

DILUTED DIESEL



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AUTOMOTIVE EQUIPMENT & TRAINING
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DILUTED DIESEL

VEHICLE: 2016 MITSUBISHI TRITON (KK1) 2.4L TURBO DIESEL 4N15 A/T (283,000KM)

By Herbert Leijen



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 from the workshop to our Technical Support Team:

This vehicle came in from another workshop with the DPF light flashing in the dashboard. The workshop that offered it to us has no diagnostic gear and we frankly are worried that such shops take on modern cars like this. This shop had contacted another workshop first, and quoted that to diagnose the job should cost around \$1800+gst without guarantee of repair. We would like a second opinion please. The fault code we found is "P252F Engine oil level too high".

431

Vehicle Diagnostic Report

The Report is created by **LAUNCH X431**

Pre-Repair

Inspection Information

Shop Name: [REDACTED]
Address: [REDACTED]
Zip Code: [REDACTED]
Telephone: [REDACTED]
Email: [REDACTED]
SN:985692888700
Test Time:2021-02-20 08:13:01
Technician Name: [REDACTED]



LAUNCH AUSCAN 3

AUTOMATICALLY GENERATED LAUNCH AUSCAN3 FAULT CODE REPORT OF ALL ECU'S.

(DETAILS AND LOGO REMOVED FOR PRIVACY REASONS).



Vehicle Information

Make:Mitsubishi
VIN:MMAJYKK10GH0 [REDACTED]
Odometer:282839 km
Vehicle Software Version:V33.60
Diagnostic Application Version:V7.00.028
Diagnostic path:As Of 2006 > Others > TRITON / L200 / STRADA (KJ#,KK#,KL#,KP#) > 2016 > 4N15 (2.4, D4, I/C, T/C) > V5AWF (5A/T-4WD) > KL1T > JYHFL > Health Report

Inspection Result

MPI/GDI/Diesel 1 problems exist

1.P252F Engine Oil Level Too High Active

Meter 1 problems exist

1.B2463 Rheostat Switch Sticking Stored

The following systems are OK:

- 1.ELC-AT/CVT
- 2.ABS (Anti-Lock Braking System)
- 3.SRS-Air Bag
- 4.KOS/Immo/Keyless
- 5.ETACS
- 6.Steering Angle Sensor
- 7.LIN

continues from above...

The last service has been done 15,000 km ago and the owner absolutely tells us that he has not topped up the oil, as he never gets under the bonnet! [Somewhat questionable].

We have found that the oil level is about 10 mm over the max. mark on the dipstick.

Should we just drop the engine oil and let the customer go or can you assist in looking a little deeper as to why the oil level is high? We simply cannot believe that this low-tech workshop which maintained the car previously has over filled the sump and that a fault is triggered about 15,000 km later, there must be a reason.

Scan

Let's take a look at this. So, what is the fault code telling us? It does not show that there is anything directly wrong with the DPF system. The fault (high oil level) prevents manual and automatic regeneration. Regeneration causes engine oil dilution with a rising level as a result, if the oil level is too high already further regeneration will be prevented. An overfull sump will cause the engine to start running on its crankcase oil and Diesel, which is uncontrollable. On modern Diesel vehicles this happens more often than you think!

This is exactly why the DPF light is on, as from this moment onward there will be no more DPF regeneration being performed. The result is that if this is ignored, the DPF will block solid, and the engine will ultimately stop altogether.

Why?

So why has the oil level risen? There are a number of possibilities.

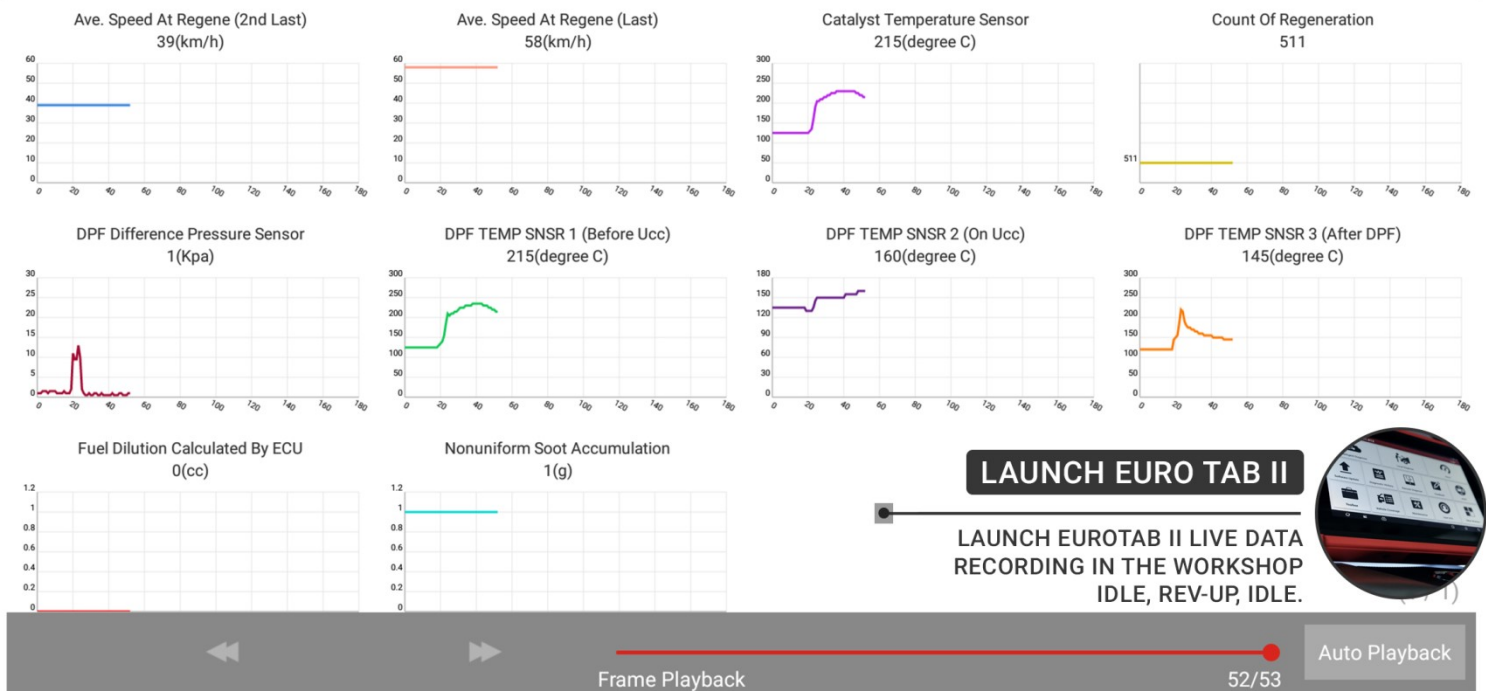
- Oil has been topped up too high (we need to forget that option).
- Oil has been diluted caused by many automatic regenerations as a result of a partially permanent blocked DPF.
- Oil has been diluted caused by many automatic regenerations as a result of non-working CAT.
- Oil has been diluted caused by many automatic regenerations as a result of incorrect sensors information reaching the ECU.
- Oil has been diluted caused by many interrupted automatic regenerations.
- Leaking Diesel return from the injectors or past the HP pump seal.

Live Data

Better have a look at some of the data lines to see if we can determine where the focus should be. There are more than 200 lines of live data to consider which is a bit much for most, but let's see where it leads us on this almost 5 year old vehicle. (See over).



Diagnostic Record



Following are some data lines taken with the engine hot and idling in the workshop, with our comments added:

- Average Speed at regeneration Last: 58km/h

I am happy with this value as it tells me that the last regeneration was done while driving at reasonable speed, so with reasonable pressure in the combustion chamber, so with no real reason for extra Diesel needed for regeneration, to enter the sump.

- Average speed at regeneration 2nd to last: 39km/h

A bit slow but given that this vehicle is a delivery vehicle, again no reason for the oil level to rise.

- Catalyst Temp sensor: 225°C

This is too low to keep the DPF clean, however perfectly normal in the workshop.

- Count of regeneration: 511

If you calculate the mileage and the regeneration count you will see that this DPF gets regenerated every 553kms, which seems perfectly normal to me. Some vehicles have an average of 800kms and some 150kms.

- DPF difference press sensor: 1KPa (10hPa)

That value at idle is perfectly normal, however the real test is under full load (high flow). A quick full acceleration in the workshop made the value jump to 150hPa which is still perfectly acceptable.

- DPF temp sensor 1, 2, and 3 showed: 230, 155, 150 degreesC respectively.

These values are in the workshop on a hot engine perfectly normal.

- Non uniform Soot accumulation: 1gram

This shows that there is no area with permanent blockage inside the DPF.

Now some significant values

- Fuel dilution calculated by the ECU; 0cc!

This indicates to me that the ECU has not done excessive regenerations at low load.

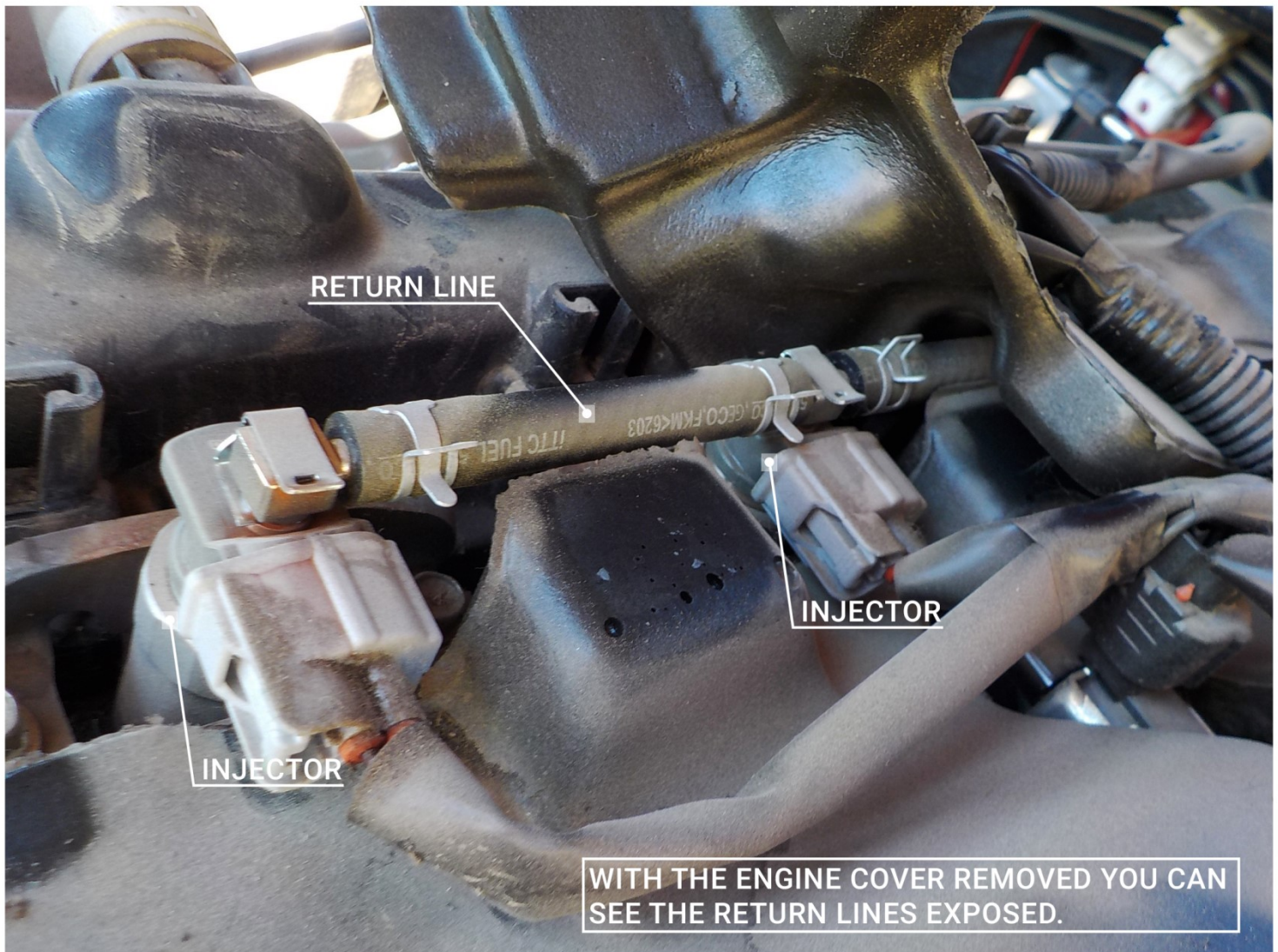
Please note that we deal with these values in detail during our Diesel Exhaust After Treatment (DMS1-4), training seminar.

So what is next?

In my view is the DPF and the catalyst are in good condition. The regeneration process has not happened (finished) an excessive number of times. Combine this with the fact that the oil has never been topped up.

What would your conclusion be?

The injectors return lines are not under the rocker cover, so a leaking injector return line as was common on older Mitsubishi engines if the bayonet washers were not replaced, is not an option. A leaking return would leak all over the engine and not inside the engine.



That leaves us with perhaps a leaking high pressure pump seal, allowing Diesel to escape into the sump, or possibly driver behaviour.

When the engine never gets hot enough (see the temperature we measured in the workshop) for long enough, the regeneration will be interrupted over and over again. The regen counter in the ECU will only count the amount of times regeneration has been completed, not how many times it started.

Even the owner's manual warns that this is possible with excessive long service intervals, who would have thought!

Resolution

The oil was changed, which was far overdue (15,000 kms). The owner has been using this vehicle now for more than 20,000 kms with an oil change every 10,000 kms. The fault has not reappeared again.

Conclusion

Yes a bit of a deflated end to this story, but it is a real one. Imagine that you had presented the owner with the quote of the \$1800 diagnostics or performed the DPF clean?? Only to find out that the vehicle just needed an oil change!

It is easy can to earn good money with diagnostics! Make sure you purchase quality equipment which is supported by engineers that understand your work. AECS is here to make diagnostics EASY!

Thank you!

Herbert Leijen

Director AECS Ltd

Like a Boss

Our industry is in a state of great activity at the moment, we've had first-hand experience, especially in the last week with many Auscan 3's arriving in our latest shipment and flying out the door, this also includes Launch ADAS camera and radar calibration equipment. A big thank you to our customers who recently received their new Auscan 3. We really appreciate the trust you place in us.

Check out the video of the team preparing many Auscan 3.



Launch ADAS - AECS Approved

From the above conversation, we have been sending a lot of Launch ADAS calibration equipment. Within conversations with our customers, we get asked is it insurance approved? Our answer is no.

Actually, there are not any ADAS systems that are approved by New Zealand insurance companies. True story.

And here's why and is quoted by one of NZ's largest insurance companies: "If we approve certain brands of equipment, we will also bear the responsibility if something is wrong with that equipment. That responsibility lies squarely with the repairer".

Simply New Zealand insurance companies do not approve ADAS equipment of any brand.

Like anything new that enters the market, be it a product or service, it can be framed in such a way either by misleading marketing or a salesperson to be much better or approved to be better than what it is. Most of us have been there, right?

Unfortunately, some good and hardworking people may have been swindled out of up to \$50k for an ADAS calibration system because they were sold on the lie of it being "insurance approved". Imagine what you could do with that extra \$30k?

AECS has been in the industry for a good 20+ years, you can say we've been around and we know our diagnostics and equipment. We've tried and tested Launch ADAS we give it a big tick of AECS Approval.



AECS TRAINING

Location	Course Name	Course ID	Date	Time
Christchurch	Air-Conditioning Systems	ECAC 1-1	5 Oct - 6 Oct	9:00 AM - 5:00 PM
Christchurch	Automotive Electronic Diagnostics	AED	7 Oct - 8 Oct	9:00 AM - 5:00 PM
Christchurch	Diesel Exhaust after treatment	DMS 1-4	11 Oct - 12 Oct	9:00 AM - 5:00 PM
Christchurch	EV Diagnostics & Maintenance: Part 1	EV2-1	13 Oct - 14 Oct	9:00 AM - 5:00 PM



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COMMERCIAL VEHICLE TEST LANE
STT45
BRAKE TEST | EURO-SYSTEM | 18T



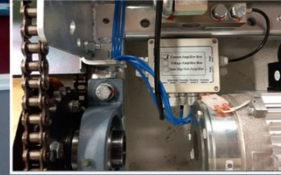
STT45 Euro Test Lane/Brake Rollers are designed for all types of braking systems for commercial vehicles.

- 18 Ton axle load
- Star/delta/softstart and 4WD mode
- Max. 45 kN brake force per wheel
- 17KW 2 speed Nord motors
- High wear resistant corundum coated rollers 248mm diameter
- German built motors, sensors, and contactors

**STT RANGE...
BUILT TOUGH**

PRICE FROM: \$57,000 +GST
Work on building not included

CAR BRAKE TESTLANE
STT10e
BRAKE TEST | EURO-SYSTEM | 4T



STT10e is designed for motor vehicles and various types of braking systems and is accurate on wheel alignment, brake and suspension analysis

- 8KN per wheel brake force
- 4 Ton axle load
- 3KW straight drive auto lock ABM Motor
- Side slip with de-stressing plate
- 25hz Eusama suspension tester
- 4x4 testing
- German built motors, sensors, and contactors

PRICE FROM: \$29,100 +GST
Price includes installation - Work on building not included

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