

SERVICE MANUAL
FOR
TF ELECTRO-HYDRAULIC
BRAKE ACTUATOR



Introduction

The TF Actuator has been designed and manufactured to give safe & reliable power to your hydraulic brake system.

This electronically powered TF Actuator is designed to perform with all **Proportional** Brake Control Units.

Please note: Most older models of Brake Control units do not have this feature, and are therefore unsuitable to use with the TF Actuator and will void warranty.

Spare Parts

plus

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54 Medcalf Street Warners Bay NSW 2282

Ph: (02) 4954 6955

admin@felks.com.au

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WARNING

This is the safety alert warning. It is used to alert you to potential injury and hazards. Obey all safety messages that follow this warning to avoid possible injury or death.

Actuator Installation Instructions

Getting Started

This unit MUST be wired by a Professional Electrician/Auto Electrician.

The following materials will be required for installation:-

- One litre of DOT 3 or DOT 4 brake fluid (from a new sealed container).
- **One Emergency Breakaway Kit** – must include a 12 volt 4 amp hour (minimum) battery.
- Wire (see Electrical Installation Requirements for proper wire size).

When selecting the location, the following items should be considered:

WARNING

1. **It is crucial to mount the TF unit in a position where it will not be immersed in water. Failure to do so will void manufacturers warranty in the event of water damage.**
2. The wiring should be as direct as possible from the TF unit to the tow vehicle to avoid voltage drop.

The TF actuator is powered from the electrical system of the tow vehicle. In order for the unit to function properly, it must have adequate electrical power (see Electrical Installation Requirements).

WARNING

The TF actuator contains sensitive electronics that must be protected. Drilling additional holes in the housing or welding anywhere on the unit will damage the unit making it inoperable & void the manufacturers warranty.

Connect the trailer brake lines to the actuator as follows:

- a) Connect the brake line to the inverted flare brake port on the actuator.
- b) Brake line must be compatible with DOT 3 & DOT 4 brake fluid.
- c) Fill the TF unit with DOT 3 or DOT 4 brake fluid to the bottom of the reservoir filler neck.

WARNING

Always use NEW DOT 3 or DOT 4 brake fluid from a sealed container. Never attempt to reuse old dirty fluid. Do not overfill the unit. To avoid damage to paint surfaces etc., avoid contact with the brake fluid. Wash any spilt brake fluid immediately with soapy water to avoid damage to those surfaces & rinse off.

WARNING

It is the responsibility of the end user to ensure that their in-cab electronic controller is compatible with the TF actuator.

The TF Actuator is designed to perform with all **Proportional Brake Control Units**.

Electrical Connections – Make sure all electrical connections are clean, dry and weather tight.

Breakaway Battery Requirement - To comply with standard requirements, a trailer must be equipped with a breakaway system. The breakaway battery, needs to have a minimum capacity of 4 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.

Charging the Breakaway Battery – The breakaway battery must be kept fully charged in order to function properly. Do not attempt to charge the breakaway battery directly from the tow vehicle without the appropriate charging device included with the breakaway kit.

Test Electrical Operation

1. Attach the trailer to the towing vehicle. Do not connect trailer plug to tow vehicle until step 2 has been completed.
2. Pull the breakaway switch. The TF unit should run. If the unit does not run, check breakaway battery and wiring system. Reset the breakaway switch that will turn the unit off.

When the TF unit is running, the motor will generate a “hum” that changes pitch as the unit is pressurised. This is normal.

3. Connect the trailer plug to tow vehicle.
4. Turn the ignition switch on and turn the in-cab electronic brake controller on. The TF unit will require the vehicle to be moving in order for the TF unit to come on by means of the brake pedal. If the unit does not run, check the wiring system.

WARNING

Testing the TF unit only confirms that it is operating however, it may not be operating properly. Regular inspection, adjustment and maintenance of the brakes is necessary to ensure proper brake operation. Brake fluid must be changed every 2 years regardless of klms travelled.

Bleeding and Brake Adjustment

1. If the trailer is equipped with drum brakes adjust the brakes shoes before bleeding the brakes.
2. It is much easier to bleed the brakes with two people working together.
3. Make sure that the TF unit does not run out of brake fluid. Check the fluid level frequently during the bleeding process, ensuring fluid does not fall below half way, otherwise you will pump air into the brake lines and the procedure will need to be repeated. **Failure to properly adjust drum brakes on trailers will result in a slower response time of the TF unit.**
4. Install plastic tubing onto the bleeding nipple of the wheel cylinder or caliper.

5. Immerse the free end of the plastic tube in a clean container.
6. Open the bleeding nipple on the wheel cylinder or caliper farthest from the TF unit. If tow vehicle has more than one axle, always start bleeding the wheel farthest from the TF unit first. ie. In order of length of brake line, longest to shortest.
7. To activate the TF unit, turn the ignition switch on and press on the brake pedal, or use manual slide.
8. Watch the free end of the bleeder hose for air bubbles escaping into the clean container. As soon as the bubbles stop, lock the bleeding nipple.
9. Turn off the TF unit and remove plastic tubing from the bleeding nipple. Bleeding of the wheel cylinder or caliper is now complete.
10. Refill the TF unit with brake fluid.
11. Repeat the process (step 1 to 8) on the rest of the wheels, always starting on the next farthest on from the TF unit.
12. New trailers fitted with disc brakes it is recommended that they are bled twice. Air trapped in the brake system will cause brake delay with an Electronic-Hydraulic system.
13. When finished, ensure the rubber dust cap lid is **securely fitted** to ensure outside elements (water, dust condensation etc) do not enter the brake fluid chamber. Brake fluid is Hygroscopic and will absorb moisture from the atmosphere. Exposure to outside elements will result in rust and mechanical failure of the TF unit and is not covered by warranty. Replacement Caps are readily.

Adjustment of Electronic Controller Unit

1. Adjust the gain setting on the in-cab controller to a mid range setting.
2. Drive vehicle at 15 to 20 kph
3. Apply the brakes. If braking is too severe, adjust the gain setting down to decrease pressure and retest.

Repeat this process until the brakes respond appropriately.

WARNING

The correct pressure setting will vary depending on the weight of the load, weather and road conditions. Retest the brake performance each time the trailer is used. Failure to properly adjust the TF actuator may result in poor brake performance and could result in serious or fatal injuries or property damage.

Troubleshooting Guide

Unit will not run or brakes are slow to respond. To determine if the unit is functioning properly, perform the checks outlined below.

1. Check that the wiring is according to the electrical schematic in “Electrical Requirements”.
2. Re-bleed trailer brakes. Air trapped in the trailer brake system causes brake delay.
3. If the trailer is equipped with drum brakes, re-adjust the drum brakes to the trailer manufacturers recommended tolerance.
4. Trailer wiring that is too small can cause slow response (see section on Electrical Installation Requirements)

5. Slow response can be caused by undersized brake line. The trailer brake line must be at least 4mm in diameter.
6. Check to see if the white ground wire runs directly to the tow vehicle ground. It must be connected directly to the vehicle battery ground. **NO EXCEPTIONS.**
7. Detach all wires from the TF unit leaving only the blue, black, white and yellow wires. It is important to disconnect all wires to the tow vehicle. Failure to do so may result in a faulty test.
8. Using a 12 volt battery, connect the white wire to the negative (-) terminal of the battery.
9. Connect the black wire to the positive (+) terminal of the battery. The motor should **not run**. If it runs, the unit could be faulty.
10. Leave the white wire connected to the negative(-) terminal of the battery.
11. Connect the blue and black wires together to the positive (+) terminal of the battery.
12. The motor should run and the unit should pressurise.
13. If this does not occur, the unit may be faulty.
14. Leave the white wire connected to the negative (-) terminal of the battery.
15. Connect only the yellow wire to the positive (+) terminal of the battery.
16. The motor should run and the unit should pressurise.
17. If this does not occur, the unit could be faulty.
18. If the unit checks OK, reconnect the wires leading to the trailer plug and repeat steps 9 through to 14 at the trailer plug. If you do not get the same results as before, the problem is the trailer wiring or the electronic in-cab brake controller.

Using the breakaway system to check a unit that is not operating correctly.

1. With a fully charged breakaway battery and the trailer plug disconnected, pull the breakaway switch on the trailer.
 - a. If the unit runs and builds up pressure, the breakaway system is functioning properly.
 - b. If the unit runs and builds up pressure when the breakaway switch is pulled , but will not function under normal operating condition, the problem is most likely a faulty in-cab controller or defective wiring between the tow vehicle and the TF actuator.
 - c. If the unit runs but will not build pressure when the breakaway switch is pulled, the TF unit may be faulty.
 - d. If the unit does not run, measure the DC voltage between the white wire and the yellow wire. If the voltage is less than 12 volts, either the battery hasn't had enough charge, the breakaway switch or the breakaway wiring is at fault.
2. After completing the above steps, reset the breakaway switch and reconnect the trailer plug.

If the trailer brakes are too aggressive :-

1. Reduce the gains setting on the in-cab electronic brake controller.
2. Check brake adjustment.

TF Limited Warranty

TF Warrants to the original purchaser that the TF brake actuator (the unit) shall be free from defects in material and workmanship for a period of two (2) years from the date of first sale or to the first retail purchaser, of a trailer or other towed device to which the unit is fitted. Any receipts, proof of purchase, or other documents obtained at the time of purchase from a dealer/distributor, should be retained.

This Warranty is not transferable from the original owner.

The duration of any implied Warranties including the implied Warranties of merchantability and fitness for a particular purpose, are limited to the duration of the expressed Warranties herein. TF hereby excludes incidental and consequential damages, including loss of time, inconvenience, loss of use, towing fees, telephone calls or cost of meals, for any breach of any expressed or implied Warranties, including the implied Warranties of merchantability and fitness for a particular purpose.

This Warranty shall not extend to any unit, or any parts thereof which have been improperly 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 of the consumer. Refer to the instruction manual included in with the unit.

If it is determined that the claim is valid, the unit may be repaired, replaced or a credit issued. If a claim is deemed invalid and the unit is found to work properly, the unit will be returned to the submitter, freight collect, unless otherwise instructed.

All enquiries regarding the warranties should be addressed to **THE ORIGINAL PLACE OF PURCHASE.**

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