VOLVO
Construction Equipment

Service Information

Document Title: **Section 4, content, structure**	Function Group: **400**	Information Type: **Service Information**	Date: **2014/8/22**
Profile: **ART, A35D [GB]**			

Section 4, content, structure

The primary organization follows Volvo CE's function group index for articulated haulers. The function groups are based on Volvo's company standard with 10 main groups, numbered from 0 to 9. There is an additional section on safety. The main groups are divided into sub-groups which expand in several levels.
Example of function group for final drive according to the below:

4 Power transmission

Level 2	**Level 3**	**Level 4**
40 General		
41 Clutch, torque converter		
42 Transmission, hydraulic control		
43 Transmission, mechanical		
44 (Not used)		
45 Propeller shaft		
46 Front axle, rear axle	460 General, common information	
	461 Front axle	**4612 Final drive/ differential gear** 4613 Hub, hub reduction 4614 Drive axle, drive shaft 4616 Axle housing 4617 Drive axle bearings/ universal joint 4618 Drive axle seal 4619 Miscellaneous
	463 Rear axle 1	
	464 Rear axle 2	
	468 Differential lock, with control	
47 (Not used)		
48 Power take-off		
49 Miscellaneous		

Document Title:	Function Group:	Information Type:	Date:
Drivetrain, description	**400**	**Service Information**	**2014/8/22**
Profile: **ART, A35D [GB]**			

Drivetrain, description

The flywheel housing and power take-off for driving the hydraulic pumps are built as a single unit. Lubrication takes place via the engine lubrication system and oil is returned to the engine by way of a built-in oil pump.

A flex plate located in the flywheel housing drives the torque converter in the transmission.

The transmission is of the planetary type and fully automatic with six forward gears and two reverse gears. There is Lock-up on all gears, except for the reverse gears. The automatic gearshifting is controlled by an electronic control unit (T-ECU) which, through the gearshifting control system, selects the correct gear in relation the travel speed. A hydraulic retarder is also built into the transmission.

The dropbox has a differential with a lock function as well as a high and low range.

The ground dependent hydraulic pump for the secondary steering system is also located on the dropbox.

The dropbox is driven by the transmission via a propeller shaft and in turn drives the front and rear drive axles via propeller shafts.

The drive axles have differentials with differential locks and are equipped with the planetary gears in the hubs, so-called hub reductions.

Six-wheel drive can be engaged and disengaged on the move and is operated together with the longitudinal differential lock.

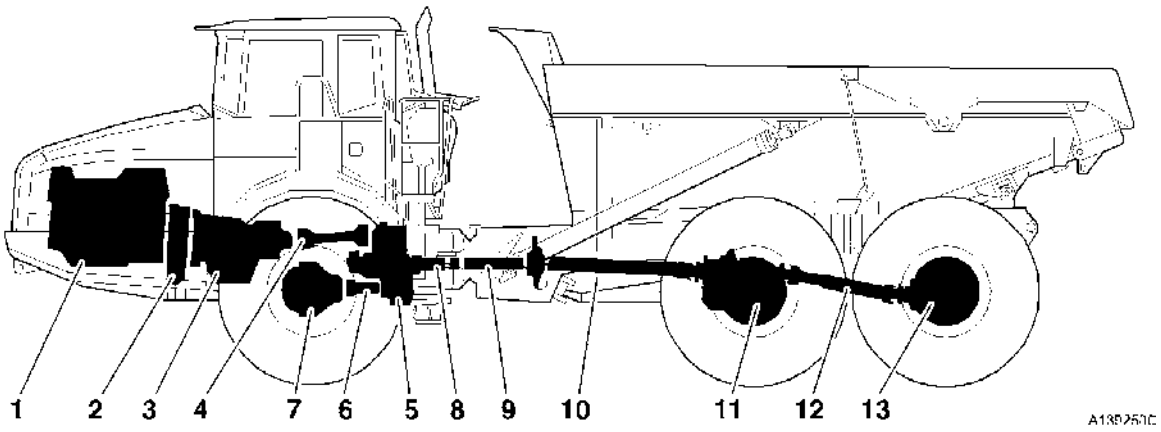

Figure 1
Power transmission

1. Engine D12C
2. Flywheel housing (rear engine timing gear) and power take-off
3. Transmission PT1860/ PT1861
4. Propeller shaft
5. Dropbox FL862
6. Propeller shaft
7. Front drive axle AHW71L/ AHW71O
8. Propeller shaft (steering joint)
9. Propeller shaft (frame joint)
10. Propeller shaft
11. Front bogie axle (load unit) with power divider 6x6 AHW71M/ AHW71P
12. Propeller shaft
13. Rear bogie axle (load unit) AHW71N/ AHW71Q

VOLVO
Construction Equipment

Service Information

Document Title:	Function Group:	Information Type:	Date:
Description	**414**	**Service Information**	**2014/8/22**
Profile: **ART, A35D [GB]**			

Description

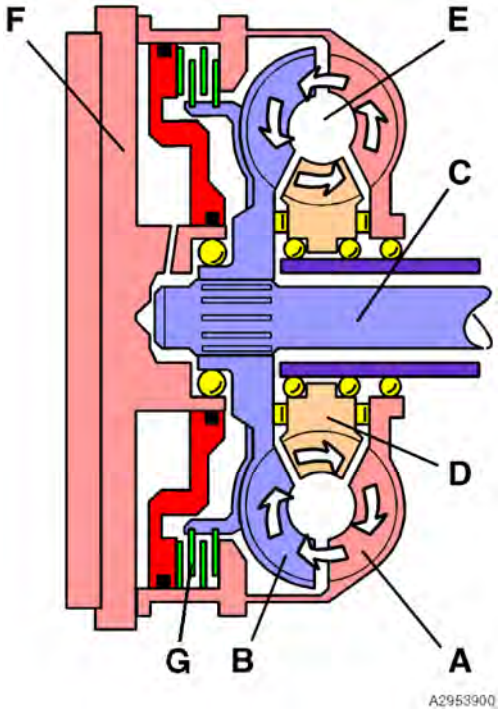

Figure 1

A. Pump rotor
B. Turbine rotor
C. Turbine shaft
D. Stator
E. Space
F. Engine flywheel
G. Lock-up

The torque converter consists of a pump rotor (A), a turbine rotor (B) which is connected to a turbine shaft (C), and a stator (D). The space (E) between the pump rotor and the turbine rotor is filled with oil.
The pump rotor is attached to the engine flywheel (F). When the flywheel starts to turn, the impellers on the pump rotor force the oil to flow. The oil flow from the pump rotor flows over to the turbine rotor and forces it to turn in the same direction as the pump rotor.

The stator, located between the pump rotor and the turbine rotor, is provided with a free-wheel so that, when i.e. Lock-up clutch is applied, it can rotate freely in one direction. The impellers on the stator direct the oil flow from the turbine rotor back to the impellers on the pump rotor.

The torque converter provides smooth transmission of the power from the engine to the transmission. The power is transmitted to the turbine shaft (C), hydraulically or via the direct clutch (Lock-up) (G). Some of the engine power is transmitted directly to the transmission's oil pumps via a drive sleeve.

VOLVO
Construction Equipment

Service Information

Document Title: **Transmission, removing downward**	Function Group: **421**	Information Type: **Service Information**	Date: **2014/8/22**
Profile: **ART, A35D [GB]**			

Transmission, removing downward

Op nbr 43774-1

11668020 Transport brace
9993590 Gear wheel
9993681 Bracket right
9993682 Bracket left
11668015 Lifting tool

NOTICE

If there's been a transmission breakdown or if there are impurities in the transmission's oil sump, filter or oil system:

- change the transmission's oil cooler, see Oil cooler, changing.
- Thoroughly clean the lines to the transmission's oil cooler.

1. Park the machine in service position.
2. Release the brake pressure by repeatedly depressing the brake pedal.
3. Lower the front grille and pump up the engine hood.
4. Turn off the electric power with the battery disconnect switch.
5. Remove the front and rear underbody skid plates.

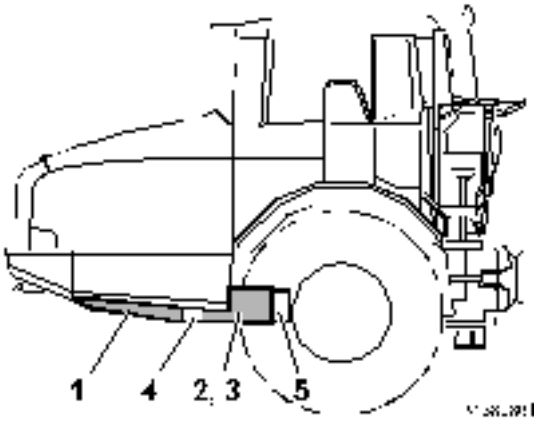

Figure 1
Underbody skid plates

1. Front underbody skid plate
2. Rear underbody skid plate, left
3. Rear underbody skid plate, right
4. Front cross member
5. Rear cross member

6. Remove the front and rear cross members.
7. Pull the oil dipstick out of the transmission.
8. Remove the hexagonal stay.

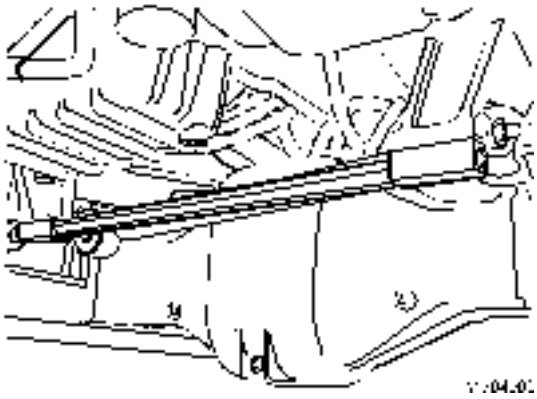

Figure 2

9. Remove the cross member

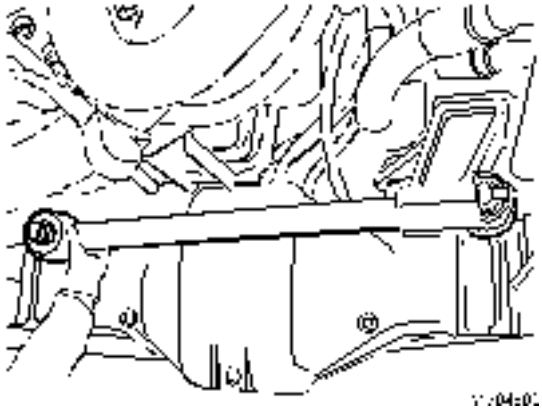

Figure 3

Applies to machine with a shut-off valve for the hydraulic oil tank. Serial numbers according to table below:

Machine	Place of manufacture, serial number		
	EU	US	Brazil
A35D	11001 – 11917	61001 – 61303	71001 – 71195
A40D	10001 – 11101	60001 – 60286	

10. Remove the pin and close the valve for the hydraulic oil tank.

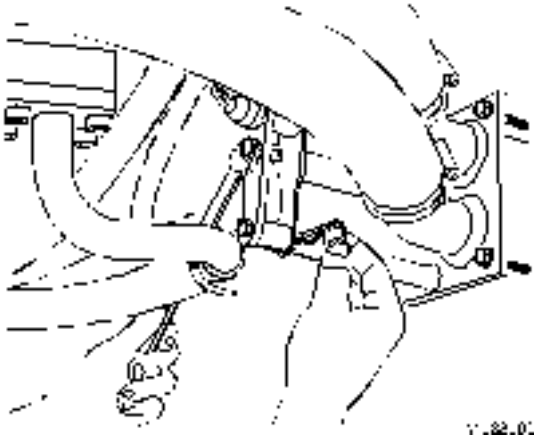

Figure 4

11. Mark and disconnect the pressure oil hoses, the leak-off oil hoses and the LS-hoses from the two rear hydraulic pumps.
    Plug the hoses and the connections on the hydraulic pumps.

12. Loosen the two rear hydraulic pumps and remove the O-rings.
    Applies to machines without a shut-off valve

13. Suspend the pumps by their suction hoses along the left side of the machine.
    Use straps to take the strain off the suction hoses.
    Weight hydraulic pump: approx. **25 kg (55 lb)**

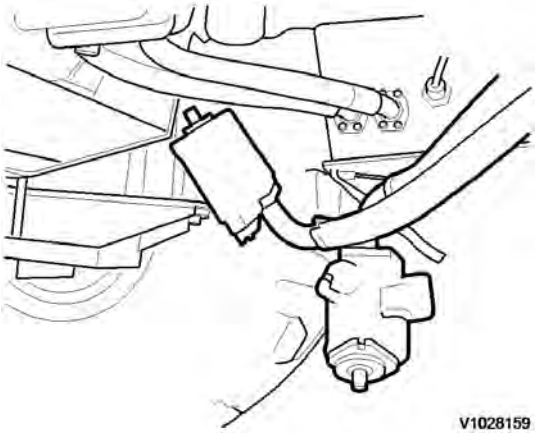

Figure 5

14. Alternatively drain the hydraulic oil.
    Volume: **200 l (52.8 US gal)**

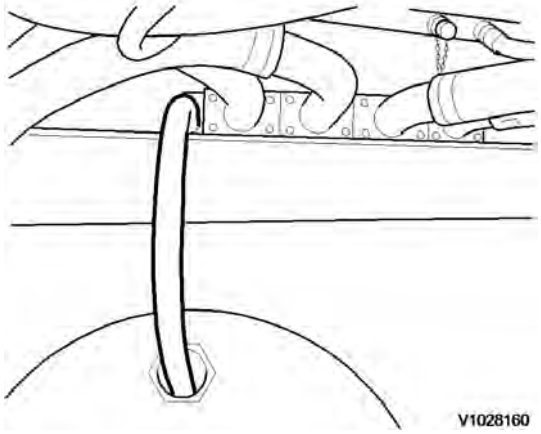

Figure 6

Removing, continued

WARNING

Risk of burns! Use protective work gloves.

15. Drain the transmission oil.

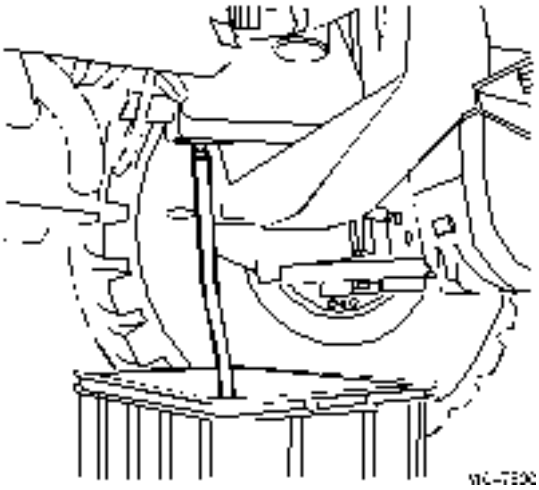

Figure 7

16. Remove the clamp and the Cannon connector plug from the connector socket (EH) on the transmission
17. Disconnect the suction pipe from the rear tandem pump.
18. Loosen the bolt and swing out the radiator.

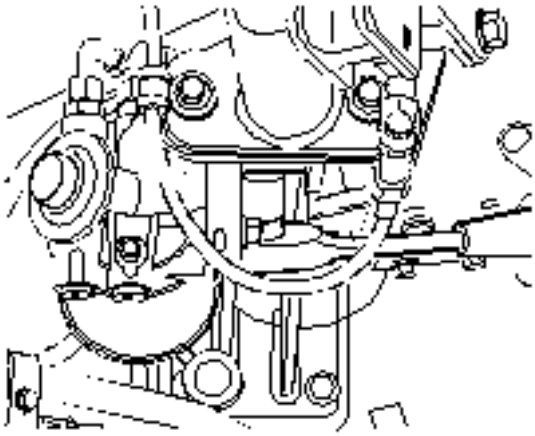

Figure 8
Overhead view

19. Disconnect the inlet hose from the turbo charger

NOTICE

Always cover open air connections with a plastic bag and rubber bands. Gravel, dust and other particles in these connections may result in engine failure!

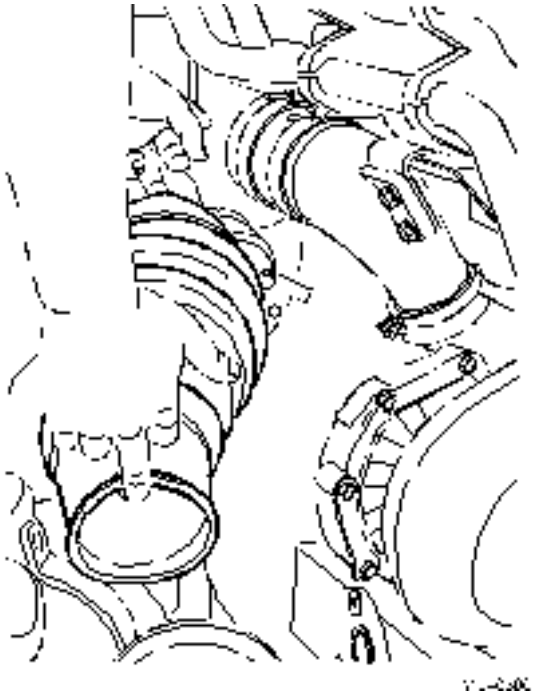

Figure 9

20. Remove the protecting covers.
    Remove the bolted joint between drive disc and transmission torque converter.
    Use gear wheel **9993590** to rotate the crankshaft.
    Rotate the crankshaft so that two bolts can be removed at a time.

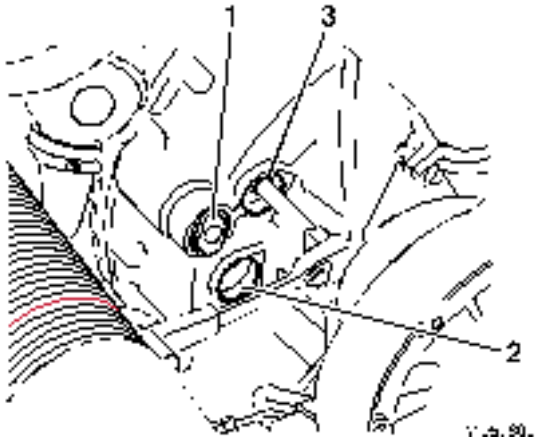

Figure 10

1. Rotating crankshaft.
   The gear wheel **9993590** is positioned in the hole in the flywheel housing. Use a standard ratchet handle that, when necessary, can be combined with an extension piece from a 1/2″ socket set.
2. Flywheel graduation.
3. Removing and installing bolted joint drive disc – torque converter.

Work in the cab

21. Remove the floor mat.

22. Disconnect air and electrical lines from the operator seat.

23. Remove and lift out the operator seat.

24. Remove the centre and rear floor plates.

25. Mark up the steering column position with, for example, a knife.

26. Remove the locking pin from the steering column universal joint.
Remove the bolt and push down the steering column.

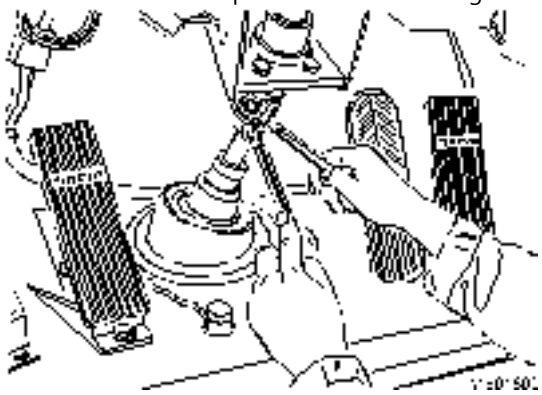

Figure 11

27. Remove the seals

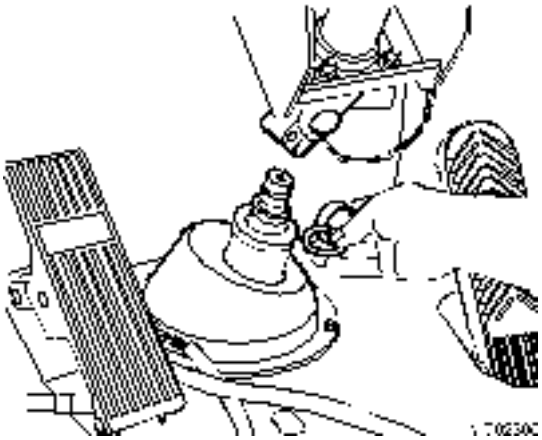

Figure 12

28. Disconnect and mark the connectors for the retarder pedal and the accelerator pedal and remove the differential lock connector (**SW4604**).
Remove the rubber bellows from the steering column.

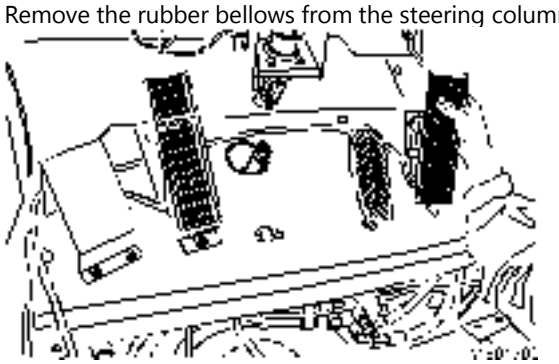

Figure 13

29. Loosen and press down the brake pedal through the front floor plate without disconnecting the hydraulic connections.

30. Remove the front floor plate.

31. Mark and disconnect the connectors from the brake pedal (**SE5203, SE5204, SW2505**) and the retarder valve (**PWM4204** and **SE4204**).

32. Secure the dropbox.
Insert a lifting sling around the bracket for the steering cylinder hoses and pull the dropbox rearwards with the aid of a ratchet block.

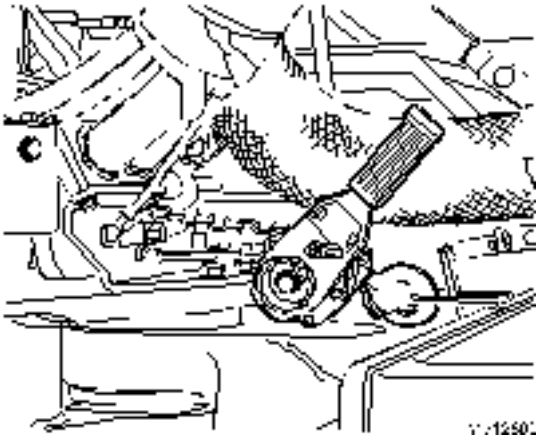

Figure 14

WARNING

Risk of crushing injuries

33. Secure the propeller shaft and remove the bolts from the front bolted joint.
Lower the propeller shaft and move it to the right.

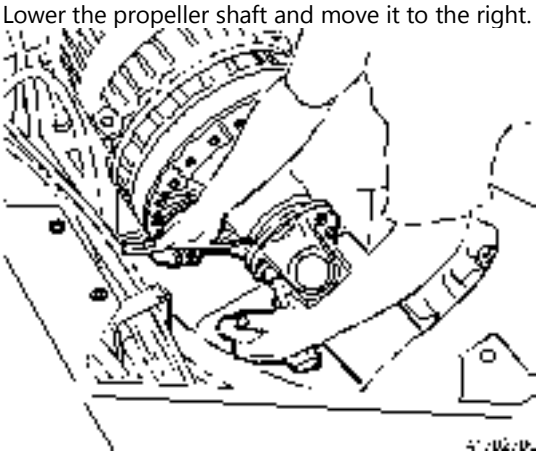

Figure 15

34. Remove the oil filler hose and the hose for the oil dipstick.
Plug the connections.

Figure 16

35. Remove the breather hose from the transmission.
    Plug the connections.

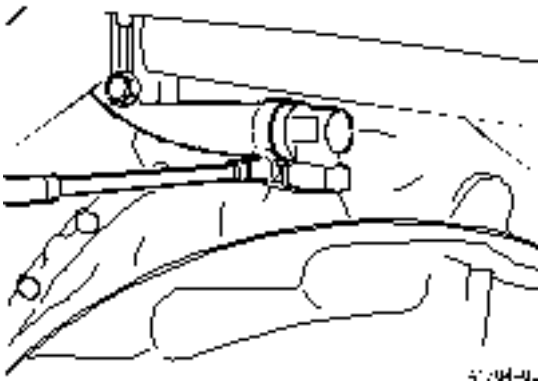

Figure 17

36. Remove the bracket without disconnecting the brake hoses.

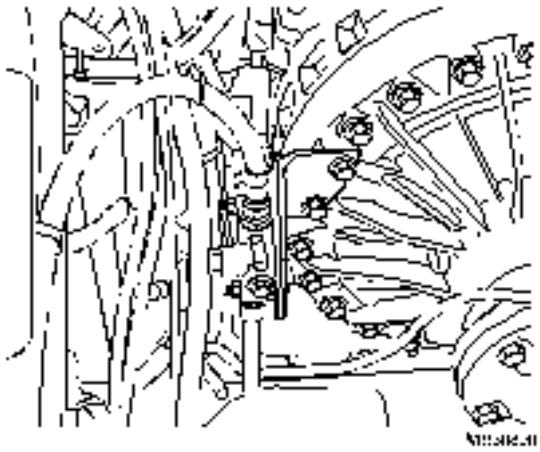

Figure 18

37. Loosen the nut on the link stay to the steering gear.
    Screw up the nut slightly above the steering rod end.
    Loosen the link stay by knocking on the nut.
    Move the link stay to one side.

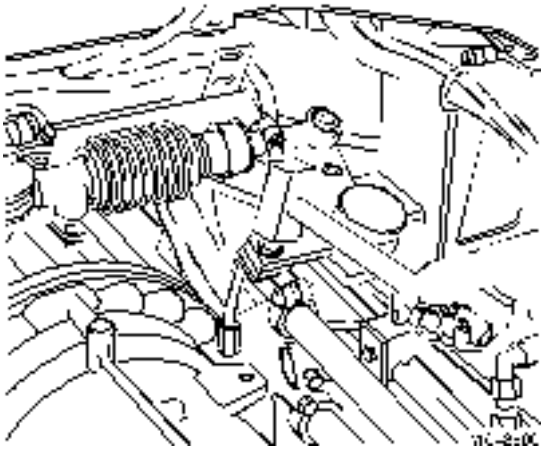

Figure 19

WARNING

Risk of crushing injuries! Do not remove all the bolts between the transmission and the flywheel housing. The transmission will fall down!

38. Remove the bracket for the plate heat exchanger.

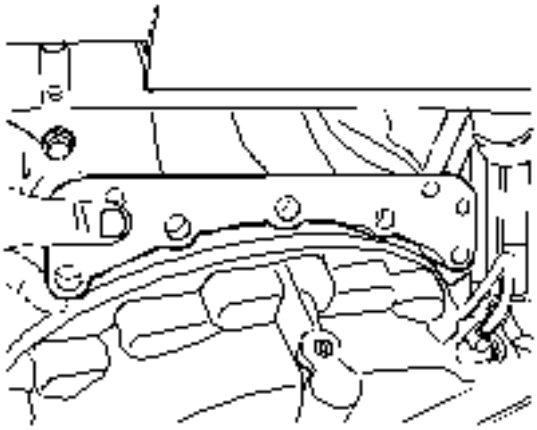

Figure 20

39. Disconnect the retarder valve return oil pipe from the transmission.
    NOTE!
    Check the O-ring.

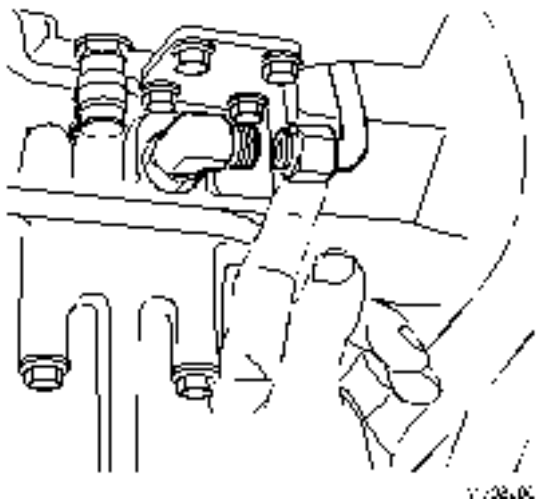

Figure 21

40. Detach the retarder valve and suspend it from the frame with the aid of tensioning strap.
    NOTE!
    Protect exposed surfaces with plastic sheeting.

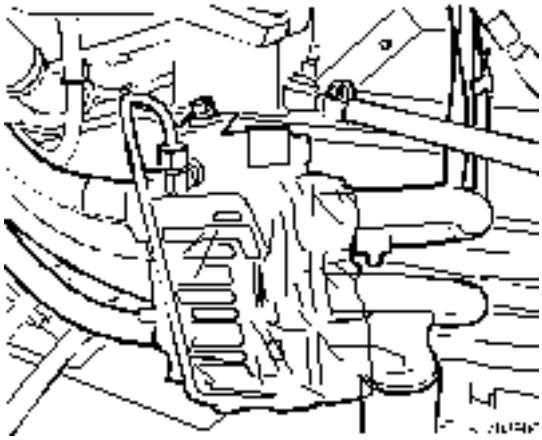

Figure 22

41. Cover the retarder valve and the valve housing on the transmission with plastic sheeting.

42. Remove the oil filter together with bracket and cover the filter housing with plastic sheeting.

43. Install bracket right **9993681** and bracket left **9993682** on the transmission.
    NOTE!
    Use four bolts **M16x45** part No. **955365**, and four nuts **M16**, part No. **955785**.

44. Secure the transmission with lifting tool **11668015** and two ratchet blocks.

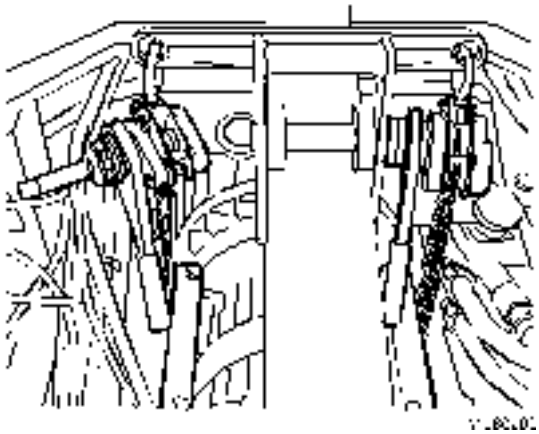

Figure 23

45. Remove the bolted joint between the transmission and the flywheel housing.

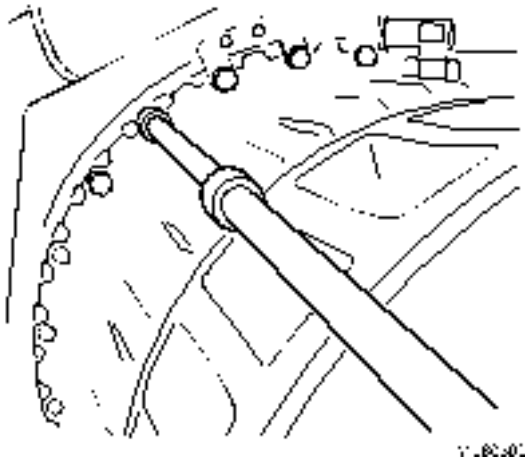

Figure 24

46. Carefully pull the transmission straight rearwards so that the transport braces **11668020** (3 pcs) can be installed on the torque converter.
    NOTE!
    Make sure that the torque converter follows the transmission rearwards. It is important to secure the torque converter adequately as it could otherwise slide out of position and be damaged.

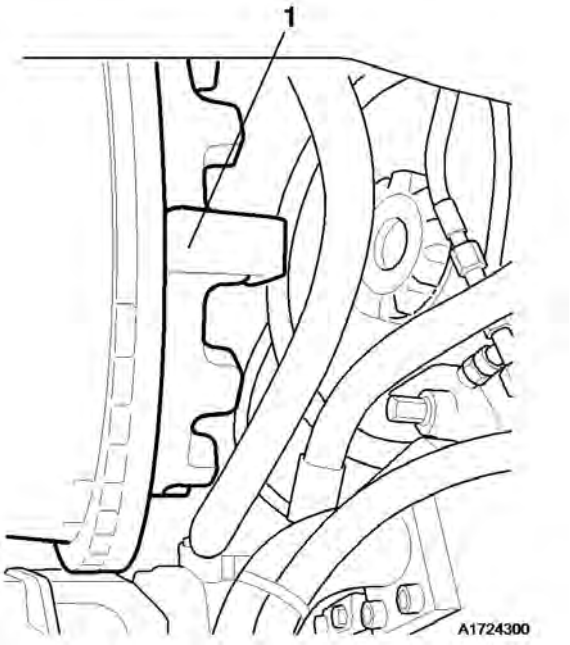

Figure 25

1. Transport brace

47. Move the transmission rearwards and tilt it down.

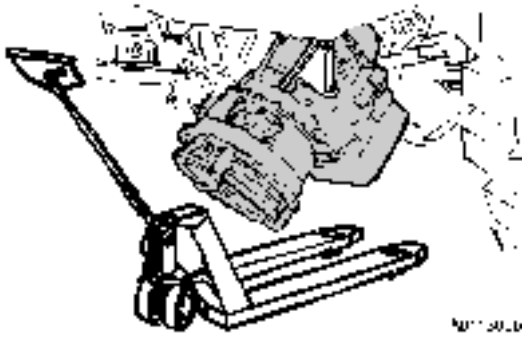

Figure 26

48. Lower the transmission and tilt it up to horizontal position before lowering it onto the pallet truck.

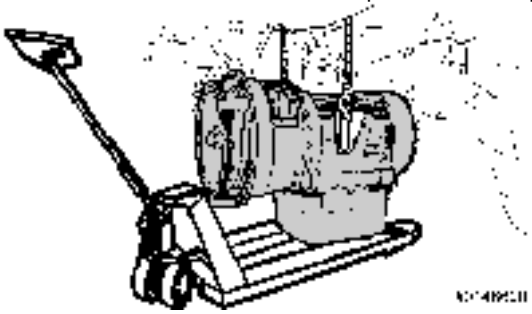

Figure 27

49. Pull out the transmission.

50. Remove the retarder valve.

VOLVO
Construction Equipment

Service Information

Document Title: **Transmission, installing from underneath**	Function Group: **421**	Information Type: **Service Information**	Date: **2014/8/22**
Profile: **ART, A35D [GB]**			

Transmission, installing from underneath

Op nbr 43776-1

11668020 Transport brace
9993590 Gear wheel
9993681 Bracket right
9993682 Bracket left
11668015 Lifting tool

NOTICE

When changing transmission, the retarder valve and oil filter should be used from the replacement transmission. Maintain greatest possible cleanliness when removing the main oil filter with bracket and the retarder valve. Protect required surfaces with, for example, plastic film (plastic wrap) and plug all connections.

1. Connect the hoses (4 pcs) to the retarder valve.
   NOTE!
   Leave the hoses loose on the valve so that its position remains adjustable.

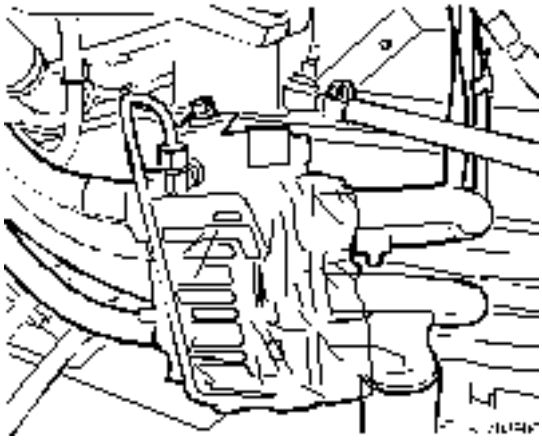

Figure 1

2. Suspend the retarder valve on one side and secure with two straps.
3. Install bracket right **9993681** and bracket left **9993682** on the transmission.
4. Install the transport braces **11668020**.
   NOTE!
   It is important to secure the torque converter adequately as it could otherwise slide out of position and be damaged.
5. Move the transmission in underneath machine.
6. Hoist the transmission into a vertical position.

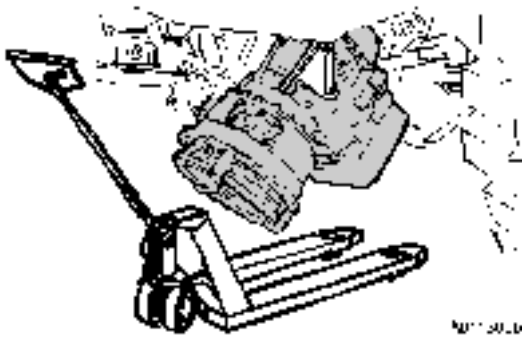

Figure 2

7. Tilt the transmission to horizontal position.

8. Install the guide pin (**M12**) in the torque converter and remove the transport braces.

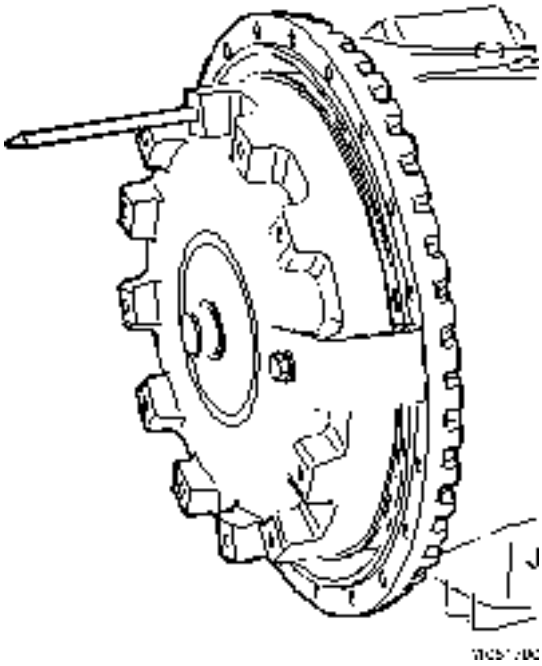

Figure 3

9. Move the transmission and the flywheel housing together.
   NOTE!
   Use the guide pin by inserting it through the drive disc and the lowest hole for the protecting covers on the flywheel housing.

10. Tighten the bolted joint between the transmission and the flywheel housing.
    Tightening torque: **85 Nm (62.7 lbf ft)**.

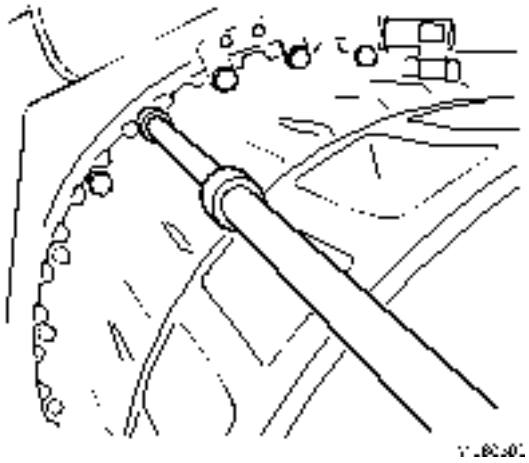

Figure 4

11. Remove lifting tool **11668015** and the ratchet blocks.

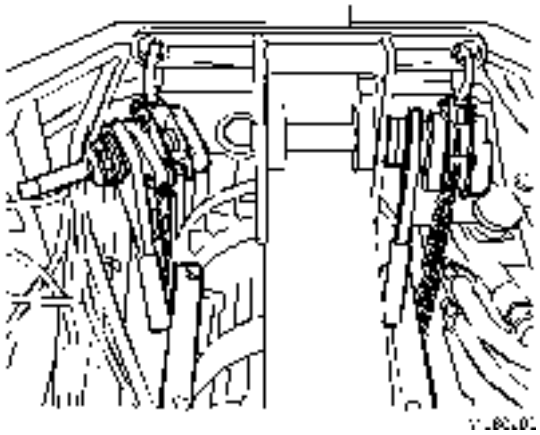

Figure 5

12. Remove brackets **9993681** and **9993682** from the transmission.

13. Install the propeller shaft and slacken the ratchet block for the dropbox.

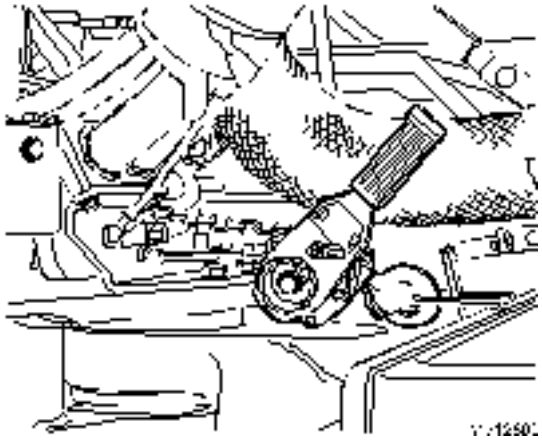

Figure 6

14. Tighten the bolted joint between the propeller shaft and the transmission.
    Tightening torque: **180 Nm (133 lbf ft)**

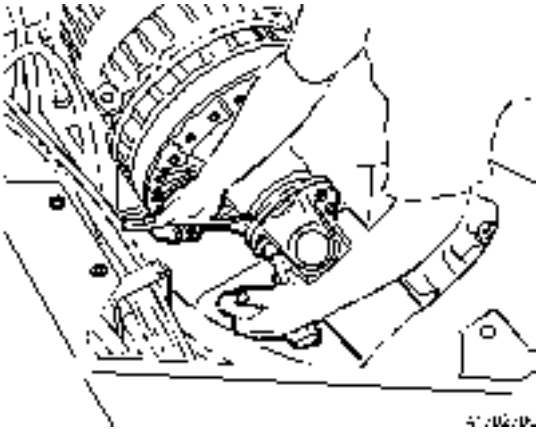

Figure 7

15. Install the bracket for the plate heat exchanger.
    Tightening torque **M12**: **85 Nm (62.7 lbf ft)**
    Tightening torque **M10**: **50 Nm (36.9 lbf ft)**

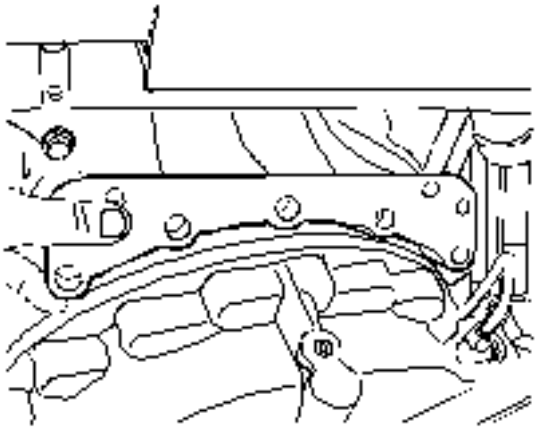

Figure 8

16. Install the breather hose for the transmission.

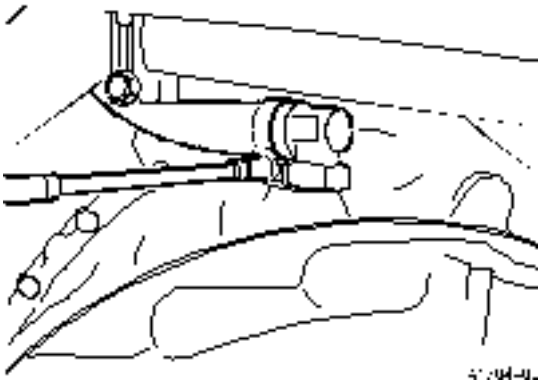

Figure 9

17. Install the oil filter on the transmission.
    Tightening torque: **20 Nm (14.8 lbf ft)**
    NOTE!
    Make sure that the gasket remains in position and that the protective film has been removed.

18. Install the Cannon connector plug to the connector socket (EH) and the clamp.

19. Install the retarder valve on the transmission and tighten the hoses.
    Tightening torque: **20 Nm (14.8 lbf ft)**
    NOTE!
    Check that the gasket is not damaged and that the protective film has been removed.

20. Connect the retarder valve return oil pipe.
    NOTE!
    Check the O-ring.

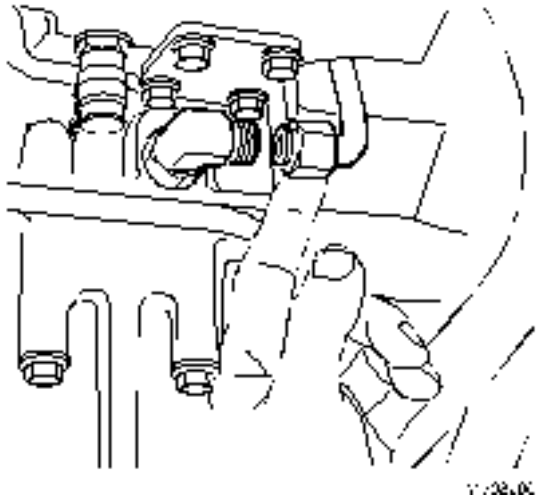

Figure 10

21. Connect the oil filler hose and the hose for the oil dipstick.

Figure 11

22. Install and tighten the bolted joint between the drive disc and the transmission torque converter.
    Use gear wheel **9993590** to rotate the crankshaft. Rotate the crankshaft so that two bolts can be installed at a time.
    Tightening torque: **91 Nm (67.1 lbf ft)**

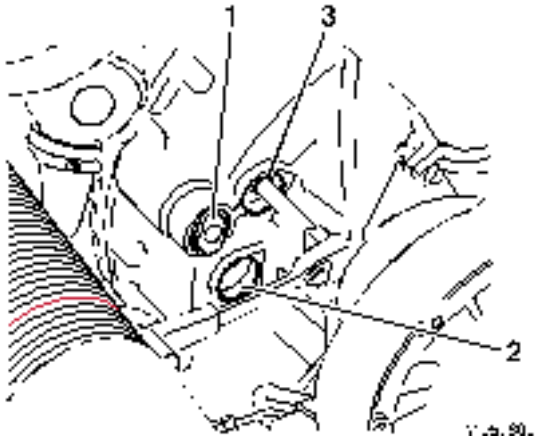

Figure 12

1. Rotating crankshaft.
   The gear wheel **9993590** is positioned in the hole in the flywheel housing. Use a standard ratchet handle that, when necessary, can be combined with an extension piece from a 1/2" socket set.
2. Flywheel graduation.
3. Removing and installing bolted joint drive disc – torque converter.

NOTE!
To prevent the drive disc from turning, install all bolts before torque-tightening them.

23. Check the gaskets and replace when necessary.
    Install the protecting covers.

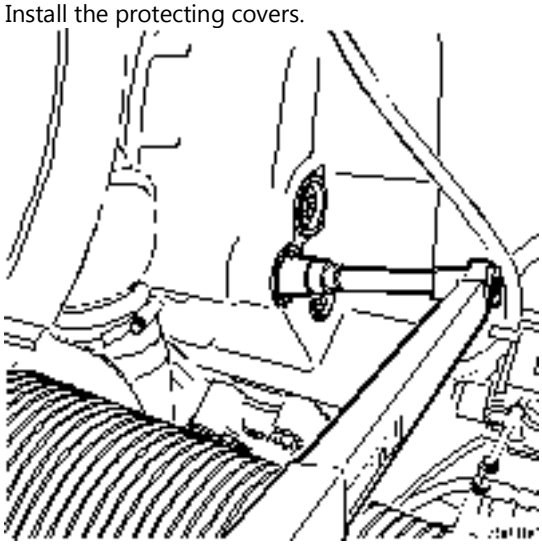

Figure 13

24. Connect the inlet hose to the turbocharger.
    NOTE!
    Check that plastic bags (sheets) and protective film have been removed and that hoses and connections are free from contaminants.

Thank you so much for reading.

Please click the “Buy Now!” button below to download the complete manual.

After you pay.

You can download the most perfect and complete manual in the world immediately.

Our support email:

ebooklibonline@outlook.com