FR180.2

EFF. S/N 335-UP

WHEEL LOADER

OPERATION AND MAINTENANCE

INSTRUCTION MANUAL

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The information in this manual was current at the time of publication. It is our policy to constantly improve our product and to make available additional optional items. These changes may affect procedures outlined in this manual. If differences are observed, verify the information through your Dealer.

ONE MANUAL IS SUPPLIED WITH EACH MACHINE

MACHINE - SERIAL NUMBER _____

1ST EDITION - FORM FA 75314958

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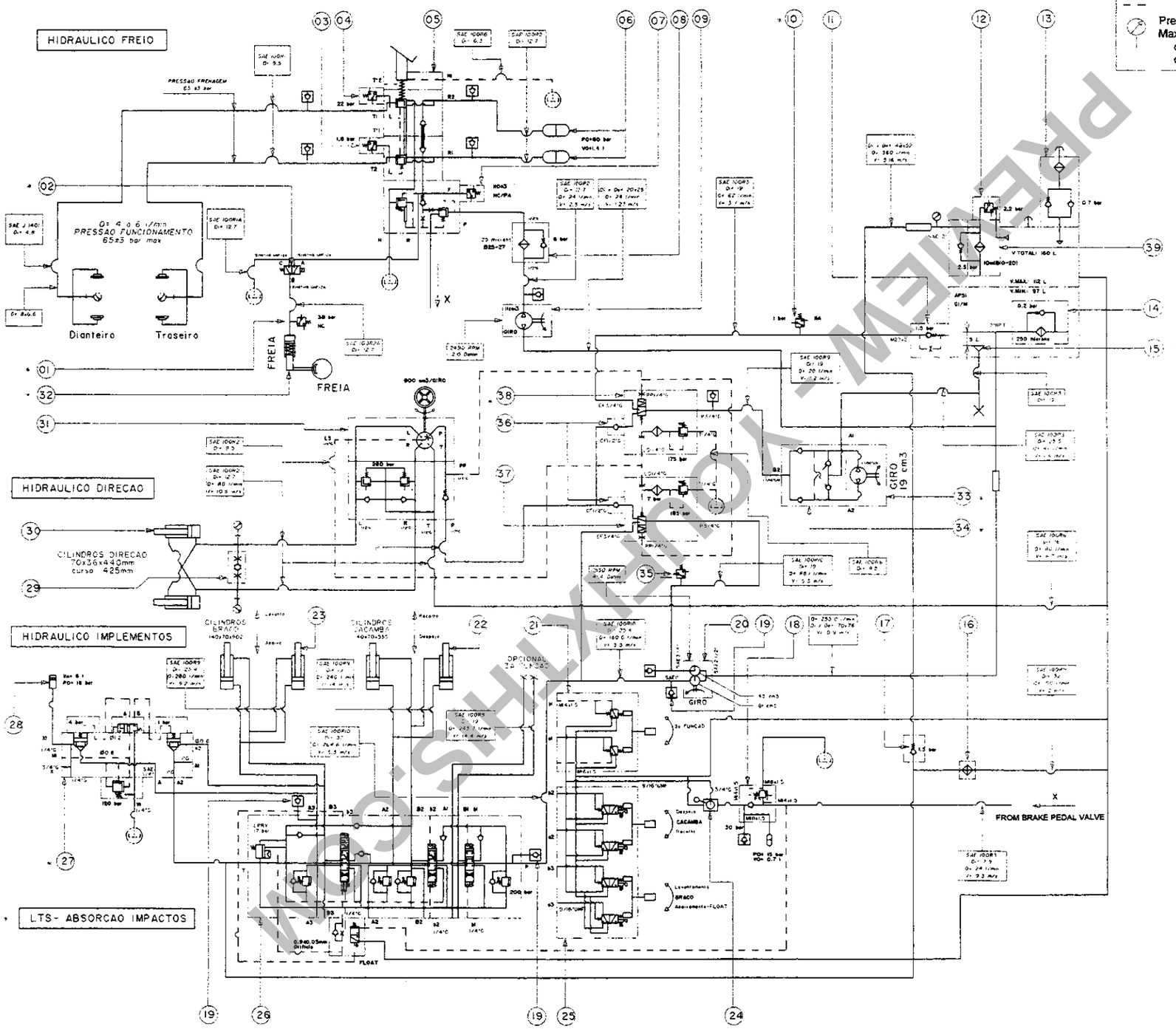
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ESQUEMA ELÉTRICO
ELECTRICAL SYSTEM
SISTEMA ELECTRICO

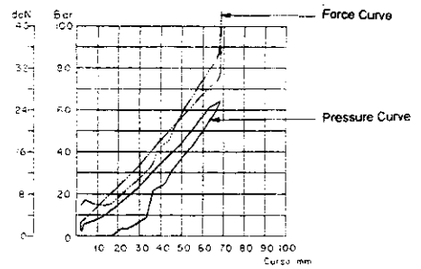
SPEED	ENERGIZED WIRES	SOLENOID
F1	9T, 4T, 5T, 8T	F, 1, 2, 3
F2	8T, 5T, 9T	F, 2, 3
F3	8T, 9T	F, 2
F4	8T	F
N	A5, 4T, 5T, 9T	1, 2, 3
R1	7T, 4T, 5T, 9T	R, 1, 2, 3
R2	7T, 5T, 9T	R, 2, 3
R3	7T, 9T	R, 3
R4	7T	R
N2	A3,3T,9T	2, 3
N3	A3,9T	3
N4	A3	—

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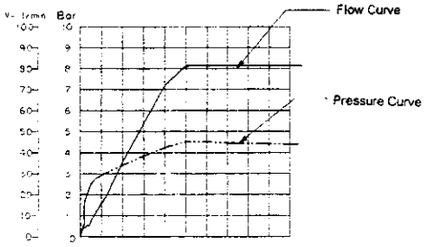
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NOTES
- Optional
- Hose conforming to AQF1002
- Hose conforming to STD. 2008
- Steel Tube
- Pressure check point (with cap)
- Maximum contamination level: conforming to ISO 4406:18/15 conforming to NAS 1638:9



Curve of Pressure/Force against Stroke



Curve of Hyd. System Loss

		FR180.2		
ITEM	QTY	DESCRIPTION	PART NUMBER	
1	1	BRAKE SWITCH	75241216	OPTIONAL
2	1	VALVE	73154750	OPTIONAL
3	1	BRAKE LITE SWITCH	70094334	
4	1	DECLUTCH SENSOR	75243642	
5	1	BRAKE VALVE	76032541	
6	2	ACCUMLATOR	76028575	
7	1	BRAKE LOW PRESSURE	75243579	
8	1	OIL FILTER ASY	79109811	
9	1	BRAKE PUMP ASY	75251653	
10	1	SENSOR, EMERGENCY	75242536	OPTIONAL
11	1	VALVE ASY	79102828	
12	1	HYD. FILTER RESTRICTION	79094756	
13	1	HYD. TANK CAP	79104494	
14	1	HYD. OIL SCREEN	79088008	
15	1	SCREEN, EMERGENCY	79087782	OPTIONAL
16	1	HEAT EXCHANGER	75244888	
17	1	VALVE	75251649	
18	1	VALVE ASY	79110121	
19	11	TEST FITTING	79087380	
20	1	HYD. PUMP ASY	75235329	
21	1	MANIPULATOR, 3 FUNCTION	79102821	
22	1	DUMP CYL. ASY RH	75238954	
	1	DUMP CYL. ASY LH	75238955	
23	1	LIFT CYL. ASY RH	75238936	
	1	LIFT CYL. ASY LH	75238937	
24	1	LOCKOUT VALVE	79107235	
25	1	MANIPULATOR	75249715	
26	1	CONTROL VALVE	75249716	
27	1	LTS VALVE	76034266	OPTIONAL
28	1	ACCUMULATOR, LTS	76034685	OPTIONAL
29	1	VALVE	79105255	
30	2	STEERING CYLINDER	75238267	
31	1	STEERING VALVE	76032527	
32	1	BRAKE CYLINDER ASY	79099765	OPTIONAL
33	1	PUMP ASY, EMERGENCY	73150265	OPTIONAL
34	1	VALVE, EMERGENCY	75241213	OPTIONAL
35	1	PRESSURE SWITCH	79102096	
36	2	VALVE ASY	79112678	
37	1	PRIORITY VALVE	79090997	
38	1	PRIORITY VALVE	79090391	OPTIONAL
39	1	HYD. FILTER ASY	79082397	

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HYDRAULIC SYSTEM

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3.3.3.3 Reassembly

Place the dust cover on the hub.

Press the outer and inner races of the bearing, making sure they are firmly against the shoulder.

Install a new seal. Prior to installing it, smear the outer diameter of the seal with Loctite 573.

Support in a safe manner the support flange and mount it on the hub.

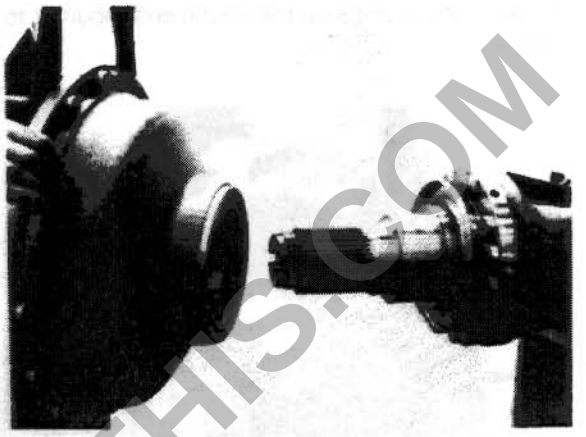


Fig. 3.20

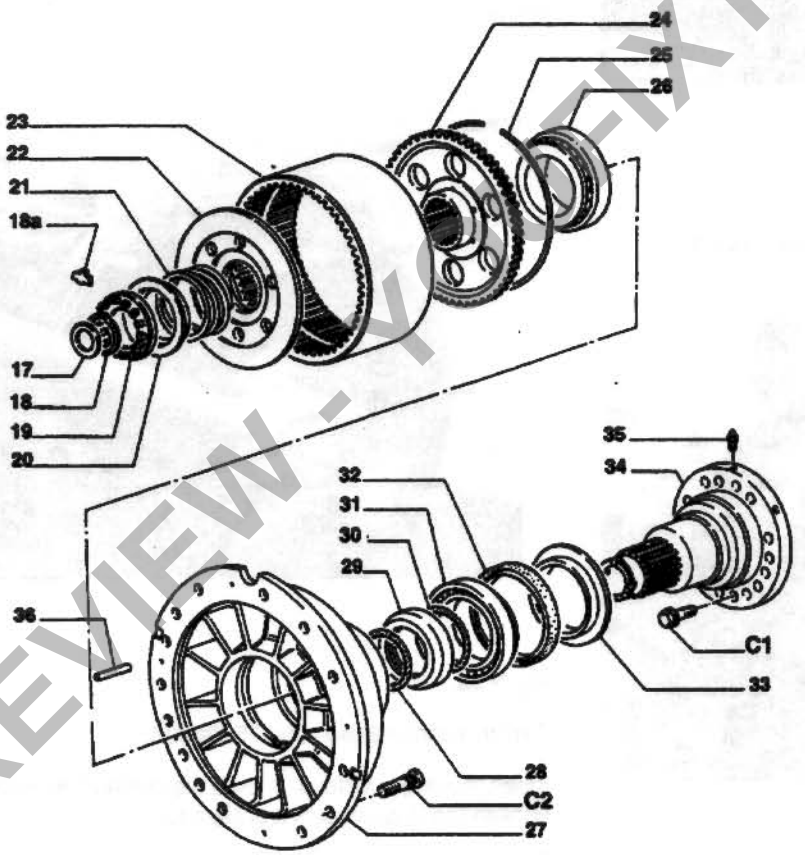


Fig. 3.21 - Final drive: exploded view of components

C1. Securing screws, front wheel hub (tightening torque: 85.5 ÷ 94.5 daNm ~ 620 ÷ 685 lb.ft). Securing screws, rear wheel hub (tightening torque: 62 ÷ 68 daNm ~ 450 ÷ 490 lb.ft) - **C2**. Securing screws, planetary carrier (tightening torque: 6.1 ÷ 6.9 daNm ~ 44 ÷ 40 lb.ft) **17**. Thrust ring - **18**. Snap ring - **18a**. Safety plate - **19**. Ring nut - **20**. Spring retaining cup - **21**. Spring **22**. Thrust plate - **23**. Crown - **24**. Support - **25**. Elastic ring - **26**. Bearing - **27**. Wheel support flange - **28**. Piston O-ring - **29**. Piston - **30**. Piston O-ring - **31**. Bearing - **32**. Seal - **33**. Dust seal - **34**. Wheel hub - **35**. Oil bleeding **36**. Pin.

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3.5 SPECIFICATIONS AND DATA

Front axle	
- Type	Rigid supporting structure type
- Reduction ratio	1:21.700
Rear axle	
- Type	Rigid supporting structure type
- Reduction ratio	1:21.700

3.6 TIGHTENING TORQUE

Item to be tightened	Reference	Torque daNm (*)
Final drives		
Securing screws, front/rear wheel hub	C1, fig. 3.2/3.25	62 ÷ 68 / 85.5 - 94.5 (450 ÷ 490)/(620 ÷ 680 lb.ft)
Screws, securing planet carrier	C2, fig. 3.2/3.25	6.1 ÷ 6.9 (44 ÷ 50 lb.ft)
Nuts, securing wheel rims	C3, fig. 3.2/3.25	60 (435 lb.ft)
Screws, securing final drive cover	C4, fig. 3.2/3.25	3.3 ÷ 3.7 (24 ÷ 27 lb.ft)
Bevel gear and differential, rear axle		
Nut, locking pinion	C1, fig. 3.3/3.41/3.49	57 ÷ 63 (410 ÷ 455 lb.ft)
Screws, securing ring gear	C2, fig. 3.3/3.49/3.73	31.5 ÷ 34.5 (230 ÷ 250 lb.ft)
Screws, securing differential half-housing	C3, fig. 3.3/3.49/3.73	11.5 ÷ 12.5 (83 ÷ 90 lb.ft)
Screws, pinion nose support bracket	C6, fig. 3.41	31.5 ÷ 34.5 (230 ÷ 250 lb.ft)
Bevel gear and differential, front axle		
Securing screws, half-housing	C1, fig. 3.3.1/3.68	11.5 ÷ 12.5 (83 ÷ 90 lb.ft)
Retaining nut, pinion	C2, fig. 3.3.1/3.68	57 ÷ 63 (410 ÷ 455 lb.ft)
Screws, securing ring gear	C5, fig. 3.3.1/3.68/3.73	46 ÷ 51 (330 ÷ 370 lb.ft)
Supports		
Screws, securing front axle supports to frame	page 3-12	80 (580 lb.ft)
Screws, securing rear axle supports to frame	C, fig. 3.7	80 (580 lb.ft)
Securing screws, front axle support covers	C1, fig 3.89	3.2 (23 lb.ft)
Screws, securing rear axle support covers	C2, fig 3.89	30 (217 lb.ft)
Prop-shafts		
See fig. 3.90	C1, fig. 3.90	10.5 (75 lb.ft)
See fig. 3.90	C2, fig. 3.90	13 ÷ 14 (95 ÷ 100 lb.ft)
See fig. 3.90	C3, fig. 3.90	24.6 (75 lb.ft)
See fig. 3.90	C4, fig. 3.90	30 (217 lb.ft)
See fig. 3.90	C5, fig. 3.90	60 (435 lb.ft)
See fig. 3.90	C6, fig. 3.90	5.5 (40 lb.ft)
See fig. 3.90	C7, fig. 3.90	6.5 (47 lb.ft)

(*) Lubricate with engine oil

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4.4 TROUBLE-SHOOTING

TROUBLE	PROBABLE CAUSE	REMEDY
1. The braking action does stop after releasing the brake pedal.	Brake pedal seized.	Overhaul brake pedal valve.
	Brake pedal not completely released.	Check that no hardened mud or foreign bodies are located under the pedal. Check that with the pedal totally released the output pressure from the brake valve is nil.
2. Excessive travel of brake pedal.	Air in the system.	Bleed the system.
	Oil leakage inside the brake pedal valve.	To analyze the performance of the valve, it is recommended to mount a safety cock on the output of the brake pedal valve toward the equipment manipulator. This cock must be kept open during the phase with engine running to recharge the accumulators. Once the engine is stopped, the cock must be closed quickly. Measure the time required to drop the pressure from 150 + 160 tear to 115 + 121 bar. If below 15 minutes, the brake pedal valve has unacceptable leakages thus requiring overhauling or replacement.
3. Hard pedal travel.	Brake pedal valve pistons seized.	Overhaul brake pedal valve.
	Brake oil delivery piping clogged.	Disassemble, clean or replace.
4. Hard braking operation	Wrong setting of pressure.	Reduce the pressure by regulating the adjusting screw located at the base of the brake pedal (refer to chapter 4.3.3).

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SPECIFICATIONS

Operation times :
Boom lift ..... 6,2 s
Boom low ..... 3,0 s
Bucket dump ..... 1,0 s
Bucket roll back ..... 1,6 s

FRAME

Articulated, consisting of front and rear sections coupled through two ball joints.
Both sections are made of welded sheet steel box sections, carrying the different operational units.

ELECTRICAL SYSTEM

Tension ..... 24 V
Alternator ..... 45 A
Starter ..... 5,5 kW
Batteries 2

WHEELS AND TIRES

Rims ..... 19,5 "
Tires :
23,5 x 25 - 12 PR tubeless, L3 ..... Standard
23,5 x 25 - 16 PR, L3 ..... Optional
23,5 x 25 - 16 PR, L5 ..... Optional

CAPACITIES

	litres	US gallons
Cooling system	45,0	11,9
Crankcase	20,3	5,4
Fuel tank	270,0	71,3
Front/rear axles differentials and wheel hubs	104,0	27,5
Torque converter and transmission oil	27,0	7,1
Hydraulic system	112,0	29,6

OPTIONAL EQUIPMENT

Some of the equipment items described and illustrated are supplied to certain markets to meet specific requirements.
Other special devices and attachments are also available as optional equipment. Check with your FIATALLIS dealer.

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SERVICE AND LUBRICATION GUIDE

HOURS	SERVICE POINTS	*	Nº OF POINTS	LUBRICANT	APROX. CAPACITY
10 Hours or daily	1- Engine sump and filter	V	1	A	19,0L (5,016 GAL)
	2- Transmission oil level	V	1	E	27,0 L (7,128 GAL)
	3- Hydraulic tank and implement	V	1	C	169,0 L (44,616 GAL)
	4- Fuel filter	D	2	-	
	5- Radiator coolant level	V	1	-	44,0L (11,616 GAL)
50 Hours or each 15 days	6- Differential and planetary oil level	V	2/4	B	104,0 L (27,456 GAL)
	7- Fuel tank	D	1	-	290,0L (76,56 GAL)
	8- Fuel sediment bowl filter	CL	1	-	
	9- Bucket linkage grease fittings	LU	4	D	
	10- Steering cylinders grease fittings	LU	4	D	
	11- Rear axle support grease fittings	LU	2	D	
	12- Drive shaft grease fittings	LU	7	D	
	13- Articulation joint grease fittings	LU	2	D	
100 Hours	14- Fuel filter	R	2	-	
	15- Boom and linkage grease fittings	LU	10	D	
	16- Lift cylinder grease fittings	LU	2	D	
	17- Dump cylinder grease fittings	LU	2	D	
	18- Batteries	V	6	-	
250 Hours	19- Engine sump and filter	R	1	A	19,0 L (5,016 GAL)
	20- Engine oil filter	R	1	-	
	21- Alternator and fan belt	V	1	-	
	22- Tire pressure	V	4	-	
	23- Brake line pressure filter	CL	1	-	
	24- Engine water filter	R	1	-	
	25- Breathers	CL	4	-	
500 Hours	26- Hydraulic system return oil filter	R	1	-	
	27- Transmission oil filter	R	1	-	
	28- Hydraulic suction line filter	CL	1	-	
	29- Hydraulic tank filler neck filter	CL	1	-	
1000 Hours	30- Transmission oil level	R	1	E	27,0 L (7,128 GAL)
	31- Hydraulic tank and implement	R	1	C	169,0 L (44,616 GAL)
	32- Differential and planetary oil level	R	2/4	B	104,0 L (27,456 GAL)
	33- Valve lash adjustment	V	12	-	
	34- Hydraulic tank filler neck filter	R	1	-	
	35- Radiator coolant level	R	1	-	44,0 (11,616 GAL)
	36- Transmission screen filter	CL	1	-	
	37- Fuel injection nozzles	V	6	-	
As required	38- Engine air filter	CL	1	-	
	39- Engine air filter	R	1	-	
	40- Brake system bleeding	V	2/4	-	

* *Symbols for service intervals: V= Check R= Change LU= Lubricate CL= Clean D= Drain*

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1.2 REMOVAL AND INSTALLATION

⚠ WARNING

Position the machine on a flat surface and set the parking brake on .

Position bucket flat on the ground.

⚠ WARNING

*Always turn the master switch to the **OFF** position before cleaning, repairing, servicing or parking the unit, to prevent injuries.*

Remove radiator guards, upper hoods and side panels;

Remove hydraulic reservoir plug and drain oil completely. Collect it in a proper clean container;

Disconnect the hoses from hydraulic reservoir and remove it from the machine;

Disconnect the water and hydraulic oil radiators hoses and remove both radiators from the machine;

Disconnect the fuel system hoses, electric wiring and brake pump hoses mounted on engine side;

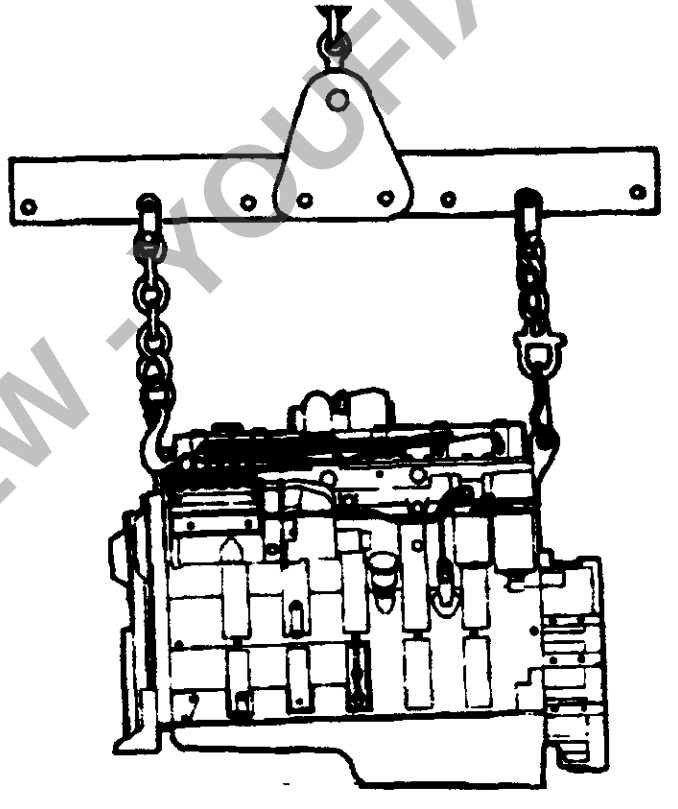


Fig. 1.2 Engine lifting

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IDENTIFICATION

FR 180.2 ..... WHEEL LOADER

ENGINE

Make ..... Cummins
Model ..... 6 CT 8.3
Type: Diesel, in line, vertical, 4 stroke , direct injection, turbocharged, open combustion chamber, water cooled.
Number of cylinders 6
Bore ..... 114 mm (4.5 in)
Stroke ..... 135 mm (5.3 in)
Total displacement ..... 8.270 cm^3 (505 in^3)
Net flywheel power
- (DIN 6270) ..... 194 CV (1 42 kW)
- (SAE J 1 349) ..... 190 HP (142 kW)

Maximum torque (at 1.500 rpm) ..... 769 Nm
..... 567 lb.ft
Governed rpm 2.200
Fuel Injection Pump ..... Robert Bosch
Low Idle ..... 700 -900 RPM
High Idle ..... 2372 - 2480 RPM
Compression Ratio 17.3:1
Valve Clearance:
- Intake (engine cold) ..... 0.30 mm (0.0118")
- Exhaust (engine cold) ..... 0.61 mm (0.0240")

Fuel Injection Timing ..... 22° before TDC

LUBRICATION

Type ..... full pressure, full flow
Pump type ..... gear pump
Filter: ..... replaceable micro filter

INJECTION SYSTEM

Fuel pump ..... Robert Bosch
Firing order 1-5-3-2-4-6
Valve opening pressure ..... 1.5 Bar (22 PSI)
Fuel injectors release pressure ..... . .205 to 213 bar (2974 ~ 3090 PSI)

RADIATOR

Type Soldered construction, brass tube and copper fin core
Core size .....
Cap release pressure ..... 0.49 Bar (15 PSI)

AIR FILTER

Make ..... Donaldson
Type: Turbo dust air turbofil, dry, aspirated with secondary element
Diameter ..... mm

OIL FILTER

Type ..... Single replaceable element
BY PASS pressure ..... Bar

FUEL FILTERS

Two cartridges in series.

TRANSMISSION

Make ..... Clark
Model ..... 13 HR 28.441 series 01 6154
Full power-shift, countershaft, 4 forward and 4 reverse speeds. Electric over hydraulic operated by a single lever on steering column. Operator selected transmission cut- off. Four wheel drive.

Speeds (Forward & reverse)	km/h	mph
1st	6.0	3.7
2nd	11.3	7.0
3rd	21.9	13.6
4th	33.7	21.0

TORQUE CONVERTER

Type ..... single stage
Multiplication ratio 2.728:1

AXLES

Axles with hypoid gear and pinion. Torque proportioning differentials. "Max trac" type.
Rear axle with vertical oscillation of 25° (420 mm/ 16.50" stroke). Planetary reductions at axles end.

Total reduction ratios:

Front axle ..... 1 : 21.097
Rear axle ..... 1 :21.097
Make ..... FIATALLIS (GRAZIANO)

SERVICE BRAKES

Disc type oil bath, are located inside the axle final drives. Pressing the brake pedal the brake control valve provides the braking circuit with a control pressure proportionate with the pedal stroke.

Pump delivery ..... 11 cc/turn
Operation pressure ..... 160 bar (2300 psi)
Accumulators recharging starting pressure ..... 110 ± 3 bar (1600 ± 43 psi)
Accumulators precharging pressure ..... 60 bar (870 psi)
Setting of brakes oil low pressure sensor ..... 110 bar (1600 psi)
Setting of stop lights pressure switch ..... 1.8 bar (260 psi)

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SAFETY RULES

This symbol is your safety alert sign. It MEANS ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED.

Read and heed all safety instructions carrying the signal words WARNING and DANGER.

STUDY THE OPERATION AND MAINTENANCE INSTRUCTION MANUAL THROUGHLY BEFORE STARTING, OPERATING, MAINTAINING, FUELING OR SERVICING THIS MACHINE.

Machine mounted safety signs have been color coded yellow with black borders and lettering for warning and red with white borders and lettering for danger points.



MOST ACCIDENTS ARE CAUSED BY FAILURE OF SOME INDIVIDUAL TO FOLLOW SIMPLE AND FUNDAMENTAL SAFETY RULES OR PRECAUTION. FOR THIS REASON MOST ACCIDENTS CAN BE PREVENTED BY RECOGNIZING THE REAL CAUSE AND DOING SOMETHING ABOUT IT BEFORE ACCIDENT OCCURS. REGARDLESS OF THE CARE USED IN THE DESIGN AND CONSTRUCTION OF ANY TYPE OF EQUIPMENT THERE ARE MANY CONDITIONS THAT CANNOT BE COMPLETELY SAFEGUARDED AGAINST WITHOUT INTERFERING WITH REASONABLE ACCESSIBILITY AND EFFICIENT OPERATION.



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