

Team 22 – Automated High Volume Bearing Bore Gage

Project Plan

Deliverable 2

Eric Allgeier
Boler
Seth Norman
Christopher Proffett
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Matthew
Kevin Flemming

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Problem statement

The objective of this project is to improve the out-of-date bearing bore gage system used by Koyo Bearings. This improvement must advance the user interface while maintaining the quality of the measuring device and the sampling rate. The improvement should also allow for the communication of each gage to a central terminal. This will allow for multiple systems to be monitored from a single device.

Project Objectives

The main goal for this project is to retrofit the bearing gauge testing console with a new computer, operating system, and display. In addition, the machine should later be able to connect to the network at the Koyo plant. Projected date of completion is May 2014.

The plan for the Fall Semester:

1. Research the inner workings of the machine and components.
2. Research for a heavy duty industrial rated computer and display.
3. Research interfacing options.
4. Use a Decision Matrix to choose best design.
5. Make bill of material for all the parts needed to complete this task.
6. Submit our design to Koyo Bearings.
7. Quote and order all parts needed for the design.
8. Create Project Objectives for Spring Semester.

Overall Methodology

The designing of this retrofit will be broken down into multiple phase. The first phase will be to study the behavior/controls of the air transducers. Then there will be a group decision, consisting of the team members and project advisors, to see if there is any need to replace the transducers with a different style of pneumatic transducer. Phase two will be to research the new heavy duty industrial rated computer and display. Phase three will be to design a complete working system, then submit the design to Koyo Bearing. Phase four will be to make a bill of material and then order the parts needed. Phase five will be to make scope of work for the spring semester.

Project Constraints

There are many constraints that must be taken into account starting this project. Money will be a large constraint. It will determine what technology we can actually use in the redesign of this bore gauge. As of right now, the budget is \$2,000.00 and Koyo Bearing has requested that we do all purchasing through their company. Another constraint to this project is time. We will have until the end of this semester to explore all design options and decide on a final working prototype. Our goal is to order all parts needed for the physical prototype by December to ensure that when we come back for the spring semester we have everything we need to begin on our prototype. This will give us ample time to troubleshoot and make any modifications to the design that are needed in order to deliver a finished product.

Deliverables

A Gantt chart has been attached to the back. The concept generation relies upon the analysis of the bearing bore gage. This will occur at the same time as the research so that current hardware may be compared to possible replacements. A design selection must be made by the end of November to allow for approval by Koyo Bearing and parts to be ordered.

Assign Resources

Eric Allgeier - He has the responsibility of displaying and organizing any group information on a website. He will also need to keep record of all the deliverables, meeting minutes, personal information, critical dates or other records of information that is critical to the project. The information will need to be well organized and easily accessible to all members or inquiring parties.

Matthew Bolter - He is responsible for ensuring that all deadlines are met. He is to keep track of all deliverables and assign tasks for each deliverable. He will be the one to turn in all assignments, whether digital or physical. He is also responsible for overseeing and delegating the mechanical aspects of the design.

Kevin Flemming - He will be in charge of building models and machining any parts that are needed. He will have primary access to the bearing bore gauge machine that is located on campus. Also, he will be in charge of the group's finances and will coordinate purchases with Koyo Bearing.

Seth Norman - The role of project manager is to delegate work amongst the team members accordingly to their qualification. He should oversee all work being done on the project and make sure it is being done correctly and in a timely fashion. Also, he will help coordinate with other team members on a realistic timeline for the project, so the team can set mini-goals throughout the project.

Christopher Proffett - It is his primary responsibility to take care of all scheduling for meetings on a weekly and biweekly basis. He is also in charge of communicating with all of our outside advisors and scheduling when the team can meet with them on a consistent basis. He will be in charge of contact with our sponsor, Mr. Robert Potts, and will decide when, where, and how often he would like to meet with us. He is in charge of sending memos to everyone reminding them when and where to be for all meetings.

Product Specifications

Design Specifications

The design chosen must be able to run off of a 120V power supply; this is the current power supply being implemented at Koyo Bearing. Air transducers will be used to measure each boring. The device must be able to operate at a rate of one bearing per six seconds; this includes measuring the bore and determining whether or not it passes the allowable tolerances.

Performance Specifications

The design must incorporate a large touch screen display/input. It must also be able to communicate with the network at Koyo Bearing's facility. The device must maintain 100% accuracy on tolerance acceptance and maintain the failure alert system; this means that three consecutive failures will alert the staff.

