Lectures

8th Semester B. Tech. Mechanical Engineering

Subject: Internal Combustion Engines

I/C Prof M Marouf Wani

Topic: Characteristic Performance Curves of I C Engines – 28-04-2020

The engine performance based graphical results given below can be understood after reading the explanatory notes for similar graphical results given in the two research papers on I C engines available on the website of NIT Srinagar along with lecture notes for the subject of I C Engines.

(a) Constant Speed and Variable Load Engine Test Results:

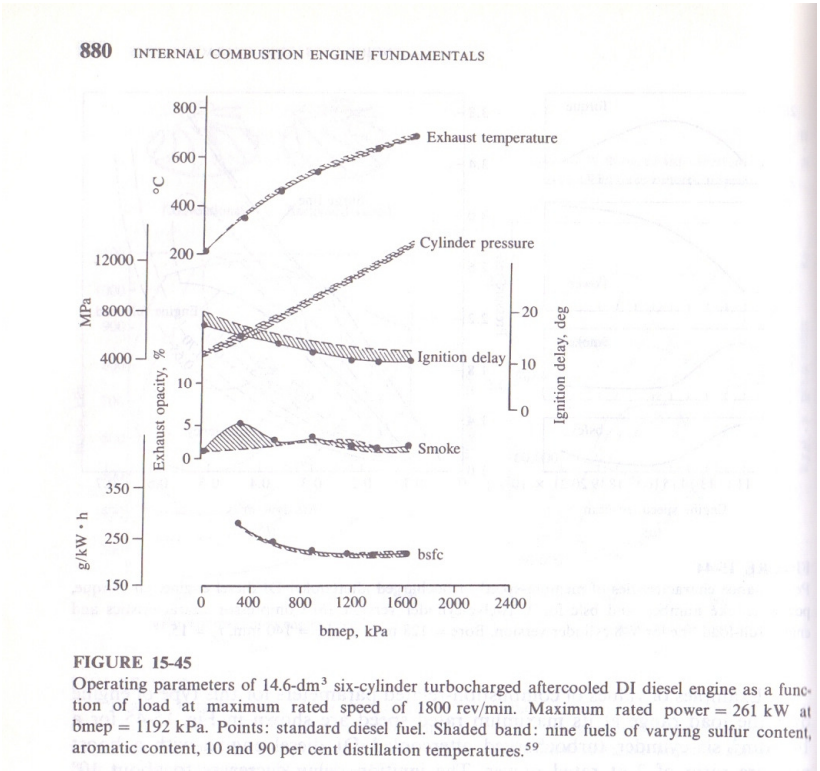

FIGURE 15-45
Operating parameters of 14.6-dm^3 six-cylinder turbocharged aftercooled DI diesel engine as a function of load at maximum rated speed of 1800 rev/min. Maximum rated power = 261 kW at bmep = 1192 kPa. Points: standard diesel fuel. Shaded band: nine fuels of varying sulfur content, aromatic content, 10 and 90 per cent distillation temperatures.[59]

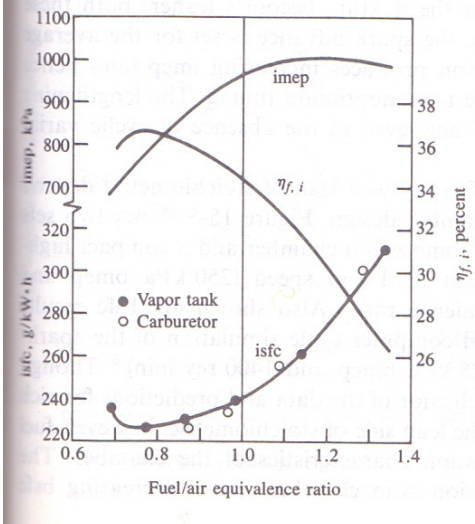

FIGURE 15-4
Effect of the fuel/air equivalence ratio variations on indicated mean effective pressure, specific fuel consumption, and fuel conversion efficiency of six-cylinder spark-ignition engine at wide-open throttle and 1200 rev/min. Data for standard carbureted engine, and engine equipped with vapor tank which extends the lean operating limit, are shown.[9]

15.4. The attached graph shows how the brake power and specific fuel consumption of a four-stroke cycle single-cylinder spark-ignition engine vary with the fuel/air equivalence ratio at wide-open throttle. It also shows how the following efficiencies vary with equivalence ratio:

The volumetric efficiency: η_v

The mechanical efficiency: η_m [Eq. (2.17)]

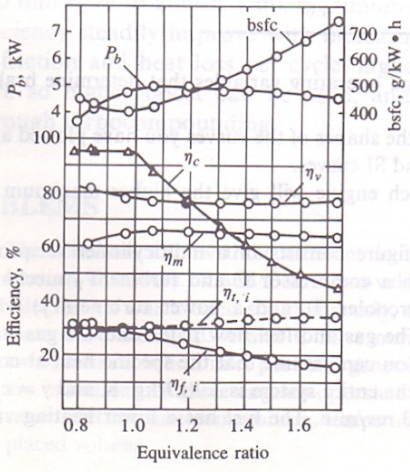

FIGURE P15-4

(b) Variable Speed and Constant Load Engine Test Results:

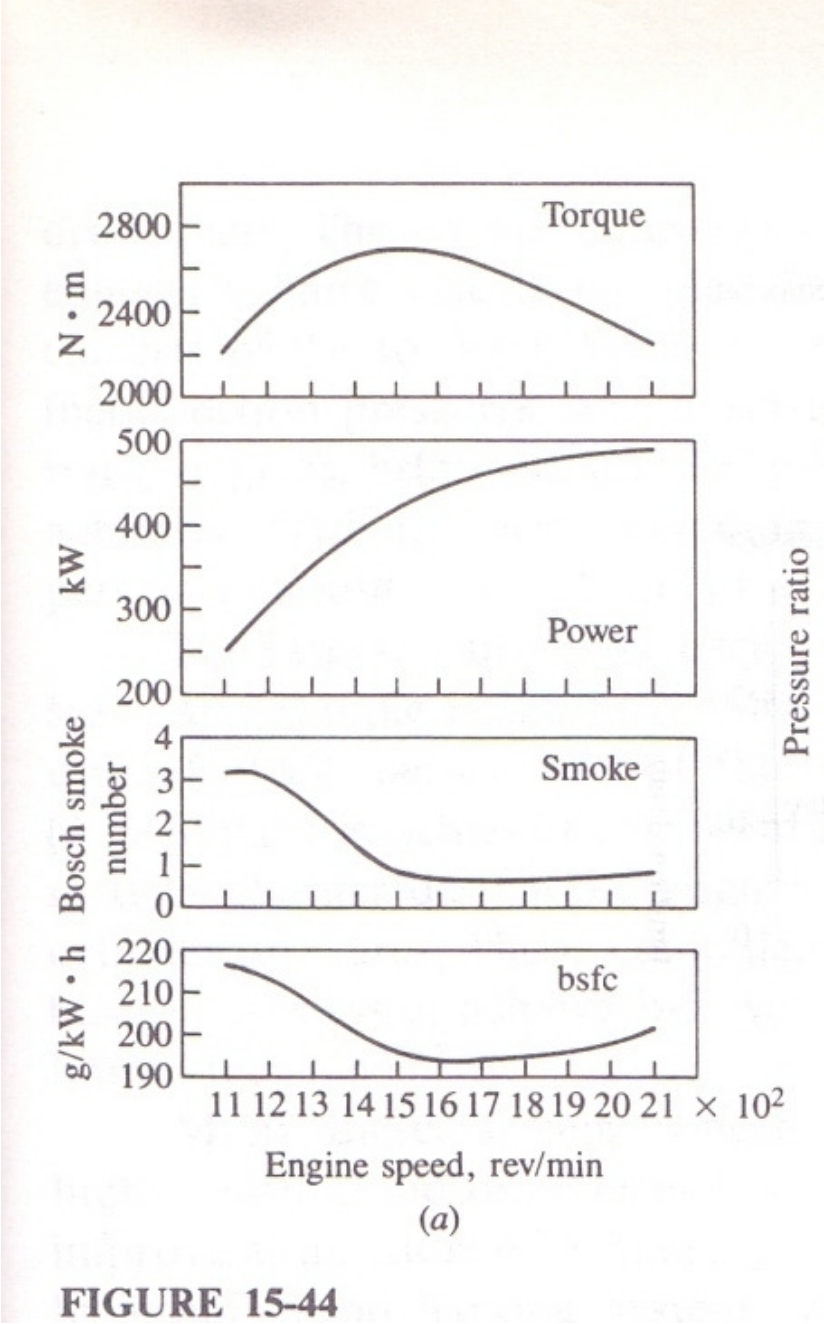

Fig.15-44: Performance Characteristics of medium-speed turbocharged after-cooled DI diesel engine. Torque, Power, Smoke number, and bsfc for V twelve-cylinder version. Bore = 128 mm, stroke = 140 mm, rc = 15.

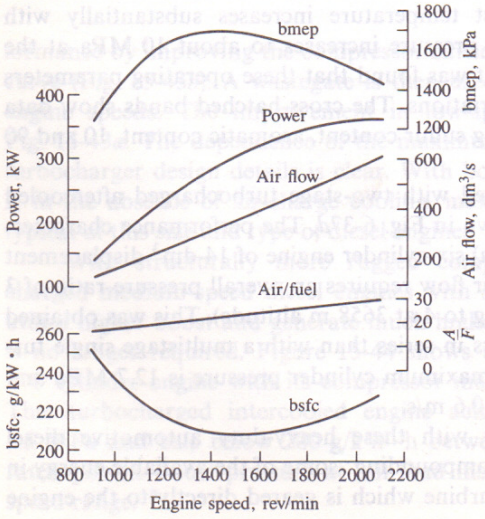

FIGURE 15-46
Operating characteristics of 14-dm³ six-cylinder two-stage turbocharged aftercooled quiescent-chamber DI diesel engine. Maximum bmep = 1.74 MPa. Boost pressure ratio at rated power = 3. Bore = 140 mm, stroke = 152 mm.[60]

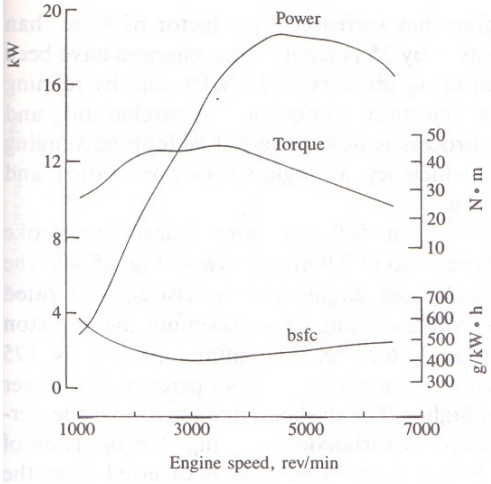

FIGURE 15-48
Performance characteristics of a three-cylinder 450-cm³ two-stroke cycle spark-ignition engine. Maximum bmep = 640 kPa. Bore = 58 mm, stroke = 56 mm.[64]

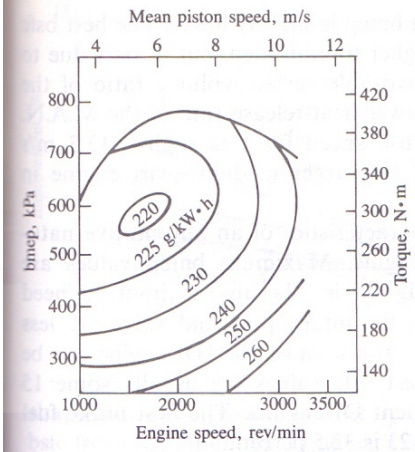

FIGURE 15-21
Performance map for 6.54-dm^3 eight-cylinder air-cooled naturally aspirated medium-swirl DI diesel engine. Contours of constant bsfc in grams per kilowatt-hour shown. Bore = 102 mm, stroke = 100 mm, r_c = 18. Multihole fuel nozzle.[33]

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In charge Course:

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Text Book:
Internal Combustion Engine Fundamentals
By John B Heywood
Published By: McGraw-Hill Book Company