Mechanical Maintenance & Trouble Shooting Course (PMMI)

Mechanical Troubleshooting Course: This is a 3 day course on mechanical systems. At the completion of the course the students take the PMMI Level 1 Mechanical Certificate Test.

Course Length: 3 Days

Day	Module	Module Objective	Summary of Task/Actions	Hands On	Time (Hours)	Quiz
1	Mechanical Drives	Provide an overview of simple machines, hardware, motor mounting and an introduction to Lock Out/Tag Out Process as well as overall Safety.	• Lecture • Lab: Pulley • Hands on – SAE Bolts	Pulley Principle: Utilizing three different pulley arrangements, demonstrate that the force F and the distance S are inversely proportional	2	Yes
	Key Fasteners	Provide an overview of the various keys as an integral part of fasten of mounting hubs to shafts, the varieties of keys and their applications	• Lecture • Hands on various keys	Hands on various samples of keys	1	Yes
	Fluid Power	Provides students with an introductory understanding of both Hydraulic and Pneumatic systems. Additionally, students will learn Pascal's, Boyle's and Charle's Law, factors effecting fluid power systems and basic system trouble-shooting techniques	• Lecture		2	Yes
	Couplings	Provides students with an understanding of the various	• Lecture • Hands on various	Hands on Various Couplings	1	Yes

		couplings, their application and the methods of alignment	couplings			
	Power Transmission, Bearings and Shafts	Provide students with an understanding of bearings, the mounting of bearings, bearing load types. Additionally, students will understand the importance of shaft alignment and the various methods used in obtaining shaft alignment	• Lecture • Hands on – Shaft Alignment	Using straight bar alignment method, mount and align shafts of two motors • Proper mounting of motor to base plate • Measurement of shaft runout • Alignment of shafts using straight bar • Proper attachment of couplings	3	Yes
2	Belt Drives	Provide students with an understanding of the application of V Belts, the proper installation and tensioning of V Belts, the variety of bushings and bushing selection as well as High Torque Drives and Synchronous Belt Drive Systems	• Lecture • Lab – Belt Tensioning • Pulley speed ratio	Belt Tensioning Lab • Perform pulley alignment using straight edge • Mount belts properly • Tension belts using tension gauge • Predict and measure pulley speeds using stroboscope	3	Yes
	Chain Drives	Provides students with an understanding of the application the components of chain drive systems. In addition, the module will cover the proper method of installation and removal of chains, chain sag, the various sprocket types, lubrications methods and the maintenance, inspection and troubleshooting of a	• Lecture • Hands on – Gears	Provide students with an understanding of the application the components of gears in drive systems. In addition, the module will the pitch circle and pitch diameter of a gear, how to calculate the ratio of gears and the speed of a shaft. The module reviews	2	Yes

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		chain		the various types of gears and their application, backlash and measuring backlash, the installation and alignment of a gear system		
	Lubrication	Provide students with an overview of the functions of lubrication as well as the various types and their methods of application. The module reviews the types of oil and grease, viscosity and includes a review of MSDS sheets and the proper methodology for the recycling and disposal of lubricants	Lecture		2	Yes
	Safety	Provide students with an overview of safety in a manufacturing environment as it pertains to providing maintenance. The module covers topics on proper clothing, lock out/tag out basics, materials and chemical storage, and fire safety	• Lecture • Hands on – Lock Out / Tag Out	Lock Out / Tag Out	1	Yes
3	Sensors and Safety Systems	Provide students with an overview of Sensors and Safety systems	• Lecture • Hands on	Extensive hands on with sensors.	4	
	PMMI Test				2	