

- a) Evidence of chain elongation and measuring of distance available for tightening.
- b) Subsequent increasing of tightening distance.
- c) Correction of retarded ignition timing as the result of chain elongation, retarded begin of delivery and consequent reduction in output.
- d) Chain noises.

a) Normal wear may lead to an elongation of the double roller chain which will result in rattling noises, as well as change delivery (begin of feed) of the injection pump and the timing. When the vehicle is serviced according to plan E the reserve distance "a" of the chain tightener should be measured. This is done by means of a gauge 2 mm thick, part No. 621 589 02 23 00, which is inserted from the front, in-between lever (2) of the idler sprocket support and web (3) of the cylinder head (refer to Figure 05-20/1).

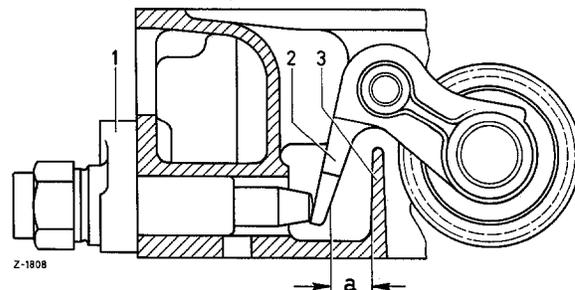


Figure 05-20/1

- 1 Chain tightener
- 2 Lever of idler sprocket support
- 3 (Web) Oil pocket cyl. head
- a Reserve distance

If the gauge can be introduced between the lever and the web or if the distance is even larger, chain elongation is still relatively low and only the feed begin (delivery) requires correction (for correction of feed begin refer to Job No. 00-6).

If the gauge just fits in-between lever (2) and web (3) there is already a considerable elongation of 6 mm and more and in addition to the feed begin the timing requires attention. (Refer to section C further below.) A chain elongation of 1 mm results in a timing change in the direction "retarded" of approx. 1° crankshaft and an elongation of 6 mm will therefore retard the timing by 6° crankshaft.

For comparison please note that a 6° crankshaft timing change reduces the output and the torque by approx. 3%, and 10° crankshaft by approx. 5%.

If the gauge can no longer be introduced between lever and web the chain should be replaced, in older vehicle models an immediate remedy would be a subsequent extension of the reserve distance.

b) Subsequent extension of chain tightener reserve distance

To extend the life of the double roller chain the reserve distance of the chain tightener has been increased from 8-10 mm to 11-13 mm. The change in production engines begins

- for type 621.912 as from engine end number 016 133
- for type 621.913 as from engine end number 004 820
- for type 621.914 as from engine end number 006 046.

In older engine types the reserve distance can be extended by 3 mm by replacing the idler sprocket support, by machining the inner, upper slide rail, and by shortening the thrust pin of the chain tightener. These 3 mm increase chain life by approx. 18 000 miles. Conversion is as follows:

1. Remove idler sprocket support (see Job No. 05-23).
Remove lockwasher, washer and idler sprocket from idler sprocket support and mount on new sprocket support 621 050 01 10.

Note: The different designs of the idler sprocket support are distinguished by the numbers cast on the blank.

Old design: R 121 052 02 06

New design: R 621 052 00 06

2. Remove inner, upper slide rail and refinish connecting rib along chain path (refer to Figure 05-20/3), or install new slide rail, part No. 621 050 05 16, to prevent idler sprocket from running against slide rail when in end position.

Section A-B

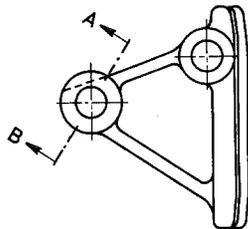
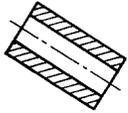


Figure 05-20/2

Slide rail **before** refinishing

Section C-D

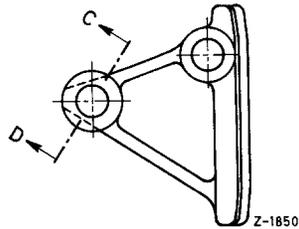
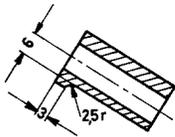


Figure 05-20/3

Slide rail **after** refinishing

3. Disassemble chain tightener, shorten to 86 mm and face (refer to Figure 05-20/4); reassemble chain tightener. If refinishing is impossible, use new chain tightener part No. 621 050 02 11. The pressure pin requires shortening to obtain sufficient clearance when using a new chain.

4. Reinstall idler sprocket bearing, slide rail and chain tightener.

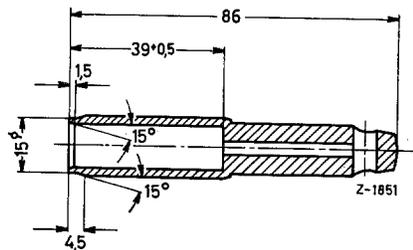


Figure 05-20/4

Pressure pin part No. 621 052 02 74

c) Correction of Timing

Check timing and correct, if required; refer to Job No. 00-8 and 00-0. The change in timing depends on the chain length. Installation of a spring washer set to the right (seen in driving direction) will correct timing.

Timing changes of 6° and more definitely require correction, to prevent the exhaust valves from knocking against the piston crown. The distance between exhaust valve and piston at 5° before TDC should be at least 2.3 mm (Refer to Job No. 00–8).

d) **Chain noises**

I. **General**

Spring in chain tightener weakens; replace spring (part No. of spring 621 993 02 01).
Excessive chain elongation; increase reserve distance or replace chain.

II. **Chain rattles already when idling**

Idler sprocket support jammed or pressure pin in chain tightener sticks; bring idler sprocket support and pressure pin back in operating condition.

III. **Occasional chain noises**

A hot engine and excessive righthand cornering may cause occasional chain noises. When driving around righthand corners the oil pocket may become empty to the extent that the chain tightener pulls in air and becomes soft, resulting in chain rattle. The rattling will stop after a while when the air is gradually evicted.

