workshop manual for 4.192, 4.203 & D4.203 diesel engines

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This publication is written for world wide use. In territories where legal requirements govern engine smoke emission, noise, safety factors etc., then all instructions, data and dimensions given must be applied in such a way that, after servicing (preventive maintenance) or repairing an engine, it does not contravene the local regulations when in use.

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In addition to the above companies, there are Perkins distributors in most countries. Perkins Engines Ltd., Peterborough or one of the above companies can give details.

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Unified Threads and Engine No. Location

All threads used on 4.192, 4.203 and D4.203 Engines, except on proprietary equipment are Unified Series, and American Pipe Series.

Unified threads are not interchangeable with B.S.F. and although B.S.W. have the same number of threads per inch as Unified Coarse Series, interchanging is not recommended, due to a difference in thread form.

The engine number is stamped on the cylinder block as shown in the illustrations. The number position and composition have been changed at various times as detailed below.

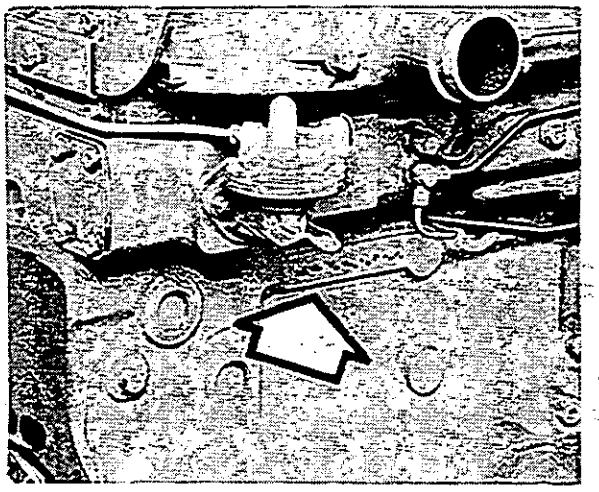
With early engines, the number was stamped on either side of the cylinder block — on the camshaft side near the fuel lift pump or on the fuel pump side near the final fuel filter. The number consisted of seven digits commencing with the letters 25 for 4.192 engines or 26 for 4.203 engines.

Later engine numbers were positioned as above, but a typical number is 203U2541.

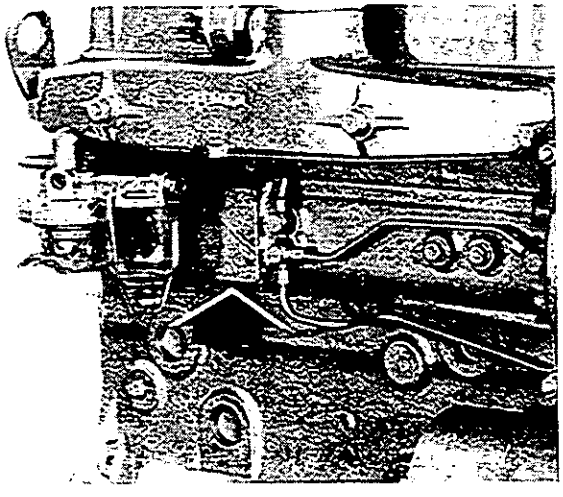
With current engines, the engine number is stamped on a pad on the centre of the camshaft side of the cylinder block and a typical number would be JE18279U510312D. For a very few applications, the engine number is stamped on the rear face of the cylinder block towards the top.

When requesting information or ordering parts, always quote all the letters and numbers in the same sequence as they are stamped on the block.

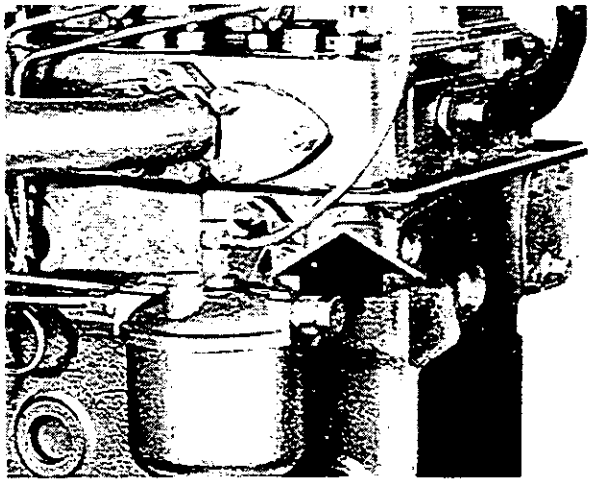
The illustrations below indicate where the engine number may be found for the first systems mentioned above.



Current Engine Number Location.



Engine No. Location on Camshaft Side of Engine



Engine No. Location on Fuel Pump Side of Engine.

FOREWORD

This manual is designed to be of assistance to all personnel concerned with the maintenance and overhaul of the Perkins Diesel Engine. It presents a complete and detailed description of the Engine, together with precise instructions on servicing and overhaul procedure also a schedule covering manufacturing data and dimensions which should be closely followed when overhauling any part of the Engine to the Manufacturers standards.

Unless specified otherwise, the information given applies to both 4.192, 4.203 and D4.203 engines. Where the information given differs for engines built for Massey Ferguson applications reference is made in the text.

Throughout this manual, whenever the "left" or "right" hand side of the engine is referred to, it is that side of the engine when viewed from the flywheel end.

The direction of rotation of the engine is clockwise when viewed from the front.

When fitting setscrews or studs into holes which are tapped through into the interior of the engine, a suitable sealant should be used.

Some setscrews may already have sealant coated threads, these can be identified by the colour of the threads which will be red or blue etc. Ensure that where these setscrews are fitted, the holes do not have sharp edges as this could remove the sealant.

Division of the manual into sections is intended to simplify the task of locating any specific information contained therein.

Page and illustration numbers are not accumulative, but start afresh with each section, preceded by the appropriate reference letter for that section, for example, Page C.2. and Figure C.3. are page and illustration numbers respectively, under Section C.

Effective maintenance can only be carried out if the personnel concerned are fully conversant with the various components of the engine. Before maintenance operations are commenced, therefore, this manual should be carefully studied, and it should at all time be kept where it will be needed in the workshop.

Certain operations described herein require the use of special Tools. These tools are available from Perkins distributors or

Messrs. V. L. Churchill & Co. Ltd.

Full details are given in the appendix.

A School of Instruction is maintained at Peterborough, where the staff employed by Distributors and Operators of Perkins powered applications are given instructions on Diesel engine maintenance, with regard to the special characteristics of Perkins Engines.

In the event of difficulty, Distributors are recommended to communicate with one of the Companies given on Page 2.

Throughout this manual where it is considered necessary to use abbreviations, they are in accordance with those recommended by the British Standards Institute.

ENGINE PARTS

Wherever parts are ordered for Perkins Engines it is essential that the fullest information possible is given, always quote the engine number, type of application, and where possible the part number and description.

This Publication is produced by the Service Publications Department of Perkins Engines Ltd., and every endeavour is made to ensure that the information contained in this Manual is correct at the date of publication but due to continuous developments, the manufacturers reserve the right to make alterations without notice.

USE ONLY GENUINE PERKINS PARTS

TO ENSURE YOU OBTAIN THE BEST RESULTS FROM YOUR ENGINE AND TO SAFEGUARD YOUR OWN GUARANTEE, FIT ONLY GENUINE PERKINS PARTS. THESE ARE READILY OBTAINABLE THROUGHOUT THE WORLD.

SAFETY PRECAUTIONS

THESE SAFETY PRECAUTIONS ARE IMPORTANT. Refer also the the local and government regulations applicable in your jurisdiction.

Do not use these engines in marine applications.

Do not modify the engine.

Do not smoke when refuelling.

Always remove spilt fuel and soaked clothing to a safe place.

Do not refuel whilst the engine is running (unless absolutely necessary).

Never clean, lubricate or adjust the engine whilst it is running (unless qualified to do so, in which case, extreme care should be taken to avoid injury).

Do not attempt any adjustments you do not understand.

Ensure the engine is positioned so as to prevent a build-up of toxic emissions.

Warn persons in the area to keep well clear during engine and equipment or vehicle operation.

Do not wear loose clothing or allow long hair near moving machinery.

Keep well clear of rotating parts or machinery in operation. Note that fans are not clearly visible whilst the engine is running.

Do not run the engine with any safety guards removed.

Do not remove the radiator cap whilst the engine is hot and the coolant is under pressure as scalding can result.

On no account should sea water or any other electrolytic or corrosive medium be used in the cooling system.

Keep sparks or flames away from batteries as the gases from the electrolyte (especially whilst the battery is under charge) are highly inflammable. This acid is also dangerous to the skin and especially the eyes.

Always disconnect the battery terminals before repairing or interfering with the electrical system.

Only one person should be in control of the engine.

Always operate the engine from the control panel or operators seat.

If your skin comes into contact with high pressure fuel, seek medical attention immediately.

Diesel fuel can cause skin infection to some people. Use protective gloves or hand cream.

Do not move mobile equipment without first ensuring that the brakes are in good working order.

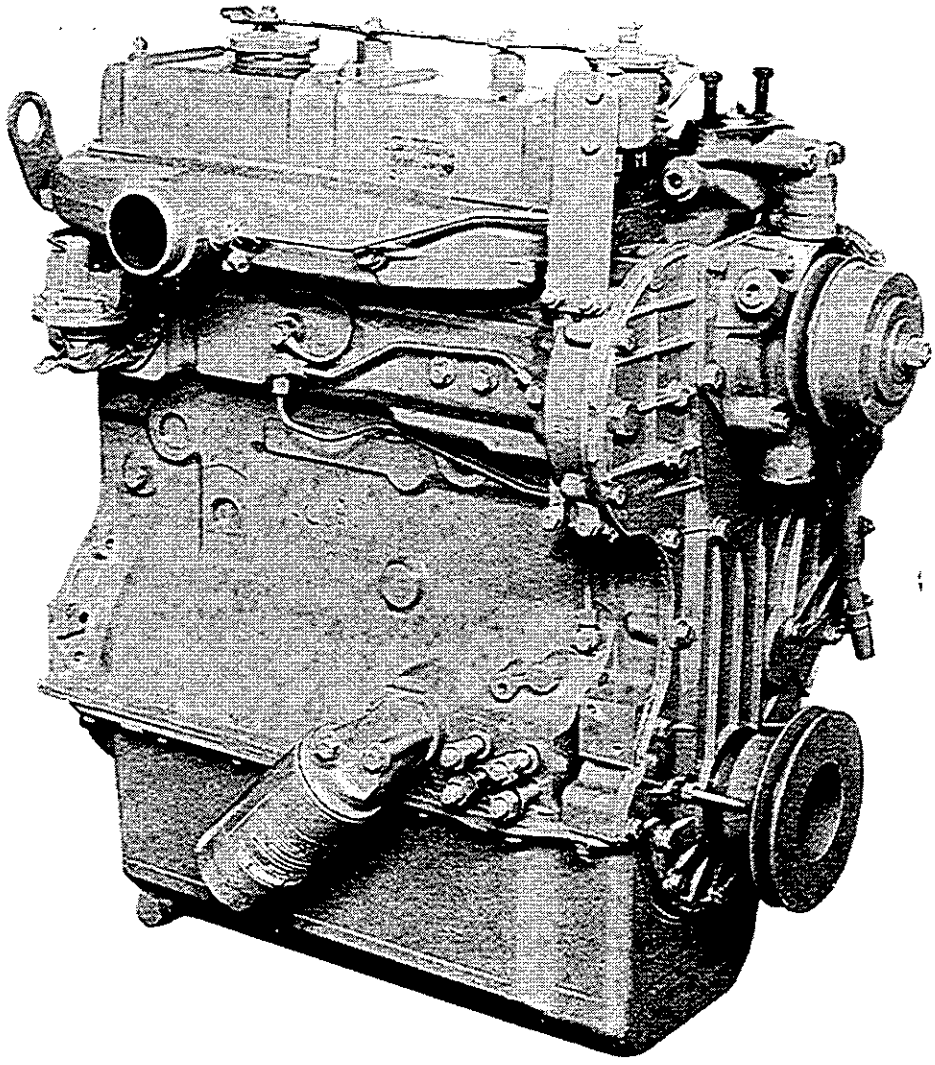
Ensure that the transmission drive control is in "Out of Drive" position before starting the engine.

Fit only genuine Perkins Parts.

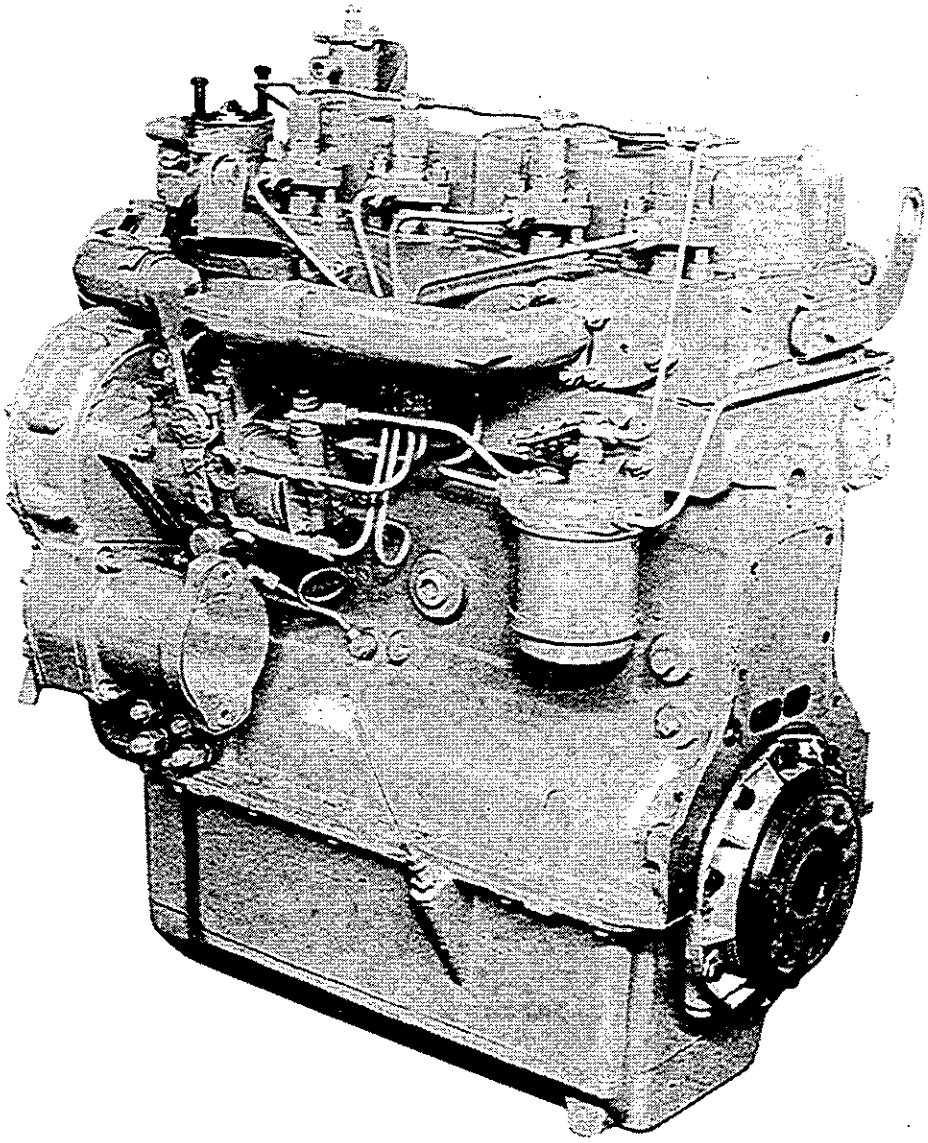
SAFETY IS SENSE. USE IT.

SECTION A
Engine Views

Perkins engines are built to individual requirements to suit the applications for which they are intended and the following engine views do not necessarily typify any particular specification.



View of Front Right Hand Side of Engine.



View of Rear Left Hand Side of Engine.

SECTION B
Technical Data

Type	Four Cylinder, Four Stroke
Combustion System 4.192/4.203	Indirect Injection
Combustion System D4.203	Direct Injection
Bore 4.203/D4.203	3.6 in (91,44 mm)*
Bore 4.192	3.5 in (88,9 mm)*
Stroke	5 in (127 mm)
Cubic Capacity 4.203/D4.203	203 in³ (3,33 Litres)
Cubic Capacity 4.192	192 in³ (3,14 Litres)
Compression Ratio 4.192	16.5 : 1
Compression Ratio 4.203	17.4 : 1
Compression Ratio D4.203	18.5 : 1
Firing Order	1, 3, 4, 2.
Tappet Clearances (4.192, 4.203 and D4.203 prior to Engine No. JE. . . U564083G)	
Inlet and Exhaust	0.012 in (0,30 mm) Cold
Tappet Clearances (D4.203 from Engine No. JE. . U564083G)	
Inlet	0.008 in (0,20 mm) Cold
Exhaust	0.012 in (0,30 mm) Cold

*Nominal—for actual bore size, refer to inside diameter of finished liner. Page B.3.

Engine Ratings

4.192

Vehicle Engine.....60 bhp (45 kW) at 2,600 rev/min
Maximum Torque .....143 lbf ft (19,7 kgf m)
Agricultural Engine.....54 bhp (40 kW) at 2,250 rev/min
Maximum Torque .....143 lbf ft (19,7 kgf m)
*Industrial Engine (Mech. Governor).....50 bhp (37 kW) at 2,000 rev/min
Maximum Torque .....143 lbf ft (19,7 kgf m)
*Industrial Engine (Hyd. Governor).....58 bhp (43 kW) at 2,400 rev/min
Maximum Torque .....143 lbf ft (19,7 kgf m)
*Maximum intermittent rating varies according to application.

4.203

Vehicle Engine.....63 bhp (47 kW) at 2,600 rev/min
Maximum Torque .....147 lbf ft (20,3 kgf m)
Agricultural Engine.....57 bhp (42 kW) at 2,250 rev/min
Maximum Torque .....151 lbf ft (20,9 kgf m)
*Industrial Engine (Hyd. Governor).....60 bhp (45 kW) at 2,400 rev/min
Maximum Torque .....141 lbf ft (19,5 kgf m)
*Industrial Engine (Mech. Governor).....53 bhp (39 kW) at 2,000 rev/min
Maximum Torque .....151 lbf ft (20,9 kgf m)
*Maximum intermittent rating varies according to application.

D4.203

Agricultural Engine.....56 bhp (41 kW) at 2,000 rev/min
Maximum Torque .....161 lbf ft (22,2 kgf m)