Timing tool
VW Audi Seat Cupra Skoda 1.5 TSI

C01/0275

Manufacturer:

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The product is intended for professional use.

CASTEX cannot be held responsible for incorrect use and cannot be held liable for any damage caused to personnel, property or equipment when using the tools.

Incorrect use will also invalidate the warranty.

The application database and any instructional information provided is intended to provide general guidance on the use of a particular tool. It is mandatory to read the instruction manual before use.

The **C01/0275** uses a battery-powered digital inclinometer in conjunction with precision-made adapters and alignment tools to ensure camshafts are set to the manufacturer's specifications. There should be no requirement to interact with the vehicle's OBD system when performing the procedures described below.

- Applications include Audi (from 2017), Seat (from 2017), Skoda (from 2017) and Volkswagen (from 2017).
- Engine applications include: 1.5L TSi petrol engines -DACA, DACB, DADA, DFYA, DHFA, DPBA, DPCA & DPBE.
- Engine variants include the EA211, EVO 4-cylinder TSi ACT.
- Use only after reading instructions C01/0275.

Warning: Hybrid vehicles use a high voltage system. When working on hybrid vehicles, appropriate precautions must be taken to avoid the risk of electric shock.

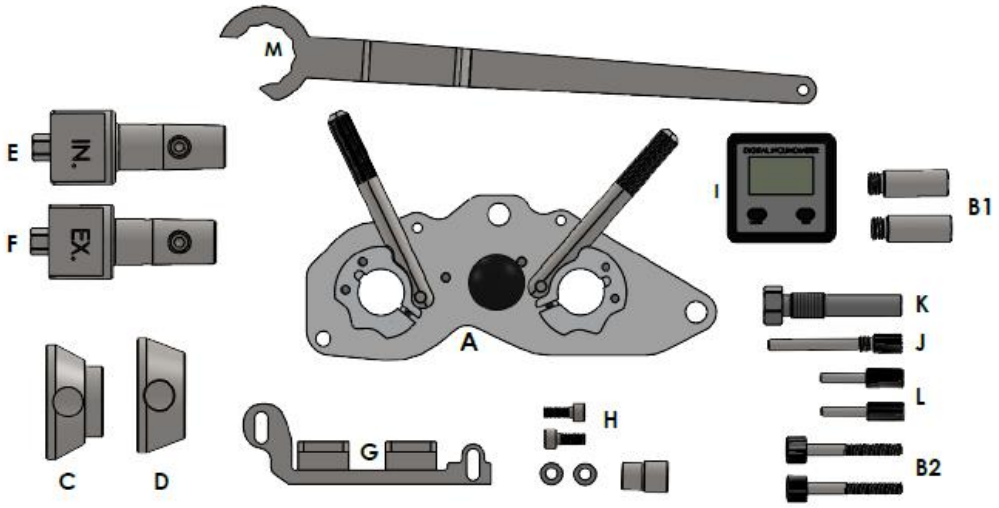
Staff working with hybrid and PHEVs must be trained to the level required by the vehicle manufacturer.

Application:

Brand	Model	Year
AUDI	A1	FROM 2018.
	A3	FROM 2017.
	Q2	FROM 2018.
	Q3	FROM 2018.
SEAT	ARONA	2017 TO 2021
	ATECA	FROM 2018.
	IBIZA	2017 TO 2021
	LEON	FROM 2018.
	TARRACO	FROM 2019.
SKODA	KAMIQ	FROM 2019.
	KAROQ	FROM 2017.
	KODIAQ	FROM 2019.
	OCTAVIA III/IV	FROM 2017.
	SCALA	FROM 2019.
	SUPERB III	2017-2020
VOLKSWAGEN	ARTEON	2018-2020
	GOLF VII/VIII	FROM 2017.
	PASSAT	FROM 2018.
	POLO	2017 TO 2021
CUPRA	LEON	FROM 2022.
	FORMENTOR	FROM 2020.
	ATECA	FROM 2023.

Engine codes
1.5LT
DADA
DFYA
DHFA
DPCA
DACA
DPBA
DACB
DPBE
DXDB

Set composition



Designation	Description	OEM.
A	Adapter plate for camshaft case	VAS 611 007
B	Spacers and mounting screws for A	VAS 611 007
C	Camshaft spacer (EA211 EVO)	VAS 611 007
D	Exhaust camshaft spacer (EA211 EVO)	VAS 611 007
E	Intake camshaft adapter (EA211 EVO)	VAS 611 007
F	Adapter for exhaust camshaft (EA211 EVO)	VAS 611 007
G	Inclinometer reference bar (EA211 EVO) 1.5	VAS 611 007
H	Fastening screws for G	VAS 611 007
I	Inclinometer	
J	Rear camshaft sprocket (water pump) Timing pin	T10504/1
K	Crankshaft timing pin	T10340
L	Lever stop pins x 2	
M	Tensioner pulley adjustment tool	T10499

Important before use:

! TORQUE SETTINGS BE FOUND IN DATA FROM THE OEM, SUCH AS VEHICLE MANUFACTURER OR AUTODATA.

! WHEN INSTALLING THE TIMING, THE CAR MUST BE SUPPORTED ON FIXED POINTS OR LIFTED ON A LIFT.

! THE INCLINOMETER MUST BE CALIBRATED EACH TIME.

The use of this engine timing kit is entirely up to the user and CASTEX is not liable for any damage.

Instructions for use:

NOTE: Do not use a camshaft or crankshaft alignment tool when loosening and tightening the pulley or sprocket mount. Use the correct tool for the sprocket/pulley fixing.

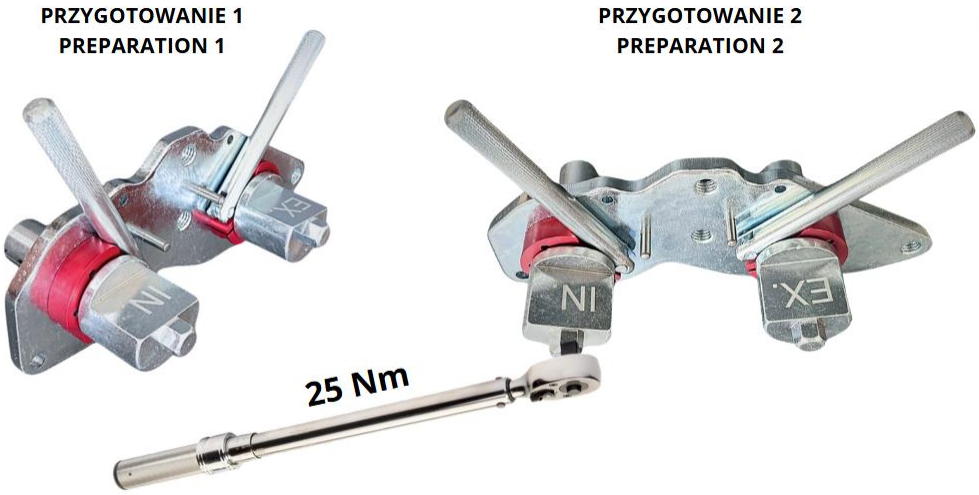
IMPORTANT

BEFORE EACH USE:

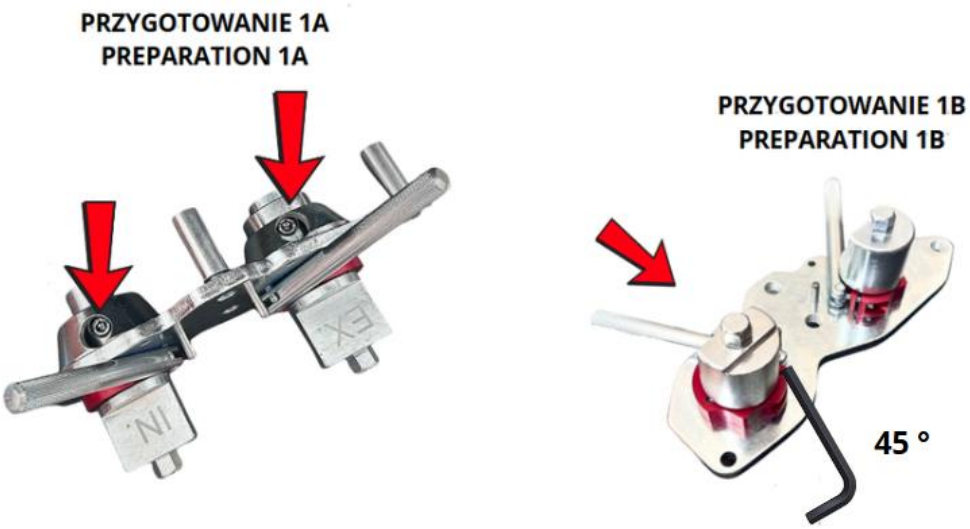
The clamping action of the adapter locking levers may need to be adjusted before each use. Use the following procedure to adjust the clamping force.
(see figure 1):

Assemble camshaft locking tools C01/0275 on the table as shown in illustration PREPARATION 1, including fitting the camshaft adapter.

Lock the adapter locking levers and insert the lever stop screws as shown in illustration PREPARATION 1B. Using a 6mm hex socket and torque spanner, check that the adapters do not rotate when 25Nm torque is applied



If the adapters turn with a torque of less than 25 Nm, tighten the adjusting screw



Clamping force adjustment:

Unlock the levers and turn the assembly upside down to access the adjustment screws.

Note: make sure the camshaft adapters are fully inserted into the clamps. Adjust the clamping force using a 3 mm allen spanner as shown in picture PREPARE 2. Tighten the bolt by 1/8 turn, then recheck the torque as shown in picture PREPARE 1B.

Vehicle preparation

Access to both ends of the drive train is required, which may require the removal of some or all of the following components depending on the vehicle model:

- Engine coolant.
- Upper and lower engine cover.
- Right front wheel and inner wheel arch.
- Coolant expansion bottle.
- Air filter housing and turbocharger pipes.
- Water pump drive belt and hoses.

Working from the transsission end of the engine remove:

- Intake valve camshaft cover.
- Water pump (exhaust camshaft end).

Working from the end of the engine belt:

- Remove the timing belt cover.
- Remove the 5 fixing screws from the exhaust camshaft adjuster cover.

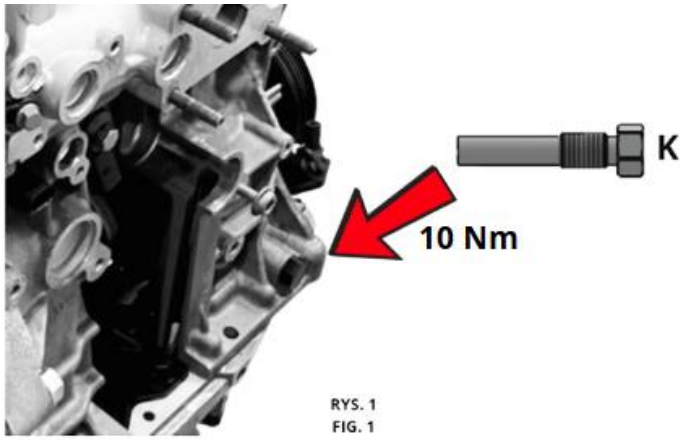
Initial engine set-up (old belt in place):

Component K - Crankshaft locking pin

Locate the crankshaft locking pin plug at the rear of the engine block and remove it. Screw the crankshaft locking pin (K) into the tapped hole and tighten to a torque of 10 Nm. If

(K) will not screw in completely, remove it and turn the crankshaft ¼ turn clockwise. Reinstall (K) and tighten to a torqque of 10 Nm. Now turn the crankshaft clockwise until it locks onto the end of (K).

See Figure 1.

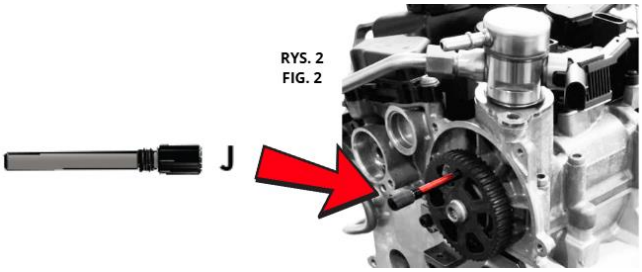


RYS. 1
FIG. 1

Component J - Rear exhaust camshaft timing pin:

Fit the timing pin of the rear exhaust valve camshaft wheel (transsmision side) as shown in Figure 2.

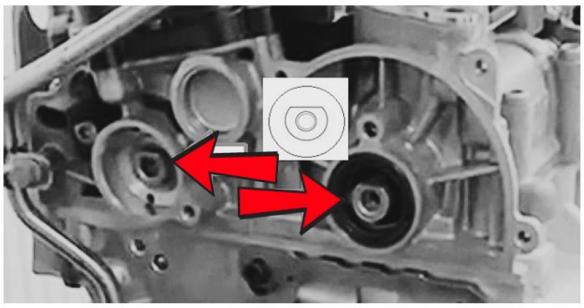
If the pulley hole is 180 degrees out, remove (K) and rotate the crankshaft 360 degrees. Reinstall (K) and install (J) as shown.



RYS. 2
FIG. 2

Once the mechanical pre-alignment has been set, remove (J) and use a suitable pulley holding tool to remove the water pump drive pulley from the camshaft.

Check that both flat camshafts are in the horizontal position at 12 o'clock, as shown in Figure 3.



RYS. 3
FIG. 3

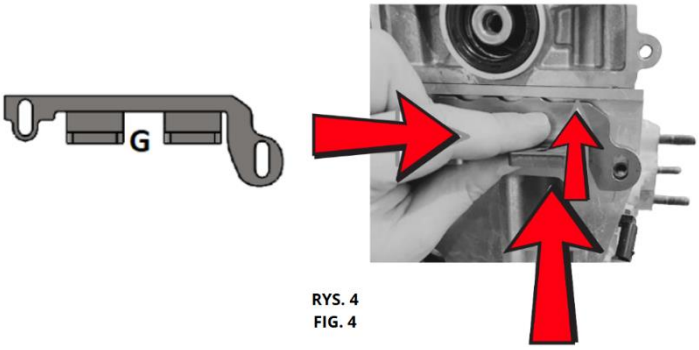
Installation of the camshaft timing kit:

In order to accurately check the camshaft timing, it is necessary to fit a full set C01/0275 at the end of the transsmision camshafts as follows:

Elements G and H - Inclinometer reference bar:

First fit the reference bar (G) with the fixing screws (H), as shown in Figure 4.

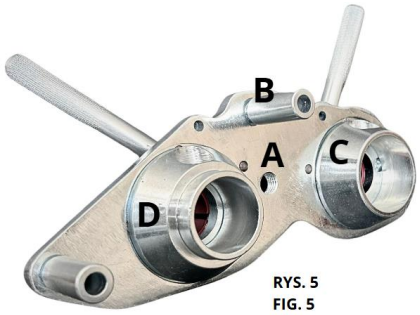
IMPORTANT: Make sure the area is clear so that the rod is against the bottom of cylinder head for the full length of the top (G) as shown.



RYS. 4
FIG. 4

Components A, B, C and D - Camshaft locking tool assembly:

Assemble components (A), (B), (C) and (D) as shown in Figure 5. Then mount the assembly on the motor with the holes in C and D facing upwards as shown in Figure 6.



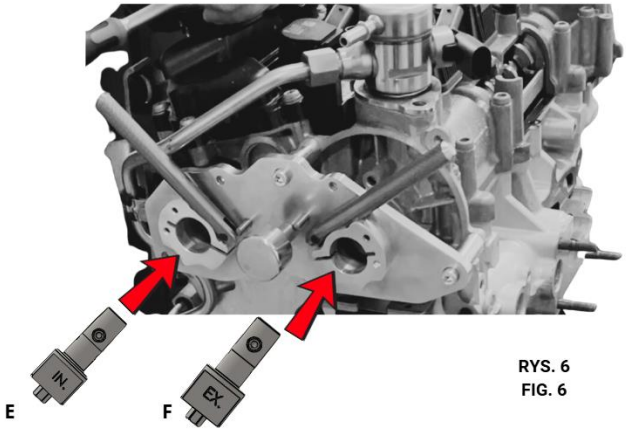
RYS. 5
FIG. 5

Components E and F - Camshaft adapters:

Insert the 2 camshaft adapters (E and F). See Figure 6.

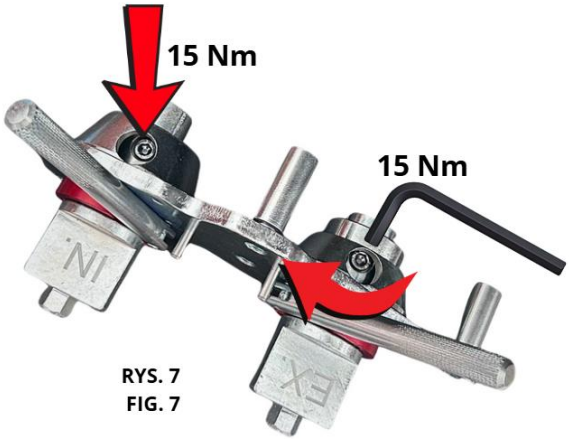
NOTE: it is important that (E) and (F) are mounted on the correct camshaft as indicated. (E) must be mounted on the intake camshaft and (F) on the exhaust camshaft. The ends (E) and (F) must mesh correctly with the camshafts.

Tighten the clamping screws on both (E) and (F) with a 6 mm Allen spanner as shown in Figure 7. Maximum torque 15 Nm.



RYS. 6
FIG. 6

Note: make sure that the E I F adapters are firmly seated on the camshafts and can't turned.



RYS. 7
FIG. 7

Checking the angle:

Place the inclinometer (I) on a flat surface and switch it on.

Wait for the reading to stabilise.

After positioning the motor as described above, place the inclinometer (I) upside down on the inclinometer reference rod (G) as shown in Figure 8 and allow it to stabilise.

Holding the inclinometer facing (G), press the ZERO button to set the inclinometer to 00.0.



RYS. 8
FIG. 8

Move the inclinometer to the flat surface of the inlet adapter (correctly upwards) and record the value shown. Repeat for the outlet adapter and record the readings. See Figure 9.

NOTE: always record the direction of the reading.
Up arrow = negative angle
Down arrow = positive angle.

NOTE: The arrows on the inclinometer indicate the direction to follow in order to find zero.



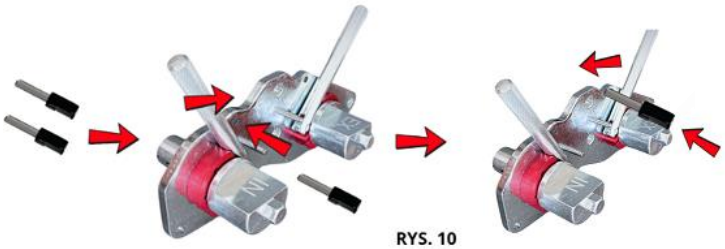
RYS. 9
FIG. 9

Compare the recorded reading with the vehicle engine manufacturer's data.
WARNING: Refer to the specific engine tolerances given by the vehicle manufacturer or Autodata.

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Removing the drive belt

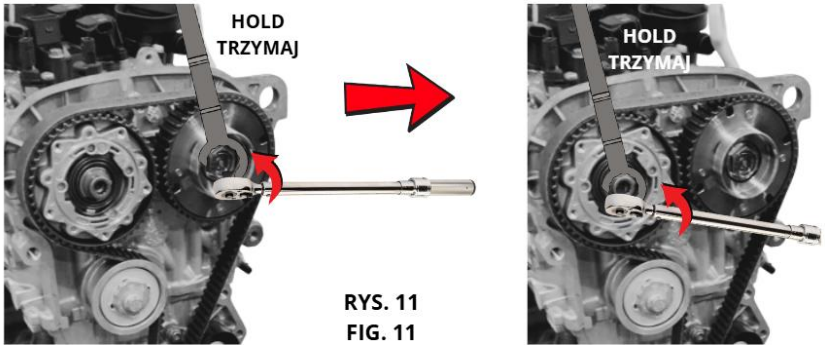
After fitting kit C01/0275 as shown in Figure 7, lock the camshaft adapters (E) and (F) by lifting the corresponding locking lever and inserting the lever locking pins (L) as shown in Figure 10.



RYS. 10
FIG. 10

Using a suitable pulley retaining tool, loosen the intake camshaft control valve. See Figure 11.

Using a suitable pulley holding tool, loosen the exhaust camshaft pulley bolt and replace it with a new one (finger tightening only). See Figure 11.



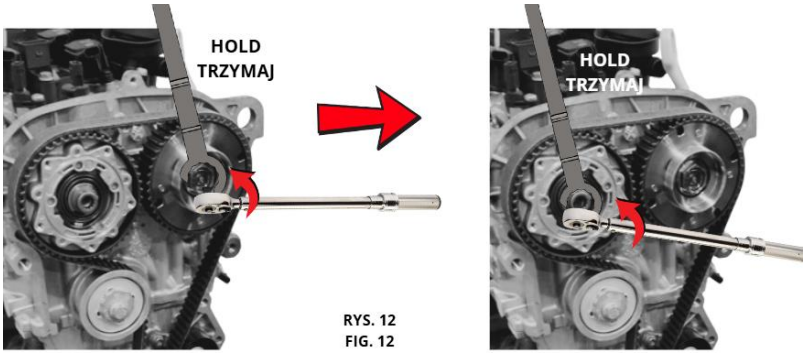
RYS. 11
FIG. 11

NOTE: do not reuse the system pulley fixing bolt exhaust.

WARNING: Never attempt to loosen or tighten camshaft or crankshaft timing tools.

Element M - Tensioner pulley adjustment tool

- With the crankshaft still seated on the crankshaft locking pin (K) and the camshaft locked as shown in Figure 10, release the timing belt tensioner using the tensioner adjustment tool (M). See Figure 12.



RYS. 12
FIG. 12

- Remove the belt, leaving the pulleys on the camshaft with their mounts.

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Installation of the camshaft drive belt:

NOTE: Before fitting a new belt, ensure that the camshaft control valve and crankshaft tool are in good condition, according to the manufacturer's instructions.

WHEN INSTALLING THE TIMING, THE CAR MUST BE SUPPORTED ON FIXED POINTS OR LIFTED ON A LIFT.

With the crankshaft still seated on the crankshaft locking pin (K) and both camshafts locked, as shown in Figure 10, place the new belt only on the crankshaft pulley.

Install the lower timing belt cover and crankshaft pulley according to the manufacturer's instructions, using a suitable tool to hold the crankshaft pulley. Tighten the crankshaft pulley bolt to the correct torque and angle (see manufacturer's specifications).

Fit the new belt to the remaining pulleys in the following order:
- guide pulley, exhaust valve camshaft and intake valve camshaft.

Check that the camshaft pulley mounts are finger tight and that the pulleys can turn independently of the camshafts. Tighten the belt using the tensioner pulley adjuster (M) in accordance with the manufacturer's instructions.

Check the angles of the camshaft adapter as described in the **Checking the timing tool** section

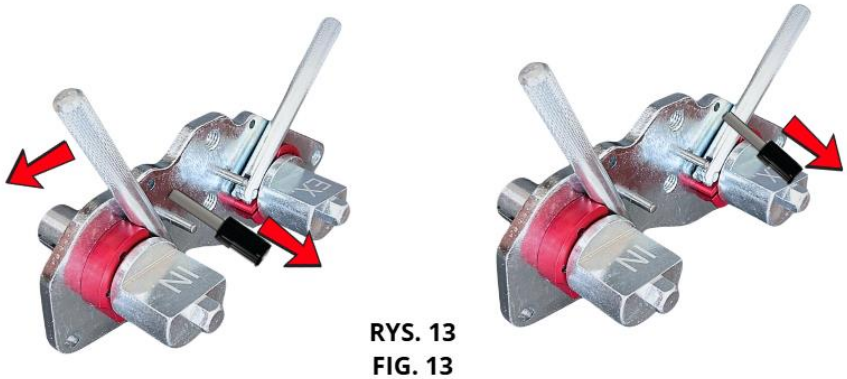
above to ensure that the camshafts have not moved (Figures 8 and 9).

Using suitable holding tools, tighten the camshaft pulley mounts with the torque specified by the manufacturer (installation torque only, not full end torque, in this example approx.. 20 Nm).

NOTE: Whenever angles are checked, always zero the inclinometer using the reference bar (G), Figures 8 and 9. This is to ensure that any changes in engine angle, for example when raising or lowering the vehicle ramp, are compensated for.

Final checks:

Release both locking levers by removing the lever stop pins (L), as shown in Figure 13.



RYS. 13
FIG. 13

Remove the crankshaft locking pin (K).

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Rotate the crankshaft 2 full revolutions, stopping just before returning to the TDC position, and re-insert the crankshaft locking pin (K). Rotate the crankshaft until it stops at (K).

Recheck camshaft angles as described under **Checking timing** (Figures 8 and 9)

Compare the reading with the manufacturer's specifications. If no adjustment is required, wheels camshaft pulleys can be tightened to the full manufacturer's specification.

If an adjustment is required, follow the procedure below:

Initial camshaft alignment and calculation of correction angles:

With the crankshaft still agned to the crankshaft pin (K), lock the camshafts as shown in Figure 10. Using a suitable pulley holding tool, loosen the intake valve camshaft control valve and finger tighten. See Figure 11.

Place the inclinometer (I) upside down on the inclinometer reference rod (G) as shown in Figure 8 and allow it to stabilise.

Holding the inclinometer at (G), press the ZERO button to set the inclinometer to 00.0° and move the inclinometer to place it on the flat surface of the intake camshaft adapter (E) (correctly upwards).

Insert a 6 mm hex key into the end of the intake valve camshaft adapter (E) and, holding the hex key, unlock the intake valve camshaft by removing the lever stop pin (L - intake valves only).

Adjust the camshaft position with the hex key until zero (00.0°) appears on the inclinometer, then lock the adapter with the locking lever and re-insert the locking pin of the lever (L).

Repeat this procedure for the exhaust cam.

Once both camshafts have been reset and locked, tighten the camshaft pulley mounts with a torque of 20 Nm.

NOTE: Again check that both camshafts are still indicating zero, if not, repeat the above process.

Release both locking levers by removing the lever stop pins (L) as shown in Figure 13. Remove the crankshaft locking pin (K).

Rotate the crankshaft 2 full revolutions, stopping just before returning to the GMP position, and reinstall the crankshaft locking pin (K). Rotate the crankshaft until it stops at (K).

Recheck camshaft angles as described under **Checking the timing**

(Figures 8 and 9)

Make a note of the recorded values, which will be used to calculate the correction angle.

The correction angles for each camshaft must be calculated. The following equation is used for this.

(Specified angle) - (Current angle) = Correction angle

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Final angle setting:

NOTE: Once the correction angle has been determined, the camshafts must be set to **zero** and then adjusted from zero by the correction angle to compensate for the engine manufacturer's tolerances.

Using a suitable pulley holding tool, loosen the intake camshaft control valve and finger tighten it. See Figure 11.

Using a suitable pulley holding tool, loosen the pulley bolt of the exhaust camshaft pulley and tighten it with your finger. See Figure 11.

Place the inclinometer (I) upside down on the inclinometer reference rod (G) as shown in Figure 8 and allow it to stabilise.

Holding the inclinometer opposite (G), press the ZERO button to set the inclinometer to 00.0° and move the inclinometer to place it on the flat surface of the intake camshaft adapter (E) (correctly upwards).

Insert a 6 mm hexagonal spanner into the end of the intake camshaft adapter (E) and adjust the camshaft position with the hexagonal spanner until the correct calculated camshaft correction angle appears on the inclinometer, then lock the adapter with the locking lever and insert the locking pin of the lever (L).

Repeat this procedure for the exhaust cam.

Once both camshafts have been reset and locked, tighten the camshaft pulley mounts with a torque of 20 Nm.

Check the timing:

Recheck camshaft angles as described under **Checking the timing** (Figures 8 and 9)

Compare the reading with the manufacturer's specifications.