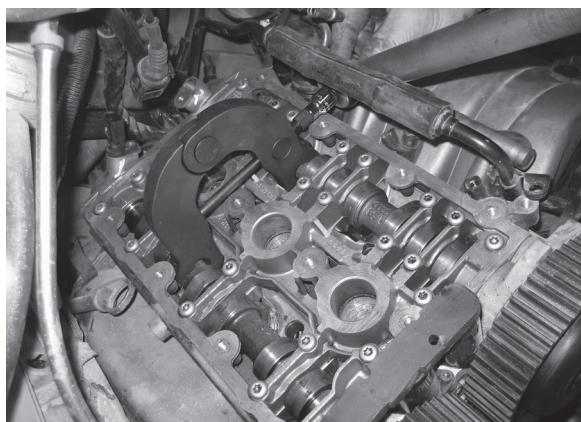


AST4940 Petrol Engine V6 Setting/Locking Tool Kit

Associated Tools: AST4741
Front Panel Support Guide Set



IMPORTANT: Always refer to the vehicle manufacturer's service instructions, or proprietary manual, to establish the current procedures and data. Product Information Sets detail applications and use of the tools with any general instructions provided as a guide only.

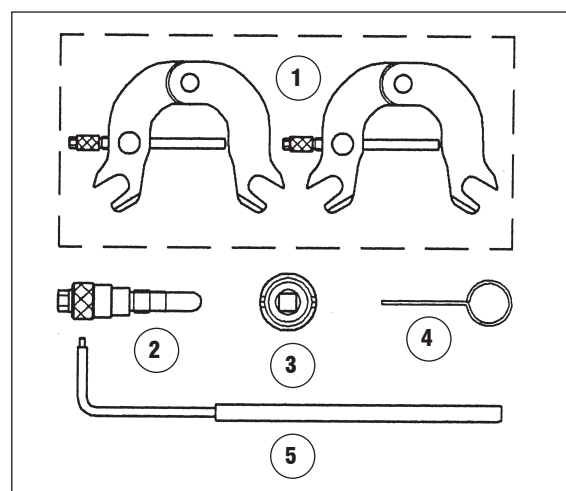


Applications:
V W GROUP 3.0 V6 Quad Cam Petrol
engines in

AUDI

A4 Cabrio A6
A8

ASN, AVK, BBJ engines



Kit Contents/Spares

Item	Part Number	Description
1	AST4941	Camshaft Setting Plate Set (Pair)
2	AST4942	Crankshaft Locking Pin
3	AST4943	Camshaft Sprocket Adjusting Tool
4	AST4593-1E	Tensioner Locking Pin (Automatic Tensioner)
5	AST4637	Tensioner Adjuster (Adjustable Tensioner)
-	AST4940-84	Case + Insert

AST4940 3.0 V6 Petrol Engine Setting/Locking Tool Kit

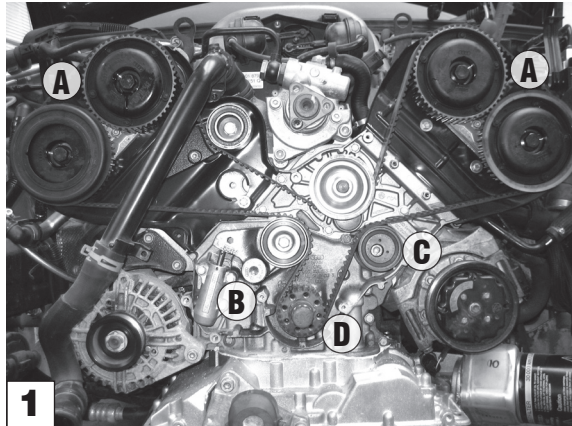
Comprises: AST4941 Camshaft Setting Plate Set (Pair)

AST4942 Crankshaft Locking Pin

AST4943 Camshaft Sprocket Adjusting Tool

AST4593-1E Tensioner Locking Pin
(Automatic Tensioner)

AST4637 Tensioner Adjuster
(Adjustable Tensioner)



The VAG 3.0 V6 petrol engines are 'Quad Cam' engines with the timing belt directly driving all four camshafts from the crankshaft.

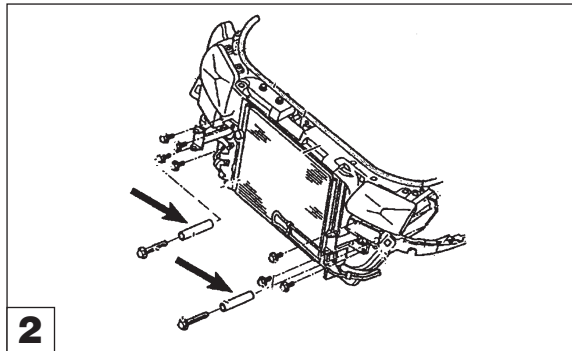
A – Camshafts (with variable valve timing)

B – Automatic Tensioner Unit

C – Adjustable Tensioner (Pulley)

D – Crankshaft

It will be necessary to fit AST4441 Front Panel Support Guides (from AST4741 Set), and to slide the front panel forward to provide access to the engine,



AST4741 Front Panel Support Guide Set Associated Tool – not included in AST4940 Kit

To fit Support Guides, raise and support the front of the vehicle and disconnect the auxiliary heater pipe. Remove the undershield, air filter cover, air intake pipe and left-hand engine cover.

Remove the front bumper and front panel bolts. Fit AST4441 Support Guides (from AST4741 Set) to both sides of the vehicle, and slide the front panel forward.

NOTE: Remember to re-fit the upper bolts to hold the front panel steady.

Remove the front engine cover, release tension off the auxiliary belt and remove the auxiliary belt.

Remove the auxiliary belt tensioner, PAS pump pulley, crankshaft pulley and thrust washer

NOTE: The thrust washer is only fitted when crankshaft gear ref 06C 105 063 is fitted.

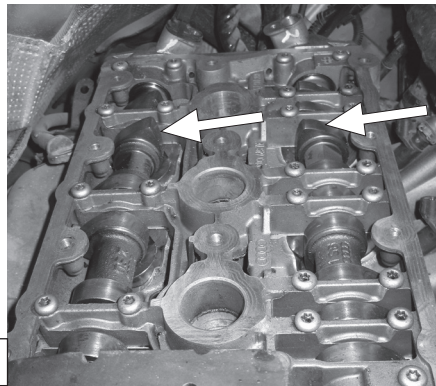
Remove timing belt covers and rear engine cover panel.

Unbolt the coolant expansion tank and move to one side, without disconnecting the hoses.

Remove the air filter housing and hoses. Pull the oil dipstick tube upwards out of the sump, pivot forward and remove.

Pull out ignition coils and remove the air hose from right-hand cylinder head, detach rear crankcase breather hose.

Remove cylinder head covers.

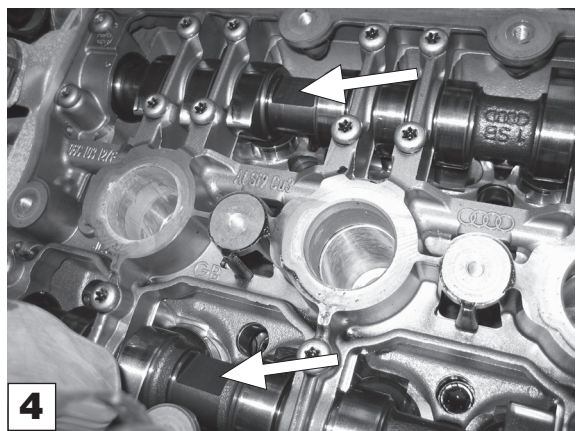


Turn the crankshaft **clockwise**, using the centre bolt of the crankshaft, so that the lobes of the inlet and exhaust camshafts for No. 3 cylinder are **angled upwards**, (Left-hand bank, when looking from the camshaft sprockets).

WARNING: The engine must only be turned over using the crankshaft centre bolt and only in normal direction of engine rotation.

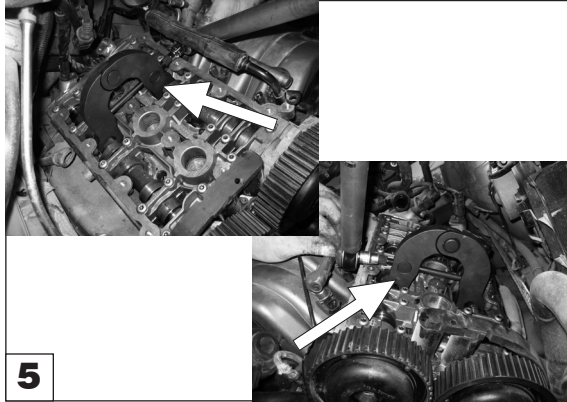
Camshaft Setting Plates Locations

AST4941 Camshaft Setting Plates are fitted into 'flats' in the camshafts, located at cylinders No. 3 and No.4.



AST4941 Camshaft Setting Plate Set (Pair)

AST4941 Camshaft Setting Plates 'set' the position of the camshafts by locating onto 'flats' in the camshafts. They are then expanded by means of a centre adjusting screw to firmly 'lock' the camshafts.



Fit one of the AST4941 Camshaft Setting Plates to the camshafts at No. 3 cylinder position on the left-hand bank (when looking from the camshaft sprockets), and the other Setting Plate onto the camshafts at No. 4 cylinder position right-hand bank (when looking from the camshaft sprockets).

NOTE: Subsequent removal of the Plates is assisted by applying a little grease to the inside of the cut-outs in the Plates that fit on to the 'flats' of the camshafts.

Expand the Setting Plates, by tightening the adjustment screws to a maximum of 10Nm., in order to fully engage the camshafts. Rock the crankshaft back and forth and ensure there is no play/movement of the camshafts.



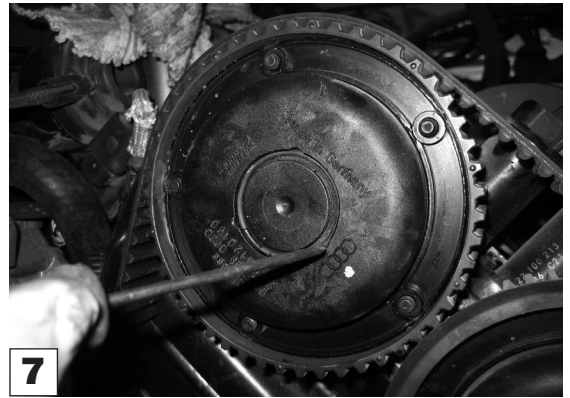
AST4942 Crankshaft Locking Pin

If a coolant run-on pump is fitted, unplug the connector.

Remove the blanking plug from the engine block and screw in AST4942 Crankshaft Locking Pin to 'lock' the crankshaft.

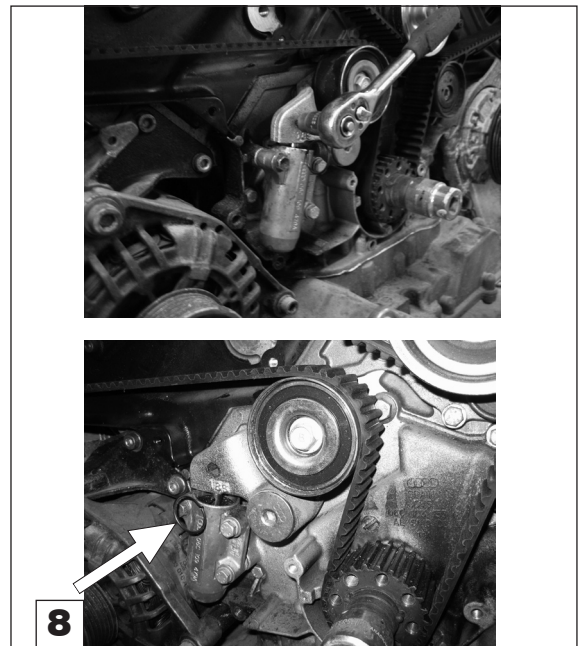
Rock the crankshaft to assist entry of the Pin as it is inserted.

NOTE: The Pin does not enter fully up to the step before the knurling. A small gap will remain visible.



Prise off the circlips and blanking plugs of all four camshaft sprockets, and slacken each camshaft sprocket bolt, leaving the bolt in place.

NOTE: Ensure you have a shop rag available to catch oil spillage when removing blanking plugs.



AST4593-1E Tensioner Locking Pin (Automatic Tensioner)

Using an 8mm. hexagon socket bit in the hexagon of the tensioner lever arm, turn in an **anti-clockwise** direction, to depress the plunger, until the holes in the tensioner plunger and body align, and insert Pin AST4593-1E.

NOTE: The automatic tensioner is oil dampened and can only be depressed slowly.

Slacken the nut on the Adjustable Tensioner pulley, and remove the old timing belt.

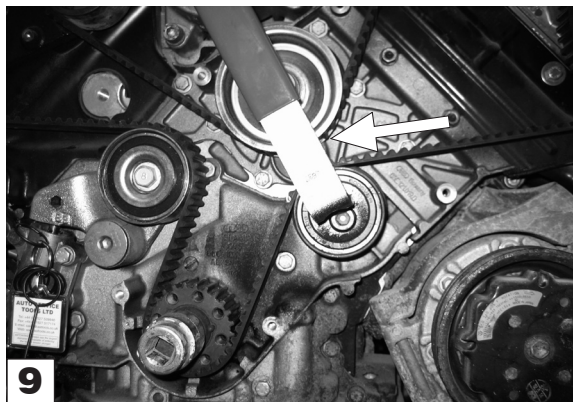
Installing a new belt.

Check that the Camshaft Setting Plates and Crankshaft Locking Pin are fitted.

IMPORTANT: Ensure that the camshaft sprockets are 'free to turn' on the camshafts, but do not tilt.

Fit the new belt in a **clockwise** direction, starting at the crankshaft gear.

WARNING: To achieve accurate valve timing, the edges of the belt **MUST** align with the edges of the sprockets.



AST4637 Tensioner Adjuster (Adjustable Tensioner pulley)

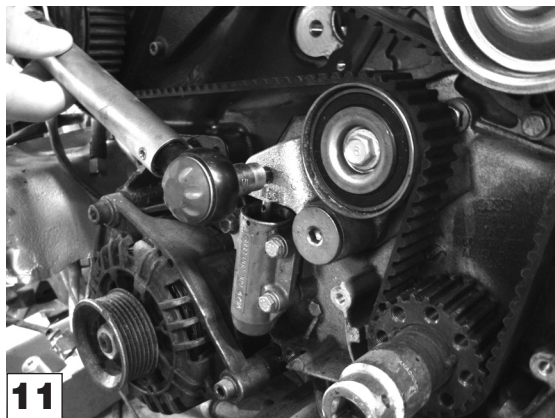
IMPORTANT: Fit the AST4637 Adjuster into the two holes in the Adjustable Tensioner pulley and turn **clockwise** until the handle of the AST4637 is positioned **EXACTLY** over the centre axis of the coolant pump pulley - see pic 9.

Counter-hold the tensioner pulley using AST4637 whilst tightening the pulley nut to 45Nm.

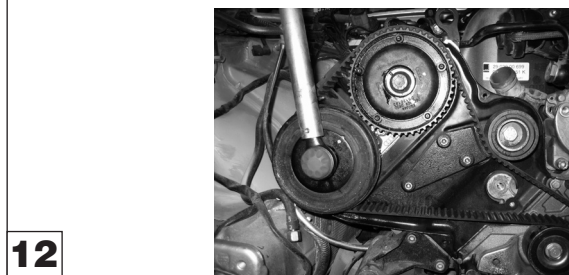
Fit a torque wrench and socket bit into the hexagon of the Automatic Tensioner lever arm and apply a **clockwise** torque of 45Nm. to pre-tension the belt



Apply pressure to the lever arm in an **anti-clockwise** direction until AST4593-1E Locking Pin can be removed. Remove the Pin to release the tensioner plunger.



Fit torque wrench and 8mm hexagon socket bit to tensioner lever arm and apply 25Nm. torque in a **clockwise** direction.



AST4943 Camshaft Sprocket Adjusting Tool

Fit AST4943 Adjusting Tool to the sprocket of camshaft No.4.

Fit a torque wrench in to the square drive of AST4943 and turn **clockwise**, applying a torque of 10Nm.

Then fit AST4943 and torque wrench to the sprocket of Camshaft No. 1 and again turn **clockwise**, applying a torque of 10Nm.

Tighten the bolt of each camshaft to 100Nm. and re-fit the blanking plugs and circlips.

Remove the AST4941 Camshaft Setting Plates (you may find it necessary to gently 'tap' these off the camshafts), and AST4942 Crankshaft Locking Pin.