

Halted Honda

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

Vehicle

2001 Honda Civic, D15Y, 4cyl. petrol engine.



(Picture sourced from internet)

Problem presented to the Helpdesk

Car was driving fine, parked up, next morning it would wind over but not fire up any more. No combustion at all.

We have scoped ignition and injection; both are not present. Injection is flat lining at 12V, so does not get triggered by the ECU. However, we do have a crankshaft and camshaft sensor signal

Where do we go next?

Background and overview

In the AECS EMS1-1 training, we spend a lot of time on this first line diagnostics in the first couple of hours. We run several scenarios where the car does not want to fire up and then investigate how each scenario takes you in a different direction based on your first measurements. It is surprising how many diagnosticians go always straight to the crank shaft sensor for no intelligent reason or whatsoever. At the end of the EMS 1-1 training seminar this is quite different!

Peer review

We asked the diagnostician to post the crank and cam recording to the AECS tech support forum, so we could review the recording (picture 1) and go from there.

Perhaps we will see something he did not.

SCOPES



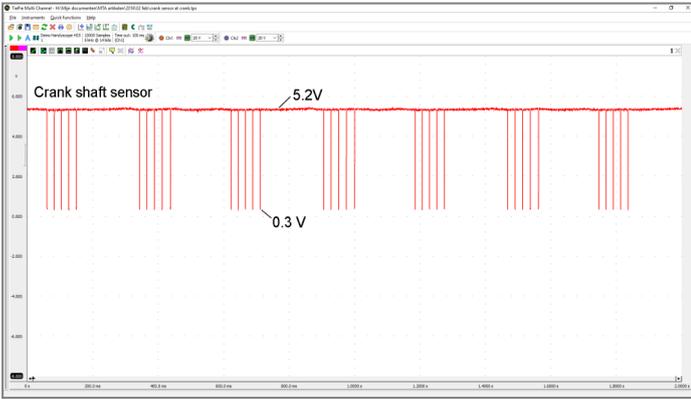
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Picture 1: ATS 500XM scope recording crank shaft sensor while winding over

Analyse the signal

The crank shaft sensor is a Hall sensor which switches the signal voltage coming from the ECU's 5V rail to

2016 Training Dates:

Hastings - 17th & 18th March 2016

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This training is aimed at Vehicle inspectors (CoF and WoF). The training is specifically designed for CoF B (heavy goods vehicles) vehicle inspectors, and is very useful for Cof-A and WoF inspectors.

The content deals with brake and stability engineering principles in a manner that makes even the most experienced operator of any brand roller brake tester, looking at the results produced by their equipment, in a very much more professional manner.

For more information, ring us and we will email you the detailed course descriptor.

This training is also recognised as part of the Mito Vehicle Inspector CoF B education.

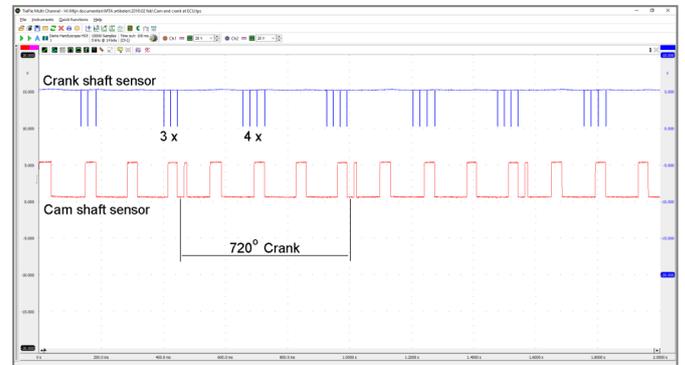
earth (0V) or not (5V) we go deeper into this during the AED training.

Simple! The ECU is obviously powered up or else there would not be 5V present at the sensor's signal wire. Also the sensor is perfectly able to switch the 5V to earth, so the sensor is also in fine condition!

I must add at this point that we did not like the pattern as the reference mark (missing teeth) seems oddly large.

Some ECU's do not start triggering ignition and injection when the cam shaft sensor signal has not been received.

We asked for a cam/crank recording measured at the ECU, to make sure that the signals at the ECU were correct. (Picture 2)



Picture 2: ATS scope recording cam/crank sensors while winding over.

Both the crank shaft sensor and the cam shaft sensor produced a signal. Was it correct?

That is not right

The pattern that was sent from across the ditch was exactly what we needed. It shows clearly the repetitive pattern of the camshaft sensor, and it also shows that the crank shaft pattern is all wrong! How can this fine working sensor sometimes show 3 pulses and a little later 4 pulses on the same section of the crank shaft?

That can only be an airgap issue or a damaged tone wheel.

We advised the diagnostician to open up the timing cover and have a good look for mechanical damage or is perhaps the bracket of the sensor was loose.

He sent the following two pictures the next day.



Picture 3: Crank shaft sensor and tone wheel picture



Picture 4: Clear to see that the spring (??) does not go there!

Personally I would do the timing belt for good measure. There might be a tensioner spring and bits of the belt missing.

Conclusion

Diagnostics; most of the time is simple, as long as you have the knowledge and the tools. I read some time ago in a technical publication a line that really stuck with me: "knowledge is your best tool".

That line could not be more true, however in diagnostics you have to be able to make the signals visible, to be able to apply your knowledge, that is why we use scopes so often. There is no point in guessing with a lot of knowledge, if you cannot see what is going on, you can only guess.

In this case the diagnostician was new on the ATS 500XM scope, still a pretty good result!

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For **AECS** Ltd
Herbert Leijen
(trainer/research)
06 8749 077
info@aeecs.net

AECS 2016 Training Calendar

March	April	May	June
1	1	1	1
2 AED - Auckland	2	2	2 DMS13 - Hamilton
3 AED - Auckland	3	3 AIRCON - Gisborne	3 DMS13 - Hamilton
4 CAN Bus - Auckland	4	4 AIRCON - Gisborne	4
5	5 DMS13 - Orange, Australia	5 SCAN1 - Gisborne	5
6	6 DMS13 - Orange, Australia	6 SCAN1 - Gisborne	6 Queens birthday
7	7 AED - Hastings DMS13 - Orange, Australia	7	7 AED - Auckland (closed)
8	8 AED - Hastings DMS13 - Orange, Australia	8	8 AED - Auckland (closed)
9 ATS11 - Auckland	9	9	9 AED - Auckland (closed)
10 ATS11 - Auckland	10	10 EMS13 - Auckland	10 AED - Auckland (closed)
11 ATS12 - Auckland	11	11 EMS13 - Auckland AEDD - Ohakea - CLOSED	11
12	12 AED - Wellington	12 AEDD - Ohakea - CLOSED	12
13	13 AED - Wellington	13 AEDD - Ohakea - CLOSED	13
14 Taranaki anniversary	14 EMS14 - Palmerston North ATS12 - Wellington	14	14 AED - Christchurch
15	15 EMS14 - Palmerston North CANbus - Palmerston North	15	15 AED - Christchurch
16	16	16 EMS1-4 - Auckland ECAC11 - Wellington	16 EMS14 - Christchurch
17 RBM - Auckland	17	17 EMS1-4 - Auckland ECAC11 - Wellington	17 EMS14 - Christchurch
18 RBM - Auckland	18	18 AED - Whangarei SCAN2 - Auckland	18 CANBus - Christchurch
19	19 AED - Auckland (closed)	19 AED - Whangarei SCAN2 - Auckland	19
20	20 AED - Auckland (closed)	20	20 AED - Dunedin
21	21 AED - Auckland (closed)	21	21 AED - Dunedin
22	22 AED - Auckland (closed)	22	22 CANBus - Dunedin
23	23	23	23
24	24	24	24 ATS12 - Christchurch
25 Good Friday	25 Anzac day	25	25
26	26	26	26
27	27	27	27
28 Easter Monday	28	28 TRUCKSCAN - Hamilton	28
29 Southland anniversary	29	29 ATS11 - Hamilton TRUCKSCAN - Hamilton	29
30	30	30 ATS11 - Hamilton AIRCON - Hamilton	30
31	31	31	31

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- EMS1-1—Engine Management Systems 1 (module 1) (EMS1-1) training seminar
- EMS1-3— Engine Management Systems 1 (module 3) (EMS1-3) training seminar (cam timing, variable lift and direct injection petrol)
- EMS1-4—Hybrid Management Systems (EMS1-4) training seminar
- EMS1-5—Engine Management Systems 1 (module 5) (EMS1-5) training seminar (immobiliser)
- DMS1-3—Diesel Management Systems 1 (module 3) (DMS1-3) training seminar (common rail)
- ECAC1-1— Electronic Controlled Air-conditioning 1 (module 1) (ECAC1-1) training seminar
- SCAN 1— Scan Tool Diagnostics (SCAN1) training seminar
- SCAN 2— Scan Tool Diagnostics (SCAN2) training seminar
- RBM1-1—RBM training for COF VI's

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