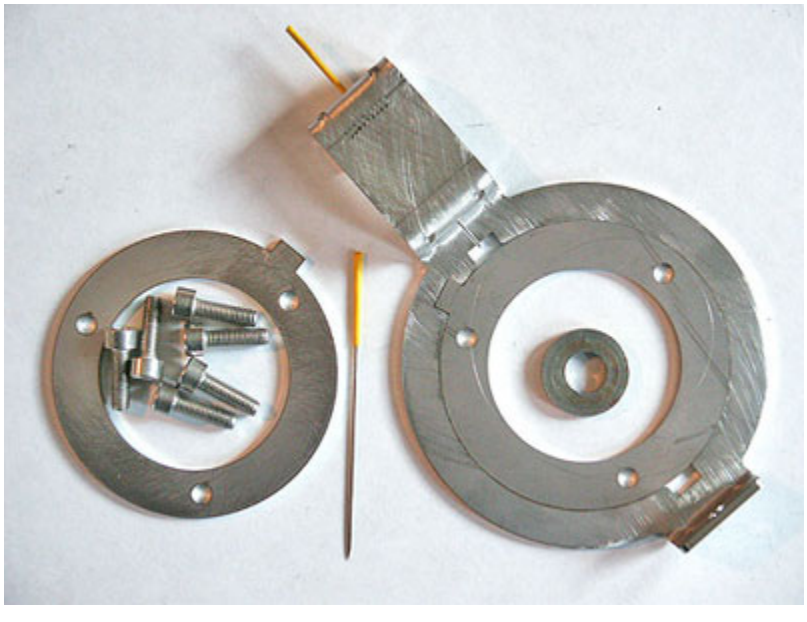
PORSCHE

928

32V’r Valve Timing Instructions



1.2

Tools

Long socket wrench or breaker bar with 27mm socket

3/8” torque wrench with 17mm socket

17mm, 32mm wrenches

4mm allen key

32V’r

Each hole is one degree, going in a zigzag pattern. The center, raised hole is zero. Left and down from the zero hole is one degree advance.

When looking at installed tool, CCW of zero hole is advance, CW is retard.

A good basic setting is:
Left: 0°
Right: 1-2° retard

The retard on the right side is to compensate for engine expansion when warm.

Conventions used in text

Left is USA drivers side, cylinders .
Right is passenger side, cylinders ¼

Author assumes that reader has access to workshop manuals and has the basic knowledge, tools, and skills to change a timing belt.

Notes are in italic font.

TDC 0 | T
20° 2 | 0
45° 4 | 5

CW clockwise, left
CCW counterclockwise, right

Warnings

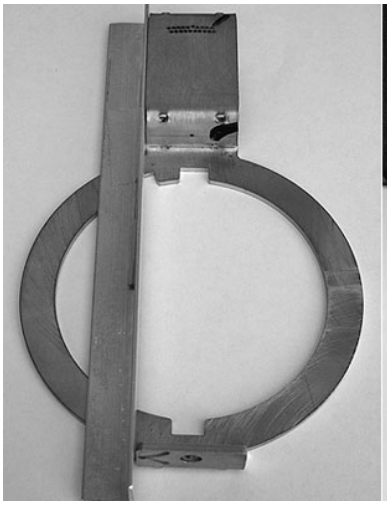
Do not run engine with indicator or spacer installed!

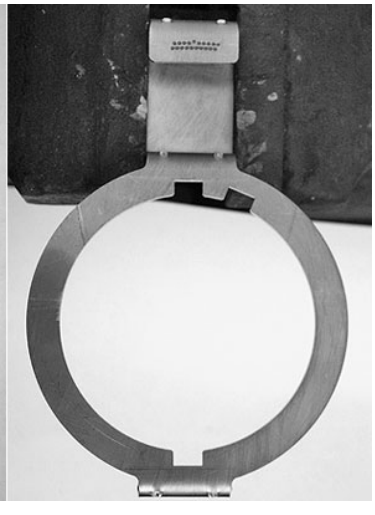
Always counter hold the cam bolt shoulder washer with 32mm wrench while loosening or tightening cam bolt.

Tighten 5mm clamp ring bolts evenly!

Indicator needle is sharp!

Alignment





Hold alignment bar tightly against both ends of the arm, and the ring. Note the gap, if any between the bar and the tail. Repeat on the other side of the arm. The gap, if any, should match on both sides. If the gap is larger on one side, clamp the arm in a vise, and gently pull or push the ring to even the gap. Very slight movement is all that is needed.

Check for flatness on both the top and bottom of the arm.

Roll the needles along a flat surface to check for flatness. Use finger pressure to gently straighten them. You can also roll the needle s when installed, noting any movement at the tip. Align the high or low section up or down in the **V** while checking the valve timing.

Checking

Rotate the crank clockwise using the crank bolt, until the balancer indicates cylinder #1, TDC.

The large cast indentation on the front of the cam gear and/or small notch on the rear, should be pointing upwards near the **V** notch cast into rear timing belt cover.

Measurement can also be performed at cylinder #1,-45°, and cylinder #6, TDC or -45°

If the indentations/notches on the cam gears are pointing downward, then the engine is at cylinder #6, TDC.

Install clamp rings with 5mm allen head bolts on both left and right cam gears.

One bolt is offset, so the clamp rings will fit in one position only.

The square 'key' should point to the large front indentation on the cam gear. The key should always be CCW of the bolt hole next to it. *If the key is CW of the hole, then the ring is upside down.*

Tighten all clamp ring bolts evenly.

Slip 32V'r over clamp ring.

There are three keyways, one for each possible measuring angle. 32V'r should always point upwards.

Slide needle through hole that most closely centers the needle in the **V**.

Each hole is one degree, going in a zigzag pattern. The center, raised hole is zero. Left and down from the zero hole is one degree advance.

Adjustment

Confirm that 5mm clamp ring bolts are tight.

Counter hold cam bolt washer, loosen and remove cam bolt.

If the gear has not been (re)moved before, you may want to spray penetrating oil in the keyway.

Reinstall cam bolt with spacer.

Counter hold cam bolt washer, tighten cam bolt to specification using torque wrench.

For advancing, or clockwise adjustment, slide needle into the hole that corresponds to the amount of advance desired.

Loosen the clamp ring bolts. Using a wrench on the cam bolt, rotate the cam bolt clockwise until the needle is in the center of the **V**.

For retarding, or counter-clockwise adjustment, there is too much valve spring pressure to use the cam bolt to rotate the cam.

Remove 32V'r.

Counter hold cam bolt washer, loosen and remove cam bolt. Reinstall cam bolt without spacer. Counter hold cam bolt washer, tighten cam bolt to specification using torque wrench.

Rotate crankshaft CW using the crank bolt until 20° advance (CW of TDC).

Counter hold cam bolt washer, loosen and remove cam bolt. Reinstall cam bolt with spacer. Counter hold cam bolt washer, tighten cam bolt to specification using torque wrench.

Replace 32V'r, slide needle into the hole that corresponds to the amount of retard desired.

Rotate crank clockwise using the crank bolt until the needle is centered in the **V**.

Loosen the clamp ring bolts, and while holding the cam bolt with a wrench, rotate the engine clockwise to #1 TDC.

Notes on the 1-4 gear adjustment

When adjusting the 1-4 gear, hold the bolt firmly with the wrench - the cam will try to rotate CCW strongly because of valve spring tension.

You may have to add a degree or two of advance to your desired amount to compensate for belt stretch when doing the 1-4. EG. for -2°, set to 0.. After rotating the engine the reading will be correct.

While continuing to hold cam bolt with wrench, tighten clamp ring bolts. Remove 32V'r.

Counter hold cam bolt washer, loosen and remove cam bolt. Reinstall cam bolt without spacer. Counter hold cam bolt washer, tighten cam bolt to specification using torque wrench.

Using crank bolt, rotate crankshaft CW again to #1 TDC. Use indicator to recheck cam position. *For best results, remove EZK relay, and spin engine using the starter, to equalize tension on the belt.*

When a consistent reading is attained after rotating crankshaft, recheck cam bolt torque using torque wrench, and remove clamp ring.