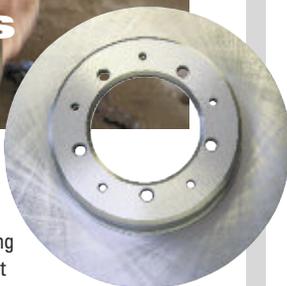


Replacement of Front Brake Discs

Range Rover Classic 1987-'95
Discovery I 1991-'99
Defender 90/110 1993-present

Land Rovers require regular maintenance and one is brake disc/rotor replacement. To ensure the safety and reliability of your Land Rover, brake checks should be performed often. When the discs begin to groove, it is time to think about replacing them. Disc replacement is a procedure that can be preformed at home by those with even limited mechanical experience. Replacing both front discs can be done in about two hours, and requires few special tools.



Required parts

QTY

(2) Front brake discs

Defender

Brake Disc, Defender 110, Genuine, ea.....	RNB006	\$ 89.95
Brake Disc, Defender 110, ProLine, ea.....	PLB006A	\$ 39.50
Brake Disc, Defender 90 NAS, Genuine, ea.....	RNB022	\$ 89.50
Brake Disc, Defender 90 NAS, ProLine, ea.....	PLB022A	\$ 39.50
Brake Disc, Slotted & Drilled, Defender 90, ProLine, pair.....	PLB022SD	\$ 129.00
Brake Disc, Slotted & Drilled, Defender 110, ProLine, pair.....	PLB006SD	\$ 109.00

Range Rover Classic

Brake Disc, '87-'89, Genuine, ea.....	RNB006	\$ 89.95
Brake Disc, '87-'89, ProLine, ea.....	PLB006A	\$ 39.50
Brake Disc, '90-'95, Genuine, ea.....	RNB022	\$ 89.50
Brake Disc, '90-'95, ProLine, ea.....	PLB022A	\$ 39.50
Brake Disc Slotted & Drilled, '87-'89, ProLine, pair.....	PLB006SD	\$ 109.00
Brake Disc Slotted & Drilled, '90-'95, ProLine, pair.....	PLB022SD	\$ 129.00

Discovery I

Brake Disc, Genuine, ea.....	RNB006	\$ 89.95
Brake Disc, ProLine, ea.....	PLB006A	\$ 39.50
Brake Disc Slotted & Drilled, ProLine, pair.....	PLB006SD	\$ 109.00

(1) Hub nut removal tool.....



Tool Bar for RNF406.....	RNF406	\$ 15.65
.....	RNT0004	\$ 6.18

(4) Defender Brake Pads

Non-Vented Early, Defender 90 to 1989 (w/fitting kit), Genuine.....	RNI180	\$ 79.90
Non-Vented Early, Defender 90, '90-'93 (w/fitting kit), Genuine.....	RNI181	\$ 98.61
Vented, Defender 110, '86-'93 (comes w/fitting kit), Genuine set.....	RNF323	\$ 79.20
Vented, Defender 110, '86-'93 (comes w/fitting kit), Genuine set.....	RNF302	\$ 89.90
Vented, Defender 110, '86-on (fitting kit PLB204* sold separately) ProLine set.....	PLF323	\$ 36.50
Fitting Kit, ProLine, Set.....	PLB204	\$ 3.99

Range Rover Classic Brake Pads

Non-ABS, Genuine 1987-'89.....	RNB001	\$ 69.99
Non-ABS, ProLine 1987-'89.....	PLB001	\$ 35.95
ABS, Genuine 1990-'95.....	RNB002	\$ 59.00
ABS, ProLine 1990-'95.....	PLB208	\$ 36.50

Discovery I Brake Pads

Brake Pad Set w/o Sensor, Genuine.....	RNB208	\$ 89.95
Brake Pad Set w/o Sensor, ProLine.....	PLB208	\$ 36.50
Fitting Kit, Non-Vented, Genuine.....	RNB204	\$ 10.95
Fitting Kit, Non-Vented, ProLine.....	PLB204	\$ 3.99
Brake Pin Kit.....	RNB199	\$ 19.95

(1) Hub Seal Kit, Genuine (includes folding lock washer #5, hub seal #3, drive flange gasket #6, see parts illustration above).....

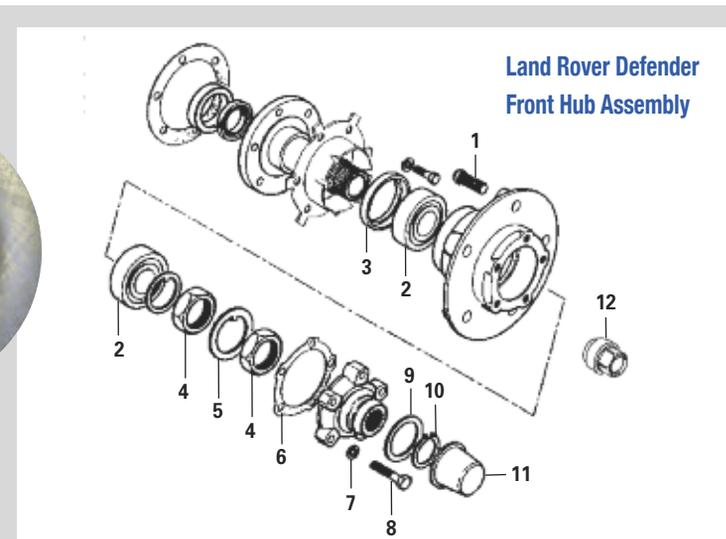
.....	RNK5623	\$ 10.50
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Suggested tools:

Snap ring/Circlip removal tool,
Can of generic brake parts cleaner,
Penetrating lubricant, Hammer,
Needle nose pliers, Socket
wrench, and Hubnut tool.

Required tools:

Land Rover jack
Breaker bar
Jack Stand
Chisel/Flathead screwdriver
Metric 12pt Sockets 10mm-20mm



Land Rover Defender
Front Hub Assembly

Suggested Replacement Parts

Some of these parts are good to have on hand when replacing your front brake discs as the front hub assembly needs to come apart. This is a reference listing for most replacement parts. You never know when you encounter that stubborn broken bolt!

1. Wheel Stud , Defender 90, Genuine, each.....	RNH012	\$ 4.51
Wheel Stud, Defender 110, Genuine, each.....	RNE193	\$ 9.20
2. Wheel Bearing , Genuine.....	RNH003	\$ 25.71
Wheel Bearing, ProLine.....	PLH003	\$ 13.13
3. Grease Hub Seal , Genuine.....	RNH001	\$ 7.65
4. Hub Axle Nut , Genuine.....	RNH006	\$ 11.95
Hub Axle Nut, ProLine.....	PLH006	\$ 3.68
5. Folding Lock washer		
Defender 90, Genuine.....	RNH020	\$ 2.59
Defender 110, Range Rover Classic, Genuine.....	RNH005	\$ 2.49
Defender 110, Range Rover Classic, ProLine.....	PLH005	\$ 1.05
Range Rover Classic ABS.....	RNH004	\$ 2.95
6. Drive Flange Hub Gasket		
Defender 90, Range Rover Classic, Genuine.....	RNH007	\$ 1.95
Defender 110, Genuine.....	RNE179	\$ 2.95
7. Lock Washer , Drive Flange Member.....	RNH011	\$ 1.49
8. Bolt , Drive Flange Member, Defender.....	RNF430	\$ 0.99
Bolt, Drive Flange Member, Range Rover Classic.....	RNH008	\$ 3.21
9. Shims , use as required		
Shim, 0.45mm, Genuine.....	RNX006	\$ 3.95
Shim, 0.60mm, Genuine.....	RNX007	\$ 6.95
Shim, 0.75mm, Genuine.....	RNX008	\$ 9.95
Shim, 0.90mm, Genuine.....	RNX009	\$ 6.95
Shim, 1.05mm, Genuine.....	RNX010	\$ 10.95
Shim, 1.20mm, Genuine.....	RNX011	\$ 5.93
Shim, 1.35mm, Genuine.....	RNX012	\$ 6.95
Shim, 1.50mm, Genuine.....	RNX013	\$ 5.95
Shim, 1.65mm, Genuine.....	RNX014	\$ 6.53
10. Circlip , Genuine RNX040.....		
11. Hubcap , Defender 90, RRC, Genuine.....	RNX021	\$ 3.95
Defender 110, Genuine.....	RNE186	\$ 8.95
12. Lug Nuts for Steel Wheels, Defender 90, 110, Genuine, ea.....	RNS066	\$ 2.98
Lug nut for Steel Wheels, Defender 90, 110, ProLine, ea.....	PLS066	\$ 1.31
Lug Nut for Alloy Wheels, Stainless Capped, Genuine, ea.....	RNX041	\$ 14.72
Lug Nut for Alloy Wheels, Stainless Capped, Genuine, ea.....	PLX041	\$ 7.80
Lug Nut Wrench for 1 1/16" nuts.....	LUG1116	\$ 18.85
Synthetic multi-purpose grease tube, Amsoil 14oz.....	GLC10	\$ 8.90



Hub Seal Kits
RRC, DEF, DISCO RNK5623 \$ 10.50
RRC 90-92 ABS RNK5622 \$ 10.50
RRC Non-ABS RNK5621 \$ 37.90

Safety first!

- Ensure the vehicle is securely chocked on level ground before working underneath.
- Support the vehicle on axle stands, never work on a vehicle with just a jack!
- Be sure to wear safety glasses for eye protection.
- Make sure to double check all bolts for proper torque. 



Disassembly

Park Land Rover on level, solid surface. Engage parking brake. Break tension on wheel nuts, 1 turn only. Position vehicle jack on front axle where being performed. Lift vehicle until tire clears ground. Position jack stands, lower axle onto jack stand. Leave vehicle jack in place, but with vehicle weight on jack stand.

Step 1: Loosen wheel nuts, remove. Remove brake line clips, remove caliper bolts. Calipers are secured by two 12pt bolts, located on the back of the calipers. A lubricating penetrant will help break any rust build-up. After removing caliper bolts, leave caliper in place. The caliper has to be moved only when removing the disc in the later steps.



Breaking nut tension.

Step 2: Remove dust cover, separate circlip with needle nose pliers, or snap-ring puller. Remove circlip. Remove driveshaft shim. Remove five bolts on drive member. Withdraw driving member, withdraw drive member joint washer. This is a paper gasket that should be scraped and replaced upon reassembly. Bend back lock washer tabs; the chisel is a good tool for this. Remove lock nut using hubnut removal tool. Remove lock washer. Remove hub adjusting nut, use hubnut removal tool again. Remove spacing washer. Hold caliper to side, Remove hub and brake disc assembly from stub axle.



Fig 1 - Hub assembly with dust cover removed.



Fig 2 - Circlip, (2) driveshaft shims.



Fig 3 - Pulling drive member off with bolts removed.



Using the hub nut removal tool RNF406.

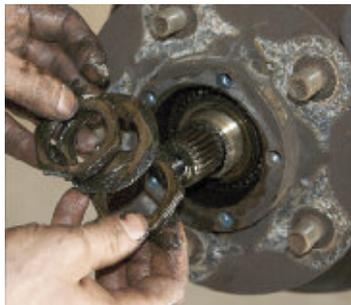


Fig 4 - The removed lock nut, lock washer and hub adjusting nut.



Fig 5 - Pulling hub-disc assembly. Hold caliper to side, put back in place after removing hub-disc assembly.

Step 3: Remove outer bearing from hub assembly. Turn disc over to remove grease seal from hub assembly. Remove inner bearing that lies below grease seal. Remove five hub bolts. Because of the severe heat endured by the discs, the five hub bolts may be very stubborn. If there is not a vise available, more leverage can be gained by temporarily attaching the hub assembly back to the wheel and tire. Two wheel lug nuts will secure hub assembly back to the wheel. Laying the tire down provides excellent leverage. If the bolts still won't free, use a blowtorch to heat the areas around each bolt, without blasting heat on the bolts directly. This is a good time to employ the breaker bar over the end of the socket wrench. Remove hub from brake disc, rust may make the assembly stick together. Using a hammer to break tension on the old disc is a good way of separating the unit. Use your new disc to help visualize where the hub needs to be separated (Hammered) from the old disc.



Fig 6 - Removing outer bearing.



Fig 7 - Remove the grease seal and inner bearing.



Fig 8 - Removing hub bolts.



Fig 9 - Separated hub from disc.

Digital Factory Manuals

Parts Manuals, Workshop Manuals, Owners' Handbooks, Supplementary Information

With these Land Rover DVD's, you will have all the information you will need right at your fingertips.

- Parts Manual
- Workshop Manual
- Owners' Handbook
- Supplementary Information



NOTE: DVDs are compatible with Windows operating systems from 2000 through Windows 7 as well as all versions of Adobe Acrobat from version 6 through 9 (Windows 7 requires special settings, see online for details). The DVDs can also be run on Apple MAC Computers when running Windows. A virtualization software like VMware Fusion 3 or Parallels will need to be used to do this.

Defender 90

- 110 & XD Military, 1984-'99...LHP25...\$ 29.95
- D90, 110 & 127, 1983-'89.....LHP26...\$ 29.95
- D90, 110 & 130, 1990-'98.....LHP27...\$ 29.95
- D90, 110 NAS, 1993-'97.....LHP28...\$ 29.95
- RR Classic, 1970-'85.....LHP1....\$ 29.95
- RR Classic, 1986-'95.....LHP2....\$ 29.95
- RR Classic NAS, 1987-'95....LHP29...\$ 29.95
- Discovery I, 1989-'94.....LHP3....\$ 29.95
- Discovery I, 1994-'98.....LHP32...\$ 29.95
- Discovery I NAS, 1994-'99...LHP33...\$ 29.95



Reassembly

Step 1: Clean the old grease and grit from the inside of the hub. Clean any excess grit from wheel bearings, with a rag, by working the bearing around in your hand. Using liquid degreaser will also clean the bearings; if this is done it must be ensured that the bearings are thoroughly packed with grease upon reassembly.



Amsoil Synthetic Grease,
14oz multi-purpose GLC10 \$ 8.90

Step 2: Position the new disc over the hub. Set lightly in place, ensuring that all bolt holes line up. The disc will not sit flush; use two hub bolts to progressively tighten the disc onto the hub. Once the disc and hub are coupled, progressively tighten all hub bolts. It is not necessary to use a thread lock, but is helpful in locking bolts securely. Load the inside of the cleaned hub with fresh grease. Place the innermost bearing (The one that will sit closest to the axle upon reassembly) back in the hub. Place the new grease seal on top of the innermost bearing, depress until it sits tight on the wheel bearing. It should now look as you found it. On the grease seal there is a caption, "this side to stub axle," be sure this side is looking at you after the install. Turn the hub assembly over, place second bearing back in its place in the hub.

Step 3: Hold caliper to side, place hub assembly back on the stub axle from which it came. Put caliper back in place. Put spacing washer over the outer wheel bearing. Place hub adjusting nut back in place. Using hubnut tool, tighten hub adjusting washer enough to seat the hub assembly securely on the stub axle. The hub assembly should spin somewhat freely. Put new lock washer over hub adjusting nut. Place lock nut over lock washer. Using hubnut adjustment tool, tighten lock nut.

Note: It needs to be understood that the hub adjusting nut, and lock nut look the same but perform very different functions. The purpose of the hub adjusting nut is to seat the hub firmly on the stub axle. **Fit the spacing washer first**, then the hub adjusting nut and torque to 61nm, back-off 90° then you tighten to 4nm, that gives the required hub end float of .010mm. Then, place the lock washer on and tighten the second hub adjusting nut to 61nm and lock the washer down. Bend one side of lock washer towards lock nut. Bend until flat against side of lock nut. Clean area of hub where drive member will sit. Place drive member gasket onto hub. Place drive member onto stub axle. Spin hub assembly to make bolt hole line up. Tighten five drive member bolts. Place driveshaft shims over end of stub axle. Separate circlip with pliers, place on stub axle. This is sometimes a troublesome area; try to seat bottom of circlip in groove first. Work rest of circlip into groove. Pop dust cover back into place; try to lightly grease perimeter of dust cover to make a good seal.



Fig 10 - Cleaned hub.



Fig 11 - Repacked bearing ready to install into hub.



Fig 12 - Before assembling disc to the hub, clean with hot soapy water to remove any protective manufacturing film.



Fig 13 - Coupling hub to disc.



Fig14 - Outermost bearing in place. Note: check bearing races for "bluing", if clean and without grooves or wear marks, most often these can be reused and left in place with new bearings.



Fig 15 - Install inner bearing and new grease seal. Note: A round drift can be used to install the seal; be careful to not damage when installing.



Fig 16, 17 - Grease stub axle before putting hub-disc back into place. Remember to hold caliper to side when fitting hub-disc assembly. With the caliper in hand, get a feel for the tension of the brake lines. Be very careful to not put stress on the brake lines.



Fig 18 - After the outer wheel bearing, install the hub adjusting nut, lock washer and lock nut.



Fig 19 - The hub adjusting nut, lock washer and lock nut. Note that the tabs on the lockwasher are bent.



Fig 20 - Apply RTV silicone sealant (or similar) to the drive member hub face only before applying gasket.

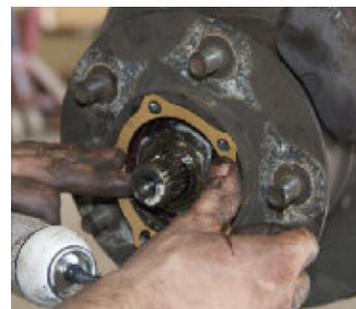


Fig 21 - The drive member hub gasket sitting on the hub face. Install drive flange with bolts and spring washers.



Step 4: Hub assembly and new disc are now tightened, and in place. Re-install both caliper bolts that were removed in previous steps. Do not tighten one until both are started into their holes. Look at calipers closely. With needlenose pliers, remove tension springs. There are two rods holding brake pads in place, remove cotterpins from end of rods. These are found on opposing sides between the pad and actual caliper. With rods removed, grab pads with pliers or hands. Work back and forth until pad comes free. The best procedure is to put the new brake pad in as soon as the old one has been pulled out. This will prevent having to fight the brake pistons. If fit is snug, lightly motivate new pad into place with hammer. With both pads replaced, re install rods and pins as they were found. Be sure to put tension spring back into place. The spring looks like an airplane wing, and can be put into place by setting one end under the rod, and then pushing the other end into place. See pictures below to familiarize yourself with the setup. Brake calipers should now look as you found them. Ensure that all bolts are tight.

Note: Land Rover does not advocate use of squeal reducing compounds. In this application I have found it useful to apply a little brake grease or copper anti-seize to the backside of each brake pad before putting it back into place. This is useful in restricting brake squeal, as it absorbs vibrations. On the project RRC, brake squeal is always a problem. Your Land Rover may not have any squealing problems, if so, carry on.

Hopefully your Land Rover is back in one piece and looking good with new front brake discs. We hope that this has been an informative and fun procedure for you. Besides saving money, you now know more about your land Rover and the way it is built. If this instruction set has been helpful, please email us to let us know. tech@roversnorth.com



Factory recommended torque settings

- Hub drive flange bolts.....(65 Nm) 48 lb/ft
- Caliper retaining bolts(81 Nm) 60 lb/ft
- Disc to hub bolts(52 Nm) 38 lb/ft
- Lug nuts, alloy and steel wheels(130 Nm) 96 lb/ft



Fig 22 - The two driveshaft shims and circlip, with drive member installed and tightened.

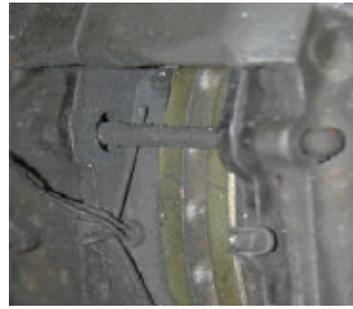


Fig 23, 24 - The caliper before removing old pads and pins. Above right is the pin and tension spring as they should look when put back together.



Fig 25, 26 - This is a close up of the rods and rod springs. Note the position of the pin in the end, the hole is sometimes hard to find. Above right is the caliper with new pads and brake grease installed.

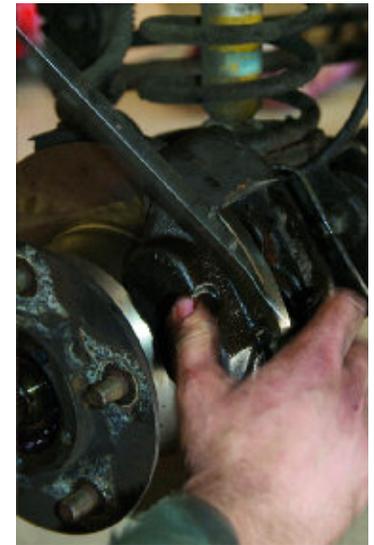


Fig 28 - Before inserting the brake pads, use a large pry bar to push the caliper pistons back into the caliper if needed. Open your brake reservoir cap first and check the level as you go. Note: Check caliper pistons for any surface corrosion. If any, you'll need to rectify this first. Stay tuned for rebuilding your brake calipers in the next issue.



Fig 27 - Clean the disc, caliper and complete assembly with a brake cleaner.



Fig 29 - Apply brake grease or copper anti-seize on the back of the pad. To avoid it rubbing off onto the piston, try to slide pad in with as much room as possible. This is done by working the pad back and forth to fully depress caliper pistons. Applying brake grease will not work if the piston scrapes it all off during the install.



Fig 30 - Finished brake disc install. Clean any small grease or residue off with brake clean again, keeping care not to get any on the brake pads.