

KOBELCO[®]

Model DC
MITSUBISHI DIESEL ENGINE



SHOP MANUAL



APPLICABLE

8DC8-256818

8DC9-250688

and up

Bur • Issue Date 07-1984

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

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. |

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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 |

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NOTES

1. GENERAL

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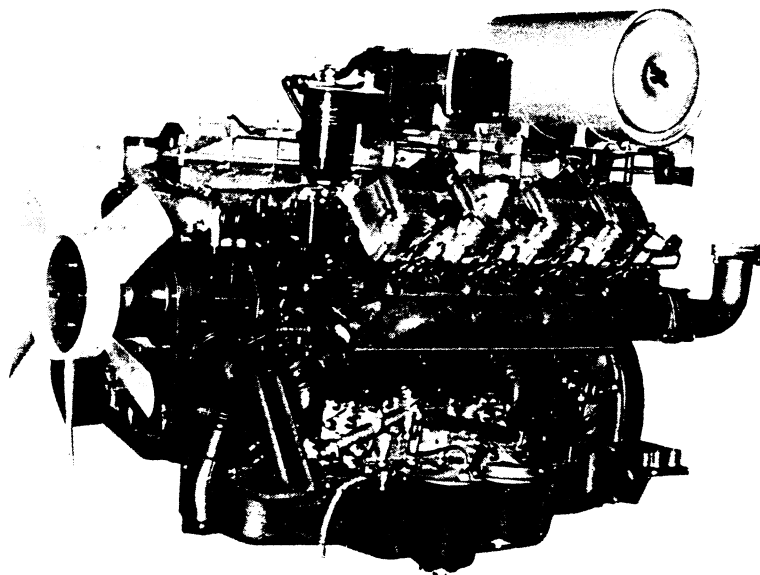
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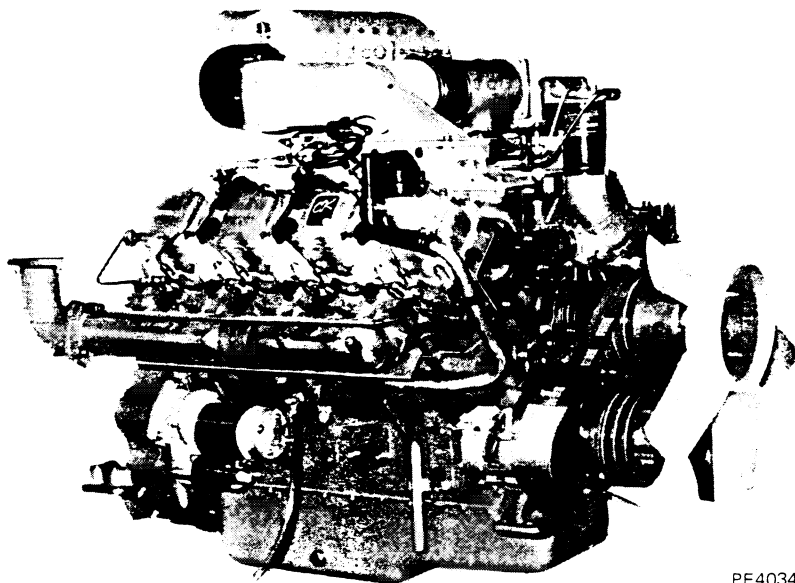
1-1 GENERAL DESCRIPTION

1-1-1 Outside View Photographs

(1) 8DC8, 8DC9

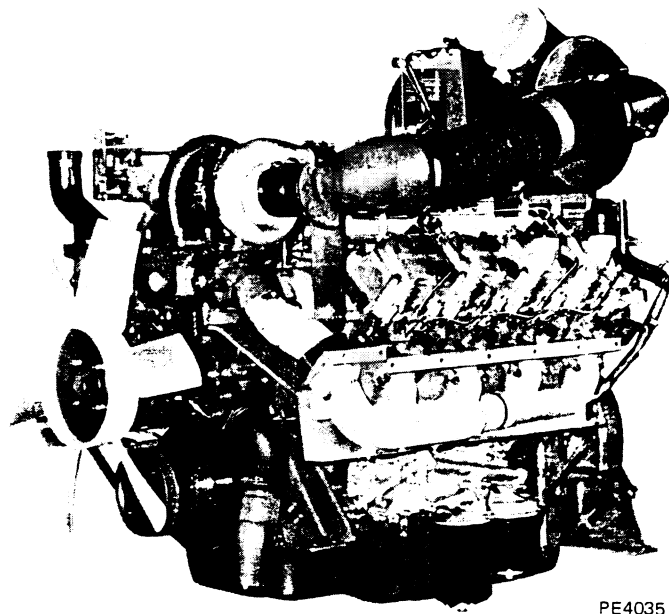


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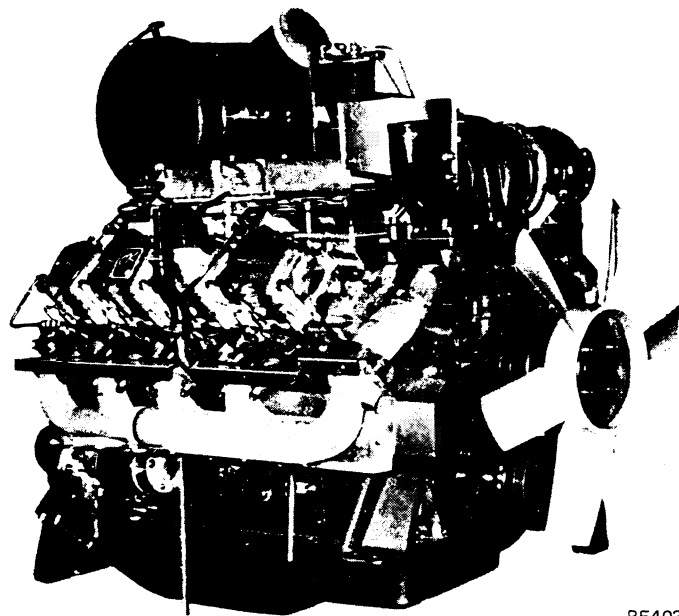


PE4034

(2) 8DC9-T



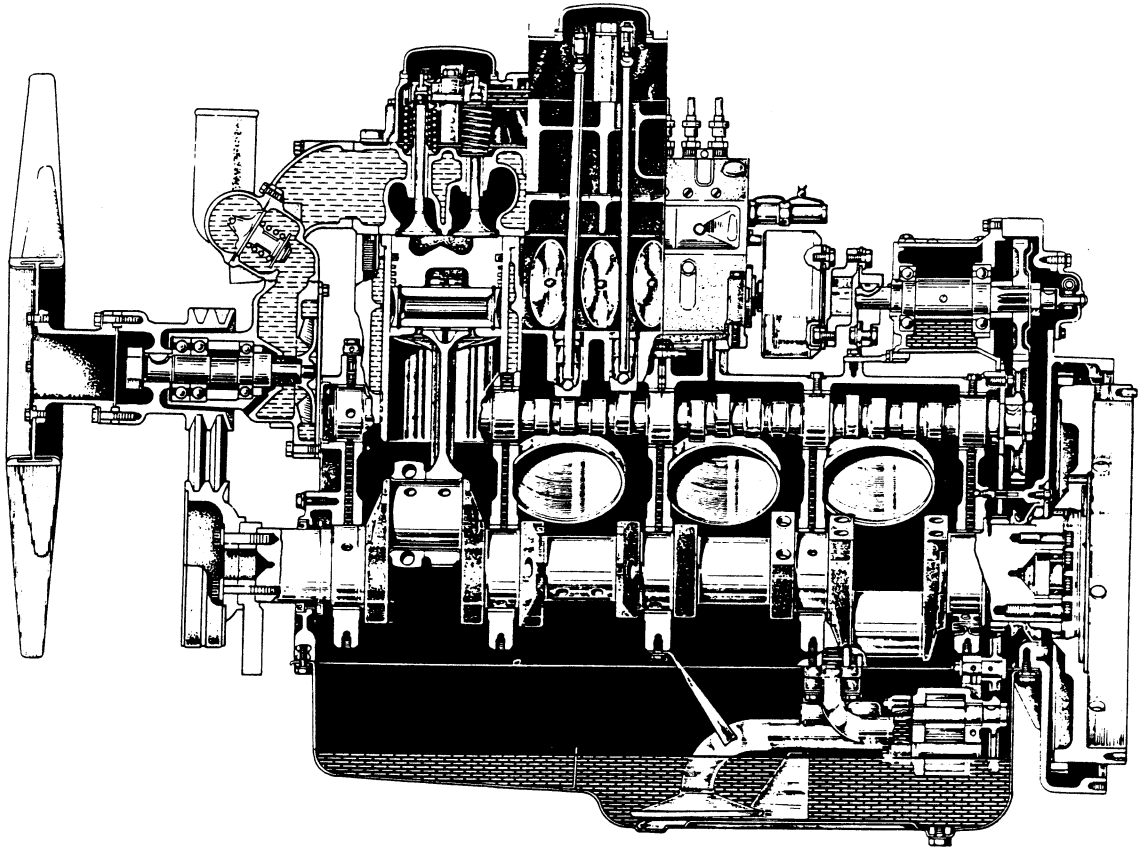
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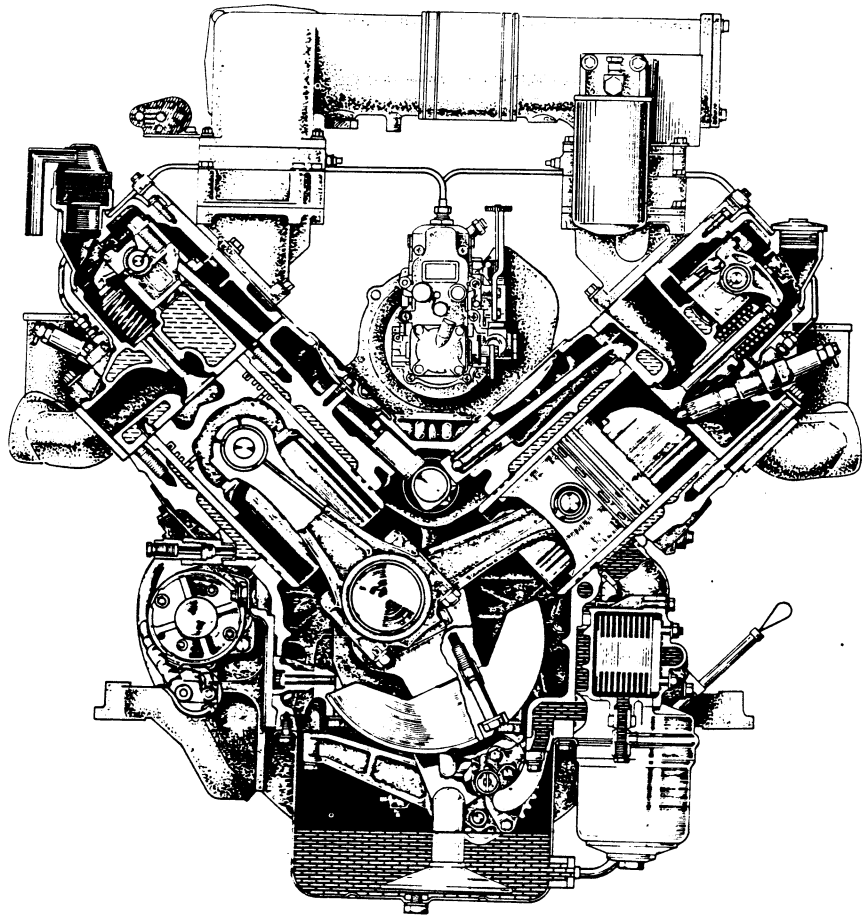
PE4036

1-1-2 Engine Sectional Views

(1) 8DC8, 8DC9

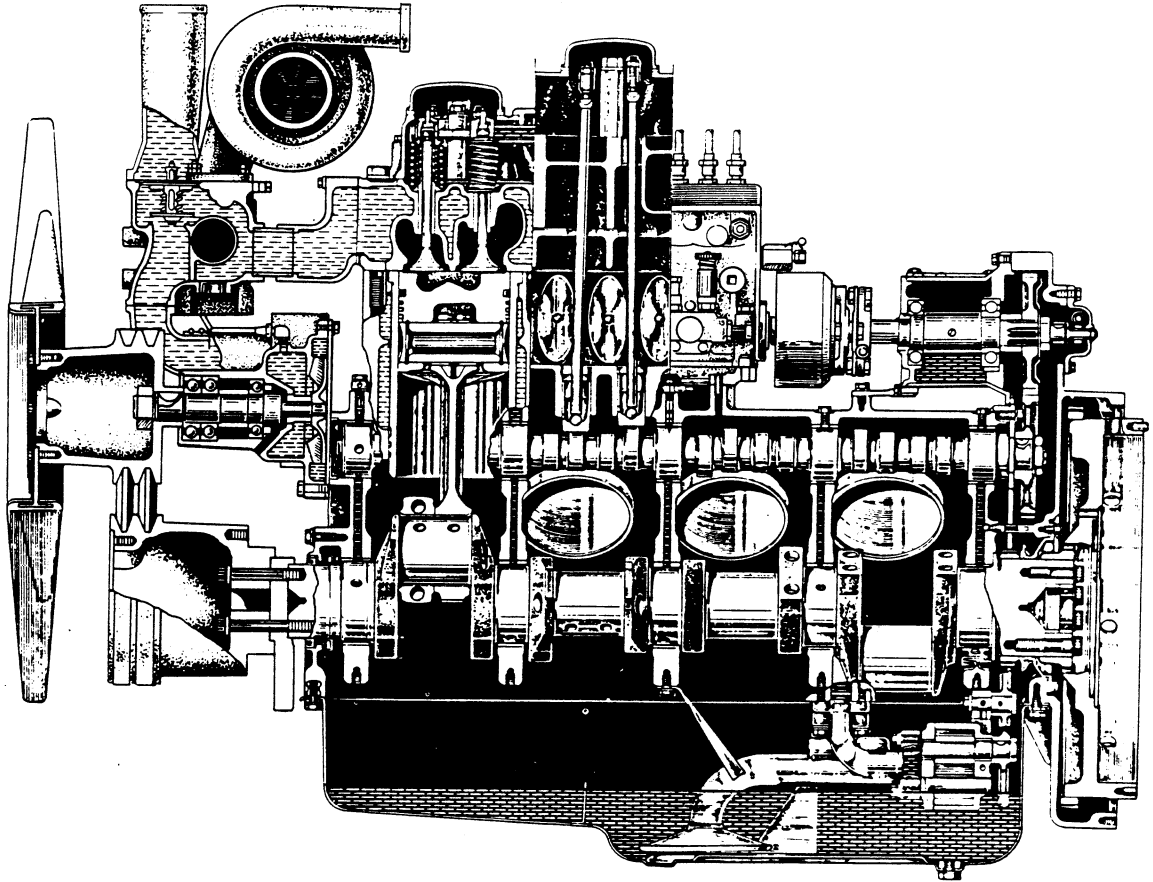


PE9239

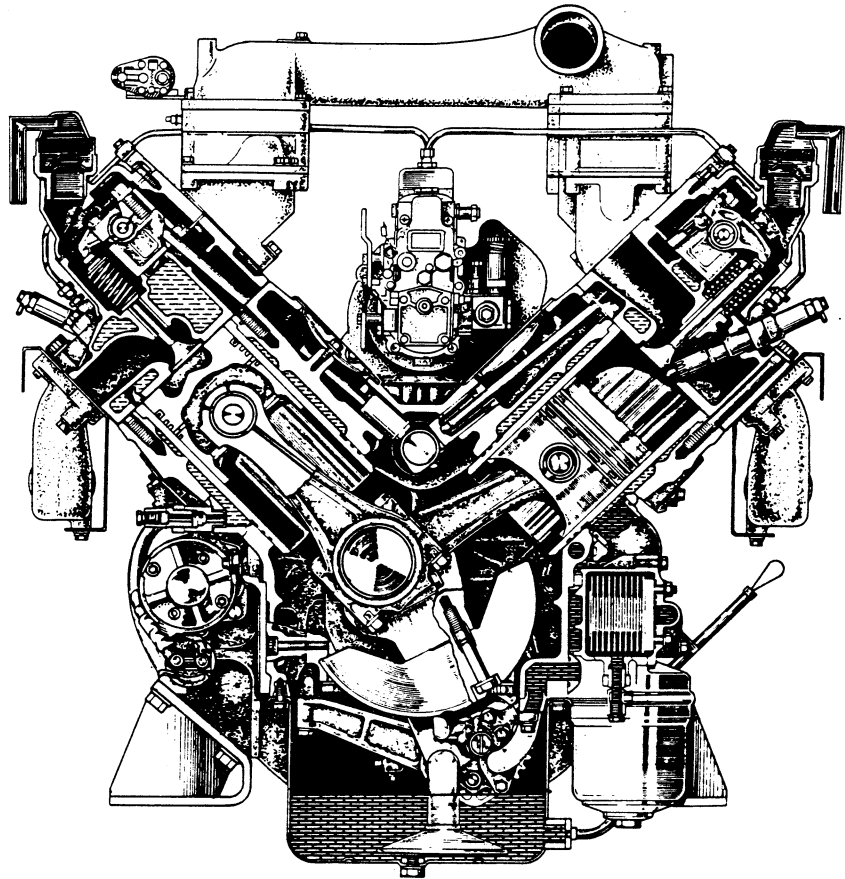


PE9240

(2) 8DC9-T



PE9241



PE9242

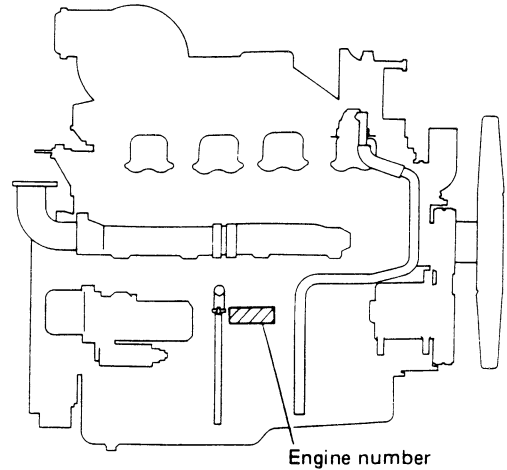
1-1-3 Engine Number and Nameplate

(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.



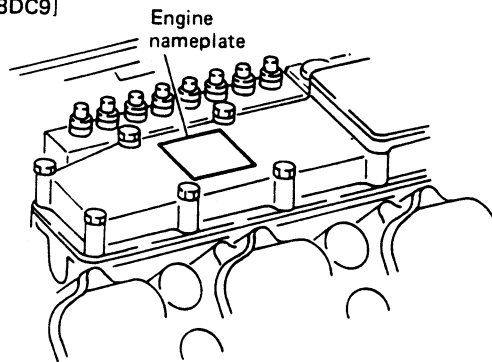
Engine number

DC588

(2) Nameplate

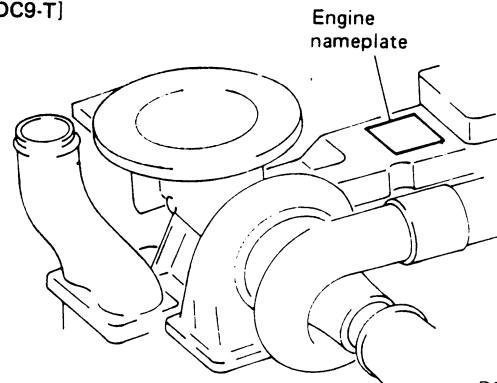
The nameplate is located at the position shown in illustration at right. The nameplate shows the engine model, application symbol, total displacement, rated output/engine speed, valve clearance, firing order, and fuel injection timing

[8DC9]



DC603

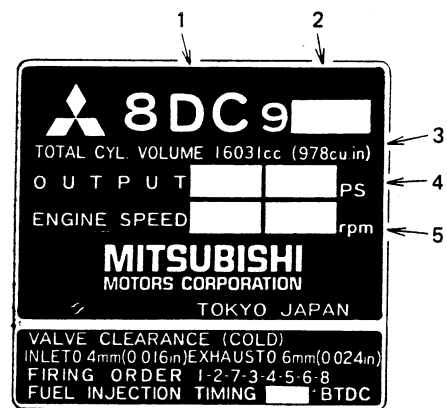
[8DC9-T]



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 diesel |
| Number of cylinders - arrangement | 8-90°V | 8-90°V | 8-90°V |
| Valve mechanism | Overhead valve | Overhead valve | Overhead valve |
| Combustion chamber | Direct injec- tion type | Direct injec- tion type | Direct injec- tion 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.



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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 Donaldson 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 | |

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