

Modern diagnostics, old car.

AECS' core business is supplying NZ (and Australian) workshops with Equipment, Training, and Technical support for diagnostics on vehicles.

We have been doing this successfully for more than 10 years. Most workshops around NZ have used our services and most are very happy with what we have to offer. Our clients range from very large dealerships to very small one-man bands. We even have a number of prominent vehicle distributors and training institutes as clients.

The equipment we sell covers all requirements you could possibly have in the automotive diagnostic field. We spend a lot of time researching which equipment works in the field and what does not. It is not just our own research we trust, it is also through the extensive technical support we provide that we find out which equipment is actually valuable in the field.

Frustratingly we often provide technical support to technicians who purchased incapable equipment from other sources. If the correct equipment would have been present in that workshop the call for support would not have happened, as most technicians are very capable.

Our wider view on the industry puts us in a position to advise what equipment you need and what level of accessories need to go with that equipment. As long as you advise us of the kind of work you do, we can find a tailor made solution for you.

Problem Presented to the Helpdesk

1999 Citroen Xantia 2.0Ltr petrol

This car had simply a new starter motor fitted, after, which it would not run anymore.

While winding over it would fire briefly and then die. The car's battery had been disconnected for the starter motor job. A scan tool was used to check for faults. A crankshaft sensor code was logged; something some older European cars (e.g. GM) do when the key is on with the crankshaft is not turning. The code could not be reset, so was regarded as a hard fault (!).

The Ignition and injection was checked with an inappropriate late model scope. It was seen that the ignition worked on both DIS coils and that injection stopped after a few beats.

The crankshaft sensor signal was checked with that scope and found to be good.

All appropriate steps, well done so far, but what next?



X-431 GX3 scan tool is a perfect complete unit, it out performs all other diagnostic tools we have seen so far!

**\$4,750.00
+ gst**

**NEW Shipment arriving.
MAKE USE of this GREAT offer!**

LAUNCH X-431
GX3 Latest model SCAN TOOL

Features:

- ▶ Touch Screen PDA
- ▶ Inbuilt printer
- ▶ Able to be used on [56 car brands](#) including Jaguar, Isuzu and Great Wall.
- ▶ Very simple to operate
- ▶ Many protocols are almost identical to factory software
- ▶ 1 year free updates and 12 month warranty
- ▶ Strong carry case for all connectors and tool

Great value!



And....**AECS** technical support.

Parallel import.

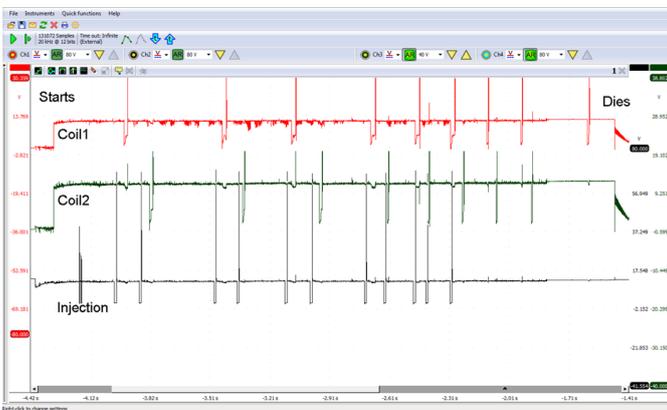
What next?

The crankshaft sensor was replaced, regardless of the good signal and later the ECU was replaced all with no positive results.

The question, which was posed to the help desk, was if the immobiliser could have reset itself by disconnecting the battery.

Useful equipment

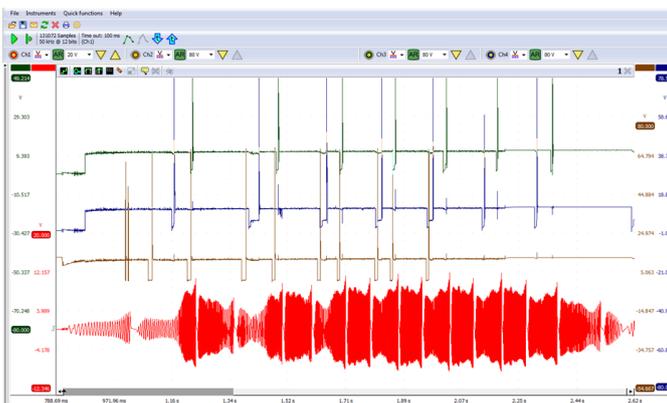
After all this, the car got towed to a shop, which used AECS as a provider. This shop used the Launch scan tool, which did reset the crankshaft sensor code. They proceeded by using the ATS 5004 4-channel scope to record ignition over injection.



ATS 5004 Ignition over injection recording when the engine briefly begins to run on 2 cylinders and dies again.

Only for the trained eye, it is visible that the both the ignition patterns are not 180 degrees offset. The irregular injection is normal during start enrichment.

Better, add the crankshaft sensor to the recording!



ATS 5004 recording of both coils, injection and the crankshaft sensor.

AECS equipment

VTEQ (made in Spain)

is a long established brake tester manuf. producing equipment for distributors all over the world, including AECS Ltd in NZ. We have installed machines throughout New Zealand, prices ranging for small workshops to large dealerships.

The VTEQ 2000 analogue brake tester at \$17,000 (+gst, installed, but excl. work on building)



The 3080 Suspension and brakes inspection test lane at \$32,000 +gst. The 3080 (and 2080) has a testing ability of up to 6 ton axle weight and can test shocks and alignment in one drive through. Quick, sturdy and reliable!



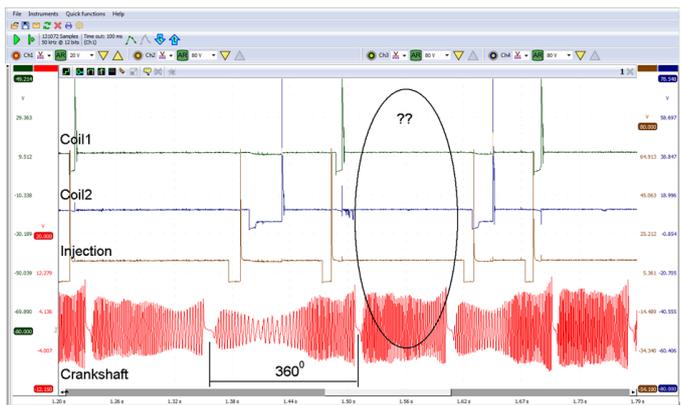
Sales, Installation and training by AECS Ltd

Check our catalogue for specifications at:

www.aecs.net
Ph: 06 8749 077

VTEQ

This is where things become clear. The wiring diagram (part of the scope software) shows that there are only 2 coils. That means we have 2 waste spark coils. Each coil has to fire once per crankshaft revolution. Look at the zoomed in pattern.



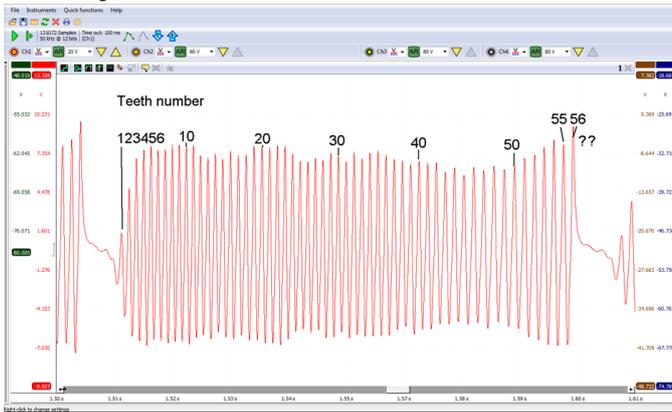
Zoomed in on 5 crankshaft revolutions

That is clear! Every second revolution there was no ignition and no injection! This is why it ran on 2 cylinders when it briefly fired up. This is also, why the first garage saw it firing on both coils and saw injection.

It is also obvious that the crankshaft pattern is present, so why the incorrect activation?

The devil is always in the detail!

So why?

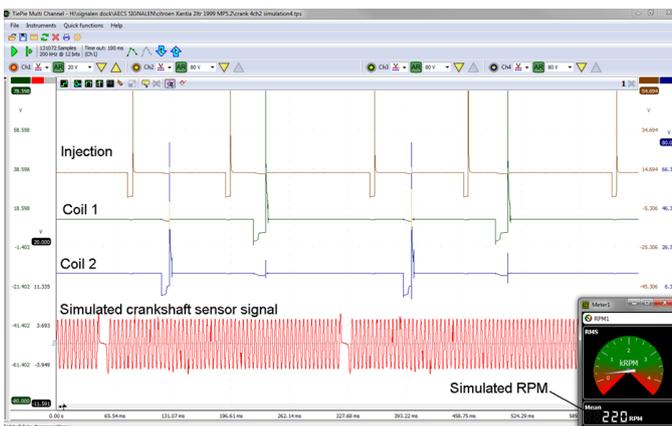


Zoomed in on the circled crankshaft portion of the 4-channel recording.

The zoomed in pattern shows a healthy 56 teeth on the crankshaft tone wheel, with as exception that the number 1 teeth looks a bit low in voltage. Looking at the sample pattern in the ATS scope software revealed that the Citroen Xantia needs to have 58 teeth!

Simulate

Through the menu in the scope software, a 58 teeth signal was called up and send out with the ATS 5000's signal generator. The scope's generator leads were connected to the crankshaft sensor connector. The fuel pump connector was disconnected as the injection could flood the engine. The 4-channel recording is below.



ATS 5004 recording while the ATS 5000 sends out a signal.

The generated proper pattern makes the ECU inject and ignite each revolution (360°) for as long as the signal generator runs. I am sure you understand why the fuel pump needed to be disconnected.

This IS special...

We have achieved a major price wind back!



Full kit
\$7090.52
+ gst

ATS 5004d scope in tool case

The ATS Scope has dropped in price due to the following set of circumstances:

- 1) favourable exchange rate
- 2) a bulk purchase deal,
- 3) **AECS** has achieved a higher dealer level,
- 4) political changes in the factory, and
- 5) severe economic pressures in the EU.

Use this to your advantage.

A super level scope has never been so close within **your reach!**

- ▶ **ATS 5000** (2 channel + signal generator) or
- ▶ **ATS 5004d** (4 channel differential scope)

For a low **\$3,827.00+gst**

Expand your existing scope set (multichannel sw), build a set up, or buy a whole set for **\$7,090.52+gst**



ATS 5000 50Mhz

Start set
\$3,827.00
+ gst

Check out the spec's at www.aecs.net

Many modern high tech options available, like

- **G sensor,**
- **pressure sensor,**
- **return flow sensor,**
- **AC pressure sensor.**

Check out our web catalogue, *this is a very special deal !!* Call us at 06 8749 077 or, visit:

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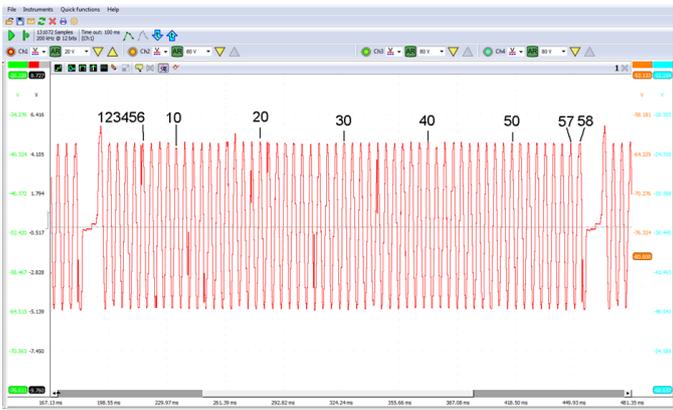
Did you know:

AECS is busier than ever with training and equipment sales.

We are looking for someone to join the team.

hpleijen@aecs.net or Ph:06-874 9077 ask for Herbert

Did you know that you can: Download the high resolution version of this news letter from our web site www.aecs.net. Click on 'training info'



Zooming in on the pre-recorded (ATIS), generated signal reveals that we are sending out 58 teeth per revolution.

Just what the doctor ordered!

Knocked teeth

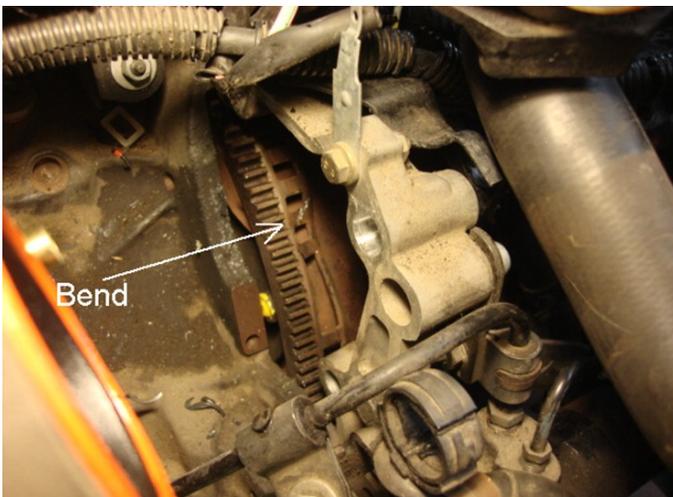
We knew now what went wrong. While fitting the starter motor the starter housing must have hit the crankshaft tone wheel knocking 2 teeth over. The ECU was waiting after every 58 teeth for the reference mark to pass the sensor again. This waiting was spent NOT injecting and NOT igniting.

Conclusion

Sending a pre-set crankshaft signal with the ATS 5000 scope into the car's wiring loom revealed a perfect ignition and injection pattern for as long as we wanted. So no ECU or immobiliser fault, just a crankshaft tone wheel which had a few teeth knocked by the starter motor replacement.

The technician had to repair the tone wheel after which the car ran fine again.

This is what he found:



Bent tone wheel behind the ring gear of the flywheel Citroen

Not hard

Many technicians realise after coming to the AECS training seminars that the above is not hard to do, yet a fault like this is impossible to find with inappropriate equipment. That is where the frustration starts, which ends in self-doubt.

The equipment, the training and support used in this case is nationwide; available from AECS Ltd.

Many more cases, where a workshop loses out big time on a job like this, are on our records, I am sure you know of a few yourself.

Please choose your equipment and training provider with due consideration!

Herbert

For **AECS Ltd:**
H.P. Leijen
(trainer/research)
E-Mail: hpleijen@aecs.net

AECS training

Courses that are current with today's Technology

Diesel Management Systems 1 – 3

11th & 12th May 2011
AUCKLAND

13th & 14th May 2011
WHANGARAEI

Test, diagnose, and predict failures in the electronic & mechanical components of the Common Rail Diesel technology. A very 'up to date' course with lots of modern diagnostic methods.

EMS 1-4 (HYBRID Training)

31st May & 1st June 2011
TAURANGA



- How does it work.
- How to stay safe.
- How to maintain.
- How to repair.

EMS1-1 (Engine management 1-1)

2nd & 3rd June 2011

HAMILTON

27th & 28th June 2011

WELLINGTON

This course will save you time, on first line diagnostics and teach you how to read the most important oscilloscope patterns in detail and much more.. A good idea to have done the AED first..

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www.aecs.net