

SERVICE MANUAL

COMPACT EXCAVATOR
8026 CTS, JCB 30PLUS

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This manual contains original instructions, verified by the manufacturer (or their authorized representative).

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Foreword

The Operator's Manual

 You and others can be killed or seriously injured if you operate or maintain the machine without first studying the Operator's Manual. You must understand and follow the instructions in the Operator's Manual. If you do not understand anything, ask your employer or JCB dealer to explain it.

Do not operate the machine without an Operator's Manual, or if there is anything on the machine you do not understand.

Treat the Operator's Manual as part of the machine. Keep it clean and in good condition. Replace the Operator's Manual immediately if it is lost, damaged or becomes unreadable.

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Introduction

(For: Perkins 400 Series)

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.

Replacement of oil seals, gaskets, etc., and any component that show signs of wear or damage, is expected as a matter of course.

It is expected that components will be cleaned and lubricated where required, 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 Perkins 400 series engines are indirect injection engines. The engines are controlled with a mechanically actuated fuel injection pump. The engine cylinders are arranged in-line. The cylinder head assembly has one inlet valve and one exhaust valve for each cylinder. Each cylinder valve has a single valve spring.

The crankshaft for the engine has main bearing journals. End play is controlled by the thrust washers that are located on the rear main bearing.

The timing gears are stamped with timing marks in order to ensure the correct assembly of the gears. When the No. 1 piston is at top centre compression stroke, the teeth that are stamped on the crankshaft gear and the camshaft gear will be in alignment with the idler gear.

The crankshaft gear turns the idler gear which then turns the camshaft gear and the gear for the engine oil pump.

The fuel injection pump is mounted in the crankcase. The fuel injection pump is operated by lobes on the camshaft. The fuel transfer pump is located on the right hand side of the crankcase. The fuel transfer pump is also operated by lobes on the camshaft.

The fuel injection pump conforms to requirements for emissions. If any adjustments to the fuel injection pump timing and high idle are required you must refer to a Perkins distributor or a Perkins dealer. Some fuel injection pumps have mechanical governors that control the engine rpm. Some fuel injection pumps have a governor that is electrically controlled.

A gerotor oil pump is located in the centre of the idler gear. The engine oil pump sends lubricating oil to the main oil gallery through a pressure relief valve and an engine oil filter. The rocker arms receive pressurized oil through an externally located oil line that runs from the main oil gallery to the cylinder head.

Coolant from the bottom of the radiator passes through the belt driven centrifugal cooling pump. The coolant is cooled by the radiator and the temperature is regulated by a water temperature regulator.

Engine efficiency, efficiency of emission controls, and engine performance depend on adherence to correct operation and maintenance recommendations. Engine performance and efficiency also depend on the use of recommended fuels, lubrication oils, and coolants. Refer to the Maintenance Schedules (PIL 78-24).

Health and Safety

Hot Components

Touching hot surfaces can burn skin. The engine and machine components will be hot after the unit has been running. Allow the engine and components to cool before servicing the unit.

Turning the Engine

Do not try to turn the engine by pulling the fan or fan belt. This could cause injury or premature component failure.

Notice: *The engine and other components could be damaged by high pressure washing systems. Special precautions must be taken if the machine is to be washed using a high pressure system. Make sure that the alternator, starter motor and any other electrical components are shielded and not directly cleaned by the high pressure cleaning system. Do not aim the water jet directly at bearings, oil seals or the engine air induction system.*

WARNING! *To bleed the injectors you must turn the engine. When the engine is turning, there are parts rotating in the engine compartment. Before starting this job make sure that you have no loose clothing (cuffs, ties etc) which could get caught in rotating parts. When the engine is turning, keep clear of rotating parts.*

Notice: *Clean the engine before you start engine maintenance. Obey the correct procedures. Contamination of the fuel system will cause damage and possible failure of the engine.*

Notice: *Do not exceed the correct level of engine oil in the sump. If there is too much engine oil, the excess must be drained to the correct level. An excess of engine oil could cause the engine speed to increase rapidly without control.*

WARNING! *The engine has exposed rotating parts. Switch off the engine before working in the engine compartment. Do not use the machine with the engine cover open.*

WARNING! *Hot oil and engine components can burn you. Make sure the engine is cool before doing this job. Used engine crankcase lubricants contain harmful contaminants. In laboratory tests it was shown that used engine oils can cause skin cancer.*

Notice: *A drive belt that is loose can cause damage to itself and/or other engine parts.*

WARNING! *Do not open the high pressure fuel system with the engine running. Engine operation causes high fuel pressure. High pressure fuel spray can cause serious injury or death.*

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*

Technical Data

Table 18.

Description					
Engine model	HL 403C-15 (Tier 2), GL 403D-15 (Tier 3)	GK 403D-15 (Tier 3)	HL 403C-17 (Tier 2), GK 403D-17 (Tier 3),	HL 403C-11 (Tier 2), GJ 403D-11 (Tier 3), EJ 403F-11 (T4F)	GH 403D-07 (Tier 3)
Type	Vertical in-line, 3 cylinder, normally aspirated, 4 stroke, water cooled diesel.	Vertical in-line, 3 cylinder, normally aspirated, 4 stroke, water cooled diesel.	Vertical in-line, 3 cylinder, normally aspirated, 4 stroke, water cooled diesel.	Vertical in-line, 3 cylinder, normally aspirated, 4 stroke, water cooled diesel.	Vertical in-line, 3 cylinder, normally aspirated, 4 stroke, water cooled diesel.
Weight (dry)	154kg	154kg	160kg	87kg	71kg
Number of cylinders	3	3	3	3	3
Nominal bore size	88mm	88mm	88mm	77mm	67mm
Stroke	90mm	90mm	100mm	81mm	72mm
Combustion Cycle	4-stroke	4-stroke	4-stroke	4-stroke	4-stroke
Firing order	1-2-3	1-2-3	1-2-3	1-2-3	1-2-3
Compression ratio	22.5:1	22.5:1	23:1	23:1	23.5:1
Swept volume	1496 cm ³	1496 cm ³	1663 cm ³	1131 cm ³	762 cm ³
Valve clearance (cold)	0.2mm	0.2mm	0.2mm	0.2mm	0.2mm
Idling speed	1050 RPM (Revolutions Per Minute)	1050 RPM	1050 RPM	1325 RPM	
Maximum no-load speed	2420 RPM	2250 RPM	2592 RPM	2450 RPM	
Compression pressure	29.4bar (426.1psi) at 250 RPM	29.4bar (426.1psi) at 250 RPM	29.4bar (426.1psi) at 250 RPM		
Power output	20.9kW at 2200 RPM	18.4kW at 2100 RPM	29.4kW at 2400 RPM	13.7kW at 2200 RPM (Tier 2), 14.6kW at 2200 RPM (Tier 3), 14.4kW at 2200 RPM (T4F)	12.2kW at 2800 RPM

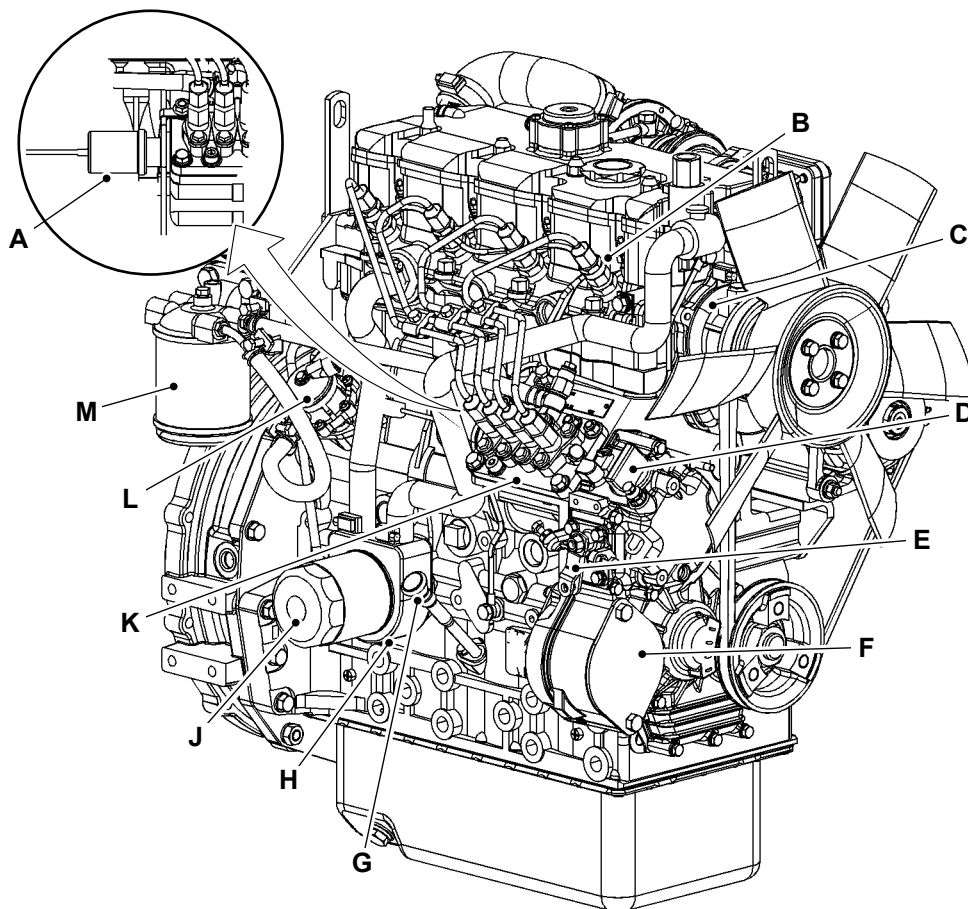
Component Identification

(For: Perkins 400 Series)

External

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

Figure 75. Front and right side view



A Fuel shutoff solenoid
C Water pump
E Throttle lever
G Engine oil level gauge
J Engine oil filter
L Transfer pump

B Number one fuel injector
D Lower engine oil filler cap
F Cover plate for the accessory drive
H Engine oil cooler
K Fuel injection pump
M Fuel filter

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