Installation Guide

Thank you for your selection of C.E. Smith disc brakes by Sturdy Built Trailer Parts, an essential step towards a safer towing experience. We strongly recommend having brakes installed on all axles of the trailer, even if your state law does not require it. Having brakes installed on all axles is a matter of safety. These brakes are designed for saltwater use but will perform excellently in freshwater applications as well.

The type of brake kit included in this box is referred to as a Slip-On style, or "hat" style rotor. Common in the Automotive industry as well, slip-on rotors slide over a trailers idler hub, and are secured by the lug nuts once the wheel has also been installed. Like a trailer wheel, the rotor centers as the lug nuts are being tightened down. This kit is intended to complete one axle.

For Detailed Installation Instructions, and additional Warranty &Technical Information, please visit:

www.sturdybuiltonline.com/sturdybuiltbrakes

Box Contents:

As you unpack this kit you will note that it contains the following:

- ✓ (2) Dacromet coated vented slip-on rotors to mount over trailer idler hubs
- ✓ (2) Dacromet coated disc brake caliper brackets to mount to trailers brake flange
- ✓ (2) Dacromet coated disc brake calipers loaded with (2) inner and (2) outer brake pads
- ✓ (4) Stainless steel guide bolts for mounting calipers to the caliper brackets

Tools Required

1. 7/16" End wrench – for caliper bleeder screw
2. ½" end wrench or 5/16" hex key – for caliper guide bolts
3. ½" end wrench – for brake line inlet
4. Lug Wrench
5. Additional tools may be required
6. Properly bleeding the brake system will depend upon your trailer actuator, consult your actuators manual for additional bleeding instructions
7. Safety Equipment – floor jack, wheel chocks, etc.
8. Mounting hardware (see page 5)

General Safety Information:

While trailer disc brakes are not highly specialized, brake installation should only be performed by qualified and experienced persons with in-depth knowledge of automotive and trailer brakes

and brake systems. Installation is highly recommended to be performed by an SAE certified automotive technician. Additionally, ensure you are using the correct tools and safety equipment required for each step of the installation.

Towing a trailer of any capacity is something to be taken very seriously. With that, the use of brakes is mandated in most states. Please check your states requirements for trailer brakes to ensure you are compliant with all updated regulations. Additionally, when traveling across state lines, check out the states you are moving through, as states laws may vary.

Over the road, allow extra vehicle separation to allow longer stopping distances.

Be mindful never to drive into a situation where you will need to back up while pointed even slightly downhill. Always be mindful to set the brake actuator lockout while still on level ground or pointed uphill. Reversing a trailer with a functioning actuator while pointed downhill will lock all braked wheels. Then the only fix is to chock the wheels, pull the actuator out by driving slightly downhill, then set the actuator lockout.

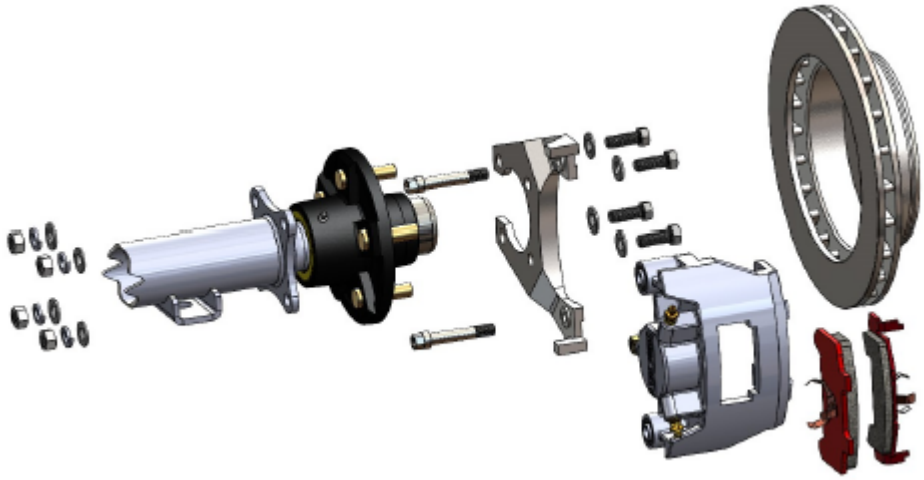
Make sure the brake actuator installed on your trailer is compatible with disc brakes only. A surge brake actuator designed for use with drum brakes will not adequately operate a disc brake system. Generally, disc brakes require more hydraulic pressure to operate than drum brakes. Be sure that the hydraulic brake actuator that you use will generate adequate hydraulic pressure for your use based on the number of axles you are installing brakes onto.

Take the time to visually inspect all the important components of your trailer before each towing experience. As with proper trailer tire and bearing inspection periods, check your trailer's disc brake system at each stop when traveling long distances. Inspections for your disc brake system should include:

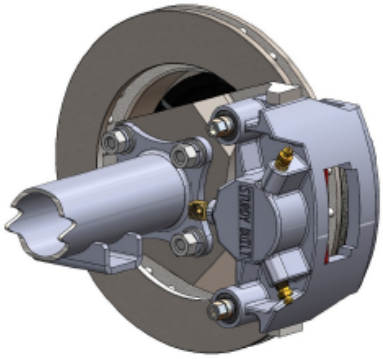
a) Brake Pads - check for evidence of excessive or uneven wear
    a. Rotor damage from excessive pad wear (metal to metal damage) is not covered by our product warranty.
b) Rotors- check for evidence of excessive wear, excessive heat build-up, scoring, cracks, and/or warpage
c) Brake Fluid Reservoir- make sure you have a full reservoir of fluid
d) Mounting Bolts – check for loose hardware, loose bolts, and re-tighten according to requirements
e) Calipers, Brake lines and fittings – inspect all connection points for leaks or evidence of previously leaking fluid

Installation Instructions:

Please see the exploded view below:



Please see the Assembled View below:



Installation:

1. Confirm that the axle on which you intend to install brakes has brake caliper mounting flanges installed behind the spindles. Brakes can only be installed on axles that feature factory installed brake caliper mounting flanges.

2. This kit contains brake parts for the driver side and passenger side. One kit per axle.

3. Properly lift and support the trailer.

4. Remove the wheels where brakes are to be installed.

Before fully installing the slip-on rotor onto your trailers idler hub, please take note of the following important details to confirm proper fit:

5. Confirm that the rotor slips over your trailer's hub properly, and fully. (Note: There are standard hub flange diameters for the industry standard hubs, but some hubs may vary from this standard dimension.) Verify that the hub wheel bolts will fit through the rotor wheel bolt holes. The 5 Lug Rotors accommodate the industry standard 5 on 4 ½ lug pattern. For the 6 Lug rotors, they accommodate the industry standard 6 on 5 ½ lug pattern.

6. Confirm that wheel bolts are long enough to fully engage the wheel nut after the rotor is installed.

    a. Standard 1/2-20 x 2" Wheel bolts countersunk are suitable for most steel wheels, and some aluminum wheels. (For aluminum wheels, this is dependent on the distance that the wheel bolts are countersunk in the hub and the distance the wheel nuts are recessed.) Confirm there is sufficient thread length for the wheel nut to fully engage and create a strong connection.

7. Confirm the brake flange was installed correctly. There should be nominal clearance between the outer edge for the caliper mounting bracket and the inner edge of the rotor. This clearance dimension should be the same when measured at either of the two threaded mounting holes. This nominal clearance may vary by the manufacturer and size of your axle. Normally, clearance will range from 1/4" to 1/2".

8. Once you have verified the fit of the rotor in the previous steps, you can continue.
    a. Inspect the trailer hubs flange (the portion the rotor touches). Look for any burs or build-up, that might impact the rotor's ability to nest on the hub. Remove any build-up and clean any rust build-up.
    b. Check with a straight edge to ensure that the hub is true, meaning it has no excessive runout. What you are looking for in this step is that your axles spindle is not bent, or the hub is not installed crooked. If this has occurred, it will cause issues, and you must revisit your trailers hub, and axle condition to resolve before continuing.
    c. Install the rotor by slipping it on to the wheel bolts. Make sure that the rotor fits perfectly to the hub face and install the wheel nuts and torque to 10 to 20 lbs, to hold the rotor in place.

d. Rotate the hub and rotor assembly and check for proper rotation. Be sure to confirm that the rotor turns freely and that the caliper will slide with some effort on the guide bolt sleeves.
    i. If there is excessive runout, remove the wheel nuts and re-install the rotor 180 degrees relative to the hub. Repeat this step as necessary to minimize runout. Mark this location with a dot or hatch mark for future reference. Remember that the rotor is wheel bolt piloted. Be sure to allow for the difference in the rotor wheel bolt hole diameter and the wheel bolt diameter.

e. Install the caliper mounting bracket at the recommended position below depending on axle size using the appropriate caliper mounting bracket hardware that is customer provided. Make sure to fully tighten all caliper bracket hardware in this step.
    i. For the 10” 5 Lug kit – the caliper mounting brackets are the same. You will bolt each bracket behind the axle with the offset in the castling leaning outward.
    ii. For the 12” 6 Lug kit – the caliper mounting brackets are different for each side. You will bolt each bracket such that the offset in the casting is leaning outward.
f. Customer supplies the stainless steel or zinc caliper mounting backet hardware. Standard hex head hardware and standard split ring lock washers are recommended, but Nylon lock nuts and socket head bolts if preferred.
    i. For axles with 5 lug hubs, you should find 4 hole mounting flanges and you will need:
        1. (8) 7/16”-14 thread per inch x 1-1/4" bolts
        2. (16) 7/16” washers, one on each side
        3. (8) 7/16” lock washers, one under each nut
        4. (8) 7/16”-14 hex nuts, one per bolt
    ii. For 6 lug kits – you should find 5 hole mounting flanges and you could encounter one of 3 different bolting scenarios. Brake flanges with smooth holes, brake flanges with threaded holes, and some manufacturers install pressed in studs.
        1. Smooth holes (most spring axles)
            a. (10) 3/8”-16 threads per inch x 1-1/4" bolts
            b. (20) 3/8” washers, one on each side
            c. (10) 3/8” lock washers, one under each nut
            d. (10) 3/8”-16 hex nuts, one per bolt

        2. Threaded holes (Rockwell torsion)
            a. (10) 3/8”-24 threads per inch (fine) x 1-1/4" bolts
            b. (20) washers, one on side
            c. (10) lock washer, one under each nut
            d. (10) 3/8”-24 hex (fine) nuts, one per bolt

3. Pressed in studs (TDE torsion)
    a. (10) washers, one on first
    b. (10) lock washers, one on second
    c. (10) 3/8”-24 threads per inch (fine) nuts, one on third

Caliper Bracket Positioning Recommendation:

3,500 lbs. (5 Lug) to 7,000 lbs. Axles (6 Lug)	3 o’clock position on left side and 9 o’clock position on the right side. For Torsion Axles, slight variation might be required as the arms might position the brackets slightly different from 3 and 9 positions. Align the bracket at the closest possible position, with bleeders pointed up.

g. Install the caliper to the caliper mounting bracket with bleed screws pointing up, as you always bleed from the highest bleed screw, allowing air to escape more easily. Mount the caliper with the included caliper guide bolts (two per caliper). Torque the caliper guide bolts to 40-50 ft lbs.
h. After bleeding the brake system, you’ll remove the previously installed placeholder wheel nuts from the rotor and install the trailer wheel assembly per manufacturer’s specifications.
i. When tightening the wheel nuts on a wheel with a 5-hole bolt circle use a star pattern to tighten down wheel nuts. When tightening wheel nuts on wheels with a 6-hole bolt circle tighten opposite pairs until complete. See Details Below.

Note: Use caution when using power impact tools during re-assembly. Too much initial torque, or torque in the wrong pattern, will cause the tire to rotor and trailer wheel assembly to rotate irregularly, and cause issues.

j. Wheel lug nuts should be torqued before initial use of the trailer and properly re-torqued after installing wheels. This is done in a three-stage process outlined below.
k. It is additionally recommended to re-check the torque on the brake hardware, as well as the tire and wheel assembly after the first short distance tow, and long-distance tow.

For 13” Wheels with 5 Lugs	1st Stage- 20-25 ft lbs. 2nd Stage – 34-50 ft lbs. 3rd (Final) Stage- 60-75 ft lbs.
For 14” and 15” Wheels with 5 Lugs	1st Stage- 20-25 ft lbs. 2nd Stage – 50-60 ft lbs. 3rd (Final) Stage- 100-120 ft lbs.
For 15” Wheels with 6 Lugs	1st Stage- 20-25 ft lbs. 2nd Stage – 50-60 ft lbs. 3rd (Final) Stage- 100-120 ft lbs.

Additional Notes:

1. Our calipers are assembled and installed with several sealants, lubricants, and oils to provide longevity in saltwater environments. Petroleum based grease is NOT compatible with these seals and O-rings. **DO NOT USE PETROLEUM BASED GREASE OR OIL**.
2. This brake kit uses a floating caliper. **DO NOT PAINT THE GUIDE BOLT AND/OR GUIDE BOLTS SLEEVES**. Doing so will inhibit caliper movement.

Bleeding the Brakes:

1. Follow the actuator manufacturer's recommendations to pressurize the brake lines.

   Notes:
   a. Air bubbles tend to rise to the highest point in a brake line. You should ensure that break lines are run as level as possible to avoid high spots that trap air. In cases with surge brake actuators, make sure the calipers are as high as possible and the actuator as low as possible when bleeding.
   b. We recommend using a small bleeder hose that will fit over the bleeder screw and submerge the loose end of the hose in a clear container of brake fluid to observe bubbling.
2. Install the bleeder hose on the bleed screw on the first caliper to be bleed, typically the caliper furthest from the actuator.
3. After the system is pressurized, open the bleeder screw one turn. This will vent the trapped air and pressurized brake fluid into the atmosphere through the passage in the screw. The bleeding operation is complete when all entrapped air is removed from the system.
4. Be sure to close the bleeder screw completely after each compression stroke of the master cylinder push rod or actuation of the electric or hydraulic actuator during the bleeding process.
5. After the bleeding process is complete make sure the master cylinder's reservoir is filled completely and all bleeder screws are tightly closed.

Notes:

1. Calipers should be mounted so that the bleeder screw is pointed up to properly expel trapped air.
2. This is a high-pressure brake system and will not function properly with any air in the system. Be sure to bleed the brake system thoroughly.
3. We recommend bleeding your brake system again after the first 100 miles of use.

Preventative Maintenance

1. Visually inspect brakes before each use.
    a. Pads- check for evidence of excessive or uneven wear
    b. Rotors- check for evidence of excessive wear, excessive heat build-up, scoring, cracks, and/or warpage
    c. Brake Fluid Reservoir- ensure proper fluid levels
    d. ALL Bolted Connections- ensure all connections are tight and secure
    e. Calipers and Brake Lines- check for evidence of brake fluid leaks
    f. Check to make sure calipers are still floating
2. After every hook-up ensure that trailer brakes are operational before attaining normal driving speed.
3. Follow all manufacturer's recommendations regarding use of and replacement of brake fluid.
4. Wash down brake assembly immediately after exposure to saltwater.
5. During each trip, periodically check hub and assemblies to ensure there is no excessive heat. **DO NOT TOUCH BRAKE COMPONENTS**. They may be much hotter than your trailer wheel or hub, especially after braking. Do not perform this check after recent, severe, or prolonged braking. Doing so could lead to injury.

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