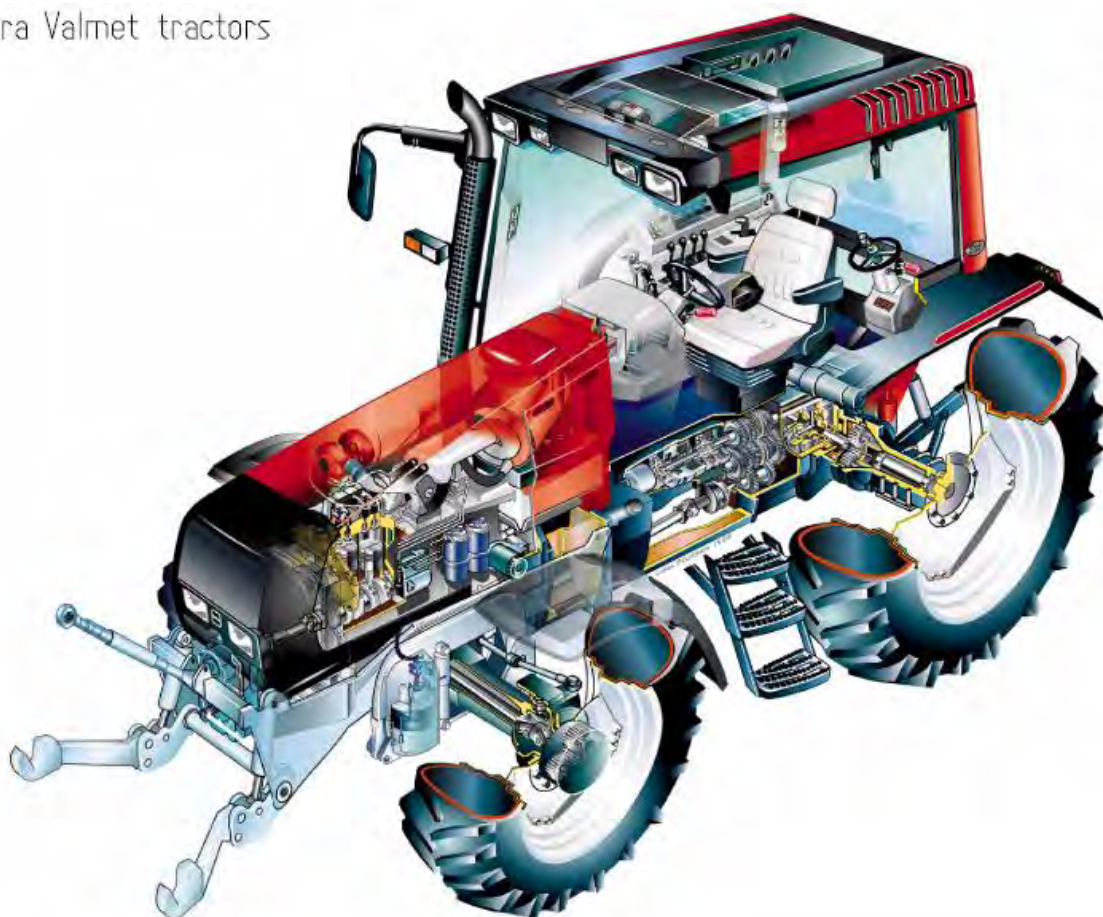


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WORKSHOP MANUAL

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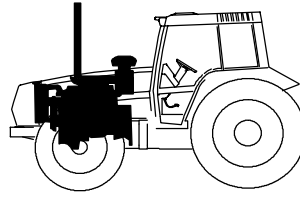
Service Manual Tractors

Groups 10–100

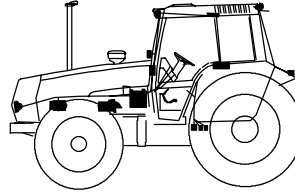
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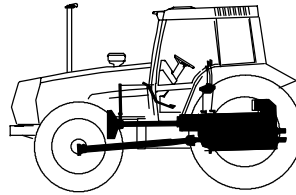
10 General



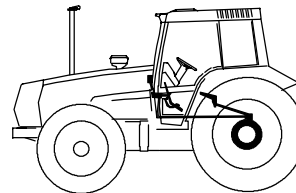
20 Engine



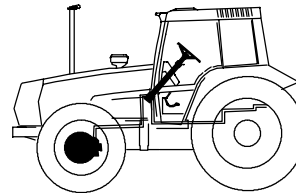
30 Electrical system



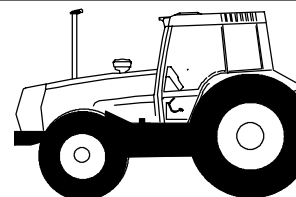
40 Power transmission



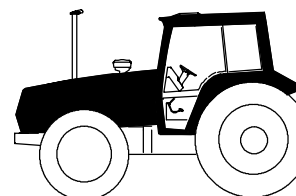
50 Brake system



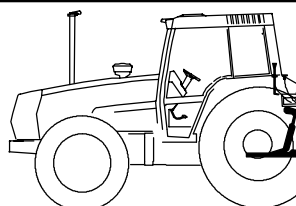
60 Steering system and Front axle



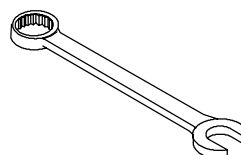
70 Frame and Wheels



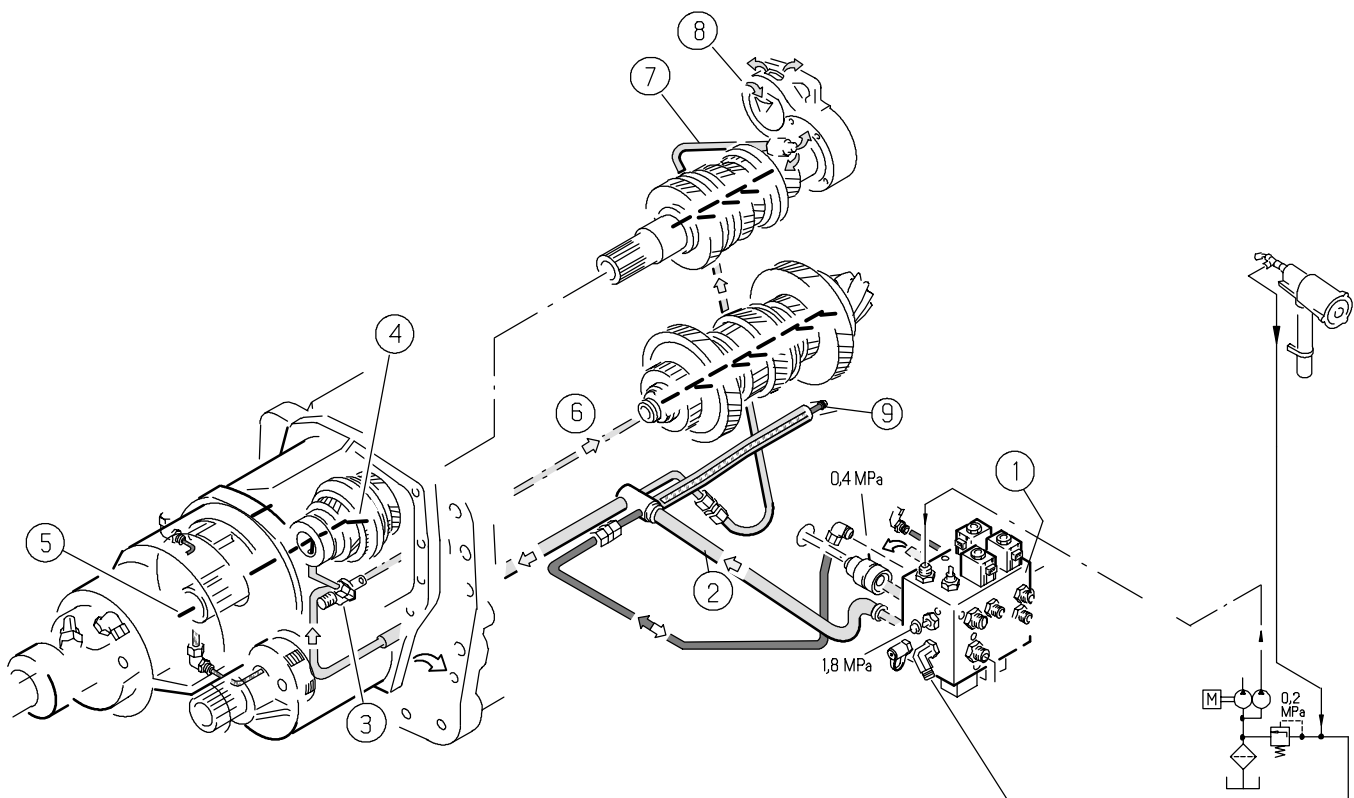
80 Cab and Shields



90 Hydraulics



100 Tools



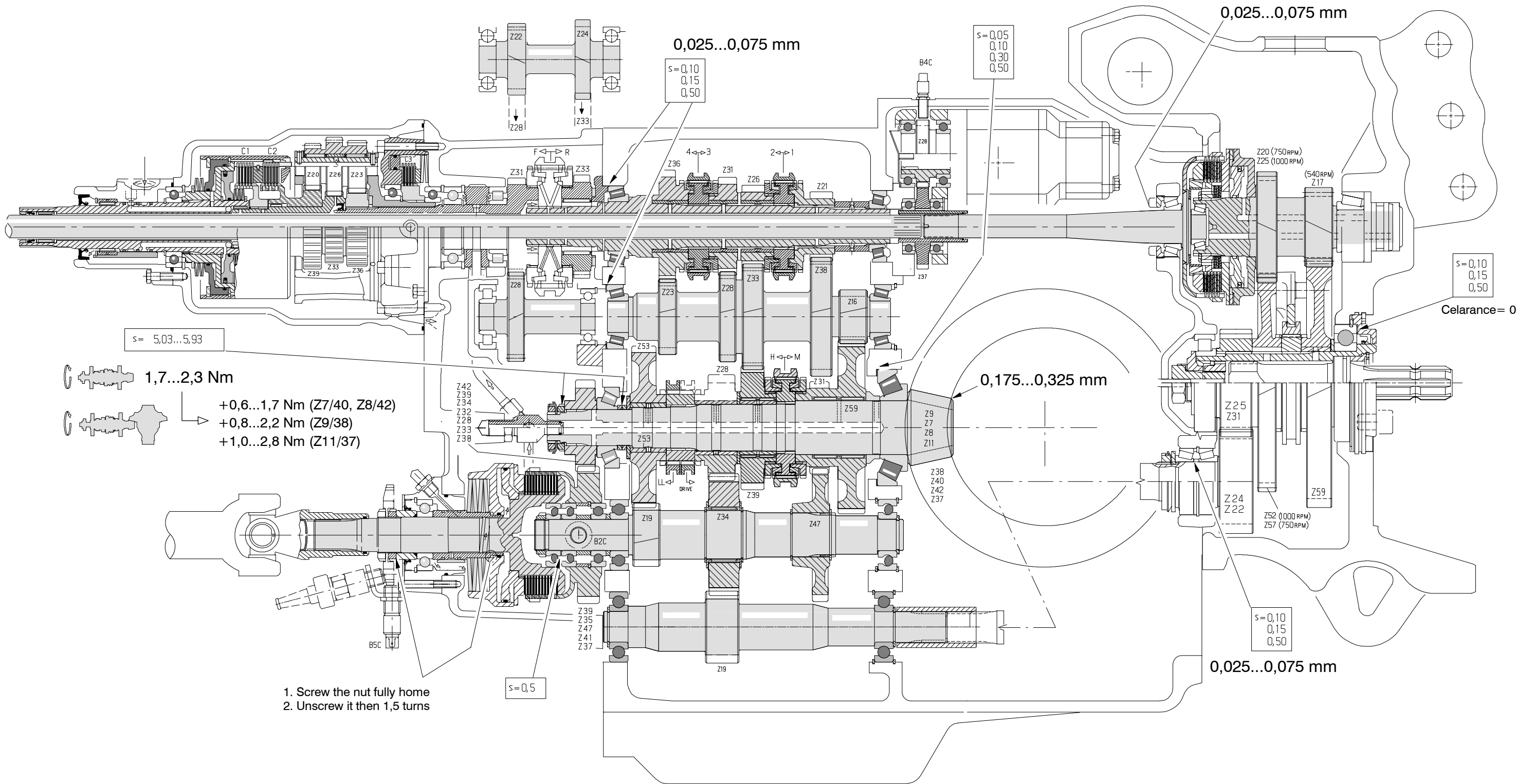
Picture 23. Lubricating system of power transmission on tractors which have 3–step quick–shift gear (Delta Powershift), **660071**–.

1. Servo valve block, **660071**–
2. Lubricating oil supply pipe
3. Distribution piece inside the reverse shuttle housing
4. Lubricatin oil of reverse shuttle
5. Lubricating oil of Delta Powershift
6. Lubricating oil to bevel pinion shaft
7. Lubricating oil to gearbox input shaft
8. Lubricating oil of pump drive mechanism
9. Lubricating oil to power take–off

Working order

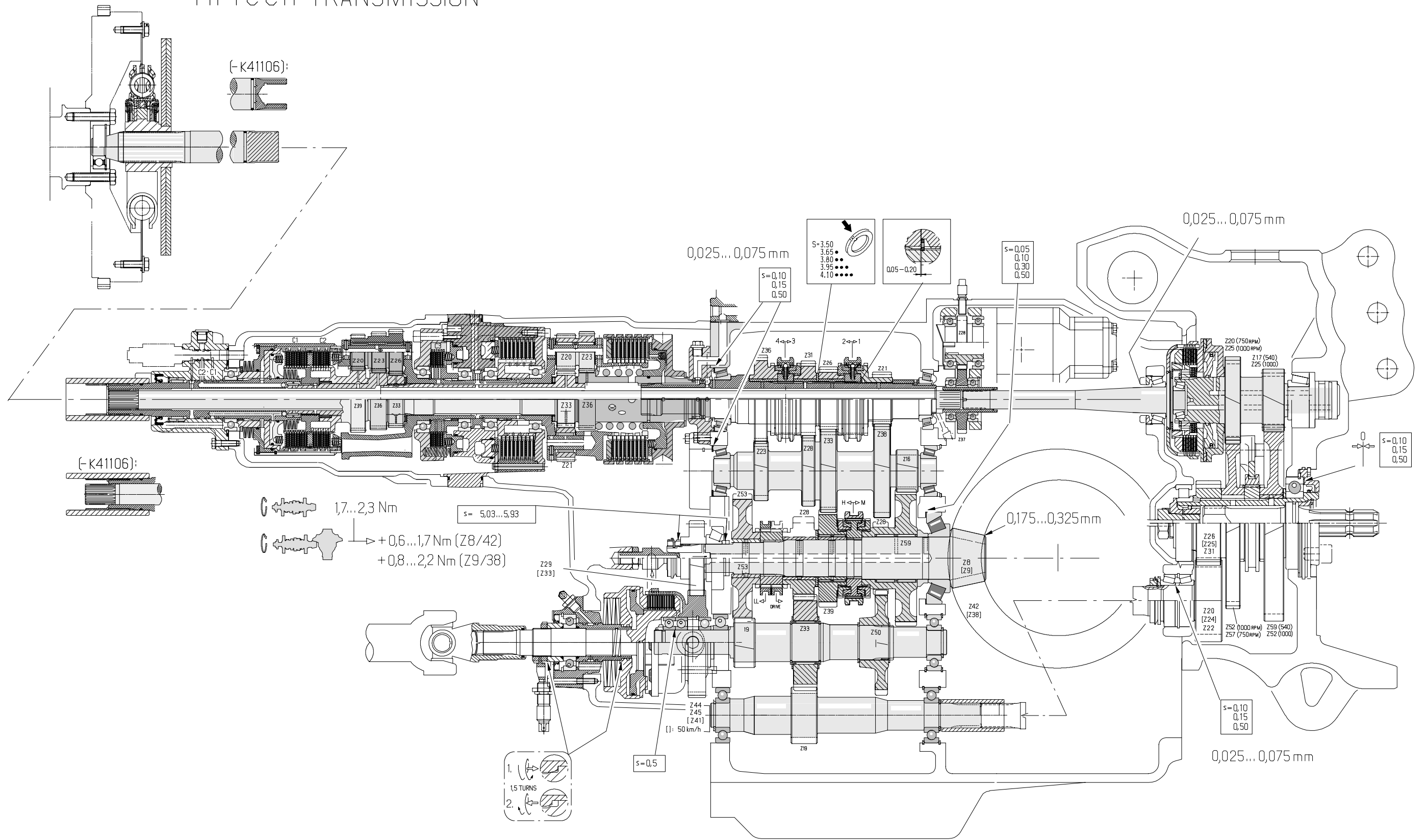
In the table below is shown the working orders for certain gearbox repair work. Reconditioning selector forks, see code 421. Removing, reconditioning and fitting gearbox, see code 423.

	Drain transmission oil	Remove side cover	Raise front and tractor between gearbox – fuel tank	Raise cab side and split tractor between gearbox – fuel tank	Remove PTO unit	Raise rear and tractor between gearbox – fuel tank	Remove quick – shift gear and reverse shuttle	Remove final drives/ brake housings	Remove differential	Remove selector forks	Remove ground speed shaft (optional)	Remove bevel pinion shaft and transmission shaft
Adjusting selector forks for gears 1 – 2, 3 – 4 and M – H	1	2										
Adjusting selector forks for range LL and PTO (optional)	1	2	3				4					
Changing selector forks	1	2	3				4					
Changing selector levers	1	2										
Reconditioning differential	1				2			4	5			
Changing bevel pinion shaft/ crown wheel	1	7			2			5	6	8	9	
Changing synchronizing rings on input shaft	1	7			2	3	4	5	6	8	9	10



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Hi Tech TRANSMISSION



42. Gearbox	X	Model	Code	Page
	8. 11. 1990	6000–8750	421	1

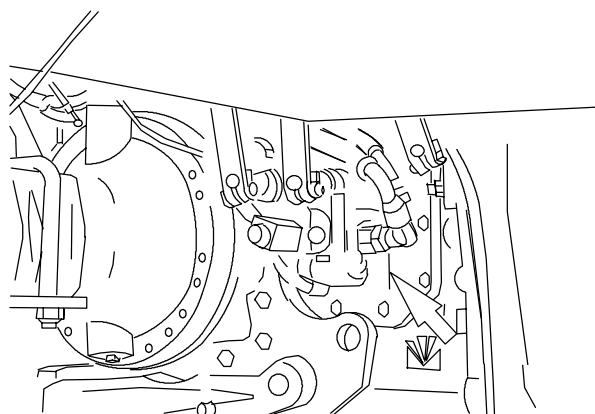
Selector forks (Op. no. 421)

1. Adjusting selector forks

Note! If the gear change mechanism does not function properly (e.g. if selected gear does not stay in the engaged position), the selector forks can be adjusted as follows:

A. Removing side cover

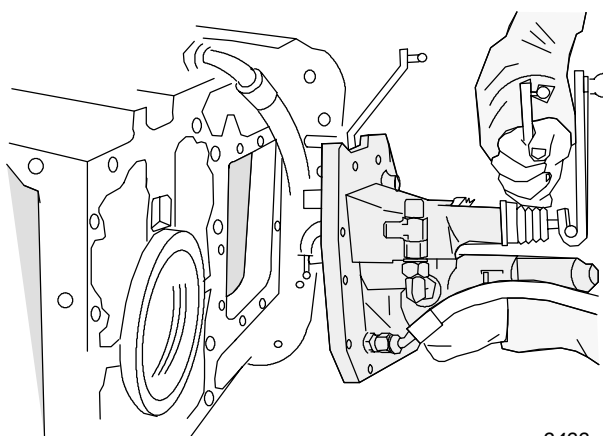
1. Drain the oil from the gearbox. Remove the RH side rear wheel. Move the gear levers to the neutral position.



2. Disconnect oil hoses from the hydraulic power lift control valve. Disconnect the return oil hose from the side cover.

3. Disconnect the shifter rod rear ends and the cable wires from the shifter levers on the side cover.

Note! There is an access hole on the RH side mudguard.

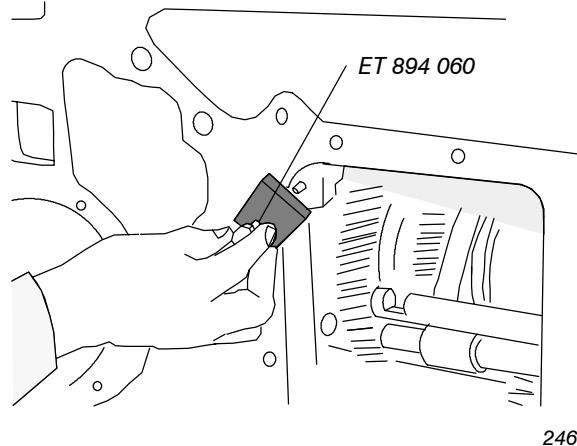


4. Unscrew the side cover bolts and remove the cover. At the same time the selector fork rail locking pins (3 pcs) are released.

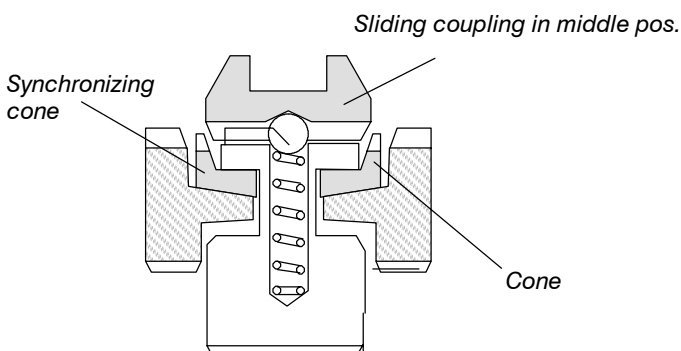
B. Adjusting selector forks

5. Fit the locking balls, springs and pins into their holes.

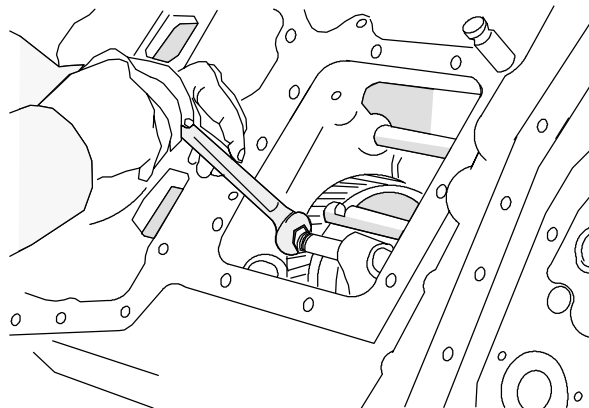
Note! The longer pins into the two upper holes and the shortest pin into the lowest hole.



5. Press the upper pin (for gears 1–2) into its drilling with tool ET 894 060.



6. Move the selector fork (and rail) for gears 1–2 to the middle position. Adjust the fork to the middle position by screwing the adjusting piece at the rear end of the selector fork rail.



7. When the fork (and the sliding coupling) is in the middle position, push the selector rail/fork to the rear position (it is locked by the ball) and tighten the adjusting piece nut (prevent rotation of the adjusting piece while tightening).

42 Gearbox	1. 1. 1995	Model	Code	Page
	15. 5. 1996	6000–8750	421	2

8. Take the hold of the rail and move it. It must move loosely.
9. Then push the rail (together with the fork) to the front position. Move the rail again. It must move loosely.
10. Adjust if necessary and finally tighten the adjusting piece nut.
11. In the same way adjust the selector fork for gears 3–4.

Note! Selector fork for gears 3–4 is easiest to adjust by moving the fork so that the groove on it is opposite the groove on the fork for gears 1–2 when the gears are in neutral position.

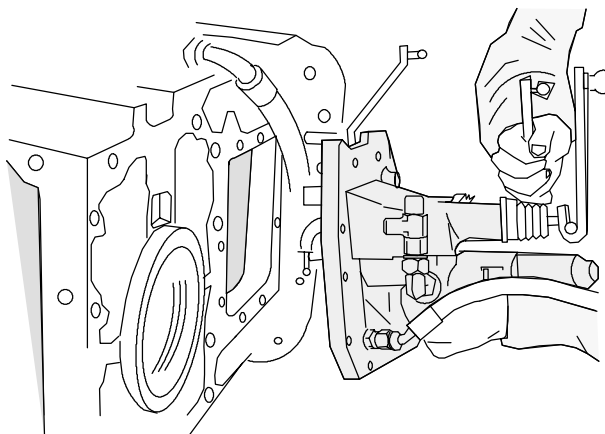
12. Check the adjustment in the extreme positions, so that the rail/fork for gears 3–4 moves loosely in these positions.
13. Adjust the selector fork for range gears (H–M) in the middle position and check the adjustment in the extreme positions as above.

14. Move the fork for range LL (and fork for ground speed PTO, if fitted) to the neutral position and make sure that the groove on the M–H fork is exactly opposite the groove on the fork for range LL (gears in neutral).

Note! If the LL–fork has to be adjusted, the tractor frame must be split between the gearbox and fuel tank and the reverse shuttle housing must be detached. Thus the nut at the front end of the LL–fork rail can be opened and the rail can be turned.

C. Fitting the side cover

15. Make sure that the selector fork rail locking pins are in their holes.
16. Move all selector forks to the neutral position. Apply sealing compound (e.g. Silastic) to the contact surface between the cover and the gearbox. Clean mating surfaces if necessary.



2433

17. Fit the side cover (upper end first).
- 18 Tighten the bolts to **50 Nm**.
19. Connect the oil hoses to the cover and to the control valve.
20. Connect the cables and the shifter rods to the shifter levers on the cover

21. Pour the oil into the gearbox. Test–drive the tractor and check that the gear change mechanism functions properly.

2. Changing selector forks

Note! See also the following instructions:

- instr. **423 2D** (removing the selector forks)
- instr. **423 4B** (fitting and adjusting the selector forks)

1. Drain the oil from the gearbox.
2. Split the tractor between the gearbox and the fuel tank; see instr. **441 1A** (cab attached to the rear frame) or instr. **423 1A** (cab attached to the front frame).
3. Remove the quick–shift gear (see instr. **441 1B**) and the reverse shuttle (see instr. **442 1A**) from the gearbox front side.
4. Remove the gearbox side cover.
5. Remove the selector fork locking pins. Pull out the rails forwards and remove the forks through the side opening in the following order:
 - fork for ranges M–H (remove first the LL/PTO–rail)
 - fork for ground speed PTO (if fitted)
 - fork for gears 3–4
 - fork for range LL
 - fork for gears 1–2
6. Fit the forks in the reverse order.

Note! The rail, fork and the locking pin for gears 1–2 must be fitted before other parts are fitted into the gearbox. In addition, the fork for ranges M–H must be fitted onto the sliding coupling before fitting the rail for range LL (and ground speed PTO (if fitted))

Sliding pieces on the selector forks

(see picture 16 on page 420/15).

With effect from tractor ser. no. **661937**, the selector forks and the plastic sliding pieces have been changed. In connection with possible repair works, new forks and sliding pieces must be fitted.

Note! In connection with repairs the earlier forks and sliding pieces must be changed into new ones in spite of the condition of the earlier parts.

Forks 1–2, 3–4, M–H and F–R have each 4 pcs sliding pieces and they are all similar (spare part number 32888200, 16 pcs). Fasten the sliding pieces on the forks with a little grease during fitting.

Also the later AVO and LL forks have sliding pieces.

Note! The reverse shuttle fork F–R is different on tractors which have a 2–speed quick–shift gear or the Delta Power-shift. Changing the shuttle fork, see under code **442**.

42. Gearbox	8. 11. 1990	Model	Code	Page
	1. 8. 1998	6000–8750	423	1

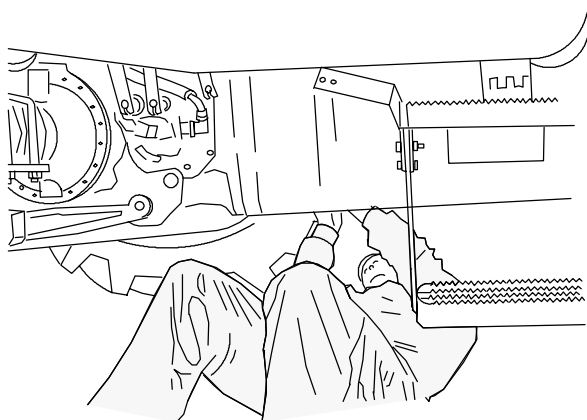
Reconditioning gearbox (Op. no. 423)

1. Removing gearbox

Note! The gearbox is easiest to remove if it is possible to remove the cabin (removing and fitting cabin, see Op. 811 1A). In the instruction below the cabin, however is in place. In addition, on E–models the sensor wires must be disconnected.

A. Splitting tractor between gearbox and fuel tank (cab attached to front frame)

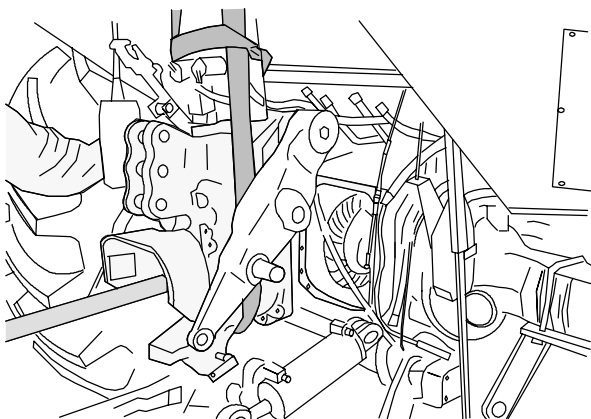
1. Remove all engine hood plates.



2. Remove the propeller shaft guard and disconnect the propeller shaft rear end flange joint (on tractors with Delta Powershift, there is not a flange joint at the rear end of the propeller shaft).

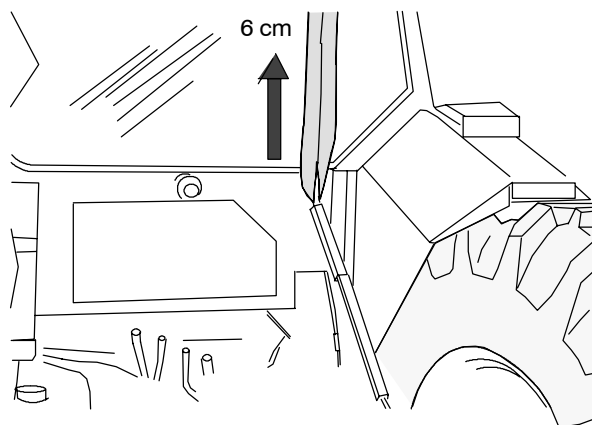
3. Drain the oil in the transmission.

4. Release the lower end of the PTO control cable, lower end of the pick–up hitch release control and the joint at the lower end of the levelling screw control rod (these are at the rear of the tractor).



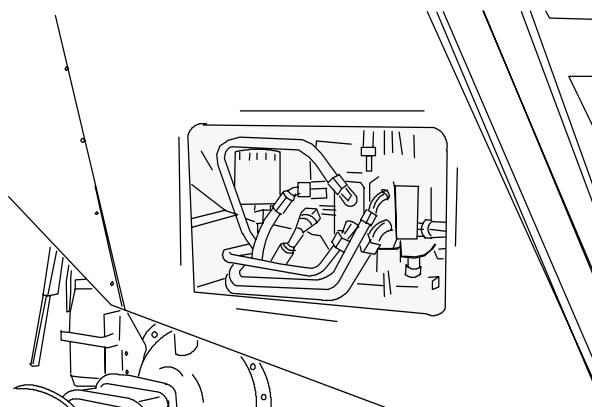
5. Remove the power take–off unit (see Op. 462 1A).

6. Unscrew the cab rear fastening bolts and raise the cab rear part about 6 cm.



Note! Lifting rope can be fastened to the levelling screw control rod support according to the figure above.

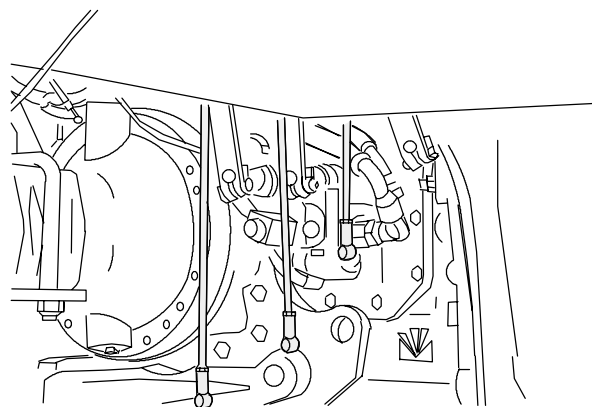
7. Remove the RH side rear wheel and open the hatch on the RH side rear mudguard.



8. Disconnect the oil pipes from the rear and front sides of the valve blocks for the auxiliary hydraulics.

9. Unscrew the fixing bolts for the valve block bracket on the gearbox and lift the valve blocks upwards.

Note! The valve blocks can be fastened to the cab with wire. If necessary, extra valve blocks must be detached for easier opening of the bracket bolts.

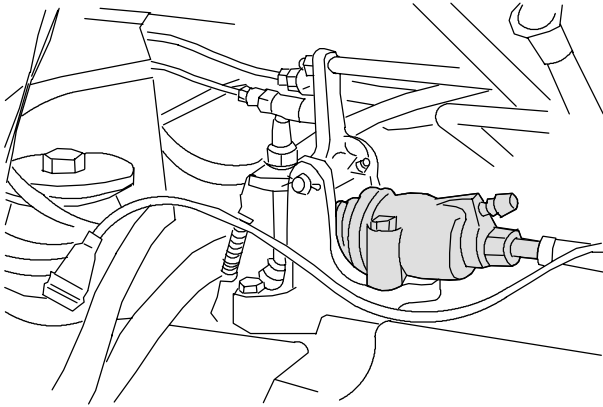


10. Disconnect the shifter rods from the lower ends of the gear levers. Disconnect the cable from the shifter levers and from the gear lever lower ends. Remove the gearbox housing breather filter by disconnecting its pipe through the mudguard opening.

11. Disconnect the control valve solenoid wires on the gearbox side cover. Disconnect oil hoses from the pressure filter.

Note! It is easier to disconnect and connect the hoses if the pressure filter is removed. Pressure filter is fitted under the cab floor on the RH side front corner.

12. Remove the hose clip (on RH side), which binds two hoses (one hose is connected to the pump side of the valve block set and another to the pump pressure connection).



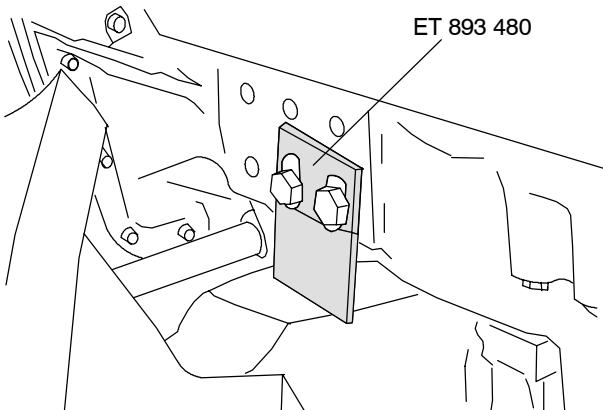
13. Remove the brake cylinder fixing bolts (at the rear of the tractor) and free the cylinders and support them to the cab floor. Release the parking brake cable from its mechanism.

14. Disconnect the hydraulic power lift sensor connectors in the lever console in the cab (remove console side panel). Remove also the lead-in plate for the wires.

15. Disconnect the sensor wires from the servo valve block on the LH side of the gearbox. Disconnect hoses and pipes (on the LH side) which prevent splitting.

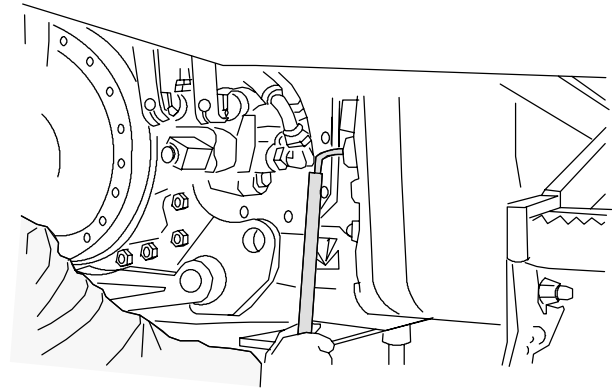
16. Disconnect the wires from the solenoid valves on the servo valve block (on LH side).

17. Fit the RH side rear wheel.

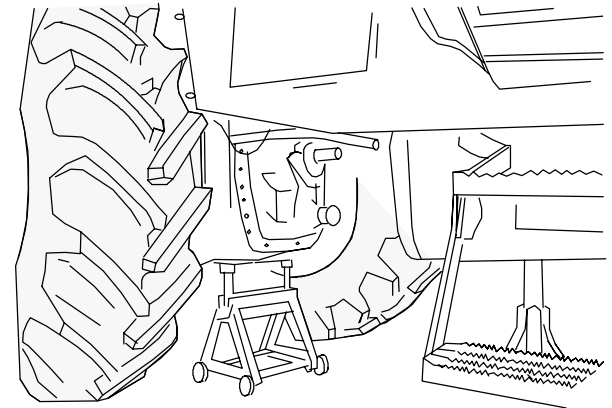


18. Fit supports ET 893480 on the front axle (on both sides) to prevent front axle oscillation.

19. Fit a steady trestle under the fuel tank. Fit a trestle fitted with castors under the gearbox front edge and under the towing hook.

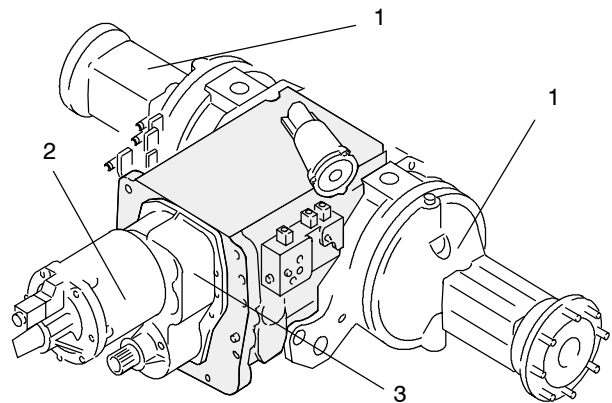


20. Open the bolted joint between gearbox–fuel tank (on RH side, disconnect the control valve hoses for easier work).



21. Part the tractor by pushing at the rear wheels. If the tractor has big rear wheels the rear mudguards should be removed.

Note! Make sure that every hydraulic pipes have been released. Disconnect the front end of the hose to the priority valve and remove the hose between the valve block set and the control valve of the hydraulic lift.



22. Remove the rear wheels, rear axles (1), quick shift gear (2) and reverse shuttle (3) from the transmission unit. Place the gearbox in the fitting stand.

N.B. Label all detached parts and pipes from the transmission unit for easier assembling.

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