Flushing Out an Intermittent No-Start

"My engine won't start". A no-start is usually an easy diagnosis, but it's really irritating when the engine starts immediately after the tow truck drops the front wheels to the ground. This 1997 Camry played that game. The rotary solenoid idle control device is the most common cause of a no-start on this generation of Toyota engines, but that's just a guess now that the engine is starting fine.

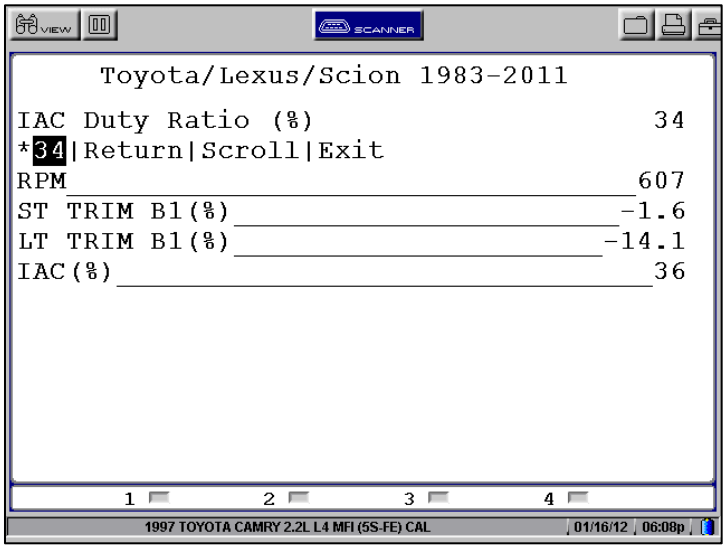
No Symptoms Present. Any Measurable Faults?

The traditional no-start flow chart really doesn't help here, because it assumes that the fault is present. But this fault *is not* present...or is it? Are there still indications of a fault with the idle control solenoid even though it's currently working? Well, you'll never see it in a flow chart, but this is the time to leverage your Scan Tool to quickly and non-invasively see if the idle solenoid is hanging up. By 'non-invasive' we mean that you're not grabbing tools and taking things apart. This is really important for 2 reasons:

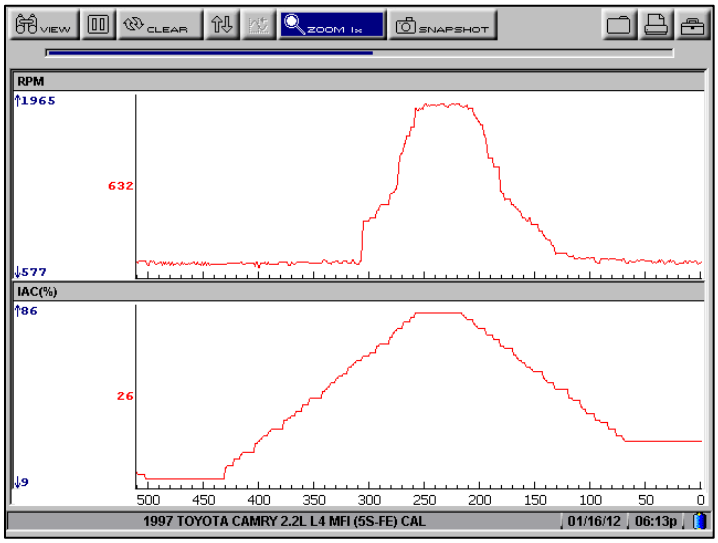
- If you start 'wrenching' before you diagnose, you are changing the vehicle in some way. Did you break something loose, or help a poor connection make contact, thereby fixing the fault? You may think that the problem is simply not reproducible, when in reality you already fixed it. Now it's not billable time and you can't make any assurances to the customer.
- This is the really important point – money! By leveraging your Scan Tool instead of taking things apart for inspection, you're saving time, thereby increasing both your productivity and your customer's satisfaction.

Test Procedure

The Scan Tool was connected, and the bi-directional controls for IAC (Idle Air Control) Duty Ratio were selected. The capture to the right shows the command forced to 34%. You can run the command from 0% to 99% to check the range of the component. Also, the data list had been trimmed to only 4 PIDs in order to speed up the data refresh rate (very important on 2003 & older Toyotas with slow data rates).



The capture on the next page shows the RPM and IAC% PIDs graphed over time (during the bi-directional test) so you can see the relationship. If your Scan Tool supports PID graphing, use this function to get a better feel for component control and results.



Nailed It!

As you can see in this capture, the RPM doesn't exactly follow the IAC command. The technician increased the IAC% command from 9% to 99%, and then back to 26%. The RPM, however, didn't jump up until the IAC% command was over 70%. Using this simple graphing strategy, it's easy to see that this idle control solenoid is sticking and needs to be replaced. Even though the engine did not stall during testing, this is a clear diagnosis. With hoses and gaskets this job exceeds $450, so it's nice to be able to sell it with confidence that it's not a 'guess'.

Conclusion

This wasn't a difficult diagnosis, but that's not the reason we shared it with you. This is a good example of using tools and techniques in ways not addressed in traditional diagnostic information. This was a 5-minute confirmation of a fault that wasn't actually presenting any symptoms at the time of diagnosis. Remember, the engine started fine after being towed in, but there were still some measurable clues to be found when the solenoid was forced to its limits. Sure, we could have removed it for inspection, but it's hard to visually discern between a good solenoid and a sticky one. Therefore, like other ATG case studies, this isn't about some really clever solution to a once-in-a-lifetime scenario. Rather, it's a demonstration of how an everyday diagnosis can be so much faster and more accurate. It sure beats the usual trade-off of guessing at a root cause vs. sending the customer out with 'could not duplicate' on their repair order.