

# PIPER CAMS

## Volkswagen 'Pump Duse' Fitting Guide.

### ① Important Notice

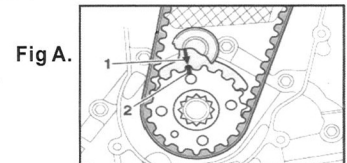
Before fitment, please read these notes carefully. If you are unsure of any of the fitting instructions please refer to the vehicle manufacturer's technical advisory notes:- It is highly recommended that all injector rocker arms are marked prior to removal so that they may be fitted back to their correct location.

### Removal:-

When removing old camshaft, ensure rocker assemblies and camshaft are removed in the correct manner to minimise distortion - if this is not adhered to then premature failure is likely.

### Camshaft Installation.

- 1 Ensure engine is timed correctly and crankshaft sprocket is locked at TDC position before any removal takes place. (Fig A)



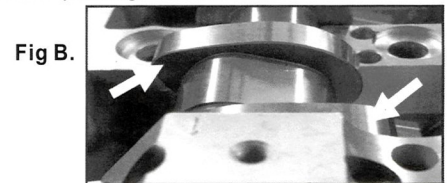
### ① Note

- ▶ It is strongly recommended that new cam bearing shells are fitted.
- ▶ If bearing shells are not replaced, mark position of camshaft bearing shells on rear with a waterproof pen.
- ▶ Make sure that the camshaft bearing shells are not interchanged.
- ▶ Remove old camshaft

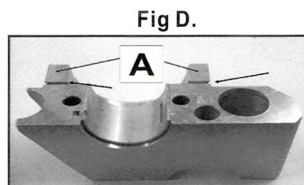
### INSTALLING

- ▶ It is strongly recommended that the engine sump and filtration system are cleaned through and new oil and filter fitted.
- ① Ensure correct grade of oil is used as advised by the vehicle manufacturer.
- ▶ Before fitment, please ensure camshaft is washed and inspected to remove any rust proofing protection.
- ▶ It is advisable that the hydraulic lifters are slightly decompressed to allow working movement to aid initial start up. Once engine has started - run at no more than 1500-2000 rpm for two minutes so hydraulics can initiate priming.

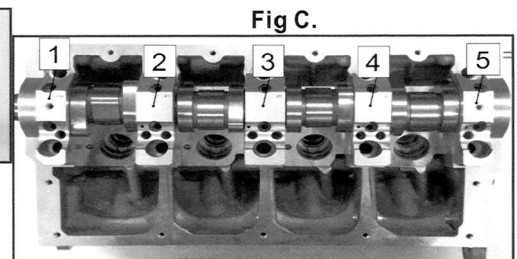
- 2 When installing the camshaft, make sure that the retaining lugs on the bearing shells are correctly seated in the bearing caps and cylinder head.
- 3 When fitting shells ensure no oil / contaminant is present under shells, lubricate contact surfaces of the camshaft only - **not** the shell surfaces.



- 4 Install camshaft in the TDC position:
  - ▶ The cams for cylinder 1 must point upward on camshaft (Fig B arrows)



- ▶ Tighten bearing caps 2 and 4 (see Fig C) alternately in diagonal sequence, using torque table below.
- 5 Apply a thin and even coat of sealant to surfaces (A) of bearing caps 1 and 5. Make sure **no sealant** gets into the grooves (arrows fig D) or onto the other surfaces.



- ▶ Install bearing caps 1, 3, and 5 and tighten to torque specification. (see table).

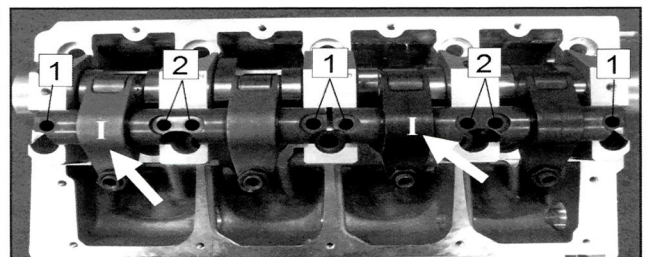
Table - Tightening torques	
Component	Nm
Bearing cap to cylinder head	8Nm + 90°
Rocker arm to cylinder head	20Nm + 90°
Hub to camshaft	100Nm
Notes:	* Renew bolts 90° equals 1/4 Turn

### ① Note: New bolts must be used.

- ▶ Bearing cap '5' must be flush with the outer edge of the cylinder head, otherwise the tandem pump may leak.
- ▶ Renew camshaft oil seal.

- ▶ Install rocker arm shafts. When doing so, note the markings made on removal (arrows).
- ▶ First tighten inner bolts (2) then outer bolts (1) in several stages (Fig E) taking note of torque settings above.
- ▶ It is imperative that vehicle manufacture's specifications for injector timing and rocker/roller assemblies/adjustment(s) is adhered to.
- ▶ Ensure operation of injector rocker assembly is operating correctly and no seizures are apparent.

Fig E.



### ① Important Note:

- ▶ After installing the camshaft, wait for about 30 minutes before starting engine. The hydraulic tappets have to settle (otherwise valves may strike the pistons).
- ▶ After working on the valve gear, manually turn the engine carefully at least 2 rotations to ensure that none of the valves make contact when the starter is operated and re-confirm timing settings.

### ① Important warranty note:

- ▶ Failure to adhere to these instructions may cause serious damage and invalidate your warranty.