

# OC60, OC95, EA330

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# 1. BRAKE HORSE POWER AND FUEL CONSUMPTION

a) ISO 3046, 2534

	Item	Unit	OC60-E3-D1-Q OC60-E3-D1-QX-L1		OC95-E3-D1-Q OC95-E3-D1-QX-L1		EA330-E3-NB1 EA330-E3-NB1- APU-1		EA330- E3-NB1- APU-2
			3000	3600	3000	3600	2500	3000	3000
	Engine Speed	min <sup>-1</sup> (rpm)	3000	3600	3000	3600	2500	3000	3000
Gross	Brake Horse Power	kW	-	-	-	-	-	-	5.9
		PS	-	-	-	-	-	-	8.0
Overload	Brake Horse Power	kW	4.05	4.5	6.1	7.0	4.6	5.15	-
		PS	5.5	6.1	8.3	9.5	6.3	7.0	-
	Specific Fuel Consumption	kg/kW•hr	0.269	0.289	0.270	0.287	0.265	0.282	-
		kg/PS•hr	0.198	0.213	0.199	0.211	0.195	0.207	-
Fuel Consumption	lit/hr	1.30	1.55	1.96	2.39	1.45	1.73	-	
Continu- ous	Brake Horse Power	kW	3.7	4.1	5.2	6.25	4.05	4.4	4.8
		PS	5.0	5.6	7.1	8.5	5.5	6.0	6.5

b) SAE J1349

	Item	Unit	OC60-E3-D1-Q OC60-E3-D1-QX-L1		OC95-E3-D1-Q OC95-E3-D1-QX-L1		EA330-E3-NB1 EA330-E3-NB1- APU-1		EA330- E3-NB1- APU-2
			3000	3600	3000	3600	2500	3000	3000
	Engine Speed	min <sup>-1</sup> (rpm)	3000	3600	3000	3600	2500	3000	3000
Gross Intermit- tent	Brake Horse Power	kW	-	-	-	-	-	-	5.9
		HP	-	-	-	-	-	-	7.9
Net Intermit- tent	Brake Horse Power	kW	4.05	4.5	6.1	7.0	4.6	5.15	-
		HP	5.4	6.0	8.2	9.4	6.2	6.9	-
	Specific Fuel Consumption	kg/kW•hr	0.269	0.289	0.270	0.287	0.265	0.282	-
		kg/HP•hr	0.201	0.216	0.201	0.214	0.198	0.210	-
lb/HP•hr	0.442	0.475	0.444	0.472	0.436	0.464	-		
Fuel Consumption	Gal/hr	0.34	0.41	0.52	0.63	0.38	0.46	-	
Net Con- tinuous	Brake Horse Power	kW	3.7	4.1	5.2	6.25	4.05	4.4	4.8
		HP	5.0	5.5	7.0	8.4	5.4	5.9	6.4

c) JIS D1005, B8014

	Item	Unit	OC60-E3-D1-Q OC60-E3-D1-QX-L1		OC95-E3-D1-Q OC95-E3-D1-QX-L1		EA330-E3-NB1 EA330-E3-NB1- APU-1		EA330- E3-NB1- APU-2
			3000	3600	3000	3600	2500	3000	3000
	Engine Speed	min <sup>-1</sup> (rpm)	3000	3600	3000	3600	2500	3000	3000
Net Intermit- tent (D1005)	Brake Horse Power	kW	4.05	4.5	6.1	7.0	4.6	5.15	-
		PS	5.5	6.1	8.3	9.5	6.3	7.0	-
Continu- ous (B8014)	Brake Horse Power	kW	3.7	4.1	5.2	6.25	4.05	4.4	4.8
		PS	5.0	5.6	7.1	8.5	5.5	6.0	6.5

**Note :**

1. Above powers may be changed by emission regulations applied.

## 2. Conversion rates

☆ 1 kW = 1.35962 PS = 1.34048 HP

☆ 1 PS = 0.7355 kW = 0.985925 HP

☆ 1 HP = 0.7457 kW = 1.01428 PS

**Fuel Consumption Calculating Formula**

$$\text{Fuel Consumption (lit/hr)} = \frac{\text{Fuel Consumption (kg/kW}\cdot\text{hr)} \times \text{Brake Horse Power (kW)}}{0.84}$$

0.84 (g/cc) : Gravity of Diesel Fuel

$$\text{Fuel Consumption (Gal/hr)} = \frac{\text{Fuel Consumption (lb/HP}\cdot\text{hr)} \times \text{Brake Horse Power (HP)}}{7.01}$$

7.01 (lb/Gal) : Gravity of Diesel Fuel

## 2. NOISE LEVEL

Model	Engine Speed min <sup>-1</sup> (rpm)	Unit	Sound Pressure at 1 m (3.3 ft)	
			at Full Load	at No Load
OC60	1200	dB (A)	-	80.4
	1300		-	81.2
	1500		-	82.3
	2000		-	85.3
	2500		88.5	87.6
	2700		-	88.2
	2800		89.7	88.8
	3000		90.7	89.6
	3200		91.1	89.8
	3400		92.0	90.8
	3600		92.3	92.7
	3800		-	92.6
OC95	1200	dB (A)	-	82.5
	1300		-	83.5
	1500		-	85.7
	2000		-	88.8
	2500		92.0	91.1
	2700		-	92.4
	2800		93.7	92.4
	3000		94.9	93.2
	3200		96.1	94.2
	3400		96.5	94.5
	3600		97.6	94.7
	3800		-	96.3

These data show the average noise level at four points.

**Note :**

**[Measurement conditions]**

☆ With oil cooler, cooling fan, air cleaner and muffler.

Model	Engine Speed min <sup>-1</sup> (rpm)	Unit	Sound Pressure at 1 m (3.3 ft)	
			at Full Load	at No Load
EA330	800	dB (A)	-	75.0
	1000		-	77.6
	2000		87.0	84.6
	2250		-	86.0
	2500		90.3	86.8
	2700		-	87.7
	2800		91.5	88.4
	3000		92.6	89.7
	3200		-	90.5

These data show the average noise level at four points.

**Note :**

**[Measurement conditions]**

☆ With radiator, cooling fan, air cleaner and muffler.

### 3. AIR REQUIREMENTS

#### (1) Intake Air Volume

Model	min <sup>-1</sup> (rpm)	rpm	2500	3000	3600
OC60	Intake Air Volume	m <sup>3</sup> /hr	-	20.5	24.6
		m <sup>3</sup> /min	-	0.34	0.41
		lit/sec	-	5.69	6.83
		in <sup>3</sup> /sec	-	347	417
		ft <sup>3</sup> /min	-	12.1	14.5
OC95	Intake Air Volume	m <sup>3</sup> /hr	-	29.9	34.9
		m <sup>3</sup> /min	-	0.50	0.58
		lit/sec	-	8.31	9.69
		in <sup>3</sup> /sec	-	507	592
		ft <sup>3</sup> /min	-	17.6	20.5
EA330	Intake Air Volume	m <sup>3</sup> /hr	20.3	24.9	-
		m <sup>3</sup> /min	0.34	0.42	-
		lit/sec	5.64	6.92	-
		in <sup>3</sup> /sec	344	422	-
		ft <sup>3</sup> /min	11.9	14.7	-

**Note :**

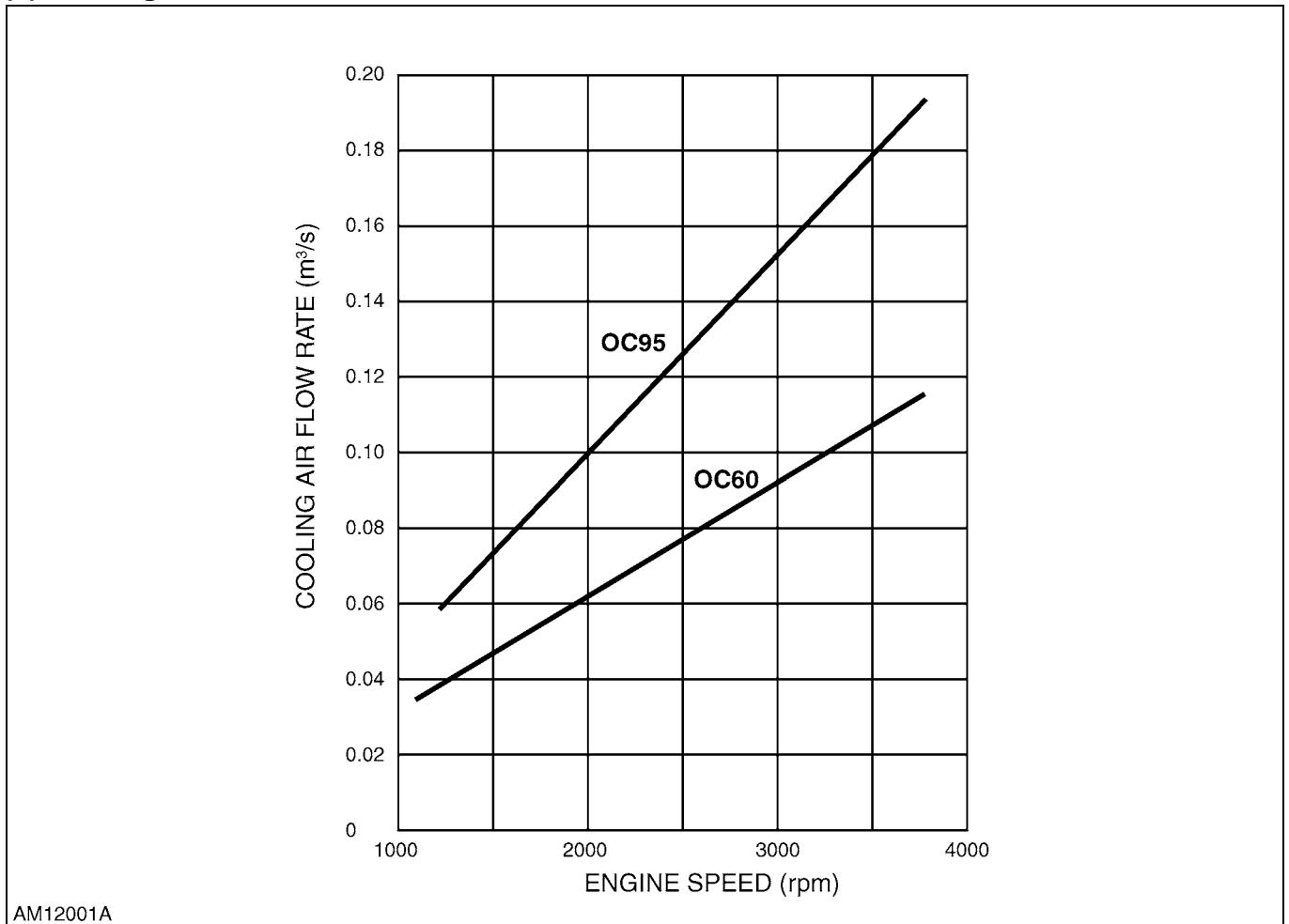
**[Measurement conditions]**

☆ Atmosphere : 750 mmHg

☆ Intake air temperature : 25 °C

☆ With standard air cleaner

**(2) Cooling Air Volume**



**Note :**

**[Measurement conditions]**

☆ With standard oil cooler, oil cooler cover and standard cooling fan.

**(3) Cooling Air Requirements**

{Refer to 25 °C (77 °F) and 750 mmHg}

Engine Speed	min <sup>-1</sup> (rpm)	2500	3000
EA330	kg/hr	675	804
	m <sup>3</sup> /hr	570	679
	m <sup>3</sup> /min	9	11
	lit/sec	158	189
	in <sup>3</sup> /sec	9658	11507
	ft <sup>3</sup> /min	335	400

**Note :**

Above data is decided by condition which engine is run as open unit.

**[Conversion Rates]**

☆ 1 lit = 61.0237 in<sup>3</sup> = 0.035315 ft<sup>3</sup>

☆ 1 ft<sup>3</sup> = 28.3168 lit

☆ 1 lit/sec = 3.6 m<sup>3</sup>/hr = 2.1189 ft<sup>3</sup>/min

## 4. EXHAUST GAS VOLUME

{Refer to 25 °C (77 °F) and 750 mmHg}

Model	Engine Speed	rpm	2500	3000	3600
OC60	Intake Air Volume	m <sup>3</sup> /min	-	0.34	0.41
	Brake Horse Power	kW	-	4.05	4.5
	Fuel Consumption	lit/hr	-	1.30	1.55
		g/hr	-	1089	1301
	Exhaust Gas Volume	m <sup>3</sup> /hr	-	55.3	68.4
		m <sup>3</sup> /min	-	0.92	1.14
		lit/sec	-	15.4	19.0
		in <sup>3</sup> /sec	-	938	1160
ft <sup>3</sup> /min		-	32.6	40.3	
OC95	Intake Air Volume	m <sup>3</sup> /min	-	0.50	0.58
	Brake Horse Power	kW	-	6.1	7.0
	Fuel Consumption	lit/hr	-	1.96	2.39
		g/hr	-	1647	2009
	Exhaust Gas Volume	m <sup>3</sup> /hr	-	77.1	102.7
		m <sup>3</sup> /min	-	1.28	1.71
		lit/sec	-	21.4	28.5
		in <sup>3</sup> /sec	-	1306	1741
ft <sup>3</sup> /min		-	45.4	60.5	
EA330	Intake Air Volume	m <sup>3</sup> /min	0.34	0.42	-
	Brake Horse Power	kW	4.6	5.15	-
	Fuel Consumption	lit/hr	1.45	1.73	-
		g/hr	1219	1452	-
	Exhaust Gas Volume	m <sup>3</sup> /hr	54.1	67.4	-
		m <sup>3</sup> /min	0.90	1.12	-
		lit/sec	15.0	18.7	-
		in <sup>3</sup> /sec	918	1142	-
ft <sup>3</sup> /min		31.9	39.7	-	

**Note :**

$$GL = (AL + 7.1 \times Be/10000) \times (298 + t) \times 760 / 298 / (760 + Ps) \quad (\text{m}^3/\text{hr})$$

AL : Intake Air Volume (m<sup>3</sup>/hr)

Be : Fuel Oil Consumption (g/hr)

t : Exhaust Gas Temperature (°C)

Ps : Exhaust Gas Back Pressure (mmHg)

**[Conversion Rates]**

$$\star 1 \text{ lit} = 61.0237 \text{ in}^3 = 0.035315 \text{ ft}^3$$

$$\star 1 \text{ ft}^3 = 28.3168 \text{ lit}$$

$$\star 1 \text{ lit/sec} = 3.6 \text{ m}^3/\text{hr} = 2.1189 \text{ ft}^3/\text{min}$$

## 5. HEAT REJECTION TO COOLANT

a) ISO 3046 (Value at Overload)

Model	Engine Speed	rpm	2500	3000	3600
OC60	Brake Horse Power	kW	-	4.05	4.5
	Specific Fuel Consumption	kg/kW•hr	-	0.269	0.289
	Heat Rejection	kJ/hr	-	13140	15685
		kcal/hr	-	3139	3747
OC95	Brake Horse Power	kW	-	6.1	7.0
	Specific Fuel Consumption	kg/kW•hr	-	0.270	0.287
	Heat Rejection	kJ/hr	-	19864	24230
		kcal/hr	-	4745	5788
EA330	Brake Horse Power	kW	4.6	5.15	-
	Specific Fuel Consumption	kg/kW•hr	0.265	0.282	-
	Heat Rejection To Coolant	kJ/hr	16802	20018	-
		kcal/hr	4014	4782	-

b) SAE J1349 (Value at Net Intermittent)

Model	Engine Speed	rpm	2500	3000	3600
OC60	Brake Horse Power	kW	-	4.1	4.5
	Specific Fuel Consumption	kg/kWh	-	0.269	0.289
	Heat Rejection	kJ/hr	-	13140	15685
		Btu/hr	-	12458	14871
OC95	Brake Horse Power	kW	-	6.1	7.0
	Specific Fuel Consumption	kg/kWh	-	0.270	0.287
	Heat Rejection	kJ/hr	-	19864	24230
		Btu/hr	-	18833	22972
EA330	Brake Horse Power	kW	4.6	5.15	-
	Specific Fuel Consumption	kg/kWh	0.265	0.282	-
	Heat Rejection To Coolant	kJ/hr	16802	20018	-
		Btu/hr	15930	18979	-

**Note :**

☆ Heat Rejection (to Coolant) Calculating Formula

$$H_o = H_u \times N_e \times b_e \times i$$

**H<sub>o</sub> :** Heat Rejection (to Coolant)

**H<sub>u</sub> :** Diesel Fuel Low Caloric Value  
(43070 kJ/kg, 10290 kcal/kg)

**N<sub>e</sub> :** Brake Horse Power (kW)

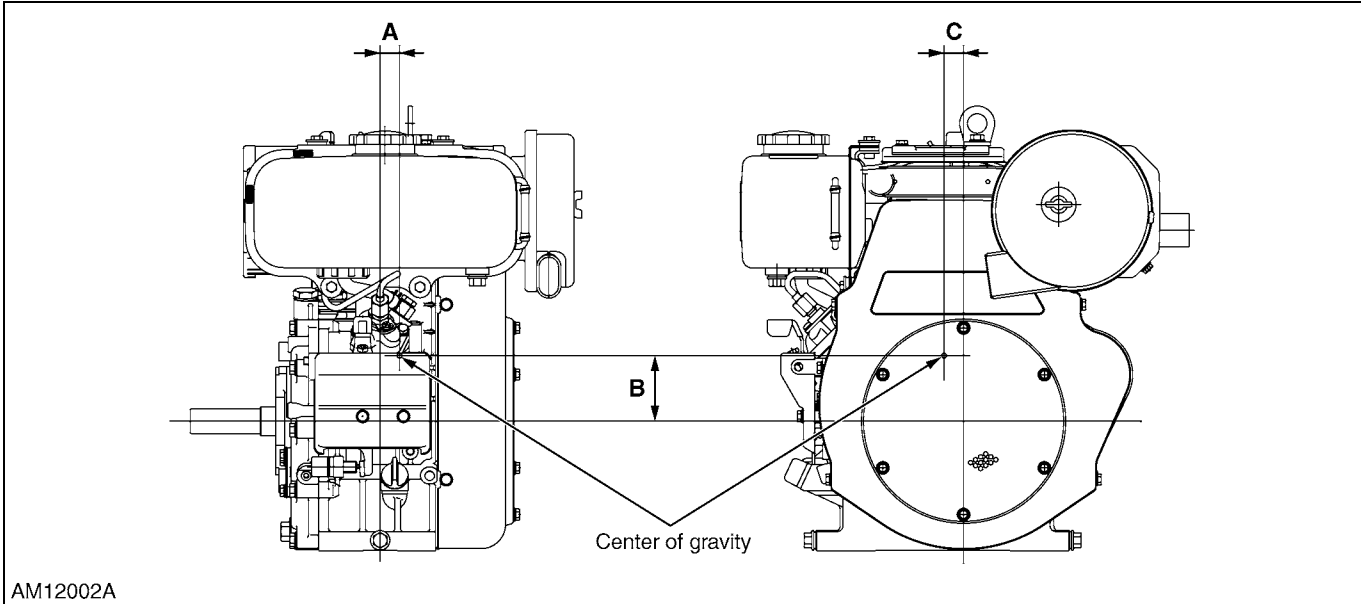
**b<sub>e</sub> :** Specific Fuel Oil Consumption (g/kW•hr)

**i :** Dispersion Ratio (to Coolant) (%)

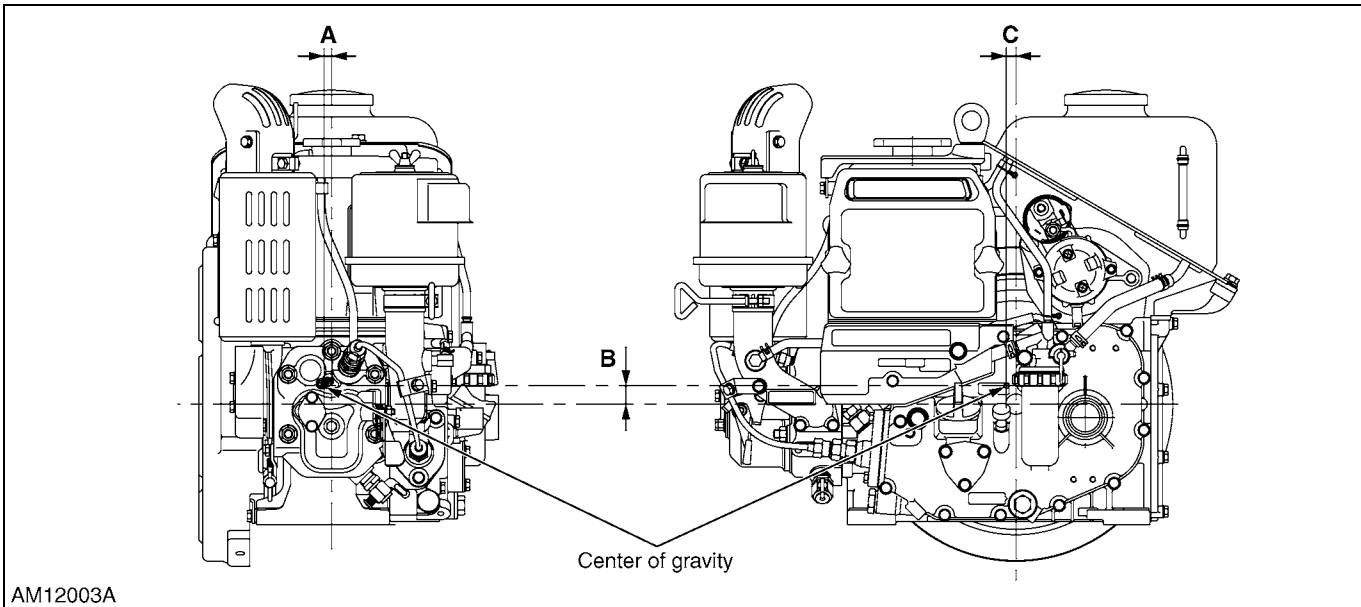


## 6. CENTER OF GRAVITY

OC60, OC95



EA330



MODEL	A	B	C
OC60	15.5	67.5	-3
OC95	20	83	4
EA330	8	19	19

**Note :**  
**[Measurement condition]**  
 ☆ Dry condition