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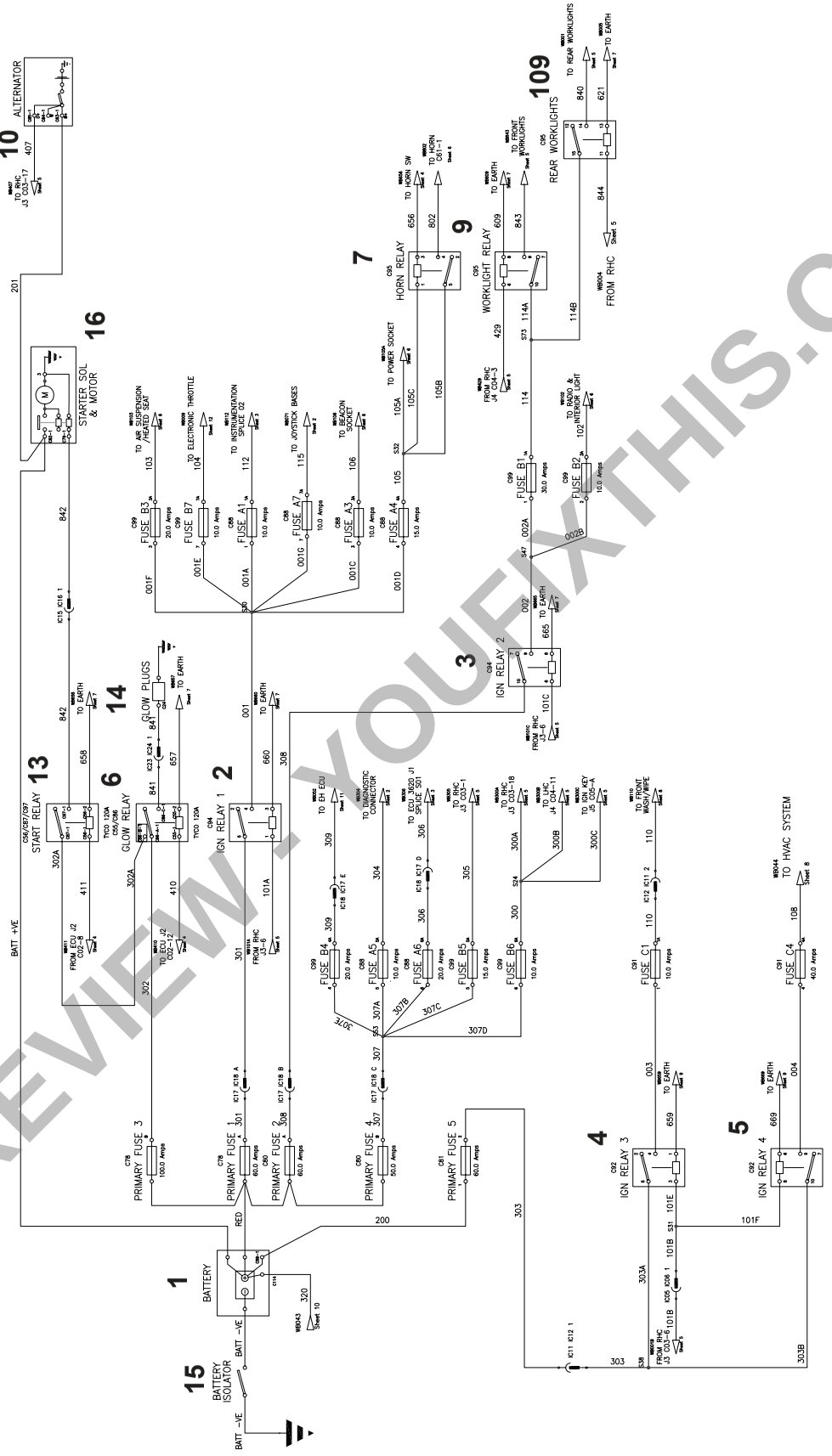


Fig 1. Start Circuit and Primary and Secondary Fuses - 332/X5551-3 - sheet 1

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Diagrams

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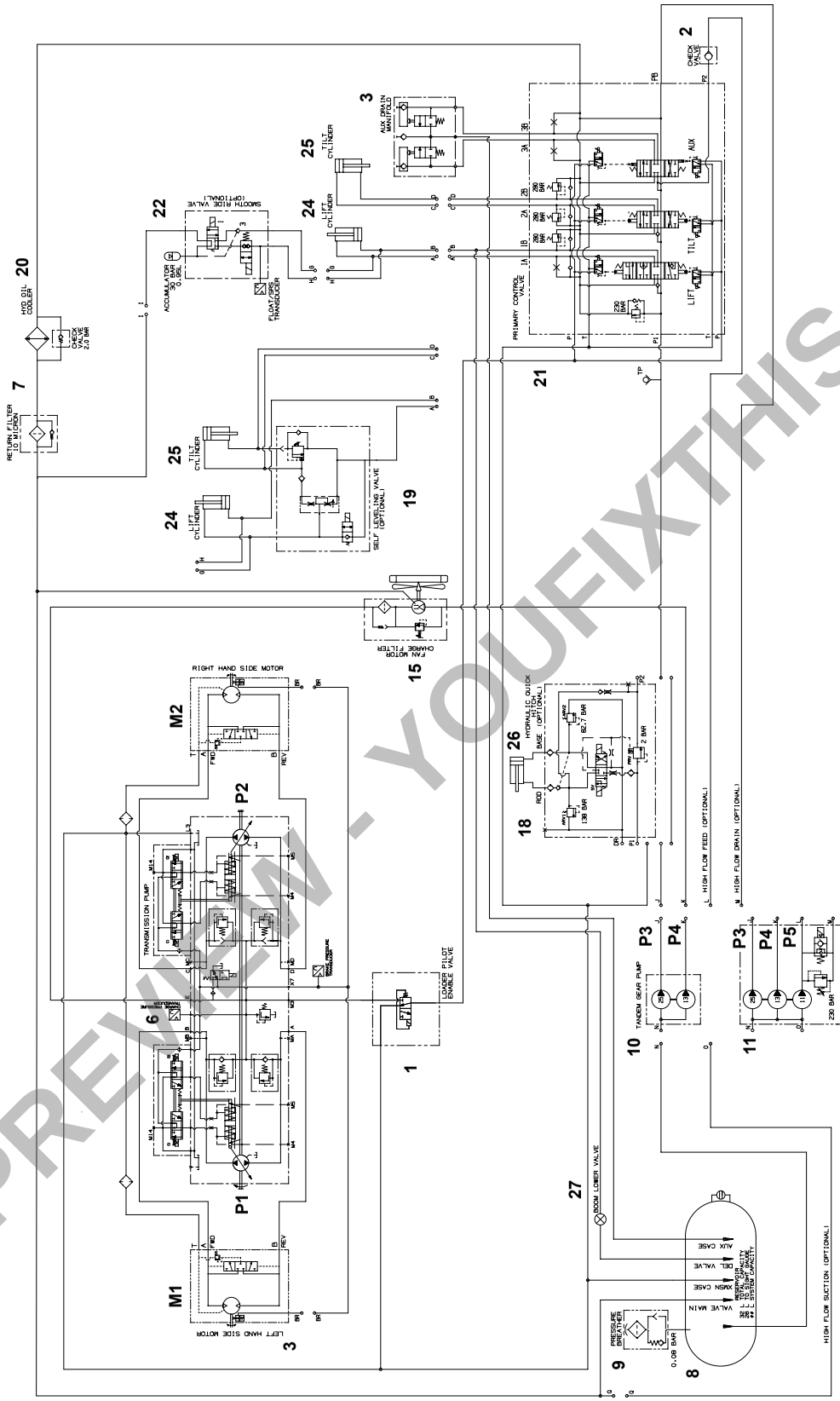


Fig 8. Hydraulic Schematic - 332/X5553-1

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Dismantling and Assembly

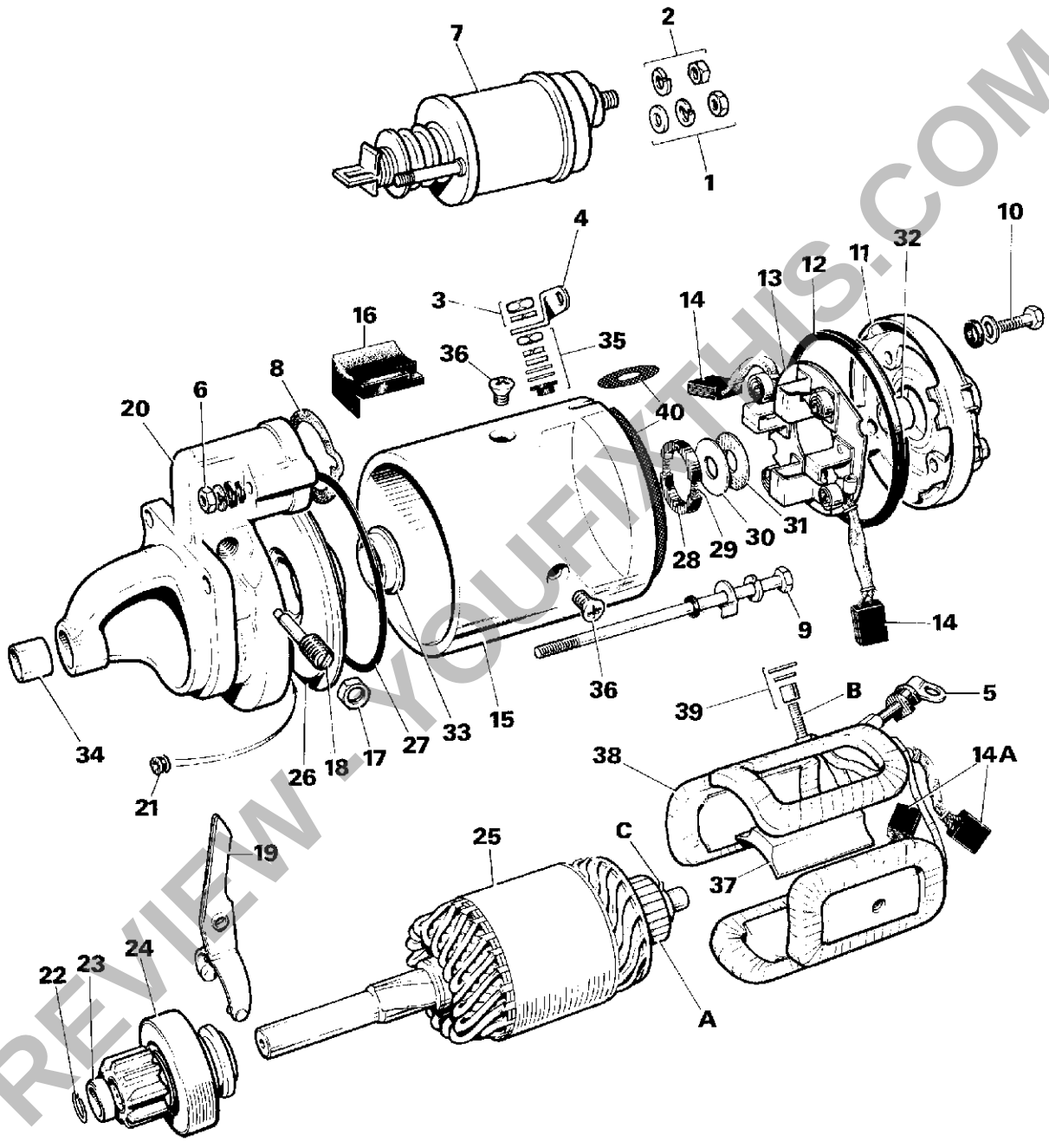


Fig 1.

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Zinc Plated Fasteners and Dacromet Fasteners

Table 2. Torque Settings - UNF Grade 'S' Fasteners

Bolt Size		Hexagon (A/F)	Condition 1			Condition 2		
in.	mm	in.	Nm	kgf m	lbf ft	Nm	kgf m	lbf ft
1/4	6.3	7/16	11.2	1.1	8.3	10.0	1.0	7.4
5/16	7.9	1/2	22.3	2.3	16.4	20.0	2.0	14.7
3/8	9.5	9/16	40.0	4.1	29.5	36.0	3.7	26.5
7/16	11.1	5/8	64.0	6.5	47.2	57.0	5.8	42.0
1/2	12.7	3/4	98.00	10.0	72.3	88.0	9.0	64.9
9/16	14.3	13/16	140.0	14.3	103.2	126.0	12.8	92.9
5/8	15.9	15/16	196.0	20.0	144.6	177.0	18.0	130.5
3/4	19.0	1 1/8	343.0	35.0	253.0	309.0	31.5	227.9
7/8	22.2	1 15/16	547.0	55.8	403.4	492.0	50.2	362.9
1	25.4	1 1/2	814.0	83.0	600.4	732.0	74.6	539.9
1 1/8	31.7	1 7/8	1181.0	120.4	871.1	1063.0	108.4	784.0
1 1/4	38.1	2 1/4	1646.0	167.8	1214.0	1481.0	151.0	1092.3

Table 3. Torque Settings - Metric Grade 8.8 Fasteners

Bolt Size		Hexagon (A/F)	Condition 1			Condition 2		
ISO Metric Thread	mm	mm	Nm	kgf m	lbf ft	Nm	kgf m	lbf ft
M5	5	8	5.8	0.6	4.3	5.2	0.5	3.8
M6	6	10	9.9	1.0	7.3	9.0	0.9	6.6
M8	8	13	24.0	2.4	17.7	22.0	2.2	16.2
M10	10	17	47.0	4.8	34.7	43.0	4.4	31.7
M12	12	19	83.0	8.5	61.2	74.0	7.5	54.6
M16	16	24	205.0	20.9	151.2	184.0	18.8	135.7
M20	20	30	400.0	40.8	295.0	360.0	36.7	265.5
M24	24	36	690.0	70.4	508.9	621.0	63.3	458.0
M30	30	46	1372.0	139.9	1011.9	1235.0	125.9	910.9
M36	36	55	2399.0	244.6	1769.4	2159.0	220.0	1592.4

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Error Codes

Machine Error Codes

Table 1.

Code	Description
C111	SC to + at Fuel Sender
C114	SC to + at Hydraulic Oil Temp Sender
C116	SC to + at Fan Solenoid
C117	SC to + at High Flow Solenoid
C118	SC to + at Charge Pump Transducer
C119	SC to + at Parallel Lift Solenoid
C125	SC to + at Implement Pilot Solenoid
C126	SC to + at Aux. A Solenoid
C127	SC to + at Aux. B Solenoid
C130	SC to + at Quick Hitch A
C131	SC to + at Quick Hitch B
C133	SC to + at Water Temp Sender/Switch
C134	SC to + at SRS Solenoid 1
C136	SC to + at LH Turn Signal
C137	SC to + at RH Turn Signal
C139	SC to + at Air Filter Switch
C140	SC to + at Transmission Pilot Solenoid
C141	SC to + at Crowd Solenoid
C142	SC to + at Dump Solenoid
C143	SC to + at Float Transducer
C144	SC to + at Lower Solenoid
C145	SC to + at Transmission X1F Solenoid
C146	SC to + at Parkbrake Transducer
C147	SC to + at Transmission X2F Solenoid
C148	SC to + at Transmission X2R Solenoid
C148	Oil pressure switch (if the engine is NOT running and the switch is CLOSED)
C149	SC to + at Fuel Pump Motor
C150	SC to + at Raise Solenoid
C151	SC to + at Transmission X1R Solenoid
C155	SC to + at Glow Plug Relay
C156	SC to + at Starter Relay
C157	SC to + at Reverse Alarm
C158	SC to + at Brake Light
C171	SC to + at Aux. Roller
C185	SC to + at D+ Terminal
C196	SC to + at SRS Solenoid 2
C211	SC to - at Fuel Sender
C214	SC to - at Hydraulic Oil Temp Sender
C216	SC to - at Fan Solenoid
C217	SC to - at High Flow Solenoid
C218	SC to - at Charge Pump Transducer
C219	SC to - at Parallel Lift Solenoid
C225	SC to - at Implement Pilot Solenoid
C226	SC to - at Aux. A Solenoid
C227	SC to - at Aux. B Solenoid
C230	SC to - at Quick Hitch A
C231	SC to - at Quick Hitch B
C233	SC to - at Water Temp Sender/Switch
C234	SC to - at SRS Solenoid 1
C236	SC to - at LH Turn Signal
C237	SC to - at RH Turn Signal
C240	SC to - at Transmission Pilot Solenoid
C241	SC to - at Crowd Solenoid
C242	SC to - at Dump Solenoid
C243	SC to - at Float Transducer
C244	SC to - at Lower Solenoid
C245	SC to - at Transmission X1F Solenoid
C246	SC to - at Parkbrake Transducer
C247	SC to - at Transmission X2F Solenoid
C248	SC to - at Transmission X2R Solenoid
C249	SC to - at Fuel Pump Motor
C250	SC to - at Raise Solenoid
C251	SC to - at Transmission X1R Solenoid
C255	SC to - at Glow Plug Relay
C256	SC to - at Starter Relay

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Loader Circuit

Table 1.

PROBLEM	CAUSE
Lack of power in all loader functions.	1, 2, 3, 4, 6, 7,18, 20
All hydraulic rams slow to operate.	3, 4, 7, 8, 10, 11, 13
One hydraulic service fails to operate or is slow to operate.	13, 14, 15, 16, 17, 19
Engine tends to stall when hydraulics are under load.	3, 19, 20
Valve spool sticking.	21, 23, 24, 25, 26, 27, 28, 29
Ram creep.	15, 18
Hydraulic oil becomes too hot.	5, 6, 12, 22
Boom judders when used while machine is moving.	9, 11, 13

Table 2.

Key to Cause		Remedy	Page Ref.
1	Insufficient hydraulic fluid.	Check for leaks and top up as required.	⇨ *Hydraulic System (3-71)*
2	Hydraulic leaks in system.	Check hoses, replace as required.	
3	Main relief valve (MRV) setting incorrect.	Check and adjust as required.	⇨ *Valves (E-11)*
4	Low loader pump flow.	Check pump flow, if necessary service or replace pump.	
5	Hydraulic filter clogged.	Change hydraulic filter.	⇨ *Hydraulic System (3-71)*
6	Charge filter by-pass valve leaking.	Check condition of hydraulic filter. Check operation of by-pass valve.	⇨ *Hydraulic System (3-71)*
7	Charge pressure incorrect.	Check relief valve or charge pump	⇨ *Logic Control (C-63)*
8	N/A		
9	Loader pump flow low.	Check flow rate.	
10	Neutral circuit or low pressure lines leaking, damaged, trapped or kinked.	Check pipe lines and replace as required.	
11	Restriction in neutral circuit lines.	Check hoses and pipes, replace as necessary.	
12	Air in hydraulic system	Bleed System	⇨ *Bleeding the Hydraulic System (Start-Up Procedure) (E-66)*
13	Service pipe lines leaking, damaged, trapped or kinked.	Check hoses and pipes, replace as required.	
14	Ram or pipe lines from ram leaking.	Check and rectify as required.	
15	Valve spool not operating.	Check for leaks, rectify as required.	

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Service Schedules

Introduction

T3-036_3

⚠ WARNING

Maintenance must be done only by suitably qualified and competent persons.

Before doing any maintenance make sure the machine is safe, it should be correctly parked on level ground.

To prevent anyone starting the engine, remove the starter key. Disconnect the battery when you are not using electrical power. If you do not take these precautions you could be killed or injured.

8-3-1-1

A badly maintained machine is a danger to the operator and the people working around him. Make sure that the regular maintenance and lubrication jobs listed in the service schedules are done to keep the machine in a safe and efficient working condition.

Apart from the daily jobs, the schedules are based on machine running hours. Keep a regular check on the hourmeter readings to correctly gauge service intervals. When there is no hourmeter fitted, use the calendar equivalents to determine the service intervals. Refer to ***Calendar Equivalents***. Do not use a machine which is due for a service. Make sure any defects found during the regular maintenance checks are rectified immediately.

How to Use the Service Schedules

T3-012_4

In the example shown, **A** shows all service requirements to be carried out every 10 hours and **B** shows the requirements to be carried out every 500 hours.

Important: *Services should be carried out at either the hourly interval or calendar interval, whichever occurs first. Refer to* ***Calendar Equivalents****.*

Important: *The intervals given in the schedules must not be exceeded. If the machine is operated under severe conditions (high temperature, dust, water, etc.), shorten the intervals.*

Pre-start Cold Checks, Service Points and Fluid Levels

	Operation	A: 10	50	100[1]	B: 500	1000	2000	8000
ENGINE								
Coolant Quality and Level	- Check	□	□	□	□	□		
Cooling System	- Drain and Refill						□	□
Oil level	- Check	□	□					
Oil and Filter[2][3][4]	- Change				□	□	□	□
Air Cleaner Dust Valve[5]	- Change				□	□	□	□
Air Cleaner Outer Element[5]	- Change					□	□	□
Air Cleaner Inner Element	- Change						□	□
Pre-Cleaner (if fitted)	- Check			□				
Water Seperator	- Check for contamination and Drain		□	□	□	□	□	□
Engine Fuel Filter	- Change					□	□	□
Front End Accessory Drive (FEAD) Belt Condition	- Check				□	□	□	□
Front End Accessory Drive (FEAD) Belt	- Change							□
Engine Mounting Bolts for Tightness	- Check			□	□	□	□	□
All Hoses - Condition	- Check			□	□	□	□	□
Radiator[5]	- Clean				□	□	□	□
Crankcase Ventilation Filter	- Change					□	□	□

795390-1

Calendar Equivalents

Calendar equivalents:

Every 10 Hours = Daily

Every 50 Hours = Weekly

Every 500 Hours = Six Months

Every 1000 Hours = Yearly

Every 2000 Hours = 2 Years

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Technical Data

Perkins 404D-22 Series

Specifications

Note: *Full technical data and service information for all engine variants is given in publication 9806/4450.*

Table 1.

Type	404D-22 Naturally Aspirated	404D-22T Turbocharged
Power	35.7 kW (47.9 bhp) @2600 rpm	44.7kW (59.9 bhp) @2800 rpm
Max. Torque	143 Nm @1800rpm	189.1 Nm @1800rpm
Emission compliance	Tier 3	
Weight (dry)	177kg	190kg
Number of cylinders	4	
Nominal bore size	84mm (3.31 in)	
Stroke	100mm (3.94 in)	
Cylinder arrangement	In-line	
Firing Order	1,3,5,4	
Displacement	2.216 Litres	
Compression ratio	23.3:1	
Direction of rotation (viewed from crankshaft pulley end)	counter clockwise	
Valve tip clearances (measured cold)	0.2mm (0.0078 in)	
Fuel injection pump	Direct	
Idle speed	High 2600, Low 1400 rpm	High 2800, Low 1400 rpm

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How to Prepare the Machine for Maintenance (Loader Arm Lowered)

Important: *You can complete most of the maintenance procedures with the loader arm lowered. Unless a maintenance procedure instructs you differently, you must lower the loader arm.*

1 Park the machine on level, solid ground.

If necessary, refer to ***Stopping and Parking the Machine*** in the Operator Manual.

2 Lower the loader arm.

3 Put the attachment flat on the ground.

4 Stop the engine and remove the ignition key.

If the keyless ignition option is fitted stop the engine and wait 15 seconds.

5 Disconnect the battery to prevent accidental operation of the engine.

6 If necessary, put blocks against the two sides of the wheels before you get below the machine.

How to Prepare the Machine for Maintenance (Loader Arm Lifted)

⚠ WARNING

Raised Equipment

Never walk or work under raised equipment unless it is supported by a mechanical device. Equipment which is supported only by a hydraulic device can drop and injure you if the hydraulic system fails or if the control is operated (even with the engine stopped).

Make sure that no-one goes near the machine while you install or remove the mechanical device.

13-2-3-7_3

Note: *If you lift the arm to get access for maintenance, you must install the maintenance strut on the arm.*

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Attachments For Your Machine

Before selecting an attachment for use, assess the application and select the appropriate attachment. The density of any materials being handled will affect the selection of the appropriate attachment.

⚠ CAUTION

If you have an attachment which is not covered in the Operator Manual do not install it, use it or remove it until you have obtained, read and understood the pertinent information. Install attachments only on the machines for which they were designed.

5-5-1-1_2

Remember, do not operate attachments until you have read and fully understand the attachment operating instructions.

These attachments will help increase the productivity of your machine, for more information contact your JCB Distributor.

Do not operate or work with attachments until the machine hydraulic oil has reached its normal working temperature.

Hydraulic attachments are only compatible with auxiliary couplers positioned on the right hand side of the loader arm, and not with the left hand auxiliary coupler option.

Table 1. Dirt/GP Buckets

Part #	Item	JCB Model Name	135	155	175	190	205	150T	190T	205T
333/L8800	54" Dirt/GP Bucket / 12.1 cu. ft. Capacity	DB54	*							
333/L8803	60" Dirt/GP Bucket / 13.1 cu. ft. Capacity	DB60	*	*	*	*				
332/X3184	66" Dirt/GP Bucket / 13.9 cu. ft. Capacity	DB66		*	*	*	*	*	*	*
333/L4683	68" Dirt/GP Bucket / 14.1 cu. ft. Capacity	DB68				*	*	*	*	*
332/L1798	72" Dirt/GP Bucket / 15.4 cu. ft. Capacity	DB72						*	*	*

Table 2. Landscape Buckets

Part #	Item	JCB Model Name	135	155	175	190	205	150T	190T	205T
333/L8820	54" Landscape Bucket / 14 cu. ft. Capacity	LSB54	*							
333/L8821	60" Landscape Bucket / 15 cu. ft. Capacity	LSB60	*	*	*					
332/L1826	66" Landscape Bucket / 16 cu. ft. Capacity	LSB66	*	*	*	*				
332/L1827	72" Landscape Bucket / 19.2 cu. ft. Capacity	LSB72							*	*

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Table 2.

Specification for Distillate Diesel Fuel(1)				
Property	**Units**	**Requirements**	**“ASTM” Test**	**“ISO” Test**
Aromatics	%Volume	35% maximum	D1319	“ISO 3837”
Ash	%Weight	0.02% maximum	D482	“ISO 6245”
Carbon Residue on 10% Bottoms	%Weight	0.35% maximum	D524	“ISO 4262”
Cetane Number(2)	-	40 minimum	D613/D6890	“ISO 5165”
Cloud Point	°C	The cloud point must not exceed the lowest expected ambient temperature	D2500	“ISO 3015”
Copper Strip Corrosion	-	No. 3 maximum	D130	“ISO 2160”
Density at 15°C (59°F)(3)	Kg/M^3	801 minimum and 876 maximum	No equivalent test	“ISO 3675 ISO 12185”
Distillation	°C	10% at 282°C (539.6°F) maximum 90% at 360°C (680°F) maximum	D86	“ISO 3405”
Flash Point	°C	legal limit	D93	“ISO 2719”
Thermal Stability	-	Minimum of 80% reflectance after aging for 180 minute at 150°C (302°F)	D6468	No equivalent test
Pour Point	°C	6°C (42.8°F) minimum below ambient temperature	D97	“ISO 3016”
Sulfur(1)(4)	%mass	The level of sulfur that is in the fuel is controlled by emissions regulations. Refer to Table for more information. ⇨ *Table 3. (3-20)*	D5453/D26222	“ISO 20846 ISO 20884”
Kinematic Viscosity(5)	“MM^2/S (cSt)”	The viscosity of the fuel that is delivered to the fuel injection pump “1.4 minimum/4.5 maximum”	D445	“ISO 3405”
Water and Sediment	%weight	0.1% maximum	D1796	“ISO 3734”
Water	%weight	0.1% maximum	D1744	No equivalent test
Sediment	%weight	0.05% maximum	D473	“ISO 3735”
Gums and Resins(6)	mg/100mL	10mg per 100mL maximum	D381	“ISO 6246”
Lubricity corrected wear scar diameter at 60°C (140°F)(7)	mm	0.46 maximum	D6079	“ISO 12156-1”

(1) The specification includes the requirements for Ultra Low Sulfur Diesel (ULSD). ULSD fuel will have < or = 15 ppm (0.0015%) sulfur. Refer to “ASTM D5453”, “ASTM D2622”, or “ISO 20846, ISO20884” test methods. The specification includes the requirements for Low Sulfur Diesel (LSD). LSD fuel will have < or = 500 ppm (0.05%) sulfur. Refer to “ASTM 5453, ASTM D2622”, “ISO 20846” and “ISO 20884” test methods. Refer to Table 3.

(2) A fuel with a higher cetane number is recommended in order to operate at a higher altitude or cold weather.

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Cooling Pack

Removal and Replacement

Removal

1 Make the machine safe.

2 Drain the cooling system.

3 Remove the clips **5** and **6**.

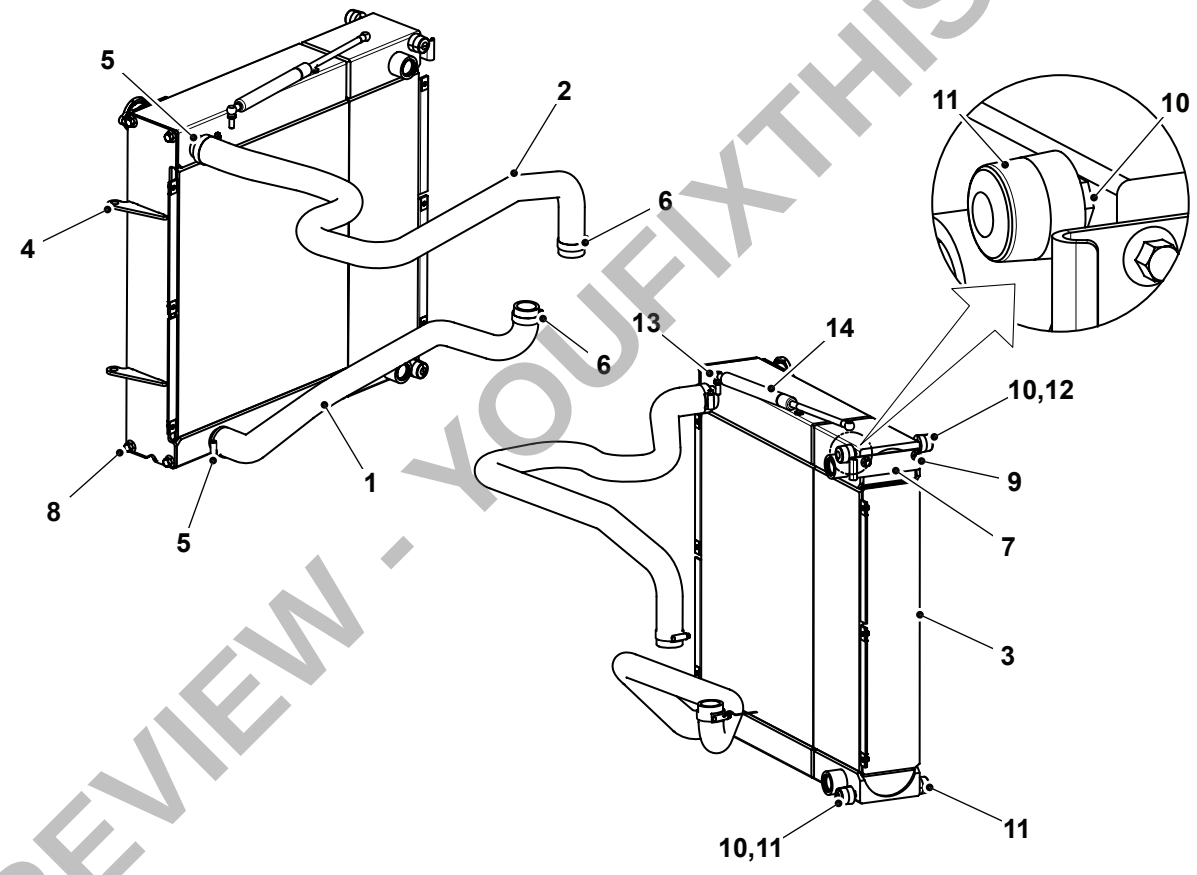
4 Remove the radiator top and bottom hoses.

5 Remove the bolts that attach the cooling pack hinge **4**.

6 Remove the Cooling Pack.

Replacement

Replacement is a reversal of the removal procedure.



P031120-02

Fig 1.

Component Key:

1	Bottom Hose
2	Top Hose
3	Cooling Pack
4	Cooling Pack Hinge
5, 6	Clip
7	Latch Plate Pressing
8, 9	Bolt
10	Nut
11, 12	Buffer
13	Ball Stud
14	Gas Strut

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Logic Control

Introduction

The right hand display and switch panel (EMS) forms part of a system comprising of a 3620 ECU and a left hand switch panel (optional). The EMS panel communicates information to the operator about the systems on the machine and warns of any abnormal conditions that may occur.The EMS panel comprises of:

- 3 motor driven gauges:

  fuel level

  coolant temperature

  hydraulic temperature

- 15 warning/status LED's
- JCB corporate ignition switch
- 5 membrane switches for controlling different standard functions on the machine
- 3 membrane switches for navigating the screens of the LCD infomessage display
- Warning buzzer

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minimum. If leaving for more than one week, apply a light coating of suitable grease or petroleum jelly to the exposed part of the ram piston rod.

2 Use genuine JCB parts when replacing parts.

a If parts other than genuine JCB parts are used, the desired results may not be obtained. Use only genuine JCB parts.

3 Caution during dismantling and reassembly.

a Dismantling the ram while it is still installed on the machine can be dangerous as unexpected movements of the machine can occur. Remove the ram from the machine and then dismantle.

b If reassembled with dirty hands, foreign matter can enter the ram causing a shorter life span and also the other hydraulic equipment may be damaged. Reassemble in a clean state.

c Follow the instructions in the diagrams regarding torque tightening for screwed parts. If the torque is too high or too low, it can cause damage.

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Charge Check/High Pressure Relief Valves

The high pressure relief and charge check valve assembly may be removed for cleaning and replacement of the O-rings. These valves are factory set and are not field adjustable. Refer to the pump model code for the factory setting when ordering replacements.

Removal

1 Using an 8 mm internal hex wrench, remove the valve seat plugs **A**.

2 Carefully lift the valve **B** and spring **C** assemblies from the centre section using a magnet.

Replacement

1 Inspect the valves and mating seats in the valve seat plugs **A** for damage or foreign material.

2 Lubricate and install new O-rings **D**,**E** and backup ring **F** on valve seat plug **A**.

3 Verify that the conical springs **C** are properly retained on the check relief valves **B**. Install the valve assemblies into the centre section. Ensure each valve assembly moves freely in its bore.

4 Install the valve seat plugs into the centre section and torque to 80 Nm (59 lbf ft).

5 Operate machine through full range of controls to ensure proper operation. Check for leaks.

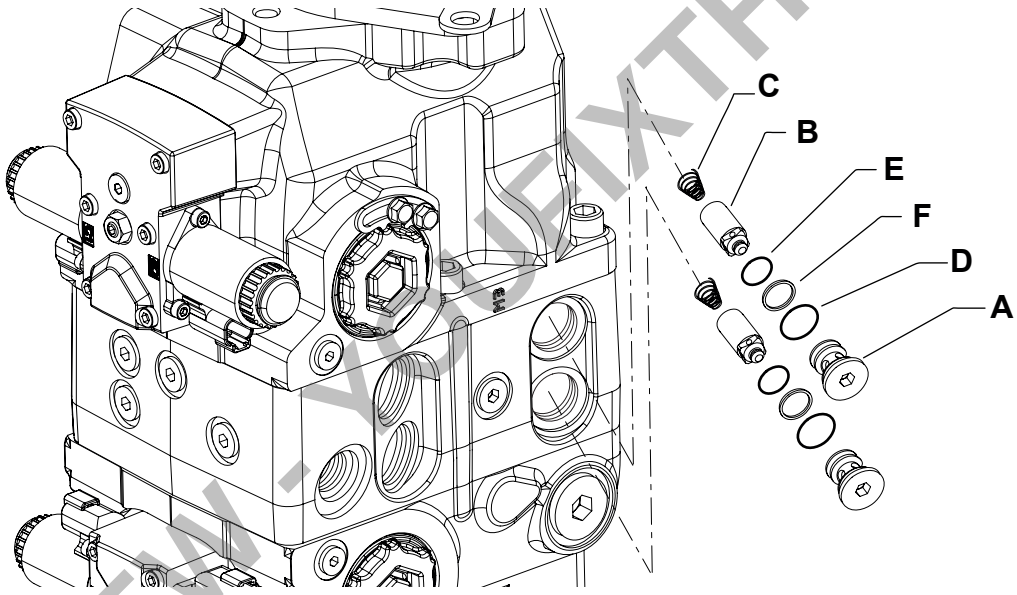


Fig 18.

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