

SI Engines

Model	Application	N _{cyl}	Type	Bore	Stroke	Max Power	Speed@ Max Power
Suzuki	moped	1	2-stroke	39.7 mm	39.7 mm	5 kw	7000 rpm
Polaris	snowmobile	2	2-stroke	77 mm	64 mm	138 hp	8500 rpm
Ford Focus	passenger car	4	4-stroke	3.44 in	3.27 in	140 hp	6000 rpm
Lamborghini	sports car	10	4-stroke	82.5 mm	92.8 mm	388 kw	8000 rpm
Cadillac CTS	sports sedan	8	4-stroke	4.06 in	3.62 in	556 hp	6100 rpm

CI Engines

Model	Application	N _{cyl}	Type	Bore	Stroke	Max Power	Speed@ Max Power
Cummins	genset	2	2-stroke	65 mm	65 mm	25 kw	3600 rpm
Audi R10	racecar	12	4-stroke	80 mm	91.4 mm	650 hp	5000 rpm
Dodge	pick-up truck	8	4-stroke	99.5 mm	90 mm	350 hp	3000 rpm
Caterpillar	semi truck	6	4-stroke	5.4 in	6.75 in	625 hp	2100 rpm
Sulzer	container ship	14	2-stroke	38 in	98 in	100000 hp	100 rpm

- 4) Calculate the total engine displacement (in cubic meters as well as liters), mean piston speed (in m/s), and bmep (in kPa) for each of the engines you are assigned.

Handy Dandy Conversions

1 in = .0254 m

1 ft-lb = 1.35 N-m

1 hp = .746 kw

1 m³ = 1000 liters

Model	Displacement (meters ³)	Displacement (liters)	Mean Piston Speed (meters/sec)	Brake Mean Effective Pressure (kpa)

- 5) What general trends do you observe in mean piston speed between SI and CI engines? Why?

- 6) What general trends do you observe in bmep between SI and CI engines? Why?

- 7) Is there any relationship between total displacement and mean piston speed or bmep? Why?

- 8) What trends do you observe in mean piston speed and bmep within the SI engines?
Speculate on reasons for this.

- 9) What trends do you observe in mean piston speed and bmep within the CI engines?
Speculate on reasons for this.

- 10) How would you estimate the max speed and maximum power of an engine if you only knew its type and displacement?