

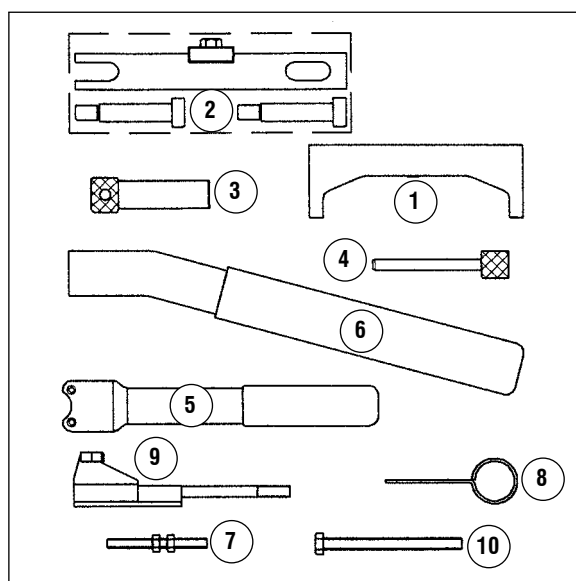
AST4740

Diesel & Petrol Engine Setting/Locking Tool Kit

Associated Tool: 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 Diesel (1.7 & 1.9D/SDi/TDi)
& Petrol (1.6 – 2.0) engines in**

AUDI

80	A3	S3
A4	A6	TT
Cabriolet		

SEAT

Ibiza	Cordoba	Arosa
Leon	Inca	Toledo
Alhambra		

SKODA

Fabia	Felicia	Octavia
Superb		

VOLKSWAGEN

Lupo	Polo/Classic	Caddy
Golf	Bora	Beetle
Passat	Touran	Sharan
Transporter		

Refer to the Application Charts on the following page(s) for specific model information

Additional AST Tools required:

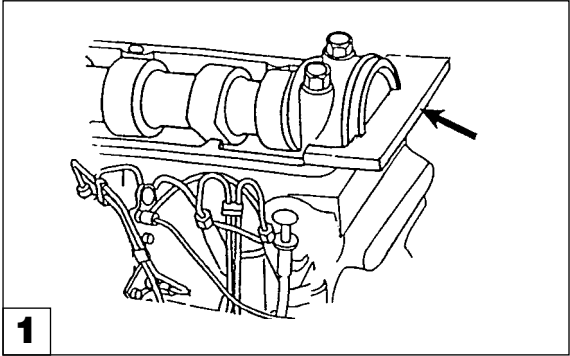
AST4741 Front Panel Support Guide Set
AST4844 Camshaft Sprocket Holding Tool

Kit contents/spares

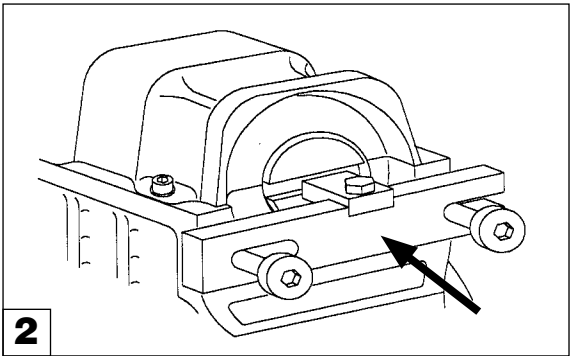
Item	Part Number	Description
1	AST4115A-1	Camshaft Setting Plate
2	AST4749	Camshaft Setting Plate
3	AST3054V3	Injection Pump Locking Pin
4	AST44440V2	Injection Pump Locking Pin
5	AST4444	Tensioner Adjuster
6	AST4633	Tensioner Adjuster
7	AST4440T1	Tensioner Retainer
8	AST4593-E1	Tensioner Lock Pin
9	AST4809	Tensioner Retainer
10	AST4440V1	Fan Retaining Bolt
--	AST4740-84	Case + Insert

AST4740 Diesel and Petrol Engine Setting/Locking Tool Kit for VAG models covers a comprehensive range of VAG - D, SDi and TDi diesels (1.7 & 1.9) and a range of standard 1.6 to 2.0 petrol engines, including 1.8/1.8T Chain in Head engines - refer to Application Charts for specific model/engine applications.

Diesel Engine – Camshaft Setting Plates
Refer to Application Charts for model/engine applications



AST4115-1



AST4749

AST4115A-1 and AST4749 Camshaft Setting Plates

Camshaft Setting Plates are used to accurately align a datum slot, located in the end of the camshaft, with the top face of the camshaft housing, to hold the camshaft at the TDC position.

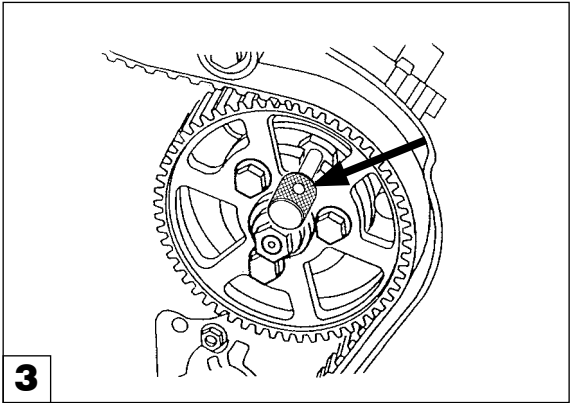
AST4115A-1 Plate has extended right angles at each end to allow it to rest on the sides of the cam housing.

Remove the camshaft cover and timing belt cover and turn the engine in the normal direction of rotation until the setting plate can be inserted into the machined slot in the end of the camshaft.

When fitting the setting plate, feeler gauges of equal thickness can be inserted on either side of the plate until free play has been eliminated.

AST4749 Setting Plate is for specified 1.9 diesel engines where the camshaft can be set in timed position without removing the cam cover. The vacuum pump (exhauster) is removed giving access to the slot in the end of the camshaft. The vacuum pump retaining bolt holes are used to attach the two AST4749 bolts and plate.

Diesel Engine – Injection Pump Locking Pins
Refer to Application Charts for model/engine applications



AST4440V2

AST3054V3 and AST4440V2 Injection Pump Locking Pins

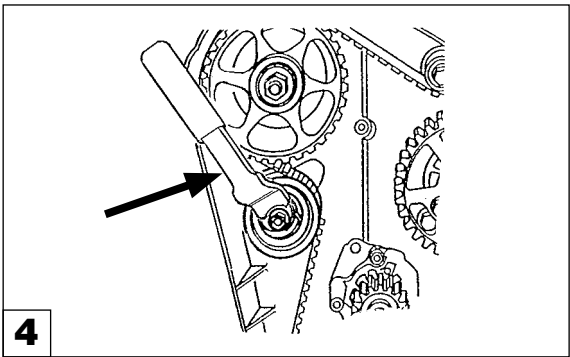
Locking pins are designed to pass through datum holes in the sprockets into fixed holes on the engine.

AST3054V3 is the larger diameter of the two locking pins in the kit and is used on engines having One Piece Injection Pump Sprockets.

AST4440V2 Pin is used when 2 - Part Sprockets are fitted, (Sprockets with three retaining bolts securing a front sprocket to a rear mounting).

IMPORTANT: Do NOT use Camshaft Setting Plates or Locking Pins to hold the camshaft/injection pump in position whilst releasing or re-tightening the sprocket bolt. Plates and Pins are for retention of timing position only. Use Sprocket Holding Tool AST4844 to counter-hold sprockets.

Diesel and Petrol Engines – Timing Belt Tensioner Adjusters
Refer to Application Charts for model/engine applications



AST4444 and AST4633 Tensioner Adjusters

AST4444 and AST4633 Adjusters are used on a very wide range of V W diesel and petrol engines, in all of the Group's marques, to adjust timing belt tension. The tensioner cam has two holes into which the two pegs of the Adjuster locate to allow the tensioner to be turned and provide tension adjustment for the timing belt.

Petrol Engine – 1.8/1.8T Automatic Belt Tensioner and Chain in Head valve timing

Refer to Application Charts for model/engine applications

This V W range of 1.8 and 1.8 Turbo twin cam petrol engines, introduced around 1997 (dependant upon V W Group marques), have a timing belt connecting the crankshaft to exhaust camshaft, and a timing chain situated inside the cylinder head, driving the inlet camshaft from the exhaust camshaft.

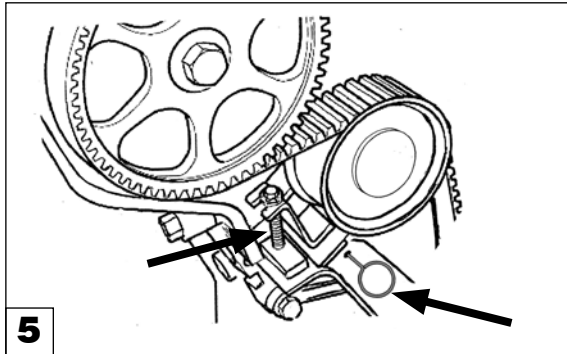
Timing Belt Replacement

Timing belt replacement is straightforward. The plunger of the automatic tensioner must be compressed and retained by a pin to allow the belt to be removed.

Position the crankshaft at TDC

Check that the marks on the crankshaft pulley and camshaft front sprocket align correctly with their timing marks.

Support the engine, as the R-H engine mounting bracket must be removed, along with the crankshaft pulley and timing covers.



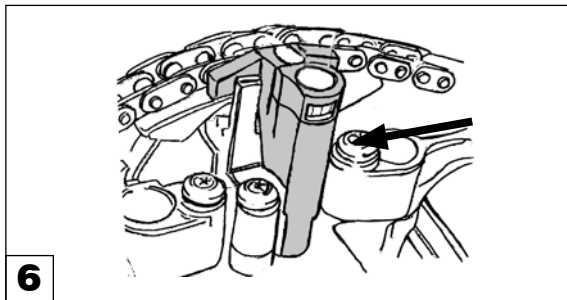
AST4440T1 and AST4593-1E Tensioner Tools

Insert Tensioner Retainer AST4440T1 into the tensioner and tighten sufficiently to depress the plunger and to align the holes in the plunger with the hole in the tensioner housing.

'Lock' the plunger in position by inserting Pin AST4593-1E

When fitting a new belt, ensure it is taut on the non-tensioned side. Apply tension by removing the Locking Pin. Remove AST4440T1 Retainer.

Valve Timing – Chain in Head



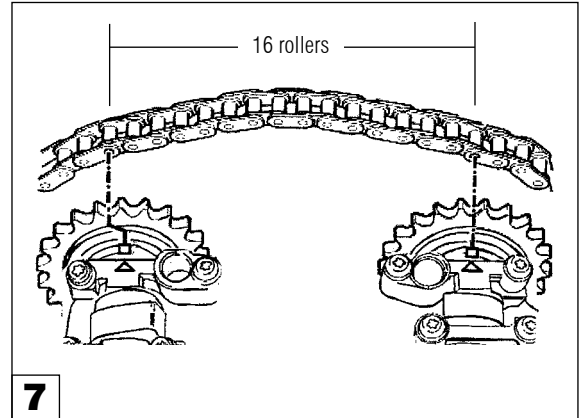
AST4809 Chain Tensioner Retainer

Removal and refitting of the valve gear, camshafts, timing chain etc. will require setting of the valve timing.

Prior to any dis-assembly, the crankshaft must be positioned at TDC No1. cylinder and the mark on the front camshaft sprocket must be aligned with the mark on the cylinder head cover.

Mark with paint if necessary, the position of the chain links relative to the arrows on the camshaft rear bearing caps. The distance between arrows should be 16 rollers on the chain.

The head cover and timing belt can then be removed.



Remove the camshaft front sprocket, using a counter-holding tool such as AST4844, to retain sprocket whilst releasing the bolt.

The notches on the camshaft must be aligned with the arrows on the bearing caps.

Fit Chain Tensioner Retainer AST4809 to release tension off the chain

WARNING: Do not over-tighten Retainer as damage to the tensioner can result.

IMPORTANT: When refitting a chain, align the paint marks with the notch/arrows. A new chain must be fitted so that the distance between the timing marks (the arrows on bearing caps/notches on camshafts) should be 16 rollers on the chain.

Note however that the link being located onto the exhaust camshaft is slightly offset from the notch on the camshaft – see diagram.

AST4440V1 Viscous Fan Retaining Bolt

On Audi A4 and A6 latest 1.6 and 1.8 petrol engines, timing belt renewal requires the viscous fan coupling to be released. For this to be achieved it must first be "locked" in position using AST4440V1 and released with a suitable allen key.

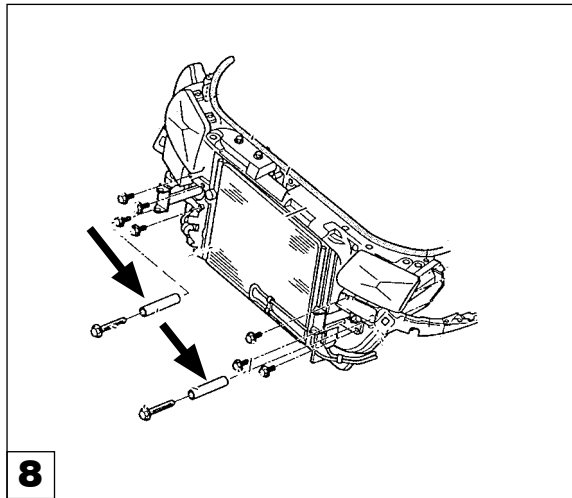
Associated Tools

In addition to the special timing tools in Kit AST4740, it is recommended you also have available:-

AST4741 Front End Support Guide Set

AST4844 Camshaft Sprocket Holding Tool

– see Application Charts for models/engines requiring these additional tools



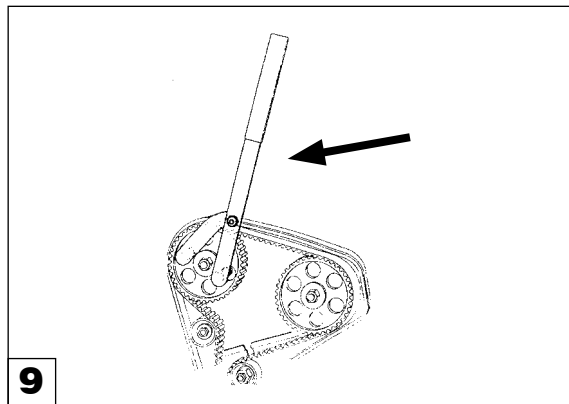
AST4741 Front End Support Guide Set – Associated Tool – not in kit

Lock Carrier – “Service Position”

Almost all V W Group models have the facility of extending the front panel of the vehicle to provide increased access space in the engine compartment to carry out various service applications.

On a number of models, Audi A4, A6, A8, Volkswagen Passat, for example, moving the front end out to “Service Position” is part of the timing belt replacement procedure.

Remove the front panel bolts, fit the appropriate Support Guides and slide the panel forward. Re-fit the upper bolts to hold panel in position.

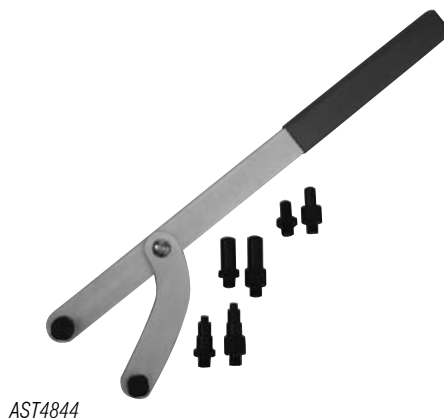


AST4844 Camshaft Sprocket Holding Tool – Associated Tool – not in kit

Many engine timing procedures require the camshaft to be ‘set’ in position and the camshaft sprocket or gear released to turn freely on its shaft, to realign engine timing correctly.

AST4844 provides a safe and correct means of counter-holding the sprocket whilst releasing and tightening the camshaft nut/bolt, without damage to the sprocket or to timing tools fitted to the engine. It can also be used for turning the camshaft and diesel injection pump sprockets for timing alignment.

IMPORTANT: Do NOT use Camshaft Setting Plates or Locking Pins to hold the camshaft/injection pump in position whilst releasing or re-tightening the sprocket bolt. Plates and Pins are for retention of timing position only. Use Sprocket Holding Tool AST4844 to counter-hold sprockets.



Inter-changeable Location Pins – AST4844 comes complete with 4 pairs of Location Pins, all different sizes and diameters to suit the wide range of camshaft sprockets and gears you will encounter on VAG engines.

AST4740 Application Chart – DIESEL ENGINES 1.7 & 1.9D/SDi/TDi

Use tools from AST4740 Kit:-

- AST4115-1 Camshaft Setting Plate
- AST4749 Camshaft Setting Plate
- AST3054V3 Injection Pump Locking Pin
- AST4440V2 Injection Pump Locking Pin
- AST4444 Tensioner Adjuster
- AST4633 Tensioner Adjuster

Additional AST tools required:-

- AST4741 Front End Support Guide Set
- AST4844 Camshaft Sprocket Holding Tool

DIESEL ENGINES Models (Year) / engine codes	Camshaft Plates		Inject Pump Pins		Tensioner Adjustment		Viscous Fan AST4440V1	Additional AST Tools Required
	AST4115A-1	AST4749	AST3054V3	AST4440V2	AST4633	AST4440T1	AST4593-1E	
AUDI								
80 1.9D Turbo (91-94), 1.9TDi (91-96) 1Z/AAZ	●		●		●			AST4844
A3 1.9TDi (96-03) AGR/AHF/ALH/ASV		●		●				AST4844
A4 1.9TDi (95-01) 1Z/AHU/AFF/AFN/AVG	●		●					AST4741 AST4844
1.9TDi (98-01) AHH	●			●				AST4741 AST4844
Cabriolet 1.9TDi (95-00) 1Z/AHU	●		●					AST4741 AST4844
A6 1.9TDi (94-02) 1Z/AHU/AFN/AVG	●		●		●			AST4741 AST4844
SEAT								
Arosa 1.7SDi (98-05) AKU	●		●		●			
Ibiza/Cordoba 1.7SDi (98-99) AKW	●		●					AST4844 AST4844
1.9D (93-99) 1Y	●		●					
1.9D Turbo (93-97) AAZ	●		●					
1.9SDi (96-99) AEY	●		●					
(99-02) AGP/AQM		●		●	●			
(02-06) ASY		●		●	●			
1.9TDi (96-99) 1Z/AFN/AHU	●		●					
(99-02) AGR/ALH/ASV		●		●				
Leon 1.9SDi (00-05) (AGP/AQM								
1.9TDi (99-05) AGR/AHF/ALH/ASV	●	●		●				
Toledo 1.9D (94-99) 1Y	●		●					AST4844
1.9D Turbo (94-99) AAZ	●		●					
1.9TDi (95-99) 1Z/AFN/AHU/AAZ	●		●					
(99-05) AGR/AHF/ALH/ASV		●		●				

DIESEL ENGINES Models (Year) / engine codes	Camshaft Plates AST4115A-1	Inject Pump Pins AST3054V3	Tensioner Adjustment			Viscous Fan AST4440V1	Additional AST Tools Required
			AST4444	AST4633	AST4440T1 AST4593-1E		
SEAT <i>continued</i>							
Alhambra 1.9TDi (96-00) 1Z/AFN/AHU/AVG	●	●	●				
Inca 1.9D (96-04) 1Y	●	●	●				
1.9SDi (96-04) AEY	●	●	●	●			
(00-04) AYQ							
SKODA							
Fabia 1.9SDi (99-06) ASY	●	●	●				AST4844
Felicia 1.9D (95-01) AEF	●	●	●				AST4844
Octavia 1.9SDi (97-05) AGP/AQM		●	●				AST4844
1.9TDi (96-06) AGR/AHF/ALH/ASV			●				AST4844
VOLKSWAGEN							
Lupo 1.7SDi (98-05) AKU	●	●	●				
Polo / Polo Classic 1.7D (96-00) AHG/AKU	●	●	●				
1.7SDi (96-00) AHB/AKW	●	●	●				
1.9D (95-02) 1Y/AEF	●	●	●				
1.9SDi (96-02) AEY/AGD/ASX	●	●	●				
(99-02) AQM/AGP			●				AST4844
(02-06) ASY			●				AST4844
1.9TDi (97-02) AFN/AHU/ALE/	●	●	●				AST4844
(99-02) AGR/ALH/ASV			●				
Golf/Bora 1.9D (94-96) 1Y	●	●	●				
1.9D Turbo (94-98) AAZ	●	●	●				
1.9SDi (95-98) AEY/AEF	●	●	●				
(97-05) AGP/AQM			●				AST4844
1.9TDi (93-03) 1Z/AHU/AFN/ALE/AVG/AAZ	●	●	●				AST4844
(97-05) AGR/AHF/ALH/ASV							
Passat 1.9TDi (96-00) AFN/AHH	●	●	●				AST4741
2 Part Pump Sprocket	●	●	●				AST4741
Single Piece Sprocket	●	●	●				AST4741
(97-00) AHU/AVG							AST4844

DIESEL ENGINES Models (Year) / engine codes	Camshaft Plates		Inject Pump Pins		Tensioner Adjustment			Viscous Fan AST4440V1	Additional AST Tools Required
	AST4115A-1	AST4749	AST3054V3	AST4440V2	AST4444	AST4633	AST4440T1	AST4593-1E	AST4809
VOLKSWAGEN <i>continued</i>									
Beetle 1.9TDi (98-02) AGR/ALH		●		●	●				AST4844
Sharan 1.9TDi (95-00) 1Z/AHU/AFN/AVG	●		●		●				AST4741
Caddy 1.7SDi (96-00) AHB/AKW	●		●		●				
1.9D (96-01) 1Y/AEF	●		●	●	●				
1.9SDi (96-00) AEF	●		●	●	●				
(98-04) AQM/AYQ		●		●	●				AST4844
1.9TDi (96-00) AFN/AHU/ALE	●		●	●	●				AST4844
(99-03) ALH/ASV		●		●	●				
Transporter 1.9D (90-96) 1X	●			●	●				
2 Part Pump Sprocket	●		●		●				
Single Piece Sprocket	●								
1.9D Turbo (92-03) ABL	●			●					
2 Part Pump Sprocket	●			●					
Single Piece Sprocket	●		●		●				

More AST Engine Setting/Locking Tool Kits covering VAG Diesel Engines

- 2.5TDi V6 Diesel Engine Setting/Locking Tool Kit - use **AST4450**
- 2.4/2.5TDi Diesel Engine Setting/Locking Tool Kit - use **AST4448**
- 1.2, 1.4, 1.9, 2.0TDi Pumpe Düse Diesel Engine Setting/Locking Tool Kit - use **AST4840**

AST4740 Application Chart – PETROL ENGINES 1.6 to 2.0

Use tools from AST4740 Kit:-

- AST4444 Tensioner Adjuster
- AST4633 Tensioner Adjuster
- AST4440T1 Tensioner Retainer
- AST4593-1E Tensioner Lock Pin
- AST4809 Tensioner Retainer (Chain in Head)
- AST4440V1 Viscous Fan Retaining Bolt

Additional AST tools required:-

- AST4741 Front End Support Guide Set
- AST4844 Camshaft Sprocket Holding Tool

PETROL ENGINES Models (Year) / engine codes	Camshaft Plates AST4115A-1 AST4749	Inject Pump Pins AST3054V3 AST4440V2	AST4444	Tensioner Adjustment AST4633 AST4440T1 AST4593-1E AST4809			Viscous Fan AST4440V1	Additional AST Tools Required
AUDI								
80 1.6 (92-96) ABM/ADA 2.0 (91-96) ABK/ABT/ACE			● ●					
A3 1.6 (96-06) AEH/AKL/APF/AVU/BFQ/BGU 1.8 (96-03) AGN/AGP 1.8 Turbo (96-03) AGU/AJQ/APP/AOA ARX/ARY/ARZ/AUM/AUQ/AMK 2.0FSI (03-06) AXW				● ● ● ●	● ●	● ●		
S3 1.8 Turbo (99-03) AMK/APY/BAM				●	●	●		
A4 1.6 (95-97) ADP (96-06) AHL/ALZ/ANA/ARM 1.8 (95-01) ADR/APT/ARG 1.8 Turbo (95-99) AEB/AJL/ANB/APU (99-01) AEB/AJL/ANB/APU (2001) AWT			● ● ●	●		● ● ● ● ● ●		AST4741 AST4741 AST4741 AST4741 AST4741 AST4741
Cabriolet 1.8 (97-00) ADR 2.0 (91-96) ABK/ACE			● ●			●		
A6 1.8 (95-97) ADR (97-02) AJP 1.8 Turbo (97-99) AEB/AJL/ANB/APU (99-05) AEB/AJL/ANB/APU 2.0 (94-97) AAE/ABK/ACE			● ● ●		● ● ● ●	● ● ● ● ● ●	● ●	AST4741 AST4741 AST4741
TT 1.8 (98-05) AJQ/APP/APX/ARY/AUM/ AUQ/BAM			●	●	●	●		

PETROL ENGINES Models (Year) / engine codes	Camshaft Plates		Inject Pump Pins		Tensioner Adjustment			Viscous Fan AST4440V1	Additional AST Tools Required
	AST4115A-1	AST4749	AST3054V3	AST4440V2	AST4444	AST4633	AST4440T1	AST4593-1E	AST4809
SEAT Ibiza / Cordoba 1.6 (96-02) AFT/AEH/AKL/ APF/AUR 1.8 (93-99) ABS/ADZ 1.8 16v (94-97) ADL 1.8 Turbo (99-02) AQX/AYP					• • •	•	•	•	•
Leon 1.6 (99-05) AEH/AKL 1.8 (99-05) AGN/APG/APT 1.8 Turbo (99-05) AJQ/APP/ARY/AUQ 1.8 CupraR (02-05) AMK						•	• • • •	• • • •	• • • •
Toledo 1.6 (94-99) 1F/AFT (99-05) AEH/AKL 1.8 (94-97) ABS/ADZ (99-05) AGN/APG/APT 1.8 Turbo (02-05) ARY/AUQ 2.0 (94-99) 2E/AGG 2.0 16v (94-99) ABF					•	• • • •	• •	• •	• •
Alhambra 1.8 Turbo (97-06) AJH/AWC 2.0 (96-06) ADY/ATM					ADY	ATM	•	•	•
Inca 1.6 (95-04) 1F					•				
SKODA Octavia 1.6 (97-05) AEH/AKL/AVU 1.8 Turbo (96-00) AGN (98-05) AGU/ARX/ARZ/AUM 1.8 TurboRS (00-06) AUQ 2.0 (99-05) AEG/APK/AQY/AZH/AZJ						•	• • • •	• • • •	• • • •
Superb 2.0 (02-06) AZM					•				AST4741
VOLKSWAGEN Polo / Classic 1.6 (95-02) AFT/AKS (99-02) AEH/AKL/APF					•	•			

PETROL ENGINES Models (Year) / engine codes	Camshaft Plates AST4115A-1	AST4749	Inject Pump Pins AST3054V3	AST4440V2	AST4444		AST4633		Tensioner Adjustment AST4440T1		AST4593-1E	AST4809	Viscous Fan AST4440V1	Additional AST Tools Required
VOLKSWAGEN <i>continued</i>														
Golf / Bora 1.6 (94-98) AEK/AFT/AKS (98-05) AKS (97-05) AEH/AKL/APP/AVU/BFQ/BGU 1.8 Turbo (97-03) AGN (97-04) AGU/AQA/ARZ/AUM/AUQ 2.0 (98-02) APK/AQY/AZH/AZJ/BEH (99-02) ATU/AWF/AWG 2.0 16v (92-97) ABF 2.0FSi (04-06) AXW					• •		•		• •	• •				AST4741
Beetle 1.6 (00-06) AYD/BFS 1.8 Turbo (99-06) AVC/AWU 2.0 (98-06) AQY/AZJ							• •		•			•		
Passat 1.6 (96-05) ADP/AHL/ANA/ARM/ALZ 1.8 (96-00) ADR/APT/ARG 1.8 Turbo (96-00) AEB/ANB/APU 2.0 (01-05) AZM					• • •				•		•	• •		AST4741 AST4741 AST4741 AST4741
Touran 1.6 (03-06) BGU 2.0FSi (03-06) AXW							• •							
Sharan 1.8 Turbo (97-06) AJH/AWC 2.0 (95-00) ADY/AKT (00-06) ATM					•				•		•	•		
Caddy 1.6 (95-00) AFT (03-06) BGU					•		•							
Transporter 2.0 (90-03) AAC (04-06) AXA					•		•							

More AST Engine Setting/Locking Tool Kits covering VAG Petrol Engines

- 2.4-2.8V6 Petrol Engine Setting/Locking Tools - use **AST4401/AST4402/AST4403**
- 1.4/1.6 16v (Belt) Petrol Engine Setting/Locking Tool Kit - use **AST4635**
- 1.4/1.6FSi (Chain) Petrol Engine Setting/Locking Tool Kit - use **AST4845**
- 3.7 - 4.2V8 Petrol Engine Setting/Locking Tool Kit - use **AST4827**
- 1.2 16v-12v Petrol Engine Setting/Locking Tool Kit - use **AST4810**

AUTO SERVICE TOOLS

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