

# ASSEMBLY INSTRUCTIONS

FOR

## DYNAPRO BIG BRAKE FRONT HAT KIT, VENTED ROTOR

1999 - 2004 SUNFIRE / CAVALIER

PART NUMBER

**140-8423\***

### WARNING

INSTALLATION OF THIS KIT SHOULD **ONLY** BE PERFORMED BY PERSONS EXPERIENCED IN THE INSTALLATION AND PROPER OPERATION OF DISC BRAKE SYSTEMS. IT IS THE RESPONSIBILITY OF THE PERSON INSTALLING ANY BRAKE COMPONENT OR KIT TO DETERMINE THE SUITABILITY OF THE COMPONENT OR KIT FOR THAT PARTICULAR APPLICATION.

RACING EQUIPMENT AND BRAKES MUST BE MAINTAINED AND SHOULD BE CHECKED REGULARLY FOR FATIGUE, DAMAGE AND WEAR.



### FOR OFF ROAD USE ONLY

BEFORE OPERATING VEHICLE, TEST THE BRAKES UNDER CONTROLLED CONDITIONS. MAKE SEVERAL STOPS IN A SAFE AREA FROM LOW SPEEDS AND GRADUALLY WORK UP TO RACING SPEEDS. **DO NOT RACE ON UNTESTED BRAKES!** ALWAYS UTILIZE SAFETY RESTRAINT SYSTEMS WHILE OPERATING VEHICLE.

### IMPORTANT

READ DISCLAIMER OF WARRANTY INCLUDED IN THE KIT.

**WARNING: Some cleaners may stain or remove the finish on brake system components. Test the cleaner on a hidden portion of the component before general use.**

\*DRILLED SRP ROTORS AVAILABLE; ADD "-D" TO END OF PART NUMBER WHEN ORDERING

## Important Notice

Before any tear-down or disassembly begins, review the wheel clearance diagram, Figure 1 below to verify that there is adequate clearance with the wheels you will be using with this installation.

## Important Notice

Before any tear-down or disassembly begins, modifications are required to the stock spindle. These include removing the original equipment caliper slides from the stock spindle that will interfere with the assembly of the Wilwood disc brake kit. It is recommended that these modifications be performed by a qualified machine shop. Please refer to the modification procedure and Figure 2 below.

## General Information and Disassembly Instructions

Installation of this kit should **ONLY** be performed by persons experienced in the installation and proper operation of disc brake systems. Before installation begins, please read the complete procedure thoroughly to familiarize yourself with the process, and double check the following items to ensure a trouble-free installation.

- Make sure this is the correct kit to match the exact make and model year of the vehicle's spindle (i.e., brackets for a 1998 Sunfire may not fit a 2003 Sunfire spindle).
- Verify the hat stud pattern in this kit matches the stud pattern of the vehicle's hubs.
- Verify your wheel clearance using Figure 1.
- Inspect the package contents against the parts list to ensure that all components and hardware are included.

### Disassembly

- Disassemble the original equipment front brakes:  
Raise the front wheels off the ground and support the front suspension according to the vehicle manufacturer's instructions.

Remove the wheel. Remove the two bolts that hold the stock caliper mounting bracket to the spindle. Lift off the bracket and stock caliper as one unit, then slide off the stock hat and rotor assembly. On some models you may have to unbolt the stock caliper from the caliper bracket before removal.

- Thoroughly clean and de-grease the spindles while removing all nicks or burrs around the spindle and threads.

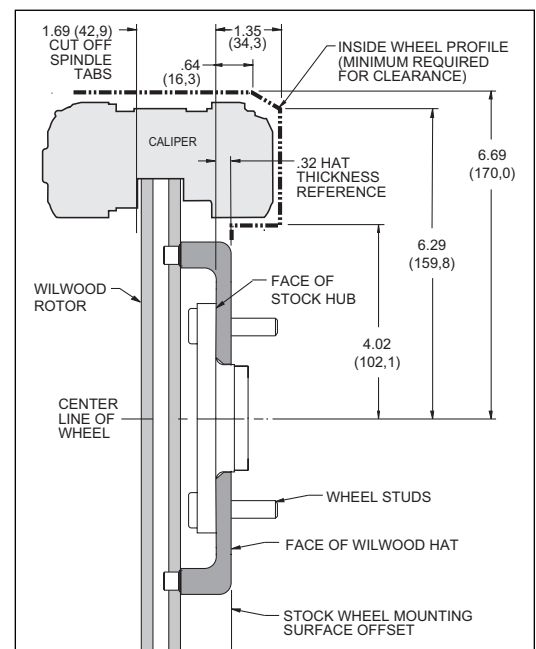


Figure 1. Wheel Clearance Diagram

## Spindle Modifications

- These modifications should be performed by a qualified machinist. Refer to Figure 2, right. Only one view of the spindle is shown, but the modifications need to be performed on both spindles.
- Remove the OE caliper slides from the top and bottom of the existing spindle as shown in the gray shaded areas. The amount to be removed is 1.69 (42,9) measured from the face of the stock hub. After removal, be sure that the area is free of any burrs or sharp edges.

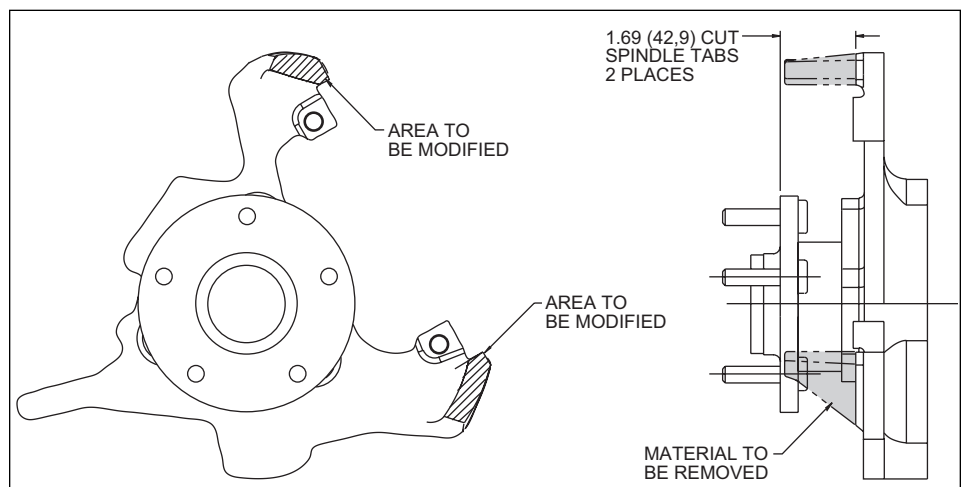
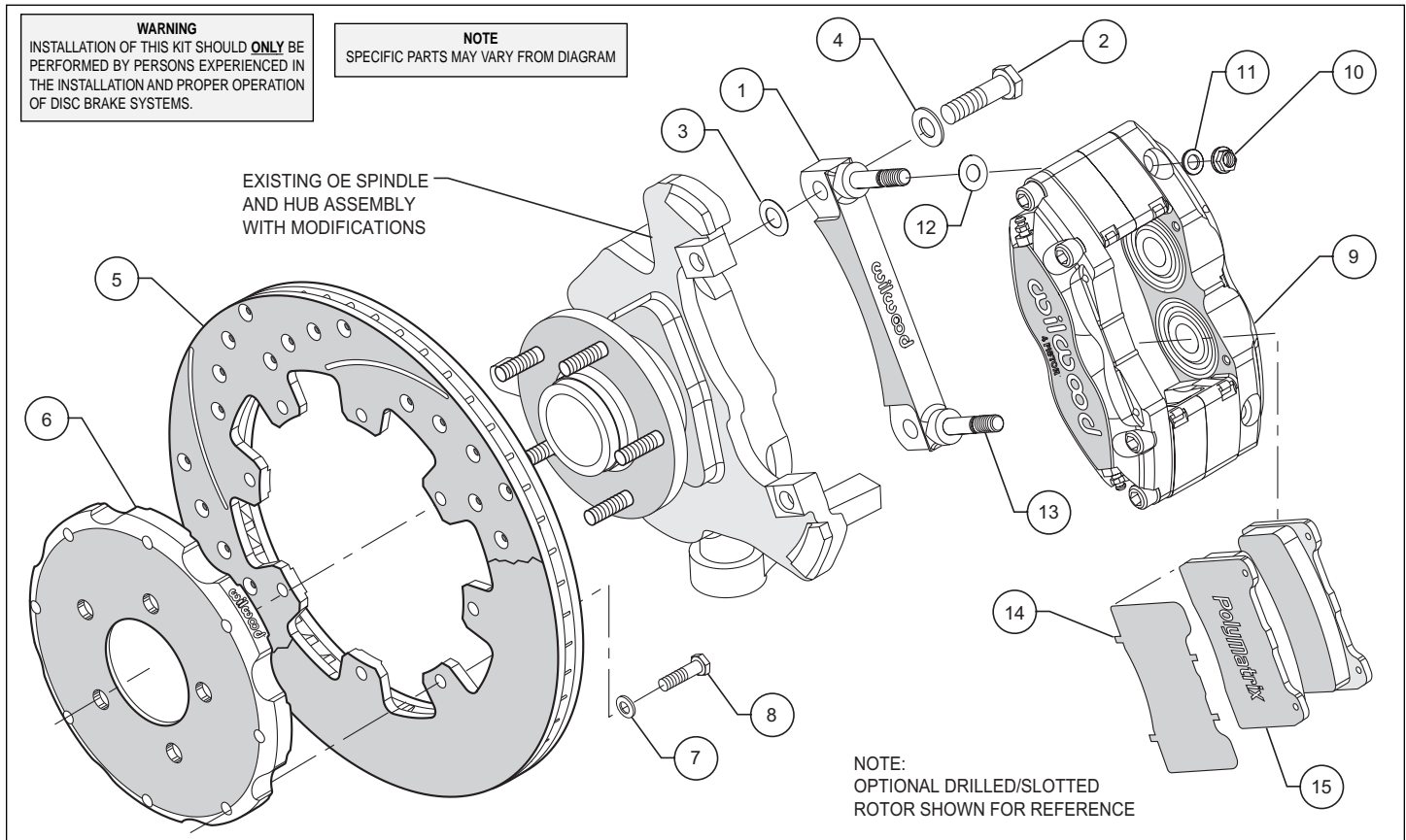


Figure 2. Spindle Modifications

## Exploded Assembly Diagram and Parts List



**Figure 3. Typical Installation Configuration**

<b>ITEM NO.</b>	<b>PART NO.</b>	<b>DESCRIPTION</b>	<b>QTY</b>
1	250-8325	Bracket, Caliper Mounting	2
2	230-8333	Bolt, M11-1.5 x 32mm Long	4
3	240-5680	Washer, 7/8 inch, Shim	4
4	240-0476	Washer, 59/64 inch	8
5	160-5843	Rotor, .81" Thk x 12.19" Dia, 8 x 7.00" Bolt Circle	2
5A	160-7103/04	Rotor, Drilled and Slotted	2
6	170-8324	Hat	2
7	240-0541	Washer, 5/16 inch	16
8	230-8473	Bolt, 5/16-18 x 1.00 Long, Hex Head	16
9	120-7327	Caliper, DynaPro	2
10	230-6001	Nut, Self-Locking Hex Head	4
11	240-2510	Washer, flat, 5/8 inch	4
12	240-3736	Washer, flat, 51/64 inch	16
13	230-6232	Stud, 3/8-16 x 3/8-24 x 2.5 Long (pre installed in bracket)	4
14	300-8259	Anti-Squeal Shims	4
15	15Q-7268K	Pad, PolyMatrix, Axle Set	1
	300-8362	Thread Lock (not shown)	1

**NOTES:**

Part Number 230-8390 Rotor Bolt Kit, includes part numbers 230-8473 and 240-0541

Part Number 250-8326 Caliper Bracket Mounting Bolt Kit, includes P/N's 230-6001, 230-6232, 240-3736, 240-2510 & 250-8325

Part Number 230-8421 Spindle Bracket Mounting Bolt Kit, includes P/N's 230-8333, 240-0476, 240-5680 & 300-8362 (Thread Lock)

Item 7A is an optional item and is included with the "-D" kits. Add "-D" to end of part number when ordering.

Wilwood offers an optional Braided Stainless Steel Hose Kit. Order part number 220-8422 (not included in kit)

## Assembly Instructions

**Assembly Instructions** (numbers in parenthesis refer to the parts list/diagram on the preceding page):

- The caliper mounting bracket assembly (1) should be installed first with clean, dry threads on the mounting bolts. Install the bracket from the rear side of the spindle by sliding bolts (2) through flatwasher (4). Place shim washer (3) between the bracket (1) and the backside of the spindle (see Figure 3). The bracket must tighten squarely against the side of the spindle body. Inspect for interference from casting irregularities, machining ridges, burrs, etc. Use one thin shim (3) between the spacer and spindle during initial trial fitting.

- With the larger I.D. side of the rotor (5) facing away from the hat (6), bolt rotor (5) to hat (6) through the backside of the rotor using washers (7) and bolts (8). Torque bolts (8) in an alternating sequence to 180 **in-lb**. Safety wire bolts (8) using standard 0.032 inch diameter stainless steel safety wire as shown in Figure 4. Please refer to Wilwood's data sheet DS-386 (available at [www.wilwood.org/ds386.pdf](http://www.wilwood.org/ds386.pdf)) for complete safety wire installation instructions. Slide the rotor/hat assembly onto the spindle. Install a couple of lug nuts (finger tighten) to keep the rotor/hat assembly in place while continuing with the installation.

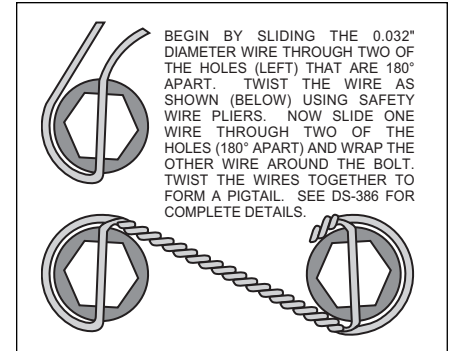


Figure 4. Safety Wire Diagram

- Install one washer (12) over each pre-installed stud (13) on the radial mount bracket (1). Slide the caliper (9) in place over the studs and rotors and install the washer (11) and lock nut (10) to hold the caliper in place. The caliper bleed screws should be pointing up. Snug the lock nuts (10) and check that the rotor (5) is centered in the caliper (9). Add or subtract .02" shims (3) as necessary between the spacer and the spindle to center the caliper (9).

- Remove the caliper quick-clip pad retainer from the caliper. Remove the protective material from the adhesive side of the anti-squeal shims (14) and place against the backing plate side of the brake pads (15) utilizing the contour of the backing plate as a guide. Secure material to backing plate by bending the four tabs over the edge of the backing plate. Slide the brake pads (15) with the shims into place. They should install easily without interference. Check that the outside radius of the brake pad is aligned with the outside diameter radius of the rotor face. Add or subtract shims (12) between the caliper and mount bracket to gain the proper alignment. Reinstall the quick-clip pad retainer.

- Remove the lug nuts that were holding the hat in place. Install the wheel. Check to see that the wheel rotates freely without interference.

- Once all clearances have been checked, remove the wheel, caliper, hat, and rotor from the spindle and hub. Secure the caliper mounting bracket (1) to the spindle with bolt (2) using red *Loctite*<sup>®</sup> 271 supplied in the spindle bracket mounting bolt kit. Torque the bolts to 47 ft-lbs. Reinstall the hat and rotor assembly and again use several lug nuts to hold it in place. Reinstall the caliper and torque the caliper nuts (10) to 47 ft-lb.

- NOTE:** The caliper inlet hole has a 1/8-27 NPT thread. A steel adapter fitting, straight or 90° elbow, should be installed in the caliper. Stainless steel braided flex line with enough length to allow the wheels to turn lock to lock without straining or pinching the line should be used to fabricate new brake hoses. Wilwood offers a hose kit, P/N 220-8422, which includes hoses, fittings, etc., all in one package. **THE ORIGINAL EQUIPMENT PRODUCTION RUBBER BRAKE HOSES WILL NOT ADAPT TO WILWOOD CALIPERS AND ARE NOT RECOMMENDED.**

- Bleed the brake system (reference additional information on the last page as necessary).

- Remove the lug nuts that were used to hold the rotor/hat assembly in place during caliper installation. Install the wheel and lug nuts, torque to OEM specifications.

- Repeat the entire procedure for the other wheel.

## Additional Information and Recommendations

- Please read the following concerning balancing the brake bias on 4 wheel disc vehicles.

This brake kit can be operated using the stock OEM master cylinder. However, as with most suspension and tire modifications (from OEM specifications), changing the brakes may alter the front to rear brake bias. Rear brakes should not lock up before the front. Brake system evaluation and test should be performed by persons experienced in the installation and proper operation of brake systems. Evaluation and test should be performed under controlled conditions. Make several stops from low speeds and gradually work speeds up. Always utilize safety restraint systems while operating vehicle.

Use a Wilwood adjustable proportioning valve if necessary to achieve proper brake balance, or

Use a Wilwood brake pedal/balancebar assembly with dual master cylinders (requires custom mounting as used in fabricated chassis race cars). A balance bar brake system permits incremental front to rear brake pressure adjustments.

- For optimum performance, fill and bleed the new system with Wilwood Hi-Temp° 570 grade fluid or EXP 600 Plus. For severe braking or sustained high heat operation, use Wilwood EXP 600 Plus Racing Brake Fluid. Used fluid must be completely flushed from the system to prevent contamination. **NOTE:** Silicone DOT 5 brake fluid is **NOT** recommended.
- To properly bleed the brake system, begin with the caliper farthest from the master cylinder. Bleed the outboard bleed screw first, then the inboard. Repeat the procedure until all calipers in the system are bled, ending with the caliper closest to the master cylinder. **NOTE:** When using a new master cylinder, it is important to bench bleed the master cylinder first.
- If the master cylinder is mounted lower than the disc brake calipers, some fluid flowback to the master cylinder reservoir may occur, creating a vacuum effect that retracts the caliper pistons into the housing. This will cause the pedal to go to the floor on the first stroke until it has "pumped up" and moved all the pistons out against the pad again. A Wilwood in-line two pound residual pressure valve, installed near the master cylinder will stop the fluid flowback and keep the pedal firm and responsive.
- Test the brake pedal. It should be firm, not spongy and stop at least 1 inch from the floor under heavy load.  
If the brake pedal is spongy, bleed the system again.

If the brake pedal is initially firm, but then sinks to the floor, check the system for fluid leaks. Correct the leaks (if applicable) and then bleed the system again.

If the brake pedal goes to the floor and continued bleeding of the system does not correct the problem, a master cylinder with increased capacity (larger bore diameter) will be required. Wilwood offers various lightweight master cylinders with large fluid displacement capacities.

- **NOTE:** With the installation of after market disc brakes, the wheel track may change depending on the application. Check your wheel offset before final assembly.
- On some models of disc brake spindles there are "ears" where the OEM calipers were mounted and these "ears" interfere with the assembly of the Wilwood disc brake kit. If it becomes necessary to remove these "ears", remove as little as possible being careful not to cut away any of the mounting holes that may be required to bolt on the caliper mounting bracket.
- If after following the instructions, you still have difficulty in assembling or bleeding your Wilwood disc brakes, consult your local chassis builder, or retailer where the kit was purchased for further assistance.

### PAD BEDDING PROCEDURE:

- Pump brakes at low speed to assure proper operation. On the race track, or other safe location, make a series of hard stops until some brake fade is experienced. Allow brakes to cool while driving at moderate speed to avoid use of the brakes. This process will properly burnish the brake pads, offering maximum performance.

### Associated Components

PART NO.	DESCRIPTION
260-1874	Wilwood Residual Pressure Valve (2 lb for disc brakes)
260-1876	Wilwood Residual Pressure Valve (10 lb for drum brakes)
260-8419	Wilwood Proportioning Valve
290-0632	Wilwood Racing Brake Fluid (Hi-Temp° 570) (12 oz)
290-6209	Wilwood Racing Brake Fluid (EXP 600 Plus) (16.9 oz)
340-1285	Wilwood Floor Mount Brake Pedal (with balance bar)
340-1287	Wilwood Swing Mount Brake Pedal (with balance bar)
260-6764	Wilwood 3/4 inch High Volume Aluminum Master Cylinder
260-6765	Wilwood 7/8 inch High Volume Aluminum Master Cylinder
260-6766	Wilwood 1 inch High Volume Aluminum Master Cylinder
270-2016	Quick Release Steering Hub (3/4 inch shaft)
270-2017	Quick Release Steering Hub (5/8 inch shaft)
220-3509	Fitting, Straight (1/8-27 NPT to -3)
220-6412	Fitting, 45° Elbow (1/8-27 NPT to -3)
220-6413	Fitting, Adaptor Tubing (10mm to -3)
220-6415	Fitting, 90° Elbow (1/8-27 NPT to -3)
220-8422	Stainless Steel Braided Flexline Kit, Sunfire / Cavalier (Consult the Wilwood Catalog for a complete parts list)

### Bolt Torque Specifications

BOLT SIZE	TORQUE
1/4-20	85 in-lb
1/4-28	103 in-lb
5/16-18	180 in-lb
5/16-24	198 in-lb
3/8-16	22 ft-lb
3/8-24	30 ft-lb
7/16-14	42 ft-lb
7/16-20	47 ft-lb
1/2-13	65 ft-lb
1/2-20	77 ft-lb
9/16-12	95 ft-lb
9/16-18	105 ft-lb
5/8-11	110 ft-lb
5/8-18	120 ft-lb

**NOTE:** This bolt torque specification list is for use with specific grades of bolts as supplied in the particular Wilwood kit and is not intended as a guide for any other application.