READING NOTES: Heywood – Chapt 1

1.1 Historical Perspective

- Contrast development of external and internal combustion engines
- Four principles for maximizing cycle efficiency
- What makes the Otto Engine superior to the Otto & Langen Engine (see Table 1.1)
- What advancements in fuels assisted engine development in the 20th Century?
- When and why did automotive emissions become a major design consideration?
- What are typical units for regulating automotive and truck emissions? (see Table 1.2)

1.2 Engine Classifications

- 10 criteria for classification
- Typical usage of different engine classifications (Table 1.3)

1.3 Engine Operating Cycles

- Fundamental cylinder geometry and nomenclature
- Engine design features in realization of 4-stroke engines
- Engine design features in realization of 2-stroke engines

1.4 Engine Components

- 4 cylinder Chrysler SI engine (identify components & function in Figure 1-4)
- 2-Stroke Electromotive CI engine (identify components & function in Figure 1-5)

1.5 SI Engine Operation

- Carburetor components and function
- Fuel injection system components and function
- SI Engine processes occurring at different crankangles

1.6 Examples of SI Engines (identify components and functions)

- General Motors V-6 SI Engine (Figure 1-9)
- Turbocharged 4-stroke SI Engine (Figure 1-10)
- Turbocharger (Figure 1-11)
- Two Cylinder loop scavenged 2-stroke Marine Engine (Figure 1-12)
- Wankel Rotary engine (Figure 1-13)

1.7 CI Engine Operation

- CI Engine processes occurring at different crankangles
- In-line fuel injector pump (Figure 1-17)
- Fuel injector nozzles (Figure 1-18)

1.8 Examples of CI Engines (identify components and functions)

- Cummins 6-cylinder turbocharged diesel engine (Figure 1-20)
- Volkswagen 4-cylinder naturally aspirated diesel engine (Figure 1-21)
- Caterpillar 6-cylinder turbocharged heavy duty truck engine (Figure 1-22)
- Sulzer 2-stroke marine engine (Figure 1-24)

1.9 Stratified Charge Engines

- Multi-fuel designs
- Torch ignition designs