

CORVETTE BRAKES FOR STREET AND TRACK

Wilwood Engineering's new W6AR Big Brake Kit for C5 and C6 Corvettes

The Wilwood part number 140-10163 front brake installation kit comes complete with the W6AR calipers, caliper mounting brackets, the pads, the rotors and hats, and all of the hardware required to finish the installation.



The Wilwood part number 140-9101 rear brake installation kit comes complete with the Billet Narrow Superlite 4 calipers, caliper mounting brackets, the pads, the rotors and hats and all of the hardware required to finish the installation.



Very few automobile marques come from the factory in greater need of a brake upgrade than a standard Corvette. That is not to say that Corvettes come from the factory with inferior brakes, actually the standard brakes are some of the best you will find on any factory car and can easily handle the demands of spirited



daily transportation. Ah but there's the rub; a disproportionate number of Corvette owners aren't satisfied with just spirited daily transportation. Consequently many find themselves on weekend excursions to their local racetrack. The demands put on your brake system after a few laps around Laguna Seca can quickly point out the weaknesses that are inherent in any factory street setup.

One of the ironies of home building a competent performance car is how much emphasis is almost always placed on going fast and how little is placed on stopping. In order to record fast lap times at the track, you have to have brakes that will allow you to go as deep into the turns on the last lap, as you did on your first lap. It won't matter how much power you have if your brakes won't let you use it.

Fortunately for those of you who appreciate total performance, there are aftermarket companies that produce very credible alternatives to your stock brakes. Now we will admit that Corvette aftermarket kits in general are not on a par with the awesome binders on the new ZR1; but it would

take a professional driver, driving the car at its absolute limits, to appreciate the difference. I should also mention that the typical aftermarket kit will dip into your wallet only one tenth as deep as the ZR1's carbon-ceramic setup.

One of the better-known names in racing and aftermarket brakes is Wilwood Engineering and the installation of their new "W6AR Big Brake Kit" for the C5 and C6 Corvettes, is the subject of this article. The W6AR Caliper was designed for the specific purpose of providing big capacity braking for show and dual purpose street and track vehicles. The caliper incorporates race technology into a body design with radial mounting and a maximum rotor diameter of 14.25-inch. The caliper generates big brake clamping force with six differential bore stainless steel pistons. Stainless steel is used for its high resistance to corrosion. The differential bore pattern balances pad loading to help maintain even pad wear. The calipers are anodized to protect them from corrosion, but you can get them polished or with a gloss red, black, blue or yellow finish if you prefer a little more bling. The rotors are a two-piece assembly; 14.25-inch in diameter with staggered vanes that provide maxi

imum cooling for sustained high heat durability. The aluminum alloy hat contributes to a significant weight reduction in unsprung weight from the stock suspension system. The kits listed for Corvettes are fully compatible with OE master cylinder output and ABS function. The brake system kits featured in this story are as follows, the kit for the front is Wilwood part number 140-10163 and the rear kit is 140-9119. Also ordered were the Wilwood part number 220-9100 Flexlines for the front and part number 220-9101 Flexlines for the rear. The W6AR kit is complete, right down to shims, instructions, and brake pads appropriate for street use and the occasional track day.

Wilwood recommends persons experienced in the installation and proper operation of disc brake systems should only perform the installation of this kit. A hobby builder can install this kit if he has good mechanical knowledge and

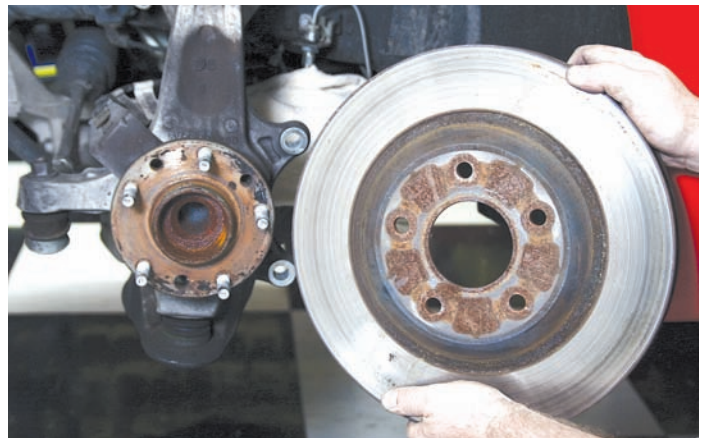
ability, car building experience and a good assortment of tools. You will need a jack and jack stands; a basic tool kit with SAE and metric wrenches and sockets; a foot pound torque wrench, an inch pound torque wrench, an impact gun, Teflon tape (or paste), Loctite 271 and replacement fluids such as Wilwood Hi-Temp 570 Racing Brake Fluid or Wilwood EXP 600 Plus Super Hi-Temp Racing Brake Fluid. Tony Porto, Wilwood's own R&D Technician performed this Corvette installation. Follow along as he does this installation to see if it is something you are capable of doing or if it would be better to have a professional install the kit for you. You will probably run into a few photos in this story that show different color rotors and calipers and that is due to the fact that the front installation and rear installation were done in the Wilwood R&D department at different times and on different cars. We joined them together to show you a complete Corvette front and rear Wilwood disc brake installation.



The car was raised using the floor jack and then jack stands were placed underneath in a safe Corvette specified place. The two tires that were still resting on the ground were chocked to keep the car from moving. The wheels and tires were removed and here you can see the original Corvette caliper and rotor assembly.



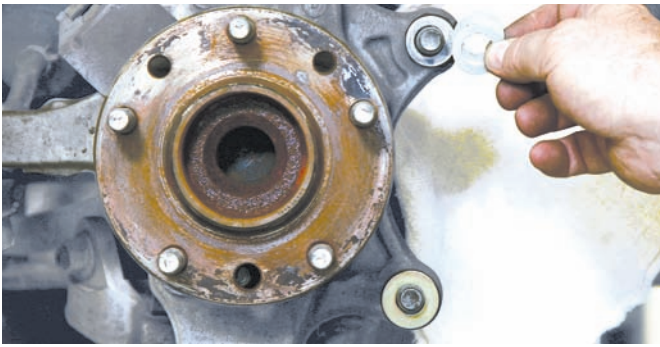
The two caliper mounting bolts were disconnected and then the rotor was lifted away from the brackets. The original brake line can be removed from the chassis bracket and the line should be capped to prevent fluid from leaking out.



After the caliper was disconnected and shelved, the rotor could be removed from the hub assembly.



The face of the hub assembly and the lug nut threads were cleaned with a wire brush. Any debris left on the hub can keep the rotor from properly seating, resulting in run-out. Here you can also see the original caliper mounting ears where the new caliper bracket will be connected.



Two shims were placed on both of the mounting bolts before the bracket was installed. This will be a starting point to get the caliper centered over the rotor. This may be perfect the first time, but shims can be added or subtracted to get the caliper centered over the rotor.



Using the two mounting bolts that were loaded with two shims, the Wilwood caliper bracket was installed and it was tightened down. After the perfect centering is accomplished these bolts will be coated with Loctite 271 and they will be tightened to 65 ft-lbs using a foot-pound torque wrench.



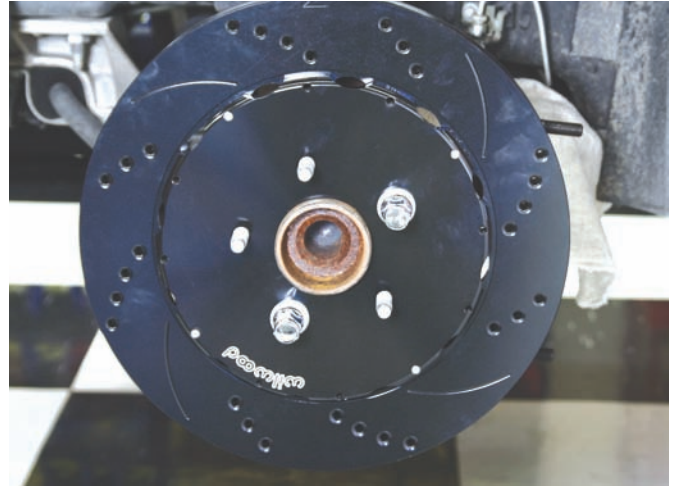
Now it is time to mount the hat to the rotor. The bolts and hat threads must be clean and free of oil or other contaminants. Loctite 271 was applied on the threads in preparation for installing them in the rotor to hat connections.



Here the bolts are being installed and they were tightened in an alternating sequence.



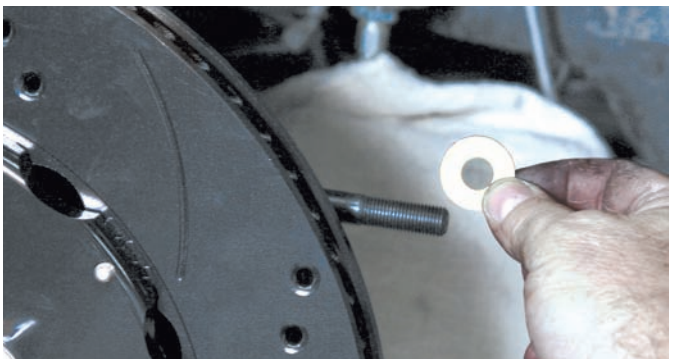
After all of the bolts were installed, they were tightened in an alternating sequence to 85 in-lbs using an inch-pound torque wrench.



The assembled rotor was installed on the hub assembly. The rotor was secured with two temporary washers and lug nuts to allow the caliper to rotor centering process to be done.



The caliper inlet fitting threads were wrapped with Teflon tape and then the fitting was installed in the side of the caliper. The 90-degree inlet fitting was rotated until it faced the upper bleed nipple.



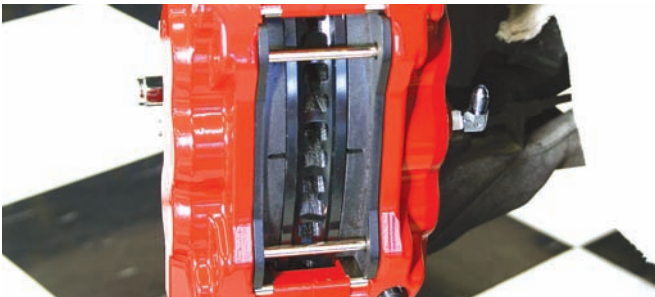
Two shims were placed on each caliper mounting stud before the caliper was installed.



The caliper was installed on the studs and it was tightened using a socket wrench. Now the caliper to rotor centering process was done to make sure rotor is centered in the caliper. The caliper can be moved inside or outside just a little by adding or subtracting shims. After the center position was achieved, the caliper mounting bolts were coated with Loctite 271 and were tightened to 85 in-lbs.



After the centering was achieved, the BP-10 Smart Pads were installed in the caliper and then the two retaining clips and snap rings secured the pads.



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To finish off the front brakes, the braided steel flex line coming from the caliper inlet fitting is connected to the hard-line that rests in the chassis mounted bracket.



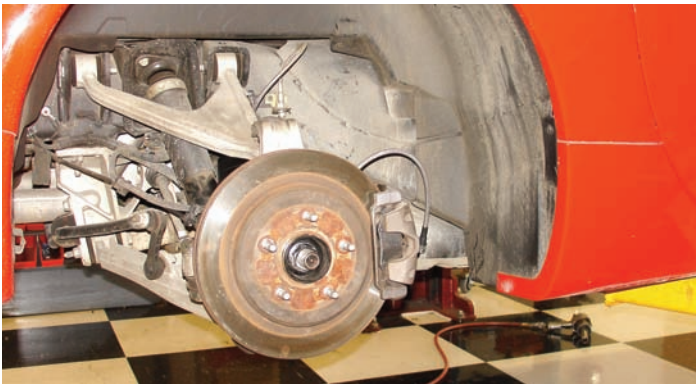
Here is the Wilwood front brake system finished and ready for some track time. This system features red calipers and black E-coated rotors.



The wheels were installed and the brakes were bedded in. The bedding process removed the E-coat from the rotor surface leaving a nice silver rotor face while the rest of the rotor remains coated and protected.



The original Corvette hubcaps were removed to access the lug nuts. Using the correct size socket and an impact gun, the lug nuts were disconnected and the wheels were removed.



Here is the Corvette independent rear suspension system complete with the stock brake system. The newer Corvettes are much more sophisticated than they were in the past.



In order to access the OEM hard to hose connector, the two bolts that secure the OEM Automatic Suspension Control Module to the fender well were removed and the unit was moved out of the way.



With the Automatic Suspension Control Module out of the way, the bracket that secured the hard line to hose line connection was easy to access. Using a line wrench, the two lines were disconnected. This is the same location where the Wilwood rear Flexlines will be connected after the brakes are installed.



Using a socket wrench and the appropriate size socket, the two bolts that secure the caliper to the upright bracket were disconnected and removed.



After the bolts were removed from the caliper bracket, the loose caliper was removed from the bracket assembly and then it was set aside.



The rotor face was tapped on the backside to release it from the centering ring. When it was loose it was removed from the assembly. If you look closely you can see the two mounting ears that will be used to secure the Wilwood caliper bracket.



The caliper bracket mounting bolts were placed through the ears and then they were loaded with two shims per bolt.



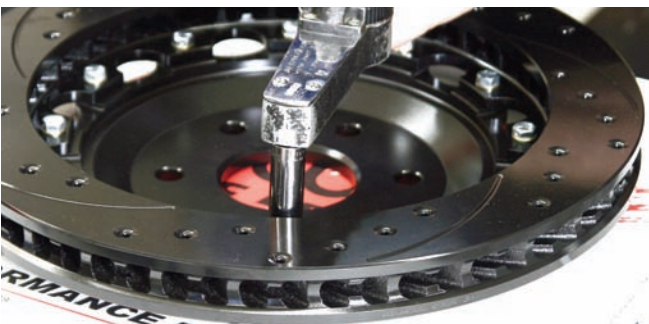
Here is the caliper bracket after it was secured to the original mounting ears. The bolts should be tight but just enough to check the rotor to caliper centering. After the centering is found, the bolts should be coated with Loctite 271 and tightened to 65 ft-lbs using a torque wrench.



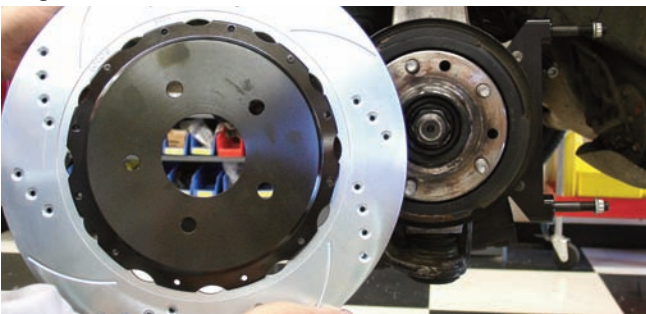
Before the assembly could go any further, the hat to rotor connection was made. The small bolts that make the connection were coated with Loctite 271.



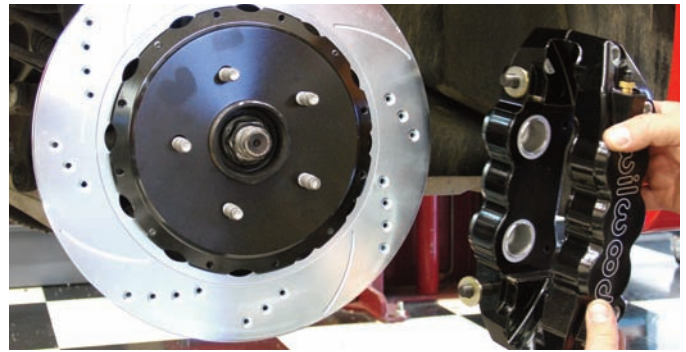
The hat assembly is being lined up with the tabs on the rotor. This hat is designed to work with the original Corvette internal parking brake assembly.



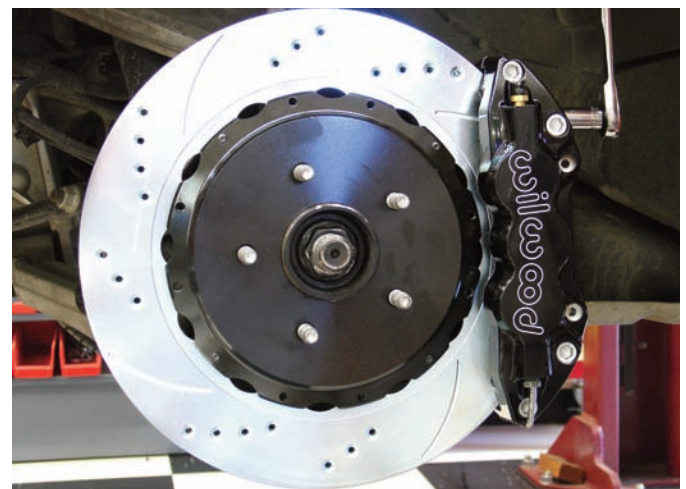
The small bolts that were included in the kit and were previously coated with Loctite 271 were used to connect the rotor to the hat assembly. The bolts were tightened in an alternating sequence to 85 in-lbs. After the bolts were tight, they were safety wired following the diagram in the instruction sheet.



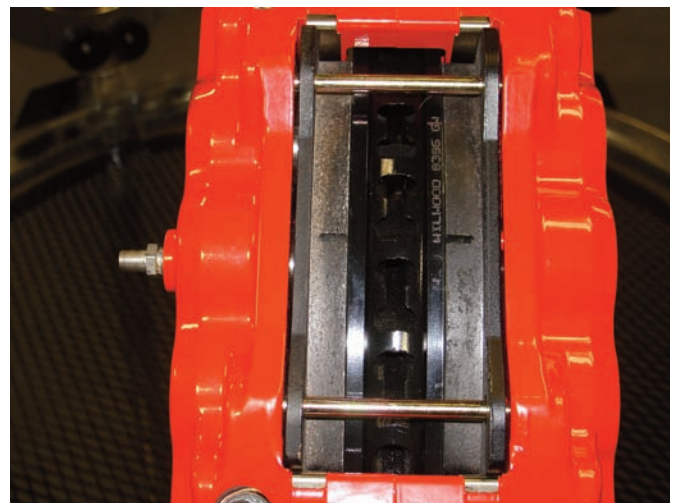
All of the Wilwood rotors are currently E-coated black for protection but in this photo a rotor that was zinc coated was used. This rotor is drilled and slotted for a nice appearance and to displace heat and brake dust.



The rotor was attached to the rear hub assembly and here the caliper is ready to be installed. Notice that the rotor bolts are loaded with a two 0.035-inch shim washers per bolt. The calipers were tightened with a washer and self-locking nut per stud. Four piston calipers are used in the rear and they provide a good front to rear balance.



The rotor was attached to the bracket and the centering was checked and achieved. After the centering was perfect, the caliper mounting bolts were coated with Loctite 271 and were tightened to 65 ft-lbs using a torque wrench.



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The Wilwood Engineering Flexline was routed from the caliper inlet fitting to the rear frame bracket that secures the original hard line. Here the two are being attached.



The brake pads were installed and secured with the center bridge pad retaining bolts. Here is the rear brake assembly ready for action. This system is great on the street but it is also track ready.

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