Legend

105 - 115 - 130 - 145 - 165



Workshop Manual

Publication P/N 3549054 M2

Landini

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Working in safety

1-1 Essential rules for accident prevention

The structures, systems and equipment in repair shops must conform to the current laws governing labour safety in order to safeguard the health and safety of each worker.
Although they are obviously only partial, the regulations given in this section inform the workers about the dangers they may encounter on the job.

Always bear your safety and that of others in mind whenever you work on a machine, whichever type it may be.
To work in complete safety, it is essential to know the nature of the job, to correctly use the tools and materials required and to rely on your common sense.

To prevent accidents, it is important to:

- **BEHAVE** correctly and act with caution;
- Pay **ATTENTION** and keep your actions under control;
- Comply with the **REGULATIONS** and rules of behaviour of a general character.



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3-2 Technical specifications

ENGINE		105 2/4 WD	115 2/4 WD	130 2/4 WD
MAKE		Perkins Diesel Direct Injection 4 Stroke	Perkins Diesel Direct Injection 4 Stroke	Perkins Diesel Direct Injection 4 Stroke
Commercial Description		1006.6HR4	1006.6HR3	1006.6TLR2
Type		YA 6001	YA 6131	YB 6101
Engine list		YA 80796	YA80774	YB 80765
Cycle		Aspir. /4 stroke	Aspir. /4 stroke	Turbo /4 stroke
Number of cylinders		6	6	6
Bore by stroke	mm.	100 x 127	100 x 127	100 x 127
Displacement	cc.	6,000 cc	6,000 cc	6,000 cc
Compression ratio		16,5 : 1	16,5 : 1	16 :1
Cylinder liners		dry removable in cast iron	dry removable in cast iron	dry removable in cast iron
Maximum power rate	RPM	2,200	2,200	2,200
Max. power (Din 70020)	HP/kW	103/75.8	110/81.5	127/93.5
Max. speed with no load	RPM	2,310	2,310	2,310
Max. speed on load	RPM	2,200	2,200	2,200
Max. torque (DIN70020)	Nm.	395	425	505
Max. torque rate.	RPM	1,200	1,400	1,400
Torque reserve	%	17	20	22
Idling rate		750	750	750
Valves per cylinder	N°	2	2	2
Weight	Kg.	410	410	410
VALVE GEAR				
Valves	N°	2 overhead	2 overhead	2 overhead
Timing data:	IVO(btcd)	19°	19°	19°
Intake. Opens before t.d.c.	IVO (abdc)	33°	33°	33°
	EVO (bbcd)	52°	52°	52°
Intake. Closed after b.d.c.	EVO (atcd)	16°	16°	16°
Exhaust opens before t.d.c.	valve lift intake mm	10.49	10.49	10.49
Exhaust closes after b.d.c.	valve lift exhaust mm.	10.27	10.27	10.27
Tappet gap				
Engine hot				
a – intake	mm.	0.20	0.20	0.20
b – exhaust	mm.	0.45	0.45	0.45
c – exhaust pressure	Kn/m^2	10.2	10.2	10.2

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Bevel gear pair and rear differential

6 - Ring gear-pinion adjustment

The adjustments required by the bevel gear pair of all the gearboxes mounted in the tractors in question (L 105-115-130-145-165) can be summarized in the following way:

a - Adjustment of the position of the pinion shaft in relation to the bevel gear pair.

b - Regulation of the established preload for the two taper bearings that support the pinion shaft in order to obtain the exact moment of rotation.

c - Regulation of the play between the teeth of the pinion shaft and those of the ring gear.

d - Regulation of the established preload for the taper bearings that support the differential.

The operations described below are not only valid when adjustments are made to the bevel gear pair during a general overhaul, but also when merely checking the regulation alone.
To make all this clearer, we will now describe the circumstances that lead to adjustments 1 and 2 being required again.

Adjustment 1 must be made whenever the gearbox housing or that of the rear taper bearing that supports the pinion shaft must be changed. Adjustment 2 must be carried out whenever one or both taper bearings that support the pinion shaft are changed.

a - Adjusting the position of the pinion shaft in relation to the bevel gear pair.

This operation establishes the exact position of the pinion shaft in relation to the bevel gear pair to achieve the prescribed coupling between the teeth. To do this, it is necessary to establish the exact value of the adjuster shim since this is the only element that is variable as it compensates for machining differences on the gearbox housing and the height of the rear taper bearing that supports the pinion, in relation to the values in the drawings.
Determination of the adjuster shim depends on three main measurements:

1. The distance between the housing of the circlip that separates the two taper bearings and the axis of the ring gear (dimension 'A' indicated in Fig.38-5).
   Dimension (A) is accurately measured on all differential housings and is shown by a number stam-

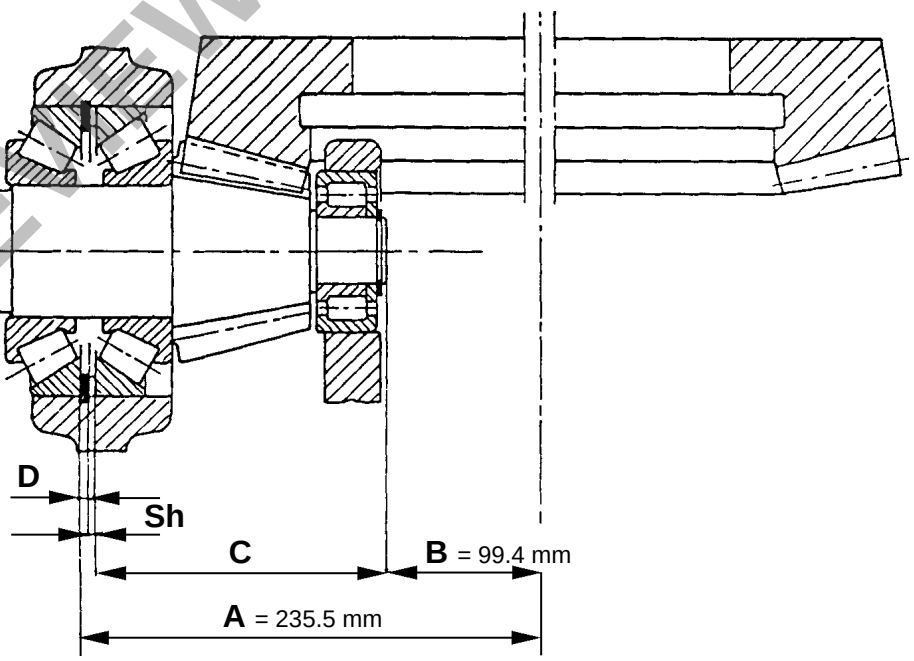


Fig.38-5

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9-1 General hydraulic circuit - Top tractors

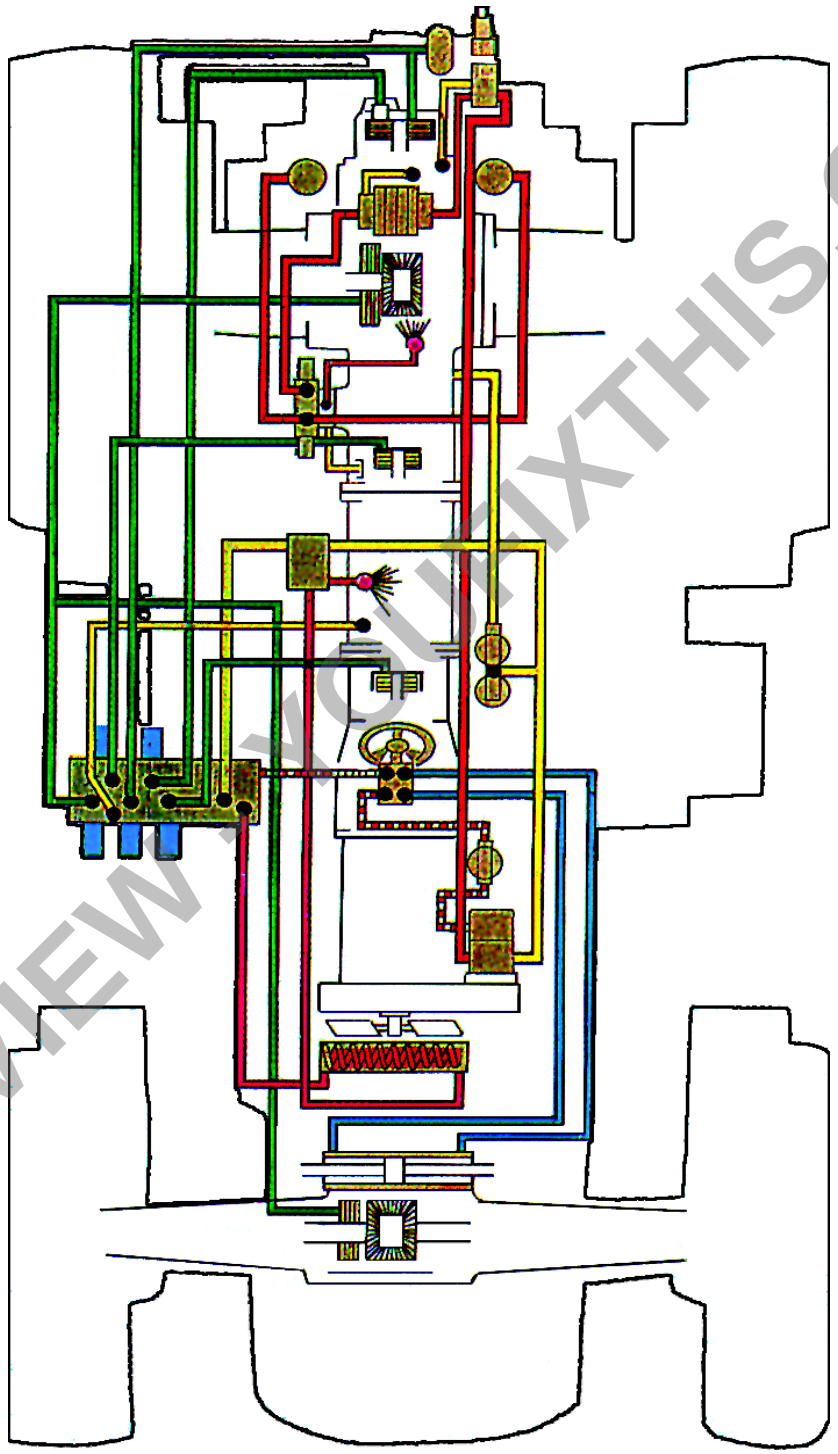
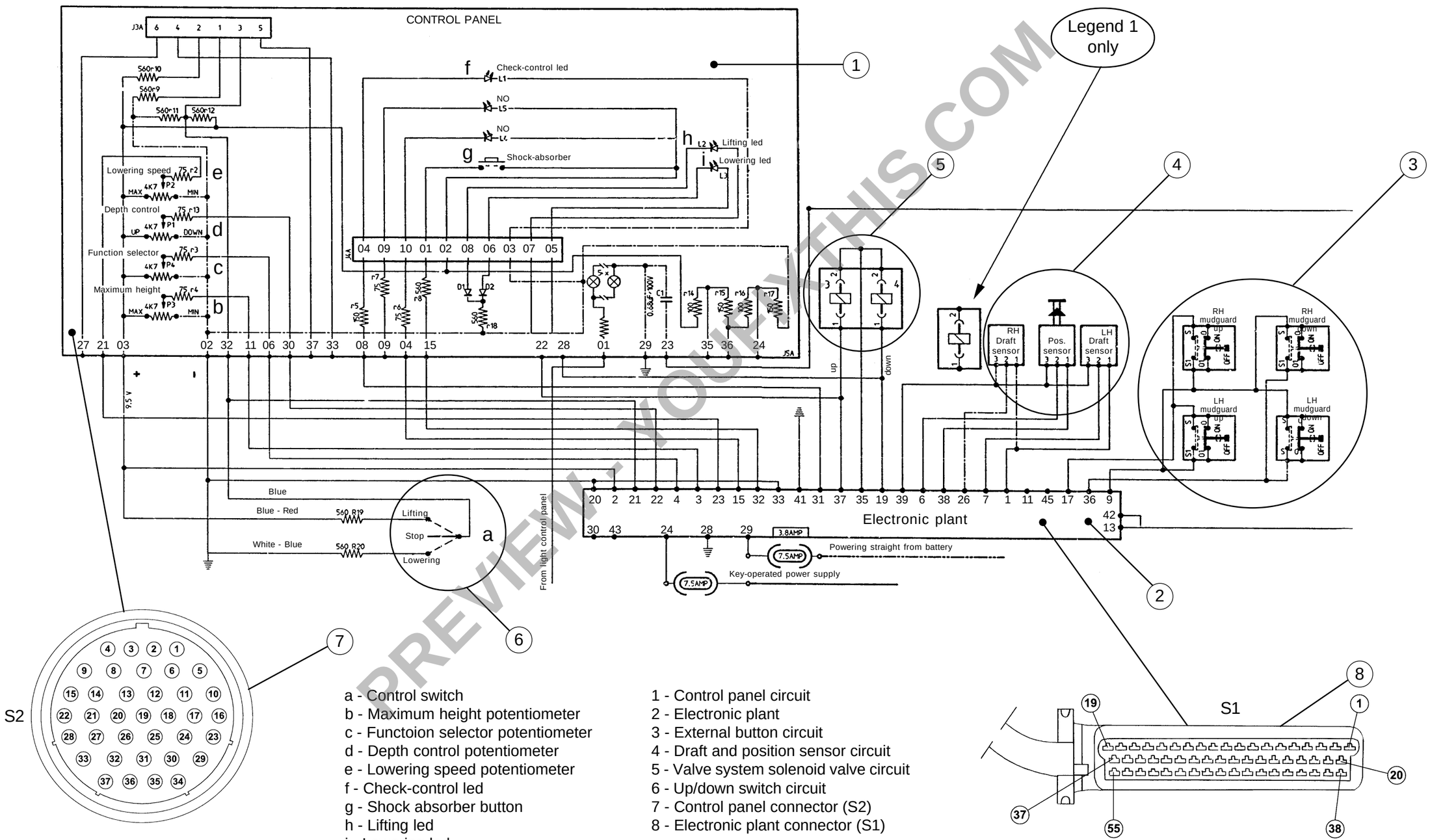


Fig.1-9

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Wiring diagram of electronic power lift



a - Control switch
b - Maximum height potentiometer
c - Functoion selector potentiometer
d - Depth control potentiometer
e - Lowering speed potentiometer
f - Check-control led
g - Shock absorber button
h - Lifting led
i - Lowering led

1 - Control panel circuit
2 - Electronic plant
3 - External button circuit
4 - Draft and position sensor circuit
5 - Valve system solenoid valve circuit
6 - Up/down switch circuit
7 - Control panel connector (S2)
8 - Electronic plant connector (S1)

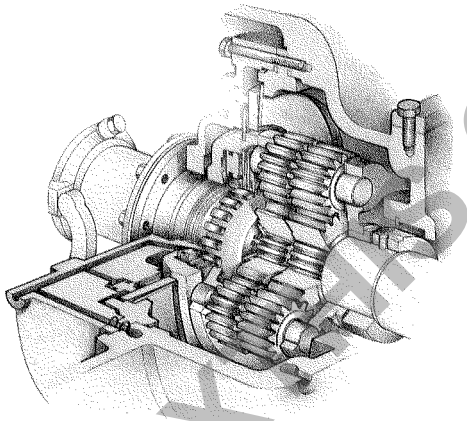
Fig.48-11

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Gearbox drive shaft

5 - Power-six exploded drawing of assembly (part 1)

1 - Cover
2 - Piston
3 - Steel discs
4 - Sintered discs
5 - Hub
6 - Crown wheels
7 - Planetary gear
8 - Housing
9 - Shaft
10 - Belleville washer
11 - Steel disc
12 - Sintered disc
13 - Piston
14 - Cover
15 - Flange



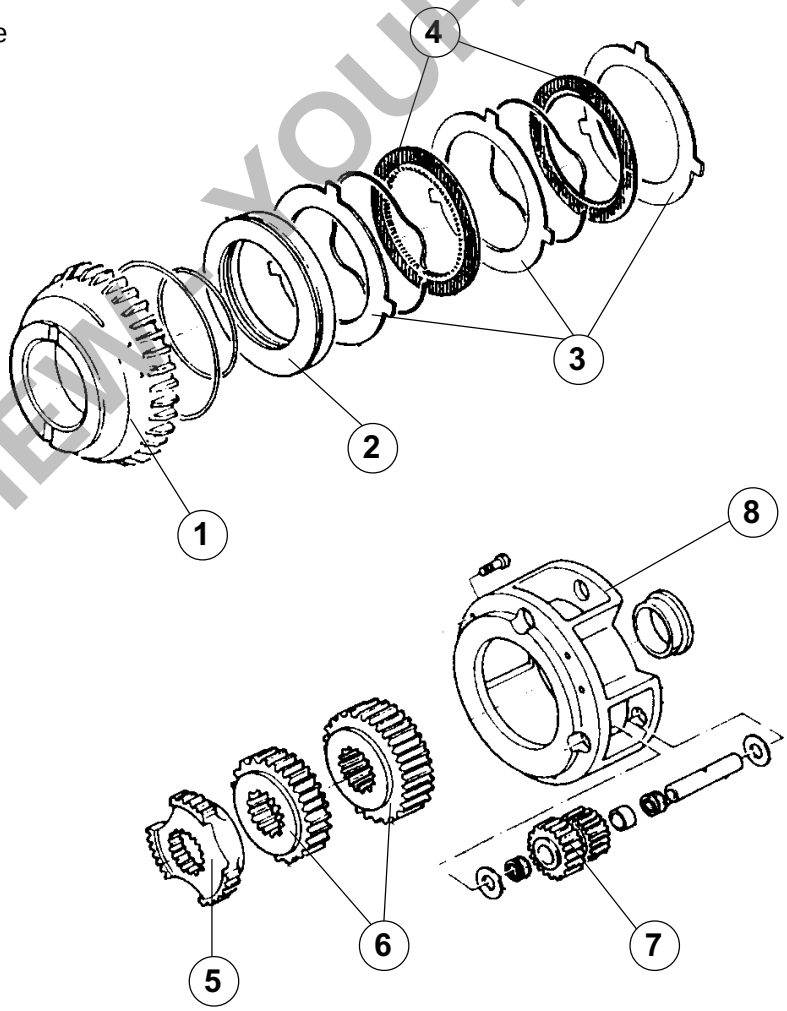


Fig. 14-5

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2-10 Table of bolt driving torques

MATERIAL	8.8		10.9		12.9	
BOLT	Z	B	Z	B	Z	B
M 8 x 1	25	27	36	38	43	46
M 8 (1.25)	23	25	33	35	40	42
M 10 x 1.25	50	55	70	75	85	90
M 10 (1.5)	46	50	66	70	80	85
M 12 x 1.25	90	97	127	135	143	155
M 12 (1.75)	82	86	115	120	138	145
M 14 x 1.5	142	153	200	215	240	260
M 14 (2)	130	140	182	195	220	235
M 16 x 1.5	215	230	300	320	360	390
M 16 (2)	200	215	280	300	340	360
M 18 x 1.5	310	330	435	470	520	560
M 18 (2.5)	270	295	385	415	460	495
M 20 x 1.5	430	460	610	660	720	770
M 20 (2.5)	390	415	550	585	660	705
3/8" -24 UNF	44	47	62	67	75	80
3/8" -16 UNC	40	43	56	60	68	72
1/2" -20 UNF	105	112	147	157	175	190
1/2" -13 UNC	95	102	135	145	160	173
9/16" -18 UNF	150	160	210	225	250	270
9/16" -12 UNC	135	145	190	205	230	245
5/8" -18 UNF	205	215	285	305	345	365
5/8" -11 UNC	185	200	260	280	315	335
3/4" -16 UNF	355	380	500	535	600	645
3/4" -10 UNC	325	345	455	490	550	585

Torque value in Nm ***Z = galvanized bolt*** ***B = burnished bolt***

TORQUING TOLERANCES

Critical assembly	**+5% / -5%**
Important assembly	**+5% / -15%**
Secondary assembly	**+5% / -30%**

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Check control codes

2 - Slight fault

A = Fault code
B = Short description
C = N° Pin affected
D = Description of fault

A	B	C	D
3-1	Rh draft sensor	26	Signal meaning rh draft measuring sensor not O.K. ⇒ Cable broken or not connected ⇒ Possible short-circuit or grounding ⇒ Possible sensor overload
3-2	Lh draft sensor	7	Signal meaning lh draft measuring sensor not O.K. ⇒ Cable broken or not connected ⇒ Possible short-circuit or grounding ⇒ Possible sensor overload
3-3	Battery	24	Battery voltage too low (<11.5 Volt)
3-4	Down speed potentiometer	23	Signal meaning down speed potentiometer not O.K. Cable broken or not connected
3-6	Intermix potentiometer	4	Signal meaning Intermix potentiometer not O.K. Cable broken or not connected
3-7	Defective solenoid valve		Despite the fact that Lifting current is being transmitted to the terminal of the plant housing, the lifting device fails to lift. Is the engine on? If it is, the oil pressure is insufficient or the valve has jammed

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3-12 Troubleshooting

FAULT	POSSIBLE CAUSES	
	INSPECTIONS BY THE USER	INSPECTIONS BY WORKSHOP PERSONNEL
The starter motor turns the engine over too slowly	1. 2. 3. 4.	
The engine fails to start	5. 6. 7. 8. 9. 10. 12. 13. 14. 15. 17.	34. 35. 36. 37. 38. 42. 43. 44.
The engine starts with difficulty	5. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 19.	34. 36. 37. 38. 40. 43. 44
Insufficient power	8. 9. 10. 11. 12. 13. 16. 17. 18. 19. 20. 21.	34. 36. 37. 38. 39. 42. 43. 44. 61. 63. 64.
Ignition failure	8. 9. 10. 12. 13. 15. 20. 22.	34. 36. 37. 38. 39. 40. 41. 43.
High fuel consumption	11. 13. 15. 17. 19. 21. 22.	34. 36. 37. 38. 39. 40. 42. 43. 44. 63.
Black exhaust fumes	11. 13. 15. 17. 19. 21. 22.	34. 36. 37. 38. 39. 40. 42. 43. 44. 61. 63.
Blue or white exhaust fumes	4. 15. 21. 23.	36. 37. 38. 39. 42. 44. 45. 52. 58. 62.
Lubricating oil pressure too low	4. 24. 25. 26.	46. 47. 48. 50. 51. 59.
The engine knocks	9. 13. 15. 17. 20. 22. 23.	36. 37. 40. 42. 44. 46. 52. 53. 60.
The engine operates irregularly	7. 8. 9. 10. 11. 12. 13. 15. 16. 18. 20. 22. 23.	34. 38. 40. 41. 44. 52. 60.
Vibrations	13. 18. 20. 27. 28	34. 38. 39. 40. 41. 44. 52. 54.
Lubricating oil pressure too high	4. 25.	49.
Engine temperature too high	11. 13. 15. 19. 27. 29.	30. 32. 34. 36. 37. 39. 52. 55. 56. 57. 64.
Crankcase pressure	31. 33.	39. 42. 44. 45. 52.
Bad compression	11. 22.	37. 39. 40. 42. 43. 44. 45. 53. 60.

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Working in safety

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1-4 Safe use of the tractor ..... " 1-14

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Technical specifications

ENGINE		145 2/4 WD	165 2/4 WD	
MAKE		Perkins Diesel Direct Injection 4 Stroke	Perkins Diesel Direct Injection 4 Stroke	
FAN				
Viscostatic type		aspirating	aspirating	
Number of blades	N°	7	10	
Blade diameter	mm	504	504	
Control		Viscostatic	Viscostatico	
Normal heat rate	°C	90/95	90/95	
Engine oil cooling		exchanger	exchanger	
LUBRICATION				
Pump		with tricoidal rotor	with tricoidal rotor	
Type		with vanes	with vanes	
Min/max pressure at max rate	bar	2.1/4.8	2.1/4.8	
Max valve opening pressure	bar	3.5/4.8	3.5/4.8	
ELECTRICAL SYSTEM				
Voltage	V	12	12	
Negative		earthed	earthed	
Alternator:				
Make		Lucas/Iskra	Lucas/Iskra	
Type		A115-/	A 115-/	
Power rating	W	500/	500/	
Maximum delivery	Amp	55	55	
STARTER MOTOR				
Make		Lucas/Marelli	Lucas/Marelli	
Type		/M 127	/M127	
Power Control	kW	2.9 electromagnetic	2.9 electromagnetic	
BATTERY				
Make		Marelli/Scaini	Marelli/Scaini	
Capacity	A/h	95	95	
Charging time	hours	20	20	

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Gearbox

Gearbox

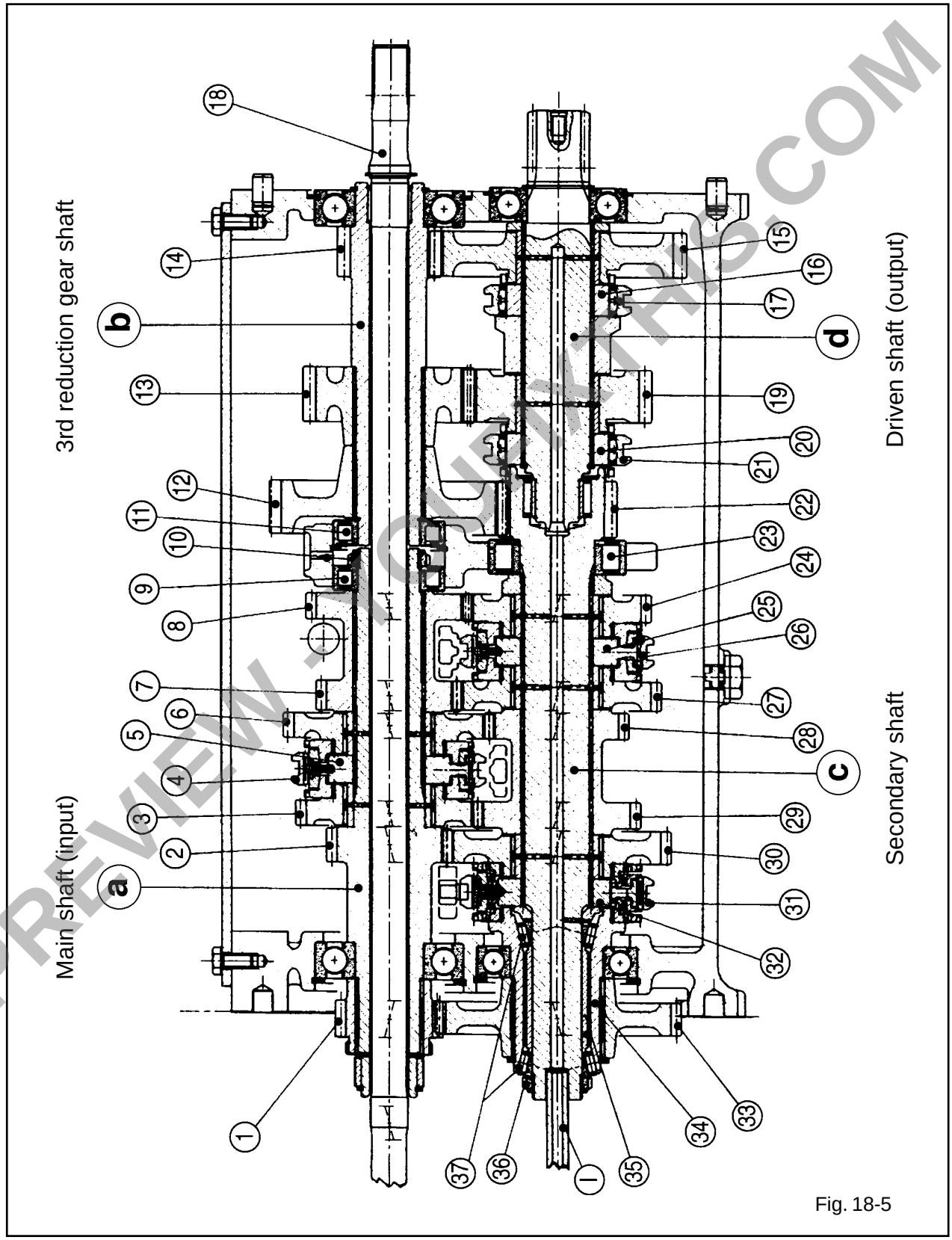


Fig. 18-5

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Mechanical power take-off

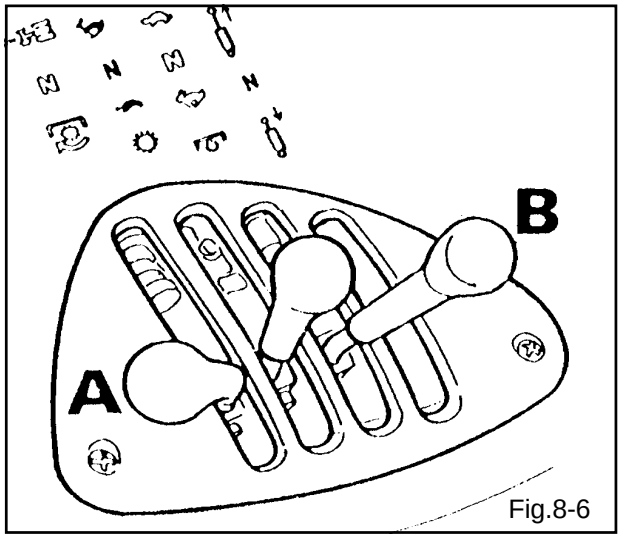
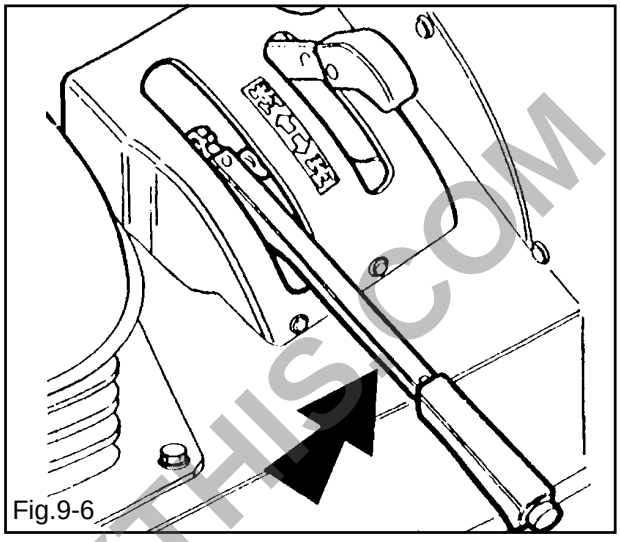


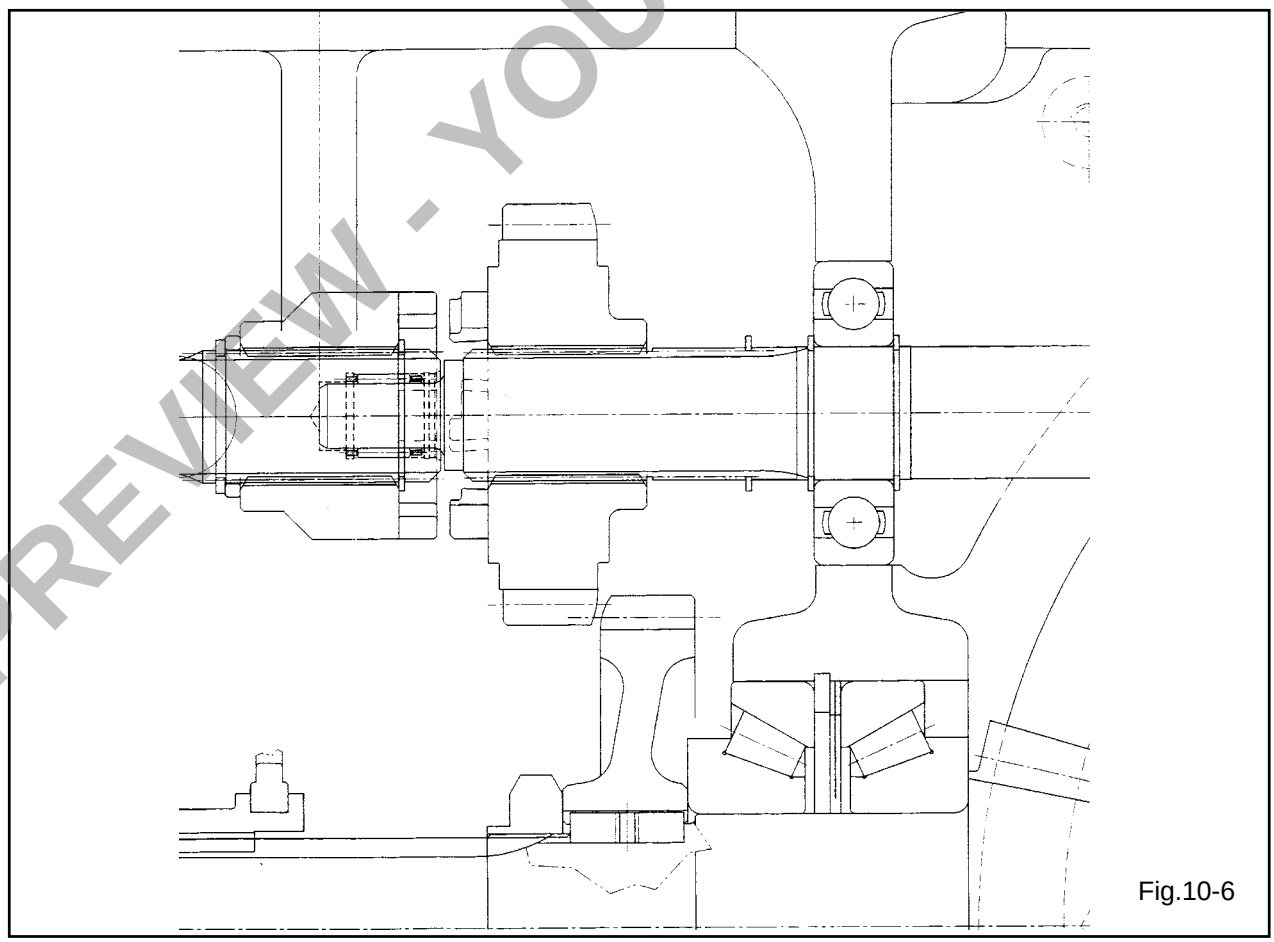
Fig.8-6

A - Lever to select PTO either independent or synchronized with the gearbox

B - PTO speed selector lever: 540-750 RPM or 540-1000 RPM.


Fig.9-6

PTO clutch engaging / disengaging lever.

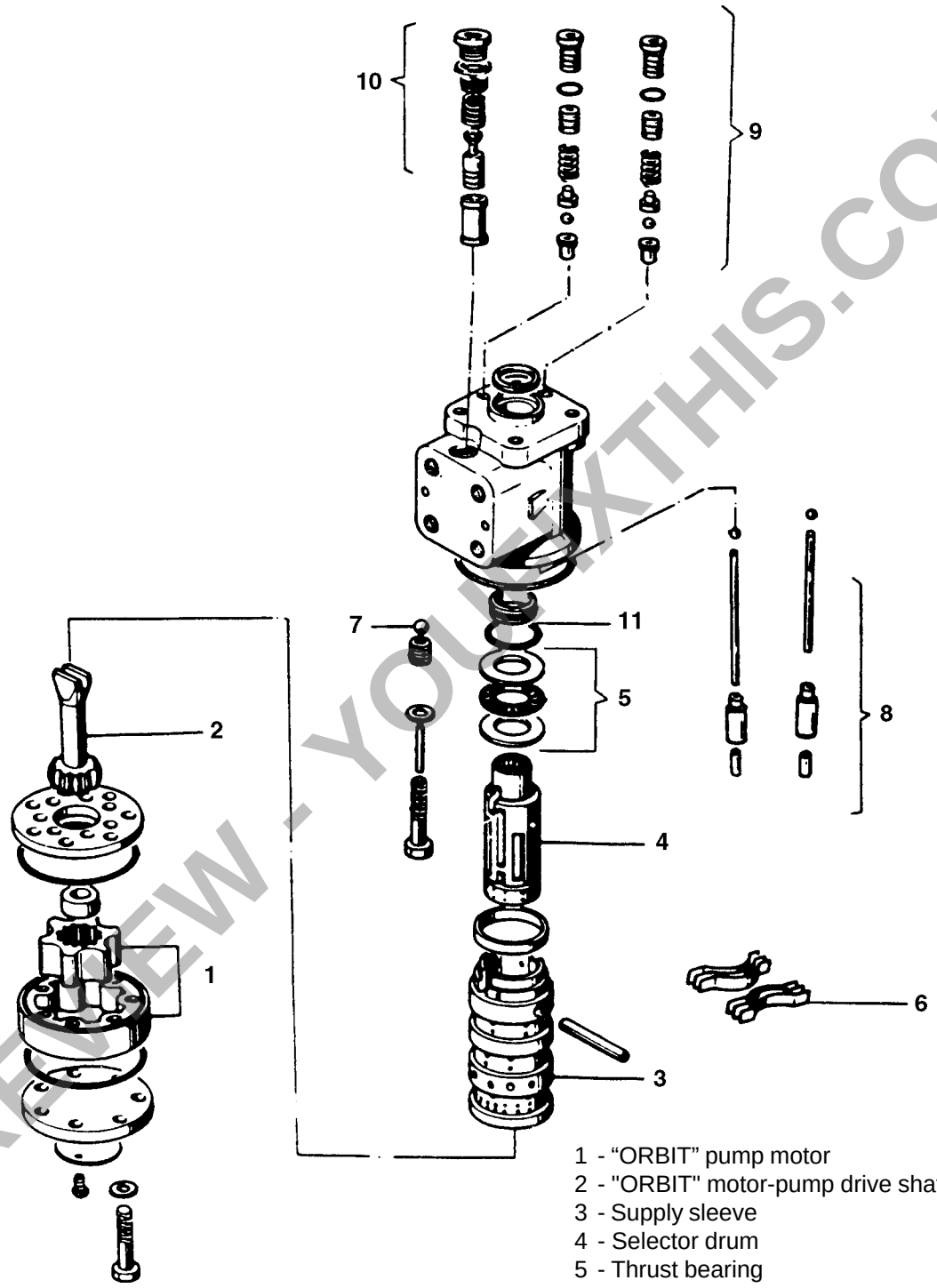

Fig.10-6

Independent / synchronized PTO engaging sleeves

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Power steering system



1 - “ORBIT” pump motor
2 - "ORBIT" motor-pump drive shaft
3 - Supply sleeve
4 - Selector drum
5 - Thrust bearing
6 - Return to neutral springs
7 - Unidirectional (non-return) valve
8 - Anti-cavitation valves
9 - Anti-shock valves
10 - Maximum valve
11 - Retention ring.

Fig.10-9

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Control valve components

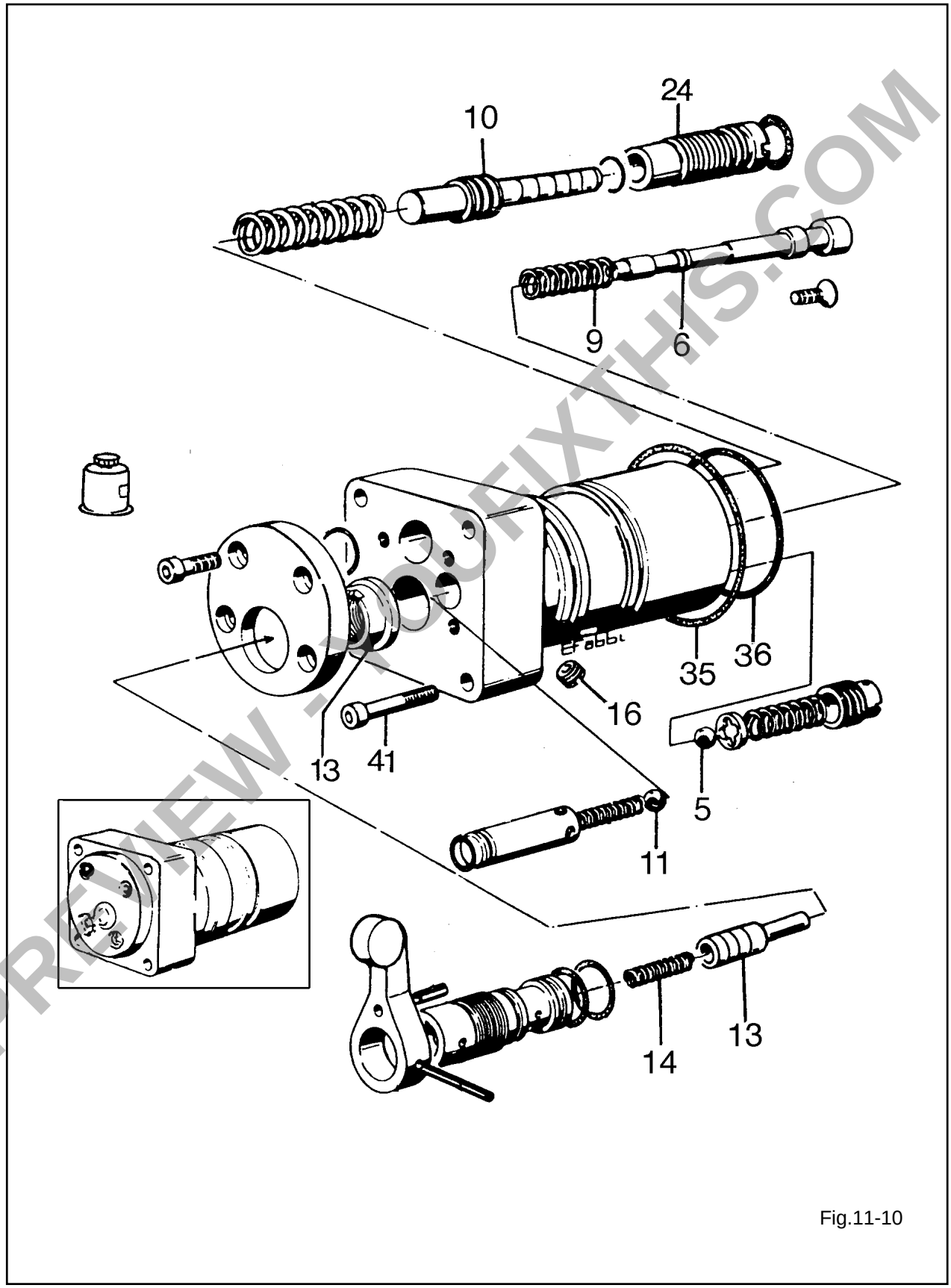


Fig.11-10

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The hydraulic circuit of the power lift

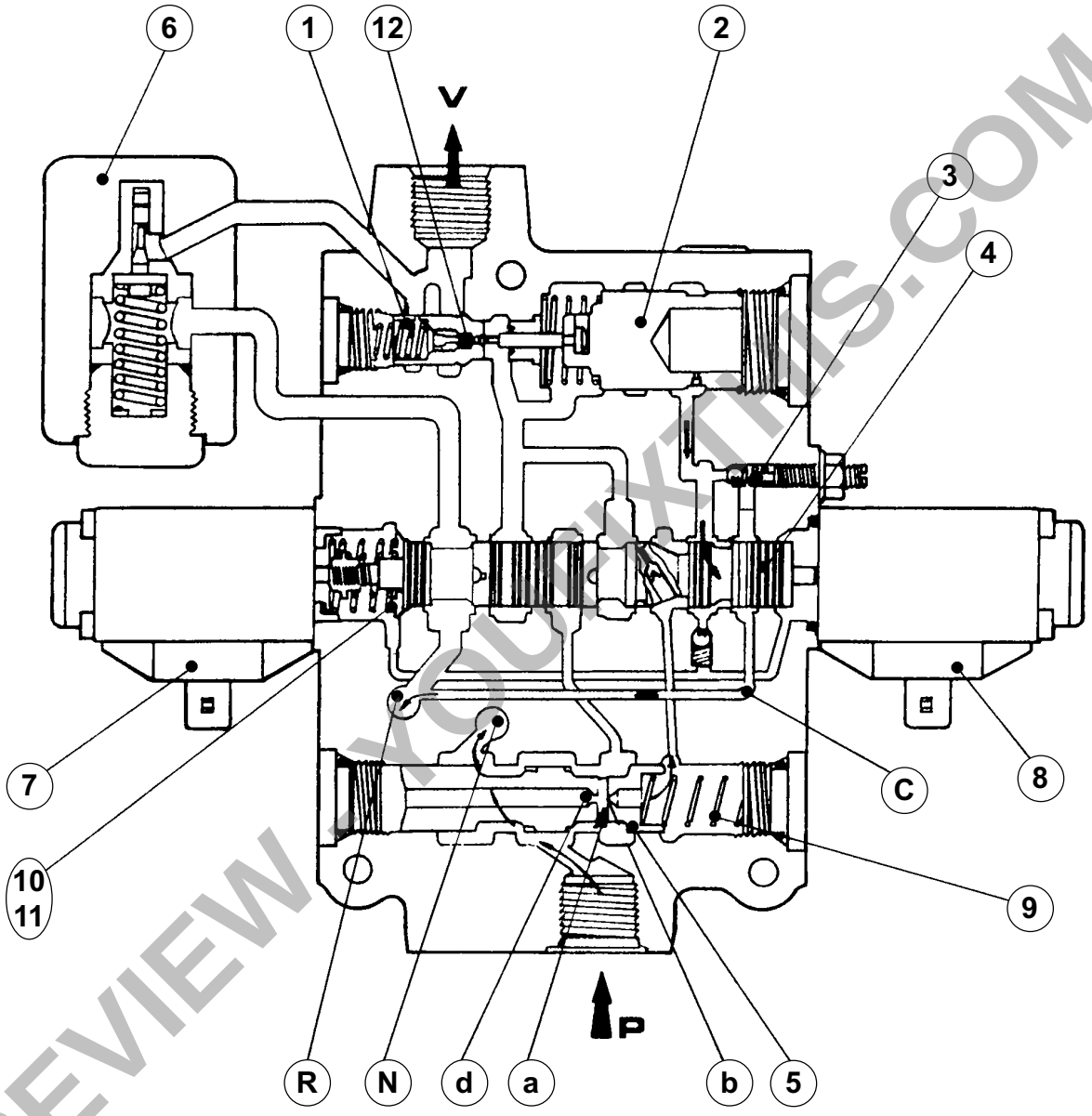


Fig.29-11

1 - Non-Return valve
2 - Servo Piston
3 - Check valve
4 - Control valve stem
5 - Flow Governor valve
6 - Anti-Shock overpressure valve
7 - Down control solenoid valve
8 - Up control solenoid valve
9 - Spring
10 - Return to neutral position spring
11 - Return to neutral position spring
12 - Non-return valve ball

N : Discharge and return for lubricating circuit
P : Inlet hole
R : Discharge towards gearbox housing
V : Towards the cylinders

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Basic principles

The instrument used to measure the pressure of fluids is the **pressure gauge** (Fig.2-12).

The pressure gauges normally used in practice are the differential type since they indicate the difference between the pressure of the environment in question and the atmospheric pressure.

The dials of differential pressure gauges have scales (in the required units of measurement) where the zero "0" corresponds to the atmospheric pressure and where the indicated pressure or manometric pressure is called **relative pressure.**

On the other hand, **absolute pressure** is the pressure measured on a scale where zero "0" is the absolute vacuum and "1" corresponds to the normal atmospheric pressure.
The absolute pressure is therefore given by the sum of the manometric (or relative) pressure and the normal pressure (= 1 by definition).
A relative pressure that is lower than the normal pressure is indicated as **negative pressure** or vacuum or degree of vacuum.
The instrument used to measure negative pressure is the **vacuometer** (Fig. 3-12).

Main conversions between the more common units of measurement for pressure:

1 N/m² = 1 Pa
1 N/cm² = 104 Pa
1 bar = 10^5 Pa = 10^5 N/m² = 10 N/cm²
1 atm = 101325 Pa = 1.01325 x 10^5 Pa
1 at = 98066.5 Pa = 0.980665 x 10^5 Pa
1 atm = 1.01325 bar = 10.1325 N/cm²
1 at = 0.980665 bar = N/cm²
1 bar = 0.98692 atm = 1.01972 at
1 psi = 0.068 atm = 0.069 bar = 6894.6 Pa
1 atm = 14.697 psi
1 bar = 14.505 psi

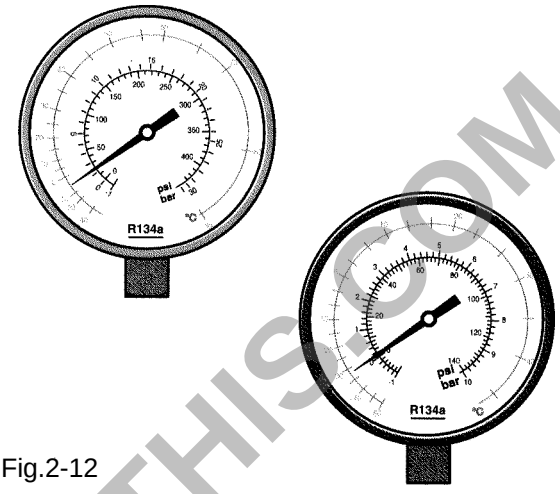
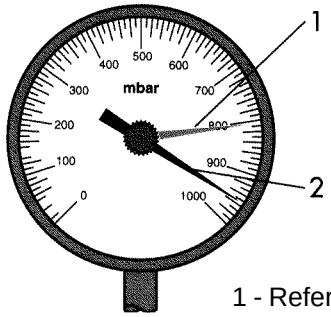


Fig.2-12



1 - Reference pointer
2 - Measuring pointer

Fig.3-12

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Working in safety

1-2 Danger decals

When replacing a tractor part bearing a sticker with safety warnings (yellow coloured), it is ESSENTIAL to affix the same sticker to the spare part.

A complete list of the places where these stickers are applied is given below.

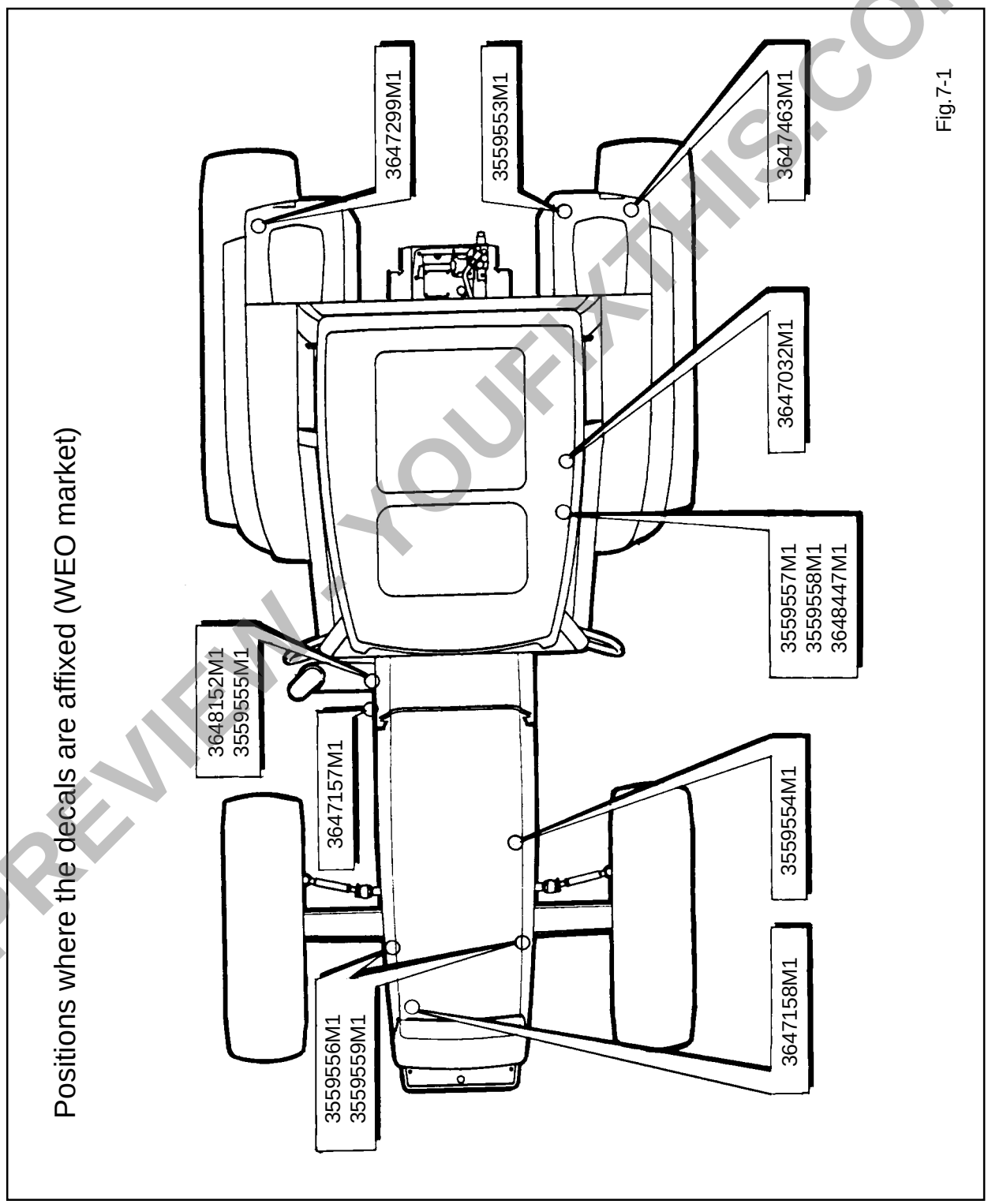


Fig.7-1

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CHAP. 3

General description

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1-4 Description of lubricating and cooling circuit 3-10

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General description

Electric current

An orderly movement of electric charges, however it is produced and through whichever physical medium, is called *electric current.*

In technical applications, the type of current more generally used is the one caused by the *circulation of free electrons throuch conducting materials connected to electric generators.*

However it is connecdted to generators and users, every complex of conductors forms an *electric circuit.*

Thus defined, the electric circuit contains a *current* whenever it is *closed*, i.e. whenever electrical continuity is formed in it amongst all the components with which it is formed. If this continuity is broken, the circuit is known as *open* and no current can be produced in it.

The migratory movement of the electric charges along a circuit containing current can possess uniform and constant, fade-free characteristics: in this case, the current is called *direct* current. *Variable* current is when the electrons do not circulate in a uniform and constant way.

The greater or lesser *intensity* of an electric current can be completely defined by means of the *quantity of electricity that passes through any section of the circuit within one second.*

This unit of measurement has been intentionally named *ampere* and is indicated by the symbol A.

By and large, if any section of the circuit is crossed by a Q coulomb quantity of electricity within Δt seconds, one can say that the circuit is crossed by an electric current whose *intensity I,* expressed in amperes, is given by the ratio

$$I = \frac{Q}{\Delta t}$$

By measuring the CURRENT, one measures the intensity of a flow of electrons in a determined branch of the electric circuit.

Current is measured with the aid of an amperometer (tester function)

Multiples and submultiples

Kiloamperes (KA) = 1000 A
Amperes (A) = 1 A
Milliamperes (mA) = 0.001 A

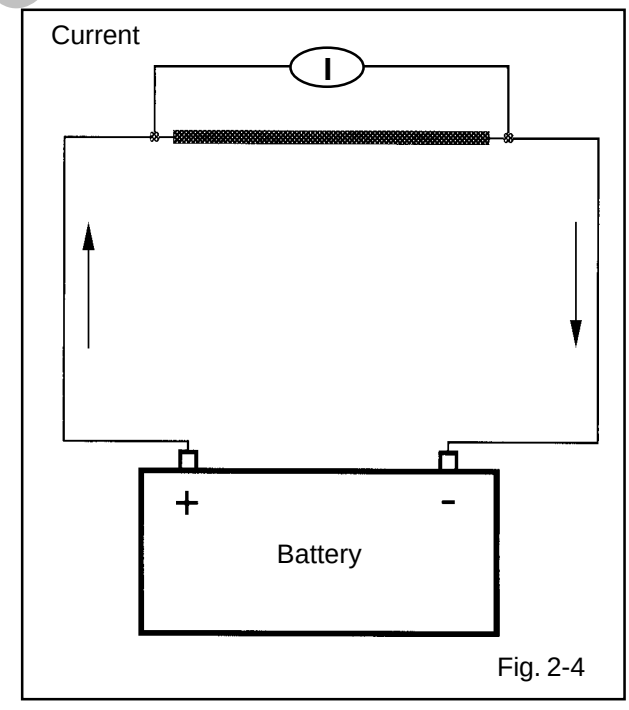


Fig. 2-4

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Sensors

Four Hall effect sensors are mounted in Legend Delta Six tractors. They are used as mechanical proximity sensors.
Two of these sensors are mounted on the lower part of the gearbox-drive shaft (1/2 Fig. 92-4). They detect the input speed and the spinning direction.
The tractor advancement direction indication is determined by the distance (a few centimeters) between the two sensors. It staggers the respective signals on the output.
Another Hall effect sensor is mounted on the right-hand side of the engine (3 Fig. 93-4) and measures the engine RPM rate.
A further sensor is mounted between the rear axle housing and the brake lever (4 Fig. 94-4), on the right-hand side. It measures the ground speed of the tractor.

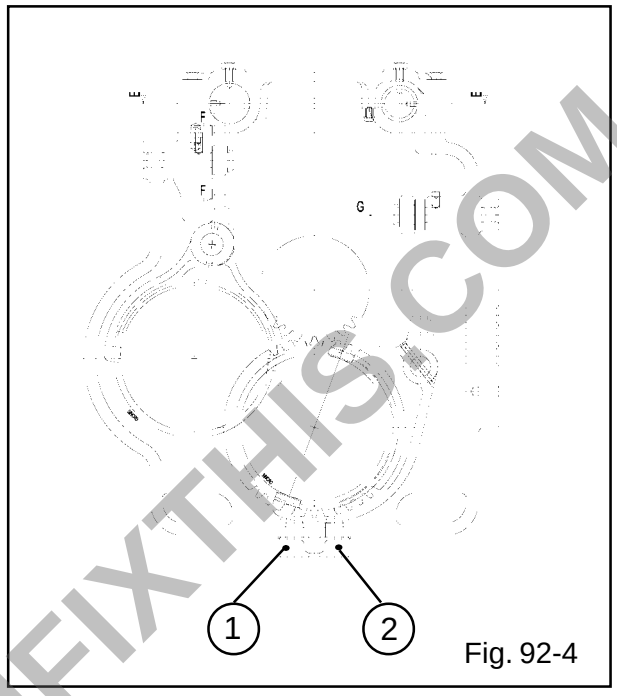


Fig. 92-4

Adjustment:

- sensors (1/2 Fig. 92-4): fully screwed down on to the gearbox drive axle housing.

- sensors (3 Fig. 93-4): fully screwed down on to the flywheel; loosen by180°.

- sensor (4 Fig. 94-4): fully screwed down on to the gear; loosen by 180°.

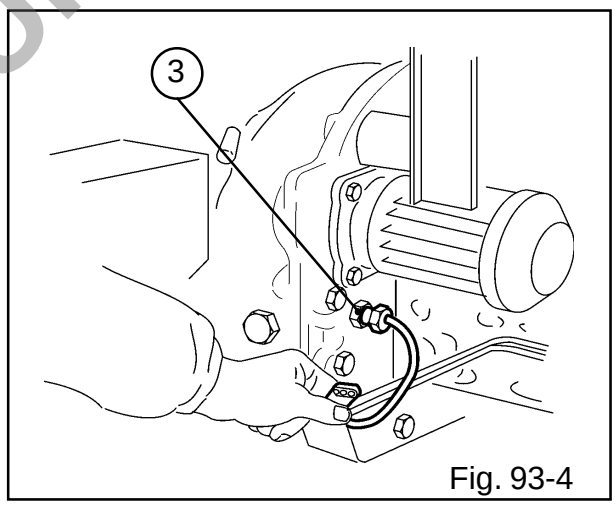


Fig. 93-4

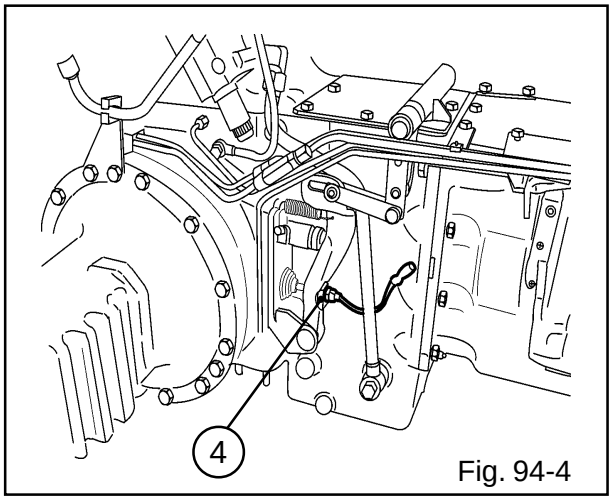


Fig. 94-4

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Check control

		Connector 1b	Connector 1a	Main connector (1)
Overdrive synchronizer solenoid valve connector (8)	1	3	3	27
	2	43	43	6 ground

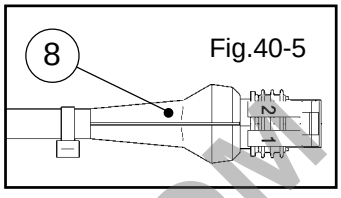


Fig.40-5

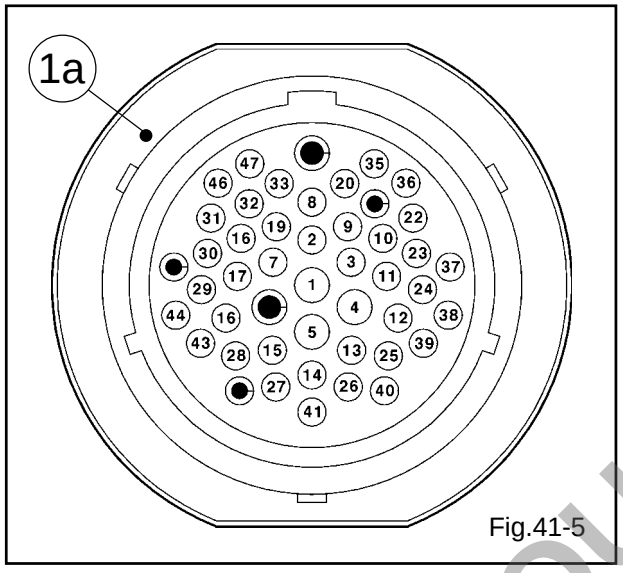


Fig.41-5

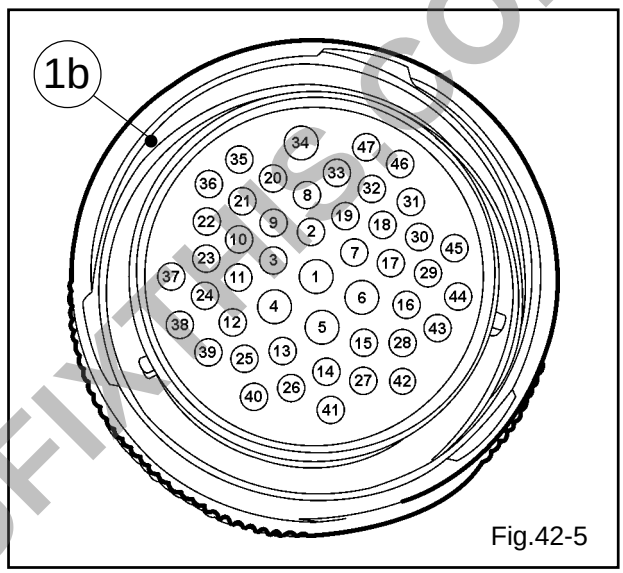


Fig.42-5

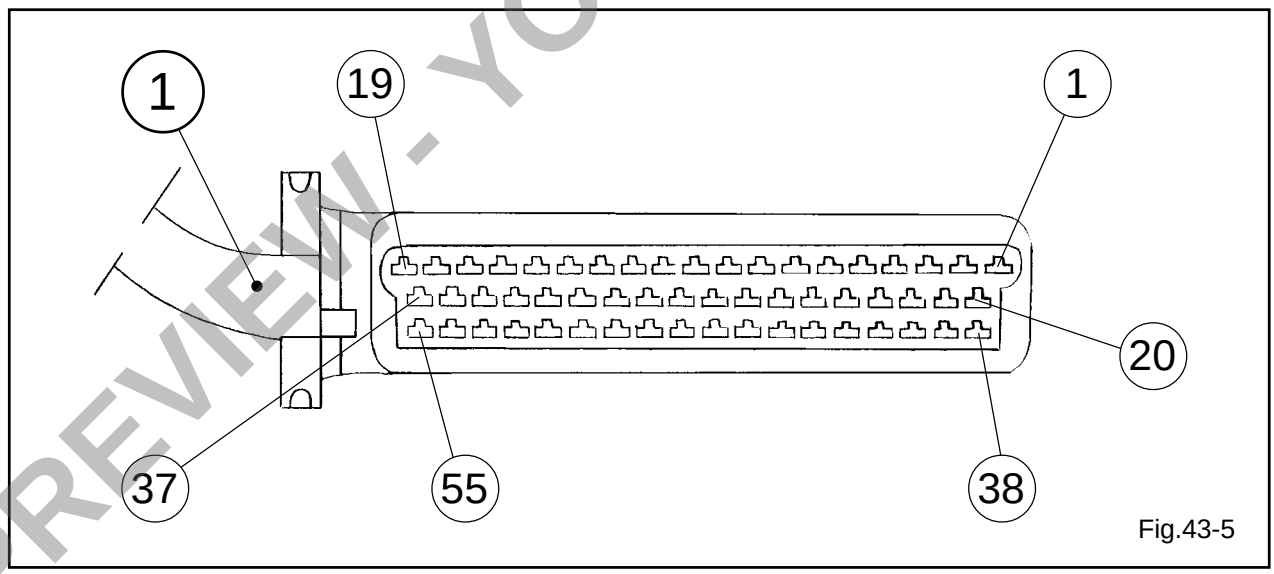


Fig.43-5

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Guide to the "functional tests" module

Proceed in the following way to conduct the tests:
- click on key (G Fig.50-6) relative to the Underdrive option;
- make sure that the rectangle (H Fig.50-6) turns green with the message OK inside. If this happens, the electronic plant and solenoid valve that control the Underdrive are connected in the correct way.
If the connection is faulty, the rectangle (H Fig.50-6) will turn red and will contain a message indicating the probable fault. In this case, the test result must be considered negative and the "Negative Test" key must be clicked to pass on to the next test.
- If the solenoid valve connection test result is positive, the functionality of the Underdrive limit switch will be automatically tested. The program automatically operates the piston (I Fig.51-6) on the control cover so that it presses the limit switch. If this latter operates in the correct way, the circle (M Fig.50-6) will light up and the test is considered positive. In this case, the program will automatically pass on to the next test, activating the Test OK message (N Fig.52-6). If the limit switch fails to operate correctly, the circle (M Fig.50-6) will remain off. In this case, check to make sure that the switch connector is correctly connected and that the actual switch is not damaged. The program will not pass automatically on to the next test and the current test is considered negative. Click on the "Negative Test" key to pass on to the next test.

The synchromesh units of the Overdrive, Reverse and Neutral options are also tested in the same way, the only difference being the keys that activate the tests.

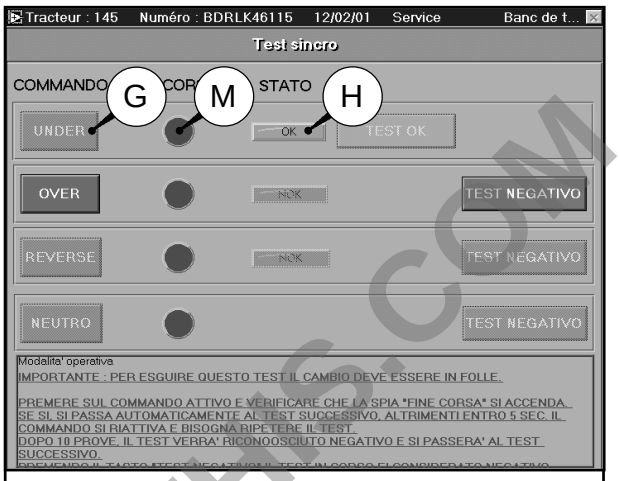


Fig.50-6

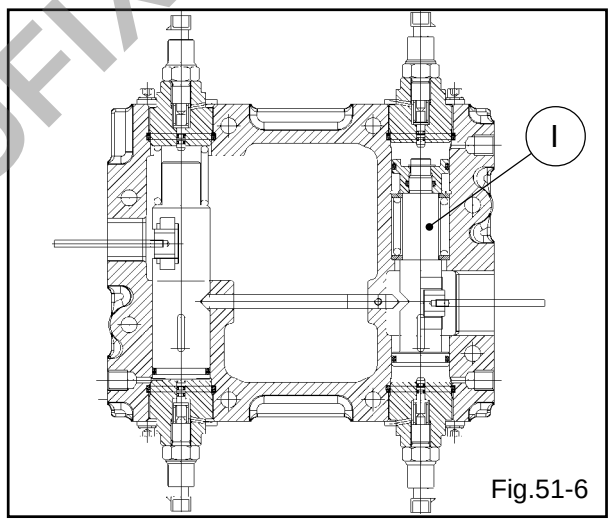


Fig.51-6



Fig.52-6

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