

05 Hydraulic valve clearance compensating elements

Coordinates

Bubbling and ticking noise after starting at idle, particularly on a cold engine. The engine can also shake at the same time	B 17
Noises from hydraulic valve clearance compensating elements for short time after starting engine	D 17
Ticking noises from valve clearance compensating elements	E 17
Noises from timing chain drive, rough idle, timing chain jumped	G 17
Turbine-type howling from timing chain in lower and medium engine speed range	H 17
Unusual noises from chain drive	H 17

13 Tensioner/belt drive

Tension lever bearing for poly V-belt tensioner worn	N 17
Noise from area of single belt drive. Damaged or cracked belt. Damage to coolant pump pulley, to idler pulley bracket and fan	O 17
Noises from belt drive or from poly V-belt tensioner such as chattering, vibrating noises when starting up at low engine speed Whistling, squeaking, knocking at idle and in lower engine speed range	A 18

18 Engine lubrication, engine cooling

Oil pressure drops about 2 bar at high speed and oil level indicator lamp comes on	B 18
Oil leak at O-ring of oil filter cap	D 18

Operation no. of operation texts and work units
or standard texts and flat rates

05 Hydraulic valve clearance compensating elements

Complaint:

Bubbling and ticking noise after starting in idle, particularly on a cold engine.

The engine can also shake at the same time.

Engines 601, 602, 603

Cause/Remedy:

There is air in the oil reservoir chamber on individual hydraulic valve clearance compensating elements. This can change the timing. The residual gas in relevant cylinders is pressed out when the intake valves open and causes the bubbling noise stated.

The ticking noise which occurs to some extent at the same time is produced by contact between the valve tappet and the hydraulic valve clearance compensating element (element is compressed).

Checking hydraulic elements, refer to Operation no. (05-211).

The modified compensating elements Part no. 601 589 05 25 can be fitted in the event of repair.

05 Hydraulic valve clearance compensating elements

Complaint:

Noises from hydraulic valve clearance compensating elements for short time after starting engine.

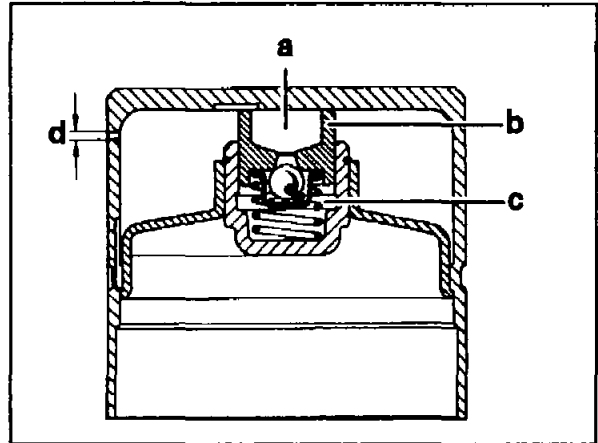
Engines 601, 602, 603

Cause/remedy:

Some of the oil can run out of the hydraulic elements when the engine is started and shut off frequently or after it has remained shut off for a longer period, e.g. over night, resulting in noises for a short time after starting.

Install modified bucket tappets, part no. 601 050 05 25.

These compensating elements have a reduced residual stroke, i.e. the piston stroke (9) and the working chamber (c) have been reduced increasing the size of the reservoir chamber (a). Less oil is required in the working chamber due to the reduced stroke. For this reason the working chamber refills more quickly when the engine is started.



P05-0175-13

Note

Only improved bucket tappets are now supplied.

Repair note

See RI 05-211 for checking and replacement of the hydraulic valve clearance compensating elements.

Part	Part no.
Hydraulic valve clearance compensating element	601 050 05 25

05 Hydraulic valve clearance compensating elements

Complaint:

Ticking noises from valve clearance compensating elements

Engine 601.911

Cause/remedy:

On these engines ticking noises can occur even with the improved version of the valve clearance compensating elements.

Engines up to October 1984 are affected.

Model	Engine	Engine end. no. Manual transmission	Engine end. no. Automatic transmission	Chassis end no.
201.122	601.911	028239	003360	A 104824/F 021158

Gases can leak into the oil passage for oil supply to the hydraulic valve clearance compensating elements due to settling of the cylinder head gasket.

Replace cylinder head gasket.

05 Timing chain

Complaint:

Noises from timing chain drive, rough idle, timing chain jumped
Engines 601, 602, 603

Cause/remedy:

Worn timing chain

Replace timing chain.

Affected vehicles from February – September 1989

Model	Vehicle ident. end. no.	
	A/B	F
124	943320–091699	102455–125313
201	486234–537850	595551–672571

05 Timing chain

Complaint:

Turbine-type howling from timing chain in lower and medium engine speed range.
Engines 601, 602, 603

Cause/remedy:

Results from sound transfer from air to solid bodies as timing chain rolls across chain sprockets.

None.

Replacement of chain tensioner, of timing chain or chain sprockets does not help.

05 Timing chain

Complaint:

Unusual noises from chain drive

Engine 601, 602, 603, 604, 605, 606

Cause/remedy:

Engine problems as a result of stretched timing chain.

Vehicles affected: 07/92 up to 04/94

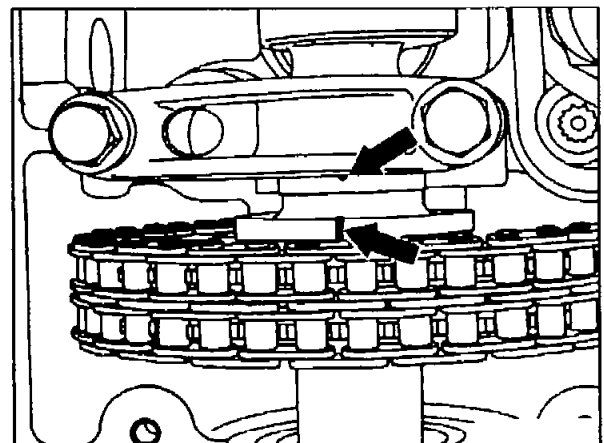
Model	Engine	Vehicle ident end number	
		from	to
124	601, 602, 603 605, 606	B 810470	B 999999
		C 000001	C 142875
		J 001335	J 049633
		F 231885	F 293159
140	603	A 092142	A 202313
201	601, 602	A 693534	A 716228
		G 007363	G 099573
202	601, 604, 605	A 000001	A 124468
		F 000001	F 099330

If the following problems exist, the timing chain must be inspected for stretch:

- Abnormal noises from the chain drive
- Irregular engine running
- Engine does not start easily
- Engine output not in order
- Verified increased oil consumption

Checking

1. Slowly rotate the crankshaft in direction of rotation of engine until the markings of the camshaft and bearing bracket are aligned.
2. Read off the difference in degrees crank angle ($^{\circ}$ CA) at the crankshaft belt pulley. For engine 604/605/606 see AR 05.20-6010 HA).
 - a) If difference is 3° to 10° CA, the timing chain should be replaced.
Engine 601/602/603 (RA 05.10-320)
Engine 604/605/606 (AR 05.10-7601 HA)



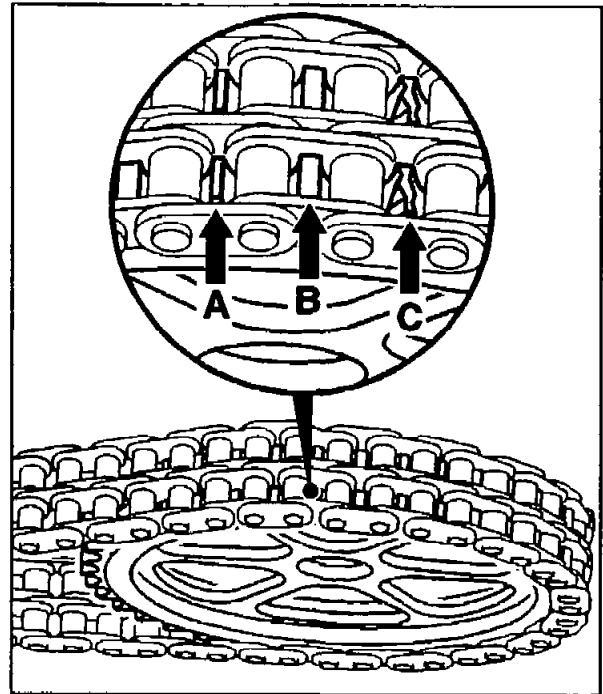
P05-2206-13

b) Inspect all the teeth of the camshaft sprocket for signs of wear. Crank the engine twice at the crankshaft for this purpose. Specified condition arrow B. If teeth tips are broken off (arrow C), or wear at tooth flanks (arrow A), replace camshaft sprocket and timing device.

Engine 601/602/603 (RA 07.1.1011-240)

Engine 605/606 (AR 07.12-8014 H)

On engine 604 replace camshaft sprocket and drive gear of distributor-type injection pump.



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3. Difference greater than 10° CA.

a) Inspect engine with inspection lamp and check whether the valves have struck the piston.

b) If impressions of the valve are visible in the piston crown, submit warranty/goodwill inquiry and replace engine, if necessary.

c) If no impressions of the valves are visible on the piston crowns, proceed as stated in 2a and 2b.



Traces of grinding or wear at the top on the tensioning rail are not a justification for removal.

Parts

Designation	Part number	Engine
Timing chain	003 997 48 94	601, 602, 603
	003 997 49 94	604, 605, 606

Operation text and time allowance

- Re 2a): Replacing timing chain, see microfilm – Operation text and work units –
- Re 2b): Inspecting camshaft sprocket for signs of wear and timing chain for stretch
(cylinder head cover removed)
02-2557/01 Combined work 3 work units or 0.25 hours
- Re 2b): Replacing camshaft sprocket and timing device (drive gear of distributor-type
injection pump), see microfilm – Operation text and work units –
- Re 3a): Inspecting engine with inspection lamp, see microfilm – Operation text and work units –
- Re 3b): Replacing engine, see microfilm – Operation text and work units –

Cost settlement

*The cost incurred can be requested through the usual warranty and goodwill channels by stating
Damage Code 0511149.*
