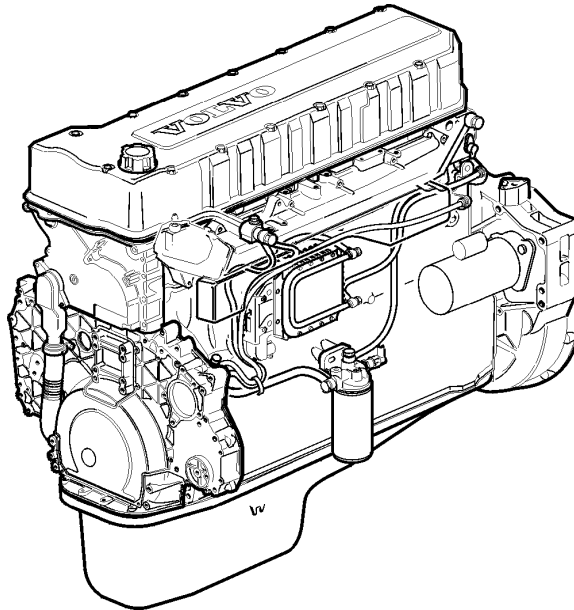


This TSI Service Bulletin and others in Groups 21 and 33 replace TSI Service Manual 210–600, “Basic Engine, D12, D12A, D12B, D12C” (11.2001), publication no. PV776–TSP160586.

Date	Group	No.	Supp.	Page
10.2003	<b>216</b>	<b>004</b>		1(11)

Flywheel  
D12, D12A, D12B, D12C

## Flywheel



W2003244

Fig. 1: Volvo D12C Engine

This information covers procedures for servicing the flywheel on Volvo D12, D12A, D12B, and D12C engines.

### Contents

- [“Special Tools” page 2](#)
- [“Flywheel, Checking” page 3](#)
- [“Flywheel, Replacement” page 4](#)
- [“Flywheel Bearing, Replacement” page 9](#)
- [“Flywheel Ring Gear, Replacement” page 10](#)

# 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.



**9991821**  
Flywheel Bearing Removal Tool



**9992564**  
Drift



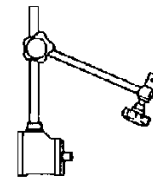
**9996950**  
Flywheel Blocking Tool



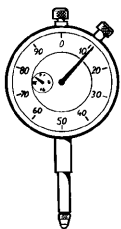
**9996956**  
Flywheel Turning Tool



**9991801**  
Drift Handle



**9999696**  
Magnetic Stand



**9989876**  
Dial Indicator

# Service Procedures

## 2166-06-03-01

### Flywheel, Checking

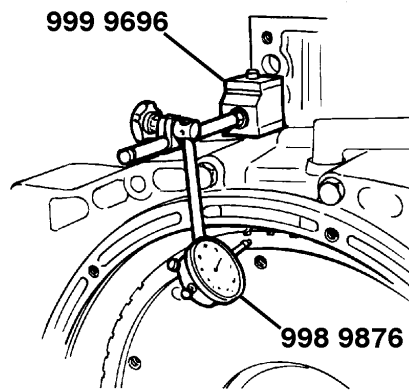
#### (Runout: Circumference and Surface)

You must read and understand the precautions and guidelines in Service Information, Group 21, "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, 9999696, 9989876*

#### 1

Use dial indicator 9989876 with magnetic base 9999696 for this procedure. Position the probe against the flywheel and set the dial indicator at zero (0).



T2008997

Checking the flywheel for warp

#### 2

Remove the flywheel inspection cover and install flywheel turning tool 9996956. Rotate the flywheel and read off the highest reading on the dial indicator.

9996956

#### 3

The reading must not exceed 0.20 mm (0.008 in.) on a measuring radius of 150 mm (6 in.). In the case of excessive warp, remove the flywheel and check for dirt or unevenness between the flywheel and the crankshaft flange.

0.20 mm (0.008 in.)  
150 mm (6 in.)

## 2166-03-02-02 Flywheel, Replacement

(In vehicle — Transmission and clutch removed.)

Not Included:

- “Flywheel, Overhaul” (rebush bearing bore, flywheel removed)
- “Flywheel, Checking” page 3
- “Rear Crankshaft Seal, Replacement” (flywheel removed)
- “Flywheel Ring Gear, Replacement” page 10

**Prerequisites:**

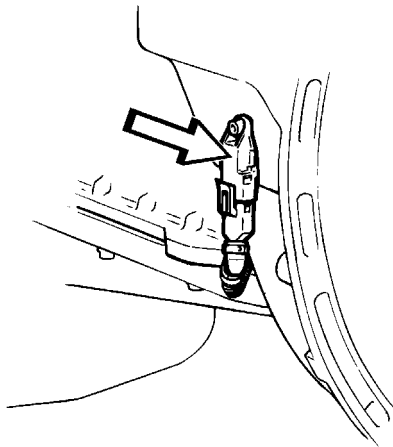
- Transmission removed.
- Clutch assembly removed.

*Special tools: 9996950*

**Removal**

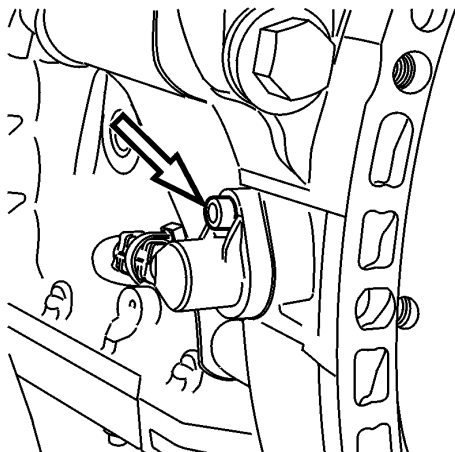
1

D12A/B: Remove sensor from the flywheel housing.



T2006665

Fig. 2: Engine Speed Sensor location on flywheel housing, D12A/B

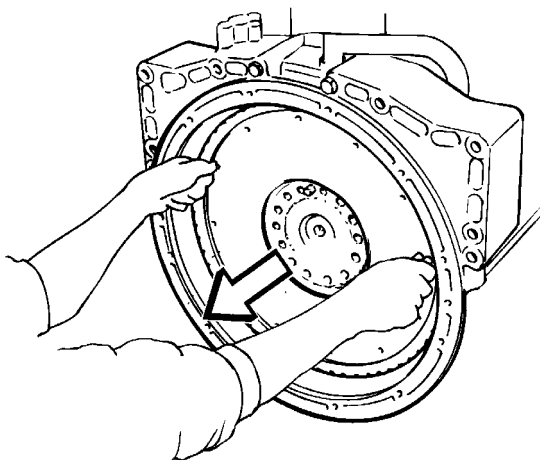


W2003426

Fig. 3: Speed sensor location on flywheel casing, D12C

**2**

D12C: Remove the speed sensor from the flywheel housing.



T2006667

Fig. 4: Removing the flywheel

**3**

Attach two bolts (M12 x 100) to the flywheel. Remove the flywheel bolts and lift off flywheel with the help of the bolts.

## Inspection

**4**

Minor scores or cracks in the friction face can be removed by grinding. However, do not remove more than 0.5 mm (0.02 in.). In cases of more severe damage, replace the flywheel. The flywheel depth (the distance from the clutch plate face to the clutch retaining plate face) must remain unchanged. Therefore, the clutch retaining plate face must be ground down the same amount as the clutch plate face.

0.5 mm (0.02 in.)

**5**

Install new flywheel pilot bearing.

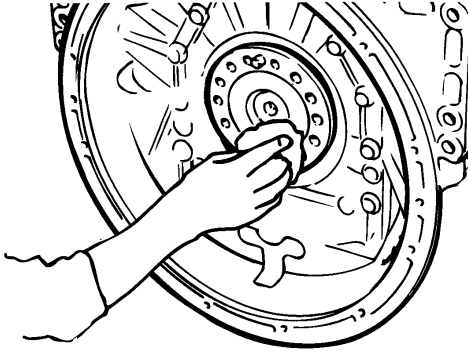
## Installation

**6**

Install new crankshaft rear seal. See "Rear Crankshaft," 216-003.

**7**

Carefully clean the flywheel contact surface on the crankshaft and the flywheel bolt holes in the crankshaft.



T2006668

Contact surface

**8**

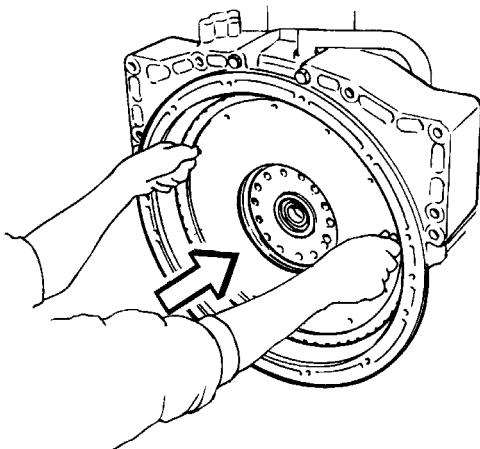
Carefully clean the contact surface on the flywheel.

**9**

Make sure that the flywheel alignment stud is in position and undamaged.

**10**

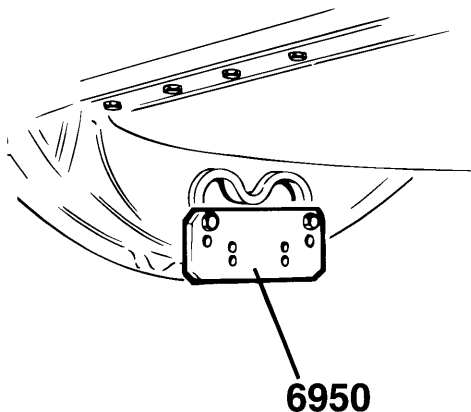
Lift the new flywheel into position with the help of two bolts (M12x100). Install the retaining bolts.



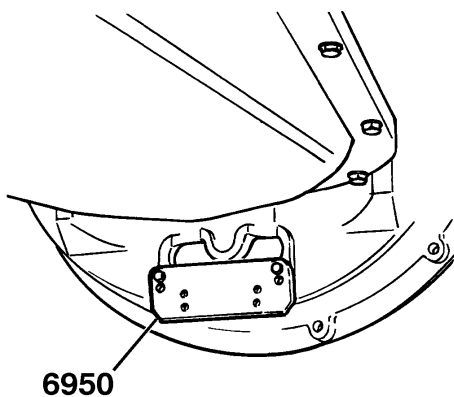
T2007091

Installing the flywheel

11



T2006666  
Fig. 5: Blocking tool installed, D12A/B



T2008983  
Fig. 6: Blocking tool installed, D12C

Remove the inspection cover from beneath the flywheel housing and install blocking tool 9996950.

9996950

12

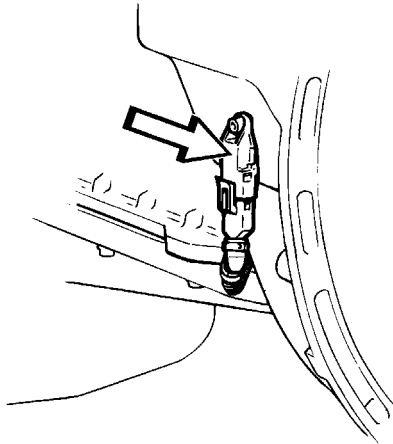
Torque-tighten the flywheel bolts, using the following 2-step procedure:

D12, D12A, D12B	85 ± 5 Nm (63 ± 4 ft-lb) Turn the bolts another 30 ± 3°
D12C	Torque-tighten to: 60 Nm Turn the bolts another 60° ± 5°

13

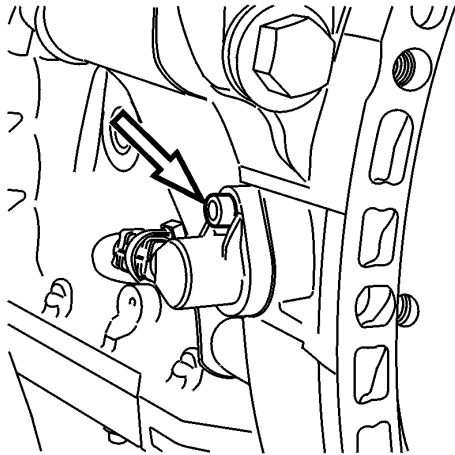
Remove blocking tool 9996950 from the flywheel housing and reinstall the inspection cover.

9996950



T2006665

Fig. 7: Speed sensor location on flywheel housing, D12A/B



W2003426

Fig. 8: Speed sensor location on flywheel casing, D12C

Clean and install the speed sensor. Check and adjust sensor distance as needed. See Service Specifications, Group 20.



## 2169-03-03-01 Flywheel Bearing, Replacement Clutch Removed

Not included:

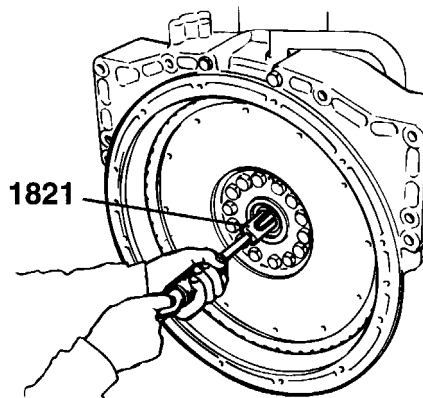
- Flywheel, Overhaul (rebush bearing bore, flywheel removed)
- "Flywheel, Checking" page 3
- Rear Crankshaft Seal, Replacement (flywheel removed)

*Special tools: 9991821, 9992564, 9991801*

**1**

Remove the old flywheel bearing with tool 9991821.

9991821



T2006733

Fig. 9: Removing the flywheel bearing

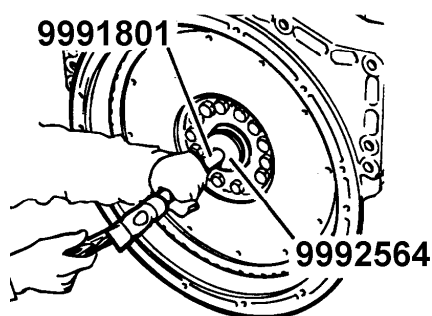
**2**

Clean the flywheel and check it for damage.

**3**

Install the new flywheel bearing, using drift tool 9992564 and handle 9991801.

9992564, 9991801



C2000452

Fig. 10: Installing the new flywheel bearing

## 2166-03-05-01 Flywheel Ring Gear, Replacement

(Flywheel removed)

Not Included:

- Flywheel, Overhaul (rebush bearing bore, flywheel removed)
- Rear Crankshaft Seal, Replacement (flywheel removed)
- "Flywheel, Checking" page 3

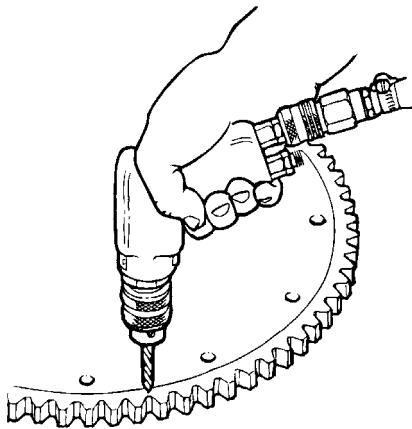


### WARNING

Always wear appropriate eye protection to prevent the risk of eye injury due to contact with debris or fluids.

1

Drill 1 or 2 holes in the ring gear between the teeth. Crack the ring at these holes with a chisel. Lift the ring gear off the flywheel.



T2006659

Fig. 11: Drilling the ring gear

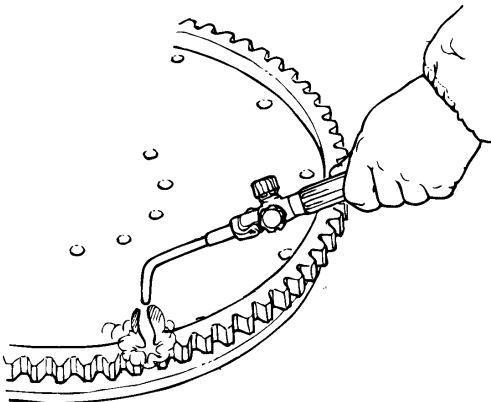
2

Clean the ring gear contact surface with a wire brush.

3

Heat the new ring gear with a blow torch or in an oven. Apply heat evenly over the entire ring gear. Make sure the ring gear does not become too hot and lose its tempering. To check the heating process, polish the ring gear to a shine at several places and stop the heating process when the surfaces become blued, approximately 180 – 200 °C (360 – 400 °F).

180 – 200 °C  
(360 – 400 °F)

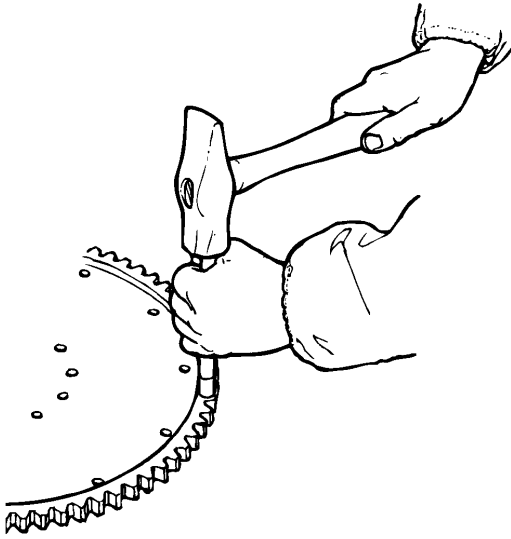


T2006660

Fig. 12: Heating the ring gear

**4**

Install the heated ring gear onto the flywheel and tap it into place using a soft drift and a hammer.



T2006661

Fig. 13: Installing new ring gear

**5**

Allow the ring gear to air dry until cool.