

# Design & Development of Electromagnetic Dynamometer for Testing of FHP Motor: A Review

PG Student Rajgonda Shivgonda Patil

Dr. J.J. Magdum College of Engineering  
Jaysingpur Maharashtra, India

Principal S.H.Sawant

Dr. J.J. Magdum College of Engineering  
Jaysingpur Maharashtra, India

**Abstract** -Ensuring any kind of Motor Performance as a part of Design Validation of FHP Motor is necessary to know against actual theoretical design of motor verses real test results obtained only through motor testing .Electromagnetic Brake Dynamometer (Eddy Brake Dynamometer ) is best suitable for Testing the Motor as a part of Loading & knowing the results at different torque values which enable us to know various characteristics parameters like Speed verses Torque, Current verses Torque, Input watt verses Torque & efficiency verses Torque as these are Key Motor parameters which should know to Designer or Motor manufacturer before releasing the product to customer cum market . This New Test Rig consisting of Designing, Development & validation of Motor.

**Keywords** -FHP Motor, Electromagnetic Brake Dynamometer.

## I. INTRODUCTION

Design , Development , proving of Complete test rig for motor testing which consisting of Dynamometer , Mounting fixture , Test bed with use of control panel , AC/DC Source with measuring equipment's for both AC & DC parameters. Test rig development need arises to ensure motor performance & Temperature rise values in loaded condition of motor during protosample performance verification & validation through measurement of test parameters those are applicable to related Motors , as load testing facility to test the motor as per various IS/IEC/UL standard is very rarely available at government/Nongovernment certified agencies. To get the motor testing in early time period which is a difficult task as it involves spending huge time for testing as per their schedule ,sending the motor /product to long distance test labs with many follow-up ,involving waiting time and exorbitant test charges which adding the input cost in getting product testing . Which ultimately leads delay in releasing the motor or product to customer or market for field trial and approval and later on product ionized?

## II. RELEVANCE

This Design & development of Dynamometer Test Rig for AC/DC Universal Motor/Ac Induction Motor/PMDC/BLDC Motor. It would help to do the various experiments & understand the product performance,derive its insulation class according to Rating based on temperature rise of the motor parts ,verification ,comparison ,finding Pros & Cons in the product through analysis related to R&D as well establish

the product quality in lesser time by doing the testing , Knowing the results & accordingly doing the development cum improvement.

## III. LITERATURE REVIEW

1. Design, Reconstruction and Evaluation of a Dynamometer for Quarter Scale by Samuel Sanchez.
2. 2009-2010 Hydraulic Dynamometer
3. A Major Qualifying Project Submitted to the faculty of Worcester Polytechnic Institute
4. Design of Dynamometer for Engine Testing In partial fulfillment of the requirements for the Degree of Bachelor of Science in Mechanical Engineering by Prince Mohamed Bin University.
5. Design of Dynamometer -Engine Coupling shaft by Mohamad HasunArif Bin Hassan.
6. Development of active flow control Mixed Flow Turbine on Eddy Current Dynamometer for automotive Turbocharger by Imperial College London.
7. Knowledge gained through visit to various industry & test lab.

## IV. SUMMARY

1. Very few researchers have worked on Electromagnetic Brake Dynamometer for FHP Motor Testing.
2. These studies are motivated by the fact that the need of knowing motor performance before to release the same to customer becomes more essential.
3. As compared to various test rigs available in the market those are like Hydraulic, Pneumatic, Alternator type such EBD test system finds us great in advantage in all respect.

4. As compared to other test system mentioned above EBD test system seems more reliable in terms of designing development & accuracy, cost effective.
5. For other test systems like Pneumatic it requires special arrangement of providing air supply & compressor set up & many more other parts.

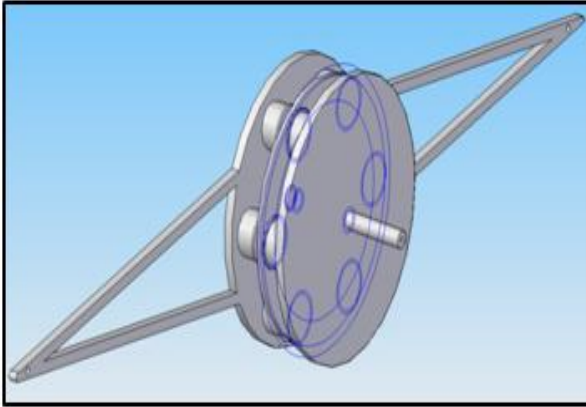


Fig. 1 3D View of Assembled Dynamometer

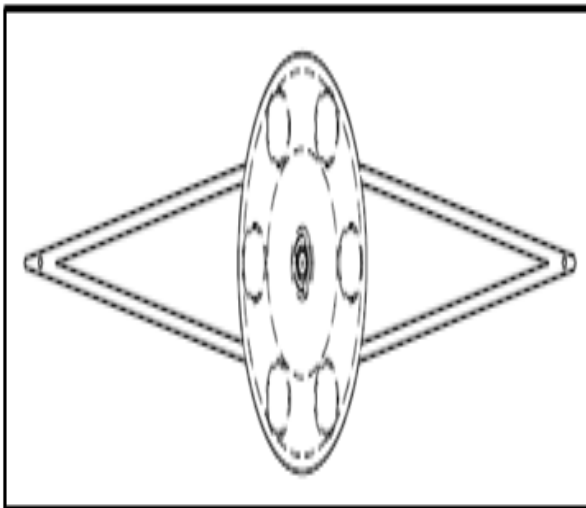


Fig. 2 Front view of Final Assembled Dynamometer

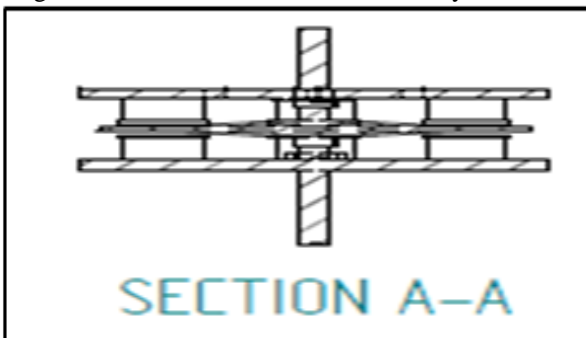


Fig. 3 Sectional view of Dynamometer

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