

Wilwood Disc Brake Installation

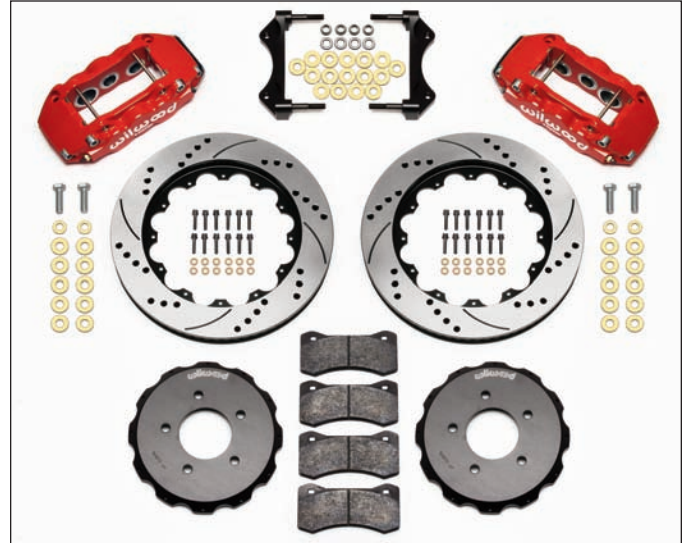
Front Big Brake Installation on a 2003 BMW E46 330i



The Ultimate Driving Machine is a fairly accurate statement for the BMW E46 3 Series. However, when one wants to push these vehicles to the limit in “track day” or “road race” conditions, then it becomes evident that updating the brake system becomes a necessity. This need is underscored by the fact that more cars are passed under braking than anywhere else on the track. **Wilwood Disc Brakes** has the solution! BMW Original Equipment brakes are good, but Wilwood brings high performance braking to a whole new level. You need Wilwood’s if you want the best braking performance.

Wilwood is offering performance braking solutions for the BMW E46 3 Series (our test fit vehicle was a 2003 model year). The base kit (P/N 140-11974) features Wilwood’s W6A 6 piston differential bore radial mount calipers clamping down on oversized 14.00” diameter GT slot pattern vented rotors. The kit comes with aluminum hats, mounting brackets, and all hardware for an easy bolt-on installation. BP-10 high performance street pads round out the kit. Other brake pad compounds for off-road applications are an available option. Optional items include SRP drilled and slotted rotors, and/or red powder coated calipers.

As you read through the installation procedure you will see that it is basically a bolt-on kit, just as Wilwood advertises, with only a additional step required to remove the OE dust shield. Kit includes everything necessary for an easy and complete installation. However, the stainless steel braided flexline kit, P/N 220-11983 is a necessary item and must be ordered separately. You will be amazed as to how much



Wilwood part number 140-11974 comes complete with W6A calipers, caliper mounting brackets, GT rotors, aluminum hats, BP-10 brake pads and all necessary hardware for an easy bolt-on installation.

better the Wilwood brake kit performs over the original factory brakes.

A complete set of mechanics tools will be necessary. Unique items include an impact screwdriver, large size socket set (check vehicle for size), large breaker bar, and a 250ft/lb torque wrench. Also, a bottle of red *Loctite*® 271, Teflon tape, and Wilwood’s Hi-Temp 570 racing brake fluid or Wilwood EXP 600 Plus Hi-Temp racing brake fluid for extreme temperature applications.

Before you begin the installation, read over the instructions carefully to be sure you understand the procedure, and make note of any additional steps that may have to be performed by a qualified machine shop. Compare the parts with the parts list on the installation document that came with the kit to ensure all necessary components are included.

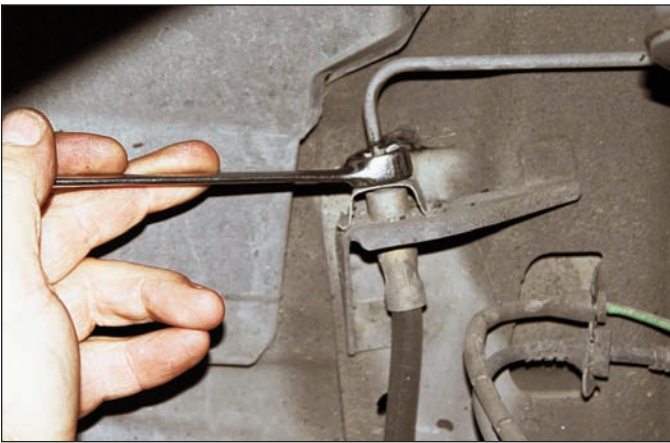
NOTE: *Disc brakes should only be installed by someone knowledgeable and competent in the functioning and maintenance of disc brakes.* If you are not sure, get help or return the product. You may obtain additional information and technical support by calling Wilwood at 805 • 388-1188, e-mail for technical assistance at: support@wilwood.com, or visit our web site at www.wilwood.com.



Sequence 1: Raise the front wheels off the ground and support the front suspension according to the vehicle's manufacturer's instructions. Remove the wheel bolts, then slide off the wheel.



Sequence 4: Using a breaker bar and socket, break loose the caliper mounting bolts from the back side of the rotor.



Sequence 2: Disconnect the rubber brake fluid hose where it connects to the brake hard line. Try to keep fluid leakage to a minimum.



Sequence 5: Remove the pad wear sensor wire from the caliper (left side only).



Sequence 3: Install the new fitting from the Wilwood flex line kit, P/N 220-11983. Temporarily cap (not included) the line to minimize fluid loss.



Sequence 6: Lift off the caliper and keep the rubber brake line hose in the vertical position to avoid spilling brake fluid that remains in the hose.



Sequence 7: Break loose the hat locator screw using an impact screwdriver. Then remove the screw.



Sequence 10: Pry off the dust cap from the face of the hub using a chisel or screwdriver and a hammer.



Sequence 8: Slide off the rotor from the hub. If it is stuck, it may be necessary to hit it a few times with a rubber mallet to break loose.



Sequence 11: After the dust cap is removed, the crimped over area of the spindle nut needs to be straightened so that it can be removed (arrow).



Sequence 9: Clean the hub assembly with a wire brush and remove any nicks, burrs, or grease that may interfere with installation of the new brake components.



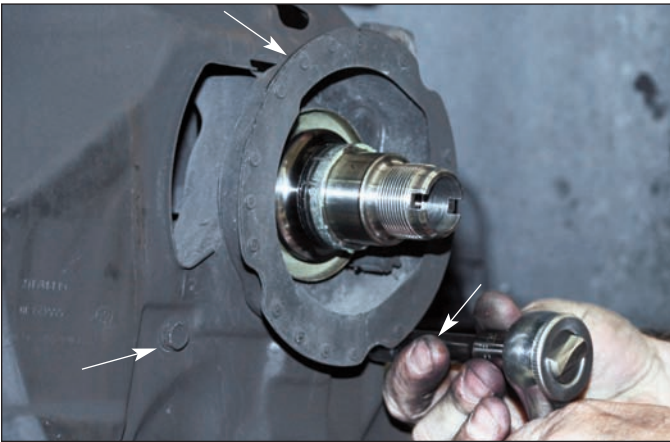
Sequence 12: Remove the spindle nut (save for reinstallation) from inside the hub assembly using the corresponding socket size.



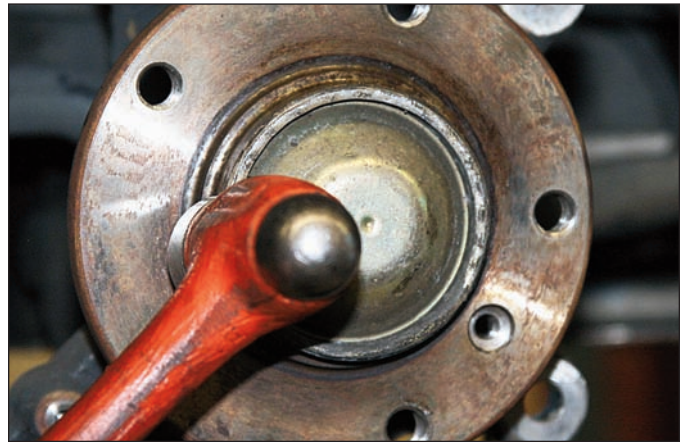
Sequence 13: After the spindle nut is removed, slide off the hub assembly and save for reinstallation later.



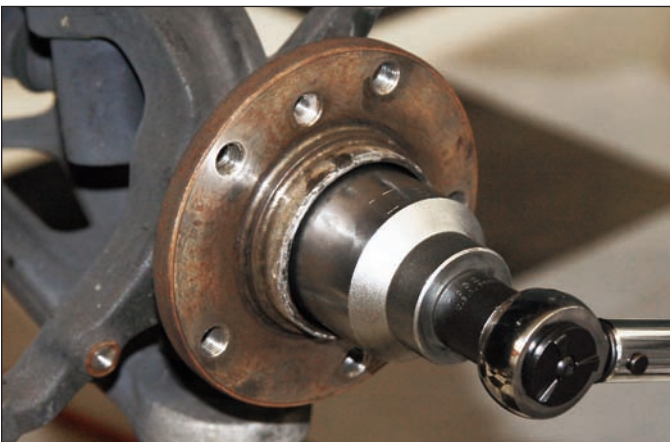
Sequence 16: Using a screwdriver, crimp over the flange of the spindle nut to keep it from unscrewing.



Sequence 14: Remove the three bolts (arrows) that hold the dust shield in place. Remove the dust shield and discard, it will not be utilized in the installation of the Wilwood brake kit.



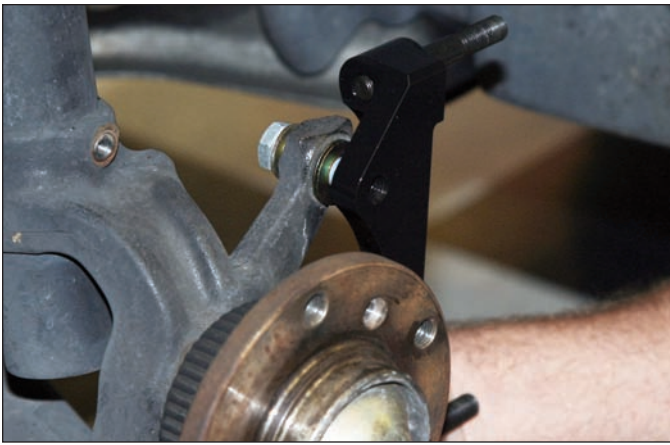
Sequence 17: Reinstalled the OEM dust cap.



Sequence 15: Install a new OE spindle nut and torque per vehicle manufacturer's instructions.



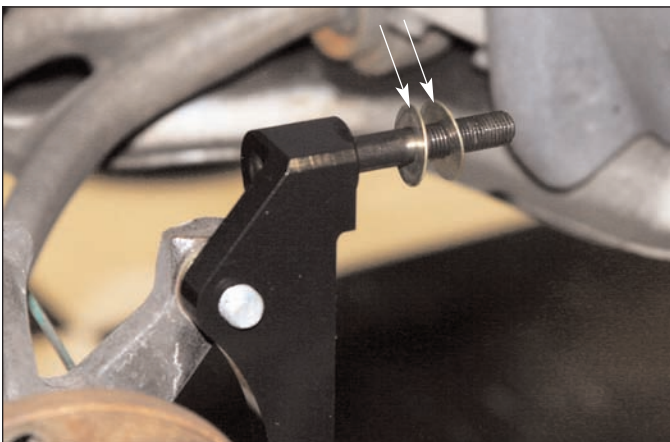
Sequence 18: Slide caliper bracket mounting bolts thru OEM caliper mounting ears from the inboard side. Initially install two shim washers on each bolt between mounting ear and bracket.



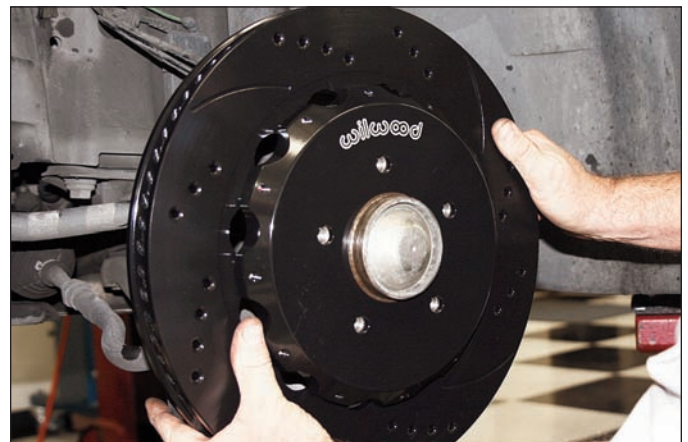
Sequence 19: Attach the Wilwood caliper mounting bracket to the OEM mounting ears on the outboard side. Temporarily tighten the mounting bolts. **NOTE:** The bracket must fit squarely against the mounting ears. Inspect for interference from casting irregularities, burrs, etc. Grind as necessary. Do not Loctite at this time.



Sequence 22: Using an alternating sequence, torque rotor bolts to 155 in-lbs.



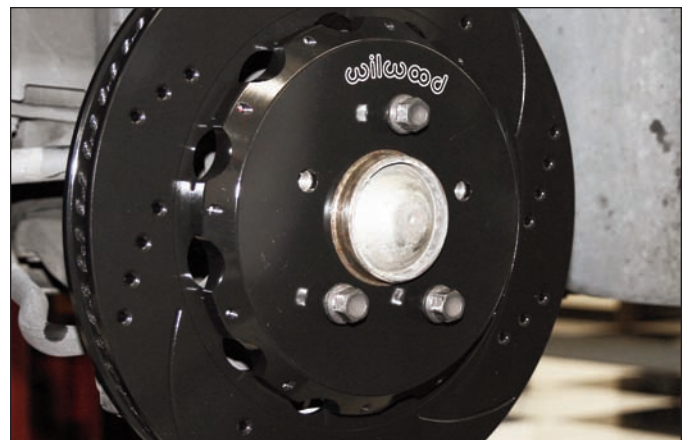
Sequence 20: Lubricate the caliper mounting studs with lightweight oil. Initially place two shim washers (arrows) on each stud between the bracket and caliper.



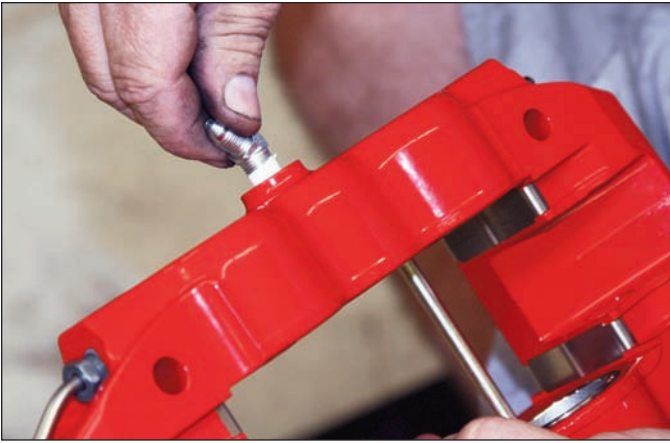
Sequence 23: Install the hat/rotor assembly over the hub assembly. **NOTE:** The hat/rotor must fit flush against the axle hub flange or excessive rotor run out may result.



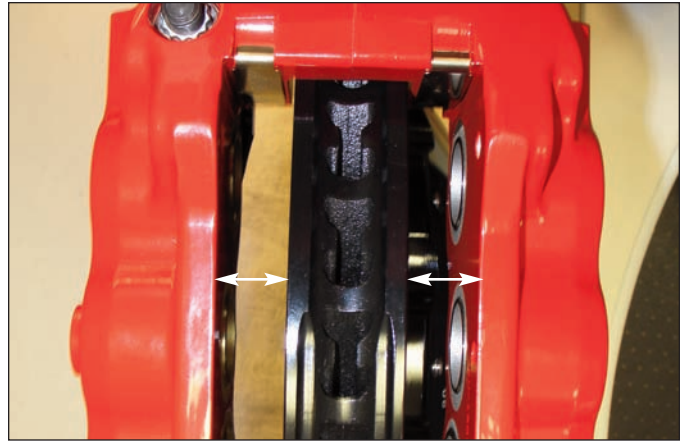
Sequence 21: The hat needs to be bolted to the rotor. Orient the rotor over the hat in the configuration shown above. Place one flat washer over each hole on the rotor mounting tabs. Coat the mounting bolts with red Loctite® 271 and slide through the washer and thread into the hat.



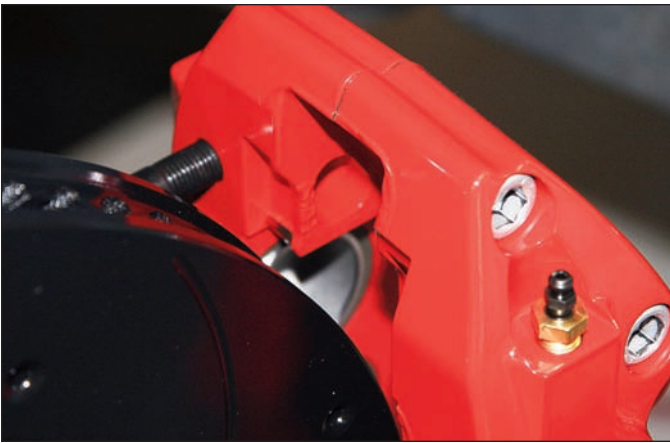
Sequence 24: Secure the hat/rotor with three wheel bolts (finger tight) to keep the hat/rotor assembly in place while continuing with the installation.



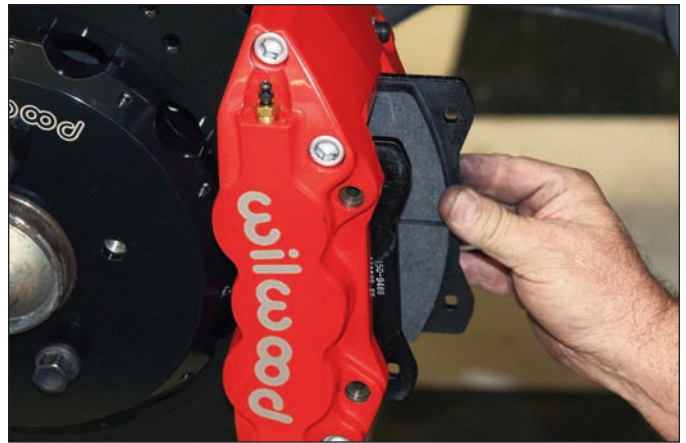
Sequence 25: Remove the protective sticker from the caliper fluid inlet. Coat the inlet fitting with Teflon tape and screw into the caliper with the 45° angle perpendicular to the length of the caliper.



Sequence 28: View the rotor through the top opening of the caliper. The rotor should be centered in the caliper. If not, adjust by adding or subtracting shims between the bracket and the mounting ears. Once the caliper alignment is correct, remove the bracket bolts one at a time and apply red *Loctite*® 271 to the threads and torque to 65 ft-lbs



Sequence 26: With the bleed screws pointing up, mount the caliper onto the bracket so that the largest pistons are at the rotor exit end of the caliper, in relation to the direction of rotor rotation.



Sequence 29: With the pad retain pins removed, insert the brake pads into the caliper with the friction material facing the rotor.



Sequence 27: Secure the caliper with washer and locknut, temporarily tighten.



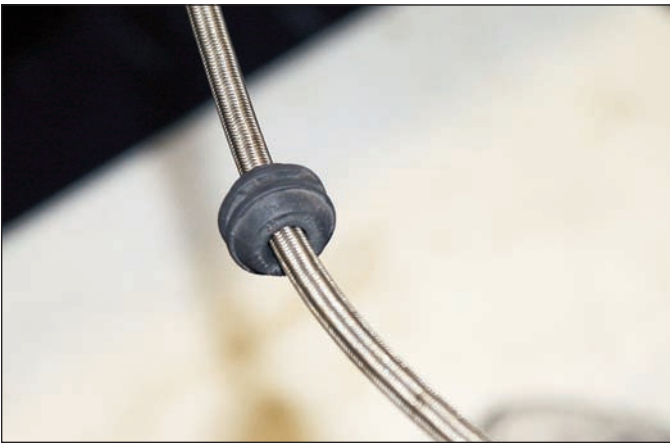
Sequence 30: Check that the top of the brake pad is flush with the outside diameter of the rotor (arrow). If not, adjust by adding or subtracting shims between the bracket and the caliper.



Sequence 31: After the pad height is set, install the pad retainer pins and secure with the pin retainer clips. Then finalize the caliper mounting by torquing the caliper mounting lock nuts to 35 ft-lb.



Sequence 33: Connect one end of the flexline to the previously installed caliper fitting. Route line along the same path as the OEM rubber hose and connect the other end of the flexline to the fitting at the brake hard line. Secure line as necessary to prevent contact with moving suspension, brake, or wheel components. Bleed the system referring to the additional information in the data sheet as necessary for proper bleeding instructions.



Sequence 32: Carefully cut a slit in the rubber grommet and remove it from the OEM rubber hose. Slide grommet around the Wilwood flexline, P/N 220-11983, in the approximate location as on the OEM hose.



Sequence 34: Install the wheel and torque the wheel bolts to manufacturer's specification. Bed in the brake pads and rotor in a safe location before general use driving.

Brake Testing

**WARNING • DO NOT DRIVE ON UNTESTED BRAKES
BRAKES MUST BE TESTED AFTER INSTALLATION OR MAINTENANCE
MINIMUM TEST PROCEDURE**

- Make sure pedal is firm: Hold firm pressure on pedal for several minutes, it should remain in position without sinking. If pedal sinks toward floor, check system for fluid leaks. DO NOT drive vehicle if pedal does not stay firm or can be pushed to the floor with normal pressure.
- At very low speed (2-5 mph) apply brakes hard several times while turning steering from full left to full right, repeat several times. Remove the wheels and check that components are not touching, rubbing, or leaking.
- Carefully examine all brake components, brake lines, and fittings for leaks and interference.
- Make sure there is no interference with wheels or suspension components.
- Drive vehicle at low speed (15-20 mph) making moderate and hard stops. Brakes should feel normal and positive. Again check for leaks and interference.
- Always test vehicle in a safe place where there is no danger to (or from) other people or vehicles.
- Always wear seat belts and make use of all safety equipment.

Wilwood Engineering
4700 Calle Bolero, Camarillo, CA 93012
805 / 388-1188 • www.wilwood.com
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