

N18 VANOS In-Place Solvent Purge

Break up sludge inside the VANOS units without a full teardown

Step-by-step procedure:

Phase 1: Preparation

1. **Engine State:** The engine should be **cool to the touch** (so the solvent doesn't evaporate instantly).
2. **Access:** Remove both VANOS solenoids. You now have two open ports on the passenger side of the cylinder head.
3. **The Solvent:** Use **MAF Sensor Cleaner** or **Electronic Parts Cleaner**. These are "safe" solvents that leave zero residue and won't eat the internal seals.
4. **Hardware:** Have a **27mm socket** on the crankshaft (through the wheel well) and a **large adjustable wrench** or a **24mm wrench** for the camshaft "flats" (with the valve cover off).

Phase 2: The Soak & Agitation

This is where you mechanically break the sludge loose.

1. **Inject Solvent:** Use the straw on the cleaner to spray deep into the solenoid ports. Fill the "hallway" until you see liquid at the edge of the port.
2. **Wait 5 Minutes:** Let the solvent sit. It is seeping through the camshaft galleries and into the internal chambers of the phasers.
3. **Mechanical Agitation (The Rock):**
 - Place your wrench on the **hexagonal flats** of the camshaft.
 - Gently "rock" the camshaft back and forth. You are not trying to turn the engine; you are just trying to move the camshaft within the "play" of the VANOS unit.
 - **The Goal:** You want to hear or feel a "click" or "thunk." That is the internal locking pin and the vanes moving through the solvent.
4. **Repeat:** Do this 3–4 times per side. Spray, soak, rock.

Phase 3: The High-Pressure Purge

Now you need to get the "solvent-sludge soup" out of the head before it drains into your new oil.

1. **The Catch-Rag:** Lay a heavy shop towel or rag over the open solenoid holes.
2. **The "Dry Crank":**
 - **Disable Ignition:** Pull the fuel pump fuse and disconnect the ignition coil harness.
 - **Crank the Engine:** Spin the engine with the starter for 10 seconds.
 - **The Result:** The oil pump will send a "wall" of oil up the galleries, pushing the solvent

and loosened grit **out** of the solenoid ports and into your rag.

3. **Inspect the Rag:** If you see black "sand" or thick black streaks, the purge worked. Repeat once more if it looks very dirty.

Phase 4: Reassembly & Priming

1. **Evaporate:** Use a flashlight to look into the ports. Ensure no liquid solvent is pooling. If it is, wait another 10 minutes for it to evaporate.
2. **Pre-Lube:** Squirt a small amount of **fresh engine oil** into the ports. This ensures the phasers don't "run dry" for even a second.
3. **Install Solenoids:** Install your solenoids. Torque to **8 Nm (approx 6 ft-lb)**.
4. **Final Prime:** Crank the engine for another 10 seconds (still with fuel disabled) to fill the phasers with clean, fresh oil.

The **P13C0** and **2D5A** codes happen because the internal vanes are "velcroed" in place by thick oil. By combining the **chemical solvent** (to thin the oil) and the **mechanical rocking** (to move the vanes), you are manually doing what the engine's oil pressure is currently too weak to do at idle.

Final Caution

- **Do not use Brake Cleaner;** it is too aggressive for the internal seals if left to soak.
- **Do not use the center VANOS bolt** to rock the cam; only use the hex flats on the camshaft itself.