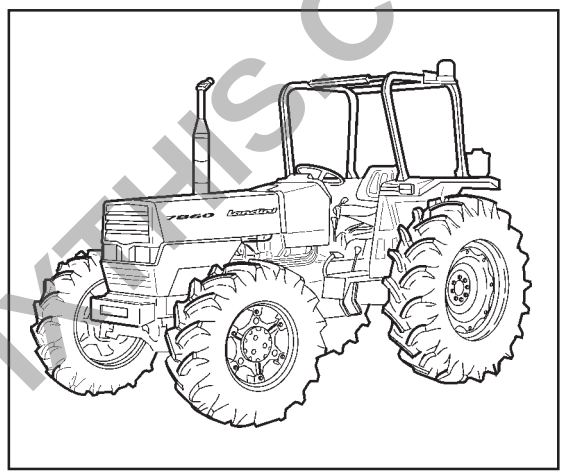
60 Series 5860-7860 / 6860-8860

Evolution



Training Manual

P/N° 3667270M1

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Landini

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Chap. 5 4WD FRONT AXLE

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Chap. 10 ELECTRICAL SYSTEM

Chap. 11 SPECIAL TOOLS

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Sect.3 - Working in safety

3-1 Essential rules for 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.





This is the warning symbol. Any time you see it, either on the machine or in the manual, pay attention to the possible danger of accidents.

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Tractor identification and technical specifications

2-3 Engine specifications

Engine		5860
Type		Perkins 4-stroke Diesel engine with direct injection
Model		903 - 27
Fuelling		Natural
Number of cylinders		3
Bore	mm	95
Stroke	mm	127
Swept volume	liters	2.7
Compression ratio		17.25:1
Power rating (DIN 70020)	HP/kW	54/40
ISO power rating	HP/kW	2300
Max. speed under load	RPM	2475
Max. speed with no load	RPM	193.1
Max. torque (DIN 70020)	Nm	1200
Max. torque speed	RPM	750
Idling speed	RPM	
Valve gear		
Type		Overhead valves controlled by tappets
Tappet gap with cold engine		
Intake	mm	0,20
Exhaust	mm	0,45
Fuel system		
Fuel pump		AC - DELCO
Injection pump		Lsx rotary
Filter on injection pump delivery		C.A.V.
Injection order		1-2-3
Injectors		Perkins
Injector pressure setting	bar	296
Cold starting device		Thermostarter
Air filter		dry, with two removable elements for maintenance

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Pre-delivery inspections and maintenance

4-3 Routine maintenance table for Atlantis tractors

PERFORM the following operations		EVERY				REFER to
ASSEMBLY	DESCRIPTION	100 HOURS	250 HOURS	500 HOURS	1000[1] HOURS	Maintenance points
LUBRICATION	General lubrication	●				18 to 25
	Lubricate swinging support of three-point linkage	As required				8
	Grease front axle hubs, non-driving front axle			●		34
ENGINE	Check engine oil level	As required				4
	Change engine oil	●				27
	Change engine oil filter		●			28
	Check and adjust valve clearance *			○		31
FUELSYSTEM	Clean fuel filter bowl	As required				5
	Replace fuel filter cartridges			●		33
	Check injector settings				○	44
	Check oil level in air filter and clean pre-filter	As required				2
	Dry air filter: clean or change filter cartridge	As required				3
	Drain sludge from fuel tank			●		4
COOLING SYSTEM	Check coolant level in radiator	As required				1
	Clean radiator fins	As required				16
	Flush cooling circuit				●	36
TRANSMISSION HYDRAULIC POWER LIFT	Check oil levels in gearbox, front axle differential and front and rear final drives	As required				7-9-10 11-12
	Change oil in gearbox [2], front axle differential and front and rear final drives				●	34-35-38 39-40
	Clean power lift oil filter and magnetic spark plug		●			29
	Check free travel of gearshift clutch pedal, PTO clutch lever, and brake pedals	As required				13-14-15
	Check oil level in front brake circuit reservoir (if fitted)					15
STEERING SYSTEM	Check oil level in power steering reservoir	●				26
	Clean power steering oil filter			●		32
	Check oil level in power steering reservoir			○		35
ELECTRIC SYSTEM	Check level of electrolyte in battery	As required				6
	Check fan and alternator belt tension	As required				7
	Check efficiency of alternator and starter motor *				○	42-43
OTHERS	Check tyre pressure	As required				0
	Check wheel nuts tightness	As required				0
	Check tightness of nuts and bolts in general	As required				17

Operations marked with m must be carried out by our Dealer or Area Agent:
(1) Operation to be carried out once a year.
(2) The oil in the gearbox should be replaced for the first time after 500 hours work, then every 1000.
CAUTION: Use your own discretion and experience when deciding the actual intervals for variable interval service and maintenance operations. Always remember, however, that it is better to perform such operations too often than not often enough.

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General description

1-3 Main wiring diagram

PART-1

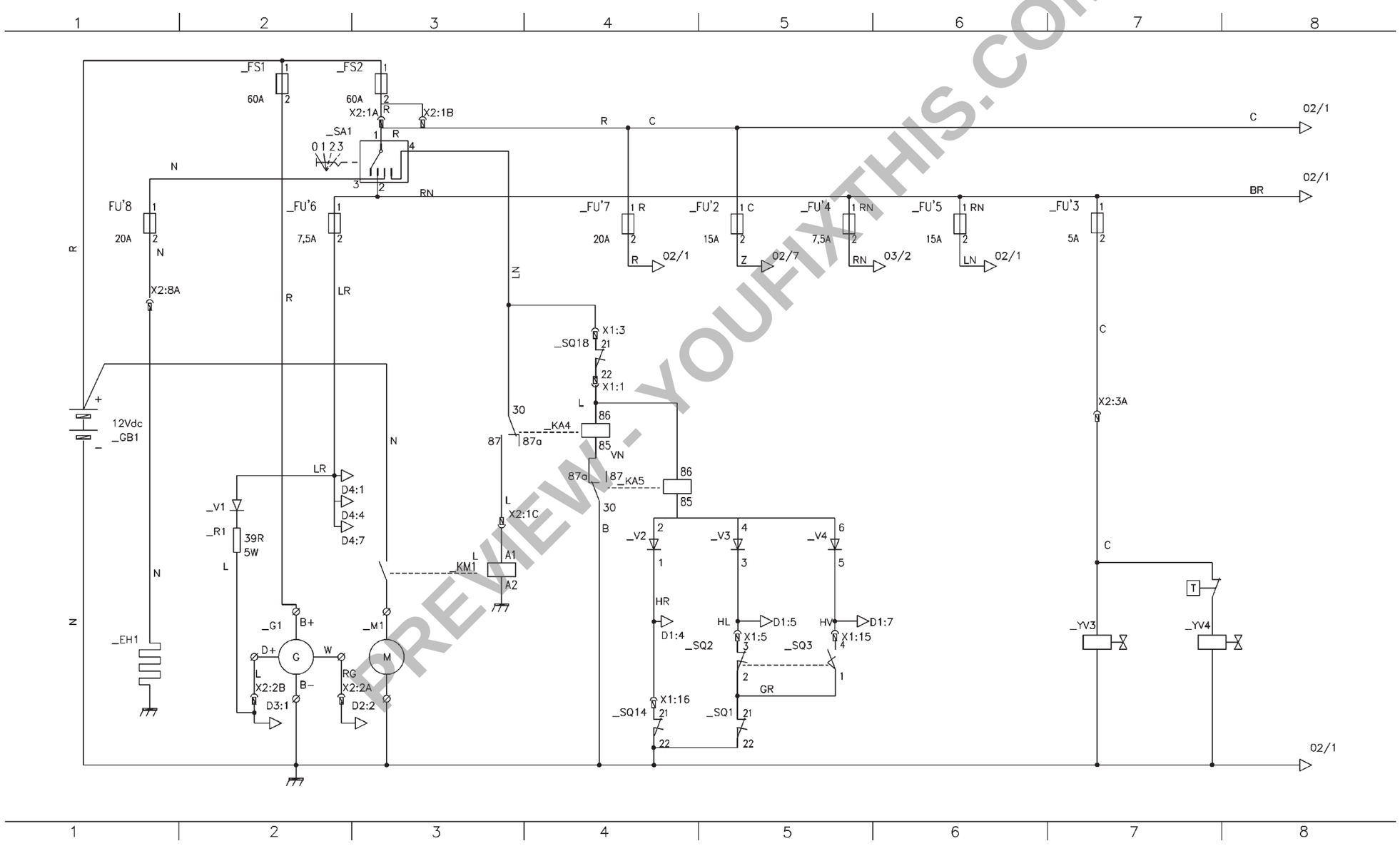


Fig.13-10

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Sect.1 - General description

1-1 Low pressure hydraulic circuit

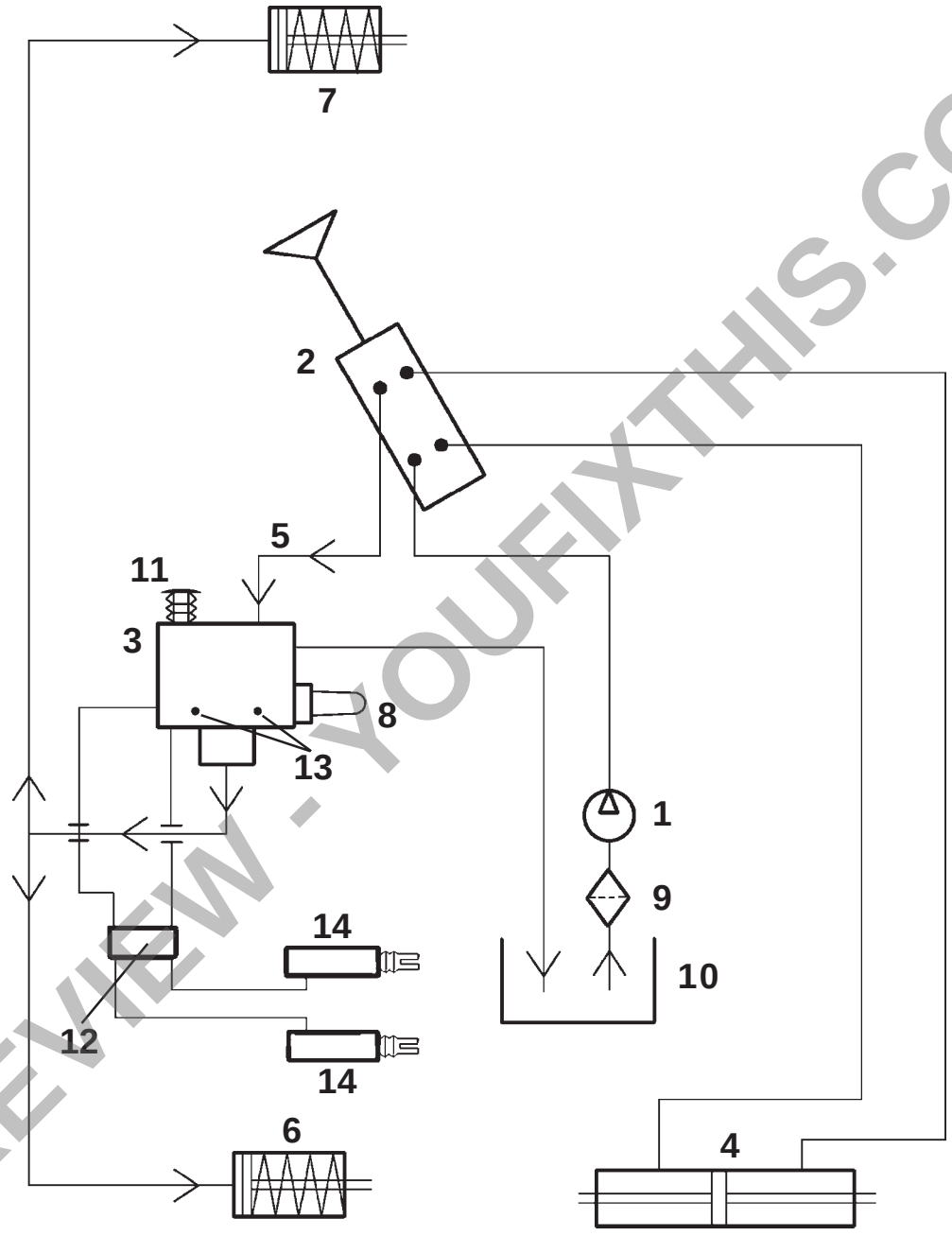


Fig.1-7

1- Pump
2- Steering ass'y valve system
3- Valve system
4- Steering cylinder
5- Orbitrol outlet
6- Front diff lock
7- Rear diff lock
8- Sensor
9- Filter
10- Reservoir
11- Diff lock engagement pedal
12- On-off valve
13- Bleed screws
14- Transducers

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A - Engine-gearbox axle assembly

A1 - Drawing of assembly and main components

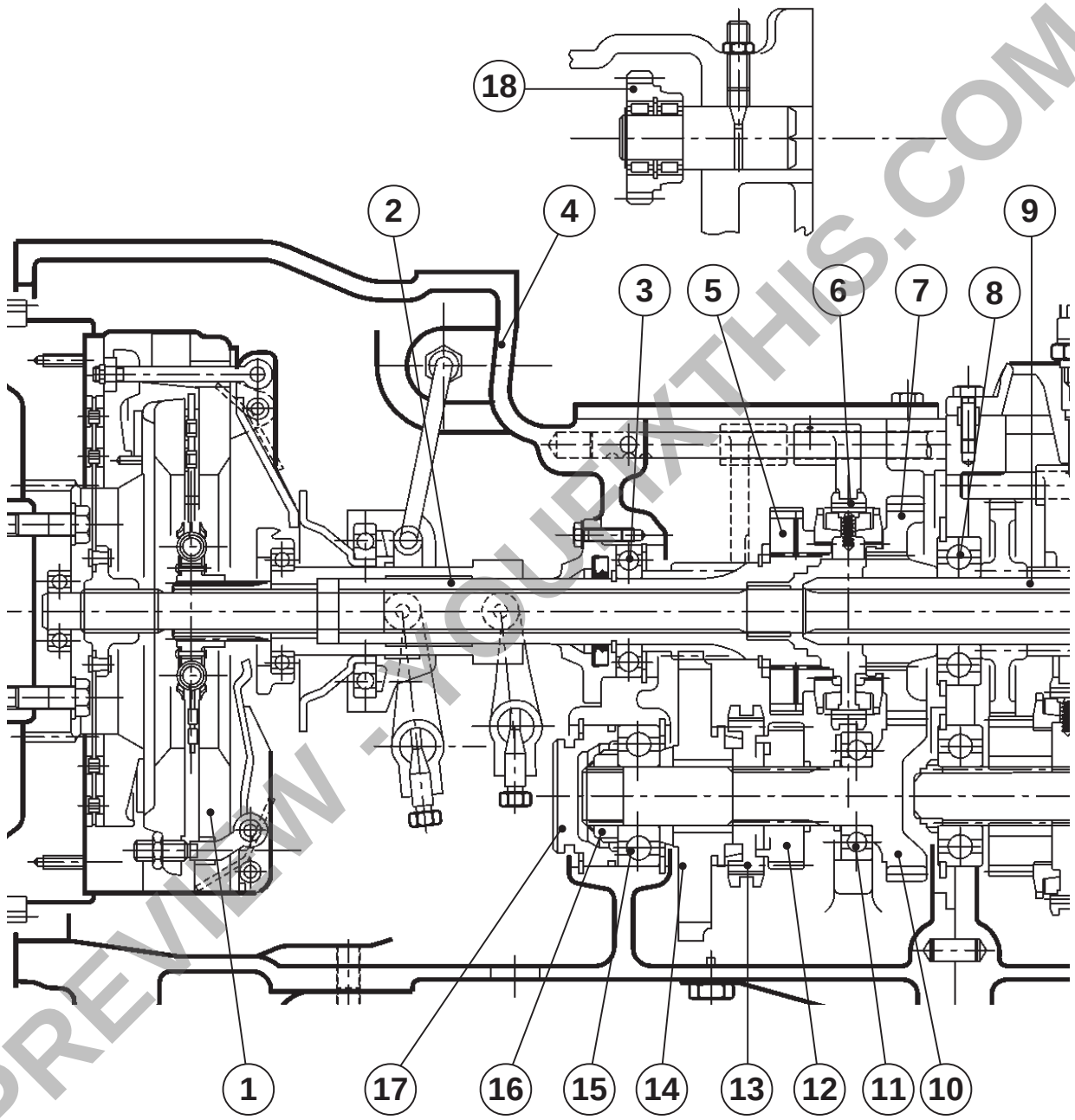


Fig.10-4

1 - Clutch
2 - Transmission shaft
3 - Ball bearing
4 - Axle housing
5 - Reverse shuttle gear
6 - Synchromesh unit
7 - Upper underdrive gear
8 - Ball bearing
9 - Main gearbox shaft
10 - Transmission shaft
11 - Ball bearing
12 - Reverse shuttle transmission shaft gear
13 - Creeper engaging sleeve
14 - Creeper transmission shaft gear
15 - Ball bearing
16 - Ring nut
17 - Cover
18 - Reversing gear

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Sect. 7 - 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 values 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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Inspections, adjustments and troubleshooting

3-4 Troubleshooting

FAULTS	PROBABLE CAUSES	REMEDIES
The power lift fails to lift in no-load mode	- Servo valve (10 Fig.9-9) locked in the open position	- Make sure that the part is free to slide and that it is tight
	- The pump fails to deliver oil as it is no longer primed	- Prime the pump by filling it and the inlet pipe with transmission oil
The power lift fails to lift the implement or is slow in lifting	- Clogged filter on the intake	- Demount and clean the filter
	- Inefficient pump	- Replace the pump
	- Imperfect servo valve seal (10 Fig.9-9)	- Check the seal
	- Calibration valve (5) or safety valve (12 Fig.9-9) with low setting	- Check and calibrate the two valves
	- Lower retention ring of the valve system faulty	- Replace the ring
	- Leaking discharge valve (1 Fig.9-9) - Diverter retention rings faulty	- Check and overhaul the discharge valve - Replace the rings
	- Implement too heavy	- Change the implement or move the hitch nearer
The power lift fails to keep the implement in the raised position	- Defective non-return ball seal (11 Fig.9-9)	- Subject the valve system to hydraulic bench tests to locate the leaks
	- Leaking discharge valve (1 Fig.9-9) - Leaking safety valve (12 Fig.9-9) - Upper retention ring of the valve system faulty	- Check the discharge valve and replace it if necessary - Check and overhaul the safety valve - Replace the ring
	- Faulty diverter retention ring	- Replace the ring
	- Faulty seals on the lifting cylinder piston	- Replace the ring
	- Aluminium plugs to shut the machining holes on the lift cover and cylinder	- Replace the plugs

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903.27 engine timing

3-2 How to find the compression TDC of cylinder N°1 (Fig.10-2)

1 - Remove the tappet cover.

2 - Turn the drive shaft clockwise (viewed from the front part) until the intake valve (the first valve) has just closed. There is a groove (3) on the left-hand side of the rear plate (viewed from the rear), allowing access to the starter ring gear. A lever (4) can be used to turn the flywheel towards the groove.

3 - Fit the drive shaft locking plug (6) - Perkins PD241 tool - into hole (5) under the groove in the rear plate.
Continue to slowly turn the drive shaft clockwise until the plug fits into the hole in the flywheel. The engine is now set to TDC of cylinder number 1 on the compression stroke.

4 - Remove the plug from the flywheel and from the rear plate.

5 - Mount the tappet cover.

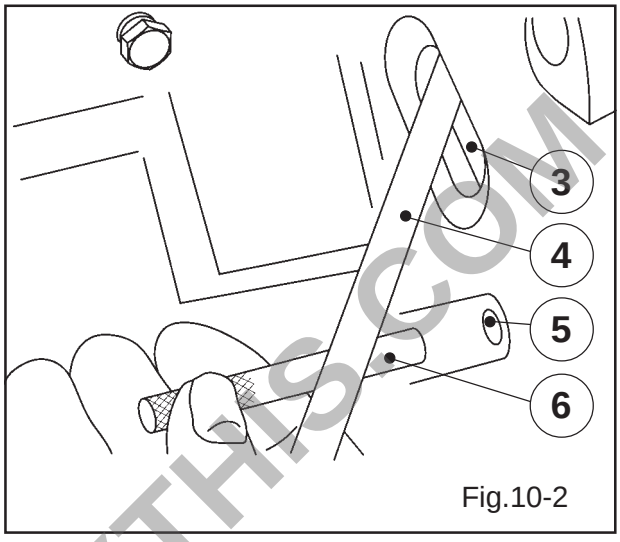


Fig.10-2

3-3 Checking the camshaft timing

1 - Check the valve play and adjust if necessary.

2 - Preset cylinder number 1 to the TDC of the compression stroke.

3 - Mark the drive shaft pulley.
Place a suitable indicator on the valve gear housing in order to align it with the mark on the pulley.

4 - Turn the drive shaft clockwise from the front part until the exhaust valve of cylinder number 3 has completely opened.

5 - Set a 0.631 mm valve play for the intake valve of cylinder number 1.

6 - Turn the drive shaft clockwise (viewed from the front part) until the rod of the intake valve tappets of cylinder number 1 begins to close. In this position, make sure that the mark on the pulley is within 2.5° of the indicator. 2.5° equals 3.5 mm of the cir cumference of the standard pulley, whose diameter is 163.2 mm.

7 - If timing is more than 2.5° out of range, the gears of the timing system are probably not meshed in the correct way.

Note: A gear tooth of the camshaft equals 20.5 mm on the circumference of a pulley whose diameter is 163.2 mm.

8 - Turn the drive shaft clockwise (viewed from the front part) until the intake valve of the rear cylin der has completely opened.
The cylinder 1 intake valve play should be 0.20 mm.

9 - Mount the tappet cover.

10 - Remove the temporary indicator from the valve gear housing and the timing mark from the pulley.

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Technical specifications

2-2 Power train diagram

BASIC GEARBOX + REVERSE SHUTTLE

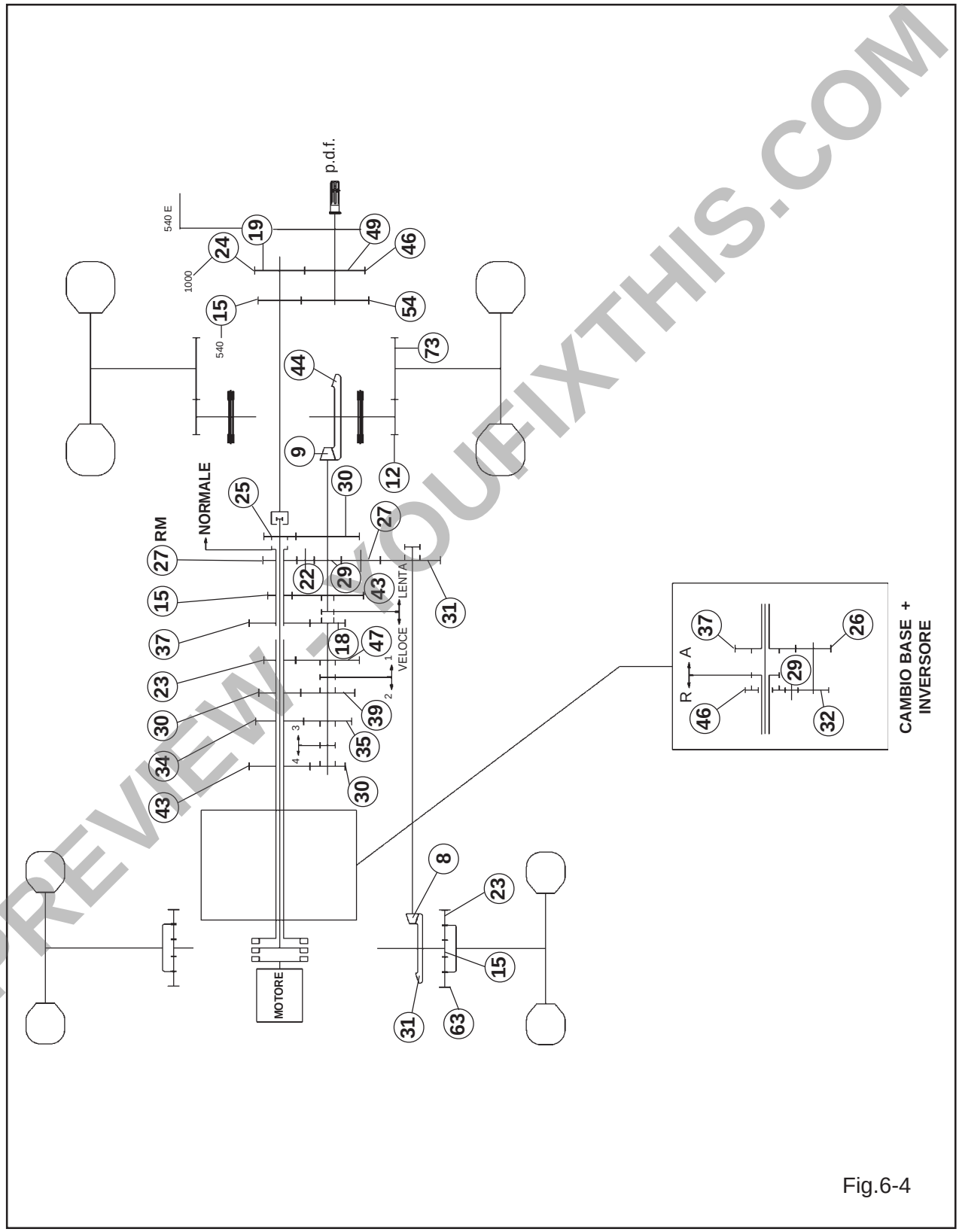


Fig.6-4

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Driving torques

DESCRIPTION	Thread	DRIVING TORQUE	
		Nm	kgfm
Cylinder head			
Cylinder head fixing screws	M12/M14		
Metal cover – tappet cover flanged nuts	M10	30	3.0
Plastic cover – tappet cover flanged nuts	M10	20	2.0
Screws fixing intake manifold on cylinder head	M8	22	2.2
Nuts fixing exhaust manifold to cylinder head	M8	22	2.2
Engine lifting bracket fixing screws	M10	44	4.5
Temperature switch	5/8 UNF	30	3.1
Temperature switch	3/8 PTF	30	3.1
Pistons and connecting rods			
Connecting rod nuts	7/16 UNF	77.5	7.9
Drive shaft			
Main bearing fixing screws	9/16 UNF	152.5	15.6
Drive shaft pulley fixing screws	7/8 UNF	325	33.2
Drive shaft pulley fixing screws with washer	7/8 UNF	365	37.2
Screws fixing flywheel to drive shaft	1/2 UNF	105	10.7
Rear oil seal casing fixing screws	M8	22	2.2
Flanged screw fixing adapter to pulley	3/8 UNC	37	3.8
Valve gear housing and respective control			
Screws fixing valve gear housing to engine block	M8	22	2.2
Screws fixing lower cover of valve gear housing	M8	22	2.2
Screws fixing front cover to valve gear housing	M8	22	2.2
Screws fixing front cover to valve gear housing	M6	9	0.9
Camshaft gear fixing screw	M8	27	2.8
Intermediate gear fixing screw	1/2 UNF	65	6.6
Intermediate gear fixing screw	M12	78	8.0

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Bevel gear pair and rear differential

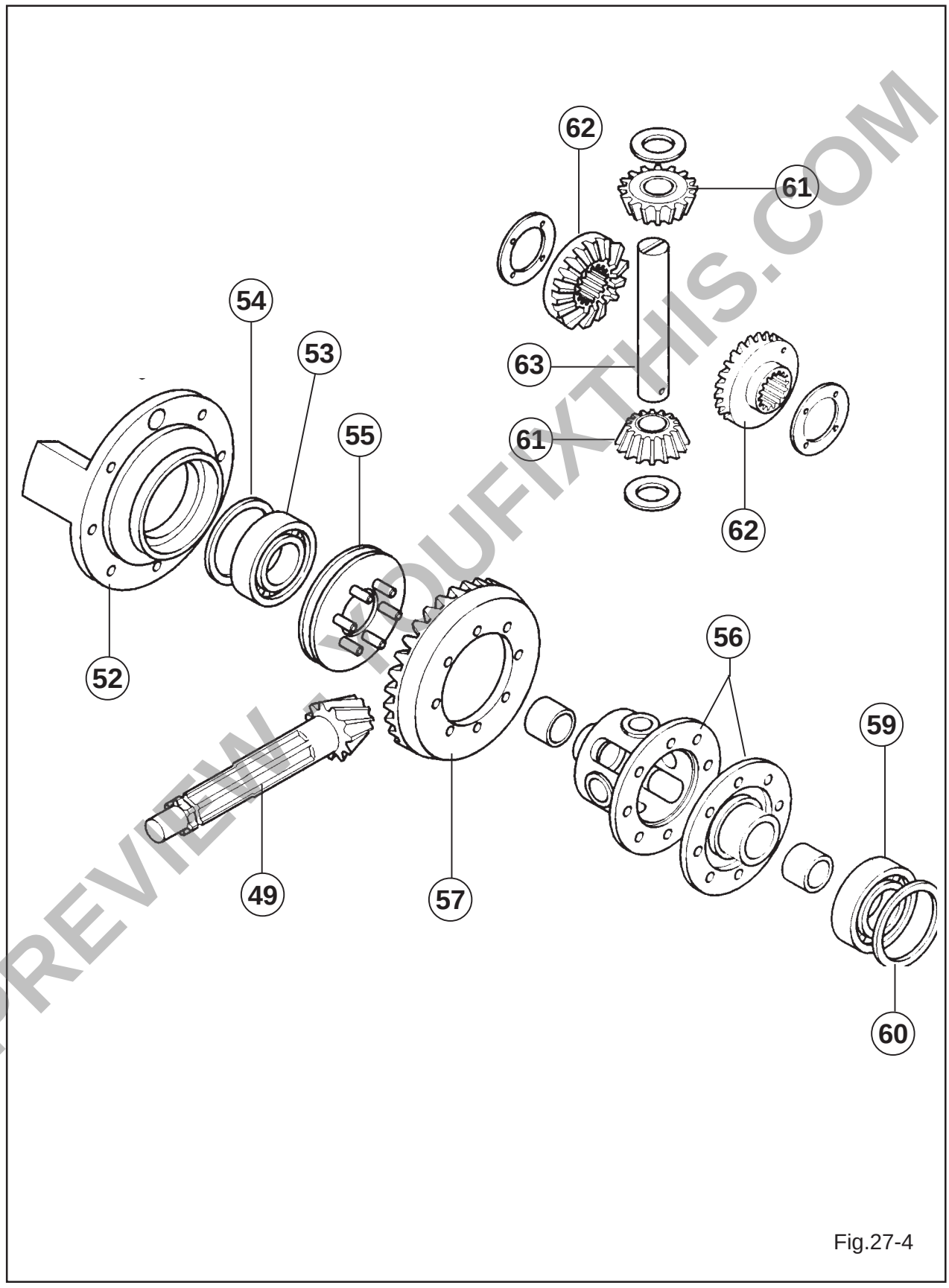


Fig.27-4

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Main components of the low pressure circuit

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CHAP.9

Mechanical power lift

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Starter motor-battery line (positive)

3A-4 Connector identification

TERMINAL (A6) FOR CONNECTION TO STARTER MOTOR

Terminal	Colour of wire or component	To connector
A6	N	_M1

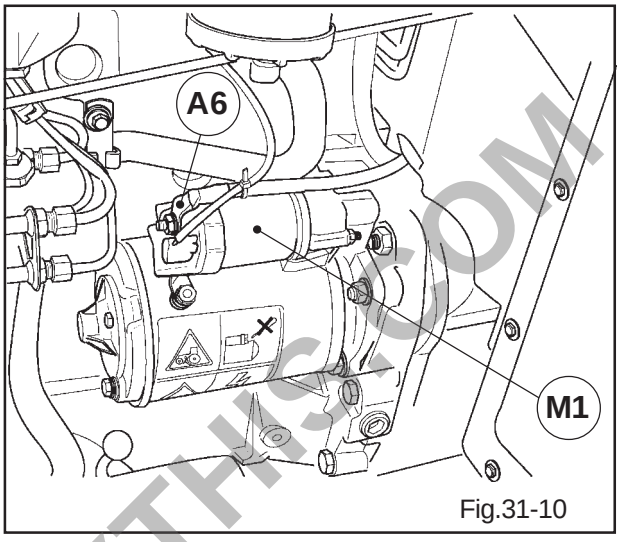
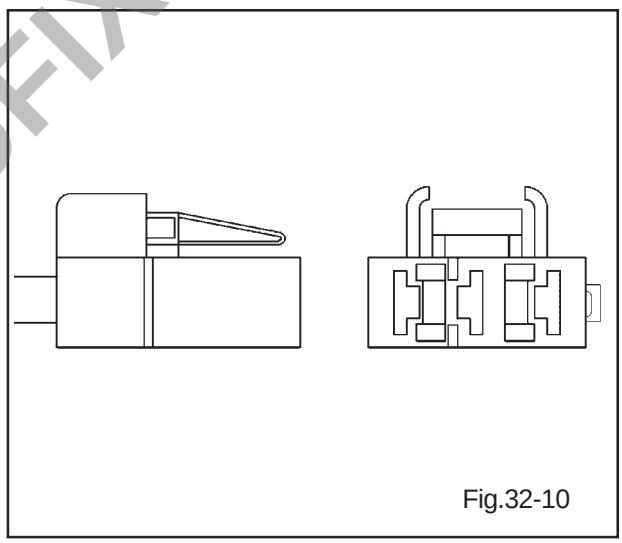


Fig.31-10

TERMINAL (A7) FOR CONNECTION TO FRONT FUSE BOX

Terminal	Colour of wire or component	To connector
A7	R-R-RN	B14


Fig.32-10

The connection between the terminal (A7) of the battery line and the terminal (B14) of the front line, allows the rest of the tractor's electrical system to be powered. The front fuses protect the system against short-circuits and excessive power draws.

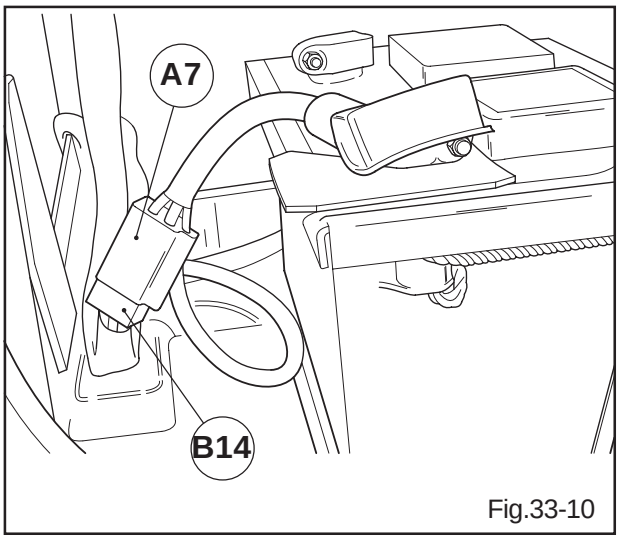


Fig.33-10

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