

**Marian University, Indianapolis**

**Literature assignment 2 - Road vehicles** The usual strategies apply:

Use all literature available (including Wikipedia), but apply proper research methods to verify information, and refer to sources appropriately.

Divide labor, then one person will collect data before end of IGSS and write a report.

Include calculations where appropriate.

Discuss your results amongst yourselves, and post results (“mini-reports”) to your page on IGSS Wiki.

The relevant textbook chapters are 3 and (technical chapter) A.

**Topics (example):**

1. Mackay gives average “power consumption” figures for UK commuters. Using census data and any other resources available, generate analogous values for the USA (and for Indiana, if appropriate data are available).
2. Calculate “gross” and “net”  $\Delta_c H$  values for some typical gasoline hydrocarbons and for some typical biodiesel monoglycerides.
3. Gasoline engines are approximated by the thermodynamic “Otto cycle”, while diesel engines obey the “Diesel cycle” (capitalized in honor of Rudolf Diesel). What is the theoretical efficiency of each cycle for typical operating temperatures and compression ratios?
4. Use the modified version of equation A.2 on p.256 to obtain power consumption figures for each value of “drag area” appearing in Table A.7 (at some appropriate speed, say 55 mph). Try to find drag area values for a few currently popular vehicle types, and include these values. Summarize any conclusions.