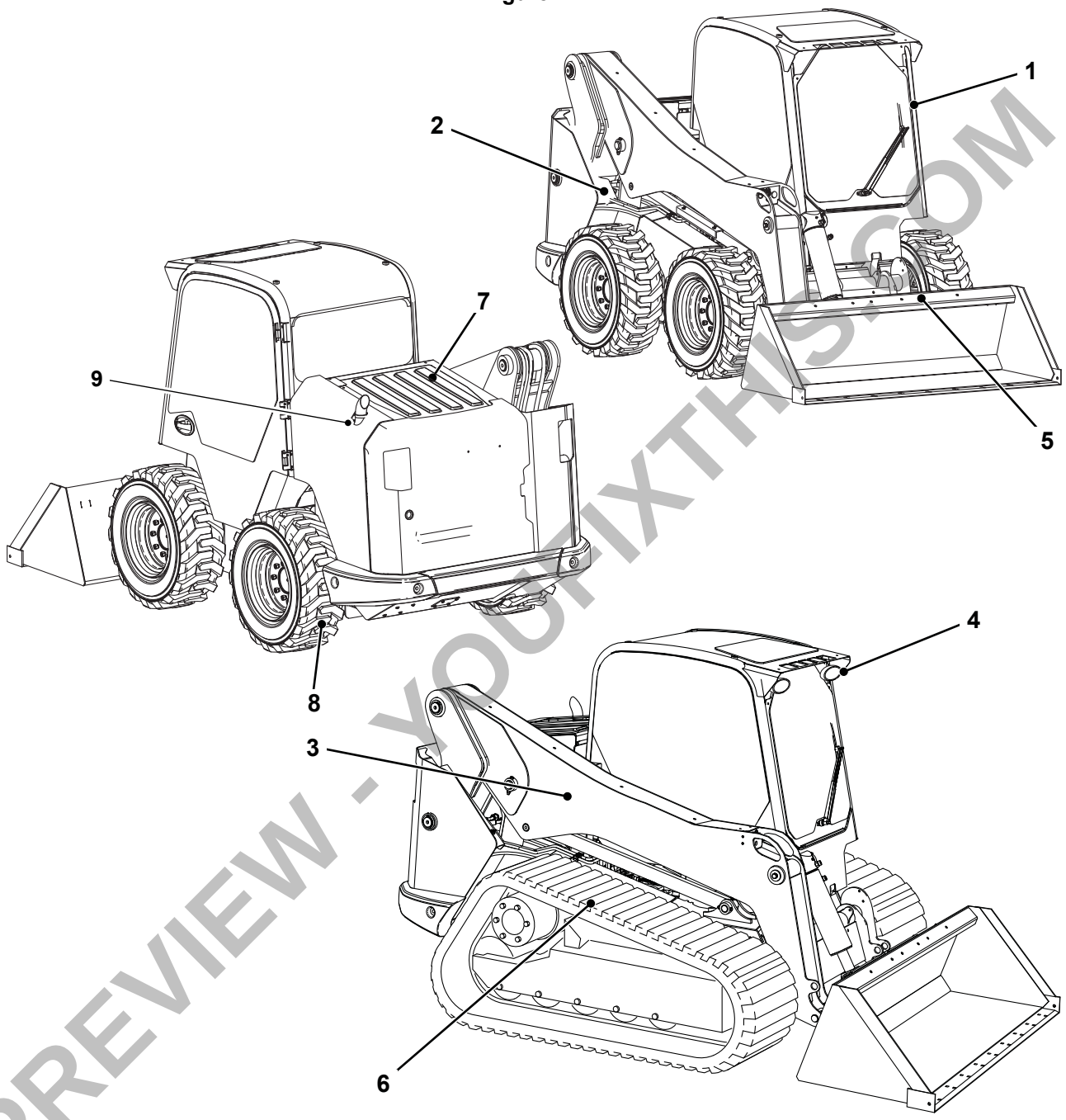
Figure 11.

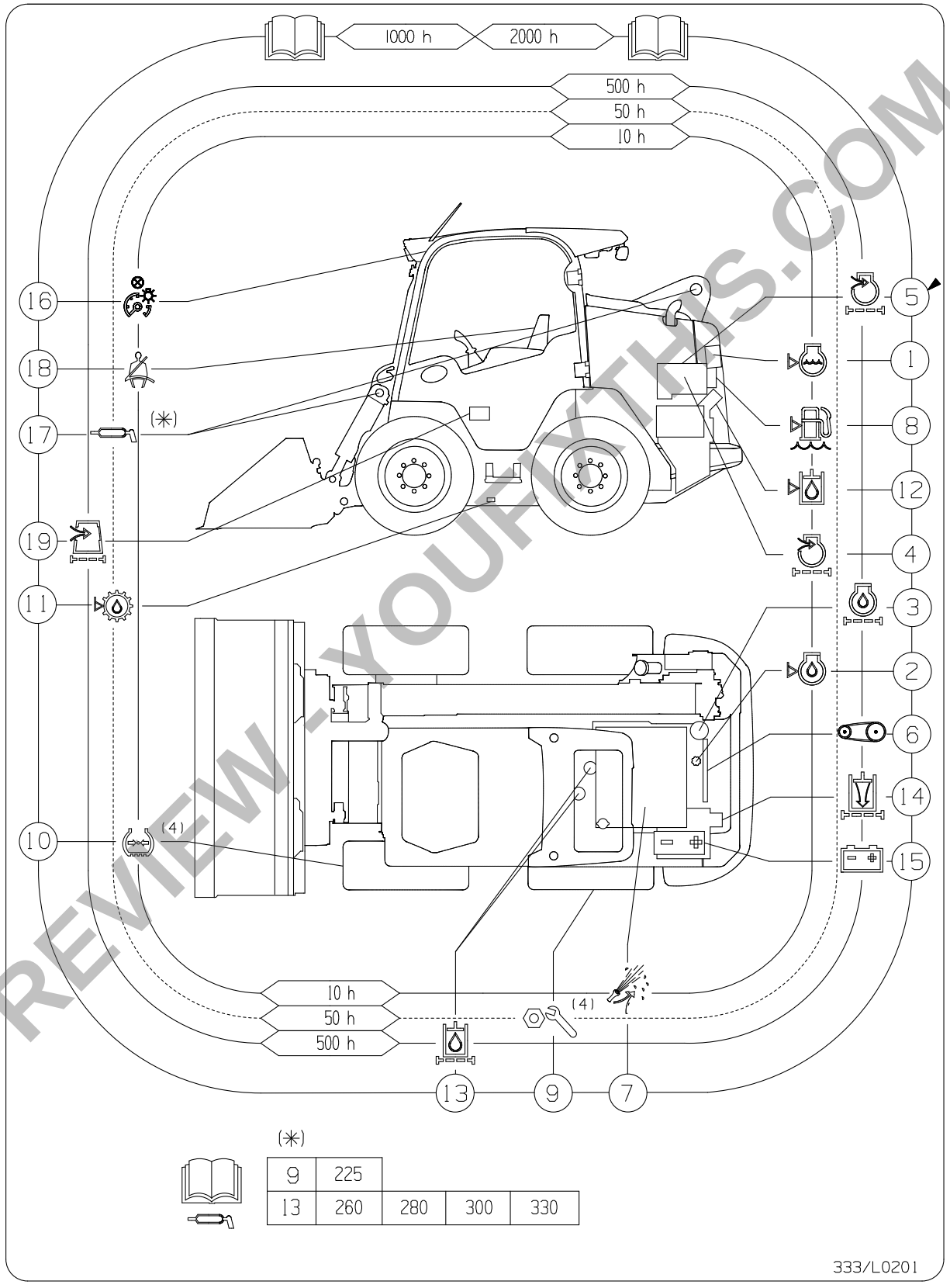


1 ROPS/FOPS cab
2 Fuel tank filler point
3 Lift arm/boom
4 Front working lights
5 Quickhitch
6 Rubber tracks
7 Engine top cover
8 Wheels/tyres
9 Exhaust

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

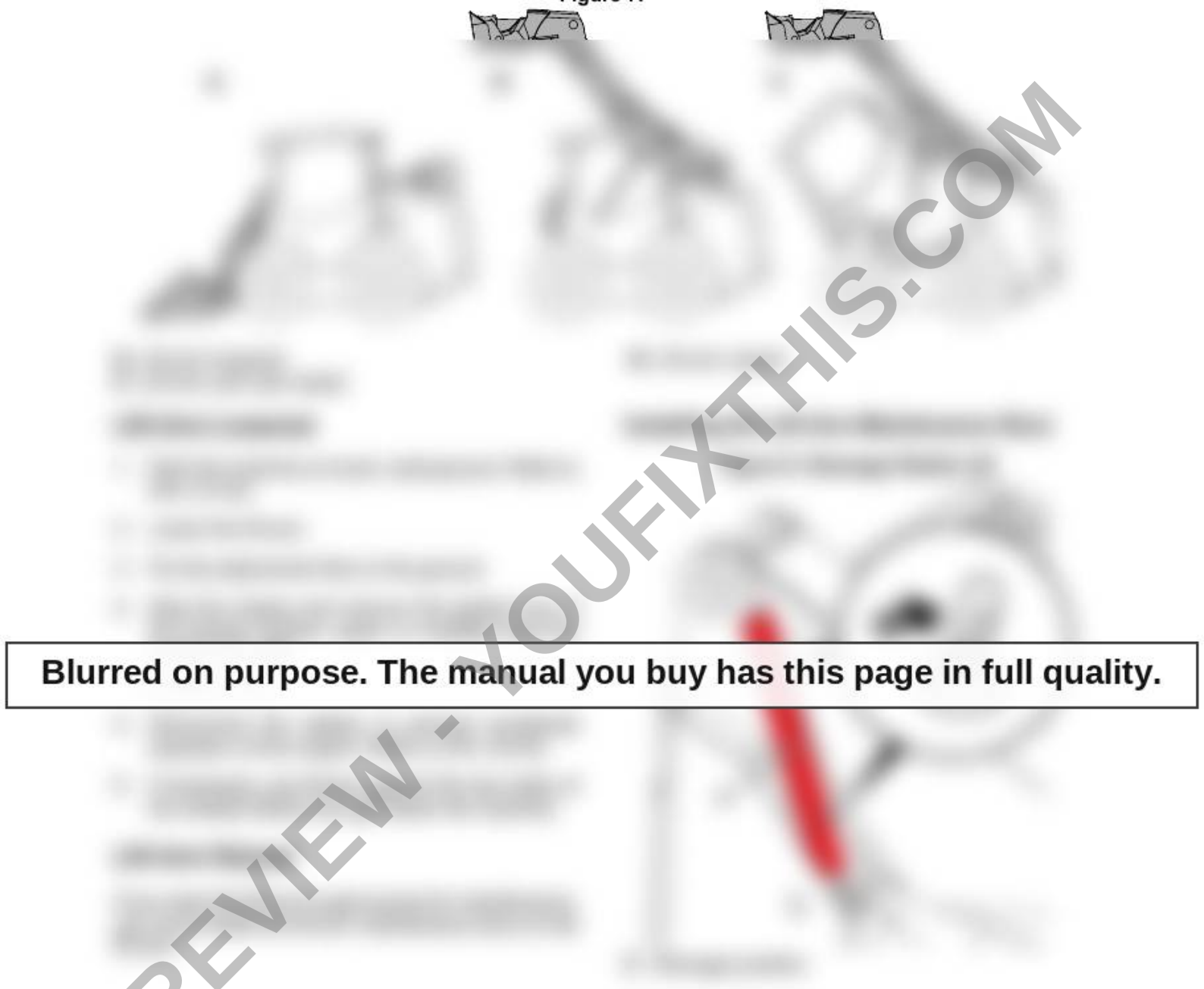
Figure 15. 225, 260, 280, 300,330



PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Figure 7.



Blurred on purpose. The manual you buy has this page in full quality.

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

24 - Risk Assessment

Introduction

It is the responsibility of the competent people that plan the work and operate the machine to make a judgement about the safe use of the machine, they must take into account the specific application and conditions of use at the time.

It is essential that a risk assessment of the work to be done is completed and that the operator obeys any safety precautions that the assessment identifies.

If you are unsure of the suitability of the machine for a specific task, contact your JCB dealer who will be pleased to advise you.

The following considerations are intended as suggestions of some of the factors to be taken into account when a risk assessment is made. Other factors may need to be considered.

A good risk assessment depends on the training and experience of the operator. Do not put your life or the lives of others at risk.

Personnel

- Are all persons who will take part in the operation sufficiently trained, experienced and competent? Are they fit and sufficiently rested? A sick or tired operator is a dangerous operator.
- Is supervision needed? Is the supervisor sufficiently trained and experienced?
- As well as the machine operator, are any assistants or lookouts needed?

The Machine

- Is it in good working order?
- Have any reported defects been corrected?
- Have the daily checks been carried out?
- Are the tyres still at the correct pressure and in good condition and is there sufficient fuel to complete the job (if applicable)?

The Load

- How heavy is it? Is it within the capabilities of the machine?
- How bulky is it? The greater the surface area, the more affected it will be by wind speeds.
- Is it an awkward shape? How is the weight distributed? Uneven loads are more difficult to handle.
- Is there a possibility of the load shifting while being moved?

Loading/Unloading Area

- Is it level? Any slope of more than 2.5% (1 in 40) must be carefully considered.
- Is more than one direction of approach to the load possible? Approaching across the slope must be avoided, if possible.
- Is the ground solid? Will it support the weight of the machine when loaded?
- How rough is the ground? Are there any sharp projections which could cause damage, particularly to the tyres?
- Are there any obstacles or hazards in the area, for example, debris, excavations, manhole covers, power lines?
- Is the space sufficient for safe manoeuvring?
- Are any other machines or persons likely to be in or to enter the area while operations are in progress?

The Route to be Travelled

- How solid is the ground, will it provide sufficient traction and braking? Soft ground will affect the stability of the machine and this must be taken into account.
- How steep are any slopes, up/down/across? A cross slope is particularly hazardous, is it possible to detour to avoid them?

Weather

- How windy is it? High wind will adversely affect the stability of a loaded machine, particularly if the load is bulky.
- Is it raining or is rain likely? The ground that was solid and smooth when dry will become uneven and slippery when wet, and it will not give the same conditions for traction, steering or braking.

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Lift Arm Lowered

1. Park the machine on level, solid ground. Refer to (PIL 01-03).
2. Lower the lift arm.
3. Put the attachment flat on the ground.
4. Stop the engine and remove the ignition key. If the keyless ignition option is installed stop the engine and wait

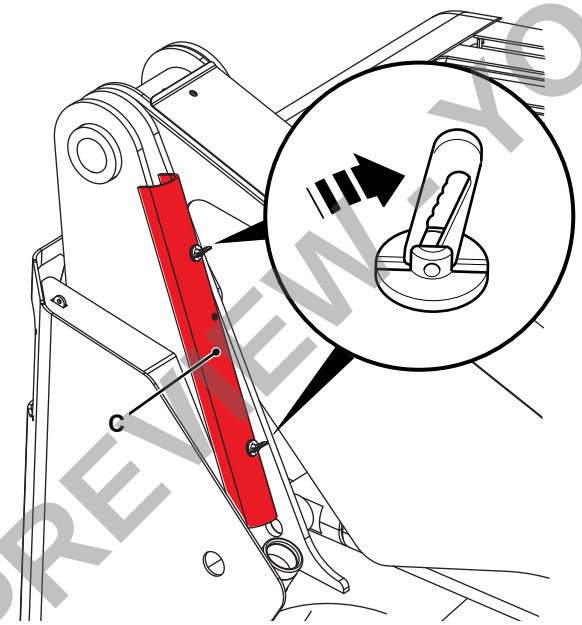
   Duration: 15s
5. Disconnect the battery to prevent accidental operation of the engine. Refer to (PIL 33-03).
6. If necessary, put blocks against the two sides of the wheels before you get below the machine.

Lift Arm Raised and Lift Arm and Cab Raised

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

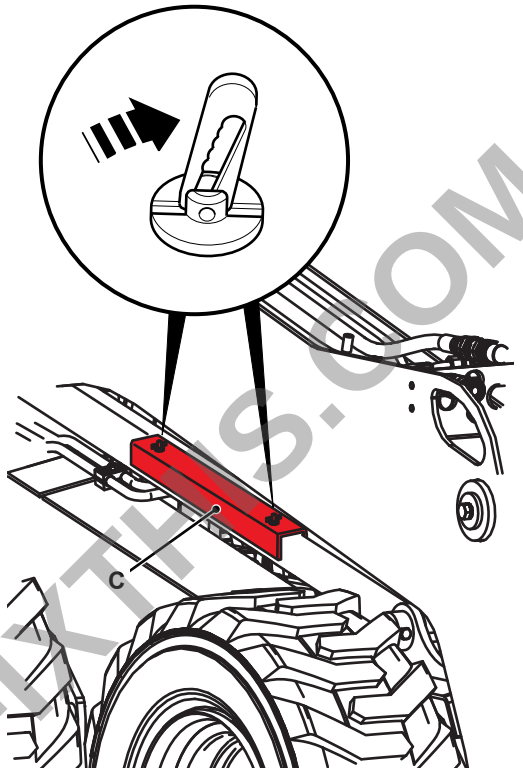
Installing the Lift Arm Maintenance Strut

Figure 3. Stowage Radial Lift



C Stowage position

Figure 4. Stowage Vertical Lift



C Stowage position

1. Remove the shovel or attachment.
2. Park the machine on level, solid ground. Stop the engine.
3. Remove the strut from its stowage position.
4. Raise the lift arm just far enough to install the strut.
5. Stop the engine and remove the ignition key. If the keyless ignition option is fitted stop the engine and wait

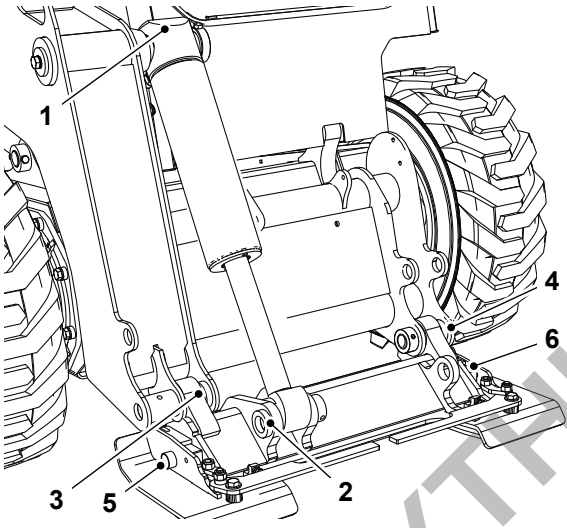
   Duration: 15s
6. Place the strut around the lift ram piston rod. Secure it in position with the strap.

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Total of 6 grease points.

Figure 38.



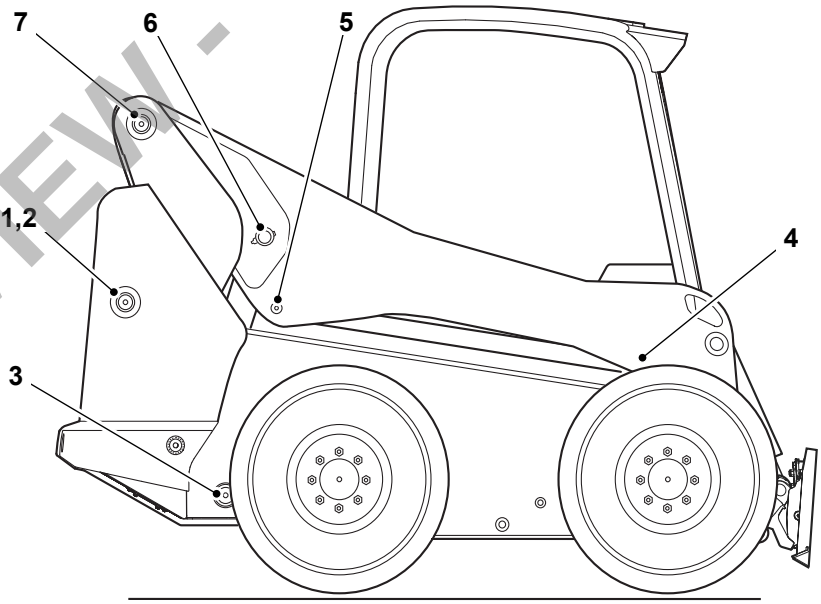
Lift Arm and Ram Pivot Points

Switch off the engine and ensure it cannot be started while you are doing this job.

Table 4.

	Total Grease Points
Vertical Lift	7, Refer to Figure 35.Refer to Figure 39.
Radial Lift	3, Refer to Figure 36.Refer to Figure 40.

Figure 39. Vertical Lift



PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

75 - Fire Extinguisher

Contents **Page No.**

06-75-00 General 06-43

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

00 - General

Introduction 15-3
Health and Safety 15-11
Technical Data 15-12
Component Identification 15-15
Operation 15-23
Fault-Finding 15-30
Clean 15-40
Check (Pressure) 15-41
Remove and Install 15-45
Store and Recommission 15-52

Introduction

For: JCB Tier 4i /T4F <55kW Engine 4 Cyl ..... Page 15-3
For: JCB Tier 2/3 Mech Engine 4 Cyl ..... Page 15-6

(For: JCB Tier 4i /T4F <55kW Engine 4 Cyl)

This section contains information about the complete engine assembly. For specific engine technical information refer to the technical data section.

Make sure that the correct engine service tools, consumables and torque figures are used when you perform service procedures.

Renewal of oil seals, gaskets, etc., and any component showing obvious signs of wear or damage is expected as a matter of course.

It is expected that components will be cleaned and lubricated where appropriate, and that any opened hose or pipe connections will be blanked to prevent excessive loss of hydraulic fluid, engine oil and ingress of dirt.

Basic Description

The JCB ecoMax engine is a 4 cylinder diesel engine in which the fuel is ignited by compression ignition. The engine operates on a four stroke cycle.

The engine is started by an electric starter motor. The starter motor turns the engine via a pinion and teeth on the engine flywheel. Refer to: PIL 15-75.

When the engine runs the crankshaft drives the camshaft via gears. The camshaft opens and closes the inlet and exhaust valves and via push rods in time with the four stroke cycle. The engine has 16 valves, 2 inlet and 2 exhaust valves for each cylinder.

The crankshaft also drives a high pressure fuel pump via gears. The pump is part of the electronically controlled common rail fuel injection system. Refer to: PIL 18-00.

Air is drawn into the engine, via the inlet manifold and exhaust gases exit via the exhaust manifold. The engine uses a VGT (Variable Geometry Turbocharger) which pressurises the air at the inlet manifold. Refer to PIL 18-36.

A mechanical lubrication oil pump is driven by the crankshaft via gears. The pump pressurises and circulates oil for engine lubrication and cooling purposes.

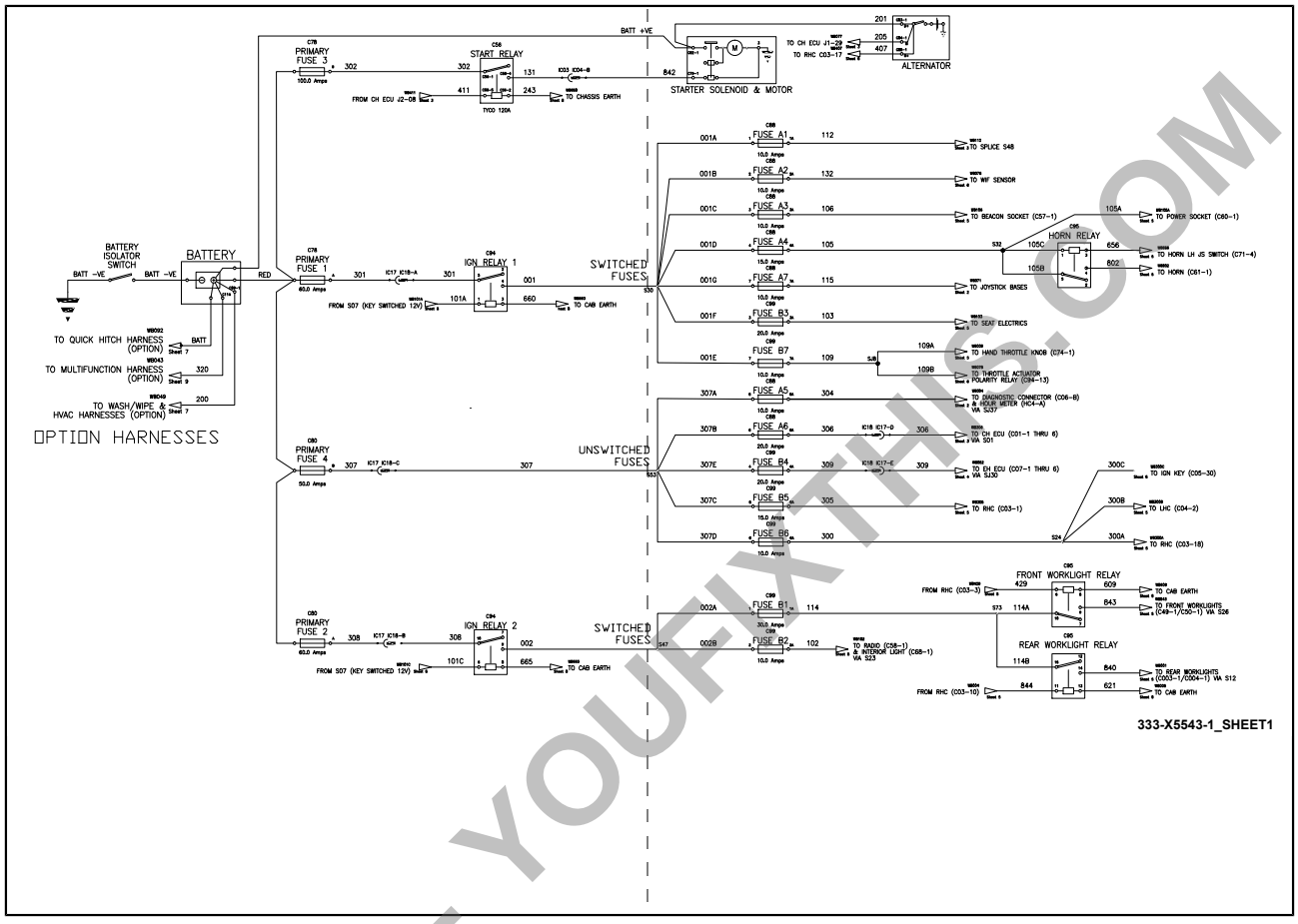
PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Page 33-10

Figure 531. Start Circuit, Primary and Secondary Fuses

Page 33-11



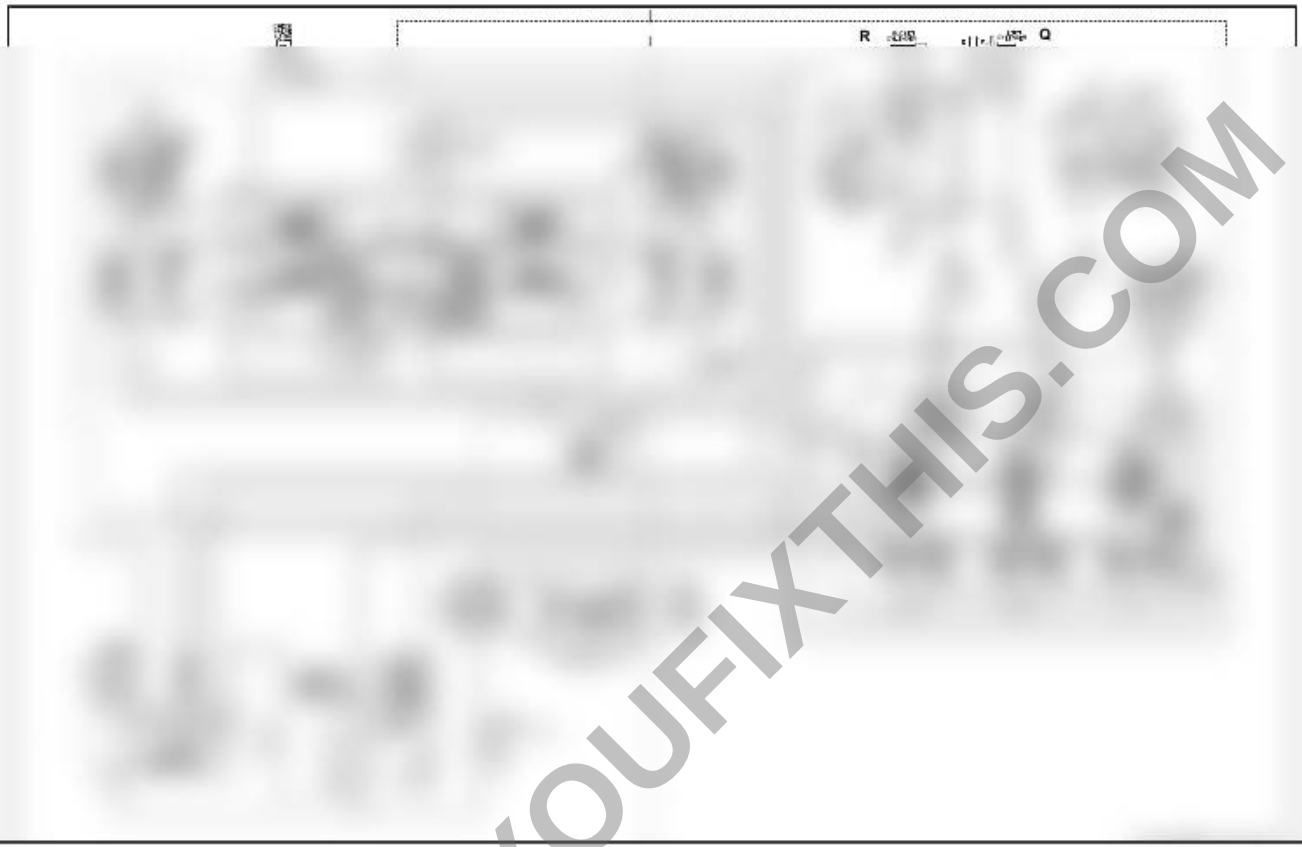
PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Page 30-26

Figure 456.

Page 30-27



Blurred on purpose. The manual you buy has this page in full quality.

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

03 - Model and Serial Number

Introduction

This manual provides information for the following model(s) in the JCB machine range:

Model	From:	To:
225	2427501	2427800
	2499351	2499500
	2556651	2556850
	2427801	2428800
	2491771	2492270
	2503001	2503500
	2584341	2584840
225T	2427501	2427800
	2499351	2499500
	2556651	2556850
	2427801	2428800
	2491771	2492270
	2503001	2503500
	2584341	2584840
260	2427501	2427800
	2499351	2499500
	2556651	2556850
	2427801	2428800
	2491771	2492270
	2503001	2503500
	2584341	2584840
260T	2427501	2427800
	2499351	2499500
	2556651	2556850
	2427801	2428800
	2491771	2492270
	2503001	2503500
	2584341	2584840
280	2427501	2427800
	2499351	2499500
	2556651	2556850
	2427801	2428800
	2491771	2492270
	2503001	2503500
	2584341	2584840
300	2427501	2427800
	2499351	2499500
	2556651	2556850
	2427801	2428800
	2491771	2492270
	2503001	2503500
	2584341	2584840
300T	2427501	2427800
	2499351	2499500
	2556651	2556850
	2427801	2428800
	2491771	2492270
	2503001	2503500
	2584341	2584840
320T	2427501	2427800
	2499351	2499500
	2556651	2556850
	2427801	2428800
	2491771	2492270
	2503001	2503500
	2584341	2584840
325T	2427801	2428800
	2491771	2492270
	2503001	2503500
	2584341	2584840
330	2427501	2427800
	2499351	2499500
	2556651	2556850
	2427801	2428800
	2491771	2492270
	2503001	2503500
	2584341	2584840

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

01 - Machine

Contents **Page No.**

Acronyms Glossary 01-2

01-03 Safety
- 01-03-03 Safety - Yours and Others 01-3
- 01-03-06 Safety Warnings 01-4
- 01-03-09 General Safety 01-5
- 01-03-12 Maintenance Safety 01-6
- 01-03-15 Safety Practice 01-8
- 01-03-18 Operating Safety 01-9
- 01-03-21 Worksite Safety 01-12
- 01-03-24 Risk Assessment 01-13
- 01-03-27 Maintenance Positions 01-14

01-06 About this Manual
- 01-06-03 Model and Serial Number 01-21
- 01-06-06 Using the Manual 01-22

01-09 Description
- 01-09-12 Main Component Locations 01-25
- 01-09-15 Service Point Locations 01-27

01-33 Cleaning
- 01-33-00 General 01-43

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

03 - Safety - Yours and Others

Introduction

All machinery can be hazardous. When a machine is correctly operated and maintained, it is a safe machine to work with. When it is carelessly operated or poorly maintained it can become a danger to you (the operator) and others.

In this manual and on the machine you will find warning messages, you must read and understand them. They inform you of potential hazards and how to avoid them. If you do not fully understand the warning messages, ask your employer or JCB dealer to explain them.

Safety is not just a matter of responding to the warnings. All the time you are working on or with the machine you must be thinking of what hazards there might be and how to avoid them.

Do not work with the machine until you are sure that you can control it.

Do not start any work until you are sure that you and those around you will be safe.

If you are not sure of anything, about the machine or the work, ask someone who knows. Do not assume anything.

Remember:

- Be careful
- Be alert
- Be safe.

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Notes:

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

69 - Maintenance Strut

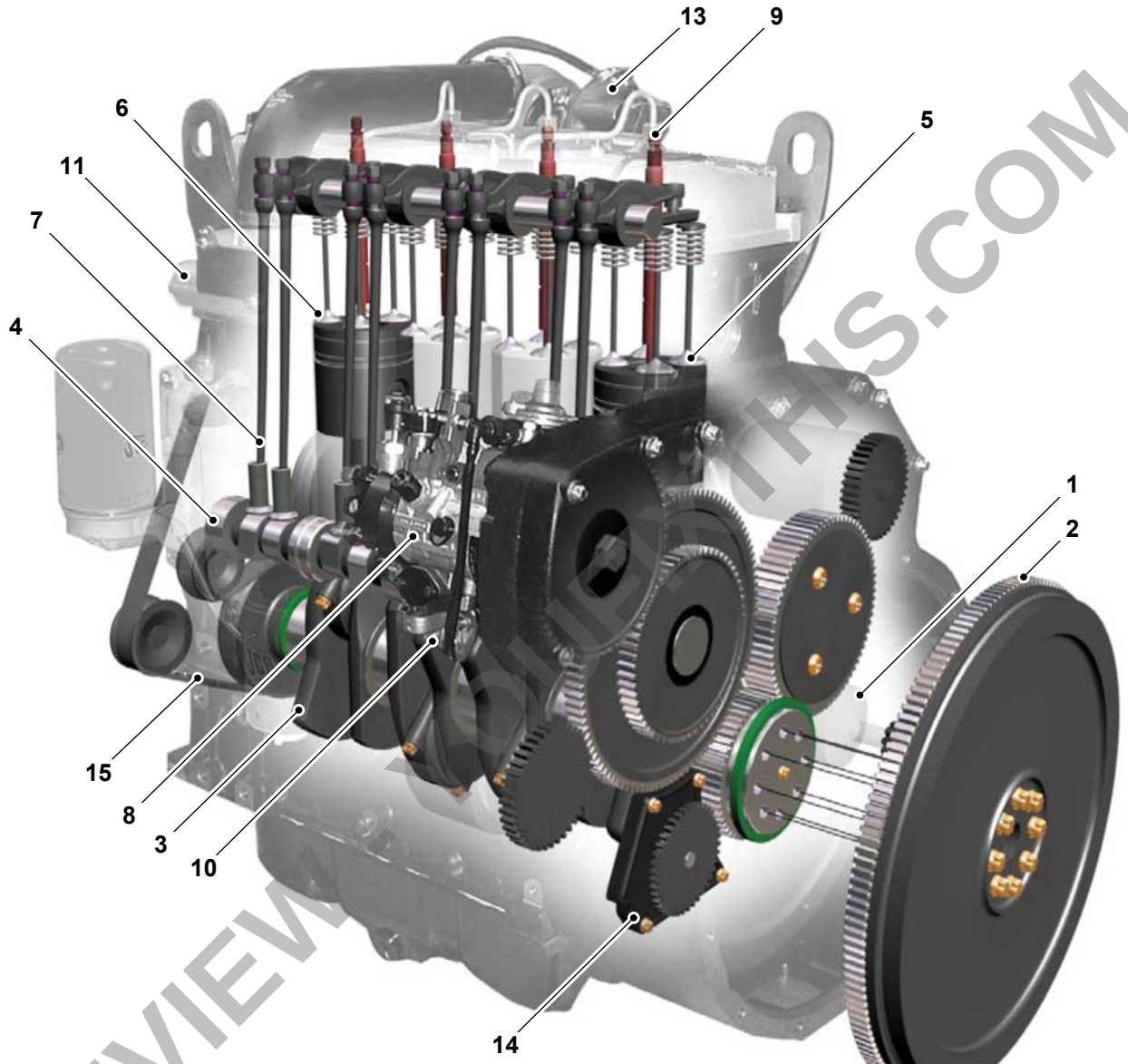
Contents **Page No.**

06-69-00 General 06-41

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Figure 100.



1 Starter motor
2 Flywheel
3 Crankshaft
4 Camshaft
5 Inlet valves (x8)
6 Exhaust valves (x8)
7 Push rods (x8)
8 Fuel injection pump
9 Fuel injectors (x4)
10 Fuel lift pump
11 Inlet manifold
13 Turbocharger
14 Lubrication oil pump
15 Front end drive belt

PREVIEW ONLY - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Health and Safety

Oil

Oil is toxic. If you swallow any oil, do not induce vomiting, seek medical advice. Used engine oil contains harmful contaminants which can cause skin cancer. Do not handle used engine oil more than necessary. Always use barrier cream or wear gloves to prevent skin contact. Wash skin contaminated with oil thoroughly in warm soapy water. Do not use petrol, diesel fuel or paraffin to clean your skin.

CAUTION! *It is illegal to pollute drains, sewers or the ground. Clean up all spilt fluids and/or lubricants. Used fluids and/or lubricants, filters and contaminated materials must be disposed of in accordance with local regulations. Use authorised waste disposal sites.*

CAUTION! *Oil will gush from the hole when the drain plug is removed. Keep to one side when you remove the plug.*

CAUTION! *The oil filter canister will contain some oil which could spill out when you remove the canister.*

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

03 - Housing

Remove and Install

For: JCB Tier 4i /T4F <55kW Engine 4 Cyl ..... Page 15-228
For: JCB Tier 2/3 Mech Engine 4 Cyl ..... Page 15-231

(For: JCB Tier 4i /T4F <55kW Engine 4 Cyl)

Special Tools

Description	Part No.	Qty.
Template for Sealant Flywheel Housing to Gear Case (4 Cyl Elec)	892/12349	1

Before Removal

The flywheel housing is integral with the drive gears front case. When the housing is removed the drive gears will be exposed. DO NOT attempt to remove the camshaft and the drive gears. Removing the camshaft with the engine in the upright position will cause the tappets to dislodge, requiring the engine block to be dismantled.

1. This procedure requires service parts. Make sure you have obtained the correct service parts before you start.
2. Remove the starter motor.

   Refer to: PIL 15-75-00.
3. Remove the flywheel.

   Refer to: PIL 15-54-00.

Removal

1. Remove the flywheel housing fixing bolts and then separate the flywheel housing from the gear case.
2. If required, undo the bolts and remove the access cover.
3. Remove and discard the crankshaft rear oil seal. Take care not to damage the seal bore in the housing.

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

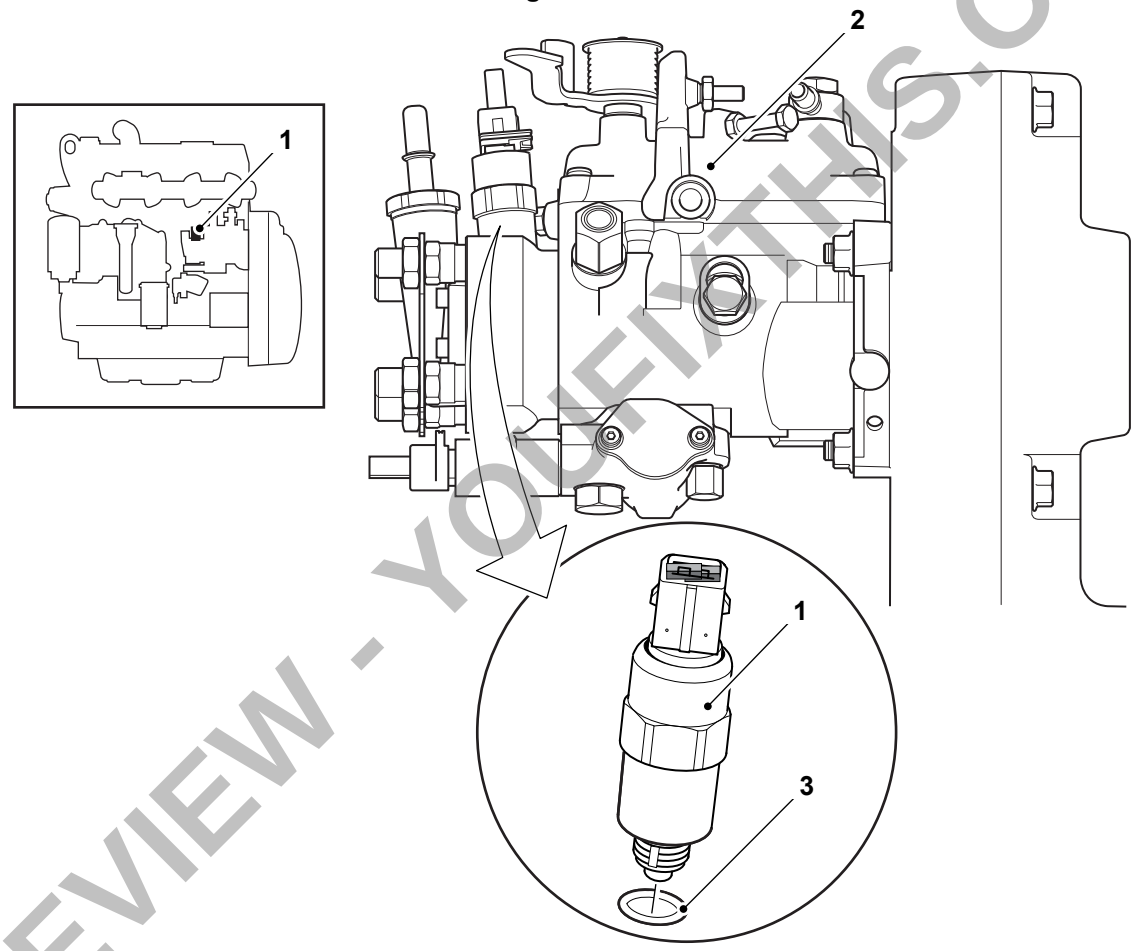
Remove and Install

(For: JCB Tier 2/3 Mech Engine 4 Cyl)

Before Removal

1. Make sure that the engine is safe to work on. If the engine has been running, let it cool before you start the service work.

Figure 294.

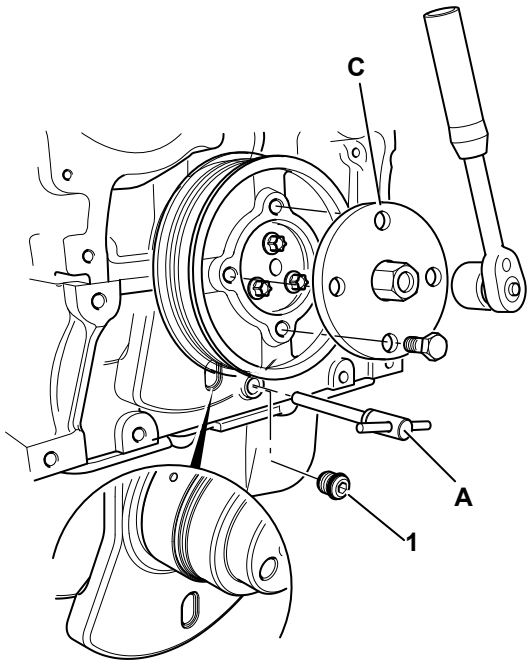


1 ESOS (Engine Shut-Off Solenoid) cartridge
2 Fuel injection pump
3 O-ring

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Figure 353.



1 Bedplate plug
A Crankshaft / Camshaft timing pin
C Crankshaft turning tool

4. Use the crankshaft turning tool to turn the crankshaft until the timing pin engages in the crankshaft timing hole.

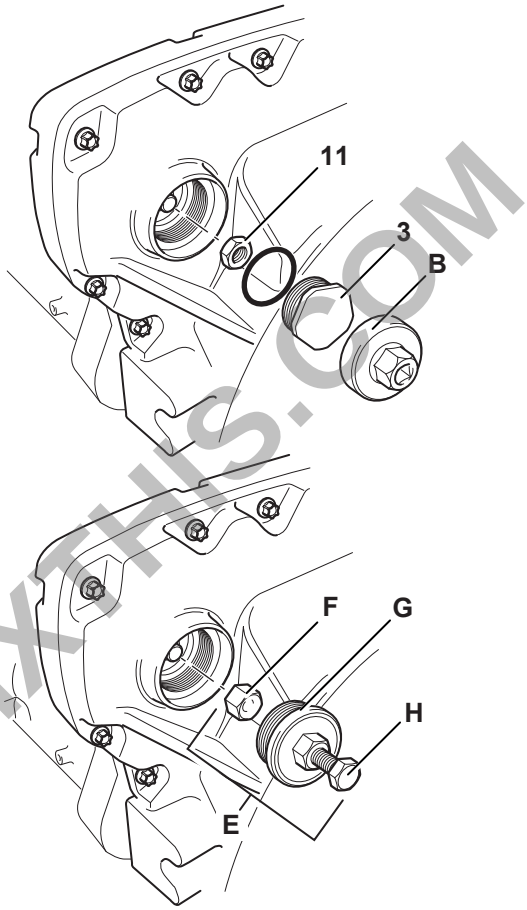
   Special Tool: Crankshaft Turning Tool (95.25mm PCD)- JCB 4 Cylinder Ecomax and Dieselmax (Qty.: 1)
   Special Tool: Crankshaft / Camshaft Timing Pin (444/448/672 Engine) (Qty.: 1)

5. Use the gear removal tool and a suitable ratchet drive to remove the fuel injection pump gear cover.

   Special Tool: Pump Gear Removal Tool (Qty.: 1)

6. Remove the drive shaft nut.

Figure 354.



3 Gear cover
11 Drive shaft nut
B Gear removal tool
E Pump gear removal tool, comprises:
F Pump gear removal tool (Reaction cap)
G Pump gear removal tool (Body)
H Pump gear removal tool (Bolt)

7. Remove the nuts. Use the special C shaped ring spanner to remove the nut closest to the crankcase. Make sure you remove all nuts (X3).

8. Install the reaction cap over the pump shaft. Screw the body to the housing. Use a suitable ratchet drive and socket to screw the bolt in until you feel a slight resistance.

   Special Tool: C-Shaped Ring Spanner (Qty.: 1)
   Special Tool: Pump Gear Removal Tool (Qty.: 1)

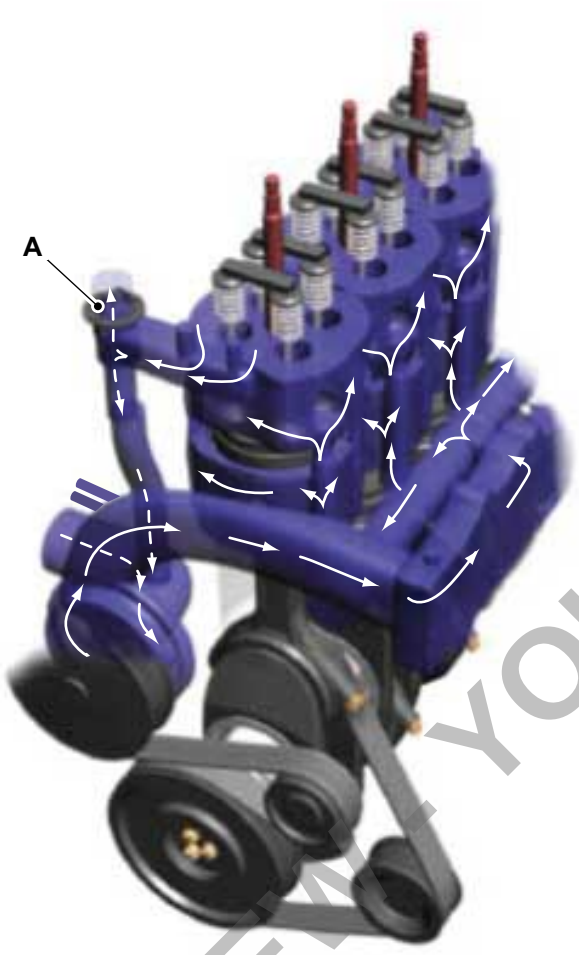
PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Component Identification

(For: JCB Tier 4i /T4F <55kW Engine 4 Cyl)

Figure 426.



A Thermostat

Operation

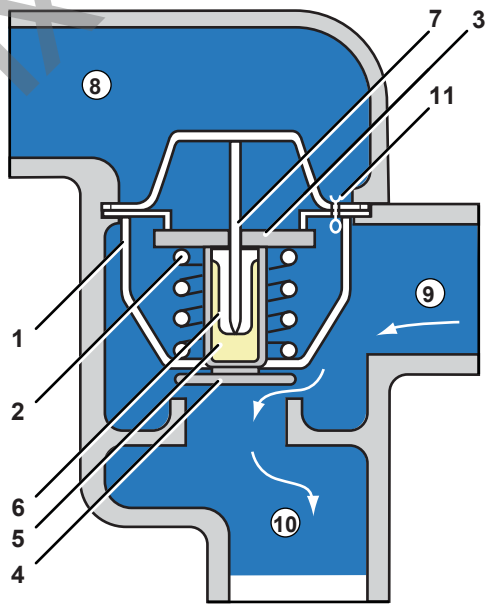
(For: JCB Tier 4i /T4F <55kW Engine 4 Cyl)

The thermostat is a wax element type and is configured for by-pass blanking. The thermostat functions as follows:

State A - Closed (Engine Cold)

When the engine is cold the wax pellet has contracted into its housing. This allows the spring to act against the thermostat body and move the valve plate up against its seat, closing the outlet port to the radiator. Since the bottom valve plate is connected to the top valve plate it also moves up, opening the bypass port. The coolant flows from the thermostat housing inlet port into the bypass gallery.

Figure 427.



1 Thermostat
2 Spring
3 Top valve plate
4 Bottom valve plate
5 Wax pellet
6 Diaphragm
7 Actuating rod
8 Outlet port to the radiator top hose
9 Inlet port thermostat housing
10 Outlet port bypass gallery
11 1mm diameter orifice

State B - Open (Engine Hot)

When the engine is hot, the wax pellet melts, as it does so it expands and pushes against the diaphragm. The diaphragm reacts against the actuating rod and both the top and bottom

PREVIEW - YOUFIXTHIS.COM
Download full manual at youfixthis.com

Health and Safety

Hydraulic Pressure

Hydraulic fluid at system pressure can injure you. Before connecting or removing any hydraulic hose, residual hydraulic pressure trapped in the service hose line must be vented. Make sure the hose service line has been vented before connecting or removing hoses. Make sure the engine cannot be started while the hoses are open.

Lifting Equipment

You can be injured if you use incorrect or faulty lifting equipment. You must identify the weight of the item to be lifted then choose lifting equipment that is strong enough and suitable for the job. Make sure that lifting equipment is in good condition and complies with all local regulations.

WARNING! *A raised and badly supported machine can fall on you. Position the machine on a firm, level surface before raising one end. Ensure the other end is securely chocked. Do not rely solely on the machine hydraulics or jacks to support the machine when working under it. Disconnect the battery, to prevent the machine being started while you are beneath it.*

Precautions for Installation

1. Precautions when installing the ram on the machine.
    1.1. When installing and removing from the machine, suspend the ram safely.
    1.2. Suspending the ram by the piping is not only dangerous, but can also cause damage to the cylinder.
    1.3. Secure the piston rod with a band. It is very dangerous if the rod extends unexpectedly. Also, the rod can be damaged and become unusable.
2. Welding after installing the ram may result in damage.
    2.1. If electric welding is done even at a point away from the ram, there may be sparking inside the ram and it will become necessary to replace the ram with a new one.
3. When painting the machine, mask the ram. If paint adheres to the rod surface or to the wiper ring and the ram is operated, the wiper ring will not function properly and foreign matter and paint can easily enter the ram. This will cause damage to the seals, drastically shortening the life of the ram.
4. Install the ram only when it is clean.

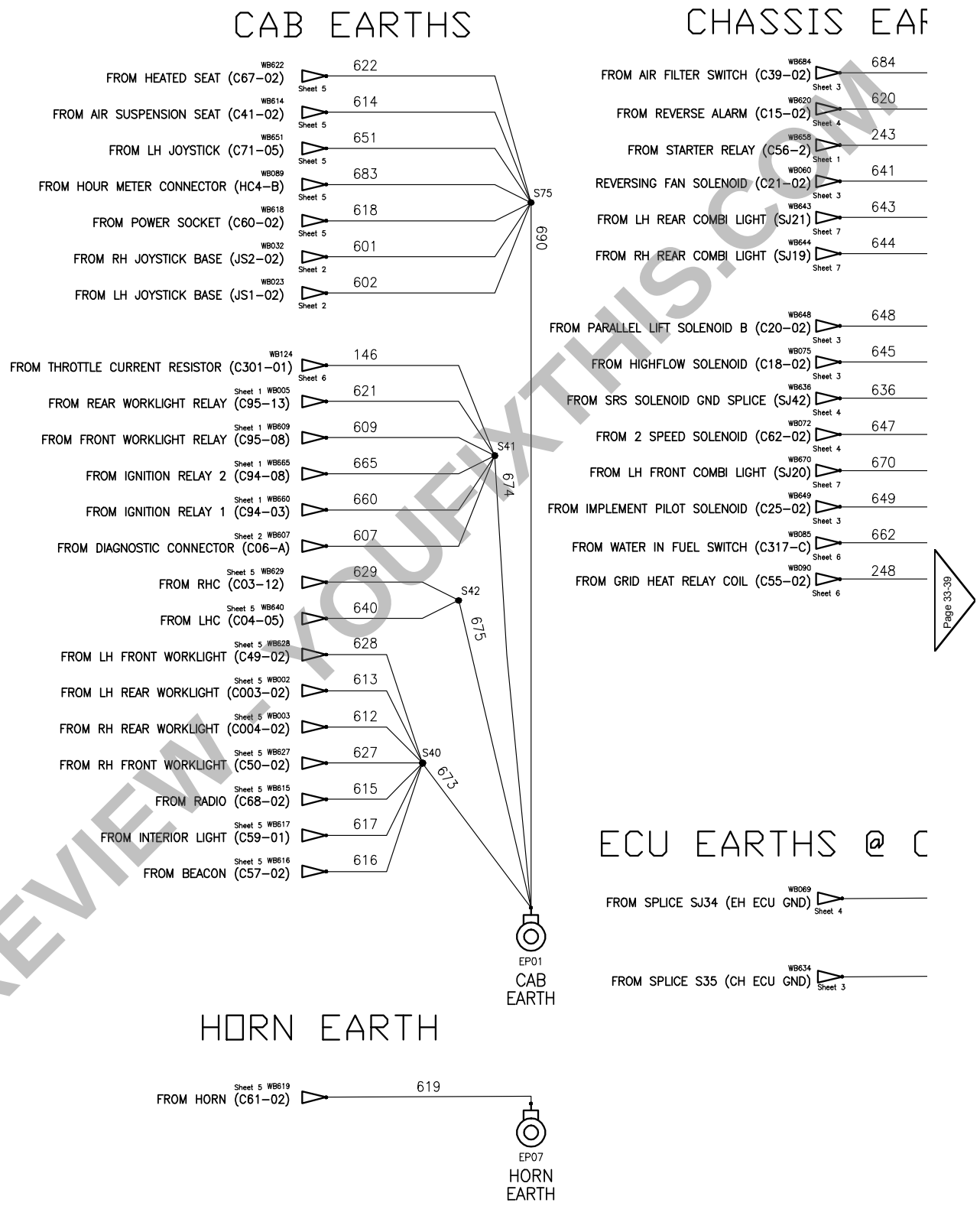
Caution During Use

1. Use only under designated conditions.
    1.1. If hydraulic oil other than the designated oil is used, the seals quickly degenerate and become damaged. If the relief valve is set at a value higher than specified, it may cause ram damage and is dangerous.
    1.2. In high temperature environments (approx. 90°C and above) or low temperature environments (below -20°C), seals quickly become damaged. Special seal materials are necessary so check to see if the ram that you are using is suitable or not.
    1.3. The number one cause of ram oil leakage is rod damage. Be careful not to damage the rod.
2. Warm up sufficiently before beginning work.
    2.1. In cold conditions the rod seals may be frozen, so if the ram is operated at maximum pressure and maximum speed, the seals will be damaged.
    2.2. There is a large amount of air in a new ram or one which has been left for a long time, so the ram will not operate smoothly. Also, if pressure is applied suddenly without bleeding the air, high temperatures will be generated due to adiabatic compression and the seals may burn.
    2.3. Before beginning work, always move the ram at full stroke with no load and expel air from the cylinder.
3. When stopping or storing, do it at a safe and fixed position.
    3.1. The installed ram cannot maintain the same position for a long period of time, because the oil inside the ram may leak and the hydraulic oil volume decreases as it cools. Stop or store the machine in a safe and fixed position.

Maintenance, Inspection Points

1. Carry out daily maintenance and inspection.
    1.1. The key point for correct long-term ram function is daily maintenance and inspection. Carry out maintenance and inspection so that the ram functions fully at all times. Always remove any mud, water, dust or oil film adhering to the rod and keep it in normal condition. However, when cleaning the wiper ring and seals, do not get them wet with water but wipe clean with a rag. To prevent rust forming during storage, the amount of exposed ram piston rod

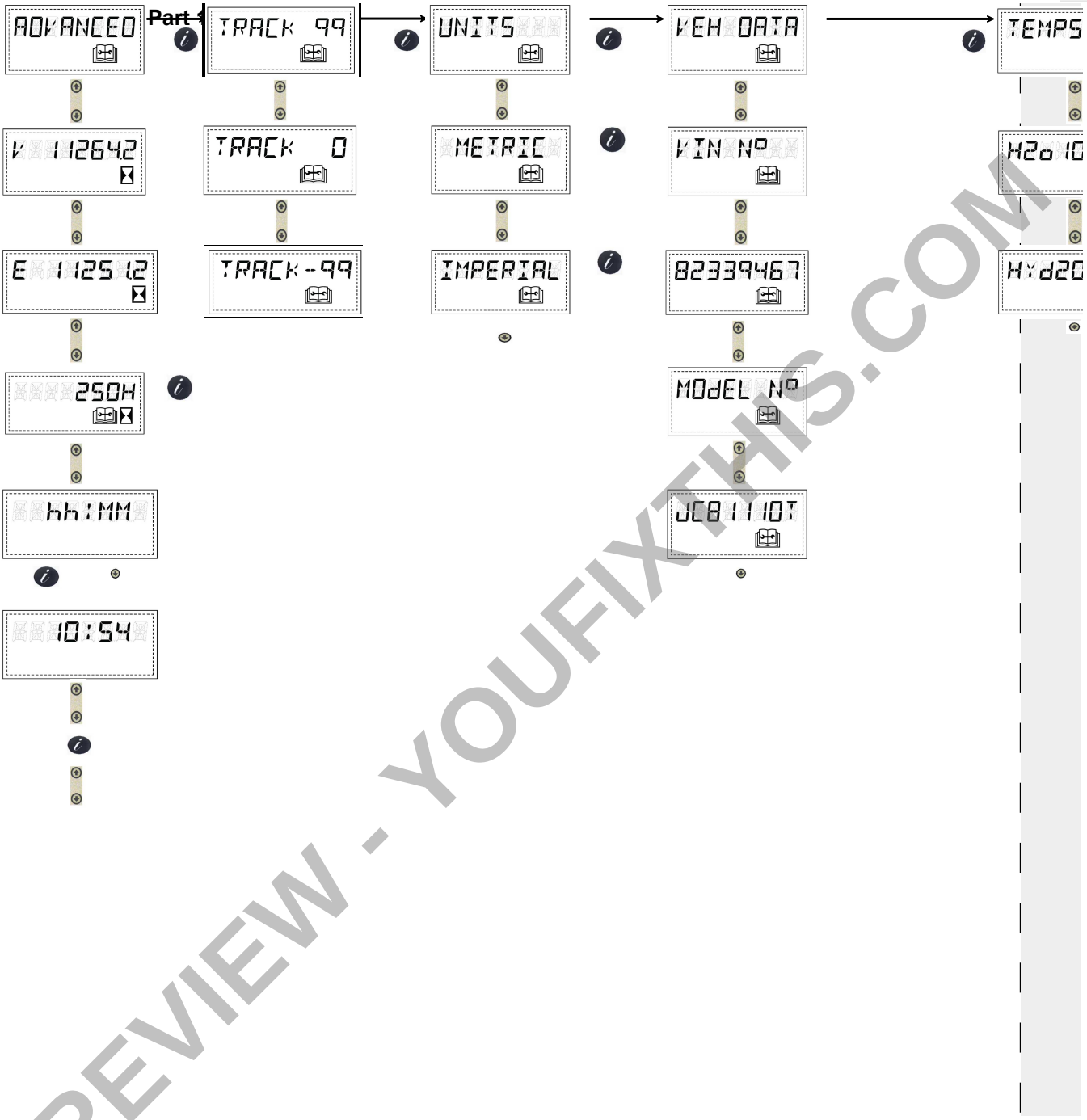
PREVIEW - YOUFIXTHIS.COM
Download full manual at youfixthis.com



PREVIEW. YOUFIXTHIS.COM

Download full manual at youfixthis.com

Page 33-148 Page 33-149



Page 33-149

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Technical Data

From JCB standard STD00019 issue 15.

1. This information does not apply to:-
   1.1. Hydraulic fittings (i.e. BSP, SAE O-ring boss, UNF, four bolt split flange and JIC).
   1.2. Locking type fasteners (those with a nylon insert, or with distorted thread nuts such as Cleveloc).
2. For information on fastener conditions, refer to fasteners and fixings, bolts, general, introduction.

Table 269. Torque Settings - UNF S Fasteners

Bolt Size	Treads per Inch	Hexagon (A/F)	Condition 1	Condition 2
in	in	in	N·m	N·m
(1/4 in)	28	7/16	11.2	10
(5/16 in)	24	1/2	22.3	20
(3/8 in)	24	9/16	40	36
(7/16 in)	20	5/8	64	57
(1/2 in)	20	3/4	98	88
(9/16 in)	18	13/16	140	126
(5/8 in)	18	15/16	196	177
(3/4 in)	16	1 1/8	343	309
(7/8 in)	14	1 15/16	547	492
(1 in)	12	1 1/2	814	732
(1 1/8 in)	12	1 7/8	1,181	1,063
(1 1/4 in)	12	2 1/4	1,646	1,481

Table 270. Torque Settings - UNF X Fasteners

Bolt Size	Treads per Inch	Hexagon (A/F)	Condition 1	Condition 2
in	in	in	N·m	N·m
(1/4 in)	28	7/16	17.6	15.9
(5/16 in)	24	1/2	35.2	31.6
(3/8 in)	24	9/16	64	57
(7/16 in)	20	5/8	101	91
(1/2 in)	20	3/4	155	139
(9/16 in)	18	13/16	221	199
(5/8 in)	18	15/16	310	279
(3/4 in)	16	1 1/8	542	488
(7/8 in)	14	1 15/16	864	777
(1 in)	12	1 1/2	1,285	1,156
(1 1/8 in)	12	1 7/8	1,865	1,679
(1 1/4 in)	12	2 1/4	2,598	2,339

Table 271. Torque Settings - Coarse Metric Grade 8.8 Fasteners

Bolt Size	Tread Pitch	Hexagon (A/F)	Condition 1	Condition 2
mm	mm	mm	N·m	N·m
4	0.7	7	2.9	2.6
5	0.8	8	5.8	5.2
6	1	10	9.9	9
8	1.25	13	24	22
10	1.5	17	47	43
12	1.75	19	83	74
14	2	22	132	119
16	2	24	205	184
20	2.5	30	400	360
24	3	36	690	621
30	3.5	46	1,372	1,235
36	4	55	2,399	2,159

Table 272. Torque Settings - Coarse Metric Grade 10.9 Fasteners

Bolt Size	Thread Pitch	Hexagon (A/F)	Condition 1	Condition 2
mm	mm	mm	N·m	N·m
4	0.7	7	4	3.6
5	0.8	8	8.1	7.3
6	1	10	13.9	12.5
8	1.25	13	34	30
10	1.5	17	67	60
12	1.75	19	116	104
14	2	22	185	167
16	2	24	288	259
20	2.5	30	562	506
24	3	36	971	874
30	3.5	46	1,930	1,737
36	4	55	3,374	3,036

Table 273. Torque Settings - Coarse Metric Grade 12.9 Fasteners

Bolt Size	Thread Pitch	Hexagon (A/F)	Condition 1	Condition 2
mm	mm	mm	N·m	N·m
4	0.7	7	4.8	4.4
5	0.8	8	9.8	8.8
6	1	10	16.6	15
8	1.25	13	40	36
10	1.5	17	80	72
12	1.75	19	139	125
14	2	22	223	200
16	2	24	345	311

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

PREVIEW ONLY

You're viewing 25 of 1328 pages

The full manual includes:

- All 1328 pages, complete
- Searchable PDF (find any keyword)
- No watermarks
- Instant download
- Print-ready quality

GET FULL MANUAL NOW

Jcb 225, 225T, 260, 260T, 280, 300, 300T, 320T, 325T, 330 Service Manual

Scan or click anywhere
youfixthis.com

Click anywhere on this page to get the full manual