SERVICE MANUAL

TD5010 / TD5020 / TD5030
TD5040 / TD5050
Tractors

Print No. 84176561B

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TD5010 - TD5020 - TD5030 - TD5040 - TD5050 MODEL TRACTORS SERVICE MANUAL

SECTIONS

GENERAL *00*
ENGINE *10*
CLUTCH *18*
GEARBOX *21*
TRANSMISSION OF MOTION *23*
FRONT MECHANICAL TRANSMISSION *25*
REAR MECHANICAL TRANSMISSION *27*
POWER TAKE-OFF *31*
BRAKES *33*
HYDRAULIC SYSTEMS *35*
STEERING *41*
AXLE AND WHEELS *44*
AUXILIARY EQUIPMENT *50*
ELECTRICAL SYSTEM *55*
CAB *90*

S E R V I C E

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SAFETY RULES

PAY ATTENTION TO THIS SYMBOL



This warning symbol points out important messages involving personal safety. Carefully read the safety rules contained herein and follow advised precautions to avoid potential hazards and safeguard your safety and personal integrity. In this manual you will find this symbol together with the following key-words:



***WARNING** - it gives warning about improper repair operations and deriving potential consequences affecting the service technician's personal safety.*

***DANGER** - it gives specific warning about potential dangers for personal safety of the operator or other persons directly or indirectly involved.*

TO PREVENT ACCIDENTS

Most accidents and personal injuries taking place in workshops are due from non-observance of some simple and essential prudential rule and safety precautions. For this reason, IN MOST CASES THEY CAN BE AVOIDED. It suffices to foresee possible causes and act consequently with necessary caution and care.

The possibility that an accident might occur with any type of machines should not be disregarded, no matter how well the machine in question was designed and built.

A wise and careful service technician is the best precautions against accidents.

Careful observance of this only basic precaution would be enough to avoid many severe accidents.

DANGER: Never carry out any cleaning, lubrication or maintenance operations when the engine is running.

SAFETY RULES

GENERALITIES

◊ Carefully follow specified repair and maintenance procedures.

◊ Do not wear rings, wristwatches, jewels, unbuttoned or flapping clothing such as ties, torn clothes, scarves, open jackets or shirts with open zips which could get hold into moving parts. We advise to use approved safety clothing such as anti-slipping footwear, gloves, safety goggles, helmets, etc.

◊ Never carry out any repair on the machine if someone is sitting on the operator's seat, except if they are certified operators to assist in the operation to be carried out.

◊ Never operate the machine or use attachments from a place other than sitting at the operator's seat.

◊ Never carry out any operation on the machine when the engine is running, except when specifically indicated.

◊ Stop the engine and ensure that all pressure is relieved from hydraulic circuits before removing caps, covers, valves, etc.

◊ All repair and maintenance operations should be carried out with the greatest care and attention.

◊ Service stairs and platforms used in a workshop or in the field should be built in compliance with the safety rules in force.

◊ Disconnect the batteries and label all controls to warn that the tractor is being serviced. Block the machine and all equipment which should be raised.

◊ Never check or fill fuel tanks and accumulator batteries, nor use starting liquid if you are smoking or near open flames as such fluids are flammable.

◊ Brakes are inoperative when they are manually released for maintenance purposes. In such cases, the machine should be kept constantly under control using blocks or similar devices.

◊ The fuel filling gun should remain always in contact with the filler neck. Maintain this contact until the fuel stops flowing into the tank to avoid possible sparks due to static electricity buildup.

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CONSUMABLES

COMPONENT TO BE FILLED OR TOPPED UP	QUANTITY			RECOMMENDED PRODUCTS	INTERNATIONAL SPECIFICATION
	liters/dm 3	US gal	IMP gal		
Cooling system: without cab: TD 5010, TD5020 TD 5030, TD5040, TD5050 with cab: TD 5010, TD5020 TD 5030, TD5040, TD5050	 12 14 14 16	 3.17 3.69 3.69 4.22	 2.64 3.08 3 3.52	Water & liquid **AMBRA AGRIFLU 50% + 50%** (NH 900 A)	-
Windscreen washer bottle	2	0.53	0.44	Water & cleaning liquid	-
Fuel tank.....	90	24.3	19.80	Decanted and filtered diesel fuel	-
Engine sump: TD 5010, TD 5020, TD5030 : TD 5040, TD5050 :	 8.5 10.0	 2.25 2.64	 1.87 2.20	**AMBRA MASTERGOLD SAE 15W - 40** (NH 330H)	API CH-4 ACEA E5
Brake control circuit	0.4	0.1	0.09	**AMBRA BRAKE LHM** Oil (NH 610 A)	ISO 7308
Hydrostatic steering circuit	2.0	0.52	0.44	Oil **AMBRA MULTI G** (NH 410B)	API GL4 ISO 32/46 SAE 10W-30
Front axle: - axle housing - final drives (each):	 7.0 1.25	 1.8 0.3	 1.54 0.28		
Rear transmission (bevel drive and brakes), gearbox, hydraulic lift and PTO	46	12.15	10.12		
Rear final drives (each)	5.3	1.40	1.17		
Front wheel hubs	-	-	-	Grease **AMBRA GR9** (NH 710A)	NLGI 2
Grease fittings	-	-	-		

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ENGINE TROUBLESHOOTING

Problems	Possible Causes	Solutions
Engine does not start.	1. Batteries partially discharged.	Check and recharge batteries. Replace if necessary.
	2. Battery terminal connections corroded or loose.	Clean, inspect and tighten terminal nuts. Replace terminals and nuts if excessively corroded.
	3. Injection pump timing incorrect.	Adjust injection pump timing.
	4. Impurities or water in fuel lines.	Disconnect fuel lines from injection pump and clean thoroughly. If necessary clean and dry the fuel tank.
	5. No fuel in tank.	Fill tank.
	6. Fuel supply pump malfunction.	Check and replace pump if necessary.
	7. Air in fuel system.	Check fuel lines, unions, supply pump, filters and injection pump for air; then bleed the air from the circuit.
	8. Starter motor faulty.	Repair or replace starter motor.
	9. Thermostarter faulty.	Check and replace thermostarter if necessary.
Engine stalls.	1. Idle speed too low.	Adjust idle speed.
	2. Injection pump delivery irregular.	Check injection pump delivery on test bench.
	3. Impurities or water in fuel lines.	Disconnect fuel lines from injection pump and clean thoroughly. If necessary clean and dry the fuel tank.
	4. Fuel filters clogged.	Replace the filter cartridges.
	5. Incorrect valve - rocker arm clearances.	Adjust the clearance between the rocker arms and the valves.
	6. Burnt or cracked valves.	Replace the valves.
	7. Air in fuel system.	Check fuel lines, unions, supply pump, filters and injection pump for air; then bleed the air from the circuit.
	8. Injection pump drive mechanism damaged.	Replace damaged parts.

(continued)

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GENERAL SPECIFICATIONS	4 Cylinders
Engine, technical type:	
- TD 5040 model - type F4CE9487M*J (BOSCH pump)	See data on page
- TD 5050 model - type F4CE9487N*J (BOSCH pump)	See data on page
Cycle	diesel, 4-stroke
Fuel injection	direct
Number of cylinders in line	4
Piston diameter	
- model TD 5040, TD 5050	4.0944 in. (104 mm)
Piston stroke	5.1968 in. (132 mm)
Total displacement:	
- model TD 5040, TD 5050	273.67 in^3. (4485 cm^3)
Compression ratio for Models TD 5040, TD 5050	17.5:1
Maximum power:	
- model TD 5040 - type F4CE9487M*J	65 kW (88 HP)
- model TD 5050 - type F4CE9487N*J	70 kW (95 HP)
- Maximum torque: TD 5040 - type F4CE9487M*J	375 (Nm)
- Maximum torque: TD 5050 - type F4CE9487N*J	390 (Nm)
Maximum torque speed	1300 rev/min
Number of main bearings	5
Sump	structural, cast iron
Lubrication	forced, with lobe pump
Pump drive	camshaft
Engine speed/oil pump speed ratio	1:1
Oil cleaning	mesh filter on oil intake and filtering cartridge on delivery line
Normal oil pressure with motor warmed-up	
at slow idling speed	17.4 psi (1.2 bar)
at fast idling speed	55.1 psi (3.8 bar)

(continued)

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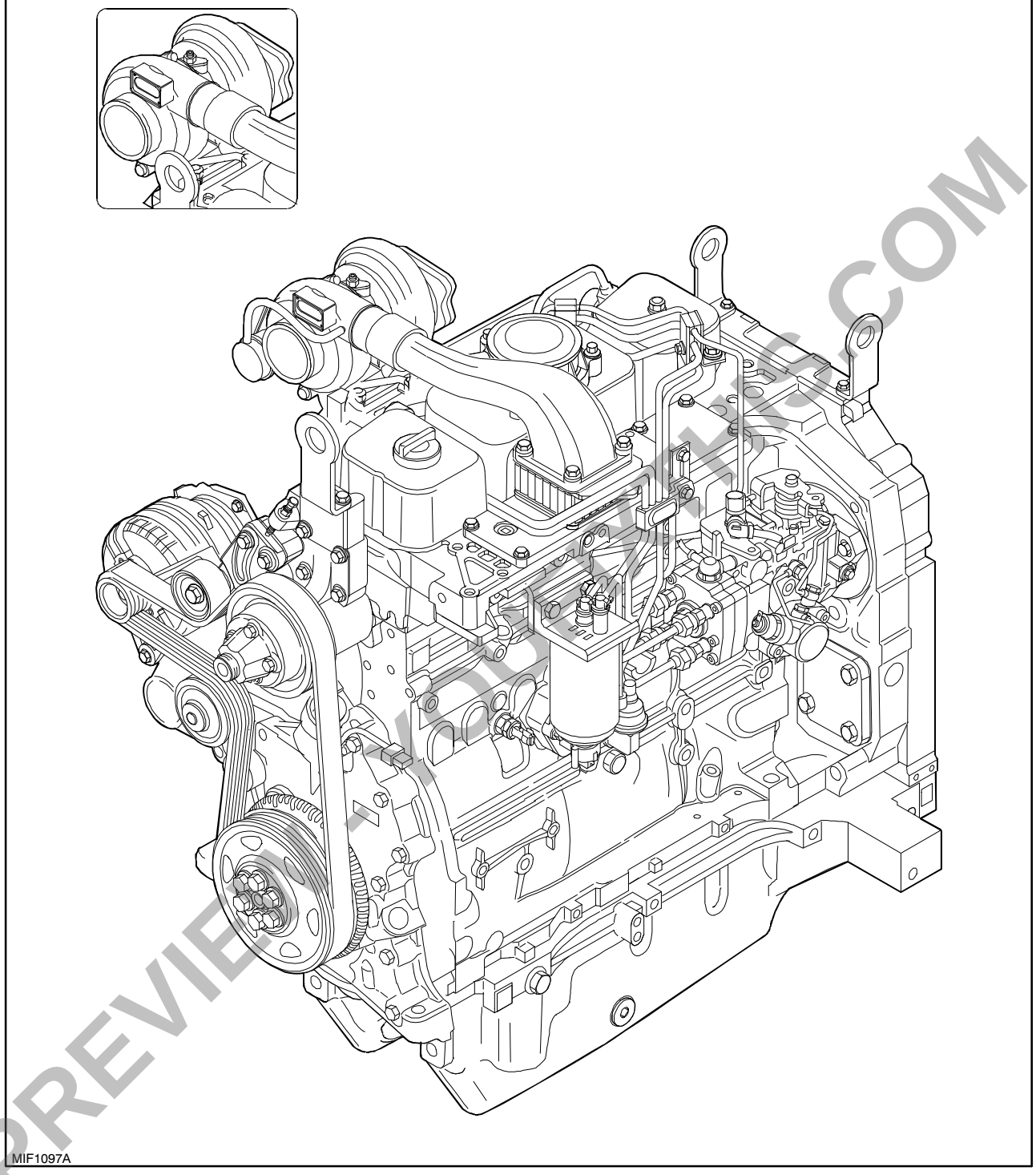
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TIGHTENING TORQUES

PARTS TO BE TIGHTENED	Thread	Tightening torque	
		Nm	kgm
Flywheel casing retaining bolts (2, fig. 202)	M 12 x 1.75 x 100	80 ± 10	8 ± 1
	M 16 x 1.50 x 80	200 ± 20	20 ± 2
	M 16 x 1.50 x 100	200 ± 20	20 ± 2
	M 12 x 1.75 x 78	80 ± 10	8 ± 1
Oil sump retaining bolts (3, fig. 209)	M 10 x 1.50 x 45	50 ± 5	5 ± 0.5
	M 10 x 1.50	70 ± 5	7 ± 0.5
Oil sump threaded plugs (2, fig. 209)	M 22 x 1.5	50 ± 5	5 ± 0.5
Rocker arm support retaining bolts (2, fig. 186)	M 8 x 1.25	25 ± 5	2.5 ± 0.5
Tappet cover retaining bolts (1, fig. 224 - 225)	M 8 x 1.25	25 ± 5	2.5 ± 0.5
Exhaust manifold retaining bolts (3, fig. 221)	M 10 x 1.50	53 ± 5	5.3 ± 0.5
Intake manifold retaining bolts (2, fig. 224 - 225)	M 8 x 1.25	25 ± 5	2.5 ± 0.5
Oil cooler retaining bolts (4, fig. 216)	M 8 x 1.25	25 ± 5	2.5 ± 0.5
Coolant pump retaining bolts (2, fig. 214)	M 8 x 1.25	25 ± 5	2.5 ± 0.5
Coolant inlet manifold retaining bolts (2, fig. 212)	M 10 x 1.50	45 ± 10	4.5 ± 1
Thermostat valve assembly retaining bolts (3, fig. 175) . . .	M 8 x 1.25	25 ± 5	2.5 ± 0.5
Fan support retaining bolts (3, fig. 215)	M 8 x 1.25 x 50	25 ± 5	2.5 ± 0.5
	M 10 x 1.50 x 25	45 ± 5	4.5 ± 0.5
Injector fastener (1, fig. 184)	-	60 ± 5	6.0 ± 0.5
Fuel pump retaining bolts (5, fig. 223)	M 8 x 1.25	25 ± 5	2.5 ± 0.5
Nuts securing turbine mod. (2, fig. 221) .	M 8 x 1.25	25 ± 5	2.5 ± 0.5
Alternator retaining bolts (3, fig. 217)	M 10 x 1.50	45 ± 5	4.5 ± 0.5
Starter motor retaining bolts (5, fig. 228)	M 10 x 1.50	55 ± 5	5 ± 0.5
Camshaft plate retaining bolts (3, fig. 151)	M 8 x 1.25	25 ± 5	2.5 ± 0.5
Injection pump retaining bolts (3, fig. 195)	M 8 x 1.25	12 ± 5	1.2 ± 0.5
Oil pump gear casing retaining bolts (2, fig. 208)	M 8 x 1.25	25 ± 5	2.5 ± 0.5
Additional counterweight retaining bolts (3, fig. 199)	M 10 x 1.5	48 ± 8	4.8 ± 0.8
Camshaft gear retaining bolts (1, fig. 190)	M 8 x 1.25	36 ± 4	3.6 ± 0.4

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54

View of TD 5040 tractor engines of 65 kW (88 HP) and TD 5050 of 70 kW (95 HP)

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Op. 10 001 10
ENGINE R.I.

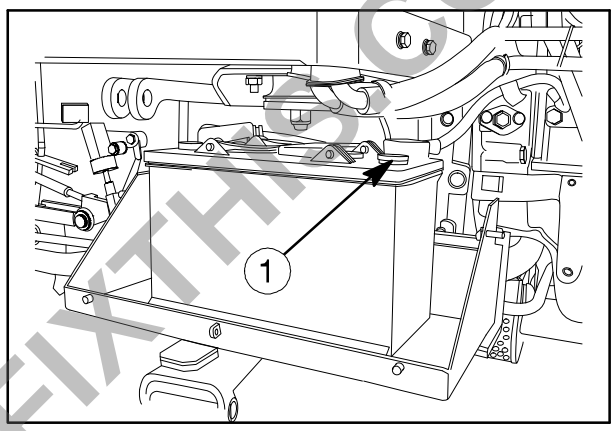
DANGER

Lift and handle all heavy parts using suitable lifting equipment.
Make sure that assemblies or parts are supported by means of suitable slings and hooks. Check that no one is in the vicinity of the load to be lifted.

CAUTION

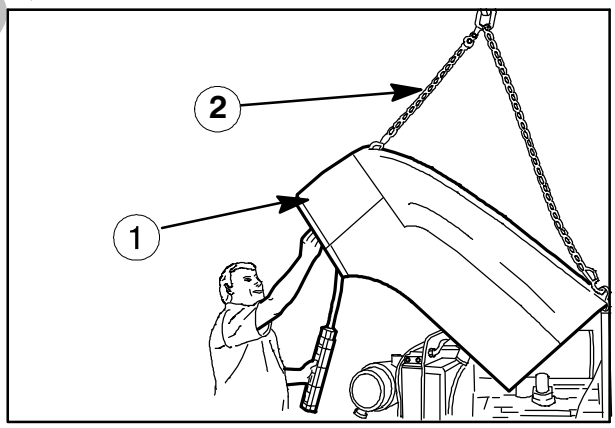
Always use appropriate tools to align fixing holes. NEVER USE FINGERS OR HANDS.

1. Disconnect the battery negative lead (1).
2. Drain the oil from the transmission-gearbox housing.
3. Drain the cooling system.



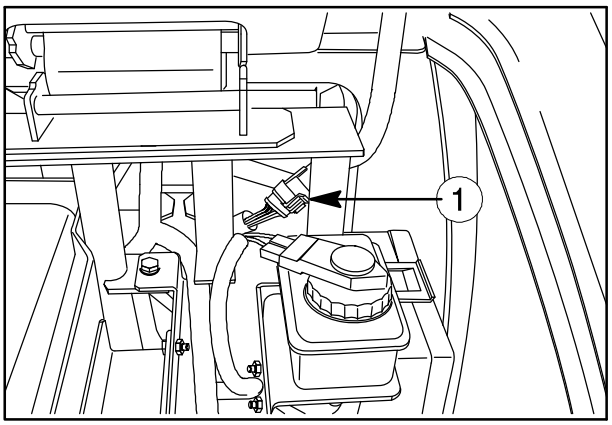
1

4. Remove the exhaust pipe, attach lifting chains (2) to the bonnet (1) and attach the chain to the hoist.



2

5. Disconnect the electrical connection (1) of bonnet.



3

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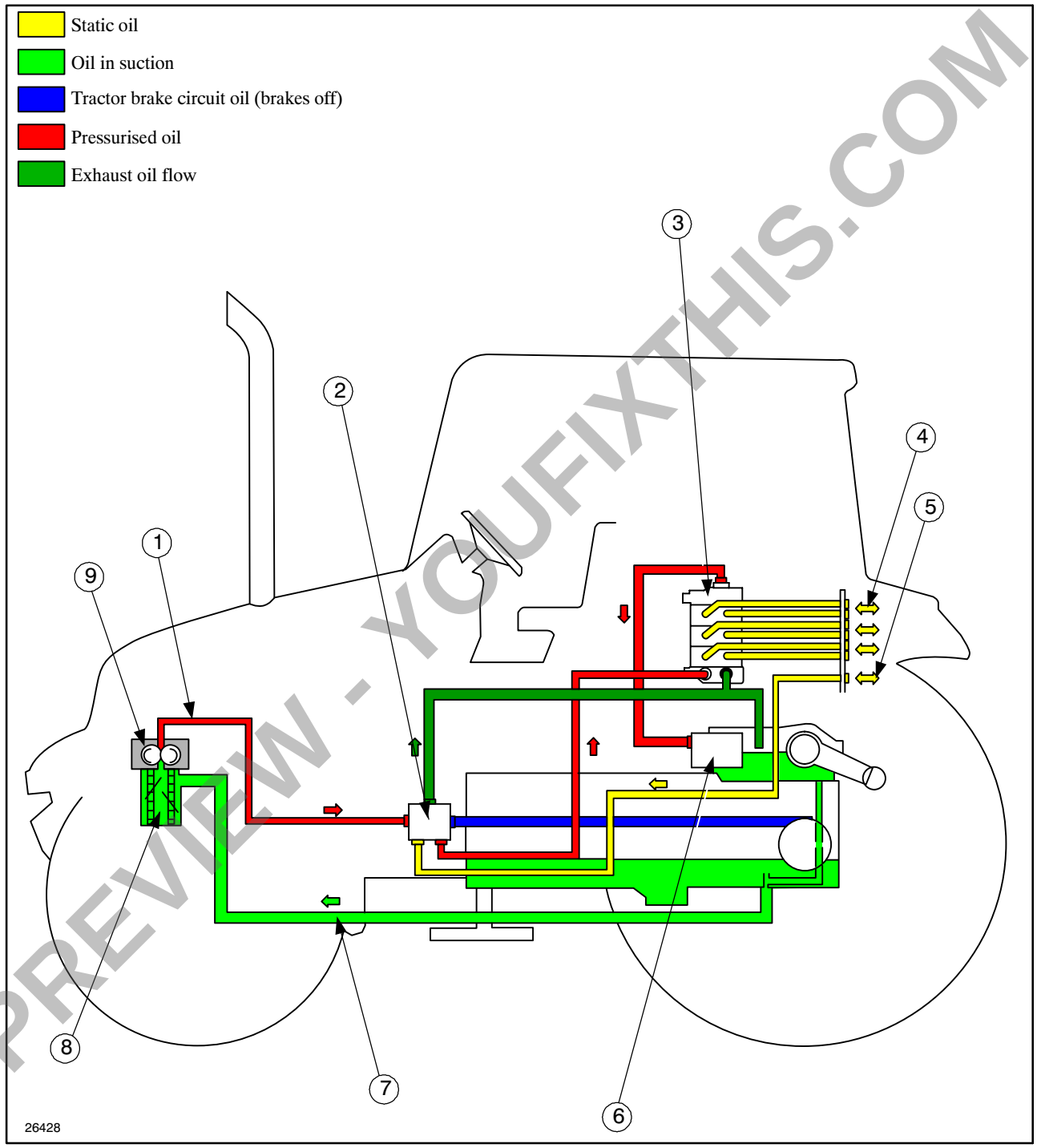
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DESCRIPTION AND OPERATION

The mechanical lift can operate with controlled position or draft control and with a combination of the two. The lift is controlled by two levers located on the operator's right. It also features the Lift-O-Matic device which raises and lowers the implement without the need to use the position and draft control levers.

Draft control is actuated by the flex bar positioned in the special box mounted under the rear transmission.

The lower lift arms and corresponding control rods are connected to the flex bar.



3

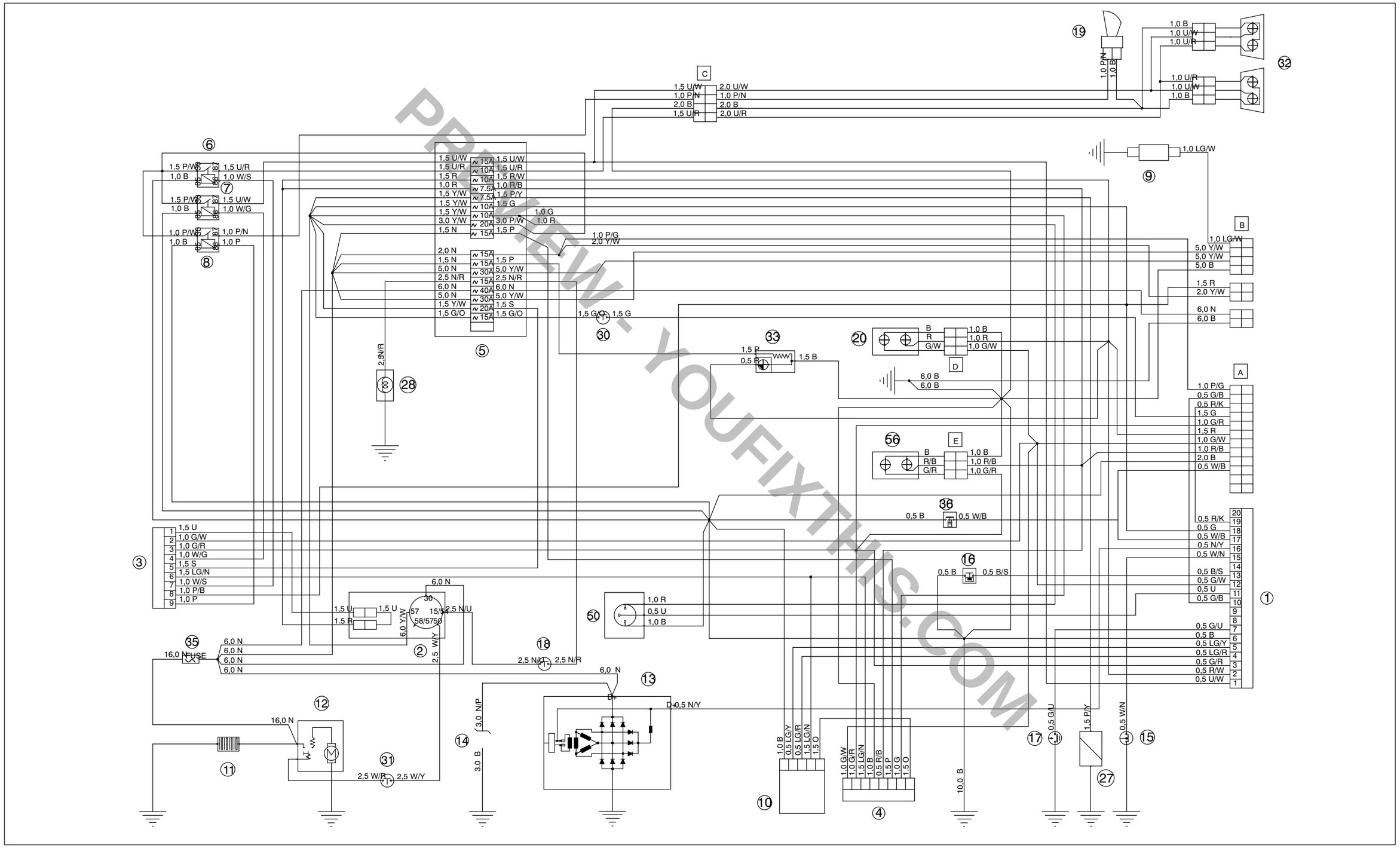
HYDRAULIC LIFT CIRCUIT

1. Delivery line to control valve (3).
2. Trailer brake control valve.
3. Auxiliary control valves.
4. Auxiliary control valve lines.
5. Trailer brake control valve line.
6. Lift control valve.
7. Suction line.
8. Oil filter.
9. Hydraulic pump.

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GENERAL DIAGRAM -CENTRE(WITH CAB)



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Repair Manual - TD Series Tractors

CONTENTS

GENERAL **SECTION 00**

General Instructions and Health and Safety **Chapter 1**

Section	Description	Page
00 000	General instructions	1
	Notes for spare parts	2
	Notes for equipment	2
	Safety rules	3
	Consumables	6

ENGINE **SECTION 10**

Engine System (F5C) **Chapter 1**

Section	Description	Page
	Tools	2
	Engine Troubleshooting	3
10 001 10	Engine R.I.	7

Engine System (NEF) **Chapter 1**

Section	Description	Page
	General specifications	2
	Data	5
	Tightening torques	11
	Tools	2
	Engine views	14
	Lubrication diagram	15
	Cooling system diagram	16
	Fault diagnosis	3
10 001 10	Engine R.I.	7
10 001 53	Engine D.A. Checks, measurements and repairs	37
10 102 70	Crankshaft front seal - Replacement	89
10 102 74	Crankshaft rear seal - Replacement	92
10 106 12	Valve tappet and rocker arm clearance - Adjustment	95
10 218 30	Engine injector R.I.	98
10 246 14	Bosch injection pump R.I. Timing. Air bleed	100

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TOOLS

Warning - The operations described in this section can only be carried out with **ESSENTIAL** tools indicated by an **(X)**.

To work safely and efficiently and obtain the best results, it is also necessary to use the recommended specific tools listed below and certain other tools, which are to be made according to the drawings included in this manual.

List of specific tools required for the various operations described in this Section.

X	**380000216**	Engine removal and installation tool.
	380000220	Clamp for fitting piston in cylinder liner 2.3622-4.9212 in. (60-125 mm).
X	**380000221**	Pliers for piston ring disassembly and reassembly 2.5590-4.3307 in. (65-1 10 mm).
	380000301	Rotating stand for overhaul operations (capacity 1000 daN, torque 120 daN/m).
X	**380000302**	Tool for engine valve disassembly and reassembly.
	380000304	Pair of gauges for angular tightening with 1/2" and 3/4" square connection.
	380000362	Crankshaft lifting tool.
X	**380000364**	Dial gauge base for various measurements (use with **380000228**).
	380000569	Movable tool for dismantling tractors with bracket **380000500** and adapter plate **380000844**.
X	**380000661**	Engine mounting brackets for rotating stand **380000301**.
X	**380000663**	Tool to extract crankshaft rear seal.
X	**380000664**	Splining tool for fitting rear seal on crankshaft.
X	**380000665**	Tool to extract crankshaft front seal.
X	**380000666**	Splining tool for fitting front seal on crankshaft.
X	**380000667**	Drift for camshaft bushing disassembly and reassembly (use with **380000668**).
	380000668	Grip for interchangeable drifts.
X	**380000669**	Gasket extraction tool.
X	**380000670**	Tool for cartridge filter disassembly.
	380000671	Injector extraction tool.
	380000975	Box with full set of tools to regrind valve seats.
	380000976	Spring load test appliance.
	380001003	Complete square to check for connecting rod distortion.
	380001268	Belt tension gauge.

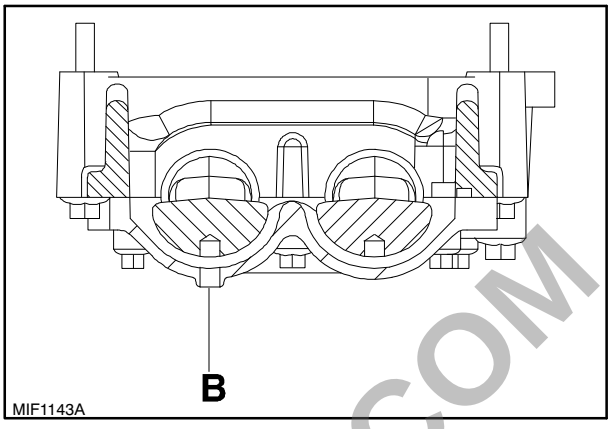
Injection pump bench test.

	380000228	Dial gauge 0-019.68 in. (0-5 mm).
X	**380000914**	Dial-gauge holder tool for rotary injection pump timing (use with **380000228**).
X	**380000732**	Tool for engine flywheel rotation (use with **380000988**).
X	**380000988**	Plate for engine flywheel rotation tool with flywheel timing pin (use with **380000732**).

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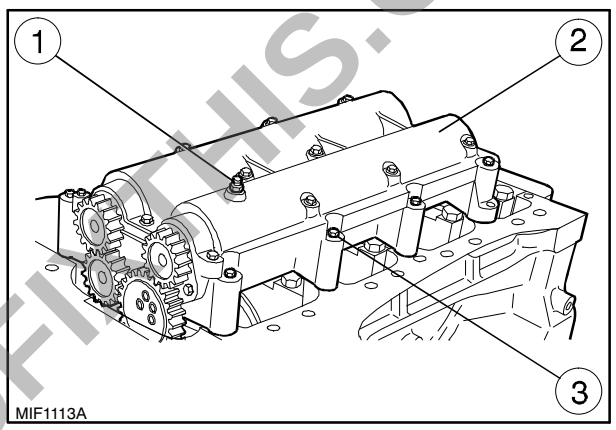
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- Insert the retaining pin in the hole (B) on the additional counterweight assembly to block rotation during the subsequent installation phase.



198

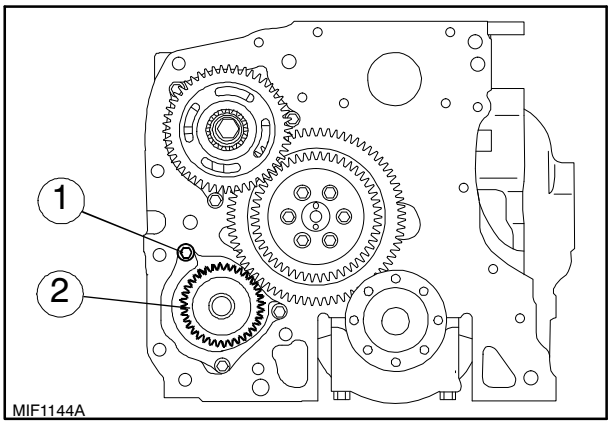
- Fit the additional counterweights (2), tighten the screws (3) to the torque prescribed on page 11 and remove the retaining pin (1) from the hole (B).



199

FITTING THE HYDRAULIC PUMP DRIVE GEAR
(Disassembly operation 48.)

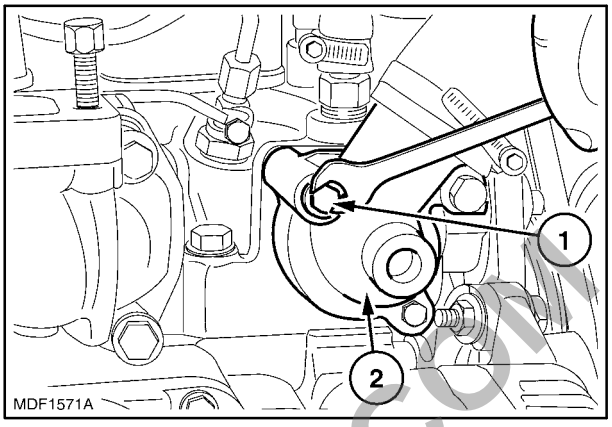
- Insert the gear driving the hydraulic pumps (2) into the seat and tighten the bolts (1).



200

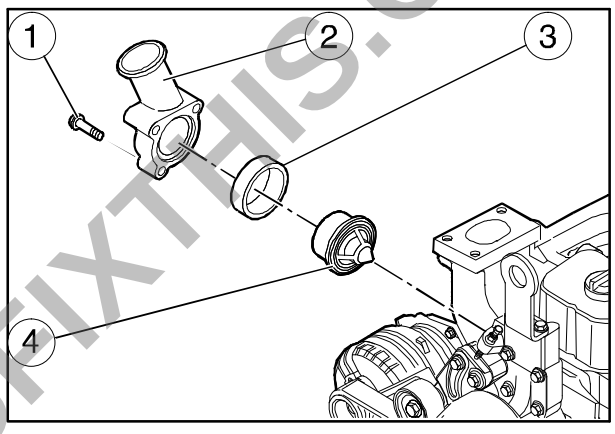
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6. Take out the bolts (1) retaining the thermostat valve body (2).



321

7. Remove the thermostat valve body (2), seal (3) and thermostat valve (4).
8. To refit the thermostat valve, proceed as follows.



322

323

Always use appropriate tools to align fixing holes. NEVER USE FINGERS OR HANDS.

- Respect the tightening torques prescribed on page 11.
- Refit the thermostatic valve, after positioning the thermostat valve seal.
- Fit the thermostat valve body and the retaining bolts.
- Fit the radiator-thermostat valve connecting sleeve and the clamp.
- Install the fitting of the cab heater radiator coolant return pipe connected to the bottom of the coolant pump and refill the engine coolant.
- Fit the guard on the right-hand side of the fan and tighten the three retaining bolts.
- Reconnect the battery negative lead.
- Close the bonnet.

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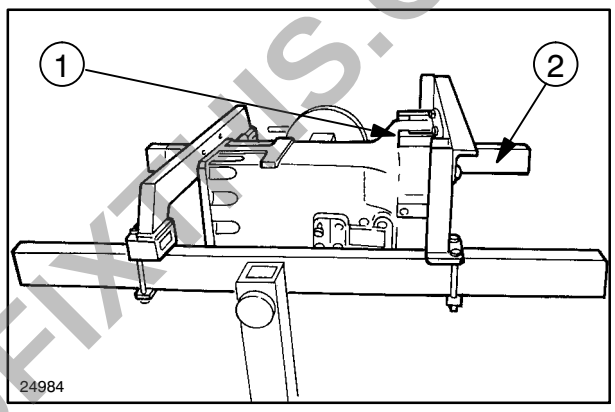
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CLUTCH/REVERSER CASING
Replacement (Op. 21 110 85)

⚠ WARNING ⚠

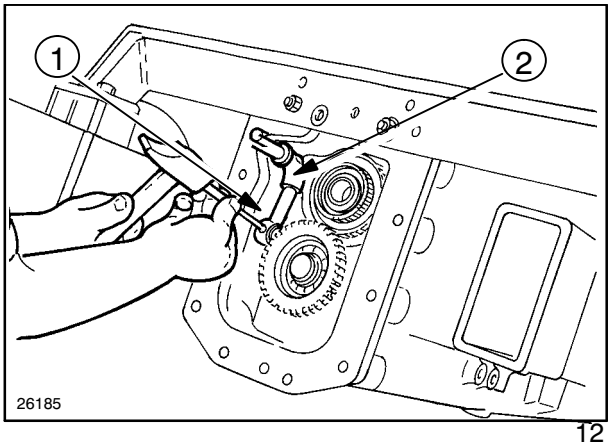
Handle all parts with great care.
Never insert fingers or hands between one piece and another. Wear suitable safety clothing, i.e., safety goggles, gloves and shoes.

1. Fix the clutch / reverser casing (1) to stand **380000301** (2) using the two brackets **380000271** and **380000272**.



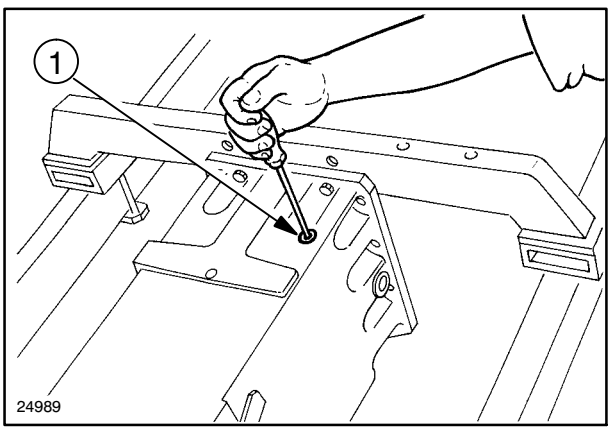
11

2. Withdraw the spring pin and recover the link lever (1) and the internal lever (2).



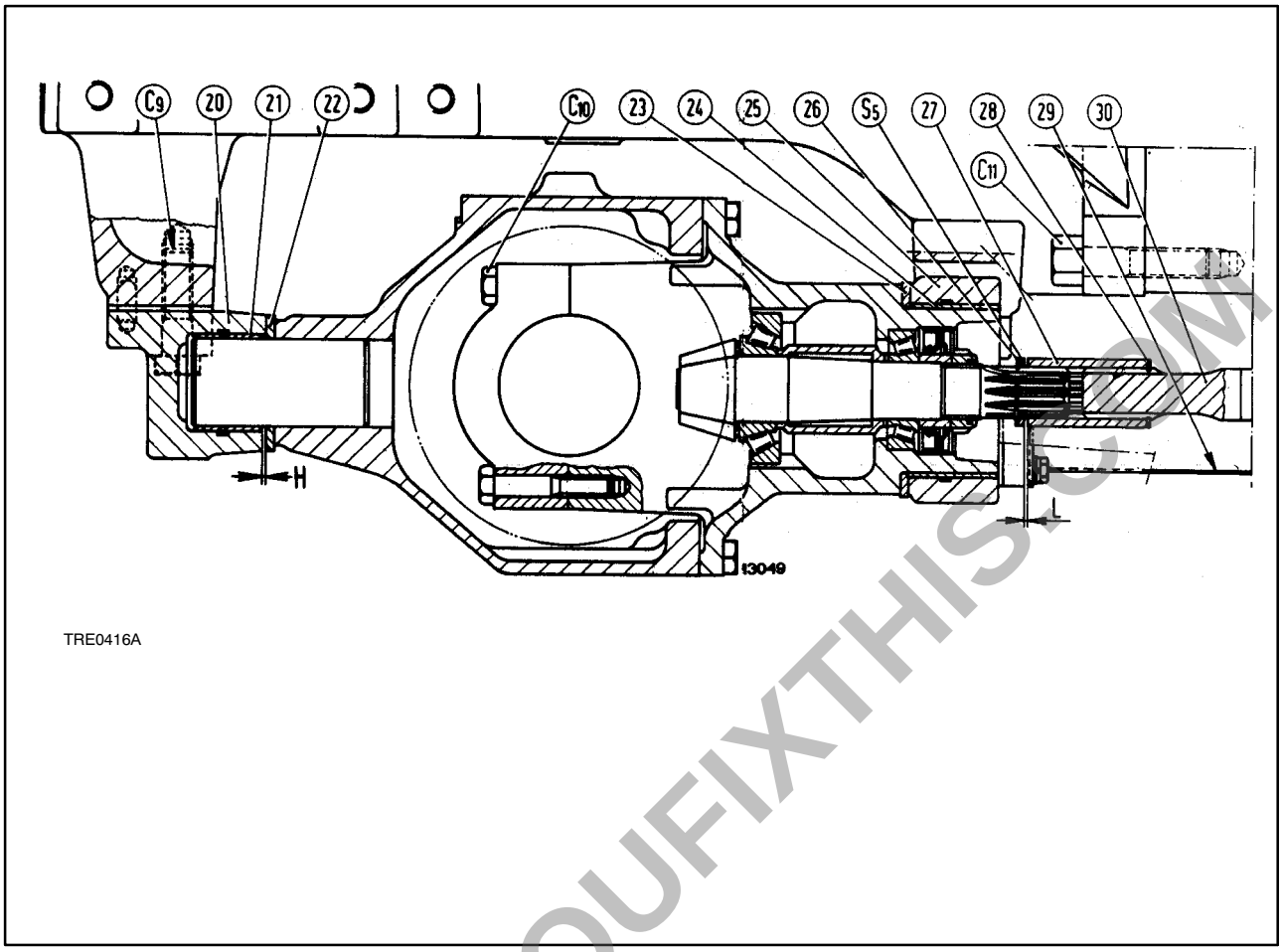
12

3. Unscrew the retaining bolt (1) and recover the detent ball and spring.



13

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4

Cross-sectional view of front axle pivot

H = 1 mm (0.0394 in.)
L = 1 to 1.5 mm (0.0394 - 0.0590 in.)
S_5 = Sleeve position shim

C_9 = Axle pivot support capscrew
C_{10} = Differential bearing cap capscrew.
C_{11} = Capscrews securing front axle support to engine.
20. Front axle pivot support
21. Front bushing
22. Front thrust washer
23. Rear thrust washer
24. Rear bushing
25. Rear axle pivot support
26. Retaining rings
27. Front splined sleeve
28. Retaining rings
29. Drive shaft guard
30. Drive shaft

DESCRIPTION AND OPERATION

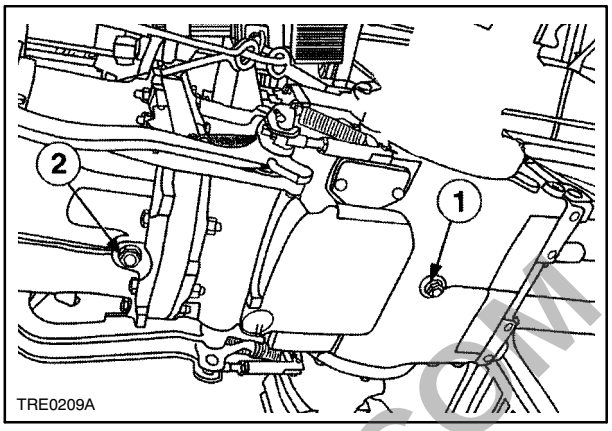
TD5010, TD5020, TD5030, TD5040 and TD5050 models have a centrally pivoting front axle with the pivot and the drive shaft coaxial with the longitudinal axis of the tractor. The drive shaft has no universal joints.

The differential has two planet pinions; drive is transmitted to lateral epicyclic final drive units (installed on the wheel hubs) through universal joints which require no maintenance.

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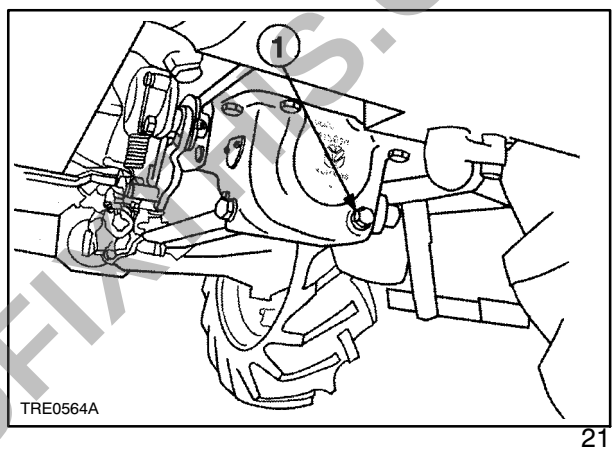
To remove the gearbox rear transmission, proceed as follows:

1. Disconnect the negative terminal from the battery. Remove the rear transmission drain plug (1) and the gearbox drain plug (2). Drain the oil into suitable containers.



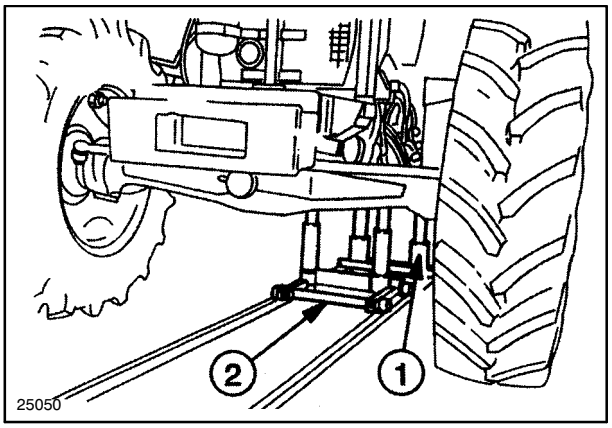
20

2. Remove the drain plug from the 4WD transfer box (1) and drain the oil into a suitable container.



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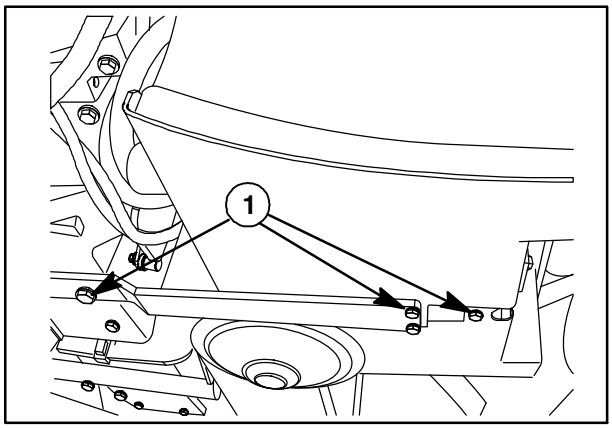
3. Place the tractor dismantling stand **380000236**, so that the fixed support (1) is beneath the rear transmission case in supporting the engine coupling flange and the moveable support (2) under the engine in supporting the flange attached to the gearbox case.



22

4. Remove fuel tank by loosening retaining bolts (1) which are under the tank after drain the fuel.

NOT: If there is an expansion tank also remove the expansion fuel tank.



23

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MECHANICAL POWER TAKE-OFF

(continued)

		TD5010 and TD5020	TD5030, TD5040 and TD5050
Ground speed PTO. Rear wheel speed with PTO shaft rotating at 540/750 rev/min (30 and 40 km/h versions)	wheel speed rev/min	as for single-speed PTO	
Ground speed PTO. Rear wheel speed with PTO shaft rotating at 1000 rev/min (30 km/h version)	wheel speed rev/min	14.1	15.2
Ground speed PTO. Rear wheel speed with PTO shaft rotating at 1000 rev/min (40 km/h 4WD version)	wheel speed rev/min	11.5	12.4
Diameter of PTO shaft at splined end:			
- 540 rev/min		$1^3/_8$ in. (6-spline)	
- 750 rev/min		$1^3/_8$ in. (6-spline)	
- 1000 rev/min		$1^3/_8$ in. (21-spline)	
External diameter of driven gear support bushings	mm (in.)	49.925 - 49.950 (1.9655 - 1.9665)	
Internal diameter of driven gears	mm (in.)	50.050 - 50.089 (1.9705 - 1.9720)	
Clearance between driven gears	mm (in.)	0.100 - 0.164 (0.0039 - 0.0065)	
Diameter of driven shaft at front and centre bushings	mm (in.)	39.166 - 39.191 (1.5420 - 1.5429)	
Diameter of driven shaft at rear bushing	mm (in.)	34.984 - 35.000 (1.3773 - 1.3780)	
Internal diameter of front and centre bushing	mm (in.)	39.200 - 39.239 (1.5433 - 1.5448)	
Internal diameter of rear bushing	mm (in.)	35.009 - 35.048 (1.3783 - 1.3798)	
Clearance between shaft and front and centre bushings	mm (in.)	0.009 - 0.073 (0.0004 - 0.0029)	
Clearance between shaft and rear bushing	mm (in.)	0.009 - 0.064 (0.0004 - 0.0025)	

TOOLS

Important - The operations described in this section must be performed solely with the **ESSENTIAL** tools marked below with **(X)**.
To work in complete safety and to ensure optimal technical results with a minimum of time and effort, they must however be supplemented with the specific tools recommended below and with those to be specially constructed by you and for which the construction diagrams are given in this manual.

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SECTION 35 - HYDRAULIC SYSTEM

Chapter 1 - Rear mechanical hydraulic lift

CONTENTS

Section	Description	Page
35 000	Main specification	1
	Tightening torques	6
	Tools	7
	Cross-sectional views	8
	Description & Operation	10
	Hydraulic circuit	10
	Description and operation of lift phases	11
	Fault diagnosis	14
35 110.30	Hydraulic lift - disassembly reassembly	16
35.110.40-42-46	Hydraulic lift - bench overhaul	22
	Adjusting the lift	27
35.110.08	Linkage adjustment	33
35.110.30	Pressure relief valve - disassembly reassembly	35
35.110.32	Pressure relief valve - setting	35
35.110.14	Lift control valve - disassembly assembly and overhaul on bench	37
35.0101.10	Lift pump	42

35 000 - MAIN SPECIFICATION - TORQUE SETTINGS - TOOLS - SECTIONAL DRAWINGS - DESCRIPTION AND OPERATION - TROUBLESHOOTING

MAIN SPECIFICATION OF REAR MECHANICAL HYDRAULIC LIFT

Type		position or draft control with a combination of the two
Operating system		two independent levers
LIFT-O-MA TIC		provides fast lifting/lowering operations using pushbuttons, without using the position or draft control levers
Single-acting cylinder:		
- rated diameter and stroke:		
All models	mm	100x128
	(in.)	(3.9370x5.0394)
- capacity:		
All models	cm^3	1005
	($in.^3$)	(61.33)
Pressure relief valve setting	bar	186 - 191
	psi	(12697.69 - 2770.21)
Cylinder safety valve setting	bar	210 - 215
	psi	(3045.78 - 3118.30)

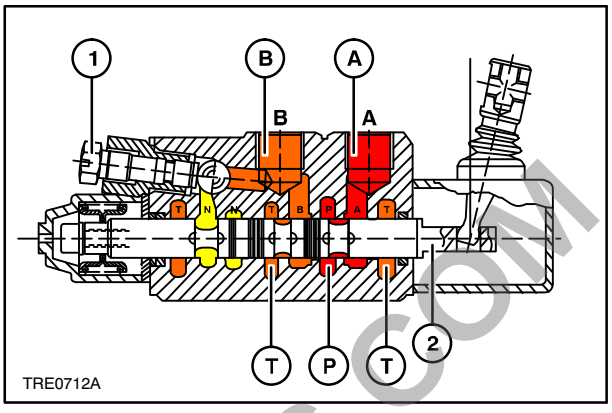
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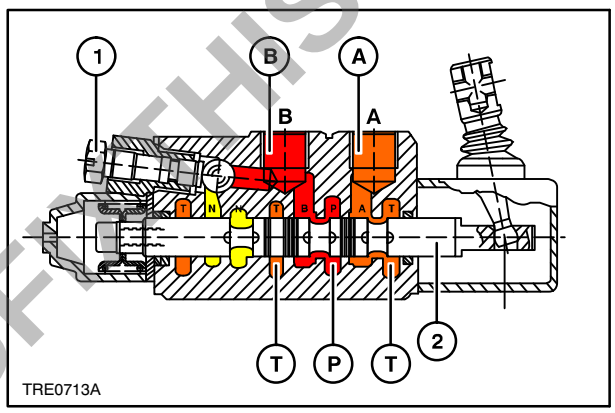
OPERATING STAGES OF AUXILIARY CONTROL VALVE FOR OPERATION OF A DOUBLE-ACTING CYLINDER (FIGS. 5 & 6) AND SINGLE -ACTING CYLINDER (FIGS. 7 & 8)

1. LIFTING - On pulling back the control lever, (located in the cab) the control valve spool (2) moves to connect: pressure line (P) with the lower chamber of the cylinder by way of line (A), and also exhaust line (T) by way of line (B), intercepting the supply of oil to the lift control valve. Keep the lever pulled back, to extend the cylinder to its full stroke. On releasing the lever it will automatically return to neutral position, under the action of the return spring, and the entire flow from the pump will be conveyed to the lift control valve by way of line (P).



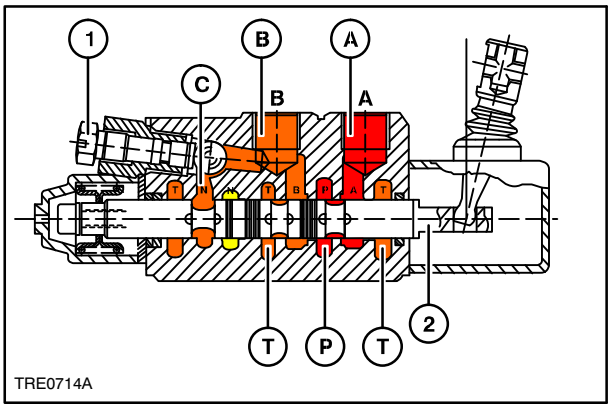
5

2. LOWERING - To lower the implement, push the control lever (located in the cab) forward. The control valve spool (2) will move to the position indicated in fig. 6, thus allowing the oil in the lower cylinder chamber to flow to the exhaust (T) through line (A), while the upper chamber is connected to the pressure line (P) through line (B) .



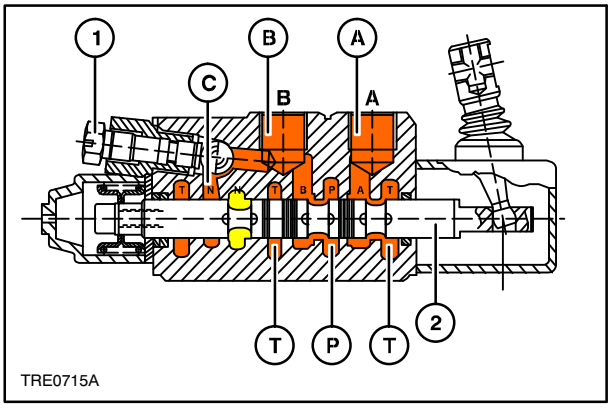
6

3. LIFTING - On pulling the control lever back, the control valve spool (2) fig. 7 moves to connect the cylinder with the pressure line (P) by way of line (A). Line (C), for the control of single- acting cylinders, is used in this stage as it is permanently connected to the exhaust (T) by the open position of the switching valve (1).



7

4. LOWERING - On pushing the control lever forward, the spool (2) will move to the position indicated in fig. 8. The oil contained in the cylinder, pressurised by the weight of the lifted implement, will flow to the exhaust (T) by way of line (A), while the entire flow from the pump is also conveyed to the exhaust (T) through the line (B).



8

Pressurised oil

Suction, delivery or exhaust oil

Static oil

NOTE: To operate a double-acting cylinder, tighten screw (1) fully home. To operate a single-acting cylinder, fully undo screw (1).

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B - CHECKING RETURN TO NEUTRAL POSITION

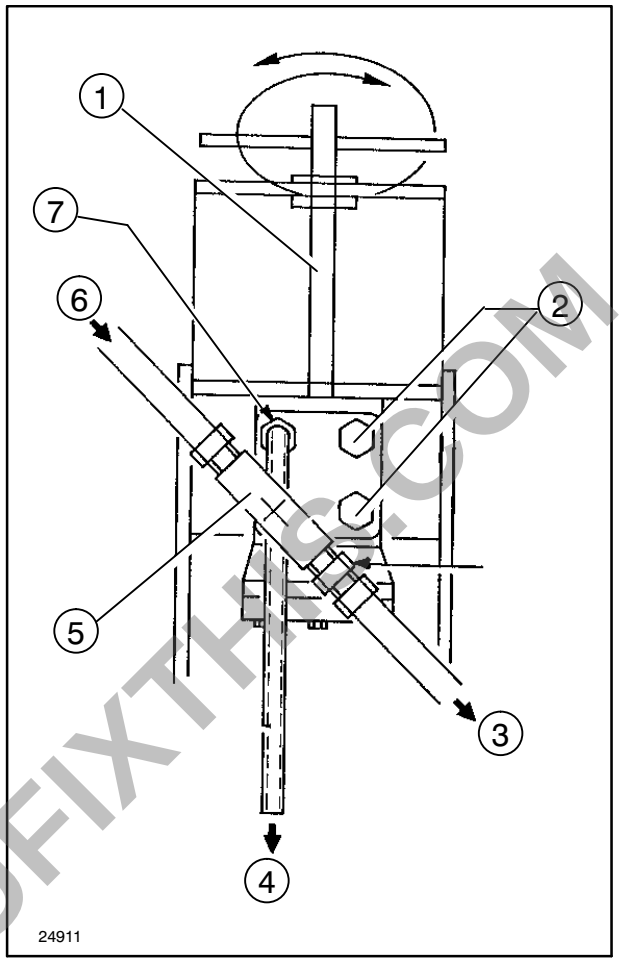
In the same test conditions as **A**, check that the valve automatically returns to neutral position when the control shaft (1) is released after each simulated steering movement.

C - CHECKING SEAL EFFICIENCY

In the same test conditions as **A**, hold the valve in steering position with the control shaft (1) for about three minutes and check the seals for leaks.

D - SETTING THE PRESSURE RELIEF VALVE

1. Make the connections as shown in figure (68) and complete the circuit as in figure (69).
2. Using the control shaft (1), simulate a steering cycle (to right or left) so as to interrupt the oil flow to the outlet.
3. Gradually increase the pressure in the circuit by turning the handwheel (5) fig. 68, and check on the pressure gauge that the pressure relief valve (22, fig. 2) cuts in at the pressure shown on page 1. If not, increase or reduce the pressure relief valve setting by tightening or slackening the adjuster screw.



69

1. Splined control shaft
2. Plug G 1/2”
3. To throttle
4. Outlet
5. Three-way coupling G 1/2”
6. From delivery line
7. Outlet coupling G 1/2”

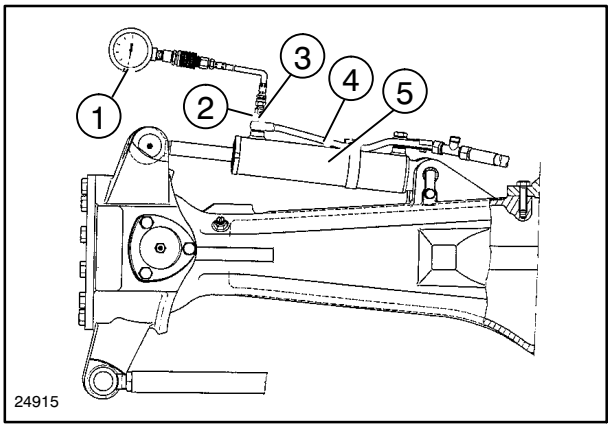
CHECKING THE HYDROSTATIC STEERING PRESSURE RELIEF VALVE WITH STEERING CONTROL VALVE INSTALLED ON TRACTOR.

Proceed as follows:

1. Start the engine and run until the oil temperature reaches approx. 50°C (122°F).
2. Switch off the engine and unscrew the oil delivery pipe union (4) on the hydraulic cylinder (5).
3. Fit union (2) in place of union (4), and connect the pressure gauge (1) with a 0 - 21.3350 psi scale by way of union (3).
4. Start the engine again, bring the speed up to medium rpm, and apply full-steering lock to bring the hydraulic cylinder to the stroke-end position.

In this condition, the pressure relief valve (22, fig. 2) should open and the pressure gauge should indicate the value given on page 1.

5. If the pressure gauge reading deviates significantly from the prescribed value, adjust the valve opening pressure by way of the adjuster screw.



70

1. Pressure gauge (supplied in kit **380000240**)
2. Union **380000618** (supplied in kit **380000240**) to be fitted in place of original union
3. Union **380000613** (supplied in kit **380000240**)
4. Hydraulic cylinder oil feed pipe
5. Hydraulic cylinder.

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Note - The circular sector of the humidity indicator (15, fig. 15) must remain green throughout the recycling operation.
If the colour of the sector tends to vary between yellow and green, or turns completely yellow, this means that the filter is saturated with moisture and therefore must be replaced.

23. On completion of the decontamination operation, close the yellow cock (18-REF) and continue to recover the refrigerant.The compressor will stop automatically when .the pressure gauge (2) shows a reading of -0.3 bar (-4.35 psi).

24. Close the cock (6-LOW), the two cocks on the ends of the yellow (16) and blue (11) service pipes, disconnect pipes (16 and 11) and switch off the station, turning switch (5) to position ”0”.

Discharge of recovered oil

The presence of contaminated recovered oil can be seen in the distillation cylinder (4). The recovered oil must always bee discharged and disposed of according to local regulations.

Proceed as follows:

25. Slowly open the yellow cock (7) and discharge the recovered oil in the graduated container.

26. If no refrigerant leaks, whether major or minor, have ever been detected in the system, on recharging, replace the contaminated oil with same quantity of new oil (see page 26).

Transfer of decontaminated refrigerant from cylinder (10) to an external cylinder

If for any reason the decontaminated refrigerant is not to be put back into the air conditioning system immediately, for reasons of safety it must be transferred from cylinder (19) to a homologated refillable gas container.

Proceed as follows:

27. Check that all the cocks are closed with the exception of cock (9) and that the station is switched off. Check that the container (cylinder) is large enough to contain all the refrigerant to be transferred without exceeding the permitted safety level.

28. Connect the end of the yellow service pipe (16) without the cock to the free connector on the left-hand side of the pressure gauge manifold, and connect the other end (with the cock) to the red connector of the external cylinder.

29. Set switch (5) to position ”2” HEATING CYLINDER to switch on the refrigerant heater fitted to the cylinder (19) so as to facilitate the transfer of the refrigerant from the cylinder to the external cylinder.

30. Open the yellow cock (18-REF), the yellow cock on the service pipe and red cock on the external cylinder.

31. On completion of the transfer, close all cocks and switch off the station by turning switch (5) to position 0.

Evacuation and charging the cab air conditioning system using the evacuation/charging station 294030.

Note - Operations 32 ÷ 34, must only be carried out if the graduated cylinder (31) is empty of refrigerant.

Evacuation of the graduated cylinder (31) of the evacuation/charging station

Refer to figure 16 and proceed as follows:

32. Close cocks (4, 22 and 27).

33. Open cocks (3, 9 and 10).

34. Start the pump by turning switch (19) to position “1” to evacuate the cylinder (31). After 5 minutes close cocks (3, 9 and 10) and switch off the pump.

Charging the graduated cylinder (31) of the evacuation/charging station

If the decontaminated refrigerant in the recovery/recycling station is to put back into the tractor air conditioning system immediately, it must be transferred from cylinder (19, fig. 15) to cylinder (31, fig. 16) of the evacuation/charging station, proceeding as follows:

35. With reference to figure 16, connect the end (without cock) of the yellow service pipe (24) to the free connector (28) on the left-hand side of the pressure gauge manifold of the evacuation/-charging station..

36. Connect the other end (with cock) of the service pipe to the free connector (17, fig. 15) on the left-hand side of the pressure gauge manifold of the recovery/recycling station.

37. With reference to figure 15, check that all the cocks of the recover/recycling station are closed with the exception of cocks (9 and 18) and that on the pipe (16).

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If the voltmeter reading is higher than 14 V or 14.4 V, for Magneti Marelli or Bosch alternators respectively, the alternator regulator must be changed, as described in this section. (After installing a new regulator, carry out tests 4 and 5).

If the voltmeter reading is less than 13.6 V, there is either a faulty component in the alternator or a failure due to excessive resistance in the external charging system connections.

If the ammeter reads zero amps, then one of the alternator components is malfunctioning. Turn the engine off and carry out the alternator component test, as described in this chapter.

3. CHARGING CIRCUIT VOLTAGE DROP TESTS

(a) Insulated side voltage drop test

See figure 7.

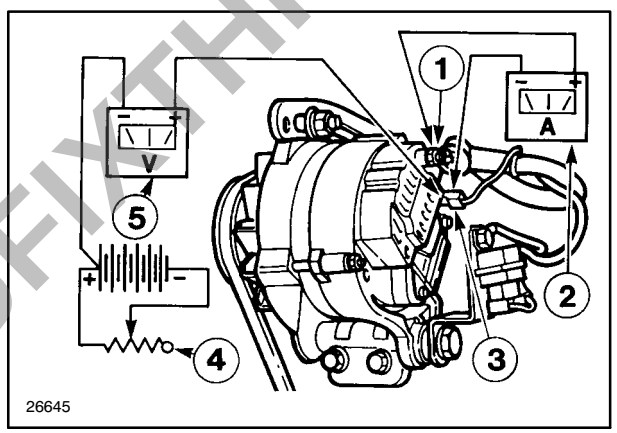
Check the ignition key is in OFF position.

1. Disconnect the negative battery cable and the B+ alternator wire (1).
2. Connect a millivoltmeter (5) between the positive battery terminal clamp and D+ wire (3) (positive side of the wire)
3. Connect an ammeter (2) between the B+ alternator terminal and the D+ wire (negative side of the wire).
4. Reconnect the negative battery cable and connect a varying load resistance (4) with cursor in minimum current absorption position (maximum resistance) through the battery terminal clamps.
5. Start the engine and increase speed to 2000 rev/min.
6. Decrease resistance charging load (decreasing resistance) slowly until the ammeter reads 45 or 65 A. according to the type of alternator.
7. Note the reading on the millivoltmeter. This must not be higher than 400 millivolts.

A reading higher than 400 millivolts indicates malfunctioning due to excessive resistance in the external circuits.

If the alternator does not output required power and the millivoltmeter reading is less than 400 millivolts, there is a malfunctioning component in the alternator. Carry out the alternator component tests, as described in this section.

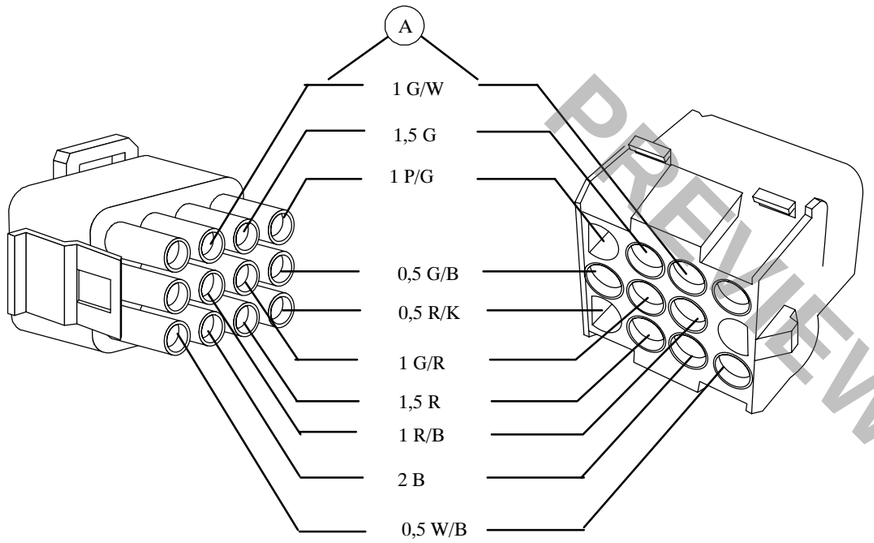
8. Stop the engine.



7

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CONNECTOR OVERVIEW



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