

JCB Dieselmex Mechanical Engine

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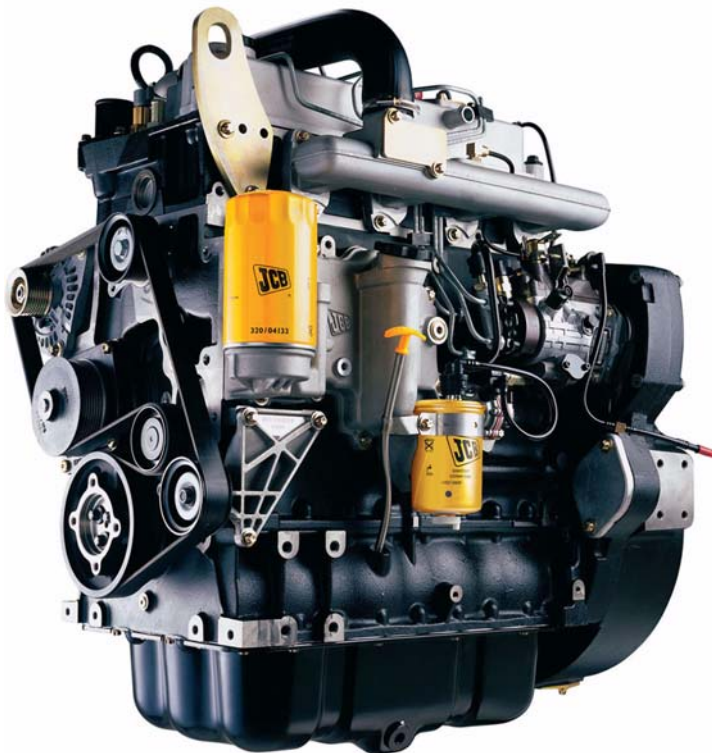
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General Information

Service Manual - JCB Dieselmex Mechanical Engine

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Section 1 - General Information

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Introduction

About this Manual

Using the Service Manual

This publication is designed for the benefit of JCB Distributor Service Engineers who are receiving, or have received, training by JCB Technical Training Department.

These personnel should have a sound knowledge of workshop practice, safety procedures, and general techniques associated with the maintenance and repair of engines.

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. Finally, please remember above all else **SAFETY MUST COME FIRST!**

The manufacturer's policy is one of continuous improvement. The right to change the specification of the engine without notice is reserved. No responsibility will be accepted for discrepancies which may occur between the specifications of the engine and the descriptions contained in this publication.

Section Numbering

The manual is compiled in sections, the first three are numbered and contain information as follows:

- 1 **General Information** includes torque settings and service tools.
- 2 **Care & Safety** includes warnings and cautions pertinent to aspects of workshop procedures etc.
- 3 **Maintenance** includes service schedules and recommended lubricants.

The remaining sections deal with Descriptions, Fault Finding, Dismantling, Overhaul etc. of specific components, for example:

- 4 **Systems Descriptions**

- 5 **Fault Finding ...etc.**

Left Side, Right Side

References to the 'left' side and the 'right' side of the engine are when viewed from the flywheel end of the engine, as shown at **1A**.

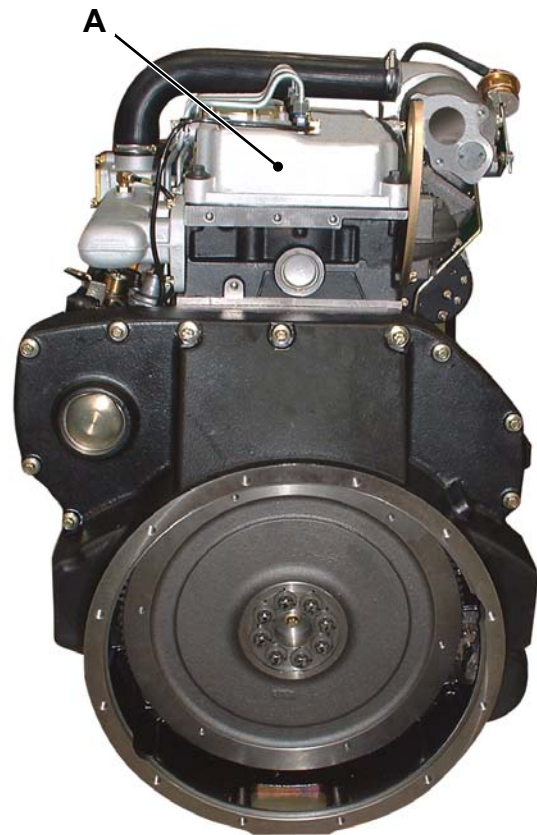


Fig 1.

Units of Measurement

In this manual, the S.I. system of units is used. For example, liquid capacities are given in litres. The imperial units follow in parenthesis () e.g. 28 litres (6 UK gal).



Machine Related Data

The JCB Diesemax Engine can be fitted to a variety of constructions and agricultural machines. The scope of this publication is limited to the engine, but references to a typical machine installation will be made. Tasks and information specific to a machine installation will be listed in the relevant machine Service Manual, for example engine removal and replacement procedures.



Acronyms and Abbreviations

Some of the following acronyms and abbreviations are used in this service manual. The remainder are used in the automotive industry and are repeated for reference only.

°C	Celsius	Nm	Newton Metre
°F	Fahrenheit	NSP	Non Serviced Part
A/R	As Required	O/D	Outside Diameter
API	American Petroleum Institute	OEM	Original Equipment Manufacturer
BBDC	Before Bottom Dead Centre	PPM	Parts per Million
BDC	Bottom Dead Centre	PSI	Pounds per square Inch
BSFC	Brake Specific Fuel Consumption	PTO	Power Take Off
BTDC	Before Top Dead Centre	RH	Right Hand
CCV	Crankcase Vent	RME	Rapeseed Methyl Ester
CID	Cubic inch Displacement	RPM	Revolutions per Minute
CSA	Cold Start Advance	SAE	Society of Automotive Engineers
CSAS	Cold Start Advance Solenoid	SME	Sunflower Methyl Ester
cST	Centistokes	SOME	Soyabean Methyl Ester
ECM	Electronic Control Module	STD	Standard
ECS	Emission Control System	TBA	To be Advised
EPA	Environmental Protection Agency	TC	Turbocharged
ESOS	Electric Shut-Off Solenoid or Engine Shut-Off Solenoid	TCA	Turbocharged Aftercooled
FAME	Fatty Acid Methyl Esters	TDC	Top Dead Centre
FEAD	Front End Accessory Drive	TI	Technical Information
FIE	Fuel Injection Equipment	VOME	Vegetable Oil Methyl Esters
FIP	Fuel Injection Pump		
Hg	Mercury		
HP	Horse Power		
I/D	Inside Diameter		
kg	Kilogram		
KPH	Kilometres per hour		
Kw	Kilowatt		
LH	Left Hand		
ltr	Litre		
mm	Millimetre		
MPH	Miles per Hour		
NA	Naturally Aspirated		
N/A	Not Applicable/Not Available		

Identifying the Engine

Engine Identification Plate

Typical Engine Identification Number

Engine data labels **2B** are located on the cylinder block and rocker cover (if fitted). The data label contains important engine information and includes the engine identification number.

A typical engine identification number is explained as follows:

S	A	320/40098	U	00001	04
1	2	3	4	5	6

5 Engine serial number

6 Year of manufacture

09 = 2009

1 Engine Displacement

D = 4.8 litre series

S = 4.4 litre series

2 Engine Type

Tier 2 Engines

A = Naturally Aspirated

B = Turbocharged

C = Turbocharged with Intercooler

Tier 3 Engines

D = Turbocharged

E = Electronic Common Rail

F = Turbocharged with Intercooler

3 Engine part number

4 Country of manufacture

U = United Kingdom

Component Labels

In addition to the engine labels, some of the machine engine components will also have a label attached, or a part number etched into the casting, these include:

- the starter motor
- the alternator
- the fuel injection pump
- engine bedplate
- engine block
- cylinder head
- turbo charger

In some instances, it may be necessary to quote the information on these labels, for instance if there is a parts query, or a warranty claim. Make a note of these numbers.

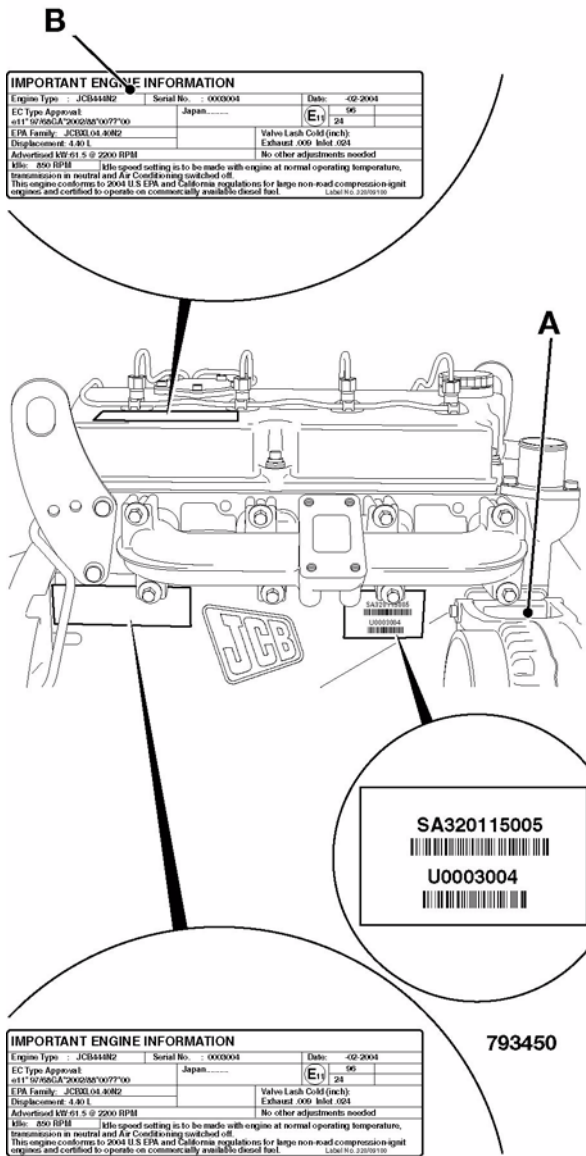


Fig 2.

The last three parts of the engine identification number are stamped on the cylinder block at position **2A** as follows:

U 00001 04

Engine Component Identification

The following identifies the main components of a typical engine assembly visible from the exterior. Some variants may differ in detail.

Table 1. Engine - As viewed on the left hand side.

Remember that the left and right sides are determined when viewing the flywheel (rear) end of the engine.

1	Rocker cover	12	Fuel filter
2	Fuel injectors and high pressure fuel pipes	13	Lubrication oil filler cap
3	Lubrication oil filler cap	14	Lubrication oil filter
4	Timing gear case	15	Lubrication oil cooler housing
5	Flywheel housing	16	Lubrication oil dip stick
6	Bed plate	17	Low duty PTO (blanking cover if no device is fitted)
7	Lubrication oil pan (sump)	18	Water temperature sender (cold start)
8	Engine lifting eye	19	Low pressure fuel line (to tank)
9	Air Inlet manifold	20	Oil drain plug (sump)
10	Fuel injection pump	21	Oil pressure switch
11	Fuel lift pump	22	Inlet manifold induction heater (if fitted)

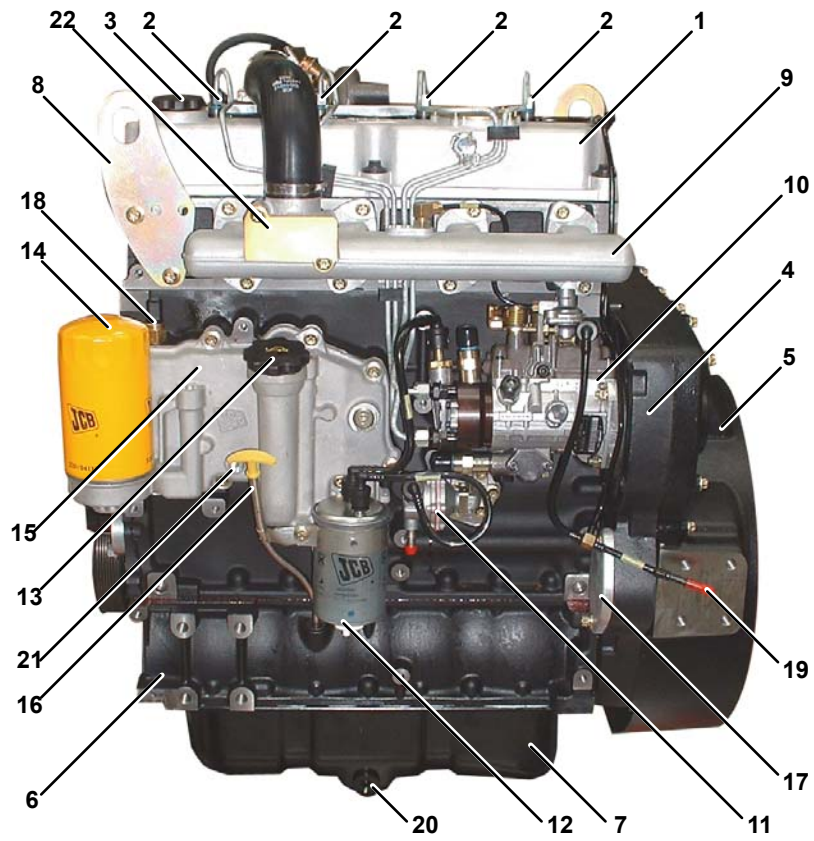


Fig 3.

Table 2. Engine - As viewed on the right hand side

Remember that the left and right sides are determined when viewing the flywheel (rear) end of the engine.

1	Rocker cover	11	Exhaust manifold
2	Breather chamber inspection cover	12	Alternator and drive pulley assembly (belt not fitted)
3	Cylinder block	13	Coolant pump drive pulley (belt not fitted)
4	Timing gear case	14	Coolant pump housing (cylinder block)
5	Flywheel housing	15	Coolant inlet/radiator hose connector
6	Bed plate	16	Heavy duty PTO (blanking cover if no device is fitted)
7	Lubrication oil pan (sump)	17	Starter motor assembly
8	Lifting eye	18	Turbocharger oil drain line (turbocharged engine only)
9	Turbocharger (turbocharged engine only)	19	Turbocharger oil feed line (turbocharged engine only)
10	Turbocharger waste gate actuator assembly	20	Oil drain plug (sump)

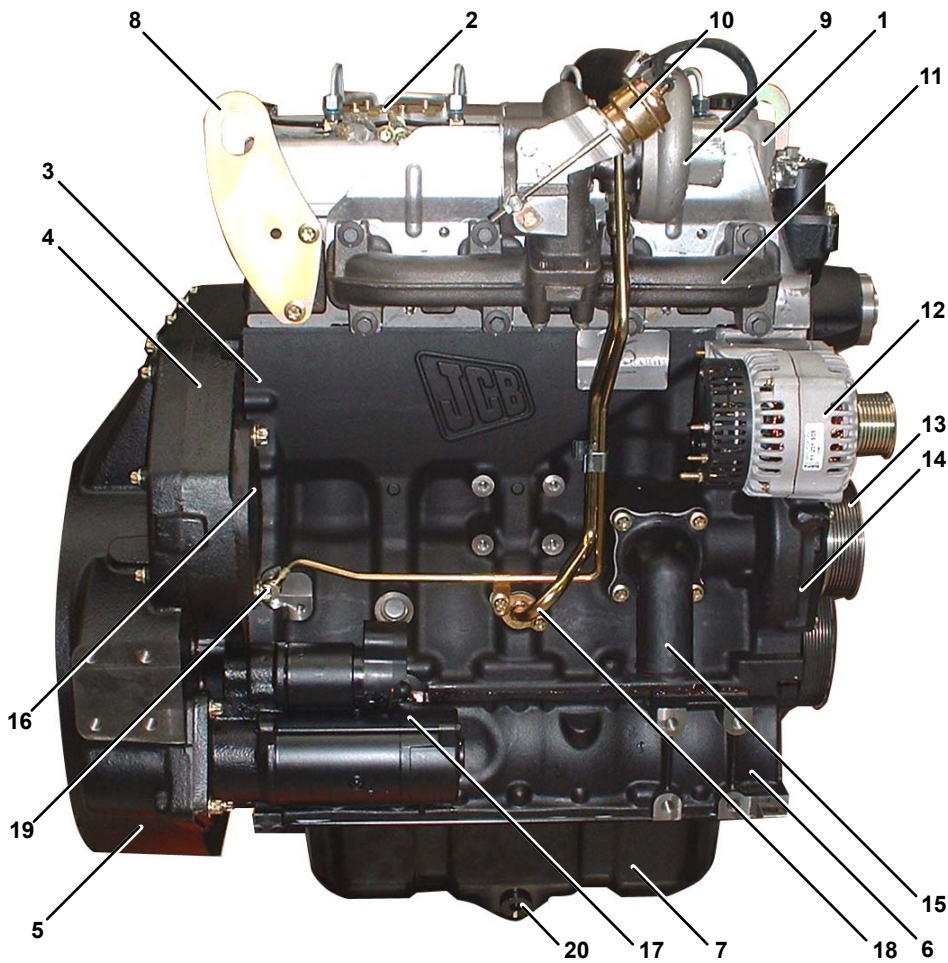


Fig 4.

Table 3. Engine - As viewed on the crankshaft pulley (front) end

Remember that the left and right sides are determined when viewing the flywheel (rear) end of the engine.

1	Rocker cover	9	Drive belt tensioner and pulley
2	Cylinder head	10	Coolant pump and drive pulley assembly
3	Cylinder block	11	Idler pulley
4	Bed plate	12	Alternator and drive pulley assembly
5	Lubrication oil pan (sump)	13	Cab heater water hose connector
6	Crankshaft pulley	14	Coolant temperature sender
7	Front end accessory drive belt	15	Coolant thermostat housing/radiator hose connector
8	Idler pulley		

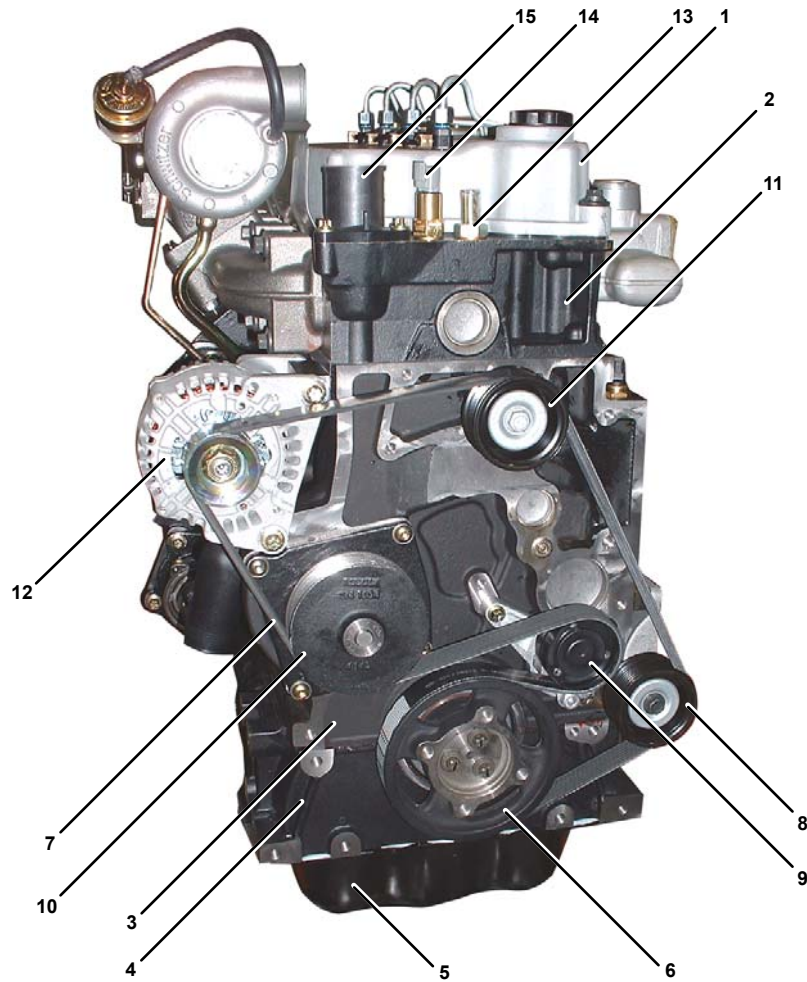


Fig 5.

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