

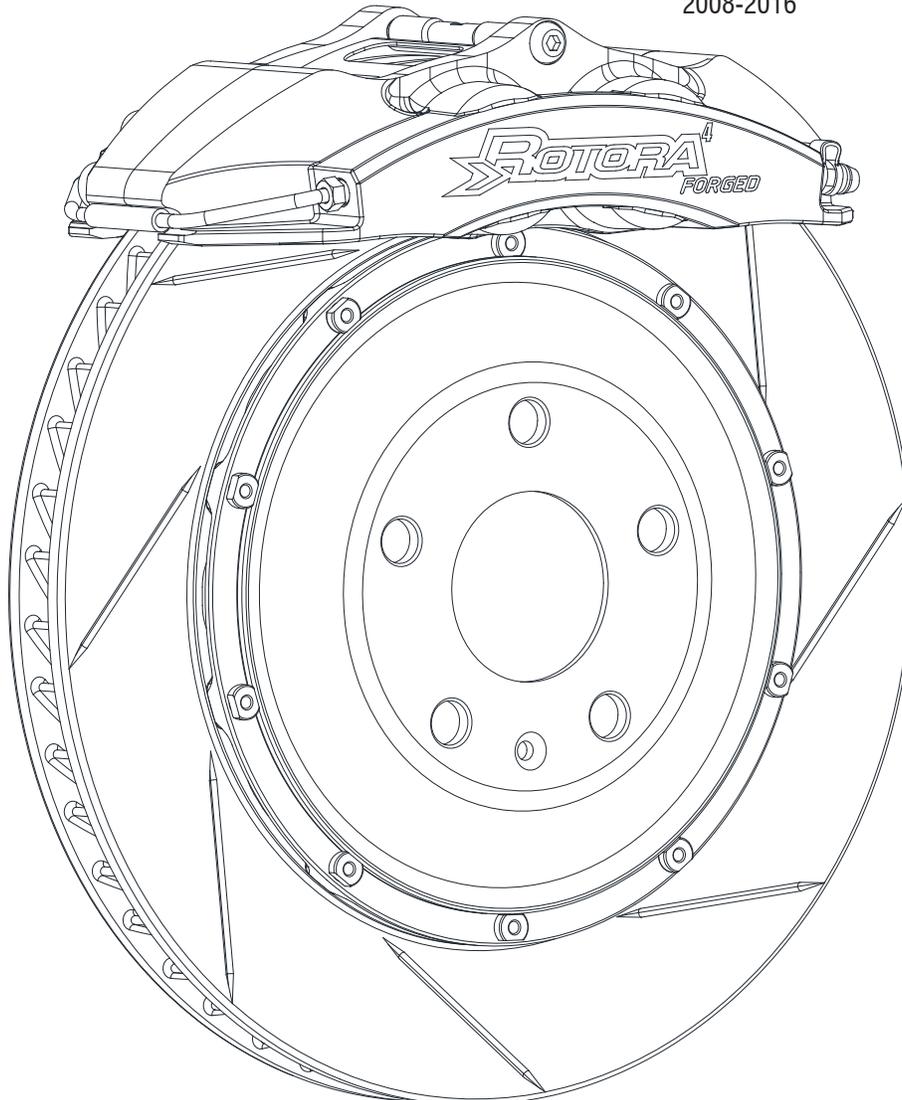


## REAR BRAKE SYSTEM

# INSTRUCTION MANUAL

REV: A 03-15-2019

VOLVO S60, S60L, S60 POLESTAR (P3)	2011-2018
VOLVO S80, S80L (P3); W/ ELECTRONIC PARKING BRAKE	2007-2016
VOLVO V60, V60 POLESTAR (P3)	2014-2018
VOLVO V70 (P3)	2008-2016
VOLVO XC60 (P3)	2010-2017
VOLVO XC70 (P3)	2008-2016



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# IMPORTANT NOTICES:

## WHEEL FITMENT:

Wheel fitment must be confirmed before starting the brake system installation. Do not assume your wheels will fit. Obtain a Wheel Clearance Chart (for your vehicle and Brake System setup) from Rotor to determine whether if your current wheels will fit; if wheel spacers are necessary; or what new wheel sizes will clear.

## PAD TO DISC BEDDING PROCESS:

Proper pad and brake disc bed-in process is crucial to the performance of your new system. Failure to properly bed-in your new system will significantly impact how well they work and how long they last. The main cause of brake vibration is due to uneven pad material deposition onto the braking surface of the disc. Proper bed-in will greatly minimize such problems. Please follow the bedding procedure listed later in this manual as closely as possible.

## VEHICLE SUSPENSION HEIGHT:

For vehicles using lift suspension kits, please check Rotor stainless steel braided brake line length for proper clearance. Rotor Brake Systems are designed for vehicles at original suspension ride height.

## APPLICATION DISCLAIMER

## CALIPER TO WHEEL CLEARANCE:

Most 17" wheels will clear the outer diameter of the caliper using a 328~332mm discs. 18" wheels are typically required for 350~355mm diameter discs, 19" wheels for 380mm discs, and 20" wheels for 405mm discs. The most critical clearance is the gap between the inner wheel spokes and the outer face of the caliper. Do not assume 22" or higher wheels will clear the outer caliper face. Refer to Wheel Clearance Chart page in Rotor's website to obtain wheel fitment templates or contact Rotor technical support for further assistance. Final fitment of the wheel to the brake system is the sole responsibility of the installer or the customer.

## WHEEL SPACERS:

Wheel spacers can provide additional clearance to the outer face of the caliper. This will also space out the entire wheel, widening the track width of the vehicle. Fender clearances should be checked on lowered vehicles, and longer lug studs (wheel bolts) are usually required. Rotor does not recommend the use of aluminum wheel spacers. Should wheel spacers be used, it would be the responsibility of the installer or customer to ensure wheel spacers are properly specified and installed.

## BRAKE NOISE:

Certain brake pad compounds produce more noise than others. The fact is performance pads are more prone to noise and squeal. Proper anti-squeal shim plates between the caliper pistons and backing plate of the pad help reduce the problem. Anti-squeal lubricants are also available to help reduce noise and squeal. The buyer is responsible for any noise and squeal related problems due to pad selection.

## BRAKE VIBRATION:

The most common cause of brake vibration is improper bedding of pads and discs or improper pad selection for the specific driving environment. Under the most extreme conditions, any brake disc may distort (warp), but uneven pad deposition is a more typical cause of vibration. If the system is not properly bedded-in or street compounds are used for track, uneven pad deposits will occur causing an ever-worsening vibration. Failure to immediately address a pad deposition/vibration issue may lead to permanent damage to the brake discs. Please read carefully and understand the bed-in procedure included with this installation manual. If you have any questions, please contact Rotor technical support for further assistance. Rotor is not liable for vibrations or warping of brake discs caused by extreme usage or improper bed-in procedure.

## CHEMICAL AND BRAKE FLUID EXPOSURE:

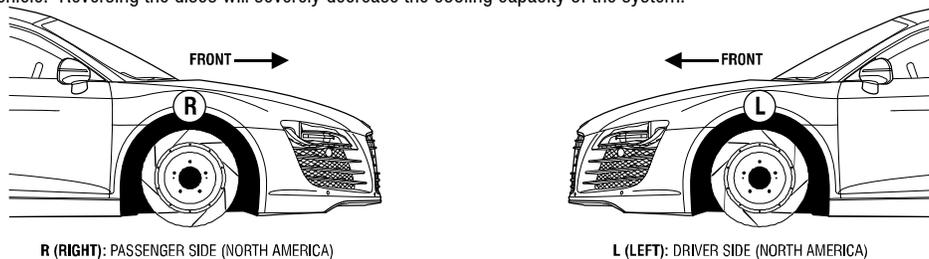
Many cleaning solutions and brake fluids are corrosive in nature therefore it may damage the coating on the caliper or aluminum anodize finish. Avoid over-spraying, and rinse off as quickly as possible. Rotor is not liable for damage on finishes of calipers, aluminum hats, and mounting adaptors due to prolonged chemical and brake fluid exposure.

## REPLACEMENT / SERVICE PARTS:

Rotor replacement/service parts are designed and intended specifically only for Rotor Brake Systems. Use of other manufacture brands and/or self fabrication will be the sole responsibility of the installer or the customer. Rotor is not liable for any damages which may result from improper material specifications, product finishes, and/or fitment issues.

## BRAKE DISC DIRECTION:

Rotor brake discs are machined with directional pattern, each disc and box is marked "L" (left) or "R" (right) so they can be identified. Make sure the new disc is on the correct side of the vehicle. Reversing the discs will severely decrease the cooling capacity of the system.



## LIMITED WARRANTY AND LIMITATION OF LIABILITY

By purchasing the Rotor Brake System and/or Brake Components described herein and opening the packaging, the buyer(s) expressly (1) acknowledge that they have read and understood all terms set forth herein; (2) understand and agree that the Rotor Brake System and/or Brake Components, whether acquired new or used, whether complete or incomplete, whether of merchantable or non-merchantable quality, whether saleable or non-saleable, is taken, purchased, selected and/or acquired "as is" and "with all faults"; (3) acknowledge that the Brake System and/or Brake Components contained herein are intended only for recreational off-road use regardless of whether said Brake System and/or Brake Components are approved by a state or the United States Department of Transportation; (4) understand and agree that they bear all risks, including but not limited to the risk as to the quality and performance of said Brake System and/or Brake Components, the risk of any and all liability arising from the use or misuse and/or correct or incorrect installation of said Brake System and/or Brake Components, and the risk of bearing all the costs of repair or replacement of the subject Brake System and/or Brake Components, whether in defective or non-defective condition. Rotor is not responsible for damage, consequential or otherwise, for misuse, abuse, improper application, improper installation, accident, or normal wear; understand that (5) Motorsport is a dangerous sport, and Brake System and/or Brake Components are subject to failure when exposed to high stresses involved with use on a racetrack.

Rotor makes no express or implied warranties, whether oral or written, whether true or untrue and regardless of source, to any buyer(s) of its Brake System and/or Brake Components. Any implied warranty of merchantability or warranty of fitness for a particular purpose is hereby expressly and effectively disclaimed and such disclaimer is also hereby acknowledged by the buyer(s). Rather, the buyer(s) expressly and impliedly affirm that he/she/they are relying upon their own skill and judgment in selecting and purchasing the Brake System and/or Brake Components contained herein as suitable for their intended use. The buyer(s) understand and agree that no officer, director, employee, agent, salesman, representative, distributor, or other affiliate of Rotor has any authority to make any statement or representation contrary to the terms set forth hereinabove. Any such statement or representation is hereby effectively disavowed.

### CHANGES TO TERMS AND CONDITIONS:

Rotor reserves the right to change these terms and conditions at any time without prior notice, and purchaser's continued purchase of parts constitutes acceptance of those changes.

## BRAKE SYSTEM PACKAGE CONTENT

1. 1 pair of 4-Piston forged aluminum calipers (RF411 series).
2. 1 pair of 355 x 29mm (14") 2-piece directional disc rings: heat-treated, zinc plated (slotted or drilled). 1 pair of forged aluminum hats (6061-T6) with Anti-Rattle Float Drive hardware pre-mounted.
3. 1 set of H2 Ceramic Street Pads (not suitable for track use).
4. 1 pair of upper and directional lower stainless steel braided brake lines (DOT compliant), 1 pair of Banjo bolts, and 2 pairs of crush washers.
5. 1 pair of aluminum caliper brackets (7075-T6) with stainless steel caliper studs. 2 pairs of 7/16-20 Jet nuts, and 2 pairs of M12 washers.
6. 1 pair of directional Electronic Parking Brake Bypass (EPBB) module and 2 pairs of M5-0.8mm x 30mm length screws.

**OPTIONAL:** Higher pad compound grades are available. Please call Rotor for further assistance in pad grade selection.



### NOTE:

Image shown is for component identification only. Actual components for your specific vehicle may be slightly different (depending on application).

## STEP 1

**NOTE:** Images shown are for **Volvo V60 Polestar (P3) 2016 model: with rear 4-Piston / 355 x 29mm Brake System**. Though there is a slight difference in brake line routing and fitment, the order in which the Brake System is installed applies to all vehicle models listed in this installation manual. All images are shown left-hand side (Driver Side-North America), unless otherwise noted.

**RAISE THE VEHICLE AND REMOVE THE WHEEL:** Break loose the wheel lugs on both rear wheels before raising the vehicle. Refer to the Owner's Manual to identify the correct location of the jack for raising the vehicle. Remove the rear wheels.



**⚠ WARNING:** Rotor recommends setting the vehicle to **SERVICE (MAINTENANCE) MODE** prior to the removal of the entire rear OEM brake system so that the Electronic Parking Brake (EPB) system can retract back to full release position. This procedure varies depending on the vehicle model and the diagnostic scanning software tool.

**NOTE:** An audible noise will be heard to confirm that the electronic parking brake has been released in service (maintenance) mode and a warning/indicator light on the instrument cluster will appear.

If a diagnostic scanning software tool is unavailable, you can deactivate the parking brake manually:

1. Turn ignition on.
2. Put the vehicle in **NEUTRAL POSITION**.
3. Apply the brake pedal and **PULL** the parking brake switch to the **RELEASE POSITION**.
4. Turn ignition off.

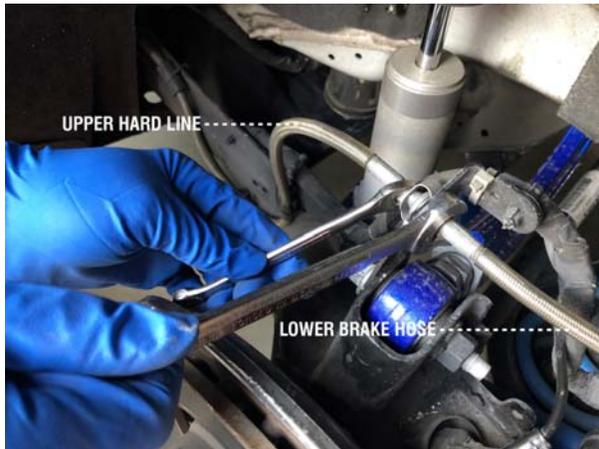


## STEP 2

Use a 13mm flare wrench to loosen the **UPPER** hard line fitting. Free the original **LOWER** brake hose from the locating bracket and quickly place a bleeder screw dust cap over the tip of the **UPPER** brake hose hard line to control/stop fluid loss during the installation.

**NOTE:** The hard line and fitting will remain in the spring clip.

**⚠ WARNING:** With prolong exposure; brake fluids will damage caliper finish. Be sure to immediately clean spilled fluids from any painted surface (including caliper) with soap and water.



**STEP 3**

**NOTE:** All vehicle models listed in this installation manual incorporates an integrated Electronic Parking Brake (EPB) servomotor attached to the rear OEM caliper. This rear EPB system must be disconnected before it can be removed.

Press the small tab on the cable connector to disconnect the EPB servomotor.



Loosen the 2 stock caliper bolts with a 15mm wrench/socket (retain these bolts for later use) and remove the entire rear EPB assembly with the brake hose attached.



**STEP 4**

Remove the disc retaining set screw with a T-50 TORX Impact Driver/bit socket (retain this screw for later use) and remove the original brake disc.

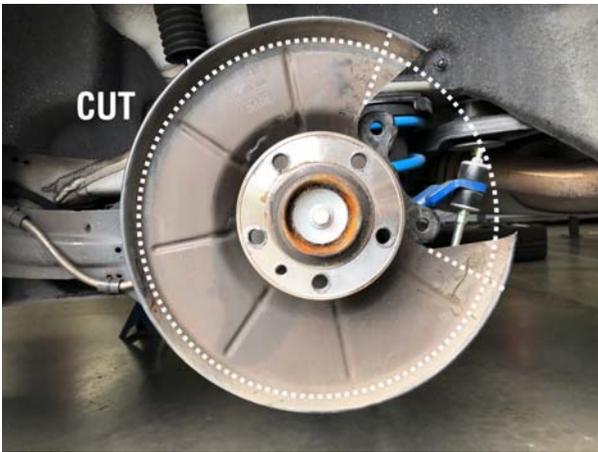


**NOTE:** It may be necessary to strike the brake disc on the outer edges with a rubber mallet if corrosion prevents the disc from coming off. If so, place a wheel lug in one of the holes first, to prevent the disc from falling when it comes loose.



**STEP 5**

A portion of the dust shield must be **REMOVED COMPLETELY** in order for the new system to mount properly (tin snips or cutting wheels may be used). Cut along the area (dotted lines) as image shown to remove the section of the dust shield that would otherwise interfere with the new system.



**NOTE:** Test fit the new 2-piece disc assembly. Rotate it to see if any portion of the dust shield would rub or comes in contact with it. You may strike the backing plate with a hammer in order to bend it back slightly to prevent interference. Use a file and smooth out the rough edges.

**NOTE:** Test-fit the new caliper bracket (and caliper) to determine the exact amount needed to be trimmed off.

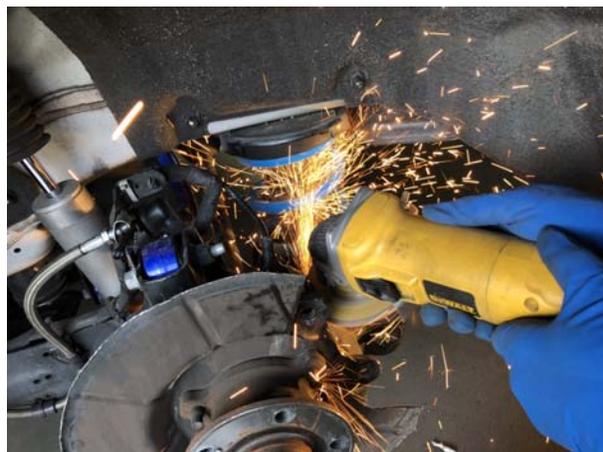
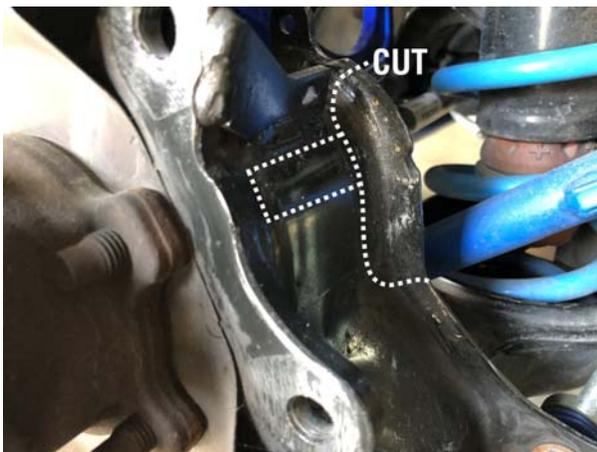


**⚠ WARNING:** These operations can be dangerous, and injury can occur. Safety glasses and gloves should be worn. For anyone who is not competent or comfortable performing these operations; Rotor recommends that they seek the services of a trained professional.

#### STEP 6

**⚠ WARNING:** This step requires a significant modification to the rear OEM trailing arm. This operation can be dangerous, and injury can occur. Safety glasses and gloves should be worn. For anyone who is not competent or comfortable performing these operations; Rotor recommends that they seek the services of a trained professional.

Excess material on the trailing arm will need to be removed with a power die grinder/plasma cutter in order for the Electronic Parking Brake Bypass (EPBB) module-servomotor assembly to mount properly to the new caliper bracket. Mark the area of the trailing arm and grind/cut off (as images shown below).



**NOTE:** Removing this material does not compromise the structural integrity of the trailing arm.

#### STEP 7

Using a 15mm wrench/socket, mount the aluminum caliper bracket (7075-T6) with the original caliper mounting bolts and torque to **60 ft/lbs (81 n/m)**.



### STEP 8

Separate the original servomotor from the rear OEM caliper by removing the 2 retaining screws with a T30 TORX bit.



**NOTE:** Rotor's Electronic Parking Brake Bypass (EPBB) module and lower stainless steel braided brake lines are directional, with each marked "LEFT" or "RIGHT" so they can be identified. Check both carefully and compare them to those shown in the photograph(s) below; to ensure that they are on the correct side of the vehicle.

**LEFT**=Left-hand side (Driver Side-North America)  
**RIGHT**=Right-hand side (Passenger Side-North America)

Thread an ① **UPPER** and ② **LOWER LEFT-SIDE** stainless steel braided brake lines to their designated inlet ports on the **LEFT-SIDE** EPBB (as image shown). Thread finger-tight only (do not tighten yet).



Install the 2 supplied o-ring seals to the inner and outer groove of the aluminum centering ring. Secure the centering ring to the EPBB as image shown below.



Using a T30 TORX bit, attach the original servomotor to the new EPBB module with the original 2 retaining screws.



**NOTE:** Ensure that the orientation of the servomotor to the new **LEFT-SIDE EPBB** module is as image shown.

Secure the EPBB-servomotor assembly behind the aluminum caliper mounting bracket by sliding 2 supplied M5-0.8mm x 30mm length screws through the 2 mounting holes. Tighten both M5 screws with a 4mm Allen bit socket to **8 ft/lbs (11n/m)**.



**NOTE:** Ensure that the orientation of the new **LEFT-SIDE EPBB-servomotor** assembly to the mounting bracket is positioned as image shown.

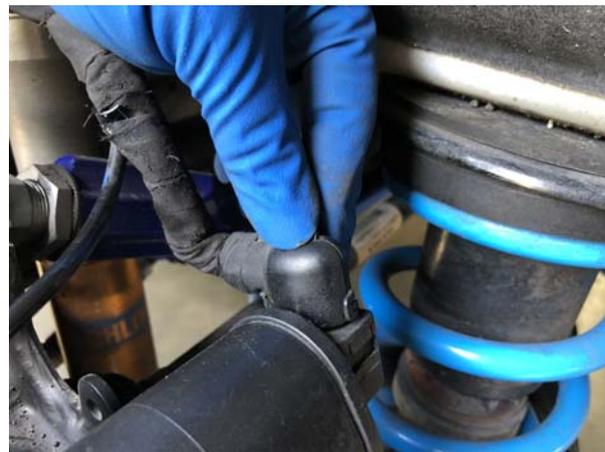


Determine the ① **UPPER** stainless line's angle of rotation by inserting temporarily the inboard end of the **UPPER** stainless steel brake line fitting through the existing hole of the locating bracket (as image shown). Once the position is confirmed, use an 11mm wrench to tighten the 90° swivel male-end fitting to **14 ft/lbs (19n/m)**.



Determine the ② **LOWER LEFT-SIDE** stainless line's angle of rotation by presetting the Banjo fitting end to where the caliper inlet port location will be (as image shown below). You may temporarily mount the Rotor brake caliper onto the new bracket to determine the actual rotating angle. Once the position is confirmed, use an 11mm wrench to tighten the 135° swivel male-end fitting to **14 ft/lbs (19n/m)**.

Reconnect the EPB cable to the original servomotor.



**STEP 9**

Clean the hub with a wire brush to remove debris.



Mount the new **LEFT-SIDE** disc/hat assembly, ensuring that it is seated firmly on the hub face. Reinsert the original disc retaining set screw with a T-50 TORX Impact Driver/bit socket.



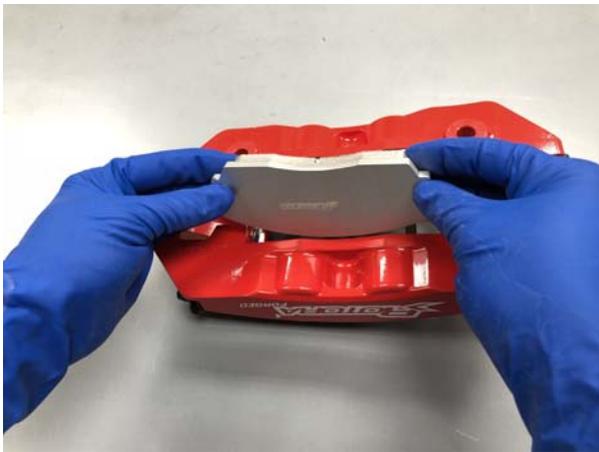
**NOTE:** Make sure the new disc is on the correct side of the vehicle. Reversing the discs will severely decrease the cooling capacity of the system. Refer to diagram on page 1 to determine direction.

#### STEP 10

Flip the new Rotor Caliper so that the underside is on top and slide a new pad spring clip into position (as image shown).



Insert one brake pad into position on one side of the caliper by setting the pad spring clip into tension. Then insert another brake pad onto the other side to set the spring clip into full tension. Ensure that the friction side of each brake pad is facing the brake disc.



**STEP 11**

Mount the **LEFT-SIDE** caliper onto the new bracket (the bleeders should be at the top of the caliper). Be sure that the caliper is square and evenly started on both studs. It may be necessary to use a rubber mallet to gently tap the caliper into position.



Insert a Jet nut onto each stainless steel caliper stud with a 12mm washer under each nut. Tighten the Jet nuts to **40 ft/lbs (54 n/m)** of torque, using a 1/2" socket.



**STEP 12**

Install the caliper end of the **LOWER LEFT-SIDE** stainless line by first placing a copper crush washer on both side of the Banjo fitting. Insert and orient the Banjo bolt into the caliper by threading into the inlet port of the caliper (as image shown below).



Be sure to orient the Banjo fitting (as image shown), with the **LOWER LEFT-SIDE** stainless line in a looped down position. Tighten the Banjo bolt using a 14mm wrench/socket and torque to approximately **14 ft/lbs (19n/m)**.



**NOTE:** Do not use a torque wrench, as over tightening the bolt can strip the aluminum threads, causing irreparable damage to the caliper.

Remove the bleeder screw dust cap and screw the original **UPPER** hard line fitting into the **UPPER** stainless steel brake line by hand for a few turns, to ensure that it is properly engaged. Use a 17mm wrench to hold the line inboard **UPPER** fitting, while using a 13mm flare wrench to tighten the **UPPER** hard line fitting.

**NOTE:** Use both hands to align the fittings as the spring clip may keep the hard line fitting from immediately lining up.



**NOTE:** Double check the **UPPER** stainless line clearance to ensure there is neither excessive binding tension, nor interference with any suspension components. Make necessary adjustment by re-clocking the 90° swivel male-end fitting to reposition.



**⚠ WARNING:** With prolong exposure; brake fluids will damage caliper finish. Be sure to immediately clean spilled fluids from any painted surface (including caliper) with soap and water.

### STEP 13

Bleed the Brake System.

#### NOTES:

- Complete the installation on both sides of the vehicle before bleeding the system.
- During the bleeding procedure, ensure that the brake fluid reservoir on the master cylinder does not fall below the minimum level marked on the reservoir.

For most vehicles, start at the farthest caliper from the master cylinder (consult your Service Manual for correct procedure). Bleed the Brake System with a 10mm box wrench to loosen and close the bleeder screws. A general sequence for bleeding the brakes should be as follows:

1. Right Outboard Bleeder Screw
2. Right Inboard Bleeder Screw
3. Left Outboard Bleeder Screw
4. Left Inboard Bleeder Screw

Gently tap the caliper body with a rubber mallet to dislodge any air bubbles that may still be trapped inside the caliper and then re-bleed the Brake System again. After bleeding, apply constant pressure to the brake pedal, and check for brake fluid leaks. When completed, close all bleeder screws and tighten to **10 ft/lbs (14 n/m)**. Check the fluid level in the brake fluid reservoir. Fill to the maximum level indicated on the reservoir.

**⚠️ WARNING:** With prolonged exposure, brake fluids will damage caliper finish. Be sure to immediately clean spilled fluids from any painted surface (including caliper). Rotor recommends spraying soap and water to all bleeder screws after the bleeding system.



#### STEP 14

**⚠️ WARNING:** Once the rear Rotor Brake System has been installed (both sides) and bleeding of the system is complete, the **SERVICE (MAINTENANCE) MODE** must be cancelled. This procedure varies depending on the vehicle model and the diagnostic scanning software tool.

Deactivate the service (maintenance) mode. This procedure will automatically recalibrate the new Electronic Parking Brake (EPB) system.

**NOTE:** An audible noise will be heard to confirm that the electronic parking brake has been released from **SERVICE (MAINTENANCE) MODE** and a warning/indicator light on the instrument cluster will go away.



#### CONDUCT A FUNCTION TEST MANUALLY:

1. Start the ignition.
2. **PRESS** to activate the parking brake switch to the **APPLY POSITION**. Turn both rear brake discs by hand to ensure they are locked.
3. Apply the brake pedal and **PULL** the parking brake switch to the **RELEASE POSITION**. Turn both rear brake discs by hand to ensure they spin freely.
4. Repeat several (5–10) more times to ensure that the new Electronic Parking Brake (EPB) system is working properly.

#### STEP 15

Mount the wheels. Torque wheels to factory specifications. Carefully test-drive the vehicle in a safe area, to ensure that all components are working properly. It is recommended that the wheel lugs be checked after 500 miles.



#### NOTES:

-Double check to make sure that the inner spokes of the wheels will not touch the caliper.

-Double check the valve stem on wheel (especially 3-piece wheels) so that it does not interfere with the caliper.

-Check positions of the wheel lead weights behind the spokes/inside the inner wheel well to make sure it does not interfere with the caliper. If necessary, place a new piece of the same weight further inboard or outboard, to clear the caliper.

#### STEP 16

## PLEASE READ:

**BY READING THE FOLLOWING, YOU WILL AVOID THE MOST COMMON CAUSES OF BRAKE PROBLEMS AND BRAKE JUDDER/VIBRATION.**

- Bedding in the new system properly will improve pedal feel, reduce brake noise and squeal, extend disc and pad life, and above all else; allows the complete system to reach their full optimum performance.
- The bed-in process involves a gradual heat-cycling of the discs and pads. This process will lay down a thin layer of transfer film onto the disc face (braking surface) evenly. If not done properly, an uneven layer of pad material will be deposited onto the disc, causing judder/vibration. Virtually every instance of a "warped" disc is attributed to uneven pad deposits.
- Failure to follow these procedures may result in disc judder/vibration, which may lead to warped discs and/or glazed brake pads.
- Rotor does not recommend conducting the bed-in process in wet weather or wet road conditions.

1. All Rotor brake discs use a clear zinc plating to help reduce corrosion. Prior to bed-in process, this plating must be removed at the braking surfaces (area where the pads will make contact with the disc). Drive the vehicle from a speed of 25mph (40 km/h) and gently apply the brakes to remove the plating without generating heat. Do a visual inspection of the braking surfaces to confirm that the plating has been removed evenly before proceeding to the next step.

**NOTE:** With too much heat or pedal pressure, this plating can be deposited unevenly on the disc, and "stick" into the pad, further increasing the likelihood of causing judder/vibration development.

2. From a speed of 45mph (72 km/h), gently apply the brakes a couple of times to bring them up to operating temperature. This step prevents thermally shocking the disc and pads.

**NOTE:** Rotor does not endorse speeding on public roads. If going above the speed limit, do so in a safe area that is away from traffic.

3. Make a series of ten near-stops from 60 to 5 mph (97 to 8 km/h). To do so, accelerate to 60mph (97 km/h) and apply the brakes firmly without engaging the ABS (Anti-Lock Brake System) to slow down the vehicle to about 5 mph (8 km/h). **DO NOT COME TO A COMPLETE STOP BY PLACING YOUR FOOT ON THE BRAKE PEDAL** (pad material will imprint unevenly onto the heated discs, which could lead to judder/vibration).

4. With each near-stop, apply the brakes harder. The brakes may begin to fade after the 8th or 9th near-stop. This fade will stabilize, but will not completely go away until the brakes have fully cooled. A de-gassing process occurs which may produce an odor, coming from the brakes. Smoke may be evident after several stops as well.

5. After the 10th near-stop, accelerate back up to speed and cruise for a while, using the brakes as little as possible. This step allows the new brakes to cool down to ambient temperature naturally before using again.

6. If bedding-in higher racing performance pads, such as Rotor's H6, add four near-stops from 80 to 5 mph (129 to 8 km/h) and if a full race pads (Rotor's H8-H9), four stops from 100 to 5 mph (161 to 8 km/h).

7. After the first break in cycle shown above, the system may not still operate at their optimum performance. A second or third bed-in cycle is typically necessary before the brakes really start to "kick in" (a cycle is a series of stops with a cool down in between each cycle).

**NOTE:** The pedal travel may not feel as firm as you expected. After the second cycle, the pedal will become noticeably firmer. If necessary, bleed the brakes to improve pedal firmness.