Every Formula Youll Need

1. Rod ratio

Rod ratio = Center line to center line length of rod / Stroke 1.74 or greater is most desirable for racing.

2. Air temperature

Air temperature = every 7 degrees F > 60 degrees F = 1% loss in horsepower

3. CI displacement

CI displacement = bore x bore = ____ x .7584 = _____ x stroke: divide by .061 for CC x number of cylinders

4. Compression ratio

Compression ratio : Volume of the cylinder , piston dish and head dish and head gasket from top to bottom of stoke, divided by the head , piston, and headgasket volume or: bore(in) x bore(in) = ____ x stroke(in) = ____ / .061 = cc of cylinder + head cc + piston cc + headgasket cc) / head cc + piston cc + headgasket cc) = compression ratio

5. Piston speed in fpm = stroke(in) x rpm / 6

6. Piston speed desired = 5800 fpm or less

7. Horsepower = rpm x torque / 5252

8. Altitude effects on horsepower: every 1000 ft above seal level = 3% loss in hp

9. Engine cfm approximation

Engine cfm approximation: RPM x C.I displacement / 3456 = approx. cfm.

Example: Civic 1.6L = 97 C.I. x 7200 rpm = 698400 / 3456 = 202 cfm.

10. Calculation of cfm from horsepower

Calculation of cfm from horsepower: HP x .5 (BSFC) = ____ lb. per hour of fuel x 13.2 air/fuel ratio = ___ lb. air p/hr / 60 min p/hr = ___ lb. p/min/ .07 = cfm.

Example: Civic 1.6L = 127 hp x .5 = 63.5 lb. p/hr fuel x 13.2 air/fuel ratio = 838.2 air p/hr / 60 min/hr = 13.97 lb. p/min / .07 (conversion fo cfm) = 199 cfm

11. injector flow increase vs. fuel pressure increase

The square root of new fuel pressure / original fuel pressure x the original fuel injector flow =___ new flow in lb/hr.

Example: 1.6L Civic with auxillary FPR. Take the square root of 70 psi (new FPR setting) / 40 psi (original FP) = 1.3229 x 24 lb/hr = 31.75 new flow rate in lb/hr

12. Injector sizing for hp

Desired hp x .5 (BSFC) = ___ lb of fuel pressure required for desired hp / ___ amount of injectors = ___ lb. per injector x___ duty cycle = lb. p/hr per injector

13. Fuel pump or injector horsepower capability

Pounds p/hr at fuel pressure desired x 2 = HP capability

Gallons p/hr to pounds p/hr = ___ gallons x 6 = ___ lbs. p/hr