

# GENERAL INFORMATION

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## ENGINE SPECIFICATIONS

Model		D6DA	
Type		Diesel, 4cycle, Inline 6 cylinder, water cooled, direct injection	
Aspiration Type		Turbo charge Type	
Cylinder Bore x Stroke		Ø 109 x 118mm	
Displacement		6.606	
Compression ratio		17.6 : 1	
Firing order		1-4-2-6-3-5	
Direction of rotation		Counter-clockwise viewed from fly wheel	
Compression pressure		36-39kgf/cm <sup>2</sup> (280rpm)	
Idle rpm		640±25rpm	
Weight		Approx. 580kg	
Value seat angle	Intake	30°	
	Exhaust	45°	
Value face angle	Intake	30°	
	Exhaust	45°	
Value Timing (flywheel travel)	Intake	Open	BTDC 12°
		Close	ABDC 32°
	Exhaust	Open	BBDC 59°
		Close	ATDC 13°
Value clearance (cold)	Intake	0.30mm	
	Exhaust	0.50mm	
Oil pump		Gear pump Type	
Oil cooler		Water cooled plate fin type	
Injection nozzle	Type	Multi hole	
	Valve opening	160/220kgf.cm <sup>2</sup>	
Water pump	Type	Forced circulation by volute pump	
	Drive	V-belt, Centrifugal type	
Thermostat		Wax pellet and bottom bypass type	
Injection timing		BTDC 6° ± 1° (when compression stroke No.1 cylinder)	

## GENERAL

### How to Read Disassembly and Reassembly Drawings

1. The part names and numbers in the drawings correspond to those in the text. The parts are numbered in the order of disassembly.
2. The inspection items to be performed during disassembly operations are shown in the disassembly drawings.
3. All tightening torque specifications in the reassembly drawings may be considered "dry" unless "wet" is specified.

### Definition of Terms

Unless otherwise specified, all dimensional presentation in illustrations representing the following values or limits is in mm although the unit is not indicated.

1. Nominal Value (Abbr.: NV)  
Shows dimension of an individual part, mutual clearance between parts of standard performance. Values however, do not necessarily coincide with design values as they are rounded off to fall within limits necessary for inspection.
2. 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.
3. Service Limit (Abbr.: SL)  
Shows that when specified value is reached, replacement of the parts with new one is necessary.
4. Basic Diameter (Abbr.: BD)  
Shows nominal diameter of part to be measured.
5. Tightening Torque (Abbr.: T)  
Shows tightening torque of bolts or nuts.

### UNIT

The SI unit is used. Metric notation is jointly shown in parentheses.

### NOTE, WARNING AND CAUTION

#### 1. Note

A Point of information for the customer.

#### 2. Caution

Information about an activity that could cause damage to the vehicle.

#### 3. Warning

Information about an activity that could cause injury or damage to the driver, occupants or other personnel.

### Table of Conversion Rate for Foot-pound Units into SI Units

Unit	Sign of unit	Sign of Foot-pound unit	Conversion rate
Mass quantity of matter	kg	lbs	1 kg = 2.2046 lbs
	g	oz	1 g = 0.035274 oz
Dimension	m	ft.	1 mm = 3.2808 ft.
	mm	in.	1 mm = 0.03937 in.
Capacity	lit.	gal.	1 lit. = 0.2642 gal. (U.S.) 0.220 gal. (Imp.)
	cc	oz	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. <sup>2</sup>	1 kPa = 0.145 lbf/in. <sup>2</sup>
			1 kPa = 0.2953 in.Hg
Stress	N/cm <sup>2</sup>	lbf/in. <sup>2</sup>	1 N/c m <sup>2</sup> = 1.45 lbf/in. <sup>2</sup>
Moment of force	Nm	lbf.ft	1 Nm = 0.7375 lbf.ft
Output	kW (kilowatt)	HP	1 kW = 1.34 HP
Temperature	°C	°F	T°C = (1.8 t°C + 32)°F

## General Precautions For Servicing

Before starting the service procedures, check the vehicle for total distance driven, use conditions, and user's complaints and requests to know exactly the engine conditions. Record information where necessary.

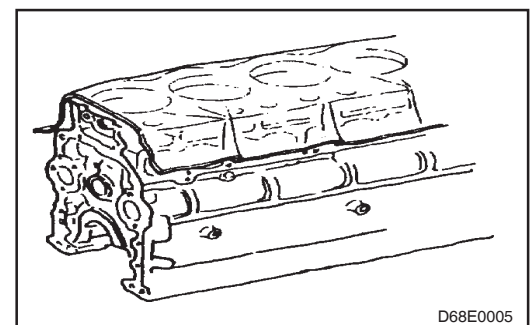
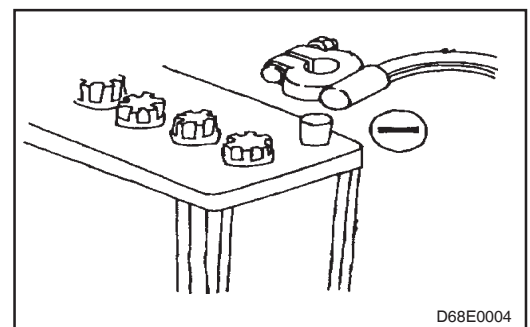
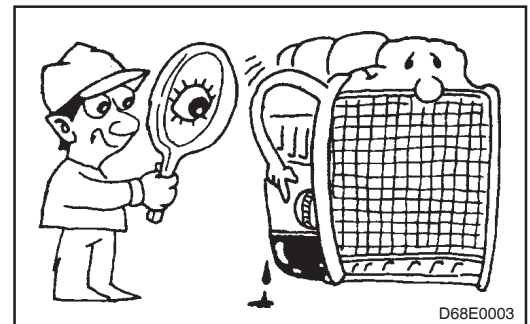
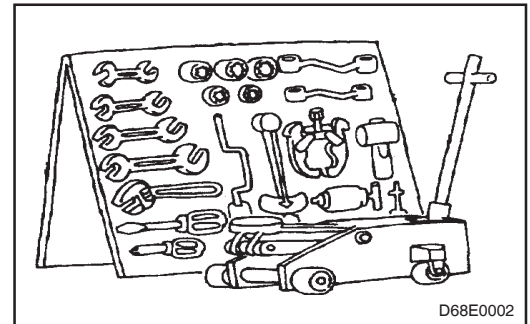
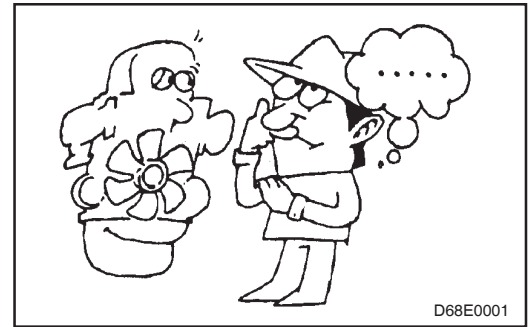
To ensure you are doing correct and efficient service jobs, observe the following precautions:

- (1) Before performing the service procedures given in this manual, know the trouble spots and isolate the possible cause to determine whether the removal or disassembly procedure is required.
- (2) Select a flat surface for the service job.

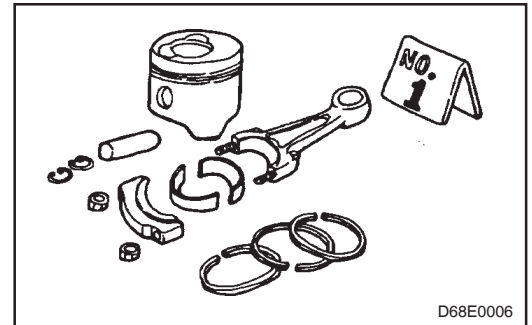
- (3) Ready and make the most of the special tools required for servicing. Use the right tools (specified special tools) in the right place to prevent damages to parts and personal injury.

- (4) Carefully check parts for oil leaks before cleaning. After cleaning, it may become difficult to spot defective areas.

- (5) When servicing the electrical system, be sure to disconnect the negative cable from the battery.



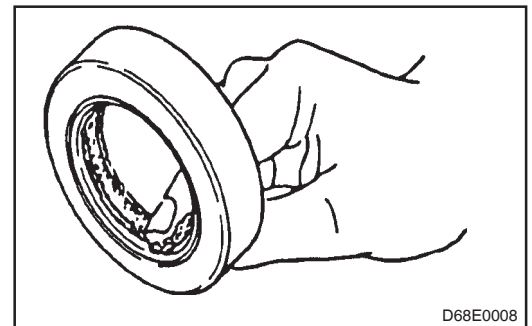
- (6) Cover areas from which parts have been removed to protect entry of dust and dirt.



- (7) Make alignment marks and keep disassembled part neatly arranged to ensure that they are reassembled into the right positions.
- o Special care must be taken for assemblies involving a number of parts, similar parts, or parts identical at right- and left-hand sides to ensure correct reassembly.
  - o For alignment and punching markings, select a position that would not mar the appearance and function.
  - o Clearly distinguish parts to be replaced from those re used.



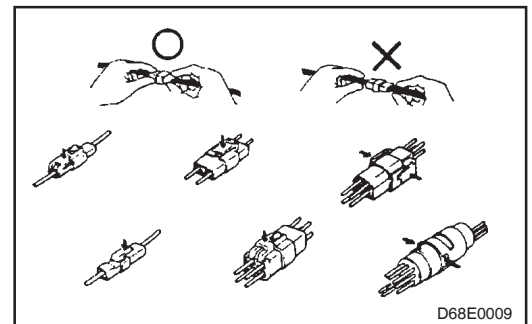
- (8) The oil seals, packings, O-rings, and other rubber parts, gaskets, and split pins must be replaced with a new one whenever they are removed. For replacement, use HMC Genuine parts.



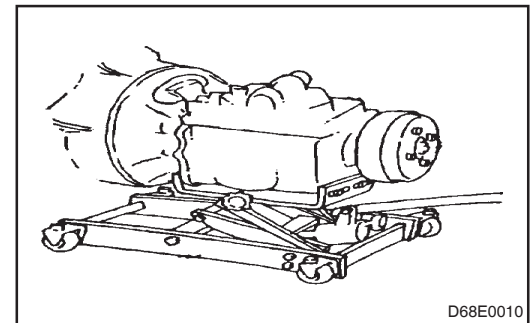
- (9) Apply the specified grease to U-packings, oil seals, dust seals, and bearings before installation.

- (10) Special care must be taken in handling sensors and relays which are susceptible to shocks and heat.

- (11) Connector handling precautions  
When disconnecting the connectors, never pull the harness. Hold the connectors. To disconnect locking connectors, push in the direction indicated by an arrow.



- (12) From a safety viewpoint, use utmost caution when handling the engine, transmission and other heavy items.



- (13) When work requires an assistant or two, always make sure of the safety each other. Never play with switches and levers.
- (14) When checking or changing lubricants, wipe off grease and oil from parts immediately with a waste.
- (15) Use care so that hands and fingers are not injured by sharp edges or corners of the parts.

## STANDARD BOLTS AND NUTS

Unless otherwise specified, the parts and equipment of vehicle must be tightened by the following standard bolts nuts. Tightening torques for these bolts and nuts are shown below.

**NOTE:**

**Threads and seat surfaces must be in dry state.**

**When there is a difference between the nut and bolt (stud) identification marks, tighten to the torque corresponding to the bolt (stud) identification mark.**

**Standard bolts and nuts**

Unit: Nm (kgf m)

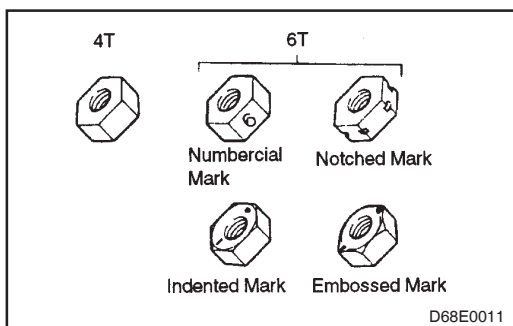
Dia. mm	Pitch mm	4T (Head mark 4 or O)	7T (Head mark 7 or Θ)	8T (Head mark 4 or ⊕)
5	0.8	2.0 to 2.9 (0.2 to 0.3)	3.9 to 5.9 (0.4 to 0.6)	4.9 to 6.9 (0.5 to 0.7)
6	1.0	3.9 to 5.9 (0.4 to 0.6)	6.9 to 10.8 (0.7 to 1.1)	7.8 to 11.8 (0.8 to 1.2)
8	1.25	8.8 to 13.7 (0.9 to 1.4)	16.7 to 25.5 (1.7 to 2.6)	19.6 to 29.4 (2.0 to 3.0)
10	1.25	18.6 to 27.5 (1.9 to 2.8)	34.3 to 53.9 (3.5 to 5.5)	44.1 to 58.8 (4.5 to 6.0)
	1.5	17.7 to 26.5 (1.8 to 2.7)	32.4 to 49.0 (3.3 to 5.0)	42.1 to 58.8 (4.3 to 6.0)
12	1.25	33.3 to 49.0 (3.4 to 5.0)	68.6 to 93.2 (7.0 to 9.5)	83.4 to 108 (8.5 to 11)
	1.75	30.4 to 46.1 (3.1 to 4.7)	63.7 to 83.4 (6.5 to 8.5)	73.5 to 98.1 (7.5 to 10)
14	1.5	58.8 to 83.4 (6.0 to 8.5)	118 to 157 (12 to 16)	127 to 177 (13 to 18)
	2.0	53.9 to 73.5 (5.5 to 7.5)	108 to 137 (11 to 14)	118 to 167 (12 to 17)
16	1.5	93.2 to 127 (9.5 to 13)	177 to 235 (18 to 24)	196 to 265 (20 to 27)
	2.0	88.3 to 118 (9.0 to 12)	157 to 216 (16 to 22)	186 to 255 (19 to 26)

**Flange bolts and nuts**

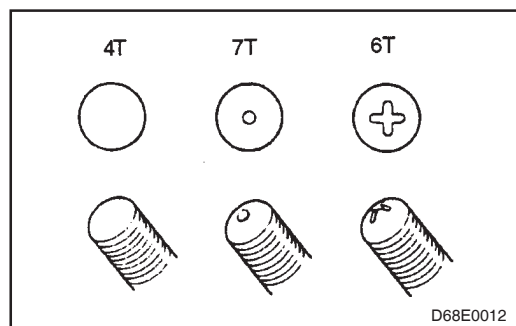
Unit: Nm (kgf m)

Dia. mm	Pitch mm	4T (Head mark 4 or O)	7T (Head mark 7 or Θ)	8T (Head mark 8 or ⊕)
6	1.0	3.9 to 5.9 (0.4 to 0.6)	7.8 to 11.8 (0.8 to 1.2)	8.8 to 13.7 (0.9 to 1.4)
8	1.25	9.8 to 14.7 (1.0 to 1.5)	18.6 to 27.5 (1.9 to 2.8)	21.6 to 32.4 (2.2 to 3.3)
10	1.25	20.6 to 30.4 (2.1 to 3.1)	38.2 to 58.8 (3.9 to 6.0)	49.0 to 63.7 (5.0 to 6.5)
	1.5	18.6 to 28.4 (1.9 to 2.9)	35.3 to 53.0 (3.6 to 5.4)	44.1 to 63.7 (4.5 to 6.5)
12	1.25	37.3 to 53.9 (3.8 to 5.5)	78.5 to 108 (8.0 to 11)	88.3 to 118 (9.0 to 12)
	1.75	33.3 to 51.0 (3.4 to 5.2)	68.6 to 93.2 (7.0 to 9.5)	83.4 to 108 (8.5 to 11)

Identification marks of nut



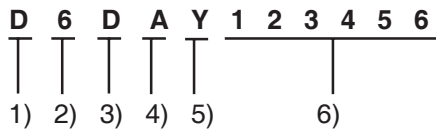
Identification marks of stud





**ENGINE NUMBER**

Example :



- 1) D: DIESEL ENGINE  
G: GASOLINE ENGINE
- 2) 6: 4 CYCLE 6 CYLINDER  
8: 4 CYCLE 8 CYLINDER
- 3) Engine development order
- 4) Engine development version
- 5) Product year  
X : 1999    Y : 2000, 1 : 2001, 2 : 2002, 3 : 2003
- 6) Production sequence number  
000001-999999