SURGE ACTUATORS

HYDRAULIC SURGE BRAKE ACTUATION

INSTALLATION AND SERVICE INSTRUCTIONS

DX20EX Actuator

⚠ CAUTION

DO NOT submerge actuator. To minimize the damaging effects of corrosion on a braking system used under corrosive conditions, actuator should be externally flushed after use with a high pressure water hose. Lubricate all moving parts after the unit has dried. Failure to properly and adequately clean, grease, and maintain the actuator can cause failure and result in serious injury.

This actuator arrives completely assembled and ready to install. Only paint a disassembled outer member. Do not paint other components of the actuator, as this can cause failure.

RATED CAPACITY AND TONGUE LOADS VARY. PLEASE REFERENCE THE COUPLER CASTING AND TOP PLATE OF ACTUATOR FOR CAPACITIES.

When used with disc brakes or non free-backing brakes, a solenoid backup valve will allow the trailer to be backed without activating the brakes. Do not block actuator movement in and out to back up the trailer. Failure to remove the blocking device will prevent all trailer braking.

1. Welding is the perfected mounting option. If not welding, bolt the actuator to the tongue using grade 5 or better mounting hardware. Light weight tongues require spacer tubes inside for reinforcement when bolting. Tighten mounting bolts to 80 ft.-lbs.
2. Install brakes and brake lines per manufacturers instructions. DO NOT remove or modify the orifice connector at the rear of your actuator's master cylinder. It connects directly to the brake tubing and ensures proper fluid flow characteristics. **FLEXIBLE BRAKE LINE HOSE MUST BE USED** to connect the orifice connector at the master cylinder to the hydraulic brake line on the trailer. This is necessary because the master cylinder is spring mounted to provide overload protection and thus moves relative to the outer member.

CAUTION

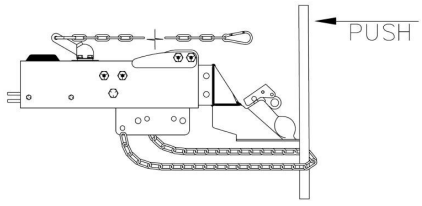
Incorrectly filling or bleed the brakes can result in brake failure. Only use fresh brake fluid from sealed container. DO NOT reuse fluid. After filling and bleeding, remember to refill the actuator. Failure to maintain an adequate fluid level may cause failure.

3. Fill and bleed the brake system per manufacturer's instructions.
4. Fill master cylinder to 3/4 full with DOT-3 brake fluid. DO NOT allow brake fluid to contact painted surfaces since it will damage the finish. Wipe up any spills immediately and wash the area with water.
5. When the air bubbling stops inside the master cylinder, install a bleeder hose on the bleeder screw of the first wheel cylinder or disc brake caliper to be bled. Be sure to use the bleeder screw on top of the caliper. Start with the rear axle on tandem axle trailers. Submerge the other end of the hose in a glass container of brake fluid so that air bubbles can be observed. Open the bleeder screw one turn. Pull the breakaway lever completely forward or vertical and close the bleeder screw to prevent air from being pulled back into the system. Air trapped in the brake lines will greatly reduce your braking efficiency. Push the breakaway lever down to nearly flat position. Repeat this process until no more air bubbles are released with each stroke. Be sure to close the bleeder screw securely.
6. Repeat the bleeding operation at each wheel cylinder or caliper. During the bleeding process, replenish the brake fluid so the level does not fall below half full level in the master cylinder reservoir. When bleeding is complete, fill the reservoir to within 3/8" of the top. Install the filler cap securely. To reset the breakaway lever, loosen the front two bolts. Position the breakaway lever and rotate the two breakaway locks to their original operating or ready position. Install the two rear bolts and lock washers and torque all four bolts to 90-120 ft.-lbs.

System Test

This procedure only indicates if the trailer brake system is functional. Regular inspection, maintenance, and adjustments of all brake system components are still required to ensure brake operation and performance.

1. Move the trailer to flat, level ground, pulling FORWARD several feet before parking. This forward motion will ensure trailers equipped with free-backing brakes are in their normal operating mode. Chock wheels, allowing for small testing motion. Disconnect the trailer from tow vehicle and jack the trailer's tongue until it is horizontal.3
2. Hook the trailer's safety chains (NOT the actuator's breakaway cable/chain) together to form a loop, which is centered below the actuator's coupler.
3. Place a sturdy board, into the chain loop below the coupler. The board should be 4 feet or longer so it will extend several feet above the actuator. Keep the end of the board a few inches off the ground, and position it to press against the front end of the actuator's coupler.



4. Stand in front of the trailer and face the rear. Apply force to the top end of the board to use it as a lever. Press back towards the rear of the trailer. The board will begin moving the inner member into the actuator's outer member.
5. Keep pressing the top of the board to stroke the actuator and its internal master cylinder. If the trailer brake system is operational, the brakes will apply and keep the trailer from rolling away from you. Disc brakes and properly adjusted uni-servo or duo-servo type brakes will prevent you from moving the trailer back more than a few inches.

Free-backing type brakes will initially provide rolling resistance, but continued force on the board will switch them into free-backing mode, and you'll be able to move the trailer backwards.

6. If stroking the actuator causes the trailer to roll away from you freely or with only minimal resistance, the brakes are NOT applying properly. Evaluate the brake system to determine cause. Corrective action MUST be taken before the trailer is used.

Hitching Trailer

Attach the actuator's breakaway chain S-hook securely to one of the tow vehicle hitch safety chain connection points. Confirm that the trailer's safety chains are adjusted relative to the actuator's breakaway chain as noted above. DO NOT loop the breakaway chain around a bracket and hook it back onto itself.

⚠ CAUTION

Safety chains must be used. The length MUST be set short enough so the actuator's breakaway cable is NOT pulled if the coupler separates from the tow vehicle's hitch but remains connected by the safety chains.

Resetting the Breakaway Lever

The pressure in the system may cause the lever to snap back quickly. Keep hands and fingers clear as you reset the breakaway mechanism.

⚠ CAUTION

DO NOT use breakaway systems as a parking brake.

1. Carefully loosen the brake line fitting going into the actuator. After the pressure is gradually released, re-tighten the fitting.
2. Remove the two rearward bolts, one located on each side of the breakaway lever. These two bolts hold down the breakaway locks. Loosen, but do not remove the two remaining bolts. This will allow the two locks to be swung aside and the lever can be pushed back into its resting position. Rotate the breakaway locks to their original positions and torque the four bolts to 90-120 ft.-lbs.
3. Before towing, check that the breakaway lever and chain are properly positioned.

⚠ CAUTION

An incorrect lever or chain position may cause the trailer brakes to drag and overheat, or may keep the brakes from being applied in a breakaway situation. After any usage of the breakaway mechanism, either real or accidental, check all system components for damage. Replace any damaged items with genuine Dexter service parts.

Pre-Towing Check List

- Check that the brake fluid reservoir is 3/4- full of DOT 3 brake fluid. Check for leaks and repair as required.

⚠ CAUTION

Use only fresh brake fluid from sealed container. DO NOT reuse fluid. Failure to maintain an adequate fluid level may cause brake failure.

- Examine the actuator for wear, bent parts, corroded/seized parts, or other damage. Have the affected components replaced with genuine Dexter service parts. Check to determine that the actuator mounting bolts are torqued to 80 ft.-lbs.
- Test the actuator and brake function as previously described. Actuator travel over 1" indicates that the brakes need adjustment. Adjust the brakes according to manufacture instructions if needed. There are no adjustments on the actuator.
- A film of grease on the hitch ball will extend coupler and ball life while eliminating squeaking. Wipe clean and renew film each time trailer is used.
- Before storage or after extended use, apply motor oil to the coupler components, lockout mechanism, and the three internal rollers to keep them moving freely and to prevent corrosion.

DX20EX Assembly

Over time, you may need to disassemble your actuator for service or to replace components.

1. Place the centering plate on the inner member and secure in place with two 5/16" bolts and lock washers.
2. Position the small diameter end of the damper to line up with the lower holes in the front of the inner member. Install damper pin and secure it with a cotter pin. Repeat the process with the second damper in the upper holes of the inner.
3. Insert a spacer tube into the edge of the top slot. Then slide the spacer tube through a rear roller with the chamfered edge out, then through the end of the damper, and finally through another rear roller with the chamfered edge out. Repeat the process for the bottom damper. Insert the third spacer tube into the back part of the long top slot.
4. Install the rear roller with chamfered edge out, a spacer, and the rear roller with the chamfered edge out. Carefully insert the inner member into the outer member maintaining the position of the components on the spacer tubes. Install a rear roller bolt into the front top spacer tube and start the castle nut on the bolt. Repeat the process for the bottom spacer tube.
5. Insert the final top bolt through the remaining spacer tube and start the castle nut. Run the castle nuts down lightly against the outer member and secure with cotter pins.
6. Take two front rollers and place in position in the front roller cover. Line up the holes in the roller cover and the outer member and thread the front roller bolt through the outer member, front roller cover, and the front roller. Secure the bolt with the lock washer and the nut. Repeat the process with the other roller bolt. Tighten nuts to 75 ft.-lbs.
7. Place the breakaway lever assembly in the rectangular opening in the top of the outer member. Install the weather seal with the slot forward on top of the brackets. Position the right and left breakaway locks and start the four 5/16" bolts with lock washers. Move the breakaway lever to vertical position and use a locking pliers to hold the breakaway locks close to the lever to assure the tabs will hold the lever in position. Torque bolts to 90 – 120 ft.-lbs. Spread the top of the breakaway locks to allow the breakaway lever to move down to normal operating position (about 45 degrees).
8. Remove the filler cap from the master cylinder and slide the assembly into the back of the outer member. Line up the front holes first and start two 5/16" bolts and lock washers. Repeat the process for remaining bolts and tighten all bolts. Then thread the filler cap in the master cylinder and install the cylinder cover.