

## 1969-73 PEUGEOT 504 4 CYLINDER

GENERAL SPECIFICATIONS										
Year	Displ.		Carburetor	HP at RPM	Torque (Ft. Lbs. at RPM)	Compr. Ratio	Bore		Stroke	
	cu. ins.	cc					in.	mm	in.	mm
Engine										
XM	109.5	1796	1-Bbl.	87@5500	108.5@3000	8.35-1	3.31	84	3.19	81
KF5	109.5	1796	⓪	103@5600	113.5@3000	8.35-1	3.31	84	3.19	81
XN1	120.2	1970	2x1-Bbl.	92@5600	119.5@3000	7.6-1	3.45	87.6	3.19	81
XN2	109.5	1796	⓪	.....	.....	7.6-1	3.31	84	3.19	81

⓪ — Fuel injected.

### ENGINE IDENTIFICATION

Engine serial number is stamped on left side engine mounting face and is also located on the identification plate attached to right inner fender panel.

Engine identification number is stamped on camshaft tunnel. The first letter and five digits designate production number. The last letter is an identification letter and is decoded as follows:

Application	Identification Letter
XM .....	P
KF6/KF5 .....	R
XM-2F .....	T
XN-1 .....	U
XN-2 .....	V
XN-2 (ZF Trans.) .....	W
XN-1 (ZF Trans.) .....	X
XM7 (7.5-1) .....	Y
XM (8.3-1) .....	E

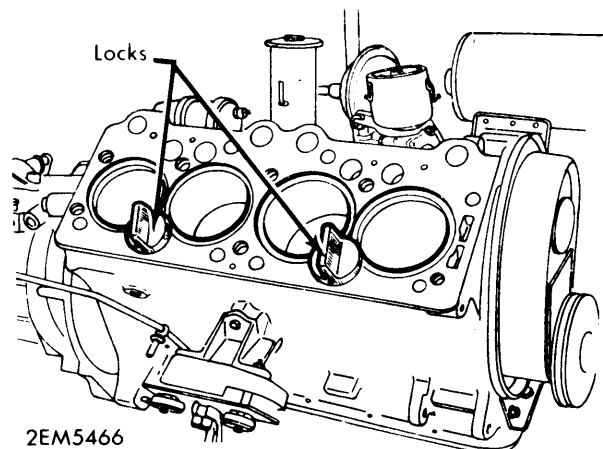
**NOTE** — If a second engine number is found stamped near original number, cylinder block has been replaced.

### ENGINE REMOVAL

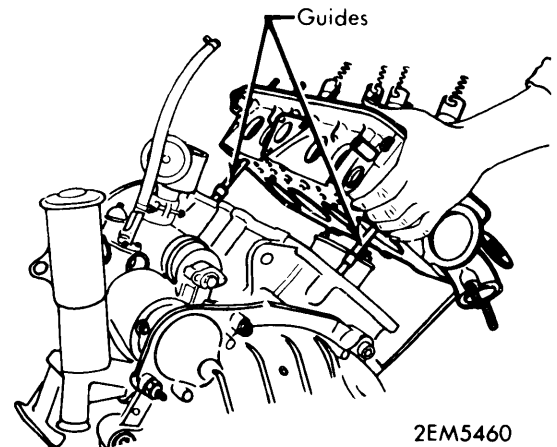
- 1) Remove battery and support. Remove radiator, ignition coil, starter, and windshield bottle. Disconnect heater hoses, fuel feed lines, carburetor controls, vacuum lines and electrical wiring. On automatic transmission models, drain transmission.
- 2) Disconnect fuel injection ducts and throttle cable. Remove electrovalve and altitude corrector. Remove air cleaner and bracket.
- 3) Lower steering rack housing. Disengage exhaust pipe from manifold. Remove flywheel covering and clutch housing bolts.
- 4) Attach a suitable hoist to engine and take up weight. Remove bolts mounting engine to crossmember. **NOTE** — Ensure left hand brake line is against crossmember. Raise engine until transmission meets tunnel.
- 5) Suitably support transmission. On automatic transmission models, remove engine without convertor. **NOTE** — Never remove engine with convertor, convertor must be attached to transmission. Lift engine from compartment. To install engine, reverse removal procedure.

### CYLINDER HEAD REMOVAL

**Removal** — 1) Drain cooling system. Remove air cleaner, air cleaner support, carburetor and carburetor linkage. Remove distributor cap, electrical leads to distributor, and upper radiator hose. On KF5, KF6 and XN2 engines, remove and cover injector lines, delivery valves, injector unions and injector caps. Separate air distribution chamber from intake manifold.



CYLINDER LINER LOCKS INSTALLED



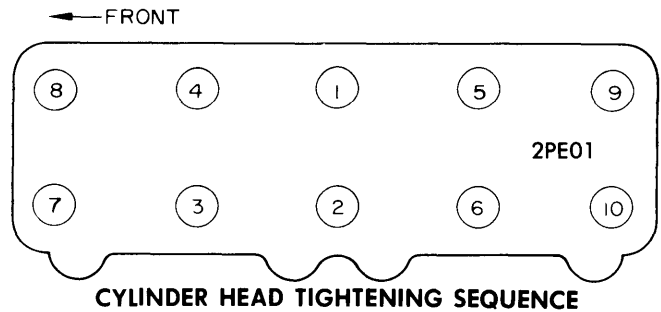
INSTALLING HEAD

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2) Disconnect remaining electrical leads and all water hoses. Separate exhaust pipe from manifold. Remove cylinder head bolts and fit dowel guides. Remove push rods keeping them in order. Pivot head on dowel guide nearest fire wall separating it from block. After removing cylinder head, install suitable liner locks to secure liners in position.

3) To install head, remove liner locks. On XN1 and XN2 engines, ensure inner flats are parallel on liners 1-2 and 3-4. Install gasket dry with "DESSUS" facing up. **NOTE** - Three gaskets are available as listed below.



VALVES							
Engine & Valve	Head Diam. In. (mm)	Face Angle	Seat Angle	Seat Width In. (mm)	Stem Diameter In. (mm)	Stem Clearance In. (mm)	Valve Lift In. (mm)
All Models Int.	1.673 (42.49)	...	30°	...	.3157 (8.01)	...	...
Exh.	1.398 (35.50)	45°	45°	...	.3150 (8.00)	...	...

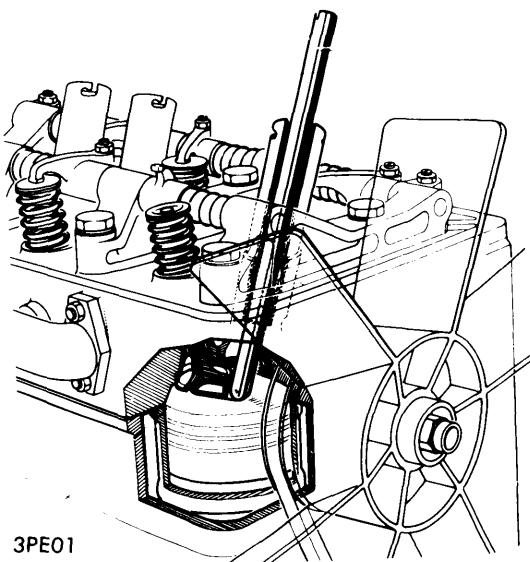
### VALVE ARRANGEMENT

All valves on left side are intake and all valves on right side of head are exhaust valves.

### VALVE SPRING REPLACEMENT (HEAD INSTALLED)

1) Remove spark plug from cylinder requiring attention. Bring opposing valve to fully closed position (intake if exhaust is defective and exhaust if intake is defective) by turning crankshaft in direction of engine rotation.

2) Insert suitable hinged tool (0 0136) into spark plug hole. Bring piston up to TDC without force as tool is between valve and piston.



**VALVE SPRING REMOVAL**

3) Using suitable valve spring compression tool (8.0101 Y), compress valve spring. With valve spring compressed, remove retainer, valve spring cup and spring. To install new valve spring, reverse removal procedure.

VALVE SPRINGS			
Engine	Free Length In. (mm)	PRESSURE Lbs. @ In. (kg @ mm)	
		Valve Closed	Valve Open
1796 cc Outer	1.75 (44.5)	....	....
Inner	1.62 (41.0)	....	....
1970 cc Outer	....	137@1.21 (9.6@30.81)	35@1.57 (2.5@39.78)
Inner	....	69@1.06 (4.9@26.80)	18@1.41 (1.3@35.79)

### VALVE CLEARANCE ADJUSTMENT

**NOTE** - Valve should only be adjusted when engine is cold.

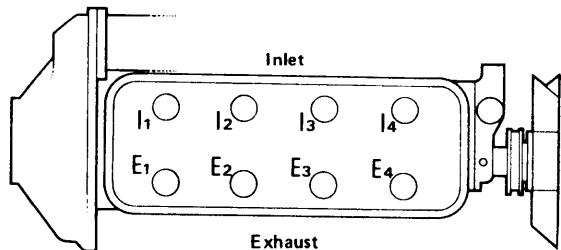
With valve cover removed, remove spark plugs. Rotate engine by turning fan until exhaust valve (indicated in first column of table) is fully open. Loosen lock nut on rocker arm of each valve (indicated in second column) and adjust clearance to specification. On 1969-72 models, adjust all intake valves to .004" (.10 mm) and all exhaust valves to .010" (.25 mm). On 1973 models, adjust intake valves to .006" (.15 mm) and exhaust valves to .012" (.30 mm). With adjustment complete and clearances rechecked, install spark plugs and valve cover.

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### Ⓞ Valve Adjustment Sequence

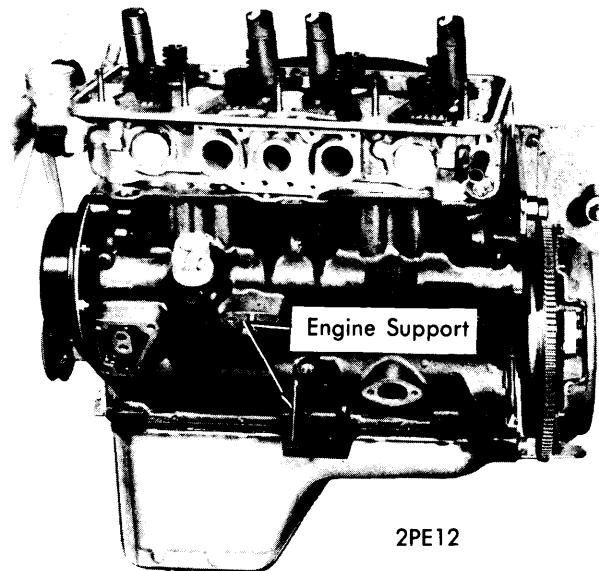
Valve Open	Valve To Adjust
E 1.....	I 3 & E 4
E 3.....	I 4 & E 2
E 4.....	I 2 & E 1
E 2.....	I 1 & E 3

Ⓞ — If valves are adjusted in sequence listed, it will not be necessary to rotate engine more than one complete turn.



2PE01

**VALVE ARRANGEMENT**

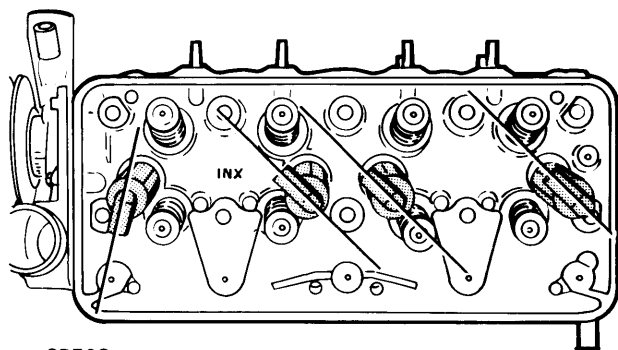


2PE12

**AUXILIARY EQUIPMENT REMOVED**

### SPARK PLUG TUBE REPLACEMENT

- 1) With cylinder head supported, screw in plugs without springs, to prevent dirt from dropping into cylinder.
- 2) Using suitable extractor or hammer, remove tubes. **NOTE** — If tubes are removed they can not be reused.
- 3) To install tubes, smear suitable sealing compound on tubes and insert them so plug caps are facing as shown in illustration. When tube is fully seated it will protrude 2.835" (72 mm) upward from cylinder head.



2PE02

**SPARK PLUG TUBE INSTALLATION**

### PISTON & ROD ASSEMBLY

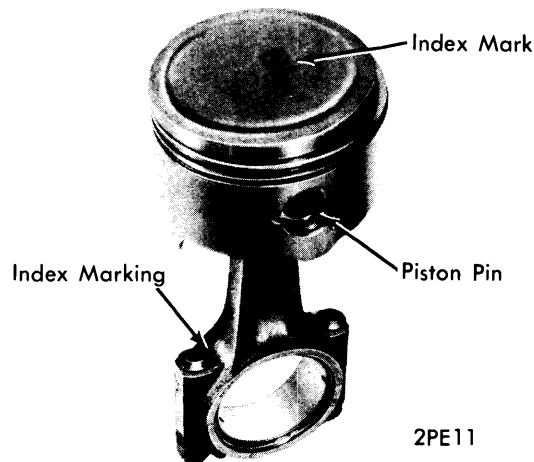
**NOTE** — If liners and pistons are to be replaced, engine must be removed.

- 1) Drain crankcase. With engine suitably supported on an engine stand, remove intake and exhaust manifolds. Remove all auxiliary equipment to point shown in illustration.

- 2) Remove cylinder head. See *Cylinder Head Removal*. Remove camshaft hydraulic lifters, keeping them in original order. Remove distributor support drive shaft.

- 3) Remove oil pan and oil pump. Extract timing cover. Remove bearing caps noting order. Remove pistons and connecting rods. Mark rod assemblies 1-4.

- 4) To install, fit piston ring clamp on piston. Insert piston and rod assembly, without twisting it. Ensure index arrow is facing front of engine.



2PE11

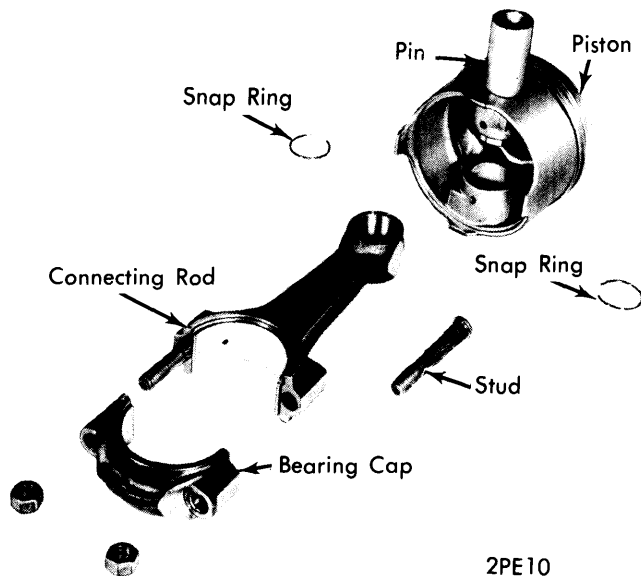
**CONNECTING ROD ASSEMBLY**

- 5) Push piston down cylinder and guide connecting rod with bearing over crankshaft journal. Install bearing cap and tighten to specifications.

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### PISTON PIN REPLACEMENT

Fit piston to rod so that index mark "AV" is at right angles to oil thrower. Insert piston pin, it may be necessary to heat piston to install pin. Install snap rings.



PISTON PIN INSTALLATION

### FITTING CYLINDER LINERS

**Free Expanding Liners** - 1) Use on XM, KF6, and KF5 engines. Before installing liners, make sure they are free of dirt or any other foreign substance. *NOTE* - Make sure that same piston and liner are replaced in block in same position from which they were removed.

2) Fit liners to cylinders without seals. Measure liner protrusion, which must lie between .000-.003" (0-.07 mm).

3) Remove liner and fit a new seal. Install liner in cylinder and secure in position with retainer.

**Compressed Liners** - 1) Used on XN and XM7 engines. Before installing liners, make sure they are free of dirt or any other foreign substance. *NOTE* - Make sure that same piston and liner are replaced in block in same position from which they were removed.

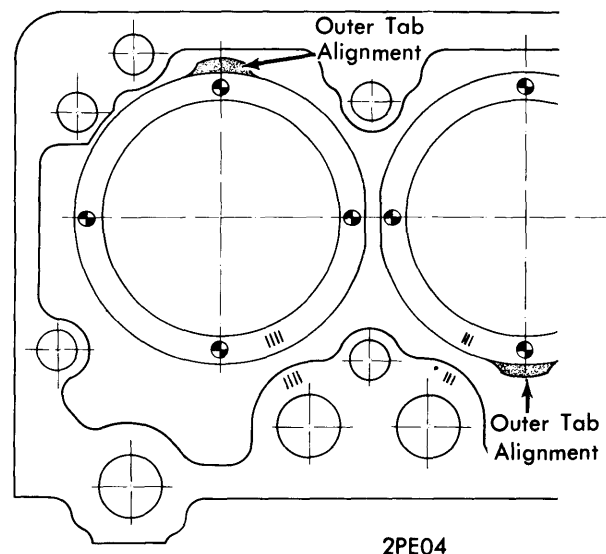
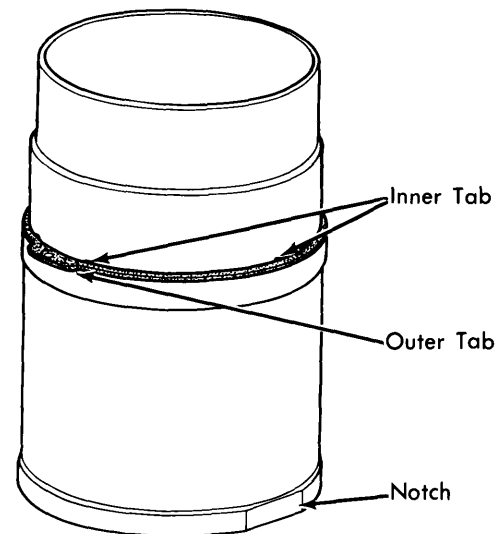
2) Insert liners, without base gaskets, with flats on shoulder of liners 1-2 and 3-4 parallel (XN1 and XN2 engines). Place a suitable dial gauge and support on block face. Synchronize dial at 0 and 5. Check each liner at four different points, noting the highest reading.

3) The maximum allowable difference between two diametrically opposed points must be less than .003" (0.07 mm). If specification is exceeded, it may be necessary to change position of liners. *NOTE* - Suitably mark liners.

4) Select a base gasket for each liner which will give a protrusion of approximately .004" (0.11 mm). *NOTE* - Only use one gasket on each liner.

5) Fit gasket on liner. Engage gasket inner tabs in liner grooves (see illustration). Position tab with reference mark at right angles to flat. Position liners with outer tabs in position as shown in illustration.

6) Fit suitable liner compressor tool to block and seat liners and ensure protrusion is correct.



FITTING GASKET TO LINER

### THRUST BEARING WASHERS

After installing crankshaft, check end play. Play must not exceed .0008" (0.2 mm). If specification is exceeded, oversize washers are available in .094" (2.40 mm), .096" (2.45 mm), and .098" (2.50 mm).

## 1969-73 PEUGEOT 504 4 CYLINDER (Cont.)

CRANKSHAFT MAIN & CONNECTING ROD BEARINGS							
Engine	MAIN BEARINGS			CONNECTING ROD BEARINGS			
	Journal Diam. In. (mm)	Clearance In. (mm)	Thrust Bearing	Crankshaft End Play In. (mm)	Journal Diam. In. (mm)	Clearance In. (mm)	Side Play In. (mm)
All							
No. 1	2.3386-2.3392 (59.40-59.415)	....	No 5	.003-.008 (.07-.20)	1.9679-1.9685 (49.984-50.00)	....	....
No. 2	2.3050-2.3060 (58.547-58.572)						
No. 3	2.2509-2.2515 (57.173-57.188)						
No. 4	2.2102-2.2112 (56.139-56.164)						
No. 5	① 2.1616-2.1646 (54.904-54.980)						

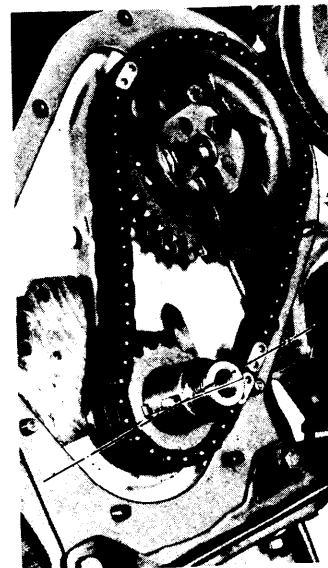
① — On early models (before 1973) journal diameter is 2.0150" (51.181 mm).

VALVE TIMING				
Engine	INTAKE		EXHAUST	
	Open (BTDC)	Close (ABDC)	Open (BBDC)	Close (ATDC)
XM				
1969	0.5°	35°	35°	10°
1970	4°	34°	34°	4°
XM7				
1971	1°	36°	33°	5.5°
Later	2°	39°	30°	8.5°
KF5 & KF6 (All)	1.5°	36°	35.5°	9°
XN1				
1971-72	4°	34°	34°	4°
1973	2°	39°	30°	8.5°
XN2				
Before 1973	2.5°	42°	36°	7°
1973	0°±3°	44.5°	33.5°	9.5°

### TIMING CHAIN REMOVAL

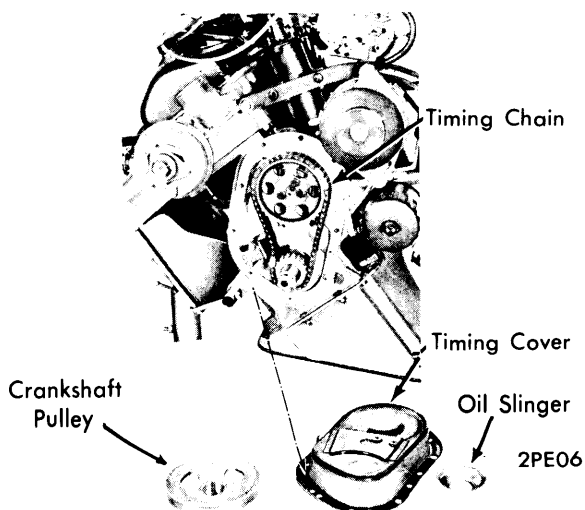
1) Remove radiator, fan belt, and spark plugs. Remove crankshaft pulley and timing chain covers (see illustration). Disengage chain tensioner: On XM, XM7 & XN1 engines with Renold tensioners, remove plug and turn 3 mm Allen key clockwise. On KF6, KF5 & XN2 engines, a special pad retainer tool is necessary to remove tensioner. On Sedis tensioners, remove the tensioner bolts and its plate. It is possible to further disassemble chain tensioners.

*NOTE — Position crankshaft as shown in illustration to avoid any possible contact of valves and pistons when rotating crankshaft with timing chain removed.*



2PE07

**CRANKSHAFT POSITION**



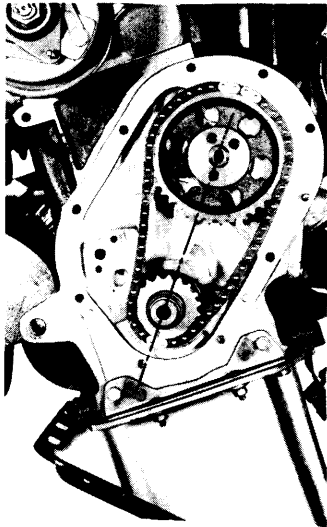
**REMOVING TIMING CHAIN HOUSING**

2) Remove camshaft sprocket, timing chain, crankshaft sprocket and Woodruff key.

3) Begin installation by holding crankshaft in original position and installing Woodruff key and sprocket. Position camshaft and then crankshaft as shown in illustration.

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2PE08

### CAMSHAFT & CRANKSHAFT ALIGNMENT

4) Install timing chain first on camshaft then on camshaft sprocket. Ensure timing marks are in correct alignment. Fit

camshaft with a new washer and tighten bolts to 16 ft. lbs. Bend up tab.

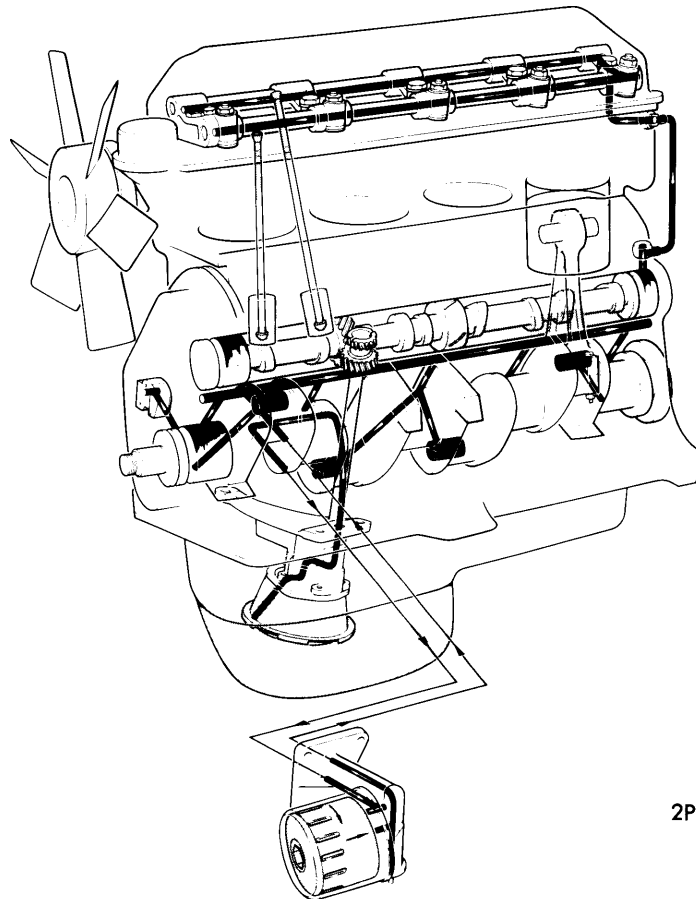
5) Engage Renold tensioner by adjusting Allen key in a clockwise manner. Install a new tab washer on plug and bend tab. On KF6, KF5 and XN2 engines install retaining tool, load tensioner, fit plug and tab washer before positioning tensioner on block. Withdraw tool after installing tensioner. On models with Sedis tensioner insert filter, fit plate and tensioner. Engage tensioner by turning screw clockwise.

6) Install thrust washers, if necessary, oil slinger cap and timing chain cover. Center timing chain cover with suitable tool (0128). Fit crankshaft pulley. *NOTE - XM engines have two different pulleys available, they are however, not interchangeable.*

### Camshaft Specifications

Application	Cam Lobe Height In. (mm)	Lobe Lift In. (mm)
XM		
Intake.....	1.4079 (35.76).....	.2417 (6.139)
Exhaust.....	1.4051 (36.689).....	.2445 (6.210)
KF6		
Intake.....	1.4335 (36.410).....	.2673 (6.789)
Exhaust.....	1.4307 (36.339).....	.2701 (6.860)

### ENGINE OILING



2PE09

### ENGINE OIL CIRCUIT

## 1969-73 PEUGEOT 504 4 CYLINDER (Cont.)

### ENGINE OILING (Cont.)

#### ENGINE OILING SYSTEM

A high output, gear type oil pump is mounted to engine block lower surface and is operated by camshaft.

**Crankcase Capacity** — Approximately 3.5 quarts in 1969-72 or 4.2 quarts in 1973.

**Filter** — Full-flow cartridge type.

### ENGINE COOLING

**Thermostat** — Opens at 167°F.

**Cooling System Capacity** — Approximately 8.25 quarts.

#### WATER PUMP

- 1) Remove radiator, top hose, and fan belt. Disconnect heater hose from pump and the self-disengaging fan brush holder.
- 2) To install, reverse removal procedures noting the following: clean contact surfaces before installing new gasket.

#### SELF-DISENGAGING FAN

Driven by water pump shaft and controlled by a thermal contact-breaker. Fan engages at 177-182°F and disengages at 152-157°F.

### TIGHTENING SPECIFICATIONS

Application	Ft. Lbs. (mkg)
Main Bearing Bolts .....	55 (7.6)
Connecting Rod Bolts.....	29 (4.0)
Cam Retaining Plate Bolts.....	12 (1.6)
Cam Sprocket Plate Bolts.....	16 (2.2)
Crankshaft Pulley Bolts .....	123 (16.8)
Oil Pan Bolts.....	7 (0.9)
Flywheel-to-Crankshaft Bolts .....	49 (6.7)
Clutch-to-Flywheel Bolts.....	11 (1.5)
Engine-to-Converter Bolts .....	16 (2.2)