

Vanos Upgraded Seal & Bolt Kit Installation Guidance

TOOLS YOU WILL NEED

4mm Allen key or short hex-bit
Long nose pliers
Gasket scraper
Small flat-blade screwdriver
22mm open-ended spanner
5mm Allen key
Small blunt tool to prise old seals out with
Lint-free cloths or towels
Torque wrench (must read as low as 8Nm)



TIME REQUIRED – depending on your mechanical abilities we would allow 2hrs. **Don't rush**, take your time! The vanos units are complicated & delicate & you don't want to break anything!

PLEASE NOTE:

Some bolts in this kit are different lengths but appear similar (M5 x 16mm & M5 x 20mm). Compare the new bolts to the original ones to ensure they are fitted in the correct positions!

Work on one part of the unit at a time to avoid inadvertently mixing up parts. **TAKE YOUR TIME**, maintain cleanliness & work methodically & carefully.

It is **ABSOLUTELY CRITICAL** that you do not twist or pinch the seals when installing – doing so will lead to premature failure. Be careful, take your time & ensure the seals are lubricated before installing on solenoid & before installing solenoids into vanos unit. Do not tilt or twist the solenoids when refitting to the vanos body.

Instructions are for the 3.2ltr Evolution engine – if you have a 3.0ltr model omit the instructions for the exhaust solenoids/covers.

Fitting this kit can be undertaken with minimal tools & a basic mechanical knowledge. However, if after reading these instructions you do not feel confident, please consult a qualified mechanic. Iridium Engineering Services offers a fitting service at modest extra cost if required.



Where you see this symbol, pay extra attention or take particular care!

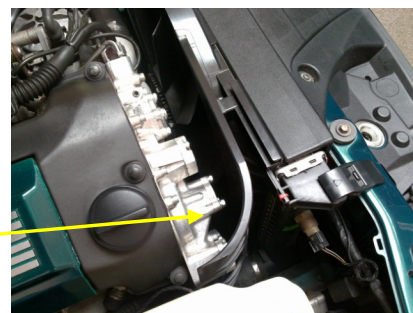


Guidance is provided in good faith & as an indication of the process. We recommend that you check & confirm correctness with the factory manual before proceeding. We accept no liability for damaged caused by or as a result of fitting this kit.



ENSURE ENGINE IS COLD – HOT ENGINE OIL CAN SEVERELY BURN

- (1) Remove drivers-side fan cowling by removing the small press-stud fixing, move the cowling back & lift the cowl vertically up. Undo the two 10mm nuts on the black electrical plug cover below the vanos unit & remove. This will expose the solenoid wiring plugs & sockets. Although it can be done in-situ, you may find it easier to undo the sockets & remove the solenoids to replace the seals on the bench. If you do this, be careful with the wiring as it can be fragile & the connections are quite small & easily damaged. Note which plug goes to which socket!



- (2) Place absorbent towels directly underneath the vanos unit to catch leaking oil when the solenoids &/or cover plates are removed. Failure to do this will enable engine oil to drip on the air-conditioning compressor clutch assembly & cause slippage.



- (3) If you are renewing the vanos filter screw, LEAVE IT TILL LAST – leaving it in place assists in fitting the inlet camshaft end cover plate.

- (4) Starting with the inlet system, remove the bolts from the camshaft end cover. Using a suitable tool, **GENTLY** prise the cap out of the housing by applying leverage to either side in turn. Be prepared for oil leakage & for the cap to pop off.



- (5) Once removed, wipe the oil off, & using a small blunt pointed object (i.e. a dart, blunt scribe or very small flat-bladed screwdriver) gently lever under the o-ring until it can be lifted out of its seating groove. **DO NOT SCRATCH THE SEATING GROOVE.**



- (6) Wipe the sealing groove clean & gently roll the new o-ring into position. **DO NOT OVERSTRETCH** the new o-ring!

- (7) Wipe clean the vanos unit housing. Note the slight cut-out in the side of the cap – this is where the vanos filter bolt is located. Place the end cap assembly into the housing (noting the vanos filter cut-out) & press home.




To aid installation a light smear of clean engine oil on the new seals will help them slip in.




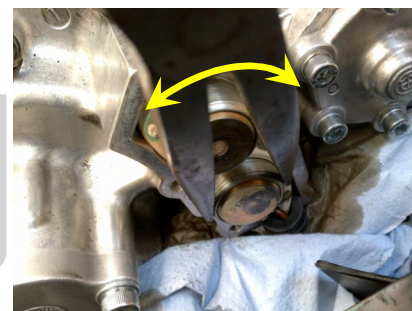
If the cap cannot be pushed in, fit the new bolts (complete with washers) & using an opposite tightening method, tighten all bolts ½ turn at a time until the cap is uniformly pulled into the housing. Tighten all bolts to the required torque setting.



- (8) Next, moving to the inlet cam solenoid cover, remove the 4 cover bolts & remove the cover. Remove & clean any residual gasket material from the mounting faces.

- (9)  Make a note of the vanos solenoid mounting positions & wiring routing. This is important, so ensure you know how it looks before you go any further (a digital camera is useful at this stage).

- (10)  When working with the solenoids & wiring – **TAKE GREAT CARE**, they are easily damaged & cost around £750 a set!!



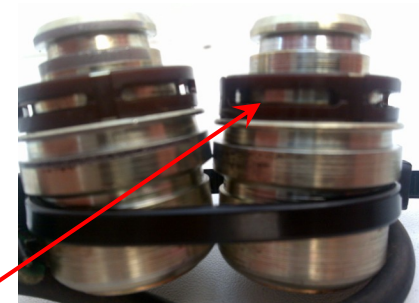
- (11) To remove the solenoids from the housing, use a large pair of pliers, & **gently** grasping the sides of the solenoids, repeatedly wiggle them **no more than a few degrees** & at the same time gently pull towards the front of the car. The residual oil pressure should pop them out after a few wiggles. Repeat for the other solenoid. Be careful not to grip or damage the small circuit boards.



- (12) Once the solenoids are loose, **be very gentle** & do not move or twist them more than absolutely necessary or damage to the wiring could result. We recommend cable-tying the solenoids together to minimise movement.


- (13) Observe the wiring connections to the small printed circuit boards & check for broken/damaged connections or chafing of the wires. Repair any defects found.

- (14) Using the small blunt pointed tool or screwdriver, remove the seals from each solenoid. **DO NOT SCRATCH THE SOLENOIDS OR SEAL SEATING GROOVES**. Observe the end of the solenoids for any cracks



in the o-ring recess just behind the first corner – this is a known weak area of the solenoid design.

(15) Wipe each solenoid clean.

(16)  Fit the new seals by rolling them onto the solenoids. Once fitted, move them around a little to release any twist in the seal caused during fitting. **Lightly coat each seal with clean engine oil** – this will assist the next step. **Do NOT twist the seals when installing or overstretch them!**

(17) Apply a little clean engine oil to the solenoid bores in the vanos unit. Loosely install the solenoids into the vanos unit, & ensure the wiring & solenoid position is exactly as noted in step 9. Apply pressure to the rear of each solenoid until it clicks into position.

 **If you force them in you risk twisting or pinching the seals & damaging them!!! Do not tilt the solenoids as this can pinch the seals. Push straight into the vanos unit with a smooth & gently increasing pressure.**

(18) Ensure the wiring fits back into position correctly & that the cable-grommet is located correctly in the base of the solenoid cover cut-out.

(19) Trial-fit the solenoid cover & ensure that the solenoid electrical circuit boards do not touch the cover or edges of the vanos housing. If required, rotate each solenoid slightly with the pliers until a satisfactory position is found. When satisfied that no contact is being made, refit the cover using the new bolts, washers & gasket supplied in the kit. Do not use gasket compound or sealant on the gaskets as this increases the solenoid-to-cover clearance & may lead to the solenoids moving during use. **OBSERVE THE TORQUE SETTING & DONT OVERTIGHTEN – you could strip the threads in the vanos body!**



(20) Repeat the above steps for the exhaust camshaft end cover & solenoid set.


(21) Locate the pressure limiting valve.

(22) Note that it has a thin metal hexagon 'nut' on the end of the main body hexagon – **DO NOT LOOSEN THIS**, it is the factory locking washer for the pre-set pressure relief setting.





(23) By using a 22mm socket or spanner on the main body, undo & remove the pressure valve.

(24) Wipe any residual oil from the unit. Remove the larger o-ring using methods applied for the solenoids seals.

(25)  NOTE – there is a very small & fragile plastic split-washer **behind** the smaller o-ring. Note its position & be VERY gentle when removing the o-ring that no damage is caused to this ring – it's brittle & fragile.

(26) Gently remove the smaller o-ring using methods applied for the solenoids seals. **DO NOT SCRATCH THE BODY OR SEATING GROOVES.**

- (27) Install the new o-rings, larger one first. Note that the smaller o-ring goes in front of the plastic split-washer (i.e. the washer is positioned between both seals).
- (28) Lightly coat the new seals with clean engine oil & refit the limiting valve assembly to the vanos unit. Tighten to 30Nm.
- (29) If you have purchased a new vanos filter, now is the time to install it. Don't forget to use the new aluminium sealing ring & tighten it to the correct specified torque.
- (30) Remove any paper towelling & clean away any oil spillage. Recheck engine oil level. Reconnect the electrical plugs/sockets if removed in stage 2. Refit connector cover & securing nuts.
- (31) Refit the fan cowling ensuring the lug on the bottom edge locates correctly in the main fan cowling lower fixing. Insert press-stud fixing.
- (32) Remove all tools & equipment, cleaning cloths & absorbent materials away from the engine bay area.
- (33) Start the engine.  **Note – engine will idle rough for a few moments & the vanos may rattle more than usual for a few seconds due to the oil pressure having been released from the vanos unit.** This is normal & should reduce when the oil pressure has built up a few seconds later & the idle will smooth out.
- (34) If it doesn't, stop the engine & re-check the vanos plug-&-sockets as overtightening the cover can twist the mounting brackets & pop the plugs/sockets apart. If it still doesn't work, pull the plugs apart & reconnect them – you may have a bad connection. Lastly, if you still have problems, remove the vanos solenoid covers & either rotate the solenoid slightly or ensure the solenoid connector PCBs aren't touching the covers when fitted as this shorts them out & stops the solenoid being energised. Fitting the seal kit will not make your vanos or idle worse unless it's been fitted incorrectly or something isn't reassembled correctly – check & double-check your work!
- (35) With the engine idling, visually check around covers etc for oil leakage.  **KEEP HANDS & LOOSE CLOTHING AWAY FROM THE FAN**, severe personal injury can result if items are caught in the rotating fan.
- (36) After approximately 7 days, check for any signs of oil leaks, loose bolts etc.
- (37) Should any oil be found on the bottom edge of the solenoid covers, with a COLD engine, remove the solenoid covers & spray some solvent cleaner onto the rear of the solenoids & insides of the solenoid cover/housing assemblies. This will remove any residual oil that may have worked its way back & down as a result of smearing oil on the seals during the installation process. Refit the covers & recheck after one week.
- (38) Tell all your friends what a good kit it is & how easy it is to uprate the vanos seals & bolts with the Iridium kit!!!!

Thank you for your purchase. Should you have any problems please contact us – we are here to help.

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