


# RECALL 25V550 / 2025-438 REMEDY INSTRUCTIONS

 <b>FOREST RIVER</b>	Make(s): RIVERSTONE Model(s): MANY, SEE BELOW Model Year(s): 2018 – 2026	Repair Code: RC-007-01-00-004746 Allotted Time: CONTACT CUSTOMER SERVICE Inspection Code: N/A
	Concern: Rubber line going to axle(s) may be too short, causing a failure in the line securement on the axle. Leading to line failure from vibration.	Allotted Time: N/A Photo(s) Required: NO Prior Authorization Required: YES Part(s) Kit Number: SEE BELOW Part(s) Return: NO – FIELD DESTROY

**Turn off LP Gas at LPG Tank(s). Disconnect the vehicles' battery Positive and Negative, disconnect any House battery(s) Positive and Negative, if equipped with a generator ensure it is off and lastly, ensure the vehicle is disconnected from shore power. Block any tires/wheels to prevent the vehicle from rolling. Failure to do so may result in electrocution, fire or other personal injury, property damage and/or death.**

**THIS ONLY AFFECTS VEHICLES WITH DEXTER HYDRAULIC DISK BRAKING SYSTEMS – ALL OTHER VEHICLES ARE EXEMPT**

- CERTAIN 2018 RIVERSTONE: RSF37IK, RSF37RL, RSF39FK, RSF39FL & RSF39RKFB
- CERTAIN 2019 RIVERSTONE: RSF37IK, RSF37MRE, RSF39FK, RSF39FKTH, RSF39FL, RSF39RKFB & RSF39RLW
- CERTAIN 2020 RIVERSTONE: RSF37FLTH, RSF37MRE, RSF381FB, RSF383MB, RSF39FK, RSF39FKTH, RSF39RBFL, RSF39RKFB & RSF39RLW
- CERTAIN 2021 RIVERSTONE: RSF3410PMK, RSF3670RL, RSF37FLTH, RSF37MRE, RSF381FB, RSF383MB, RSF3850RK, RSF391FSK, RSF3950FWK, RSF39FK, RSF39FKTH, RSF39RBFL, RSF39RKFB & RSF42FSKG
- CERTAIN 2022 RIVERSTONE: RSF3670RL, RSF37FLTH, RSF383MB, RSF3850RK, RSF391FSK, RSF3950FWK, RSF39RBFL, RSF39RKFB, RSF419RD, RSF42FSKG & RSF442MC
- CERTAIN 2023 RIVERSTONE: RSF3670RL, RSF37FLTH, RSF3850RK, RSF391FSK, RSF3950FWK, RSF39RBFL, RSF39RKFB, RSF419RD, RSF42FSKG, RSF442MC, RSF4513DST, RSF4514BATH & RSF45BATH
- CERTAIN 2024 RIVERSTONE: RSF391FSK, RSF39RKFB, RSF419RD, RSF421FK, RSF425FO, RSF42FSKG, RSF442MC, RSF4513DST & RSF4514BATH
- CERTAIN 2025 RIVERSTONE: RSF39RKFB, RSF419RD, RSF421FK, RSF425FO, RSF42FSKG, RSF442MC, RSF44DBL & RSF4513DST
- CERTAIN 2026 RIVERSTONE: RSF39RKFB, RSF421FK, RSF425FO, RSF42FSKG, RSF442MC & RSF44DBL

**KITS FOR TRIPLE AXLE AND TANDEM AXLE UNITS, NOT NEEDING REPLACEMENT RUBBER BRAKE LINE(S):**

**KIT NUMBER: F100784751**  
**7K Triple Axle Units, Hardware, Per Unit:**  
 3 – 5/16”-18 x 1” Bolt  
 6 – 5/16” Flat Washer  
 3 – 5/16”-18 NYLOCK Nut  
 3 – 3.00” I.D. P-Clamp  
 12 – 21.7”, LPC-51HDB, Zip Ties

**KIT NUMBER: F100784753**  
**8K Tandem Axle Units, Hardware, Per Unit:**  
 2 – 5/16”-18 x 1” Bolt  
 4 – 5/16” Flat Washer  
 2 – 5/16”-18 NYLOCK Nut  
 2 – 3.50” I.D. P-Clamp  
 8 – 21.7”, LPC-51HDB, Zip Ties


**KITS FOR TRIPLE AXLE AND TANDEM AXLE UNITS, NEEDING REPLACEMENT RUBBER BRAKE LINE(S):**

**KIT NUMBER: F100784320**  
**7K Triple Axle Units, Hardware, Per Unit:**  
 3 – 5/16”-18 x 1” Bolt  
 6 – 5/16” Flat Washer  
 3 – 5/16”-18 NYLOCK Nut  
 3 – 3.00” I.D. P-Clamp  
 12 – 21.7”, LPC-51HDB, Zip Ties  
 3 – 25” Rubber Brake Hose  
 3 – Brake Hose Bracket Clips

**KIT NUMBER: F100784321**  
**8K Tandem Axle Units, Hardware, Per Unit:**  
 2 – 5/16”-18 x 1” Bolt  
 4 – 5/16” Flat Washer  
 2 – 5/16”-18 NYLOCK Nut  
 2 – 3.50” I.D. P-Clamp  
 8 – 21.7”, LPC-51HDB, Zip Ties  
 2 – 25” Rubber Brake Hose  
 2 – Brake Hose Bracket Clips

- REPAIR PROCEDURES ON THE FOLLOWING PAGES -

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REPAIR – FOR 7K TRIPLE AXLE(S) AND 8K TANDEM AXLES:

STEP 1: LIFT VEHICLE USING THE VEHICLES HYDRAULIC LEVELING SYSTEM;

- ENSURE THE GROUND IS FLAT AND RATED TO LIFT A VEHICLE;
- ENSURE ALL TIRES ARE OFF OF THE GROUND;
- ENSURE ALL LOAD IS OFF OF THE TIRES AND THE AXLE(S) ARE HANGING;
- IT IS NOT NECESSARY TO REMOVE AXLE(S) OR TIRES;
- PLACE JACK STANDS UNDER THE CHASSIS BEAMS TO SUPPORT THE VEHICLE;

STEP 2: INSPECT THE RUBBER BRAKE LINE FROM THE UNION MOUNTED TO THE UNDERBELLY TO THE AXLE UNION;

- ENSURE IT HAS AMPLE SLACK WHEN THE AXLE(S) ARE HANGING WITH THE TIRES OFF OF THE GROUND;
- IF AMPLE SLACK IS PRESENT IN THE RUBBER BRAKE LINE, CONTINUE WITH STEPS 3 THROUGH STEP 10;
  - ORDER THE CORRECT KIT THAT INCLUDES THE RUBBER BRAKE LINE FOR THE AXLE SIZE;
- IF THE RUBBER LINE ON ANY AXLE(S) ARE TIGHT, THE LINE WILL NEED TO BE REPLACED;
  - ORDER THE CORRECT KIT THAT INCLUDES THE RUBBER BRAKE LINE FOR THE AXLE SIZE;
  - REFERENCE THE RUBBER LINE REPLACEMENT GUIDE;
  - CONDUCT THIS REPAIR AS NEEDED WITH THE VEHICLE LIFTED;
- FINISH STEPS 3 THROUGH STEP 10;

STEP 3: REMOVE THE ZIP TIES HOLDING THE UNION TO THE AXLE AND BRAKE LINES TO AXLES;

STEP 4: INSTALL PROVIDED P-CLAMP AROUND THE AXLE BEAM – REF. FIGURE 1;

- 3.00” I.D. P-CLAMPS FOR TRIPLE 7K AXLES
- 3.50” I.D. P-CLAMPS FOR TANDEM 8K AXLES

STEP 5: POSITION THE HOLES OF THE P-CLAMP WITH THE UNION MOUNTING HOLE AND SECURE – REF. FIGURE 1;

- USE THE PROVIDED 5/16”-18 X 1” BOLT, FLAT WASHERS AND NYLOCK NUT;
- DO NOT POSITION THE BOLTED CLAMP CONNECTION BELOW THE BOTTOM OF THE AXLE;
- INSTALL THE P-CLAMP AS SHOWN IN FIG. 1
- KEEP THE ORIENTATION OF THE BOLTED CLAMP CONNECTION AT OR AROUND 45 DEGREE FROM HORIZONTAL;

STEP 6: INSTALL FOUR (4) REPLACEMENT ZIP TIES EVENLY ACROSS THE AXLE BEAM TO THE BRAKE LINE – REF. FIG. 2;

- DO NOT CREASE OR BEND THE BRAKE LINE;

STEP 7: REMOVE THE JACK STANDS;

STEP 8: LOWER THE VEHICLE DOWN ONTO ALL TIRES;

STEP 9: TEST BRAKE FUNCTIONALITY;

STEP 10: CLAIM REPAIR CODE.

- REFERENCE PHOTOS ON THE NEXT PAGE -

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FIGURE 1



FIGURE 2



## RECALL 25V550 / 2025-438 REMEDY INSTRUCTIONS

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### RUBBER BRAKE LINE REPLACEMENT GUIDE - FOR 7K TRIPLE AXLE(S) AND 8K TANDEM AXLES:

STEP 1: LOCATE THE RUBBER BRAKE LINE UNION MOUNTED TO THE UNDERBELLY OF THE VEHICLE;

- DISCONNECT THE BRAKE LINE USING WRENCHES AS NEEDED;
- PULL THE RETAINER CLIP, RELEASING THE RUBBER BRAKE LINE;
- USE A CAN OR BUCKET TO CAPTURE EXCESS BRAKE FLUID;

STEP 2: DISCONNECT THE OTHER END OF THE BRAKE LINE FROM THE UNION AT THE AXLE;

- DESTROY AND DISCARD THE 18” RUBBER BRAKE LINE

STEP 3: INSTALL THE BRAKE LINE WITH THE PROVIDED 25” RUBBER LINE, BEGINNING AT THE UNION AT THE AXLE, AND TORQUE IN ACCORDANCE WITH THE INCLUDED DEXTER INSTALLATION MANUAL;

STEP 4: RECONNECT THE BRAKE LINE BY INSTALLING THE BRAKE LINE AT THE UNION/BACKET AT THE UNDERBELLY IN ACCORDANCE WITH THE INCLUDED DEXTER INSTALLATION MANUAL TORQUE VALUE(S);

- INSTALL NEW RETAINER CLIP PROVIDED;

STEP 5: USE ONLY DOT 3 BRAKE FLUID AS REFERENCED WITHIN THE DEXTER INSTALLATION INSTRUCTIONS;

STEP 6: PERFORM BRAKE BLEEDING PROCESS IN ACCORDANCE WITH THE PROCEDURES WITHIN THE INCLUDED DEXTER DX SERIES ELECTRIC/HYDRAULIC ACTUATOR SERVICE MANUAL;

STEP 7: TEST BRAKE FUNCTIONALITY;

STEP 8: CLAIM REPAIR CODE.



# **DX SERIES**

**ELECTRIC/HYDRAULIC ACTUATOR**



## **SERVICE MANUAL**

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### **DX SERIES ELECTRIC/HYDRAULIC ACTUATOR**

**Introduction** ..... 2

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**Electrical Wire Colors and Function**..... 3

**Electrical Installation Requirements**..... 4

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Please visit [www.dexteraxle.com](http://www.dexteraxle.com) for current warranty information.

Before proceeding, make sure that the unit is appropriate for your particular brakes. The E/H 1000 produces 1000 psi, typically used for duo-servo hydraulic drum brakes, while the E/H 1600 produces 1600 psi for most hydraulic disc brakes. Please refer to your brake manufacturer for proper operating pressures.

The Dexter DX Series brake actuator is compatible with many electric brake controllers, but the best performance will be achieved using an inertial type controller such as the Dexter Predator DX2®. The electronic timer type of controller is not recommended because these units use a fixed control that does not sense varying brake requirements.

**Please reference 059-A38-00 DX Series Compatibility Guide, available at [www.dexteraxle.com](http://www.dexteraxle.com) for more information on brake controller compatibility.**

**CAUTION**

**It is the responsibility of the end user to ensure that their electric brake controller is compatible with the Dexter DX Series brake actuator. Dexter attempts to provide compatibility with most controllers available, but is unable to anticipate design changes that might be introduced by the various controller manufacturers.**

 **CAUTION**

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

**Scan to view DX Series Actuator Installation Video**



## Installation Instructions

The following materials are required to properly install the Dexter DX Series brake actuator. 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 unit. Where possible, steel tubing is preferred.

- Four 1/4" threaded fasteners to mount the unit to the trailer.
- One quart of DOT 3, DOT 4, or DOT 5 brake fluid (from a new sealed container).
- One emergency breakaway kit - must include a 12 volt, 9 amp hour (minimum) battery.
- Wire (see Electrical Schematic, page 4.)

Location of the Dexter DX Series brake actuator is at the discretion of the trailer manufacturer or owner. When selecting the location, the following items should be considered:

1. The shorter the wiring between the unit and the electrical power source, the smaller the voltage drop.
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 Dexter DX Series brake actuator is powered from the electrical system on the tow vehicle. In order for the unit to function properly, it must have adequate electrical power (see Electrical Schematic, page 4.)
5. The Dexter DX Series brake actuator should not be placed in an area where it is susceptible to damage from trailer loads, road

## Introduction

**CAUTION**

**Dexter DX Series systems should only be installed by a qualified technician.**

This manual has been provided to guide you through the process of installing, operating, and maintaining your Dexter DX Series electrically controlled hydraulic brake actuation device (also referred to as DX Series brake actuator). This electrically powered unit has been designed and manufactured to give safe, reliable power to your hydraulic trailer brakes.

**CAUTION**

**Please review and understand all installation manual instructions before beginning installation. Many steps are sequential so it is necessary to complete all elements as instructed.**

debris, or from being stepped on. Failure to protect the actuator from damage can cause the unit to malfunction and void the Dexter warranty.

Mounting consideration should be given to the following:

1. The unit must be level, with the filler neck up.
2. It is the responsibility of the installer to provide necessary fasteners for attachment of the actuator to the trailer.
3. Mount unit where it will not be submerged in water.
4. Mounting near the hitch is preferred. Do not mount near the trailer axles or rear of the trailer.

## CAUTION

**Always use new DOT 3, DOT 4, or DOT 5 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.

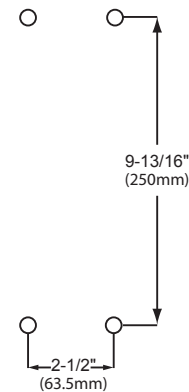
## CAUTION

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

Connect the trailer brake lines to the actuator as follows:

1. Remove the rubber or plastic plug from the 3/16" inverted flare brake port.
2. Brake line must be compatible with DOT 3, DOT 4, or DOT 5 brake fluid.
3. Flush existing brake system and lines until they are free of any contaminants using DOT 3, DOT 4, or DOT 5 brake fluid prior to connecting to the Dexter DX Series brake actuator.
4. Connect the brake line from the trailer brakes to the 3/16" inverted flare fitting on the actuator. Do not tighten the 3/16" brake line adapter more than the 22 Ft. Lbs. used at factory installation.

### Bolt Mounting Pattern

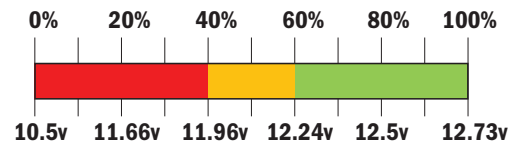


## Electrical Wire Colors and Function

## CAUTION

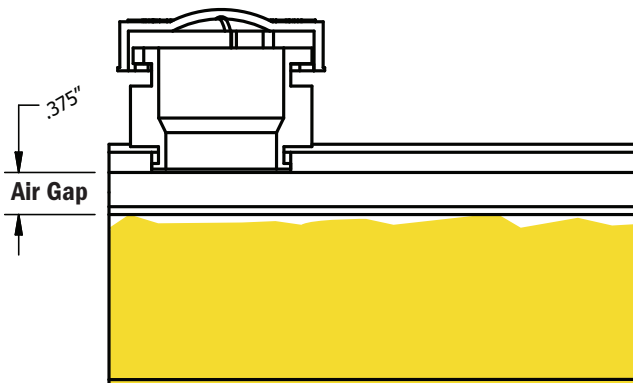
**Only use a maintained battery with no less than 12.5v (see battery chart below). Testing with a battery charger or other device will cause loss of function.**

% Battery Charge Chart



## CAUTION

**Do not overfill fluid reservoir. Fluid will expand. Max fill level is 3/8" below bottom of filler neck.**



Fill the unit with DOT 3, DOT 4, or DOT 5 brake fluid, while maintaining a 3/8" air gap below the filler neck.

## CAUTION

**Undersized wire will increase electrical resistance and will prevent proper operation of this unit.**

**BLACK** – 30 amp 12 volt supply from tow vehicle\*

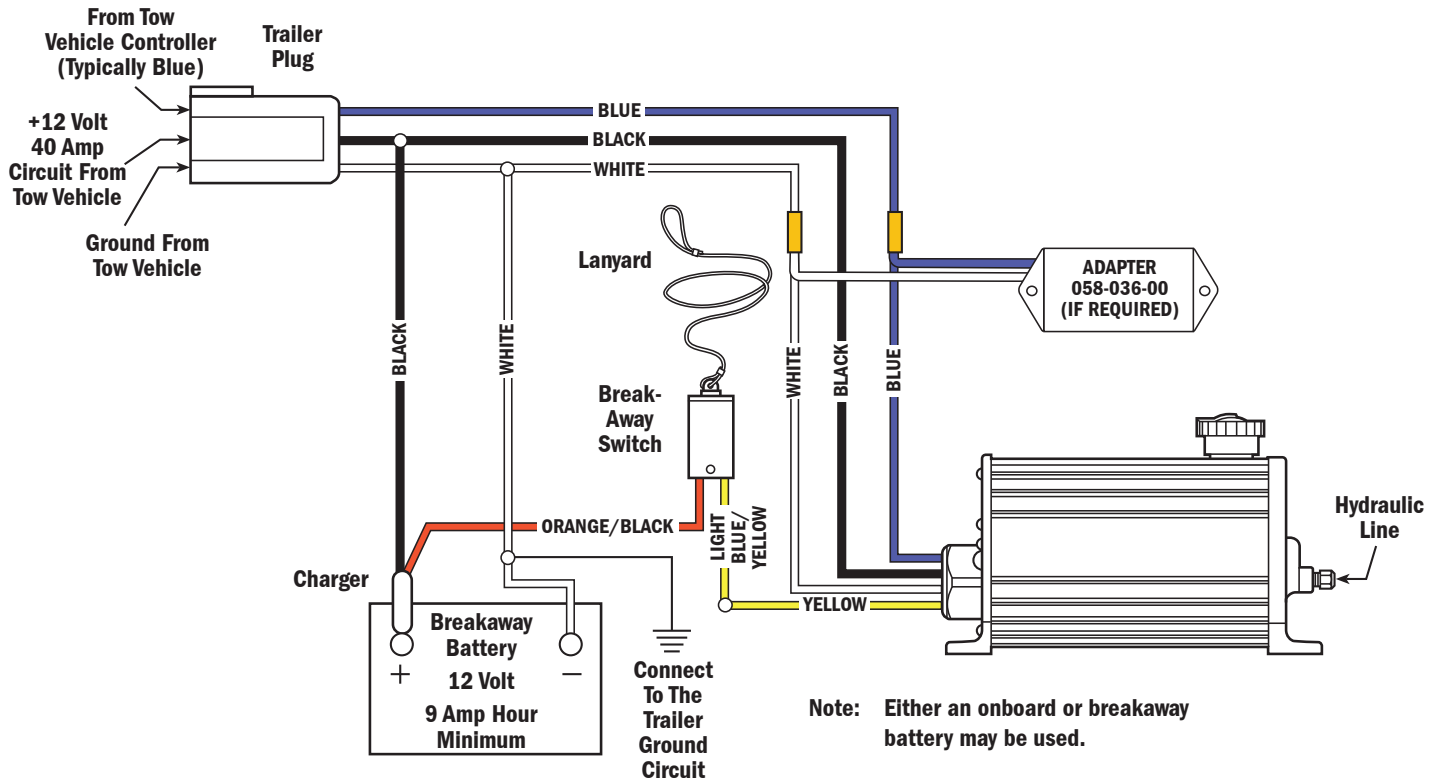
**BLUE** – Output from electronic brake controller in tow vehicle

**WHITE** – Trailer and tow vehicle ground

**YELLOW** – Cold side of breakaway switch

It is important that wire lengths for the BLACK power lead and WHITE ground lead be no longer than 25 feet from the DX Series brake actuator to the supply power (i.e. on board trailer battery or the tow

## Electrical Schematic



vehicle battery). The DX Series brake actuator needs to be located as close as possible to the battery near the front of the trailer. **DO NOT mount the DX Series brake actuator near the trailer axles or rear of the trailer.** Having the wire length longer than 25 feet may cause issues with performance and the normal operation of the unit.

It is critical that the BLACK power lead and WHITE ground lead from the tow vehicle to the input of the actuator are sized and properly terminated (i.e. dedicated 30-40\* 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.

**\*Low temperature applications below 0°F require a 40-amp circuit.**

The blue wire from the electric brake controller is connected through the trailer plug to the blue wire on the actuator. The yellow wire from the DX Series brake actuator is connected to the cold side of the trailer emergency breakaway switch. **Under no circumstances should the actuator blue wire and the DX Series brake actuator yellow wire be connected together, nor should the blue wire ever be grounded.**

The white wire is connected to the trailer ground and also connected to the tow vehicle ground through the trailer plug. The black wire is connected to the +12V power line from the tow vehicle. The black wire can also be connected to large on-board batteries. The black wire is connected to the small breakaway battery only through the black wire on the charger of the breakaway battery. When connecting and disconnecting the black wire, sparking may occur. This is a normal occurrence.

## Electrical Installation Requirements

**Requires an Electric Brake Controller** – The Dexter DX Series brake actuator is intended to be used with an electric brake controller in the tow vehicle. The unit will operate with a wide variety of controllers but provides optimum performance when used with a Dexter electric brake controller. The electric brake controller must have an output capacity of at least 5 amps for proper operation of the Dexter DX Series brake actuator. Although compatible, time based brake controllers are not recommended.

### CAUTION

**It is the responsibility of the end user to ensure that their electric brake controller is compatible with the Dexter DX Series brake actuator. Dexter attempts to provide compatibility with most controllers available, but is unable to anticipate design changes that might be introduced by the various controller manufacturers.**

**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. 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 9 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 at all times in order to function properly. Use only those breakaway battery kits that include a charging device. Do not attempt to charge the breakaway battery directly from the tow vehicle without the appropriate charging device.

## Test Electrical Operation

1. Attach the trailer to the towing vehicle. Do not connect trailer plug to tow vehicle until step #2 is completed.
2. Pull the breakaway switch. The Dexter DX Series brake actuator should run. If the unit does not run, check breakaway 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. This is normal.
3. Connect trailer plug to tow vehicle.
4. Turn the ignition switch on and turn the electric brake controller on. Inertia type controllers will often require the vehicle to be moving in order for the Dexter DX Series brake actuator to come on by means of the brake pedal. If the unit does not run, check system wiring.
5. Apply the controller manual slide. The Dexter DX Series brake actuator should run and brake lights come on.

## CAUTION

**Testing the Dexter DX Series brake actuator 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.**

6. Some brake controllers require a certain speed to actuate the trailer brakes via the brake pedal. This occurrence will not produce a high enough signal voltage to actuate the trailer brakes when the vehicle is at a standstill. Please contact your vehicle/controller manufacturer for further details.
7. When the tow vehicle brakes are released, the unit may continue to run for a few seconds.

## Bleeding and Brake Adjustment

1. It typically is much easier to bleed the brakes with two people working together.
2. Special care must be taken to insure that the Dexter DX Series brake actuator 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.

## CAUTION

**Failure to properly adjust the brakes on trailers equipped with drum brakes can result in slower response time of the Dexter DX Series brake actuator.**

5. Install plastic tubing onto the bleeder screw of the wheel cylinder/caliper farthest from the Dexter DX Series brake actuator. If towed vehicle has multiple axles, always start with the rear axle first.
6. Immerse the free end of the plastic tube in a clean clear container partially filled with brake fluid.
7. Open the bleeder screw one half turn on the wheel cylinder/caliper.
8. To activate the Dexter DX Series brake actuator, turn the ignition switch on and use manual slide on the brake controller.
9. 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 Dexter DX Series brake actuator without adequate brake fluid in the reservoir as it may damage the unit and void the warranty. Check all bleeder screws to ensure that they are securely closed and do not leak.**

10. Tighten the bleeder screw, turn off the Dexter DX Series brake actuator, and remove plastic tubing from the bleeder screw. Bleeding of the wheel cylinder/caliper is now complete.
11. Refill the Dexter DX Series brake actuator with brake fluid.
12. Continue the above process (steps 5 through 11) on the next farthest brake away from the actuator.
13. Repeat these steps until all the brakes have been bled.
14. New trailers with disc brakes should be bled at least twice. Any air in the brake system will cause brake delay with an E/H brake actuation system.

## CAUTION

**Ensure no debris enters the fluid reservoir tank while the cap is removed. Failure to do so may have an effect on product life.**

## Sleep Mode

DX Series E/H Actuator will automatically go into sleep mode after 5 hours of not receiving input from blue (brake controller) or yellow (breakaway switch) wire to conserve power consumption on trailer battery. The sleep mode timer will reset if the power/ground is removed. The DX Series E/H Actuator will wake up from this sleep mode on the first brake request signal from the tow vehicle's brake controller (blue wire). Using the breakaway switch to wake up the DX Series E/H Actuator from sleep mode is not recommended.

Disconnect battery from DX Series E/H Actuator if trailer is going to be stored for longer than one month.

## Electric Controller Unit Testing/Adjusting

1. Adjust the gain setting on the electric brake controller to a mid range setting.
2. Drive vehicle at 10 to 15 m.p.h.
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 electric brake controller and retest.
4. Repeat this process until the brakes respond appropriately.

### **CAUTION**

**The appropriate pressure setting will vary depending on the weight of the load being transported on the trailer, weather conditions and road conditions. The "Testing and Adjustment of Electronic Controller Unit" procedure should be repeated each time the trailer is used. Failure to properly adjust the Dexter DX Series brake actuator may result in poor brake performance and could result in serious or fatal injuries and/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. Verify that the trailer and tow vehicle are wired according to the electrical schematic shown in "Electrical Requirements".
2. Cycle power to reset the unit. If the trailer is equipped with an on-board battery, disconnect the black power wire to the DX Series E/H Actuator for 15 seconds and reconnect to the power source. Re-test unit. If the unit does not have an on-board battery, please disconnect the unit from the tow vehicle and then reconnect after 15 seconds.
3. Re-bleed the trailer brakes. Any air in the trailer brake system causes brake delay.
4. If the trailer is equipped with drum brakes, re-adjust the drum brakes to the trailer manufacturer's recommended running clearance.
5. Trailer wiring that is too small can cause slow response (see section on Electrical Installation Requirements).
6. Slow response can be caused by brake line restrictions. The trailer brake lines must be at least 3/16" in diameter. Steel tubing must be used as much as possible. Using too much flexible hose may cause slow brake response.
7. 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.
8. Detach all wires from the Dexter DX Series brake actuator leaving the blue, black, white, and yellow wires loose. 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.
9. Using a 12 volt battery, connect the white wire to the negative (-) terminal of the battery.
10. Connect the black wire to the positive (+) terminal of the battery and the DX Series brake actuator will click once. The motor should not run. If the motor runs, the DX Series brake actuator may be defective.
11. Leave the white wire connected to the negative (-) terminal of the battery.
12. Connect the blue and black wires together to the positive (+) terminal of the battery.
13. The motor should run and the unit should pressurize. If this does not occur, the unit may be defective.
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 pressurize. If this does not occur, the unit may be defective.

17. If the unit checks OK, reconnect the wires leading to the trailer plug and repeat steps 8 through 14 at the trailer plug. If you do not get the same results as before, the problem is in the trailer wiring or the electronic brake controller.

**Using the breakaway system to troubleshoot a unit that is not operating correctly**

1. With a fully charged breakaway battery and trailer plug disconnected, pull the breakaway switch on the trailer.
  - a. If the unit runs and builds pressure, the breakaway system is functioning properly.
  - b. If the unit runs and builds pressure when the breakaway switch is pulled but will not function under normal operating conditions, the problem most likely is a defective electric brake controller or defective wiring between the tow vehicle and Dexter DX Series brake actuator.
  - c. If the unit runs but will not build pressure when the breakaway switch is pulled, the Dexter DX Series brake actuator may be malfunctioning.
  - 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 breakaway switch or the breakaway wiring is defective.
2. After completing the above steps, reset the breakaway switch and reconnect the trailer plug.

**Trailer brakes too aggressive**

1. Reduce the gain setting on the electric brake controller.
2. Check brake adjustment.

**Trailer brakes not aggressive enough**

1. Increase the gain setting on the electric brake controller.
2. Check brake adjustment.

### Aftermarket Kits

Description	Kit Number
DX Series brake actuator Fill Cap & Gasket	K71-685-00
DX Series Brake Actuator Gaskets	K71-688-00
DX Series Compatibility Adapter	K58-036-00

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**NO PART OF THIS MANUAL MAY BE REPRODUCED WITHOUT DEXTER'S PERMISSION. ALL PART NUMBERS, DIMENSIONS AND SPECIFICATIONS IN THIS MANUAL ARE SUBJECT TO CHANGE WITHOUT NOTICE.**

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# INSTALLATION INSTRUCTIONS

## Brake Line Kits

### CAUTION

- Flexible brake hoses must allow the suspension to travel from the fully loaded position through its full possible range downward, and any potential farther travel down into a pothole and any rebounding travel upward. A damaged or broken brake hose can cause immediate loss of braking on all wheels.
- Ensure that all brake lines, whether steel or flexible material, are routed and secured to prevent any possibility of chafing, material fatigue in any way, or any contact with moving items. A damaged brake line or hose can burst under pressure and cause immediate braking loss on all wheels.
- DOT-3 is the recommended fluid for all Dexter hydraulic braking systems. DO NOT USE petroleum-based hydraulic fluid in these lines or any Dexter braking system; petroleum-based fluids will cause a system failure.
- Wear safety glasses and gloves when handling brake fluids. If working on an existing trailer, properly drain any existing brake fluid from the system and dispose of it per state and local regulations. Never reuse brake fluid.

Installation, maintenance, or repair on any trailer should be performed only by qualified persons knowledgeable of the system. Also, there are numerous variations in procedures, techniques, tools, and component choices to adequately address each unique trailer design. This document cannot possibly anticipate all such variations and provide advice and caution as to each. Accordingly, anyone who undertakes to construct, 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 selected.

### CAUTION

**Do not lift or support the trailer on any part of the axle or suspension system. Never go under any trailer unless it is securely supported on jack stands rated for the load. Improperly supported vehicles can fall unexpectedly and cause serious injury or death.**

Trailer hydraulic braking systems all include an actuator mounted at or near the front of the trailer that generates between 1,000 and 1,600 lbs. per square inch of brake fluid pressure to operate the brakes. The brake fluid distribution system consists of steel brake lines and flexible brake hoses to transfer brake fluid under pressure to each wheel's brakes. The brake line system must resist that high pressure, the effects of vibration and the elements, and provide sufficient flexibility to allow the axles or wheel ends to move up and down. Please refer to figures on the last page for brake line layout.

### Connecting to the trailer brake actuator:

Actuators are designed explicitly for drum or disc brake applications. Make sure you have the correct actuator for your brake type. Severe operational problems can arise with the incorrect matching of brake type and actuator.

If installing a pump on your trailer, mount in dry, protected, visible area with clearance for airflow as close to the front of the trailer as possible according to the manufacturer's instructions.

The hydraulic brake line system length exiting the pump is unlimited. Conversely, the tow vehicle connection's wiring length supplying the Electric/Hydraulic pump should be as short as possible. An air/hydraulic or electric/hydraulic actuator pump may have either a steel brake line or brake hose with a 3/16" inverted flare male end installed directly into the pump's outlet. A steel line should include some flexibility (usually, a "Z" shaped change of direction in the line near to the pump is sufficient) to allow the pump to be unbolted and removed for service if later needed.

If you add a surge brake actuator to your trailer, remove your coupler from the front of your trailer and bolt the brake actuator coupler in its place per the actuator manufacturer's direction.

Short flexible brake hoses are required to connect to the actuator master cylinder on the Dexter DX8.0, DX12.5, and DX20EX actuators. Their master cylinders are on spring-loaded mounts, and their master cylinder thus moves relative to the actuator outer case in operation. All other Dexter actuator models may have a steel brake line or a brake hose with a 3/16" inverted flare male end installed directly into the inverted flare output fitting of the actuator master cylinder. If a steel line, it should be routed to allow some flexibility to enable the actuator to be unbolted and removed for service if later needed. Usually, a "Z" shaped change of direction in the line near to the actuator or a pigtail coil at the far end of the line is sufficient).

If the surge brake actuator or brake system has an electric backup solenoid installed, use a wrench or other tool on the solenoid's brass end where the brake line enters to stabilize the solenoid while tightening the brake line(s) into it. The black electric solenoid coil itself is not designed to resist tightening torque and can be distorted to the point of failure if it is gripped or twisted with a wrench or a twisting force is applied to it.

If the actuator master cylinder has an orifice connector mounted at its exit, DO NOT remove or modify the orifice connector to install the trailer main brake line. The orifice should connect directly to the main brake line to provide proper fluid flow characteristics for the system.

If the main brake line exiting the actuator runs in a tubular trailer frame, include swivel fittings at one or both ends to ease installation and avoid installing any joints in the line inside the tube.

If the trailer has a folding tongue section, a flexible brake hose is required. Ensure that the hose length selected will allow the tongue to be fully opened without stretching the hose but not be too long and allow the hose to pinch, kink, or get caught in the tongue mechanism when it is closed.

## Brake lines, hoses, and connecting fittings installation:

The brake line system should be installed considering the long-term effects of vibration, component movement, and environmental exposure.

The brake line system layout and component selection must allow for 4.5" of axle of suspension travel relative to the trailer frame. Flexible hoses are required anywhere in the system where components move relative to one another.

Select the brake line lengths and route them to minimize the system's number of connections or joints. It is permissible to:

- Run the main brake line down the trailer frame on one side only and then route the lines across a trailer cross member or axle to reach the other side of the trailer, or:
- Run two main brake lines down each side of the trailer frame, and then plumb individual line drops to the axle wheel ends.

For the best braking performance, use rigid steel tubing for the majority of the system length, using flexible hose when necessary. Braking performance is best if flexible brake hoses in the system are 24" or less length each. On heavy, long trailers with three or more axles, Dexter recommends a ¼" steel main line from the actuator for the best brake response.

Dexter recommends that on trailers with concealed brake fluid distribution joints, that portion of the system be leak tested before it is hidden. The best approach is to leak test the entire system after the brakes are installed, but before the brake lines are concealed and before connecting the actuator. To leak check the system, use 50-100 pounds per square inch of dry shop air to pressurize the system. Then close a tightly sealing valve on the test air supply and use a calibrated air pressure gauge to see if the system air pressure drops, indicating a potential leak in one or more joints in the system. This initial air test gives the added benefit of pre-adjusting the disc brake calipers/pads to their operating position when the air pressure is applied.

If it is necessary to add any additional brake lines, fittings, and hoses not supplied by Dexter to complete the system, they must be rated for 3000 pounds per square inch pressure and meet FMCSA FMVSS 106 requirements. Dexter recommends 3/16" steel brazed double wall tubing per S.A.E. J527 for use with all our actuators and brake products. Use 45° double-flare tube ends for connections per S.A.E. J533.

## CAUTION

**NEVER CUT ANY BRAKE LINE TUBING!! Brake line tubing cannot be patched or hand flared and comply with D.O.T. approved systems. Never use any copper tubing for any part of a hydraulic brake system. Ensure connecting fittings have compatible threads/seats, incorrect combinations will leak. Do not use any thread sealant on inverted flare type brake line fittings.**

## Routing and mounting steel brake lines

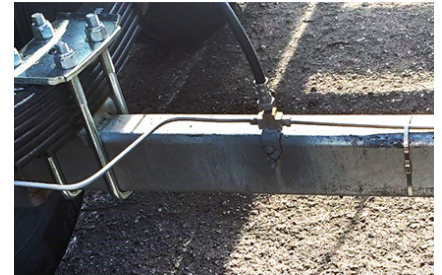
Route brake lines within the trailer chassis in a manner that protects them from damage by road debris or low ground clearance and secure all tubing for maximum protection from pinching, vibration, corrosion, or road hazards. Secure the brake lines/hoses to the trailer frame with sufficient clips or attachment devices to support them for the application. **Do not drill axle tubes to install brake line attachment fasteners.**

Brake lines that horizontally cross an axle tube or trailer chassis frame rail shall be installed on the upward or rearward facing side of the axle tube or frame rail to minimize the possibility of road impact damage.

Brake lines and hoses should never be routed on the bottom of trailer chassis frame rails where road debris or any later lifting or supporting of the trailer with a jack or jack stands can damage them.

Brake lines should be secured every 36" on a trailer frame to avoid vibration damage. If a brake line is crossing an axle tube, secure the line to the tube every 18 to 24".

Dexter recommends any "T" or cross fittings be secured to the trailer frame in a way that prevents vibration from loosening the brake line joints at the fitting. Most of these fittings either have an integral round hole to secure the "T" to a trailer frame or axle tube, or the fitting may come with a separate bracket. **Do not drill axle tubes to install brake line attachment fasteners.** It is acceptable to run a screw or small bolt through the mounting holes in the "T" fitting or bracket. The "T" fittings may be secured to a cross axle tube by spot



rosette welding the hole in the bracket to the axle tube or by stud welding an external fastener to the axle tube. The "T" fittings and any cross-axle brake lines can be secured using UV-resistant zip ties, stainless steel zip ties, or stainless steel hose clamps. If securing brake lines with zip ties, the maximum recommended tie spacing is 24". **Do not over tighten or crush brake lines if using hose clamps or zip ties to secure.**

Protect brake lines and hoses where they cross through frame and body members, near moving parts, etc. If a steel or rubber brake line passes through a hole without a grommet or other anti-chafing material, the line or hose must be secured so that it is centered in the hole and cannot flex enough to touch the hole's edge. Otherwise, use a rubber grommet or similar cushioning device to prevent contact between a brake line/hose and a nearby item or a surrounding hole. In that case, the grommet design should be that it remains in place permanently under the vibration conditions of the trailer, and the grommet material shall not deteriorate over time due to the elements.

Use a six-sided line wrench or crows-foot wrench where possible on hex brake line fasteners to avoid rounding them off. When tightening two lines that go into the same union or joining fitting, hold the line on the opposite side of the fitting with a second wrench to avoid twisting lines or loosening fittings downstream in the system.



Apply the tightening torque to the brake lines/fittings in a smooth and controlled motion. The tightening torque for a 3/16" inverted flare fitting is:

- If one or both fittings are brass: 60-75 in.-lbs., 5 ft.-lbs. or just snug using a 6" long line wrench.
- If both of the fittings are steel, or a steel fitting inserted into a cast iron fitting: 120 in.-lbs. or 10 ft.-lbs..
- ¼" steel inverted flare fittings tightened to 120 in.-lbs or 10 ft.-lbs.

Air bubbles will tend to rise to the highest point in the brake line; therefore,

route the brake lines to run as level as possible relative to the trailer frame to avoid high spots, which may trap air and make the system harder to bleed. It is acceptable to select a rigid brake line slightly longer than needed and use up the line's excess length by installing a pigtail coil in the line. On the other hand, selecting an excessively long rigid line that requires a higher number of or large diameter shortening coils can create multiple high spots that trap air bubbles during bleeding, thus increasing overall installation time.

Do not allow any debris to enter the brake lines/hydraulic system when installing the brake lines. For example, it may be necessary to cover the brake line ends with masking tape or use temporary line end caps while sliding a line inside a trailer frame rail.

## CAUTION

**Kinked and/or damaged brake lines can cause fluid flow restriction or later fatigue cracks resulting in poor braking or no brakes at all.**

When bending steel brake line tubing, always use proper bending tools to assure sound connections and prevent kinks in the tubing. Tubing bends of radii less than 6" require the use of tools similar to those in the picture.

### Routing and mounting flexible brake hoses

A flexible brake hose is required wherever a trailer or braking component moves relative to a fixed brake line. **Do not attempt to make a flexible metal brake line section to allow repeated component motion by pigtail coiling a steel brake line.**



Brake hoses have a stripe to show if the hoses are twisted during installation. Use the hose end's swiveling feature to ensure the hose is installed and tightened with minimal twist. When installing a male/female hose, hold the hose's female end with a 5/8" line wrench to avoid twists.

If a brake hose includes an integral 90-degree bend at its male end, orient its 90-degree bend so the hose's rubber portion is pointing as directly as possible to the hose's female end before tightening the male hose end swivel fitting.

Ensure the brake hoses allow at least 4-1/2" of suspension movement, with spring axle movement being approximately vertical and torsion axle movement in a radius. The hose installation shall be such that no portion of the hose can drop below the cross-axle tube elevation to avoid snagging on-road objects or obstacles. The hose installation shall prevent the possibility of contact between the hose and a rotating tire or wheel.

Most brake hoses with one male end and one female end have a feature on the female end that allows the female end of the hose location to be secured with a bracket and C-Clip. Where a brake hose is subjected to repeated flexing, any ends of that hose that connect to a metal brake line should be secured to a non-moving portion of the trailer. Some scenarios where hoses are subjected to repeated flexing are:

- The female end of a flexible hose is attached to a bracket on the trailer frame and the male end of the hose is attached to a moving wheel end or a moving cross axle tube.
- The female end of a flexible hose is secured to a stationary torsion axle mounting bracket and the male end of the hose is connected to a brake on the moving torsion axle end.

- If a flexible hose connects to a rigid steel brake line on either of its ends, anchor both hose ends to avoid repetitive motion in the rigid lines that could fatigue them.

### Connecting to the brakes at the trailer wheels

Follow the trailer axle/brake manufacturer's instructions for installing brake assemblies on the axle ends. Dexter recommends brakes on all trailer wheels.

## CAUTION

**When installing the brake system or any part of servicing, never let a brake caliper, drum brake assembly, or axle ever hang by its own weight on a flexible brake hose. If this happens, replace the hose with a new one.**

Install calipers or brakes with the bleeder screw on the top and the brake line inlet at the bottom.

Fixed piston style brake calipers and hydraulic drum brakes mounted on a spring axle may have rigid metal lines routed along the axle tube directly to them. If so, the rigid metal line on the axle should have a radiused "Z" bend in it near the brake to make the line flexible enough to remove the caliper or brake assembly for service. If a floating piston style caliper is in the same spring axle arrangement, the "Z" or a pigtail flexibility loop in the rigid line must additionally allow the caliper body to move outward a minimum of 1/2" as the brake pads wear.

A flexible brake hose is the required connection to all drum or disc brakes on torsion axle ends, and is recommended for all floating piston style calipers on spring axles.

Many Dexter disc brake calipers have a banjo style brake fluid inlet that may be positioned at various inlet angles to allow the brake line to enter from an optimum direction. If Dexter disc brake calipers came without fittings, the fittings can be added at brake system installation. These inlets have a hollowed-out banjo bolt that clamps a brass inlet fitting between two copper washers. In the case where an existing "banjo style" brass inlet fitting must be repositioned from its original tightened position to a new inlet angle during installation, always replace the original copper washers and then re-torque the banjo bolt to the caliper manufacturer's specification. An example single inlet fitting arrangement compatible with Dexter calipers with a 7/16-20 threaded inlet is shown on the next page.

### Initial Road Test of Trailer

After installing the actuator, brakes, and brake lines as described above, proceed immediately to the "BRAKE FLUID FILLING AND BLEEDING" instructions in the applicable brake actuator service manual.

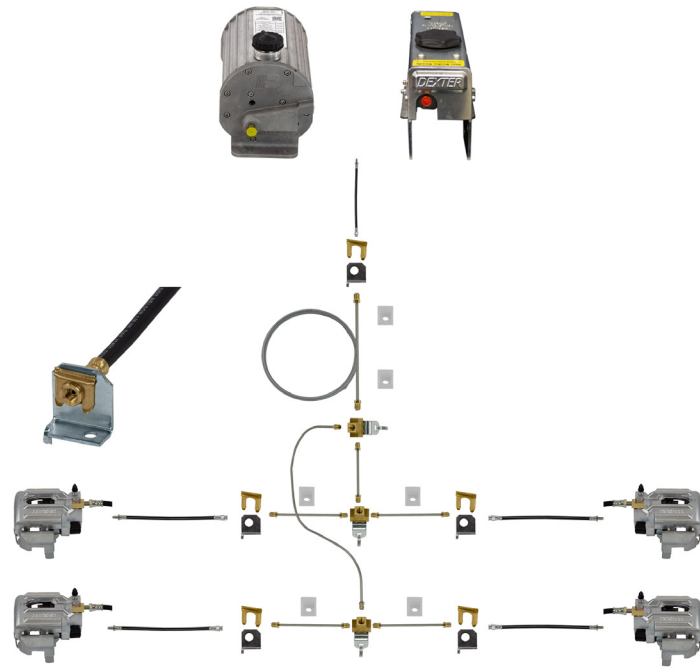
## CAUTION

**Failure to fill the system with brake fluid and bleeding air out of the system promptly after installation may result in brake actuator or system corrosion and cause brake failure.**

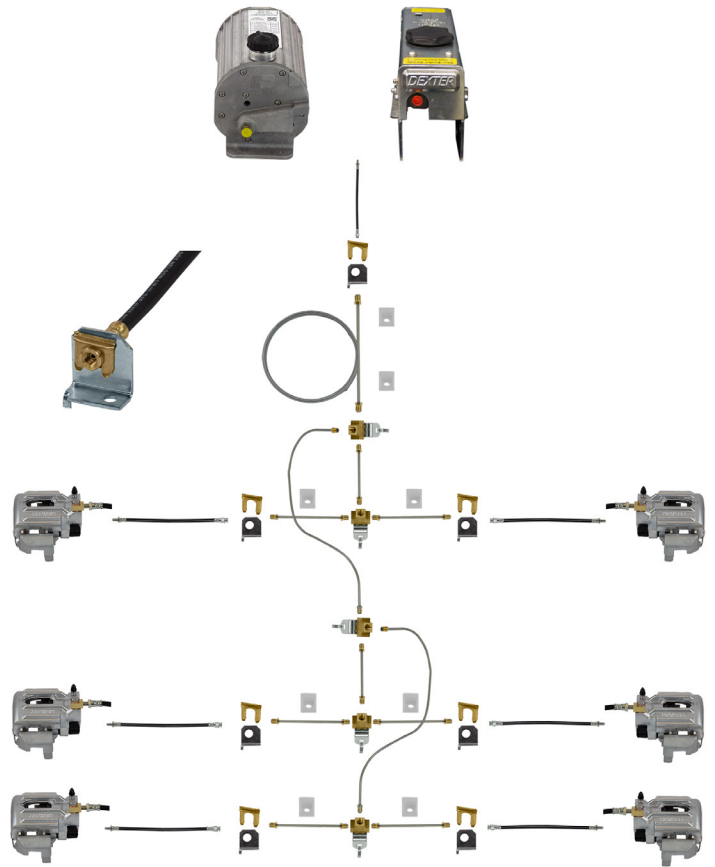
Check each system joint and brake hose for leaks after the system is initially fully pressurized with fluid and after bleeding all the system's air.

Test the unit to confirm that the trailer brakes are operating correctly in a safe location before resuming regular travel. After the first few stops and the brakes have seated, check the brake fluid in the actuator reservoir and top off the fluid again to the proper level. Check for a system leak if brake fluid runs out or needs added more than once.

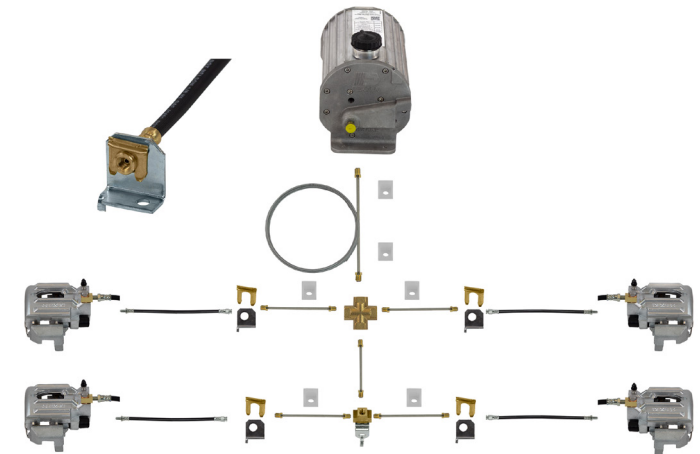
**Figure 1: Tandem Axle Brake Line using T fittings**



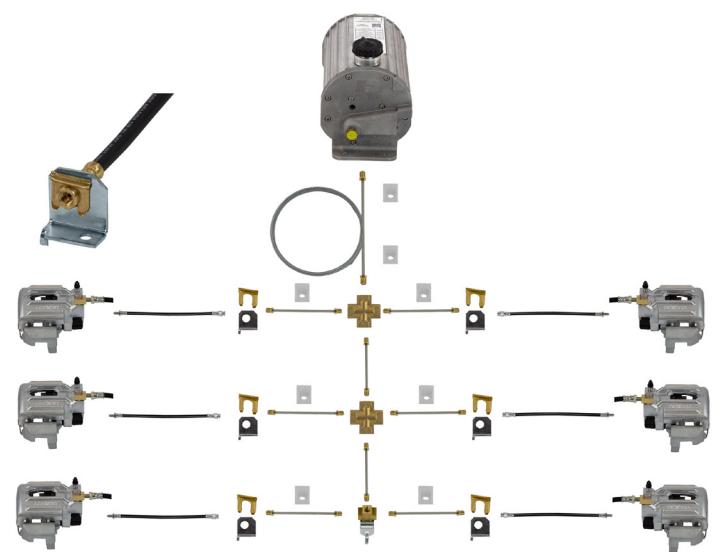
**Figure 2: Triple Axle Brake Line using T fittings**



**Figure 3: Tandem Axle Brake Line using cross fittings**



**Figure 4: Triple Axle Brake Line using cross fittings**



AP Numbers (if required)  
 Fitting: 034-323-00      Bolt: 007-307-00  
  
 Washer: 005-169-00

Note: Typical torsion axle trailer diagram shown. The diagram for a leaf spring axle is similar except that any brake line exiting a trailer frame leading to a leaf spring axle tube or brake shall be a flexible hose.