

## MAX-OUT YOUR MINI

### Installing Wilwood four-wheel disc brakes on a 2007 Mini



In 1959, Detroit stylists and designers were coming out with some of the largest cars on the planet and one good example is the big-fin '59 Cadillac. On the other side of the Atlantic a British designer, Sir Alex Issigonis designed the Mini and its sportier cousin the Cooper and Cooper S. The little cars were so small that a Cadillac owner once stated that he could put one of the little cars in the trunk instead of a spare tire. In the United States that big Cadillac has plenty of room to move about, but in England many of the roads were designed hundreds of years ago and are extremely narrow in small towns. The Mini was the perfect, low cost, high mileage car the British, as well as and many other Europeans needed to navigate in towns that were built hundreds of years ago.

The exterior dimensions of the Mini were very small, but the interior had plenty of room to hold four people. The other feature of the Mini was the car's fantastic handling ability. It could go around corners like a slot car on rails. When sports car fans found out how well they handled, they started road racing them and they were competitive with some very impressive sports cars. Basically the cars were fun to drive and soon they became a Celebrity favorite. Peter Sellers, Britt Ekland, Ringo Starr, John Lennon and George Harrison all owned and drove a Mini. Several well-known car enthusiasts also owned and drove a Mini, and they included Enzo Ferrari, Niki Lauda and Steve McQueen.

In 1994, under Bernd Pischetsrieder, a first cousin once removed of Issigonis, BMW took control of Mini and the company started designing a modern day version keeping the character of the original intact. The new version looks very similar to the original but



The Wilwood part number 140-8528 front disc brake kit comes complete with the rotors, hats, DynaPro calipers, pads, caliper brackets and all of the hardware required to finish the installation. The kit ordered features red calipers and the slotted and cross-drilled rotors.



The Wilwood part number 140-10885 rear disc brake kit comes complete with the rotors, hats, Combination Parking Brake (CPB) calipers, pads, caliper brackets and all of the hardware required to finish the installation. The kit ordered features red calipers and cross-drilled rotors.

parked together it is easy to see that the modern Mini, although very small, is much larger than the original one. That was a good design move because people today are larger than they were in 1959. BMW launched the MK I R53 in 2001 and car enthusiast in the know purchased the cars because, similar to the former Mini, they had classic style and fantastic handling combined with BMW power. The first Mini had a good sales record so in 2006 the company released the redesigned and improved MKII R56.

The brake upgrade we are making is on a MKII R56 model and it will feature a Wilwood part number 140-8528-DC kit that features Wilwood red DynaPro four-piston radial mount calipers and 12.19-inch rotors. The rotors and calipers are designed with race proven technology and will not only slow the Mini down faster than the stock brakes, they are also lighter and that will improve handling. The rear of the Mini was also improved with a Wilwood part number 140-10885-DR kit that uses the Combination Parking Brake Caliper, a hydro-mechanical parking brake caliper that utilizes hydraulic pressure from the master cylinder for stopping power and an internal mechanical lock for the parking brake. The rear calipers are coupled with 11.75-inch rotors to provide balanced brake performance for the street or the occasional track day with the added benefit of a 7-pound weight reduction.

Both of the kits feature drilled and slotted rotors and red calipers and the kits come complete with everything the installer will need to finish the installation. Another thing that was ordered was the part number 220-8941 front braided steel Flexline and the part number 220-10879 rear braided steel Flexline. The ability to customize the kits with special colored calipers and rotor designs allow you to personalize each kit to fit your needs, the performance you expect and what you can afford.

Wilwood recommends that this installation should only be done by a qualified mechanic experienced in the installation and proper operation of disc brake systems. Before you start, it would be a good idea to make sure you have the correct kit to match your exact application. Make sure the factory hub stud pattern matches the hats in your kit. Inspect the items in your kit with the instruction sheet parts list to make sure you have everything you need. The tools required to perform this installation include a floor jack with jack stands, a full assortment of American and metric wrenches and sockets, a 3/8-inch drive ratchet wrench, a

screwdriver assortment, a wire brush, t25 and t50 torx sockets, Loctite 271, and an inch-pound and foot-pound torque wrench. If you want to speed things up you can also use an air-powered impact gun and an air powered ratchet wrench.

We are going to show you a step-by-step installation on a Mini to give you an idea of how it's done. If you are going to update your Mini to stop quickly, this will provide the information you will need to decide whether you have the ability to perform the installation or if it would be better to have a professional do it for you.



1

Using a floor jack, the front of the Mini was raised and was placed on jack stands. The hubcaps were removed to access the lug bolts. Using the proper size socket and an impact gun the lug bolts were disconnected and the wheels and tires were removed.

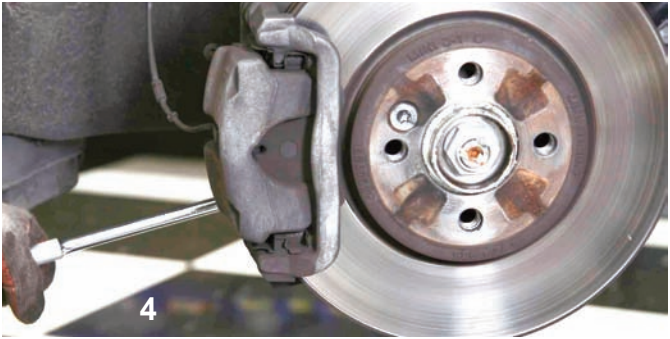


2

After the wheels and tires were removed, you can see the original Mini brakes and rotors. This car uses lug bolts instead of lug nuts and the rotor is secured to the hub with a large torx bolt.



3  
The original flexible brake line was disconnected from the steel hard line in preparation of removing the caliper. There is a rubber grommet on each flex line so it was removed and retained for reinstallation on the new Wilwood Flexline.



4  
Using a breaker bar and the correct size socket, the caliper bolts were disconnected from the front hub assembly.



5  
After the bolts were disconnected, the cast iron caliper was removed from the brake assembly. The new brake caliper is much lighter than the old caliper.



6  
The torx bolt that secures the rotor to the hub was very tight, so it was loosened with an impact screwdriver. The bolts were retained because they will be used to fasten the new rotors.



7  
The rotor was tapped with a rubber mallet on the backside to break it loose from the hub assembly. When it was loose, it was removed from the assembly.



8  
Using a torx screwdriver, the small screws that fasten the dust shield to the hub assembly were removed.



9  
The dust shields were discarded because they will not be used with the new brakes.



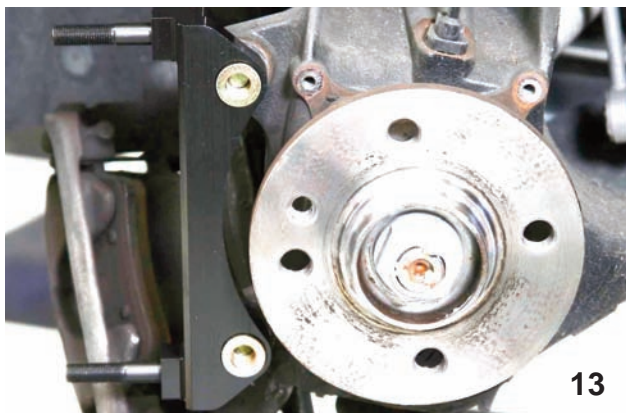
10  
Before going any further, a wire brush was used to clean the grease and grime away from the hat locator on the hub.



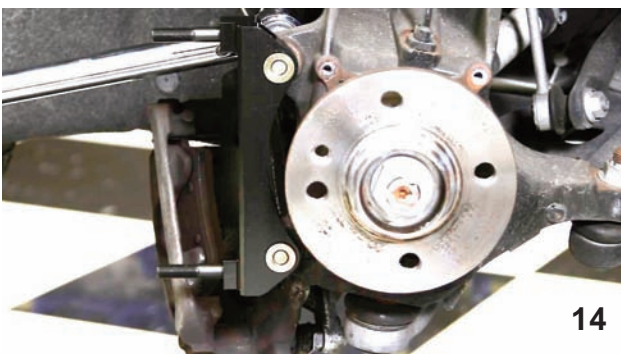
11  
The original caliper mounting holes are rather large, so sleeves are used in the top and bottom hole to downsize the holes.



12  
The bolts were installed into the original caliper mounting holes and two shims were installed.



13  
The caliper bracket was connected to the original mounting holes with the bolts supplied in the kit.



14  
The bracket should be tight to check the rotor to caliper centering. It should be centered but if it is not, shims can be added or subtracted to get it perfect. After the centering was perfect the bracket bolts were coated with Loctite 271 and then they were tightened to 75 ft-lbs.



15  
The rotor was installed on the hub assembly and the holes were aligned so that the mounting bolt could be installed and tightened.



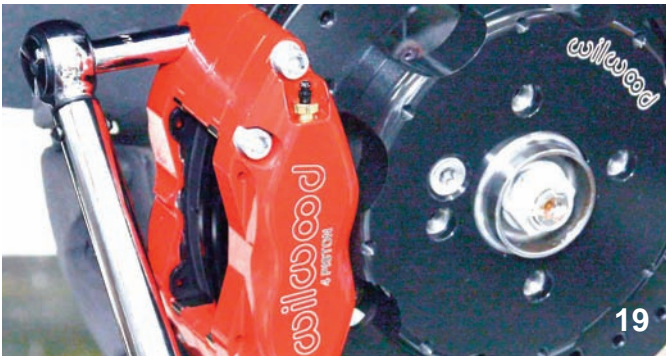
16  
The rotor was attached to the hub assembly using the same torx bolt that fastened the original rotor. The impact screwdriver is reversible so a few whacks of the hammer got the bolt very tight.



17  
The adhesive backing was removed from the anti-squeal plate and then it was attached to the rear side of the brake pad. The tabs were bent over the pad baking plate to keep them in place.



18  
The inlet fitting was coated with PTFE thread tape and then it was screwed into the caliper. The fitting should be pointing upward.



The caliper was placed on the caliper bracket and then the washers and locknuts were installed. Make sure the rotor is centered in the caliper, and when it is, the studs were lightly oiled and the mounting nuts were tightened to 30 ft-lbs using a torque wrench.



After the caliper was centered, the pads were installed from the top of the caliper. The pads were fastened with the Quick-clip pad retainer.



Here is a close look at the Quick-clip pad retainer that makes pad changes easy. Here you can also see that the rotor is centered between the pads.



The old brake hose was removed and the new Wilwood part number 220-8491 was installed remembering to install the rubber grommet that were removed from the original hose. The hole in the bracket will have to be enlarged to hold the fitting used to adapt the Wilwood Flexline to the original steel line.



The finished brake assembly is looking good with the bright red caliper and black E-coated rotor. This system will improve the Mini braking, plus it looks nice doing it.



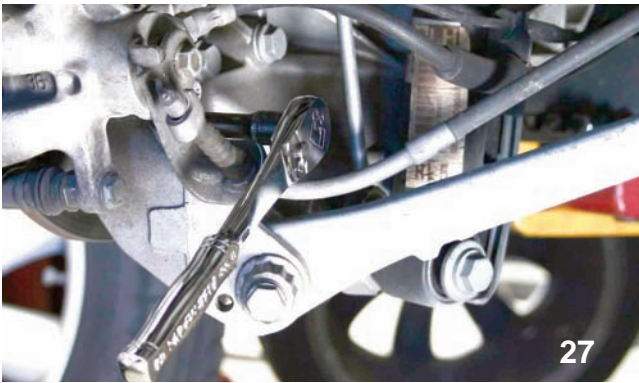
Here is the finished front brake assembly after the wheel was installed and was resting on the ground. The windows in the Mini wheels aren't real big, but you can still see the nice looking Wilwood brakes peeking through.



The rear of the Mini was raised and the jack stands were placed under the car for safety. The hubcaps were removed and then the lug bolts were disconnected with the correct size socket on an impact gun.



Here is a look at the factory disc brake setup that connects to a hub assembly that rides on a large aluminum lower control arm.



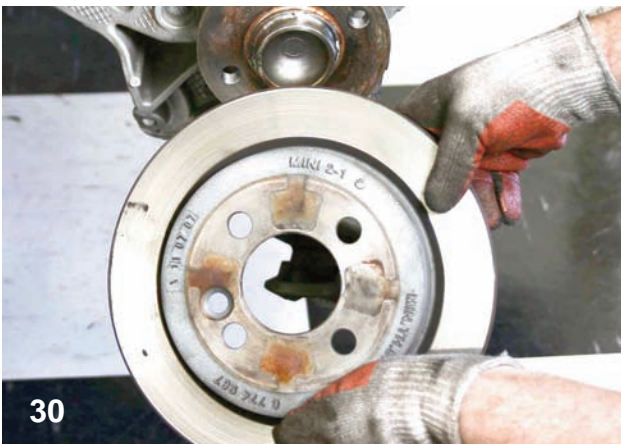
27  
The bolts that fasten the caliper to the bracket were removed from the backside of the assembly as seen here.



28  
After the bolts were disconnected, the caliper was removed from the bracket and the car.



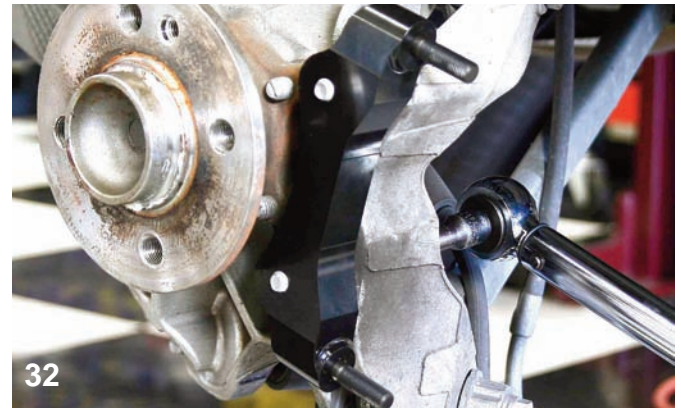
29  
The torque bolt that secures the rotor to the hub assembly was removed with an impact screwdriver.



30  
After the bolt was disconnected, the rotor was removed from the hub assembly. If the rotor sticks to the centering ring, a few taps with a rubber mallet will loosen the connection.



31  
The caliper bracket bolts to the same location the original caliper bolted to. Here you can see the bolts in the holes and they will be used with a two shims per bolt.



32  
Here is the caliper bracket after the bolts were installed and tightened. The caliper to rotor centering was perfect before the final installation. After it was determined that the centering was perfect, the bolts were coated with Loctite 271 and they were tightened to 22 ft-lbs using a torque wrench.



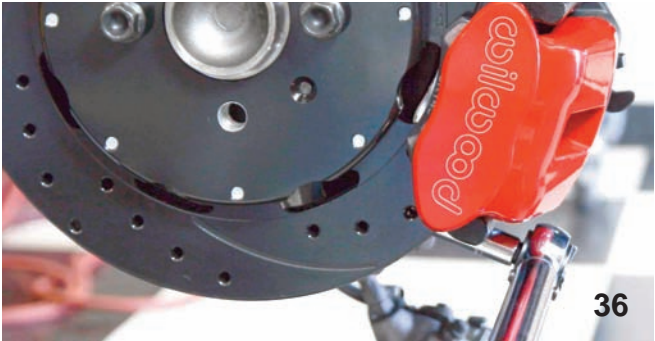
33  
Grease, dirt or debris of any kind was removed from the face of the hub assembly, especially around the centering ring.



34  
Before the caliper was installed, the bracket studs were loaded with two shims per stud.



The rotor was placed on the hub assembly and then it was tightened with two lug bolts.



The caliper was attached to the bracket and then the caliper to rotor centering was examined. Adding or subtracting shims can be used for adjustments. After the rotor is centered in the caliper, the bolts were tightened to 30 ft-lbs using a torque wrench.



The bolts for the caliper mounting bracket were coated with Loctite 271 and then they were tightened to 22 ft-lbs.



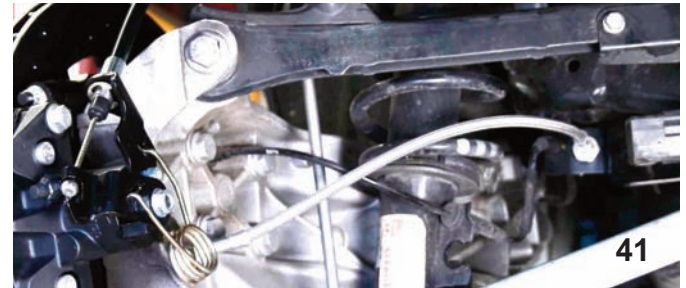
The protective rubber plug was removed from the caliper inlet. The banjo fitting was installed making sure there was PTFE thread tape on the banjo nut. The Wilwood part number 220-10879 was connected to the fitting and then the line was routed toward the steel line bracket.



The line that was just connected to the caliper fitting was routed to this frame bracket. There is a special connection that adapts the braided line to the original steel line. The original flexible line was disconnected from the steel line first and then the bracket was modified for the new adapter fitting.



After the original line was removed the bracket was drilled out just a little so that the adapter fitting seen here can be installed in the bracket.



Here is the Wilwood part number 220-10879 braided steel Flexline running from the caliper to the bracket holding the steel line and adapter fitting. The line was routed away from any moving parts.



The brake wear sensor line was wrapped up and it can be installed in an inconspicuous place while connected in the car. If the brake sensor line is removed completely, the brake wear dash warning light will remain on.



In order to complete the parking brake line routing, the bolts were removed from the second from rear heat shield and then it was removed.



The bolts fastening the cable brackets on the rear suspension arms were also removed so they can be slightly modified.



The console was removed to access the handbrake cable equalizer with two cables going toward the rear. The two cables were removed from the equalizer and they were pushed toward the rear. The OEM cable end clips are hidden at the very rear of the tunnel and hidden under the rearward brace. Using a four-inch long metal tube, it was forcefully placed into each clip and then the cable was twisted and pulled out of the holes.



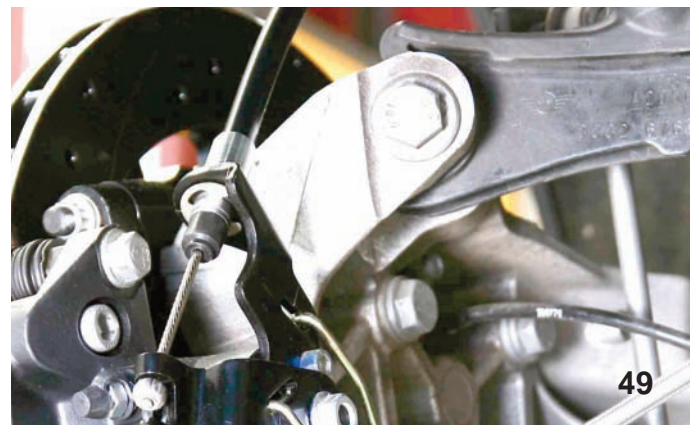
The two holes seen at the top of the photo were enlarged to 0.530-inch. The new cables were slid into the enlarged holes and were pressed into place in the equalizer.



The mounting brackets that were previously removed were modified so the new lines could be run through. Using two grommets, they were placed over the line and were pressed into the small brackets as seen here. After the lines were in place, the small brackets were bolted back on the control arms.

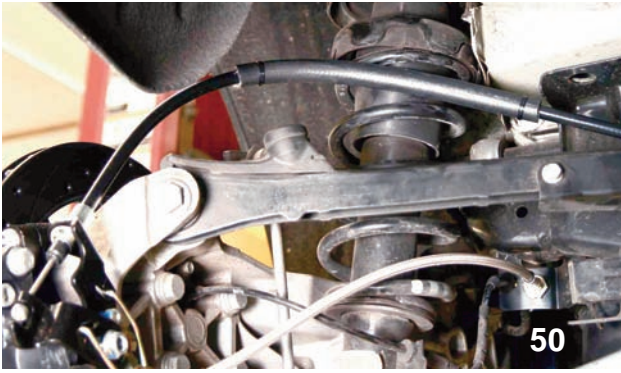


Here is the bracket after it was bolted in place. The brackets keep the parking brake lines safe and out of the way of any moving parts.



The lines were run forward and here is how they were attached to the master cylinder lever.





The parking brake line was wrapped with a rubber hose for added protection. It is secured to the line with a pair of black tie wraps.



The wheel was installed and the Mini was ready to have the brakes bled followed by the brake bedding process. When that was finished, the Mini brakes were working terrific and they also look attractive behind the Mini wheel spokes