

Engine Polygraph Case History: Mercedes I5

CS-EP-03

2017-05-30

Background

- This high mileage I5 Mercedes diesel was brought in with complaint of low power. It had been rebuilt not long before, estimated 25,000 miles. It was put into a Dodge Sprinter.
- Engine Polygraph was run to help diagnose the issue.
- The scores for the upper and lower engine are not very good.

Mercedes I5

Vehicle ID : 2006
Dodge Sprinter

Assessment 6

Owner	[REDACTED]
Serial Number	NA
Engine	MB 2.7L OM647 I5 MB (4 stroke, 5 cylinders)
Odometer	235616
Date	2017-05-30 12:00:00 AM
RPM	863
Engine Temperature	95 F
Engine Polygraph name	Dodge_Sprinter_2006_20170529-NKOEHN.pdata
User's file name	e61d9df4-3923-426b-b83a-4c5df60e0370.pdata
User's comments	Cylinder #5 no compression

e61d9df4-3923-426b-b83a-4c5df60e0370

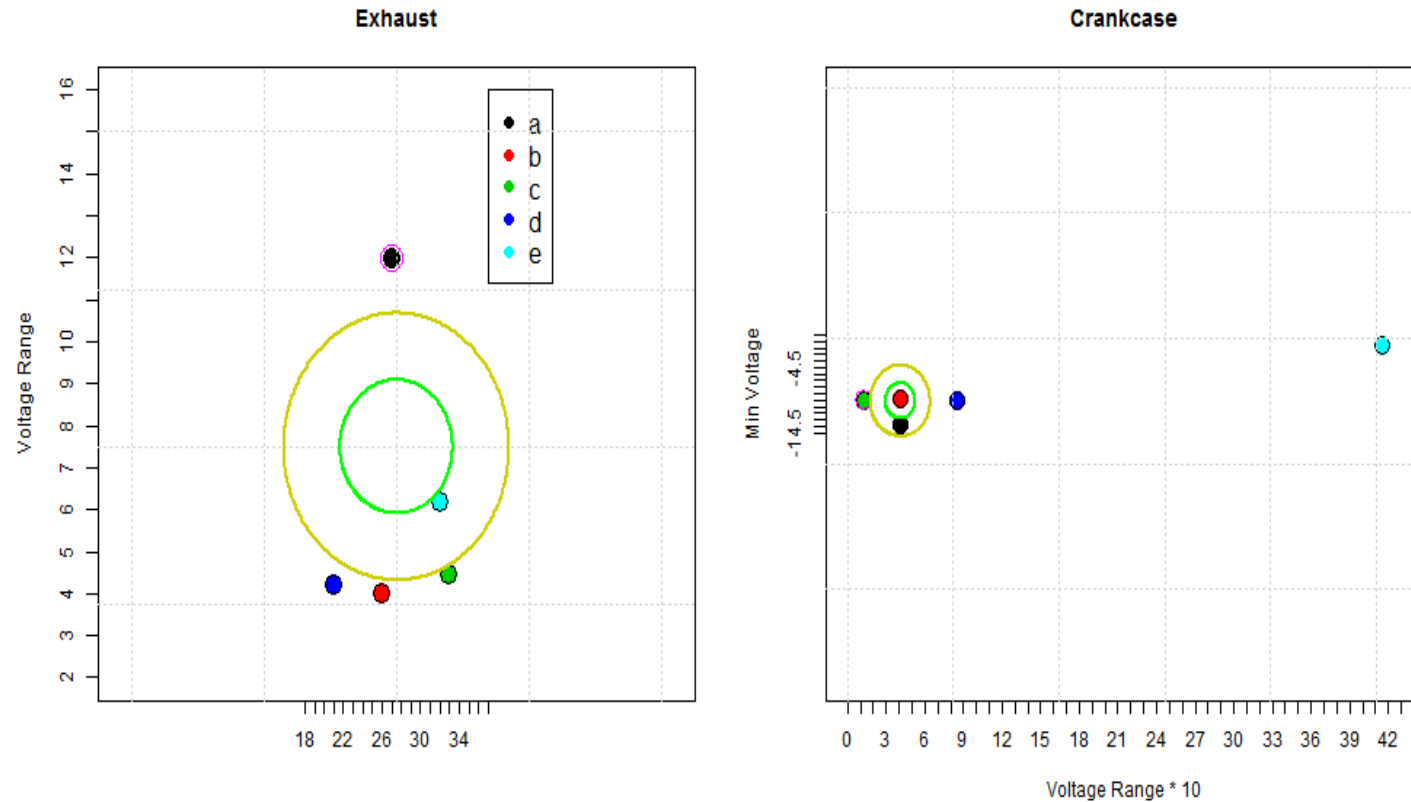
<http://www.EnginePolygraph.com>

Engine Polygraph Assessment

Version 5.0

Upper Engine	6								
Lower Engine	6								
Volumetric Eff. Score	5								
Valve Seating	1								
Warnings									
Engine temperature is low									
1	2	3	4	5	6	7	8	9	10

Cylinder Consistency Charts



Cylinder a has much more pressure range than any of the others; Cylinder e has extreme pressure range compared to the others.

Polygraph Model

Vertical lines mark cylinder intervals

Waveform Analysis

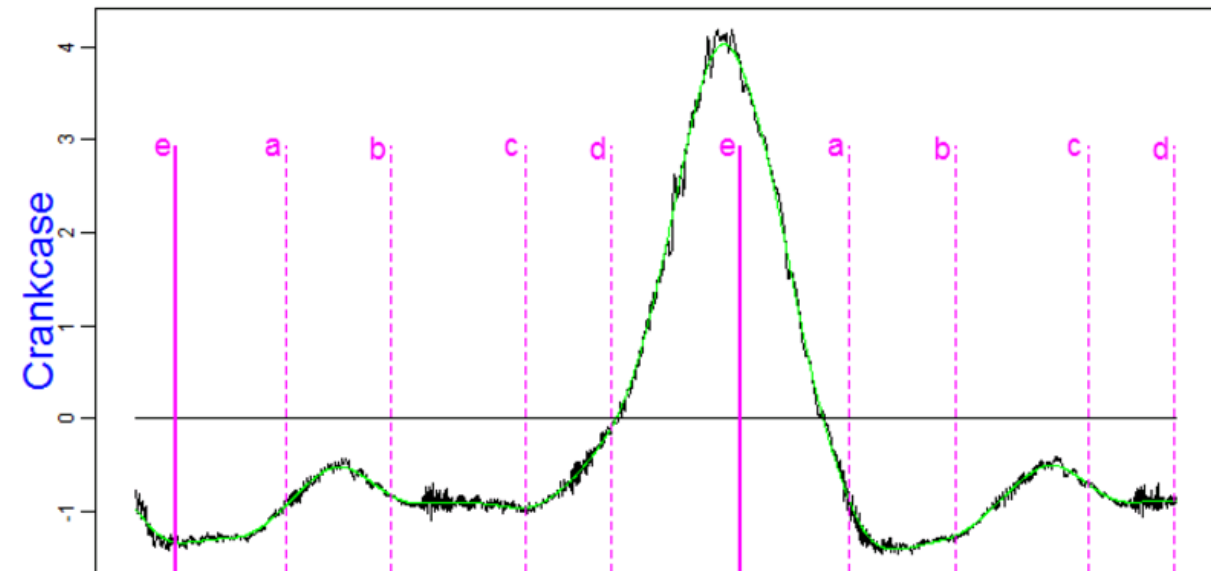
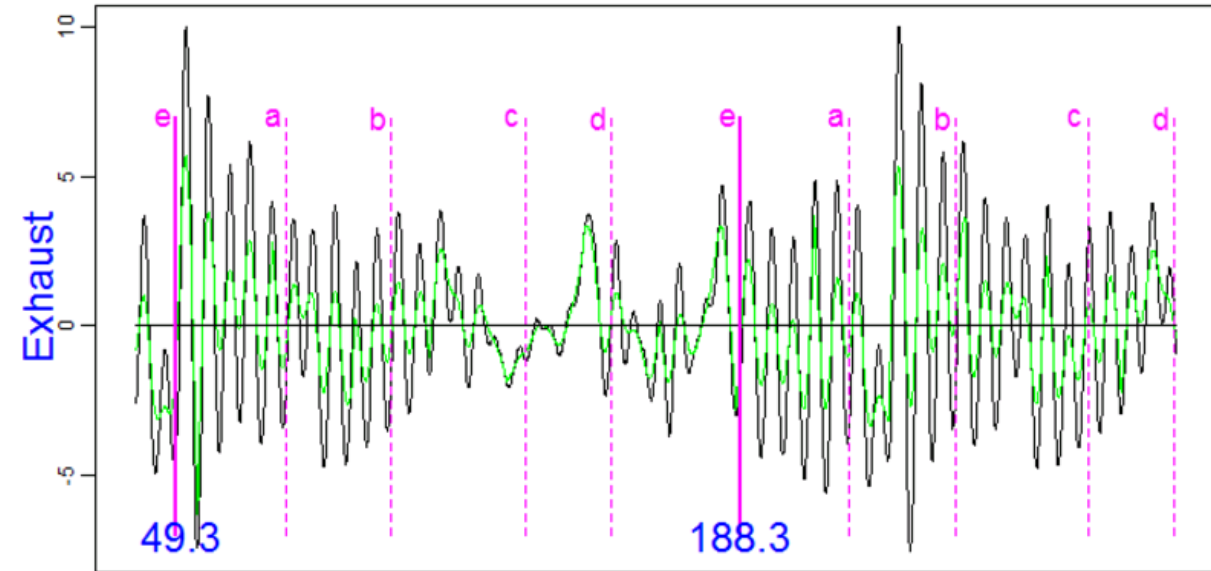
The EP system did not get the rpm correct because a cylinder did not fire.

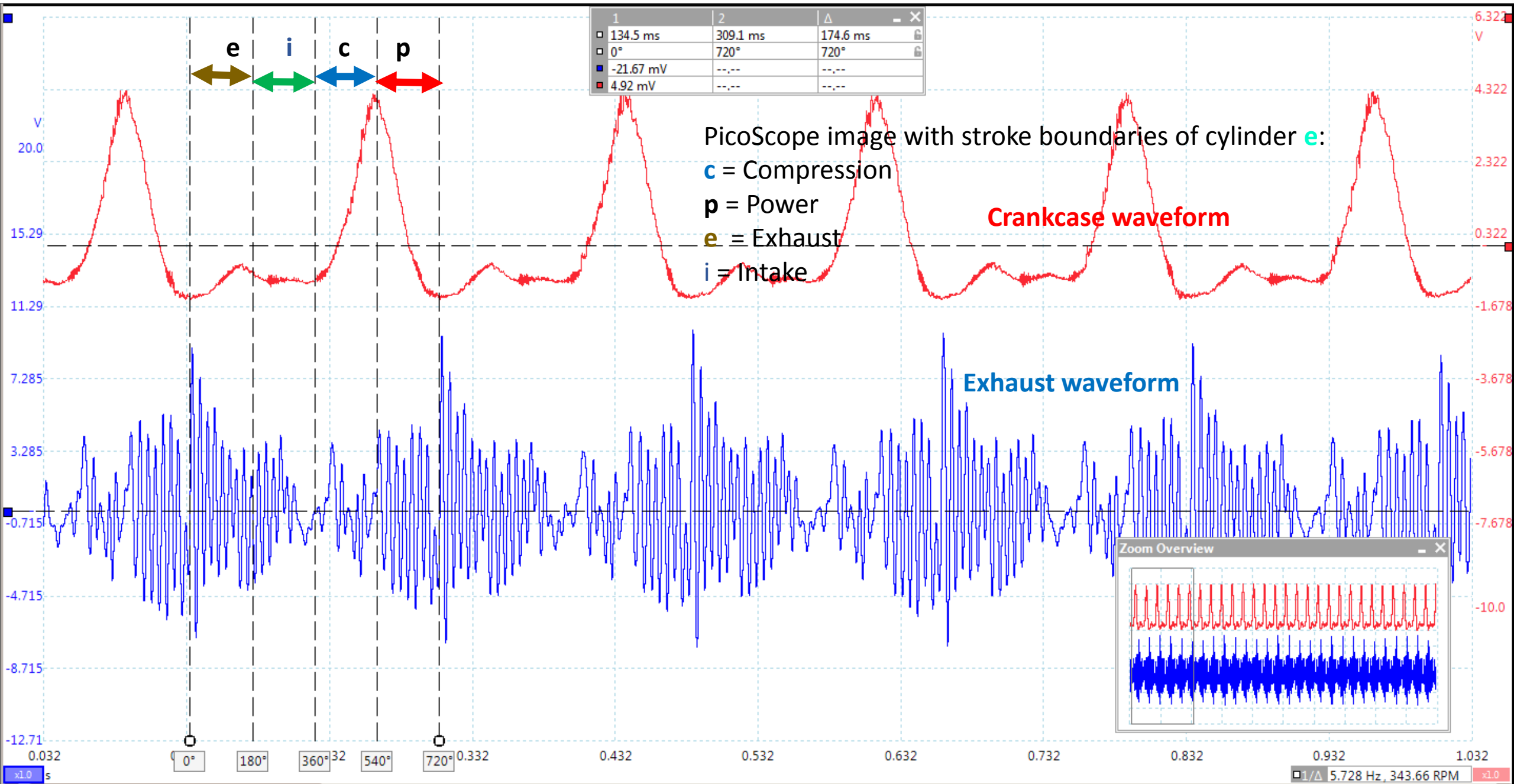
This pattern indicates that there is a regular mis-fire with fuel: the mis-fire is the Exhaust flat area at c. And it is followed by a large peak when the fuel that was not combusted hit the catalytic convertor and flashed.

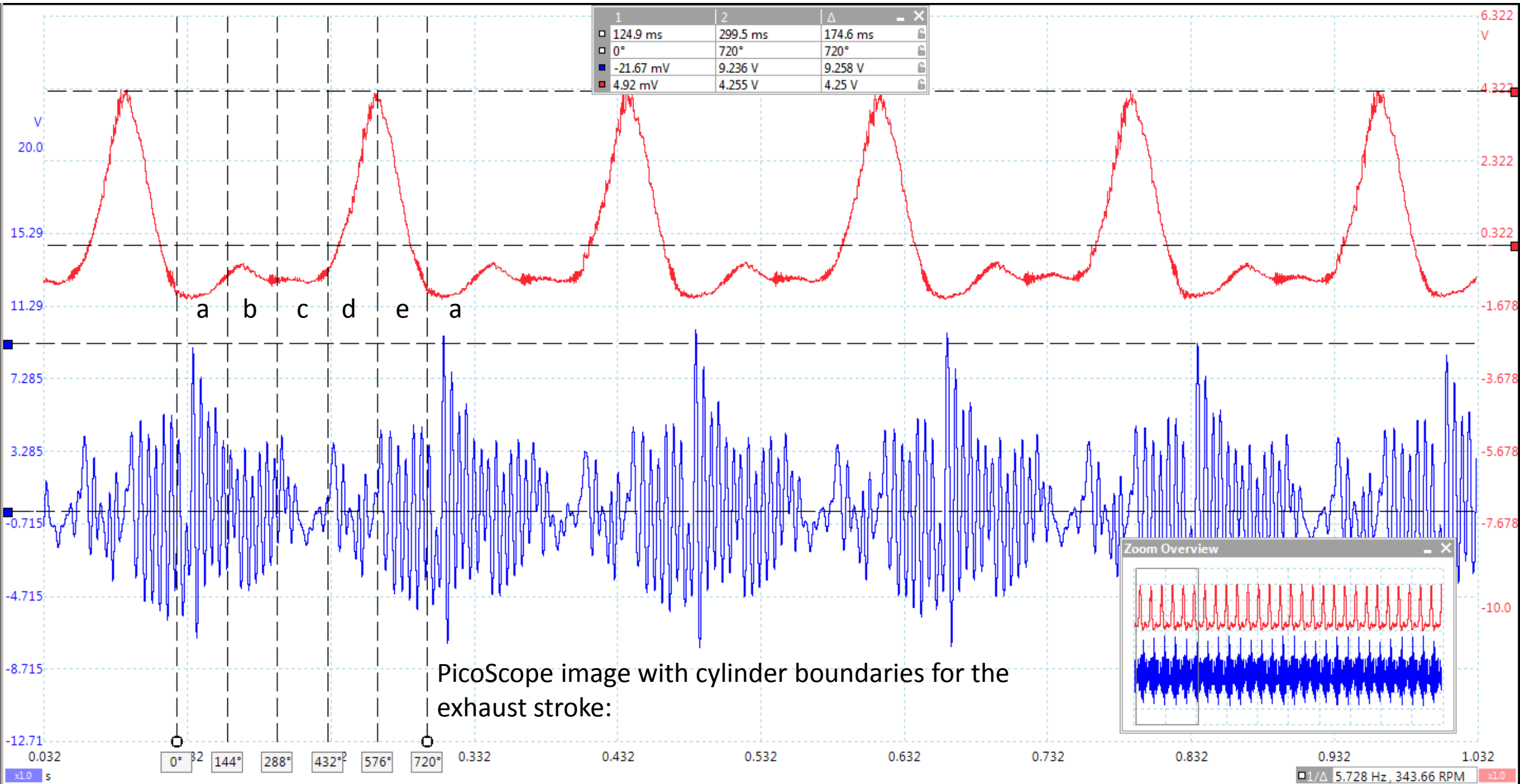
The crankcase shows a huge pressure surge once per engine cycle (two rotations. This cylinder overshows all the other cylinders in the crankcase).

The mis-fire is due likely due to lack of compression in the compression stroke; the fuel was injected but no ignition. Therefore no exhaust to speak of.

On the Crankcase graph from d to e is the compression stroke and from e to a is the power stroke. Both intake and exhaust valves are closed so when the piston goes up, it blows pressure into the cc; in the power stroke, the pressure returns to normal.







Conclusion

When they took the engine apart, they found the problem - a hole burnt through the piston. Probably as result in detonations from premature ignition (compression stroke) before the hole burned through.

