

READING NOTES: Heywood – Chapt 2

2.1 Important Engine Characteristics

- Maximum rated power – highest power for short periods of time
- Normal rated power – highest power during continuous operation
- Rated speed – rotational speed at rated power

2.2 Geometrical Properties of Reciprocating Engines

- Definition/Relationship between Compression ratio, displacement volume, clearance volume
- Typical values for Bore/Stroke ratio

2.3 Brake torque and brake power

- Short equation for brake torque $T = F_b r$
- Short equation for brake power $P = 2\pi NT$

2.4 Indicated Work per Cycle

- Gross indicated work
- Net indicated work
- Indicated power

2.5 Mechanical Efficiency

- Friction power
- Equation 2.17 (relation between indicated power, friction power, and mechanical efficiency)

2.6 Road Load Power

- Equation 2.18 (identify all terms)

2.7 Mean Effective Pressure

- Typical values for bmep
- Mean piston speed

2.8 Specific Fuel Consumption and Efficiency

- Fuel conversion efficiency
- Typical heating value of fuels

2.9 Air/Fuel and Fuel/Air Ratios

- Typical values for SI engines
- Typical values for CI engines

2.10 Volumetric Efficiency

2.11 Engine Specific Weight and Specific Volume

2.12 Correction Factors for Power and Volumetric Efficiency

- Operating Pressure correction
- Operating Temperature correction

2.13 Specific Emissions

- NO_x, Carbon Monoxide, Hydrocarbons, Particulates

2.14 Relationships Between Parameters

- Long equations for power and torque

2.15 Engine Design and Performance Data

- Table 2.1 (valuable reference)
- Comparison of different engine metrics

READING NOTES: Heywood – Chapter 15 (selected sections)

15.1 Engine Performance Parameters

- Power, Torque, and mep from short equations
- Power, Torque, and mep from long equations
- Specific fuel consumption

15.2 Indicated Brake Power and Mep

- Describe trends and causes for changes in all variables in Figure 15-1 and Figure 15-2

15.3.3 Load and Speed (SI Engines)

- Describe sfc behavior shown in Figure 15-10
- Outline reasons for variation in bsfc as one moves in all directions from the minimum bsfc

15.5.1 Load and Speed (CI Engines)

- Describe sfc behavior shown in Figures 15-21, 15-22, 15-23
- Explain relative sfc impact of different terms in Figure 15-24

15.7 Engine Performance Summary

- Note bmep and sfc trends across different engine types/sizes

15.2

15.3