



NO-GO Colorado

This article is a true description of an AECS technical help desk problem and how it was solved.

Vehicle

2015 Holden Colorado 2.8 Ltr Turbo Diesel FXH



2015 Holden Colorado (picture sourced from internet).

Problem presented to the Technical Support Team

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This vehicle has been towed into our workshop from another garage. Several new components have been fitted, amongst which a new common rail fuel pump.

The ute does not want to start, we have been asked to do a pump relearn.

The vehicle has a fault code P1297-00 - Fuel Pressure Reg Not Learned.

We cannot do a pump learn with our Launch scan tool.

Can you please assist?

Let's think

Understanding why a pump relearn needs to take place is vital in this case. We deal with that in the AECS DMS1-3 common rail Diesel training. Pump relearn is for the ECU to adapt to a new SCV. Every SCV (Suction Control Valve) has its own unique properties, not one is the same as the other, even though they look the same when they come out of the box.

Some begin to open at 40% duty cycle and are fully open at 55%. Some begin to open at 15% and fully open at 35%, and so on.

The ECU will alter the duty cycle until it sees pressure increasing and until it sees no more pressure increase. For that process to work the engine needs to be started and running.

Some ECU's will self learn and some you need to activate the learn function with a scanner.

This engine was firing every so now and then on a few cylinders and then die, certainly not idling which you need to perform a pump learn.

Something else is going on.

Murky

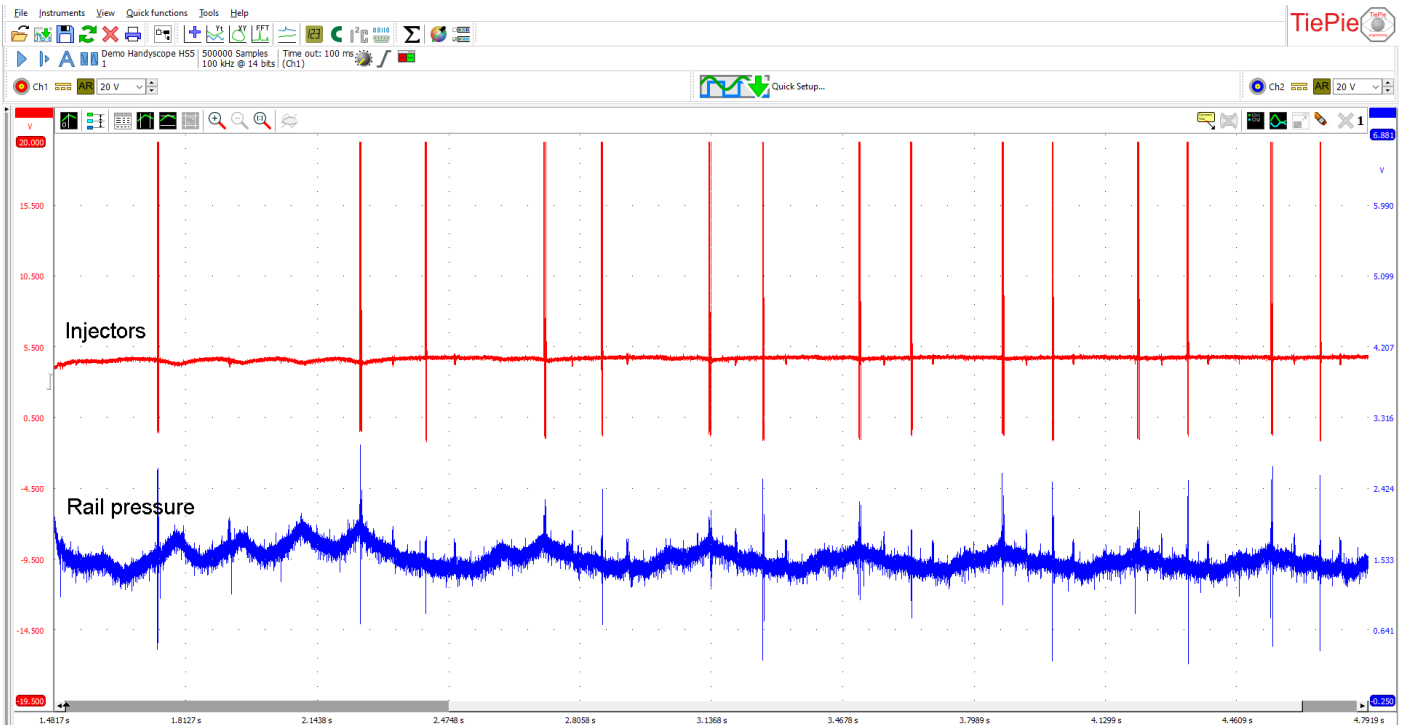
As is so often the case, when a car gets passed on from workshop to workshop, the actual customer complaint (the initial problem) has been altered by technicians along the way, or it is completely missing.

We had to start from scratch



Measure

An ATS scope recording was requested of rail pressure vs an injector, that is always a good starting point on a common rail Diesel.

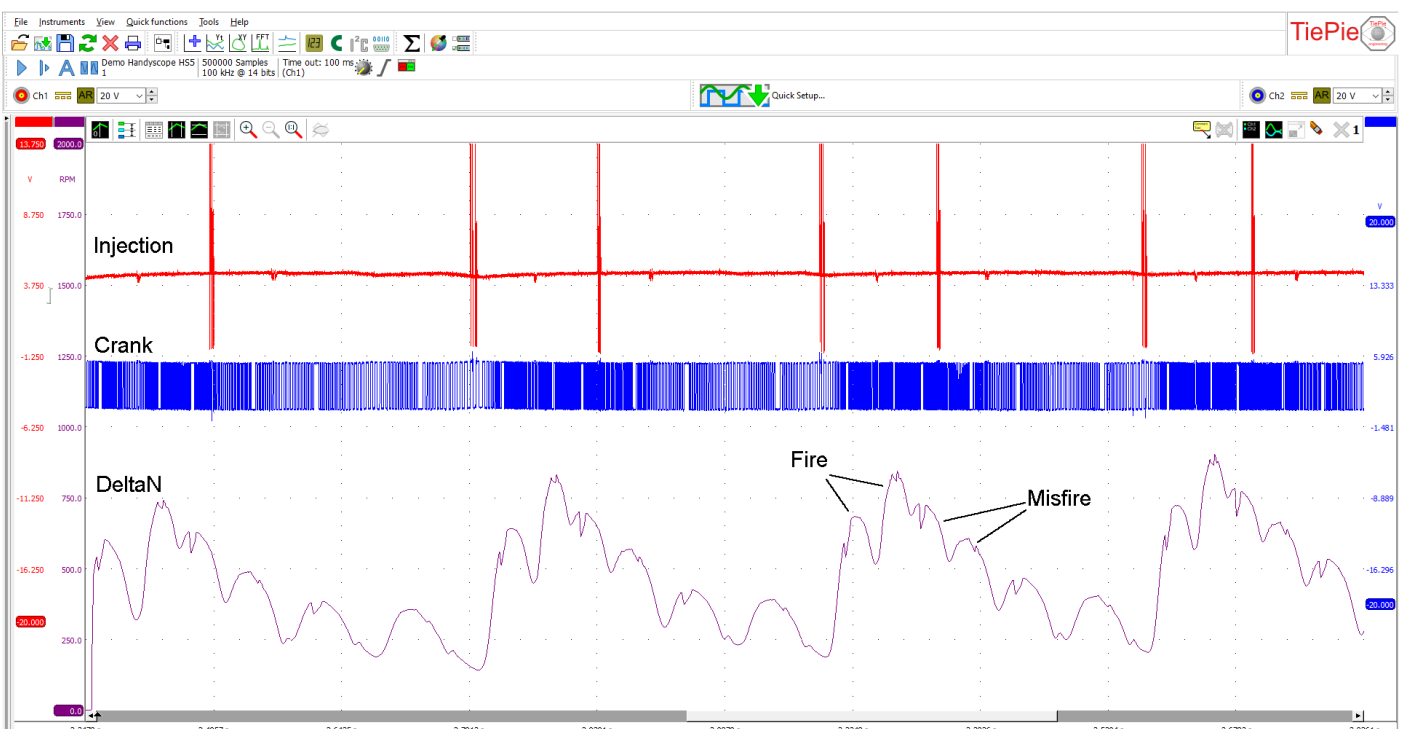


ATS scope recording rail pressure and injectors

We can see Rail pressure coming up ok as soon as you crank and injection is occurring, this means that there is enough rail pressure. So why does it not fire?

For now ignore the rail pressure (and SCV learning), as that is not your problem.

Can I please ask you to do a Crank vs Inj1 recording as looking at your recording it looks like 2 out of the 4 cylinders are firing (actual combustion). Via a deltaN line we will see how the compressions look and if there is any combustion.



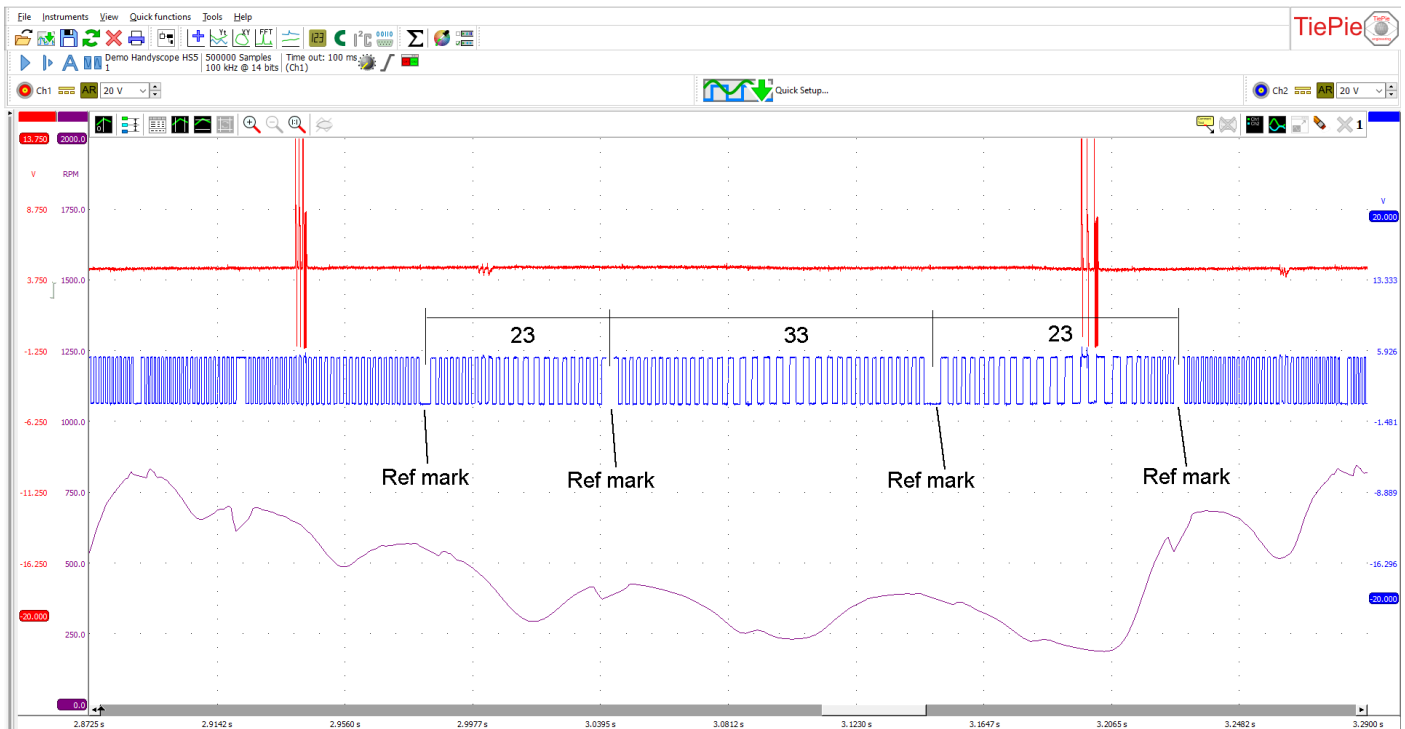
ATS scope recording Injection and crank



The Injection and Crank recording shows us that all compressions are good, and importantly that there are in fact only 2 cylinders that are firing and not even regularly. Not enough energy to keep the engine going.

Zooming

When zooming in on this recording to investigate why the injection pattern is irregular we noticed something really odd.



Zoomed in recording injection and crank

NEVER

I have never seen this in my diagnostic career! The spacing between reference marks is always even every revolution, The teeth count between reference marks is always a logical figure. In this recording we see 23 teeth and 33 teeth. Added up 56. This makes no sense.

We advised the diagnostician to have a decent look at the tone wheel as we suspect that there is something wrong with the teeth, mechanically or magnetically.

Photo

The next post on the AECS Help desk forum had a lovely picture attached:



Magnetic tape tone wheel of the Colorado, spot the missing piece.



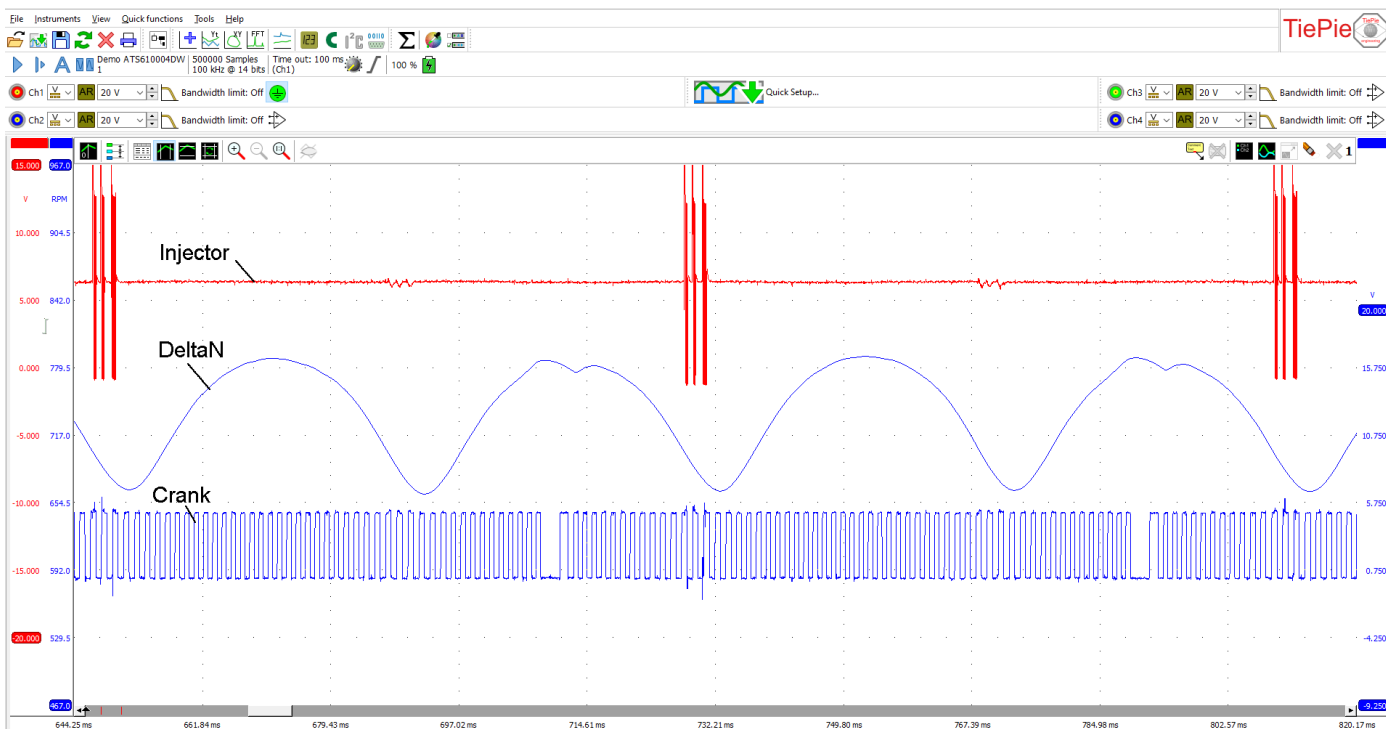
Close up detail of the damaged tone wheel

Amazing! Part of the magnetic tape of the crankshaft tone wheel is gone. That missing part was read on the scope as the second reference mark. The ECU saw the same and could not work out when to inject the remaining two cylinders.



Bingo

A new tone wheel was pressed on the crankshaft (in situ), the flywheel and transmission was fitted back again. The engine started immediately and ran fine, no codes either. The diagnostician was so kind to send us an after recording of the crankshaft and injector signals.



ATS scope recording after repair.

As you can see on the DeltaN line, there are perfect even compressions and combustions every revolution. Also the injection takes place regularly.

No pump learn needed after all.

Conclusion

How would you have done this??

To find the fault took this trained diagnostician with the aid of the AECS help desk about 15 minutes labour. Look at what the other garages have spent and replaced already!!

Diagnostics is not hard guys, we are living in 2022 now, swapnostics needs to be a thing of a long distant past!!

Training, quality equipment and a little technical support was all that was used to crack this quality case. A healthy bill at the end, for this vehicle made the job very worth while for the workshop.

So what equipment was used?



To solve this case this professional diagnostician used:

- 1) An ATS 500XM scope kit.
- 2) An updated Launch Auscan3.
- 3) AECS Training
- 4) AECS technical support.

*ATS 500XM scope
2CH + signal generator
\$3654+gst*



*LAUNCH Auscan3
Professional scanner
\$4,999+gst*



AECS Scope training Chch 5th - 6th of July 2022

It's not rocket science, YOU can do this!

Thank you,
Herbert Leijen
Director **AECS** Ltd

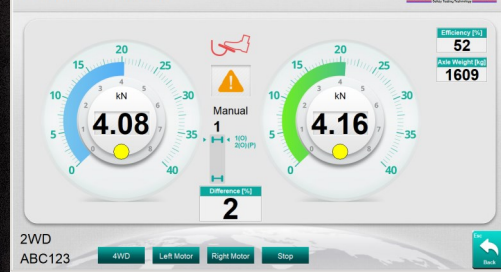
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Quick specs:

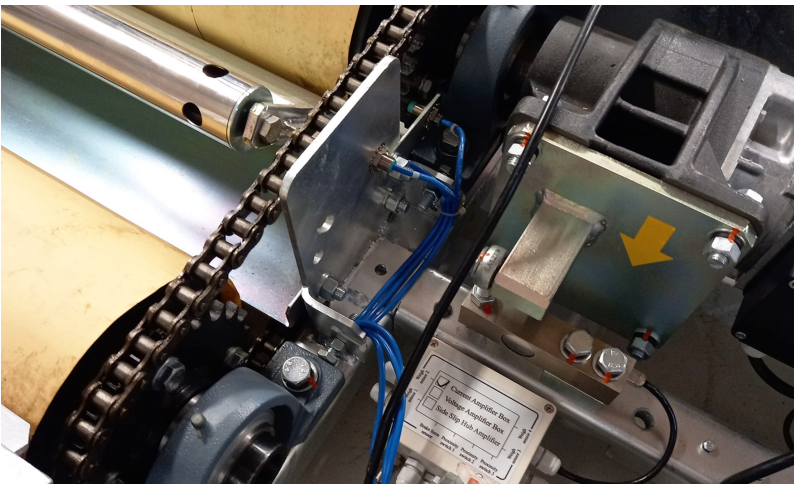
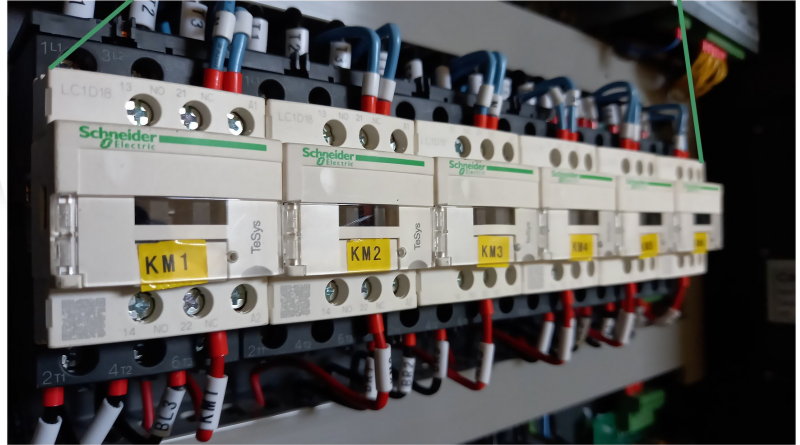
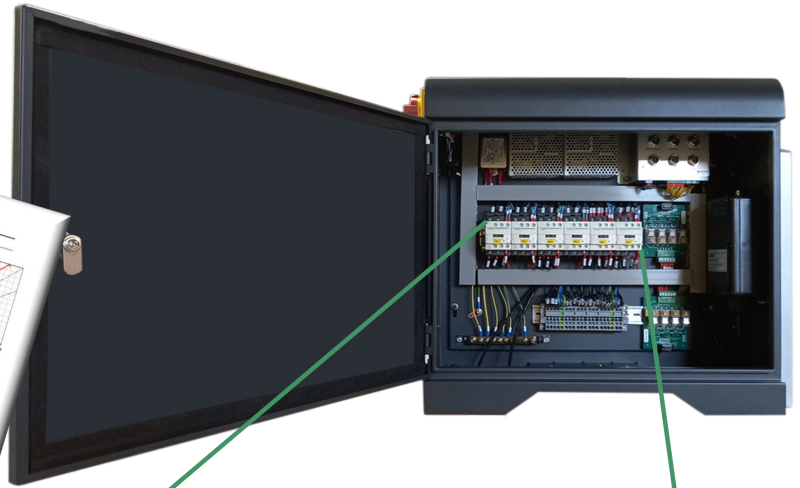
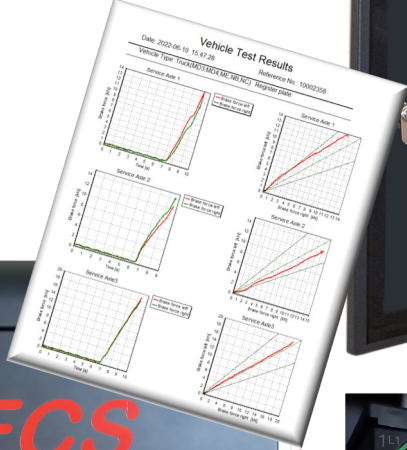
- 8KN per wheel brake force
- 4x4 testing
- 4T axle load
- 3KW straight drive ABM (European) motor and gearbox with auto brake.
- Test axle width 800mm - 2200mm
- High precision, high grip, low wear corundum rollers. Wet >0.6 Dry >0.85.
- Roller alignment to prevent drag and (camber) pull, influencing brake force readings
- Hot dipped galvanized frame
- German industrial electronics
- NZ designed software
- Installed and maintained by AECS (nationwide, since 2003)



STT10e

BRAKE TESTER

The STT10e has the quality and the latest electronics, making the STT10e one of the most accurate brake testers on the market today.



AECS STT10e BRAKE ROLLERS - TAKE A CLOSER LOOK INSIDE

