

# Engine and Auxiliary Systems

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Edited by  
Prof. Dr. A.K.M. Mohiuddin



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# **Engine and Auxiliary Systems**

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## Chapter 6

Experimental analysis to determine the relationship between noise and back pressure for muffler design – Part II: Experimental results

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### **Abstract**

This chapter describes the final part of the detailed methodology of relationship between noise and back pressure for muffler design. This part includes experimental setup, experimental procedures, results and discussions. The experimental data show a general shape of an average design of the muffler which would be the most suitable for the test car.

*.Keywords:* muffler design, experimental procedures, noise, back pressure.

### **Introduction**

For the purpose of the experimental analysis, a Mitsubishi Eterna half-cut was acquired. Since the engine for this experimental setup has been acquired from the front half-cut, it has only a small portion of the exhaust system and an exhaust setup has been constructed.

### **Experimental Setup**

The important task in constructing the experimental setup is to isolate the engine noise and the muffler sound or noise. In order to achieve this, an anechoic chamber with the holes connecting it with another anechoic chamber or just simply another good ventilated room is required for a much precise result. It is important that the chambers or rooms involved with this experimental setup has good ventilation in order to circulate the fresh air inside the room and also the removal of the combustion products released by the exhaust system. In addition, the engine also needs a constant supply of fresh air for the combustion and also the cooling process of the coolant. However, due to the limited resources, the experiment was conducted inside a small custom made wooden box (Fig. 1) that provided some isolation from the engine noise. The hole that allows the pipe passage is insulated with the clay and the end of the box has been left open to allow maximum exhaust airflow from the tailpipe.