FD80
HYDROSTATIC
OPERATION AND MAINTENANCE INSTRUCTION MANUAL

CRAWLER DOZER

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AVOID ACCIDENTS

Most accidents, whether they occur in industry, on the farm, at home or on the highway, are caused by the failure of some individuals to follow simple and fundamental safety rules or precautions. For this reason MOST ACCIDENTS CAN BE PREVENTED by recognising the real cause and doing something about it before the accident occurs.
Regardless of the care used in the design and construction of any type of equipment there are conditions that cannot be completely safeguarded against without interfering with reasonable accessibility and efficient operation.
Carefully read indications, cautions and safety warning quoted in the "SAFETY RULES" section.
A careful operator is the best insurance against an accident.
The complete observance of one simple rule would prevent many thousand serious injuries each year.
That rule is:
Never attempt to clean, oil or adjust a machine while it is in motion.

WARNING

On machines having hydraulically, or mechanically, controlled equipment be certain the equipment is lowered to the ground before servicing, adjusting and/or repairing. If it is necessary to have the controlled equipment partially or fully raised to gain access to certain items, be sure the equipment is suitably supported by means of proper devices other than those used for controlling the equipment.

CALIFORNIA
Proposition 65 Warning
Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

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6.01.2 ELECTRIC DIAGRAM

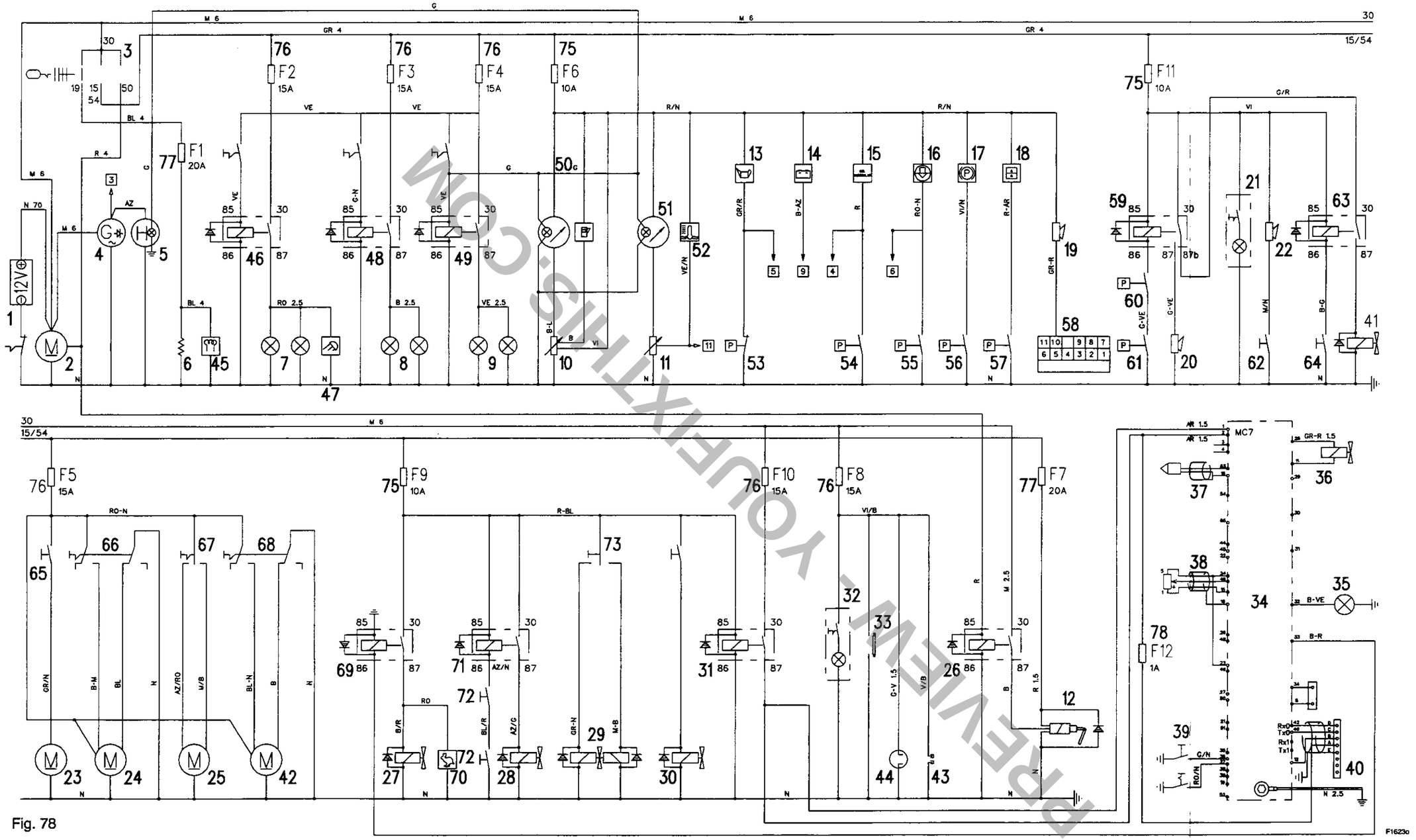


Fig. 78

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ELECTRIC WIRES COULORATION

M	Brown	VE	Green	B	White	N	Black	VI	Violet	BL	Blue	R	Red	A	Orange	G	Yellow	RO	Pink	AZ	Azure	GR	Grey

NOTE: Wires couloration is indicated with the above abbreviations: G/VE Yellow / Green (transversal couloration) - G-VEYellow - Green (horizontal couloration)

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2.13 HYDRAULIC PLANT

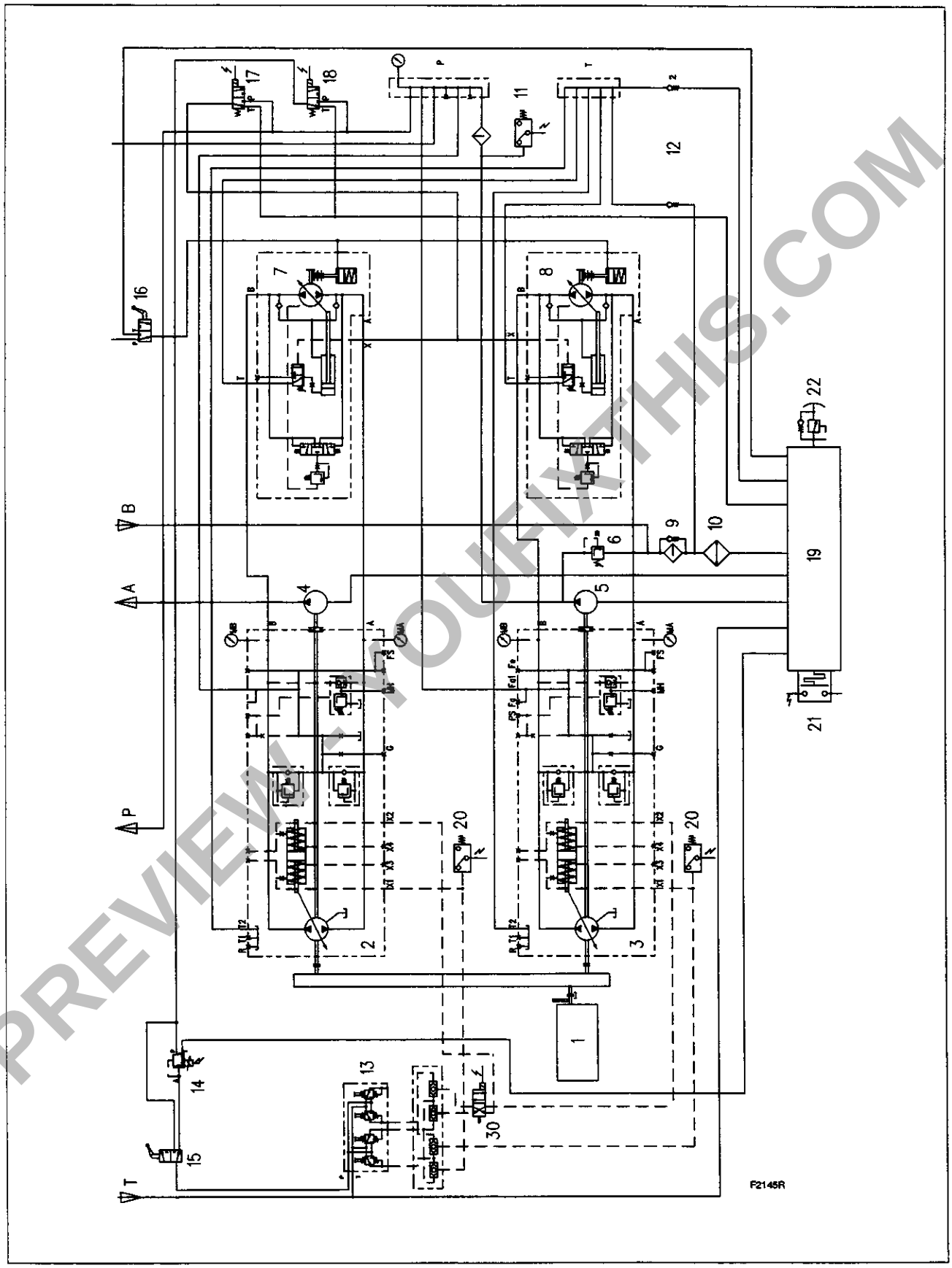


Fig. 2-87

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3.4 GEARBOX DISASSEMBLY

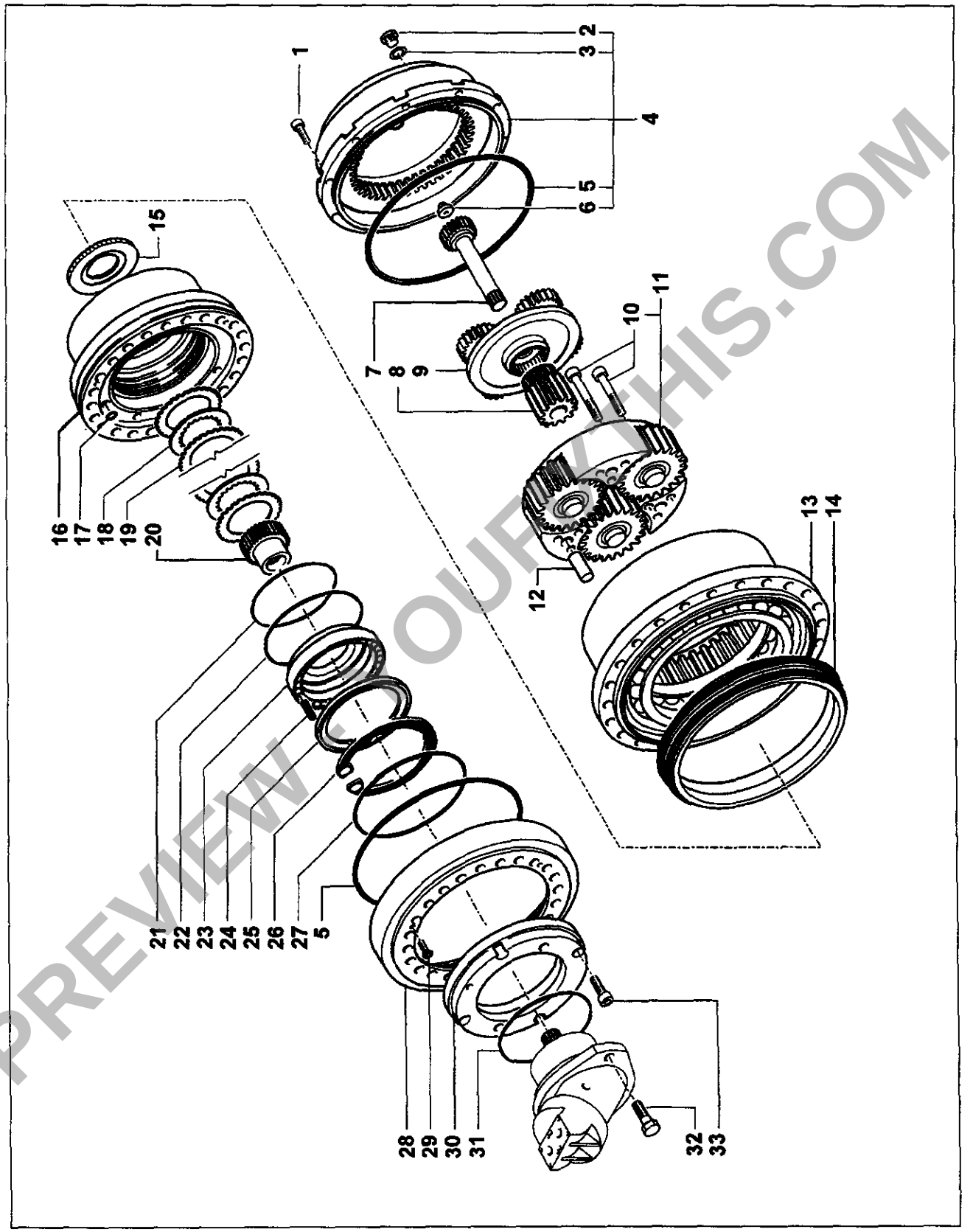


Fig. 3-9 **Gearbox exploded view**

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TIGHTENING TORQUES

Tightening torques for shaft bolts (Metric ISO Standard Thread)

The values for tightening torques shown in the table are valid only for shaft bolts with metric ISO-standard threads and head support surface dimensions in accordance with DIN 912, DIN 931 and DIN 933. These values are also valid only for light or unoiled, untreated surface as well as for use only with torque-indicating wrenches and force limiting tools.

Thread size	Strength Classes 8.8	10.9	12.9
	Tightening Torque (lb.ft)		
M 3	0,8	1,2	1,4
M 4	2,1	3,0	3,6
M 5	4,4	6,3	7,4
M 6	7,4	10,3	12,5
M 8	18,4	25,8	30,2
M10	36,1	50,9	61,2
M12	63,4	88,4	106,9
M14	99,5	140,0	169,5
M16	154,8	217,4	261,6
M18	213,7	298,5	357,4
M 20	302,2	427,5	508,5
M 22	405,4	574,9	685,4
M 24	523,5	737,0	884,4
M 27	773,9	1105,5	1326,6
M 30	1068,7	1474,0	1768,8

Tightening torques for locking screws VSTI (Metric ISO fine thread)

Thread size	Designation		Tightening torques (lb.ft)
M 8 x 1	VSTI 8 x 1	-ED/SA	= 4
M 10 x 1	VSTI 10 x1	-ED	= 7
M 12 x 1,5	VSTI 12 x 1,5	-ED	= 15
M 14 x 1,5	VSTI 14 x 1,5	-ED	= 22
M 16 x 1,5	VSTI 16 x 1,5	-ED/SA	= 22
M 18 x 1,5	VSTI 18 x 1,5	-ED/SA	= 29
M 20 x 1,5	VSTI 20 x 1,5	-ED/SA	= 37
M 22 x 1,5	VSTI 22 x 1,5	-ED	= 44
M 26 x 1,5	VSTI 16 x 1,5	-ED/SA	= 51
M 27 x 2	VSTI 27 x 2	-ED	= 66
M 30 x 1 ,5	VSTI 30 x 1,5	-ED/SA	= 74
M 33 x 2	VSTI 33 x 2	-ED/SA	= 88
M 42 x 2	VSTI 42 x 2	-ED/SA	= 147
M 48 x 2	VSTI 48 x 2	-ED	= 220

Tightening torques for seal-lock nuts (Metric ISO-Standard Thread)

The values for tightening torques shown in the table are valid only for seal-lock nuts of the strength class 8.8 and with metric ISO-standard thread.

Thread size	Strength classes 8.8	10.9	12.9
	Tightening torque (lb.ft)		
M 6	7,4		
M 8	16,2		
M 10	29,5		
M 12	50,9		
M 14	81,1		
M 16	125,3		

Tightening torques for cross-slotted lens head screws DIN 7985 (Metric ISO-Standard Thread)

The values for tightening torques shown in the table are valid only for cross-slotted lens head screws DIN 7985 of the strength class 8.8 and with metric ISO-standard thread.

Thread size	Strength classes 8.8	10.9	12.9
	Tightening torques (lb.ft)		
M 3	0,8		
M 4	2,1		
M 5	4,4		
M 6	7,4		
M 8	18,4		
M10	36,1		

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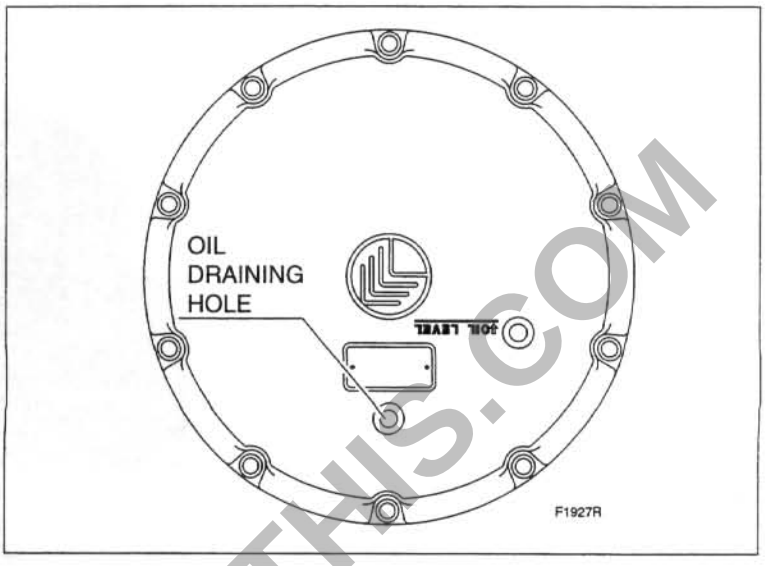
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DISASSEMBLY

Rotate the gearbox housing until the plug (1, see fig.3-10) is on the bottom of the vertical axis of the cover. Unscrew the plugs and let the oil flow; in order to facilitate the draining must be oil still warm.

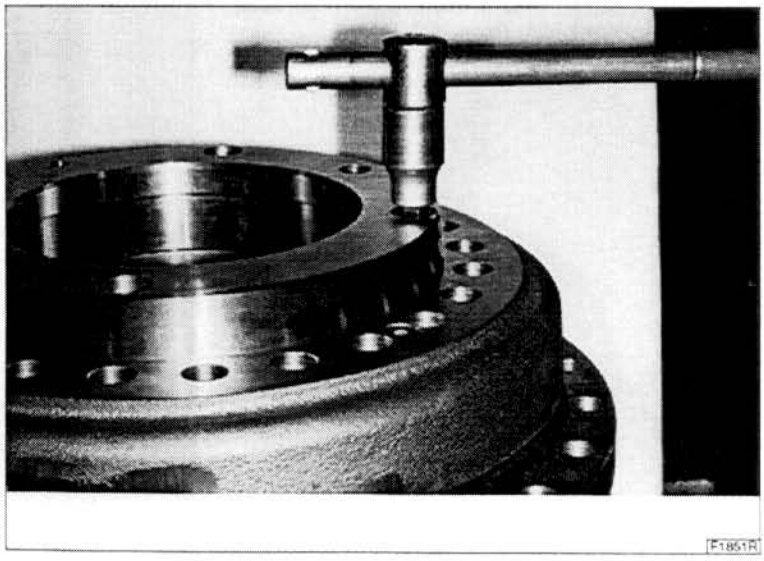
Unscrew and remove the 2 hexagonal head screws M20x45 (pos. 32), grade 8.8, and remove the hydraulic motor and the O-ring (pos. 31).



STEP 1
Unscrew and remove the 2 plugs M22x1,5 (pos. 2) and the 2 washers (pos. 3) from the end cover (pos. 4) sure that the oil is discharged as to instructions specified in section 4.3.



STEP 2
Turn the gearbox upside down and unscrew the 4 socket head screws M16x60 (pos. 33) grade 8.8, which fix the motor adaptor flange (pos. 30) to the flanged hub (pos. 16).



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5.03 ENGINE TROUBLES

TROUBLES													MEASURES	
													Check	P
													Adjust	E
													Change	W
													Refuel	A
													Lower	S
													Clean	R
													Refer to After-Sale Service	B
The engine does not run, or runs hardly														
The engine does not run at full speed														
The engine runs but operates intermittently														
The engine is overheated , the relative warning light is on														
Lack of power														
The engine does not operate with all the cylinders														
Oil pressure inexistant or poor														
Too high consumption of engine oil														
The engine releases blue smoke														
The engine releases white smoke														
The engine releases black smoke														
The engine can't be off, warning lights are off														
CAUSES													CHAPTER	
			•			•						Oil level too low	Engine oil level	A
			•	•			•	•				Oil level too high	Engine oil level	S
						•	•	•				Engine too tilted	Engine use instr.	P
•												Unproper engine oil (class SAE)	Lubricants	W
•		•		•					•			Unproper fuel	Engine use instr.	W
•		•		•				•		•		Air filter dirty	Air suction	P
				•								Fuel filter dirty	Fuel filter	P/W
			•	•						•		Oil radiator/grid dirty	Clean radiator	R
			•									Faulty fan, loose/broken belt	Engine use instr.	P/W
			•									Coolant air overheating/short-circuit		P
			•									Faulty or discharged battery	Battery	P
•												Ignition wire loose/oxidized		P
•												Faulty starter/faulty pinion connection		P
•											•	Engine stop magnet faulty		B
•												Melted fuse	Fuses	P
•		•	•	•	•						•	Faulty valve clearance	Engine use instr.	E
•		•		•	•							Injection pipe unsealed		P
•		•	•	•	•						•	Injection valve faulty	Engine use instr.	P/W
	•											Inner mechanics locked		B
	•											Engine locked by the elements it operates		B

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DIMENSIONS	Overall length (bare tractor)		mm in	2870 112.9
	Overall length (with blade)		mm in	3930 154.7
	Overall width (bare tractor)		mm in	2208 86.9
	(LGP- version 610 mm / 24 in shoes)		mm in	2410 94.8
	Overall width with blade (bare tractor)		mm in	2800 110.2
	(LGP version)		mm in	3050 120.7
	Overall height with ROPS canopy		mm in	2630 103.5
	Track gauge (bare tractor)		mm in	1700 66.9
	(LGP version)		mm in	1800 70.8
	Minimum distance from ground		mm in	400 15.7
	Length of track on ground		mm in	2075 81.6
	Track shoe width (standard)		mm in	508 19.9
	Track shoe width (LGP version)		mm in	610 24
MASS	Shipping weight (including ROPS canopy, blade lift cylinders, lubricants, coolant, 10% fuel) - bare tractor		kg pounds	7500 16534
	- LGP version		kg pounds	7600 16754.5
PERFORMANCE	SPEEDS	Fwd 1st	Km/h miles/h	0 - 3.9 0 - 2.4
		Fwd 2nd	Km/h miles/h	0 - 10 0 - 6.2
		Rev 1st	Km/h miles/h	0 - 3.9 0 - 2.4
		Rev 2nd	Km/h miles/h	0 - 10 0 - 6.2
	NOISE LEVEL	Inside cab standard (Lpa) CEE 89/514 Outside (Lwa) CEE 89/514	dB dB	84 106
	GROUND PRESSURE	Track shoes width 508 mm / 20 in	Kg/cm² pound/in²	0.35 0.024
		LGP shoes 610 mm / 24 in wide (With blade and ROPS cab)	Kg/cm² pound/in²	0.30 0.021
	GRADEABILITY	(1st speed)	degree gradient	45 100%

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EVERY HOURS	WITHIN YEARS	WITHIN MONTHS	SCHEDULE
125		1.5	
250		3	A
375		4.5	
500		6	B
625		7.5	
750		9	A
875		10.5	
1000	1	12	C
1125	1	1.5	
1250	1	3	A
1375	1	4.5	
1500	1	6	B
1625	1	7.5	
1750	1	9	A
1875	1	10.5	
2000	2	12	C
2125	2	1.5	
2250	2	3	A
2375	2	4.5	
2500	2	6	B
2625	2	7.5	
2750	2	9	A
2875	2	10.5	
3000	3	12	D
3125	3	1.5	
3250	3	3	A
3375	3	4.5	
3500	3	6	B
3625	3	7.5	
3750	3	9	A
3875	3	10.5	
4000	4	12	C
4125	4	1.5	

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3.09 TRAVEL

3.09.1 BEFORE START-UP

OPERATE THE SERVOCONTROLS

Hydraulic servocontrols are connected and disconnected with safety handles (1, fig. 23).
When lowering servocontrols are connected, when raising servocontrols are disconnected.

⚠ Operate safety handles only when correctly sitting at the operator's seat. Before abandoning the seat and get off the machine, lift the handles again.

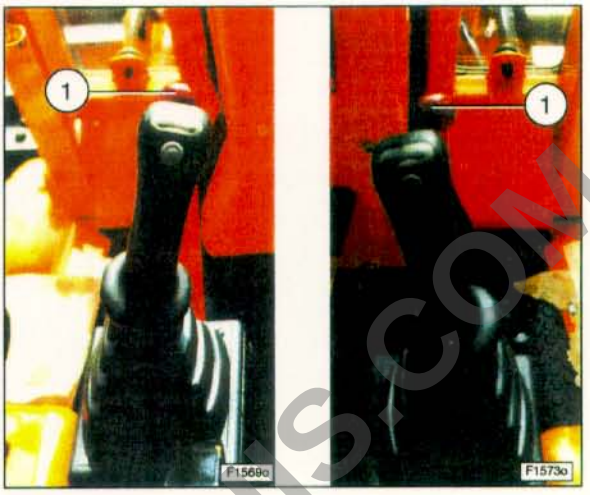


Fig. 23

3.09.2 CHOOSE TRAVEL DIRECTION

The crawler dozer moves when knob (fig. 24) is operated.

FORWARD AND BACKWARD TRAVEL

- Forward: push knob (fig. 24) forward. Travel is in direction of track idler wheel and blade.
- Backward: shift knob (fig. 24) backward. Travel is in direction of sprocket wheel.

If released, the knob shifts automatically back to position **0** (neutral).
Use reverse gear only for short distances with the help of expert signal men due to reduced visibility. Do not cross slopes horizontally and do not reverse direction when there.
Reverse gear is signalled by the intermittent sound of the buzzer located on the rear of the machine. Check for the buzzer efficiency before starting to work.

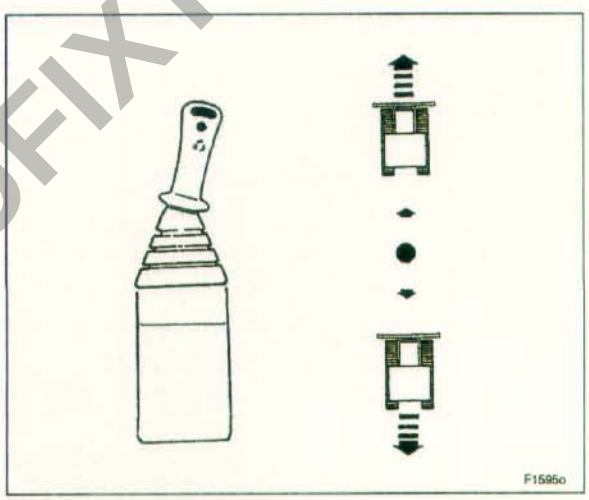


Fig. 24

⚠ In slopes or descents, blade should always be turned downhill; drive with low gear. Be extremely careful on slippery grounds.

All the indications relative to speed and travel direction check are valid only for conditions of use where the tracks have enough adherence to the ground and do not slip.

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3.01 SAFETY PRECAUTIONS FOR USE

3.01.1 THE CORRECT USE OF THE MACHINE

The crawler dozer you have purchased has been manufactured according to the most advanced technological standards and faithfully respecting all the safety rules. Despite this, its use can create dangerous situations for the operator, bystanders and for properties, included the dozer itself.

To reduce the risk of these situations as much as possible, the machine is only to be used respecting the general safety rules shown in this manual as well as the aims for which it has been designed.
The dozer with standard equipment (blade) is intended only for digging works of:
- firm ground that you can dig,
- sand,
- gravel.

With another equipment, the crawler dozer can also be used for other operations, described in this manual as well.
For a correct and safe use, it is strictly necessary to remove all faults or malfunctions that could compromise machine operation and to follow all the rules contained in this manual.

⚠ A use not limited to the functions and operations described above is not consistent with the machine aims. Examples of unconsistent functions, and therefore unallowed, are:
- riders transport,
- load lifting without an equipment tested for this function,
- tree or post felling,
- other similar works.
A use unconsistent with the machine nature and unallowed increases remarkably the danger for people and properties.

When using the equipment to fell trees, the machine should always have the special sweeps. Do not shift the machine forward until laying on the roots, in particular when felling logs. When pushing on tree logs with dry branches, be extremely careful.
Avoid brushwood, shrubs, logs or rocks. **Never pass on them** or on any other surface irregularity which could interrupt ground adhesion or friction continuity, in particular on slopes or on level changes. Be careful to possible adhesion changes that can cause machine loss of control. On slopes or near cliffs avoid frozen areas.
The kind of work on virgin, uneven ground is characterized by all the dangers and risks mentioned above. In these areas is stressed the danger level represented by heavy branches (which can fall on the machine), big roots (which can lever the machine overturning it), etc.

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4.21 PUMP COUPLER

4.21.1 CHECK OIL LEVEL AND REFUEL

Pump coupler oil level should be checked as indicated in the maintenance schedules:
- before the first machine start-up,
- after the first machine start-up,
- after the first 50 hours of operation,
- every 250 hours of operation.

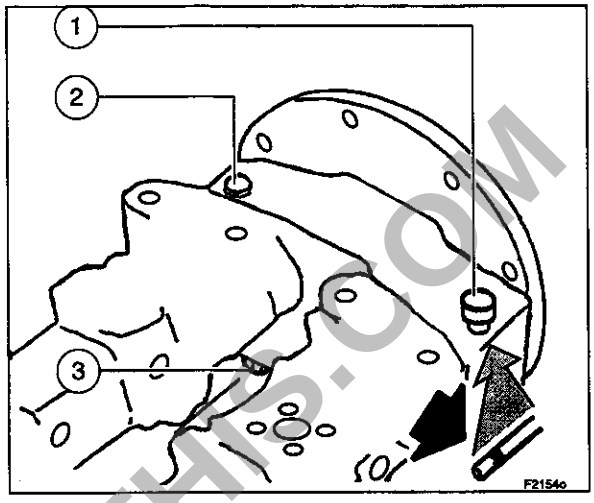


Fig. 71

- Park the machine on a level ground and avoid any accidental start-up.
- Shut the engine down.
- Open the engine hood by turning the knob on the left.
- Remove oil dipstick (1, fig. 71).
- Clean the dipstick with a cloth and place it into the hole again.
- Remove the dipstick again; oil level should be between the two dipstick marks.

If the level is lower than or equal to the one indicated as "min", fill until reaching the "max" level, using the filler plug (2, fig. 71).

4.21.2 CHANGE PUMP COUPLER OIL

Pump coupler oil can cause burns or injuries!
Collect the spilling oil and dispose of it correctly.

- Let pump coupler oil reach the operating temperature.
- Park the machine on a level ground and avoid any accidental start-up.
- Shut the engine down.
- Loosen fixing screws of closing port located under the coupler. Open the port.
- Untighten drain outlet plug (3, fig. 71).
- Let the oil flow out.

When the coupler is empty:
- retighten the plug with a new seal,
- fill the engine with oil, by means of filler plug (2, fig. 71) until reaching the "max" level,
- retighten the filling plug,
- start the engine and let it run for about 2 minutes,
- check oil level again and, if necessary, fill until reaching the "max" level.

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COMPONENT GROUPS/CONTROL COMPONENTS

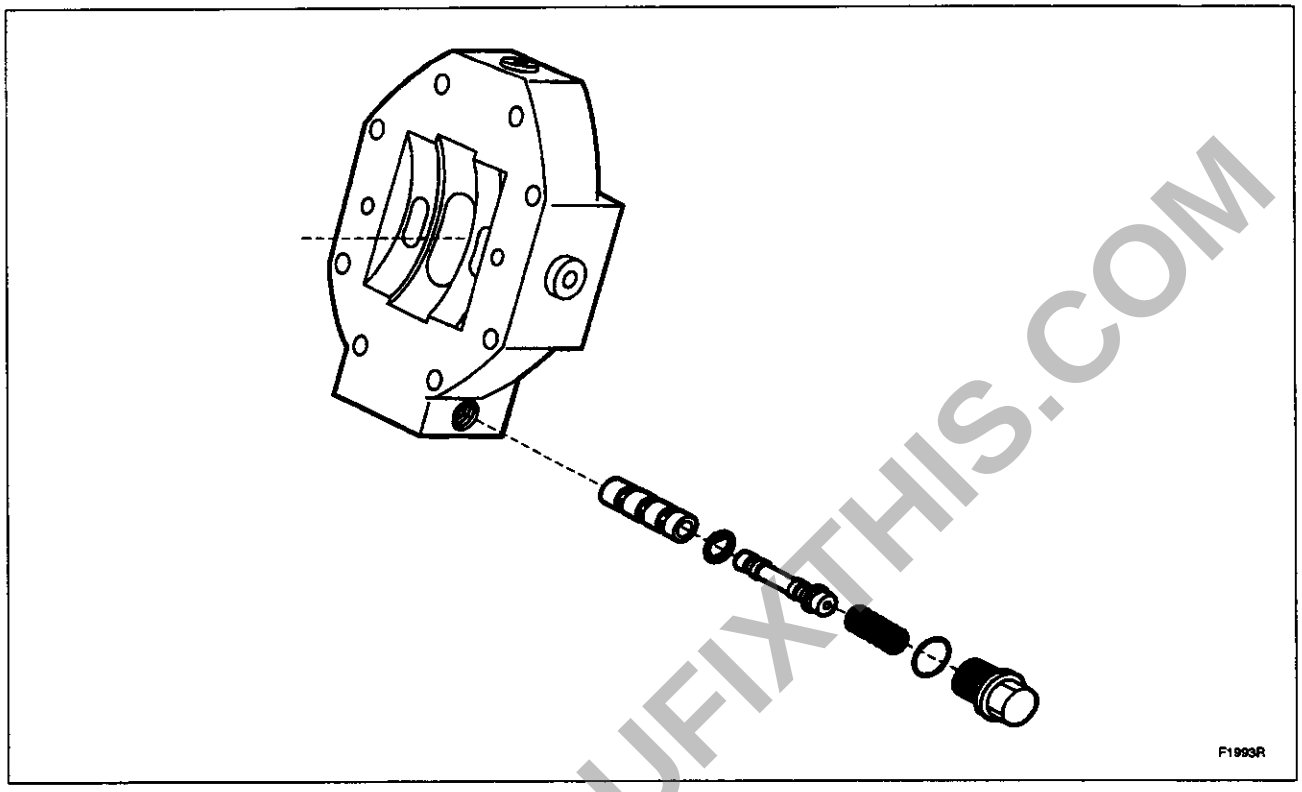
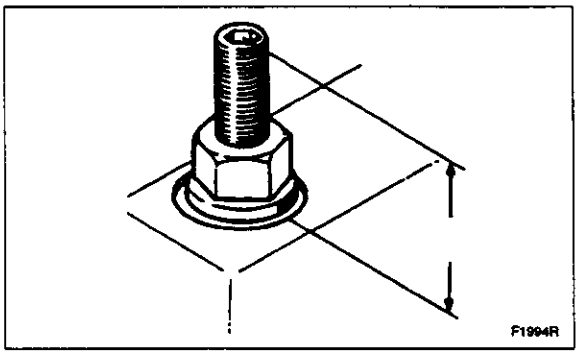


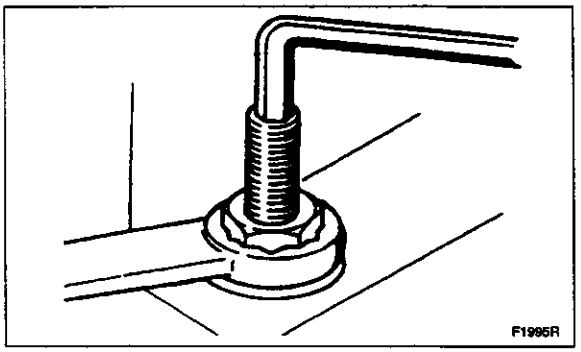
Fig. 2-15

REPLACE SEAL NUT

Replace seal nut.
First measure and record setting height.



When tightening, counterhold setting screw, then check setting height.



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2.12 SPEED CHANGE SOLENOID VALVE

2.12.1 TECHNICAL DATA

These direct acting spool style solenoid cartridge valves are particularly suitable to operate single acting cylinders, pilot circuits, unidirectional motors, etc.

- Mounting position: unrestricted
- Balanced spools
- Filtration level: 25 micron or better
- Max. internal leakage: 80 cm³/min. (4.8 in³/min.) at 210 bar (21000 kPa) and 46 cSt
- Min. operating voltage: 90% of nominal voltage
- Coils must be ordered separately.

NOTE: These valves operate only with DC coils.

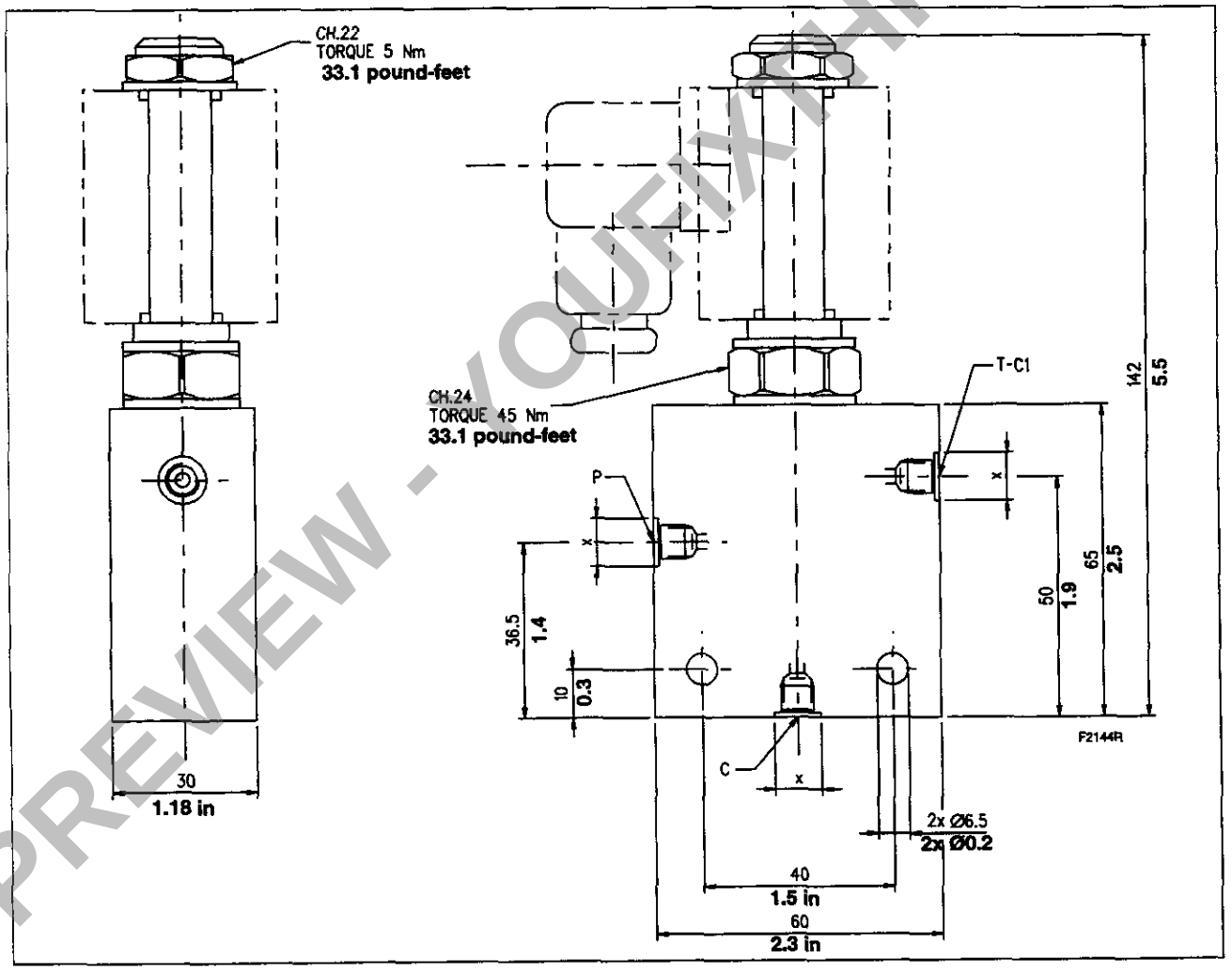


Fig. 2-83

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4.5.3 REASSEMBLY

Reassemble the idler wheel considering the following:

- Press-fit bushes (**3**) into the idler using avertical press (fig. 4-14);

- Mount the O-rings (**10**), the bracket (**5**) and pin (**4**) onto the shaft (**2**) (fig. 4-15).

- Insert a seal group (**6+7**) into the idler and one onto the shaft (**2**) (fig. 4-15).

- Then insert the above subassembly into the idler shell up to the point when it bottoms up the seal group.

NOTE - Degrease and clean the seats of the front face seals. Eliminate from the surfaces any trace of dust or fingerprints, then smear them with a thin film of oil, ensuring that other parts are not oiled.

- Resting then the idler horizontally over the already assembled bracket, assembling is completed at the other side. For final assembly you will need a certain pressure to be given by means of a vertical press.

- The seal groups of idlers should be treated as already described for rollers.

- Lubrication will be done by means of a low pressure pump fitted with nozzle through the holes removing the plug (**8**) in the idler shell body; oil to be used is a SAE 30 or 40.

- Reassembly the fork (**15**) with screws (**11**).

- Reassembly the idler assembly at the adjusted mechanism with screws (**14**).

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