


Sl No	Particulars		
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3	PhD Thesis Title	Condition Monitoring Studies on Spindle Bearing of a Drilling Machine Tool Using FEM, Multiple Regression & GMDH	
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5	Date of Registration for PhD	01-03-2003	
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6	Date of Award of PhD degree	31-03-2011	
7	<p><u>Brief synopsis</u></p> <p>Major concern in manufacturing is the quality of product. Machine tools are liable to deterioration in their performance level with respect to time due to various causes viz., wear, ageing, unbalance, looseness of parts etc. Among the machine tool elements, proper performance and functioning of bearings has always been a major concern since all the forces are transmitted to the bearings. During the machine tool operation, heat generated in the bearings is transferred to the surrounding through thermal conduction and convection. In the process, structure gets heated up causing thermal distortion. Thermal distortion is undesirable and need to be investigated. Drilling machine is a versatile machine tool used for drilling holes in the work piece. The quality of finished product depends mainly upon stability of different components of a drilling machine. Performance of the spindle bearings in terms of vibration for various disturbances has been studied using transient dynamic analysis. A single local defect in a spindle bearing outer race was simulated. The analysis was performed considering various depths of defect in different orientation. The pitting defect on spindle driver gear teeth was simulated. Performance of the spindle bearing has been studied in terms of vibration and Acoustic Emission signals during various drilling conditions. The experimental work consisted of drilling S.G cast iron block using high-speed steel drill bit. To investigate the dependence of vibration and AE parameters on the independent parameters, estimation of vibration and AE parameters was carried out using Multiple Regression Analysis and Group Method of Data Handling (GMDH).</p>		