

## USEFUL INFORMATION

N = RPM

T = Torque

$\sqrt{3} = 1.732$

PF = Power Factor

Alt Eff = Alternator Efficiency

BHP =  $\frac{2\pi NT}{33000}$

BHP =  $\frac{\text{Amps} \times \sqrt{3} \times \text{Volts} \times \text{PF}}{1000 \times .746 \times \text{Alt. Eff.}}$

BHP =  $\frac{\text{KW}}{.746 \times \text{Alt. Eff.}}$

KW = BHP x .746 x Alt. Eff.

KW = KVA x PF

KW =  $\frac{\text{Amps} \times \sqrt{3} \times \text{Volts} \times \text{PF}}{1000}$

KVA =  $\frac{\text{KW}}{\text{PF}}$

KVA =  $\frac{\text{Amps} \times \sqrt{3} \times \text{Volts}}{1000}$

Amps =  $\frac{\text{BHP} \times .746 \times \text{Alt. Eff.} \times 1000}{\text{PF} \times \sqrt{3} \times \text{Volts}}$

Amps =  $\frac{\text{KVA} \times 1000}{\sqrt{3} \times \text{Volts}}$

Displacement =  $\frac{\text{Bore}^2 \times \pi \times \text{stroke} \times \text{No. of Cyls.}}{4}$

B M E P  
4 cycle (4 stroke) =  $\frac{792000 \times \text{BHP}}{\text{Rpm} \times \text{Displacement Cubic Inch}}$

## Fuel Consumption

Fuel consumption calculations: Manufacturers express fuel consumption as Brake Specific Fuel Consumption - BSFC ie lb per BHP-Hr.

Given: BSFC = lb/BHP-Hr = (1)

To find: lbs/Hr      Multiply (1) by BHP (gross) @ RPM  
ie lb/BHP-Hr x BHP = lb/Hr = (2)

To find: Kg/Hr      Multiply (2) by 0.454  
ie lb/Hr x 0.454 = Kg/Hr = (3)

To find: Kg/KW-Hr      Divide (3) by KW  
Kg/Hr x  $\frac{1}{KW}$  = KG/KW-Hr = (4)

NOTE: Differentiate whether customer requires Kg/KW-Hr of engine or alternator.

IE: If engine then multiply BHP of engine (gross) x 0.746 = KW.  
If alternator then use KW output of alternator.

To Find: Litres/Hr      Divide (3) by specific gravity of fuel  
(assume 0.85)  
ie Kg/Hr x  $\frac{1}{SG}$  = Litres/Hr = (5)

To Find: Gal Imp/Hr      Divide (2) by 8.5  
ie lb/Hr x  $\frac{1}{8.5}$  = Gal Imp/Hr = (6)

To Find: Gal US/Hr      Divide (2) by 7  
ie lb/Hr x  $\frac{1}{7}$  = Gal US/Hr = (7)

## Useful Imperial/Metric Conversions

### Linear Measure

1 inch	=	25.4 millimetres
1 foot	=	0.305 metres
1 yard	=	0.914 metres
1 mile	=	1.609 kilometres
1 millimetre	=	0.03932 inches
1 metre	=	39.370 inches
1 metre	=	3.281 feet
1 metre	=	1.093 yards
1 kilometre	=	0.6213 miles

### Cubic Measure

1 cu. inch	=	16.386 cu. centimetres
1 cu. foot	=	0.0283 cu. metres
1 cu. yard	=	0.764 cu. metres
1 cu. centimetre	=	0.061 cu. inches
1 cu. decimetre	=	1 litre = 61.025 cu. inches
1 cu. metre	=	31.316 cu. feet = 1.308 cu. yards

### Capacity

1 British Imperial gallon equals:  
10 lb of water  
277.274 cubic inches  
4.544 litres  
1.20 United States gallons

1 Litre equals:  
2.20 lb of water  
61.025 cubic inches  
0.22 British Imperial gallons  
0.264 United States gallons

1 United States gallon equals:  
8.36 lb of water  
231 cu. inches  
3.78 litres  
0.83 British Imperial gallons

1 Cubic metre equals:  
2,203 lbs of water (nearly 1 ton)  
220 British Imperial gallons  
264 United States gallons

1 Cubic foot equals:  
62.3 lb of water  
28.375 litres  
0.0283 cubic metres  
6.23 British Imperial gallons  
7.48 United States gallons

1 Pint = 0.568 litres

1 Gallon = 4.544 litres

1 Decilitre (one tenth litre) = 0.176 pints

1 Litre = 1.76 pints

## Square Measure

1	Sq. inch	=	6.451 Sq. centimetres
1	Sq. foot	=	9.290 Sq. decimetres
1	Sq. yard	=	0.836 Sq. metres
1	Acre (4,840 Sq. yds)	=	4,046 Sq. metres
1	Sq. centimetre	=	0.155 Sq. inches
1	Sq. decimetre	=	15.50 Sq. inches
1	Sq. metre	=	1,550 Sq. inches
1	Sq. metre	=	10.764 Sq. feet
1	Hectare (10,000 Sq. metres)	=	2.470 acres

## Weight

1 pound	=	0.453 kilograms
1 hundredweight	=	50.80 kilograms
1 British ton (2,240 lb)	=	1,016,047 kilograms
1 American ton (2,000 lb)	=	907 kilograms
1 Kilogram	=	2.2046 lb
1 tonne (1,000 kg)	=	2204.6 lb = 0.9842 tons

## Conversion Factors

lb per sq. in. x 0.0703	=	kg per sq. cm
kg per sq. cm x 14.223	=	lb per sq. in
lb per sq. ft x 4.883	=	kg per sq. m.
kg per sq. m. x 0.2048	=	lb per sq. ft
lb per cu. yd x 0.593	=	kg per cu. m.
kg per cu. yd x 1.686	=	lb per cu. yd.
Tons per cu. yd 1.329	=	tonnes per cu. m.
Tonnes per cu. m. x 0.752	=	tons per cu. yd.
B.Th.U. per lb x 0.556	=	calories per kg
Calories per kg x 1.8	=	B.Th.U. per lb
Foot tons x 0.309	=	tonne-metres
Tonne-metres x 3.23	=	foot-tons
Horsepower x 1.01	=	force de cheval
Force de cheval x 0.986	=	horsepower
Horsepower x 0.746	=	kilowatts
Kilowatts x 1.34	=	horsepower