

Document Title: Timing gear, installing	Function Group: 215	Information Type: Service Information	Date: 2/5/2020 1
Profile: D12D			

Timing gear, installing

Showing Selected Profile

Valid for serial numbers			
Model	Production site	Serial number start	Serial number stop
D12D			

Op nbr

Tools:

[9993712 Socket](#)
[9993714 Puller bolt](#)
[9993717 Quick nut](#)
[9993722 Support](#)
[9993750 Intermediate piece](#)
[9998602 Press tool](#)
[9998624 Installation tool](#)
[9998624 Installation tool](#)
[9998267 Guide](#)
[9998267 Guide](#)
[9998628 Press tool](#)
[88830175 Pump](#)
[11666054 Jack](#)

11705751 Sealant

NOTE!

Since the illustrations in the service literature are reused for different engine version certain parts may differ from the version in question. However, the essential information in the illustrations is always correct.

1. Check the key groove in the crankshaft for damage and that the key is positioned correctly in the groove.
2. Install the crankshaft gear on the crankshaft with the bevel facing out.
Install intermediate piece 9993750 and puller bolt 9993714 on the intermediate piece. Install the support 9993722. Install the press tool 11666044 and 9993717 and carefully press on the gear with the hydraulic pump 11666041.

NOTE!

Check that the key is still positioned correctly in the groove on the crankshaft.

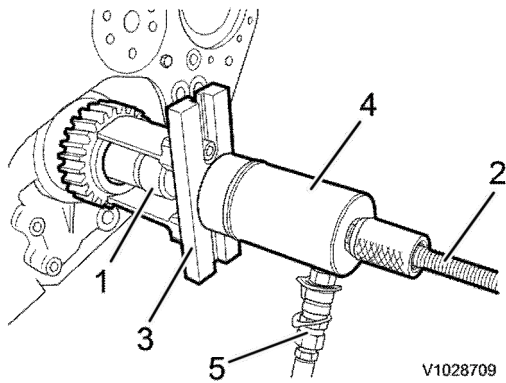


Figure 1

- 1. 9993750
- 2. 9993714
- 3. 9993722
- 4. 11666044
- 5. 11666041

3. Rotate the crankshaft with 9993590 Gear wheel to top dead centre TDC. Check that the flywheels marking stands at **0**.

NOTE!

If a marking indicator is not supplied, sharpen an M650 and screw it into the hole for the marking indicator.

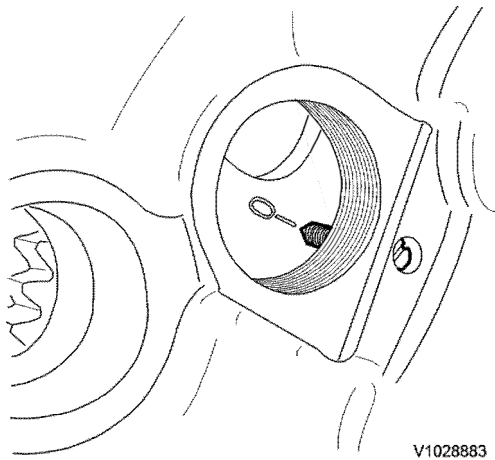


Figure 2

Marking indicator made of M650 bolt

4. Lubricate the transfer gears plain bearings with oil. Install the transfer gears together with bearing washers and hub.
IMPORTANT! Check that the part numbers on the transfer gears, hubs and thrust washers face **outward** and that the bearing washers face according to their marking "Front" "ear" referring to engines direction.
 Tighten according to diagram. Tightening torque: see [Tightening torques cylinder block](#)

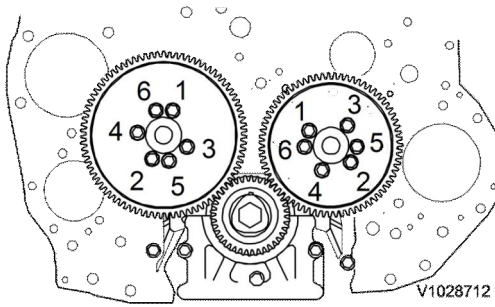


Figure 1
Tightening diagram for transfer gears

5. Install the oil nole.

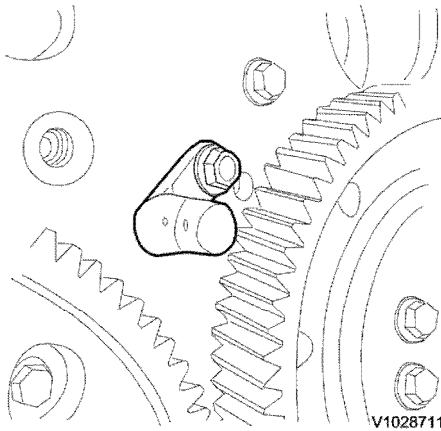


Figure 2

6. Install the adustable transfer gear.
IMPORTANT! Check that the part numbers face **outward**. Tighten the bolts by hand.
7. Check that the marking for **TD** on the camshaft stands between the markings on the camshafts bearing cap and the flywheel at "0".
NOTE!
 rotate the flywheel in the engines rotational direction.
8. Install the camshaft gear without vibration damper. se spacer sleeves and two bolts. Install a **1 mm Ø2 in** drill bit in the hole on the cylinder head between the adustable transfer gear and the camshaft gear. Check that the markings on the camshaft gear are on both sides of the drill bit. Check that the line between the centre on the drill bit and the centre on the camshaft gear ends up between the markings on the camshaft gear.
NOTE!
 Check the gear flank clearance according to the net step to prevent engine failures.

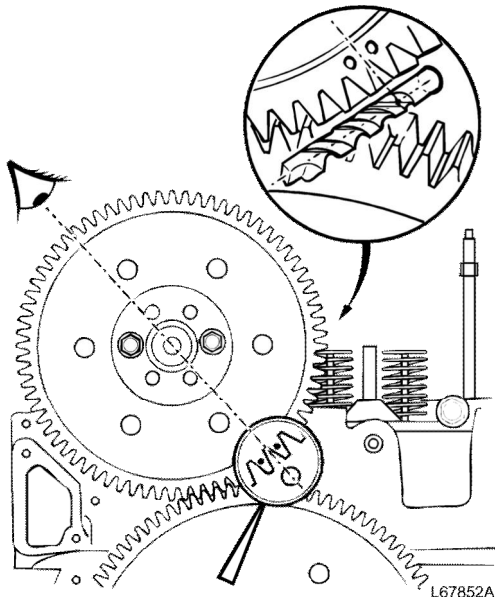


Figure 5

- Place two **0.10 mm** feeler gauges on the gears pressure side. Check that the feeler gauges move against the same resistance when they are moved back and forth between the gear teeth.

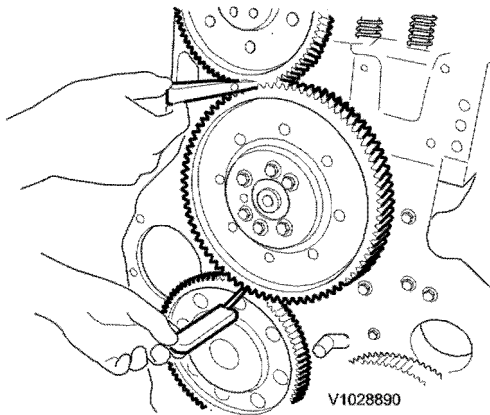


Figure 6

- Tighten the adjustable transfer gear according to step 1 [Tightening torques cylinder block](#) and then check that both feeler gauges move against the same resistance. remove the feeler gauges.
- Check the gear flank clearance between the adjustable transfer gear and the lower transfer gear by placing a dial gauge on the adjustable transfer gear. Hold the lower transfer gear at the same time as the adjustable transfer gear is rotated back and forth. Check that the gear flank clearance is within tolerance according to [Transmission, general specifications](#).

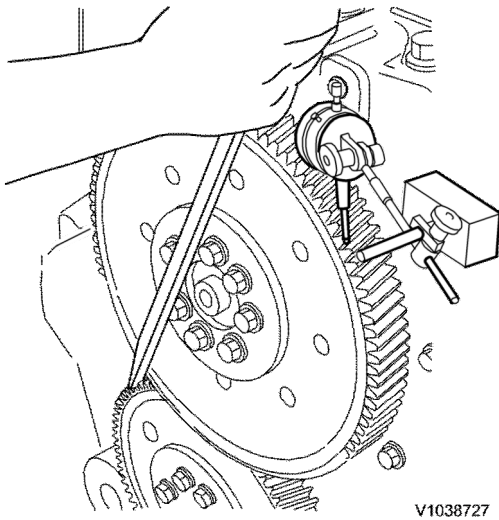


Figure 7

12. Move the dial gauge to the camshaft. Check the clearance against the camshaft's drive gear by holding the adjustable transfer gear and rotating the camshaft gear back and forth. Check that the gear flank clearance is within tolerance according to [Transmission, general specifications](#).
13. Tighten down the adjustable transfer gear.
Tightening torque: see [Tightening torques cylinder block](#)
NOTE!
Check that the gear flank clearance has not changed after torquing.
14. Install the vibration damper with spacer and sensor ring (toothed wheel) on the camshaft gear.
Tightening torque: see [Tightening torques cylinder block](#)
NOTE!
Centre the spacer.

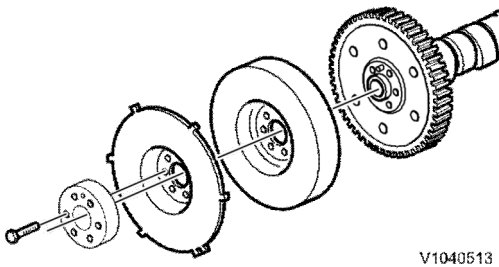
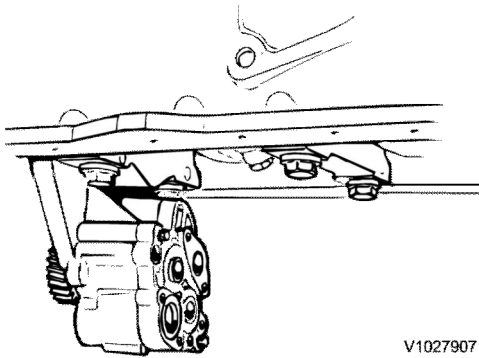


Figure 8
Spacer, sensor ring (toothed wheel), vibration damper and camshaft with gear

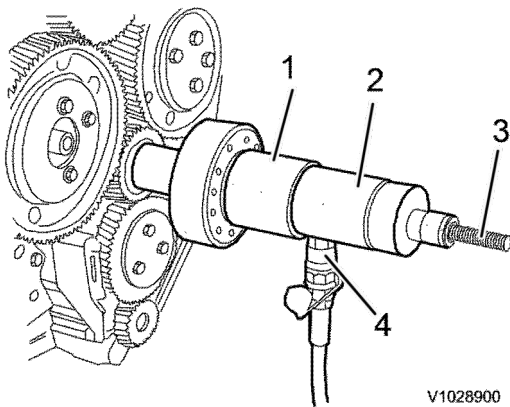
15. Fit the lubrication oil pump.
Tightening torque: see [Tightening torques, lubrication and oil system](#)



V1027907

Figure □

- 1□ Install the adapter □□□3□5□ and puller bolt □□□3□14. Install the polygon hub on the adapter □□□3□5□. Install the sleeve □□□3□12 and hydraulic cylinder 11□□□□44. Tighten the nut against the cylinder. Press on the polygon hub with hydraulic pump 11□□□□41.



V1028900

Figure □□

1. □□□3□12
2. 11□□□□44
3. □□□3□14
4. 11□□□□41
5. □□□3□5□ (not visible in fig.)

- 1□ Install the crankshaft's centre bolt with washer.
Tightening torque: see [Tightening torques cylinder block](#)
- 1□ Install the vibration damper on the crankshaft.
Tightening torque: see [Tightening torques cylinder block](#)
The bolts must be tightened in number sequence acc. to the figure.
NOTE!
The vibration damper's □□□bolts may **not** be reused.
- 1□ To check that the camshaft has been installed correctly and that the timing gear is assembled correctly, perform a check with valve lift on the inlet valves for cylinder 1.

Rotate the engine in its rotational direction one revolution until the flywheel is in position □□ □adjust the zero clearance on the rocker arm against the valve yoke and place the dial gauge against the valve yoke for cylinder 1.

Reload and reset the dial gauge.

Adjust so that there is no valve clearance.

Rotate the flywheel in the rotational direction.

Dead off the dial gauge and check that the inlet valves have opened according to [Figure 10](#).

NOTE!

If a marking indicator is not supplied to show the flywheel's position, sharpen an M10 screw and screw it in the hole for the marking indicator.

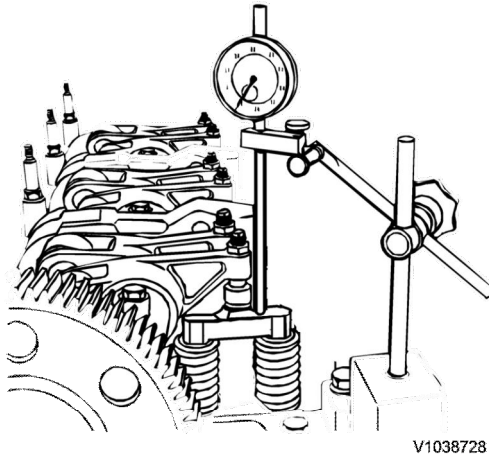


Figure 10
Dial gauge with magnetic stand against valve for cylinder

20. Lubricate the gears with engine oil.

21. Apply a 1 mm (0.08 in) thick, even bead of sealant 11013514 on the marked areas on the lower timing gear casing according to diagram [Tightening torques cylinder block](#). Install the lower timing gear casing within 20 minutes, since the sealant hardens.

NOTE!

Eight, lower timing gear casing: approximately 8 g (0.3 lbs)

22. Install the drive connection with O-ring on the timing gear casing.

23. Clean the sealing surface for the fuel feed pump on the timing gear plate.

24. Check that the seal is intact and positioned correctly on the fuel feed pump. Also check that the shaft is greased with graphite grease.

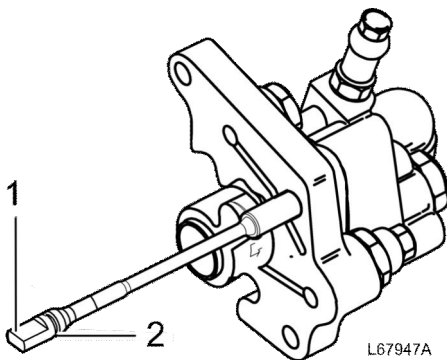


Figure 11

1. Spindle
2. Seal

25. Check that the fuel feed pump's drive shaft fits in the drive connection's groove.
26. Install the gasket on the fuel feed pump and install the pump on the engine.

NOTE!

Be very careful with the pump's drive shaft.

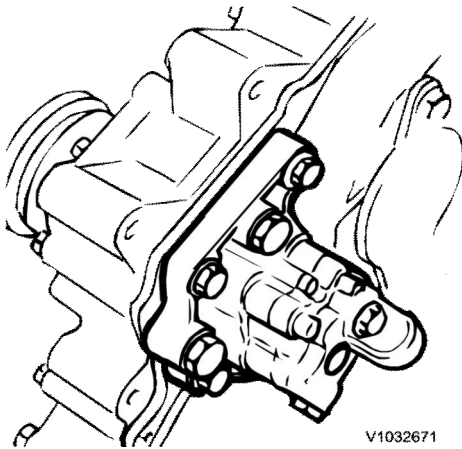


Figure 10

27. Apply a 1 mm (0,07 in) thick, even bead of sealant 11005051 on the marked areas on the upper timing gear casing and in the corners between the lower timing gear casing and the timing gear plate according to [Tightening torques cylinder block](#).

NOTE!

The timing gear casing must be installed within 20 minutes.

28. Install the bolts in the slotted holes on the timing gear casing. Tighten the bolts to contact with the casing with tightening down.
29. Install press tools 1000002 and 1000020 screw down the tensioning bolts so that the sealing surface against the valve cover on the timing gear casing is flush with the sealing surface on the cylinder head. Install the remaining bolts.

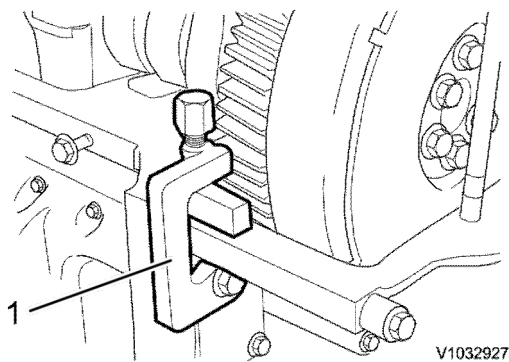


Figure 11

1. 1000020

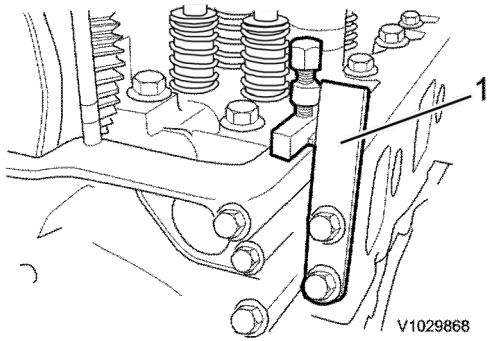


Figure 15

1. 9998602
30. Tighten the bolts in the upper timing gear casing according to [Tightening torques cylinder block](#).
31. Rotate the engine so that a tooth on the camshaft's sensor gear stands directly opposite the hole for the camshaft sensor in the upper timing gear casing. Install the camshaft sensor and check the distance with a feeler gauge between the sensor's measuring point and a tooth on the sensor ring (toothed wheel), check according to [Engine management system](#)
Adjust the distance using shims between the camshaft sensor and timing gear casing.