

# Learning On-Line

Tech Tip # 5

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*Training Your  
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## Troubleshooting Techniques

Developing a common sense step-by-step approach to troubleshooting equipment is a valuable asset all maintenance personnel must have. Addressing problems in an orderly manner simplifies repairs and will save your company down time. In any production environment, technicians should avoid the shotgun method of troubleshooting and take a more logical approach, which will assist in becoming more efficient.

There is no substitute for experience. How do most skilled personnel gain experience and perfect their troubleshooting abilities? These skills are mastered through a combination of hours of blood, sweat and tears, intense training and the ability to address troubleshooting in a methodological manner. It has been proven that there are techniques that you can use to develop your troubleshooting skills and increase your proficiency in diagnosing problems.

These technique are not intended to be a checklist, but rather a thought process to approach problem solving.

### What is the problem?

Sounds simple enough. So think for a moment and consider what happened. This is the information gathering process for which the machine operator should be your most helpful source. Do not forget common sense. Many times common sense is overlooked and the problem becomes much bigger than it actually is.

Once the problem area has been isolated, it is important to assure your safety and the safety of others before attempting to manipulate the machine. The well-trained operator may play a key role in assisting you with the controls.

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### **Define the problem:**

Now take the information that has been gathered and consider the three variables. Is the problem mechanical, electrical, pneumatic/hydraulic or a combination of all three? Beware of false indicators that can lead one astray. For example, the incorrect use of test equipment or the inability to read prints will lead to the wrong conclusions when testing electrical circuits. Identifying which of the three variables is actually causing the trouble requires an understanding of the system and the application.

### **Use the available resources:**

There maybe more options available than what is initially thought. The first important resource you have are other co-workers that may have already repaired such problems. These seasoned “old-timers” have a great deal of experience and can be helpful in confirming your observations.

Another resource that is available is the machine documents. This should include the electrical schematics, pneumatic schematics, operating instructions and parts lists. These documents should be studied before a problem arises so that you are familiar with the organization of the manuals and where to find specific information.

There is also a very helpful resource that is just a phone call away, technical support. To best take advantage of this service you should have done your research before placing the first call. This includes the status of the machine, inputs and outputs, voltage measurements, etc. Having this information will allow the technical support personnel to assist with diagnosing the problem faster and may very well make the difference in pin-pointing the problem on the first call.

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### **Formulate a theory:**

Develop an understanding of what really occurred and what exactly failed. It is highly recommended that the facts be found, as diplomatically as possible, with the operator and others. With the right approach much more detail will be disclosed on future problems.

Establishing this theory may take more time if you are unfamiliar with the system or equipment. But in the process it should be asked, "Did the problem develop from a lack of preventative maintenance, an operator error, or incorrect use of equipment?" If the answer is lack of preventative maintenance, a program should be initiated which will help prevent the problem from resurfacing in the future. If the answer is operator error or incorrect use of equipment, additional training for personnel may be necessary.

After establishing the theory, verify that the problem is what you believe. This becomes much easier if you are able to recreate the problem with the information that has been gathered. Without verification, parts and/or components maybe replaced unnecessarily, leading to more time and expense.

### **Make the necessary repairs:**

It should be obvious at this point what the problem is and the necessary steps required to repair the system equipment correctly.

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### **Test the machine to verify that the problem has been corrected:**

Testing the repair is as important as making the repairs themselves. Without testing to ensure that the problem has been corrected, there is no way of knowing that the repair was successful. Verify that the machine safety guards and components are restored to their original condition.

### **Document your steps and repairs:**

More often than not when the task is finished, other demands for the maintenance personnel will have developed. By documenting the problem, the steps to solve it and the repairs that were made will serve as a valuable reference if the same problem occurs in the future.

With practice of these techniques, down time will most certainly be reduced. There will always be the “what if” question in troubleshooting any given system, but taking a logical approach time after time, maintenance personnel can begin to fine tune their skills.

### **Want to learn more?**

*Stiles Education offers maintenance and troubleshooting courses on a wide variety of machines. Complete course descriptions are available by accessing our website at [www.stilesmachinery.com/education](http://www.stilesmachinery.com/education)*

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