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On Tractors with SG2 Cab

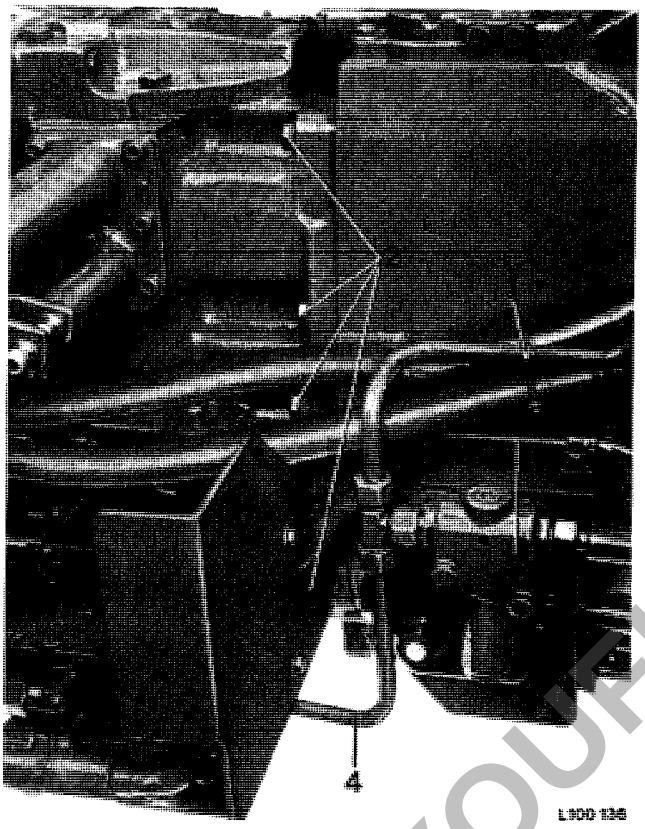

Fig. 11 — Separating between Clutch Housing and Transmission Case, Right-Hand Side

1 Retaining strap
2 Attaching cap screws (8 used)
3 Hydraulic pump pressure line
4 Line to trailer brake valve

1. Disconnect ends of hydraulic pump pressure line 3 (fig. 11) and remove.
2. Disconnect retaining straps 1 of heater hoses and pull out heater hoses to the front.
3. *When equipped:* Disconnect line 4 to trailer brake valve at T-piece.

On all Tractors

1. Disconnect leak-off and breather line 1 (fig. 9) at transmission shift cover.
2. Disconnect cable 7 (fig. 12) of transmission oil pressure warning switch.
3. Remove cap screws 2 and lift off shift cover 1 together with cover 4.

NOTE: After removing complete shift cover assembly, do not move shaft 5, otherwise detent balls may drop out of cover 4.

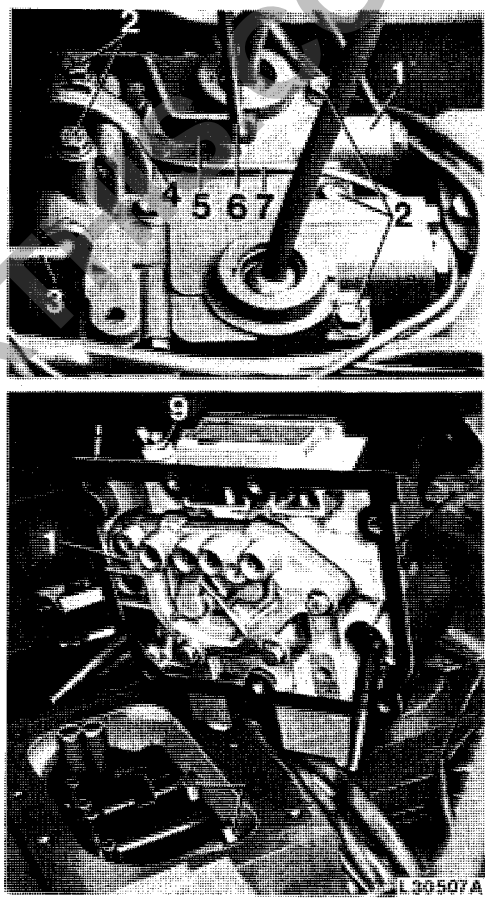

Fig. 12 — Removing Transmission Shift Cover (Tractor with Center Shift Shown)

1 Transmission shift cover
2 Shift cover attaching screws
3 Connecting rod
4 Cover
5 Shaft
6 Operating rod
7 Cable of transmission oil pressure warning switch
8 Transmission case attaching screws
9 Transmission oil pressure warning switch

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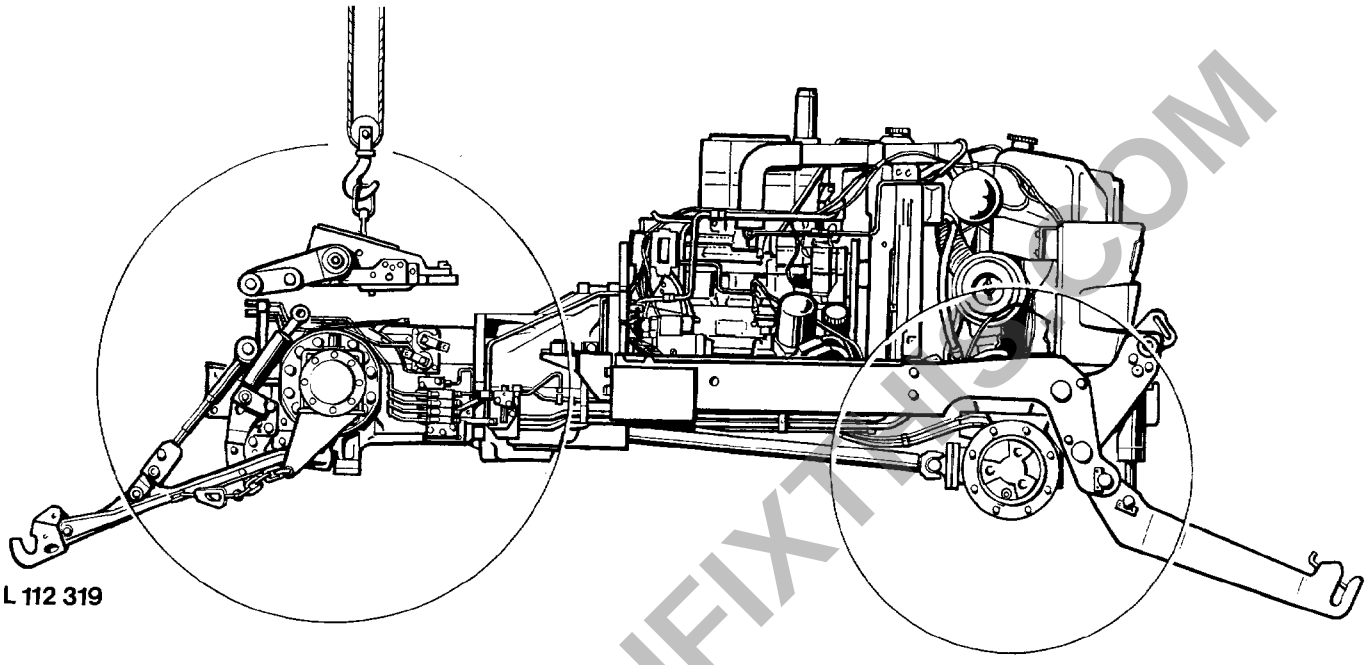
REMOVING ROCKSHAFT



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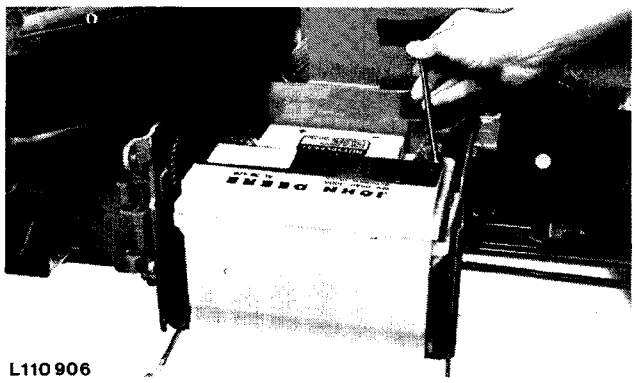
REMOVING SG2 CAB

Refer to "Removing SG2 Cab".

Disconnect battery ground straps.



L110 906

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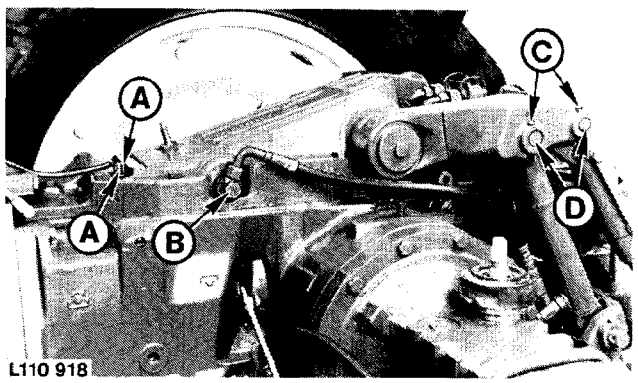
DISCONNECTING LEFT-HAND ROCKSHAFT LIFT CYLINDER

Disconnect start safety switch cable (A).
Remove hollow bolt (B) and pressure hose.
Drive out spring pins (C) and then pull out pins (D).



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Blower Switch - Resistor Test

1. Connect ohmmeter to terminals 1 and 3 for "Low" speed (see fig. 15). Resistance must be approx. 0.8 ohms.
2. Connect ohmmeter to terminals 1 and 2 (medium speed). Resistance must now be approx. 0.4 ohms.

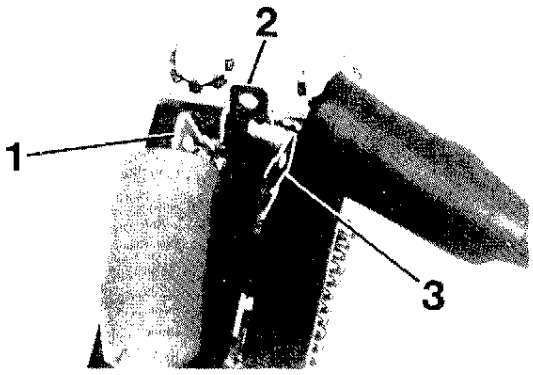

Fig. 15 – Blower Switch-Resistor Test

Air Conditioning - Compressor Clutch

1. Turn key switch to "ON" position
2. Turn air conditioning system switch to "ON" position
3. Turn on blower switch
4. There must be an audible "click" in the electromagnetic compressor clutch when turning on or off one of the above switches.

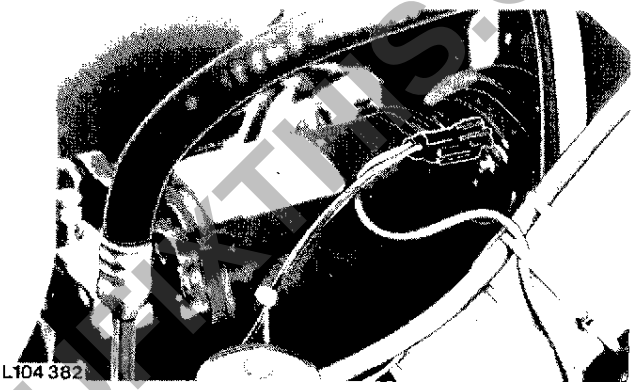

Fig. 16 – Air Conditioning Compressor Clutch

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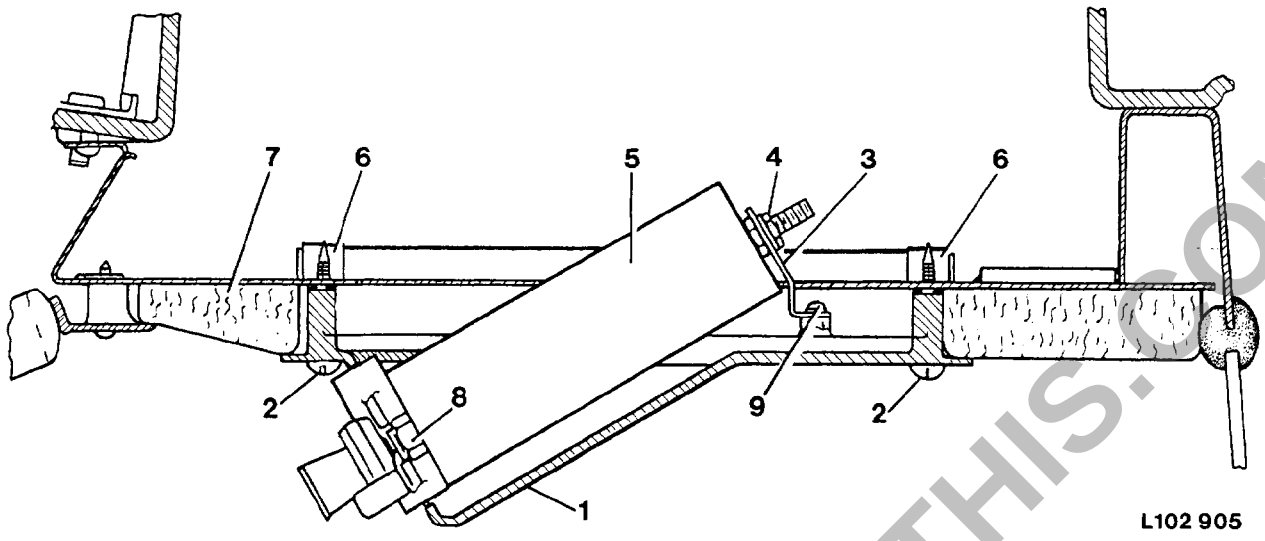

Fig. 26 – Radio Installed, Sectional View

1 Console
2 Self-tapping screw (6 used)
3 Bracket
4 Hex. nut
5 Radio
6 Spring clamp (6 used)
7 Inner cover
8 Hex. nut (2 used)
9 Self-tapping screw

REMOVAL AND INSTALLATION

Radio or Radio/Tape Player

1. Remove the six self-tapping screws 2 (fig. 26) and lift out radio 5 together with console 1 from cab roof.
2. Disconnect power supply cable (red/black), ground cable (brown), loudspeaker cable and aerial cable at radio.
3. Remove bracket 3 and hex. nut 8 and lift radio 5 out of console 1.
4. Install radio, reversing removal procedure.

Aerial

1. Remove the two cap screws from top and three at front of roof.
2. Remove cab roof.
3. Remove cover plate for windshield wiper motor.

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No.	Cables and Wires mm²	Gauge	Color	Component	from No.	Terminal No.	Component	to No.	Terminal No.
96*	1	16	green	Plug (radio)	101	5	Loud-speaker, right-hand	68	
97**	1	16	grey/black	Switch for fan	85	C	Thermostat switch	88	
98**	1	16	yellow	Thermostat switch	88		Plug	53	1
99**	2.5	14	yellow	Plug	53	1	Plug	13	6
100	2.5	14	black	Plug	54	1	Start safety switch	57	
101	2.5	14	black	Plug	54	2	Start safety switch	57	
102	1	16	green/yellow	Plug	54	4	Solenoid for front wheel drive	55	
103	1	16	green/white	Plug	54	5	Transmission oil pressure warning switch	58	
104	4	11	brown	Plug	54	7			Ground
105	1	16	brown/white	Plug	54	3	Sending unit for Hi-Lo shift unit indicator light	56	
106	1	16	orange/black	Plug	53	4	Plug	67	
107	1	16	orange	Plug	53	9	Plug	67	
108	1	16	brown/white	Plug	53	5	Plug	66	
109	1.5	15	black	Plug	53	2	Plug	66	
110	1	16	black	Plug	53	2	Plug	75	
111	1	16	grey	Plug	53	6	Plug	75	

* When equipped
** On tractors with air conditioning only

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Mechanical Front Wheel Drive (from Tractor Serial No. 450 000 L)

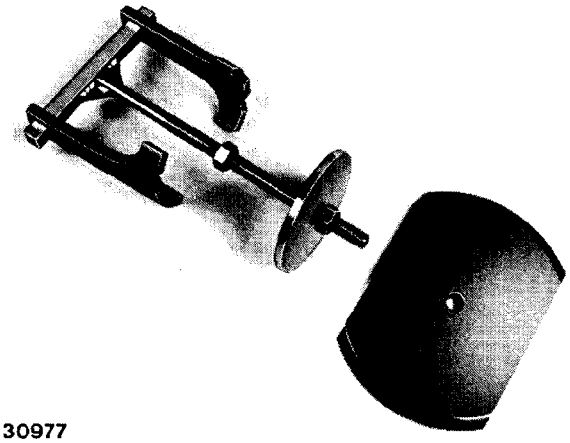
Tool	Description and Part No.	Use
	Spring compressor KML 10 005	Removing and installing Belleville springs

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Fig. 33 – Spring Compressor

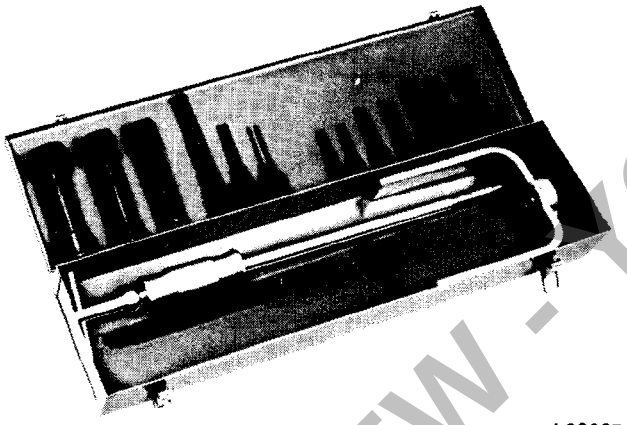
Tool	Description and Part No.	Use
	Blind hole puller set D-01061 AA	Removal of drive shaft bushings

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Fig. 34 – Blind Hole Puller Set

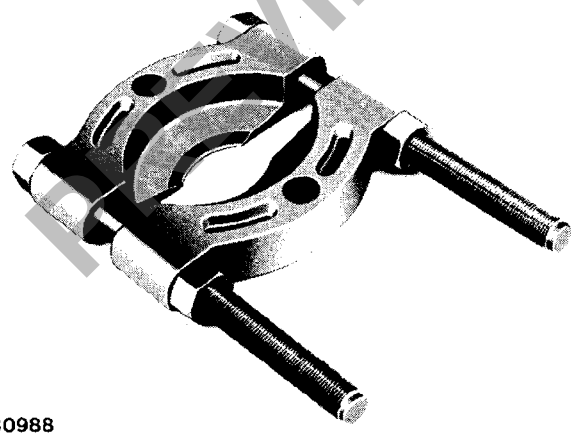
Tool	Description and Part No.	Use
	Bearing puller D-01218 AA	Removing drive pinion taper roller bearing cone and differential taper roller bearing cone
	D-01274 AA	Removing ring gear with differential casing cover

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Fig. 35 – Bearing Puller

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Installation and Adjustment

CONSOLE AND CENTER SHIFT

NOTE: Install shifter mechanism from the front with transmission bearing quill installed. Install shifter fork for range I and reverse on shift sleeve before installing transmission bearing quill. Coat detent balls and springs with grease prior to installation. Coat shifter shaft bores with oil.

CONSOLE SHIFT

1. Drive in bushings 44 and 41 (fig. 3) until flush with inner face of transmission case.
2. Attach shifter shaft housing 18 with gasket 19 to transmission case.
3. Press bushings 17 to a depth of 9 mm (0.35 in.) into shifter shaft housing 18 and install seal rings 16.
4. Press bushings 9 to a depth of 8 mm (0.31 in.) into shifter shafts 8 and 14 and install seal rings 10.
5. Press bushings 45 to a depth of 13 mm (0.51 in.) into shifter shafts 8 and 14.
6. Install plastic washers 15 on shifter shafts 8 and 14 and plastic washers 11 on shifter shafts 12 and 13.
7. Coat bushings and seals with Molykote grease type "G" before installing shifter shafts.

IMPORTANT! Screw set screws and positioning screws in respective bores of shift levers and shifter forks before installation.

8. Guide pre-assembled shifter shaft 14 in lower bore of shifter shaft housing 18. Install shift lever 23, noting marks made when removed. Coat set screws 22 with Loctite 242 (L41475) and tighten.

NOTE: When installing a new shifter shaft 14, make sure that the groove in shifter lever 23 is aligned with tooth shaped section of shifter shaft 14.

9. Position shifter shafts 13 and 14 parallel and install shift lever 24 so that the shift cams on shifter levers 23 and 24 are aligned.
10. Check axial play of shifter shaft 13. Play must be less than 1 mm (0.04 in.). When necessary, install a further plastic washer 11.
11. Guide shifter shaft 25 in bore of transmission bearing quill.
12. Press detent ball 43 and spring 42 downward and slide shifter shaft in bore.
13. Slide shifter fork 27 on shifter shaft 25. Insert shift lever 23 in groove of shifter shaft.
14. Place shifter shaft 25 in neutral position.
15. Place two detent balls 43 into cross-bore between the two shifter shafts.
16. Guide shifter shaft 28 in bore of transmission bearing quill.
17. Press detent ball 43 and spring 42 downward and slide shifter shaft 28 up to shifter fork 33.
18. Slide shifter fork 33 on shifter shaft 28.
19. Guide shift lever 24 in groove of shifter shaft 28.

NOTE: Adjustment of shifter forks is carried out by means of positioning screws 26 or 34 (fig. 3). The shifter forks may be shifted laterally on the shifter shafts by turning positioning screws in or out.

20. Adjust 1st and 2nd gear shifter fork 27 as follows:

    Place shifter shaft 25 in neutral position; slide hollow shaft in direction of bevel gear. Adjust shifter fork so that shifter collar contacts hollow shaft evenly and without tension.

21. Adjust 3rd and 4th gear shifter fork 33 as follows:

    Place shifter shaft 28 and synchronizer shifter collar in neutral position. Adjust shifter fork so that it is located exactly in the center of shifter collar.

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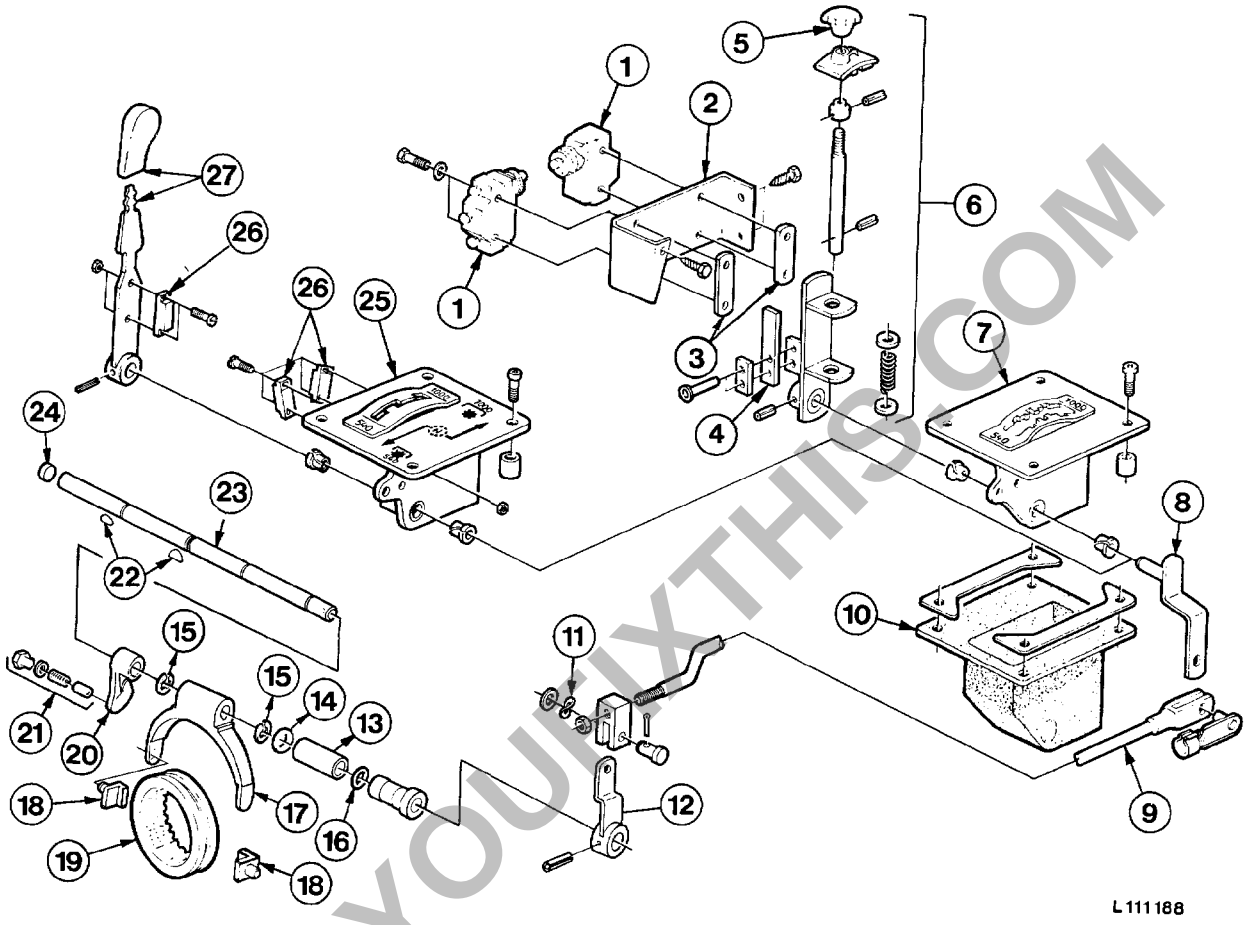

Fig. 13 – PTO Operating Linkage, Exploded View (Tractors with SG2 Cab)

1 PTO indicator light sending unit*
2 Console*
3 Link*
4 Lock plate*
5 Shifter knob*
6 Shift lever assembly*
7 Shift console*
8 Lever
9 Rod
10 Cover
11 Wavy washer
12 Lever
13 Spacer bushing
14 Washer
15 Snap ring
16 O-ring
17 Shifter fork
18 Guide shoes
19 Shifter sleeve
20 Stop lever
21 Shifter fork stop
22 Woodruff key
23 Shifter shaft
24 End cap
25 Shift console**
26 PTO indicator light sending unit**
27 Shift lever assembly

* On earlier tractor series
** On later tractor series

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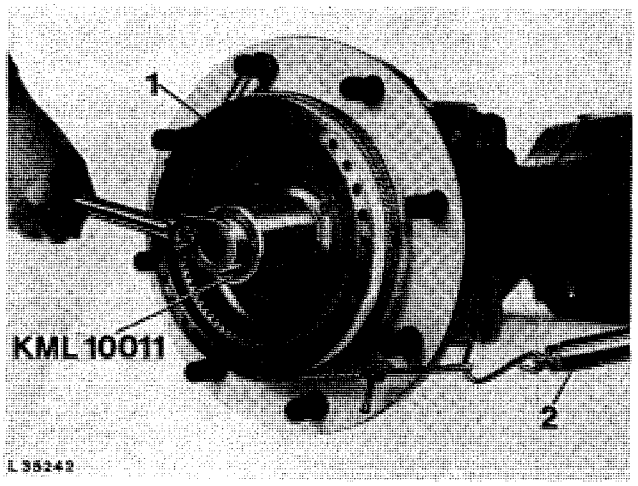

Fig. 56 – Checking Rolling Drag Torque of Hub Bearings

1 Wheel hub
2 Spring scale

10. Use special socket spanner KML-10011 to tighten first slotted nut 19 (fig. 55) until a rolling drag torque of 4 to 7 Nm (3 to 5 ft-lb) has been obtained. This value equals a pull on spring scales of 35 to 65 N (8 to 15 lb) measured at circumference of wheel hub (see fig. 56).

11. Install lock plate 20 (fig. 55) and tighten second slotted nut 19.

12. Secure both slotted nuts with lock plate.

13. Install sun gear 18 on drive shaft 16 and snap ring 17.

14. Using two suitable levers, check radial and axial play of drive shaft with knuckle housings turned as during steering (see fig. 57).

NOTE: The drive shaft must be free to move axially and radially when knuckle housings are turned as during steering.

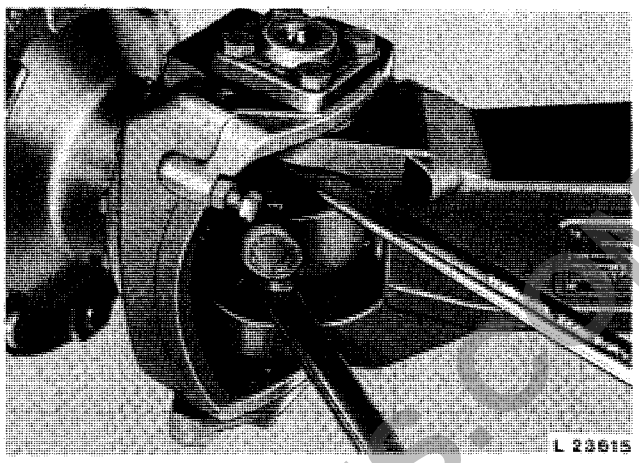

Fig. 57 – Checking Radial Play of Drive Shaft

NOTE: When radial free play can be felt when lifting or lowering the universal joint of shaft, this indicates correct adjustment.

15. If there is no noticeable radial play, then either upper or lower king pin 2 (fig. 52) must be tightened or loosened.

IMPORTANT! However the previously determined rolling drag torque (see fig. 51) must remain unaltered.

16. Secure right-hand steering arm 4 (fig. 52) to axle knuckle housing, tightening cap screws to 230 Nm (170 ft-lb) torque.

NOTE: To determine axial play of drive shaft 16 (fig. 55), preassemble wheel hub 30 and planetary carrier 2 as far as possible.

17. Turn axle knuckle housing up to stop and make sure that drive shaft turns freely.

18. In this position measure and note distance between hub face to axle shaft end face using a depth gauge (see fig. 58).

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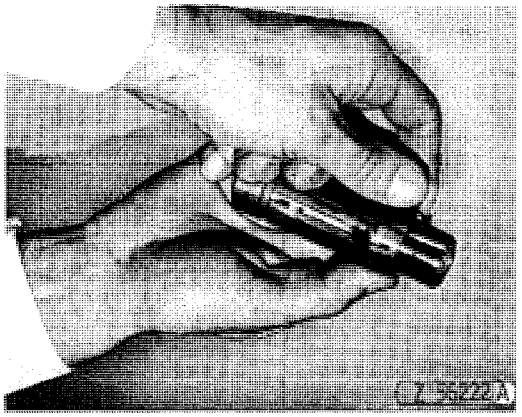

Fig. 29 – Pressing Out Leaf Springs

13. Press leaf springs 16 completely out of slot.

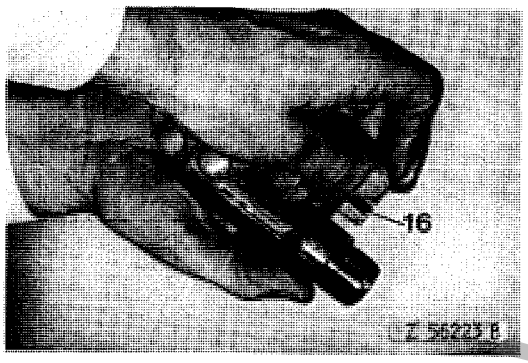

Fig. 30 – Removing Leaf Springs

16 Leaf springs

14. Take out leaf springs from valve spool.

15. Using a suitable tool, remove remaining seal ring 24 from pump housing.

Fig. 31 – Removing Seal Ring

24 Seal ring

STEERING COLUMN (Tractors with SG2 Cab)

1. Remove snap ring 8 (fig. 32) and washer 15 from upper steering shaft 1.

2. Remove hollow screw 10 out of steering column tube 14. Remove lower thrust bearing.

3. Remove complete steering shaft assembly downward out of steering column tube.

4. Disassemble steering shaft assembly, using fig. 32 as a guide.

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Tractors with SG2 Cab

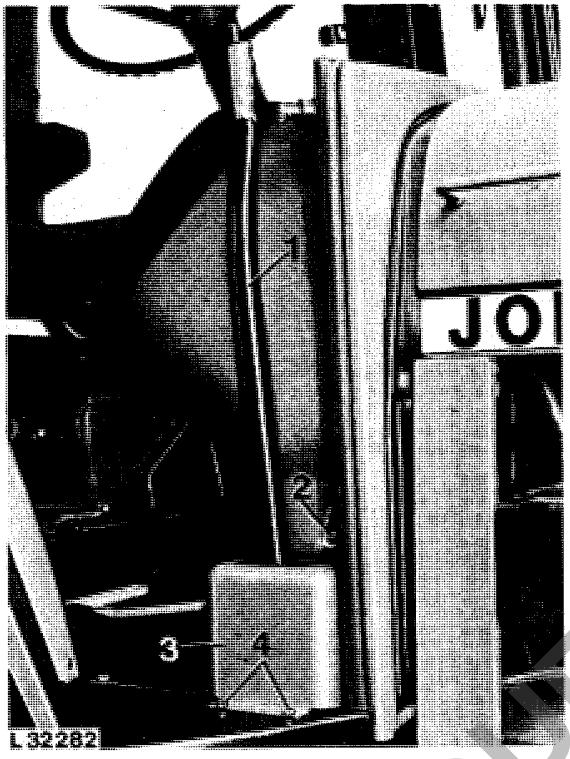

Fig. 4 – Handbrake Lever, Installed

1 Handbrake lever
2 Cap screw
3 Cover
4 Self-tapping screws

1. Raise platform mat and remove self-tapping screws 4 (fig. 4) of cover 3.

2. Lift out cover 3 and remove handbrake lever shaft cap screw. Remove handbrake lever.

3. Remove rear dash panel cap screws and lift out rear dash panel.

4. Remove side dash panel cap screw 2 and lift out dash panel.

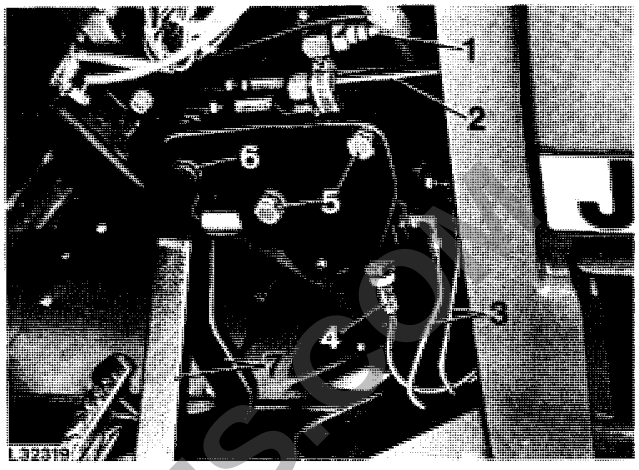

Fig. 5 – Brake Valve Assembly, Installed

1 Inlet line
2 Return line
3 Brake lines
4 Connectors
5 Cap screws
6 Snap ring (2 used)
7 Brake pedals

5. *When equipped,* pull off connectors 4 (fig. 5) at stop light switch.

6. Disconnect inlet line 1, return line 2 as well as brake lines 3 at brake valve assembly. Immediateyl cap or plug all lines and connections to prevent dirt from entering the system.

7. Remove both cap screws 5 securing brake valve assembly to dash panel support and lift out brake valve assembly.

8. Remove snap ring 6, drive out brake pedal shaft and lift out brake pedals 7.

IMPORTANT! Remove brake pedal shaft and pedals carefully so that brake piston springs are relieved slowly. Sudden expulsion of brake pistons under spring tension can cause damage to the valves.

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STEP 21

1. When equipped, repeat Step 20 with second selective control valve.
2. Adjust pressure control valve of hydrostatic or power steering (see section 70, group 10).
3. Remove shims to decrease pressure.
4. Add shims to increase pressure.

NOTE: One shim will alter pressure approximately 250 kPa (2.5 bar; 36 psi).

5. If it is not possible to obtain the correct pressure there is a restriction in the:

   – valve housing
   – connecting oil lines or couplers
   – selective control valve

6. To recheck the adjustment:

Repeat Step 20

STEP 22

Check complete lift cycle of rockshaft.

1. Run engine at 2100 rpm.
2. Move rockshaft control lever to "MIN" position (position "D" on earlier tractor series).
3. Raise rockshaft lift arms from lowest to highest position.

   Period required to fully raise or lower rockshaft lift arms . . . . . 1.8 to 2.3 secs.

4. With correct lifting cycle,

Proceed with Step 38

5. Lifting cycle too slow,

Proceed with Step 23

STEP 23

Adjust rockshaft pressure control valve.

Fig. 47 – Rockshaft Pressure Control Valve

1. Additional washers increase rockshaft speed.
2. Repeat lifting cycle check.
3. When lifting time is now correct.

Proceed with Step 24

4. When the specified lifting time cannot be reached,

Proceed with Step 38

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Load Control Mechanism

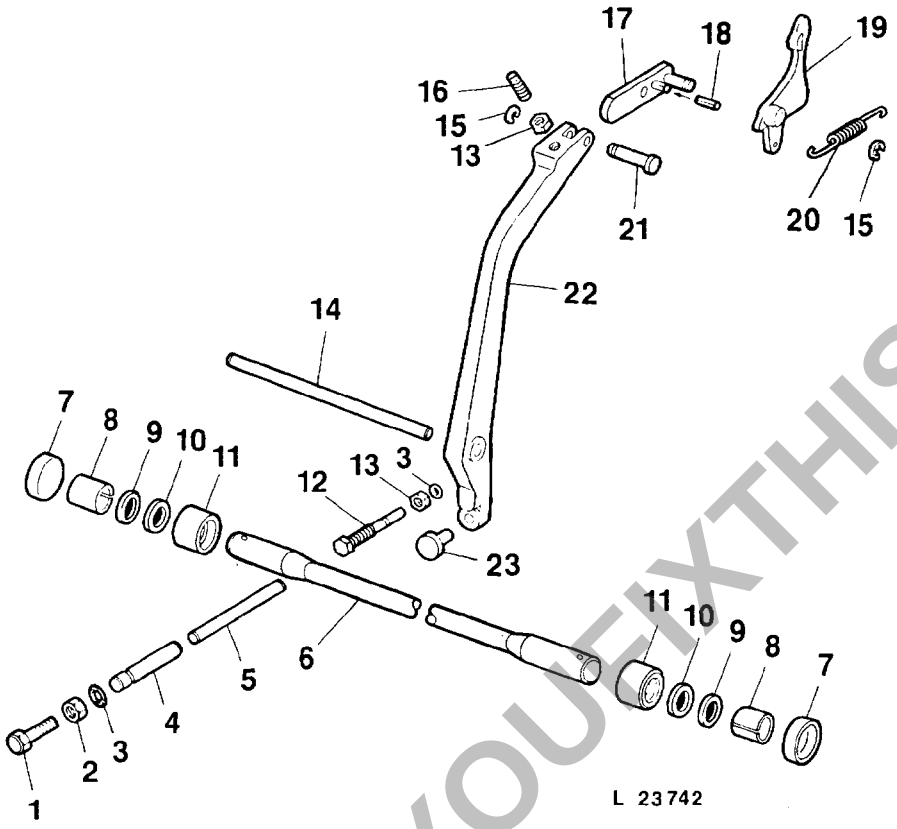

Fig. 22 – Load Control Mechanism, Exploded View

1 Cap screw*
2 Lock nut*
3 O-ring*
4 Rear pin*
5 Front pin*
6 Load control shaft
7 Cover (without rockshaft)
8 Spacer bushings
9 Seal rings
10 Seal rings (when equipped)
11 Bushings
12 Load control arm negative stop screw
13 Lock nuts
14 Pivot pin
15 Snap rings
16 Cam follower adjusting screw
17 Extension
18 Spring pin
19 Cam follower
20 Return spring
21 Special pin
22 Load control arm
23 Special pin

* On tractors with combined, independent 540/1000 rpm PTO only

REPAIR

1. Remove 3-point hitch.
2. Remove rockshaft assembly. see section 10, group 20.
3. Remove left-hand final drive, see section 10, group 20, so that control arm pivot shaft 14 (fig. 25) supporting control arm can be withdrawn.
4. Remove return spring 20 of cam follower.
5. Withdraw control arm pivot pin 14 far enough to lift control arm out of transmission case.
6. Push both spacer bushings 8 from load control shaft. Drive load control shaft out of transmission case or bushings, using a suitable driver.

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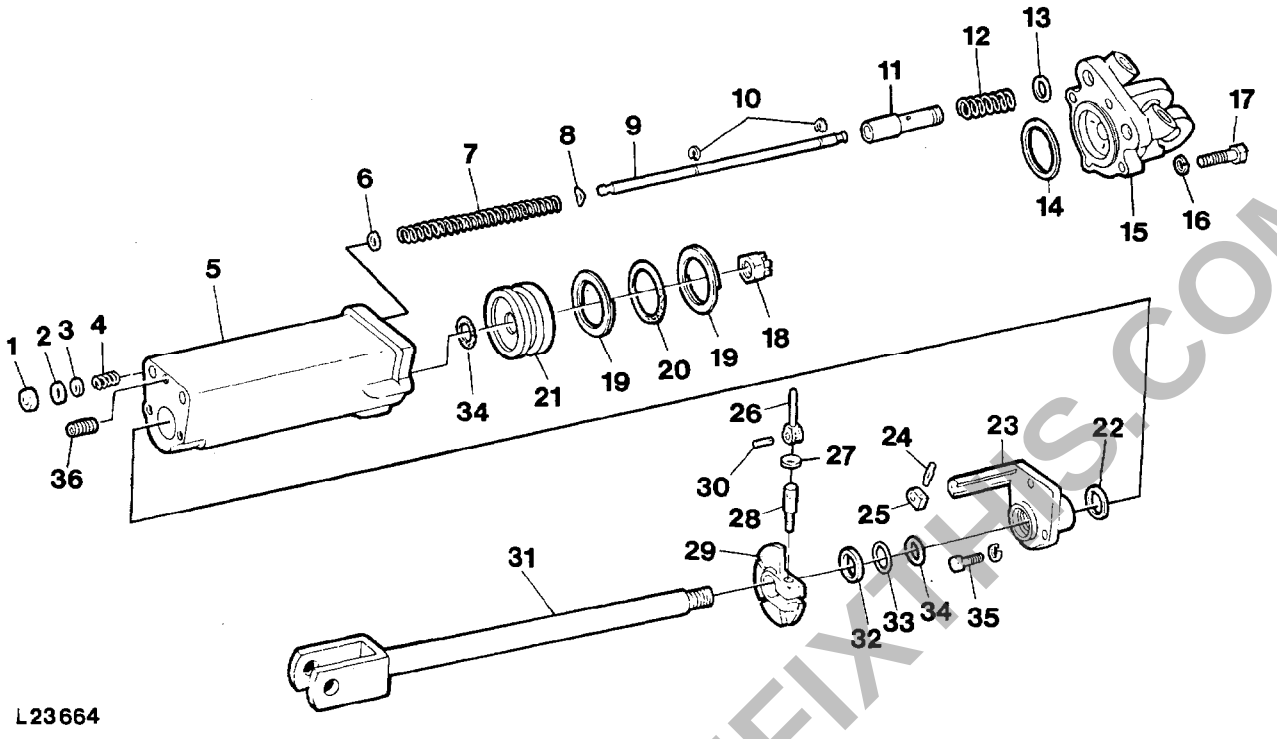

Fig. 2 – Remote Cylinder, Exploded View

1 Stop rod packing adapter
2 V-packing (3 used)
3 Stop rod packing adapter
4 Stop rod packing spring
5 Remote cylinder
6 Washer
7 Stop rod spring
8 Stop rod washer
9 Stop rod
10 Snap rings
11 Stop valve
12 Stop valve spring
13 Oil passage seal (2 used)
14 Seal ring
15 Remote cylinder end cap
16 Spring washer (4 used)
17 Cap screw (4 used)
18 Self locking nut
19 Back-up rings
20 O-ring
21 Piston
22 Piston rod guide gasket
23 Piston rod guide
24 Groove pin
25 Stop rod arm
26 Adjusting lever
27 Special washer
28 Stop screw
29 Piston rod stop
30 Spring pin
31 Piston rod with yoke
32 Oil seal
33 Back-up ring
34 O-rings
35 Cap screw (3 used)
36 Plug

Repair

DISASSEMBLY

1. Remove end cap 15 (fig. 2).
2. Push rod assembly completely into cylinder and remove stop valve 11.
3. Insert a rod through yoke of piston rod 31 and unscrew self locking nut 18 from piston rod. Pull piston 21 and rod 31 out of cylinder.
4. Push stop 29 from piston rod 31 and,if necessary, remove adjusting lever 26, washer 27 and stop screw 28.
5. Push stop rod 9 all the way into cylinder to prevent distortion of stop rod while driving groove pin 24 from stop rod arm 25.
6. Remove piston rod guide 23. Rod 9 can be used to drive packing adapters 1 and 3, together with the three V-packings 2, out of the cylinder.

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1. Close shut-off valve on dispensing valve FKM 10001-10* (see fig. 9) and attaching dispensing valve to refrigerant container FKM 10001-9*.

2. Attach yellow hose to dispensing valve.

3. Loosen yellow hose connector at gauge manifold and crack dispensing shut-off valve to purge air from yellow hose. Tighten hose connection at gauge manifold.

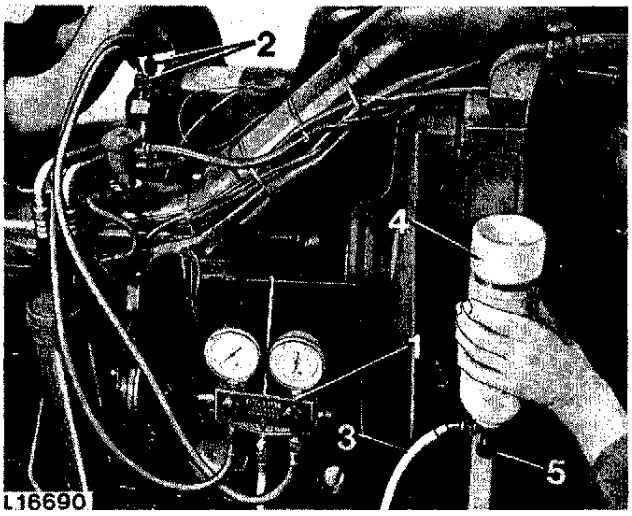

Fig. 9 – Charging the System

1 Manifold gauge set FKM 10001-6
2 Service valves
3 Yellow hose
4 Refrigerant container FKM 10001-9
5 Dispensing valve FKM 10001-10

4. Invert container to allow refrigerant to enter system in fluid form.

5. Open high-pressure gauge manifold hand valve. Both gauges should no longer show a vacuum.

NOTE: A blockage in the system is indicated should low pressure gauge remain stationary. Check system and remove blockage.

6. Close high-pressure manifold hand valve as soon as pressure stops rising.

7. Start engine and run at 1500 rpm with temperature control set for maximum cooling.

8. Invert container so that dispensing valve is now at the top and open low-pressure manifold hand valve. By this means further refrigerant in gas form will be drawn from the container.

IMPORTANT! Refrigerant fluid must not enter the compressor, otherwise this will cause internal damage.

9. If need be, use several containers until system is charged with the specified amount. Make sure that the yellow hose is purged of air when each refrigerant container is replaced.

NOTE: System charging can be quickened by placing refrigerant container in a container filled with water heated to a maximum temperature of 50°C (120°F).

CAUTION! Under no account exceed maximum temperature of 50°C (120°F), otherwise refrigerant container may explode.

10. Close dispensing valve when charging is completed.

11. Check system for full refrigerant charge at sight glass. Should bubbles appear, top up with refrigerant until sight glass is clear.

NOTE: On tractors with OPU, control receiver-dryer sight glass by removing rubber plug on cab roof.

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