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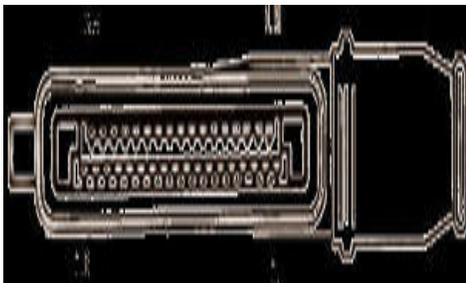
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GRXRRORNG
Range Rover 4.6 HSE Valve Block O-Ring Kit



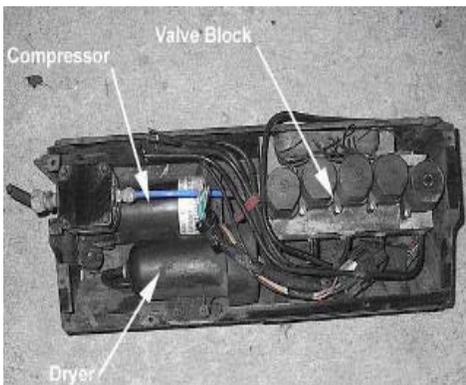
First **de-pressurize the system and springs**. With the engine off, disconnect the EAS ECU, under the drivers seat, bolted to the floor. If you unplug with the key "on" you'll hard fault the ECU and have to go to the dealer for a reset. Pin 1 has power for appx 1 minute after opening the door, so after you have the jumpers hooked up, put the key in and turn to position II for constant power. Turn the radio and A/C off so you can hear the compressor run, and the solenoids clicking.

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Remove the cover from the connector to see the pin #'s
 Run jumper wires from pin 1 (+12v) to pins 9, 10, 11, 26, 27, & 28. The easiest way I've found is with 20guage solid core wire, make a 7-strand pigtail with about 6" pieces all connected at one end. Plug in pins 9-28, and then plug in pin 1. Stand back, the Rangie will probably rise a little, then settle down onto the bump stops. Leave in for a couple minutes to ensure all air is out. Unplug and keep the pigtail (you'll need it for testing later). If one corner does not lower, check your connections, or you might have a bad solenoid or block driver.

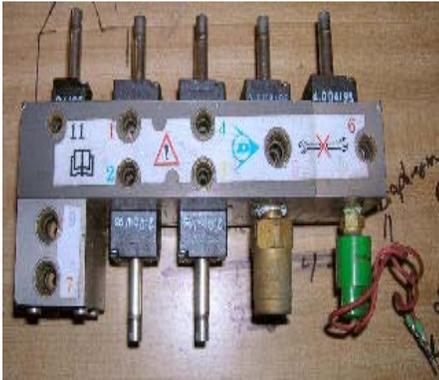
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Remove the entire EAS box from the passenger side of engine compartment.
 Remove the cruise control unit with 2 screws (don't mess with the cable) and remove the 4 bolts holding the EAS box to the top of the fender well. Mark the hoses to make sure they go back in the right hole. I just use top/bottom, front/back because they're hard to get wrong. Tilt the box towards you so you can access the brass keeper rings more easily. Push in on the keeper, and pull the hose out (easier said than done). With the box out you can fix a major source of vibration, my box was rubbing on the top of the fender, transmitting compressor vibration into the cabin, so I persuaded it a 1/2" lower with a dead-blow mallet. Thick washers under the box mount would probably work also. With the box on your bench you can remove the compressor, disconnect the blue compressor discharge line, and remove the block.



To remove the pressure switch wires from the driver multi-plug (the two red ones in the lower right corner of the picture, coming out of the green pressure switch) remove the yellow cover inside the plug and with a small screwdriver, release the catch on the pin, and pull the wire out the back of the plug. (easier said than done) it doesn't matter which way they go back in. Remove the block driver from the block and you're ready to disassemble.

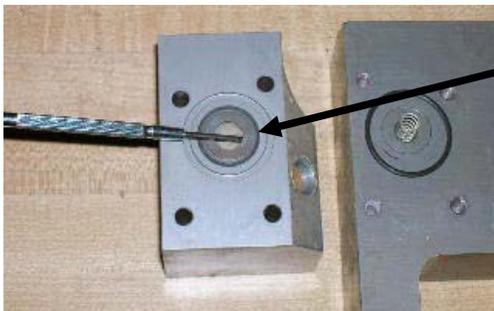


This is a Classic block, the p38 is very similar, and rebuild is exactly the same. The p38 block doesn't have the handy sticker, and port 9 is threaded instead of 8mm plastic tubing.

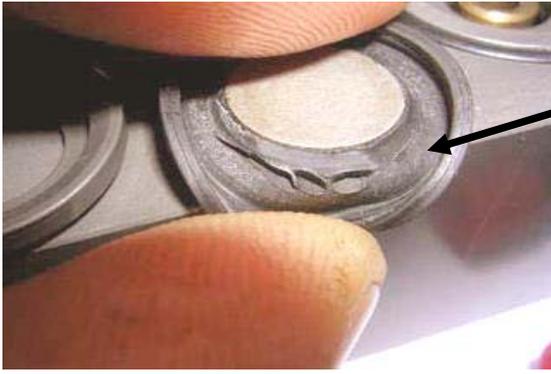
Number the solenoids the same as the sticker (or picture) to ensure they go on the same spot they came from. With a Phillips screwdriver remove the solenoids-it is easiest to remove all the screws, then pull the solenoids off together, keeping them in order. Number the valves also, it is important which way they go back on, they are the same on the outside, but different inside. The numbers painted on them are the valve seat diameter in mm, and the year of manufacture. The 4 of smallest size go to ports 1,2,3&4, the middle to port 5, and the largest to port 6, the odd valve can only go to port 11.



Remove the valves and the o-rings and set aside. (Keep the old o-rings just in case you lose or damage a new one.)
Remove the diaphragm back; the bolt holes are offset so it can only go back on one way.



Save the spring, and gently remove the diaphragm with a small screwdriver for inspection. The diaphragm is replaceable, but it costs \$80. Only one of the five blocks I have re-built has needed a new diaphragm, and the rest of the block was in horrible shape also (it was out of a dead classic)



Lift off the metal retaining ring and inspect the diaphragm for cracking, a little might be OK, but if in doubt replace it.



Remove the end block and the check valves.



Check valves

Make sure to note how they come out, one points down, the other 2 up. Check against the picture when you re-install.



The trickiest part of the whole thing is removing the o-rings from the check valves. A small screwdriver pried underneath works fairly well, but be careful not to jab your fingers and don't damage the valve. You can also cut the o-ring with an Exacto knife if desperate, but I don't recommend it.



Remove the airline keepers with a large flat bladed screwdriver. Put under the lip and twist to remove.
Remove the line o-rings with a crochet hook or a small screwdriver.
If the airlines are scored/damaged you can cut 1/2 a milli-meter from the end to get a new seating surface for the o-rings.
Now clean the block with a green scrubby pad and hot, soapy water.
Rinse thoroughly and dry, put just the block pieces in your oven on the lowest temp (mine goes to 75 degrees celsius) for about 20 min to ensure all the water is out. **DO NOT DO THIS OVER 90 degrees celsius!!!** Allow the parts to cool naturally in the oven. Clean the solenoids and valves with paper towels and 409 while you're waiting.



Replace the o-rings the reverse order they were removed. A little Vaseline will help seal and keep the o-rings in place.
Put new rings on the check valves and put them back in the end of the block.
It is important that you get them in the right way, refer to the photo and the location of the relief valve. -no Vaseline on the check valve seats.
Replace the 4 block to block o-rings, gently line up the 2 halves, the pins ensure proper alignment.
Loc-Tite the bolts and tighten down snug.



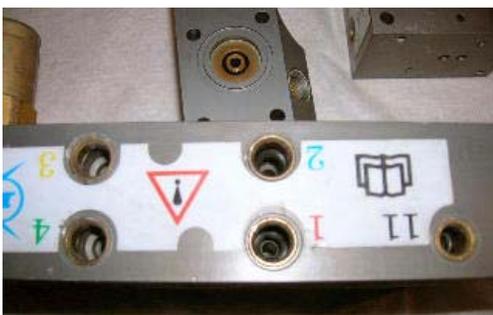
Replace the diaphragm and seal ring (same size as solenoid base rings) and diaphragm spring.
Gently set diaphragm block on valve block ensuring the spring is in the center of the diaphragm.
Loc-Tite the bolts and tighten down snug.



Disassemble the valve by removing the two remaining screws. The thinnest o-rings go over the valve stem, and seal it in the valve case. The old o-rings may be brittle as plastic because of age and pressure, yes you are looking at the right part. Re-assemble. Don't mix up the valve pieces, they are not interchangeable even though they look like they should be. Replace the 2 o-rings on the bottom of the valves (one small, one large).



Replace the valves on the block, make sure you get them back in the original positions and don't pinch the o-rings. Valves 1-4 are interchangeable. If you forgot to mark them, the 4 with the smallest numbers (2.00 something) are 1-4 the middle number (2.5 something) is valve 5 and the largest (4.0) is valve 6. Valve 11 is small and only fits in one spot. Replace the valve top o-rings and replace the solenoids in their proper positions.



Install the air line o-rings, 2 in each hole. They are a bit fiddly, but have to be tight to make a good seal. The rings like to fold up in a taco shape inside the hole, so be sure the first is laying flat before putting the second one in, and the same for the second before putting the retainer in.

Mount the EAS driver back on the block, put the block back in the EAS box the way it came out, re- install the compressor, and set the box in it's spot. Plug in the airlines, make sure they go in the hole they came out of, and make sure they seat fully, you should feel the line bottom out against the block, and the raised ring on the line should be within a couple mm of the keeper.

DO NOT SKIP THIS STEP

Using the pigtail to manually operate the system will help bring any problems to light without risking a hard fault. It also lets you check for leaks in a slow, controlled manner and gives you practice using the pigtails so you don't have to learn while stuck in a mud puddle, in the rain, trying to get out of the woods as the sun is setting.

Re connect the wiring plugs, and test the system using the pigtail you made earlier.

Pin 1 has power for about 2 minutes after the door is opened, if you don't hear the solenoids clicking, close and re-open the driver's door.

At the ECU connector, jumper pins 1 & 8 to run the compressor for about 10 minutes. Then install the jumper to pin 10 (LF spring valve) and tap pin 26 (air inlet) to let a little air into the Left Front bag, just enough to start the corner moving up. Also listen for the solenoids clicking. You might have to run the compressor again to get enough volume; it's OK to leave it running while you do this.

Repeat for pin 11(Left Rear spring valve)
 Pin 27 (right front)
 Pin 28 (right rear)
 Make sure the correct corner raises with it's respective valve.
 If it doesn't you've got either a solenoid or airline mixed up.

Repeat the process to raise the vehicle to approximately normal height, then repeat again using pin 9 (exhaust valve) instead of 26 to lower each corner a little to check the exhaust valve. If everything worked as it should, re-connect the ECU and start up the engine, leave the drivers door open to inhibit levelling until the compressor shuts off on it's own. Then shut the door and "remind" it which level you want with the up/down switch.

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