

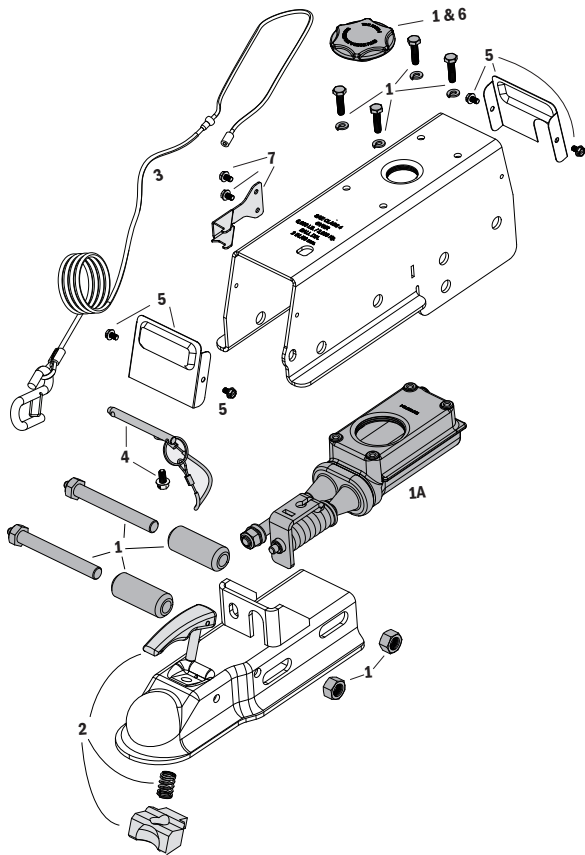


# SURGE ACTUATORS

HYDRAULIC SURGE BRAKE ACTUATION

## INSTALLATION INSTRUCTIONS

### Model 850E Actuator for Trailer Brakes



#### READ AND UNDERSTAND THE ENTIRE INSTRUCTION/ASSEMBLY PROCEDURE BEFORE INSTALLING YOUR BRAKES AND ACTUATOR.

The Model 850 works by the “surge” or “push” of the trailer toward the tow vehicle. This automatically synchronizes the trailer brakes with the tow vehicle axle brakes. When the trailer pushes against the tow vehicle, the actuator telescopes together and applies the force to the master cylinder, supplying hydraulic pressure to the brakes. The built in dampening shock absorber retards the telescoping shock against the hitch ball. Low levels of brake fluid will signal the tow vehicle operator to add brake fluid via coupler knocking.

Be sure to comply with regulations for brakes in your state. Brake laws sometimes are minimum standards and you may wish to add additional brakes to your trailer to meet minimum Gross Vehicle Weight Ratings (GVWR).

**⚠ CAUTION**

**Brake laws sometimes are minimum standards and you may wish to add additional brakes to your trailer. Read your tow vehicles owner’s manual on towing capacity and other towing recommendations before installing brakes or this actuator.**

The Model 850 Actuator is completely assembled and ready to bolt into place (Tongue sizes: 3”x3”, 3”x4” & 3”x5”).

1. Bolt the actuator to the tongue using 5/8” diameter, 4” long grade 5 bolts. Lightweight tongues, less than 10 gauge, require spacer tubes inside the tongue for reinforcement. Attachment strength should equal or exceed 1-1/2 times trailer G.V.W.R.
2. Hydraulic brake lines should be installed on the trailer as described in the installation manual supplied with the brakes. Note: Some disc brakes require the use of flexible brake lines at the connection POINT on the brake caliper. Follow brake manufacturer instructions.
3. Use only DOT-3 brake fluid in the Model 850 actuator. Use a pressure type brake bleeder to bleed brakes, following manufacturer’s instructions or manually bleed the brakes using instructions on page 3.
4. Check with your state motor vehicle department for laws concerning minimum trailer brake requirements. Some states may require brakes on all axles.
5. Road test trailer a short distance to activate the actuator several times. This will fill the reservoir of the master cylinders shock dampening system. Check fluid level again. Remember, low brake fluid levels will result in hitch ball knocking.
6. When testing is completed, make sure master cylinder is filled to approximately 3/8” below the top of the reservoir and filler cap is securely in place. Road test again to make sure brakes work properly.

#	TDE Part #	DX Part #	Description
1A	70561K - Disc	K68-531-00	Brake Master Cylinder Kit Includes: master cylinder and cap, 4 mounting screws with washers, 2 rollers, nuts and bolts
1B	11286	054-140-00	Disc Brake Solenoid
2	70411	068-562-00	Latch Kit Assembly, with Drop-N-Go™ Coupler, (serial numbers 17926 & below)
2	70412	068-563-00	Latch Kit Assembly, with Drop-N-Go™ Coupler, (serial numbers 17927 & above)
3	50317	068-738-10	Emergency Stop Cable (E-stop/ Breakaway)
4	50301	074-477-00	Safety Cable with stainless steel pin - Includes mounting screw
5	70462K	K68-524-00	Actuator Covers, Includes: front and rear cover plates and 4 mounting screws
6	48986A	068-572-00	Master Cylinder Fill Cap with internal bladder, 2.25” Opening
7	48844	046-259-00	Safety Spring with two mounting screws

**RATED CAPACITY:** Maximum Actuator Capacity: 8500 lbs. Gross Load, 850 lbs. Maximum Tongue Load, 425 lbs minimum tongue load.

The actual in-service rating is limited to that of the ball and hitch being used or the trailer manufacturer's G.V.W.R. shown on the certification label, whichever is lower (Note: GVWR is the Gross Vehicle Weight Rating which includes the trailer and the load weight as a Total Gross Weight).

## **CAUTION**

**AVOID sharp turns, which can cause the actuator to bind or jackknife against the tow vehicle or cause a bend in the tongue. Either can damage the actuator causing brake failure. AVOID towing trailer across large bumps or dips that may over stress the connection between the trailer and tow vehicle, as this could result in damage to the actuator.**

### HITCHING TRAILER

1. The vehicle, towing hitch and ball must have a rating equal to or greater than trailer GVWR.
2. Model 850 will accept 2" trailer hitch balls with a 8500 capacity. Trailer balls larger than 2.00" or out of round will not fit the coupler or may result in coupler failure. Balls smaller than 1.97" can cause shock loading and sudden disconnection. Make certain ball latch is in correct position to retain the hitch ball. Push latch lever back until safety latch engages plate below lever latch. Always insert safety pin into forward hole as a safety lock for the hitch ball coupler prior to towing. Do not tow trailer if coupler is damaged.
3. Connect safety cables or chains using crossed pattern under tongue, or follow trailer manufacturer's directions.
4. Connect actuator breakaway cable S-hook to the tow vehicle only. Do not connect S-hook to the safety cables or chains.
5. The breakaway system is designed to only operate after the trailer detaches from the tow vehicle and the safety cable/chains have failed. The breakaway is not a parking brake. Do not use as such.

## **CAUTION**

- **The breakaway system is not designed to operate if the trailer does not separate completely from the tow vehicle, or if the tongue goes under the rear of the tow vehicle.**
- **In the event that the breakaway system is used, check all system components (cable, S-hooks, etc.) for proper working order. Replace any damaged parts with genuine Dexter parts only.**
- **When resetting the breakaway system, keep hands and fingers clear as you reset the mechanism. Hydraulic pressure held in the system may cause the assembly to snap back suddenly.**

6. If the breakaway is accidentally applied while un-hitching, insert a flat bladed screwdriver into the spring clip slotted hole under the actuator and pry down to release.
7. Any control devices that restrict operation of the actuator cannot be used. This includes certain sway control devices. The actuator must be free to telescope in response to braking requirements.

## **CAUTION**

- **A loose fit between the coupler and hitch ball can cause the actuator and hitch ball to separate, causing serious damage, injury or death. Check coupler every time prior to towing and at each stop on long trips. Always make certain that coupler latch safety pin is securely installed into coupler latch.**
- **A minimum of 5% tongue weight and a maximum 10% tongue weight of the trailer GVWR must be located on the hitch ball. The Trailer tongue should be parallel to the ground. Too much weight can cause premature brake actuation and loss of control of the towing vehicle. Too little tongue weight can cause the trailer to fishtail, resulting in loss of control of the tow vehicle and trailer (total trailer weight GVWR includes weight of the trailer plus load).**
- **Never allow the coupler latch safety pin to remain in the reverse lockout position hole. After reverse maneuvering, always insert coupler latch safety pin back into coupler latch. FAILURE TO REMOVE SAFETY PIN FROM REVERSE LOCK OUT POSITION HOLE WILL PREVENT FORWARD MOVEMENT BREAKING THAT CAN RESULT IN SERIOUS PROPERTY DAMAGE, INJURY OR DEATH.**

8. Equalizing or weight distributing hitches may be used, allow six to eight inches free chain length.

## **CAUTION**

**Tongue weight beyond rating limits will interfere with performance of actuator, braking system and the tow vehicle.**

9. The actuator is designed for use with Free-Backing trailer brakes. To block braking action, (in order to back up) with other types of brakes, use an electric solenoid. For reverse trailer movement when braking is not required, place the safety pin in the upper hole on the side of the actuator to block movement of the actuator. DANGER: Failure to remove pin will also prevent forward braking. Pin must be in the lower, forward coupler hole as a safety lock for the hitch ball coupler latch when towing at all times.

## **CAUTION**

**Failure to install the hitch pin before towing can result in accidental opening of the coupler hitch latch, which can lead to the trailer coming off of the hitch ball, causing serious damage, injury or death. If pin will not fit into the front lower hole, the coupler is not attached properly. Reset coupler on hitch ball.**

**MAINTENANCE**

**⚠ CAUTION**

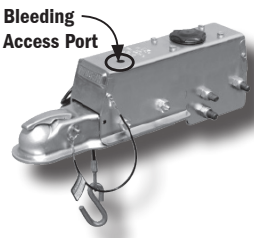
**The exterior of the actuator and brakes should always be rinsed with fresh water after use in corrosive conditions. Before storing trailer, clean brakes and repack the bearings. Failure to properly maintain the actuator could cause serious damage, injury or death.**

1. Always check the brake fluid reservoir before using trailer. Make sure it is at least half full. If not, refill to approx. 3/8" below the top of the reservoir with DOT 3 brake fluid. Check for leaks and repair as required. Never reuse brake fluid.

**⚠ CAUTION**

**DO NOT REUSE BRAKE FLUID. Always use fresh DOT 3 fluid from a fresh container. Failure to maintain proper levels of fluid in the reservoir will cause brake failure.**

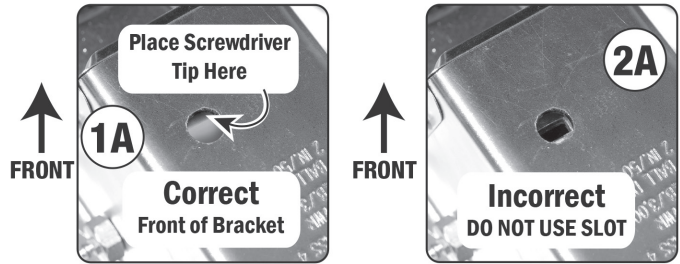
2. The model 850E is equipped with two "Super Lube" pins to provide grease to the inner rollers. Use a grease gun to lubricate the rollers through the grease fittings provided, every 6 months. For heavy use, grease every 3 months.
3. To extend coupler and ball life, coat both with a thin coating of grease. This will also eliminate squeaking. Wipe clean and renew grease film each time trailer is used.
4. Examine the actuator for bent parts or wear each time the trailer is used. Replace parts as necessary. There are no user adjustments on the actuator.
5. Actuator travel (shown by coupler roller path) over 1" indicates adjusting the brakes, adding fluid to the reservoir or a need to bleed the brakes and check connections for leaks. Adjust per instructions found in brake installation manual. In general, back-off the adjusters on drum brakes from locked position, as required. Adjust Free-Backing brakes by rotating wheel in forward direction only. Failure to adjust may result in loss of braking. Disc brakes do not require adjustment, check for pad wear periodically.
6. While towing, if the actuator appears to be knocking against the hitch ball while starting or stopping, check brake fluid reservoir and fill if below 3/8" full from the top. Dampening shock absorber requires sufficient brake fluid in order to retard movement of coupler against hitch ball during towing.



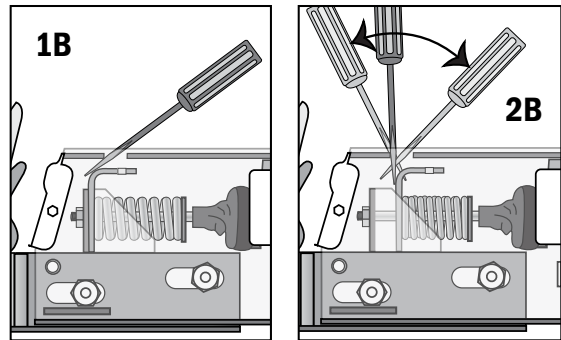
**Bleeding Instructions**

1. To bleed master cylinder and brakes, install bleeder hose on first wheel cylinder to be bled; if tandem axle trailer, bleed farthest axle first, and the farthest brake on that axle first. Use a loose end of hose from the bleeder valve submerged in a clear container of brake fluid to observe bubbling (hose must be submerged into clean brake fluid to keep air from traveling back into the brake cylinder).
2. Pump master cylinder, keeping pressure, using a flat tip screwdriver (1A). Crack bleeder valve open and tighten. Repeat until there are no more air bubbles.

3. The screwdriver should be at the lowest angle possible to the actuator so that it slides in front of the e-stop bracket (1B).



4. Screwdriver tip MUST BE IN FRONT of the e-stop bracket and NOT in the slot on the e-stop bracket (2A).
5. Push the screwdriver forward and back to pump the master cylinder. (2B).



6. The bleeding operation for that brake is complete when bubbling stops. Be sure to tighten bleeder screw securely. Each wheel cylinder must be bled until all air is out of the lines. Replenish the brake fluid during the bleeding process so the level does not fall below half full level in the master cylinder reservoir.
7. When bleeding and testing is completed, make sure master cylinder is filled to 3/8" below the top of the reservoir and filler cap is securely in place.

**Emergency Button Stop**

Release emergency stop cable by prying spring out with a flat blade screw driver.

**Normal operating position**

**If button stop cable is showing DO NOT TOW TRAILER**

