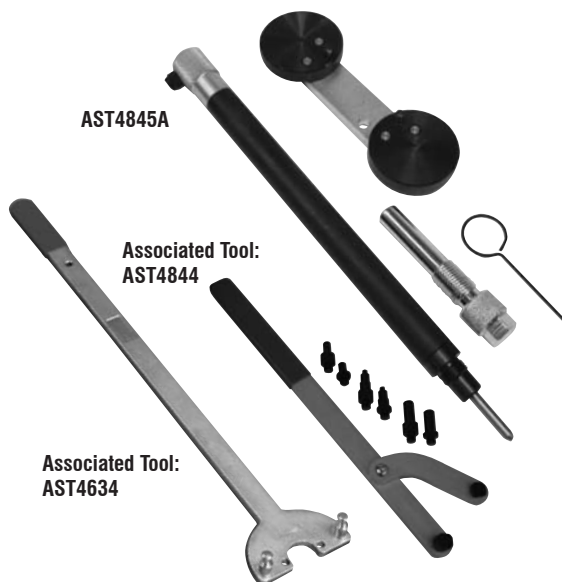


## AST4845A Petrol Engine Twin Camshaft Setting/Locking Tool Kit

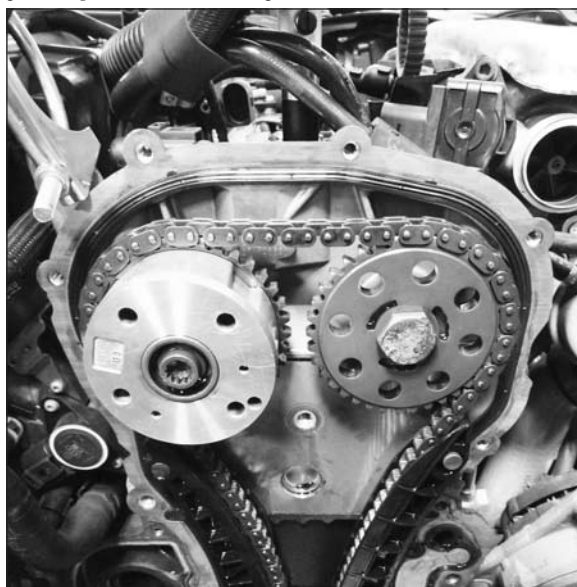
### Associated Tools:

AST4844 Camshaft Sprocket Holding Tool

AST4634 Crankshaft Pulley Holding Tool



**IMPORTANT:** Consulte siempre las instrucciones de servicio del fabricante del vehículo, o manual de propietario, para establecer los procedimientos y datos actuales. Información de producto Juegos de detalle aplicaciones y el uso de las herramientas con las instrucciones generales previstas sólo como una guía.



### Applications:

V W GROUP 1.4/1.6 FSi and 1.4 T(F)Si  
Petrol engines (CHAIN DRIVE) in

#### AUDI

A3

#### SEAT

Ibiza

Leon

Altea/XL

#### SKODA

Fabia II  
Superb II

Roomster

Octavia II

#### VOLKSWAGEN

Polo

Golf

Golf Plus

Jetta

Eos

Scirocco

Tiguan

Passat

Touran

#### FSi engines -

AXU, BAG, BKG, BLF, BLN, BLP and BTS

#### TFSi engines -

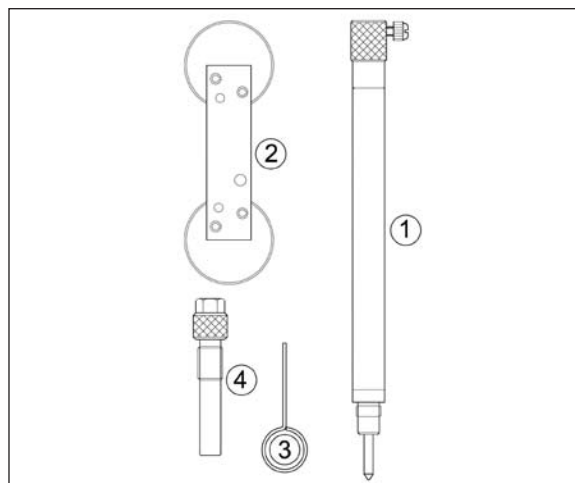
BLG, BMY, BWK, CAVA, CAVB, CAVC,  
CAVD, CAVE, CAVF, CAXA, CAXC, CDGA

#### Additional AST Tools required:

AST4844 Camshaft Sprocket Holding Tool

AST4634 Crankshaft Pulley Holding Tool

AST3054-10 DTI or other suitable Dial Gauge



#### Kit contents/spares

Item	Part Number	Description
1	AST4519	TDC Positioning Tool - use with a suitable DTI (such as AST3054-10)
2	AST4846	Camshaft Setting Plate
3	AST4593-1E	Tensioner Locking Pin
4	AST4851	Crankshaft Locking pin

Estos motores VW 1.4 y 1.6 Doble árbol de levas de gasolina son de inyección directa FSI (inyección de combustible estratificado), y son CADENA.

El combustible se inyecta directamente en la cámara de combustión y un sistema de carril común se utiliza con presiones de funcionamiento en 40-110 bar.

Hay varias variantes de estos motores, algunas con distribución variable (VVT) en el árbol de levas de admisión. Versiones con turbocompresor actualidad se han introducido (TFSi)

### AST4845A FSi/TFSi Engine Setting/Locking Tool Kit

Comprises: AST4519 TDC Positioning Tool

(use with suitable DTI)

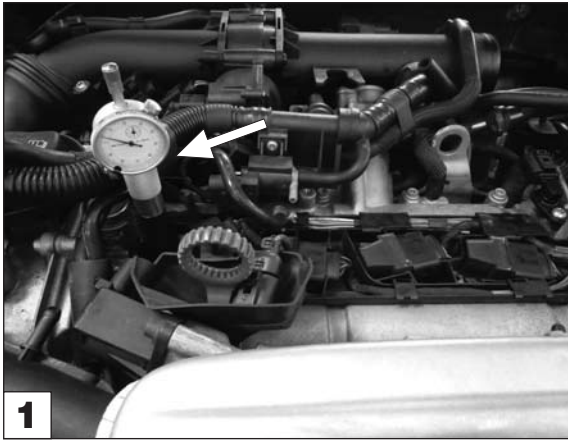
AST4846 Camshaft Setting Plate

AST4593-1E Chain Tensioner Locking Pin

AST4851 Crankshaft Locking pin

### Checking valve timing

Retire la caja del filtro de aire, el escape de la válvula de recirculación de gases y de la placa de la cubierta en la parte trasera de los árboles de levas.



#### AST4519 TDC Positioning Tool

(Use with suitable DTI – not included in set)

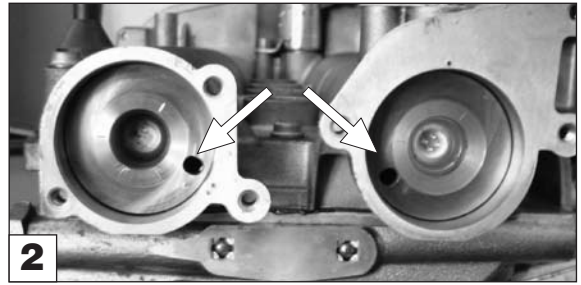
Motor / cigüeñal posición TDC correcta se establece utilizando la herramienta AST4519 junto con un DTI adecuado (Dial Gauge) como AST3054-10.

Retire la bujía del cilindro n° 1.

Instale el DTI para Herramienta AST4519 y asegure con el tornillo de mariposa.

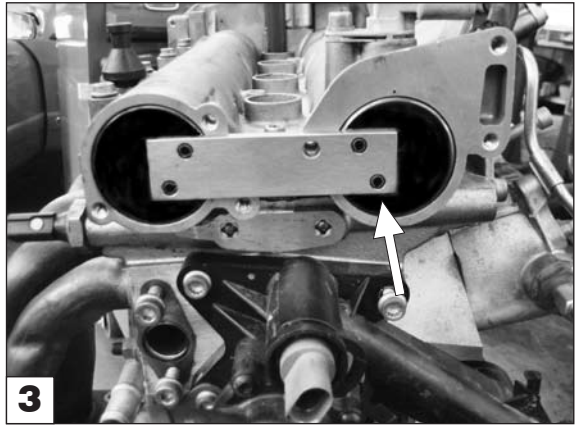
Tornillo AST4519 plenamente en el orificio de la bujía del cilindro n° 1. Girar el cigüeñal en la dirección normal de rotación del motor de manera que el pistón reacciona sobre el pasador indicador de AST4519 y a su vez mueve la aguja de la DTI.

TDC se logra cuando la aguja alcanza su lectura más alta y antes de que empiecen a moverse en la dirección inversa.



**IMPORTANT:** Compruebe que los orificios de la parte posterior de los árboles de levas están colocados como se muestra en el diagrama 2. Si no es así, girar el cigüeñal una vuelta más (360°) y establecer la posición PMS del cilindro n° 1, utilizando AST4519 y el DTI.

**WARNING:** Si bien el establecimiento de TDC en estos motores el cigüeñal no debe convertirse o se le permite moverse, más de 0,01 mm pasó posición TDC. Si esto ocurre, apague el cigüeñal hacia atrás (en sentido contrario a la rotación), aprox. 45° y luego de nuevo hacia delante, a la posición PMS del cilindro n° 1.



#### AST4846 Camshaft Setting Plate

Inserte AST4846 Configuración de la Plata en los recreos y los dos agujeros en la parte posterior de los árboles de levas

NOTA: "TOP" marcado en el puente central de la placa de calado, debe ser en la parte superior.

Si AST4846 Ajuste Plate no se puede instalar, la sincronización del motor es incorrecta y debe ser ajustado.

## Adjusting valve timing



**WARNING:** On the rear face of the crankshaft gear is a raised lug. This lug locates in to a recess in the crankshaft, setting the position and providing a positive connection between gear and crankshaft. Care must be taken when refitting the crankshaft pulley centre bolt to ensure that the lug on the crankshaft gear is located into the recess in the crankshaft. Failure to do so could result in damage to the engine.



Using AST4634 Crankshaft Pulley Holding Tool as a counter hold (Associated Tool not in set), release and remove the pulley centre bolt.

Remove the crankshaft pulley in order to remove the timing chain cover.

Refit the pulley and bolt (ensuring correct crank gear location on the crankshaft) to facilitate rotation of the engine.

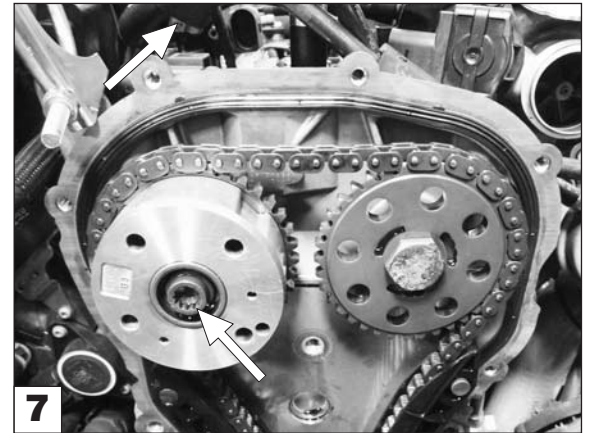
Position the engine at TDC No.1 cylinder using AST4519 Tool and DTI, ensuring the piston is at the top of its compression stroke, as described earlier in "Checking valve timing".



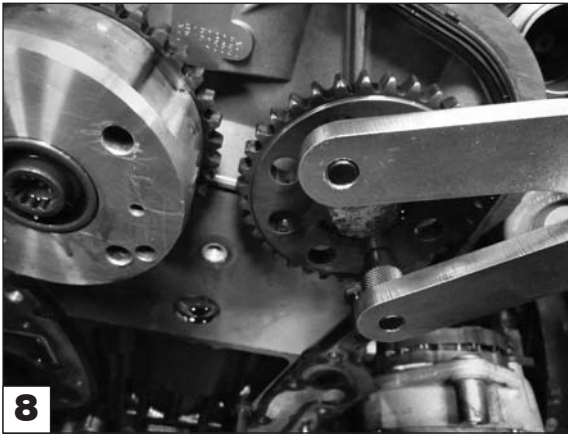
### AST4593-1E Tensioner Locking Pin

Turn the crankshaft against direction of engine rotation by 45° and push the chain guide rail against the chain tensioner piston. Insert AST4593-1E Pin to 'lock' the piston in position.

**IMPORTANT:** Mark the timing chain with direction of rotation.



**WARNING:** On engines fitted with VVT, the Camshaft Timing Adjuster bolt (inlet camshaft sprocket) has a LEFT-HAND THREAD.



Remove the camshaft sprockets/VVT unit, timing chain and bolts using AST4844 Sprocket Holding Tool (Associated Tool - not in set), as a counter hold whilst releasing the sprocket bolts. Refit the sprockets/VVT unit with new bolts, **DO NOT** refit the chain at this stage.

Tighten standard camshaft sprocket bolts to 50Nm, and VVT unit bolts to 40Nm.



Turn the camshafts until the AST4846 Setting Plate can be inserted in to the recesses and the two holes in the rear of the camshafts.

**NOTE:** "TOP" marked on the centre bridge of the Plate, must be at the top.

Counter-hold the sprockets using AST4844 Sprocket Holding Tool, and slacken the camshaft sprocket/VVT unit bolts. **DO NOT** use AST4846 Setting Plate as a counter-hold tool.

Remove one of the camshaft sprockets, install the timing chain and refit the camshaft sprocket.

Tighten sprocket bolts finger-tight only so that the camshaft sprockets/VVT unit can still turn freely on the camshafts.

Apply tension to the timing chain by removing the AST4593-1E Pin from the tensioner.

Turn the crankshaft in the normal direction of engine rotation and using AST4519 and DTI, establish TDC at No.1 cylinder.

**WARNING:** Whilst establishing TDC on these engines the crankshaft **MUST NOT** be turned or be allowed to move more than 0.01mm passed TDC position. If this occurs, turn the crankshaft backwards (against direction of rotation), approx. 45° and then forward again, to TDC No.1 cylinder position.



*Oil sump removed to show crankshaft pin locking position against crankshaft web*

### AST4851 Crankshaft Locking Pin (1.4 TFSi engines only)

On 1.4 TFSi engines a Crankshaft Locking Pin is used when adjusting the timing. This pin sets the crankshaft at TDC position by contacting a machined face on one of the crankshaft webs with the end of the AST4851 Pin. Fit AST4851 Crankshaft Locking Pin and tighten to 30Nm.

Using AST4844 Sprocket Holding Tool to counter-hold the sprockets, tighten standard camshaft sprocket bolts to 50Nm, and VVT unit bolts to 40Nm.

**WARNING:** When tightening bolts the crankshaft **MUST NOT** be allowed to turn and the timing chain should remain tensioned on both sides.

### For 1.4TFSi engines - Remove Crankshaft Locking Pin AST4851.

Remove AST4846 Camshaft Setting Plate.

Turn the crankshaft two full turns in the normal direction of engine rotation, returning to TDC position No1. cylinder using AST4519 and DTI.

Refit AST4846 to check camshaft position. If it this is not possible, repeat the "Timing Adjustment" procedure.

### For 1.4TFSi engines - Refit AST4851 Crankshaft Locking Pin and tighten in place to 30Nm.

Remove the AST4846 Camshaft Setting Plate.  
Counter-hold the camshaft sprockets using AST4844 Sprocket Holding Tool, and tighten both sprocket bolts a **further 90°** ensuring that the sprockets do not turn on the camshafts.

**NOTE:** When installing the rear camshaft cover, new seals will be required.

## Refitting the crankshaft pulley/timing chain cover

**IMPORTANT:** A **NEW** crank pulley bolt **MUST** be fitted.



Later type "drilled head" bolt

Two variants of crankshaft pulley bolt have been used on these engines. The early type is identified by having a solid bolt head, while the later bolt has a drilling in the bolt head.

The early type (solid head) is tightened to a torque of 90Nm + 90°  
The later type (drilled head) is tightened to a torque of 150Nm + 180°

Check that the crankshaft is positioned at TDC on No1. cylinder using AST4519 and DTI.

**For 1.4TFSi engines** - fit the Crankshaft Locking Pin AST4851 and tighten in place to 30Nm.

**WARNING:** On the rear face of the crankshaft gear is a raised lug. This lug locates in a recess in the crankshaft, setting the position and providing a positive connection between gear and crankshaft. Care must be taken when refitting the crankshaft pulley centre bolt to ensure that the lug on the crankshaft gear is located into the recess in the crankshaft. Failure to do so could result in damage to the engine.

Using AST4634 Crankshaft Pulley Holding Tool as a counter hold, remove the old crankshaft bolt and pulley, then refit the timing chain cover.

Refit the crankshaft pulley using a new bolt and tighten finger-tight (ensuring correct crankshaft gear location).  
Re-check camshaft position using AST4846 and crankshaft position using AST4519 and DTI.

Remove Camshaft Setting Plate AST4846.

Using the AST4634 Holding Tool as a counter hold, tighten the crankshaft bolt to the specified torque setting.

**For 1.4TFSi engines** - Remove AST4851 Crankshaft Locking Pin.

A final stage timing check **MUST** be carried out to check the valve timing is correct.

Turn the crankshaft two full turns in the normal direction of engine rotation, returning to TDC No1. cylinder, using AST4519 and DTI.  
Check the camshaft position by fitting AST4846 Camshaft Setting Plate.

Remove all tools and re-assemble the vehicle

