KOBELCO®

Model DC
MITSUBISHI DIESEL ENGINE

SHOP MANUAL

APPLICABLE

8DC8-256818
8DC9-250688
and up

FOREWORD

This shop manual contains the specifications, construction, operation, adjustment and service procedures of the Model **8DC8, 8DC9, 8DC9-T** diesel engine for service mechanics engaged in servicing of the Mitsubishi diesel engines.

Please make the most of this shop manual to perform correct servicing and wasteless operations.

Note that some of the contents of this shop manual are subject to change owing to improvements, etc. that may be introduced after publication of the shop manual.

Applicable Engine Models

8DC8
8DC9
8DC9-T
} For industrial use

Applicable Engine No.

8DC8-256818
8DC9-250688 and up

COMPILATION OF THIS MANUAL

1. The contents of this shop manual are divided as shown below when edited.

Group No.	Group Name	Contents
1	General	General description, outside view photograph and cross section view of engine, specifications, construction and operation
2	Service standards	Engine service standards, service standards table, tightening torque table, sealant and grease table
3	Special tools	Shapes and usages of special tools
4	Determining time to overhaul	Decision on time to overhaul, measurement of compression pressure
5	Removal and installation of auxiliaries	Removal and installation of auxiliaries such as injection pump, starter, alternator and compressor
6	Engine proper	Disassembly, inspection and reassembly of engine proper, including cylinder head, valve mechanism, camshaft, piston, crankshaft, timing gear, flywheel, etc.
7	Inlet and exhaust	Disassembly, inspection and reassembly of air cleaner, turbocharger, etc.
8	Lubrication	Disassembly inspection and reassembly of lubrication system, including oil pump, oil filter, oil cooler, etc.
9	Cooling	Disassembly, inspection and reassembly of cooling system, including water pump, thermostat, radiator, etc.
10	Fuel	Disassembly, inspection and reassembly of fuel system, including injection pump, injection nozzle, fuel filter, water separator, etc.
11	Electrical	Inspection of starter, starter relay, alternator, etc.
12	Other equipment	Disassembly, inspection and reassembly of air compressor, automatic stop device.
13	Clutch	Disassembly, inspection and reassembly of clutch, bearing case.

2. How to read disassembly and reassembly drawings

   (a) The part names and numbers in the drawings correspond to those in the text. The parts are numbered in the order of disassembly.

   (b) The inspection items to be performed during disassembly operations are shown in the disassembly drawings.

   (c) All tightening torque specifications in the reassembly drawings may be considered "dry" unless "wet" is specified.

3. Definition of terms

   (a) Nominal Value (Abbr.: NV)

   Shows dimension of single part, mutual clearance between parts or standard performance. Values, however, are rounded off within limits necessary for inspection.

   (b) Repair Limit (Abbr.: RL)

   Shows that when specified value is reached, repair is necessary. Repair means adjustment, grinding, replacement of bushings, metals and the like, selection of oversize, selection of shim thickness, etc.

   (c) Service Limit (Abbr.: SL)

   Shows that when specified value is reached, replacement of the parts with new one is necessary.

   (d) Basic Diameter (Abbr.: BD)

   Shows nominal diameter of part to be measured.

4. Unit

   The SI unit (International System of Units) is used. Metric notation is jointly shown in parentheses.

5. Table of Conversion Rate for Foot-pound Units into SI Units

Unit	Sign of SI unit	Sign of foot-pound unit	Conversion rate
Mass quantity of matter	kg g	lb oz	1 kg = 2.2046 lb 1 g = 0.035274 oz
Dimension	m mm	ft. in.	1 m = 3.2808 ft. 1 mm = 0.03937 in.
Capacity	lit. cc	gal. oz	1 lit. = 0.2642 gal. (U.S.) 0.220 gal. (Imp.) 1 cc = 0.033814 oz (U.S.) 0.035195 oz (Imp.)
Force	N (Newton)	lbf	1 N = 0.2248 lbf
Pressure	kPa (Kilopascal)	$lbf/in.^2$	1 kPa = 0.145 $lbf/in.^2$ 1 kPa = 0.2953 in. Hg
Stress	N/cm^2	$lbf/in.^2$	1 N/cm^2 = 1.45 $lbf/in.^2$
Moment of force	N m	ft. lbf	1 N m = 0.7375 ft.lbf
Output	kW (kilowatt)	HP	1 kW = 1.34 HP
Temperature	°C	°F	t°C = (1.8t°C + 32)°F

CONTENTS

NOTES

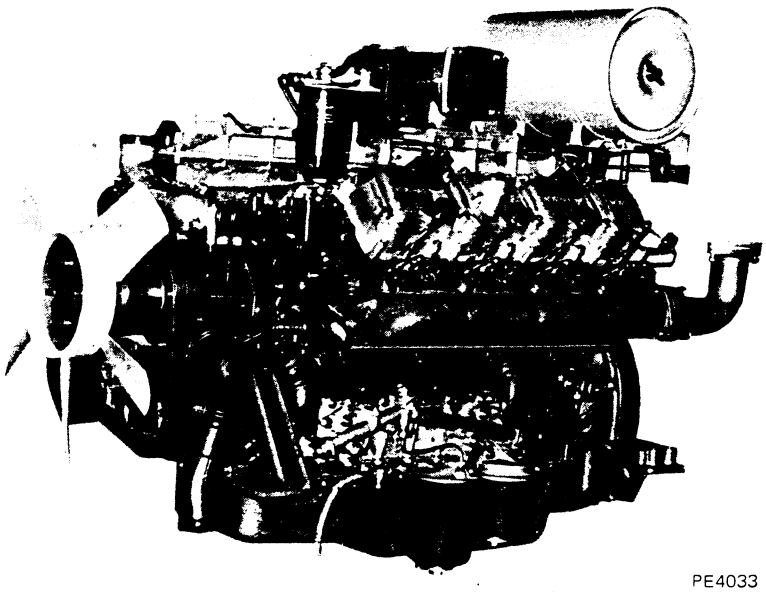
1. GENERAL

CONTENTS

1-1 GENERAL DESCRIPTION

1-1-1 Outside View Photographs

(1) 8DC8, 8DC9



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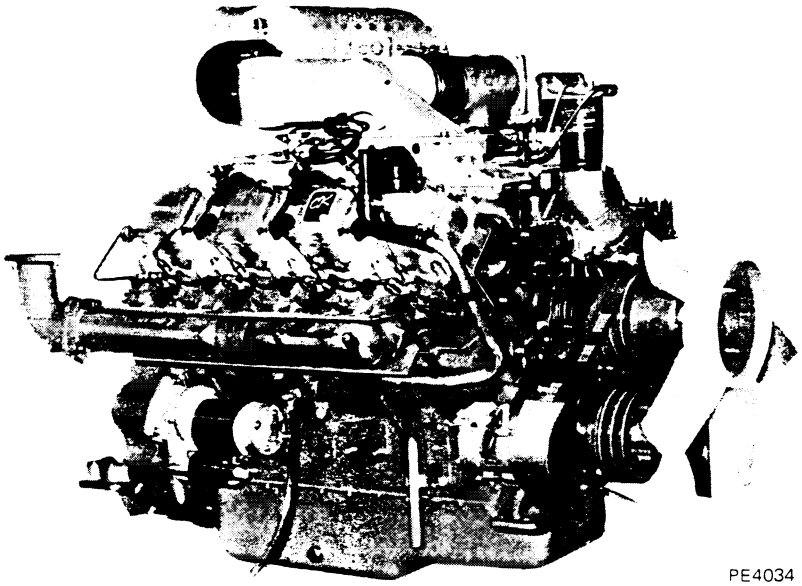
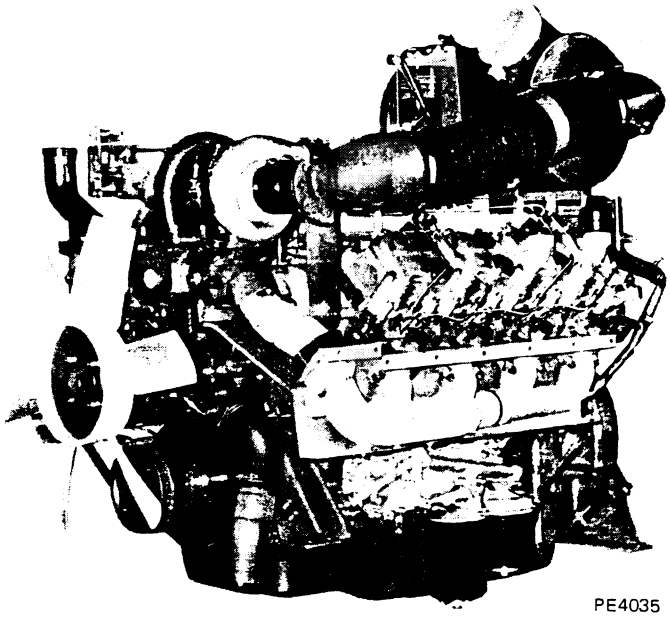


PE4034

(2) 8DC9-T



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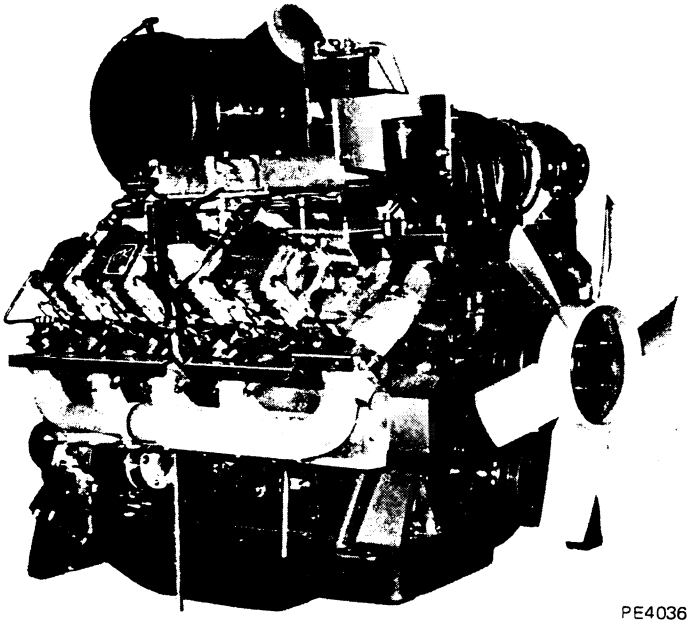

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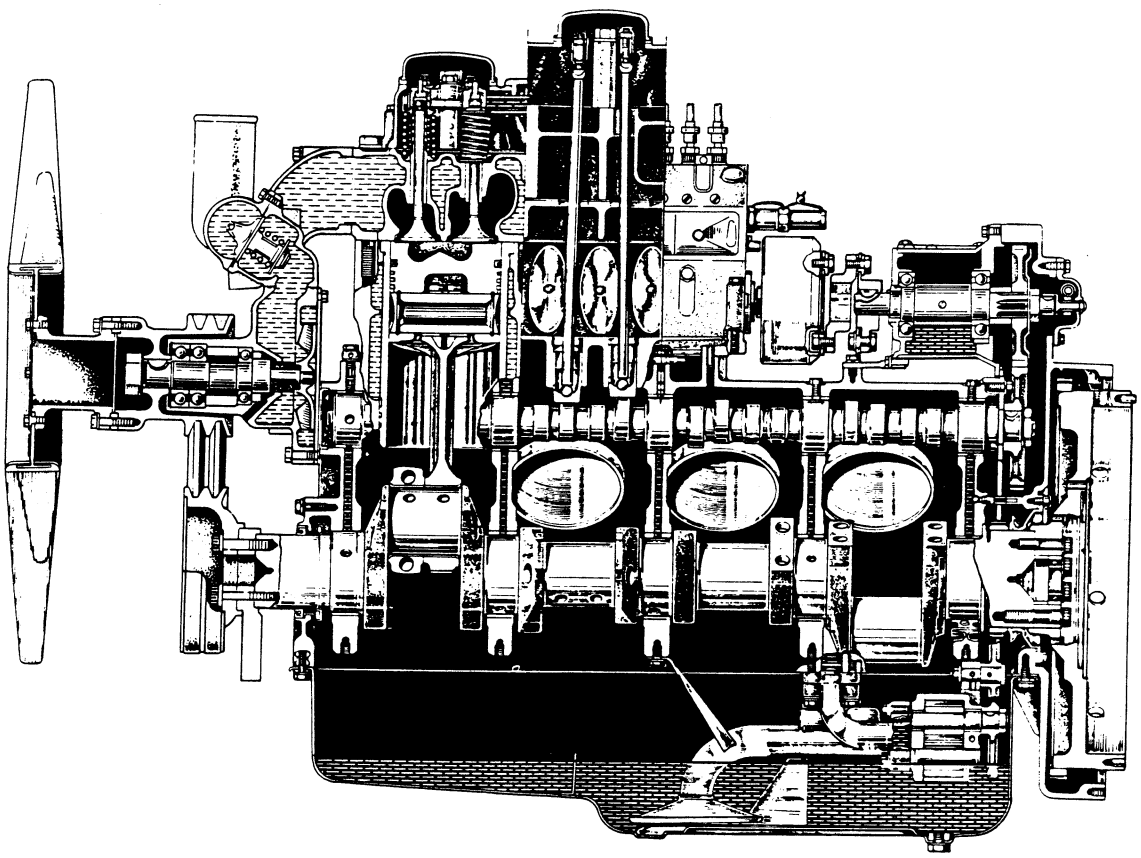
1-1-2 Engine Sectional Views

(1) 8DC8, 8DC9



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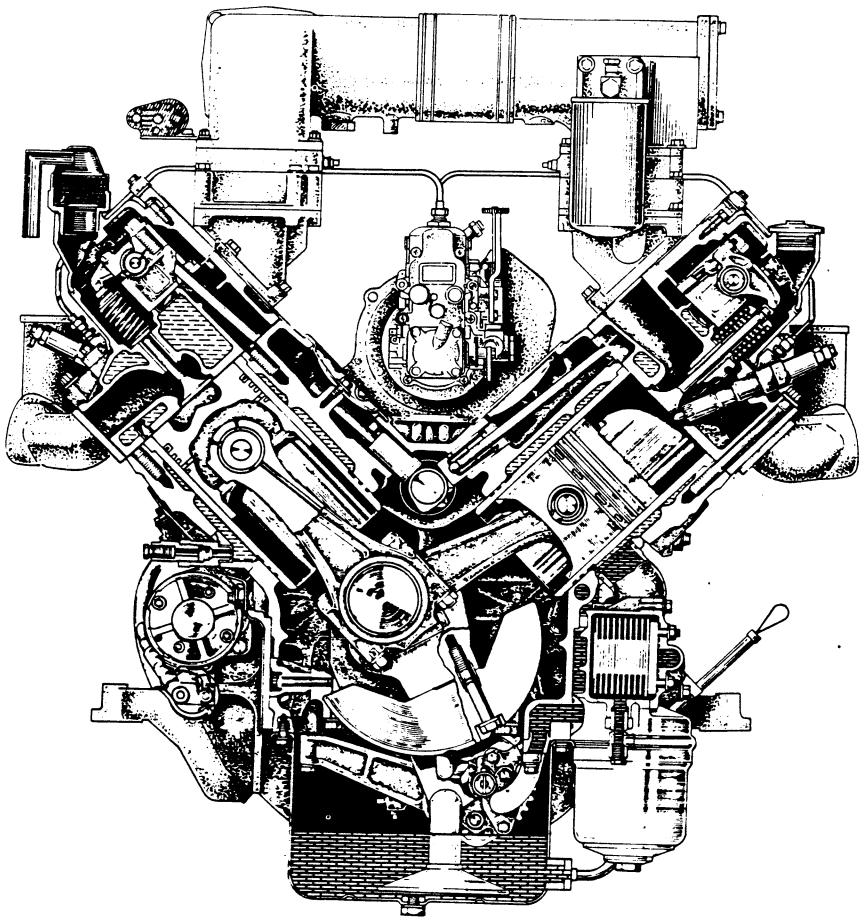

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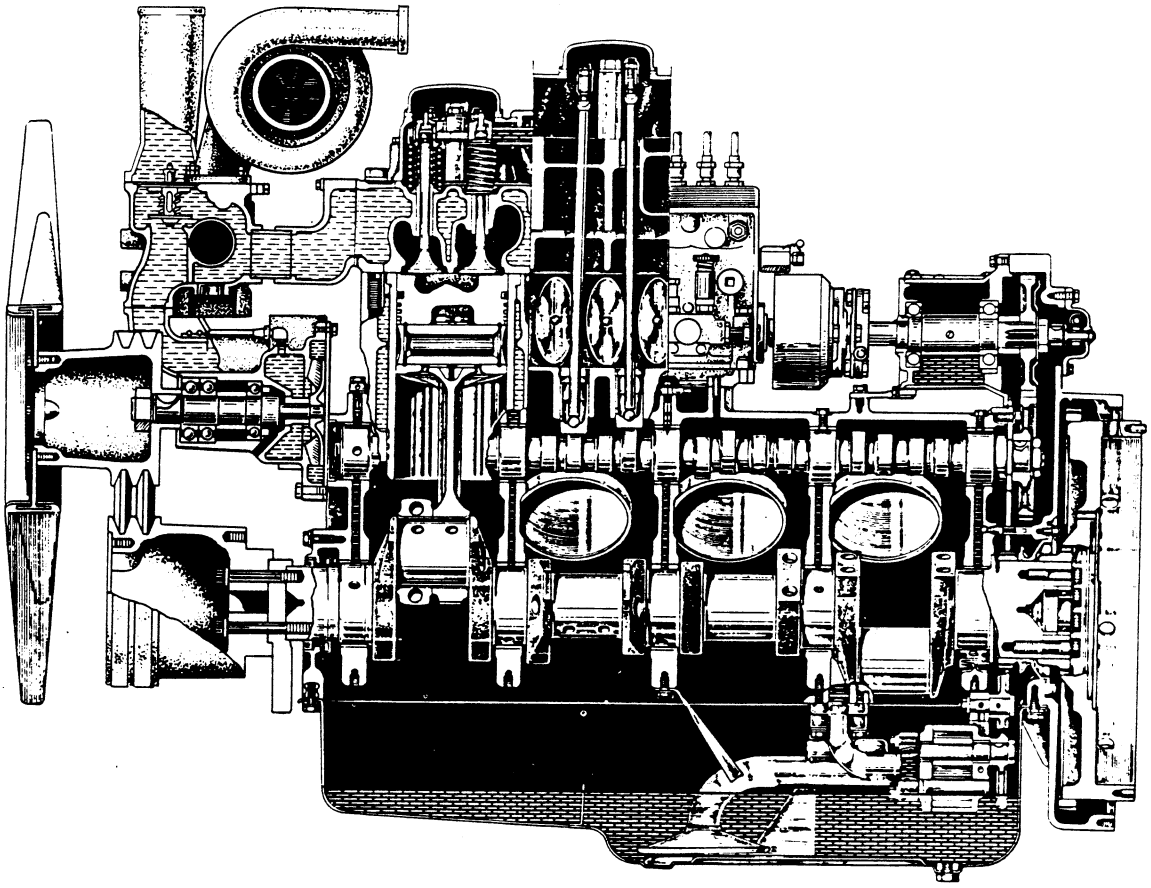

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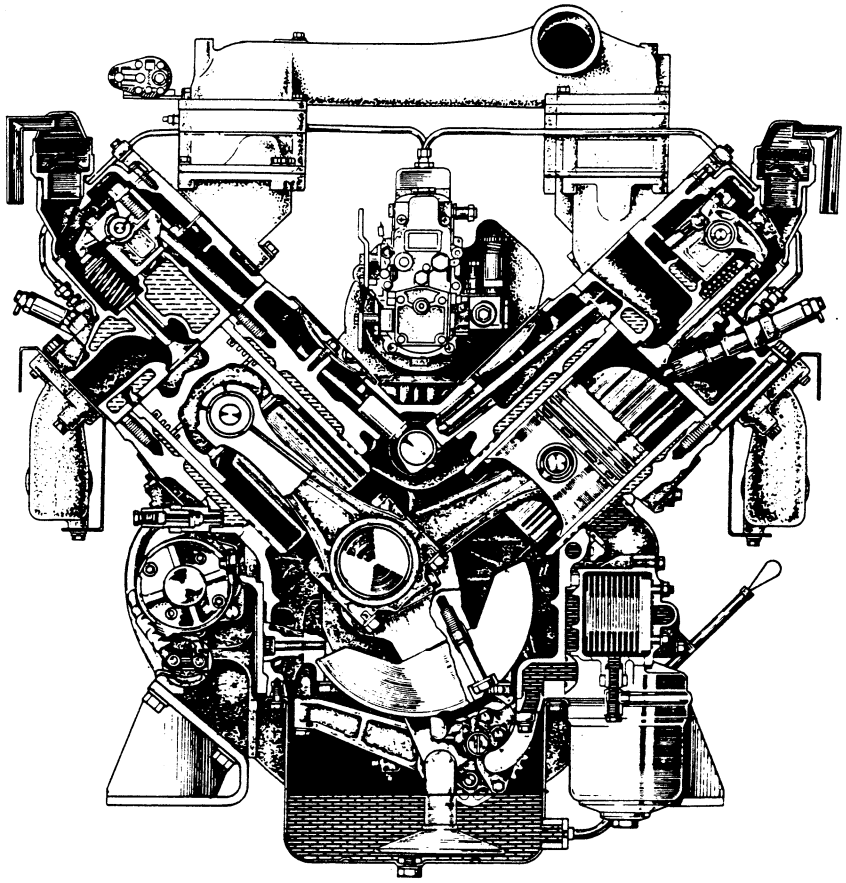

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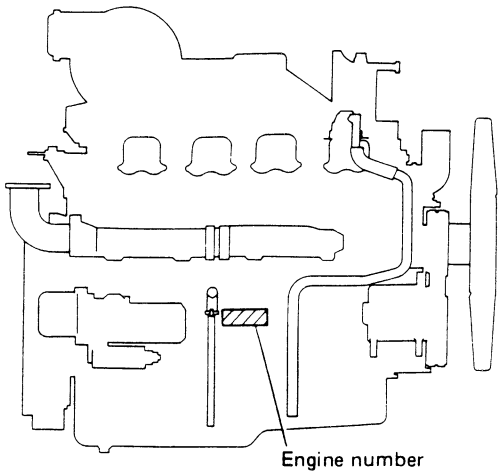
1-1-3 Engine Number and Nameplate

(1) Engine Number

The engine number stamped on the right side of the crankcase as shown below.

	Model	Number
Example	8DC8 -	260001

The engine number is an important number in learning the history of the engine.

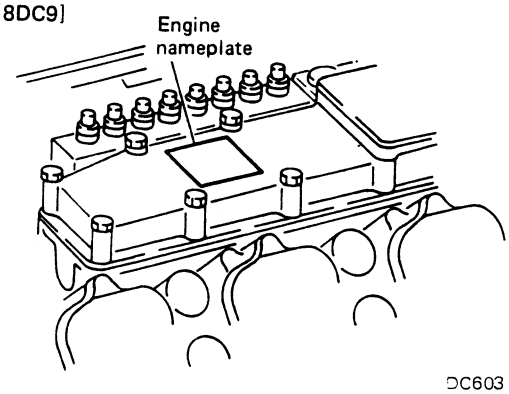


DC588

(2) Nameplate

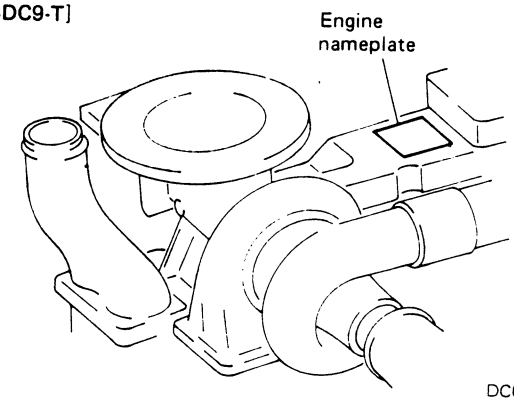
The nameplate is located at the position shown in illustration at right. The nameplate shows the engine model, application symbol, total displacement, rated output/engine speed, valve clearance, firing order, and fuel injection timing

[8DC9]



DC603

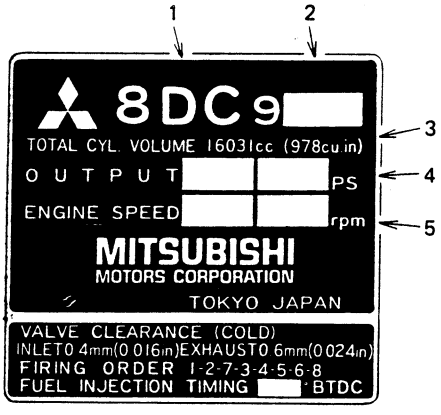
[8DC9-T]



DC604

Indication on Nameplate

1 Engine model
2 Application symbol
  C: For construction machinery (CT denotes engine with turbocharger.)
  P: For power generator and general power plant (PT denotes engine with turbocharger.)
3 Total displacement
4 Rated output
5 Engine speed



DC605

1-2 SPECIFICATIONS

1-2-1 Principal Specifications

Item	Specification		
Engine model	8DC8	8DC9	8DC9-T
Type	Water cooled, 4-cycle diesel	Water cooled, 4-cycle diesel	Water cooled, 4-cycle dieslel
Number of cylinders - arrangement	8-90°V	8-90°V	8-90°V
Valve mechanism	Overhead valve	Overhead valve	Overhead valve
Combustion chamber	Direct injection type	Direct injection type	Direct injection type
Cylinder bore x stroke	135 x 130 mm	135 x 140 mm	135 x 140 mm
Total displacement	14 886 cc	16 031 cc	16 031 cc
Compression ratio	17	17	16
Firing order	1-2-7-3-4-5-6-8	1-2-7-3-4-5-6-8	1-2-7-3-4-5-6-8
Engine dimensions			
Overall length	1 266.5 mm	1 307.5 mm	1 405 mm
Overall width	1 010 mm	1 085 mm	1 128 mm
Overall height	1 097.5 mm	1 249.5 mm	1 407.5 mm
Weight	1 130 kg	1 170 kg	1 300 kg

The engine dimensions and weight shown are Mitsubishi Motors corporation standard specifications.

1-2-2 Specifications of Each Device

Engine proper

Item		Specification
Cylinder liner	Type	Wet type
Piston	Type	Trunk, slipper-skirt type
Piston ring	Quantity	Compression ring: 2 [8DC8], 3 [8DC9, 9-T] Oil ring: 1

Inlet and Exhasut

Item		Specification
Air cleaner		(Nippon Donaldoson Ltd. product)
Element	Type	Cyclone type filter paper element
Supercharger		[8DC9-T]
	Type	Turbocharger
	Model	Mitsubishi Schwitzer 4LF type

Lubrication

Item		Specification	
Engine oil		[8DC8, 9]	[8DC9-T]
	Quality	API Classification Grade CC or better	API Classification Grade CD or better
	Quantity	Approx. 30 lit. (oil pan only), Approx. 3 lit. (oil filter only)	
Lubrication system		Forced lubrication by oil pump	
Oil pump	Type	Gear pump	
Relief valve	Type	Ball valve type	

Item		Specification
Oil filter		
Full-flow filter element		
	Type	Filter paper type
Bypass filter element		
	Type	Filter paper type
Oil bypass alarm		
	Type	Piston valve containing electric contact
Oil cooler	Type	Shell and plate type (multi-plate type)
Bypass valve		
	Type	Piston valve type

Cooling

Item		Specification	
Cooling system		Water-cooled, forced circulation type	
Cooling water quantity (engine proper)		[8DC8]	[8DC9, 9-T]
		22 lit.	25 lit.
Water pump	Type	Centrifugal type	
	Drive system	V-belt drive	
V-belt	Type x Quantity		[Option]
		Low edge cog C type x 2 (for water pump and alternator)	Low edge cog C type x 1 (for water pump and alternator), Low edge cog C type x 2 (for fan drive)
Thermostat	Type	Wax pellet bottom bypass type	
	Valve opening temperature x quantity	[8DC8, 9]	[8DC9-T]
		82 °C x 2 (with jiggle valve)	76.5 °C x 2
Fan		[Standard]	[Option]
	Type	Polypropylene pusher type	Polypropylene suction type, Steel suction type

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