

What I learned from Jorge Menchu's Strategies & Techniques For Waveform Analysis

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I chose this article because reading waveforms and deciding is something that I am new at, and need some work at to get better at it. I thought that if I read this article that I would learn more about waveforms, how to read them and how using waveforms can help me when I am working in an automotive shop in the future. This article has helped me learn how to figure out waveforms by teaching me Jorge Menchu's three most important principles of learning about and performing effective waveform analysis. His three most important principles are that waveforms are information, reading a waveform is about finding relationships, and advance waveform analysis is about process.

When he said that waveforms are information he meant that they can represent temperature, light, pressure, noise, and electricity. Also that the information is in voltage over time when displayed on the scope screen. The first thing that I learned was to not get trapped into the whole waveforms are about electricity and I don't know anything about lap scopes or electricity. Another thing that I learned was that even if you do not know about electricity if you know how to look at the scope screen and use a scope.

I learned that waveforms are about relationships. The relationship is between the waveform and what caused it to look the way it does. According to Jorge it is the goal of diagnostics to find a direct relationship or no relationship at all between the waveform and the problem or thing that caused it. When reading a waveform it is the connections of signal and circuit, system and environment that gives it its meaning to technicians.

Advance waveform analysis goes beyond the relationships of the waveform and what caused it. It is about the process of learning about the dynamics and actions of the system by reading the waveform. Jorge says it's like asking the questions of what did happen, what is going to happen, and or what is happening. The process is how the transfer of energy and information in the system will make the desired outcome, but if there is a problem in the system it will cause a breakdown in the process and change the desired outcome to something that you did not want. According to Jorge the processes used is the key to understanding the system that you are looking at. Also the process is used for building an expert level knowledge of that system.

Some other things that I learned are that waveforms can be divided into three parts. Those parts are what you see on the scope's screen, how the waveform is shaped, and what the waveform does. What the three parts mean is that the waveform itself is the first part to look at. Second part is that if the waveform changes then there was a change in voltage, current, or resistance. If there is a change in any of the three then it is a result of one or more of the components in the circuit. The reason for changes in the components in any circuit can be due to a malfunction, environment, or the change was commanded by the system. The third part is the work done by the energy that you are looking at on the scope. That energy that you look at on the scope carries information. The information that is carried by the waveform can show if the components are good or bad, also if the system operation.

A way to help understand and figure out this information is to ask yourself questions. If you are trying to figure out how the waveform was shaped then you can ask yourself how did the relationship change, what component changed the relationship, and or what dynamic changed the component. If you are trying to read the waveform then you can ask yourself what is the waveform telling us about the energy in the circuit, what is the waveform telling us about the circuit and its components, and what dose it tell us about the system in general and what the system needs to work.

If you want to teach yourself about waveforms a important strategies is to just ask yourself questions like what am I missing, what is the relationship to the problem, does that look like it is supposed to be there, and any other questions that you can think of. Another thing that should always be remembered is that you might be making a mistake and confusing yourself somehow. If you do not know and are still having trouble trying to figure out something about the waveform then stop thinking about what you don't know and think about what you do know about the system. When diagnosing using wave forms you must keep in mind that all the parts of the system fit together in a certain ways to make a specific sequence, which are makes a process that are suppose to work in a certain way. You have to follow these pathways of how the parts work in the process and what it is supposed to do. By taking things one step at a time, it will lead you to the problem.

With all that I learned from this article it will help me in the future. It will do that by teaching me to ask myself questions about the waveform that I am looking at. That what I am stuck on, might just be my own fault because I may have put cursors in the wrong place. To look for the relationships and by figuring out the information that is in the waveform. That is why I know that this article will help me in the future.

Sources

- “Strategies & Techniques For Waveform Analysis”, by Jorge Menchu, Motor Magazine, July 2012

Additional articles by Jorge: <http://www.aeswave.com/Articles-by-Jorge-Menchu-17.html>