applications and to supply power in a "breakaway condition". While for BrakeRite II RF, battery does not only supply power for "breakaway conditions" but also supplies power to operate brake system. All three systems have internal chargers to maintain charge on battery from tow vehicle. Charger circuit for BrakeRite II RF requires that Running/Marker lights be on at ALL times during towing.

Breakaway switch (circuit) is required by law. For standard BrakeRite EHB kits, neither switch nor batteries are included. For standard BrakeRite II kits, breakaway switch is included while batteries are not. Breakaway cables and batteries can be ordered separately if needed. When properly installed, breakaway switch applies trailer brakes in event trailer becomes un-coupled from tow vehicle.

Closing of a circuit is required to activate breakaway function. Breakaway switch is normally close switch held OPEN by a plastic key. A cable is attached to key and to tow vehicle. If units become uncoupled, cable pulls key from switch closing circuit activating breakaway function and applying trailer brakes.

ECB (electronic control board) has a battery protection circuit to assure breakaway (auxiliary) battery maintains a charge at all times and prevents a surge charge which could damage battery. Protection is also designed into board to prevent power draw from auxiliary battery to tow vehicles electrical system.

FOLLOWING FIGURES 1-3 SHOW WIRING DIAGRAMS FOR BRAKERITE EHB, SD, AND RF.



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Electrical (cont.)

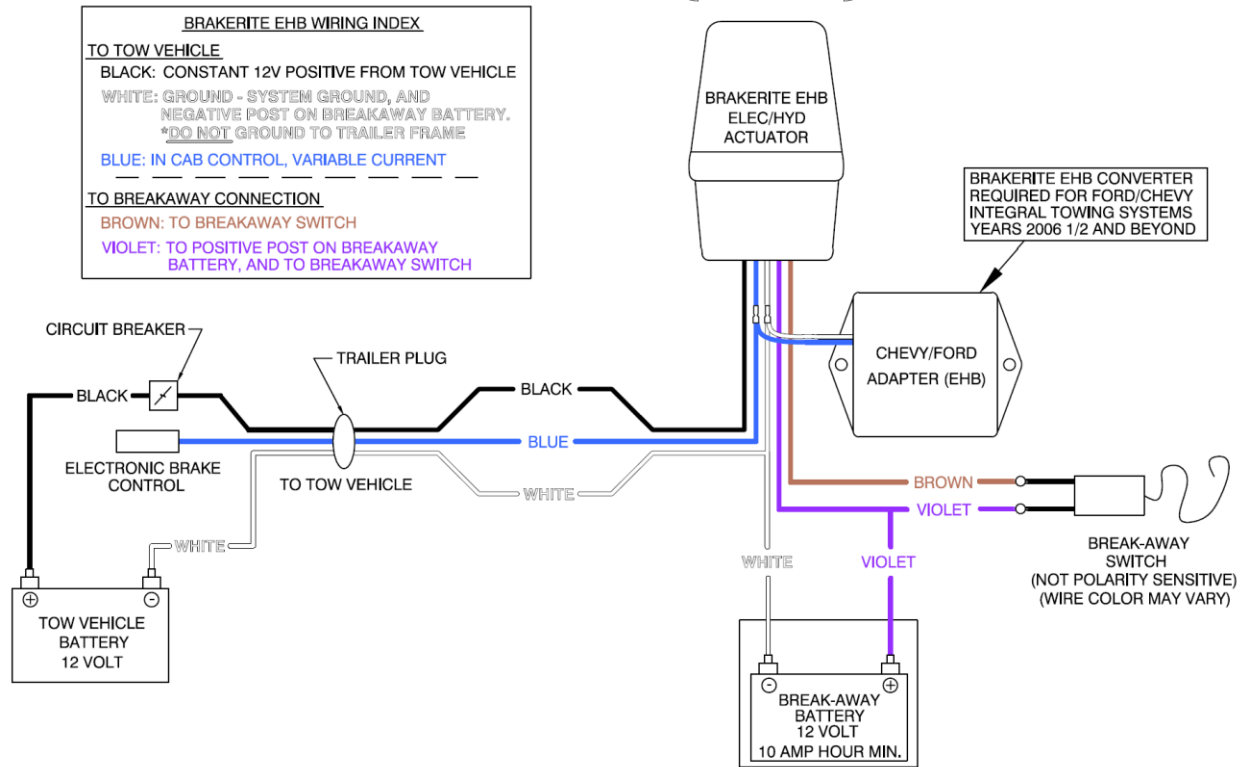


Figure 1 Brakerite EHB Wiring Diagram

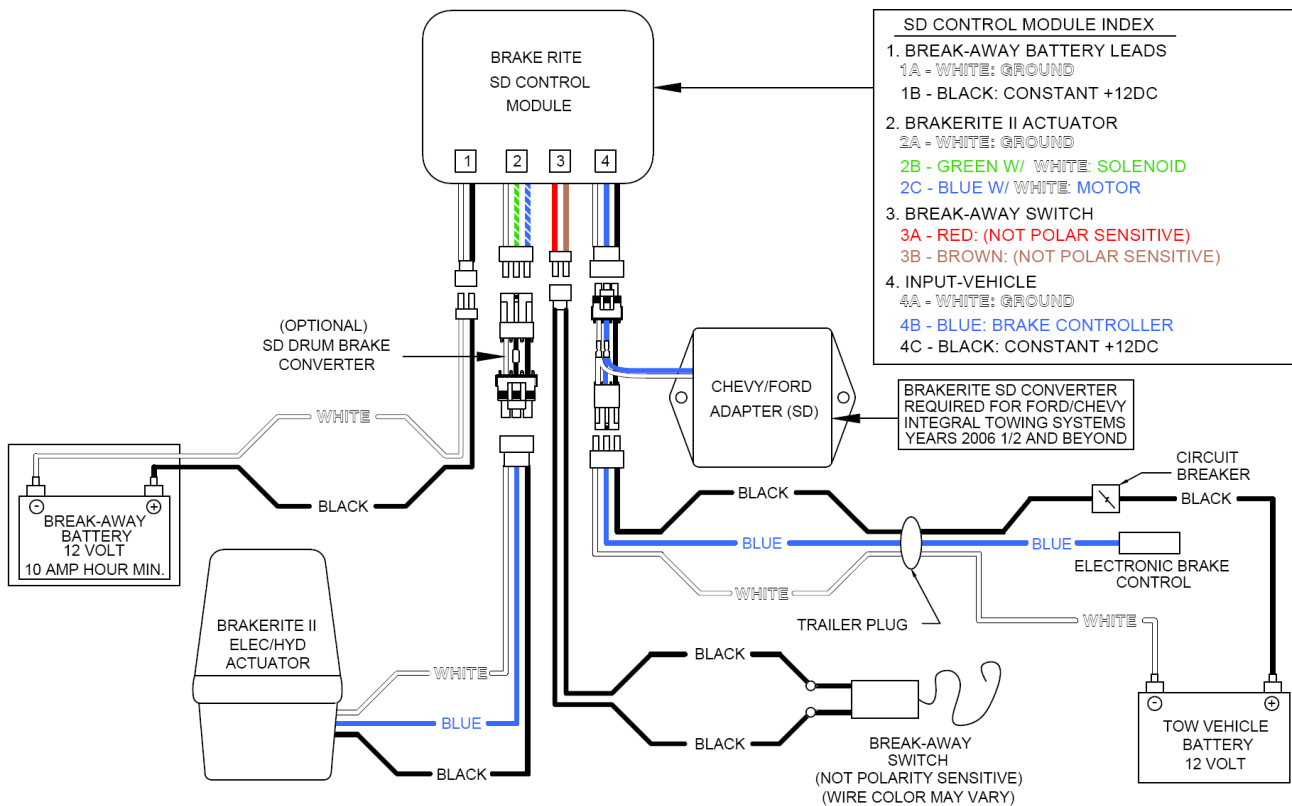


Figure 2 Brakerite II SD Wiring Diagram

Electrical (cont.)

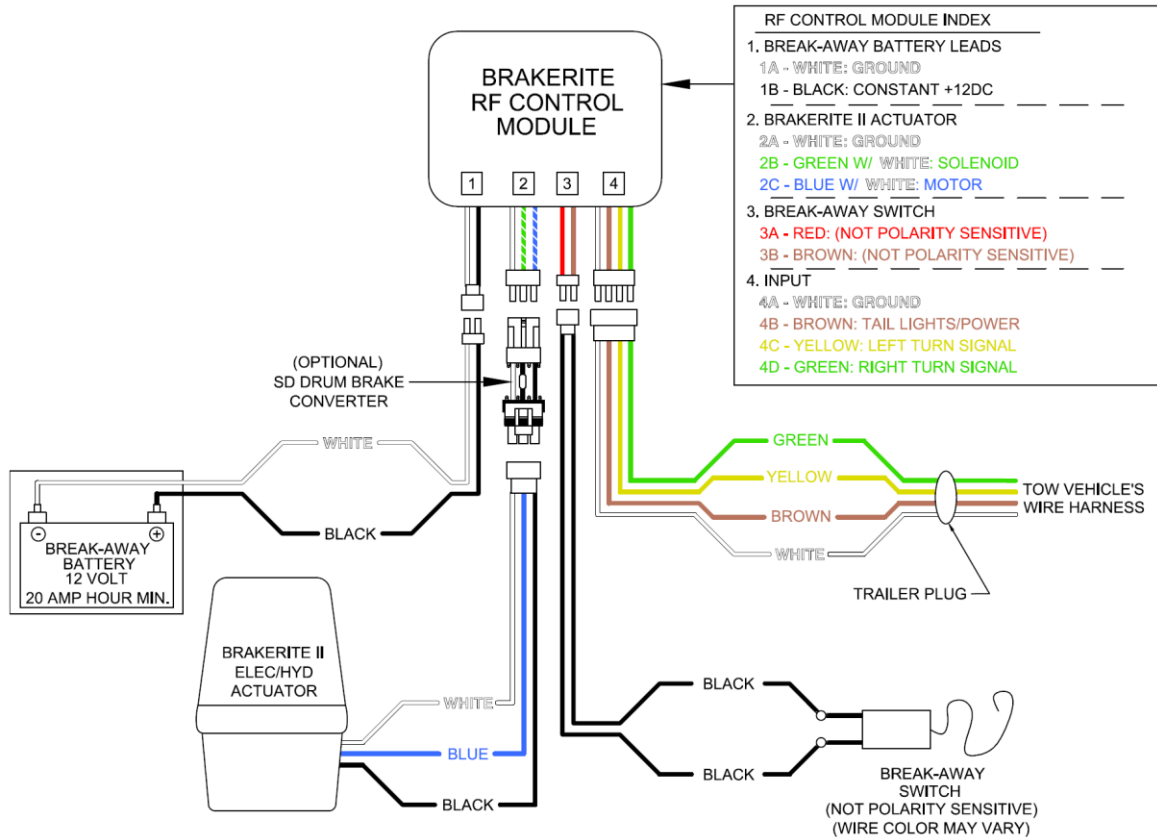


Figure 3 BrakeRite II RF Wiring Diagram

Installation

Mounting location of any BrakeRite model is at discretion of installer, however accessibility for service, protection from damage, and ability to minimize length while protecting brake lines are factors to be considered. Approximate physical envelope for power unit is 6 inches front to back, 7 ¼ inches left to right, and 9 ⅝ inches high. Two sets of mounting holes are provided in power unit; one set of four located on bottom (¼-20 UNC x ⅝ deep) and one set of three located on back (5/16-18 UNC x ⅝ deep). **Located on last page of this manual is a 1:1 scale drawing of power unit mounting holes. Drawing can be used as a marking and drilling diagram for custom bracketry and mounting hardware. Verify scale before use.**

All BrakeRites have a ⅝-27 NPTF port located on lower front of housing and a straight ⅝-27 NPTF Male by #3 Female Inverted Tube seat (¾-24 NPTF) adapter. When installing any adapter, **DO NOT USE TEFLON PIPE TAPE** as properly mated brass fitting joints **DO NOT** require a sealant. Route brake lines to axles per Brake Line Fitting Kit manufacturer's instructions. Use flexible tubing as required and secure all tubing for maximum protection from pinching, vibration, corrosion, or road hazards. When bending and flaring steel tubing, always use proper tools to assure sound connections and prevent kinked lines. Kinked and/or damaged brake lines can cause restriction in flow resulting in poor braking or no brakes at all.

Installation (cont.)

Depending on brake system chosen, there are various approaches to be considered for electrical connections. Though TITAN produces BrakeRite systems, TITAN has NO control over how towing vehicle or trailer has been wired or its color coding. Therefore, when installing any BrakeRite system, it is important that all wiring is connected per these instructions. While it is desirable to establish a ground between frame, BrakeRite unit, and negative side of breakaway battery, NEVER RELY SOLELY ON FRAME GROUNDING. Always use good ground leads between ALL specified points. If rewiring from electric brakes, start wiring as close to front of trailer as possible. A junction box, pin box, or 7-way plug, are preferred starting locations. As electrical portion of installation is carried out, make certain wires are properly routed, wrapped, anchored, and protected to prevent damage, catching on road hazards, or rubbing on frame components. When making connections in circuits, other than plug-in connectors, desirable joint is a solder joint. If using crimp-type joints, always use manufacturers recommended crimping tools in accordance with manufacturer's directions and always properly wrap and protect all joints to prevent shorting and corrosion. Heat shrinking joints also help prevent water causing shorts or corrosion.

BrakeRite EHB requires installer assure all wire are connected properly. See wiring diagram Figure 1 on page 6 for preferred method for electrical wiring. This method requires an independent battery solely for brake system. However, towed vehicle auxiliary batter can be used in place of breakaway battery if it is in good condition and fully charged. NOTE: If trailer has set for an extended period of time, auxiliary battery may have been discharged excessively resulting in poor or no braking. If system is being converted from electric brakes, remove as much old brake wiring as possible and run new wires. This will ensure wires used are of adequate size and give better operation of BrakeRite.

Function and size of five (5) wires exiting BrakeRite EBH are as follows:

White: 12 gauge, 12 VDC negative (-) system ground

Black: 12 gauge, 12 VDC positive (+) system power in

Blue: 16 gauge, Brake Control Input (from in cab electronic brake controller)

Brown: 16 gauge, Breakaway Input (from one lead of breakaway switch)

Violet (Mauve): 14 gauge, 12 VDC Input/Output between Unit and Breakaway battery. (2nd lead of breakaway switch is also connected to 12 VDC positive of breakaway battery)

BrakeRite II SD kits have a complete wiring harness as a "plug-in" system and all connections within have been "pre-selected" so that upon installation connections are simply plugged in. It is crucial that SEVEN PIN "RV" receptacle on tow vehicle is wired per Figure 4.

Two basic options left are whether to use an auxiliary battery on trailer, if one is available, or to install a separate breakaway battery (preferred). No battery is supplied with standard kits. Figure 2 on page 6 illustrates preferred method (separate breakaway battery) however; trailer auxiliary battery can be used in place of breakaway battery if it is in good condition, fully charged, and

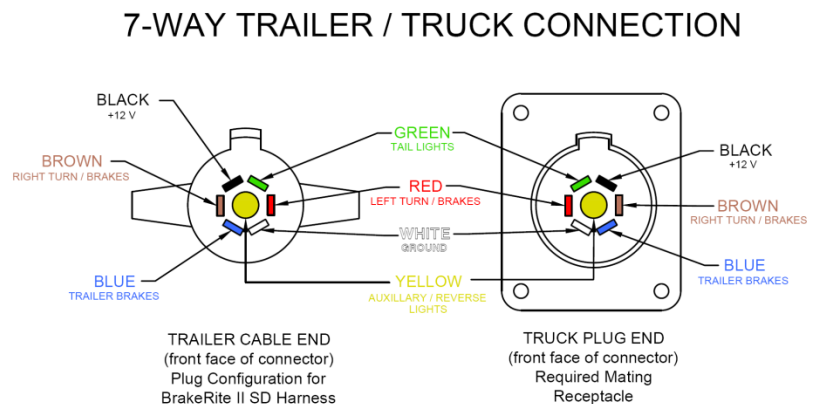


Figure 4 Most Common Factory Installed Wiring Arrangement



Installation (cont.)

BrakeRite II RF kits are supplied complete with wiring harness as a “plug-in” system so all connection within have been “pre-selected” from factory. Four Pin Flat Connector on tow vehicle must be wired as shown in Figure 5. Similar to SD kit, options that are left is whether to use an auxiliary battery on trailer, if one is available or to install a separate breakaway battery (preferred). No battery is supplied with standard kit. Figure 3 on page 7 illustrates preferred method (separate breakaway battery) however; trailer auxiliary battery can be used in place of breakaway battery if it is in good condition, fully charged, and meets amperage requirements.

After unit has been mounted, brake lines installed, and electrical connection completed, system start-up can begin. Remove one filler cap and fill reservoir to within $\frac{3}{8}$ inch of filler cap opening. (Either cap can be used as both fill same reservoir) Fill reservoir with NEW DOT3 or DOT4 BRAKE FLUID. Never reuse brake fluid that has been salvaged or removed from another system. Contaminated brake fluid may cause damage resulting in system failure.

FOUR PIN FLAT CONNECTOR - BRAKERITE II RF CONNECTION

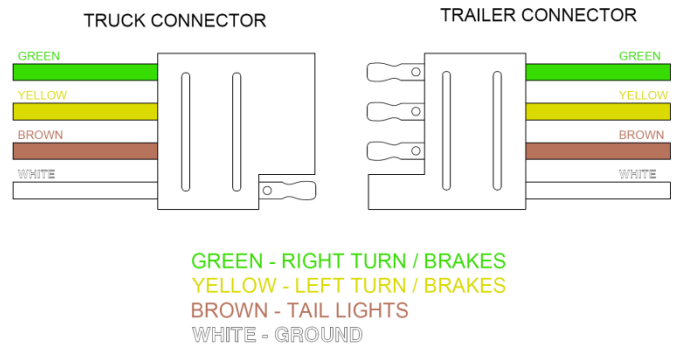


Figure 5 Industry Standard Four Pin Flat Configuration

All air must be removed from brakes and brake lines prior to trailer operation. To bleed brakes, remove key from breakaway switch to start unit. Starting with brake furthest from actuator, open ‘bleeder screw’ and allow it to remain open until brake fluid releases free of air bubbles. Close bleeder screw and move to next brake closer to BrakeRite until all brakes have been bled. While performing bleeding process, monitor fluid level in reservoir so air is not pumped into brake lines because of low fluid. Running BrakeRite pump “dry” can also cause damage to motor. To prevent spilling brake fluid on ground, place one end of length of plastic tubing over end of bleeder screw and other end should be placed into a container so that fluid flow can be monitored for bubbles. After all brakes have been bled, replace “key” in breakaway switch.

⚠ WARNING ⚠

- Use fresh DOT3 or DOT4 brake fluid from sealed container. DO NOT reuse brake fluid. Failure to use fresh brake fluid increases chance of brake failure.
- Use care when handling brake fluid. DO NOT allow brake fluid to contact painted surfaces. It will damage surface finishes. Wipe up spills immediately and wash area with water.
- This is a high pressure system. ALL air must be removed. Any air in brake lines will cause brakes not to function properly. Bleed brake system completely.

Operation

When coupling trailer to tow vehicle always assure that two vehicles are coupled in accordance with vehicle manufactures' instructions and that all coupling devices and procedures conform to applicable state and federal regulations. After units are properly coupled, connect electrical plug. Assure that "safety cable" from breakaway switch on trailer is connected to tow vehicle.

To assure proper connections have been made, most in-cab controllers have some type of indicator showing electrical connections are adequate. Consult in-cab controller manufacturers operator's manual for proper checking and setting procedures. Before moving vehicle depress tow vehicle brake pedal, BrakeRite unit should start (audibly hear unit). Release tow vehicle brake pedal and activate BrakeRite unit by operating "manual override" on in-cab controller. Again, unit will be heard running. With manual override, a tone change will occur as pressure builds relative to "activation" amount initiated from override switch. Do not attempt to move unit or trailer until brake system performs properly in described tests above.

After system responds to tests previously described, proceed with moving vehicle to establish feel for brake system and also to calibrate brake response based upon instructions given in brake controller manual. This adjustment should be performed in a parking lot or low traffic area. Do not attempt to operate unit in congested traffic or on major thoroughfares until familiarized with "feel" and performance of brake system. Every operator and every vehicle have unique requirements and characteristics. Take time to be familiar with how unit feels, performance, and proper operation and setting selections of brake controller.

Trailer brakes are meant to assist tow vehicle in stopping of combined units and are not intended to stop entire combined unit. Two basic types of "In-Cab" Electronic Brake Controllers exist. *Inertia* based controllers create a small 'bias' braking force when activated and modulates braking forces of trailer relative to braking "reaction" created by tow vehicle. Inertia controllers offer most desirable braking effect. Another type is *time* based controllers. Time based controllers turn on when tow vehicle's brake pedal is applied and braking force increases at a selected rate until it reaches a maximum set point. This does not produce as smooth of braking as inertia based controllers and is very speed sensitive. No matter type of controller used, thoroughly know controllers performance and "feel" before extensive travel is considered.

Manual override is required by law and should be fully understood for proper and safe operation. This allows trailer brakes to be activated without depressing tow vehicles brake pedal.



Service & Maintenance

Periodic inspection of electrical connectors, wiring, brake lines, and hose for entire brake system to insure no abraded or bare wires, damaged steel lines, or cracked and damaged hoses exist. During inspection assure there are no loose or “hanging” lines or wire that might drag or catch on object/debris during transport.

EVERY time trailer is coupled to tow vehicle, check following items:

1. Check fluid level in reservoir. Fluid level must be maintained within 3/8” below filler opening. If brake fluid is required, add only new, clean DOT3 or DOT4 brake fluid. Use caution when removing reservoir cap to prevent admission of any contaminants into fluid reservoir.
2. Check breakaway battery is charged and breakaway system works. Test by pulling cable on breakaway switch. If vehicle has been parked for long periods, breakaway battery may be discharged. If this situation occurs, charge battery per manufacturers recommendations prior to using trailer. If battery is discharged in cold environments, freezing battery, damage may have occurred to battery.
3. Inspect coupler and safety chains to assure they are fully functional and for wear or damage. All equipment must meet manufacturer’s specifications and recommendations and all applicable state and federal laws.

BrakeRite EHB, BrakeRite II SD, and BrakeRite II RF are shipped from factory with “tamper proof” seals between cover and casting. Warranty is void if these seals have been broken. Contact TITAN Distribution, Inc. at 800-USA-BEAR (800-872-2327) for information where to obtain related service parts such as; breakaway switches, breakaway batteries, electrical plugs, and filler caps.

Troubleshooting

Experience has shown that virtually all problems with BrakeRite unit are results of INCORRECT or FAILED WIRING. If problems arise, consult applicable wiring diagram (Pg. 6-7) and inspect all wiring and terminations.

A **bench test** can be performed as follows. Connect Black wire to positive (+) and White to negative (-) power source. Proceed to momentarily tap Blue wire to positive (+) side of power source. Motor should switch on briefly. Next momentarily tap Brown wire to positive (+) side of power source. Motor should switch on briefly. If both tests work, problems are not in BrakeRite unit. Wiring and other components should be checked for problems.

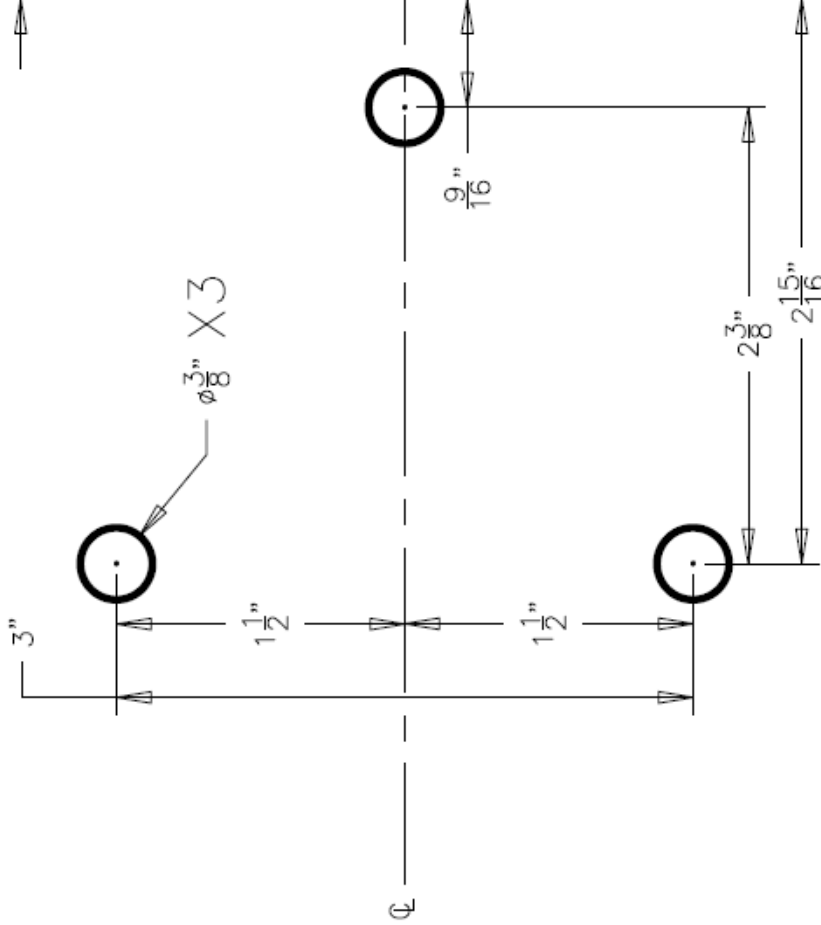
| ISSUE | SOLUTION |
|--|--|
| Indicator on “In Cab Controller” shows no connection between tow vehicle and trailer | Inspect plug and wiring for open circuit. Consult applicable wiring diagram for proper connections |
| Poor response time | Check and add brake fluid as required |
| | Bleed brake lines and devices |
| | Check input for adequate “Charge” (12 VDC) |
| Inadequate or excessive trailer braking | Adjust “gain” control on In-Cab Controller |
| BrakeRite unit runs but does not build pressure | Assure proper brake fluid level, add fluid and bleed system as required |
| BrakeRite unit does not run when breakaway is pulled | Check breakaway battery charge and assure wires are properly connected |
| BrakeRite unit does not run when vehicle brake pedal is depressed | Verify and connect wire connections in entire electrical circuit. |
| BrakeRite unit does not run when in-cab manual override is activated | Verify and connect wire connections in entire electrical circuit. |



REAR MOUNTING HOLES

TOP ←

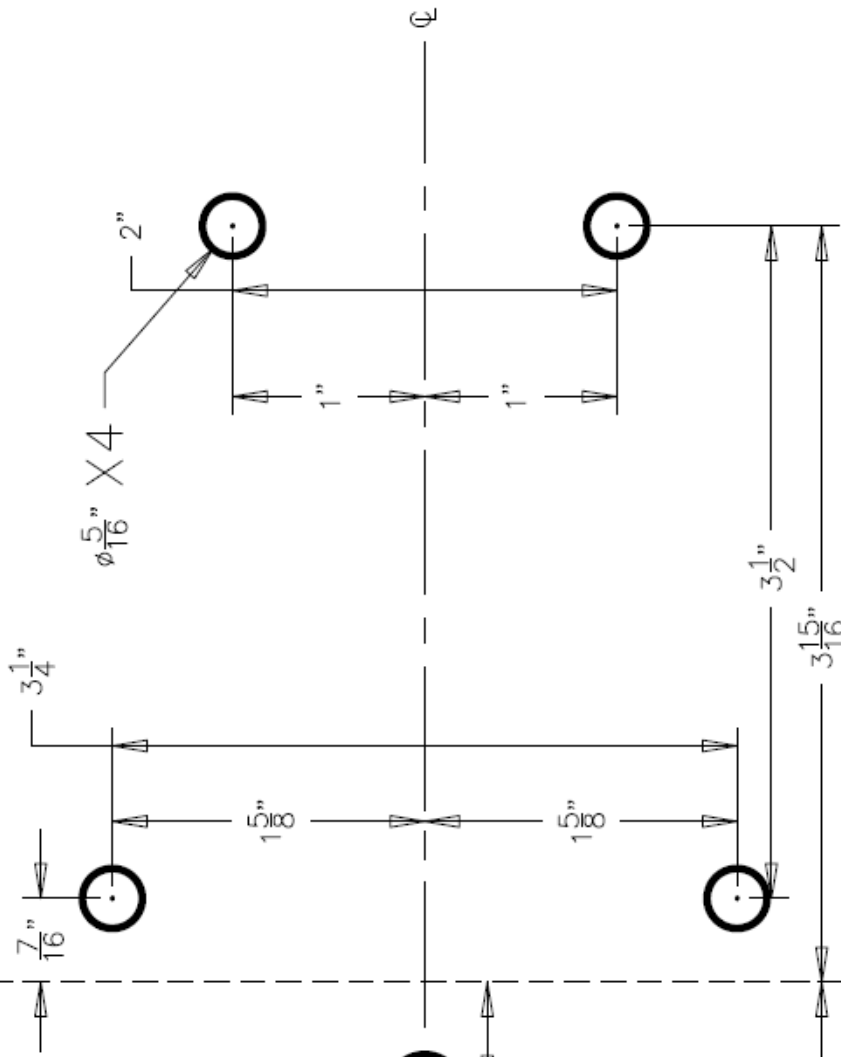
BOTTOM →



BOTTOM MOUNTING HOLES

BACK ←

FRONT →



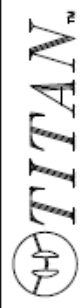
0" | 1" | 2" | 3"

3"

4"

Use page for drilling template if needed.
Measure printed ruler for correct scale.
Page must be printed at 100% scale.
Fold along dashed line for mounting on both sides.

BRAKERITE MOUNTING
HOLE DIAGRAM



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LIMITED WARRANTY

Limited Warranty Titan Tire Corporation (TITAN) warrants its products to be free from defects in material and workmanship for 18 months from date of installation with proof of purchase, or 18 months from date of manufacture if proof cannot be presented. Warranty is valid if unit has only been used on vehicle which it was first installed by the original purchaser and has been properly installed, used, and maintained by the purchaser.

This warranty does not apply to damage or loss caused by any or all of the following circumstances or conditions:

- Freight damage.
- Parts, accessories, materials or components not obtained former approved in writing by TITAN.
- Misapplication, misuse and failure to follow the directions or observe cautions and warnings on installation, operation, application, inspection or maintenance specified in any TITAN quotations, acknowledgements, sales literature, specification sheet or installation instructions and service manual ("applicable literature")

If any TITAN products are found upon TITAN's examination to have been defective when supplied, TITAN will either: credit the purchaser's account for the purchase price of the TITAN product; or repair the product. TITAN has sole discretion in choosing which option to provide. For this LIMITED WARRANTY to apply, TITAN must receive notice of the alleged defect within 30 days of either the discovery of the alleged defect or the expiration of the warranty period, whichever is earlier. Any claim not made within this period shall conclusively be deemed waived.

If requested by TITAN, purchaser shall return the alleged defective product to TITAN for examination at TITAN's direction and expense. TITAN will not pay for expenses incurred in returning a product to TITAN without TITAN's prior written authority. TITAN shall not be liable for any other expenses purchaser incurs to remedy any defect. Purchasers waive subrogation on all claims under any insurance.

Limitation of Liability It is expressly agreed that the liability of TITAN is limited and TITAN does not function as an insurer. THE REMEDIES SET FORTH IN THIS WARRANTY SHALL CONSTITUTE THE EXCLUSIVE REMEDIES AVAILABLE TO THE PRUCHASER OR USER AND ARE IN LIEU OF ALL OTHER REMEDIES, EXPRESS OR IMPLIED. THE LIABILITY OF TITAN, WHEATHER IN CONTRACT, IN TORT, UNDER ANY WARRANTY OR OTHERWISE, SHALL NOT EXCEED THE PURCHASE PRICE OF THE PARTICULAR PRODUCT MANUFACTURED, SOLD OR SUPPLIED BY TITAN.

To Obtain Technical Assistance To enable TITAN to respond to a request for assistance or evaluation of customer or user operation difficulty, please provide at a minimum the following information by calling 1-800-872-2327 or within Iowa 1-515-265-9200:

- Model number, serial number and all other data on the specific component which appears to be involved in the difficulty.
- The date and from whom you purchased your TITAN product.
- State your difficulty, being sure to mention at least the following: Application, Nature of load involved, and Weight of the load.

TITAN EXTENDS NO WARRANTY, EXPRESS OR IMPLIED, ON PRODUCTS NOT MANUFACTURED BY TITAN OR TO TITAN'S DESIGN SPECIFICATION, INCLUDING BUT NOT LIMITED TO SUCH ITEMS AS NON-TITAN TIRES, BRAKES, ACTUATORS, BEARINGS, HOSE AND TUBING, PURCHASER'S RECOURSE SHALL BE LIMITED TO ANY WARRANTY OF THE PERSPECTIVE MANUFACTURERS.

THIS WARRANTY EXCLUDES ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY PURPOSE.

THIS WARRANTY DOES NOT COVER NOR EXTEND TO INCIDENTAL OR CONSEQUENTIAL DAMAGE. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

No representative has authority to make any representation, promise or agreement except as stated in this Limited Warranty. TITAN reserves the right to make design and other changes upon its products without any obligation to install the same on any previously sold or delivered products.

THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THOSE DESCRIBED ABOVE. EFFECTIVE JANUARY 1, 1998 THIS WARRANTY SUPERSEDEDS ALL PRIOR WARRANTIES, WIRTTEN OR IMPLIED.



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