

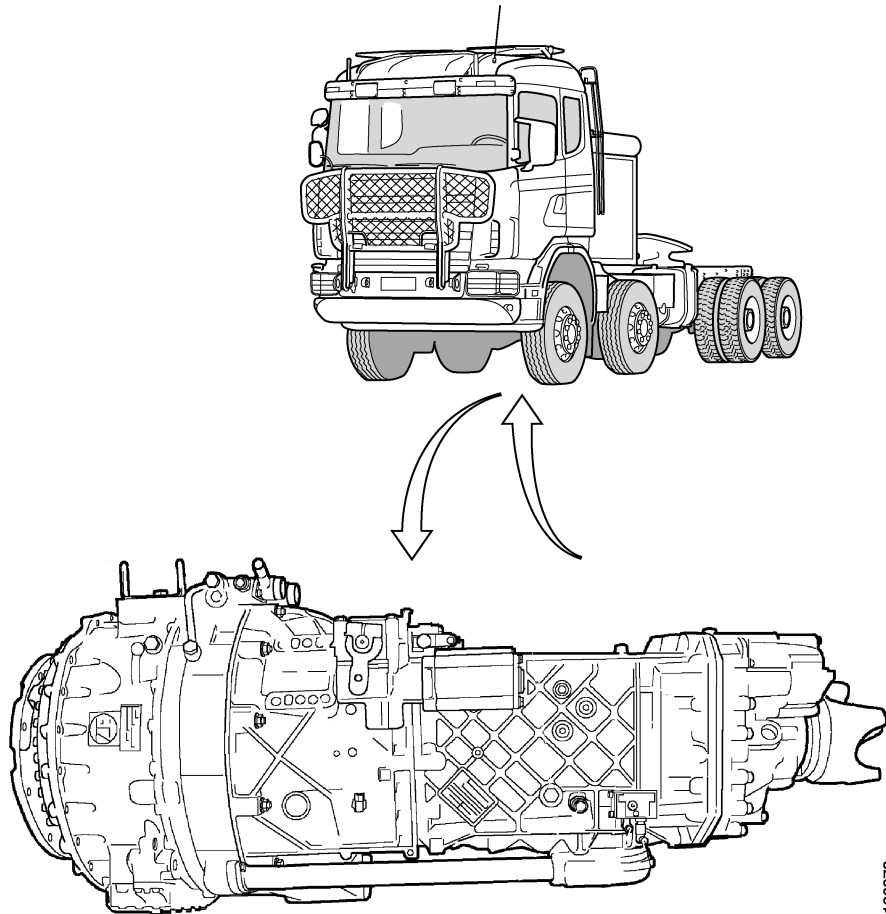
SCANIA

05:09-02

Issue 2 en

ZF Transmatic Gearbox

Removing and fitting



126973

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Work description

Safety



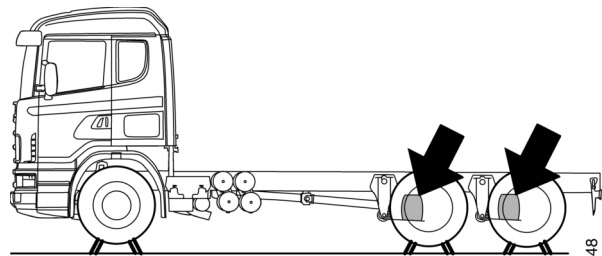
WARNING!

Never work under a vehicle supported by jacks only. Use axle stands.



WARNING!

Empty the air bellows on vehicles with air suspension before starting work.



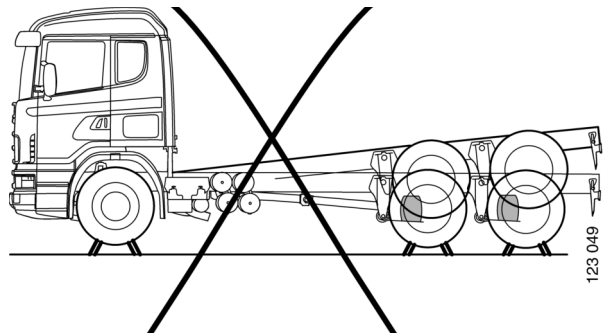
123 048

Never alter the height between the frame and the axles, e.g. by filling the air bellows, when the truck is supported on stands.



WARNING!

Wear eye protection and goggles. Fluids, oil and greases which are detrimental to health can cause personal injury if they come into contact with the skin or eyes.



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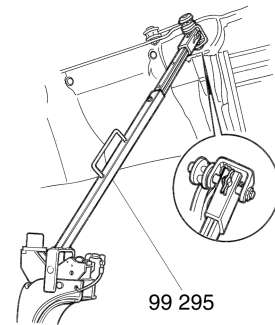
Tilting the cab



WARNING!

Do not work under a cab tilted to the intermediate position. Always tilt the cab fully. Do not stand in front of or behind the cab during tilting.

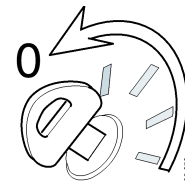
Secure the cab with cab support 99 295 during all work under the cab.



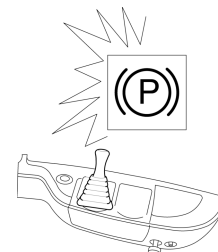
Check that there are no loose objects in the cab when tilting it.

IMPORTANT! When tilting the cab, ensure that:

1 The engine is switched off.



2 The parking brake is applied.



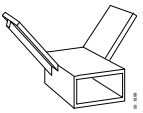
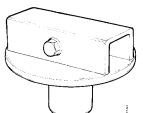
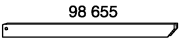
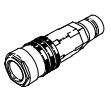
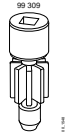
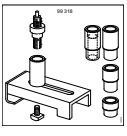


3 The gearbox is in neutral.

Note: Check that the gearbox is still in neutral after tilting. There is a risk that a gear could be engaged when tilting the cab.

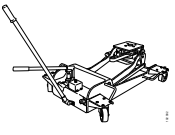
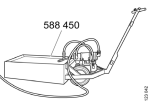


Tools

Special tools

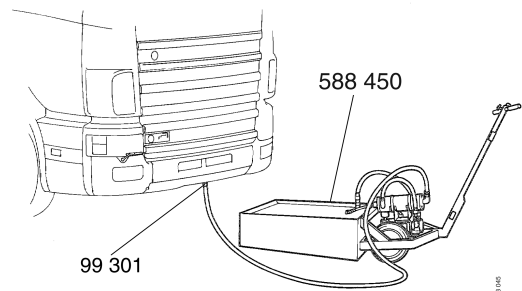
Number	Designation	Illustration	Tool board
98 401	V block		-
98 405-2	Fixture bracket x 2		-
98 655	Fixture beam		-
99 301	Adapter		D5
99 309	Turning tool		D5
99 318	Engine support		D5
2 377 964	Completing kit for engine support kit		D5
99 424	Fixture		-

Other tools

Number	Designation	Illustration	Tool board
587 313	Gearbox jack		-
588 450	Coolant tank		-

Removal

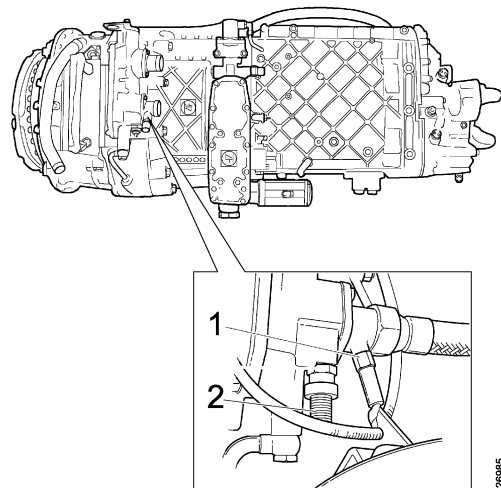
- 1 Drain cooling system using adapter 99 301 and coolant tank 588 450.



- 2 Remove any noise shields under the engine and gearbox. Refer to Workshop Manual main group 18, Noise shields.
- 3 Disconnect all power sources from the vehicle.

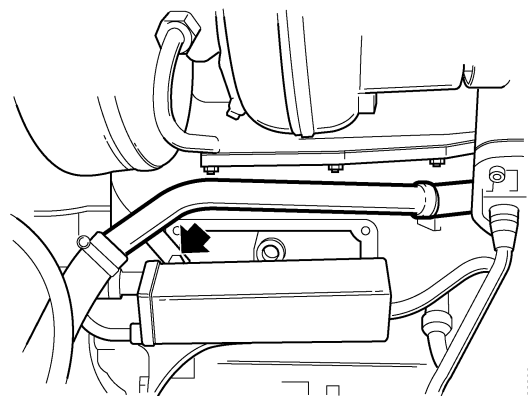
Working from above

- 1 Remove the ZF sensor and connector for T1011.



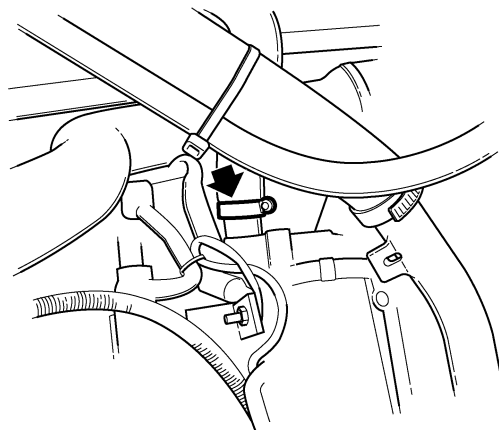
- 1 *ZF sensor*
- 2 *Connector for T1011*

- 2 Remove the water pipe bolt.



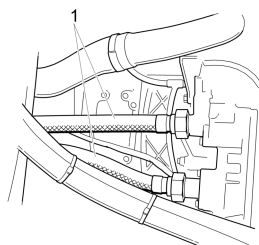
3 Remove the oil filler hose.

Note: Cover the hole to prevent dirt from penetrating.



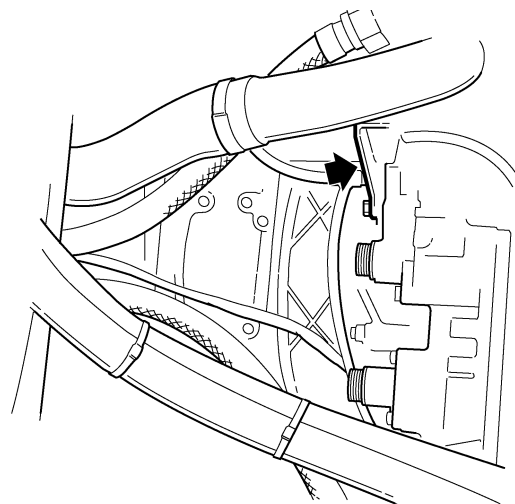
4 Detach the two oil hoses from the gearbox and bend them to one side.

Note: Mark the hoses so that they will not be mixed up when fitting.

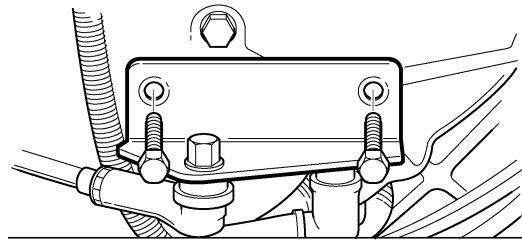


1 Oil hose

5 Remove the water pipe bracket.



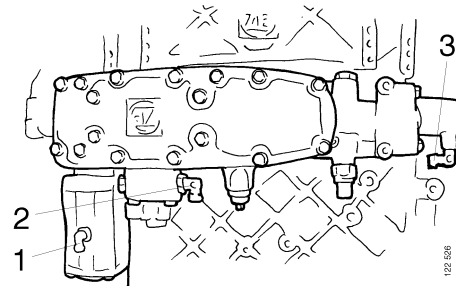
- 6 Detach the torque rod bracket from the gearbox.



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- 7 Remove the gearshift servo air lines, neutral position valve and gate interlock.

Note: Mark the air lines so that they will not be mixed up when fitting.

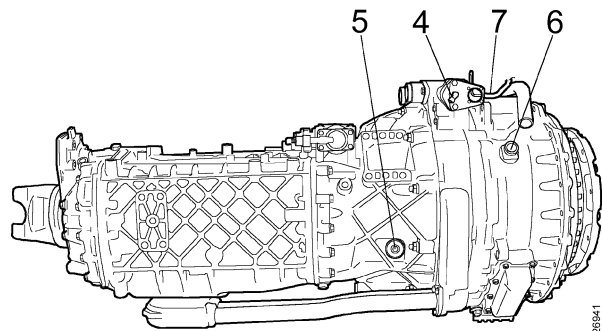


126 596

- 1 Gearshift servo
- 2 Neutral position valve
- 3 Gate interlock

- 8 Remove the proportional valve air lines, inductive sensor for N.turbine and ZVK switch.

Note: Mark the air lines so that they will not be mixed up when fitting.



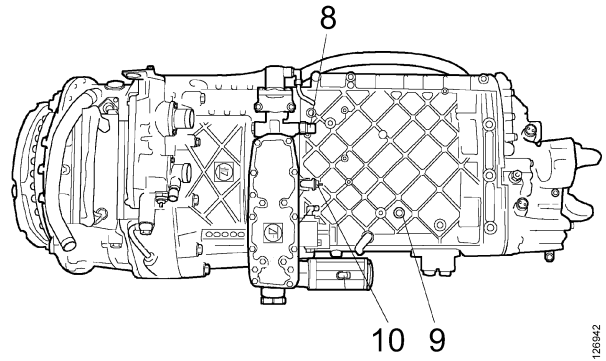
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- 9 Disassemble the cable harness.

- 4 Proportional valve
- 5 Inductive sensor for N.turbine
- 6 ZVK switch
- 7 Cable harness

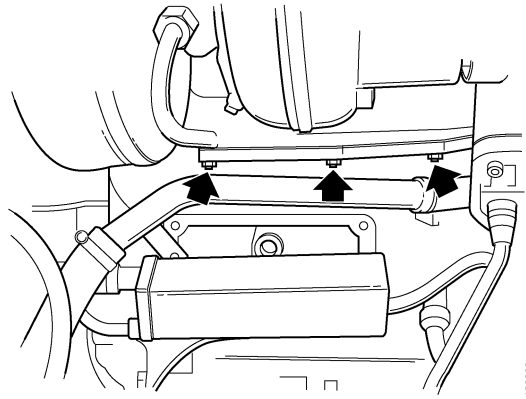
- 10 Remove the air lines for the reversing light switches and the neutral position sensor.

Note: Mark the air lines so that they will not be mixed up when fitting.



- 8 Reversing light switch
- 9 Reversing light switch
- 10 Neutral position sensor

- 11 Remove the nuts securing the gearbox to the engine on the upper side.



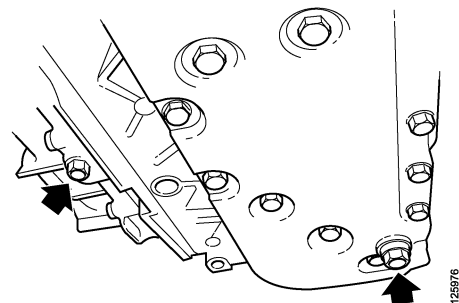
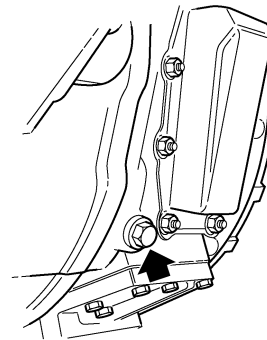
Working from below



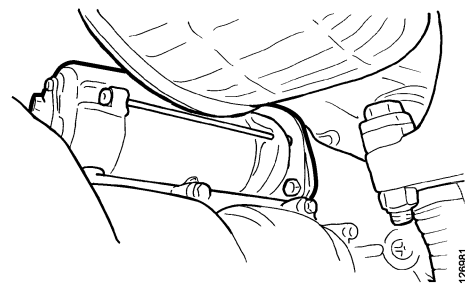
WARNING!

Beware of hot oil. Wear eye protection and goggles.

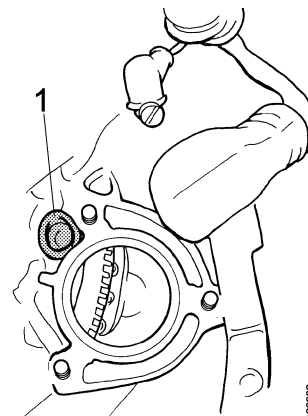
- 1 Drain the gearbox oil through the three oil plugs.



- 2 Remove the starter motor. Refer to Workshop Manual main group 16, Starter motor.

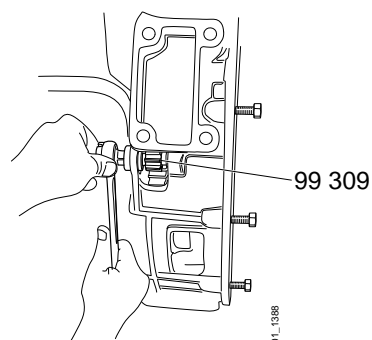


- 3 Remove the rubber plug.



1 Rubber plug

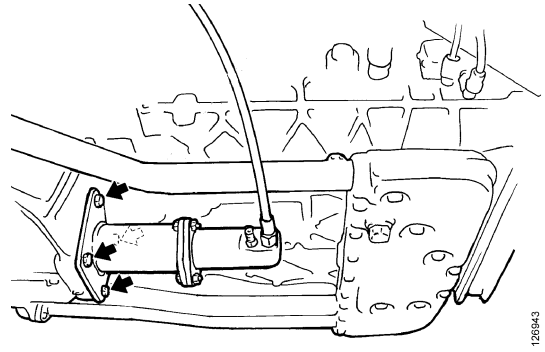
- 4 Remove the ten bolts, which secure the torque converter to the flywheel, through the hole behind the rubber plug. Use turning tool 99 309 to turn the motor so that the bolts can be accessed.



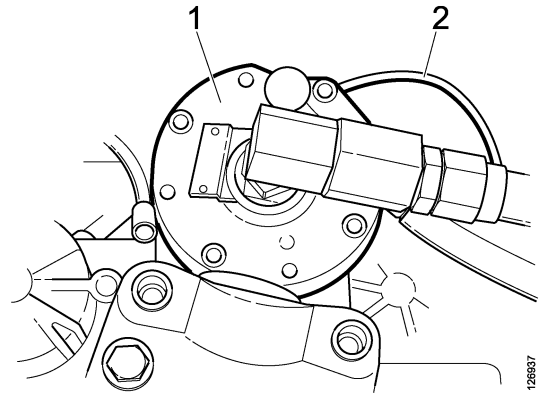
- 5 Completely remove the propeller shaft.

- 6 Remove the bolts, detach the clutch slave cylinder and place it to one side.

IMPORTANT! Do not pinch off the hose. The hose may suffer permanent damage.



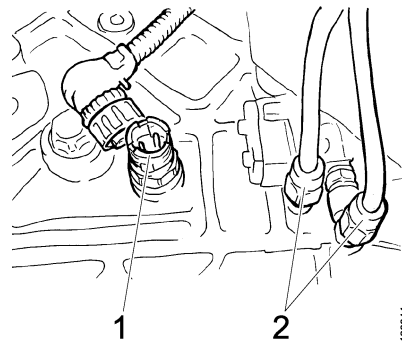
- 7 Undo the hydraulic pump at the rear of the gearbox, if the vehicle is equipped with a hydraulic pump, and place it to one side.
- 8 Remove the speedometer cable.



- 1 Hydraulic pump
- 2 Speedometer cable

- 9 Remove the connector and the air connections for the split valve.

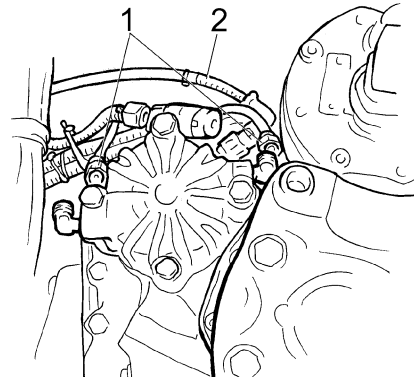
Note: Mark the air connections so that they will not be mixed up when fitting.



- 1 Split valve connector
- 2 Air connections

- 10 Remove the connector and the air connections for the range valve.

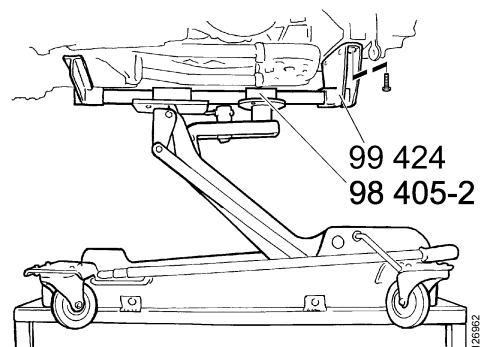
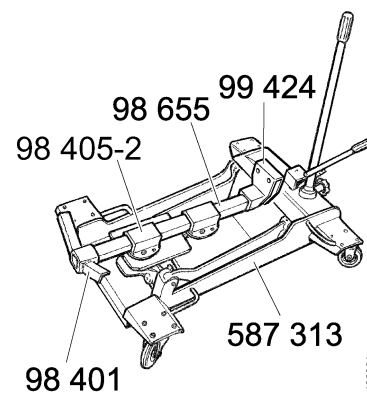
Note: Mark the air connections so that they will not be mixed up when fitting.



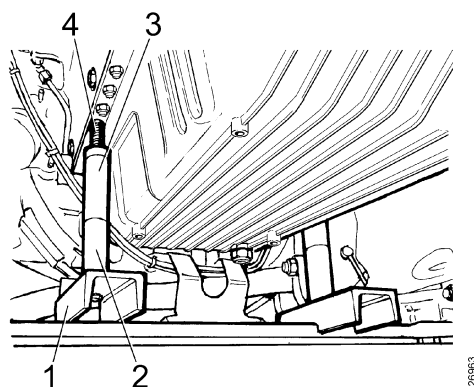
- 1 Air connections
- 2 Range valve connector

Supporting the engine

- 1 Fasten gearbox jack 587 313 using the appropriate fixtures in the gearbox. Screw the rear bracket 99 424 on to the gearbox. The rear fixture bracket 98 405-2 is a support for the fixture beam.



- 2 Secure engine support 99 318 or 2 377 964 on the front axle beam.
- 3 Fit the spacing sleeve if necessary. Do not tighten the nuts.
- 4 Remove two bolts on the oil sump. Select the bolts so that the intermediate sleeve ends up behind the centre of the front axle.
- 5 Adjust with intermediate sleeves so that the threaded adjusting device dowels can be fitted into the bolt holes.

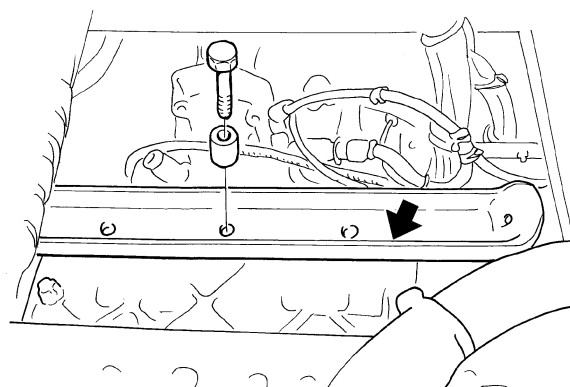


- 1 *Engine support*
- 2 *Spacing sleeve*
- 3 *Intermediate sleeve*
- 4 *Adjusting device*

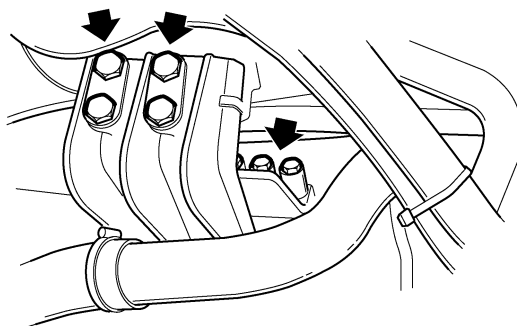
- 6 Adjust the position of the sleeves so that they are as straight as possible. Tighten the nuts on the lowest spacing sleeve.
- 7 Adjust the adjusting device so that the support reaches the bottom of the oil sump.

IMPORTANT! Never alter the distance between the front axle beam and frame, e.g. by raising the air suspension. There is a risk that the engine will drop.

- 8 Raise the gearbox to relieve the pressure. Detach the rear upper gearbox bracket from the gearbox. Leave the gearbox bracket on the vehicle.

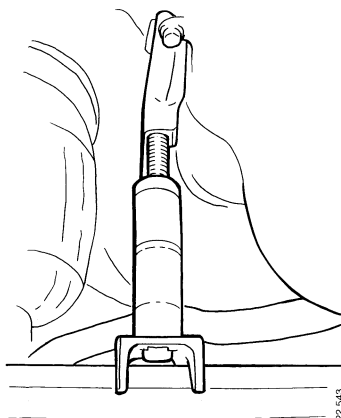


- 9 Remove the front gearbox brackets.



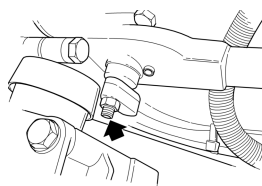
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- 10 Lower the engine and gearbox onto the engine support.



122 543

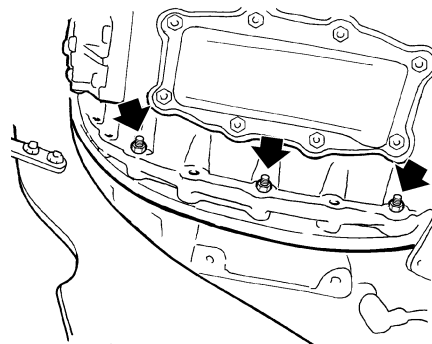
- 11 Remove the gear control on the gearbox.
Use a Torx wrench as a counterhold.



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Hole for Torx wrench

- 12 Remove the remaining nuts on the underside of the clutch housing.



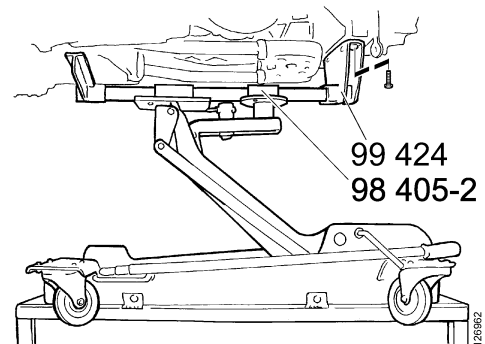
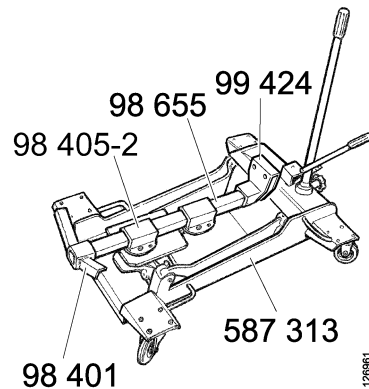
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- 13 Lower the gearbox and pull it out. Make sure that hoses and pipes come free.

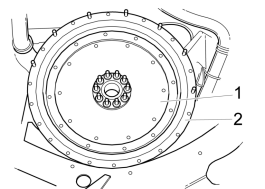
Fitting

Working from below

- 1 Fasten gearbox jack 587 313 using the appropriate fixtures in the gearbox. Screw the rear bracket 99 424 on to the gearbox. The rear fixture bracket 98 405-2 is a support for the fixture beam.

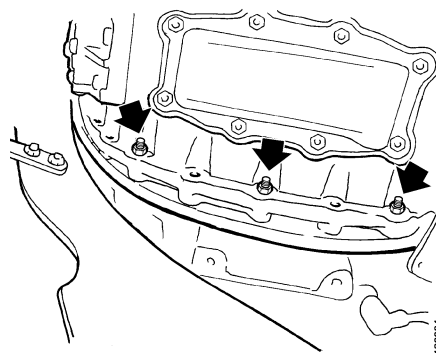


- 2 Lubricate the adapter ring and studs with anti-corrosive oil. Fit the adapter ring on the engine.

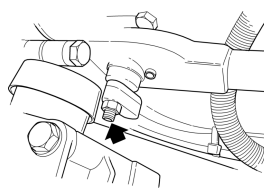


- 1 Flex plate
- 2 Adapter ring

- 3 Fit the gearbox. Check that the torque converter is correctly positioned against the flex ring so that the screw holes are aligned.
- 4 Tighten the nuts on the underside of the clutch housing.

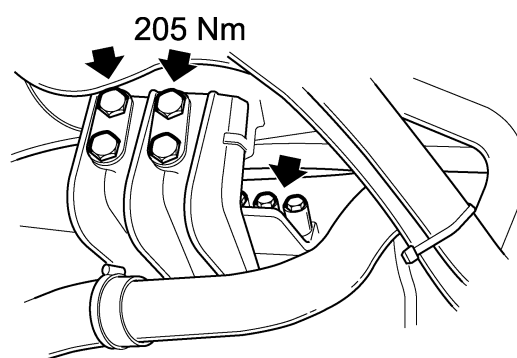


- 5 Fit the gear control. Use a Torx wrench to hold the gear control in position.

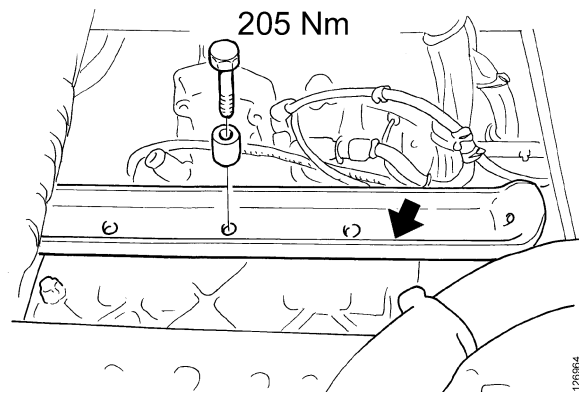


Hole for Torx wrench

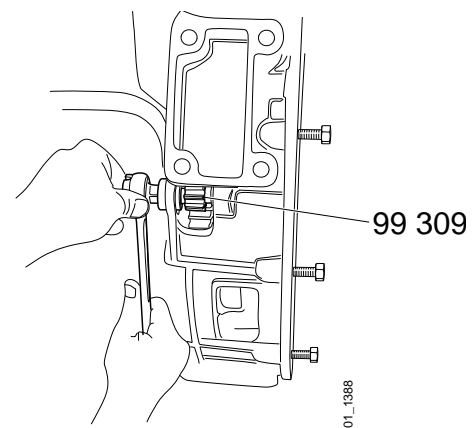
- 6 Raise the engine and gearbox. Fit the front gearbox brackets. Torque tighten the bolts to 205 Nm.



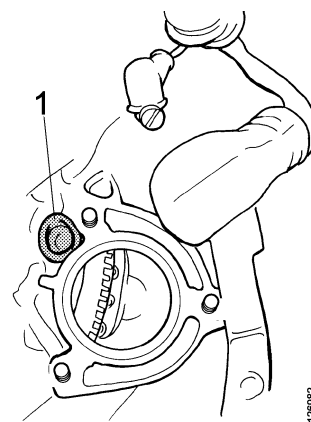
- 7 Fit the rear gearbox bracket. Tightening torque 205 Nm.



- 8 Remove the engine support and refit the oil sump bolts. Tightening torque 32 Nm.
- 9 Remove the gearbox jack.
- 10 Screw the torque converter on to the flex plate with ten bolts. Turn the engine using turning tool 99 309. Tightening torque 83 Nm.



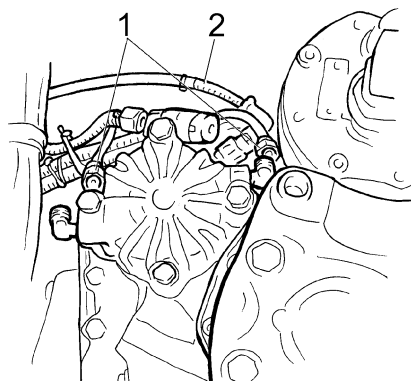
- 11 Fit the rubber plug and starter motor. Refer to Workshop Manual main group 16, Starter motor.



1 Rubber plug

- 12 Fit the connector and the air connections for the range valve.

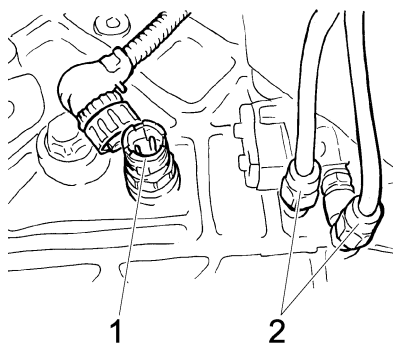
Note: Do not mix up the air connections.



- 1 Air connections
2 Range valve connector

- 13 Fit the connector and the air connections for the split valve.

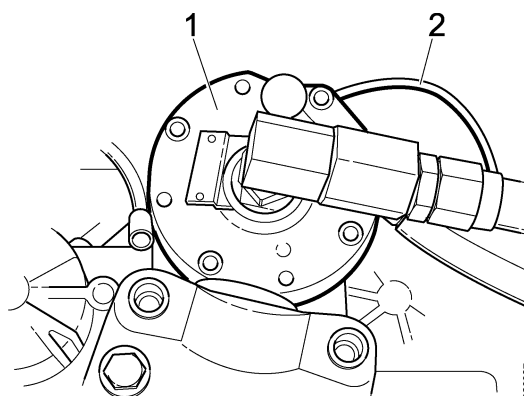
Note: Do not mix up the air connections.



- 1 Split valve connector
2 Air connections

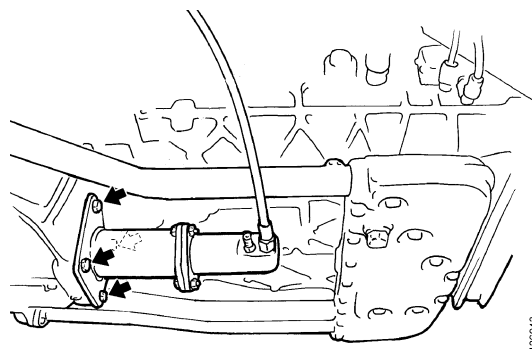
- 14 Fit the hydraulic pump at the rear of the gearbox, if the vehicle is equipped with a hydraulic pump.

- 15 Fit the speedometer cable.



- 1 Hydraulic pump
2 Speedometer cable

16 Fit the clutch cylinder.

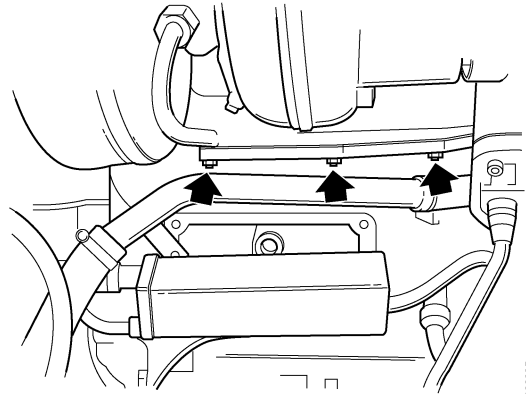


17 Fit the propeller shaft. Refer to Workshop Manual main group 6, Propeller and intermediate shafts.

18 Lubricate the bearing positions.

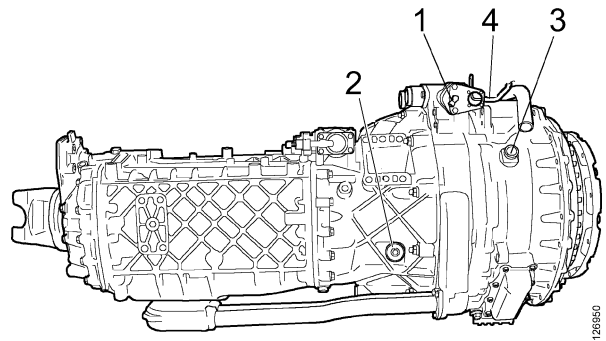
Working from above

- 1 Fit the remaining nuts securing the gearbox to the engine.



- 2 Fit the cable harness.
- 3 Fit the proportional valve air connections, inductive sensor for N.turbine and ZVK switch.

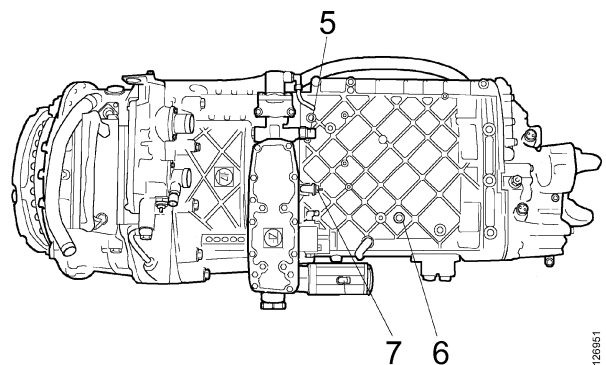
Note: Do not mix up the air connections.



- 1 *Proportional valve*
- 2 *Inductive sensor for N.turbine*
- 3 *ZVK switch*
- 4 *Cable cluster*

- 4 Fit the air connections for the reversing light switches and the neutral position sensor.

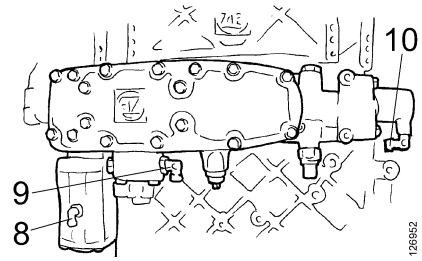
Note: Do not mix up the air connections.



- 5 *Reversing light switch*
- 6 *Reversing light switch*
- 7 *Neutral position sensor*

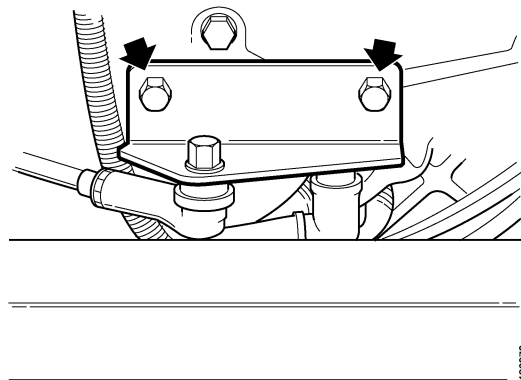
- 5 Fit the gearshift servo air connections, neutral position valve and gate interlock.

Note: Do not mix up the air connections.



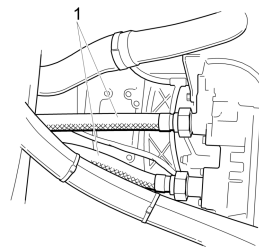
- 8 Gearshift servo
9 Neutral position valves
10 Gate interlock

- 6 Fit the bracket with torque rod for gear control.



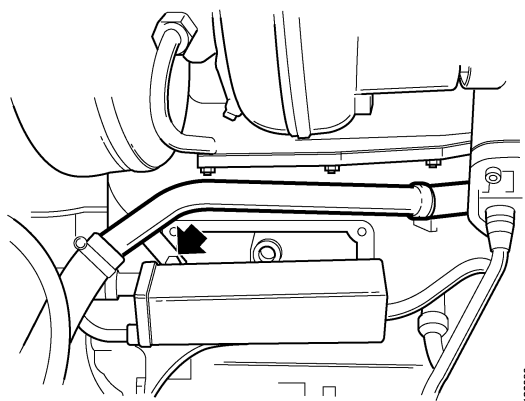
- 7 Fit the two oil hoses on to the gearbox.

Note: Make sure the right-hand hose goes on the right-hand oil cooler and the left-hand hose goes on the left-hand oil cooler.

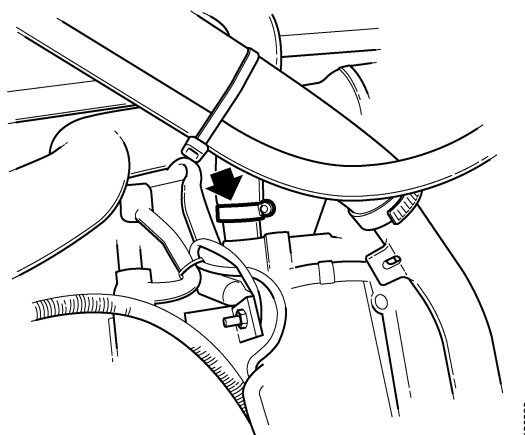


- 1 Oil hose

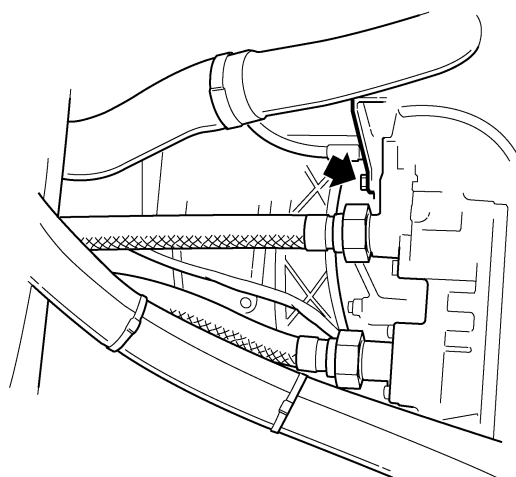
8 Fit the water pipe screw.



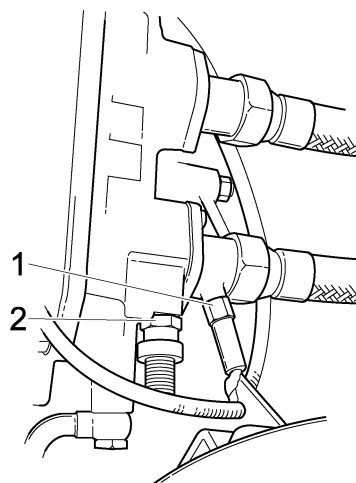
9 Fit the oil filler hose.



10 Fit the water pipe bracket.



11 Fit the ZF sensor and connector for T1011.



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- 1 ZF sensor
2 T1011

12 Top up the gearbox with oil. For oil grade, refer to Workshop Manual main group 0, Fuel, lubricants and fluids.

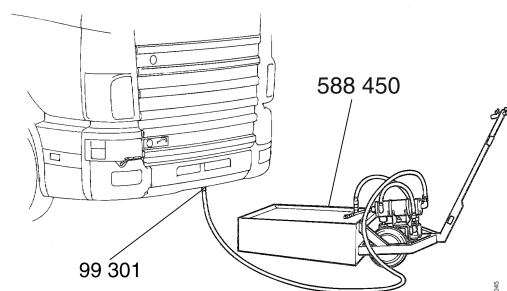
IMPORTANT! Top up before starting the engine, otherwise there is a risk of engine failure. The level is checked later.



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13 Tilt the cab back and connect the batteries.

14 Refill the cooling system with coolant using coolant tank 588 450 and adapter 99 301. When the cooling system is full, start the engine and leave it running for a few minutes. Then top up.



127105

- 15 Check the oil level in the gearbox. Refer to Workshop Manual main group 5, Manual gearbox with torque converter, ZF, Checking the oil level.
- 16 Fit the noise shields under the engine and gearbox. Refer to Workshop Manual main group 18, Noise shields.
- 17 Remove the stands beneath the vehicle.

Specifications

Tightening torques

Bolts for front gearbox bracket	205 Nm
Bolts for rear gearbox bracket	205 Nm
Bolts for oil sump	32 Nm
Torque converter bolts	90 Nm