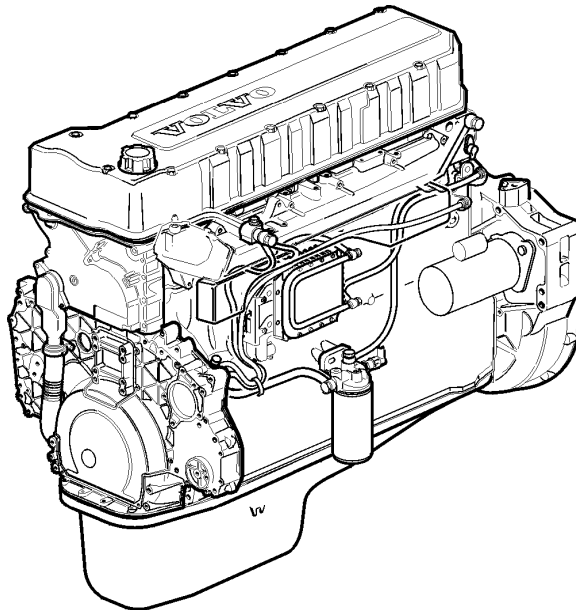


This TSI Service Bulletin replaces TSI Service Manual 215-003, "Timing Gear Adjustment, D12C" (11.2001), publication no. PV776-TSP160584.

Date	Group	No.	Supp.	Page
10.2003	215	003		1(11)

Timing Gear Adjustment D12C

Timing Gear Adjustment



W2003244

Fig. 1: VOLVO D12C Engine

This information covers procedures for checking and adjusting the timing gear on Volvo D12C engines.

Contents

- ["Special Tools" page 2](#)
- ["Timing Gear Clearance, Checking \(All\)" page 3](#)
- ["Timing Gear, Adjustment" page 5](#)

Tools

Special Tools

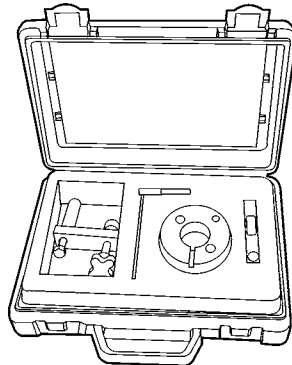
The following special tools are used to replace or repair components. The tools can be ordered from Volvo. Please use the specified part number when ordering.



W0001774

9996956

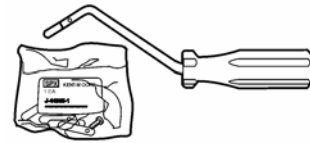
Flywheel Turning Tool



W0001814

J-44514-25

Camshaft Alignment Tool
(includes J-44426-1, Pointer Tool)



W0001979

J-44935

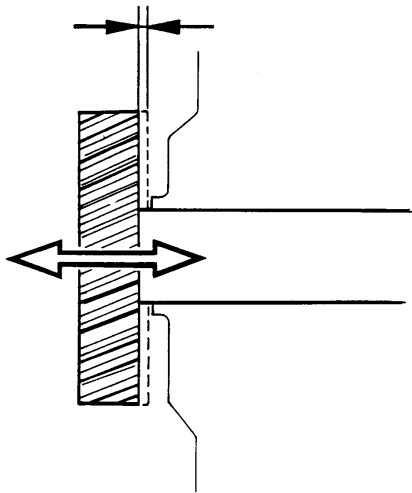
Timing Gear Lash Setting Tool
(Use with J-44514-25)

Service Procedures

2153-06-03-01

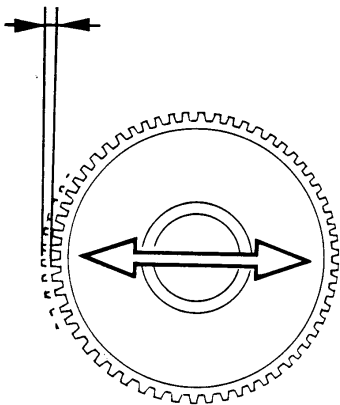
Timing Gear Clearance, Checking (All)

You must read and understand the precautions and guidelines in Service Information, Group 20, "General Safety Practices, Engine" before performing this procedure. If you are not properly trained and certified in this procedure, ask your supervisor for training before you perform it.



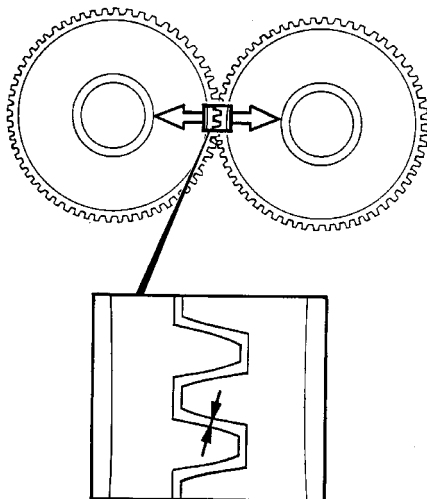
T2007105

Fig. 2: Axial clearance



T2007104

Fig. 3: Radial clearance



T2007103

Fig. 4: Backlash

Clearances for the timing gears are:

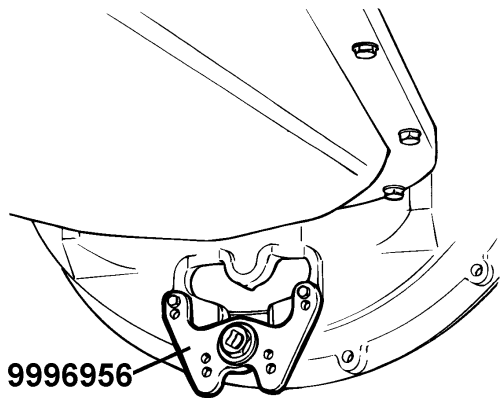
- Axial: 0.05 – 0.17 mm (0.002 – 0.007 in.).
- Radial: 0.026 – 0.070 mm (0.001 – 0.003 in.).
- Backlash: 0.05 – 0.17 mm (0.002 – 0.007 in.).

2153-05-05-01 Timing Gear, Adjustment

(Timing Gear Backlash)

You must read and understand the precautions and guidelines in Service Information, Group 20, "General Safety Practices, Engine" before performing this procedure. If you are not properly trained and certified in this procedure, ask your supervisor for training before you perform it.

Special tools: 9996956, J-44514-25



C2000183

1

Using flywheel turning tool 9996956, rotate the flywheel (in normal direction of rotation) until the **0** mark on the flywheel aligns with the pointer on the flywheel housing.

9996956

2

Remove the flywheel turning tool 9996956.

9996956

3

Install the camshaft without the camshaft vibration damper or gear installed at this time.

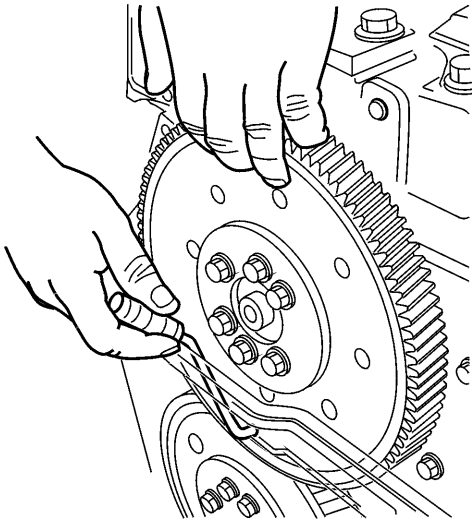
Note: Do not install the rocker lever assemblies at this time. Rocker lever assemblies will be installed after all crankshaft-to-camshaft timing and front gear backlash procedures are complete.

4

Rotate the camshaft by hand until TDC mark is aligned with the left hash mark on the #1 camshaft bearing cap.

Note: The adjustable idler gear bolts are single-use "stretch" type and must not be reused. However, the original bolts are used at this time to perform this adjustment procedure and should be replaced with new bolts after this procedure is completed (one bolt at a time).

5
With the adjustable idler gear bolts finger tight, raise the gear by hand and place a 0.1 mm (0.004 in.) feeler gauge on the loaded side of the adjustable-to-intermediate idler gear contact area.

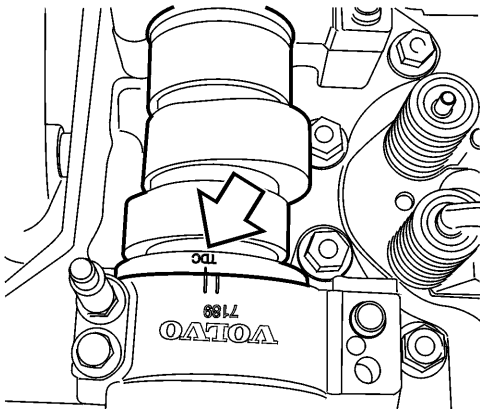


W2003488

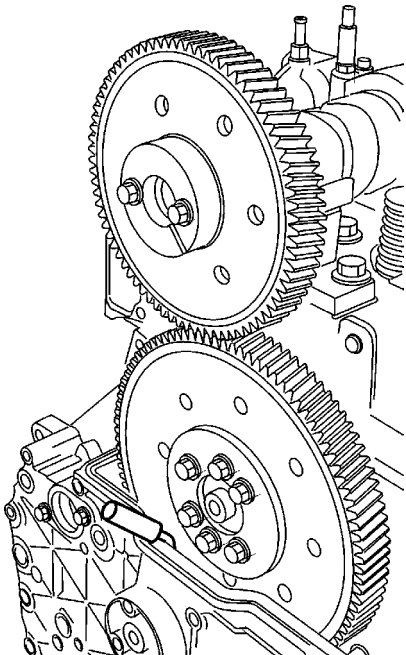
6

While leaving the camshaft TDC mark on the left hash mark, install the cam gear and timing collar J-44514-25. Use 2 camshaft vibration damper/cam gear mounting bolts to hold gear and collar in place.

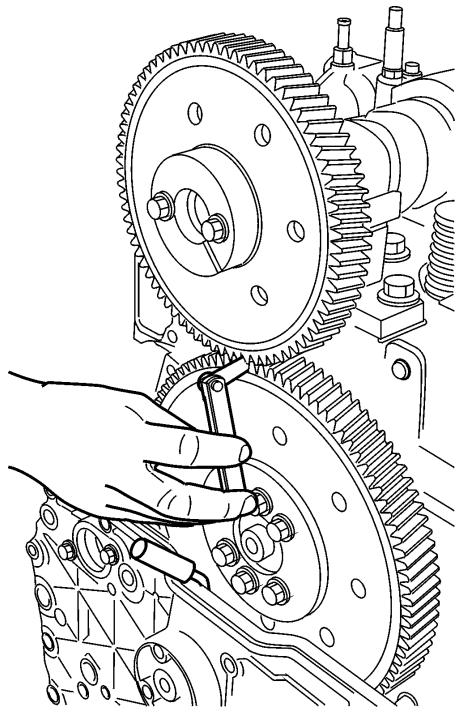
J-44514-25



W2003490

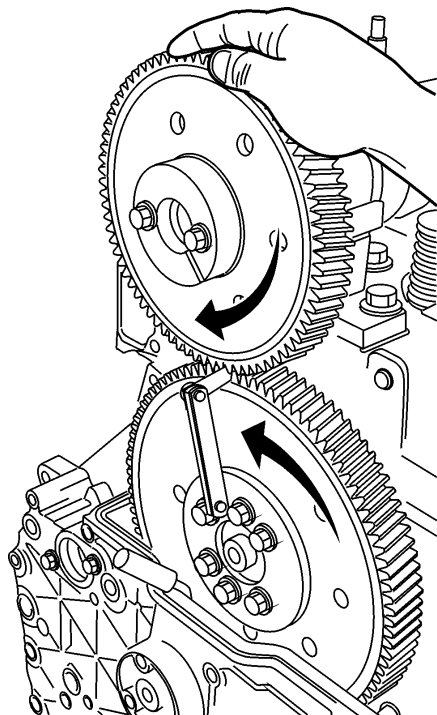


W2003489



7

Place a 0.1 mm (0.004 in.) feeler gauge between the loaded side of the cam gear to adjustable idler gear contact area.



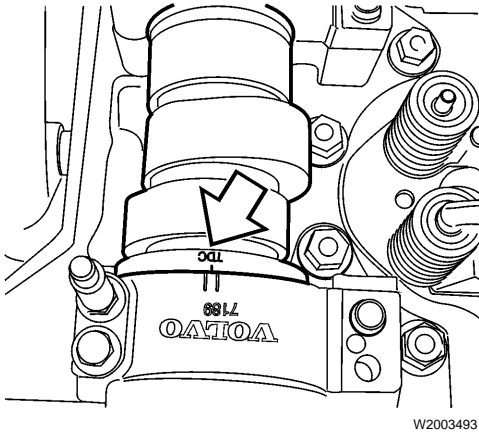
8

Using light hand pressure, slowly rotate the camgear clockwise until the camshaft TDC mark is between the two hash marks.

Note: Check to ensure that the feeler gauge is in place on the loaded side of the camshaft gear and the adjustable idler gear.

9

While using light hand pressure to set the gear last, the camshaft timing mark should line up between the two hash marks on the #1 camshaft cap.

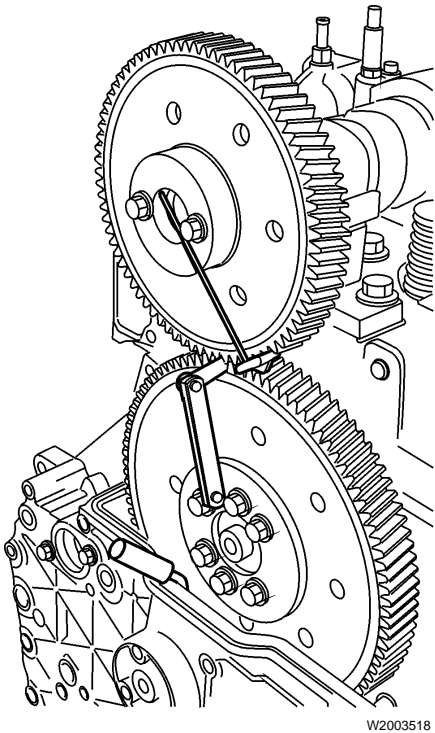


W2003493

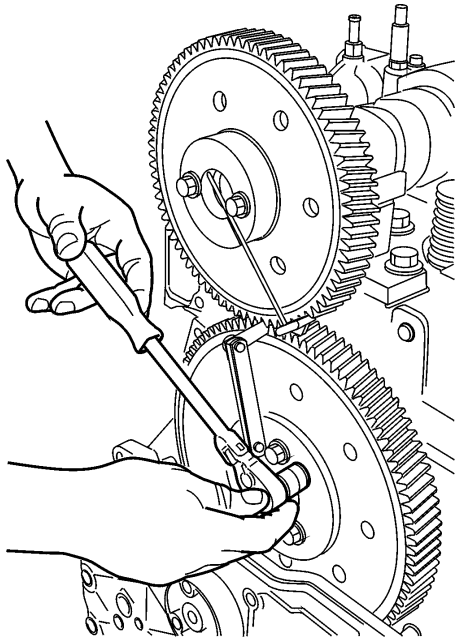
10

Using special pointer tool J-44426-1, verify that the camshaft is properly aligned by installing the pointer in the dowel below the camgear.

J-44426-1



W2003518



W2003519

11

Tighten the adjustable idler gear bolts; do not apply final torque, as these bolts must be replaced with new ones when all of the adjustments are made to the adjustable idler gear.

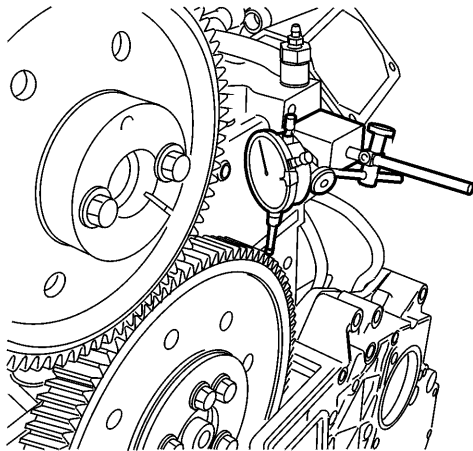
12

Remove both feeler gauges.

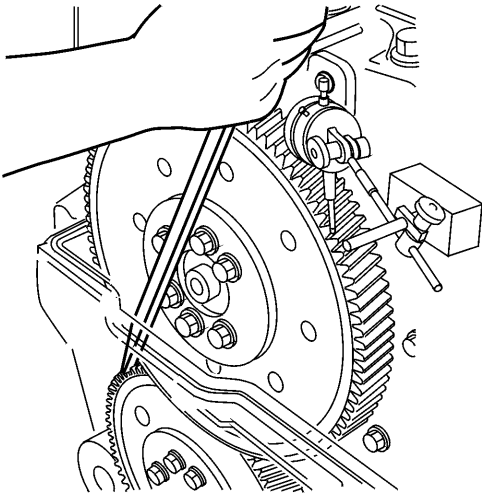
Note: Slight resistance should be felt as the feeler gauges are removed.

13

Set up a dial indicator on the adjustable idler gear.



W2003495

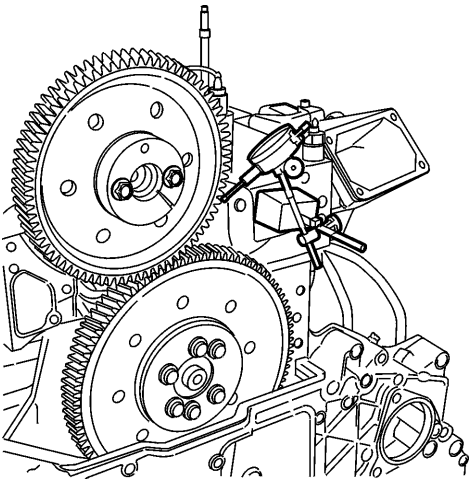


W2003496

14

Use a pry bar or long screwdriver to hold the intermediate idler gear in place. Measure the gearlash between the intermediate-to-adjustable idler gears by rocking the adjustable idler gear back and forth. Acceptable gear backlash is between 0.05 – 0.17 mm (0.002 – 0.007 in.).

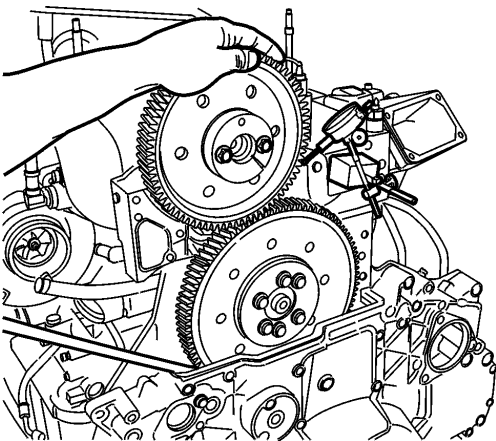
0.05 – 0.17 mm (0.002 – 0.007 in.)



W2003497

15

Set up a dial indicator on the camshaft gear; use a pry bar or long screwdriver to hold the adjustable idler gear in place.



W2003498

16

Measure the gearlash between the camshaft gear and the adjustable idler gear by rocking the camshaft gear back and forth. Acceptable gear backlash is between 0.05 – 0.17 mm (0.002 – 0.007 in.).

Note: If either backlash is out of specification, the adjustable idler gear must be readjusted by repeating the above steps.

0.05 – 0.17 mm
(0.002 – 0.007 in.)

17

Using timing pointer J-44426-1, again verify that the pointer will align with the groove in the timing collar.

Note: If the pointer does not align with the groove in the timing collar, the adjustable idler gear must be readjusted.

J-44426-1

18

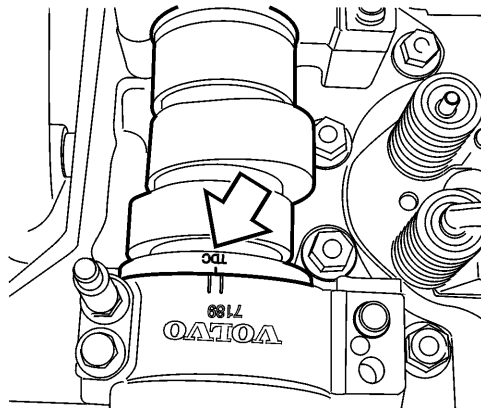
Remove all service tools.

19

Replace adjustable idler gear bolts (one at a time) with new bolts; tighten the new bolts to 15 Nm (11 ft-lb) + 120°. Visually inspect the camshaft and verify that the camshaft TDC mark is between the two hash marks.

Note: After base engine timing and gear backlash adjustments are complete, the adjustable timing idler gear bolts should be replaced and torqued one bolt at a time to maintain backlash adjustment.

15 Nm (11 ft-lb) + 120°



W2003493

20

Remove the cam gear alignment collar.

21

Reinstall camshaft vibration damper. Tighten bolts to a torque of 33 Nm (24 ft-lb) + 90°.

33 Nm (24 ft-lb) + 90°

22

Complete engine assembly according to appropriate service information.