Engine lab report

Engine Lab Report Diesel Engine Load/N | Fuel Time/s | dH/mmH2O | Speed/r. p. m | Temp/? | Air consumption/kg/H | Fuel consumption/kg/H | Air-fuel ratio | Power/kw | Efficiency/ % | | 40 | 121. 6 | 17. 5 | 3018 | 26. 6 | 130. 16 | 2. 47 | 52. 7 | 4. 5 | 0. 019 | | 80 | 94. 72 | 17. 5 | 3009 | 26. 7 | 130. 14 | 3. 17 | 41. 05 | 8. 97 | 0. 059 | | 125 | 72. 76 | 17 | 3009 | 26. 8 | 128. 25 | 4. 12 | 31. 13 | 14. 02 | 0. 111 | | 171 | 56. 95 | 17 | 3000 | 26. 9 | 128. 23 | 5. 72 | 24. 33 | 19. 12 | 0. 161 | | 212 | 46. 06 | 16. 5 | 3006 | 27. 1 | 126. 28 | 6. 51 | 19. 40 | 23. 6 | 0. 202 | | 232 | 41. 20 | 17 | 3010 | 27. 2 | 128. 16 | 7. 28 | 17. 60 | 26. 03 | 0. 216 | | Petrol Engine Load/N | Fuel Time/s | dH/mmH2O | Speed/r. p. m | Temp/? | Air consumption/kg/H | Fuel consumption/kg/H | Air-fuel ratio | Power/kw | Efficiency/ % | | 40 | 285 | 2 | 3000 | 26. 8 | 42. 50 | 3. 19 | 13. 32 | 4. 47 | 0. 014 | | 109 | 191 | 7 | 3000 | 27. 4 | 79. 44 | 4. 77 | 6. 65 | 12. 19 | 0. 072 | | 160 | 160 | 8 | 2950 | 28. 2 | 84. 81 | 5. 69 | 14. 91 | 17. 60 | 0. 125 | | 248 | 110. 5 | 14 | 3000 | 28. 2 | 112. | 8. 24 | 13. 62 | 27. 74 | 0. 215 | | 313 | 93. 56 | 20 | 3000 | 28. 3 | 145. 4 | 9. 73 | 14. 94 | 35. 01 | 0. 290 | | 374 | 71. 81 | 27 | 3000 | 28. 4 | 168. 9 | 12. 68 | 13. 32 | 41. 83 | 0. 317 | | [pic] Fig 1 [pic] Fig 2 From Fig 1, we know that air-fuel ratio of the petrol engine is not changing much as the brake power increases, however for the diesel engine, the air-fuel ratio drops as the power increases. This is because the throttle which is situated in the air intake duct of the petrol engine.

For the petrol engine, the combustion takes place in the whole cylinder, so the air-fuel ratio should be maintained to make sure the combustion to take place rapidly enough all the time. The throttle will adjust the air-fuel ratio. For the diesel engine, the combustion takes place around individual droplets of the fuel spray, therefore the output is related to the amount of fuel

injected, and the air flow is not controlled. Fig 2 shows that the efficiency increases with the power for both engines, however the diesel engine reaches higher efficiency than the petrol engine.

This is because, for the diesel engine, the input of the fuel is in the form of fuel spray. The compression of the fuel and air is avoided. This will make the maximum cylinder volume to minimum larger, and leads to higher efficiency. So, the petrol engine should be used in light vehicles because it is lighter than the diesel engine and it can reach higher power than the diesel engine which produces higher speed of the cars. And, the diesel engine should be used for the heavy vehicles, since it has higher efficiency. The heavy cars need to do more work, so the efficiency is more important to them.