

# FORMULAS

## RACING CARBURETOR CFM

$$\text{Racing Carb CFM} = \text{RPM} \times \text{Displacement} \div 3456 \times 1.1$$

## DISPLACEMENT

$$\text{Displacement} = .7854 \times \text{Bore}^2 \times \text{Stroke} \times \text{Number of Cylinders}$$

## COMPRESSION RATIO

$$\text{Combined Chamber CCs} + \text{Gasket CCs} + \text{Deck CI CCs} + (\text{Displacement} \times (N))$$

Combine Chamber CCs + Gasket CCs + Deck CI CCs

$$(N) = 2.0483 \text{ for 8-cylinder} - 2.7311 \text{ for 6-cylinder} - 4.0967 \text{ for 4-cylinder}$$

## CORRECT COMPRESSION RATIO (CCR)

$$\text{CCR} = \text{FCR} (\text{Altitude}/1,000) \times .2$$

## ROCKER ARM RATIO and VALVE LIFT

$$\text{Gross Valve Lift} = \text{Camshaft Lobe Lift} \times \text{Rocker Arm Ratio}$$

## HORSEPOWER

$$\text{Horsepower} = (\text{RPM} \times \text{Torque}) \div 5,252$$

## TORQUE

$$\text{Torque} = (5,252 \times \text{HP}) \div \text{RPM}$$

## ROD RATIO

$$\text{Rod Ratio} = \text{Rod Length} \div \text{Crank Stroke Length}$$

## AVERAGE PISTON SPEED

$$\text{Average Piston Speed} = \text{Crank Stroke} \times \text{RPM} \div 6$$

## VOLUME (CCs) of DECK CLEARANCE

$$\text{CCs of Deck Clearance} = \text{Bore} \times \text{Bore} \times 12.87 \times \text{Depth of Deck Clearance}$$

## VOLUME (CCs) of HEAD GASKET

$$\text{CCs of Head Gasket} = \text{Bore} \times \text{Bore} \times 12.87 \times \text{Thickness of Head Gasket}$$

## TIRE DIAMETER

$$\text{Tire Diameter} = (\text{MPH} \times \text{Gear Ratio} \times 336) \div \text{RPM}$$

## CIRCUMFERENCE

$$\text{Circumference} = 3.1416 \times \text{Diameter}$$

## CRUISE RPM

$$\text{RPM} = (\text{MPH} \times \text{Gear Ratio} \times 336) \div \text{Tire Diameter}$$

## REAR GEAR RATIO

$$\text{Rear Gear Ratio} = (\text{RPM at Finish Line} \times \text{Tire Diameter}) \div (\text{MPH} \times 336)$$

## LB/HR TO CC/MIN

$$\text{Injector Size in LB/HR} \times 10.50 = \text{Injector Size in CC/MIN}$$

## INJECTOR SIZE CALCULATOR

$$\text{Injector Flow Rate} = (\text{Engine HP} \times \text{BSFC}) \div (\# \text{ of Injectors} \times 0.8)$$

BSFC is Typically 0.4 - 0.6 (to estimate use 0.5)

## INJECTOR HP RATING

$$\text{Engine HP Rating} = (\text{Injector Size} \times \# \text{ of Injectors} \times 0.8) \div \text{BSFC}$$

BSFC is Typically 0.4 - 0.6 (to estimate use 0.5)

## WEIGHTS

Oil - 1 Gallon = 8.75lbs

Gas - 1 Gallon = 7.75lbs

Water - 1 Gallon = 10.50lbs

## MEASUREMENTS

1 km = 3,280.83 ft. or .6215 miles

1 cm = .3937 in.

1 kg = 2.2045855 lbs.

1 mile = 1.609 km

1 inch = 2.54 cm

1 lb = .4536 kg

## AREA OF A CIRCLE

$$\text{Area of a Circle} = 3.1416 \times (\text{Radius}^2)$$

## VOLUME OF A CYLINDER

$$\text{Volume of a Cylinder} = 3.1416 \times (\text{Radius}^2) \times \text{Height}$$