

Engine and Chassis Mechanical Diagnostics



Frank Massey, Autoinform

Ahead of the Autoinform Live training event in Cork in April, Frank Massey wants to get you thinking about problems you are facing in your own garage. In particular, mechanical diagnostics covering the engine and the chassis.

Without any doubt, the biggest concern with technicians and customers is getting it right! There are two words that define the world of diagnostics, opinion and evidence. Opinion is high risk, leaving you vulnerable to litigation and loss of reputation, not to mention profit loss.

I have decided to write about a couple of technical topics, which will form the subject of my presentation at the Autoinform Live in Cork on 27 and 28 of April 2019. It will also enable you to research the subject and perhaps reflect on problems in your workshop.

Evidence is the gold standard, no guesswork, with full justification for a professional labour fee. It removes debate and disagreement with the customer, you're in the driving seat.

The subject I have chosen is mechanical diagnostics covering two disciplines: the engine and the chassis. My chosen method is real-time compression evaluation using Pico WPS and vibration analysis using Pico NVH.

Real-time compression evaluation

The need for real time compression measurement came of age with variable cam timing and valve lift systems. Guessing if the valve timing is out won't cut the mustard any more, and suggesting dismantling the engine to PIN the engine can be a very costly, especially if its an opinion.

I am not suggesting the scope totally removes the need to pin the engine. It does, however, provide positive evidence that there is a discrepancy in the valve/piston relationship. This assessment is supported with evidence from the pressure differential in the cylinder across the four-stroke cycle.

You may call this suction or vacuum. But I'm sorry to inform you, there is no such thing, so come and debate it further on the day in Cork!

Chassis Noise, Vibration and Harshness (NVH)

The second subject is vibration, so what is it and why is it a problem?

You need to begin accepting the vehicle is a



Come see Frank Massey, and many other experts from the aftermarket motoring world, April 27th and 28th, 2019 at Autoinform Live Ireland at the Munster J&S Automotive Training Centre

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collection of components and systems in constant conflict, with different mass, direction and balance. Vibration is all about frequency and mass differential. Vibration has a source, a transfer path and a respondent. Technicians almost certainly deal with the respondent, not the cause.

Inputting vehicle data, the software separates the vehicle into the relevant frequency. This enables the technician to easily identify which system the vibration originates from, engine, transmission, or road wheels.

Using a three directional accelerometer, not only is the mass measured in milligravity “mg:”, but also the direction of the out-of-balance force. This is achieved by mounting the device to the driver seat frame. Like I said earlier, now you're in

the driving seat, literally. So, lots to debate, discuss and demonstrate. I hope you can all make it to Cork this coming April, as I am really looking forward to Autoinform Live coming to Cork.

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**Saturday April 27th and
Sunday April 28th 2019,**

**Munster J&S Automotive
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