

# CHAIN REACTION INTERLOCKS



# AECS

AUTOMOTIVE EQUIPMENT & TRAINING  
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This diagnostic article takes you through the process our technical support team use with problematic vehicles. We look at the issues involved and share how we resolved the problem. This an inside look, from the profound to everyday issues automotive workshops encounter.

### Problem presented to the technical support team...

We have a client's SUV towed into our shop with a broken ignition lock that would not turn to the starter activation position. We have now replaced the mechanical lock assembly. Unfortunately, the vehicle now does not start although the key turns all the way. We have no fault codes relating to this issue. The technician who attended the break down is concerned over two issues. Firstly, the battery was significantly discharged. Secondly, he removed the relay from the AAM (all activity module which is like a BCM) and activated the starter motor. He is concerned that he probed the wrong terminals and damaged the engine ECU at one point or spiked it in doing so causing this problem.

With no relevant fault codes, a fully charged battery, confirmation that the starter does at least work from our technicians bridging exercise we need to investigate our immobiliser and key activity next. The spare key which was working was tried to no avail. Next, we recommended going into live data. This is the quickest way into the systems with the least amount of work. When we spot something, we can go deeper. On this vehicle we know the AAM module receives a constantly changing code from the key inductively which is sent on a communication line via an amplifier to the AAM, if correct the AAM lets the engine ECU know all is good and operate the starter via the start relay. The engine ecu controls the start process.



# SCAN THE CAR

The Launch Auscan 3 scan tool is full of useful functions and made this next step very easy. We looked at the engine ECU for a, start enable signal.

MERCEDES V49.52 > Manually Select > 163-ML Class > Diesel Engine...L 270 CDI > Control Units > Drive > ECM - Engine Control Module(CDI)

The Starter Does Not Rotate

Starter Rotates And Engine Does Not Start.

Test Engine At Cold Start.


Test Engine In Warming-up Phase.

Test Engine At Idle Speed.

Check Smooth Engine Running.

AUSCAN 3


LAUNCH AUSCAN 3 MENU



There is over a dozen possible live data groups to select. The reason for this grouping is to make life easy but more importantly from a technical perspective it speeds up data transmission rates for the user. We cover this in detail in our scan tool training courses (Scan Tool – Level 1 and Level 2).

MERCEDES V49.52 > Manually Select > 163-ML Class > Diesel Engine...L 270 CDI > Control Units > Drive > ECM - Engine Control Module(CDI)

Name	Value	Unit
Serial Number	00 00 00 00 00 00 00 00	
Start Enable	NO	
Status Drive Authorization	Immobilizer Initialized 'Transport Protection Detached, Personalized, Activated'	



AUSCAN 3

LIVE DATA - SECURITY

We can clearly see our engine ECU is not getting authorisation to start the engine, but the immobiliser looks to be working. Sort of definitely...maybe?





## MEASURE

The next step is to start at the ignition switch with maybe a dozen wires which anyone with a few years under their belt could rattle off. The AAM module is connected to a mountain of wiring buried in an E box so that will be last. Firstly, let's see if our key excitor ring works? It only has two wires and either will do. The workshop owns a ATS 6004 XM WIFI scope so we can measure anything with ease. The technician measured on one of the two inductive rings wires.

## FLAT OUT ZERO

It has no signal when the key was inserted! So, what about the amplifier? It has 4 wires. Two will be power and earth, other two signal out and in. Again, keeping things as simple as possible, the technician reports no power or signals but a good earth.



ATS WIFI SCOPE

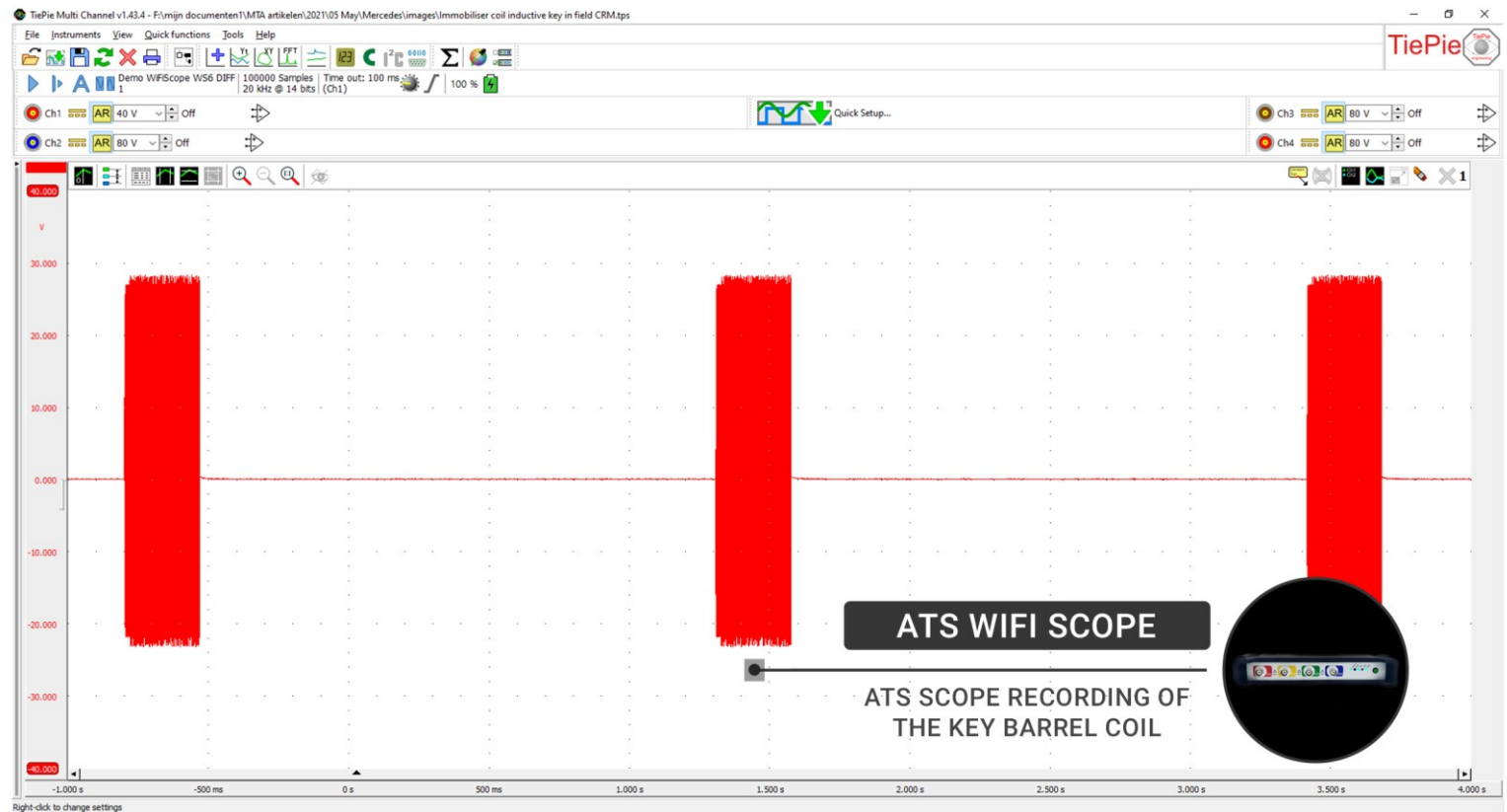
AN ATS SCOPE IS USED TO SHOW  
IF THE IMMOBILISER IS WORKING





Let's see if our ignition switch outputs are all working? They are close by and easily identified. All are good, except orange wire terminal 15C. Let's power it up manually and recheck our key excitor coil. We fitted a temporary power supply wire (15C) to confirm operation of system.

See below an ATS scope recording of the excitor ring with key inside the coil working with terminal 15C. Perfect signals show the immobiliser is now online. Also, importantly the vehicle now starts. Job done.



## CONCLUSION

Always try and find an easy way in. Use your scan equipment to quickly find what looks to be not as you would predict it should be. In this case it was relatively easy to see that the engine ECU was not getting authorisation to start.

Now is not the time to guess what the fault might be! Measure in a methodical way. By starting on the easy end of it we did not need a wiring diagram as we started with a well-known part of the vehicle. The ignition switch is the most likely to fail as it is a mechanical item which we interact with as the driver and it gets moved way more than for example an ECU.

Even though this vehicle is over 20 years old, issues like this are not simple to pinpoint without the correct equipment and "Swapnostics" is an expensive and risky game to play.

## TECH SUPPORT

Our AECS technical support removes the day-to-day stress present in your operation and thinks strategically. AECS technical support helps makes things easy and saves money for its subscribers, many times over than its cost!

## FINAL THOUGHTS

Incidentally, the technician asked the owner how often and with how much force the key was being turned during the non-starting of vehicle. More force was applied in an attempt to get it going was the reply. So, the switch ultimately failed, and the owner broke the lock. That was the start of our chain reaction.

From all the team at AECS, thanks for reading.



## DID YOU KNOW

AECS NEWS



### IN-STOCK NOW

#### Launch BST360 - Battery Analyser

We have brand new stock of the world's newest, smallest, quickest and most accurate intelligent BATTERY TESTER, the Launch BST360. Run this on any Android or IOS phone, or Launch scan tool. Email the customer (or print) directly from your phone or tablet. Simply clip on the battery and GO via Bluetooth. Keep one in your van for call outs and have one in the workshop at reception as any of your staff can run the test!

Technology has moved on, and pricing has moved down (\$169+gst). Buy from a company that knows!

**Introductory price: \$169.50 +gst**  
Normally: \$271.50 +gst

#### Tech details:

Connection method: Bluetooth

Applicable for: 6V/12V Lead acid, GEL and AGM battery systems.

Supported battery standards: CCA, BCI, CA, MCA, JIS, DIN, IEC, EN, SAE, GB.

Measurement capacity range: 30AH – 80 AH

Working temp: -10°C +60°C

No internal batteries required, tool powers up from car battery.



"making diagnostics easy..."



## BRAINBEE IS BACK

Finally, a container load of high-quality Italian aircon equipment has arrived in NZ! This shipment was due back in May! It has been held up by recent shipping issues. I am so happy that we can full fill the orders we have before the beginning of the AC season.

Before we actually receive and unload the container you can have your name on one of the few leftover machines in the container for the old price of \$8800+gst. The actual price will go up soon, as our freight bill will be close to 500% higher.

Be ready for the season, we can get you up and running with the equipment and training before the Aircon season starts! Which of your customer's cars does not have AC, 5%? You have to be able to offer this service!

## TRAINING UPDATE

We have received a huge amount of enrolments for 2022 training already. Our online calendar is already stretching into Nov '22. The most beautiful part is that already more than 900 people are on the ladder to achieve EV diagnostic engineer status through the AECS (/MITO) learnings.

Electrical vehicles will continue to be more prominent, you too can be a part of our electric vehicle training! Let us know - 06 874 9077 or visit our up and coming training seminars [here](#).





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