

EA11003EN-00743[0]

| Ser. no. | No. USA | VIN no. | HP data Bosch | HP data Bosch | HP data Bosch | KM (Mileage) | Engine no. | CP4 date | Customer complaint | Results of Pre-analysis | Further components for complaint | Comments activities from pre-analysis | Analysis Bosch | Analysis Bosch |
|----------|---------|-------------|---------------|---------------|---------------|--------------|------------|--------------|---|--|----------------------------------|--|---|--|
| 1 | 10 | 3VWPL7AJ1AM | 02240709 | BPT1133 | 0007 | 28,756 | CJA010361 | 8/7/2009 C,C | Metal chips in fuel system | DTD - Metal wear in metering unit, pump chamber and screen | 1x change filter 1x fuel filter | accompanying components are not analyzed because metal chips are in the system | Handover for analysis / 8D report - 12/7/10 | inappropriate fuel - 8D report - 01/12/11 |
| 2 | 16 | 3VWTL7AJXAM | 04130210 | BPT0234 | without | 18,121 | CJA024847 | 2/16/10 S,C | Metal chips in fuel system | DTD - Metal wear in metering unit, pump chamber and screen | | | Handover for analysis / 8D report - 12/7/10 | 8D report- DTD accepted by Bosch - corrective measures deployed - 1/14/11 |
| 3 | 20 | 3VWPL7AJ7AM | 04170410 | BPT0468 | without | 7,375 | CJA056043 | 4/28/10 S,C | does not start- P0087- fuel system pressure too low | DTD - Metal wear in metering unit, pump chamber and screen | 4x Injektor | accompanying components are not analyzed because metal chips are in the system | Handover for analysis / 8D report - 12/7/10 | 8D report- DTD accepted by Bosch - corrective measures deployed - 1/13/11 |
| 4 | 28 | 3VWRL7AJ9AM | 01040310 | BPT0267 | without | 8,084 | CJA046361 | 15/3/10 S,C | P0087- fuel system pressure too low | Plug of the HP pump broken- v.m. - DTD | 1x change filter 1x fuel filter | accompanying components are not analyzed because metal chips are in the system | Handover for analysis / 8D report - 12/7/10 | 8D report- DTD accepted by Bosch - corrective measures deployed - 1/13/11 |
| 5 | 29 | 3VWPL8AJ3AM | 01080909 | BPT0250 | 0007 | 15,976 | CJA016478 | 9/17/09 C,C | P0087- fuel system pressure too low does not start - lamp on | DTD - Metal wear in metering unit, pump chamber and screen | 1x change filter 1x fuel filter | accompanying components are not analyzed because metal chips are in the system | Handover for analysis / 8D report - 12/7/10 | 8D report- DTD accepted by Bosch - corrective measures deployed - 1/13/11 |
| 6 | 39 | 3VWTL7AJ2AM | 04300310 | BPT0048 | without | 4,868 | CJA051563 | 4/8/10 S,C | P0087- fuel system pressure too low | DTD - Metal wear in metering unit, pump chamber and screen | 1x change filter 1x fuel filter | accompanying components are not analyzed because metal chips are in the system | Handover for analysis / 8D report - 12/7/10 | |
| 7 | 50 | 3VWTL8AJ4AM | 01301009 | BPT0240 | 0007 | 787 | CJA025097 | 11/10/09 C,C | Metal chips in fuel system | no metering unit metal chips found, Filter checked - particles are suspected | 1x change filter 1x fuel filter | | Handover for analysis / 8D report - 12/7/10 | |
| 8 | 62 | 3VWRL7AJ2AM | 04190410 | BPT0430 | without | 3,112 | CJA056466 | 4/30/10 S,C | no output | no metering unit metal chips found, Filter checked - particles are suspected | 4x injectors | For further analysis the 4 injectors were given to Bosch | 8D report available about the injectors all OK 01/03/2011 | |
| 9 | 73 | 3VWPL7AJ5AM | 02060210 | BPT0909 | without | 10,234 | CJA041107 | 2/17/10 S,C | Metal chips in fuel system | no metering unit metal chips found, Filter checked - particles are suspected | 1x change filter 1x fuel filter | | Handover for analysis / 8D report - 12/7/10 | No defect found - 8D report - 03/25/11 |
| 10 | 81 | 3VWPL7AJ4AM | 04240909 | BPT0839 | 0007 | 15,542 | CJA019335 | 10/5/09 C,C | P0087- fuel system pressure too low does not start - lamp on | DTD - Metal wear in metering unit, pump chamber and screen | | | Handover for analysis / 8D report - 12/7/10 | 8D report- DTD accepted by Bosch - corrective measures deployed - 1/13/11 |
| 11 | 82a | 3VWRL7AJXAM | 04240609 | BPT0400 | 0007 | 15,293 | CJA005671 | 6/30/09 C,C | P0087- and metal chips in system | DTD - Metal wear in metering unit, pump chamber and screen | | P0087 | Handover for analysis / 8D report - 12/7/10 | Deposits - inappropriate fuel - 8D report - 01/12/11 |
| 12 | 83 | 3VWPL7AJ1AM | 02051109 | BPT1352 | 0007 | 2,931 | CJA026490 | 17/11/09 C,C | Does not start - electr. fault | DTD - Metal wear in metering unit, pump chamber and screen | | | Handover for analysis / 8D report - 12/7/10 | 8D report- DTD accepted by Bosch - corrective measures deployed - 1/13/11 |
| 13 | 84 | 3VWTL7AJXAM | 01090110 | BPT1242 | without | 12,389 | CJA035025 | 1/20/10 S,C | P0087- fuel system pressure too low -5 fault | no metering unit metal chips found, Filter checked - particles are suspected | | | Handover for analysis / 8D report - 12/7/10 | 8D report- DTD accepted by Bosch - corrective measures deployed - 1/13/11 |
| 14 | 85 | 3VWAL8AJ4AM | 04110509 | BPT0798 | 0006 | 22,726 | CJA003401 | 5/27/09 C,C | does not start - lamp on | DTD - Metal wear in metering unit, pump chamber and screen | 4x injectors | accompanying components are not analyzed because metal chips are in the system | Handover for analysis / 8D report - 12/7/10 | 8D report- DTD accepted by Bosch - corrective measures deployed - 1/13/11 |
| 15 | 86 | WVWDM7AJ4AV | 01050110 | BPT1386 | without | 8,953 | CJA033742 | 1/14/10 S,C | P0087- fuel system pressure too low metal chips in the filter | DTD - Metal wear in metering unit, pump chamber and screen | | | Handover for analysis / 8D report - 12/7/10 | 8D report- DTD accepted by Bosch - corrective measures deployed - 1/13/11 |
| 16 | 88 | 3VWAL7AJ7AM | 02280410 | BPT1037 | without | 23 | CJA056684 | 4/30/10 S,C | P0087- fuel system pressure too low | no metering unit metal chips found, Filter checked - particles are suspected | | | Handover for analysis / 8D report - 12/7/10 | No defect found - 8D report - 01/25/11 |
| 17 | 89 | 3VWAL7AJ8AM | 01170909 | BPT1336 | 0007 | 20,922 | CJA017951 | 9/24/09 C,C | Metal chips in fuel system, P013B | DTD - Metal wear in metering unit, pump chamber and screen | | For further analysis the 4 injectors were given to Bosch | 8D report available about the injectors all OK 01/03/2011 | Deposits - inappropriate fuel - 8D report - 01/12/11 |
| 18 | 90 | 3VWAL7AJXAM | 02151009 | BPT0930 | 0007 | 7,684 | CJA023120 | 10/27/09 C,C | no output | no metering unit metal chips found, Filter checked - particles are suspected | 4x injectors | Handover for analysis / 8D report - 12/7/10 | 8D report available about the injectors all OK 01/03/2011 | No defect found - HP pump - 8D report - 01/25/11 |

INFORMATION Redacted PURSUANT TO THE FREEDOM OF INFORMATION ACT (FOIA), 5 U.S.C. 552(B)(6)

EA11003EN-00743[1]

| Ser. no. | No. USA | VIN no. | HP data Bosch | HP data Bosch | HP data Bosch | (Mileage) | Engine no. | CP4 date | Customer complaint | Results of Pre-analysis | Further components for complaint | Comments activities from pre-analysis | Analysis Bosch | Analysis Bosch |
|----------|---------|-------------|---------------|---------------|---------------|-----------|------------|--------------|--|---|---|--|--|---|
| 19 | 91 | 3VWRL7AJ0AM | | | | 11,335 | CJA042927 | 2/25/10 S,C | P0087/P0088- fuel system pressure too low - 5 faults | DTD - Metal wear in metering unit, pump chamber and screen | 4x injectors | accompanying components are not analyzed because metal chips are in the system | Handover for analysis / 8D report - 12/7/10 | 8D report- DTD vaccepted by Bosch - corrective measures deployed - 1/14/11 |
| 20 | 92 | WVWNM7AJ9AV | | | | 20,902 | CJA023595 | 10/29/09 C,C | Metal chips in fuel system | no metering unit metal chips found. Filter checked - particles are suspected | 2x injectors | For further analysis the 2 injectors were given to Bosch | 8D report available about the injectors all OK 01/03/2011 | HP pump - no defect verified - 8D report 1/25/2011 |
| 21 | 93 | 3VWRL7AJ5AM | | | | 19,355 | CJA015510 | 9/12/09 C,C | | DTD - Metal wear in metering unit, pump chamber and screen | 4x injectors 1x distribution board 1x holder inline EFP | accompanying components are not analyzed because metal chips are in the system | Handover for analysis / 8D report - 12/7/10 | Deposits - inappropriate fuel-8D report - 01/12/11 |
| 22 | 94 | 3VWAL7AJ0AM | | | | 42,541 | CJA003123 | 5/25/09 C,C | Engine does not start | DTD - Metal wear in metering unit, pump chamber and screen | | | Handover for analysis / 8D report - 12/7/10 | Deposits - inappropriate fuel-8D report - 01/12/11 |
| 23 | 95 | 3VWRL7AJ3AM | | | | 9,280 | CJA037049 | 1/29/10 S,C | P0087- fuel system pressure too low does not start - lamp on | DTD - Metal wear in metering unit, pump chamber and screen | 4x injectors | accompanying components are not analyzed because metal chips are in the system | Handover for analysis / 8D report - 12/7/10 | Deposits - inappropriate fuel-8D report - 01/12/11 |
| 24 | 96 | 3VWRL7AJ6AM | | | | 38,984 | CJA003834 | 6/4/09 C,C | Does not start | DTD - Metal wear in metering unit, pump chamber and screen | 4x injectors | accompanying components are not analyzed because metal chips are in the system | Handover for analysis / 8D report - 12/7/10 | 8D report- DTD vaccepted by Bosch - corrective measures deployed - 1/14/11 |
| 25 | 97 | 3VWRL7AJ4AM | | | | 10,156 | CJA018611 | 9/30/09 C,C | Starts poorly - metal chips in the filter | no metering unit metal chips found. Filter checked - particles are suspected | 1x change filter 1x fuel filter | | Handover for analysis / 8D report - 12/7/10 | 8D report Corrosion deposits-fuel OK -02/01/11 |
| 26 | 98 | 3VWTL7AJ9AM | | | | 5,882 | CJA025311 | 11/10/09 C,C | P0087- fuel system pressure too low | no metering unit metal chips found. Filter checked - particles are suspected | 4x injectors, 1x pressure control valve | Pressure control valve handed over to Bosch for analysis | Handover for analysis / 8D report - 12/7/10 | No defect found - 8D report - 03/25/11 |
| 27 | 100 | 3VWTLAJ1AM6 | | | | 13,694 | CJA014411 | 9/7/09 C,C | P0087- fuel system pressure too low | TWS - Metallabrieb im ZME - Pumpenraum -ohne ZME angeliefert | 1x change filter 1x fuel filter | accompanying components are not analyzed because metal chips are in the system | Handover for analysis / 8D report - 12/7/10 | 8D report- DTD vaccepted by Bosch - corrective measures deployed - 1/14/11 |
| 28 | 104 | 3VWTL7AJ3AM | | | | 38,082 | CJA011934 | 8/20/09 C,C | Dismantled by changing the engine - complaint unknown | no metal chips in metering unit found. FHP pump replacement through engine replacement | | | Handover for analysis / 8D report - 12/7/10 | No defect found - 8D report - 01/25/11 |
| 29 | 82 | 3VWTL7AJ6AM | | | | 8,400 | CJA020853 | 10/13/09 C,C | Leakages | no metal chips at the metering unit screen and pump chamber found | | | Handover for analysis / 8D report - 1/5/11- | No defect found - 8D report - 01/25/11 |
| 30 | 99 | 3VWRL7AJ1AM | | | | 6,996 | CJA049352 | 3/29/10 S,C | Engine does not start - P0877 | DTD - Metal wear in metering unit, pump chamber and screen | 4x injectors | accompanying components are not analyzed because metal chips are in the system | Handover for analysis / 8D report - 1/5/11- | inappropriate fuel-8D report- 01/12/11 |
| 31 | 102 | 3VWAL7AJ8AM | | | | 9,551 | CJA015659 | 9/12/09 C,C | Vibration and sounds | no metal chips at the metering unit screen and pump chamber found | | | Handover for analysis / 8D report - 1/5/11- | 8D report - no defect verified - 2/1/2011 |
| 32 | 105 | 3VWTL8AJ1AM | | | | 16,311 | CJA017656 | 9/23/09 C,C | Engine does not start | DTD - Metal wear in metering unit, pump chamber and screen | | | Handover for analysis / 8D report - 1/5/11- | |

starting from 1/1/2011

| | | | | | | | | | | | | | | | |
|-----|-------------|--|--|--|--------|---------|---------|--------|-----------|-------------|--|--|--|--|--|
| 126 | 3VWRL7AJ1AM | | | | 20,209 | BPT0143 | 0007 | 20,859 | CJA015246 | 9/11/09 C,C | P0087-Metal chips in fuel system | DTD - Metal wear in metering unit, pump chamber and screen | | Handover for analysis / 8D report - 2/9/11 | |
| 127 | 3VWTL71K29M | | | | 41,407 | BPT0836 | 0005 | 32,025 | CBE008173 | 7/23/08 | Check lamp on, metal chips | Braune Partikel im ZME Raum und Sieb erkennbar | | Handover for analysis / 8D report - 2/9/12 | |
| 128 | 3VWAL7AJ9AM | | | | 41,904 | BPT0483 | without | | CJA056376 | 4/29/10 | Engine does not start, spark plug check light on P0087 Metal chips | DTD - Metal wear in metering unit, pump chamber and screen | | Handover for analysis / 8D report - 2/9/13 | |
| 129 | 3VWAL71K69M | | | | 11,608 | BPT0484 | 0005 | 38,705 | CBE015576 | 9/9/08 C,C | Engine does not start again - metal chips in the filter. | DTD - Metal wear in metering unit, pump chamber and screen | | Handover for analysis / 8D report - 2/9/14 | |
| 130 | WVWDM7AJ4AV | | | | 40,904 | BPT0086 | without | 20,283 | CJA033742 | 1/14/10 S,C | | DTD - Metal wear in metering unit, pump chamber and screen | | Handover for analysis / 8D report - 2/9/15 | |
| 131 | WVWMM7AJ0AV | | | | 4,251 | BPT0898 | 0007 | 8,414 | CJA029969 | 12/7/09 S,C | Engine does not start again - metal chips in the filter. | no metal chips at the metering unit screen and pump chamber found | | Handover for analysis / 8D report - 2/9/16 | |



Metering unit (MU) - O-ring damaged

Cause: Bosch assembly error Only day of manufacture 10/05/2008 concerned

Measures: Changeover of process order so that lubrication is ensured and turning assembly by hand (Nov. 07)

Effectiveness: 100%



Intake valve continuously open due to particles

Cause: Various particles

Measures: Bosch cleanliness program with focuses on housing, MU, cylinder head, flange, assembly
Regular Q meetings with BOSCH / VW / Audi



Effectiveness: approx. 60% - considerable progress with residual contamination tests and internal BOSCH failures established

Activities: Residual contamination test on 25 pumps and comparison with earlier test (May 08)

Objective: How did the particle quantity, type, material etc. change? -> Approach for improving the reduction in particles to 200 µm (target middle 08)

Drivetrain damage

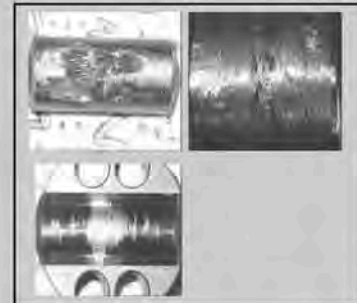
Cause: Roller sluggish or blocked causing roller / cam wear. In the end stages of damage it can cause turned tappets.

Measures: Establish / check run-in conditions in the vehicle and engine plants
Introduce an intensified, new test program -> Failures RB internal (01/11/2008 / 02/05/2008)
100% visual inspection of roller support with technoscope instead of magnifier for µ metal splashes (02/04/2008)
100% straightedge rotation check of roller on blade µ elevations -> jams on the roller (04/01/2008)

Sensitized 100% visual inspection of roller / tappet assembly after friction coefficient test for circumferential marks (02/20/2008)

Effectiveness: approx. 60% - unclear cases 3 x cold test [REDACTED] 2 current field early failures

Activities: Optimize grinding process (embedded µ particle form Al₂O₃; industrial diamond)
Optimize C3 coating process of roller support (major test ongoing) and roller end (frames)





Notes:

CP4.1 (single piston) for R4-TDI and CP4.2 (twin pistons) for V6-TDI (later V8- / V12-TDI with 1 CP4 per bank)

DM = date of manufacture BOSCH

Error

->

Vehicle effect

MU - O-ring damaged -> Nonstarter or vehicle limp-home mode

Number of errors: CP4 [REDACTED]: ---
 CP7 [REDACTED] 5 x CP4.1 (FD10/07)
 Field: 1 x CP4.1 (FD10/07)
 Q-AL: 1 x CP4.1 (FD10/07)

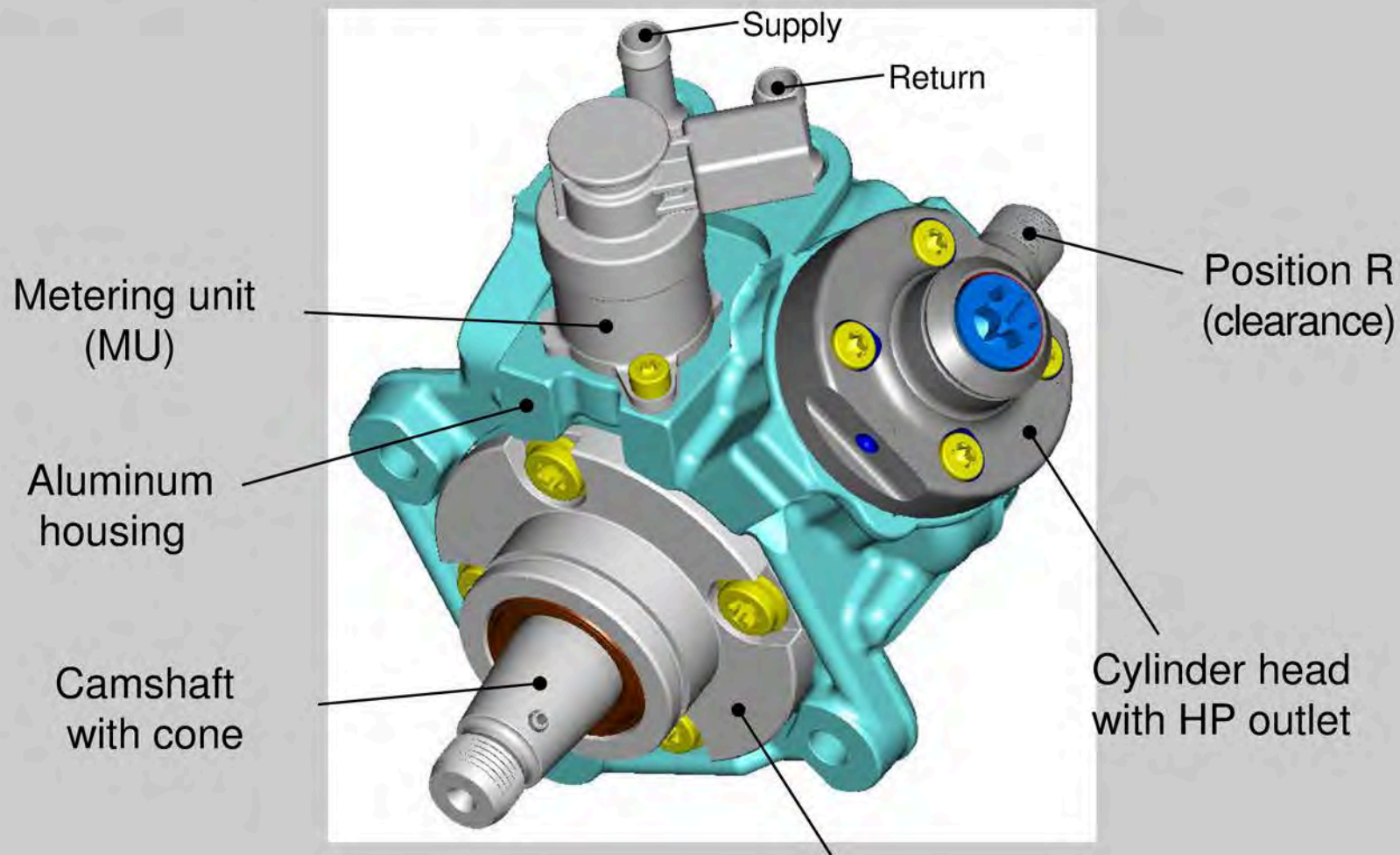
Intake valve / NR valve continuously open due to particles -> Non-starter

Number of errors: CP4 [REDACTED]: ---
 CP7 [REDACTED] 5 x CP4.1 (4 x DM 09-11/07; 1 x 01/08)
 1 x CP4.2 (DM 08/07)
 Field: 1 x CP4.1 (09/07)

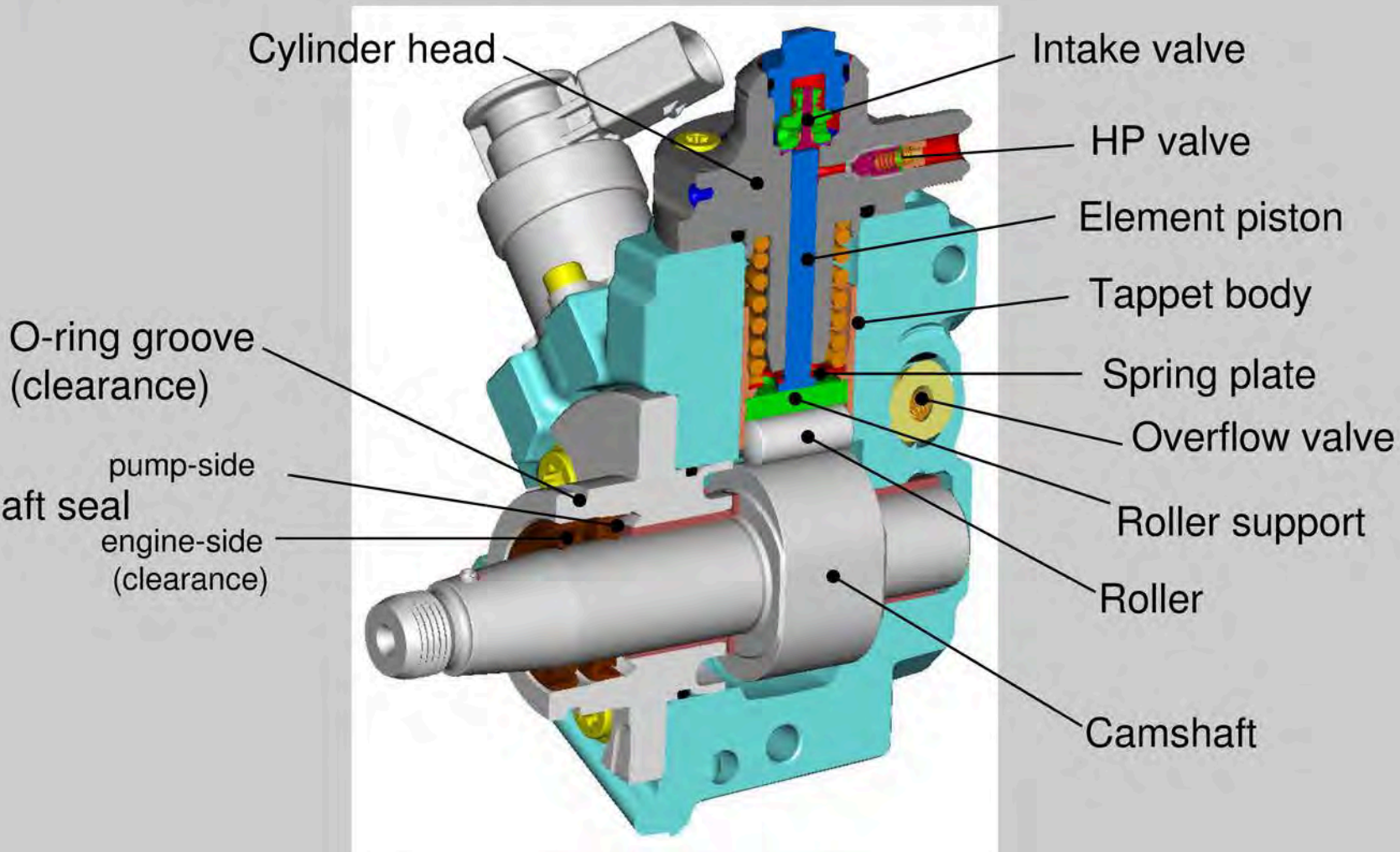
Drivetrain damage -> Breakdown, non-starter

Number of errors: CP4 [REDACTED] Non-responsive content removed **3 x CP4.1 (DM 03/08 unclear failures - cold test [REDACTED])**
 CP7 [REDACTED] Non-responsive content removed ---
 CP7 [REDACTED] Non-responsive content removed **1 x CP4.2 (current [REDACTED] roller dynamometer, DM 03/08, Q7)**
 Field: **1 x CP4.1 (current [REDACTED] B8, DM 01/11/2008, 25 km)**
1 x CP4.2 (current [REDACTED] Non-responsive content removed B8; DM 03/03/2008; 6 km)

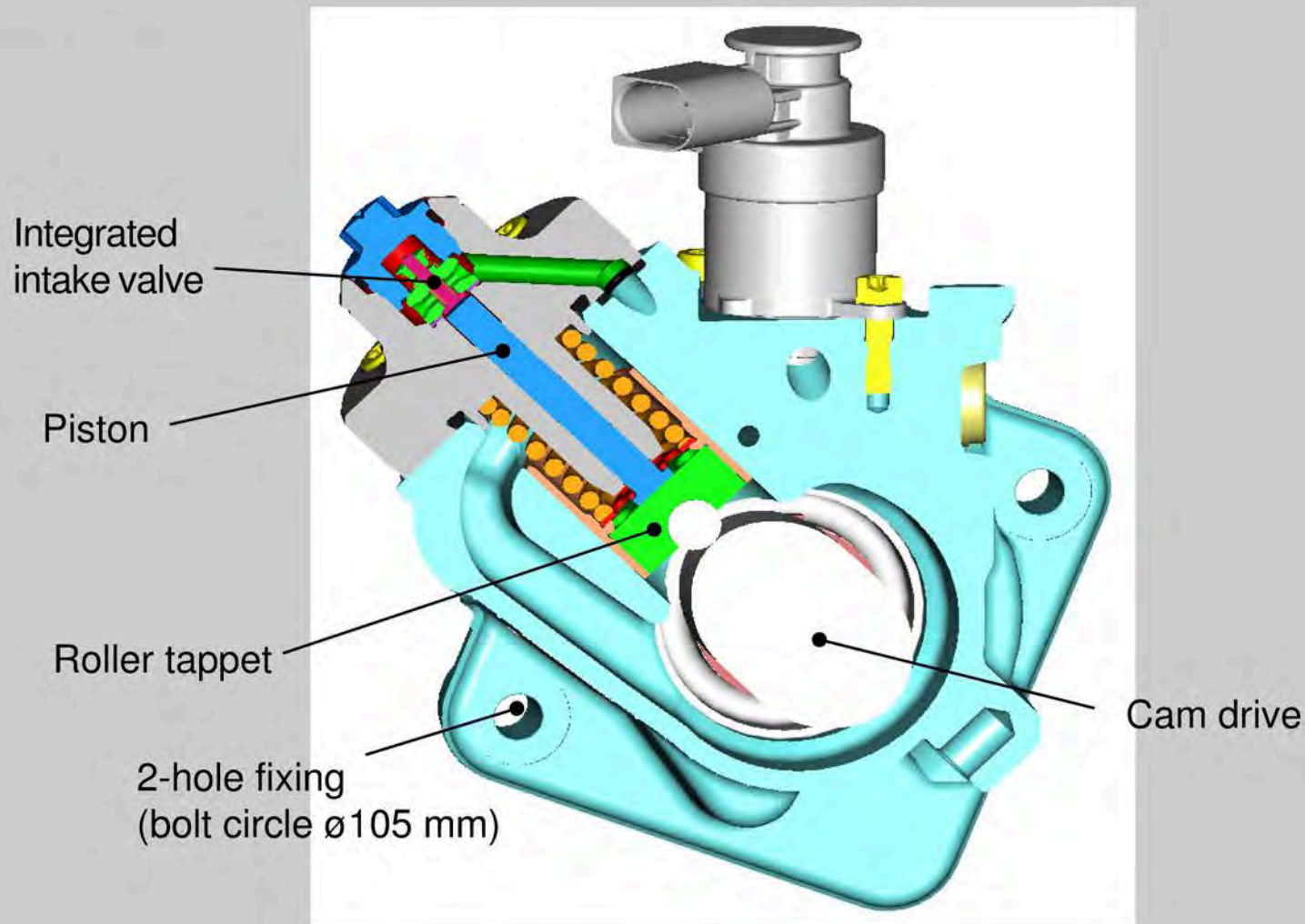
Technical information CP4.1



Technical information CP4.1



Technical information CP4.1



Drivetrain damage high pressure diesel fuel pump CP4



Failure situation V6 TDI field (CP4.2):

- Total 724 settlements (approx 80% drivetrain damage) - of which 403 settlements in [REDACTED]

Causes / analyses:

Sluggishness of the roller in the roller support

- a) due to manufacturing deviations from Bosch (microgeometry) - largely eliminated.
- b) particularly in connection with fuel peculiarities in specific markets.

-> Robustness deficit of CP4 with regard to fuel qualities around the world.

Measures implemented:

| | |
|---|---|
| Straightedge check with glasses cleaning cloth | WK19/2008 |
| Roller from new second supplier (defined texture = smoother surface) | WK20/2008 |
| <u>Optimized C layer on roller support (approx. 80% effectiveness with regard to defects)</u> | <u>WK23 / 2008</u> – Q monitoring (1) June 2008 |
| Further optimization (carbon holder for 2 systems) C layer roller support | WK16/ 2009 |
| <u>C2 instead of C3 layer on roller end (avoid fusing)</u> | <u>WK21 / 2009</u> – Q observation (2) June 2009 |
| Observation from date of manufacture of Bosch HP pump on type plate 6/1/2009 | |

Planned measures:

- Improved washing process before C coating of roller support Dec. 2009
- Camera system for 100% check of surface faults on roller support (subset from WK26/09) Late Jan. 2010
- Introduction of drivetrain anti-wear package (surface of roller, surface of roller support, play) July 2010

Further procedure:

- Since 11/09/09 field task force for [REDACTED] (Bosch-Audi) -> Determination of market-specific peculiarities. Initial findings:
- Striking features of fuel (FAME acidic) due to switch of fuel from B0 to B7 in mid-2009
 - Damage symptoms in [REDACTED] different than [REDACTED] (shaft seal worn, cam track smoothed, ...)
 - Some C coating batches have high failure rates (compare production data history)
 - Further detailed analyses are underway - weekly task force meetings

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Failure of high-pressure fuel pump - Status from WK 23/09 to WK 45/09

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3/26/2012

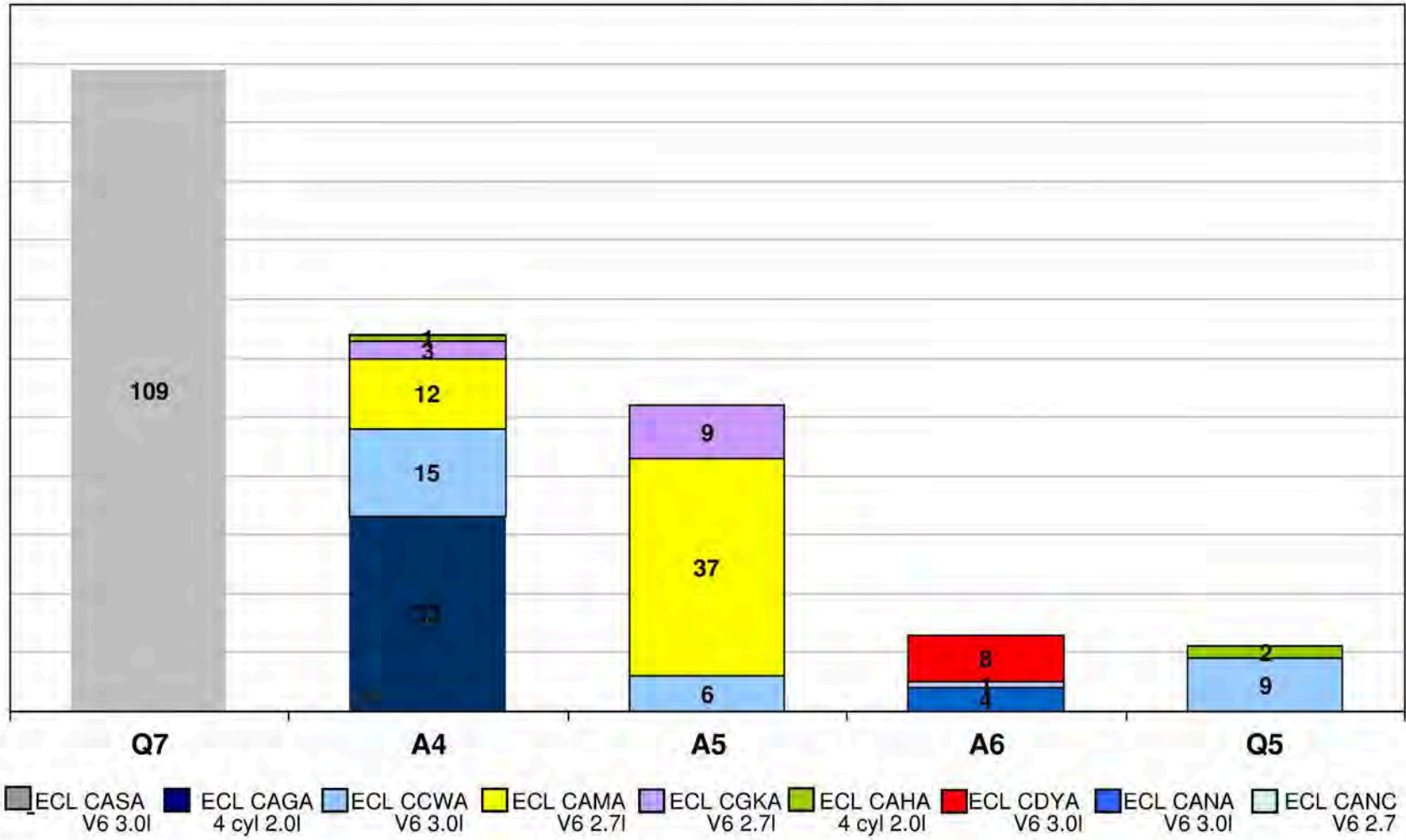
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Failure of common rail high-pressure fuel pump Period from WK 25-45 - chart by model/ECL (WK 23/09 to WK 45/09)

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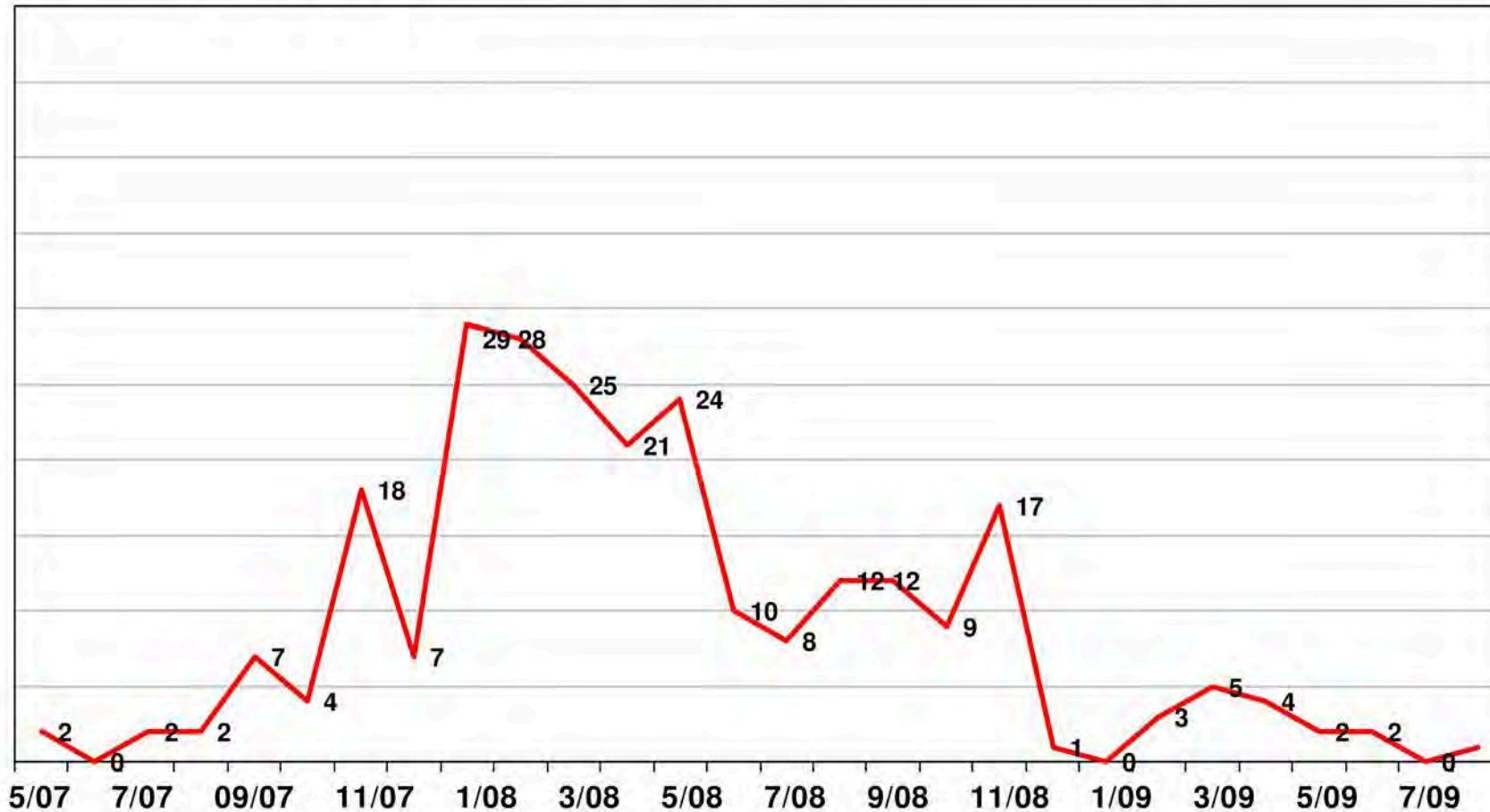


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Failure of common rail high-pressure fuel pump Period from WK 25-45 - chart by date of manufacture of high-pressure fuel pump (WK 23/09 to WK 45/09)

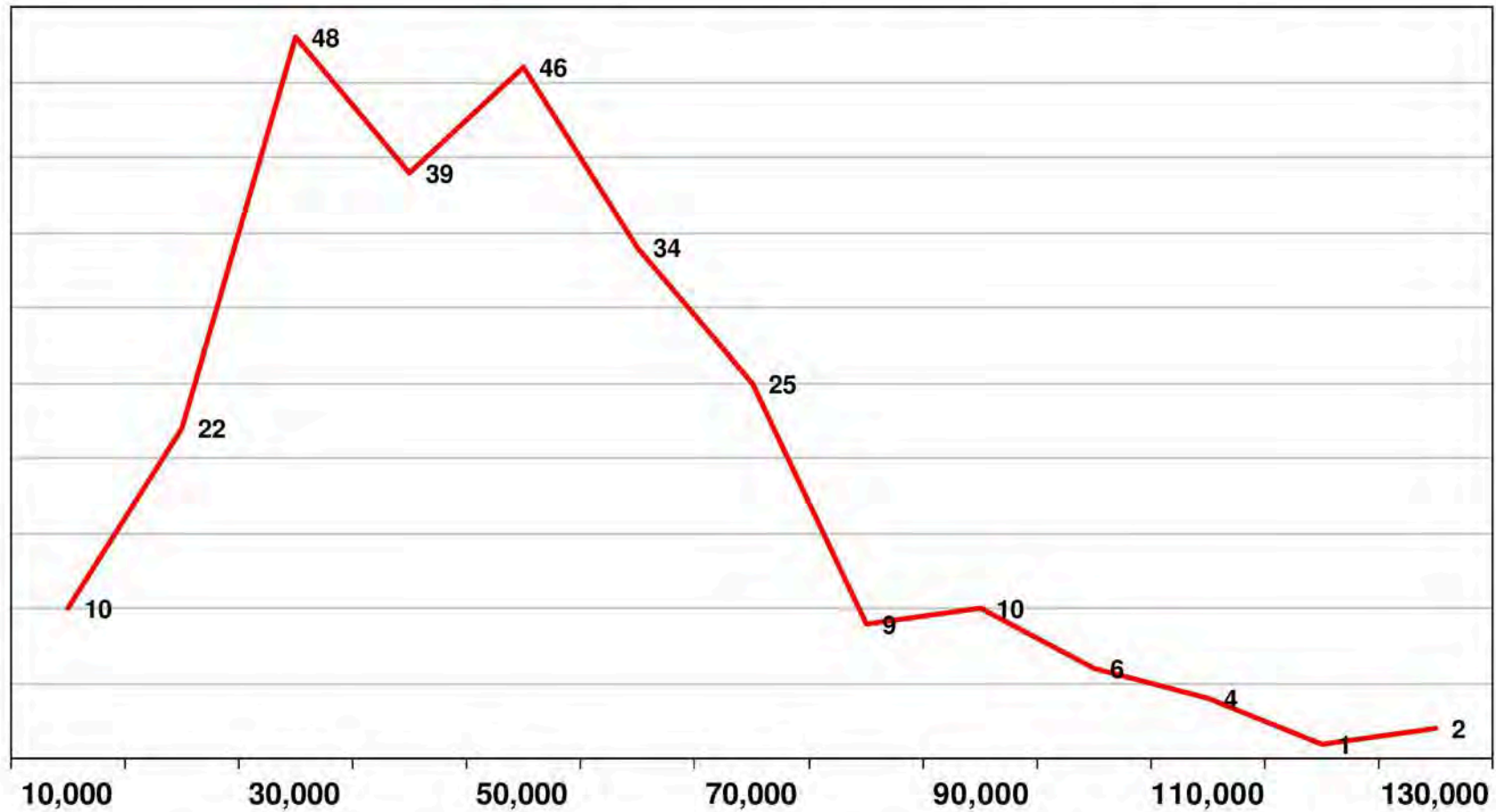
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Failure common rail high-pressure fuel pump - Non-responsive content removed Period from WK 25-45 - Chart by mileage (km) - (WK 23/09 to WK 45/09)



From: Non-responsive content removed
To:
CC:

Date: 1/15/2010, 2:36:30 PM
Subject: ANS: 3.0 TDI EU 4

Hello Non-responsive content removed

I understand your approach.

As a result of the catastrophic CoD development of the CP4.2 in RoW, we were not able to approve any new V6 TDI projects in RoW markets, as presented yesterday. We are aware that this will result in discontinuation of the V6 TDI models in existing markets as a result of stricter emissions legislation. Due to the massive number of damage cases, however, and the expected failure rate, the current situation is no longer tenable as it stands.

Thank you for your understanding in this matter.

With best wishes

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Sitz/Domicile: Ingolstadt
Registergericht/Court of Registry: Local District Court Ingolstadt
HRB Nr./Commercial Register No.: 1
Vorsitzender des Aufsichtsrats/Chairman of the Supervisory Board: Martin Winterkorn Vorstand/
Board of Management: Rupert Stadler (Vorsitzender/Chairman), Ulf Berkenhagen, Michael Dick,
Frank Dreves, Peter Schwarzenbauer, Axel Strotbek, Werner Widuckel

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>From: Non-responsive content removed

>Sent: Friday, January 15, 2010, 10:58 AM

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>Subject: 3.0 TDI EU 4

>Importance: High

>

>

>Hello Non-responsive content removed

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>1)

>I would like to ask you to check whether the above pump can still be used for all models for [REDACTED] only.

>

>Background: Since we are not blocking the models that are already in series, we would let [REDACTED] continue to run as well if it weren't for the legal requirements for EU 4.

> It is not a new deployment of the 3.0 TDI in a market where it was not previously present.

>

>2)

>Since a transmission conversion is planned in the Q7, we cannot simply let things continue here. Please check whether we could also use the pump for these markets which already received the 3.0 EU 3 with the old transmission in MY 10.

>

>

>Please provide feedback.

>

>Thank you.

>

>

>Best regards

>

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>

>Sitz/Domicile: Ingolstadt

>Registergericht/Court of Registry: Local District Court Ingolstadt

>HRB Nr./Commercial Register No.: 1

>Vorsitzender des Aufsichtsrats/Chairman of the Supervisory Board: Martin Winterkorn >Vorstand/
Board of Management: Rupert Stadler (Vorsitzender/Chairman), Ulf Berkenhagen, Michael

Dick, Frank Dreves, Peter Schwarzenbauer, Axel Strotbek, Werner Widuckel

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From: Non-responsive content removed

To:

CC:

Date: 2/1/2010, 10:20:49 AM

Subject: Audi estimation of damage analysis in [REDACTED] for the minutes

Hello [REDACTED]

Audi estimation of damage analysis in [REDACTED] for the minutes

Except for the hydrogen wear, the damage hypotheses proposed by Bosch have all been confirmed. The cams diagnosed with hydrogen wear were not actually caused by hydrogen wear, but instead probably through material fatigue with subsequent corrosion of the crack flanks.

The main damage hypotheses are:

1. Possibility of turned tappet when starting the system, which results in a high concentrated load on the roller in the roller support and in turn a standstill. The standstill of the roller is made more probable due to poor fuel quality (smaller lubrication gap). Adhesion wear then occurs on the cam and/or roller and ultimately results in failure of the system sooner or later.
2. Poor fuel quality that results in a sluggish/stopped roller.
3. Tribooxidation

Damage hypotheses 1, 2, and 3 are surely related to one another.

Best regards

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<http://www.audi.com>

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Registergericht/Court of Registry: Local District Court Ingolstadt

HRB Nr./Commercial Register No.: 1

Vorsitzender des Aufsichtsrats/Chairman of the Supervisory Board: Martin Winterkorn Vorstand/
Board of Management: Rupert Stadler (Vorsitzender/Chairman), Ulf Berkenhagen, Michael Dick,
Frank Dreves, Peter Schwarzenbauer, Axel Strotbek, Werner Widuckel

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To: [REDACTED]

CC: [REDACTED]

Date: 5/26/2010, 1:38:46 PM

Subject: Findings CP4.1 [REDACTED]

Attachments: [Überblick Befundung Rücklieferung \[REDACTED\].Stand-2010-05-26.pdf](#)

Hi all,

It's popped up in the R4-CR again - like with the V6, but in a weakened form:

- The most cases of drivetrain damage up to 05/2008 (AWP 1)
- or 06/2009 (AWP 2) at the latest
- And it's high time for the intake valve strainer.

Significant improvement from late 2008
→ failure 09/2009 !!!

Hello [REDACTED]

Please send the information to [REDACTED]

Attention: Preliminary information!!

Best regards

[REDACTED]

From: Non-responsive content removed

Sent: Wednesday, May 26, 2010, 2:06 PM

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Subject: Repeat findings CP4 [REDACTED]

Dear Sirs,

Please find attached the initial preliminary analysis results from the CP4 pumps sent back from [REDACTED] Total: 139 pieces

of which: 35 x CP4.1
(preliminary findings)
104 x CP4.2 (open)

Mit freundlichen Grüßen / Best regards

[REDACTED]

Robert Bosch GmbH

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From: Non-responsive content removed
To:
CC:



Date: 7/6/2010, 4:12:08 PM

Subject: R: Report WK 24/20120 - Failure of high-pressure fuel pump Diesel C.R.
market

Dear 

Regarding 4 cylinder cases without metal chips when removing N290, for each vehicles we had:

- Sporadic events of less power and glow system warning light on;
- P0087 fault in diagnosis protocol;

Furthermore, for 2 of these vehicles the Customer complained also a difficulty of engine start.

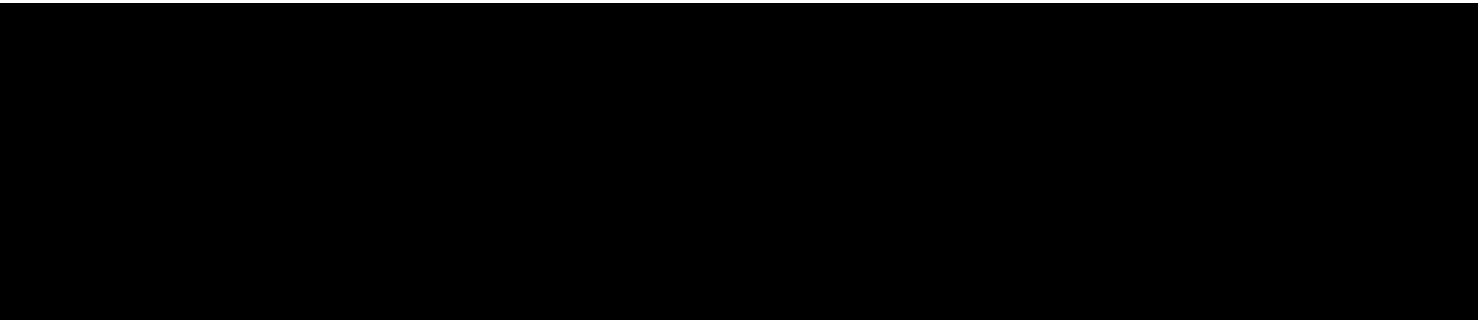
At the moment we have a positive feedback after high pressure pump replacement.

059 130 755 S Pumps:

As request we will send these pumps directly to Bosch.

Best Regards,

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Da: Non-responsive content removed

Inviato: sabato 3 luglio 2010 9.20

A: Non-responsive content removed

Oggetto: I: Report WK 24/20120 - Failure of high-pressure fuel pump Diesel C.R. Non-responsive content removed market

Ciao Non-responsive content removed

Grazie

Non-responsive content removed

<http://www.volkswagengroup.it>

Non-responsive content removed

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Da: [Non-responsive content removed]

Inviato: martedì 29 giugno 2010 15.52

[Non-responsive content removed]

Oggetto: Re: Report WK 24/20120 - Failure of high-pressure fuel pump Diesel C.R. [redacted] market

Dear [Non-responsive content removed]

3. Which complaints and defect causes do the 4-cylinders without chips have in [redacted] ??? 4 + 1 + 1 pcs.

Is that:

- * Rail pressure not OK ?
- * Noises?
- * Non-starters?
- * etc. ?

4. When can we expect the report for WK25/2010 ?

5. Please continue to send us all 059 130 755 S pumps for our task force work (predecessor pump CP1H) that fail in the near future! Transport to [Non-responsive content removed] like OK CP4.2 pumps. We have to do all we can to explain the increase from 04/2010 caused both by CP4 drivetrain damage and by CP4 deviation of rail pressure.

Best regards

[Non-responsive content removed]

From: [Non-responsive content removed]

Sent: Tuesday, June 22, 2010, 11:48 AM

[Non-responsive content removed]

Subject: R: Report WK 24/20120 - Failure of high-pressure fuel pump Diesel C.R. [redacted] market

Good morning [Non-responsive content removed]

Thank you for your note - I have corrected the error.

The next report will contain this correction. Total is with and without chips.

Regards

<< Oggetto OLE: Immagine (Bitmap Device Independent) >>

< File: Report Ausfall Hochdruckpumpe Diesel CR - Stand KW24.2010_agg.xls >>

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<http://www.volkswagengroup.it>

Da: Non-responsive content removed

Inviato: martedì 22 giugno 2010 9.28

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Oggetto: Re: Report WK 24/20120 - Failure of high-pressure fuel pump Diesel C.R. market

Dear Non-responsive content removed

Thank you for the regular information!

I noticed that the Totals line (light-blue field) only contains the drivetrain damage with chips. If this is intentional, I suggest you rename the line as "Total with chips". If not, then you should add all four lines together.

Thank you.


Best regards


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From: Non-responsive content removed

Sent: Tuesday, June 22, 2010, 8:58 AM

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Subject: Report WK 24/20120 - Failure of high-pressure fuel pump Diesel C.R.  market

Hello,

Please find enclosed an update of our weekly report "High-pressure fuel pump failures" for the period WK 25/2009 to WK 22/2010.

33 failures occurred in our market in week 24.


Failure situation incl. WK 24/2010

<< Oggetto OLE: Immagine (Bitmap Device Independent) >>

< File: Report Ausfall Hochdruckpumpe Diesel CR - Stand KW24.2010.xls >>

Regards

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From: Non-responsive content removed
To:



CC:
Date: 7/26/2010, 11:56:45 AM
Subject: Re: Report WK 29/20120 - Failure of high-pressure fuel pump Diesel C.R. [redacted] market

Attachments: [Report Ausfall Hochdruckpumpe Diesel CR - Stand KW29 2010.xls](#)

Bad!
The 4-cylinder is increasing rapidly, in particular!
RP1 for R4 !!!!!!!!!!!

Best regards

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From: Non-responsive content removed
Sent: Monday, July 26, 2010, 11:40 AM

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Subject: Report WK 29/20120 - Failure of high-pressure fuel pump Diesel C.R. [redacted] market

Hello,

Please find enclosed an update of our weekly report "High-pressure fuel pump failures" for the period WK 25/2009 to WK 29/2010.

47 failures occurred in our market in week 29.

Failure situation incl. WK 29/2010

6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12

6/09 7/09 8/09 9/09 10/09 11/09 12/09 1/10 2/10 3/10 4/10 5/10 6/10 7/10 8/10 9/10 10/10 11/10 12/10 Total

6 cyl. engine with shavings 31 46 35 46 46 52 36 38 48 64 77 62 75 84 0 0 0 0 0 740

4 cyl. engine with shavings 1 8 7 8 12 13 12 13 13 20 29 30 33 52 0 0 0 0 0 251

6 cyl. engine without shavings 31 0 1 3 7 18 10 38 49 64 77 62 4 6 0 0 0 0 0 48

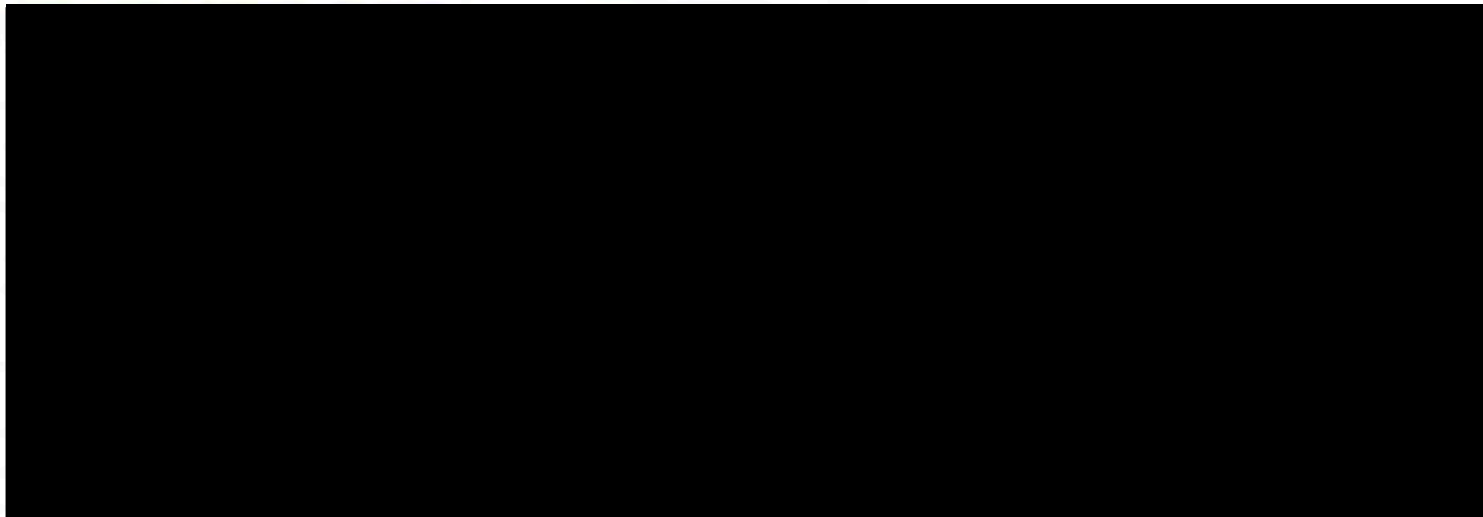
4 cyl. engine without shavings 31 0 0 0 0 4 1 38 7 64 77 62 1 1 0 0 0 0 0 48

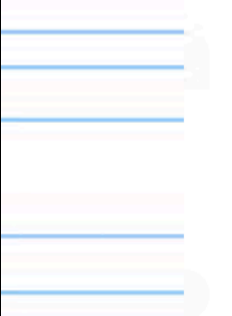
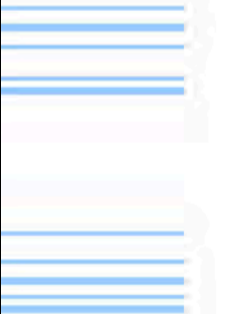
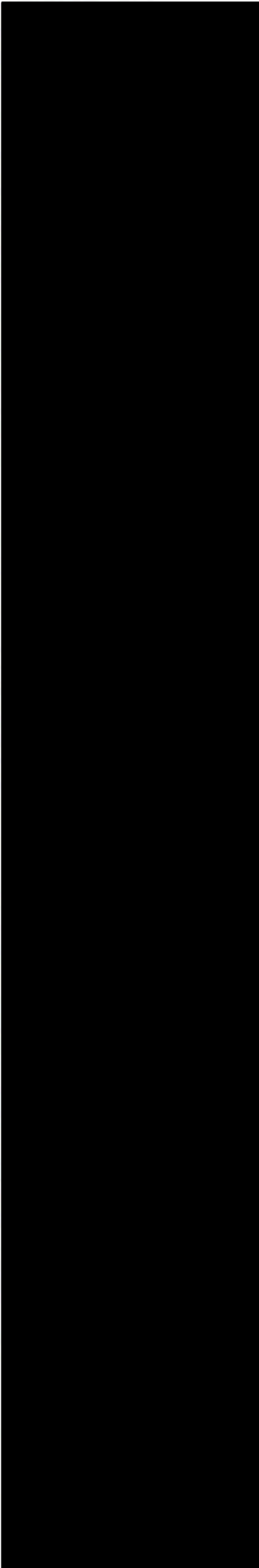
Total 32 54 42 54 58 65 48 52 64 91 128 103 113 143 0 0 0 0 0 1047

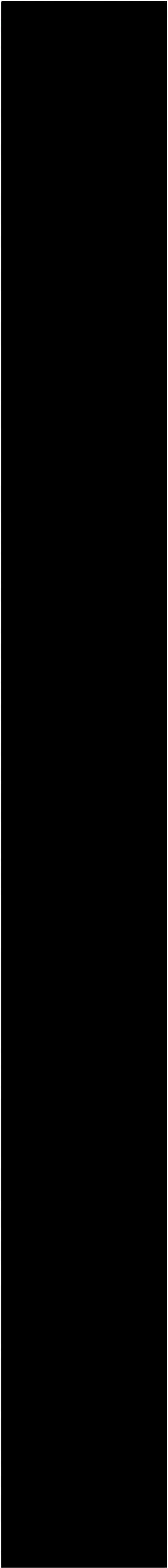
Regards



<http://www.volkswagengroup.it>

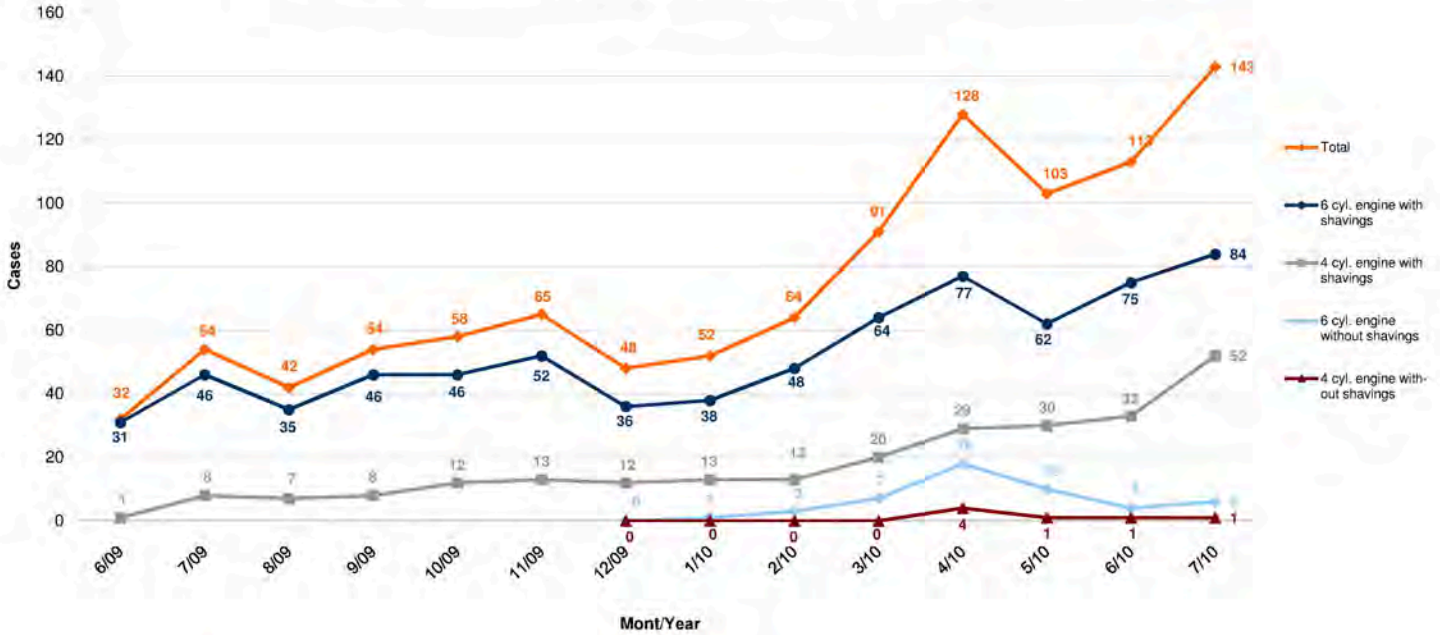






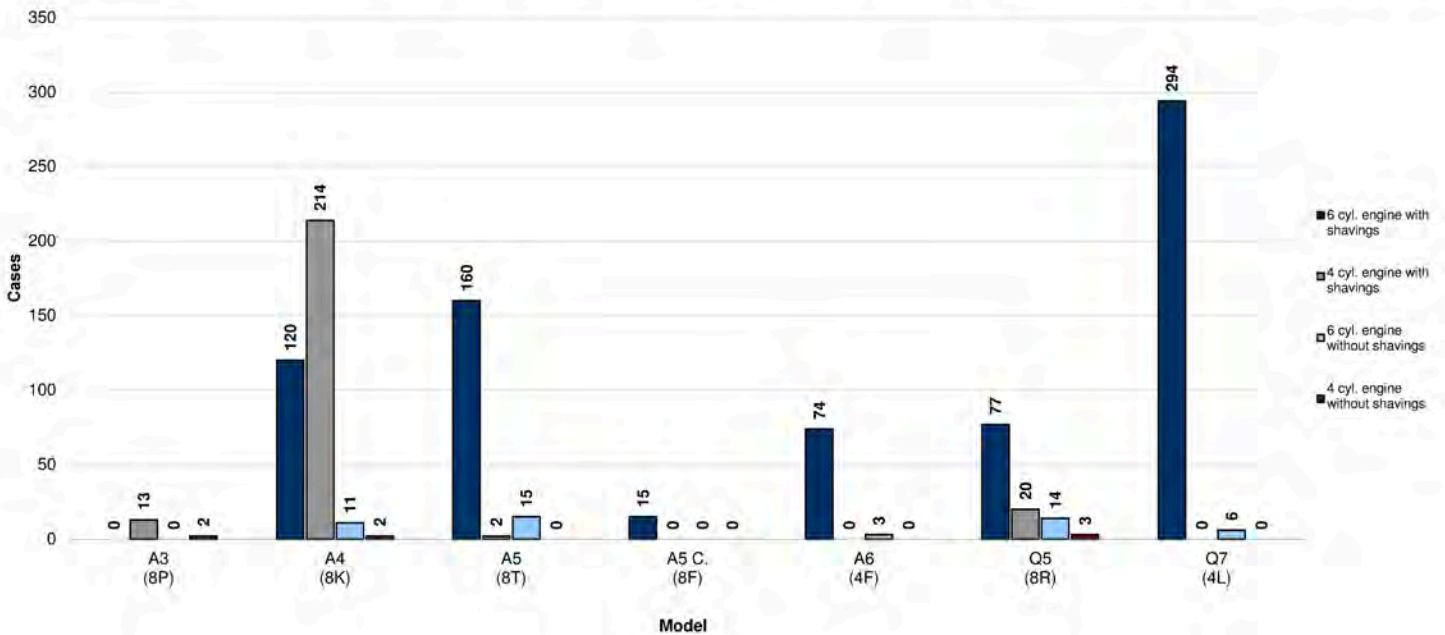
| | 6/09 | 7/09 | 8/09 | 9/09 | 10/09 | 11/09 | 12/09 | 1/10 | 2/10 | 3/10 | 4/10 | 5/10 | 6/10 | 7/10 | 8/10 | 9/10 | 10/10 | 11/10 | 12/10 | Total |
|--------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|------------|------------|------------|----------|----------|----------|----------|----------|-------------|
| 6 cyl. engine with shavings | 31 | 46 | 35 | 46 | 46 | 52 | 36 | 38 | 48 | 64 | 77 | 62 | 75 | 84 | 0 | 0 | 0 | 0 | 0 | 740 |
| 4 cyl. engine with shavings | 1 | 8 | 7 | 8 | 12 | 13 | 12 | 13 | 13 | 20 | 29 | 30 | 33 | 52 | 0 | 0 | 0 | 0 | 0 | 251 |
| 6 cyl. engine without shavings | | | | | | | 0 | 1 | 3 | 7 | 18 | 10 | 4 | 6 | 0 | 0 | 0 | 0 | 0 | 49 |
| 4 cyl. engine without shavings | | | | | | | 0 | 0 | 0 | 0 | 4 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 7 |
| Total | 32 | 54 | 42 | 54 | 58 | 65 | 48 | 52 | 64 | 91 | 128 | 103 | 113 | 143 | 0 | 0 | 0 | 0 | 0 | 1047 |

Failure of high pressure pump Diesel CR - cases of damage per month (status 07/10 WK 29)



| | A3 (8P) | A4 (8K) | A5 (8T) | A5 C. (8F) | A6 (4F) | Q5 (8R) | Q7 (4L) | Total |
|--------------------------------|-----------|------------|------------|------------|-----------|------------|------------|-------------|
| 6 cyl. engine with shavings | 0 | 120 | 160 | 15 | 74 | 77 | 294 | 740 |
| 4 cyl. engine with shavings | 13 | 214 | 2 | 0 | 0 | 20 | 0 | 249 |
| 6 cyl. engine without shavings | 0 | 11 | 15 | 0 | 3 | 14 | 6 | 49 |
| 4 cyl. engine without shavings | 2 | 2 | 0 | 0 | 0 | 3 | 0 | 7 |
| Total | 15 | 347 | 177 | 15 | 77 | 114 | 300 | 1045 |

Failure of diesel CR high-pressure fuel pump - cases of damage by model/engine type (status: 07/10 WK 29)



From: Non-responsive content removed
To:
CC:

Date: 10/8/2010, 11:25:52 AM
Subject: [ANS: IQIS:230003014652_QTS 3731540_Info.](#)
Attachments: [101008_Status_CP4_Ausfaelle_████████.pdf](#)

Hello

Let's please stop the unproductive mail correspondence on the CP4 failures with the large distribution list immediately, and check and coordinate our statements better in future. The task force for the CP4.1 failures, which consults the Audi colleagues regularly, has currently reached a status that can only conditionally confirm your statements after a detailed examination. We and AUDI are in the same place in the failure analysis and therefore support the same corrective measures that you are already familiar with as "anti-wear packages". The only difference is the implementation of the AWP's in the field, where across-the-board introduction starting with the AWP pump types is planned by 03/2011 for the CP4.1, due to the project variety and volume requirements in association with limited capacity on the Bosch side. We are regularly tracking this at Bosch, so it should not be conveyed to Bosch from a variety of instances.

The evaluation of the cases of damage in the ██████████ market carried out in AQUA confirms the effectiveness of the measures introduced so far. The failure figures have declined rapidly in manufacturing year 2010.

While it is correct that we have recorded a large number of failures in 2010, most of them are due to pumps with DM before the clean date. To respond to this and if you want to prevent further failures with the old design status, you will have to request a field cleanup.

We hope to further improve the field situation through the anti-wear packages that have already been approved and scheduled, and are also working on further anti-wear measures together with Bosch, which are currently in the development and validation phase.

P.S. BOSCH has been intentionally left out of the e-mail distribution list.

Best wishes,

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From: Non-responsive content removed

Sent: Thursday, October 07, 2010, 10:14 AM

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Subject: Re: IQIS:230003014652_QTS 3731540_Info.

... and even Non-responsive content removed has encountered (relatively late / 28,000 km) drivetrain damage cases with the CP4.1 (transverse installation MY10), without any indication of poor fuel quality.

Best regards

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From: Non-responsive content removed

Sent: Wednesday, October 06, 2010, 5:11 PM

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Re: IQIS:230003014652_QTS 3731540_Info.

Hello,

Please find attached information on the analysis of the CP4 pump

Fault scope

RB Part no. 0445.010.507

AUDI part no. 03L130755

SN: BPT 0260

DM: 10/16/2009

ML: 05

IQIS: 230003014652

Ref. no: IGG000006033-001

Customer ref. no. QTS 3731540

Engine no. CBAB 05204

Vehicle No.: WAUZZZ8P5AA [REDACTED]

Mileage: 27,818 km

Failure country: [REDACTED]

Description of problem

No specification from AUDI

RB analysis:

Roller support worn

No deposits or corrosion traces

Fuel analysis OK

RB finding

EA11003EN-01807[3]
Drivetrain damage

ENTIRE PAGE CONFIDENTIAL

Complaint was acknowledged as Bosch defect

Regards

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Status failures figures Bosch CP4

Failure figures market Non-responsive content removed MY 2008 - 2010

| | Produced | Sales | Random sample | Failures | Failures pro 1,000 |
|----------------------------|----------|--------|---------------|----------|--------------------|
| CP4.1 VW (4 cyl.) | 90,388 | 89,669 | 52,447 | 300 | 3.32 |
| CP4.1 Audi (4 cyl.) | 74,228 | 73,146 | 48,517 | 339 | 4.58 |

Status 07/2010

Failure figures market Non-responsive content removed MY 2008 – 2010

| | Failures MY 2008 | Failures MY 2009 | Failures MY 2010 |
|----------------------------|------------------|------------------|------------------|
| CP4.1 VW (4 cyl.) | 87(52) | 178(116) | 35(19) |
| CP4.1 Audi (4 cyl.) | 73(58) | 241(199) | 24(7) |

in brackets = Number of cases of damage after plausibility check, costs >

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Status 07/2010

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From: Non-responsive content removed

To:

CC:

Date: 3/25/2011, 11:49:00 AM

Subject: ANS: Failure of diesel CR high-pressure fuel pump [REDACTED] market - Current situation for 4-cylinder Engines

2nd attempt without attachment.

Best regards

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From: Non-responsive content removed

Sent: Friday, March 25, 2011, 11:46 AM

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Subject: Re: Failure of diesel CR high-pressure fuel pump [REDACTED] market - Current situation for 4-cylinder engines

Dear [REDACTED]

The worldwide implementation of RP1+ and intake valve strainer is planned for next week (WK13).

But, confidential information for you: There is still conflict with Bosch about who is to pay the modification costs.

Bosch is threatening to not implement the change if VW/Audi does not pay the costs. This topic is being negotiated by top management.

It is beyond our sphere of influence.

Best regards

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Sitz/Domicile: Ingolstadt

Registergericht/Court of Registry: Local District Court Ingolstadt

HRB Nr./Commercial Register No.: 1

From: Non-responsive content removed

Sent: Wednesday, March 23, 2011, 9:48 AM

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Subject: I: Failure of diesel CR high-pressure fuel pump market - Current situation for 4-cylinder engines

Hello Non-responsive content removed

Since early 2011, our damage quota for CR high-pressure fuel pumps has been reduced significantly; the workshop campaign is also ongoing for the 6-cylinder engines.

Please let us know the current status of our 4-cylinder CR high-pressure fuel pumps (RP-1 package).

Has the RP1 measure been implemented in series production for the 4-cylinder? If so, from which vehicle no./date?

Are the high-pressure fuel pumps with RP1 still being shipped as CS part? If so, with which SP number? Can the parts be identified externally, or only through the SP number?

As attachment: e-mail from November 2010 on topic of 4-cyl. CR.

Thank you for your information,

With best wishes

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< Message: I: AWP variants CP4.1 >>

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Da: Non-responsive content removed

Inviato: mercoledì 23 marzo 2011 9.15

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Oggetto: Report WK 11/2011 - Failure of diesel CR high-pressure fuel pump Non-responsive content removed market

Dear Sir/Madam,

Please find enclosed the update of our weekly report "High-pressure fuel pump failures" for the period WK 25/2009 to WK 11/2011.

In addition, 20 more failures have occurred or been reported in the Non-responsive content removed market in Wk 11.

INFO: All vehicles that have been repaired with a new high-pressure fuel pump CP4.2 - RP 2 are listed in green or highlighted in the attached file "Report-Ausfall unter "Basis Daten" - (40 high-pressure fuel pumps).

Effective immediately, you will receive additional information with regard to the 23G7 recall campaign, with evaluation of the completed cases through our warranty department. The completed cases have been processed through warranty and goodwill applications.

Failure situation incl. WK 11/2011

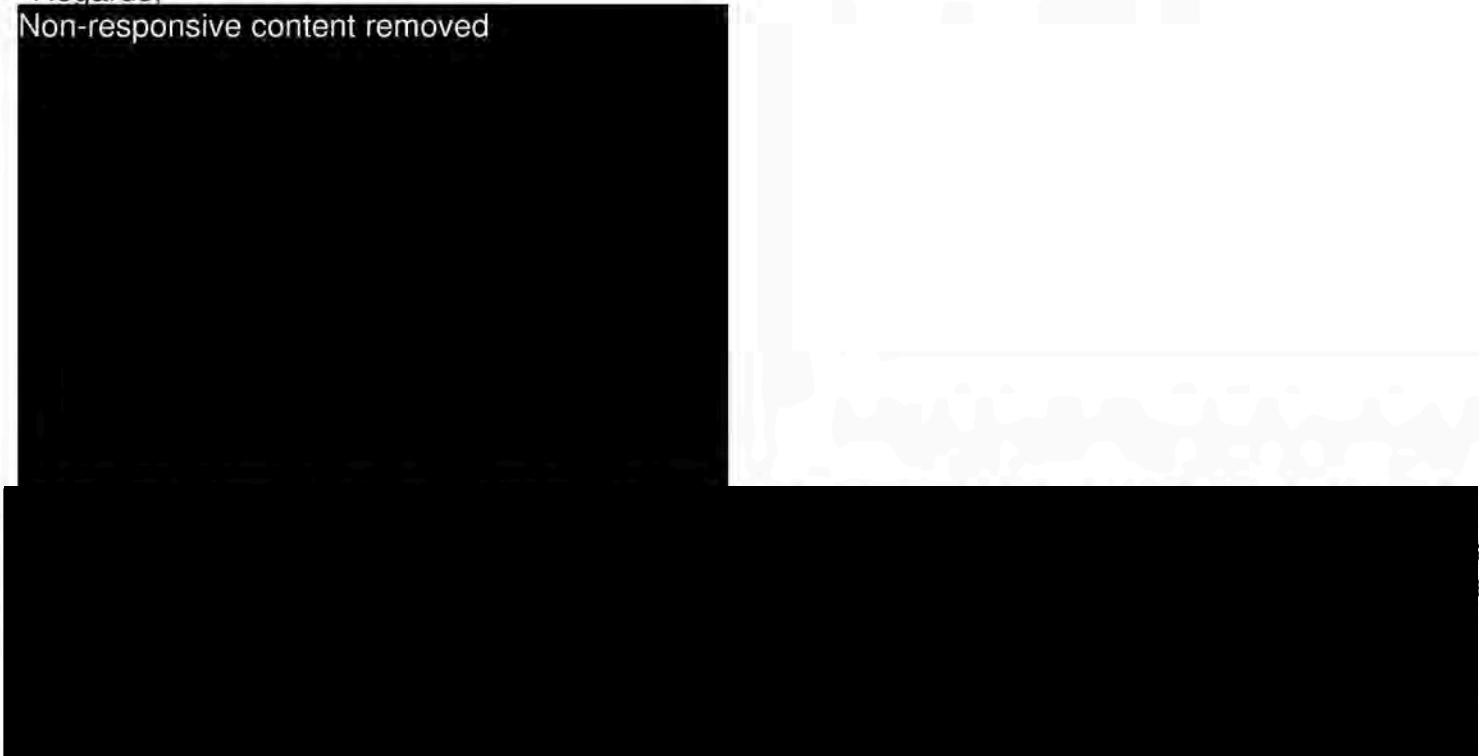
| | 6/09 | 7/09 | 8/09 | 9/09 | 10/09 | 11/09 | 12/09 | 1/10 | 2/10 | 3/10 | 4/10 | 5/10 | 6/10 | 7/10 | 8/10 | 9/10 | 10/10 | 11/10 | 12/10 |
|--------------------------------|------|------|------|------|-------|-------|-------|------|------|------|------|------|------|------|------|------|-------|-------|-------|
| 6 cyl. engine with shavings | 31 | 46 | 35 | 46 | 46 | 52 | 36 | 39 | 48 | 64 | 77 | 62 | 75 | 104 | 75 | 84 | 99 | 95 | 75 |
| 4 cyl. engine with shavings | 1 | 8 | 7 | 8 | 12 | 13 | 12 | 13 | 13 | 20 | 29 | 30 | 33 | 64 | 46 | 46 | 62 | 67 | 53 |
| 6 cyl. engine without shavings | 0 | 1 | 3 | 7 | 18 | 10 | 4 | 6 | 2 | 8 | 14 | 17 | 24 | | | | | | |
| 4 cyl. engine without shavings | 0 | 0 | 0 | 0 | 4 | 1 | 1 | 1 | 1 | 3 | 1 | 2 | 5 | | | | | | |
| Total | 32 | 54 | 42 | 54 | 58 | 65 | 48 | 53 | 64 | 91 | 128 | 103 | 113 | 175 | 124 | 141 | 176 | 181 | 157 |

| | 1/11 | 2/11 | 3/11 | 4/11 | 5/11 | 6/11 | 7/11 | 8/11 | 9/11 | 10/11 | 11/11 | 12/11 | 1/12 | 2/12 | 3/12 | 4/12 | 5/12 | 6/12 | 7/12 | |
|--------------------------------|------|------|------|------|------|------|------|------|------|-------|-------|-------|------|------|------|------|------|------|------|------|
| Total | | | | | | | | | | | | | | | | | | | | |
| 6 cyl. engine with shavings | 49 | 53 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1325 |
| 4 cyl. engine with shavings | 30 | 40 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 633 |
| 6 cyl. engine without shavings | 20 | 3 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 141 |
| 4 cyl. engine without shavings | 4 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 30 Total | 103 | 99 | 60 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2129 |

- < OLE object: Picture (Device Independent Bitmap) >>
- < OLE object: Picture (Device Independent Bitmap) >>
- < OLE object: Picture (Device Independent Bitmap) >>
- < OLE object: Picture (Device Independent Bitmap) >>
- < File: Report Ausfall Hochdruckpumpe Diesel CR - Stand KW11.2011.zip >>

Regards,

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| Year | 2010 | | | | | | | | | | | | | | | | | | | | | |
|------------------------|------|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Task | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| Audi B8 | | | | | | | | | | | | | | | | | | | | | | |
| Audi C6 | | | | | | | | | | | | | | | | | | | | | | |
| VW D1 | | | | | | | | | | | | | | | | | | | | | | |
| VW Touareg | | | | | | | | | | | | | | | | | | | | | | |
| Audi Q7 old | | | | | | | | | | | | | | | | | | | | | | |
| Audi Q7 MP | | | | | | | | | | | | | | | | | | | | | | |
| 150kW EU5 | | | | | | | | | | | | | | | | | | | | | | |
| 180kW EU6 MY12 | | | | | | | | | | | | | | | | | | | | | | |
| 165kW BIN5 MY12 | | | | | | | | | | | | | | | | | | | | | | |
| 180kW BIN5 MY12 | | | | | | | | | | | | | | | | | | | | | | |
| 180kW EU4 w/o DPF MY12 | | | | | | | | | | | | | | | | | | | | | | |
| 176kW EU4 w/o DPF | | | | | | | | | | | | | | | | | | | | | | |
| 176kW EU5 | | | | | | | | | | | | | | | | | | | | | | |
| Audi C7 | | | | | | | | | | | | | | | | | | | | | | |
| 150kW VL381fr | | | | | | | | | | | | | | | | | | | | | | |
| 150kW DL501q | | | | | | | | | | | | | | | | | | | | | | |
| 180kW DL501q | | | | | | | | | | | | | | | | | | | | | | |
| 180kW DL501q EU4 | | | | | | | | | | | | | | | | | | | | | | |
| Audi C7 | | | | | | | | | | | | | | | | | | | | | | |
| 150kW EU5 ML | | | | | | | | | | | | | | | | | | | | | | |
| 230kW Bit | | | | | | | | | | | | | | | | | | | | | | |
| Audi B8PA | | | | | | | | | | | | | | | | | | | | | | |
| 150kW EU5J VL | | | | | | | | | | | | | | | | | | | | | | |
| 180kW EU5J ML | | | | | | | | | | | | | | | | | | | | | | |
| 180kW EU5J DL | | | | | | | | | | | | | | | | | | | | | | |
| 180kW EU6 DL | | | | | | | | | | | | | | | | | | | | | | |
| Porsche E2 | | | | | | | | | | | | | | | | | | | | | | |
| 176kW CO2 EU5 | | | | | | | | | | | | | | | | | | | | | | |
| 176kW CO2 EU3 | | | | | | | | | | | | | | | | | | | | | | |
| 176kW CO2 EU4 | | | | | | | | | | | | | | | | | | | | | | |
| 155kW CO2 EU5 | | | | | | | | | | | | | | | | | | | | | | |
| 176kW Gen2 EU5 | | | | | | | | | | | | | | | | | | | | | | |
| 176kW Gen2 EU3 | | | | | | | | | | | | | | | | | | | | | | |
| 176kW Gen2 EU4 | | | | | | | | | | | | | | | | | | | | | | |
| 155kW Gen2 EU5 | | | | | | | | | | | | | | | | | | | | | | |
| Audi D4 | | | | | | | | | | | | | | | | | | | | | | |
| 150kW Allr | | | | | | | | | | | | | | | | | | | | | | |
| 184kW Alq | | | | | | | | | | | | | | | | | | | | | | |
| 155kW Alq BEL | | | | | | | | | | | | | | | | | | | | | | |
| 184kW Alq EU4 | | | | | | | | | | | | | | | | | | | | | | |
| VW TNF Gen2 | | | | | | | | | | | | | | | | | | | | | | |
| 150kW Gen2 EU5 | | | | | | | | | | | | | | | | | | | | | | |
| 150kW Gen2 EU4 | | | | | | | | | | | | | | | | | | | | | | |
| 150kW Gen2 EU3 | | | | | | | | | | | | | | | | | | | | | | |
| 180kW Gen2 EU5 | | | | | | | | | | | | | | | | | | | | | | |
| 180kW Gen2 EU4 | | | | | | | | | | | | | | | | | | | | | | |
| 180kW Gen2 EU3 | | | | | | | | | | | | | | | | | | | | | | |
| VW TNF Gen1 | | | | | | | | | | | | | | | | | | | | | | |
| 165kW CO2 Bin5 | | | | | | | | | | | | | | | | | | | | | | |

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 Flash ch. compl.
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 Flash ch. open
 Flash ch. open
 Flash ch. open

Planning dates:

- Software
- EGAS
- Premaster - Point of No Return
- Master
- Q release
- SOP

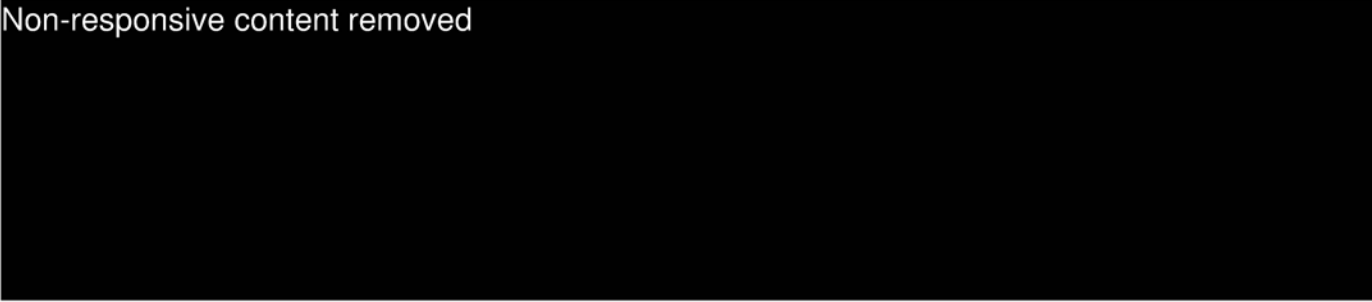
Actual dates:

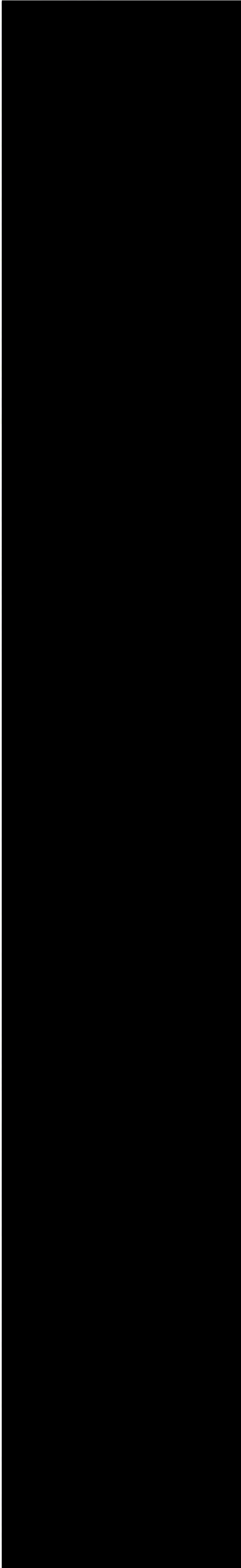
- Date with Product Safety [redacted] on 6-bar tank system
- Approval from VW EG and GQ expected for 6-bar tank system
- Approval from Porsche EG and GQ expected for 6-bar tank system

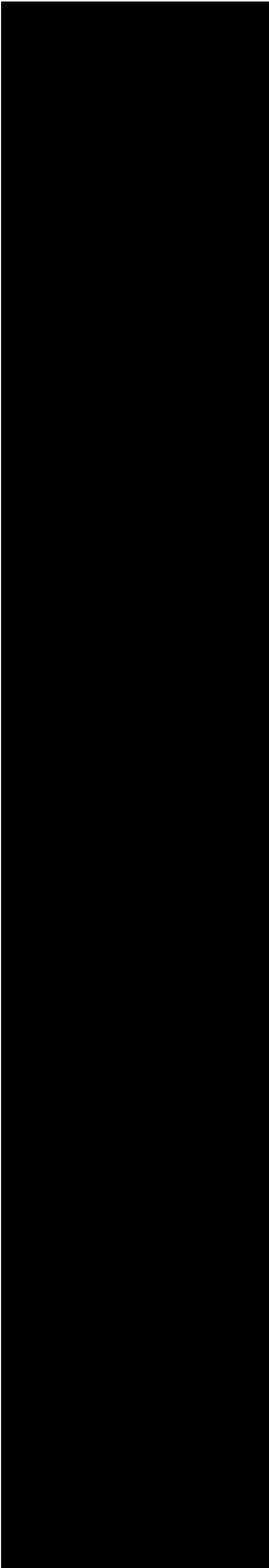
To Do: Get approval for Touareg, E2, and D1 for 2-bar tank system

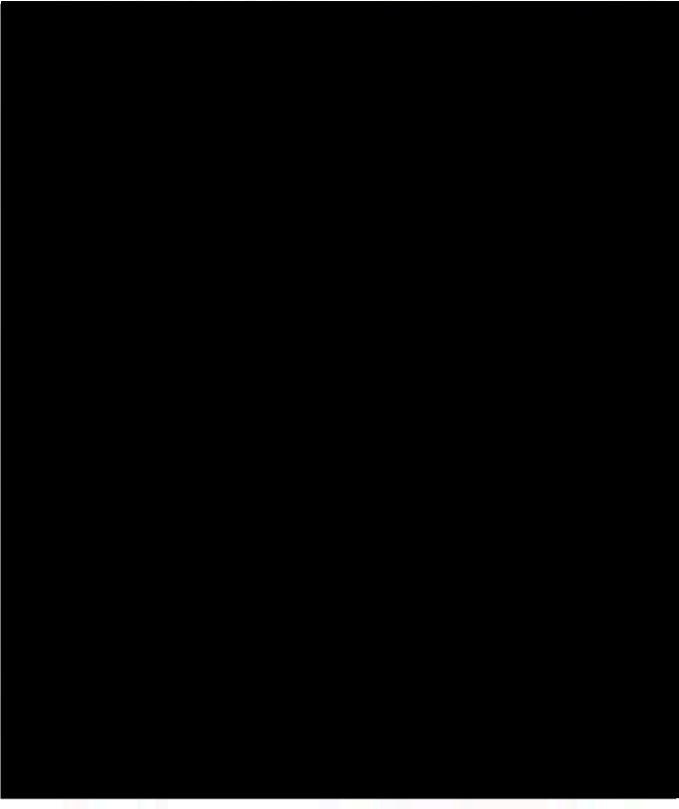
Quality responsibility for [redacted] Non-responsive content removed
 Quality responsibility VW [redacted]
 Porsche via [redacted]

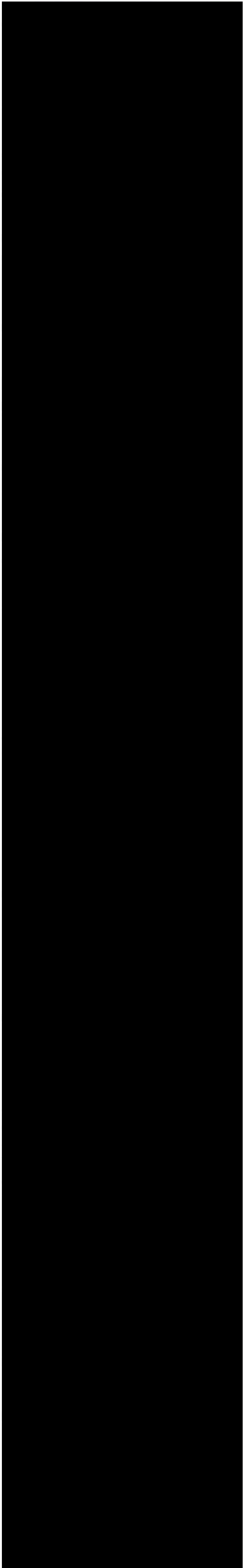
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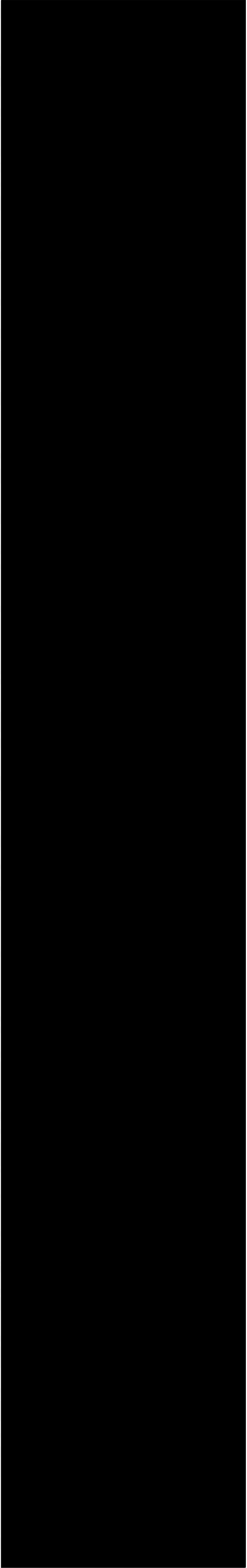


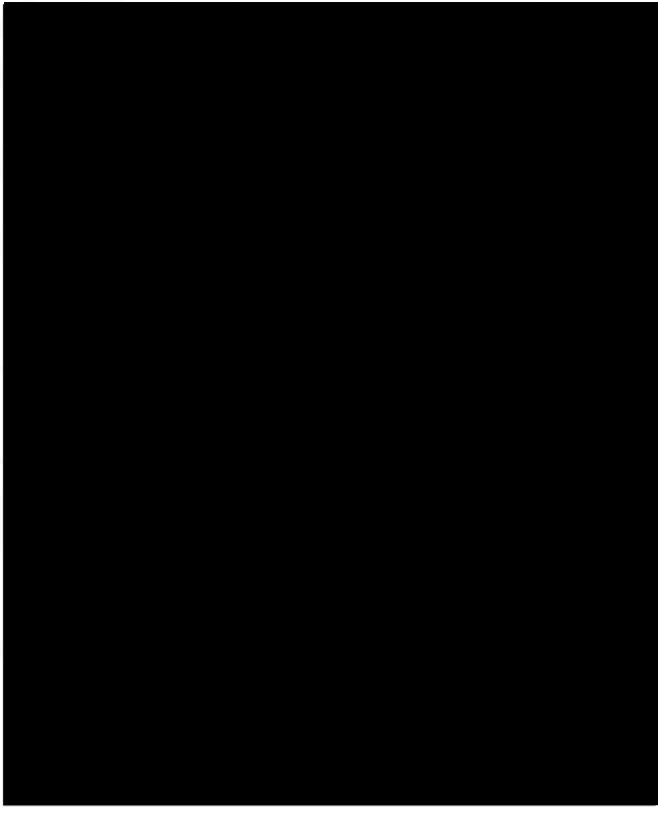








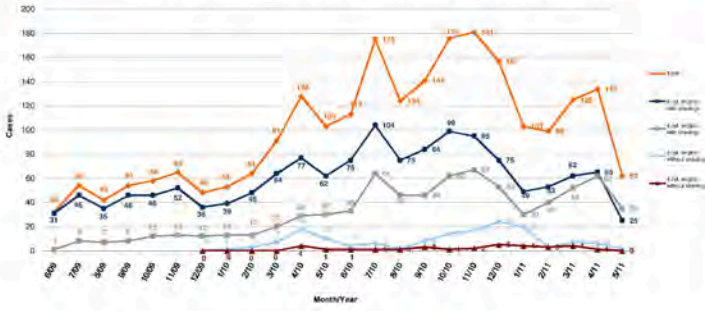




| | 6/09 | 7/09 | 8/09 | 9/09 | 10/09 | 11/09 | 12/09 | 1/10 | 2/10 | 3/10 | 4/10 | 5/10 | 6/10 | 7/10 | 8/10 | 9/10 | 10/10 | 11/10 | 12/10 |
|--------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| 4 cyl. engine with shavings | 31 | 48 | 35 | 40 | 48 | 52 | 36 | 39 | 48 | 64 | 77 | 82 | 75 | 104 | 75 | 84 | 99 | 85 | 75 |
| 4 cyl. engine with shavings | 1 | 8 | 7 | 8 | 12 | 13 | 12 | 13 | 13 | 20 | 29 | 30 | 33 | 64 | 48 | 48 | 62 | 67 | 53 |
| 4 cyl. engine without shavings | | | | | | | | | | | | | | | | | | | |
| 4 cyl. engine without shavings | | | | | | | | | | | | | | | | | | | |
| Total | 32 | 56 | 42 | 58 | 60 | 65 | 48 | 52 | 61 | 84 | 101 | 112 | 118 | 174 | 123 | 132 | 161 | 152 | 128 |

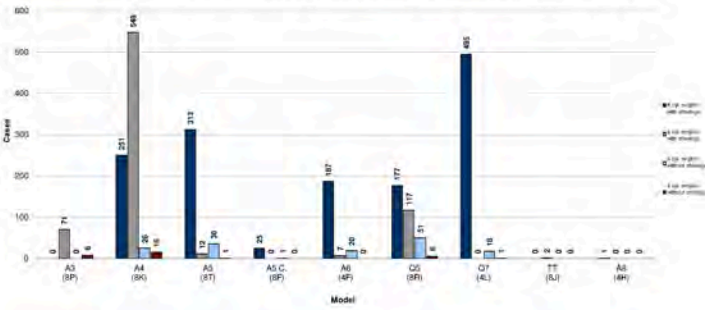
| | 1/11 | 2/11 | 3/11 | 4/11 | 5/11 | 6/11 | 7/11 | 8/11 | 9/11 | 10/11 | 11/11 | 12/11 | 1/12 | 2/12 | 3/12 | 4/12 | 5/12 | 6/12 | 7/12 | 8/12 | 9/12 | 10/12 | 11/12 | 12/12 | Total | |
|--------------------------------|------------|-----------|------------|------------|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-------------|
| 4 cyl. engine with shavings | 43 | 53 | 52 | 65 | 71 | 81 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 1442 |
| 4 cyl. engine with shavings | 30 | 40 | 52 | 62 | 35 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 757 |
| 4 cyl. engine without shavings | 20 | 3 | 7 | 8 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 152 |
| 4 cyl. engine without shavings | 4 | 3 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 32 |
| Total | 101 | 99 | 116 | 134 | 110 | 81 | 91 | 91 | 91 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 2390 |

Failure of diesel CR high-pressure fuel pump - cases of damage by month (status: 05/11 WK 19)



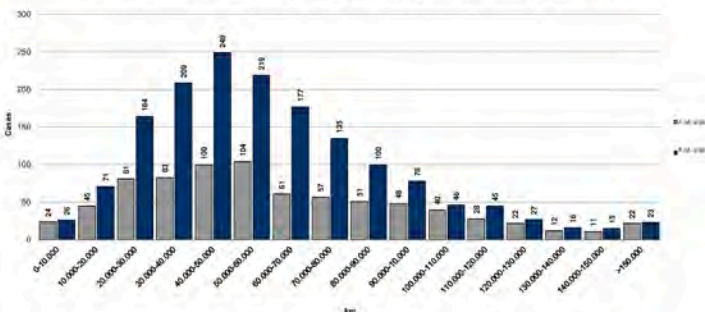
| | A3 (SP) | A4 (SP) | A5 (ST) | A5 C (SP) | A6 (4F) | A6 (4L) | A7 (4L) | A8 (4H) | Total |
|--------------------------------|-----------|------------|------------|-----------|------------|------------|------------|----------|-------------|
| 4 cyl. engine with shavings | 0 | 251 | 313 | 25 | 187 | 177 | 495 | 0 | 1 |
| 4 cyl. engine with shavings | 71 | 548 | 12 | 0 | 2 | 117 | 0 | 2 | 157 |
| 4 cyl. engine without shavings | 0 | 28 | 28 | 1 | 20 | 61 | 18 | 0 | 152 |
| 4 cyl. engine without shavings | 8 | 16 | 1 | 0 | 0 | 6 | 1 | 0 | 32 |
| Total | 79 | 841 | 382 | 26 | 214 | 351 | 614 | 2 | 2390 |

Failure of diesel CR high-pressure fuel pump - cases of damage by model/engine type (status: 05/11 WK 19)



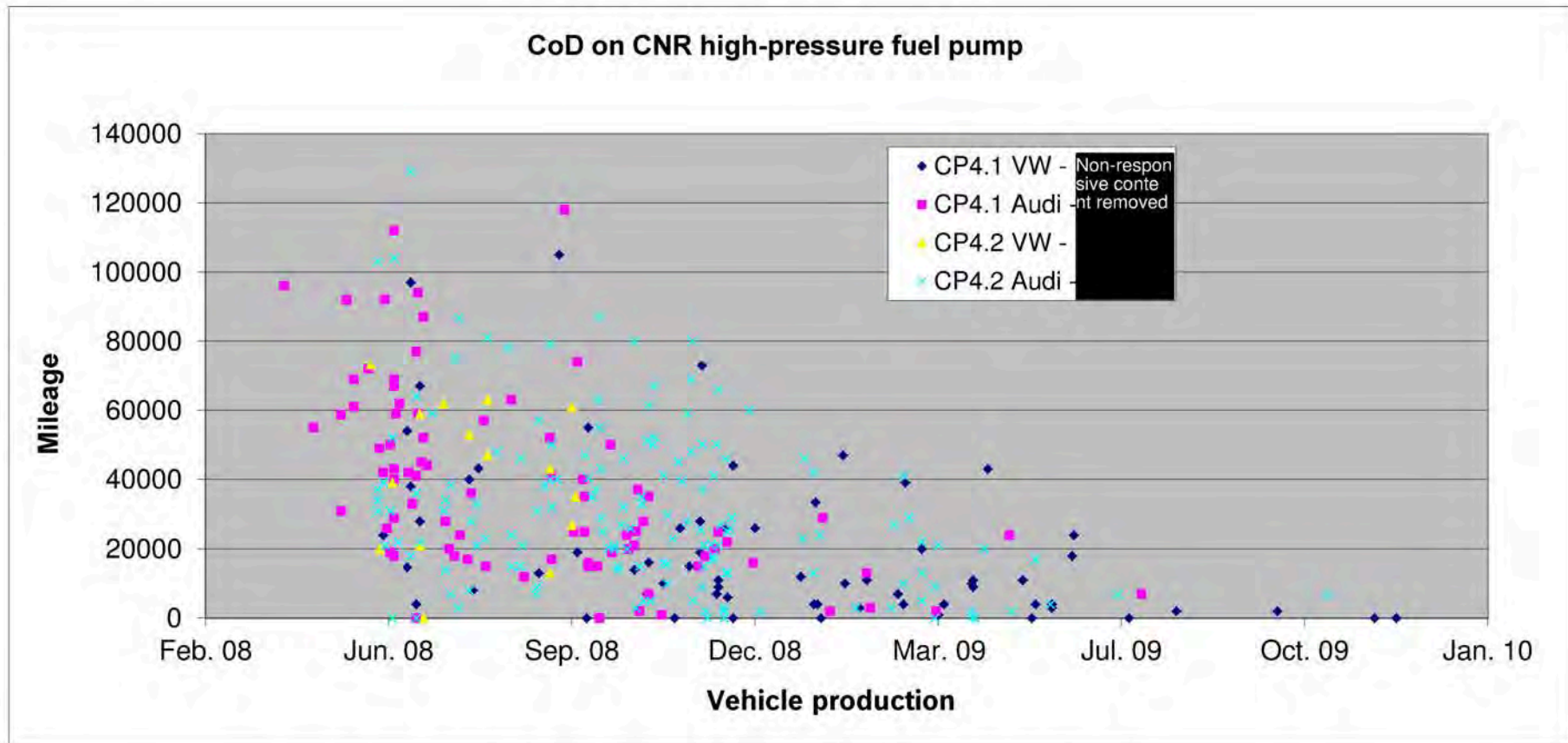
| | 16000 | 20000 | 25000 | 30000 | 35000 | 40000 | 45000 | 50000 | 55000 | 60000 | 65000 | 70000 | 75000 | 80000 | 85000 | 90000 | 95000 | 100000 | 105000 | 110000 | 115000 | 120000 | 125000 | 130000 | 140000 | 150000 | 160000 | Total | |
|-----------------------|-----------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-------------|-----|
| 4 cyl. engine cases | 24 | 45 | 51 | 63 | 100 | 124 | 124 | 81 | 57 | 51 | 48 | 40 | 38 | 22 | 13 | 22 | 11 | 22 | 11 | 22 | 11 | 22 | 11 | 22 | 11 | 22 | 11 | 22 | 757 |
| 4 cyl. engine cases % | 3% | 6% | 10% | 11% | 13% | 13% | 8% | 7% | 6% | 6% | 5% | 4% | 3% | 2% | 1% | 2% | 1% | 2% | 1% | 2% | 1% | 2% | 1% | 2% | 1% | 2% | 1% | 100% | |
| 4 cyl. engine cases | 26 | 71 | 164 | 209 | 249 | 219 | 177 | 130 | 100 | 78 | 48 | 45 | 27 | 16 | 16 | 23 | 10 | 23 | 10 | 23 | 10 | 23 | 10 | 23 | 10 | 23 | 10 | 1800 | |
| 4 cyl. engine cases % | 2% | 4% | 10% | 13% | 16% | 14% | 11% | 8% | 6% | 5% | 3% | 3% | 2% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 100% | |
| Total | 50 | 116 | 248 | 292 | 349 | 322 | 208 | 152 | 151 | 126 | 96 | 73 | 43 | 29 | 29 | 45 | 21 | 45 | 21 | 45 | 21 | 45 | 21 | 45 | 21 | 45 | 21 | 2390 | |

Failure of diesel CR high-pressure fuel pump - cases of damage by engine type/mileage (status: 05/11 WK 19)



Status of field campaign 23G7 according to evaluation by Warranty Department - WK19/11





| | Produced | Sold | Random sample | Reported damage cases | per 1,000 vehicles |
|---|----------|--------|---------------|-----------------------|--------------------|
| CP4.1 VW - Non-responsive content removed | 86,081 | 72,115 | 44,659 | 66 | 0.77 |
| CP4.1 Audi - Non-responsive content removed | 58,461 | 51,898 | 35,787 | 83 | 1.42 |
| CP4.2 VW - Non-responsive content removed | 1,562 | 1,310 | 667 | 16 | 10.24 |
| CP4.2 Audi - Non-responsive content removed | 15,386 | 13,727 | 8,998 | 153 | 9.94 |

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From: Non-responsive content removed
To: [REDACTED]

CC:

Date: 6/15/2010, 6:37:53 PM

Subject: Re: Deployment of CP4.2 with anti-wear package 2 - Summary minutes of meeting 06/10/10

Attachments: [Länder_CP-Typen_MIS_15.06.10.xls](#)

Hi all,

In my opinion, the deployment prioritization results from folders 2 and 3 of the attached file:
Prio 1 = W36 --> Q7 --> Q5 --> A4 --> A5 --> A6

Best regards

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From: Non-responsive content removed
Sent: Friday, June 11, 2010, 4:50 PM
To: Non-responsive content removed

Subject: Re: Deployment of CP4.2 with anti-wear package 2 - Summary minutes of meeting 06/10/10

Hello Non-responsive content removed

We need a failure ranking for the deployment scenario, based on the vehicle models. Can you please create a list as basis for the prioritization (after WK36)?

Thank you!

With best wishes

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From: Non-responsive content removed
Sent: Friday, June 11, 2010, 11:31 AM
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Betreff: Deployment of CP4.2 with anti-wear package 2 - Summary minutes of meeting 06/10/10

see below

With best wishes

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Summary minutes from meeting on 06/10/10:

* Contents of RP2:

- Swap inlet and return
- Robust flange
- C coated pump pistons
- OV with acoustic measures

* Check effectiveness of acoustic measures by E WK20/10: OV effectiveness confirmed

* Decision on use of C coating open

* Confirm application neutrality (OV by E WK20, RP2 after  test WK24) Initial trend statement: Measures are application-neutral

* From WK20: Availability of test parts, retooling of GQ-VR, TE-ER and fleet vehicles

* Procurement will get quotations for the line changes for V6 TDI Gen.1 and Gen.2 by WK23.

* Quotation from Bosch expected by WK21: Quotation from Bosch committed for 06/11

* Total scope will be presented at TOP Change Conference in June.

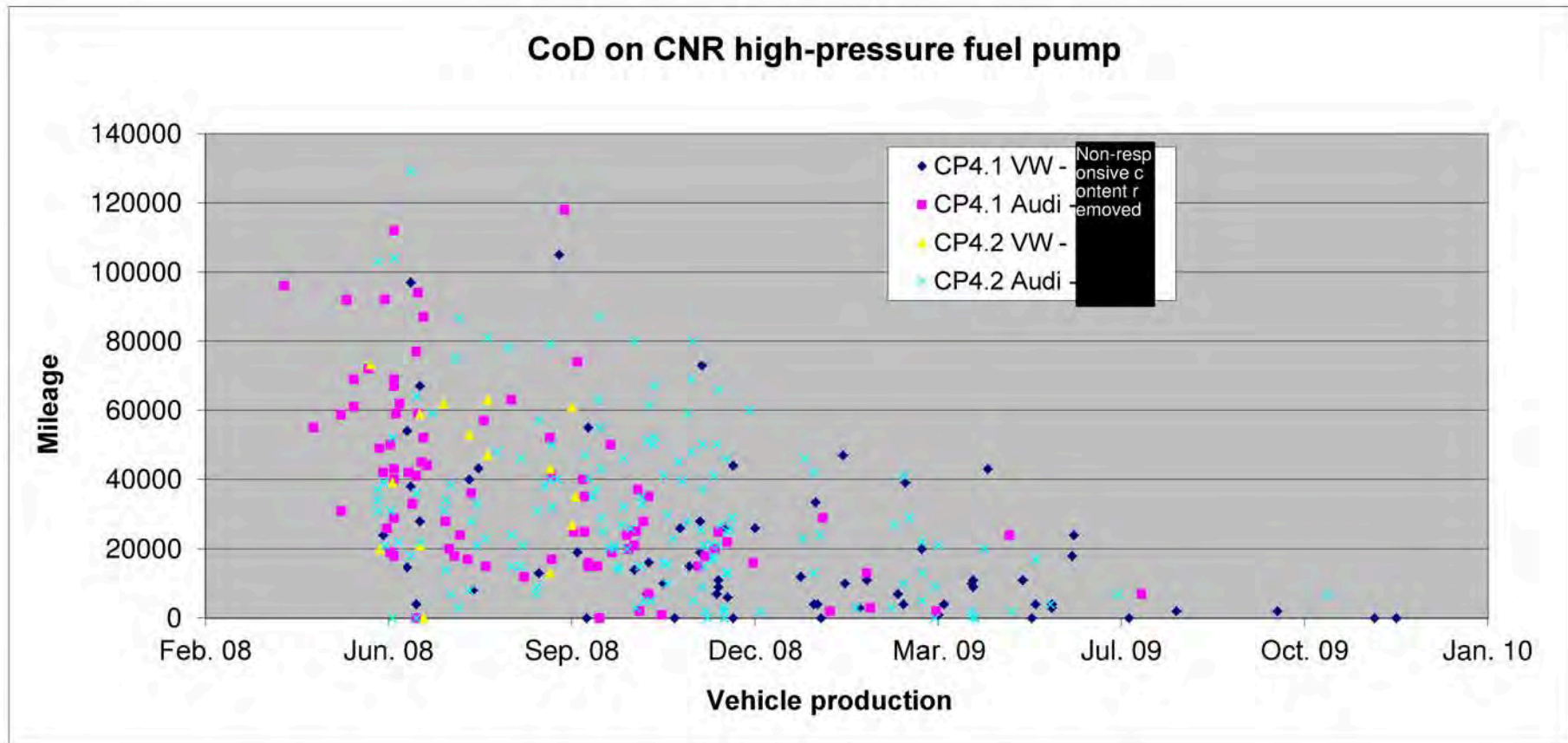
* Lines for V6 TDI Gen.2 will be introduced at Change Conference WK23.

* TOP Change conference presentation moved to July.

* The conversion scenario for the V6 TDI Gen.1 will be defined according to the following criteria:

- Failure rates by vehicle model
- Availability of series parts
- Quantities

A proposal is being developed by  Non-responsive content removed



| | Produced | Sold | Random sample | Reported damage cases | per 1,000 vehicles |
|---|----------|--------|---------------|-----------------------|--------------------|
| CP4.1 VW - Non-responsive content removed | 86,081 | 72,115 | 44,659 | 66 | 0.77 |
| CP4.1 Audi - Non-responsive content removed | 58,461 | 51,898 | 35,787 | 83 | 1.42 |
| CP4.2 VW - Non-responsive content removed | 1,562 | 1,310 | 667 | 16 | 10.24 |
| CP4.2 Audi - Non-responsive content removed | 15,386 | 13,727 | 8,998 | 153 | 9.94 |

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CP4 VIN: [redacted] / Engine no. VNR
Damage Code: [redacted]
VIN: [redacted]
Mileage: 2000
Chassis High Pressure Fuel Pump (CP4)
Chassis Diesel
Without FR numbers

Table with columns: PRODUCED, SALES DATE, ENGINE CL, ENGINE PLANT, GEARBOX NUMBER, GEARBOX PLANT, REPAIR DATE, KM, MES IMPORTER PARTNER, C/C/D'S, C/D, REPEAT ID, RETURN ID, BREAKDOWN, PART ID, KUST ID, CNR, SPMR, DESCRIPTION, SA, LEADING, MANUFACTURER, REPAIR, READ-IN RUN DATE, COMPL-D, SP NOOP NO, DAMAGE CAUSE, COMMENTS.

Process execution
File name Table
Change date
User
Frequency
Output format
Expiration date
Overview
E-mail
Phone
Header/footer
Input/output
Number of tanks
Sort sequence
Data source
General vehicle data
Brand
Model year
Non-identifiable vehicles
Customer-owned vehicles
Employee vehicles
Engine and gearbox
Fuel
E-Motor
Number and market in general

100- EA180 / 100- EA180
2000 / 2010 / 2011
D - Diesel
E - Motor
S - Warranty data
V - VIN

Table with columns: PRODUCED, SALES DATE, ENGINE CL, ENGINE PLANT, GEARBOX NUMBER, GEARBOX PLANT, REPAIR DATE, KM, MES IMPORTER PARTNER, C/C/D'S, C/D, REPEAT ID, RETURN ID, BREAKDOWN, PART ID, KUST ID, CNR, SPMR, DESCRIPTION, SA, LEADING, MANUFACTURER, REPAIR, READ-IN RUN DATE, COMPL-D, SP NOOP NO, DAMAGE CAUSE, COMMENTS.

Table with columns: PRODUCED, SALES DATE, ENGINE CL, ENGINE PLANT, GEARBOX NUMBER, GEARBOX PLANT, REPAIR DATE, KM, MES IMPORTER PARTNER, C/C/D'S, C/D, REPEAT ID, RETURN ID, BREAKDOWN, PART ID, KUST ID, CNR, SPMR, DESCRIPTION, SA, LEADING, MANUFACTURER, REPAIR, READ-IN RUN DATE, COMPL-D, SP NOOP NO, DAMAGE CAUSE, COMMENTS.

Table with columns: PRODUCED, SALES DATE, ENGINE CL, ENGINE PLANT, GEARBOX NUMBER, GEARBOX PLANT, REPAIR DATE, KM, MES IMPORTER PARTNER, C/C/D'S, C/D, REPEAT ID, RETURN ID, BREAKDOWN, PART ID, KUST ID, CNR, SPMR, DESCRIPTION, SA, LEADING, MANUFACTURER, REPAIR, READ-IN RUN DATE, COMPL-D, SP NOOP NO, DAMAGE CAUSE, COMMENTS.

Table with columns: PRODUCED, SALES DATE, ENGINE CL, ENGINE PLANT, GEARBOX NUMBER, GEARBOX PLANT, REPAIR DATE, KM, MES IMPORTER PARTNER, C/C/D'S, C/D, REPEAT ID, RETURN ID, BREAKDOWN, PART ID, KUST ID, CNR, SPMR, DESCRIPTION, SA, LEADING, MANUFACTURER, REPAIR, READ-IN RUN DATE, COMPL-D, SP NOOP NO, DAMAGE CAUSE, COMMENTS.

Table with columns: PRODUCED, SALES DATE, ENGINE CL, ENGINE PLANT, GEARBOX NUMBER, GEARBOX PLANT, REPAIR DATE, KM, MES IMPORTER PARTNER, C/C/D'S, C/D, REPEAT ID, RETURN ID, BREAKDOWN, PART ID, KUST ID, CNR, SPMR, DESCRIPTION, SA, LEADING, MANUFACTURER, REPAIR, READ-IN RUN DATE, COMPL-D, SP NOOP NO, DAMAGE CAUSE, COMMENTS.

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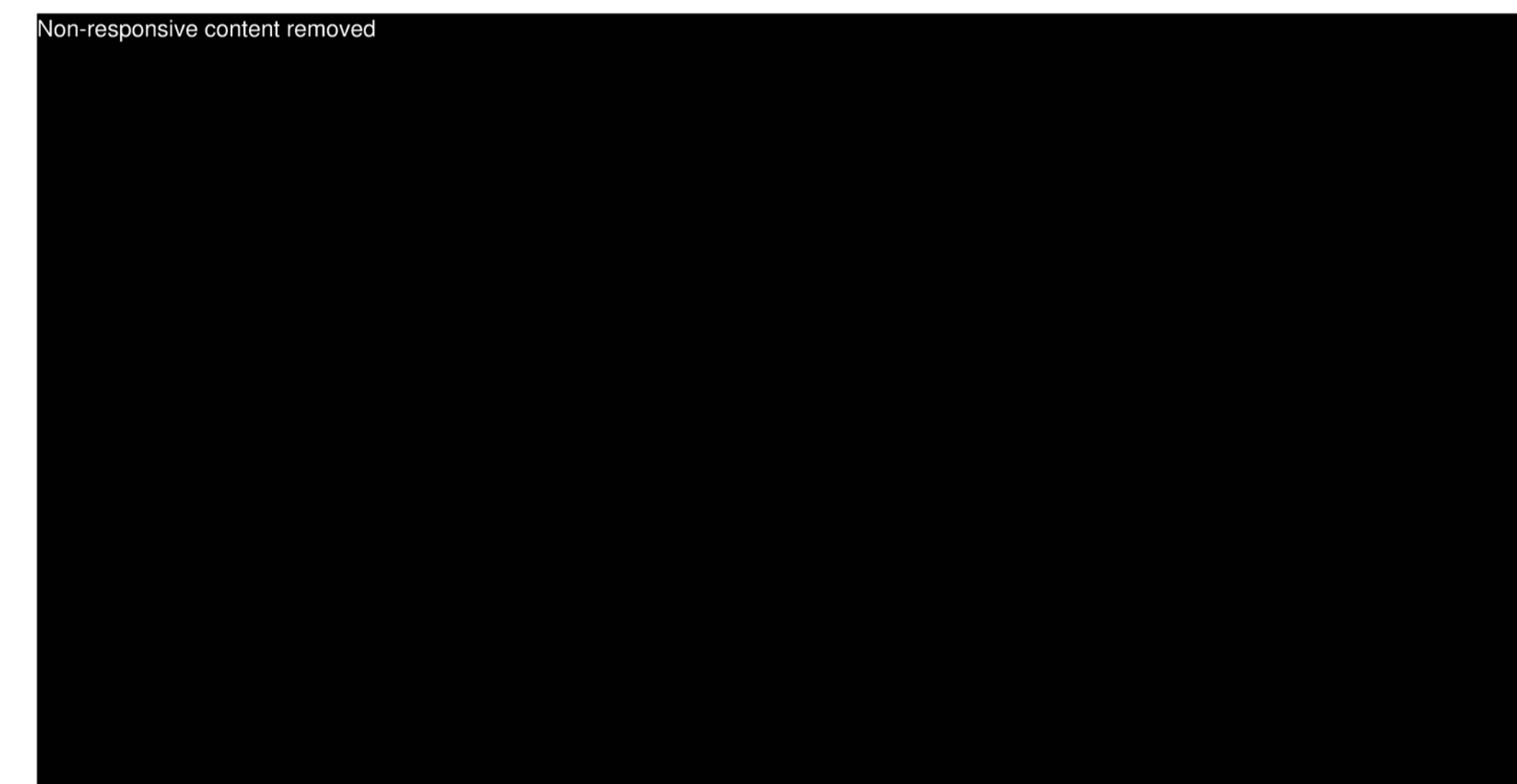
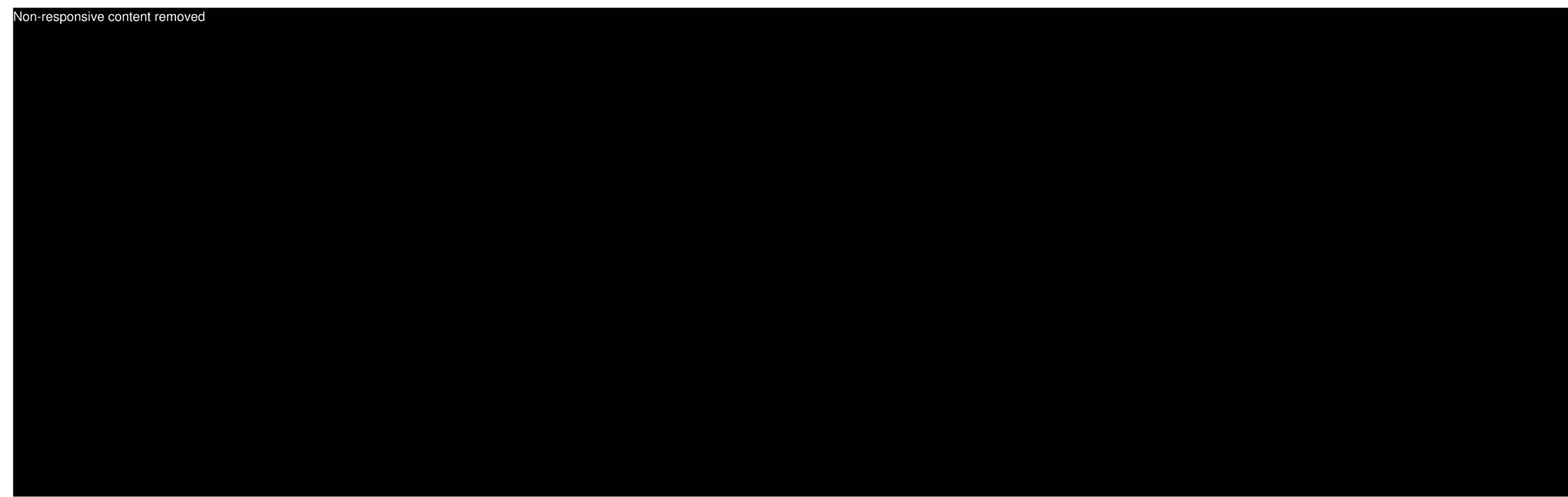
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Deployment of anti-wear package 1

| Eng. type | Pump no. (old) | Pump no. (new) | Engine type | Engine no. | Engine build date | Veh. type | Veh. date | VIN | Veh. date NSU | VIN NSU |
|-----------|------------------------|----------------|-------------|------------|-------------------|-----------------|------------|-------------|---------------|---|
| | | | 6635 | CAS 107713 | 26.03.2010 | Tou NF / Cay NF | 04/02/2010 | WVGZZZ7PZBD | | |
| | | | 6657 | CAS 107509 | 07/27/2010 | Q7 EU5 | 04/7/2010 | WAUAMD4L1AD | | |
| | | | 6576 | CCW 082801 | 03/26/2010 | B8 | 04/08/2010 | WAUZZZ8T8AA | 3/12/2010 | 8FAN --> CCW 083058 CP8 03/12/10 |
| | | | 6655 | CCW 085283 | 03/26/2010 | B8 | 04/7/2010 | WAUZZZ8T6AA | 3/12/2010 | 8KAN --> CCW 082987 CP8 03/12/10 |
| | | | 6650 | CGK 033491 | 03/26/2010 | B8 | | WAUZZZ8T0AA | 4/7/2010 | 8FAN --> CCW 085489 CP8 4/7/2010 |
| | | | 6653 | CGK 033396 | 03/26/2010 | B8 | | WAUZZZ8TXAA | 4/8/2010 | 8KAN --> CCW 085491 CP8 4/8/2010 |
| | | | 6655 | CCW 085520 | 03/27/2010 | B8 | 04/08/2010 | WAUZZZ8K1AA | 4/9/2010 | 8FAN --> CGK 033503 CP8 04/09/10 |
| | | | 6655 | CCW 085685 | 03/30/2010 | Q5 | 04/08/2010 | WAUZZZ8R5AA | 4/9/2010 | 8KAN --> CGK 033504 CP8 04/09/10 |
| | | | 6418 | CDY 031917 | 03/29/2010 | C6 | 04/12/2010 | WAUZZZ4F2AN | 4/8/2010 | 8KAN --> CGK 033417 CP8 04/08/10 |
| | | | 6419 | CDY 033545 | 03/27/2010 | C6 | 04/07/2010 | WAUZZZ4F1AN | 4/12/2010 | 8FAN --> CGK 033419 CP8 04/12/10 |
| | | | 6336 | CAN 028351 | 03/26/2010 | C6 | 04/09/2010 | WAUZZZ4F5AN | 4/10/2010 | 8FAN --> CCW 085540 CP8 04/10/10 |
| | | | 6337 | CAN 028480 | 03/26/2010 | C6 | 04/08/2010 | WAUZZZ4F3AN | ??? | 8K up to engine number CCW 085720, no NSU vehicle built |
| | | | 6339 | CAN 028823 | 03/27/2010 | C6 | 04/13/2010 | WAUZZZ4F4AN | | |
| | | | 6603 | CAT 009897 | 04/13/2010 | Q7 BIN5 | 04/19/2010 | WA1VMBFE2AD | | |
| | | | 6591 | CCM 004030 | 04/13/2010 | Q7 EU6 | 04/20/2010 | 4LAD | | |
| | | | 6593 | CCL 001085 | 04/12/2010 | B8 EU6 | 04/22/2010 | WAUZZZ8K0AA | | |
| | | | 8459 | CDS 000922 | 04/12/2010 | D4 | 07/14/2010 | WAUZZZ4H6BN | | |
| | | | 8457 | | | | | | | Engine model discontinued without use of new pump! |
| | | | 8467 | CCF 003437 | 06/03/2010 | Q7 | 07/08/2010 | WAUZZZ4L9BD | | |
| V12 TDI | 6.0l TDI 05A 130 755 B | 05A 130 755 C | | CCG002219 | 04/22/2010 | Q7 | 05/27/2010 | WUAZZZ4L3AD | | |

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From: Non-responsive content removed
To:
CC:

Date: 10/8/2010, 1:14:30 PM
Subject: ANS: IQIS:230003014652_QTS 3731540_Info.

Hello [REDACTED]

We will invite you to the next appointment and get you up to date on the latest information; this e-mail ping pong just doesn't make sense.

We don't have any problem with the current status after clean date in the customer service case - where did you get that from? Everything beyond that will be given to you as quickly as possible, but according to priority, beginning with the AWP countries [REDACTED] as a DIN 590 country, is not among them. Otherwise, please clarify with Q [REDACTED] whether you really assume the same necessity. Until then, we will continue with the additional measures in CP4.1 development.

Regards

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From: Non-responsive content removed

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Sent: Fri Oct 08 13:32:35 2010

Subject: ANS: IQIS:230003014652_QTS 3731540_Info.

Hello [REDACTED]

Sorry, but I'm not aware of any CP4.1 task force.

And I'm not familiar with any coordination with Audi colleagues (QA) either.

The fact is that I don't get information from you until asking several times (if at all); I just had to get that off my chest.

On the CP4.1 in [REDACTED]

Our importer expects a fast CS solution, so customers get a "reliable" pump that will not fail a second time.

Can we offer him an AWP pump that will fit the "old series" in the field?

If I am reading your lists correctly, then the 03L 130 755 A is not slated for RP1; does the lift fit at all?

Or:

Could we produce a larger lot of gen. 1 pumps in advance for [REDACTED] CS?

Best regards

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Subject:ANS: IQIS:230003014652_QTS 3731540_Info.

Hello [REDACTED]

Let's please stop the unproductive mail correspondence on the CP4 failures with the large distribution list immediately, and check and coordinate our statements better in future. The task force for the CP4.1 failures, which consults the Audi colleagues regularly, has currently reached a status that can only conditionally confirm your statements after a detailed examination. We and AUDI are in the same place in the failure analysis and therefore support the same corrective measures that you are already familiar with as "anti-wear packages". The only difference is the implementation of the RP packages in the field, where across-the-board introduction is planned by 03/2011 for the CP4.1, due to the project variety and volume requirements in association with limited capacity on the Bosch side. We are regularly tracking this at Bosch, so it should not be conveyed to Bosch from a variety of instances.

The evaluation of the cases of damage in the [REDACTED] market carried out in AQUA confirms the effectiveness of the measures introduced so far. The failure figures have declined rapidly in manufacturing year 2010.

While it is correct that we have recorded a large number of failures in 2010, most of them are due to pumps with DM before the clean date. To respond to this and if you want to prevent further failures with the old design status, you will have to request a field cleanup.

We hope to further improve the field situation through the anti-wear packages that have already been approved and scheduled, and are also working on further anti-wear measures together with Bosch, which are currently in the development and validation phase.

P.S. BOSCH has been intentionally left out of the e-mail distribution list.

Best wishes,

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From: Non-responsive content removed

Sent: Thursday, October 07, 2010, 10:14 AM

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Subject: Re: IQIS:230003014652_QTS 3731540_Info.

... and even [REDACTED] has encountered (relatively late / 28,000 km) drivetrain damage cases with the CP4.1 (transverse installation MY10), without any indication of poor fuel quality.

Best regards

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From: Non-responsive content removed

Sent: Wednesday, October 06, 2010, 5:11 PM

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Subject: IQIS:230003014652_QTS 3731540_Info.

Hello,

Please find attached information on the analysis of the CP4 pump

Fault scope

RB Part no. 0445.010.507

AUDI part no. 03L130755

SN: BPT 0260

DM: 10/16/2009

ML: 05

IQIS: 230003014652

Ref. no: IGG000006033-001

Customer ref. no. QTS 3731540

Engine no. CBAB 05204

Vehicle No.: WAUZZZ8P5AA [REDACTED]

Mileage: 27,818 km

Failure country: [REDACTED]

Description of problem

No specification from AUDI

RB analysis:

Roller support worn

No deposits or corrosion traces

Fuel analysis OK

RB finding


Drivetrain damage

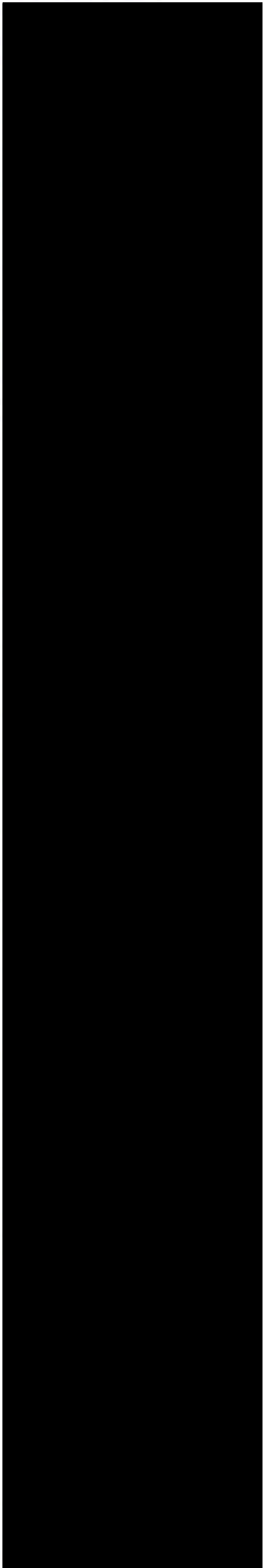
Complaint was acknowledged as Bosch defect

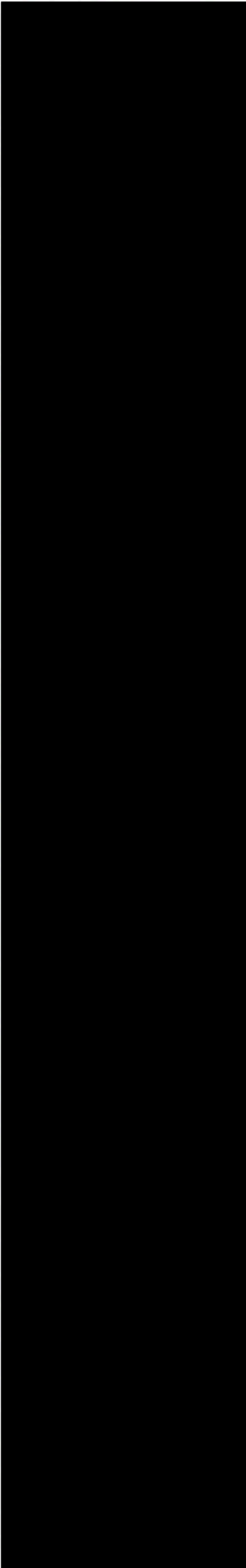
Regards

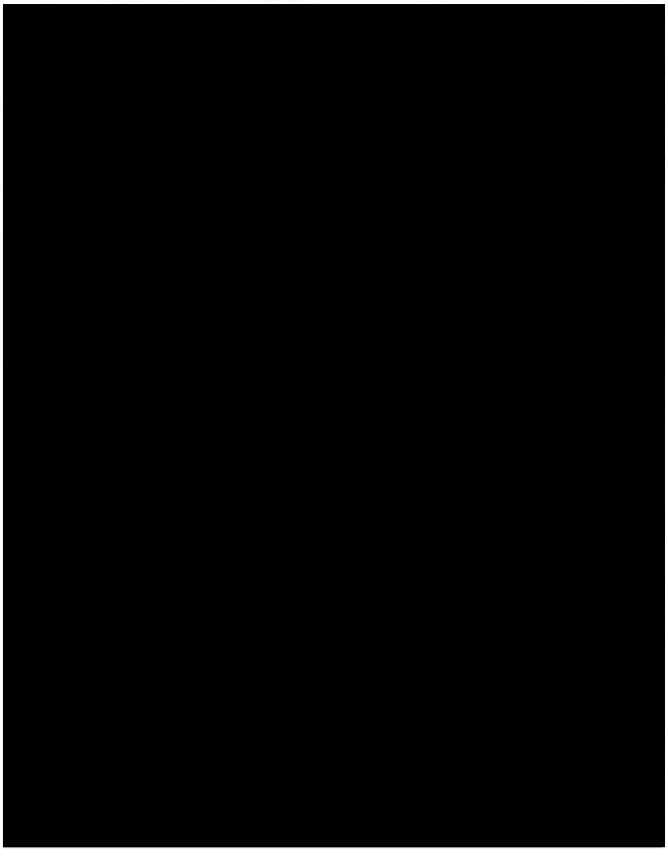
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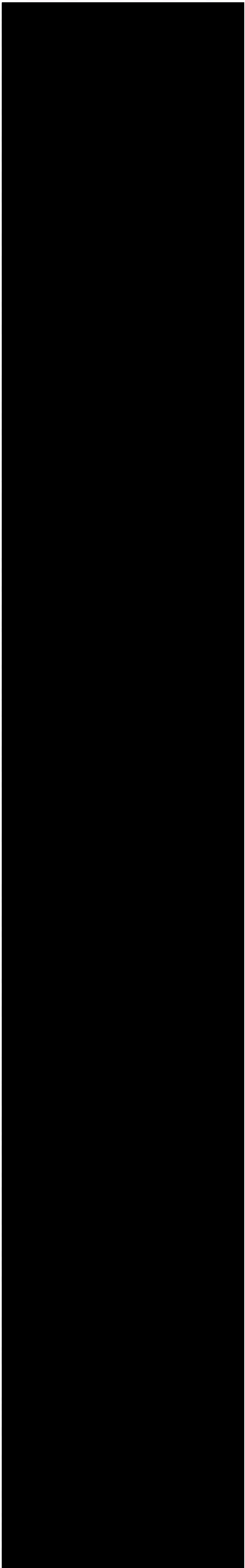
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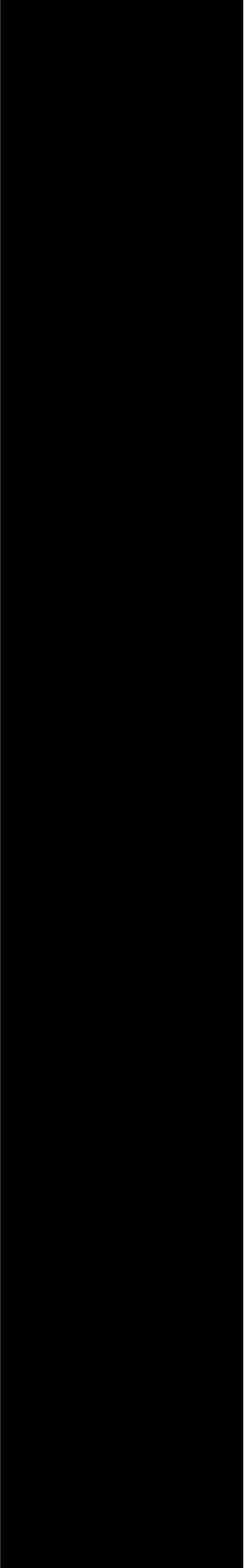


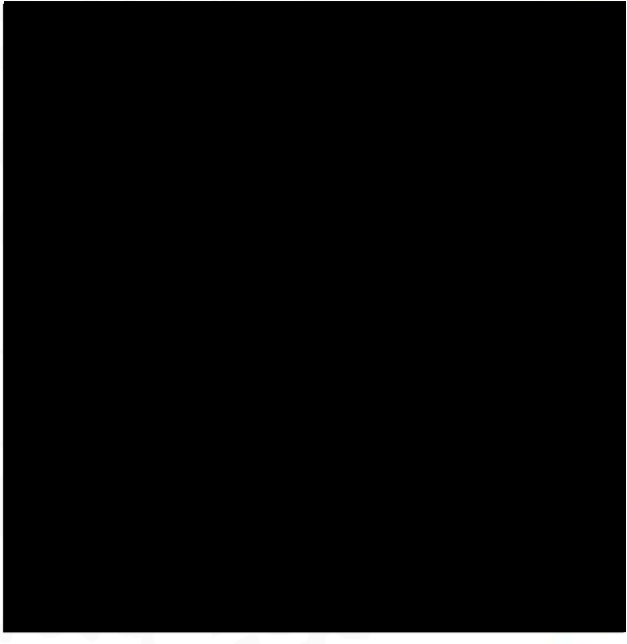








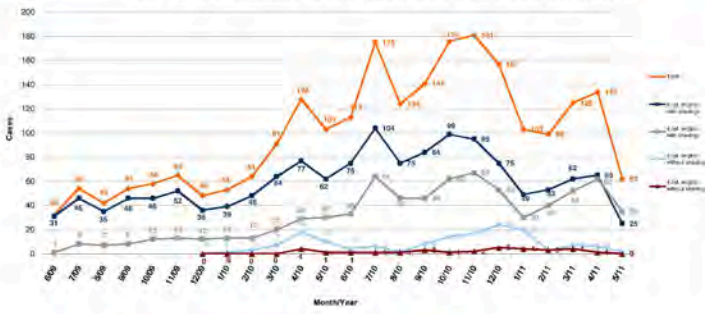




| | 6/09 | 7/09 | 8/09 | 9/09 | 10/09 | 11/09 | 12/09 | 1/10 | 2/10 | 3/10 | 4/10 | 5/10 | 6/10 | 7/10 | 8/10 | 9/10 | 10/10 | 11/10 | 12/10 |
|------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|------------|------------|------------|------------|------------|------------|------------|
| 4 cyl. engine with sludge | 31 | 48 | 35 | 40 | 48 | 52 | 36 | 39 | 48 | 64 | 77 | 82 | 75 | 104 | 75 | 84 | 99 | 85 | 75 |
| 4 cyl. engine with sludge | 1 | 8 | 7 | 8 | 12 | 13 | 12 | 13 | 13 | 20 | 29 | 30 | 33 | 64 | 48 | 48 | 62 | 67 | 53 |
| 4 cyl. engine without sludge | | | | | | | | | | | | | | | | | | | |
| 4 cyl. engine without sludge | | | | | | | | | | | | | | | | | | | |
| Total | 32 | 56 | 42 | 48 | 60 | 65 | 48 | 52 | 61 | 84 | 91 | 108 | 103 | 133 | 123 | 124 | 141 | 178 | 181 |

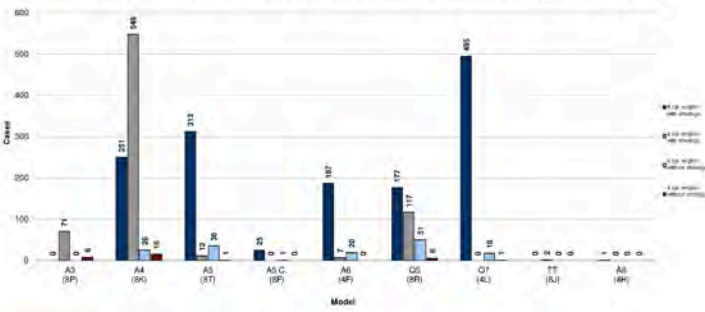
| | 1/11 | 2/11 | 3/11 | 4/11 | 5/11 | 6/11 | 7/11 | 8/11 | 9/11 | 10/11 | 11/11 | 12/11 | 1/12 | 2/12 | 3/12 | 4/12 | 5/12 | 6/12 | 7/12 | 8/12 | 9/12 | 10/12 | 11/12 | 12/12 | Total | |
|------------------------------|------------|-----------|------------|------------|-----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-------------|
| 4 cyl. engine with sludge | 43 | 53 | 52 | 65 | 71 | 81 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 1442 |
| 4 cyl. engine with sludge | 30 | 40 | 52 | 62 | 35 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 757 |
| 4 cyl. engine without sludge | 20 | 3 | 7 | 8 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 152 |
| 4 cyl. engine without sludge | 4 | 3 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 32 |
| Total | 101 | 99 | 125 | 134 | 92 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2393 |

Failure of diesel CR high-pressure fuel pump - cases of damage by month (status: 05/11 WK 19)



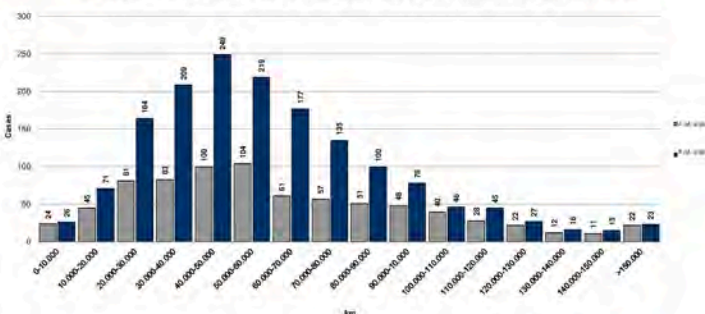
| | A3 (SP) | A4 (SP) | A5 (ST) | A5 C (SF) | A6 (AF) | C6 (RF) | C7 (SL) | T7 (SL) | A8 (4H) | Total |
|------------------------------|-----------|------------|------------|-----------|------------|------------|------------|----------|----------|-------------|
| 4 cyl. engine with sludge | 0 | 251 | 313 | 25 | 187 | 177 | 495 | 0 | 1 | 1449 |
| 4 cyl. engine with sludge | 71 | 548 | 12 | 0 | 2 | 117 | 0 | 2 | 0 | 1267 |
| 4 cyl. engine without sludge | 0 | 28 | 28 | 1 | 20 | 61 | 18 | 0 | 0 | 127 |
| 4 cyl. engine without sludge | 8 | 16 | 1 | 0 | 0 | 6 | 1 | 0 | 0 | 32 |
| Total | 79 | 841 | 382 | 26 | 214 | 351 | 514 | 2 | 1 | 2393 |

Failure of diesel CR high-pressure fuel pump - cases of damage by model/engine type (status: 05/11 WK 19)



| | 16000 | 20000 | 25000 | 30000 | 35000 | 40000 | 45000 | 50000 | 55000 | 60000 | 65000 | 70000 | 75000 | 80000 | 85000 | 90000 | 95000 | 100000 | 105000 | 110000 | 115000 | 120000 | 125000 | 130000 | 140000 | 150000 | 160000 | Total | |
|-----------------------|-----------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-------------|-----|
| 4 cyl. engine cases | 24 | 45 | 51 | 63 | 100 | 124 | 124 | 81 | 57 | 51 | 48 | 40 | 38 | 22 | 13 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 788 |
| 4 cyl. engine cases % | 3% | 6% | 10% | 11% | 13% | 13% | 8% | 7% | 6% | 6% | 5% | 4% | 3% | 2% | 1% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 100% | |
| 4 cyl. engine cases | 26 | 71 | 164 | 209 | 249 | 219 | 177 | 130 | 100 | 78 | 48 | 45 | 27 | 16 | 16 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 1800 | |
| 4 cyl. engine cases % | 2% | 4% | 10% | 13% | 16% | 14% | 11% | 8% | 6% | 5% | 3% | 3% | 2% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 100% | |
| Total | 50 | 116 | 218 | 292 | 349 | 322 | 258 | 192 | 151 | 126 | 96 | 73 | 49 | 29 | 29 | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 2393 | |

Failure of diesel CR high-pressure fuel pump - cases of damage by engine type/mileage (status: 05/11 WK 19)



Status of field campaign 23G7 according to evaluation by Warranty Department - WK19/11




Audi

Message

to distribution list

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01.18.2008

 of
 Your message dated
 Our department/reference
 Date

 AUDI AG
 D-85045 Ingolstadt

Message No.4

Market launch A4 (B8) Limousine

This will give you a summary of the technical field complaints reported since market launch of Audi A4.

Based on mandatory reporting, any technical complaints are reported from the market.

Reported are all major complaints (each breakdown, serious complaints and complaints focuses ≥ 3), which were pre-analyzed by the field start-up team A4 [A4 FAT] and included in the fault remedy process. Status 3 or 4 - issues are reported only once.

Contents:

| | |
|--|---------|
| Basic figures | Page 3 |
| Overview of breakdowns | Page 4 |
| Top 5 Complaints per assembly | Page 5 |
| Processing of technical complaints focuses | Page 8 |
| Complaint focuses in detail | Page 9 |
| Evaluation of data memory entries | Page 18 |
| Processing of field damage parts | Page 20 |

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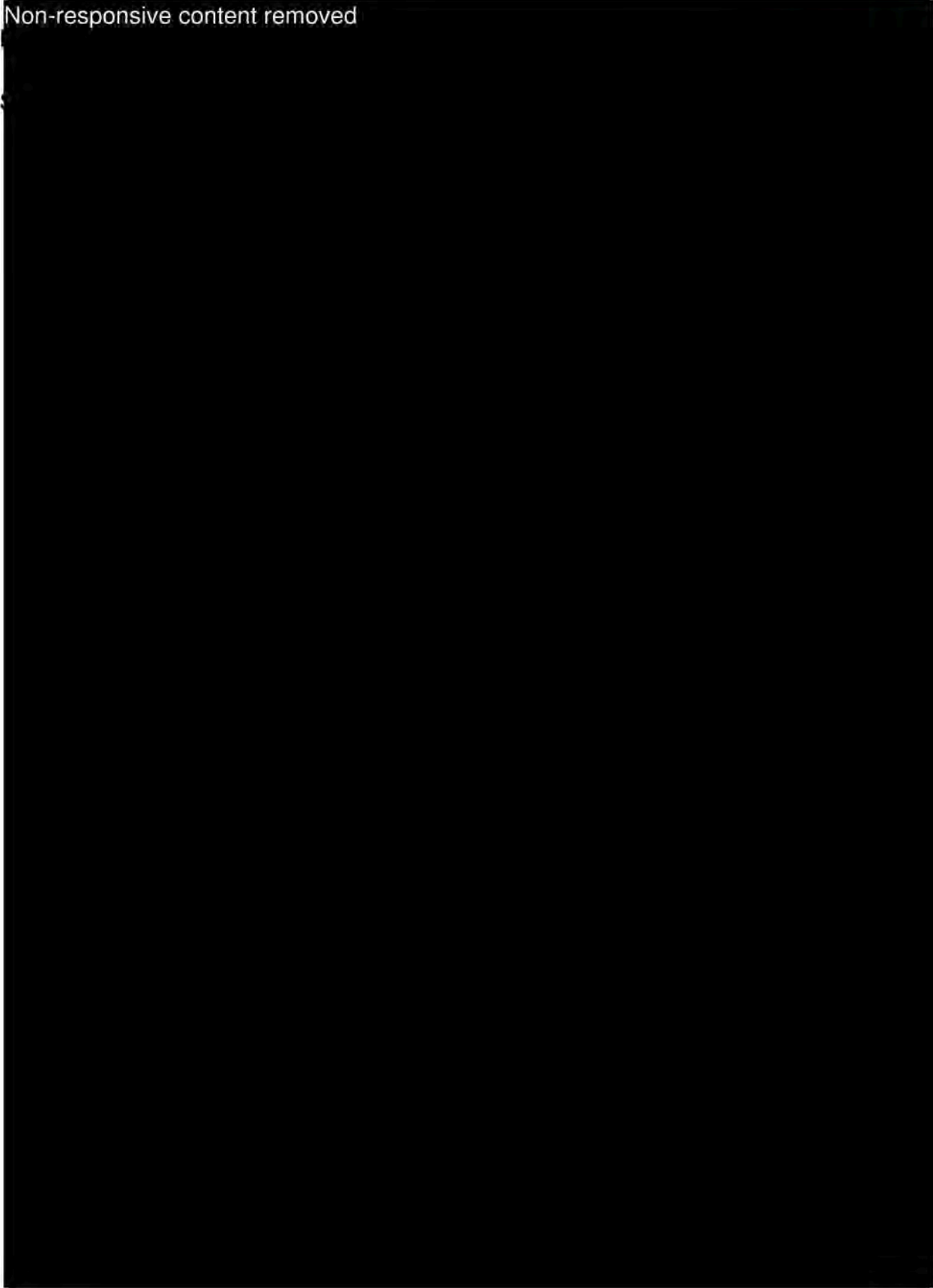


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Message No. 4

Market launch A4 Limousine

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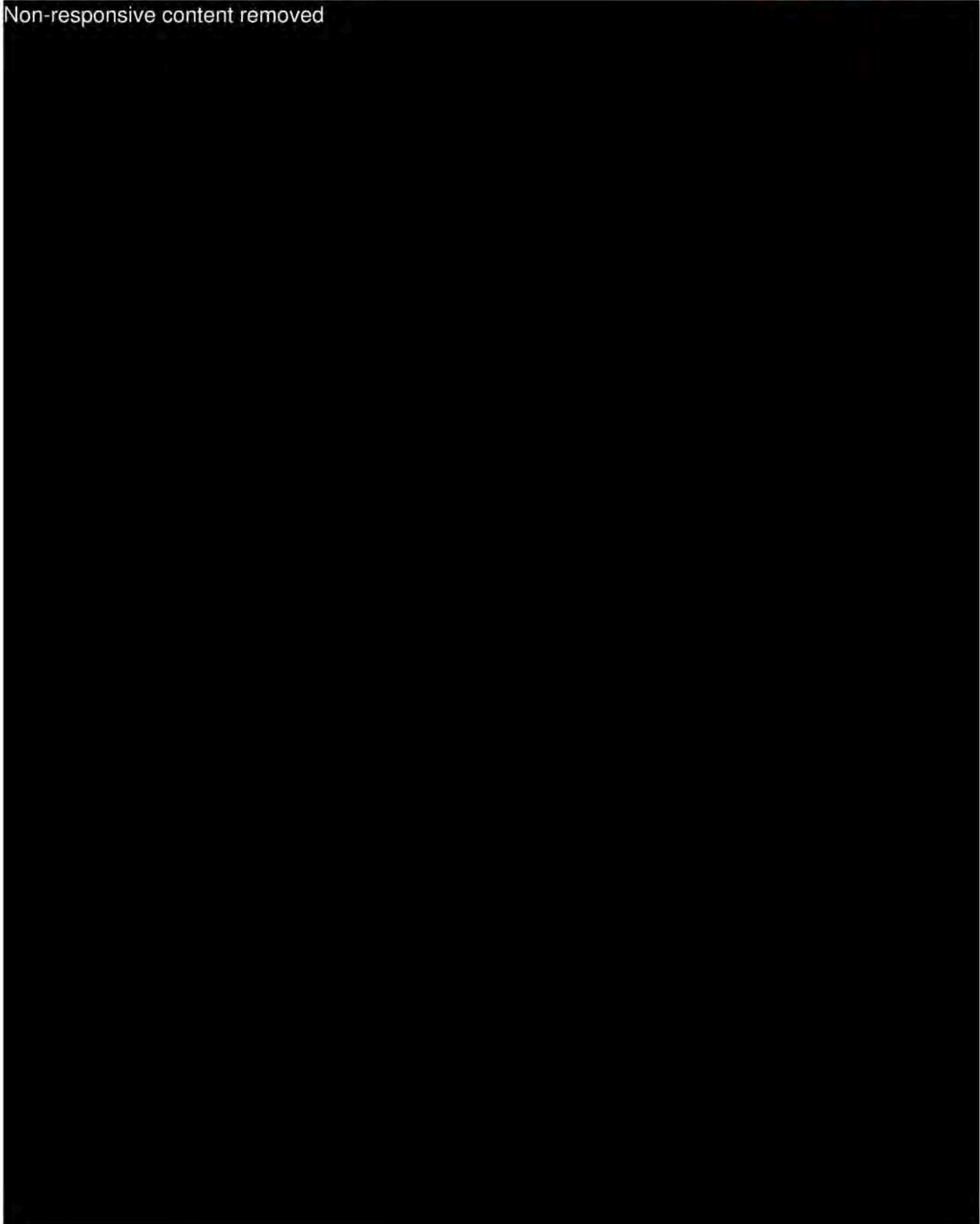


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Message No. 4

Market launch A4 Limousine

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Audi
Message No. 4
Market launch A4 Limousine
Overview of breakdowns

(Number of cases of damage previous week in parentheses (...))

| ENGINE / GEARBOX | ELECTRICAL | Non-responsive content removed |
|--|------------|--------------------------------|
| <p>1 (1) x 2.0 liter TDI engine is running irregularly</p> <p>High pressure fuel pump (HPP) without function, magnetic chip in the intake valve</p> <p>Cleanliness program at Bosch company from VIN 8K8A009613 8K8N002914</p> <p>Mileage 350km Rental car from Euromobil FAT on-site analysis</p> <div data-bbox="153 902 228 952" style="border: 1px solid black; width: 40px; height: 20px; display: flex; align-items: center; justify-content: center;"> I </div> <p style="text-align: right; color: red;">Status: 3</p> | | Non-responsive content removed |

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Message No. 4

Market launch A4 Limousine

| ENGINE / GEARBOX | ELECTRICAL | CHASSIS | COACHWORK |
|--------------------------------|------------|---------|-----------|
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I Production Ingolstadt

N Production Neckarsulm

Status 0:
Problem included

Status 1:
Analysis completed

Status 2:
Measure defined

Status 3:
Measure is being implemented

Status 4:
Measure is effective

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Audi
Message No. 4
Market launch A4 Limousine
Top 5 technical complaints per assembly

(Number of cases of damage last week in parenthesis ())

Changes to the previous week in blue.

| ENGINE / GEARBOX | ELECTRICAL | CHASSIS | COACHWORK |
|------------------|------------|---------|-----------|
|------------------|------------|---------|-----------|

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2 (1) x 2.0 liter TDI engine stops (thereof 1x breakdown)

High pressure fuel pump (HPP) without function, magnetic chip in the intake valve

Cleanliness program at Bosch company from VIN 8K8A [REDACTED] 8K8N [REDACTED]

Status 3

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Message No. 4

Market launch A4 Limousine

| ENGINE / GEARBOX | ELECTRICAL | CHASSIS | COACHWORK |
|------------------|------------|---------|-----------|
|------------------|------------|---------|-----------|

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Status 0:
Problem included

Status 1:
Analysis completed

Status 2:
Measure defined

Status 3:
Measure is being
implemented

Status 4:
Measure is effective

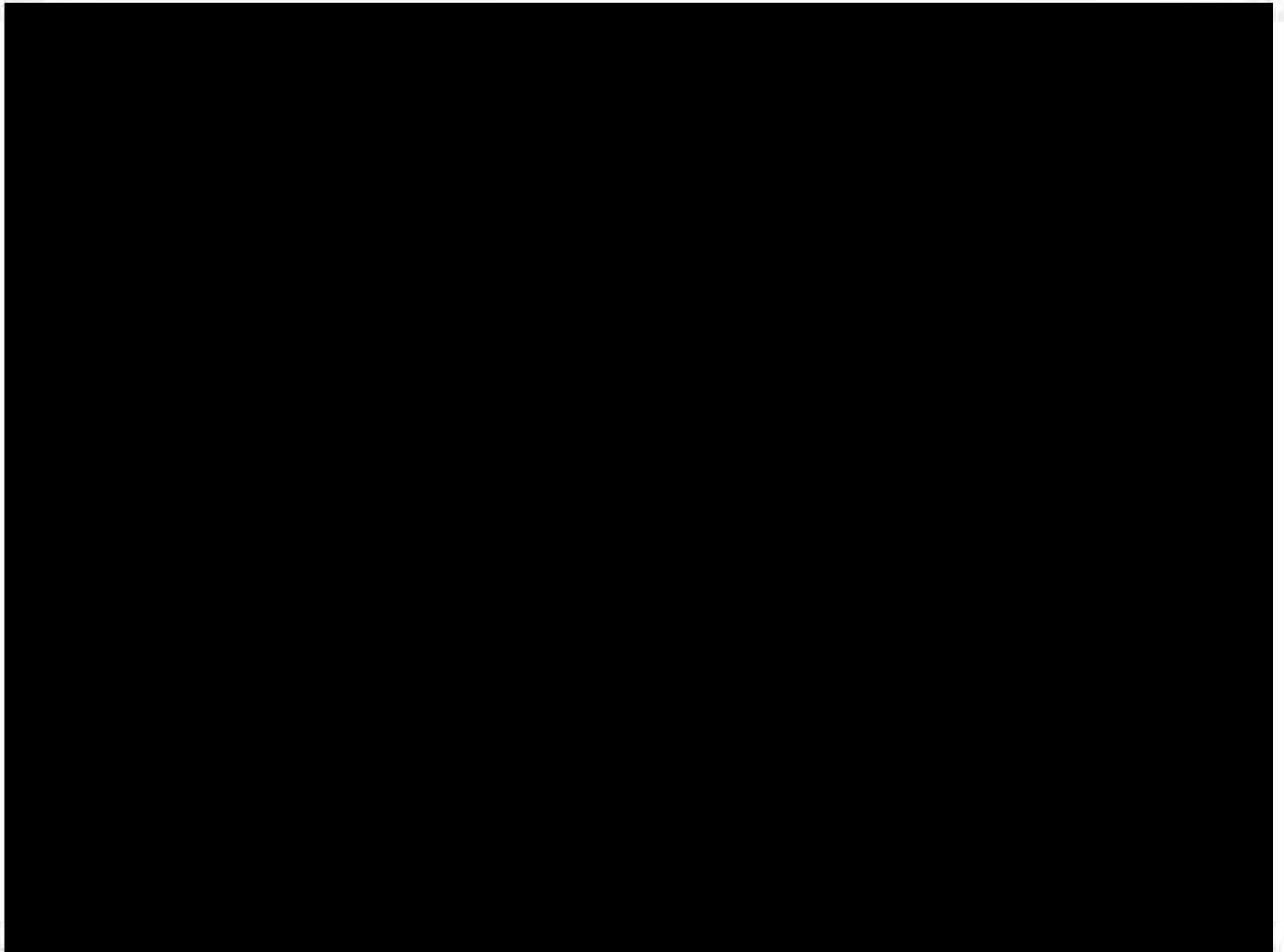
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Audi

Message No. 4

Market launch A4 Limousine





Message No. 4

Market launch A4 Limousine

Complaint focuses in detail

(Number of cases of damage previous week in parentheses (...), **breakdowns in red**)

Changes to the previous week in blue.

ENGINE / GEARBOX

| CoD | Complaint / workshop - verification / CS measure | Status | Analysis / Cause / Measure | Resp. | Deadline |
|----------|--|--------|----------------------------|--------------------------------|----------|
| 7 (6) | Non-responsive content removed | | | Non-responsive content removed | WK 04/08 |
| | | | | Non-responsive content removed | WK 04/08 |

**Message No. 4****Market launch A4 Limousine****Only engine / gearbox**

| CoD | Complaint / workshop - verification / CS measure | Status | Analysis / Cause / Measure | Resp. | Deadline |
|----------|---|--------|---|---|---------------------------------|
| 2 (1) | <p><u>Complaint:</u> 2,0 TDI: Engine stops or engine has no power (thereof 1x breakdown)</p> <p><u>Workshop observation:</u> High pressure fuel pump (HPP) without function</p> <p><u>Customer measure:</u> Replace HPP</p> <p><u>Affected plants:</u> 2 x Ingolstadt</p> | 3 | <p><u>Analysis:</u> Magnetic chip in the intake valve, known from CP7, DM 09.17.2007 Supplier by Bosch</p> <p><u>Measures:</u> - Change to flush sequence during housing production - Optimized transport of the housing - Masking of MU hole after washing / up to assembly of MU - Suction of MU hole before mounting the MU - Analysis of evacuated particles to identify / eliminate the root causes</p> <p>since 12/07 from VIN 8K8A [REDACTED] 8K8N [REDACTED]</p> <p><u>Further action:</u> Inspection of cleanliness program by Technical Audit of Supplier (TRL)</p> | <p>Non-responsive content removed</p> <p>Non-responsive content removed</p> | <p>Done</p> <p>WK 05/08</p> |
| 1 (0) | Non-responsive content removed | | | Non-responsive content removed | <p>WK 04/08</p> <p>WK 04/08</p> |

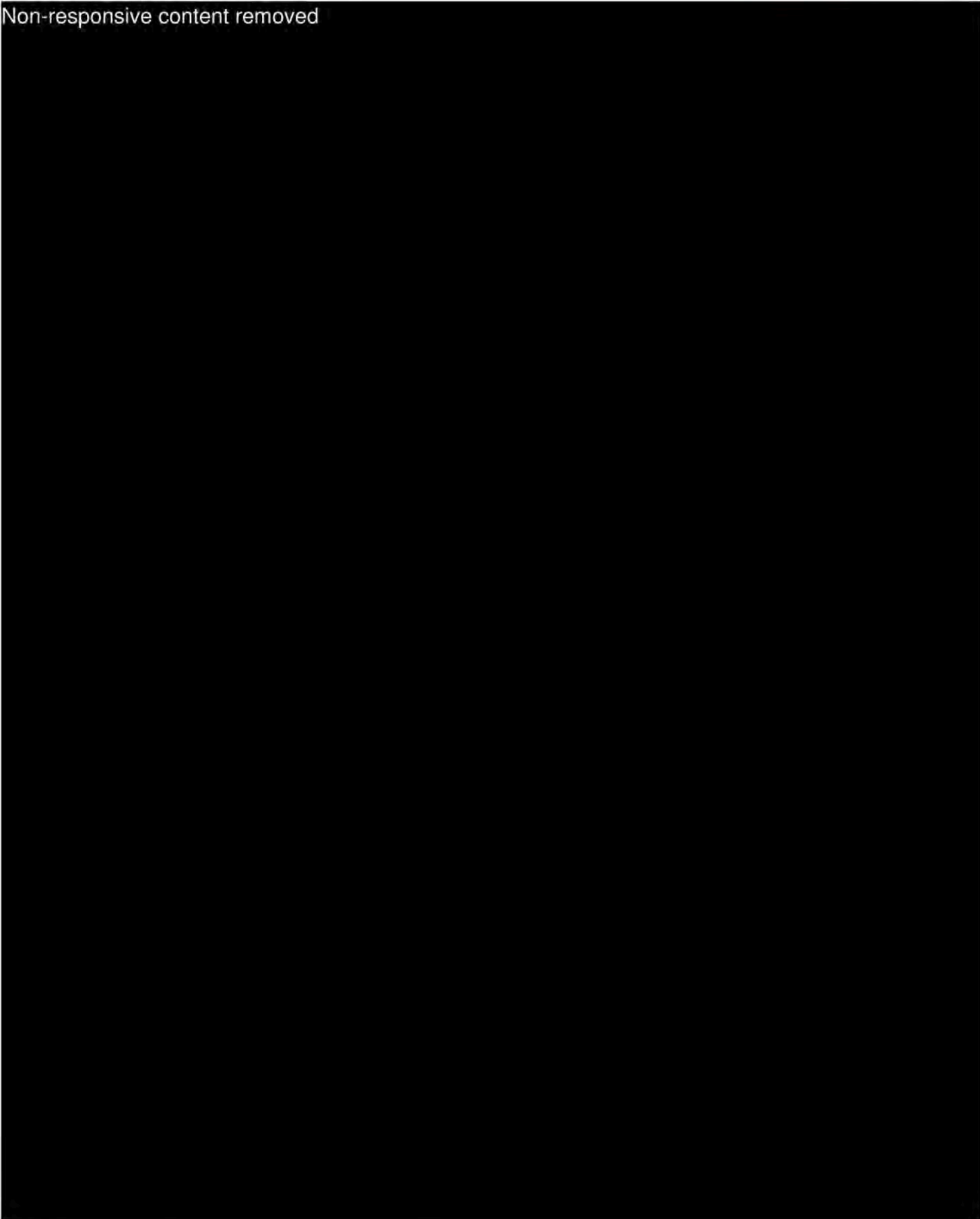


Audi

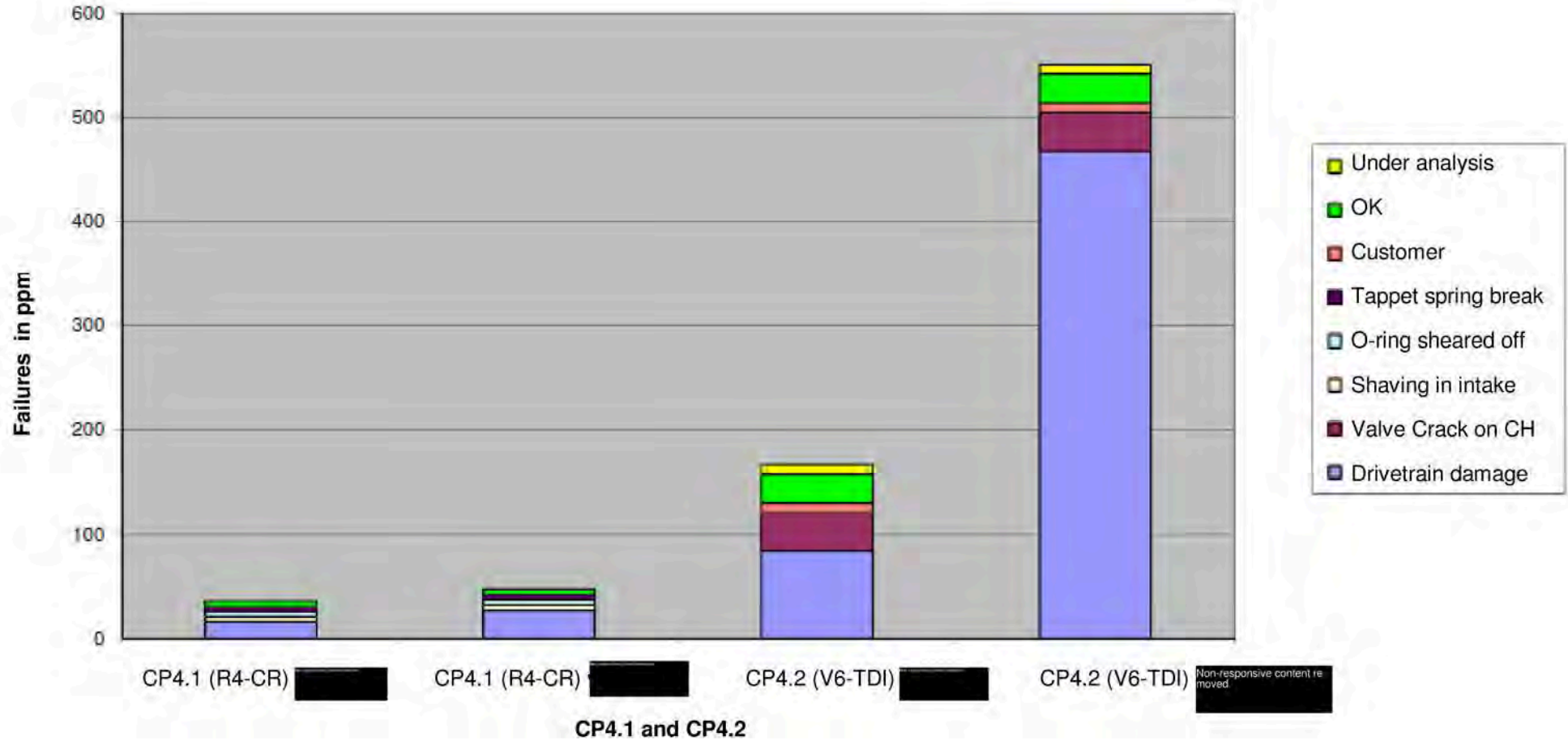
Message No. 4

Market launch A4 Limousine

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Field failures CP4 Audi in ppm
(each based on total supply quantity from Bosch to [redacted])



| error | ppm | | |
|---------------------|---------------|----------------|----------------|
| | CP4.1 (R4-CR) | CP4.2 (V6-TDI) | CP4.2 (V6-TDI) |
| Drivetrain damage | 16 | 27 | 84 |
| Crack on CH | 0 | 0 | 37 |
| Shavings in the | 5 | 5 | 0 |
| O-ring sheared off | 5 | 5 | 0 |
| Tappet spring break | 5 | 5 | 0 |
| Customer error | 0 | 0 | 9 |
| OK | 5 | 5 | 28 |
| under analysis | 0 | 0 | 9 |
| Total | 36 | 47 | 167 |

| |
|---------------------------------|
| |
| CP4.2 (V6-TDI) worldwide |
| 468 |
| 37 |
| 0 |
| 0 |
| 0 |
| 9 |
| 28 |
| 9 |
| 551 |

Current information from the field



V6 TDI EU5 high-pressure fuel pump damage

| | |
|------------------------------|--|
| Complaint: | Vehicle has no power, stops, does not restart. Engine check lamp is on |
| Workshop observation: | Data entry of engine control unit Rail pressure control limit undershot. Injection system does not build up any rail pressure. Massive chip entry into the high pressure fuel pump and the fuel system. Change to the entire fuel system is required. |
| Cause: | "Low-viscosity or poorly lubricating" fuels, such as winter diesel in summer, high water content, etc., leads to lack of lubrication and thus, seizure between roller and the high-pressure fuel pump. |
| Measures: | Camera system for detection of elevations on the roller support after WK 26/09. Introduction of C2 instead of C3 coating on roller end from WK 21/09. Large-scale test of increased testing point for selecting borderline pumps through failure in the 3rd quarter 09 |
| Note: | Robustness increase of the pump CP4 is required for global fuel qualities. |



Parameters since becoming aware of the problems:

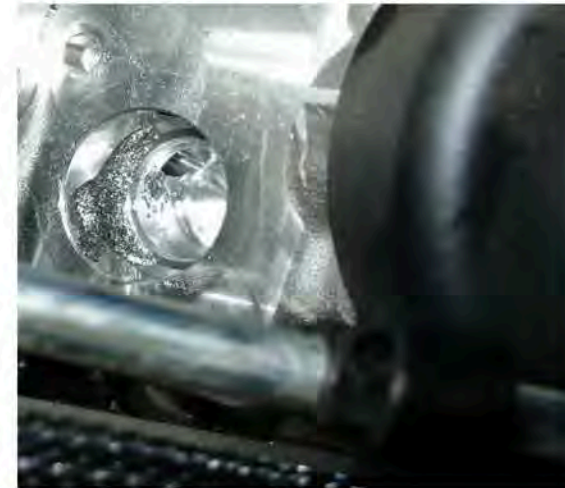
| | |
|-------------------------|--------------------------------|
| Cases of damage: | 394 CoD |
| Warranty costs: | Non-responsive content removed |
| Breakdown: | 305 |
| Repeat repair: | 11% |
| Processing body: | Quality module V6/V8 TDI |
| Status: | 1 CoD after last measure |

Current information from the field



V6 TDI EU5 high-pressure fuel pump damage

| | |
|------------------------------|---|
| Complaint: | Vehicle has no power, stops, does not restart. Engine check light is on (100% breakdown). |
| Workshop observation: | Data entry of engine control unit Rail pressure control limit undershot. Injection system does not build up any rail pressure. Massive chip entry from the high pressure fuel pump into the fuel system. Change to the entire fuel system incl. tank is required. |
| Cause: | Stiffness of the roller in the roller support due to production discrepancies. Critical fuel qualities in different markets worldwide, wherein the damaging fuel properties could not be detected analytically until now. [REDACTED] Market is separately analyzed due to the current high failure rates with respect to fuel quality. |
| Measures: | Optimized C coating of roller support from WK 16/09. Introduction of C2 instead of C3 coating on roller end from WK 21/09. Camera system for detection of surface defects on the roller support from WK 26/09 is being implemented. |
| Note: | Robustness increase of the pump CP4 is required for global fuel qualities. |

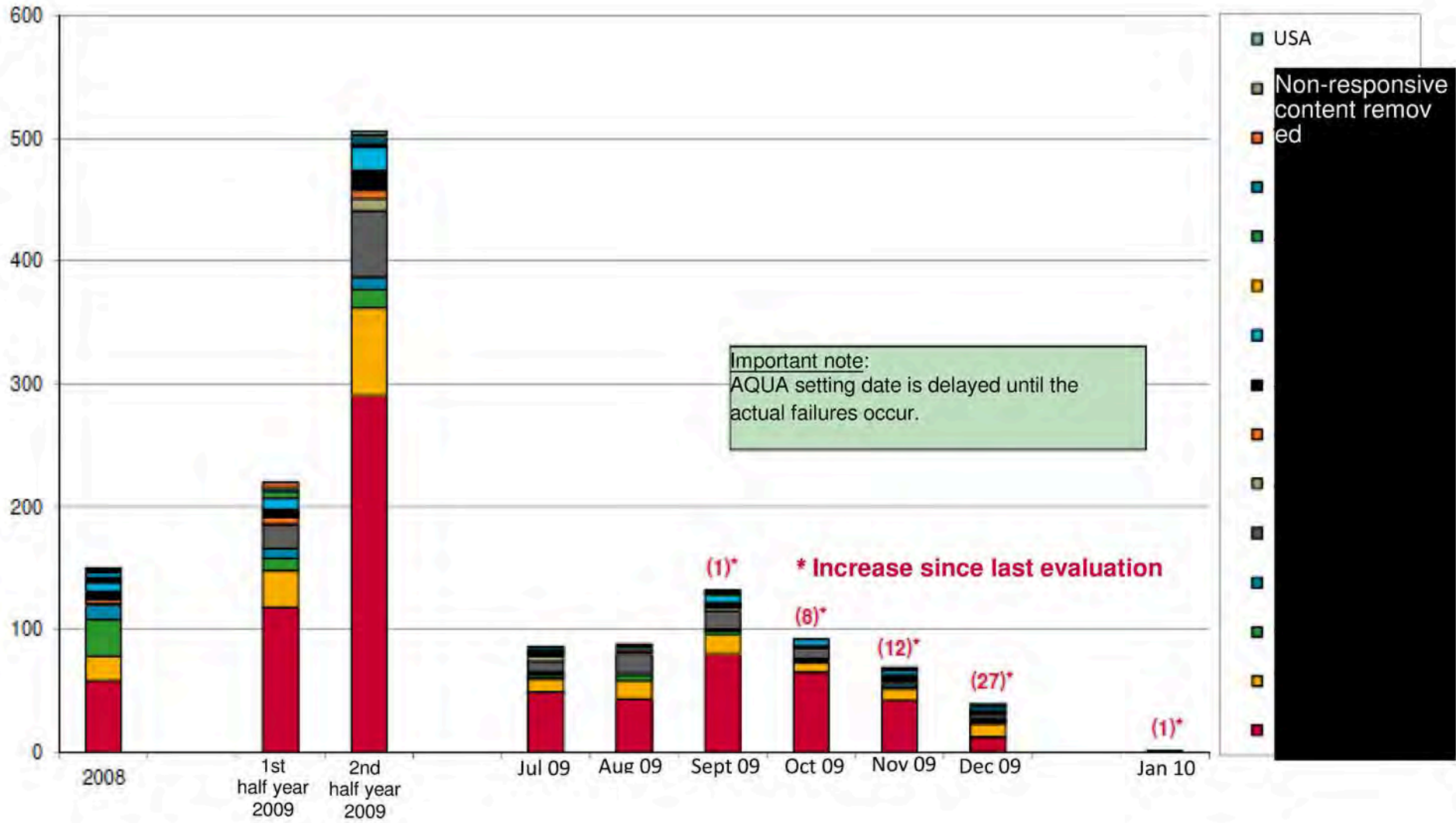


Parameters since becoming aware of the problems:

| | |
|-------------------------|--------------------------------------|
| Cases of damage: | 609 CoD |
| Warranty costs: | Non-responsive content removed |
| Breakdown: | 609 |
| Repeat repair: | 11% |
| Processing body: | Quality module V6/V8 TDI |
| Status: | 3 CoD after last measure, thereof 1x |



Settlements for high-pressure fuel pump CP4.2 V6-TDI Audi
(by **setting date** in AQUA)



Settlements for high-pressure fuel pumps CP4.2 Audi V6-TDI (by **setting date in AQUA)**

| Country | NEW ! | | | | | | | | | | | |
|--------------------------------|------------|--------------------------------|--------------------------------|-----------|-----------|------------|-----------|-----------|-----------|----------|------------|--|
| | 2008 | 1 st half year 2009 | 2 nd half year 2009 | Jul 09 | Aug 09 | Sept 09 | Oct 09 | Nov 09 | Dec 09 | Jan 10 | Total | |
| Non-responsive content removed | 58 | 118 | 291 | 49 | 43 | 80 | 65 | 42 | 12 | 0 | 467 | |
| | 20 | 30 | 71 | 11 | 15 | 16 | 8 | 10 | 11 | 1 | 122 | |
| | 1 | 19 | 54 | 9 | 16 | 15 | 9 | 1 | 4 | 0 | 74 | |
| | 30 | 10 | 15 | 3 | 5 | 3 | 2 | 0 | 2 | 0 | 55 | |
| | 7 | 9 | 19 | 1 | 1 | 6 | 5 | 3 | 3 | 0 | 35 | |
| | 12 | 8 | 10 | 2 | 1 | 1 | 1 | 3 | 2 | 0 | 30 | |
| | 6 | 6 | 16 | 2 | 1 | 4 | 2 | 5 | 2 | 0 | 28 | |
| | 4 | 6 | 7 | 2 | 3 | 0 | 0 | 2 | 0 | 0 | 17 | |
| | 5 | 3 | 4 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 12 | |
| | 2 | 6 | 2 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 10 | |
| | 0 | 1 | 10 | 4 | 1 | 3 | 0 | 1 | 1 | 0 | 11 | |
| | 1 | 4 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 6 | |
| | 2 | 0 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 4 | |
| | 2 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 3 | |
| USA | 0 | 0 | 3 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 3 | |
| Total | 150 | 220 | 506 | 86 | 88 | 132 | 92 | 69 | 39 | 1 | 877 | |

* Increase since last evaluation from 12/18/09 (Status 1/11/2010):

1 8 12 27 1 49

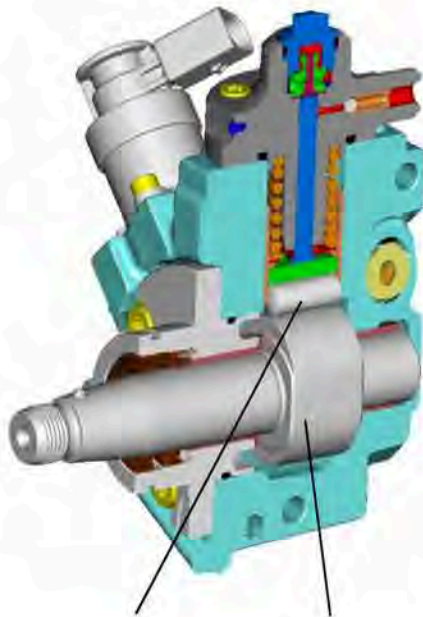
Audi 
Vorsprung durch Technik



Audi V6 TDI
Drivetrain damage high-pressure diesel fuel pump

Audi V6 TDI Drivetrain damage HPP CP4.2

High-pressure diesel pump in CR injection system 1,800 bar (EU5) from WK 45/2007



Roller Camshaft



The "sensitive heart" of the pump is the **drivetrain** with:

- Roller
- Roller support
- Twin camshafts

The **roller** with its extremely smooth surface must over the entire service life and at all operating conditions:

- **slide** smoothly in the C coated roller support
- **roll over** a very smooth cam without slippage

If this is not achieved in all situation, a **drivetrain damage** can occur in case of:

- **Stiffness** of roller in the roller support due to manufacturing deviations (mostly eliminated)
- **Critical fuel qualities** in different markets Non-responsive content removed, wherein the damaging fuel properties could not be detected analytically until now

Audi V6 TDI Drivetrain damage HPP CP4.2

► Field situation worldwide: **approx. 880 CoD (over 90% drivetrain damage)**

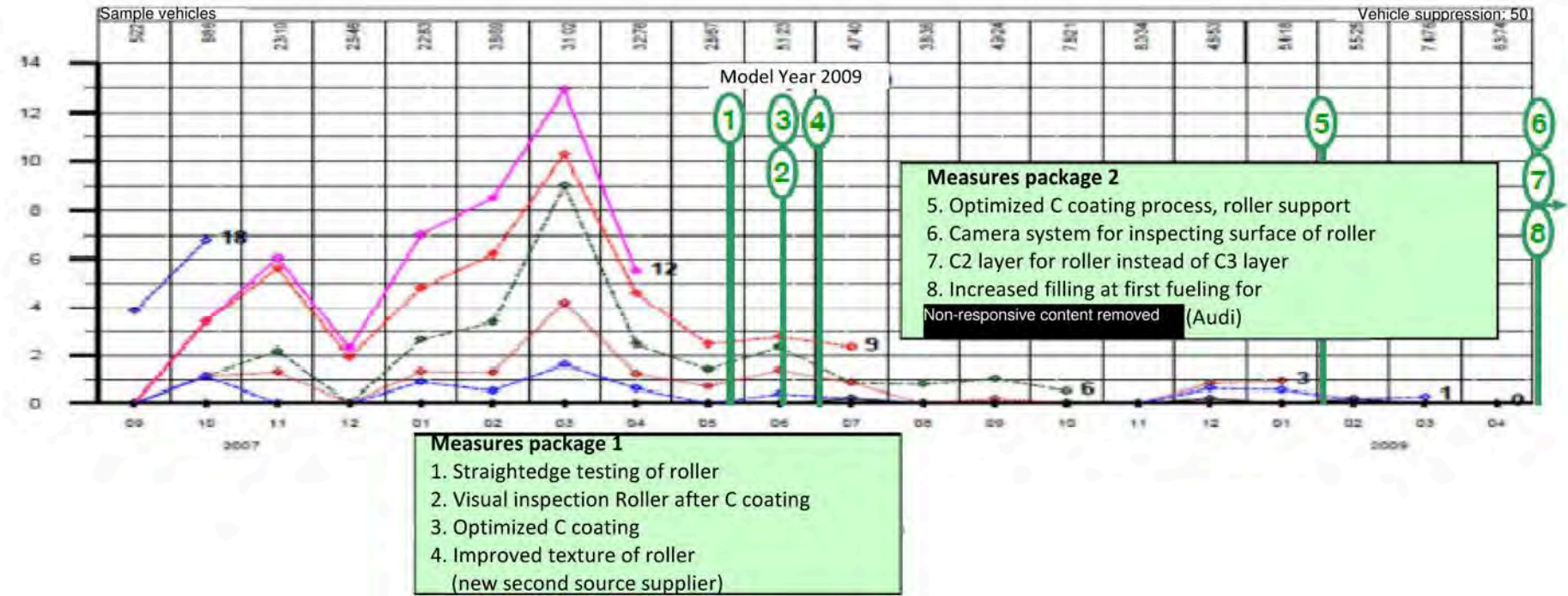
AQUA: active qualityanalysis

Status as on 09/09-11.05.09 10:27 AM
 Source / User SAGA_Gew/ [REDACTED]

Audi, *, market: Audi (approved markets)
 MY 2008 – 2010, Offset: all (Max: 3)
 CNR / Groups: High-pressure fuel pump

Confidential
 Without PR numbers
 CNR 2374

| CAMA CAMB CANA CANB CANC CAND CASA CASB CASC CASD CCWA CCWB CDYA CDYB CDYC CGKA CGKB | | | | | | | | MY | Replacement | BD | SA10 | SA17 | SA50 | SA18 | |
|--|------|--------|--------|--------|--------|--------|-------|------|-------------|-------|---------|-------|------|-------|--|
| MY | MIS0 | MIS1 | MIS3 | MIS6 | MIS9 | MIS12 | MIS18 | MY | | | | | | | |
| 2008 | 0.0 | 0.6 | 1.5 | 3.1 | 5.2 | 6.6 | 11.2 | 2008 | 98.0% | 62.8% | 76.7% | 12.3% | 7.0% | 1.7% | |
| 2009 | 0.0 | 0.2 | 0.5 | 1.2 | 1.9 | 2.4 | | 2009 | 96.7% | 50.0% | 69.7% | 17.1% | 5.3% | 4.6% | |
| Diff% | | -64.45 | -67.70 | -61.37 | -62.69 | -62.99 | | | | | MEC ERR | MAJOR | LEAK | MINOR | |



Vehicle: 29,592+92,395+37,767=159,754; Sold: 29,424+89,879+26,899=146,202; UP: 21,115+67,808+22,991=111,914; MY: 2008+2009+2010= Total

CP42 AU all MKB V6 free 08-10

Audi V6 TDI Drivetrain damage HPP CP4.2

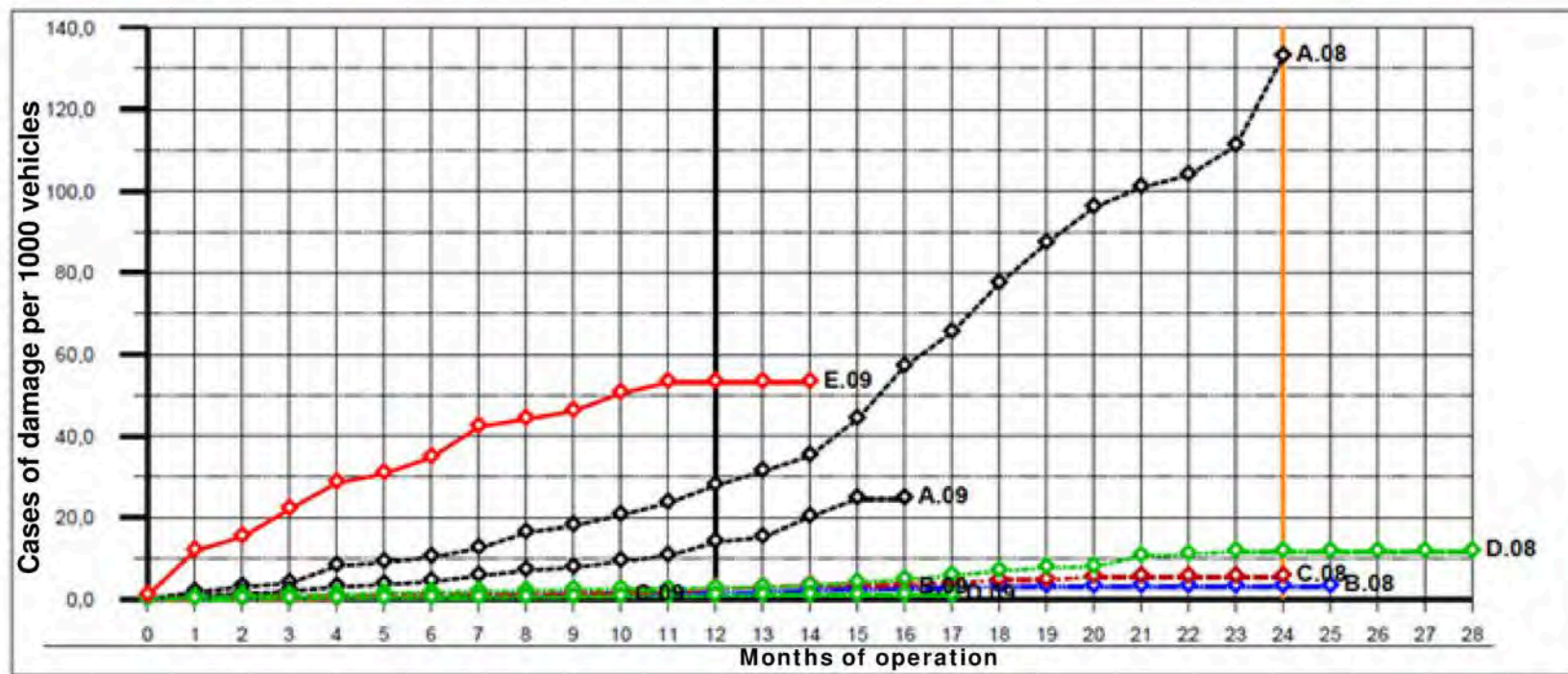
► Subdivision by country CoD

MY 2008 – 2009

Confidential

AQUA: active quality analysis
Status as on November 2009
Source / User SAGA_Gew [REDACTED]
page 1 / [REDACTED]

- A – Audi, *, Market: [REDACTED] CNR / groups: High-pressure fuel pump; CAMA|CAMB|CANA|CANB|CANC|CAND|CASA|CASB|CASC|CASD|CCWA|CCWB|CDYA|CDY
- B – Audi, *, Market: [REDACTED] CNR / groups: High-pressure fuel pump; CAMA|CAMB|CANA|CANB|CANC|CAND|CASA|CASB|CASC|CASD|CCWA|CCWB|CDY
- C – Audi, *, Market: [REDACTED] CNR / groups: High-pressure fuel pump; CAMA|CAMB|CANA|CANB|CANC|CAND|CASA|CASB|CASC|CASD|CCWA|CCWB|CDYA|CD
- C – Audi, *, Market: [REDACTED] CNR / groups: High-pressure fuel pump; CAMA|CAMB|CANA|CANB|CANC|CAND|CASA|CASB|CASC|CASD|CCWA|CCWB|CD
- C – Audi, *, Market: [REDACTED] CNR / groups: High-pressure fuel pump; CAMA|CAMB|CANA|CANB|CANC|CAND|CASA|CASB|CASC|CASD|CCWA|CCWB|CDYA|C



Failures in other markets:

▶ Failure figures:

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50
41
29
11
9
5
4

Similar to first failures



▶ Current fuel analyses in Non-responsive content removed

Diesel: Cetane number, sulfur, lubricity are particularly problematic; fuel is classified as not suitable for EU 4/5

▶ Safety factor against slip shows a strong dependence on

- Viscosity and lubricity of the fuel
- Clearance between roller – roller support:
- Roughness of roller
- Form error roller support
- Water content in fuel > 200 ppm

Measures to increase the robustness

- ▶ Further development of wear-optimized C coating
- ▶ Optimization of texture and surface of roller support
- ▶ Optimization of component tolerances (clearance) roller - roller support

According to present plans by Bosch SOP of these measures 07/2010



Drivetrain damage high pressure diesel fuel pump CP4.2

Summary of activities:

- ▶ Current CoD: worldwide 877 settlements, of which 467 in [REDACTED] - see Appendix (approximately 90% drivetrain damage)
- ▶ Findings by Task force [REDACTED]
 - Abnormalities of fuel (FAME acid) due to increase from about 3-5% to 7% biodiesel 2009 in [REDACTED]
 - Damage pattern of Italy different from [REDACTED] + RoW (smoothened cam track, shaft seal worn, etc.)
 - Individual C coated batches show high failure rates
- ▶ Failure hypotheses for market [REDACTED] by Bosch :
 - Tribo-chemical wear: Oxidation of camshaft → oxide discharge through roller → smoothing of camshaft → reduction in the coefficient of friction (contrary to target: high coefficient of friction roller / cam)
 - Deposit formation through biodiesel: Deposits → increase in the coefficient of friction of roller / roller support → roller stiff in the roller support → slip of roller / cam → wear + material discharge
 - Microorganisms in fuel: e.g. algae → acid through metabolites → corrosion on roller + camshaft → increase in coefficient of friction + surface damage → wear + fatigue of material
- ▶ Further measures:
 - Continuation of the detailed fuel and damage pump analysis
 - Review of all failure hypotheses / Ishikawa diagram
 - Test for reproduction of damage mechanism on test rig
 - Comparison of production parameters of CP4.2 (Q records) so far without evidence of damage-promoting deviations → further analyses of parameters that are not specified yet (especially C coating, component geometry)
 - Current status with respect to implementation of anti-wear package (planned Launch SOP July 2010)
Pump parts manufacture + survey. Initial test results with a critical fuel by end 01.10

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Drivetrain damage high pressure diesel fuel pump CP4.2

TOP meeting Bosch– Audi on 02.12.2010 in Non-responsive content removed

Drivetrain damage high pressure diesel fuel pump CP4.2

Current field situation:

V6-TDI Audi

Worldwide 1,035 settlements / 526 [redacted] thereof...

- MY08 632 pieces / 338 [redacted] thereof = critical production period
- MY09 377 pieces / 180 [redacted] thereof = after measures package 1
- MY10 26 pieces / 8 [redacted] thereof = after measures package 2

→ See failure statistics with measures

V8-TDI – 1 case [redacted]

V12-TDI – 2 cases [redacted]

▶ Country-specific analyses of failed pumps and GOOD pumps - Bosch

- Drivetrain damage [redacted] (factor is 10 times higher than [redacted])
- Drivetrain damage [redacted]
- Drivetrain damage [redacted]

▶ Failure hypothesis – Bosch:

- Possible turning of the tappet when starting the system, leading to a high point load on the roller in the roller support, and thus bringing it to standstill (especially CP4.2 twin pistons in the V6-TDI). Low-quality fuel (smaller lubrication gap) facilitates the roller in coming to standstill. Adhesive wear occurs at the cam and / or roller and thus, sooner or later to failure of the system.

Drivetrain damage high pressure diesel fuel pump CP4.2**▶ Continuation of failure hypotheses – Bosch:**

- low-quality fuel, which leads to a stiff / stationary roller
- Tribological oxidation (corrosion) [REDACTED]

▶ Anti-wear package 1 (RP1):

- C2 coating of roller support instead of C3 coating for better surface roughness ($R_v = 0.8$ rather than $1.3 \mu\text{m}$)
- C2 coating also prevents metal splashes
- Clearance reduction of roller / roller support by shifting tolerance range ($18 - 40 \mu\text{m}$ instead of $24 - 46 \mu\text{m}$)

▶ Short testing and effectiveness of RP1:

- Basic testing of C2 coating due to use by competitors in 2010 is completed
- Short testing with Arctic diesel - (was originally kerosene) → poorly lubricating, low-viscosity fuel by **WK08/10** → Aim: Identify potential for improvement RP1
- Declaration of effectiveness is evaluated critically by QA Audi → Potential for improvement is probably not quantitatively measurable
- No measure against the main fault hypothesis "stiffness due to clogging" of the roller!!!

▶ Readiness for production and launch date:

- Readiness for production Bosch from **WK09/10** ensured
- Planned release by development + QA Bosch + Audi beginning **WK09/10**
- Serial deliveries by Bosch from **WK10/10**
- The first 400 pieces are scheduled in advance for use at customer

Drivetrain damage high pressure diesel fuel

- ▶ **Long-term testing RP1 for series € Quantitative potential for improvement (e.g. in ER hours, etc.)**
 - Worst-case fuel VW Group / Bosch is defined → Testing from **from WK08/10**
 - Worst-case fuel VW Group / Bosch is defined → Testing **from WK08/10**
 - "Aged" diesel with biodiesel proportion of 20% (B20) → postponed **to WK ???/??**
- ▶ **Anti-wear package 2 (RP2) still open**
 - Possible objective: Avoidance of turned tappet by preventing "unguided resting position" in pump cam TDC or tappet anti-turning lock (twin piston V6 TDI significantly more critical than CP4.1 R4) → field situation **CP4.2** (factor is 10 times higher than CP4.1) !!!
 - Engine including measurements have not been completed yet
 - Critical: any new design and construction components required (previous solutions for tappet anti-turning lock have been discarded by Bosch, because strength is not sufficient = evidence of turned tappet)
- ▶ **Fallback solution of high-pressure fuel pump CP1H or CP3 for fuel-critical EU4 markets:**
 - Installation analyses N/EA-6 are done in V6 Gen 2.
 - Alternative: Reactivation of V6 1st generation with CP1H (was series status B8 with EU5 interim)
 - → Requirement for QA due to insufficient effectiveness of RP1

Drivetrain damage high pressure diesel fuel

► Requirement by Bosch: → Integration of water separator in the diesel filter

- Water separator with vacuum option in the main failure models Q7 and Touareg from the beginning in series production
- Currently, there is no available water separator technology for breakdown diesel filters in Audi B / C 7-series
- Diesel filter manufacturer, Bosch does not offer any water separation system
- For all European models, FIAT (expert on the domestic market) delivers water separator with sensors + display icon in the instrument cluster

► Warranty disclaimer by Bosch

- Bosch rejects warranty for all markets, which do not have fuels according to European standard EN590 = rest of the world RoW (specified in TCD = technical customer documentation)
- Audi currently supplies outside EU at its own risk
- Diesel volume rising sharply due to opening up of world markets
- The following growth markets **Non-responsive content removed** are classified as particularly fuel-critical
- US warranty currently not questioned by Bosch

Status drivetrain damages Bosch CP4

- Failures statistics Non-responsive content removed market

| | Produced | Sales | Random sample | Failures | Failures per 1000 |
|----------------------------|----------|--------|---------------|----------|-------------------|
| CP4.1 VW (4 cyl.) | 86,081 | 72,115 | 44,659 | 67 | 0.78 |
| CP4.1 Audi (4 cyl.) | 58,461 | 51,898 | 35,787 | 83 | 1.42 |
| CP4.2 VW (6 cyl.) | 1,562 | 1,310 | 667 | 16 | 10.24 |
| CP4.2 Audi (6 cyl.) | 15,386 | 13,727 | 8,998 | 153 | 9.94 |

Status 12/2009

- Failure statistics market USA

| | Produced | Sales | Random sample | Failures | Failures per 1000 |
|--------------------------|----------|--------|---------------|----------|-------------------|
| CP4.1 VW (4 cyl.) | 58,097 | 52,404 | 41,034 | 108 | 1.86 |

Status 12/2009

- Failure statistics Non-responsive content removed market

| | Produced | Sales | Random sample | Failures | Failures per 1000 |
|----------------------------|----------|---------|---------------|----------|-------------------|
| CP4.1 VW (4 cyl.) | 249,966 | 219,348 | 183,737 | 19 | 0.08 |
| CP4.1 Audi (4 cyl.) | 151,640 | 143,838 | 128,026 | 53 | 0.35 |

Status 01/2010

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Status drivetrain damages Bosch CP4

- Failures figures for Non-responsive content removed market

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- Failure figures for USA market

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Status 01/2010

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Status drivetrain damages Bosch CP4

- **General cause of CP4 drivetrain damage:**

- Unacceptably high mixed friction between roller and roller support cause local contacts during operation.
- The C coating of the roller support is disrupted (wear and erosion of the C coating), the coefficient of friction between the roller and roller support increases.
- Stiffness of roller \Rightarrow wear \Rightarrow particle formation \Rightarrow drivetrain damage
- Intensification factors: Fuel With low viscosity, elevated spots on the roller (e.g. fusing) and in the roller support (e.g. metal splashes), surface of roller/ roller support

- **Failures figures for** Non-responsive content removed **market**

- Blending of aged biodiesel with fuel in the Non-responsive content removed market leads to deposit formation and oxidation in the high-pressure fuel pump \Rightarrow tribochemical wear, deposits from algae and oxidation products, corrosion on the surface of camshaft and \Rightarrow stiff roller
- Further analyses of flow- and pressure conditions in tappet chambers are under progress, Effect of LP-cycle and tappet position when switching off the engine (critical against turning in the TDC position).

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Status drivetrain damages Bosch CP4

- **Introduction of anti-wear package 1 for CP4:**
- **Task**
 - Robustness increase of the drivetrain by increasing the lubricant film thickness between roller support hole and roller.
- **Characteristics of the anti-wear package 1**
 - Reducing the roller support texture in combination with switchover to C2 coating on the roller support.
 - Reduction of the clearance between roller support and roller by adjusting the center of tolerance and the tolerance range of roller support hole.
 - Validation to WK 08/2010, then introduction into production as soon as possible.

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Status drivetrain damages Bosch CP4

- **Follow a HPP drivetrain damage:**

- Chip formation in high-pressure fuel pump drivetrain
- Chips distributed through entire fuel system
- Malfunctions of HPP, PCV, RPS, injectors, PRV

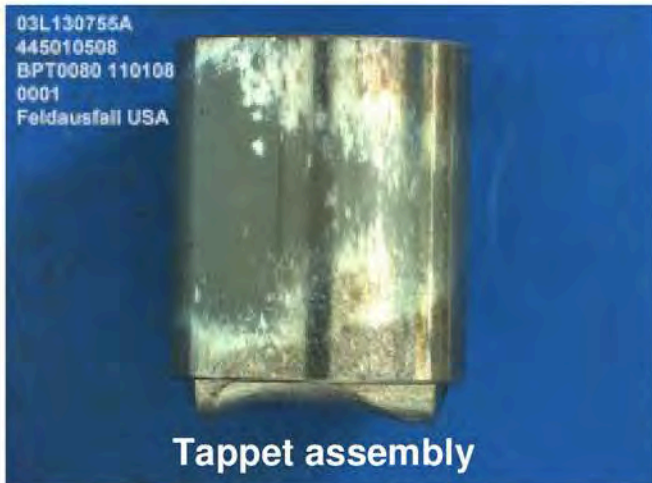
- **Repair effort:**

- Replacement of the entire injection system comprising:
 - Fuel filter
 - High-pressure fuel pump
 - High-pressure lines
 - Rail incl. rail pressure sensor and pressure control valve
 - Injectors,
 - fuel return line,
 - fuel lines
 - Cleaning of the fuel tank and flushing of the lines

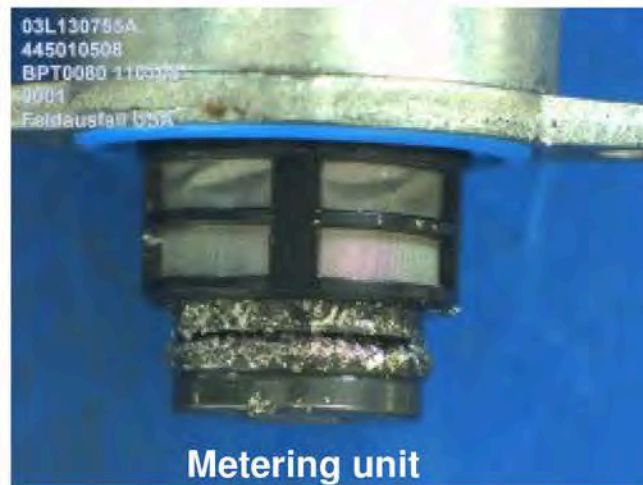
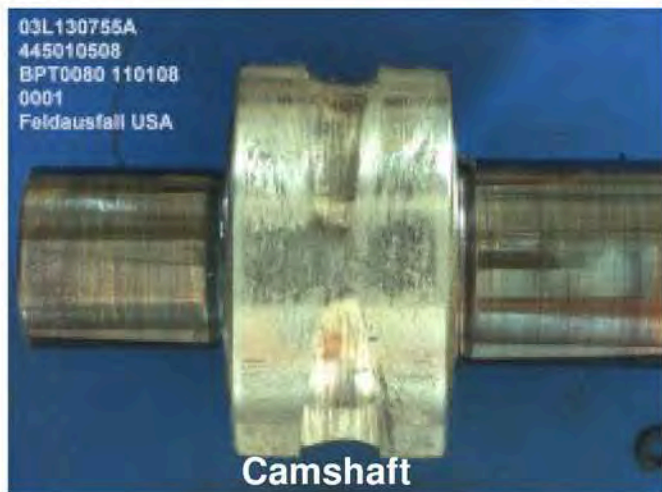
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Status drivetrain damages Bosch CP4



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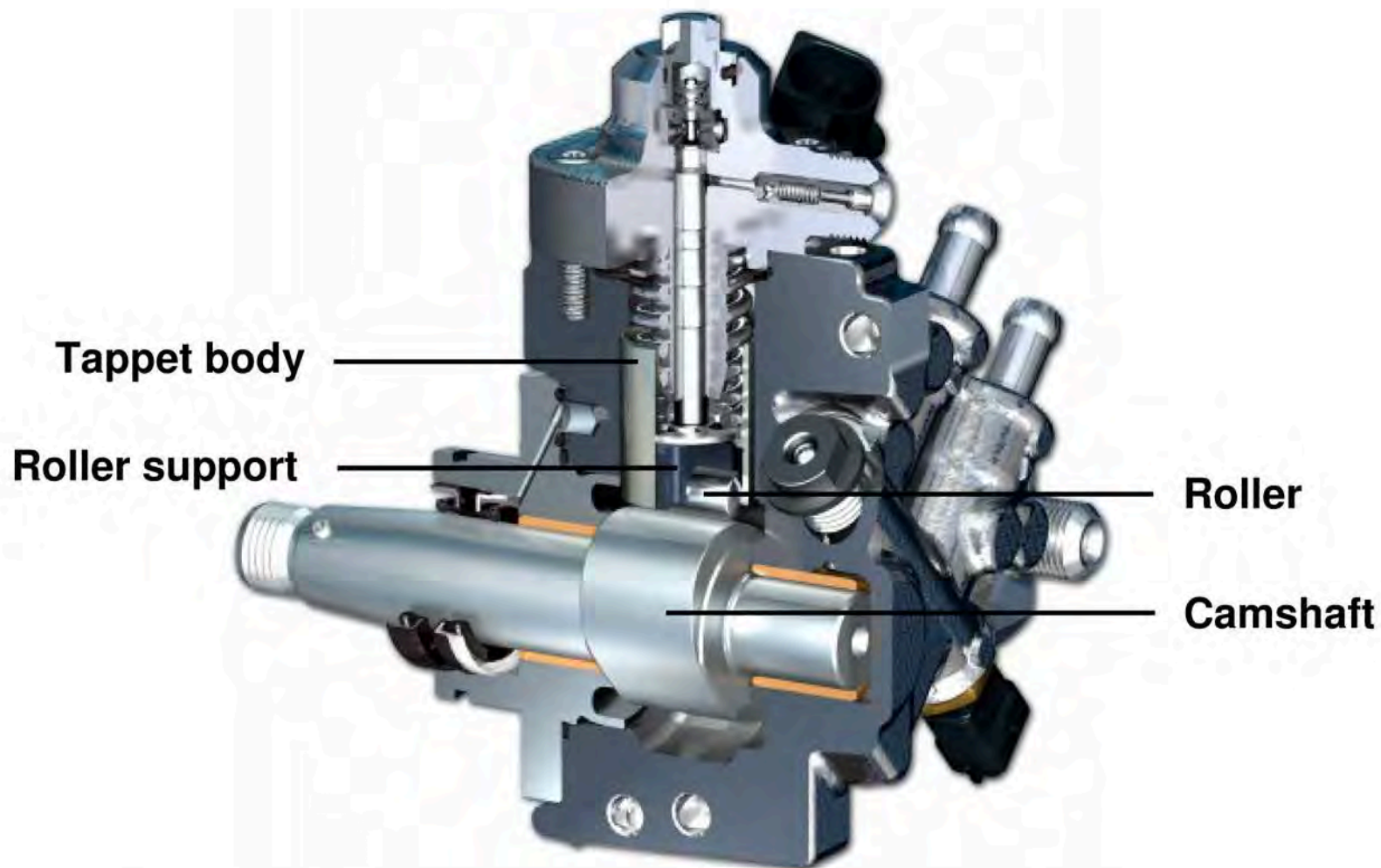


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Status drivetrain damages Bosch CP4



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From: Non-responsive content removed
To: [REDACTED]
CC: [REDACTED]
Date: 02.08.2010 5:50:19 PM
Subject: Status CP4-failures
Attachments: [100208 Status CP4 Triebwerkschaden.pdf](#)
[100208 Status CP4 Triebwerkschaden.ppt](#)

Hello [REDACTED]

Refer to the appendix for the revised status of the CP4 failures.
The failure figures have been added [REDACTED] of 4-cylinder and a cutaway view of CP4

It is striking that the failure rate of Audi is twice than that of VW for the 4-cylinder.
The failure figures for all V6 (Audi and VW) are many times higher than for the 4-cylinder.
All V6 and the Audi 4-cylinder come from the plant [REDACTED]

Yours sincerely,

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[REDACTED]

VOLKSWAGEN AG

Sitz/Domicile:

Wolfsburg

Registergericht/Court of Registry: Local District Court Braunschweig

HRB Nr./ Commercial Register No.: 100484

Vorsitzender des Aufsichtsrats/Chairman of the Supervisory Board: Ferdinand Piëch

Vorstand/Board of Management: Martin Winterkorn (Vorsitzender/Chairman), Francisco J. Garcia Sanz, Jochem Heizmann, Horst Neumann, Hans Dieter Pötsch

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Status drivetrain damages Bosch CP4

- Failures figures for Non-responsive content removed market

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| CP4.2 VW (6 cyl.) | 1,562 | 1,310 | 667 | 16 | 10.24 |
| CP4.2 Audi (6 cyl.) | 15,386 | 13,727 | 8,998 | 153 | 9.94 |

Status 12/2009

- Failure figures for **USA market**

| | Produced | Sales | Random sample | Failures | Failures per 1000 |
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| CP4.1 VW (4 cyl.) | 58,097 | 52,404 | 41,034 | 108 | 1.86 |

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Status 01/2010

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Status drivetrain damages Bosch CP4

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- Stiffness of roller \Rightarrow wear \Rightarrow particle formation \Rightarrow drivetrain damage
- Intensification factors: Fuel With low viscosity, elevated spots on the roller (fusing) and on roller support (metal splashes); surface of roller/roller support

- **Failure hypothesis of [REDACTED] market**

- Blending of aged biodiesel with fuel in the [REDACTED] market leads to deposit formation and oxidation in the high-pressure fuel pump \Rightarrow tribochemical wear, deposits from algae and oxidation products, corrosion on the surface of the camshaft and roller \Rightarrow stiff roller
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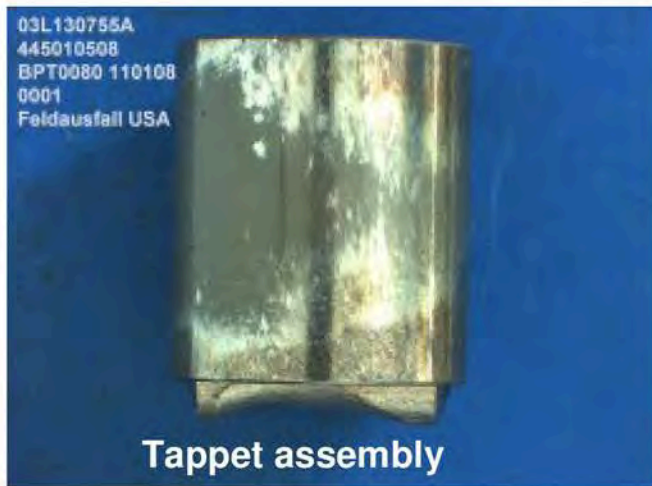
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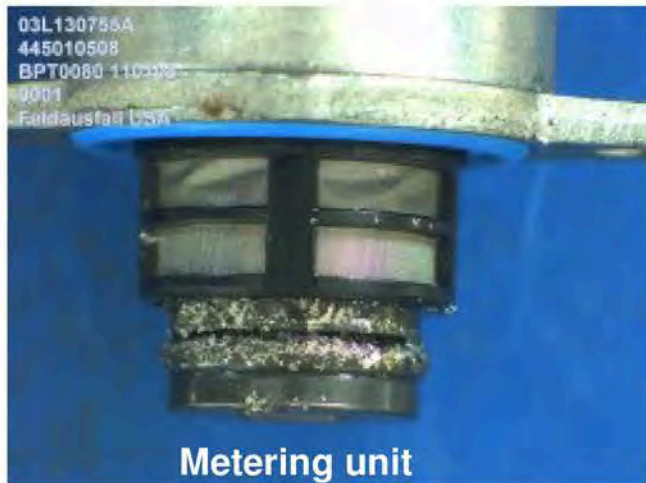
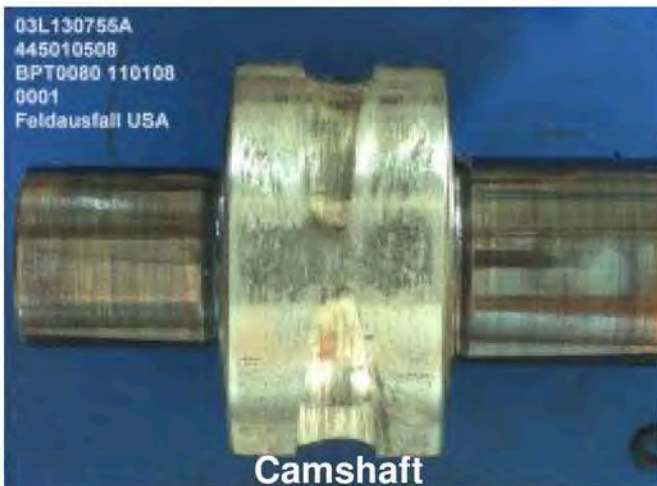
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Status drivetrain damages Bosch CP4



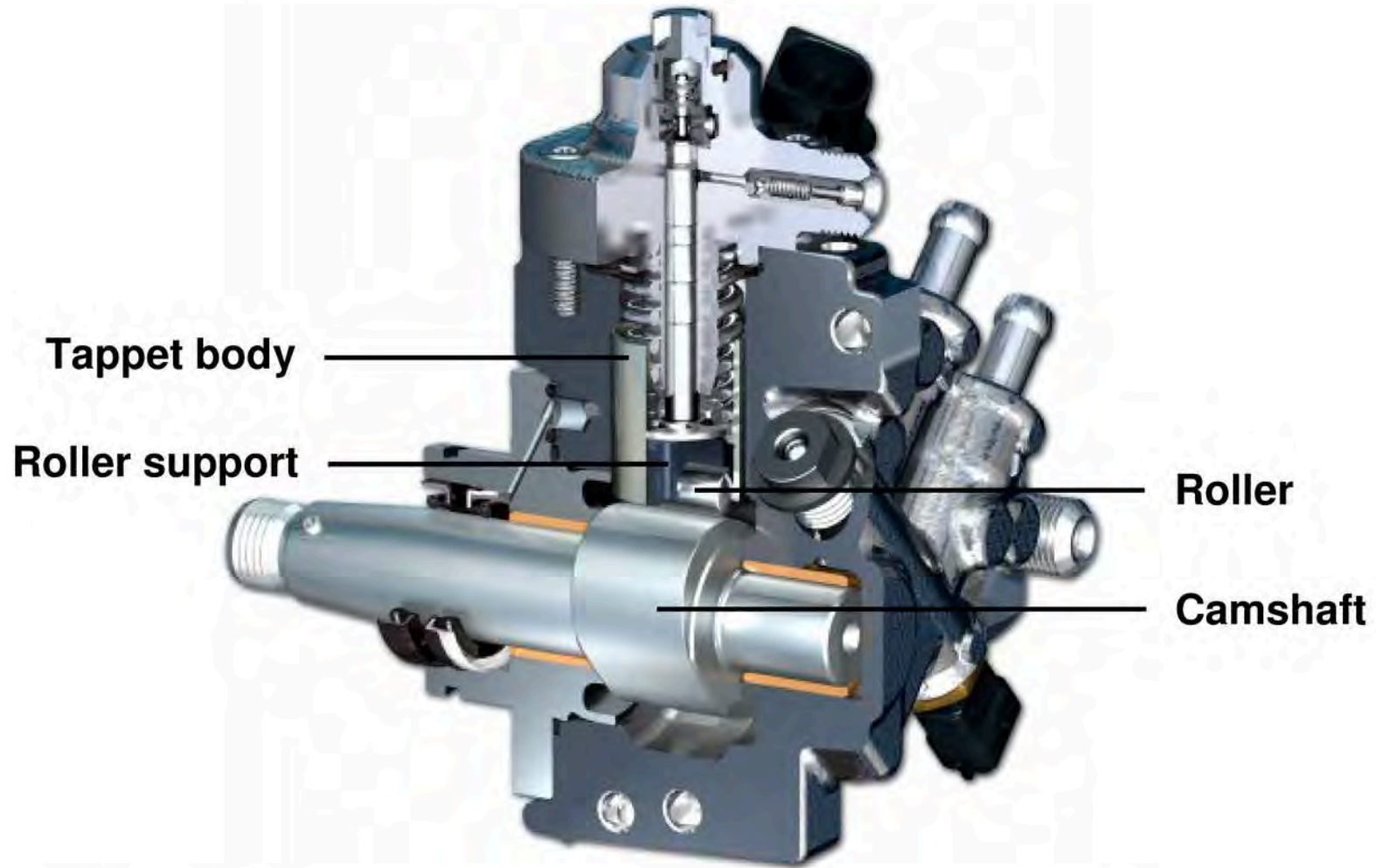
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Field failure USA



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Status drivetrain damages Bosch CP4



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Status drivetrain damages Bosch CP4

- Failures figures for **Non-responsive content removed**

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Status drivetrain damages Bosch CP4

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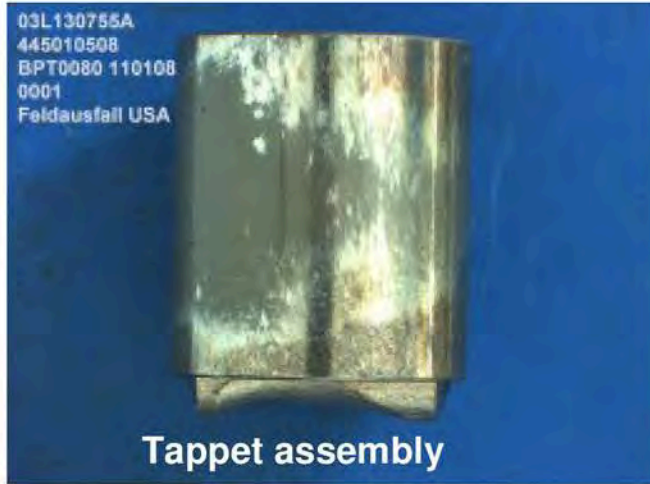
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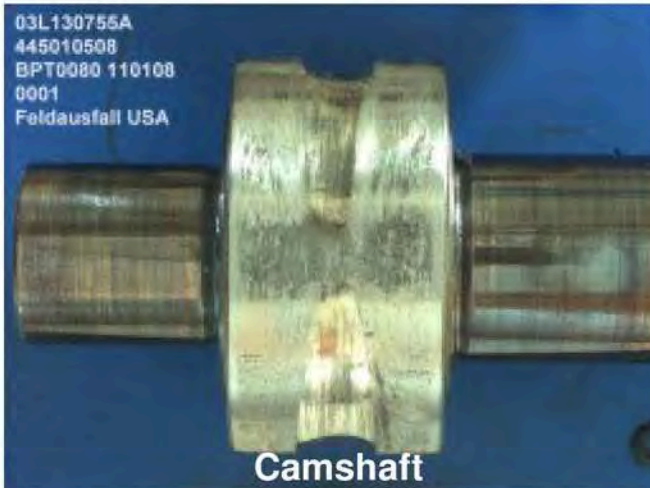
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Status drivetrain damages Bosch CP4



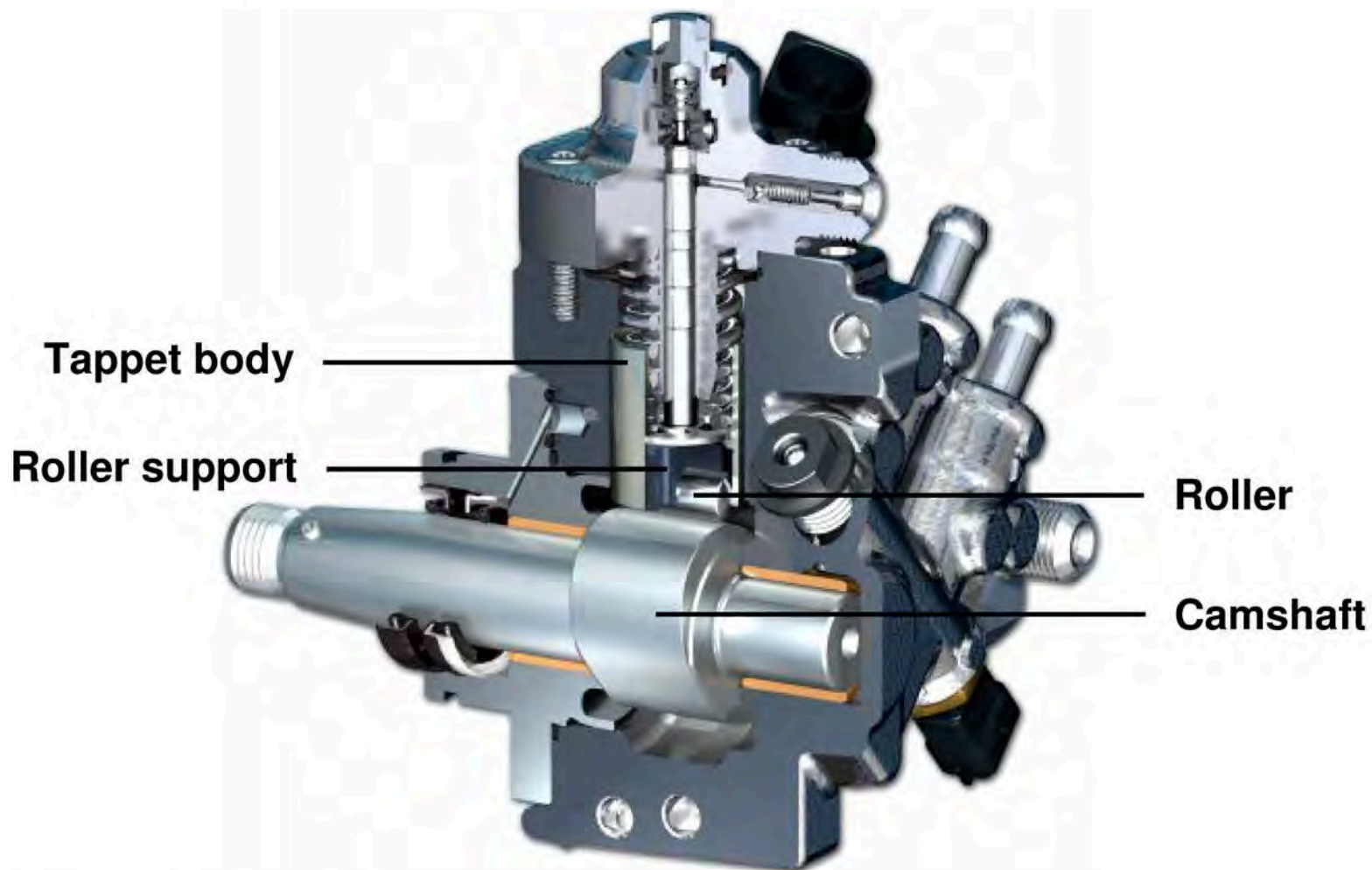
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Status drivetrain damages Bosch CP4



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Vorsprung durch Technik

Audi



Drivetrain damage high-pressure diesel fuel pump CP4.2

TOP meeting between Bosch and Audi on 02/12/2010 in

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Drivetrain damage high-pressure diesel fuel pump CP4.2

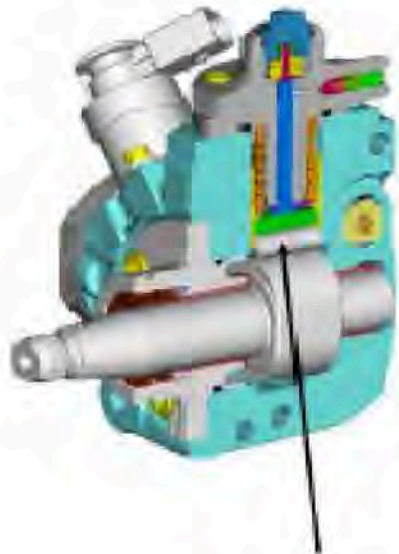
Current field situation:

V6-TDI Audi - worldwide 1,035 settlements / 526 [REDACTED] of which...

- MY08 632 units / 338 [REDACTED] = critical production period
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- MY10 26 units / 8 [REDACTED] = after package of measures 2 (see Slide 3)

V8-TDI – 1 case [REDACTED]

V12-TDI – 2 cases in [REDACTED]



Roller

The "sensitive heart" of the pump is the **drivetrain** with:

- Roller
- Roller support
- Twin camshaft

The **roller** with a very smooth surface must over the entire service life and at all operating conditions:

- glide smoothly in the C coated roller support
- roll over a very slippery cam without slippage

This is not achieved in all situations, **drivetrain damage** can occur in the case of the **sluggishness** in the roller support due to production and country-specific fuel impacts.

The field failure rate for the CP4.2 (V6-TDI) is several times greater than that of the CP4.1 (R4-CR).

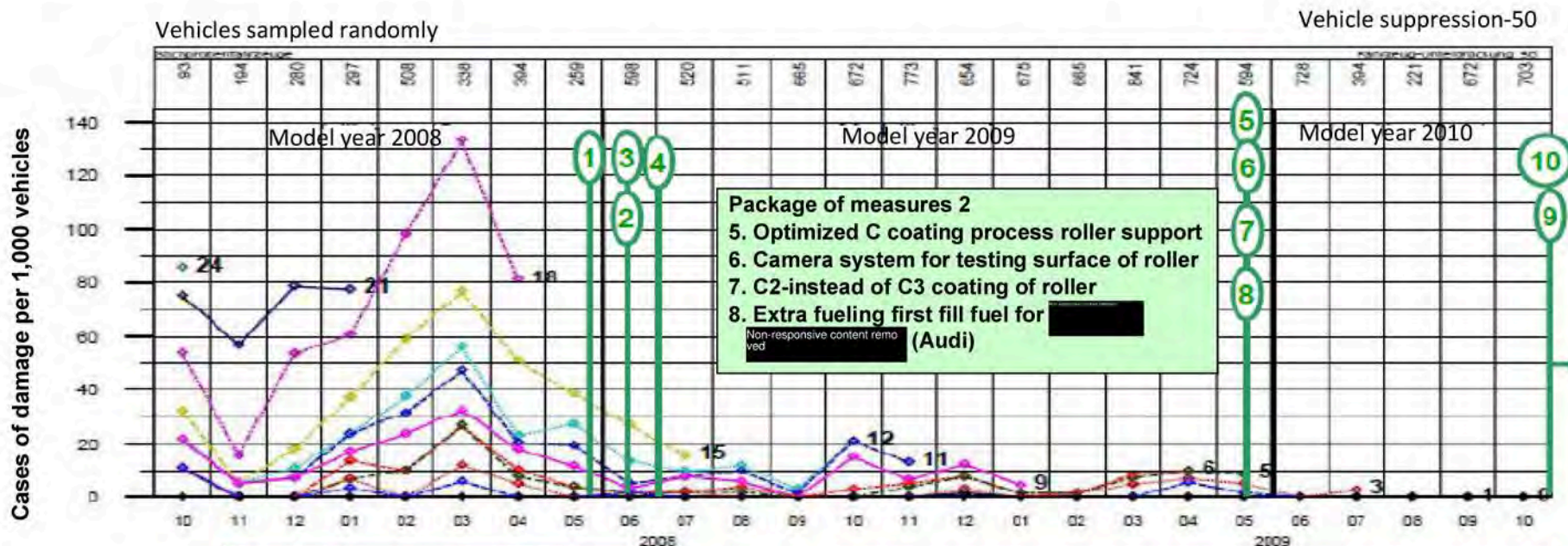
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Audi,*, Market CP4.2
 MY 2008 – 2011, offset: all (Max: 2)
 CNR / Groups: High-pressure fuel pump

Confidential
 Without PR - numbers
 2374

| CAMA | CAMB | CAMD | CANA | CANB | CANC | CAND | CASA | CASB | CASC | CASD | CATA | CATB | CCLA | CCMA | CCWA | CCWB | CDYA | CDYB | CDYC | CGK |
|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|------|--------------|-------|----------|-------|------|------|-----|
| MY | MIS 0 | MIS 1 | MIS 3 | MIS 5 | MIS 6 | MIS 9 | MIS 11 | MIS 12 | MIS 15 | MIS 16 | MIS 21 | MIS 24 | MY | Replace ment | BD | SA10 | SA17 | | | |
| 2008 | 0.0 | 1.7 | 3.9 | 9.0 | 10.3 | 18.0 | 23.6 | 27.8 | 44.5 | 78.5 | 103.2 | 119.7 | 2008 | 100.0% | 81.3% | 75.6% | 14.2% | | | |
| 2009 | 0.1 | 0.8 | 1.9 | 3.8 | 4.4 | 7.8 | 11.7 | 14.3 | 23.0 | | | | 2009 | 97.2% | | 79.4% | 13.1% | | | |
| 2010 | 0.0 | 0.0 | 2.1 | 3.1 | 3.1 | | | | | | | | 2010 | 100.0% | | 50.0% | 50.0% | | | |
| Diff% | -100 | -100 | 8.53 | 16.22 | 29.13 | | | | | | | | | | | MECFAULT | MAJOR | | | |



Package of measures 1
 1. Straightedge test on roller
 2. Visual inspection roller after C coating.
 3. optimized C coating
 4. Improved texture of roller (new second supplier)

Package of measures 3
 9. HC wash of roller support (Jan 2010)
 10. Implementation of Anti-wear package 1, SOP Bosch (March 2010)

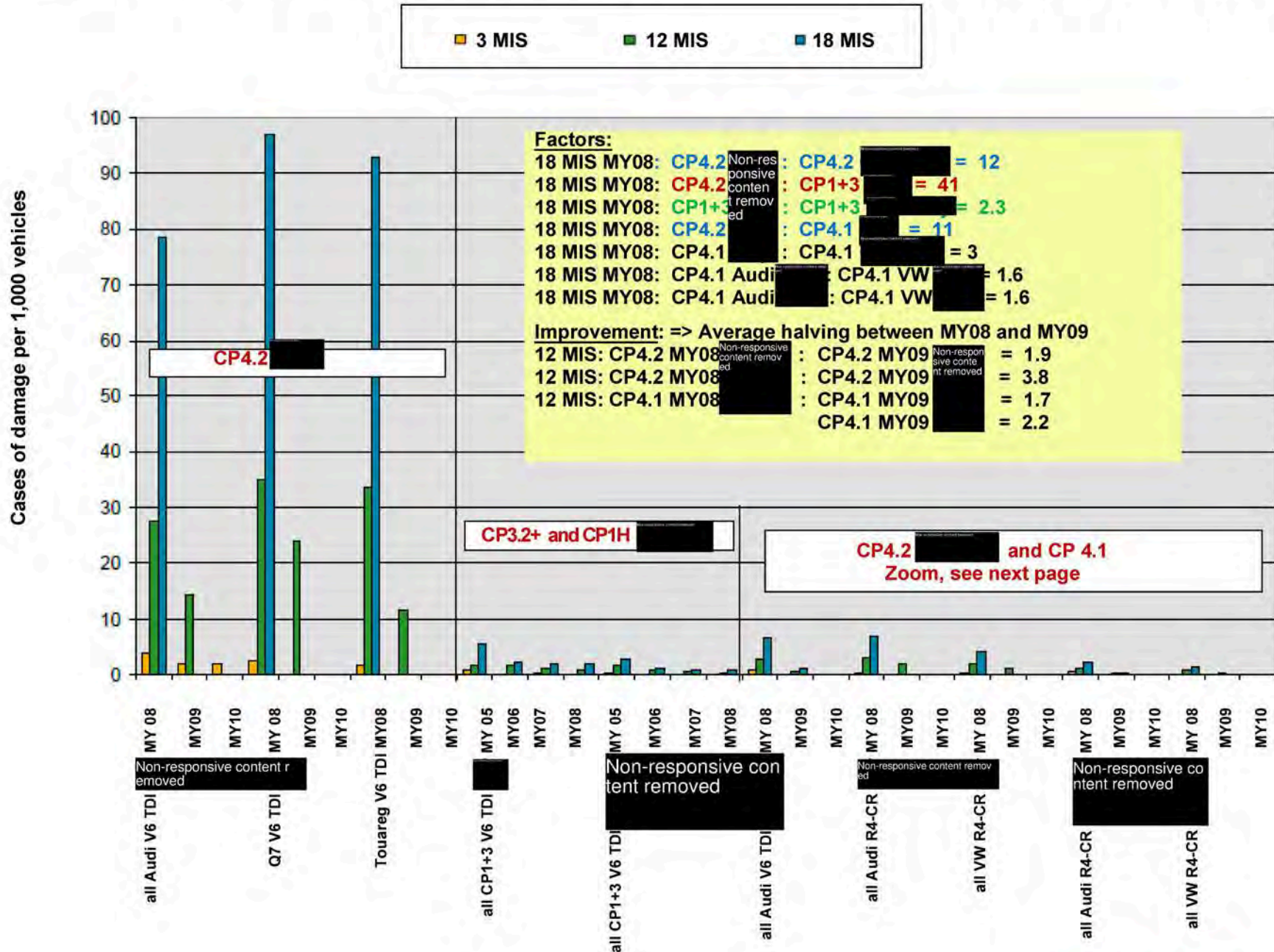
Vehicles: 3,389+12,041+6

76-13,84.1: MY 20



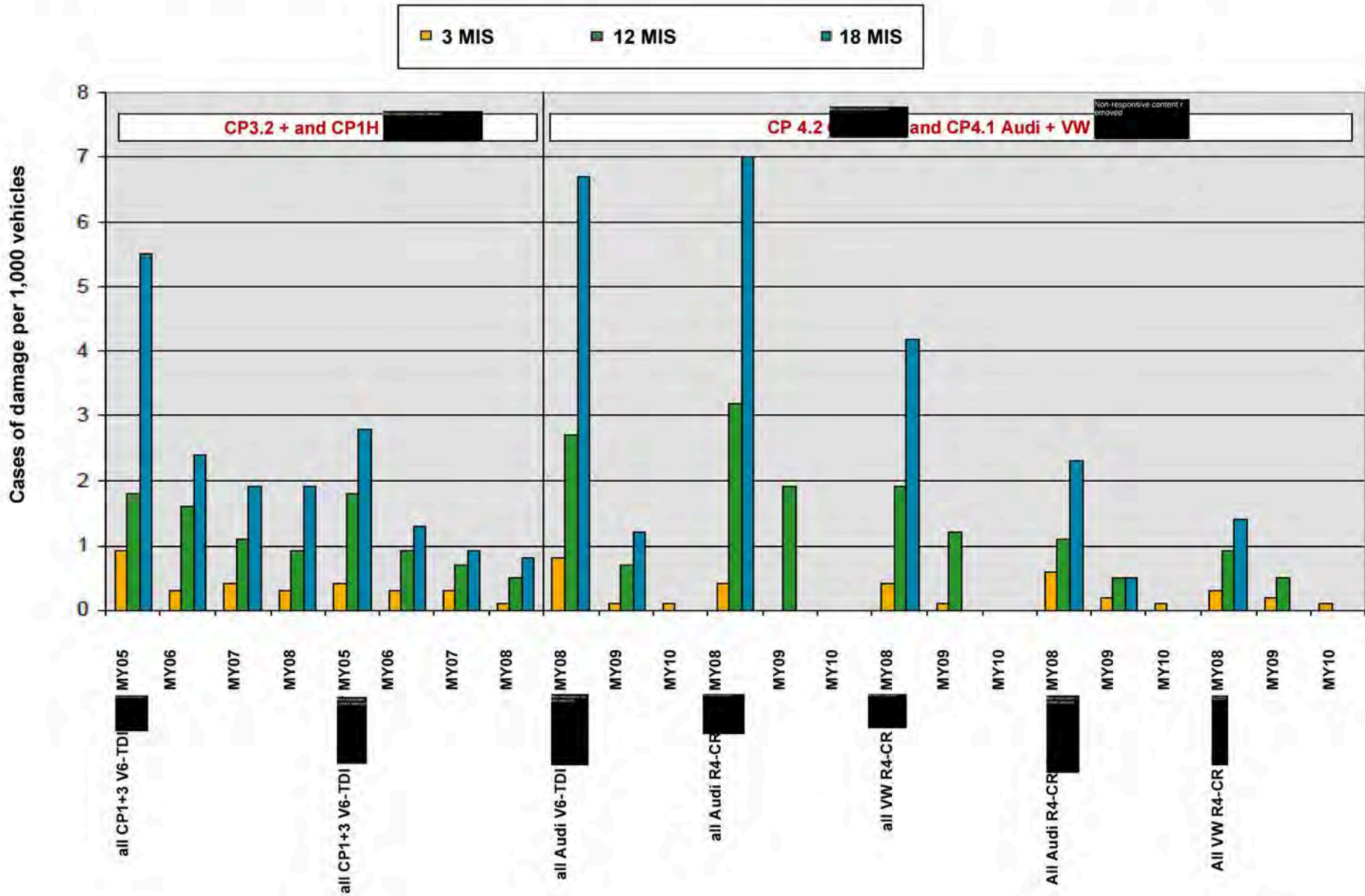
Drivetrain damage high-pressure diesel fuel pump CP4.2

Comparison of damage case rates of Audi-VW / V6-TDI to R4 CR/CP4 to CP1+3



Drivetrain damage high-pressure diesel fuel pump CP4.2

Comparison of damage case rates of Audi-VW [redacted] / V6-TDI to R4 R4-CR (without V6 [redacted])



Drivetrain damage high-pressure diesel fuel pump CP4.2**▶ Anti-wear package 1 (RP1):**

- C2 coating on roller support instead of C3 coating for better surface roughness ($R_v = 0.8$ instead of $1.3 \mu\text{m}$)
- C2 coating also prevents metal splashes
- Play reduction between roller / roller support by offsetting the tolerance band ($18 - 40 \mu\text{m}$ instead of $24 - 46$)
- Bosch has specified extra costs of 0.40 € ; no development costs.

▶ Brief test and efficiency of RP1:

- Basic testing of C2 coating on account of use with competitors in 2010 has been concluded
- Brief test with Arctic diesel - (was originally kerosene) → poor lubrication, lower viscosity fuel up to **WK 08/10** → Target: Establish potential for improvement - RP1
- Efficiency statement: Potential for improvement cannot be evaluated at present.
- No measure in view against new main error hypothesis in [REDACTED] regarding "sluggishness due to the sticking" of the roller

▶ Readiness for production and introduction date:

- Readiness for production Bosch from **WK 09/10** ensured
- Planned approval by Development + QA Bosch + Audi **start of WK 09/10**
- Bosch series production deliveries from **WK 10/10** for comprehensive implementation in all V-diesel in the Group
- First 400 parts initially planned for CS use

Drivetrain damage high-pressure diesel fuel pump CP4.2

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 - Worst-case fuel VW Group / Bosch is defined → Testing from WK 12/10
 - "Old" diesel with 20% portion of biodiesel (B20) → Test running since WK 05/10

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 - Requirement of QA middle 2010 in the case of insufficient efficiency of RP1 + RP2
 - Field situation, [REDACTED] (MIS18 / MY08): CP4.2 factor 41 greater than CP3+1!!!
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- The growth markets of Non-responsive content removed are classified as being particularly fuel critical.

Status drivetrain damages Bosch CP4

- Failures figures for Non-responsive content removed market

| | Produced | Sales | Random sample | Failures | Failures per 1000 |
|----------------------------|----------|--------|---------------|----------|-------------------|
| CP4.1 VW (4 cyl.) | 86,081 | 72,115 | 44,659 | 67 | 0.78 |
| CP4.1 Audi (4 cyl.) | 58,461 | 51,898 | 35,787 | 83 | 1.42 |
| CP4.2 VW (6 cyl.) | 1,562 | 1,310 | 667 | 16 | 10.24 |
| CP4.2 Audi (6 cyl.) | 15,386 | 13,727 | 8,998 | 153 | 9.94 |

Status 12/2009

- Failure figures for **USA market**

| | Produced | Sales | Random sample | Failures | Failures per 1000 |
|--------------------------|----------|--------|---------------|----------|-------------------|
| CP4.1 VW (4 cyl.) | 58,097 | 52,404 | 41,034 | 108 | 1.86 |

Status 12/2009

- Failure figures for Non-responsive content removed market

| | Produced | Sales | Random sample | Failures | Failures per 1000 |
|----------------------------|----------|---------|---------------|----------|-------------------|
| CP4.1 VW (4 cyl.) | 249,966 | 219,348 | 183,737 | 19 | 0.08 |
| CP4.1 Audi (4 cyl.) | 151,640 | 143,838 | 128,026 | 53 | 0.35 |

Status 01/2010

Non-responsive content removed



Status drivetrain damages Bosch CP4

- **General cause of CP4 drivetrain damage:**

- Unacceptably high mixed friction between roller and roller support cause local contacts during operation
- The C coating of the roller support is disrupted (wear and erosion of the C coating), the coefficient of friction between the roller and roller support increases.
- Stiffness of roller \Rightarrow wear \Rightarrow particle formation \Rightarrow drivetrain damage
- Intensification factors: Fuel With low viscosity, elevated spots on the roller (fusing) and on roller support (metal splashes); surface of roller/roller support

- **Failure hypothesis of [redacted] market**

- Blending of aged biodiesel with fuel in the [redacted] market leads to deposit formation and oxidation in the high-pressure fuel pump \Rightarrow tribochemical wear, deposits from algae and oxidation products, corrosion on the surface of the camshaft and roller \Rightarrow stiff roller
- Further analyses of flow and pressure conditions in tappet chambers are under progress,
Effect of LP-cycle and tappet position when switching off the engine (critical against turning in the TDC position).

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Status drivetrain damages Bosch CP4

- **Introduction of anti-wear package 1 for CP4:**
- **Task**
 - Robustness increase of the drivetrain by increasing the lubricant film thickness between roller support hole and roller.
- **Characteristics of the anti-wear package 1**
 - Reducing the roller support texture in combination with switchover to C2 coating on the roller support.
 - Reduction of the clearance between roller support and roller by adjusting the center of tolerance and the tolerance range of roller support hole.
 - Validation to WK 08/2010, then introduction into series production as soon as possible.

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Status drivetrain damages Bosch CP4

- **Following HPP drivetrain damage:**

- Chip formation in high-pressure fuel pump drivetrain
- Chip formation distributed through entire fuel system
- Malfunctions of HPP, PCV, RPS, injectors, PRV

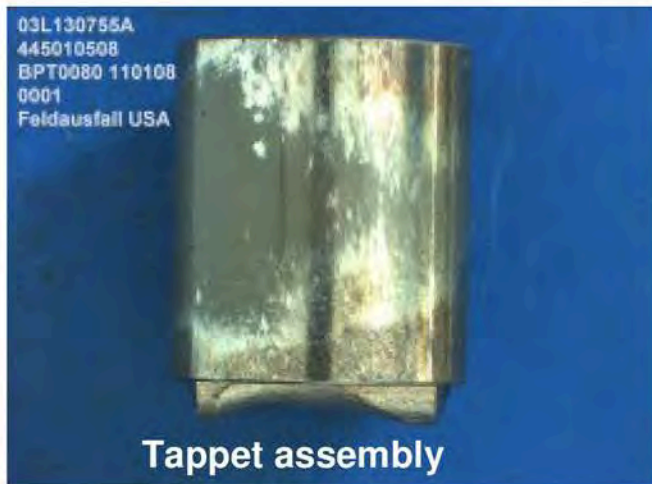
- **Repair effort:**

- Replacement of the entire injection system comprising:
 - Fuel filter
 - High-pressure fuel pump
 - High-pressure lines
 - Rail, incl. rail pressure sensor and pressure control valve
 - Injectors,
 - Fuel return line,
 - Fuel lines
 - Cleaning of the fuel tank and flushing the lines

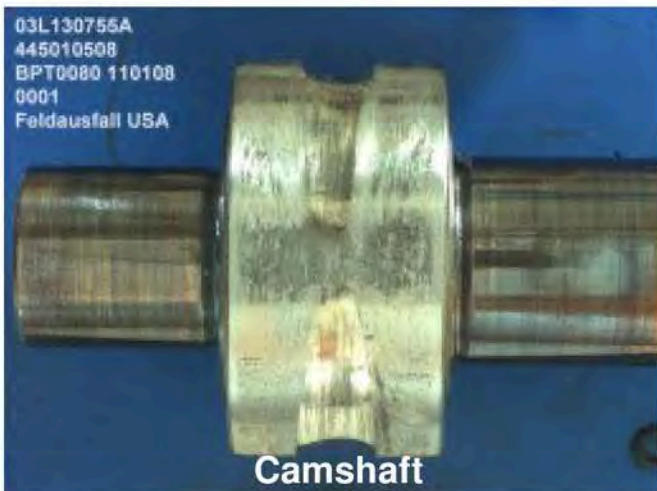
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Status drivetrain damages Bosch CP4



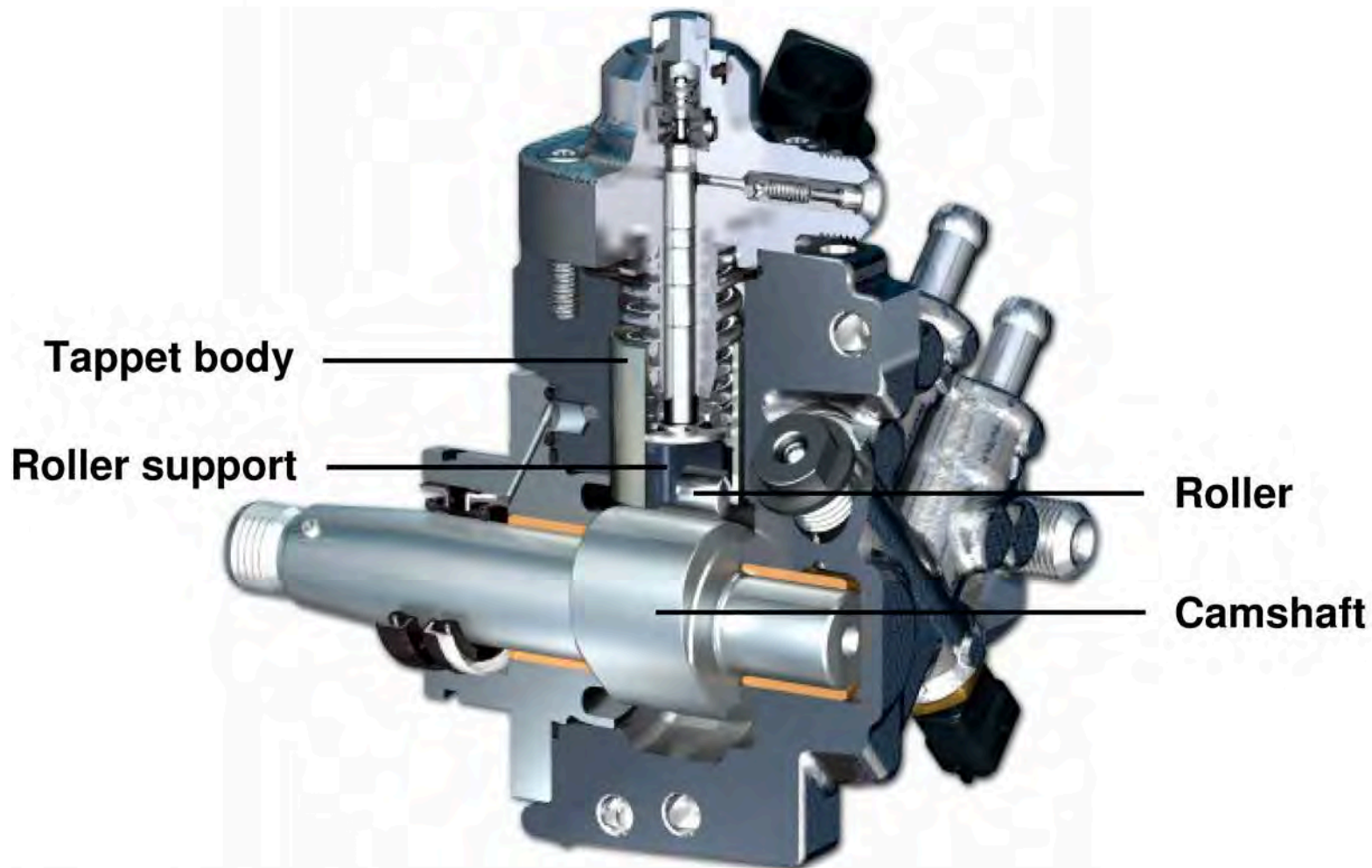
03L130755A*
445010508
BPT0080 110108
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Field failure USA



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Status drivetrain damages Bosch CP4



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EA11003EN-02112[0]

From: Non-responsive content removed
To: [Redacted]
CC: [Redacted]

Date: 02.25.2010 12:49:45 PM

Subject: V6 TDI CP4.2 drivetrain damages

Attachments: [TS Wochenstatus 22_02_10.ppt](#)
[TOP-Gespräch Bosch-Audi 11.02.10.ppt](#)

Hello [Redacted]

As just discussed above, attached is the up-to-date compilation of the field situation and other activities regarding HPP:

In particular, the high damage rates of MY 09 [Redacted] and the current failures in [Redacted] and [Redacted] are scary!

The production-related failures primarily concern MY 08 (see also our document from the TOP meeting Audi / Bosch on 02.12.10)

For this reason, we currently do not grant NEW approvals for V6 TDI concepts in ROW markets. This primarily affects the EU4 without DPF versions of Q5, Q7 and B8.

Please give your feedback on whether you also want to position yourself like that.

With kind regards,

Non-responsive content removed
[Redacted]

Domicile: Ingolstadt
Court of Registry: Local District Court Ingolstadt
Commercial Register No.: 1
Chairman of the Supervisory Board: Martin Winterkorn
Board of Management: Rupert Stadler (Vorsitzender/Chairman), Ulf Berkenhagen, Michael Dick, Frank Dreves, Peter Schwarzenbauer, Axel Strotbek, Werner Widuckel

Wichtiger Hinweis: Die vorgenannten Angaben werden jeder E-Mail automatisch hinzugefügt und lassen keine Rückschlüsse auf den Rechtscharakter der E-Mail zu.
Important Notice: The above information is automatically added to this e-mail. This addition does not constitute a representation that the content of this e-mail is legally relevant and/or is intended to be legally binding upon AUDI AG.

Vorsprung durch Technik

Audi



Drivetrain damage high-pressure diesel fuel pump CP4.2

TOP meeting between Bosch and Audi on 02/12/2010 in

Non-responsive content removed

Drivetrain damage high-pressure diesel fuel pump CP4.2

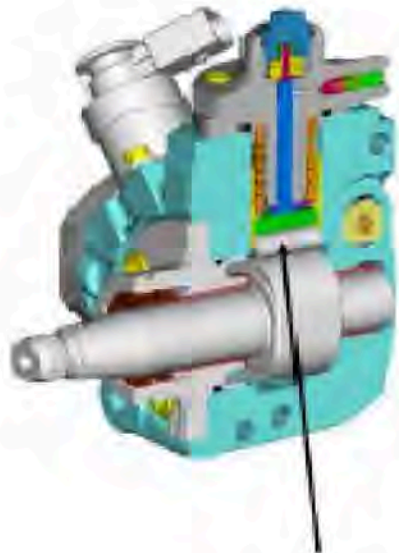
Current field situation:

V6-TDI Audi – worldwide 1035 settlements / 526 [REDACTED] of which...

- MY08 632 units / 338 [REDACTED] = critical production period
- MY09 377 units / 180 [REDACTED] = after package of measures 1 (see slide 3)
- MY10 26 units / 8 [REDACTED] = after package of measures 2 (see Slide 3)

V8-TDI – 1 case [REDACTED]

V12-TDI – 2 cases in [REDACTED]



Roller

The "sensitive heart" of the pump is the **drivetrain** with:

- Roller
- Roller support
- Twin camshaft

The **roller** with a very smooth surface must over the entire service life and at all operating conditions:

- glide smoothly in the C coated roller support
- roll over a very slippery cam without slippage

This is not achieved in all situations, **drivetrain damage** can occur in the case of the **sluggishness** in the roller support due to production and country-specific fuel impacts.

The field failure rate for the CP4.2 (V6-TDI) is several times greater than that of the CP4.1 (R4-CR).

AQUA: active quality analysis
 Status as on **09/12-01.16.10 08:43**
 Source/User: [Non-responsive content removed]

Audi,*, Market: [Redacted] CP4.2
MY 2008 – 2011, offset: all (Max: 2)
CNR / Groups: High-pressure fuel pump

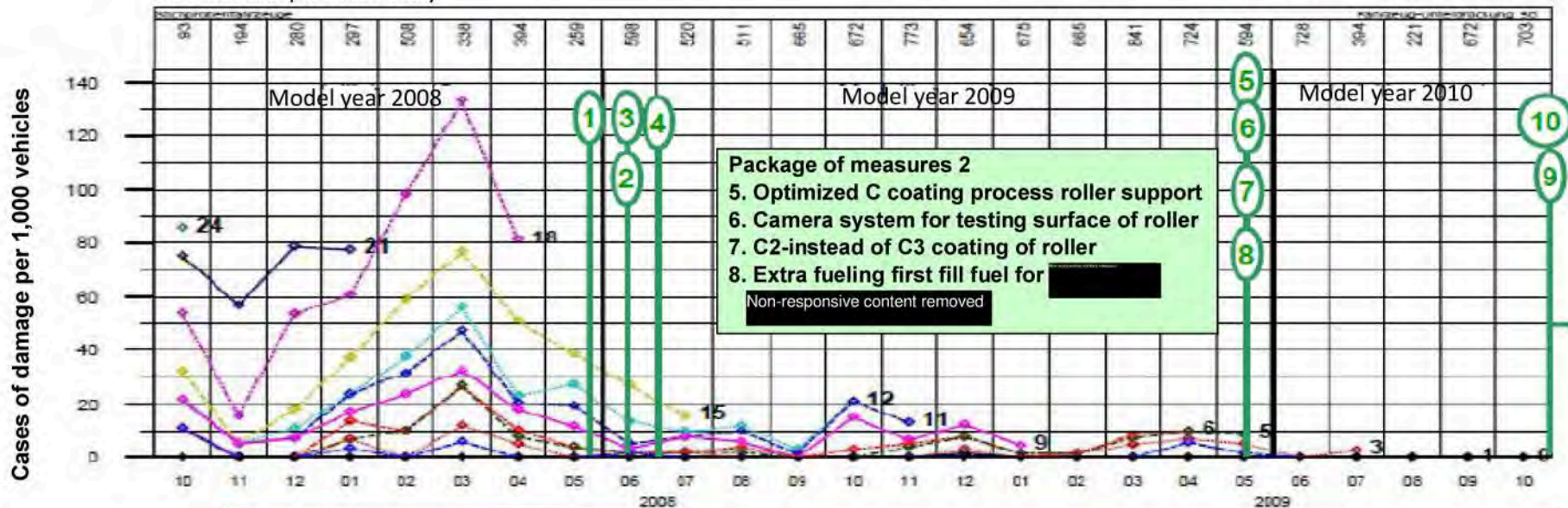
Confidential
 Without PR - numbers
2374

CNR

| CAMA | CAMB | CAMD | CANA | CANB | CANC | CAND | CASA | CASB | CASC | CASD | CATA | CATB | CCLA | CCMA | CCWA | CCWB | CDYA | CDYB | CDYC | CGK |
|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|------|--------------|-------|-------|---------|-------|------|-----|
| MY | MIS 0 | MIS 1 | MIS 3 | MIS 5 | MIS 6 | MIS 9 | MIS 11 | MIS 12 | MIS 15 | MIS 16 | MIS 21 | MIS 24 | MY | Replace ment | BD | SA10 | SA17 | | | |
| 2008 | 0.0 | 1.7 | 3.9 | 9.0 | 10.3 | 18.0 | 23.6 | 27.8 | 44.5 | 78.5 | 103.2 | 119.7 | 2008 | 100.0% | 81.3% | 75.6% | 14.2% | | | |
| 2009 | 0.1 | 0.8 | 1.9 | 3.8 | 4.4 | 7.8 | 11.7 | 14.3 | 23.0 | | | | 2009 | 97.2% | | 79.4% | 13.1% | | | |
| 2010 | 0.0 | 0.0 - | 2.1 | 3.1 | 3.1 | | | | | | | | 2010 | 100.0% | | 50.0% | 50.0% | | | |
| Diff% | -100 | -100 | 8.53 | 16.22 | 29.13 | | | | | | | | | | | | MEC ERR | MAJOR | | |

Vehicles sampled randomly

Vehicle suppression-50



Package of measures 2
 5. Optimized C coating process roller support
 6. Camera system for testing surface of roller
 7. C2-instead of C3 coating of roller
 8. Extra fueling first fill fuel for [Redacted]

Package of measures 1
 1. Straightedge test on roller
 2. Visual inspection roller after C coating.
 3. optimized C coating
 4. Improved texture of roller (new second supplier)

Package of measures 3
 9. HC wash of roller support (Jan 2010)
 10. Implementation of Anti-wear package 1, SOP Bosch (March 2010)

Vehicles: 3,389+12,041+6 76-13,84.1: MY 20

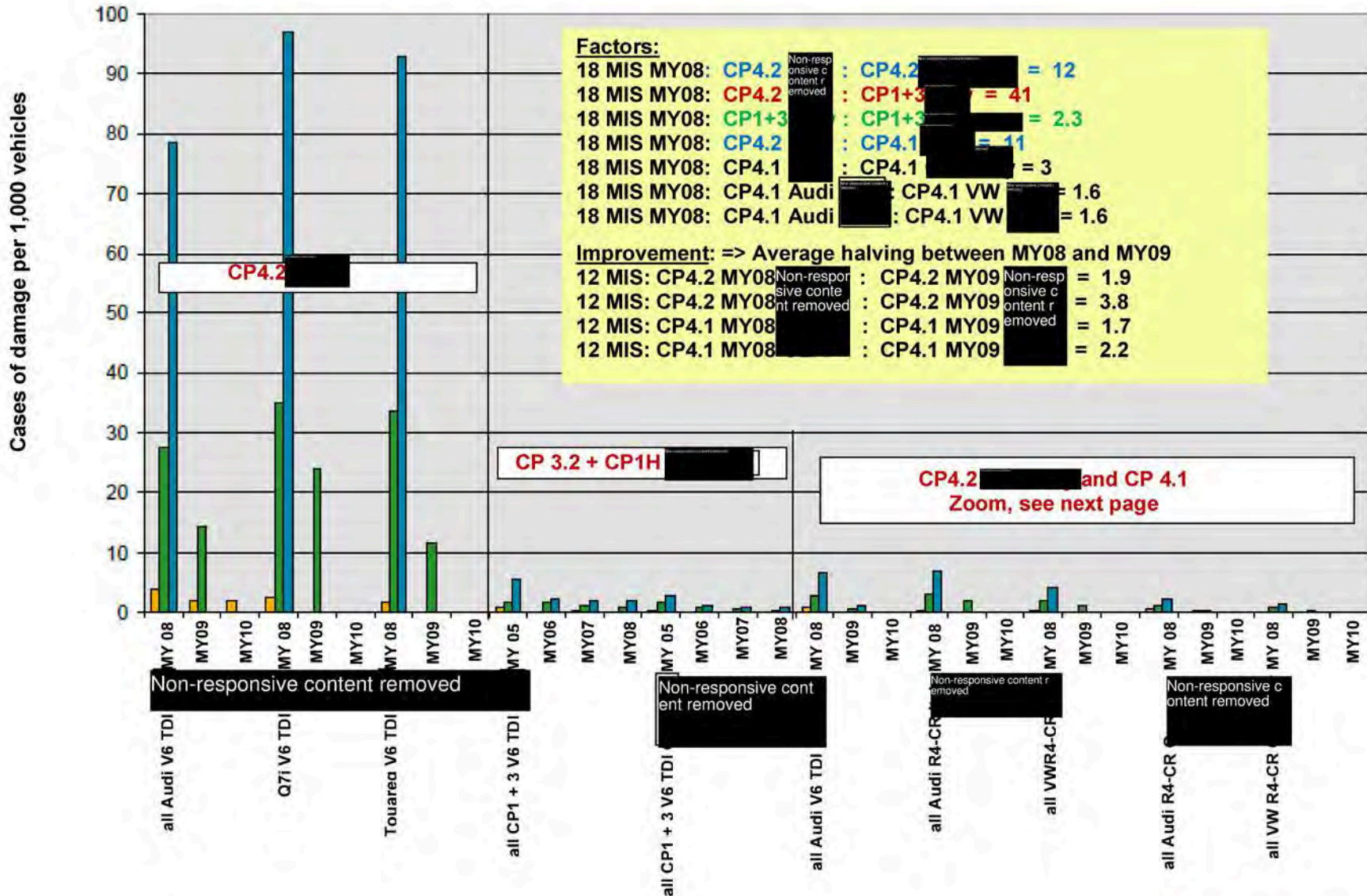
Diesel Systems

Confidential [Redacted] 02.03.2010 | © Robert Bosch GmbH 2008 All rights reserved, also regarding any disposal
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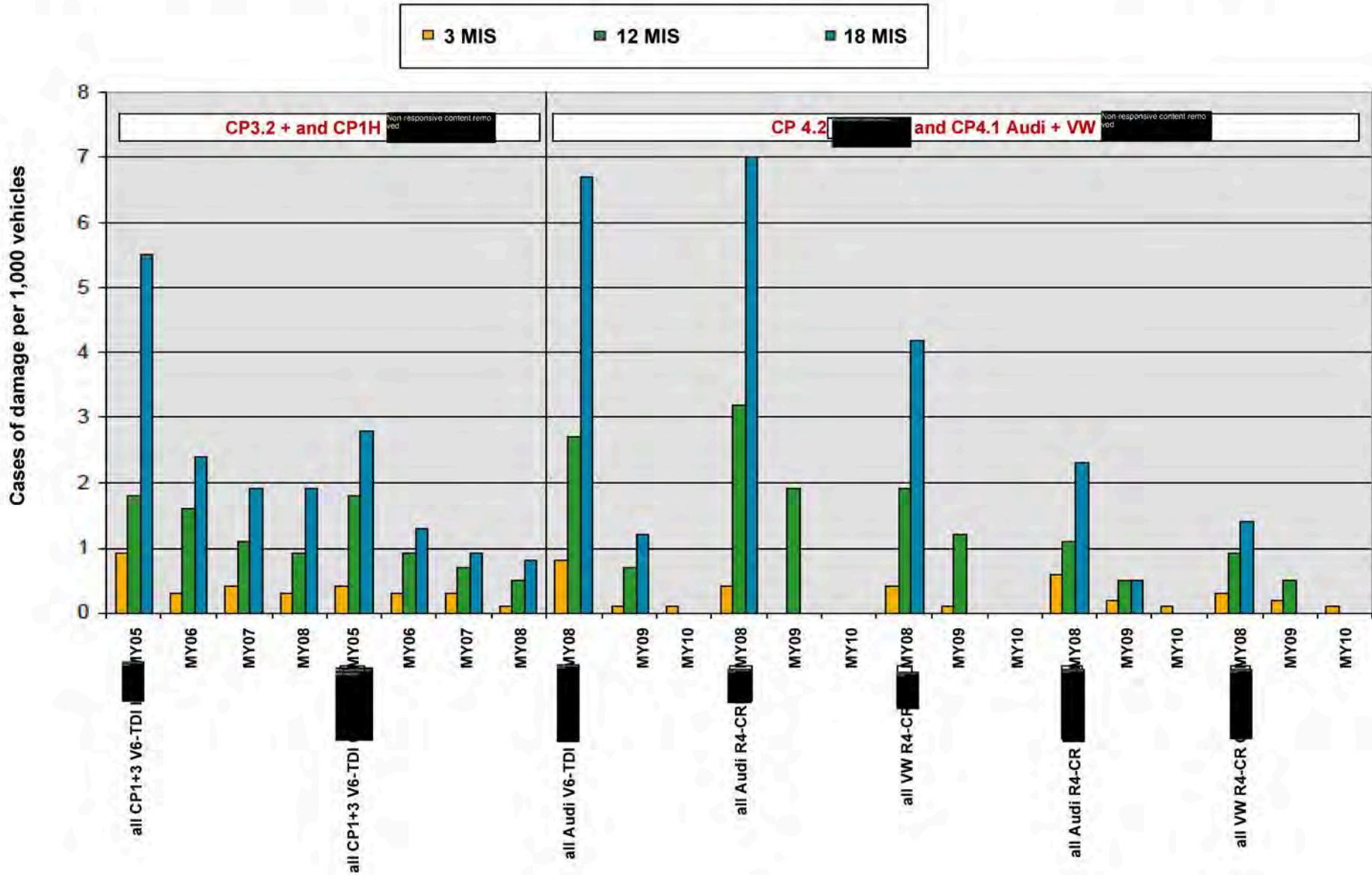
Drivetrain damage high-pressure diesel fuel pump CP4.2

Comparison of damage case rates of Audi-VW [redacted] / V6-TDI to R4 CR/CP4 to CP1+3



Drivetrain damage high-pressure diesel fuel pump CP4.2

Comparison of damage case rates of Audi-VW / Non-responsive content removed V6-TDI to R4 R4-CR (without V6 Non-responsive content removed)



Drivetrain damage high-pressure diesel fuel pump CP4.2**▶ Anti-wear package 1 (RP1):**

- C2 coating on roller support instead of C3 coating for better surface roughness ($R_v = 0.8$ instead of $1.3 \mu\text{m}$)
- C2 coating also prevents metal splashes
- Play reduction between roller / roller support by offsetting the tolerance band ($18 - 40 \mu\text{m}$ instead of $24 - 46$)
- Bosch has specified extra costs of [redacted] no development costs.

▶ Brief test and efficiency of RP1:

- Basic testing of C2 coating on account of use with competitors in 2010 has been concluded
- Brief test with Arctic diesel - (was originally kerosene) → poor lubrication, lower viscosity fuel up to **WK 08/10** → Target: Establish potential for improvement - RP1
- Efficiency statement: Potential for improvement cannot be evaluated at present.
- No measure in view against new main error hypothesis in [redacted] regarding "sluggishness due to the sticking" of the roller

▶ Readiness for production and introduction date:

- Readiness for production Bosch from **WK 09/10** ensured
- Planned approval by Development + QA Bosch + Audi **start of WK 09/10**
- Bosch series production deliveries from **WK 10/10** for comprehensive implementation in all V-diesel in the Group
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Drivetrain damage high-pressure diesel fuel pump CP4.2

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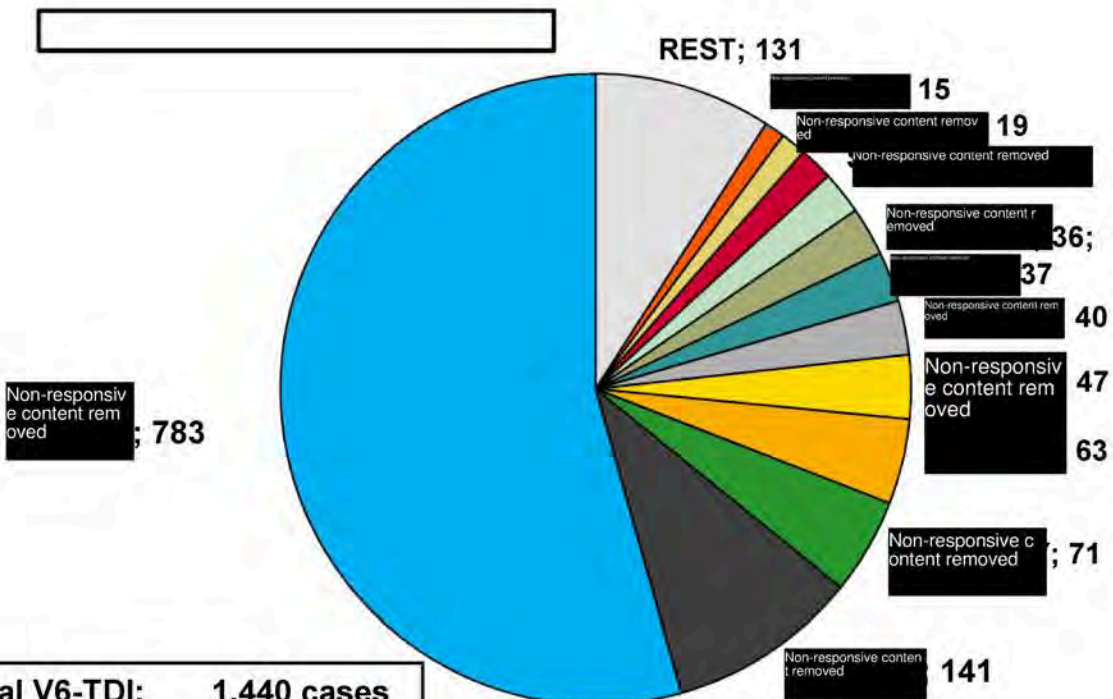
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| Country | Total until 1/11/2010 | Total 2/7/2010 | Total 3/7/2010 | Total 4/11/2010 | Total 5/9/2010 | 4 weeks Increase 1/11-2/7/10 | 4 weeks Increase 2/7-3/7/10 | 5 weeks Increase 3/7-4/11/10 | 4 weeks Increase 4/11-5/9/10 |
|--------------------------------|-----------------------|----------------|----------------|-----------------|----------------|------------------------------|-----------------------------|------------------------------|------------------------------|
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| | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 |
| | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
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| | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 0 | 0 |
| | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 0 | 0 |
| | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 0 | 0 |
| | 1 | 2 | 2 | 2 | 2 | 0 | 0 | 0 | 0 |
| | 1 | 1 | 2 | 2 | 2 | 0 | 1 | 1 | 0 |
| USA | 2 | 2 | 2 | 2 | 2 | 1 | 0 | 0 | 0 |
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| | 4 | 4 | 4 | 4 | 4 | 0 | 0 | 2 | 0 |
| | 4 | 4 | 4 | 4 | 4 | 0 | 1 | 1 | 0 |
| | 2 | 2 | 3 | 4 | 4 | 0 | 0 | 0 | 0 |
| | 4 | 4 | 4 | 5 | 5 | 0 | 0 | 0 | 0 |
| | 5 | 5 | 5 | 5 | 5 | 0 | 0 | 1 | 0 |
| | 6 | 6 | 6 | 6 | 6 | 1 | 0 | 3 | 0 |
| | 3 | 3 | 3 | 5 | 6 | 0 | 0 | 4 | 1 |
| | 7 | 7 | 7 | 7 | 7 | 0 | 0 | 0 | 0 |
| | 4 | 5 | 5 | 8 | 9 | 0 | 0 | 0 | 1 |
| | 7 | 7 | 7 | 8 | 9 | 0 | 0 | 0 | 1 |
| | 9 | 9 | 10 | 10 | 10 | 0 | 0 | 1 | 0 |
| | 5 | 5 | 5 | 9 | 10 | 1 | 0 | 2 | 1 |
| | 9 | 10 | 11 | 11 | 11 | 0 | 1 | 0 | 0 |
| | 9 | 9 | 10 | 12 | 12 | 0 | 1 | 2 | 0 |
| | 9 | 10 | 10 | 12 | 15 | 1 | 1 | 0 | 3 |
| | 11 | 13 | 16 | 18 | 19 | 2 | 3 | 2 | 1 |
| | 19 | 20 | 21 | 24 | 25 | 1 | 1 | 3 | 1 |
| | 29 | 30 | 32 | 32 | 32 | 0 | 0 | 2 | 0 |
| | 29 | 31 | 32 | 35 | 36 | 1 | 2 | 0 | 1 |
| | 29 | 29 | 29 | 31 | 37 | 2 | 1 | 3 | 6 |
| | 40 | 40 | 40 | 40 | 40 | 2 | 3 | 9 | 0 |
| | 28 | 30 | 33 | 42 | 47 | 0 | 0 | 0 | 5 |
| | 50 | 54 | 58 | 60 | 63 | 4 | 4 | 2 | 3 |
| | 49 | 56 | 64 | 70 | 71 | 7 | 8 | 6 | 1 |
| | 86 | 96 | 107 | 131 | 141 | 10 | 11 | 24 | 10 |
| | 496 | 544 | 627 | 705 | 783 | 48 | 83 | 78 | 78 |
| | 974 | 1,057 | 1,179 | 1,325 | 1,440 | 83 | 122 | 146 | 115 |

| | MY08 | MY09 | MY10 | |
|--------------------------------|------|-----------|------|-----------|
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| | 42 | | 98 | |
| | 383 | | 246 | |
| | 694 | 470 | 35 | 1,199 |

| | |
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| | 15 |
| | 19 |
| | 25 |
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| | 36 |
| | 37 |
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| | 47 |
| | 63 |
| | 71 |
| | 141 |
| | 783 |
| Total | 1,440 |

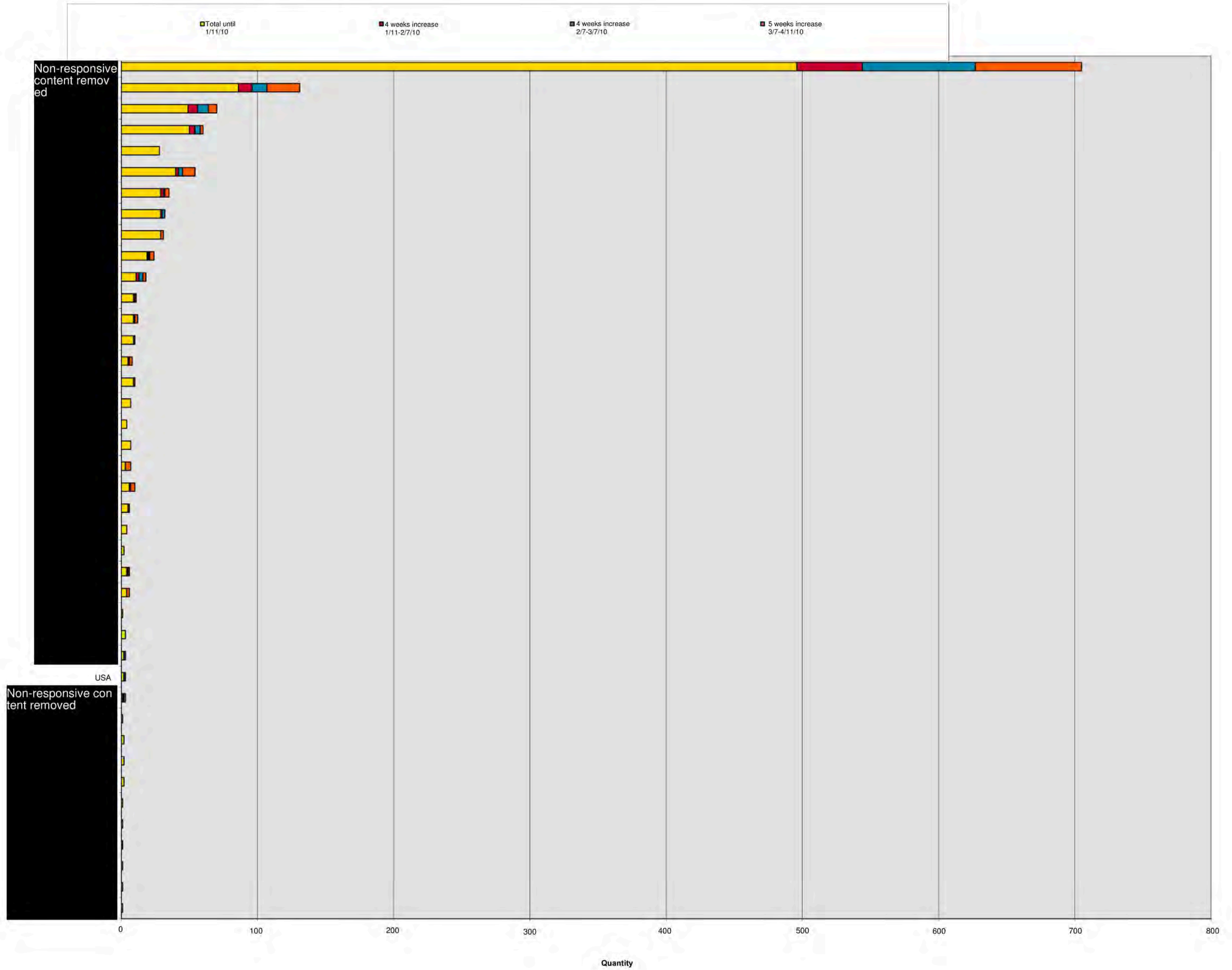


Total V6-TDI: 1,440 cases worldwide
MY08: 767 cases
MY09 614 cases

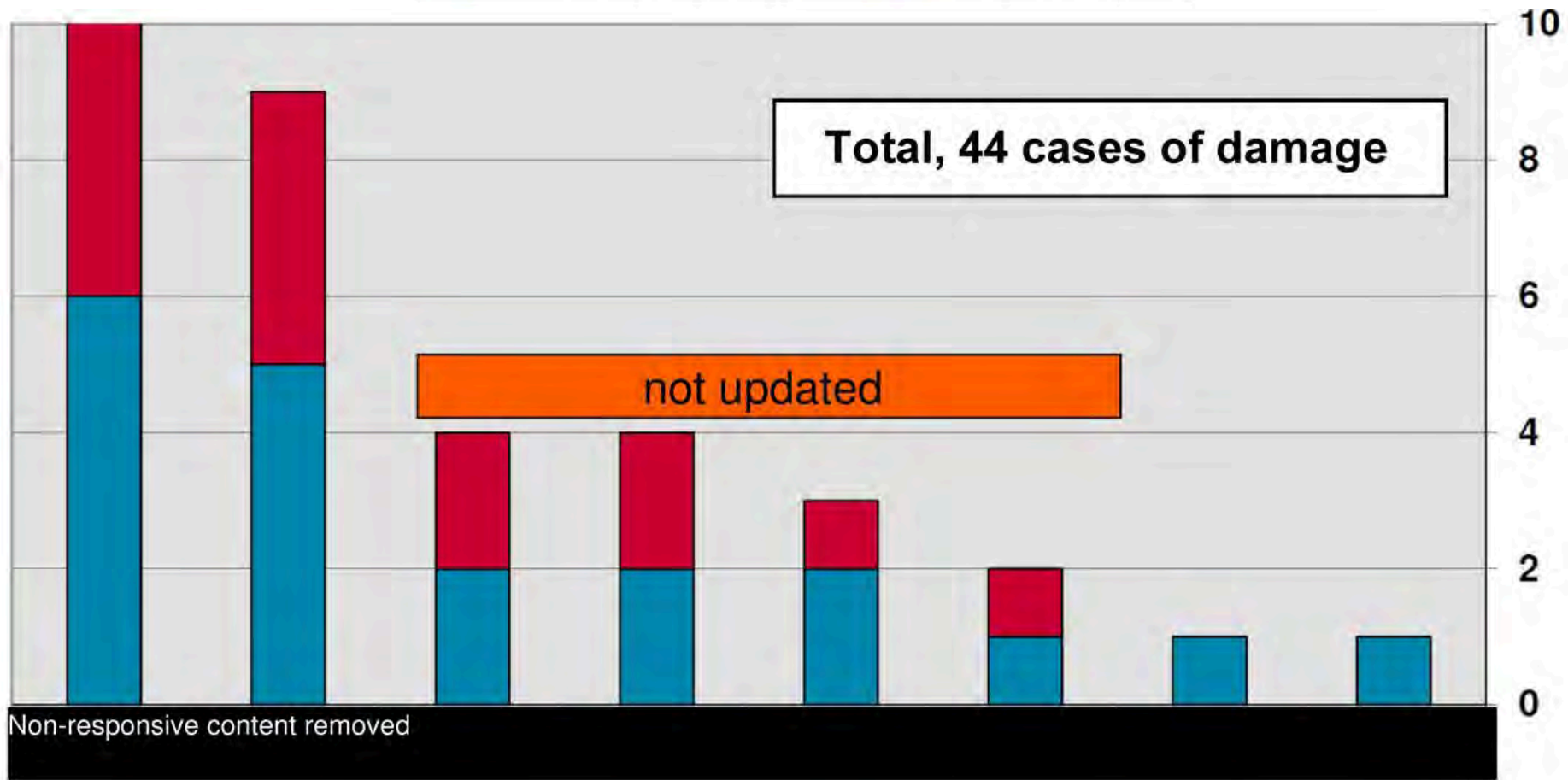
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CP4.2 Audi V6-TDI pump replacement worldwide

Country of failure

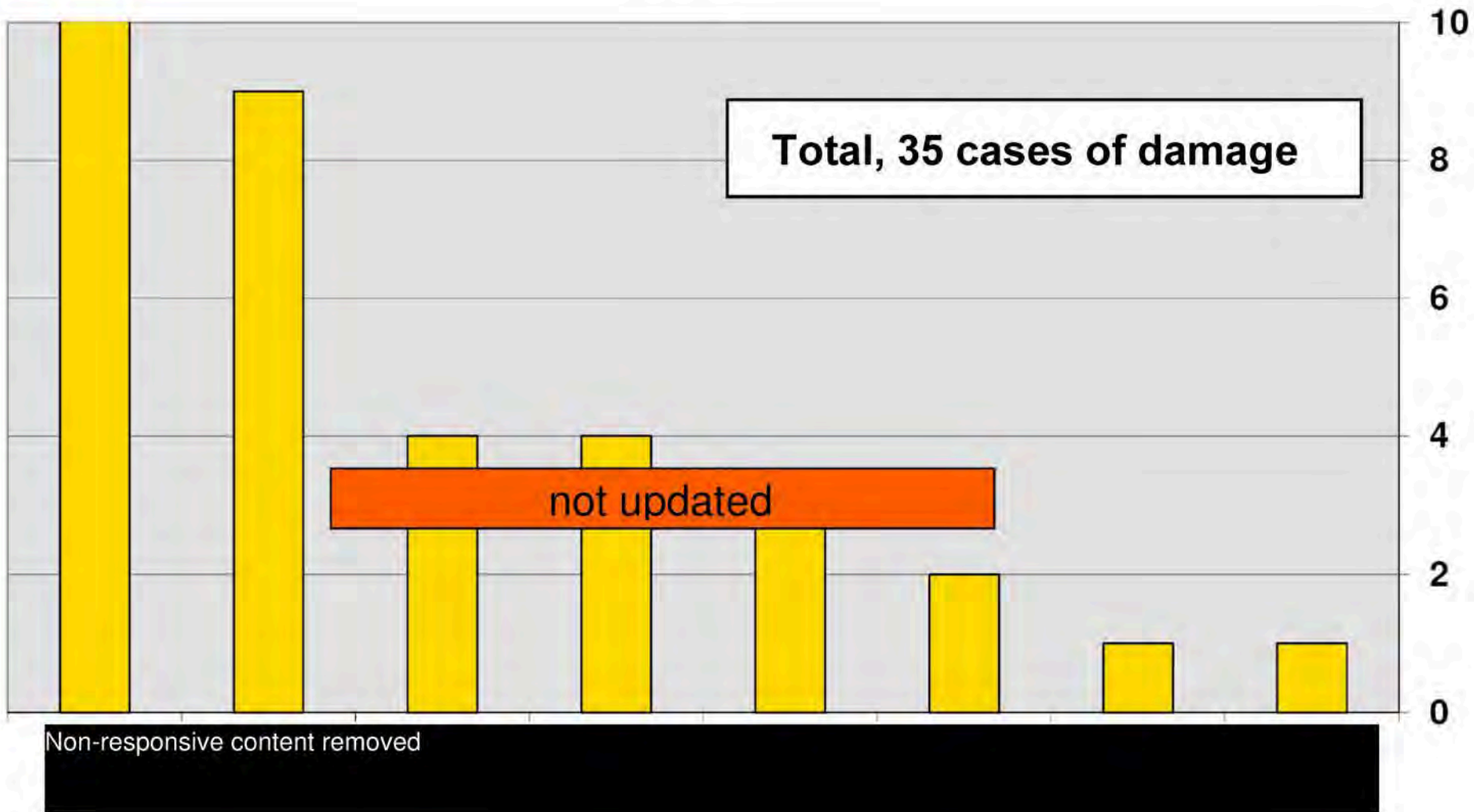


Failures MY 2010 only

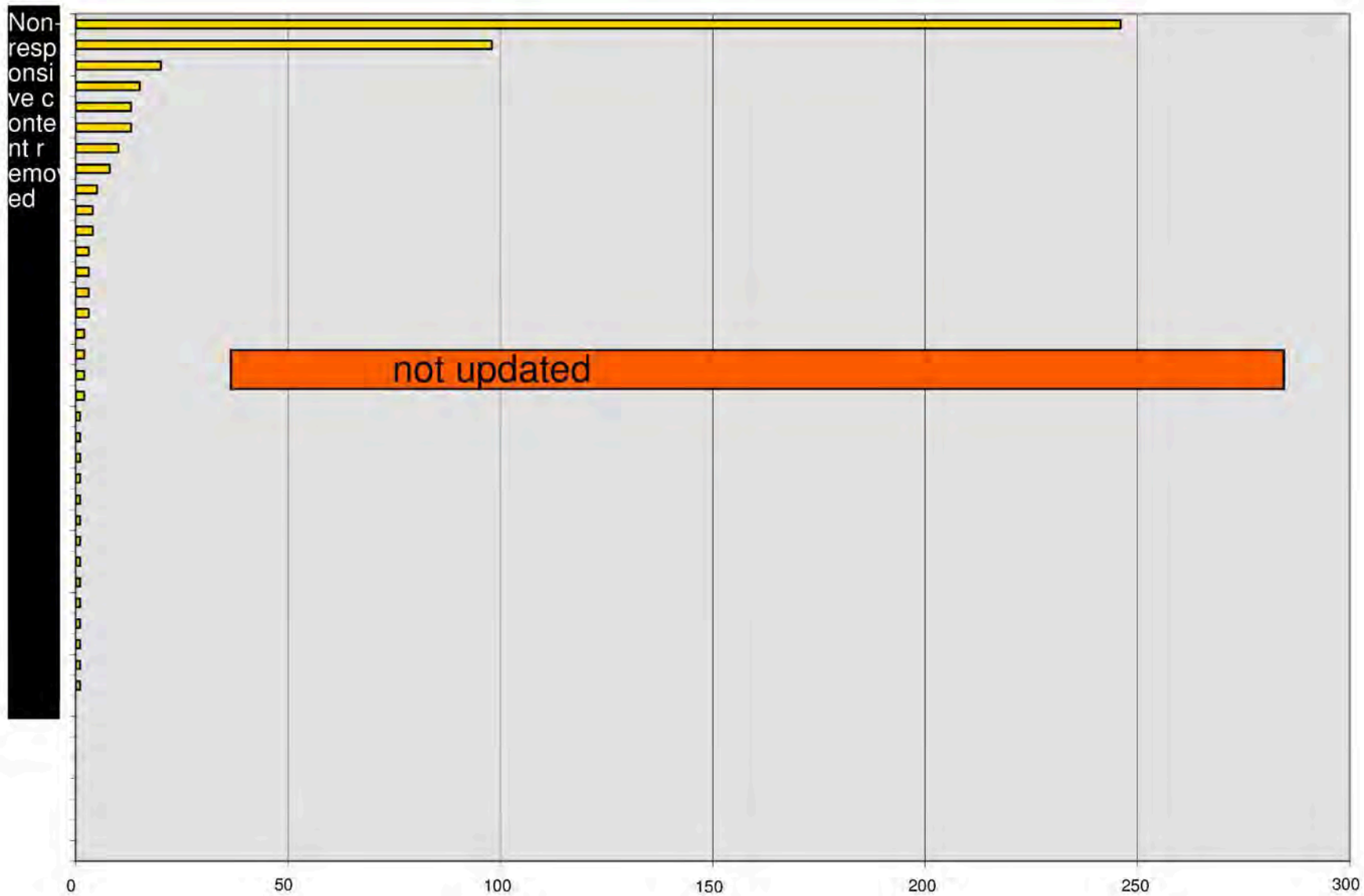


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MY10



MY09



MY09

MY08

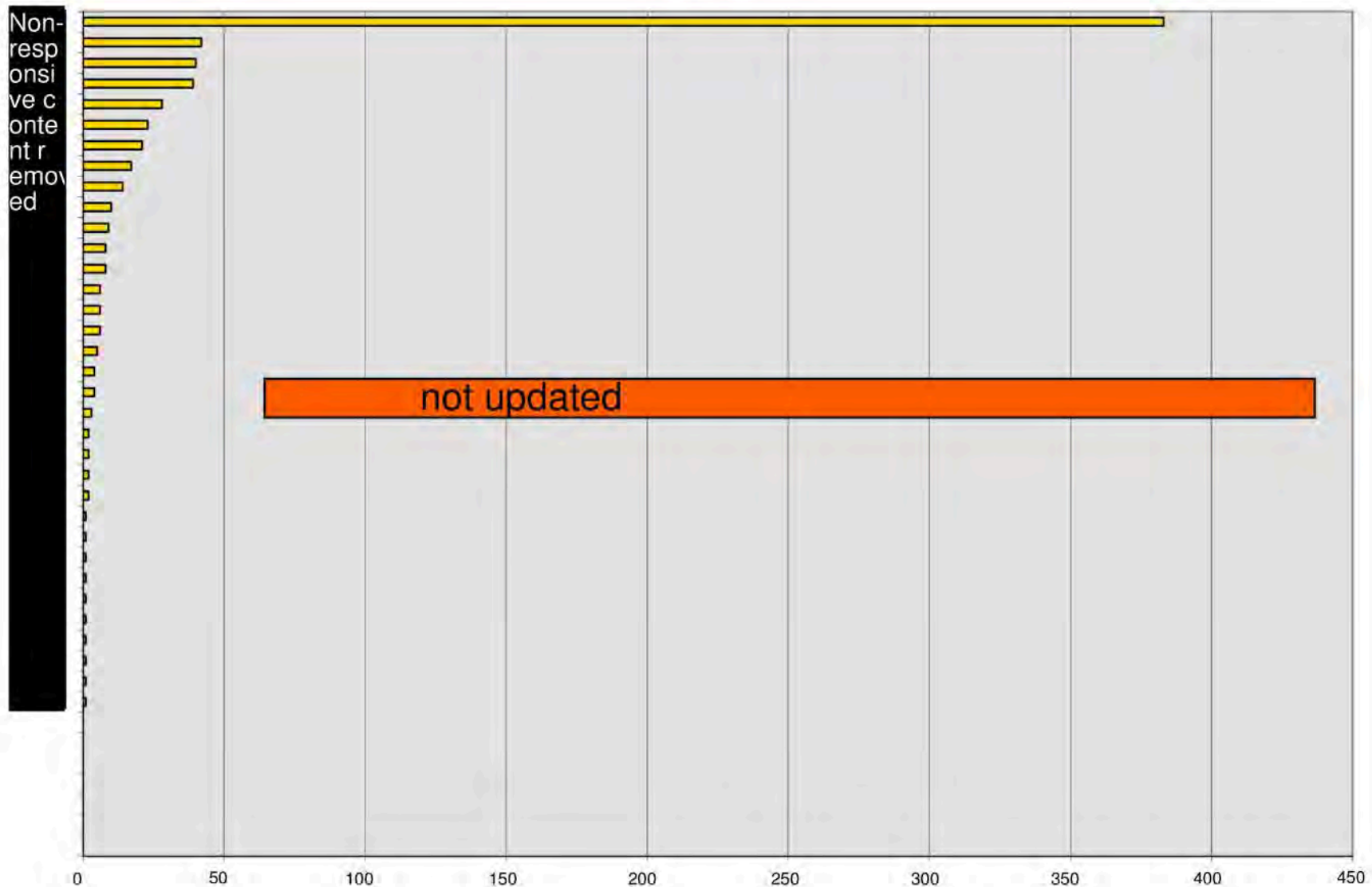


Chart for increase MY10

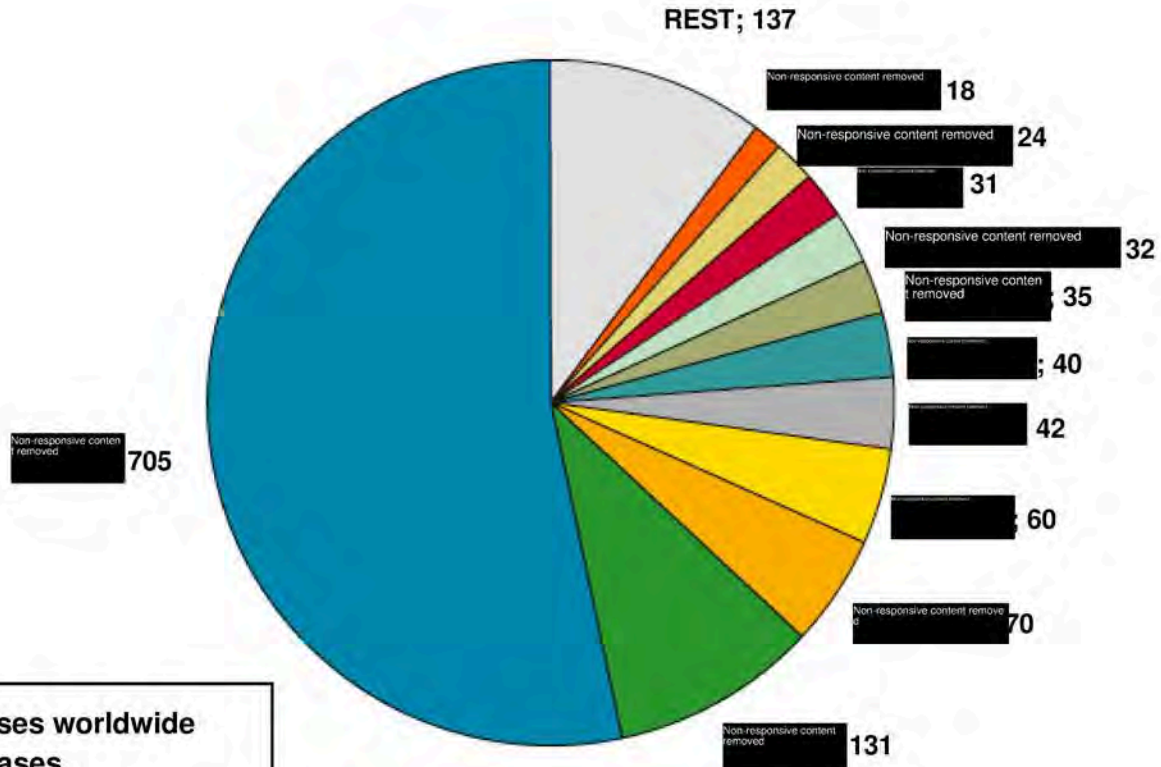
| Country | as of 1/11/2010 | 4/11/2010 | Increase 1/11-3/14/2010 |
|--------------------------------|-----------------|-----------|-------------------------|
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| | 1 | 1 | 0 |
| | 1 | 2 | 1 |
| | 2 | 3 | 1 |
| | 2 | 4 | 2 |
| | 2 | 4 | 2 |
| | 5 | 9 | 4 |
| | 6 | 11 | 5 |
| Overall result | 20 | 44 | 24 |

not updated



Drivetrain damage high-pressure diesel fuel pump CP4.2
TOP - meeting Bosch / Audi on April 16, 2010

Drivetrain damage high-pressure diesel fuel pump CP4.2

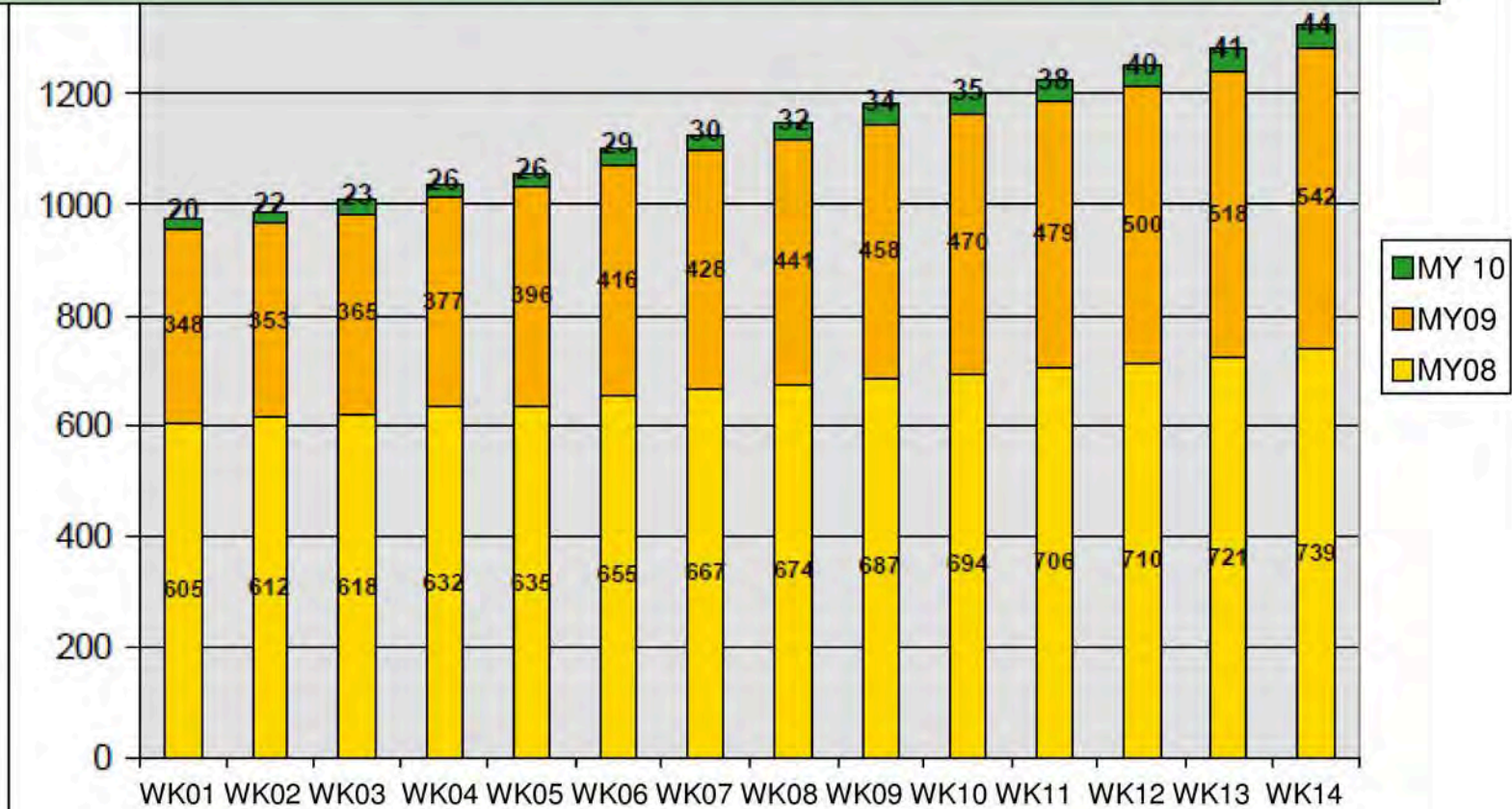


Total V6-TDI: 1,325 cases worldwide
MY08: 739 cases
MY09: 542 cases
MY10: 44 cases
 (SAGA, Status as on 04.11.2010)

Drivetrain damage high-pressure diesel fuel pump CP4.2

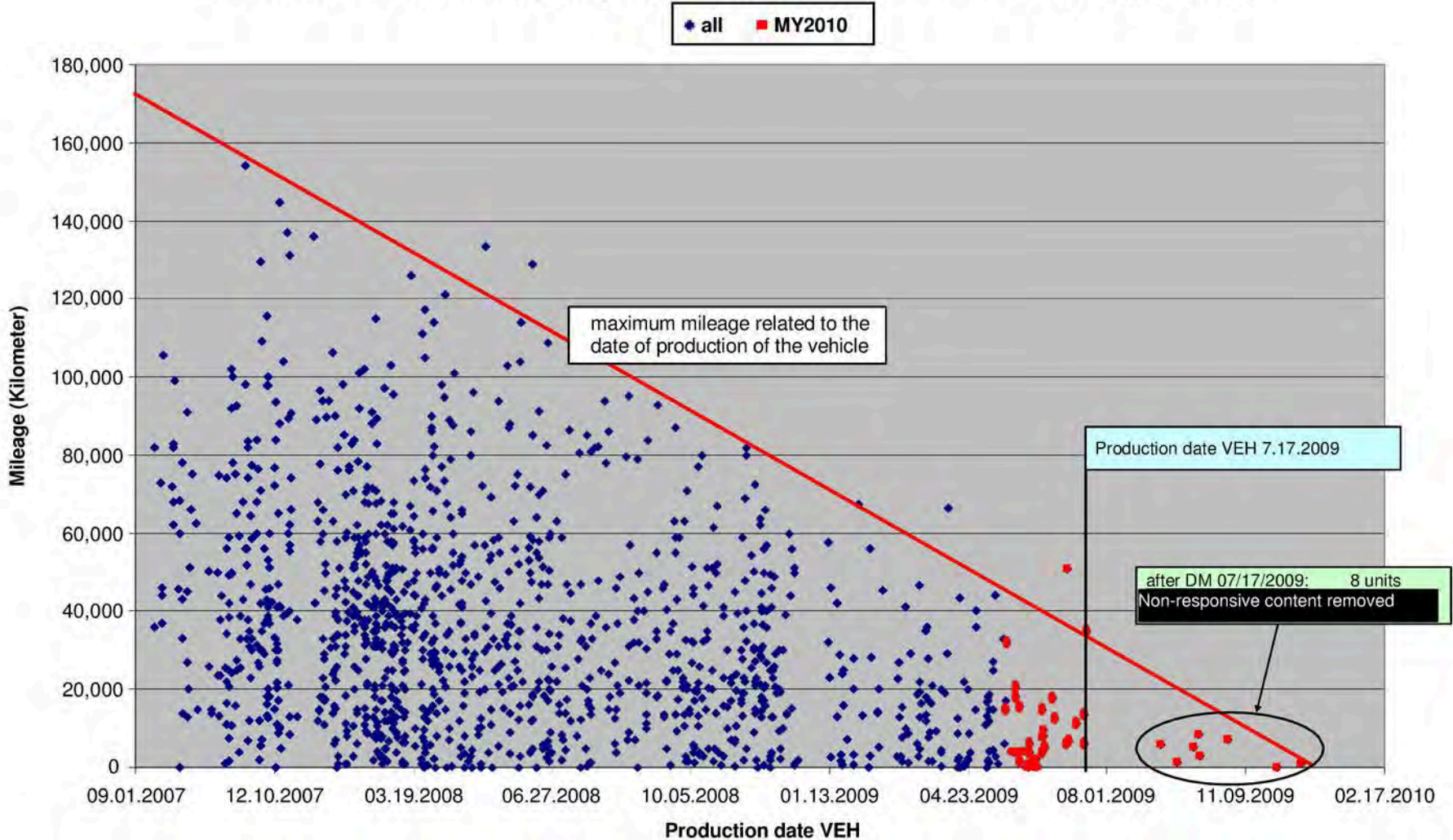
Increase in "changed" high-pressure pumps V6-TDI Audi in the field
SAGA to WK....2010

| | | | | | | | | | | | | | | |
|-----------|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|
| Total: | 973 | 987 | 1006 | 1035 | 1057 | 1100 | 1125 | 1147 | 1179 | 1199 | 1223 | 1250 | 1280 | 1325 |
| Increase: | | +14 | +19 | +29 | +22 | +43 | +25 | +22 | +32 | +20 | +24 | +27 | +30 | 45 |



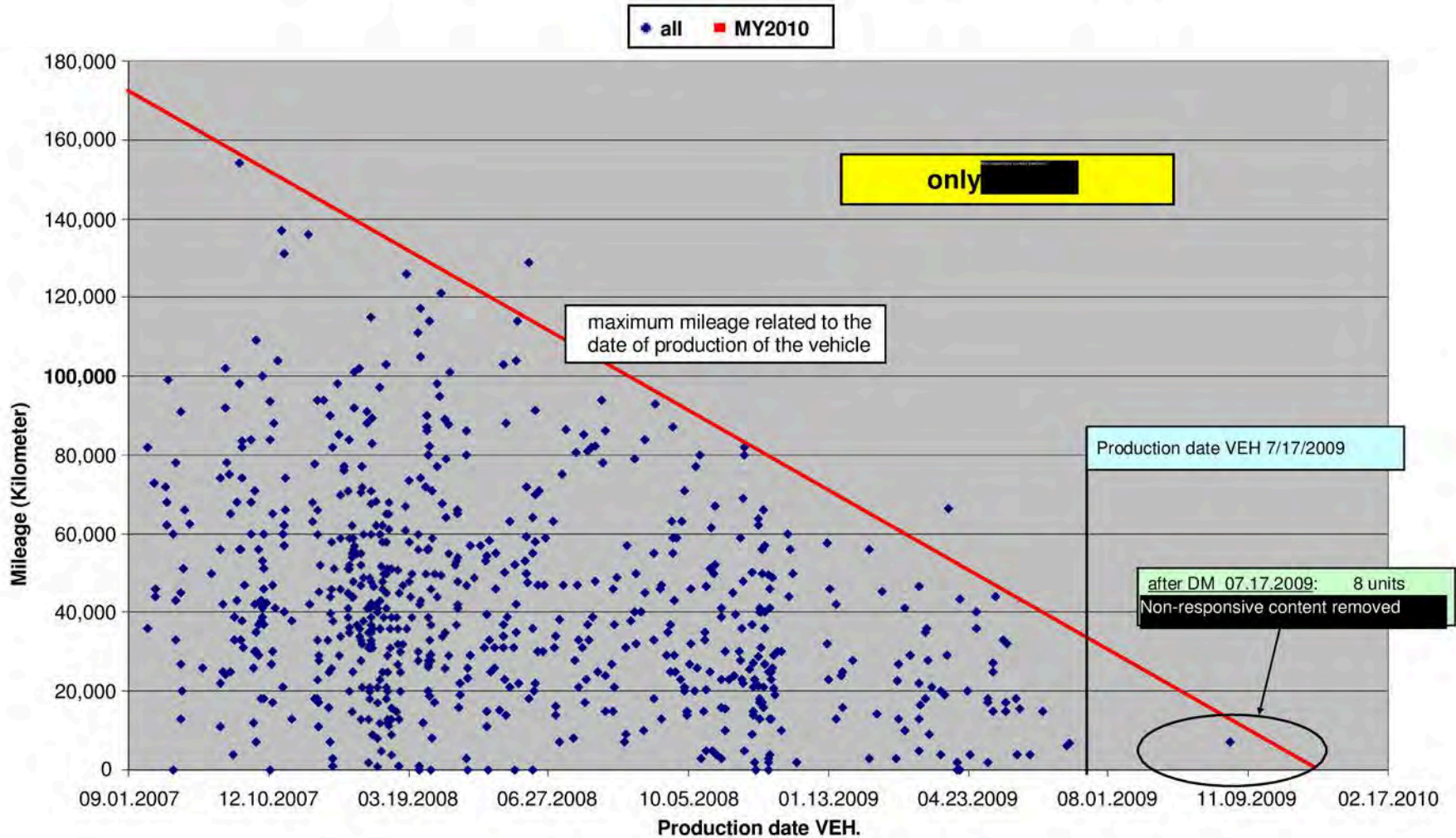
Drivetrain damage high-pressure diesel fuel pump CP4.2

Worldwide settlement pump replacement CP4.2 V-TDI according to SAGA



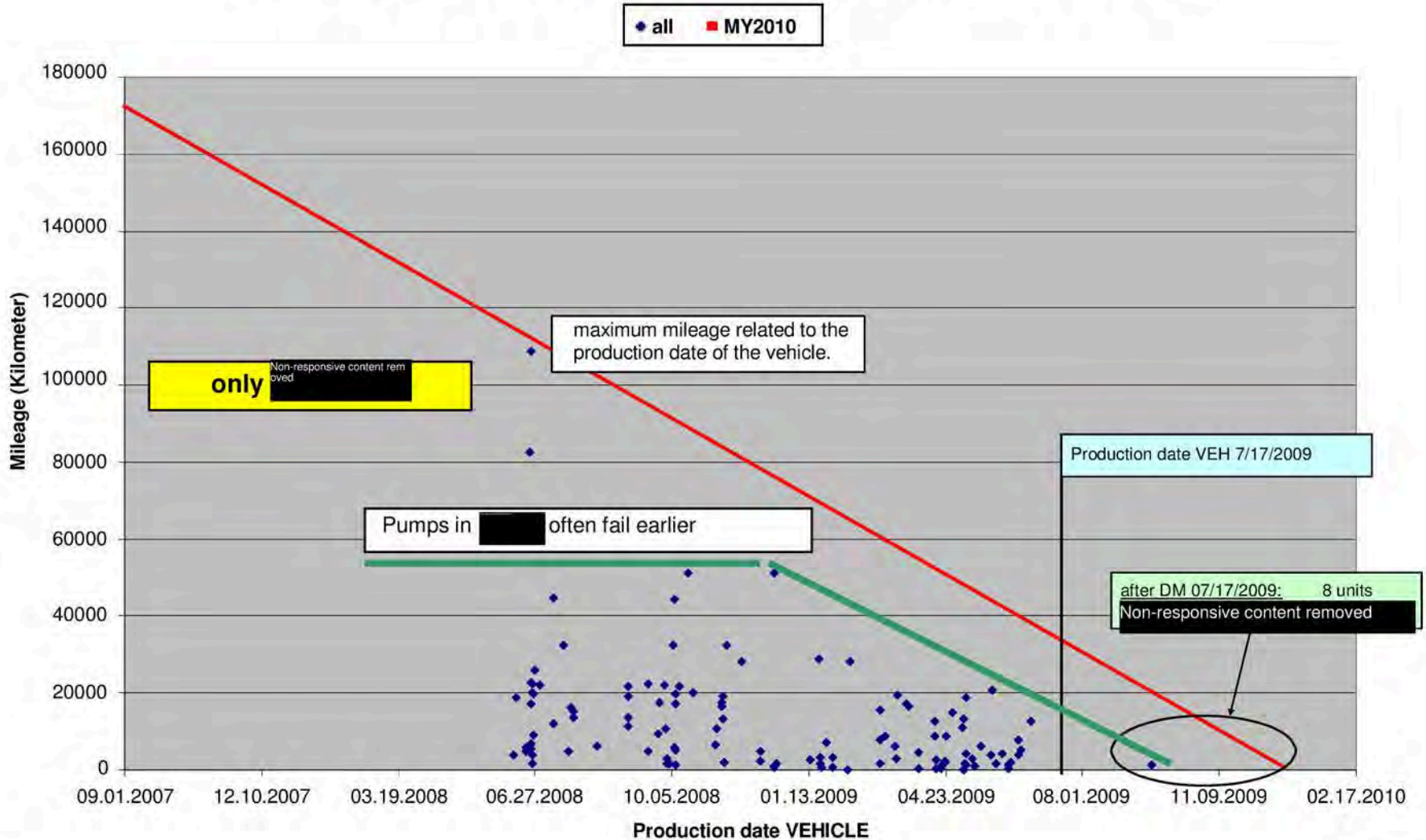
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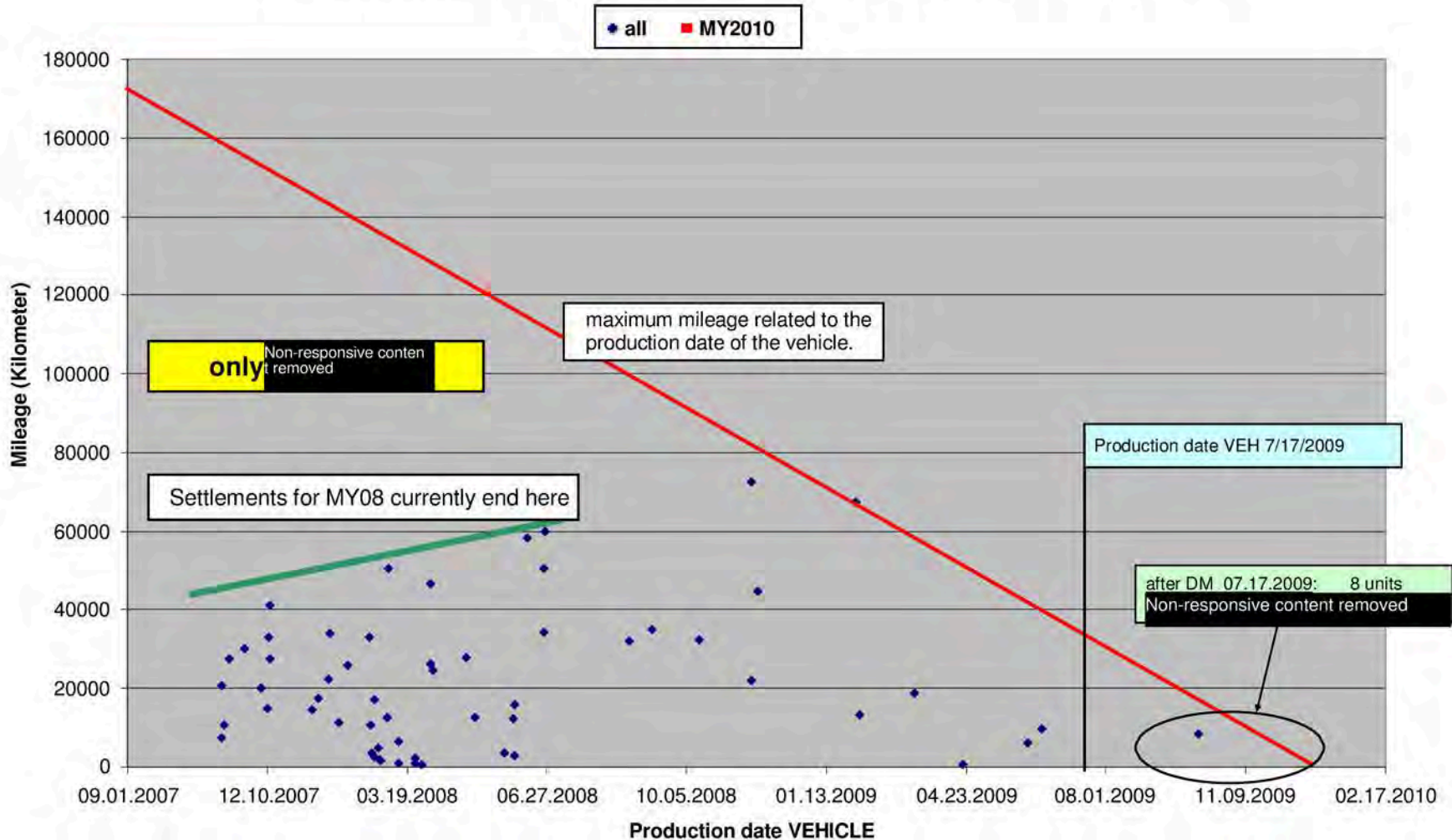
Drivetrain damage high-pressure diesel fuel pump CP4.2

Worldwide settlement pump replacement CP4.2 V-TDI according to SAGA



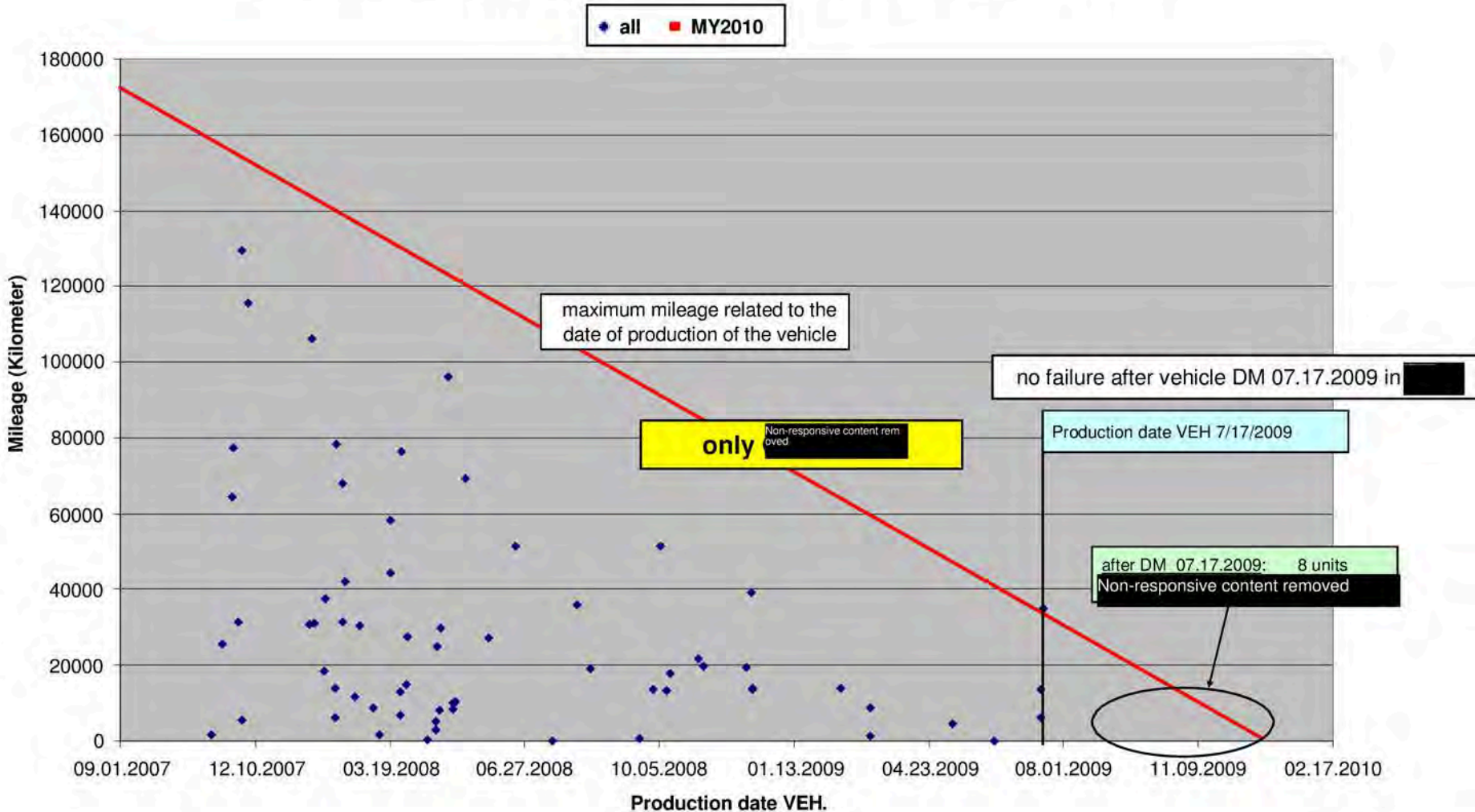
Drivetrain damage high-pressure diesel fuel pump CP4.2

Worldwide settlement pump replacement CP4.2 V-TDI according to SAGA



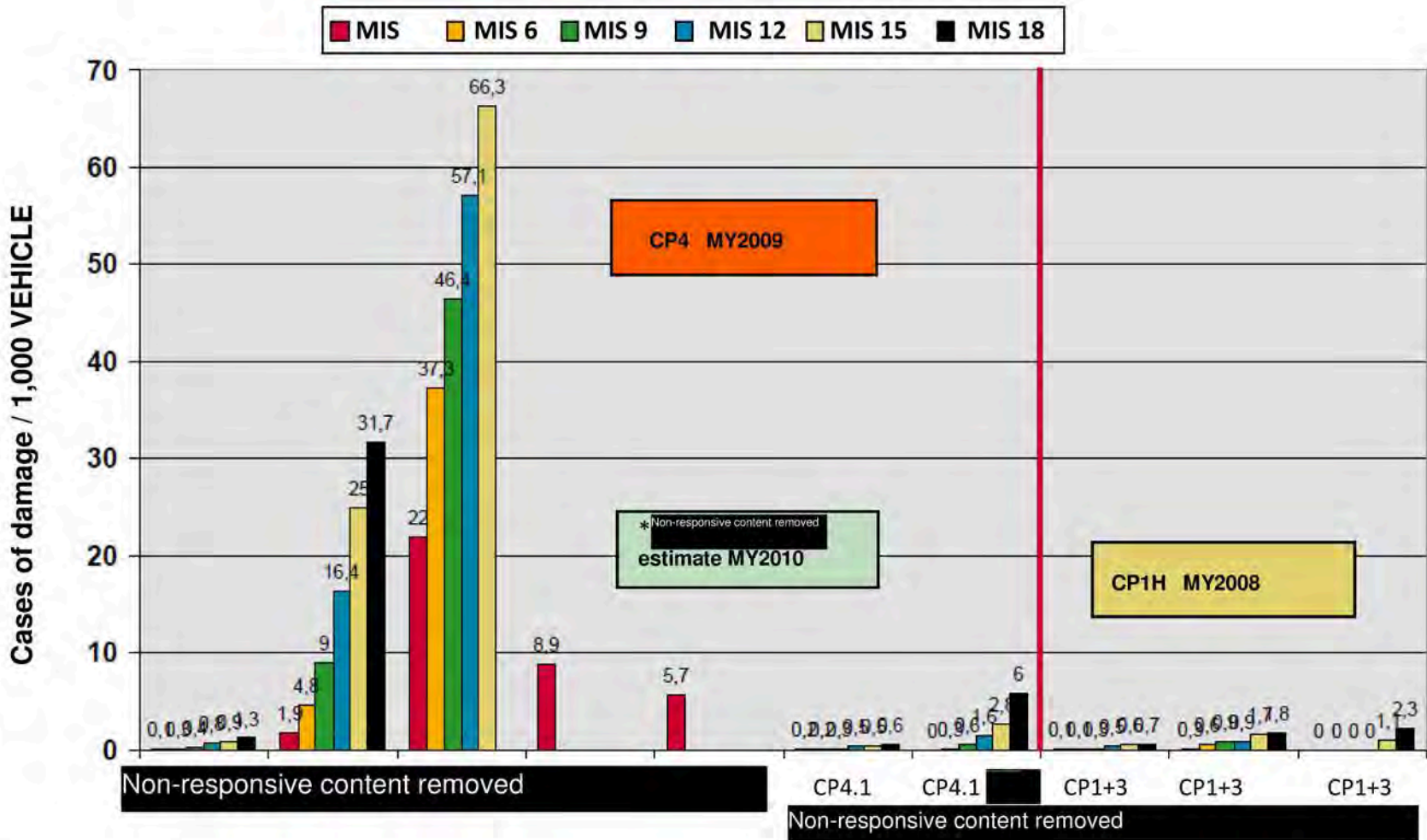
Drivetrain damage high-pressure diesel fuel pump CP4.2

Worldwide settlement pump replacement CP4.2 V-TDI according to SAGA



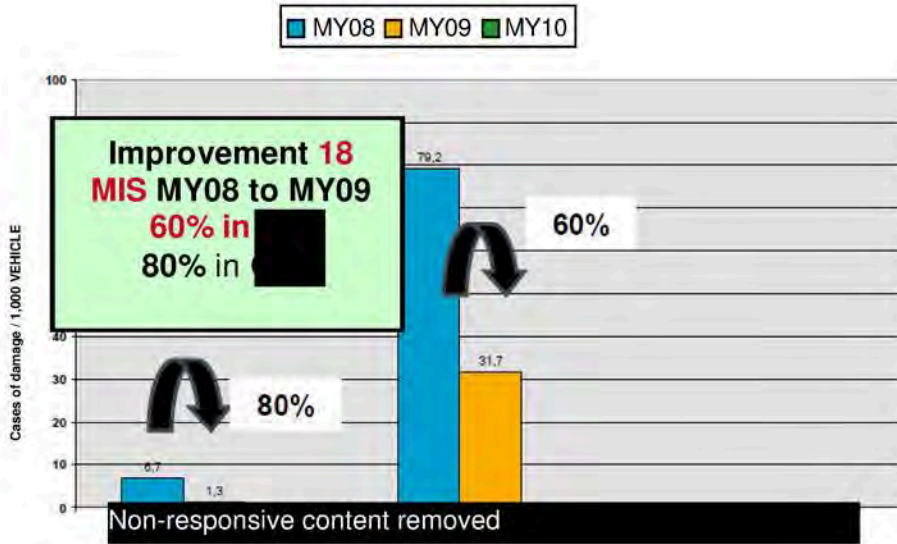
Drivetrain damage high-pressure diesel fuel pump CP4.2

CP4.2 country comparison model year 2009 (*2010) and CP1H model year 2008

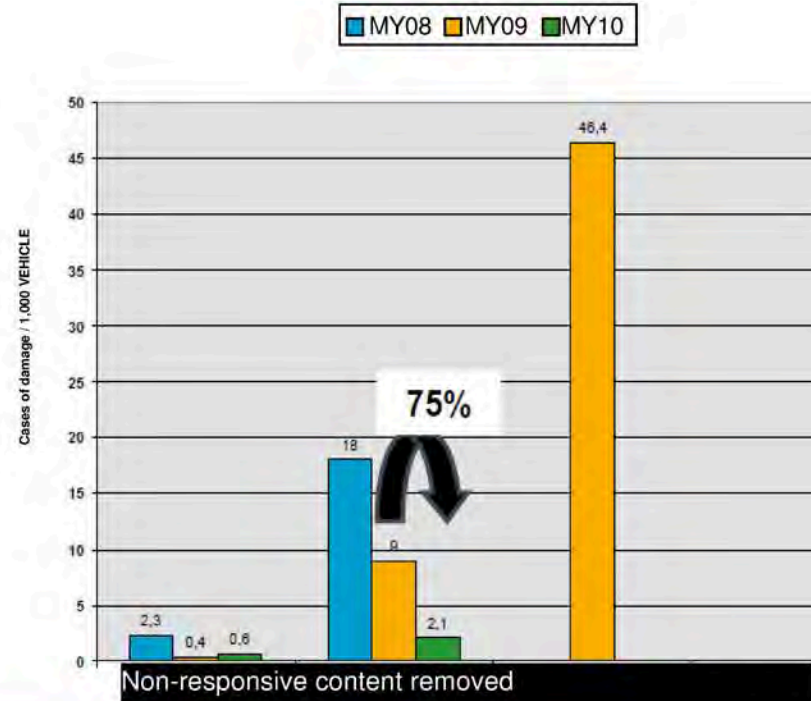


Drivetrain damage high-pressure diesel fuel pump CP4.2

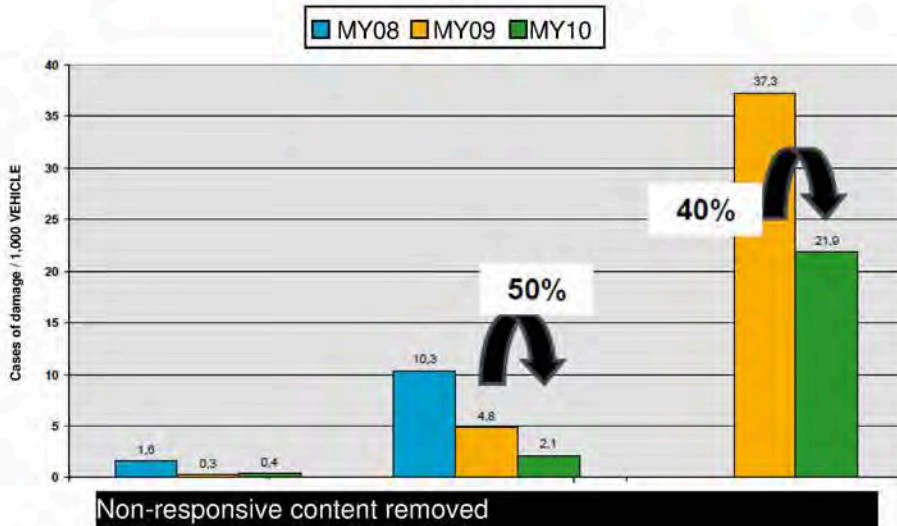
MIS 18



MIS 09



MIS 6



Improvement MY09 to MY10 75% (50%) in [redacted] 9(6) MIS 40% in [redacted] 6 MIS

Drivetrain damage high-pressure diesel fuel pump CP4.2

Topics:

- ▶ Effectiveness of anti-wear package 1.1 in comparison with series
- ▶ National releases of CP4.2 by Bosch and Audi
- ▶ Functional analyses for anti-wear package 2 (RP2)
- ▶ Technical definition of anti-wear package 2
- ▶ Scheduling sample / testing / SOP for RP2
- ▶ Non-responsive content removed





Fault mapping field failures HPP Bosch CR 2009/10

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03.29.2012



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3.29.2012

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Status CP4.1_2 field failures - Bosch 2009/10 Volkswagen and Audi

| Complaints overview | Volkswagen | | | Audi | | | Sum of VW+Audi |
|--|------------|-----|----------|------|-----|------------|----------------|
| | 4.1 | 4.2 | Total VW | 4.1 | 4.2 | Total Audi | |
| Pump drivetrain damage | 22 | 3 | 25 | 27 | 82 | 109 | 134 |
| Poor quality fuel | 8 | 2 | 10 | 14 | 4 | 18 | 28 |
| Poor quality fuel => tappet spring broken | | | 0 | 1 | | 1 | 1 |
| Poor quality fuel => Drivetrain damage | | | 0 | 4 | 11 | 15 | 15 |
| Non-starter (Audi) | | | 0 | 5 | 1 | 6 | 6 |
| Particle contamination | 2 | | 2 | | | 0 | 2 |
| External intervention | 1 | | 1 | | 1 | 1 | 2 |
| Incorrect fueling | | | 0 | 1 | | 1 | 1 |
| under Analysis | 10 | | 10 | 6 | 10 | 16 | 26 |
| OK after analysis NTF | 48 | 1 | 49 | 27 | 44 | 71 | 120 |

Total: 335



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Data source: Overview of Bosch CRI field failures Bosch 2009-2010

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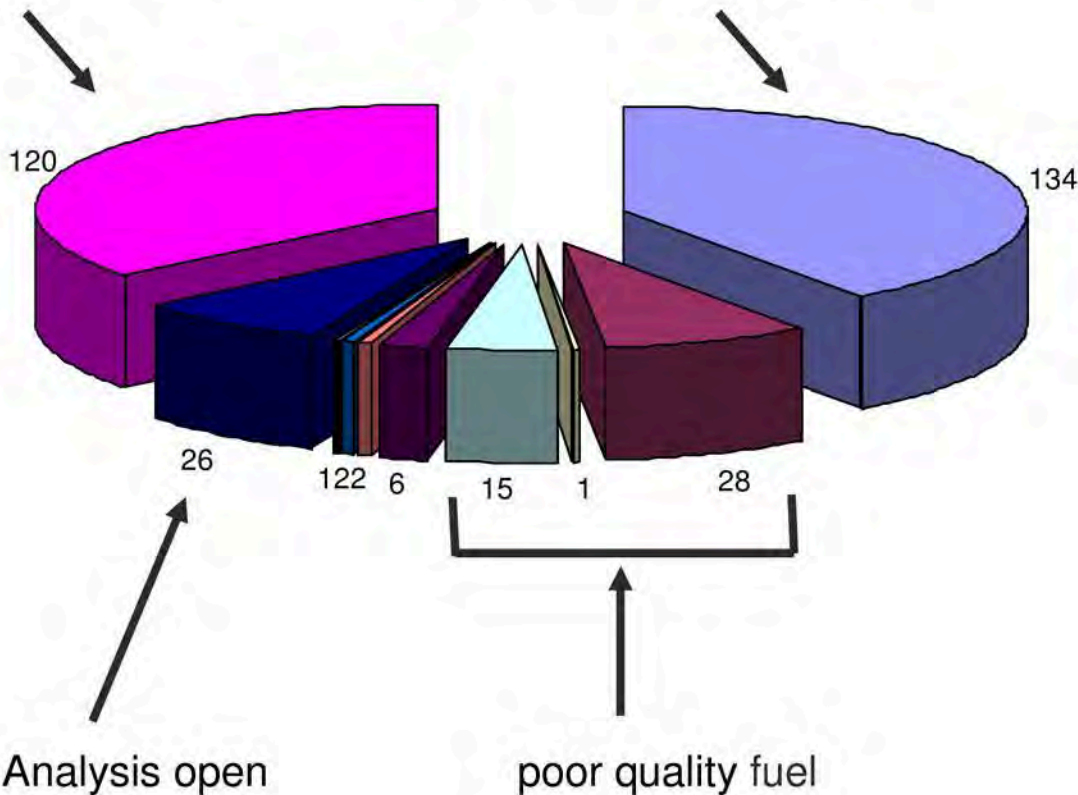
3.29.2012



Status CP4.1_2 field failures - Bosch 2009/10 Volkswagen and Audi

OK after analysis

pump drivetrain damage

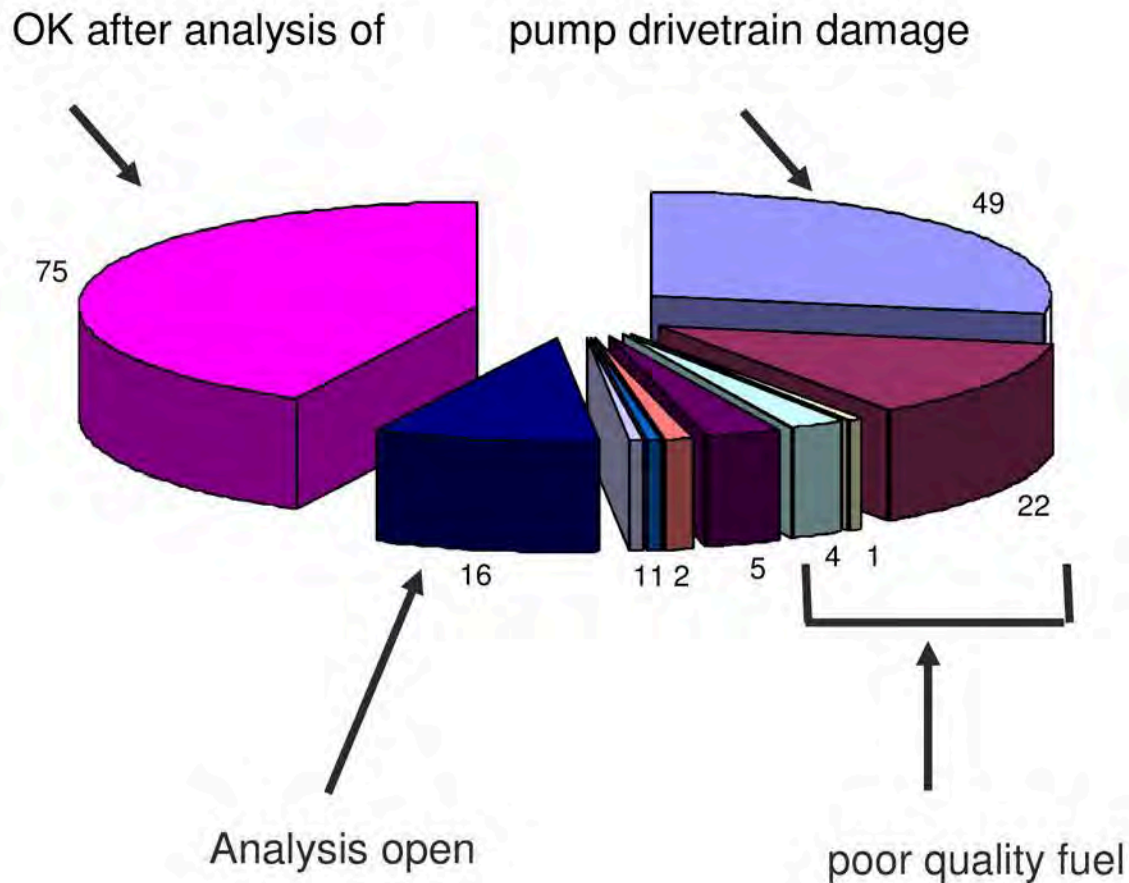


- Pump drivetrain damage
- Poor quality fuel
- Poor quality fuel => tappet spring broken
- Poor quality fuel => Drivetrain damage
- Non-starter (Audi)
- Particle contamination
- External intervention
- Incorrect fueling
- under Analysis
- OK after analysis NTF

Total failures: 335



Status of CP4.1 Field failures - Bosch 2009/10 Volkswagen and Audi



- Pump drivetrain damage
- Poor quality fuel
- Poor quality fuel => tappet spring broken
- Poor quality fuel => Drivetrain damage
- Non-starter (Audi)
- Particle contamination
- External intervention
- Incorrect fueling
- Under Analysis
- OK after analysis NTF

Total failures: 176



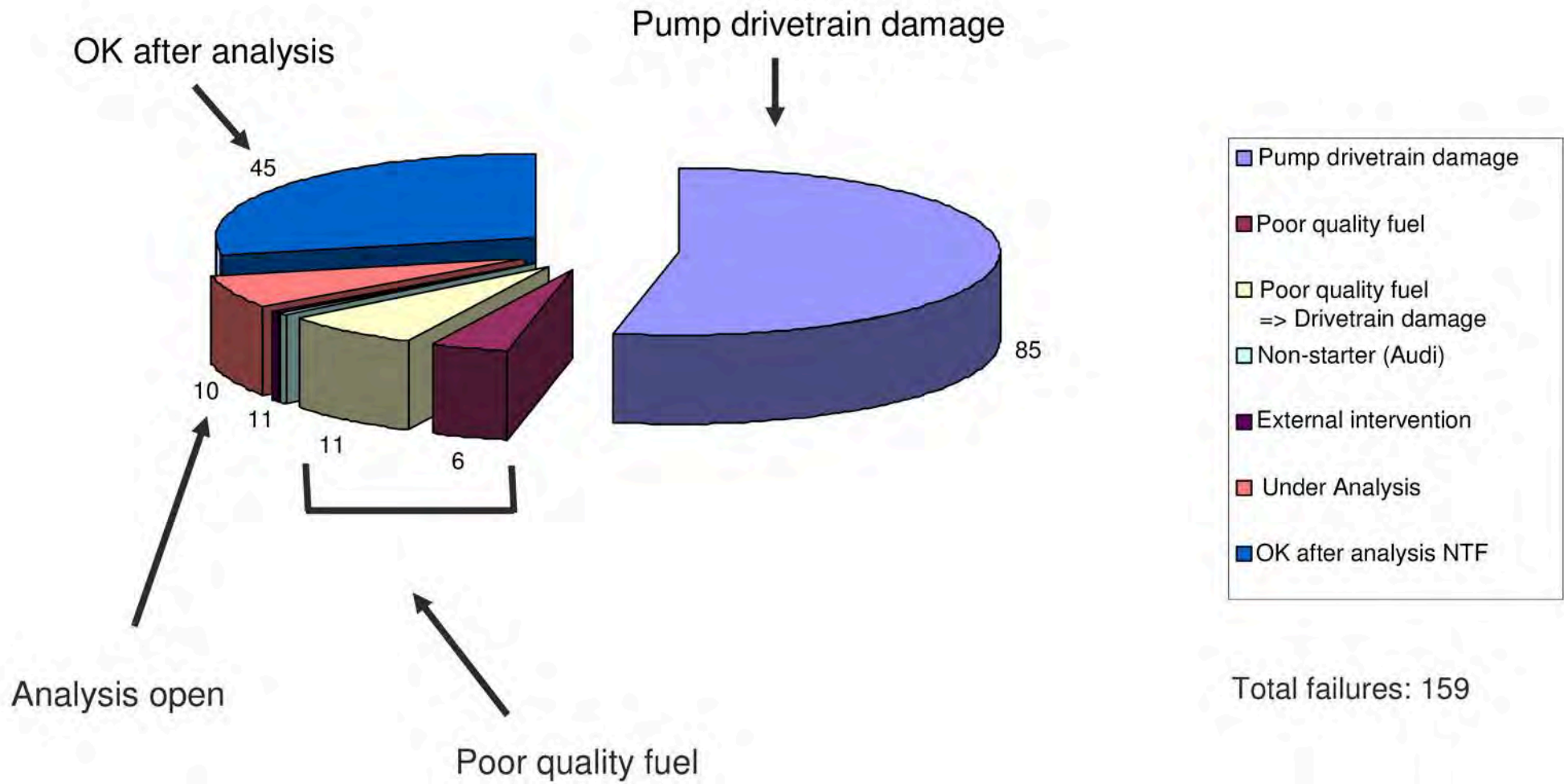
Data source: Overview of Bosch CRI field failures Bosch 2009-2010

3/29/2012

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Status of CP4.2 Field failures - Bosch 2009/10 Volkswagen and Audi



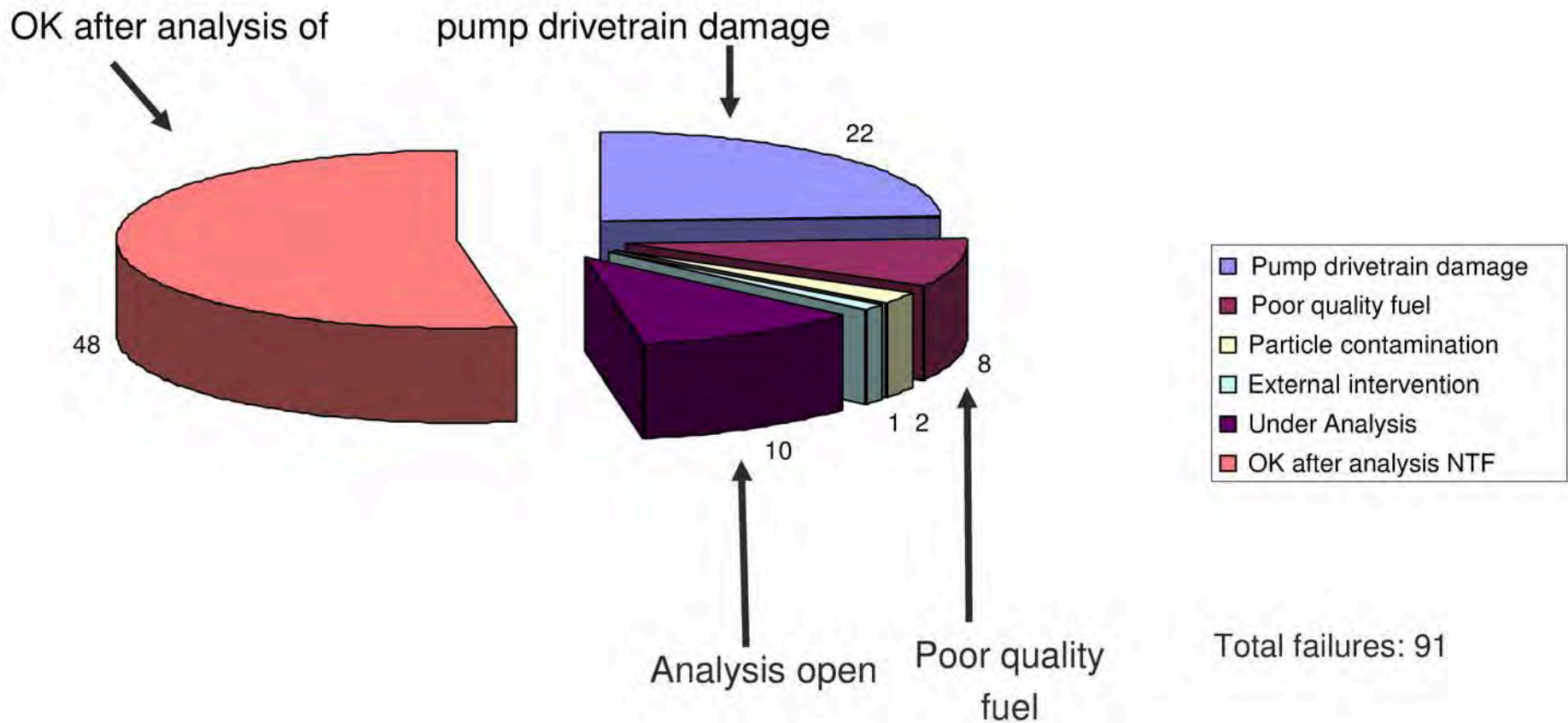
Data source: Overview of Bosch CRI field failures Bosch 2009-2010

3/29/2012

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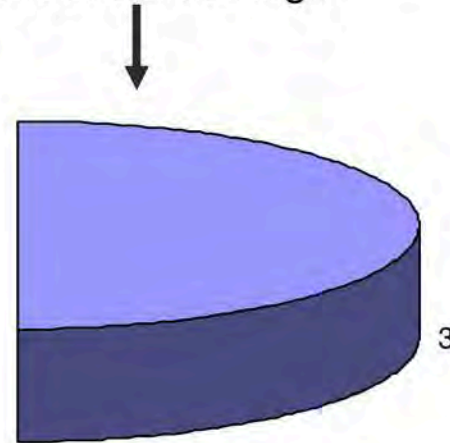
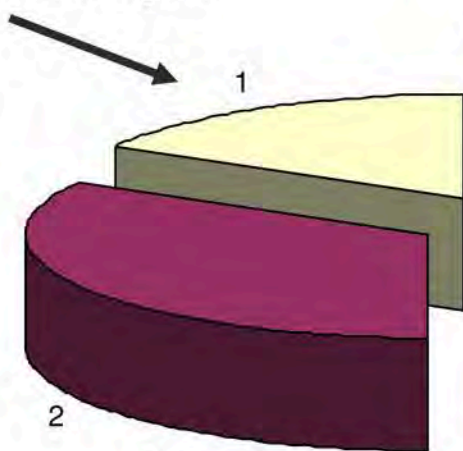
Status of CP4.1 Field failures - Bosch 2009/10 Volkswagen



Status of CP4.2 Field failures - Bosch 2009/10 Volkswagen

OK after analysis

pump drivetrain damage



- Pump drivetrain damage
- Poor quality fuel
- OK after analysis NTF

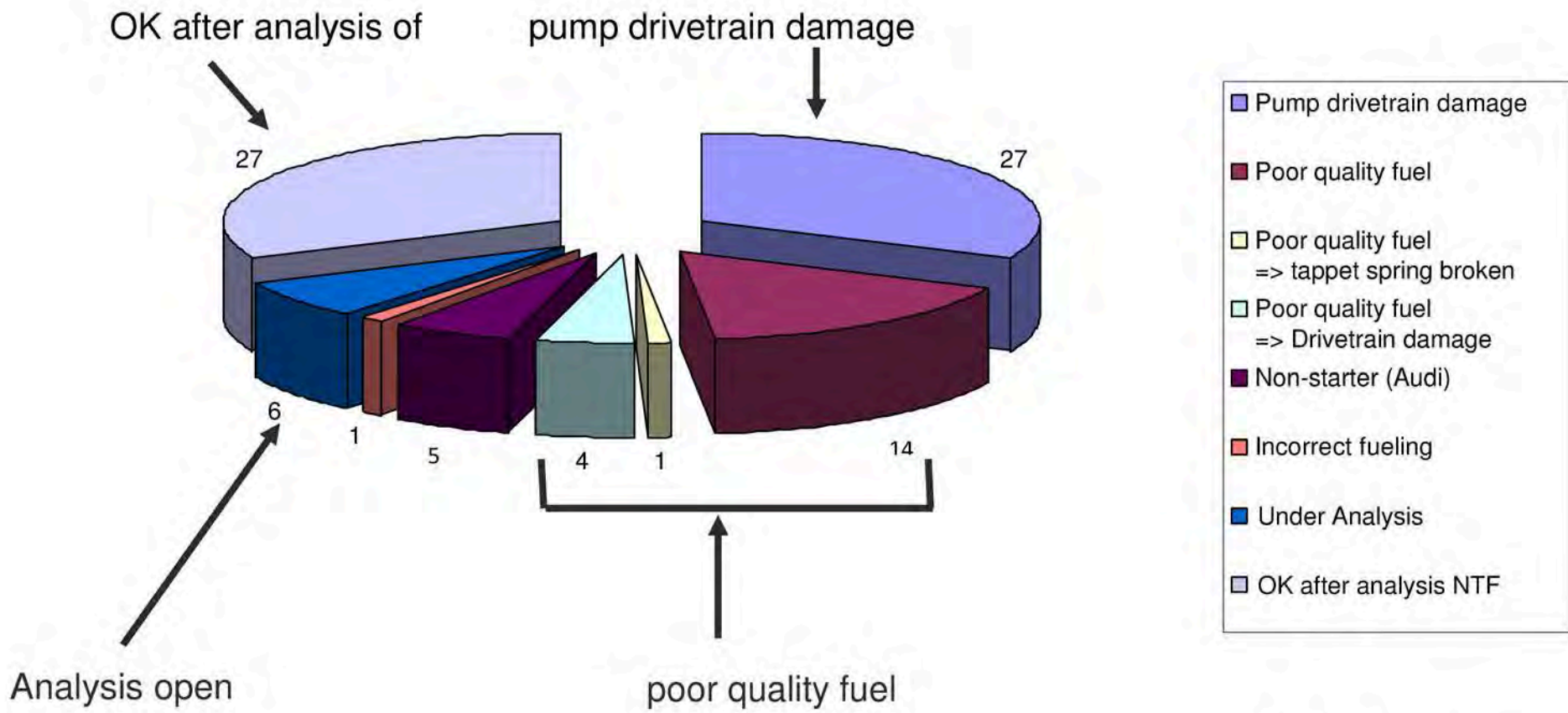
Poor quality fuel

Analysis open

Total failures: 6



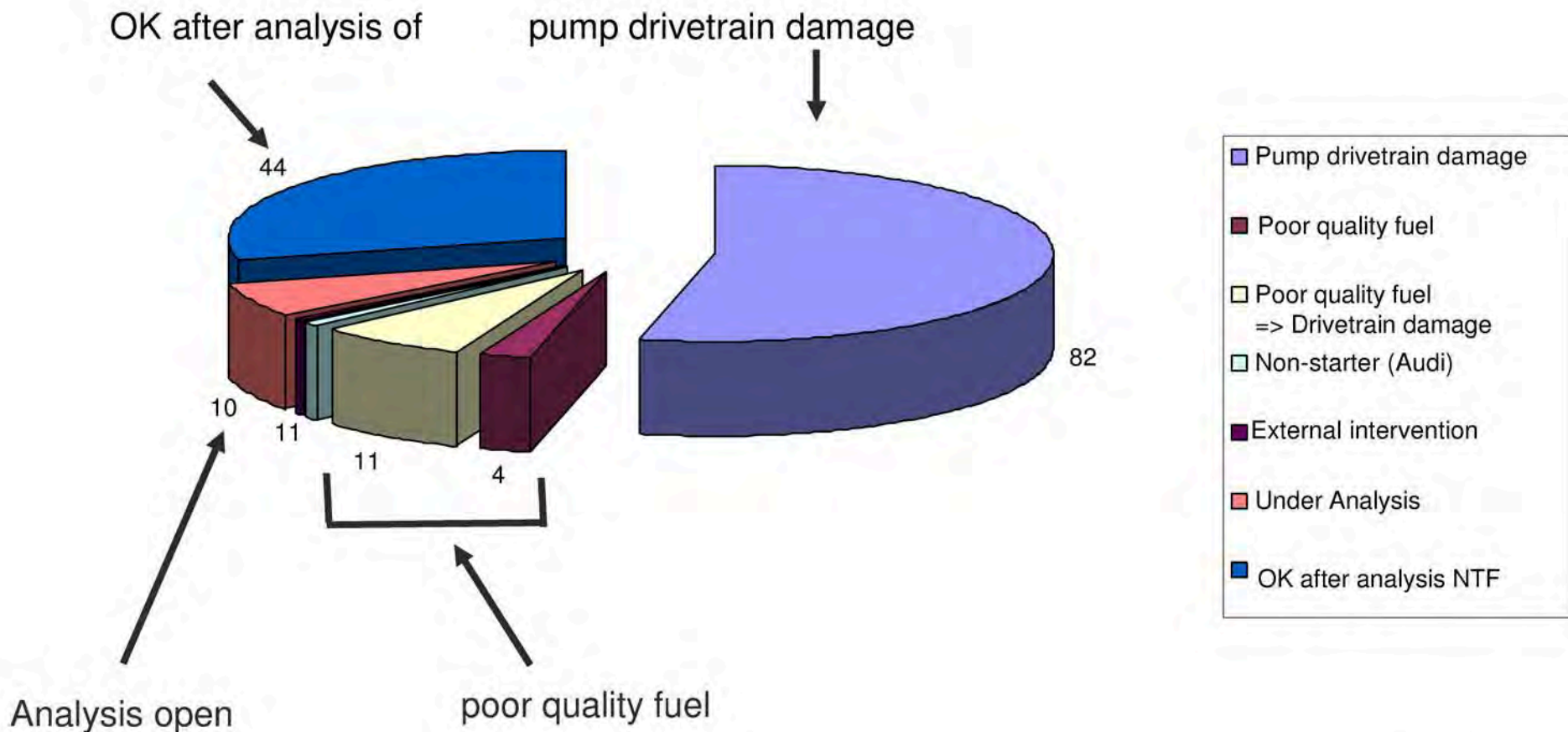
Status of CP4.1 Field failures - Bosch 2009/10 Audi



Total failures: 85



Status of CP4.2 Field failures - Bosch 2009/10 Audi



Total failures: 153



Data source: Overview of Bosch CRI field failures Bosch 2009-2010

3/29/2012

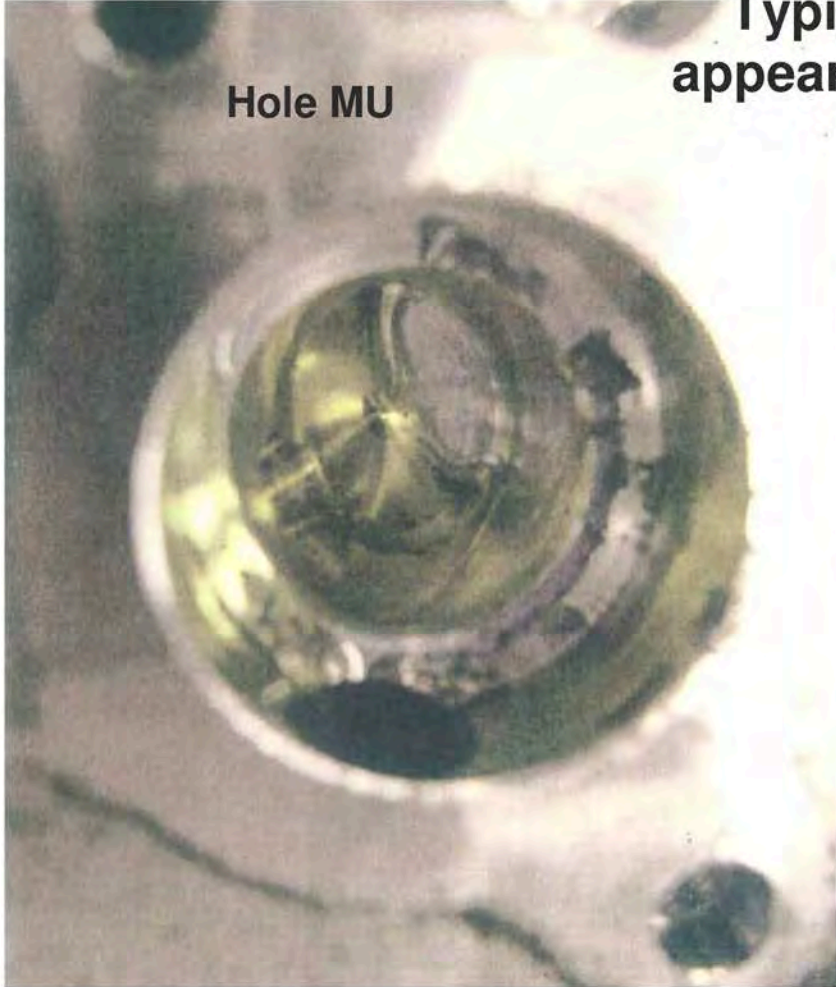
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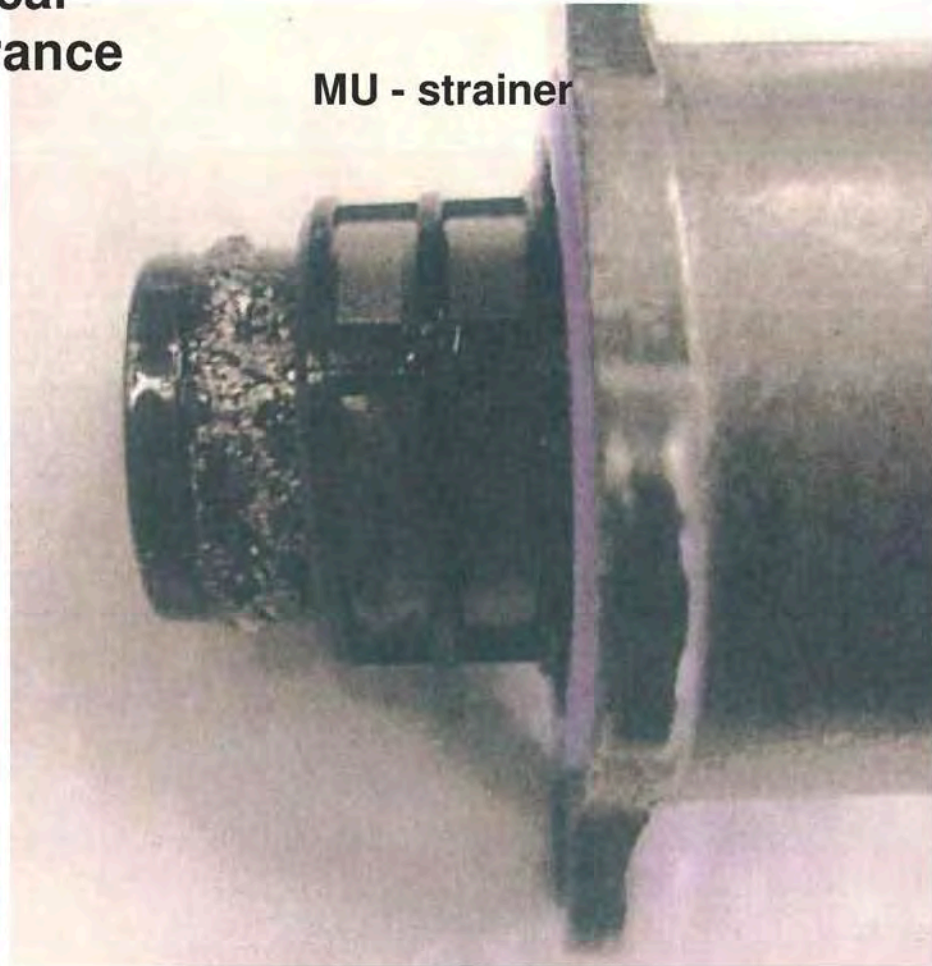
Status CP4.1_2 field failures - Bosch 2009/10 Volkswagen and Audi

Typical appearance

Hole MU



MU - strainer



Status CP4.1_2 field failures - Bosch 2009/10 Volkswagen and Audi

Pump drivetrain damage Volkswagen

Caused by:

- Metal shavings / particle in the pump
- Shavings on MU and in the hole
- Turned tappet, grinding of roller, camshaft, roller support

Impact:

- Unacceptably high mixed friction leads to local contact points between roller and roller support
- C-coating (coating) is destroyed
- The friction coefficient between the roller and roller support increases
- Sluggishness of roller, wear, particle formation => drivetrain damage

Influencing factors:

- Fuel with low dynamic viscosity, not according to specification
=> Deposit formation on roller and roller support (fusing)
- Particles in the Bosch assembly process and in the Volkswagen manufacturing process

Measure:

- Task Force team at Audi since November 2009



3/29/2012

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Status CP4.1_2 field failures - Bosch 2009/10 Volkswagen and Audi

Status of drivetrain damage Bosch CP4.1 and CP4.2

Failure figures of [redacted] market

| | Produced | Sales | Random | Failures absolute | | | Failures per 1,000 | | |
|---------------------|----------|---------|---------|-------------------|--------------|---------------|--------------------|--|--|
| | | | | HY 08 - 10 | HY 08 MIS 12 | HY 09 MIS 12* | | | |
| CP4.1 VW (4 Cyl.) | 608,089 | 558,524 | 397,811 | 419 | 0.8 | 0.6 | | | |
| CP4.1 Audi (4 Cyl.) | 514,361 | 475,995 | 350,530 | 459 | 0.9 | 0.7 | | | |
| CP4.2 VW (6 Cyl.) | 23,150 | 22,124 | 15,626 | 175 | 3.2 | 1.2 | | | |
| CP4.2 Audi (6 Cyl.) | 155,928 | 148,322 | 107,915 | 644 | 2.9 | 2.7 | | | |

Failure figures of [redacted] market

| | Produced | Sales | Random | Failures absolute | | | Failures per 1,000 | | |
|---------------------|----------|---------|---------|-------------------|--------------|---------------|--------------------|--|--|
| | | | | HY 08 - 10 | HY 08 MIS 12 | HY 09 MIS 12* | | | |
| CP4.1 VW (4 Cyl.) | 249,319 | 225,267 | 187,902 | 108 | 0.6 | 0.2 | | | |
| CP4.1 Audi (4 Cyl.) | 169,822 | 162,785 | 144,426 | 87 | 0.5 | 0.4 | | | |
| CP4.2 VW (6 Cyl.) | 15,034 | 14,158 | 11,640 | 24 | 0.3 | - | | | |
| CP4.2 Audi (6 Cyl.) | 73,303 | 70,537 | 60,197 | 117 | 1.3 | 0.3 | | | |

Failure figures of [redacted] market

| | Produced | Sales | Random | Failures absolute | | | Failures per 1,000 | | |
|---------------------|----------|--------|--------|-------------------|--------------|---------------|--------------------|--|--|
| | | | | HY 08 - 10 | HY 08 MIS 12 | HY 09 MIS 12* | | | |
| CP4.1 VW (4 Cyl.) | 81,609 | 76,772 | 44,592 | 119 | 0.9 | 1.5 | | | |
| CP4.1 Audi (4 Cyl.) | 68,573 | 63,337 | 43,213 | 153 | 2.0 | 0.8 | | | |
| CP4.2 VW (6 Cyl.) | 2,292 | 2,238 | 1,129 | 118 | 24.1 | 4.9 | | | |
| CP4.2 Audi (6 Cyl.) | 23,665 | 22,316 | 13,359 | 426 | 15.2 | 13.6 | | | |

*HY 09 MIS 12 based on Aqua extrapolation

Aqua evaluation from production year 2008; Status as on: 04/2010



[redacted]

3/29/2012

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From: Non-responsive content removed
To:

CC:

Date: Tuesday, 27 July 2010 2:34:25 PM

Subject: ANS: BNR information about the special field of work T 21 G NI

Attachments: [TOP 5 Länder-2010-07-20-V2.pdf](#)

Hello

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This coincides roughly with the figures that I presented last week at the TM:
(The attached presentation includes only the CP4.2)

Furthermore, 5 more wire mesh crates with CP4 pumps arrived last Friday from [REDACTED] (170 units)!

We are already working in the analysis workshop with additional capacity.

All of us (Bosch and Audi) can only reach the normal processing level if the return of pumps from [REDACTED] is significantly reduced as agreed.

Best regards

Non-responsive content removed

Domicile: Stuttgart, Court of Registry: Local District Court Stuttgart, Commercial Register No. 14000;
Chairman of the Supervisory Board: Hermann Scholl; Management: Franz Fehrenbach, Siegfried Dais;

Bernd Bohr, Rudolf Colm, Volkmar Denner, Wolfgang Malchow, Peter Marks, Peter Tyroller; Stefan Asenkerschbaumer, Uwe Raschke, Wolf-Henning Scheider

From: Non-responsive content removed

Sent: Tuesday, 27 July 2010 11:58 AM

Non-responsive content removed

Subject: ANS: BNR information about the special field of work T 21 G NI

Hello gentlemen,

Non-responsive content removed

has made me aware of something important:

This list never contains all open items!!!! This is aborted.

As you can read in the mail, 341 parts are currently open!!!!!!!!!!!!!! (this also includes about 50 - 100 units handled by Bosch, but not by us yet)

You can subtract another 50 injectors from that; the rest are all non-analyzed high-pressure fuel pumps CP4!

has been canceled, except 3 units per week (permanent random sampling).

Please do not use up the capacity of Non-responsive content removed for all individual opinions on this list, but complete via 8D in QTS.

Individual opinions (endurance runners, etc.) only in special cases.

With best regards

Non-responsive content removed

-----Original message-----

From: Non-responsive content removed

Sent: Tuesday, 27 July 2010 10:08

Non-responsive content removed

Subject: Re: BNR information about the special field of work T 21 G NI

Hi all,

The open list once again.

With best regards

Non-responsive content removed

-----Original message-----

From: AUDI IN head office, 0 km

Sent: Monday, July 26, 2010 22:04

To: Non-responsive content removed

Subject: BNR information about the special field of work T 21 G NI

Dear damage processor,

In the Appendix, you can see a list of the 341 complaints about your special field of work

T 21 G NI, which are already more than 30 days in progress.

With best regards

AUDI AG Quality Assurance

Supp.-No. Supplier name BNR part no part name BSCHL FSCHL entry date, origin St-date L-stat

00001283 00 ROBERT BOSCH GMBH 3646966 03L 130 755 HIGH-PRESSURE FUEL PUMP SA010
TFK08 04.29.2010 FIELD 06.02.2010 1

00001283 00 ROBERT BOSCH GMBH 3649456 03L 130 755 HIGH-PRESSURE FUEL PUMP SA017
TFK08 05.03.2010 FIELD 06.10.2010 1

00001283 00 ROBERT BOSCH GMBH 3673830 057 130 755 AC HIGH-PRESSURE FUEL PUMP
TFK04 05.31.2010 HALLE 2

00001283 00 ROBERT BOSCH GMBH 3675622 03L 130 755 HIGH-PRESSURE FUEL PUMP SA010
E0052 06.01.2010 FIELD 07.02.2010

00001283 30 ROBERT BOSCH GMBH 3573954 03L 130 755 HIGH-PRESSURE FUEL PUMP SA050
TFK04 02.16.2010 FIELD 03.24.2010 1

00001283 30 ROBERT BOSCH GMBH 3575860 03L 130 755 HIGH-PRESSURE FUEL PUMP SA050
TFK04 02.18.2010 FIELD 03.24.2010 1

00001283 30 ROBERT BOSCH GMBH 3609009 059 130 755 AH HIGH-PRESSURE FUEL PUMP
SA010 E0052 03.19.2010 FIELD 06.03.2010

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SA010 E0052 03.25.2010 FIELD 06.03.2010

00001283 30 ROBERT BOSCH GMBH 3627089 059 130 755 AH HIGH-PRESSURE FUEL PUMP
TFK04 04.09.2010 FIELD 05.09.2010 1

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TFK04 04.09.2010 FIELD 05.09.2010 1

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SA010 TFK04 04.09.2010 FIELD 05.09.2010 1

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TFK04 04.09.2010 FIELD 05.09.2010 1

00001283 30 ROBERT BOSCH GMBH 3629217 059 130 755 AH HIGH-PRESSURE FUEL PUMP
SA010 I0000 04.12.2010 FIELD 05.14.2010 2

00001283 30 ROBERT BOSCH GMBH 3629900 059 130 755 AH HIGH-PRESSURE FUEL PUMP
SA010 TFK04 04.13.2010 FIELD 05.16.2010 1

00001283 30 ROBERT BOSCH GMBH 3640583 03L 130 755 HIGH-PRESSURE FUEL PUMP SA010
MG566 04.23.2010 FIELD 3

00001283 30 ROBERT BOSCH GMBH 3640645 059 130 755 AB HIGH-PRESSURE FUEL PUMP
SA010 11111 04.23.2010 FIELD

00001283 30 ROBERT BOSCH GMBH 3640657 03L 130 755 HIGH-PRESSURE FUEL PUMP SA010
TFK04 04.23.2010 FIELD 3

00001283 30 ROBERT BOSCH GMBH 3640675 03L 130 755 HIGH-PRESSURE FUEL PUMP TFK04
04.23.2010 FIELD 3

00001283 30 ROBERT BOSCH GMBH 3640692 03L 130 755 HIGH-PRESSURE FUEL PUMP SA010
TFK04 04.23.2010 FIELD 3

00001283 30 ROBERT BOSCH GMBH 3640783 03L 130 755 HIGH-PRESSURE FUEL PUMP SA010
TFK04 04.23.2010 FIELD 1

00001283 30 ROBERT BOSCH GMBH 3640829 03L 130 755 HIGH-PRESSURE FUEL PUMP SA010
TFK04 04.23.2010 FIELD 3

00001283 30 ROBERT BOSCH GMBH 3640871 059 130 755 AB HIGH-PRESSURE FUEL PUMP
SA017 TFK04 04.23.2010 FIELD 3

00001283 30 ROBERT BOSCH GMBH

Audi
Vorsprung durch Technik



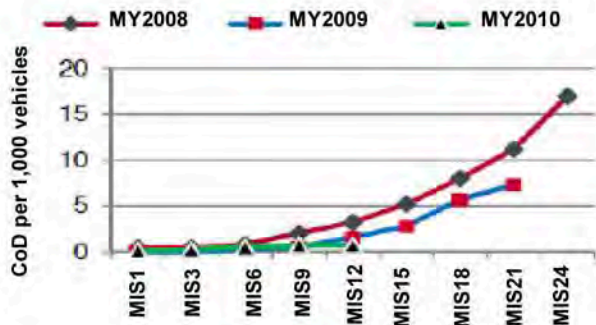
**Drivetrain damage high-pressure diesel fuel pump CP4.2
Q campaign diesel on August 2, 2010**

Drivetrain damage High-pressure diesel pump CP4**Status before APS on 09.13.2010:**

- ▶ Preliminary technical meeting for APS held on 07.15.2010.
- ▶ Anti-wear package 2 (reduces the temperature in the right roller support of the CP4.2 to CP4.1 level) is not yet decided due to the "tiresome" cost discussions with Bosch (same as for VW); at the TOP meeting of Audi-Bosch on 07.12.2010 it was agreed to clarify the matter by beginning of Sept. 2010.
- ▶ Until then, measurements of the low pressure circuit on failed vehicles in Non-responsive content removed It is argued by Bosch, that the in-line EFPs and especially those of [REDACTED] i.e. vehicles with longitudinal installation, do not supply enough lubrication (according to TCD) for the CP4 under certain circumstances (viscosity, temperature, on-board voltage, EFP "aging", clogged filter etc.).
- ▶ Sharp increase in Audi-R4-CR-lengthwise failures in [REDACTED] particularly MY2008 → see VW MY08 !
- ▶ Attached is a MOP/MIS comparison of [REDACTED] AU-R4-lengthwise, AU-R4-transverse with VW-R4-CR-transverse:
 - in MY 2008, Audi-lengthwise is worse than VW-transverse; AU-transverse is still not in the field; i.e. VW-transverse has coped rather better with the "fuel plight" in Non-responsive content removed
 - in MY 2010 there is no visible difference so far.
 - in MY 2009, Audi-transverse is better than VW-transverse and AU-lengthwise
- ▶ See next page (note scales of the Y axes) !

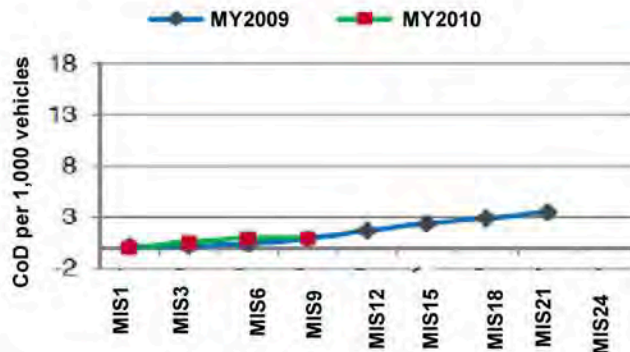
Drivetrain damage high pressure diesel fuel pump CP4.1

B8-Family



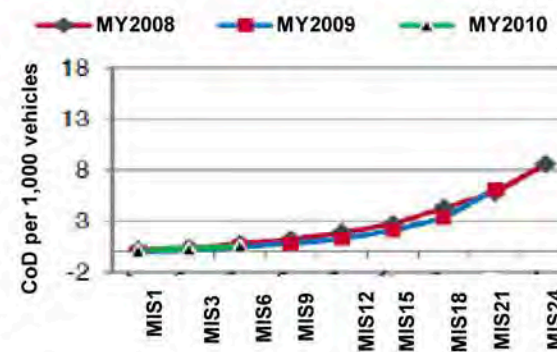
MY 2008

Audi A3 / TT

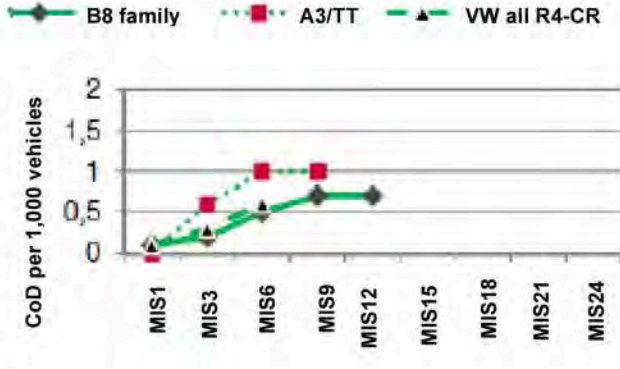
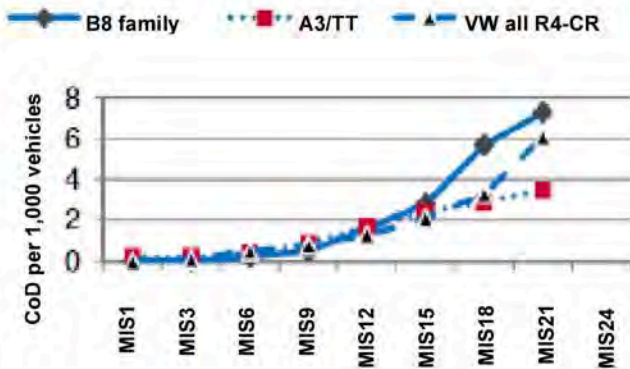
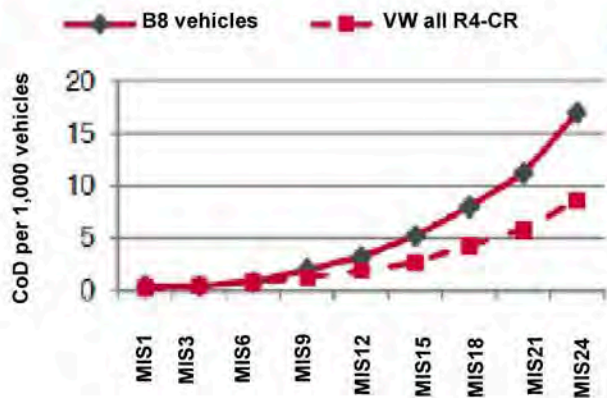


MY 2009

all VW R4-CR

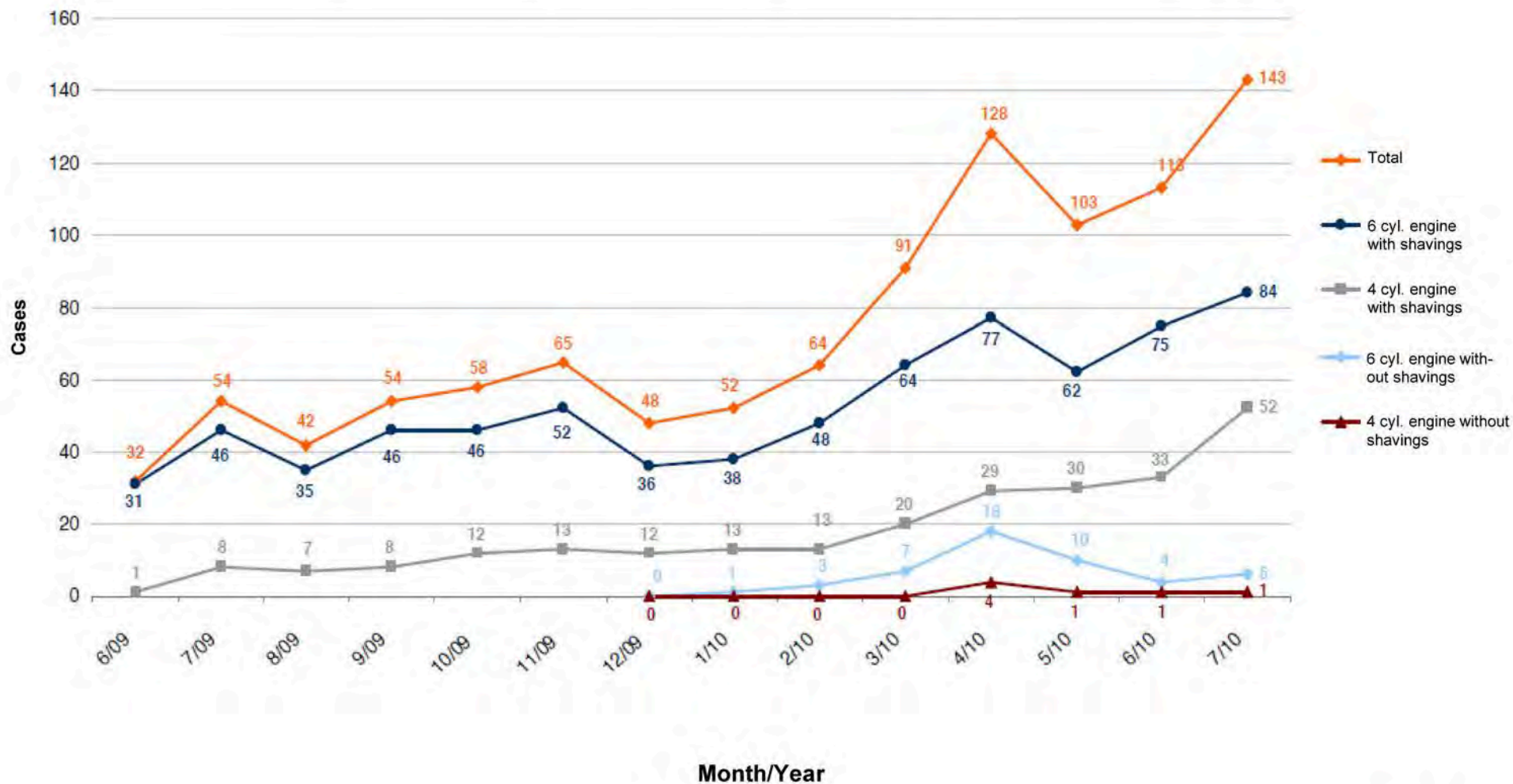


MY 2010



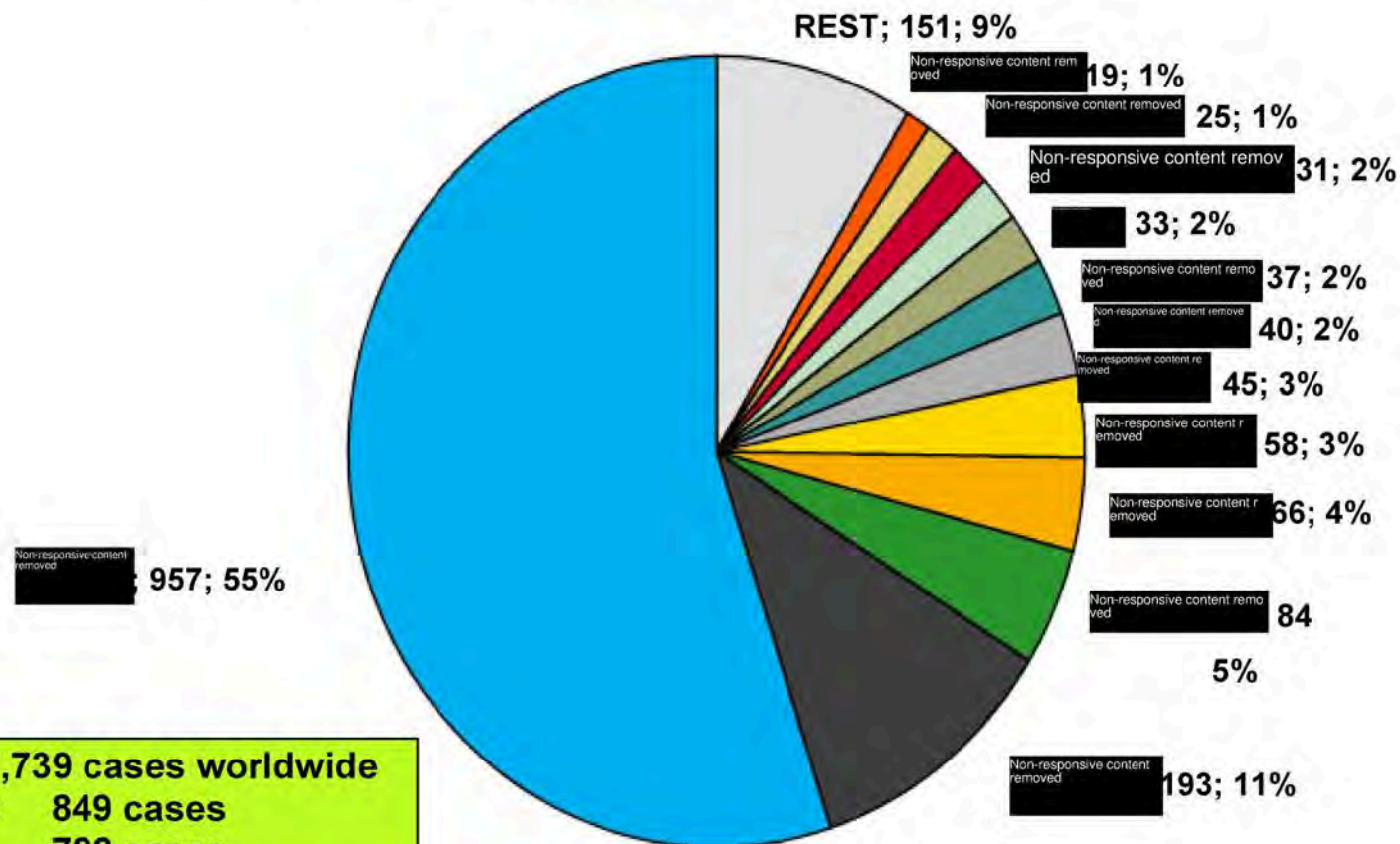
Drivetrain damage high pressure diesel fuel pump CP4.1

Failure of high pressure pump diesel CR - cases of damage per month (status 07/10 WK 29)



Drivetrain damage high-pressure diesel fuel pump CP4.2

Audi V6-TDI failures in the field, broken down by country (SAGA – replaced pumps only, 059A_/B_)

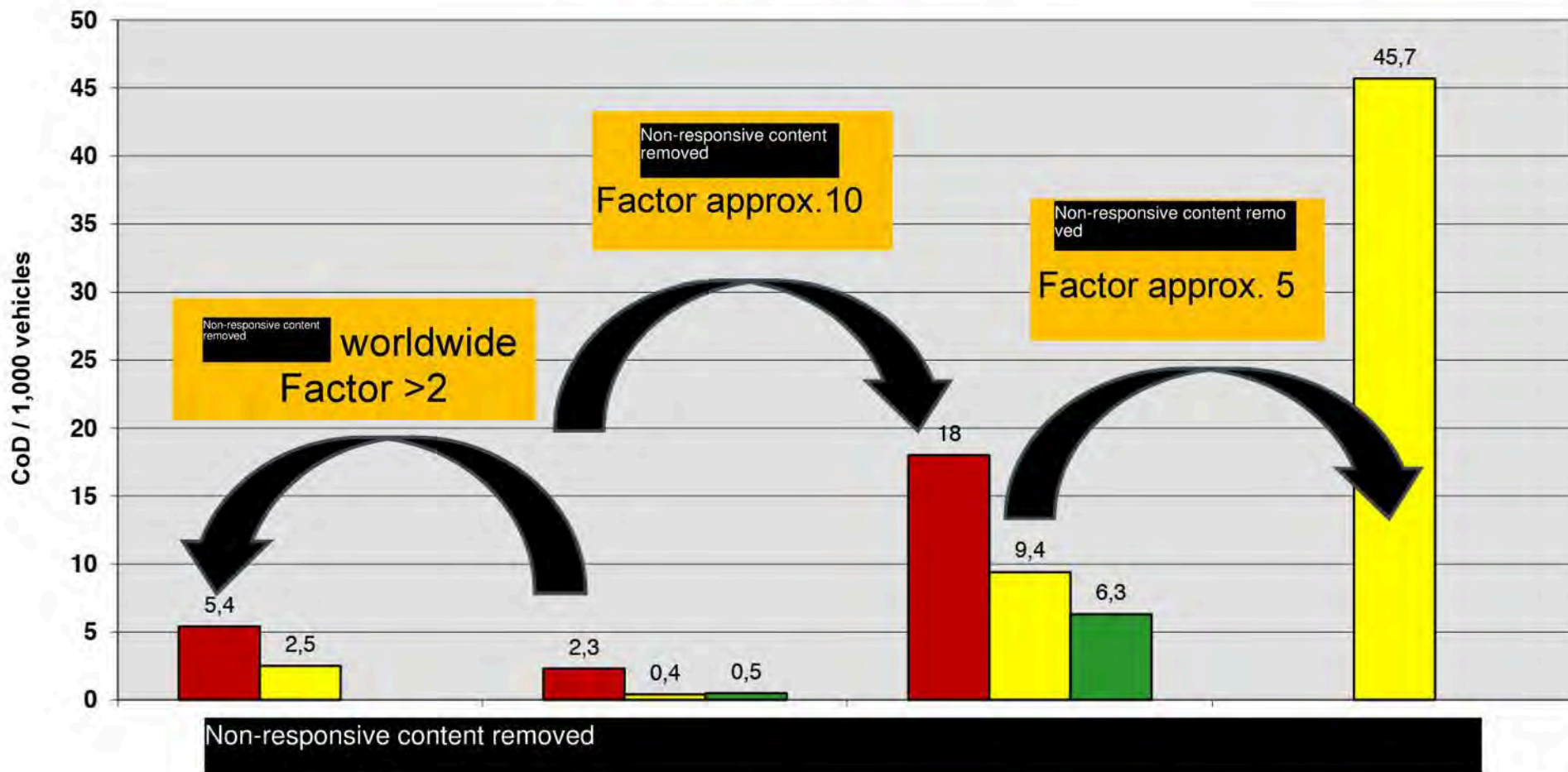


Total V6-TDI: 1,739 cases worldwide
 MY08: 849 cases
 MY09 782 cases
 MY10 108 cases
 (SAGA, status 04.07.2010)

Drivetrain damage high-pressure diesel fuel pump CP4.2

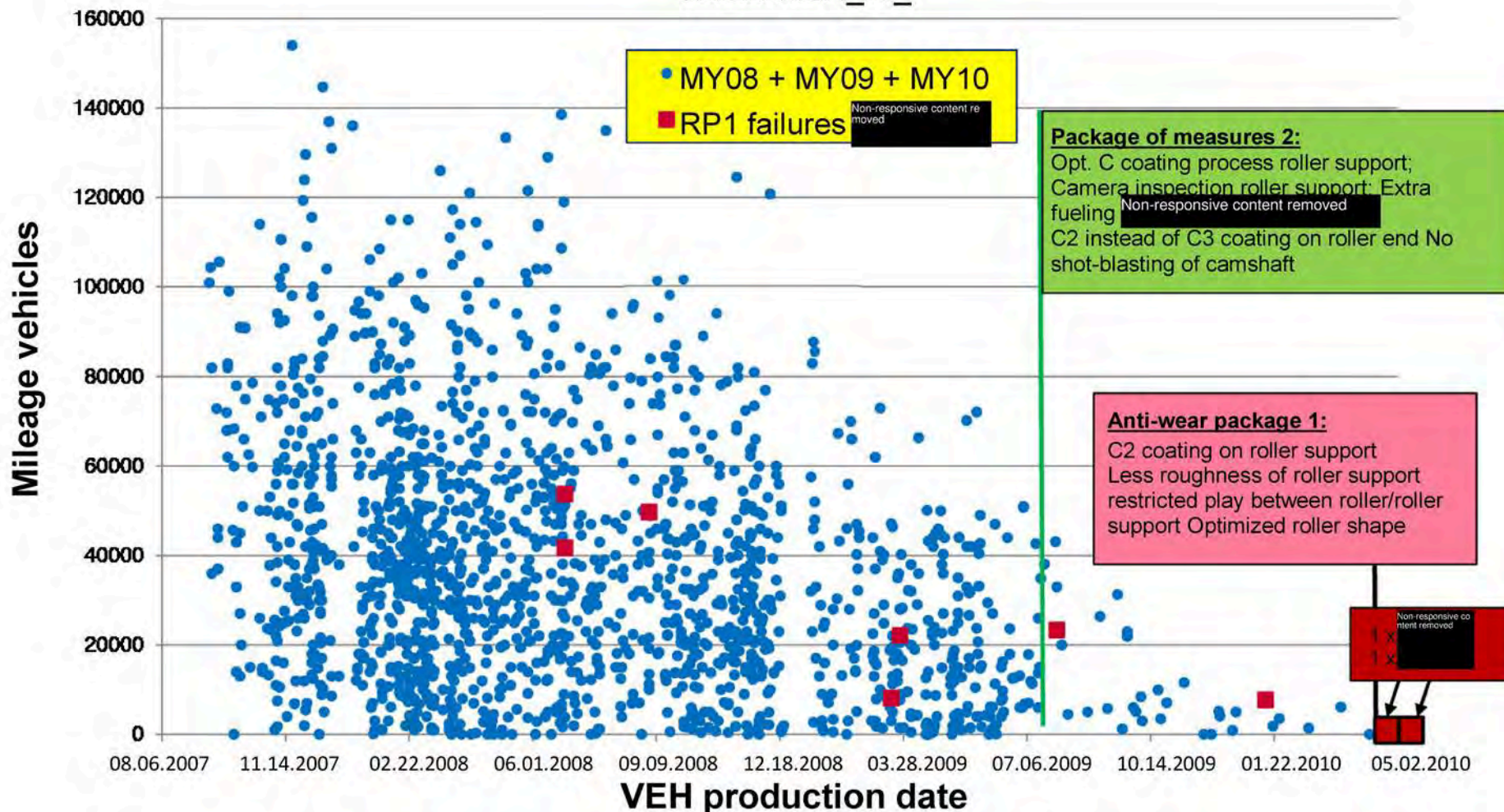
MIS 09

■ MY08 ■ MY09 ■ MY10



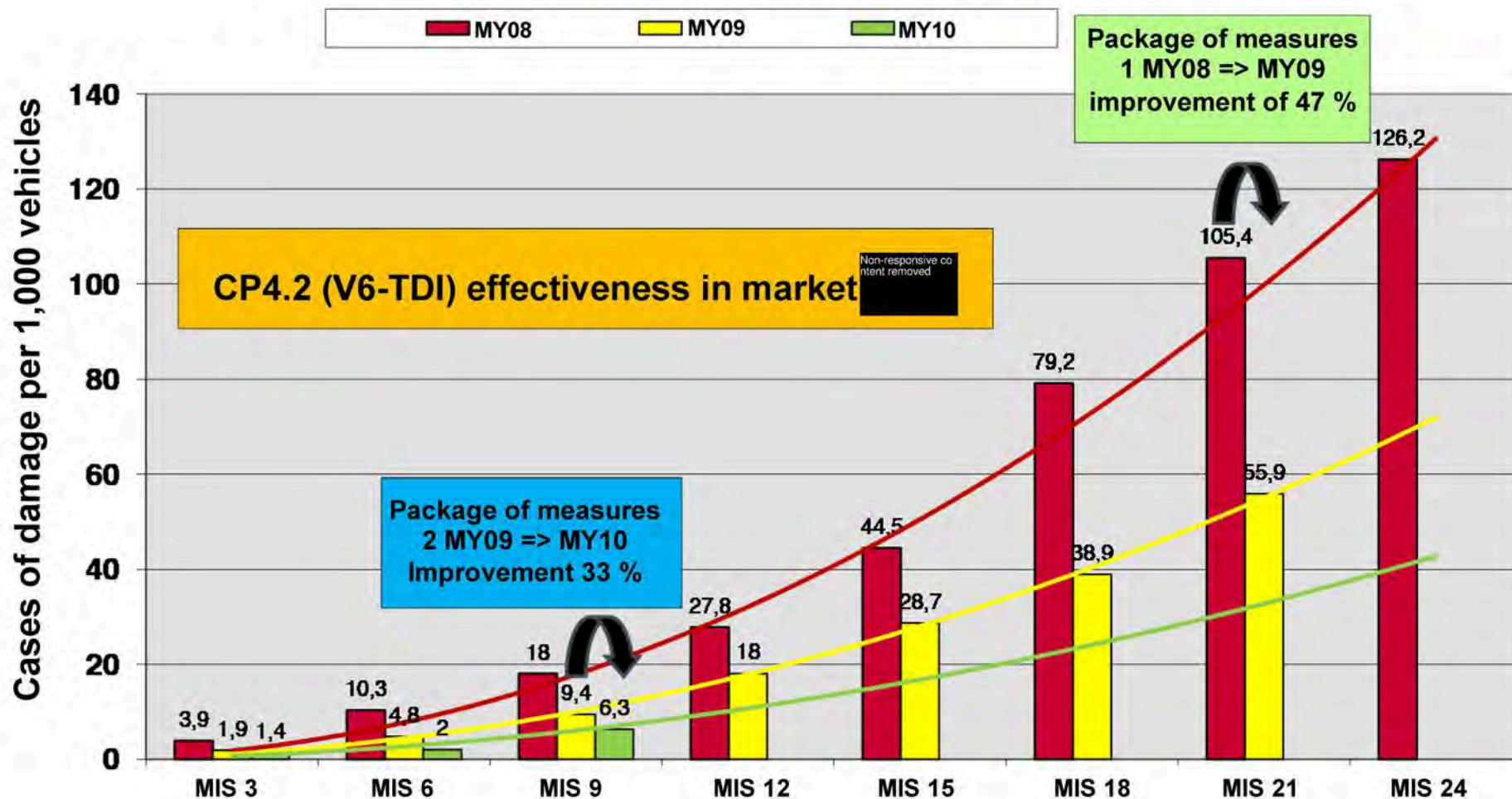
Drivetrain damage high-pressure diesel fuel pump CP4.2

Mileage over production day vehicles
all Audi V6-TDI
SAGA 059A_/B_



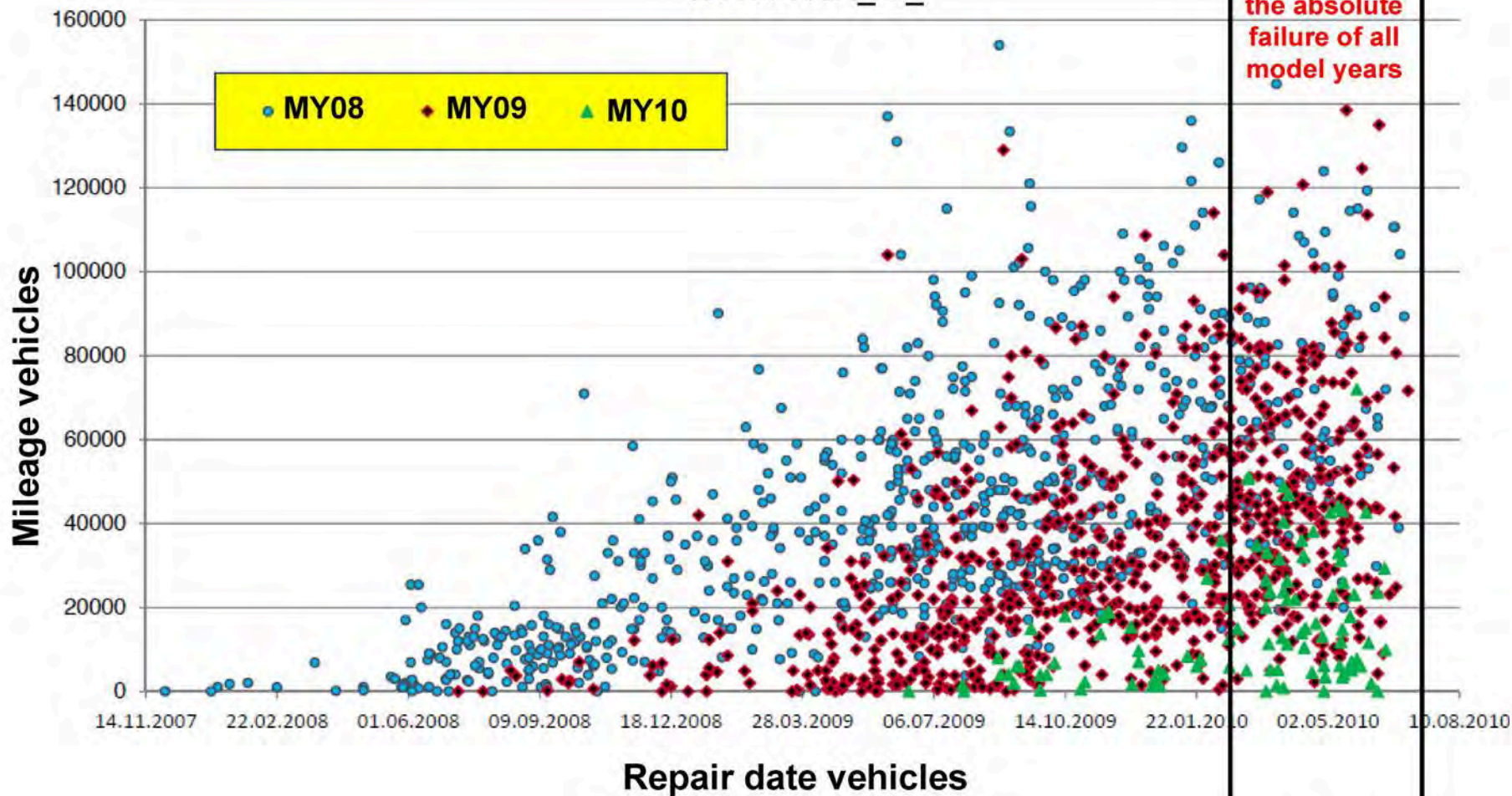
Drivetrain damage high-pressure diesel fuel pump CP4.2

CP4.2 all V6-TDI Model year comparison Model year comparison by MIS



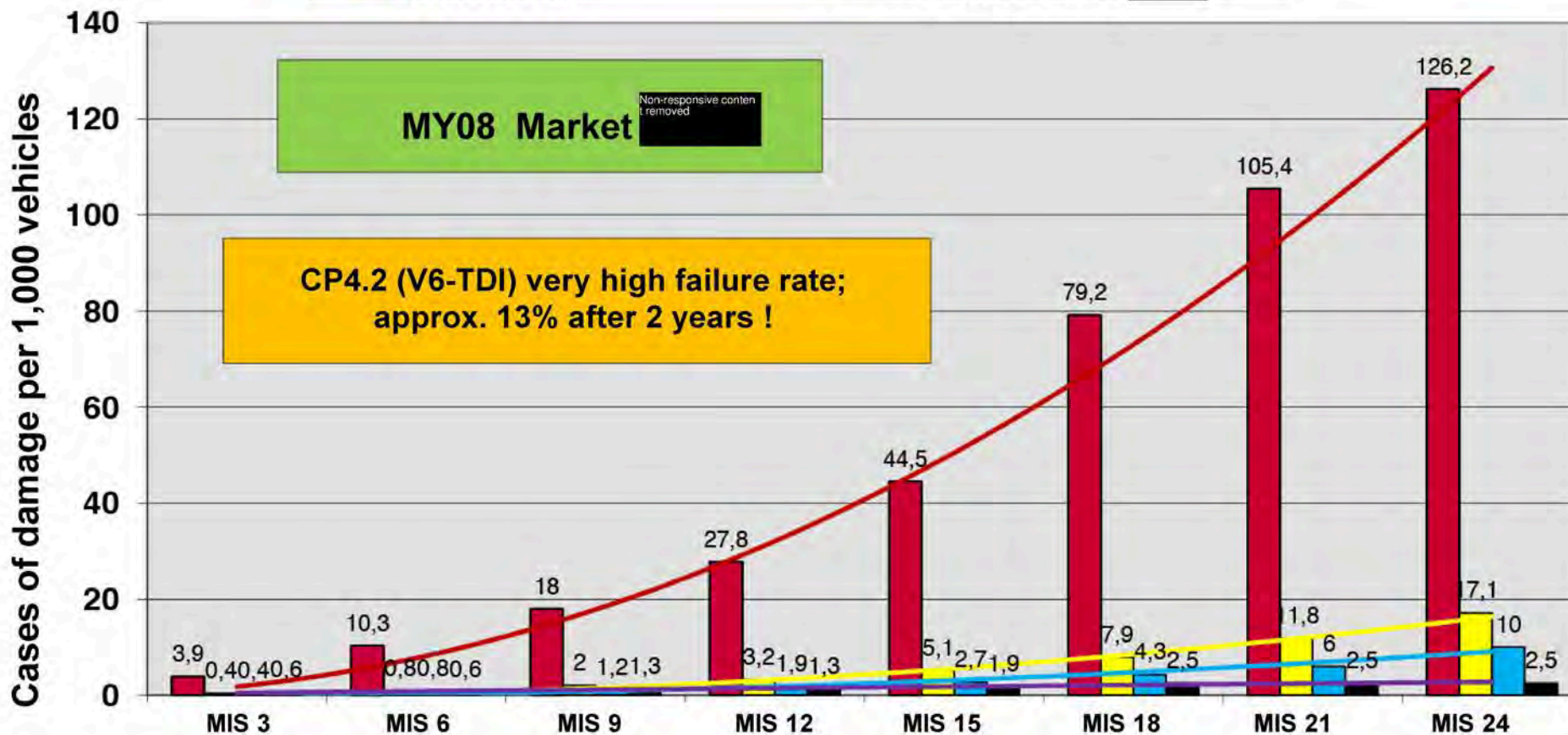
Drivetrain damage high-pressure diesel fuel pump CP4.2

Mileage by vehicles repair date
all Audi V6-TDI
SAGA 059A_/B_



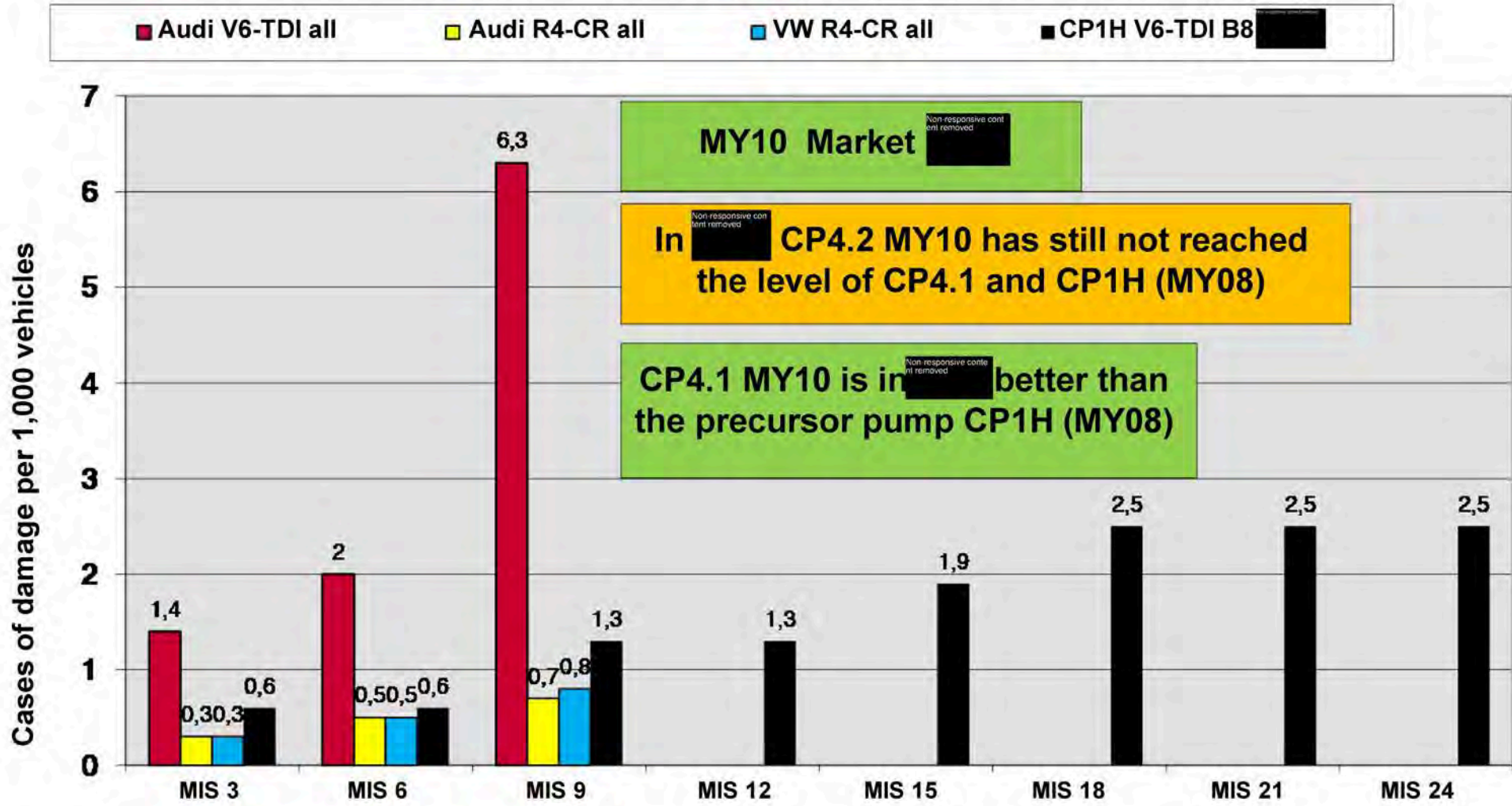
Drivetrain damage high-pressure diesel fuel pump CP4.2

CP4.2 + CP4.1 + CP1H MY08 V6-/R4-TDI Audi/VW by MIS



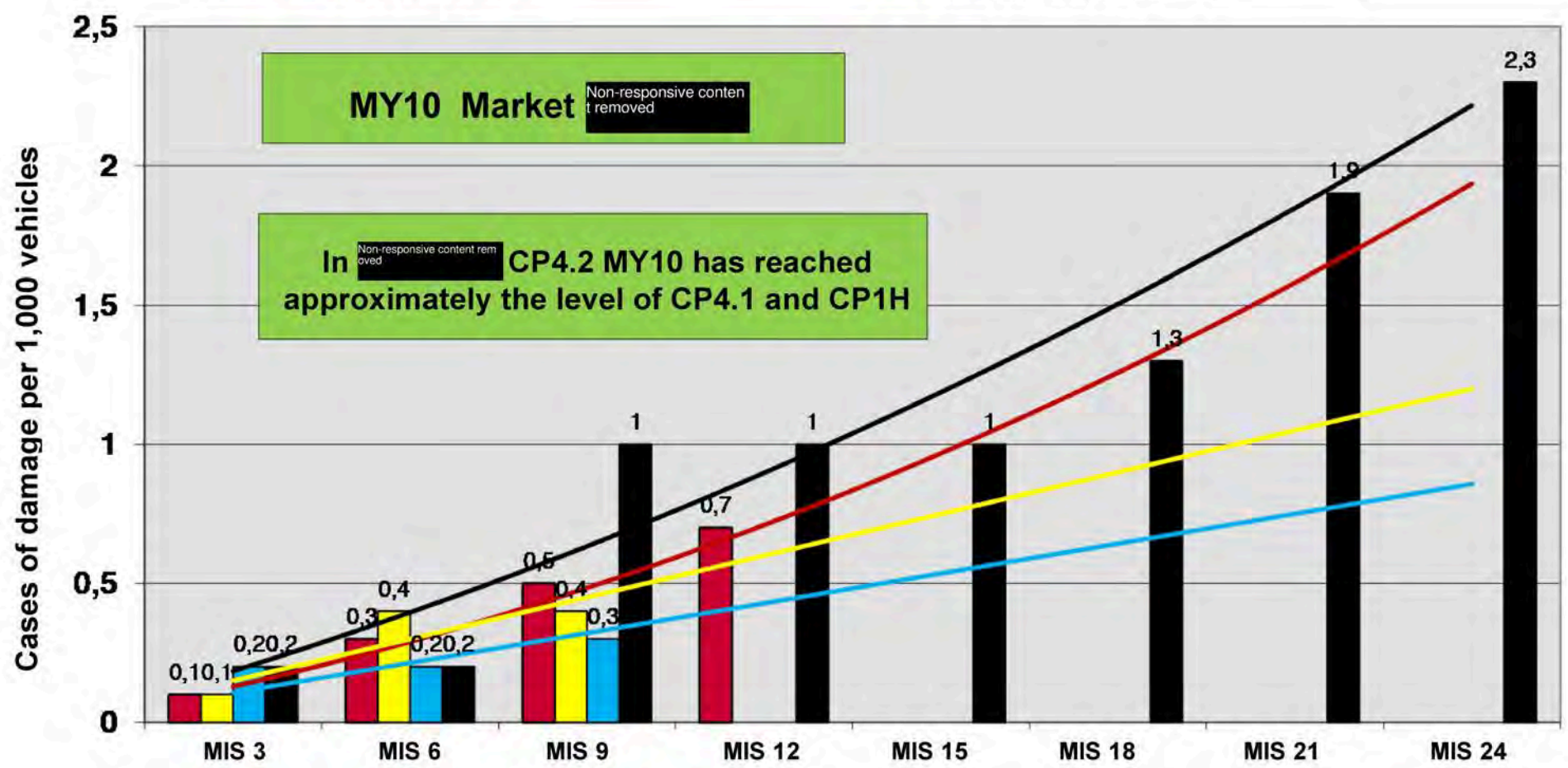
Drivetrain damage high-pressure diesel fuel pump CP4.2

CP4.2 + CP4.1 MY10 and CP1H MY08 Non-responsive content removed V6-/R4-TDI Audi/VW

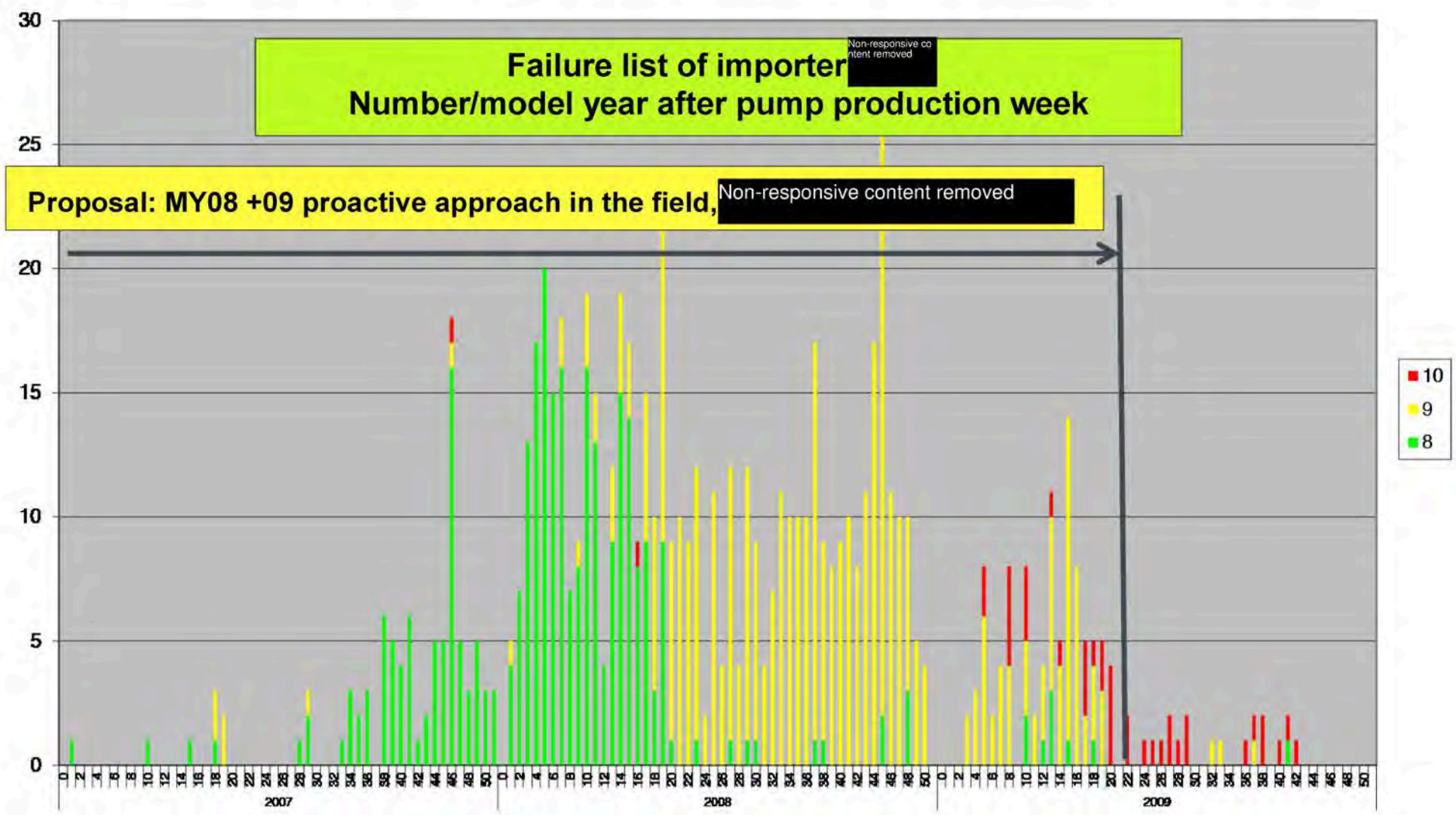


Drivetrain damage high-pressure diesel fuel pump CP4.2

CP4.2 + CP4.1 MY10 + CP1H MY08 V6-/R4-TDI Audi/VW



Drivetrain damage high-pressure diesel fuel pump CP4.2

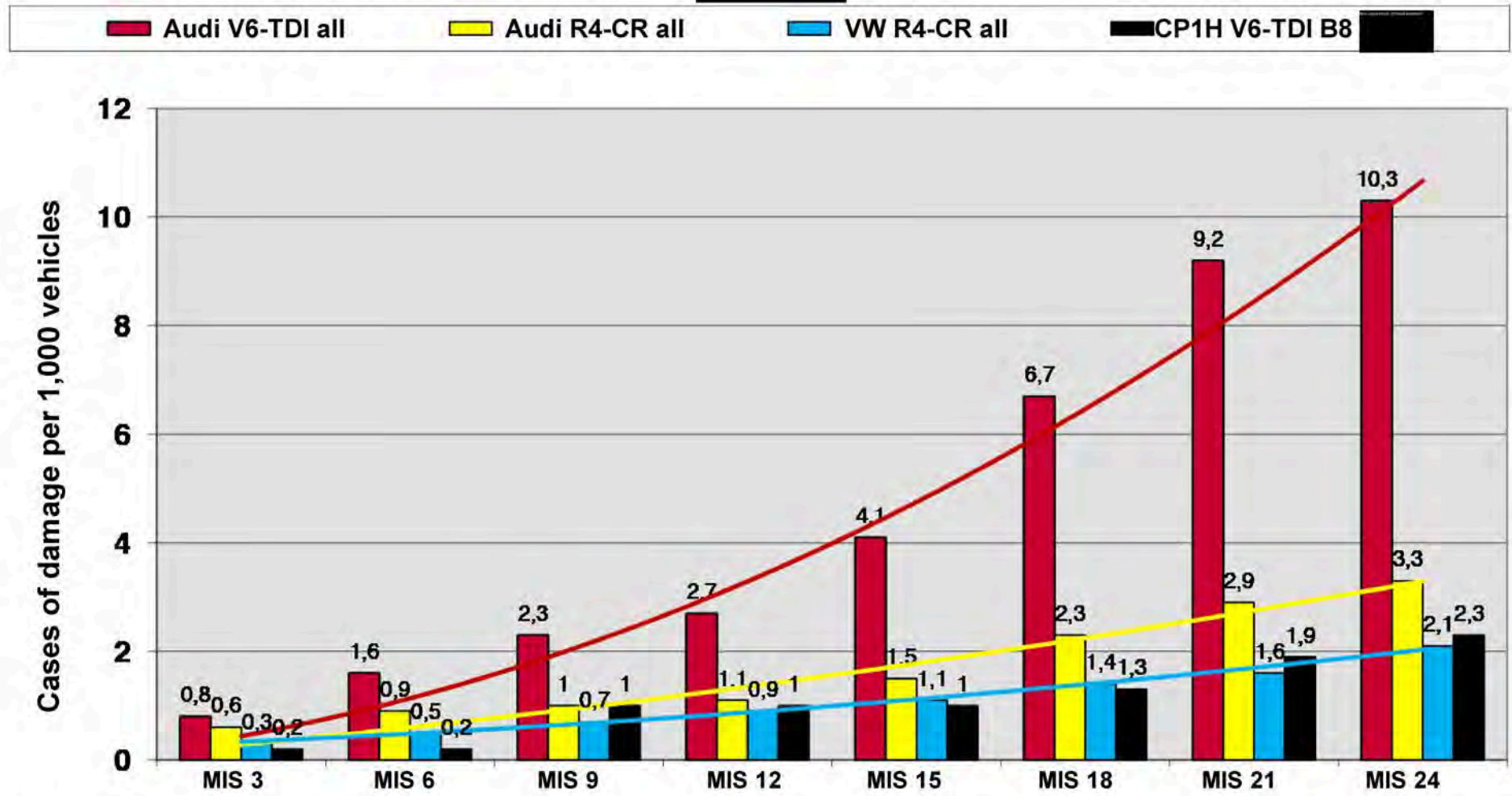


Drivetrain damage high-pressure diesel fuel pump CP4.2

Backup

Drivetrain damage high-pressure diesel fuel pump CP4.2

CP4.2 + CP4.1 + CP1H MY08 Non-responsive content removed V6-/R4-TDI Audi/VW by MIS



Drivetrain damage high-pressure diesel fuel pump CP4.2

AQUA: Active quality analysis
 Status as on 10.05-06.12.10 01:38 PM
 Source/User Non-responsive content removed

Audi, *, market: [REDACTED]

Confidential

MY 2008 – 2010, Offset: all (Max: 2)

without PR-numbers

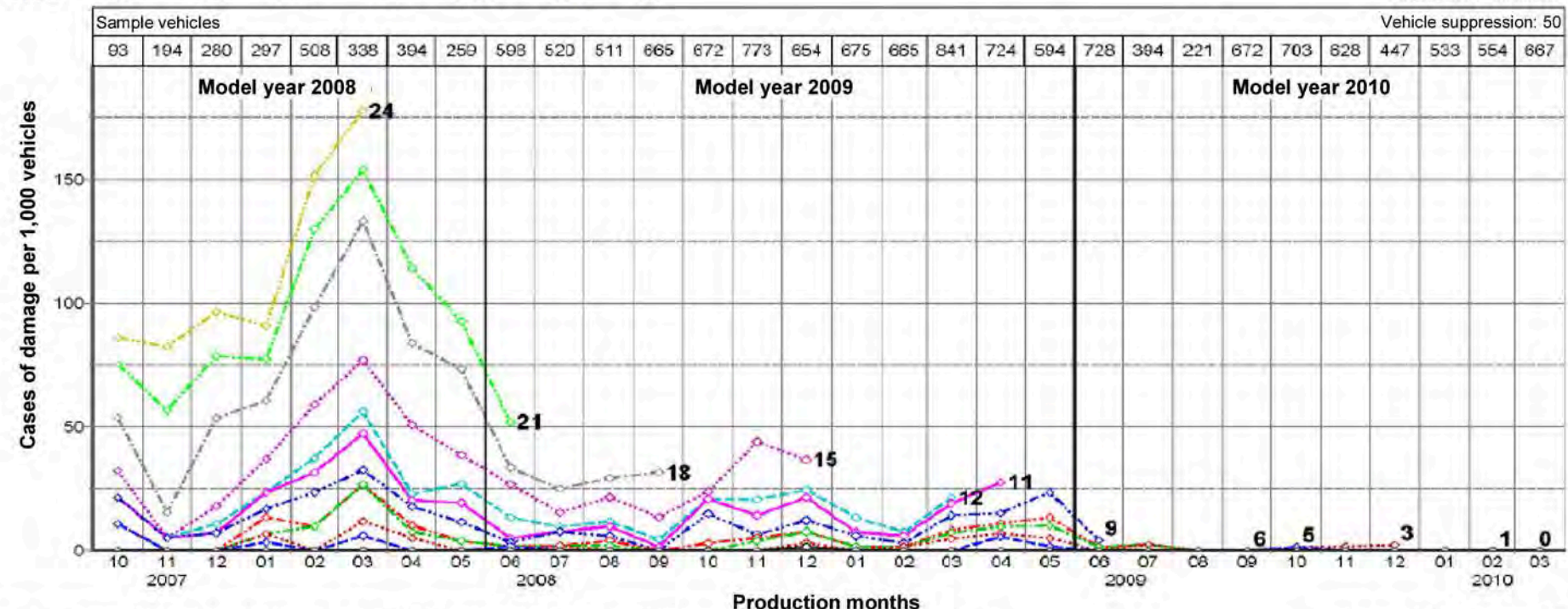
CNR

2374

CNR / Groups: High-pressure fuel pump

| | CAMA | CAMB | CAMD | CANA | CANB | CANC | CAND | CASA | CASB | CASC | CASD | CATA | CATB | CCLA | CCMA | CCWA | CAWB | CDYA | CDYB | CDYC | CG |
|-------|---------|--------|--------|--------|--------|--------|--------|-------|-------|-------|-------|-------|----------------|---------|--------|--------|--------|------|------|------|----|
| MY | MIS0 | MIS1 | MIS3 | MIS5 | MIS6 | MIS9 | MIS11 | MIS12 | MIS15 | MIS18 | MIS21 | MIS24 | MY Replacement | BD | SA10 | SA17 | | | | | |
| 2008 | 0,0 | 1,7 | 3,9 | 9,0 | 10,3 | 18,0 | 23,6 | 27,8 | 44,5 | 79,2 | 105,4 | 126,2 | 2008 | 100,0 % | 83,3 % | 76,5 % | 13,7 % | | | | |
| 2009 | 0,1 | 0,9 | 1,9 | 3,8 | 4,8 | 9,4 | 14,5 | 18,0 | 28,7 | 38,9 | 55,9 | | 2009 | 98,8 % | 81,7 % | 81,3 % | 12,5 % | | | | |
| 2010 | 0,0 | 0,2 | 1,4 | 2,0 | 2,0 | 6,3 | 10,4 | | | | | | 2010 | 100,0 % | 84,2 % | 73,7 % | 15,8 % | | | | |
| Diff% | -100,00 | -78,42 | -27,47 | -47,60 | -58,93 | -33,49 | -28,17 | | | | | | | | | | | | | | |

MEC ERR MAJOR



Vehicles: 3,389+12,041+10,864=26,294; sold: 3,388+11,958+9,663=25,009; UP: 2,335+7,730+6,666=16,731; MY: 2008+2009+2010=total

CP42 A4,A5,Q5,A6,Q7 aMKB [REDACTED] 30

Drivetrain damage high-pressure diesel fuel pump CP4.2

AQUA: Active quality analysis
 Status as on 05/10-06.12.10 01:58 PM
 Source/User Non-responsive content removed

Audi, *, market: AUDI (approved markets)

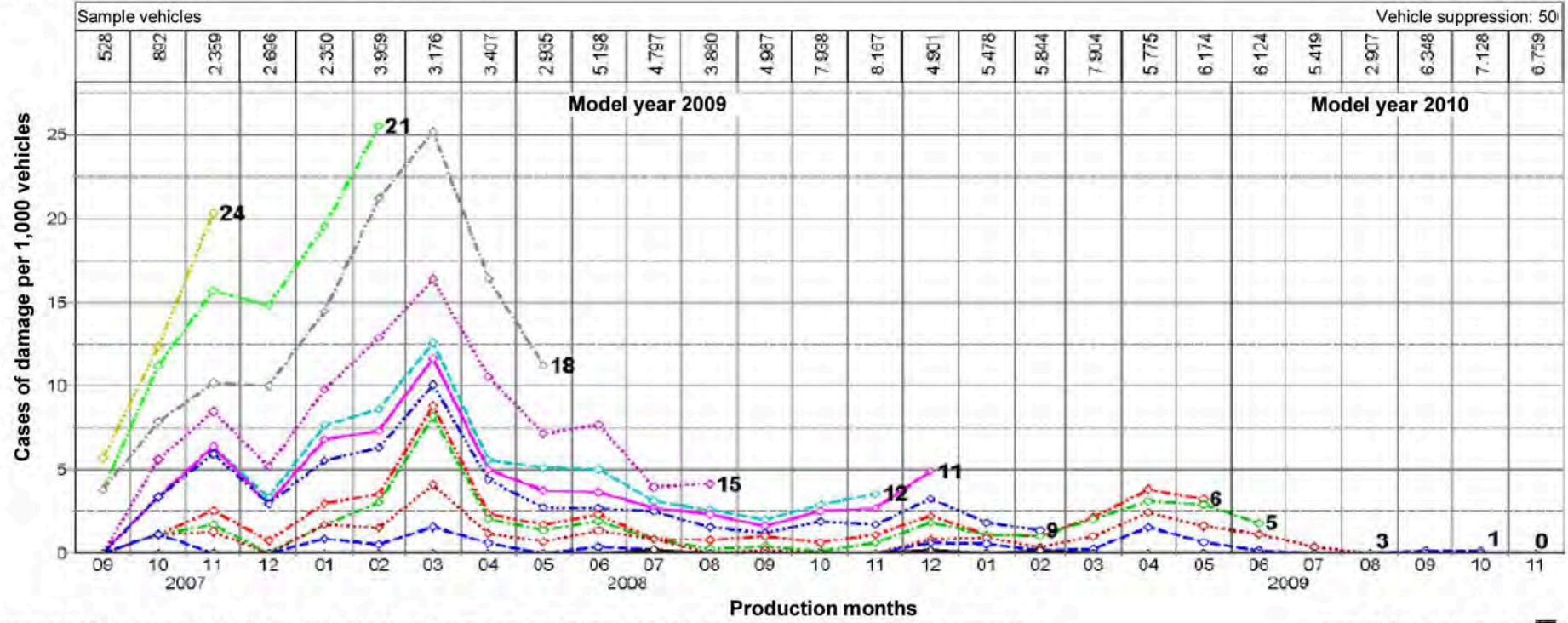
Confidential
 without PR-numbers
 CNR 2374

MY 2008 – 2010, Offset: all (Max: 6)

CNR / Groups: High-pressure fuel pump

| | CAMA | CAMB | CAMD | CANA | CANB | CANC | CAND | CASA | CASB | CASC | CASD | CATA | CATB | CCLA | CCMA | CCWA | CAWB | CDYA | CDYB | CDYC | CG | |
|-------|---------|--------|------|--------|--------|------|-------|-------|-------|-------|-------|-------|----------------|--------|--------|--------|--------|------|------|------|----|--|
| MY | MIS0 | MIS1 | MIS3 | MIS5 | MIS6 | MIS9 | MIS11 | MIS12 | MIS15 | MIS18 | MIS21 | MIS24 | MY Replacement | BD | SA10 | SA17 | | | | | | |
| 2008 | 0,0 | 0,6 | 1,5 | 2,7 | 3,3 | 5,4 | 6,3 | 7,0 | 10,2 | 15,9 | 20,2 | 22,9 | 2008 | 98,6 % | 65,7 % | 77,3 % | 11,7 % | | | | | |
| 2009 | 0,0 | 0,3 | 0,7 | 1,3 | 1,7 | 2,5 | 3,3 | 3,9 | 5,5 | 9,8 | | | 2009 | 95,8 % | 57,6 % | 73,5 % | 16,6 % | | | | | |
| 2010 | 0,0 | 0,1 | 0,8 | 1,2 | 1,2 | | | | | | | | 2010 | 91,4 % | 56,9 % | 67,2 % | 20,7 % | | | | | |
| Diff% | -100,00 | -61,69 | 2,29 | -11,49 | -29,96 | | | | | | | | | | | | | | | | | |

MEC ER MAJOR



Vehicles: 30.295+95.285+92.844=218.424; Sold: 30.244+94.857+82.400=207.501; UP: 21.579+69.553+652=157.784; MY: 2008+2009+2010=Total

CP42 A4,A5,Q5,A6,Q7 aMKB 80

Drivetrain damage high-pressure diesel fuel pump CP4.2

AQUA: Active quality analysis
 Status as on 10/05 05.28.10 2:07 PM
 Source/User [Redacted]

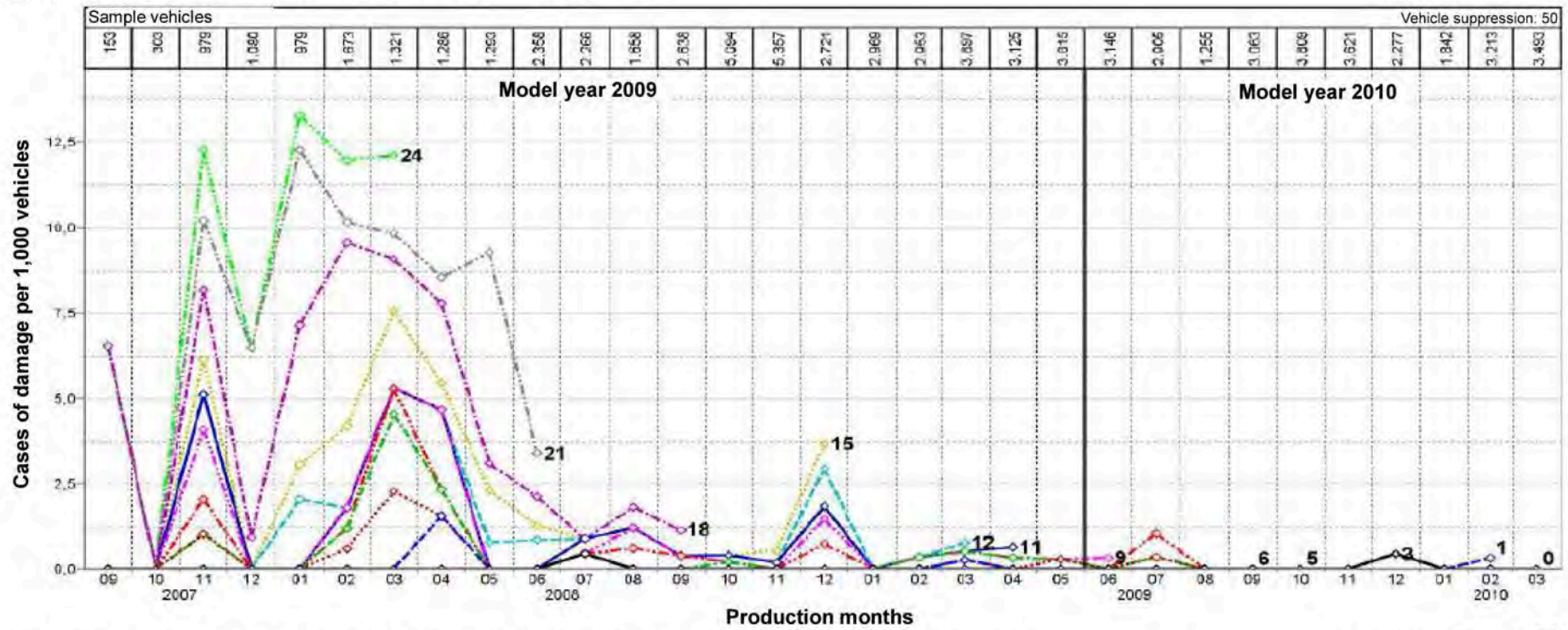
Audi, *, market: [Redacted]

Confidential
 without PR-numbers
 CNR 2374

MY 2008 – 2010, Offset: all (Max: 2)

CNR / Groups: High-pressure fuel pump

| CAMA | CAMB | CAMD | CANA | CANB | CANC | CAND | CASA | CASB | CASC | CASD | CATA | CATB | CCLA | CCMA | CCWA | CAWB | CDYA | CDYB | CDYC | CG | |
|-------|-------|-------|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------------|--------|--------|-------|------|------|----|---------------|
| MY | MIS0 | MIS1 | MIS3 | MIS5 | MIS6 | MIS9 | MIS11 | MIS12 | MIS15 | MIS18 | MIS21 | MIS24 | MY | Replacement | BD | SA10 | SA20 | | | | |
| 2008 | 0,0 | 0,2 | 0,8 | 1,4 | 1,6 | 2,3 | 2,4 | 2,7 | 4,1 | 6,7 | 9,2 | 10,3 | 2008 | 96,8 % | 47,9 % | 74,5 % | 3,2 % | | | | |
| 2009 | 0,0 | 0,1 | 0,1 | 0,2 | 0,3 | 0,4 | 0,5 | 0,7 | 0,9 | 1,5 | 3,5 | | 2009 | 90,0 % | 44,0 % | 76 % | 4 % | | | | |
| 2010 | 0,0 | 0,1 | 0,1 | 0,1 | 0,3 | 0,5 | 0,5 | | | | | | 2010 | 50,0 % | 50,0 % | 50 % | 25 % | | | | |
| Diff% | 25,05 | 33,30 | 47,17 | -36,93 | -1,73 | 39,03 | 1,34 | | | | | | | | | | | | | | MEC ERR NOISE |



Vehicles: 10.185+43.183+40.803=94.171; Sold: 10.181+43.066+37.229=90.476; UP: 8.685+37.729+33.239=79.653; MY: 2008+2009+2010=total

CP42 A4,A5,Q5,A6,Q7 aMKB 80

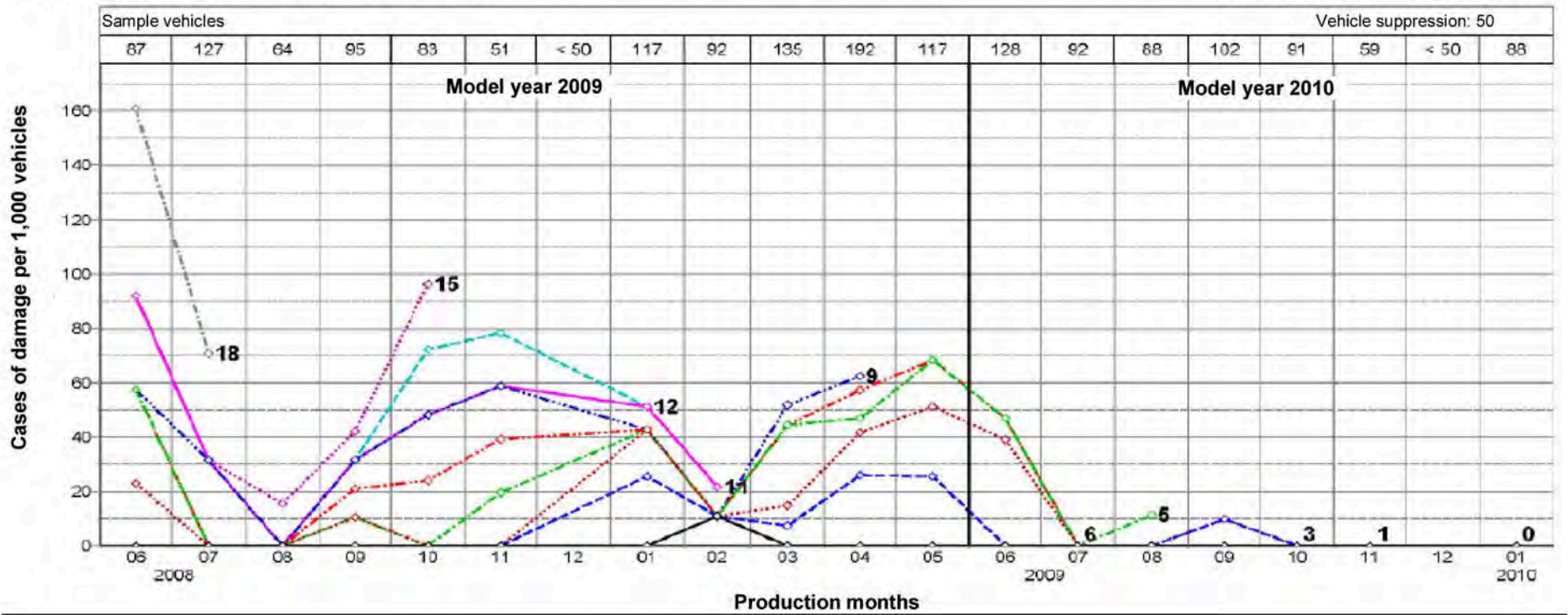
Drivetrain damage high-pressure diesel fuel pump CP4.2

AQUA: Active quality analysis
 Status as on 10.05-06.12.10 1:58 PM
 Source/User Non-responsive content removed

Audi, *, market: XXXXXXXXXX
 MY 2008 – 2010, Offset: all (Max: 4)
 CNR / Groups: High-pressure fuel pump

Confidential
 without PR-numbers
 CNR 2374

| | CAMA | CAMB | CAMD | CANA | CANB | CANC | CAND | CASA | CASB | CASC | CASD | CATA | CATB | CCLA | CCMA | CCWA | CAWB | CDYA | CDYB | CDYC | CG | |
|-------|---------|--------|--------|--------|--------|------|-------|-------|-------|-------|------|-------------|--------|--------|--------|-------|-------|------|------|-------|-------|------|
| MY | MIS0 | MIS1 | MIS3 | MIS5 | MIS6 | MIS9 | MIS11 | MIS12 | MIS15 | MIS18 | MY | Replacement | BD | SA10 | SA17 | SA18 | SA50 | | | | | |
| 2009 | 0,8 | 11,9 | 22,0 | 32,2 | 37,3 | 45,7 | 50,7 | 54,7 | 64,0 | 95,2 | 2009 | 90,6 % | 24,7 % | 49,4 % | 34,1 % | 7,1 % | 7,1 % | | | | | |
| 2010 | 0,0 | 3,3 | 12,5 | 17,2 | 17,2 | | | | | | 2010 | 100,0 % | 41,7 % | 58,3 % | 41,7 % | | | | | | | |
| Diff% | -100,00 | -72,16 | -43,04 | -46,50 | -53,80 | | | | | | | | | | | | | MEC | ERR | MAJOR | MINOR | LEAK |

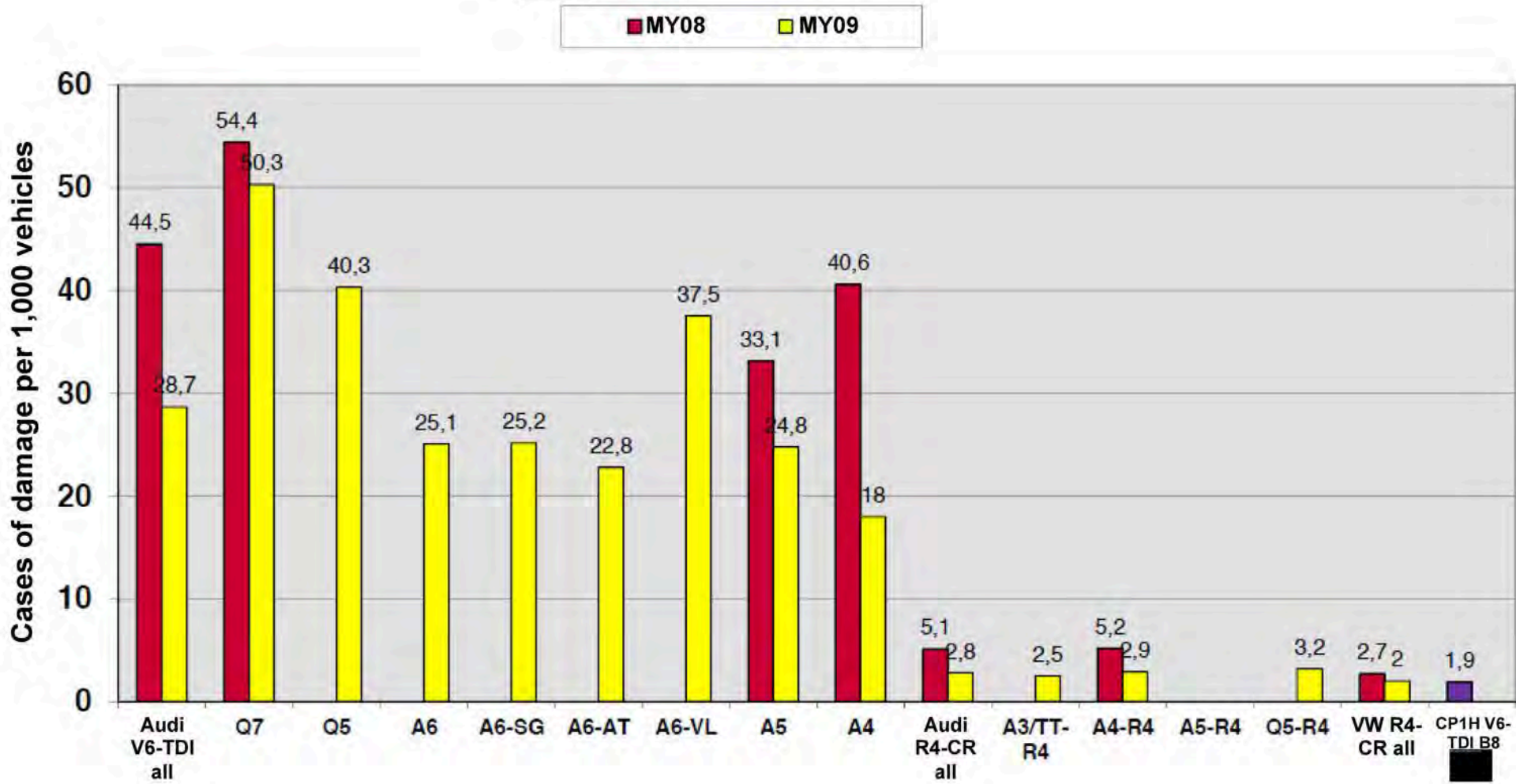


Vehicles: 1+2.074+2.026=4.101; Sold: 1+2.071+1.571=3.643; UP: 0+1.181+936=2.117; MY: 2008+2009+2010=total

CP42 A4,A5,Q5,A6,Q7 aMKB XXXX 80

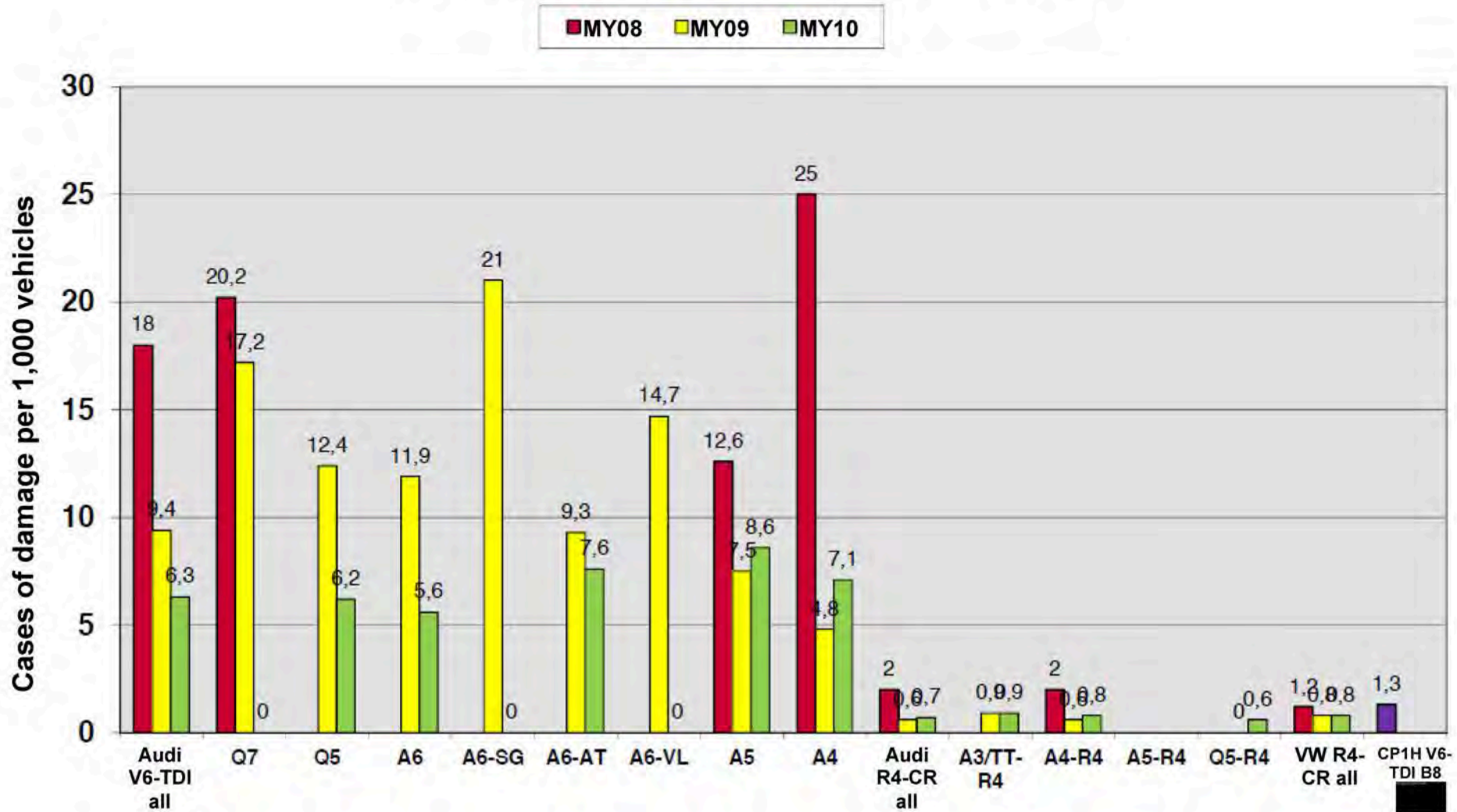
Drivetrain damage high-pressure diesel fuel pump CP4.2

CP4.2 [redacted] type/model year comparison MIS15



Drivetrain damage high-pressure diesel fuel pump CP4.2

CP4.2 [redacted] type/model year comparison MIS9



| | | |
|---|--|---|
|  | Minutes: 08.02.2010 Q campaign for diesel |  |
|---|--|---|

| Introduction | | | | | |
|--------------|-----|-------|---------------------------------------|--------------------------------|-------|
| Pos | CNR | Topic | (A)ssignment (I)nformation Date | Responsible | Dept. |
| | | | | Non-responsive content removed | |

| | | |
|---|--|---|
|  | Minutes: 08.02.2010 Q campaign for diesel |  |
|---|--|---|

| Follow-ups - diesel | | | | | |
|---------------------|-----|---|---------------------------------|---|-------|
| Pos | CNR | Topic | (A)ssignment (I)nfornation Date | Responsible | Dept. |
| 5. | | <p>Bosch high pressure pump CP-4 failures</p> <p>HPP - failures EA 896, focus Non-responsive content removed [REDACTED] will present the CoD curves for HPP. The evaluations point to long-term damages.</p> <p>Title: EA896 [REDACTED].PDF, Author: [REDACTED], Size: 257 KB, Date: 05/17/2010 https://qsappl0.wob.vw.vwg:4100/pls/portal/download/IFS:11895367/11895367</p> <p>Title: EA896 [REDACTED].PDF, Author: [REDACTED], Size: 317 KB, Date: 05/17/2010 https://qsappl0.wob.vw.vwg:4100/pls/portal/download/IFS:11895361/11895361</p> <p>Title: EA896 [REDACTED].PDF, Author: [REDACTED], Size: 282 KB, Date: 05/17/2010 https://qsappl0.wob.vw.vwg:4100/pls/portal/download/IFS:11895403/11895403</p> <p>Title: EA896 [REDACTED].PDF, Author: [REDACTED], Size: 256 KB, Date: 05/17/2010 https://qsappl0.wob.vw.vwg:4100/pls/portal/download/IFS:11895349/11895349</p> <p>Title: EA896 USA.PDF, Author: [REDACTED], Size: 192 KB, Date: 05/17/2010 https://qsappl0.wob.vw.vwg:4100/pls/portal/download/IFS:11895355/11895355</p> <p>Title: Hochdruckpumpe_CR_15_03_2010.pdf, Author: [REDACTED], Size: 1431 KB, Date: 5/17/2010 https://qsappl0.wob.vw.vwg:4100/pls/portal/download/IFS:11895409/11895409</p> <p>The analysis of the differences between CP4.2 and CP4.1 leads to the measures in the anti-wear package 2. Verification required, therefore series only in WK45.</p> <p>Title: HDP_TS Wochenstatus 11_05_10.ppt, Author: [REDACTED], size: 1055 KB, Date: 5/18/2010 https://qsappl0.wob.vw.vwg:4100/pls/portal/download/IFS:11900395/11900395</p> <p>CR for adjustment of 4-cylinder for EU4, BIN to poor quality fuel markets made by [REDACTED] What is aggravating in [REDACTED] is the mixture of diesel with biodiesel of low quality. Addition of the fuel in order to compensate lead to high deposit formation.</p> <p>Joint procedure of Audi and VW through APS Preparation through [REDACTED] Cases of damage from EA 189</p> <p>Title: EA189_2.0L [REDACTED].PDF, Author: [REDACTED], Size: 282 KB, Date: 05/17/2010 https://qsappl0.wob.vw.vwg:4100/pls/portal/download/IFS:11895397/11895397</p> <p>Title: EA189_2.0L [REDACTED].PDF, Author: [REDACTED], Size: 268 KB, Date: 05/17/2010 https://qsappl0.wob.vw.vwg:4100/pls/portal/download/IFS:11895379/11895379</p> <p>Title: EA189_2.0L [REDACTED].PDF, Author: [REDACTED], Size: 217 KB, Date: 05/17/2010 https://qsappl0.wob.vw.vwg:4100/pls/portal/download/IFS:11895385/11895385</p> <p>Title: EA189_2.0L [REDACTED].PDF, Author: [REDACTED], Size: 229 KB, Date: 05/17/2010 https://qsappl0.wob.vw.vwg:4100/pls/portal/download/IFS:11895373/11895373</p> <p>Title: EA189_2.0L USA.PDF, Author: [REDACTED], Size: 261 KB, Date: 05/17/2010 https://qsappl0.wob.vw.vwg:4100/pls/portal/download/IFS:11895391/11895391</p> <p>Resubmission in WK 31/2010</p> <p>CP 4.2 pump in V6 TDI failures -> Introduction of package of measures 2 from WK 45/10 Negotiations with Bosch regarding the assumption of costs is difficult because of the influence of the vehicle: Electric fuel pump from TI somewhat weaker (for lengthwise installations), therefore at unfavorable framework conditions due to temperature and fuel (biodiesel residues) the filter can clog so that lubrication is insufficient (failures such as in [REDACTED]</p> | | <p>Non-responsive content removed</p> <p>Non-responsive content removed</p> <p>Non-responsive content removed</p> <p>Non-responsive content removed</p> | |

| | | |
|---|--|---|
|  | Minutes: 08.02.2010 Q campaign for diesel |  |
|---|--|---|

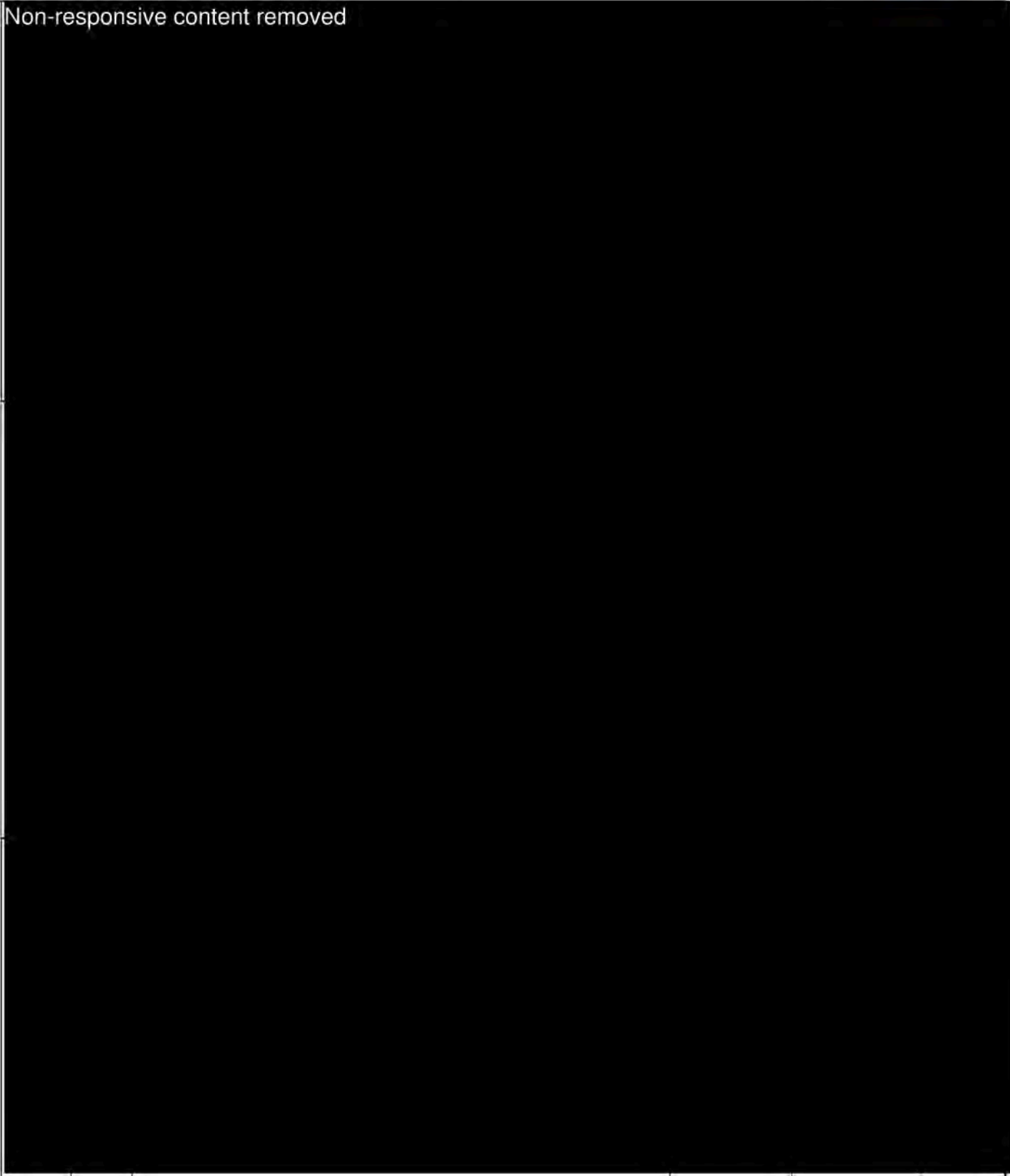
| | | | |
|--|---|---|--------------------------------|
| | <p>Title: Q-Offensive Diesel Bosch HDP 02.08.10.pdf, Author: [REDACTED] size: 2494 KB, Date: 8/3/2010 https://qswms.wob.vw.vwg:4100/pls/portal/download/IFS:11199295/11199295</p> <p>Increasing failure rates in [REDACTED] for the 4-cylinder CR as well (30 – 50 failures), CP4.1 in Audi A3 less susceptible than VW R4 CR. 50 pumps each from Audi and VW for analysis by Bosch.</p> <p>Comparative series of tests by Bosch in process in [REDACTED] for Audi A3 and Audi A4, with focus on different low-pressure cycles.</p> <p>Anti-wear packages for CP4.1 and CP4.2 are implemented together for Audi and VW.</p> <p>Requested project plan for implementation in the minutes.</p> <p>Resubmission in WK 39/2010</p> | I: 08.02.2010 I: 08.02.2010 I: 08.02.2010 A: 08.02.2010 9/27/2010 : 08.02.2010 | Non-responsive content removed |
|--|---|---|--------------------------------|

Breakdown

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| | | |
|---|---|---|
|  <p>VOLKSWAGEN Audi Volkswagen Group</p> | <p>Minutes: 08.02.2010 Q campaign for diesel</p> |  |
|---|---|---|

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| | | |
|---|--|---|
|  | Minutes: 08.02.2010 Q campaign for diesel |  |
|---|--|---|


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| | | USA market | | | |
|-----|-----|---|--|---------------------------------------|-------|
| Pos | CNR | Topic | (A)ssignment (I)nformation Date | Responsible | Dept. |
| 18. | | <p>HPP - Analyses status</p> <p>Present the result of the analyses at Bosch</p> <p>Title: 2010_06_22 USA_HDP-Bosch.ppt, Author: [REDACTED], size: 620 KB, Date: 06.28.2010 https://qswms.wob.vw.vwg:4100/pls/portal/download/IFS:11077460/11077460</p> <p>1 additional pump delivered by [REDACTED] in [REDACTED] <small>Non-responsive content removed</small></p> <p>Detailed reporting in [REDACTED] on 06.30.2010 by [REDACTED] VW [REDACTED]</p> <p>Reporting and documentation for VWoA</p> <p>Resubmission in WK 31/2010 Title: Auswertung_29_07_10_Hochdruckpumpe.pdf, Author: [REDACTED], size: 86 KB, Date: 8/3/2010 https://qswms.wob.vw.vwg:4100/pls/portal/download/IFS:11199283/11199283</p> <p>15 pumps from the USA analyzed at Bosch in the presence of [REDACTED]</p> <p>1 pump directly handed over by [REDACTED] to Bosch for analysis.</p> | <p>EA 189 2.0l CR</p> <p>A: 6/14/2010</p> <p>I: 6/28/2010</p> <p>I: 6/28/2010</p> <p>A: 6/28/2010</p> <p>I: 08.02.2010</p> | <p>Non-responsive content removed</p> | |

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| | | |
|---|---|---|
|  <p>VOLKSWAGEN LEBEN MIT FREIZEIT</p> | <p>Minutes: 08.02.2010 Q campaign for diesel</p> |  |
|---|---|---|

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From: Non-responsive content removed
To:
CC:

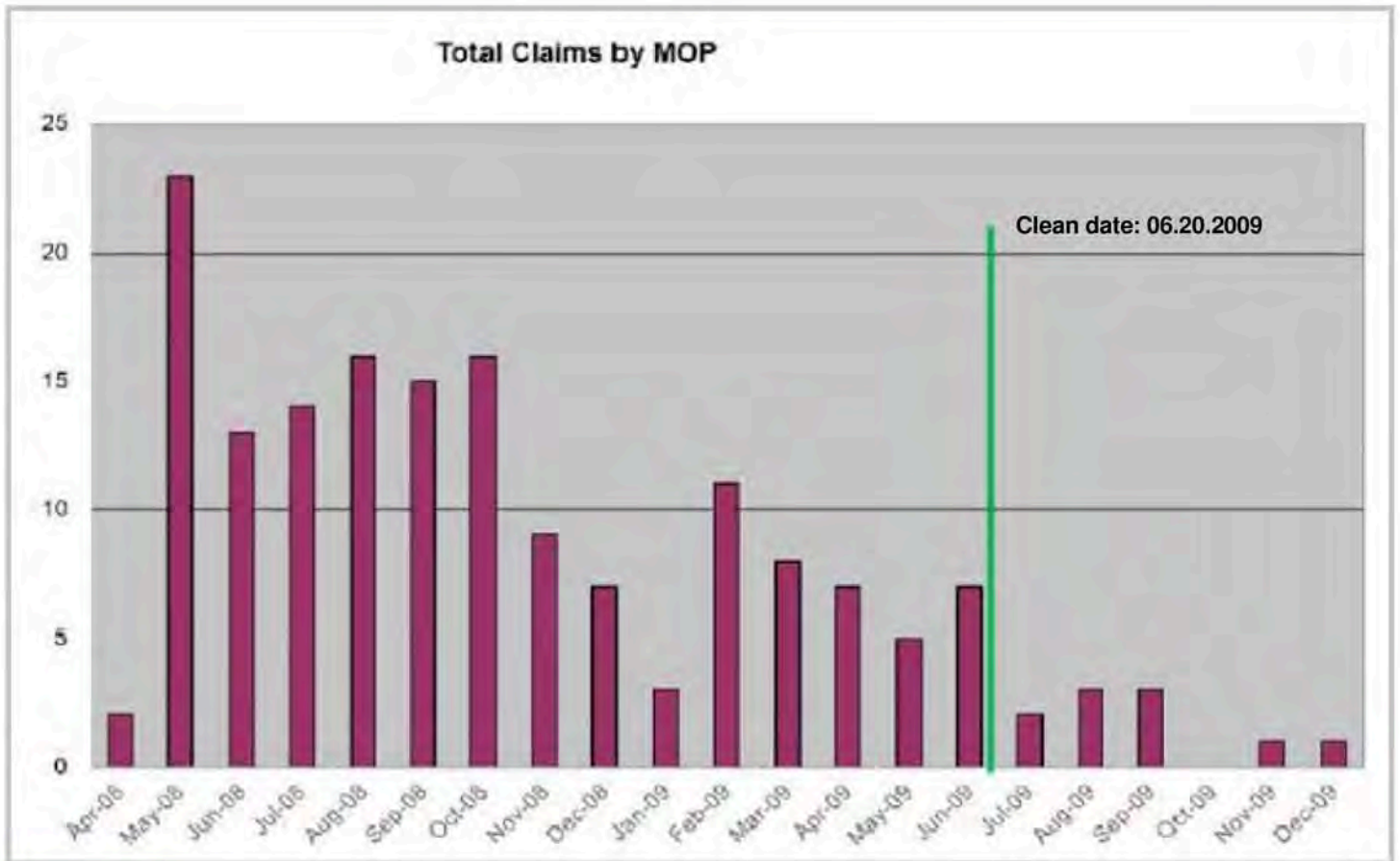
Date: 08.30.2010 11:08:08 AM
Subject: Status for US-Q-Offensive CP4 **Attachments:**
[100727 Status CP4 US Q Offensive \(1\).pdf](#)
[HD- Pumpe USA.pdf](#)

Hello

Attached is the final status of the US Q campaign of the BOSCH-HPP. Until March 2010, a total of 154 CP4.1 have failed in the US and there is a clean date in June 2009 for the existing BOSCH measures that are listed in the 2nd attachment. Unfortunately, our Aqua figures do not reproduce what the US colleagues can deduce from their own systems, so we have again inquired today about the status there for update with due urgency.

Besides the already implemented 34 corrective actions, we also introduce analog to AUDI the anti-wear packages which are listed in the second attachment and are currently in validation at VW since WK08.

By this evening, our electronics technicians will once again list what exactly is shown to the customers by the warning lamp in the chain of failure. Usually, it is assumed that the warning lamp is set according to specific criteria when the rail pressure falls short due to a defective pump. The worst case of the time-related sequence is that a chip reaches the intake valve of the pump suddenly resulting in an open valve, causing the pressure to drop quite abruptly.



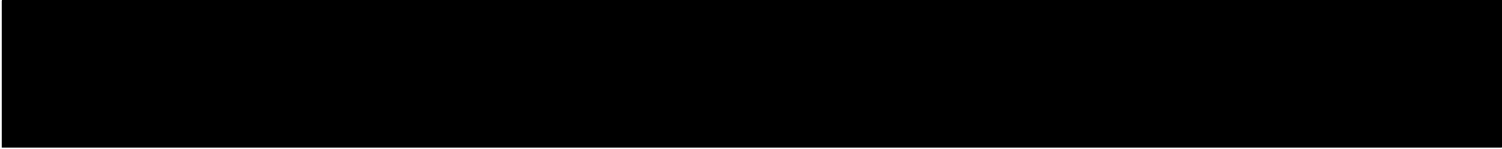
With Best regards

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HRB Nr./ Commercial Register No.: 100484

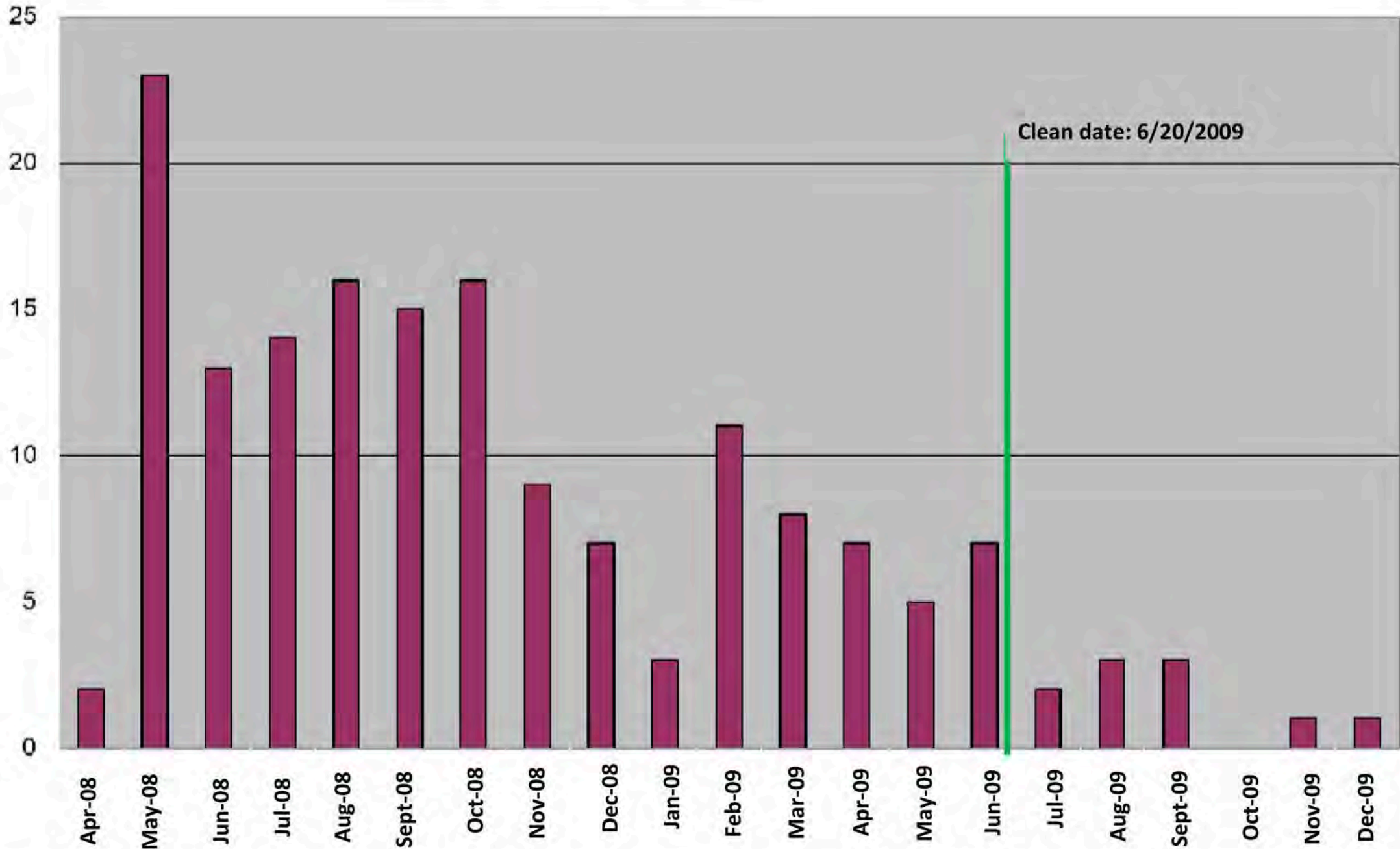
Vorsitzender des Aufsichtsrats/Chairman of the Supervisory Board: Ferdinand Piëch

Vorstand/Board of Management: Martin Winterkorn (Vorsitzender/Chairman), Francisco J. Garcia Sanz, Jochem Heizmann, Horst Neumann, Hans Dieter Pötsch



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Total Claims by MOP



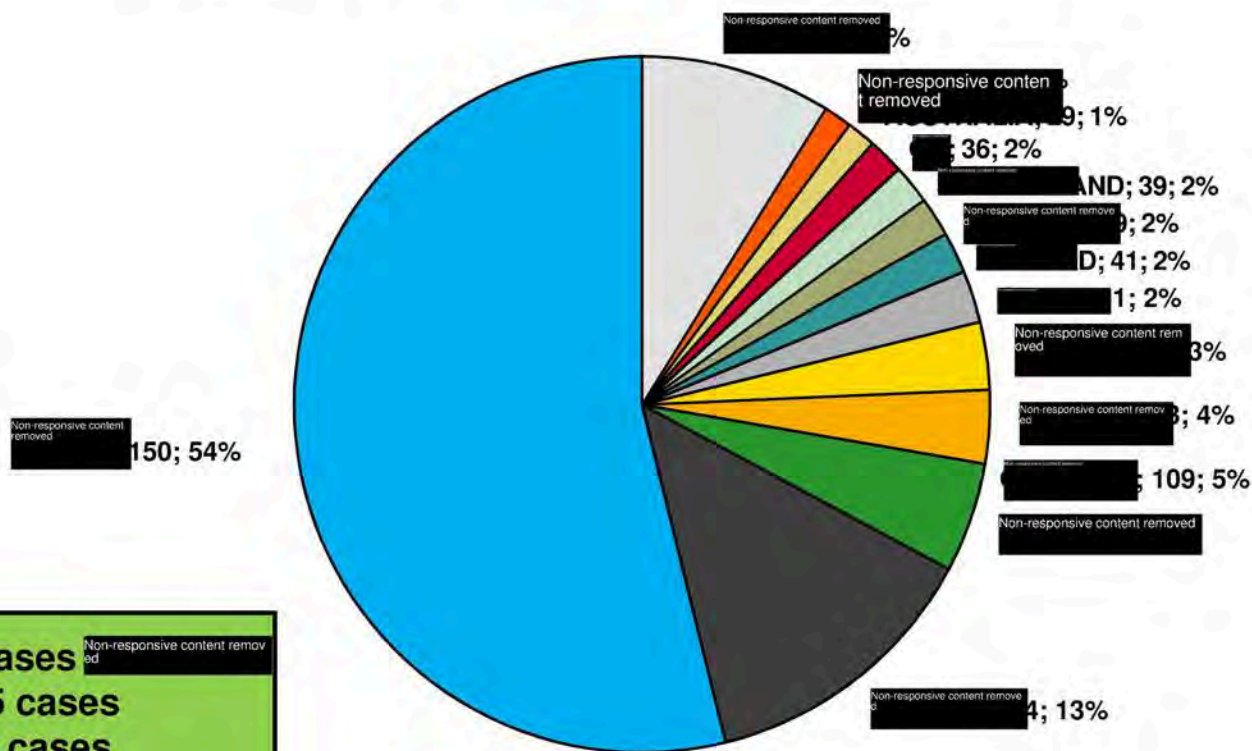
Audi
Vorsprung durch Technik



Drivetrain damage, high pressure diesel fuel pump CP4
Q campaign diesel on 2 August 2010

Drivetrain damage, high pressure diesel fuel pump CP4.2

Audi V6-TDI failures in the field, broken down by country (SAGA – replaced pumps only, 059A_/B_)

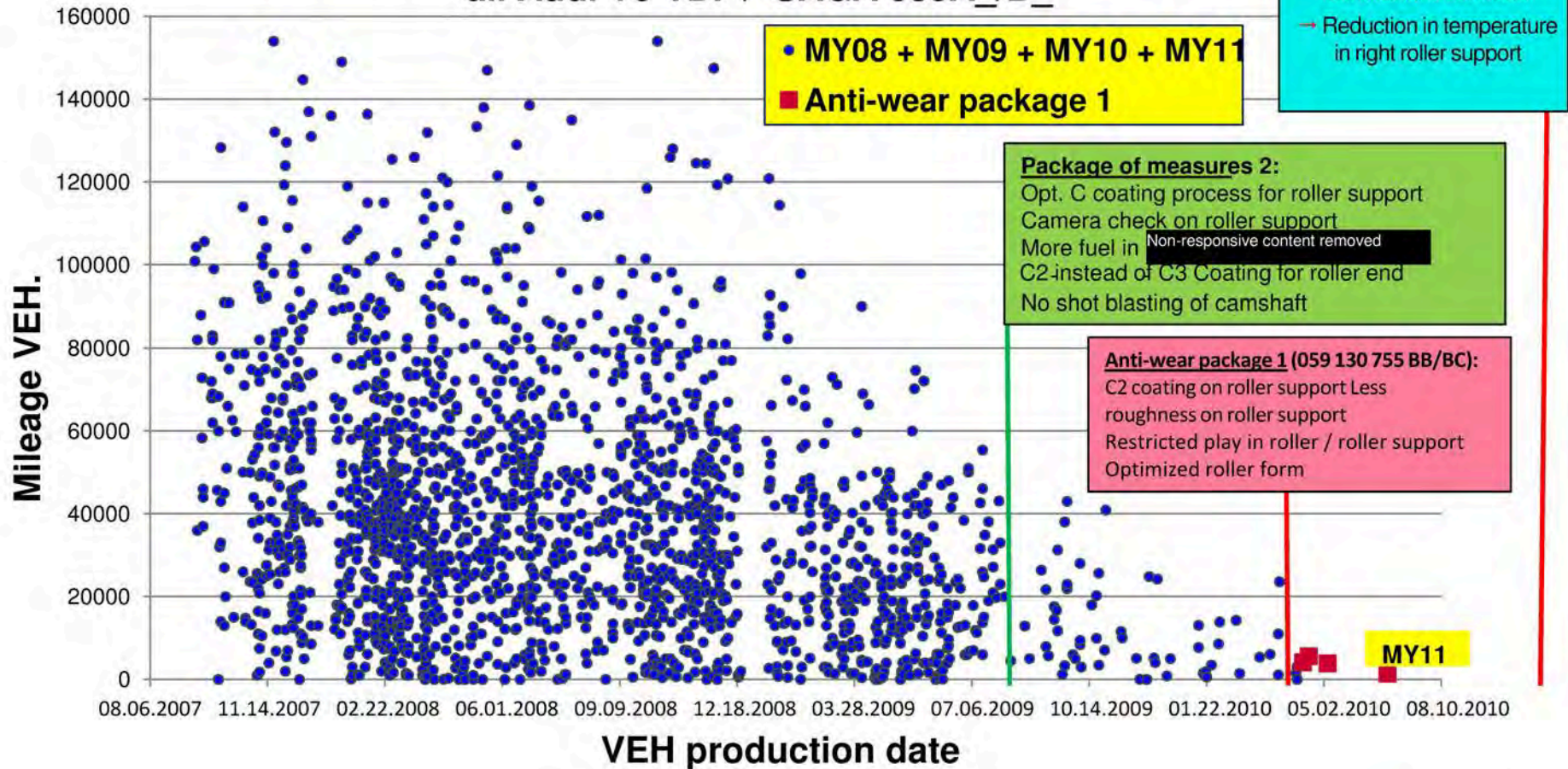


| |
|----------------------------------|
| Total V6-TDI: 2,135 cases |
| MJ08: 935 cases |
| MY09 1,018 cases |
| MY10 181 cases |
| MY11: 1 case |

Drivetrain damage, high pressure diesel fuel pump CP4

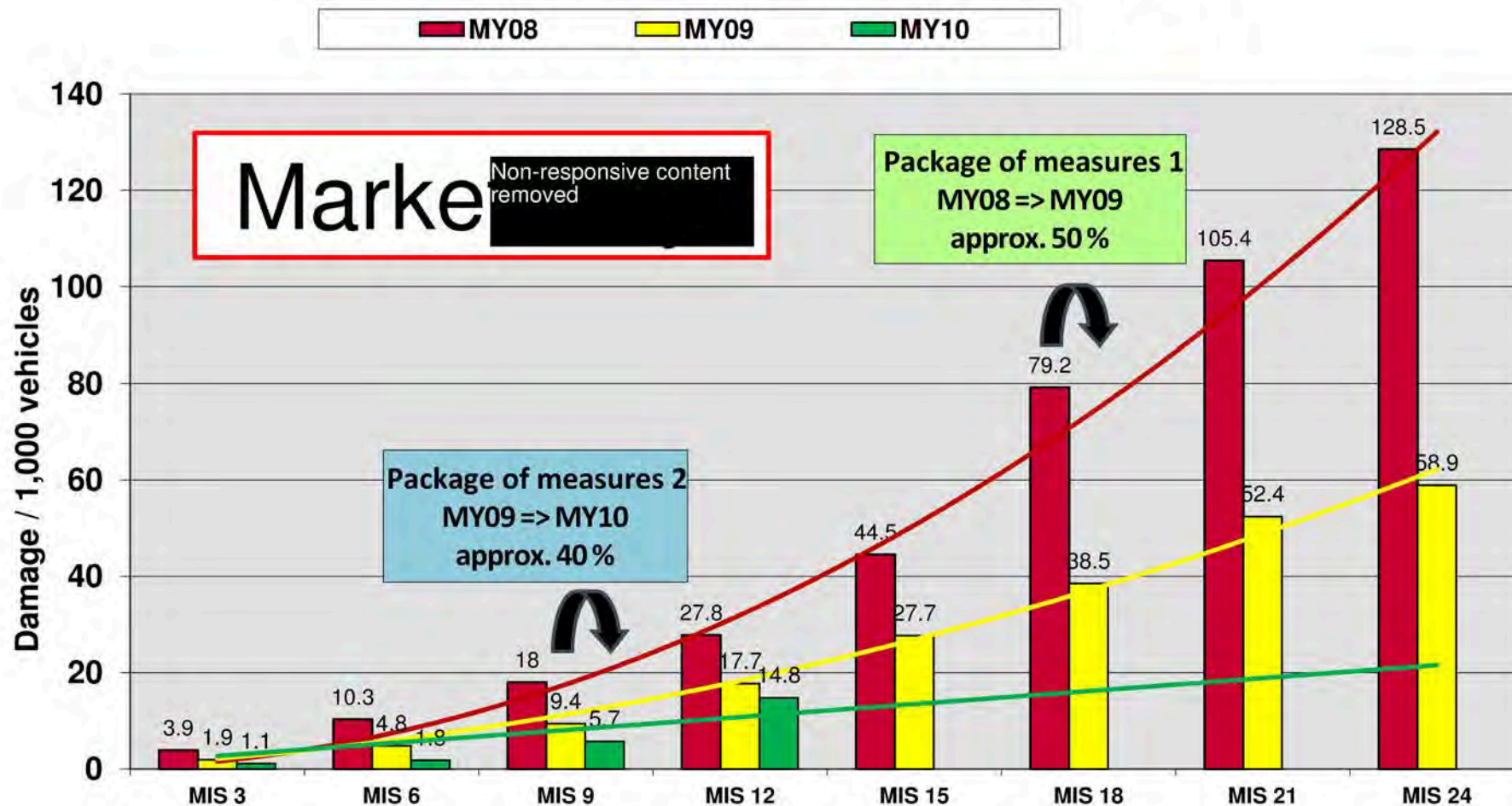
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failures in the field involving high-pressure fuel pump CP4.2, effectiveness of measures all Audi V6-TDI / SAGA 059A_/B_



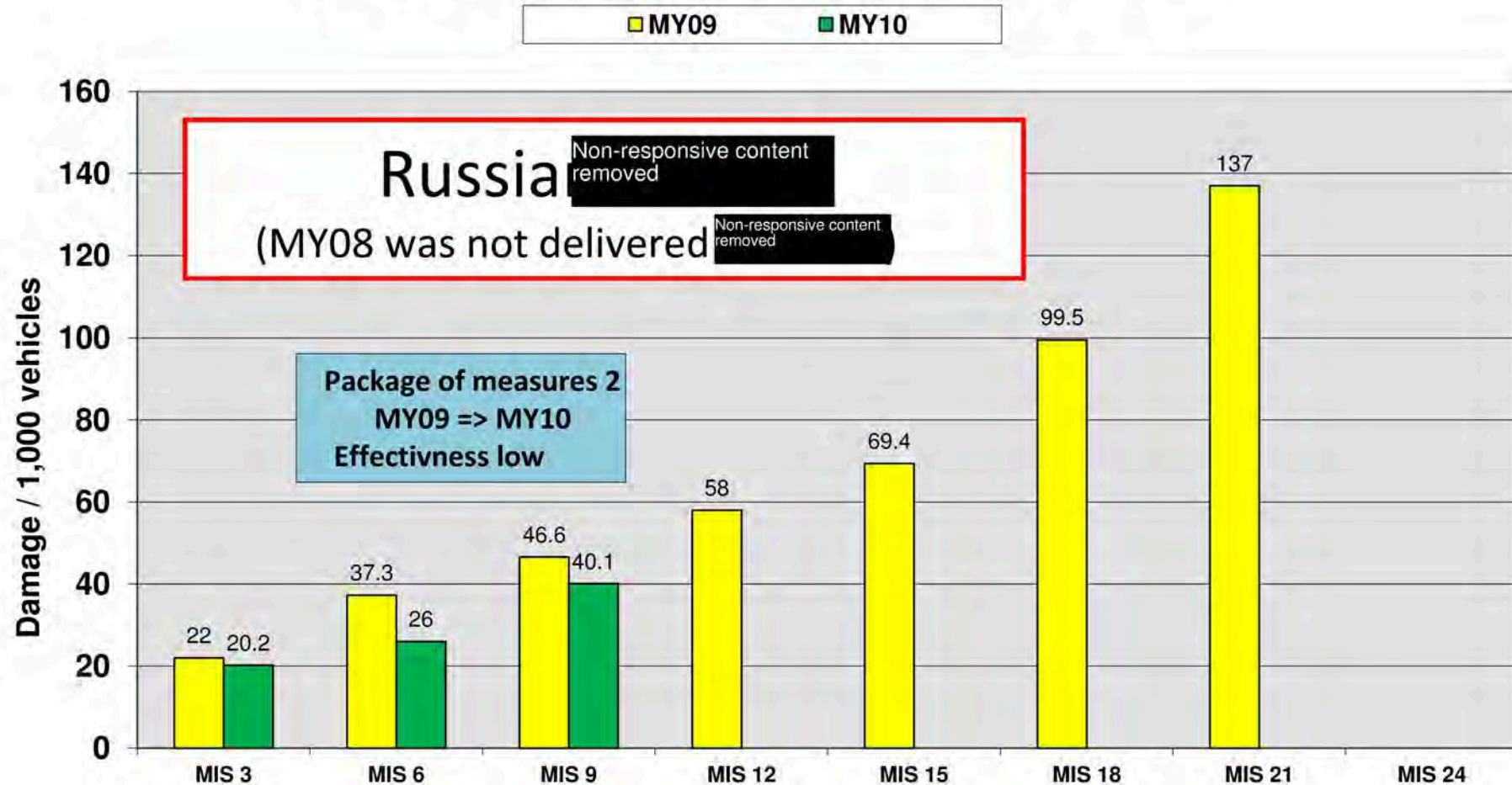
Drivetrain damage, high pressure diesel fuel pump CP4.2

CP4.2 all Audi V6-TDI - model year comparison by MIS



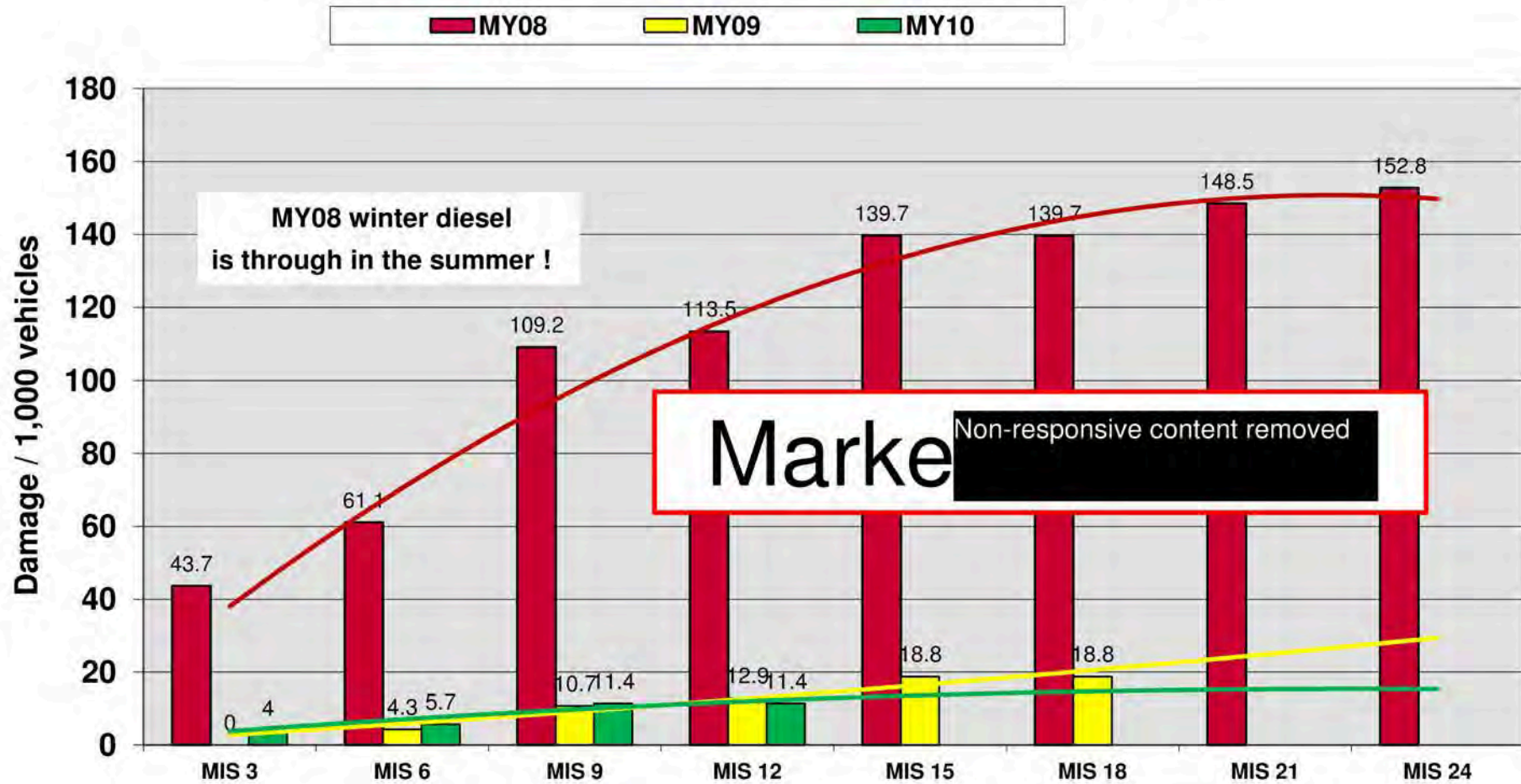
Drivetrain damage, high pressure diesel fuel pump CP4.2

CP4.2 all Audi V6-TDI - model year comparison by MIS



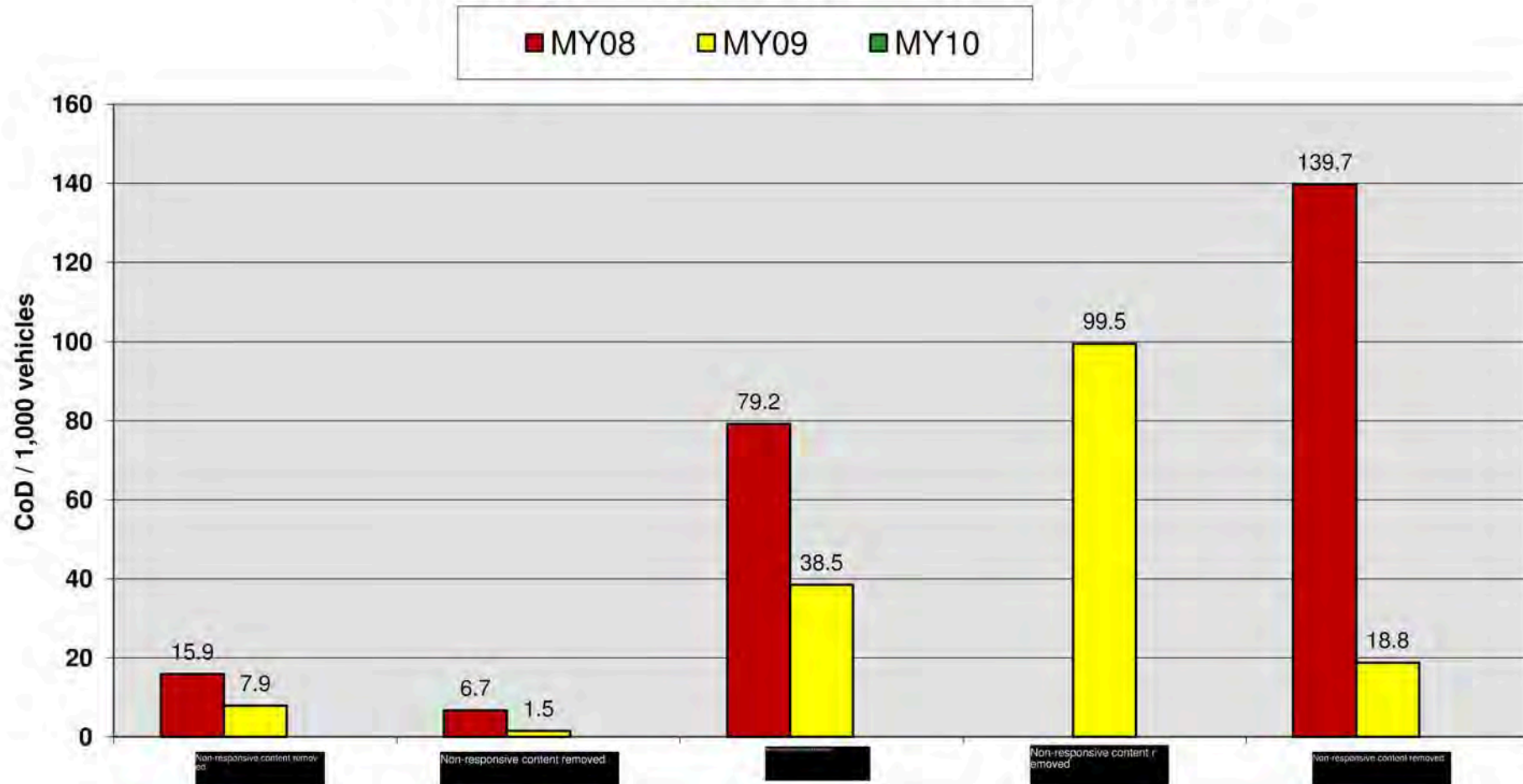
Drivetrain damage, high pressure diesel fuel pump CP4.2

CP4.2 all Audi V6-TDI - model year comparison by MIS

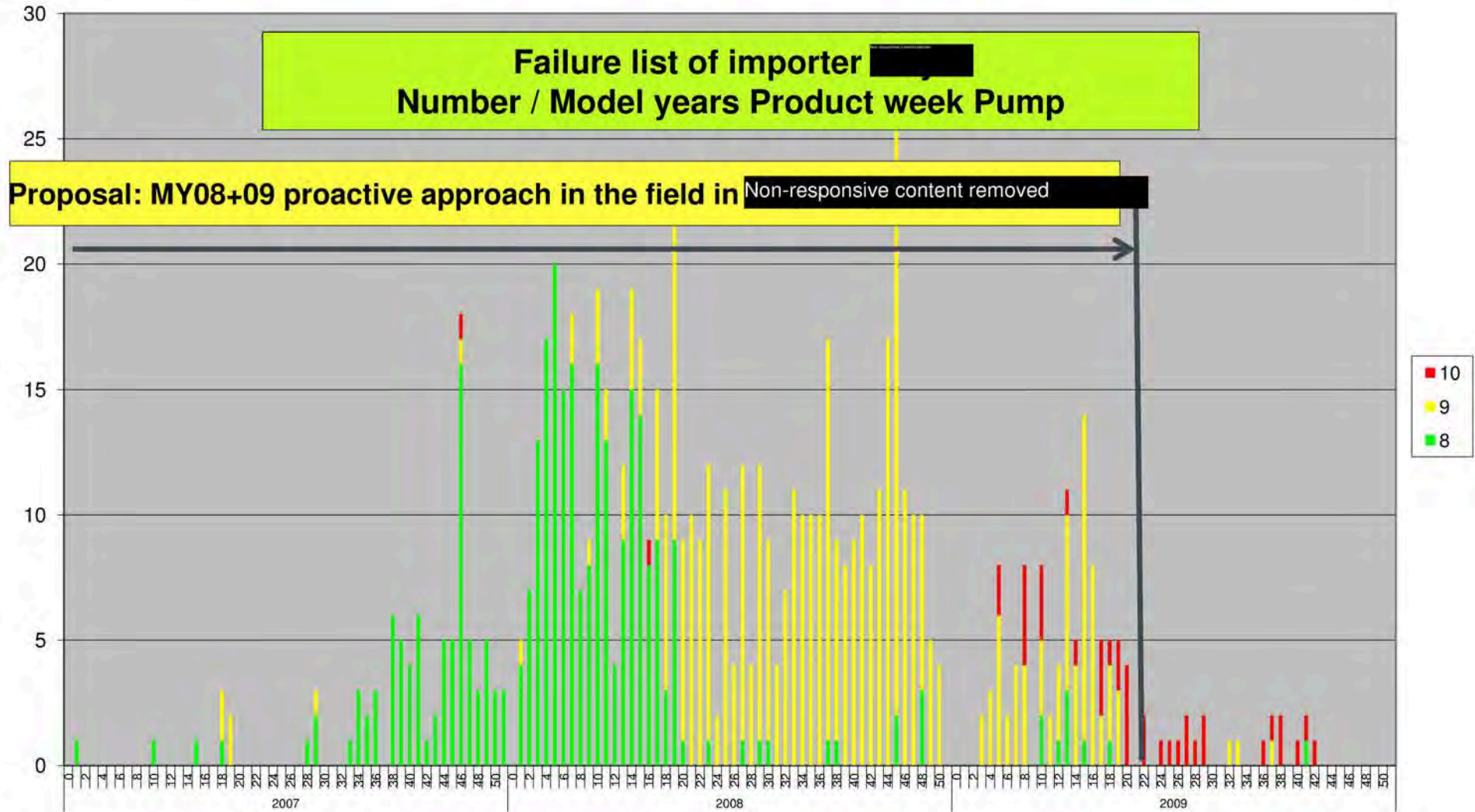


Drivetrain damage, high pressure diesel fuel pump CP4.2

Country comparison V6-TDI MIS 18



Drivetrain damage, high pressure diesel fuel pump CP4.2



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Drivetrain damage, high pressure diesel fuel pump CP4.1

Anti-wear package 2

Task

Reduction of local temperature in the right roller support to the level of CP4.1

→ Prevention of fuel decomposition, formation of coating reduced lubrication, increased friction

Measures

- Opt. arrangement of supply & return position (swapping of the supply / return connections)
- Introduction of a robust flange (large overflow cross-sections)

Result

Reduction of temp. in the lubrication gap by 24°C (from 136° C to 111°C @ 80l/h @ 70°C supply)

→ The level is thus the same as CP4.1

→ For improvement on roller support see slide 4

Test at R.B. passed; testing / verification at Audi in progress

Series use all V6-TDI (due to changed supply and return lines)

WK45/2010

Anti-wear package RP2

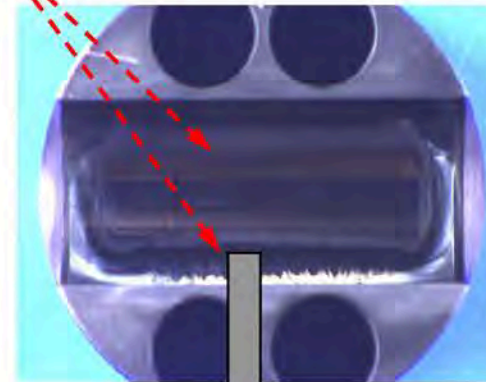
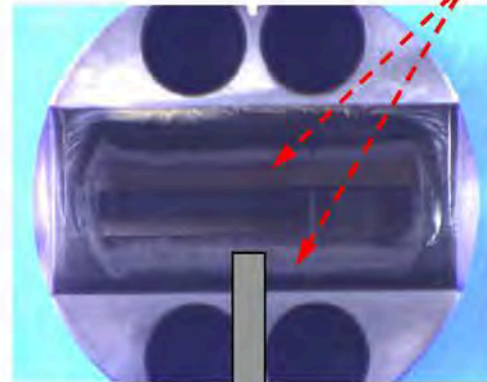
Verification of effectiveness by overload test (150 h with low viscosity, high load/temp.)

hard, solid coatings

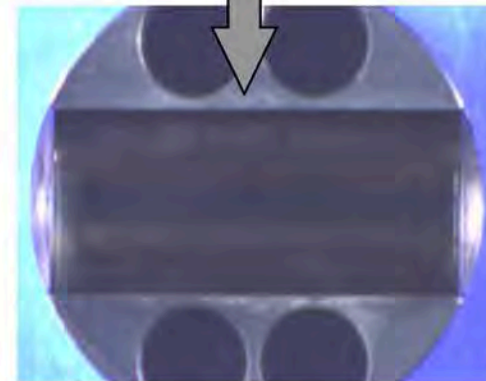
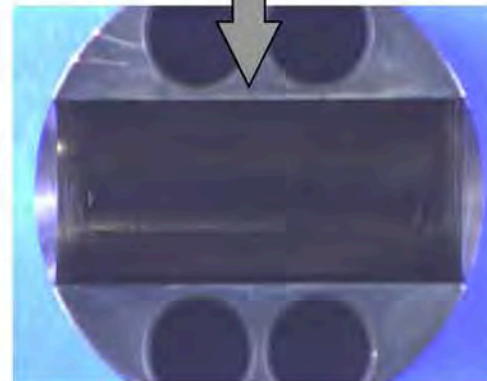
Initial status of series with C3 coating

Reduction in formation of coating

RP2



Roller supports from test 2009-CP4_0728
uncleaned



Roller supports from test 2010-CP4_304/305
uncleaned

From: Non-responsive content removed
To: [REDACTED]
CC: [REDACTED]

Date: 09.15.2010 3:56:00 AM
Subject: Re: Please read !!!!!!!!!!!!!!!!!!!!!!!!!!!!!RE: Q campaign diesel - minutes draft on 09.13.2010

Attachments: [REDACTED].docx
[Protokoll TOP 2010 09 13.pdf](#)

Hello [REDACTED]

Changes are marked in red, so that I can follow them.

HPFP V6 TDI on-field situation [REDACTED]
 High failure rates of HPFP in [REDACTED] (059.130.755.AH. and BB)
 Evaluation 6 cylinder compared to 4 cylinder. Creating A: 09.06.2010 [REDACTED]
 Measures for low-quality fuel markets, illustrate effectiveness [REDACTED]
 A: 09.06.2010 Resubmission in WK 37/2010

Title: Q-Offensive Diesel_HDP [REDACTED] 13.09.10.ppt, Author: [REDACTED], Size: 2342 KB, Date: 09.13.2010
<https://qswms.wob.vw.vwg:4100/pls/portal/download/IFS:11336910/11336910>

Focus worldwide on [REDACTED]. So far, 24 cases after
 after using RP 1, 14 x repeat failures, 8 x first failures.
 Vehicles in case of repeat failures, check for special vehicle influences using
 Bosch / Audi experts.

I: 09.13.2010 [REDACTED]

[REDACTED] Measures package 2 in June 2009 shows low effectiveness in the [REDACTED] market.
 HPFP failures is focused regionally on the region north of [REDACTED] (see map).

Information by Audi to Porsche -> Cayenne.

Audi sees application of C3-coating instead of C2-coating as problematic due to production-related reasons, because the tendency for the formation of chips and irregularities increases.

Additional additives to the fuel to improve lubricity is viewed critically because of the danger of deposit formation, etc.

Relationships between fuel types and specific damage patterns are inconclusive so far.

Similar to V6 Pump at BMW, but in counterclockwise operation with significantly lower damage rate.
 Launch of RP2 in CW45/2010 reduces temperature at the roller support of CP4.2 (6-cylinder HPFP (2 pistons)) Audi / VW (V6 TDI) to BMW levels.

Strong additional influence of the low pressure system of Bosch suspected.

The difference BMW - Audi/VW: Controlled LP system, secured with stronger EFP, has reserves during blockage of filters and screens (similar to 6 bar LP system at VW / AU in the Touareg LF / Q7 MP).

Please present the results from the analyses of repeat repair vehicles by the expert teams in the Q-strategy.

A: 09.13.2010 [REDACTED]
 Resubmission in CW 47/2010 11.22.2010

=====

With best regards

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From: Non-responsive content removed
Sent: **Wednesday, 15 September 2010 4:20 PM**
To: Non-responsive content removed
Subject: **Re: Please read !!!!!!!!!!!!!!!!!!!!!!!!!!!!!RE: Q campaign diesel - minutes draft on 09.13.2010**

OK, then I will wait.

With best regards

Non-responsive content removed

From: Non-responsive content removed
Sent: **Wednesday, 15 September 2010 04:18 PM**
To: Non-responsive content removed
Subject: **Please read !!!!!!!!!!!!!!!!!!!!!!!!!!!!!RE: Q campaign diesel - minutes draft on 09.13.2010**

Hello Non-responsive content removed

please wait, you will get the amended minutes today !!!!!!!!!!!!!!!

With best regards

Non-responsive content removed

From: Non-responsive content removed
Sent: Tuesday, September 14, 2010 05:20 PM

Non-responsive content removed

Subject: Re: Q campaign diesel - minutes draft on 09.13.2010
Importance: High

< File: Protokoll_VOR_2010_09_13.pdf >>
Hi all,

Attached is my draft for decision until tomorrow afternoon, 4 pm.

Best wishes

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From: Non-responsive content removed
Sent: Thursday, 20 May 2010 02:47 PM

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Subject: Updated: Q campaign diesel
Time: Monday, September 13, 2010 8:30-09:30 AM (GMT+01:00) Amsterdam, Berlin, Bern, Rome,

Non-responsive content removed

Schedule update due to a new dial-in number.
This number is valid from 05.31.2010.

With best regards

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Volkswagen Aktiengesellschaft
Domicile: Wolfsburg
Court of Registry: Local District Court Braunschweig
Commercial Register No.: 100484
Chairman of the Supervisory Board: Ferdinand Piëch
Board of Management: Martin Winterkorn (Chairman), Francisco J. Garcia
Sanz, Jochem Heizmann, Christian Klingler, Horst Neumann, Hans Dieter Pötsch, Rupert Stadler
Important notice: The above information is automatically added to this e-mail. This addition does not constitute a representation that the content of this e-mail is legally relevant and/or is intended to be legally binding.

=====

Dear Sir/Madam,

Attached is the list of schedules 2010 for the Q campaign diesel.

Please circulate this invitation among the concerned employees within your organization, if necessary.

Should there be any changes to this distribution list, please let us know.

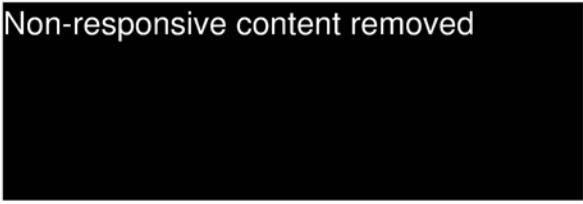
The dial-in number for the video conference is: Non-responsive content removed

In case of problems or questions about the dial-in during the video conference, please contact the video team, tel. Non-responsive content removed

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Volkswagen Aktiengesellschaft

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Volkswagen Aktiengesellschaft

Domicile: Wolfsburg

Court of Registry: District Court Braunschweig

Commercial Register No.: 100484

Chairman of the Supervisory Board: Ferdinand Piëch

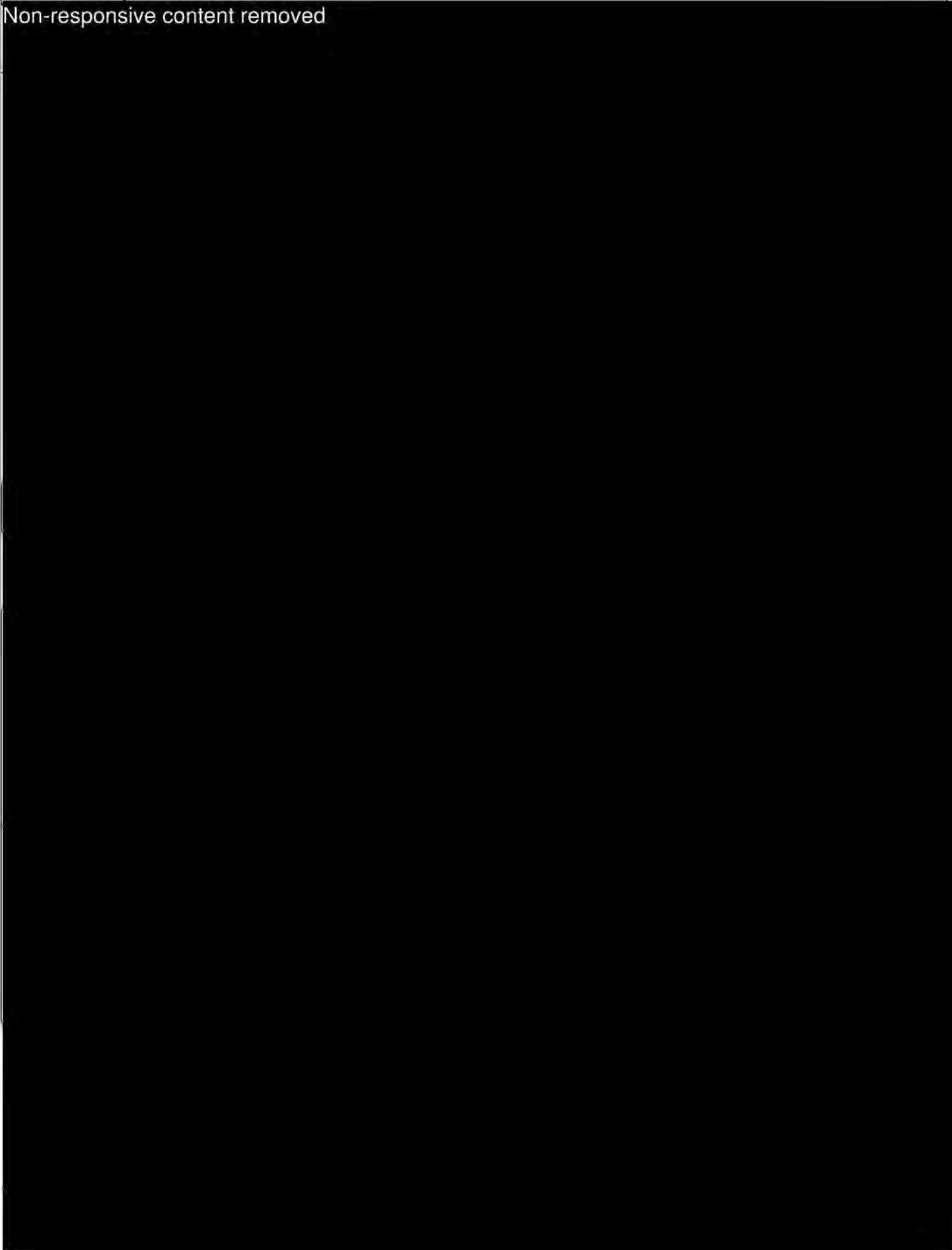
Board of Management: Martin Winterkorn (Chairman), Francisco J. Garcia Sanz, Jochem Heizmann, Horst Neumann, Hans Dieter Pötsch

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| | | |
|--|---|---|
| <p>VOLKSWAGEN <small>AGTIEGESSELLSCHAFT</small></p> | <p>Minutes: 9/13/2010 Q campaign diesel engines</p> |  |
|--|---|---|

Introduction

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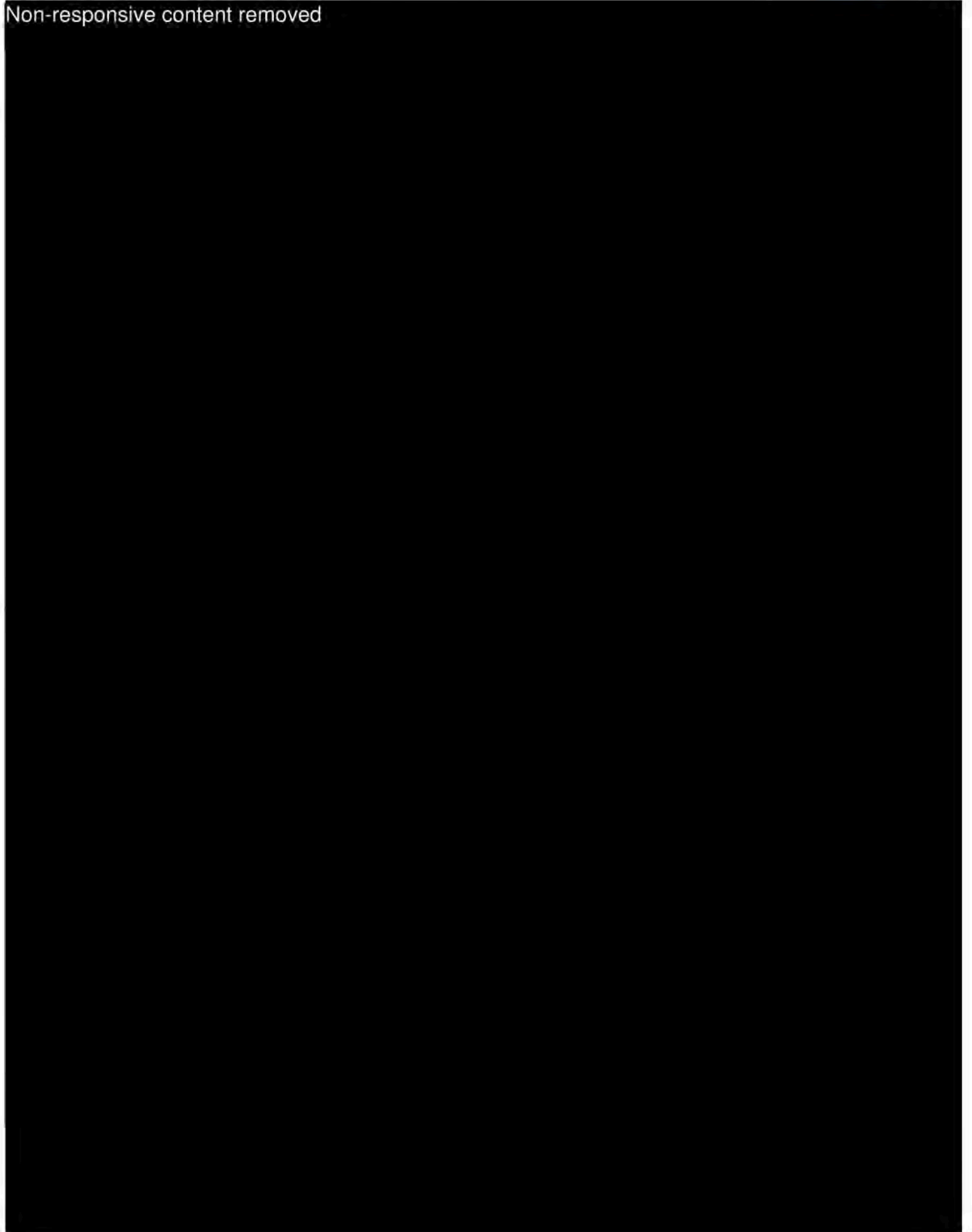


VOLKSWAGEN
AKTIENGESELLSCHAFT

Minutes: 9/13/2010
Q campaign diesel engines

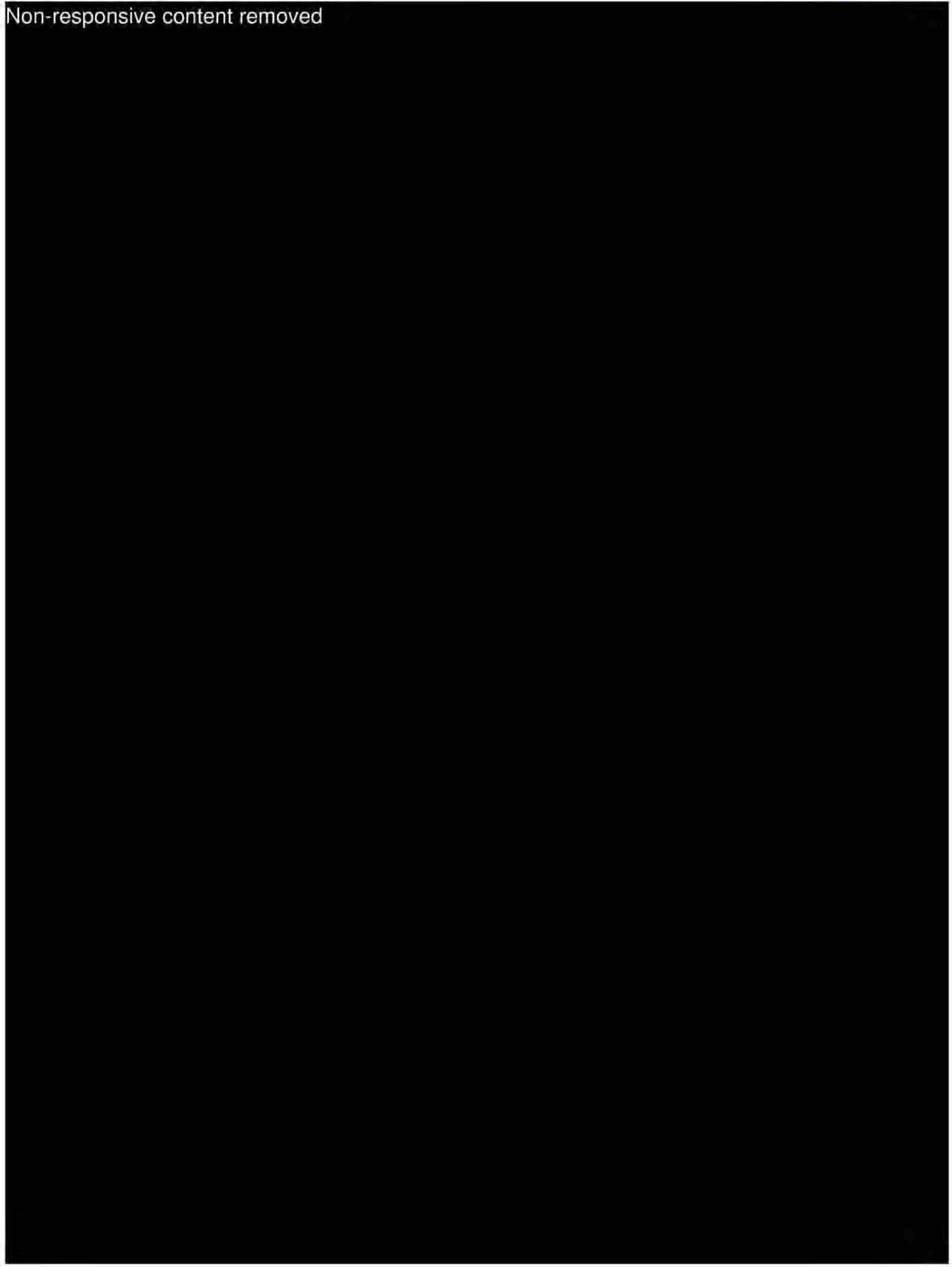


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| <p>VOLKSWAGEN <small>AGT IENGESELLSCHAFT</small></p> | <p>Minutes: 9/13/2010 Q campaign diesel engines</p> |  |
|---|---|---|

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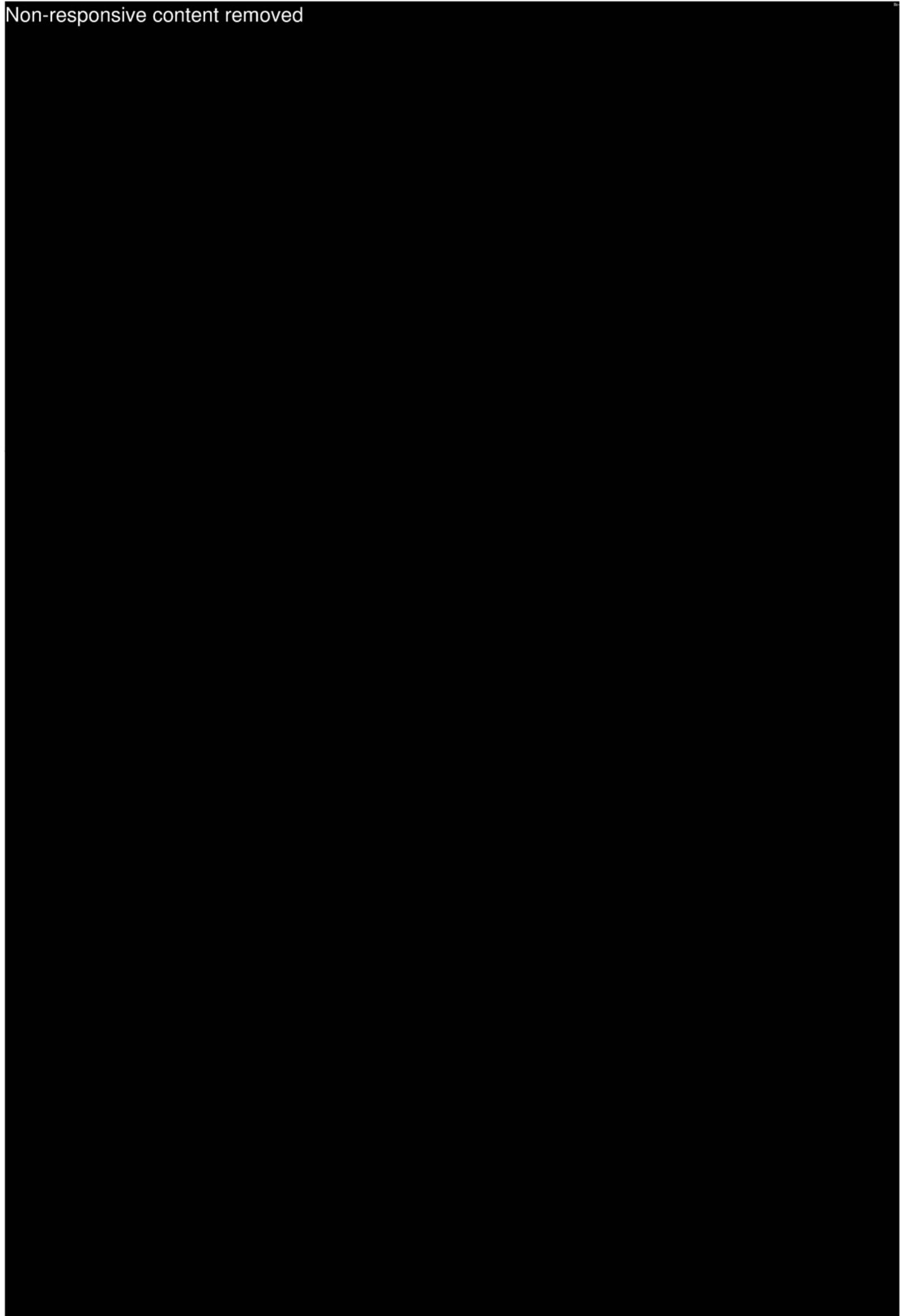


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|---|---|---|
| VOLKSWAGEN <small>KARTIERGESELLSCHAFT</small> | Minutes: 9/13/2010 Q campaign diesel engines |  |
|---|---|---|

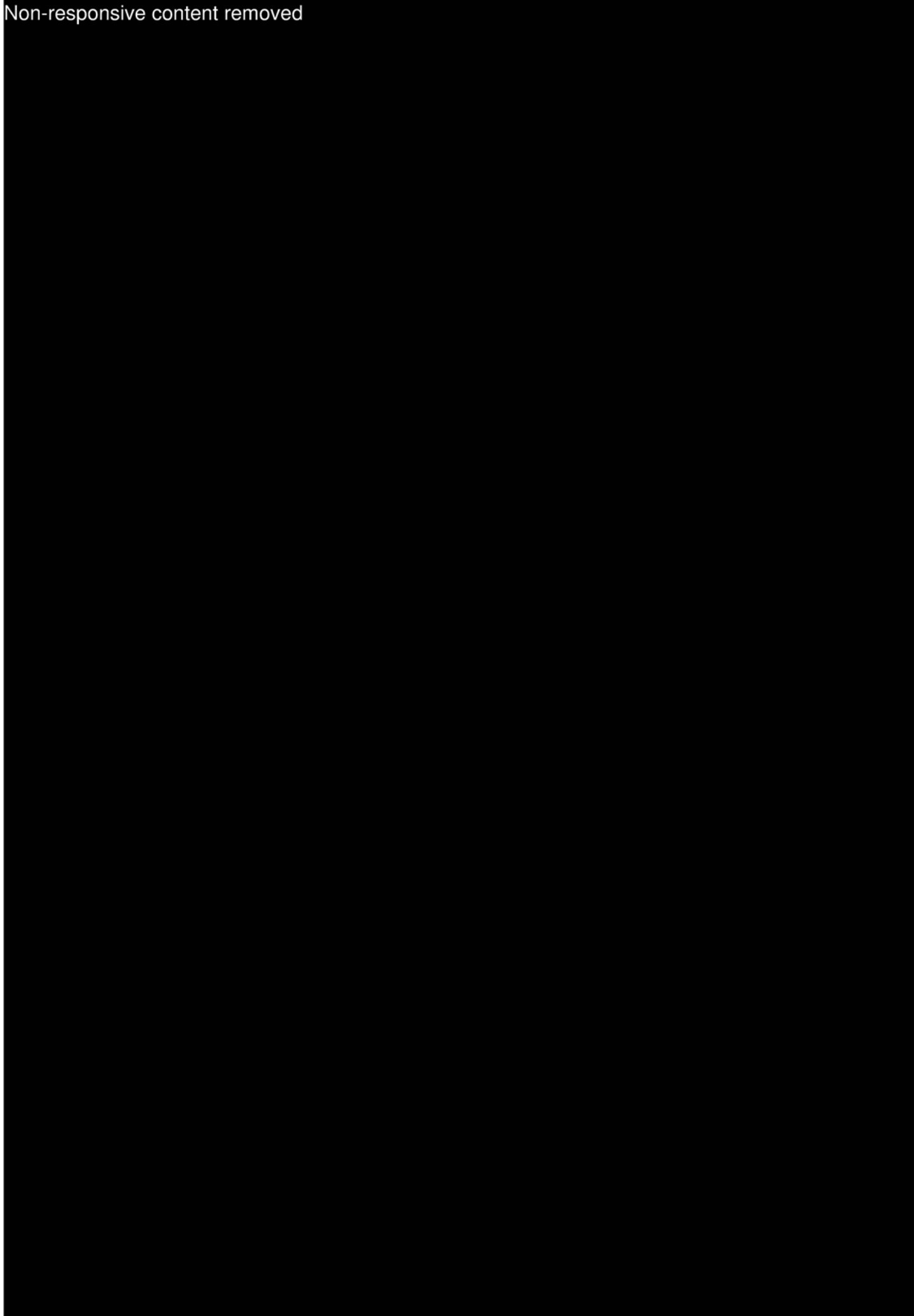
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| | | | |
|-----|---|---|---------------------------------------|
| 70. | <p>HPP V6 TDI on-field situation</p> <p>High HPP failure rates in [REDACTED] (059.130.755.BB)</p> <p>Evaluation of 6 cylinder compared to 4 cylinder Creation of measures for poor quality fuel markets, illustrate effectiveness</p> <p>Resubmission in WK 37/2010 Title: Q-Offensive Diesel_HDP_[REDACTED]09.13.10.ppt, Author: [REDACTED] size: 2342 KB, Date: 9/13/2010 https://qswms.wob.vw.wwg:4100/pls/portal/download/IFS:11336910/11336910</p> <p>Focus worldwide on [REDACTED] and [REDACTED]. So far, 24 cases after Use RP 1, partly repeat failures. Vehicles In case of repeat failures, check for special vehicles influences using expert team [REDACTED] RP 2 shows low effectiveness in the market. HPP failures regionally focused around [REDACTED] Non-responsive content removed Information by Audi to Porsche -> Cayenne. Audi sees application of C3 coating instead of C2 coating as problematic due to production-related reasons, because the tendency for the formation of spatters and irregularities increases. Additional additives added to the fuel to improve lubricity are viewed critically because of the danger of deposit formation. Relationships between fuel types and specific damage pattern are inconclusive so far. Impact of the low-pressure system is expected, as the same pump is used in BMW with significantly lower damage rate. Difference between BMW and Audi / VW: Controlled LP system ensures a larger fuel amount in the system.</p> <p>Results from the analyses of repeat repair vehicles by the expert team. Please present in Q campaign.</p> <p>Resubmission in WK 47/2010</p> | <p>EA 896</p> <p>A: 9/6/2010 A: 9/6/2010</p> <p>I: 9/13/2010</p> <p>A: 9/13/2010 11/22/2010</p> | <p>Non-responsive content removed</p> |
|-----|---|---|---------------------------------------|

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From: Non-responsive content removed
To: [REDACTED]
CC: [REDACTED]
Date: 09.16.2010 11:03:00 AM
Subject: Re: Please read !!!!!!!!!!!!!!!!!!!!!!!!!!!!!RE: Q campaign diesel - minutes draft on 09.13.2010
Attachments: [Protokoll TOP 2010 09 13.pdf](#)

Okay, I can put up with it.

With best regards

Non-responsive content removed

Sitz/Domicile: Ingolstadt
Registergericht/Court of Registry: Local District Court Ingolstadt
HRB Nr./Commercial Register No.: 1
Vorsitzender des Aufsichtsrats/Chairman of the Supervisory Board: Martin Winterkorn
Vorstand/Board of Management: Rupert Stadler (Vorsitzender/Chairman), Ulf Berkenhagen, Michael Dick, Frank Dreves, Peter Schwarzenbauer, Axel Strotbek, Werner Widuckel

Wichtiger Hinweis: Die vorgenannten Angaben werden jeder E-Mail automatisch hinzugefügt und lassen keine Rückschlüsse auf den Rechtscharakter der E-Mail zu.
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From: Non-responsive content removed
Sent: Wednesday, 15 September 2010 5:39 PM
To: Non-responsive content removed
Subject: Re: Please read !!!!!!!!!!!!!!!!!!!!!!!!!!!!!RE: Q campaign diesel - minutes draft on 09.13.2010
Importance: High

Hi all,

Attached once again is the amended text for final review, please no later than tomorrow noon.

Best wishes

Non-responsive content removed

From: [redacted]

Sent: Wednesday, 15 September 2010 4:56 PM

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Subject: Re: Please read !!!!!!!!!!!!!!!!!!!!!!!RE: Q campaign diesel - minutes draft on 09.13.2010

Hello [redacted]

Changes are marked in red, so that I can follow them.

=====

HPP V6 TDI field situation [redacted]
High failure rates of HPP in [redacted] (059.130.755.AH. and BB)
Evaluation of 6 cylinder compared to 4 cylinder Creating A: 09.06.2010 [redacted]
Measures for poor quality fuel markets, illustrate effectiveness [redacted]

A: 09.06.2010 start in WK 37/2010

Title: Q campaign Diesel_HDP_[redacted]_09.13.10.ppt, Author: [redacted], size: 2342 KB, Date: 9/13/2010
<https://qswms.wob.vw.vwg:4100/pls/portal/download/IFS:11336910/11336910>

Focus worldwide on [redacted] So far, 24 cases after using RP 1, 14 x repeat failures, 8 x first-time failed vehicles In case of repeat failures, check for special vehicles influences using Bosch / Audi experts.

I: 09.13.2010 [redacted]

[redacted] Package of measures 2 in June 2009 shows low effectiveness in the [redacted] market.

HPP failures is focused regionally on the region north of [redacted] (see map).

Information by Audi to Porsche -> Cayenne.

Audi sees application of C3 coating instead of C2 coating as problematic due to production-related reasons, because the tendency for the formation of spatters and irregularities increases.

Additional additives added to the fuel to improve lubricity are viewed critically because of the danger of deposit formation etc.

Correlations between fuel types and specific damage pattern are inconclusive so far.

Similar to V6 Pump at BMW, but in counterclockwise operation with significantly lower damage rate in action.

Launch of RP2 in WK45/2010 reduces temperature at the roller support of CP4.2 Audi / VW (V6-TDI) to BMW levels.

Strong additional influence of the low pressure system of Bosch suspected.

Difference between BMW and Audi / VW: Controlled LP system secured with a stronger EFP has reserves in case of blockage of filters and strainers (similar to 6 bar LP system at VW / Audi in the Touareg NF / Q7 MP).

Please present the results from the analyses of repeat repair vehicles by the expert teams in the Q campaign.

A: 09.13.2010 [redacted]

Resubmission in WK 47/2010 11.22.2010

< File: [redacted].docx >> < File: Protokoll_VOR_2010_09_13.pdf >>

=====

With best regards

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From: Non-responsive content removed
Sent: Wednesday, 15 September 2010 04:20
To: Non-responsive content removed
Subject: Re: Please read !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!RE: Q campaign diesel - minutes draft on 09.13.2010

OK, then I will wait.

With best regards

Non-responsive content removed

From: Non-responsive content removed
Sent: Wednesday, 15 September 2010 04:18 PM
To: Non-responsive content removed
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Subject: Re: Q campaign diesel - minutes draft on 09.13.2010
Importance: High

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Non-responsive content removed

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Sent: Thursday, 20 May 2010 02:47 PM

Non-responsive content removed

Schedule update due to a new dial-in number.
This number is valid from 05.31.2010.

With best regards

Non-responsive content removed

Volkswagen Aktiengesellschaft
Domicile: Wolfsburg
Court of Registry: Local District Court Braunschweig
Commercial Register No.: 100484
Chairman of the Supervisory Board: Ferdinand Piëch
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Sanz, Jochem Heizmann, Christian Klingler, Horst Neumann, Hans Dieter Pötsch, Rupert Stadler
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In case of problems or questions about the dial-in during the video conference, please contact the video team,
tel.: Non-responsive content removed

Best regards,

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Volkswagen Aktiengesellschaft

Domicile: Wolfsburg

Court of Registry: District Court Braunschweig

Commercial Register No.: 100484

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| | | |
|---|---|---|
| VOLKSWAGEN <small>WOLFGANG PETERSEN</small> | Minutes: 9/13/2010 Q campaign diesel engines |  |
|---|---|---|

| Introduction | | | | |
|--------------|--|--|--|--|
|--------------|--|--|--|--|

| Pos | CNR | Topic | (A)ssignment (I)nformation Date | Responsible | Dept. |
|--------------------------------|-----|-------|---------------------------------------|-------------|-------|
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| Breakdown | | | | |
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|-----------|--|--|--|--|

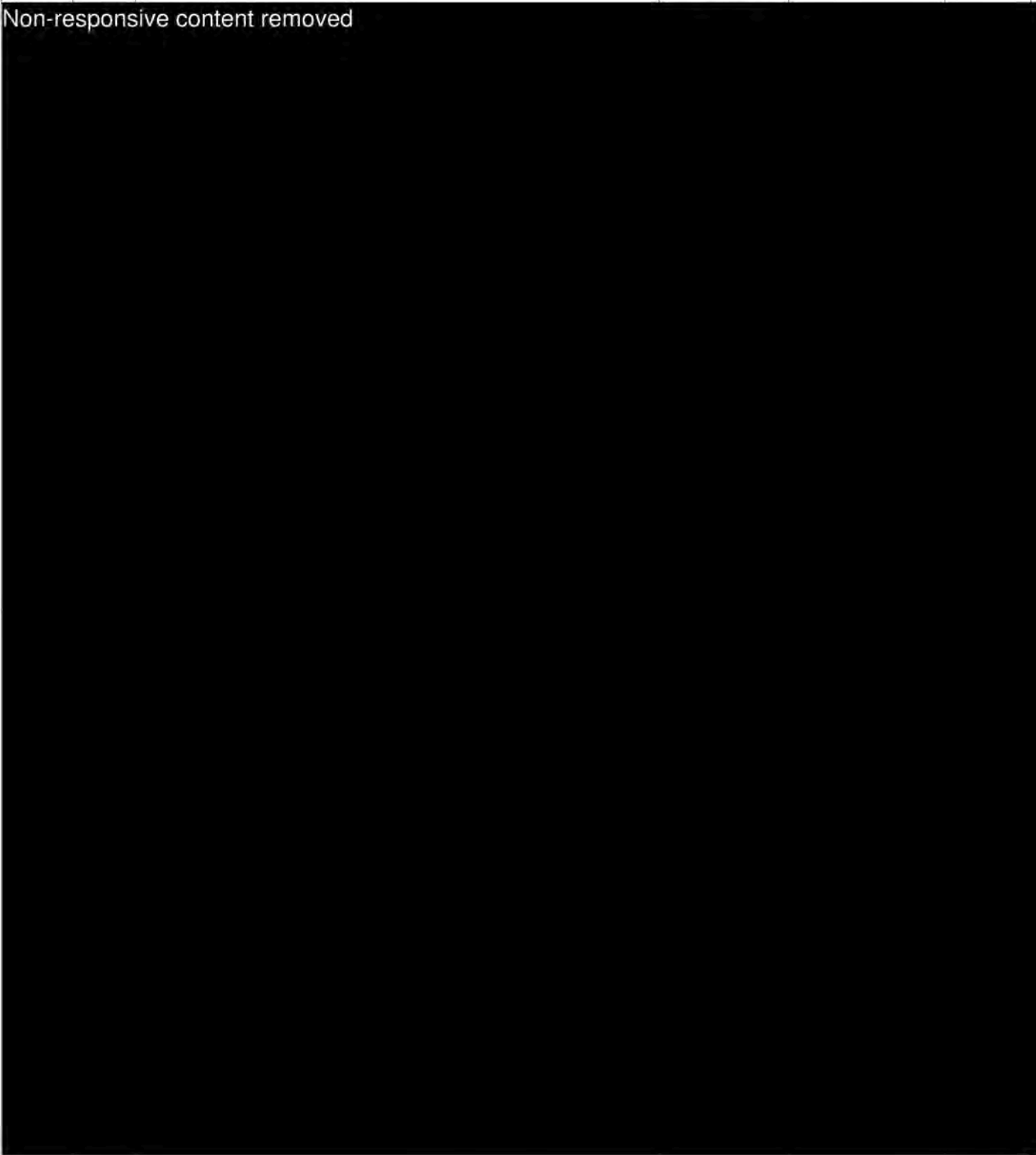
| Pos | CNR | Topic | (A)ssignment (I)nformation Date | Responsible | Dept. |
|--------------------------------|-----|-------|---------------------------------------|-------------|-------|
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|--|---|---|
| VOLKSWAGEN <small>AKTIENGESELLSCHAFT</small> | Minutes: 9/13/2010 Q campaign diesel engines |  |
|--|---|---|

Resubmission of breakdown

| Pos | CNR | Topic | (A)ssignment (I)nformation Date | Responsible | Dept. |
|-----|-----|-------|---------------------------------------|-------------|-------|
|-----|-----|-------|---------------------------------------|-------------|-------|

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| | | |
|--|---|---|
| VOLKSWAGEN <small>AKTIENGESELLSCHAFT</small> | Minutes: 9/13/2010 Q campaign diesel engines |  |
|--|---|---|

Follow-ups - diesel


| Pos | CNR | Topic | (A)ssignment (I)nformation Date | Responsible | Dept. |
|-----|-----|-------|---------------------------------------|-------------|-------|
|-----|-----|-------|---------------------------------------|-------------|-------|

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| | | |
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| <p>VOLKSWAGEN <small>AKTIENGESELLSCHAFT</small></p> | <p>Minutes: 9/13/2010 Q campaign diesel engines</p> |  |
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| | | |
|---|---|---|
|  | Minutes: 9/13/2010 Q campaign diesel engines |  |
|---|---|---|

| | | | |
|-----|---|--|--------------------------------|
| 70. | <p>HPP V6 TDI on-field situation</p> <p>High HPP failure rates in [REDACTED] (059.130.755.BB) Evaluation of 6 cylinder compared to 4 cylinder Creation of measures for poor quality fuel markets, illustrate effectiveness</p> <p>Resubmission in WK 37/2010 Title: Q-Offensive Diesel_HDP [REDACTED] 09.13.10.ppt, Author: [REDACTED] size: 2342 KB, Date: 9/13/2010</p> <p>Non-responsive content removed</p> <p>Focus worldwide on [REDACTED] and [REDACTED] So far, 24 cases after use of RP 1, 16 x repeat failures. Vehicles In case of repeat failures, check for special vehicle influences using Bosch/Audi expert team [REDACTED] RP 2 shows low effectiveness in the market. HPP failures regionally focused around the [REDACTED] Non-responsive content removed Information by Audi to Porsche -> Cayenne. Audi sees application of C3 coating instead of C2 coating as problematic due to production-related reasons, because the tendency for the formation of spatters and irregularities increases. Additional additives added to the fuel to improve lubricity are viewed critically because of the danger of deposit formation. Unproven hypothesis: Similar V6 pump is in use at BMW, but with counterclockwise rotation and significantly lower damage rate. Launch of RP2 in CW45/2010 reduces temperature at the roller support of CP4.2 (6-cylinder HPFP (2 pistons)) Audi / VW (V6 TDI) to BMW levels. <i>Unproven hypothesis: Additional influence of the low pressure system of Bosch is expected.</i> Difference between BMW and Audi / VW: Controlled LP system with a stronger EFP has reserves in case of blockage of filters and strainers (similar to 6 bar LP system at VW / Audi in the Touareg NF / Q7 MP) LP system impact has not been proven so far through measured values or comparison of AU / BMW cycles. Results from the analyses of repeat repair vehicles by the expert team. Please present in Q campaign. Resubmission in WK 47/2010</p> | EA 896 A: 9/6/2010 A: 9/6/2010 I: 9/13/2010 I: 09/15/2010 I: 09/15/2010 A: 9/13/2010 11/22/2010 | Non-responsive content removed |
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VOLKSWAGEN
AKTIENGESELLSCHAFT

Minutes: 9/13/2010
Q campaign diesel engines




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| | | |
|--|---|---|
| <p>VOLKSWAGEN <small>AKTIENGESELLSCHAFT</small></p> | <p>Minutes: 9/13/2010 Q campaign diesel engines</p> |  |
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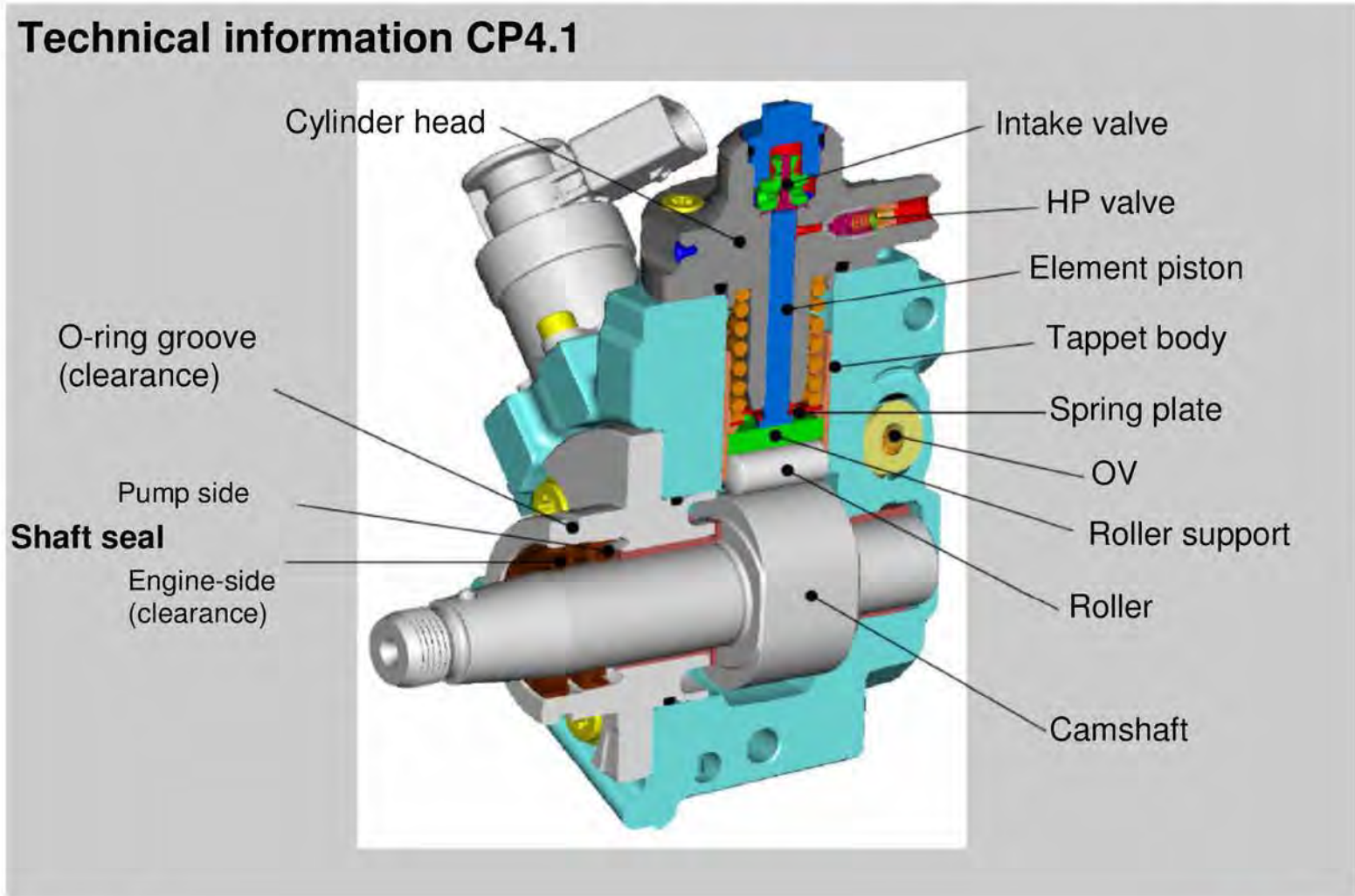
Audi
Vorsprung durch Technik



Drivetrain damage high pressure diesel fuel pump CP4

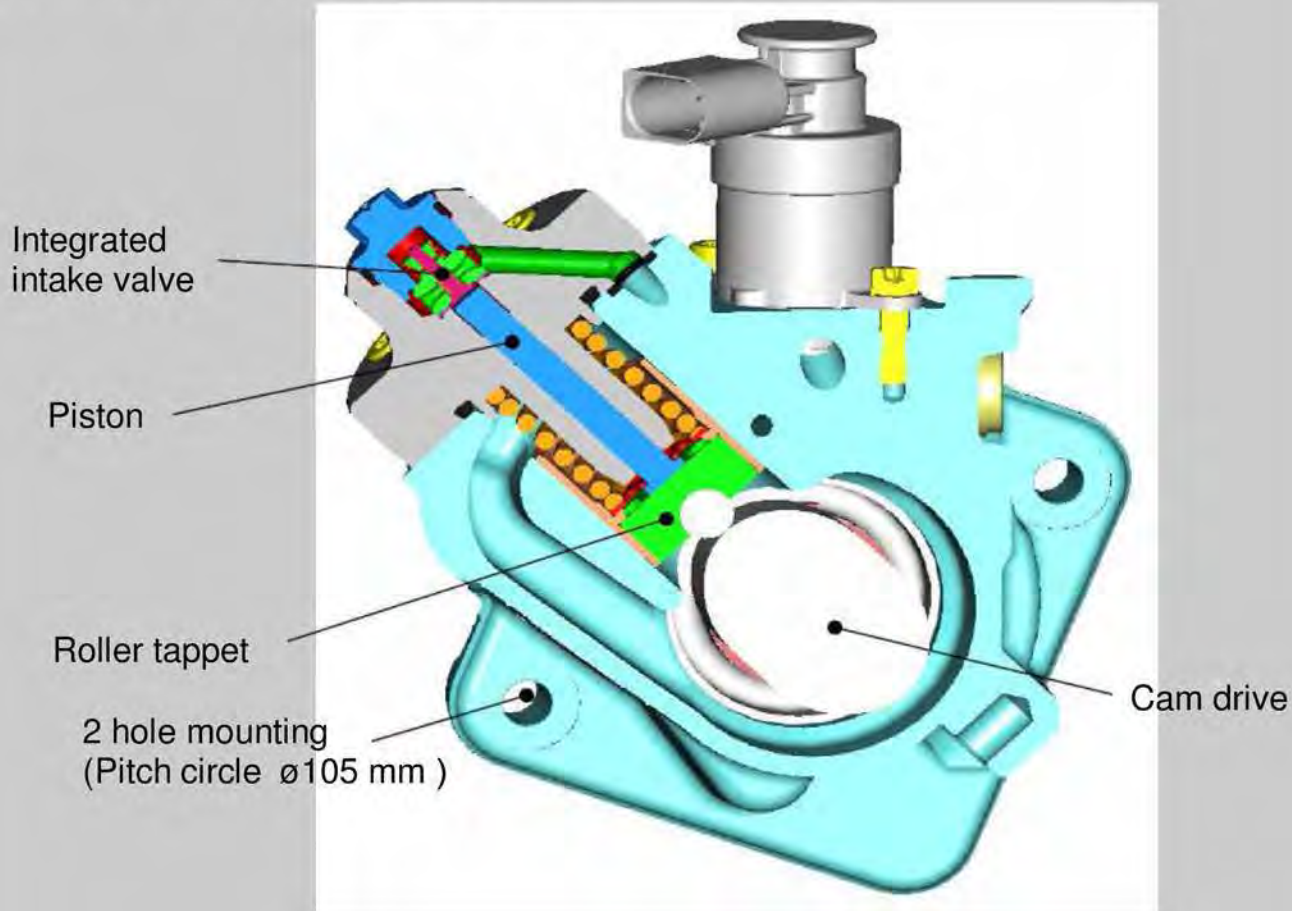
██████ 09.21.2010

Drivetrain damage high-pressure diesel fuel pump CP4.2



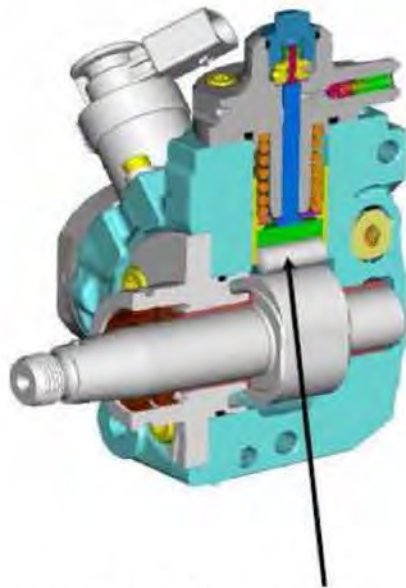
Drivetrain damage, high-pressure diesel fuel pump CP4.2

Technical information CP4.1



Drivetrain damage, high-pressure diesel fuel pump CP4.2

High-pressure fuel pump CP4.2



Right roller tappet



Left roller tappet



Drivetrain damage, high-pressure diesel fuel pump CP4.2

Audi V6-TDI failures in the field, broken down by country (SAGA – replaced pumps only, 059A_/B_)

VW Touareg V6-TDI:

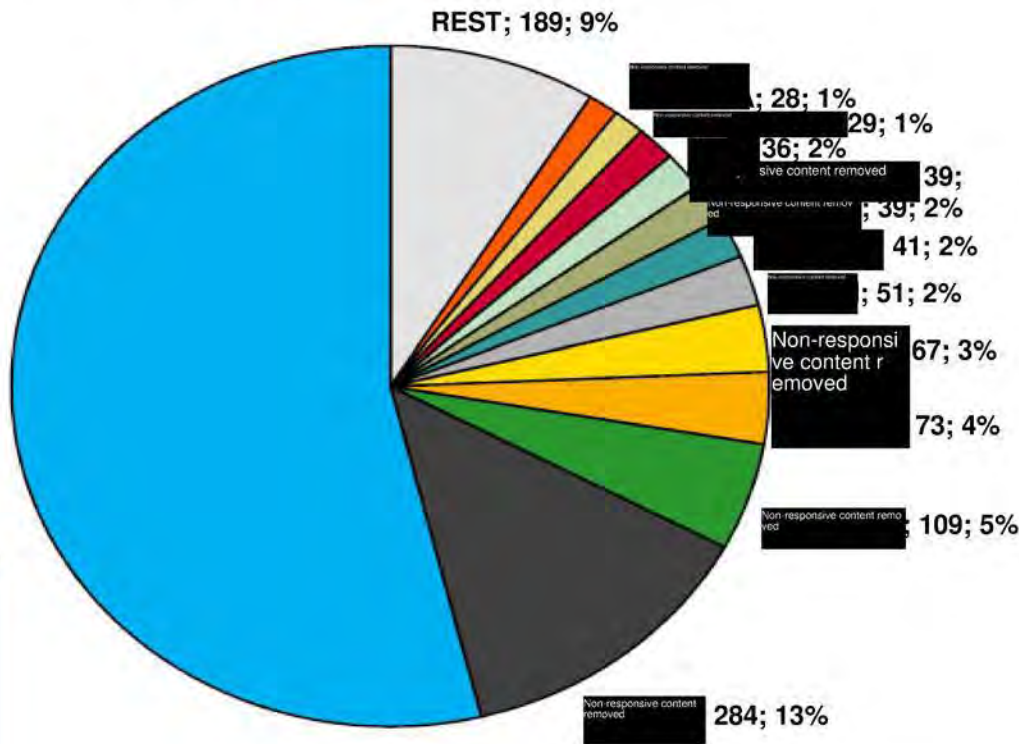
- 1,184 damage cases worldwide
- **Non-responsive content removed** damage case
- **Total costs** **Non-responsive content removed**
(SAGA, Status as on 09.16.2010)

Non-responsive content removed; 1150; 54%

Total V6-TDI: 2,135 cases worldwide

| | |
|-------|-------------|
| MY08: | 935 cases |
| MY09: | 1,018 cases |
| MY10: | 181 cases |
| MY11: | 1 case |

(SAGA, status as on 09.05.2010)



Drivetrain damage high pressure diesel fuel pump CP4

AQUA: Active quality analysis
 Status 07/10-09/13/10. 5:27 PM
 Source / User Non-responsive content removed

Audi, *, market: AUDI (approved markets)

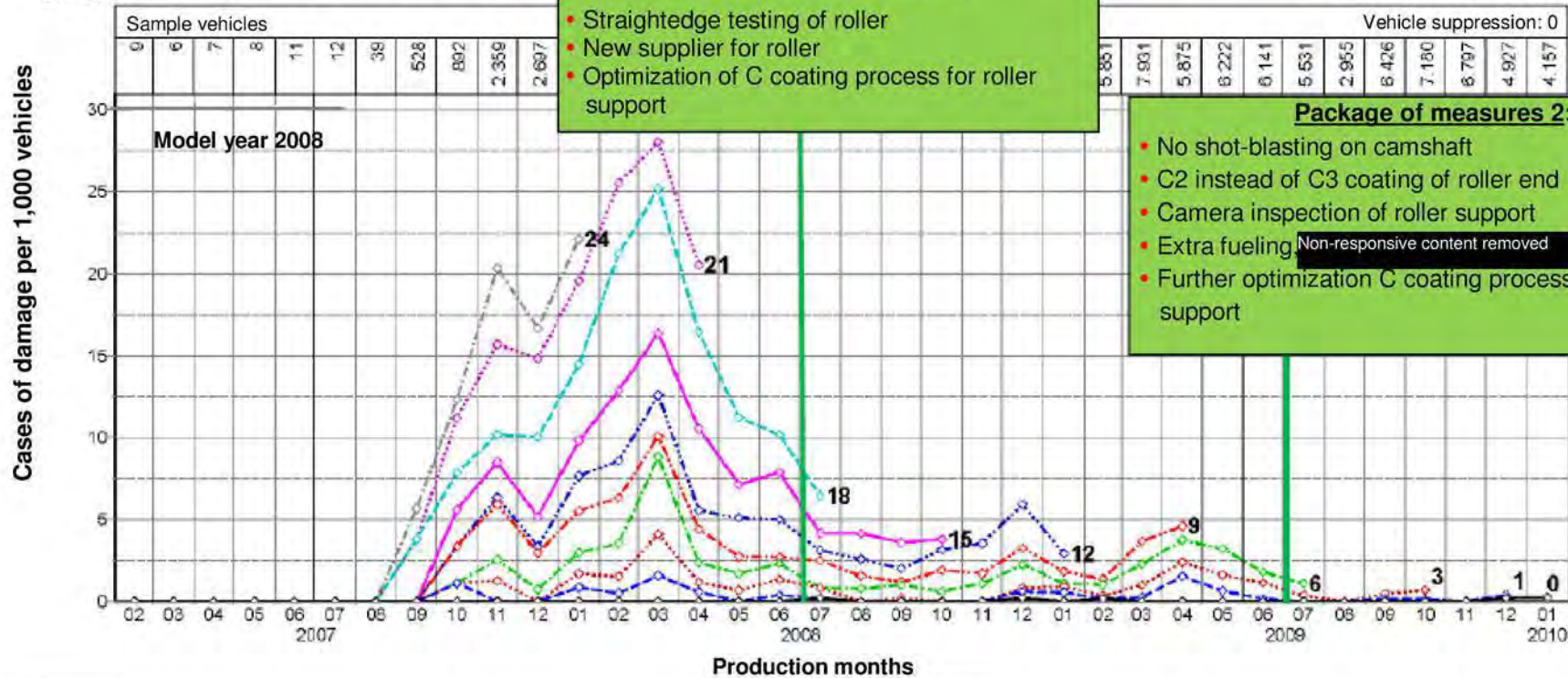
Confidential
 Without PR numbers
 CNR 2374

MY 2008-2011, Offset: all (Max: 6)

CNR / Groups: High-pressure fuel pump

| | CAMA | CAMB | CAMD | CANA | CANB | CANC | CAND | CASA | CASB | CASC | CASD | CATA | CATB | CCLA | CCMA | CCWA | CCWB | CDYA | CDYB | CDYC | CG | |
|--------|------|--------|-------|--------|--------|-------|-------|-------|-------|-------|----------------|--------|--------|--------|--------|-------|-------|------|------|------|----|--|
| MY | MIS0 | MIS1 | MIS3 | MIS6 | MIS9 | MIS12 | MIS15 | MIS18 | MIS21 | MIS24 | MY Replacement | BD | SA 10 | SA 17 | SA 20 | SA50 | | | | | | |
| 2008 | 0,0 | 0,6 | 1,5 | 3,3 | 5,4 | 7,0 | 10,2 | 15,9 | 20,2 | 23,1 | 2008 | 98,2 % | 66,3 % | 79,2 % | 10,9 % | 1,6 % | 5,6 % | | | | | |
| 2009 | 0,0 | 0,3 | 0,7 | 1,7 | 2,6 | 4,1 | 5,6 | 7,9 | 12,6 | | 2009 | 96,2 % | 56,0 % | 75,5 % | 15,1 % | 1,4 % | 3,2 % | | | | | |
| 2010 | 0,0 | 0,2 | 0,7 | 1,4 | 1,6 | | | | | | 2010 | 95,8 % | 47,9 % | 73,9 % | 15,9 % | 4,2 % | 2,8 % | | | | | |
| Diff % | 0,31 | -53,03 | -8,16 | -15,94 | -36,75 | | | | | | | | | | | | | | | | | |

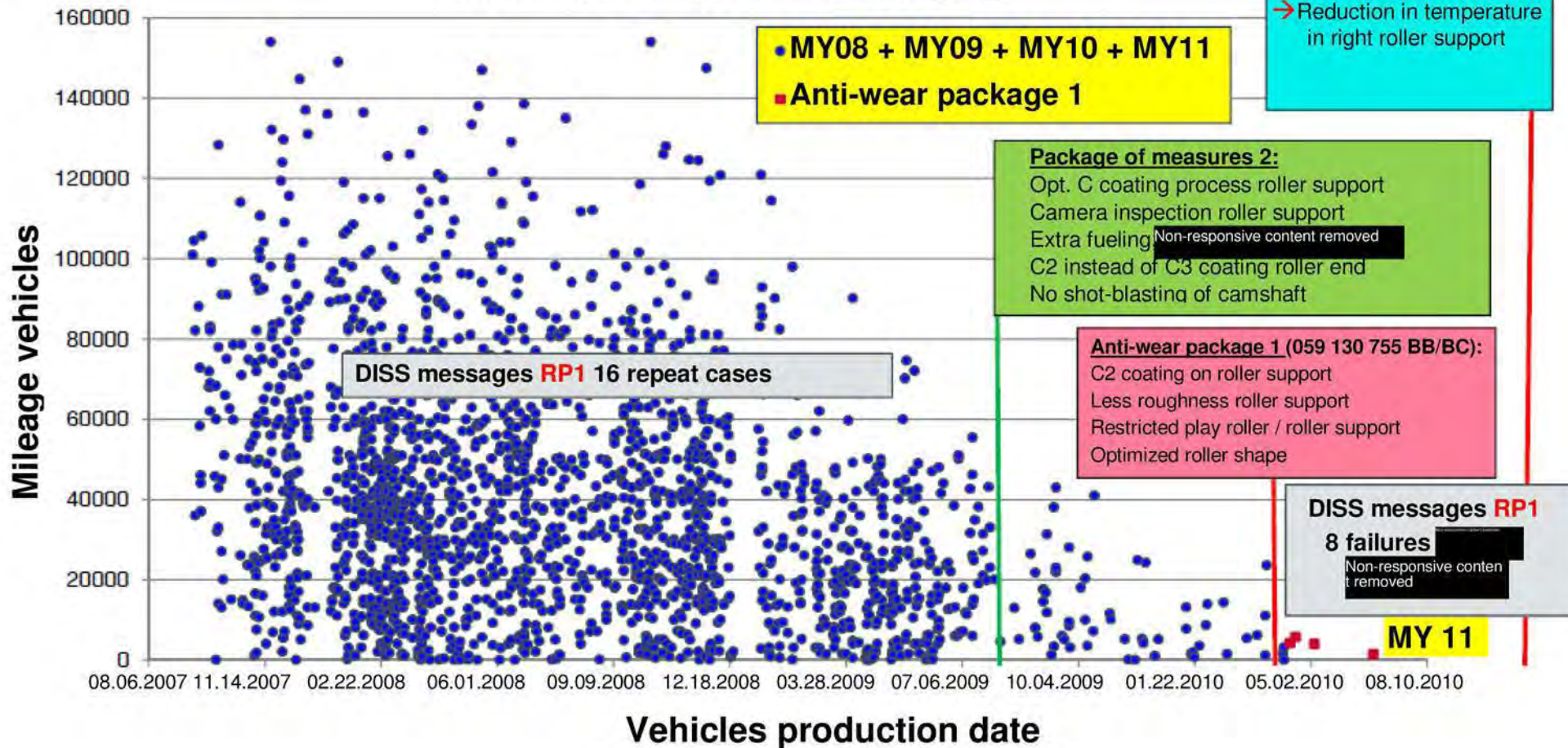
MECFAULT MAJOR NOISE LEAK



Vehicles: 30.307+95.859+94.351+19471=239.998; Sold: 30.272+95.618+91.977+12.210=230.077; UP.:21.584+69.850+72772+11.154=175.370; MY: 2008+2009+2010+2011=Total CP4.2 A4, A5, Q5, Q7aMKB free81

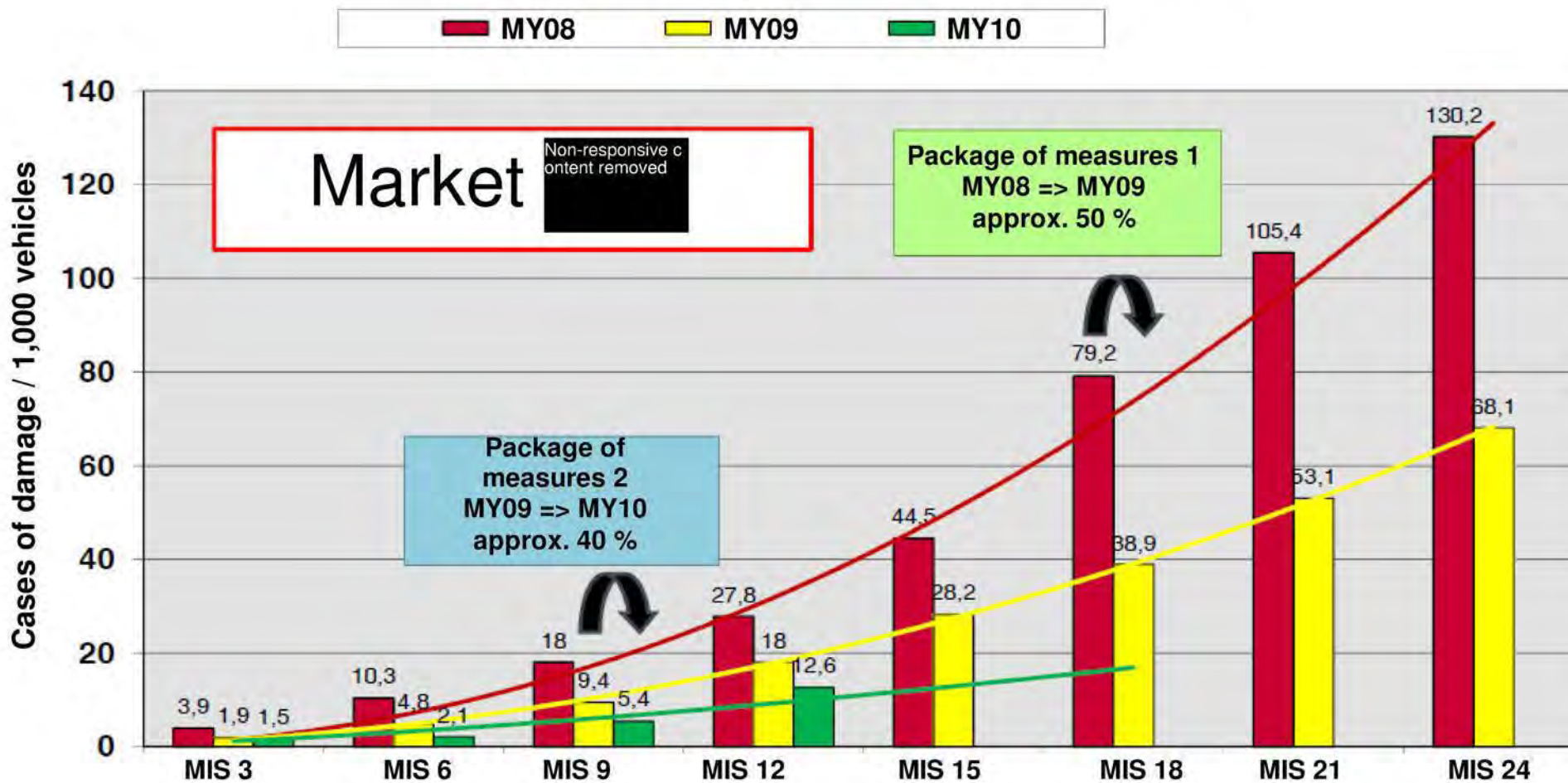
Drivetrain damage high pressure diesel fuel pump CP4

Worldwide field failures high-pressure fuel pump CP4.2 Effectiveness of measures all Audi V6-TDI / SAGA 059A_ /B_



Drivetrain damage high-pressure diesel fuel pump CP4.2

CP4.2 all Audi V6-TDI - model year comparison by MIS



Drivetrain damage high-pressure diesel fuel pump CP4.2

AQUA: Active quality analysis

Status 08/10-09/11/10 09:49 AM

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VW, Touareg, market: [REDACTED]

MY 2008 2010, Offset: all (Max: 2)

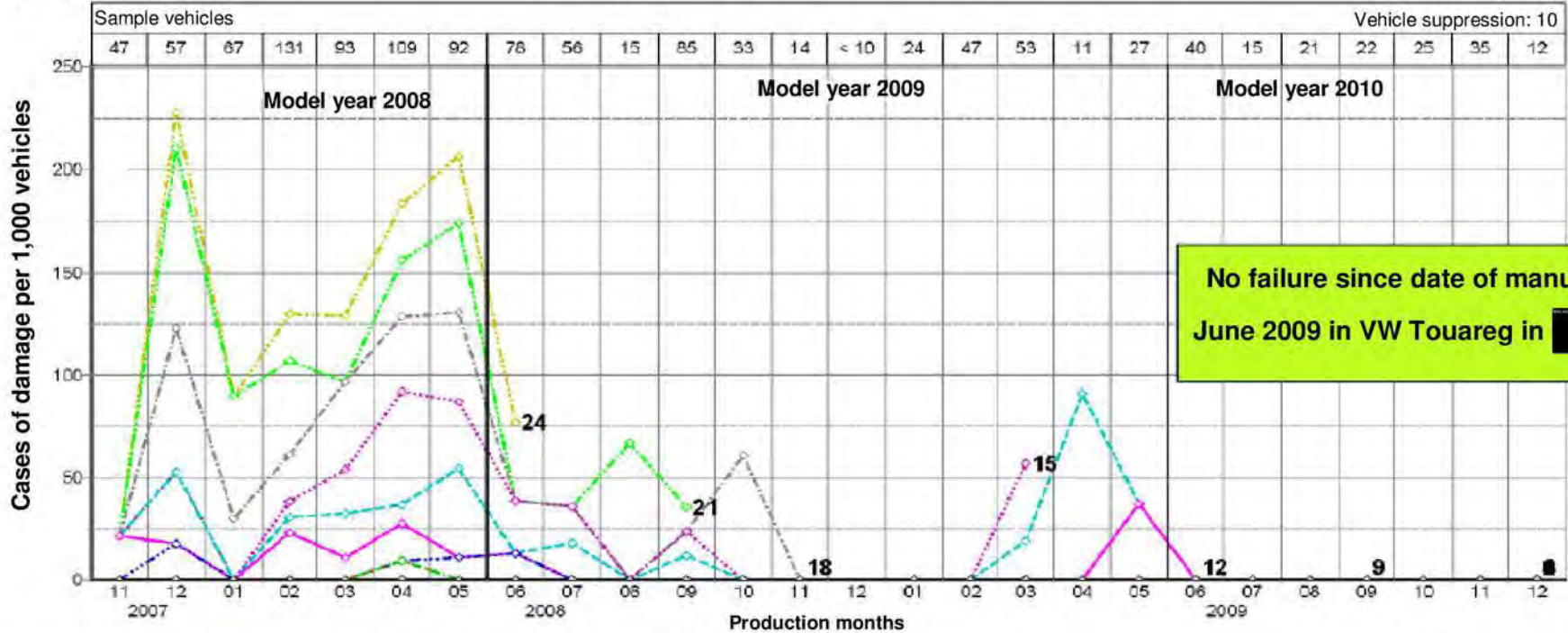
CNR / Groups: High-pressure fuel pump

Confidential

Without PR numbers

CNR 2374

| MY | CASA CASB CASC CASD CATA CATB CCMA | | | | | | | | | | | | MY | Replacement | BD | SA 10 | SA 17 | |
|--------|------------------------------------|------|------|------|------|---------|---------|-------|-------|-------|-------|-------|------|-------------|--------|--------|--------|----------------|
| | MIS0 | MIS1 | MIS2 | MIS3 | MIS4 | MIS6 | MIS9 | MIS12 | MIS15 | MIS18 | MIS21 | MIS24 | | | | | | |
| 2008 | 0,0 | 0,0 | 0,0 | 1,8 | 1,8 | 5,3 | 17,7 | 33,7 | 55,0 | 92,2 | 125,9 | 148,9 | 2008 | 99,1 % | 52,8 % | 76,9 % | 17,6 % | |
| 2009 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 2,1 | 4,3 | 14,9 | 28,4 | 34,6 | 54,9 | 81,6 | 2009 | 100,0 % | 79,3 % | 75,9 % | 20,7 % | |
| 2010 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 24,1 | | | | | 2010 | 100,0 % | 33,3 % | 100 % | | |
| Diff % | | | | | | -100,00 | -100,00 | 61,79 | | | | | | | | | | MAJOR MECFAULT |



Vehicles: 993+916+486=2,395; sold: 992+916+486=2,394; UP: 564+470+177=1,211; MY: 2008+2009+2010=total

CP42 VW Touareg fECL [REDACTED] 80

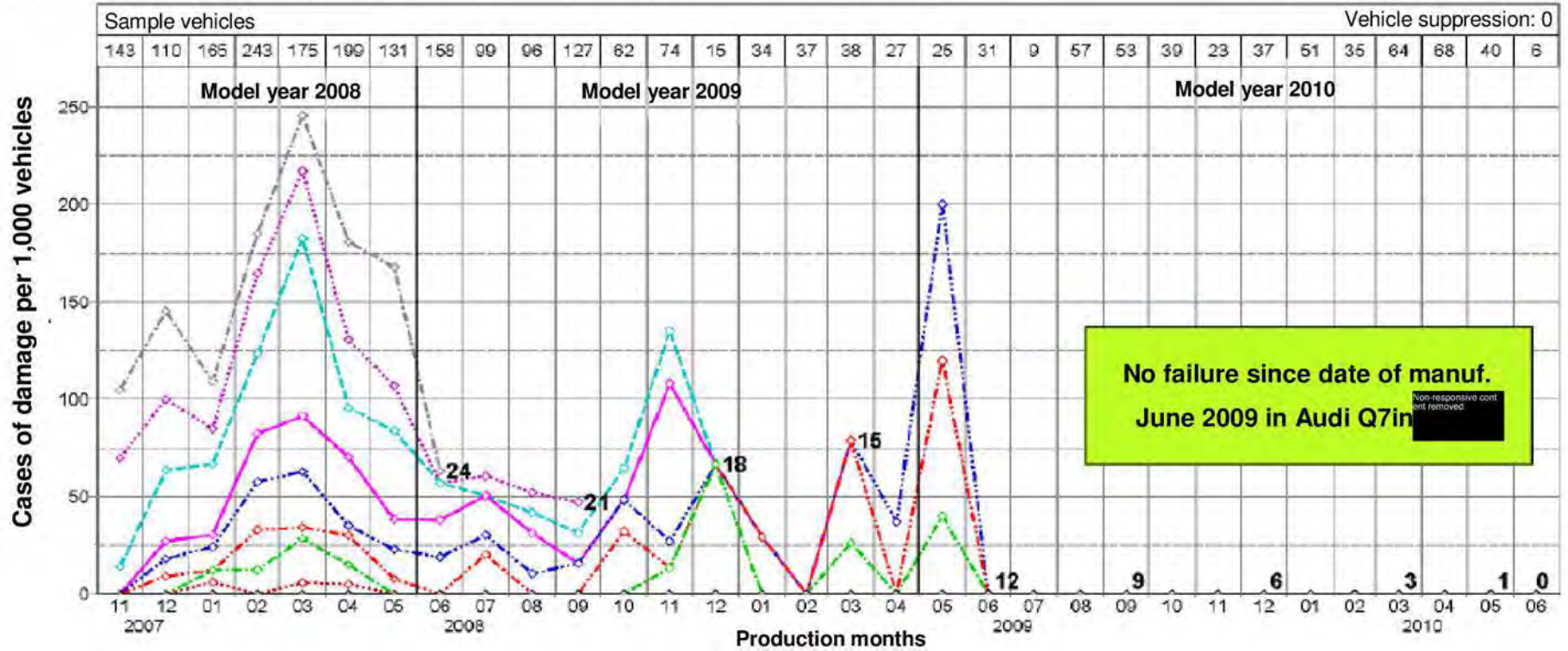
Drivetrain damage high-pressure diesel fuel pump CP4.2

AQUA: Active quality analysis
 Status 10/08-11.09 10.07:08
 Source / User [Non-responsive content removed]

Audi, Audi Q7, Market: [Redacted]
 MY 2008-2010, Offset: all (Max: 2)
 CNR / Groups: High-pressure fuel pump

Confidential
 Without PR numbers
 CNR 2374

| MY | CASA CASB CASC CASD CATA CATB CCMA | | | | | | | | | | MY | Replacement | BD | SA 10 | SA 17 | SA 18 | SA 50 |
|-------|------------------------------------|------|---------|--------|--------|-------|--------|--------|--------|--------|------|-------------|--------|--------|--------|-------|---------------------------|
| | MIS0 | MIS1 | MIS3 | MIS6 | MIS9 | MIS12 | MIS15 | MIS18 | MIS21 | MIS24 | | | | | | | |
| 2008 | 0,0 | 0,0 | 2,6 | 11,4 | 20,2 | 35,1 | 54,4 | 97,4 | 132,5 | 169,3 | 2008 | 100,0 % | 85,5 % | 76,5 % | 14,0 % | 4,5 % | 4,1 % |
| 2009 | 0,0 | 0,0 | 0,0 | 4,9 | 17,2 | 31,9 | 48,5 | 61,2 | 71,2 | 79,1 | 2009 | 98,3 % | 94,8 % | 74,1 % | 24,1 % | 1,7 % | |
| Diff% | | | -100,00 | -56,96 | -14,86 | -9,08 | -10,81 | -37,11 | -46,24 | -53,27 | | | | | | | MECFAULT MAJOR MINOR LEAK |



Vehicles: 1.661+1.711+1.031=4.403; Sold: 1.660+1.711+988=4.359; UP.: 1.140+815+516=2.471; MY 2008+2009+2010=total

CP42 Q7 aMKB V6 [Redacted] 80

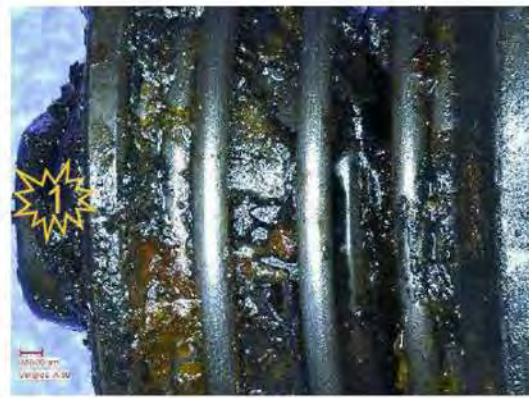
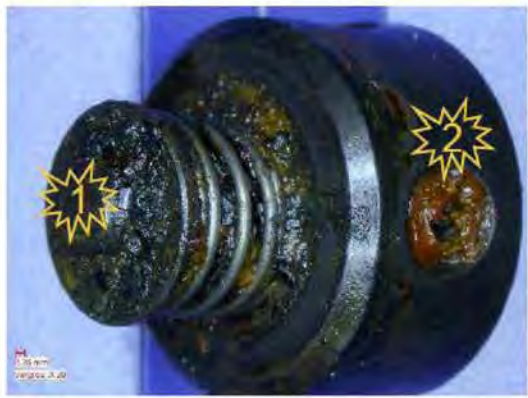
Drivetrain damage high pressure diesel fuel pump CP4

Examples of **fuel aging** at the intake valve (CP4.1)

Non-responsive content removed

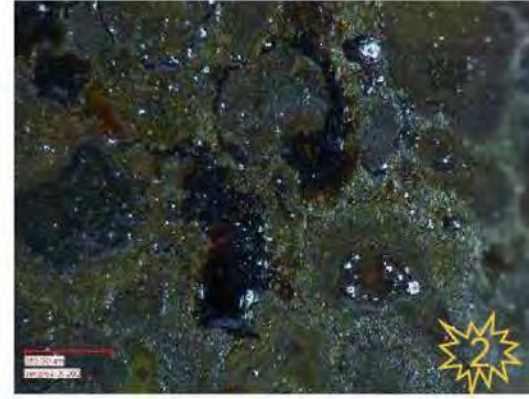
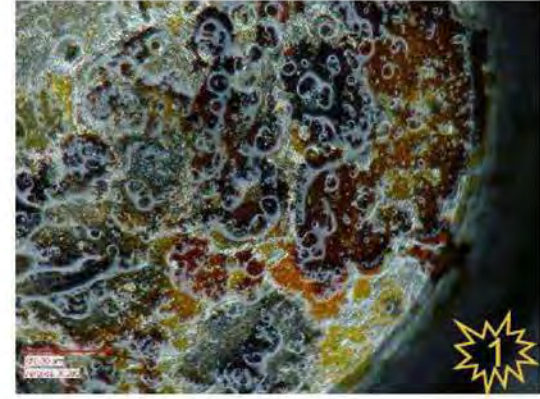
4VW372 DM Mar 08 35,010 km

with drivetrain damage



4VW354 DM Sept 09 5,358 km

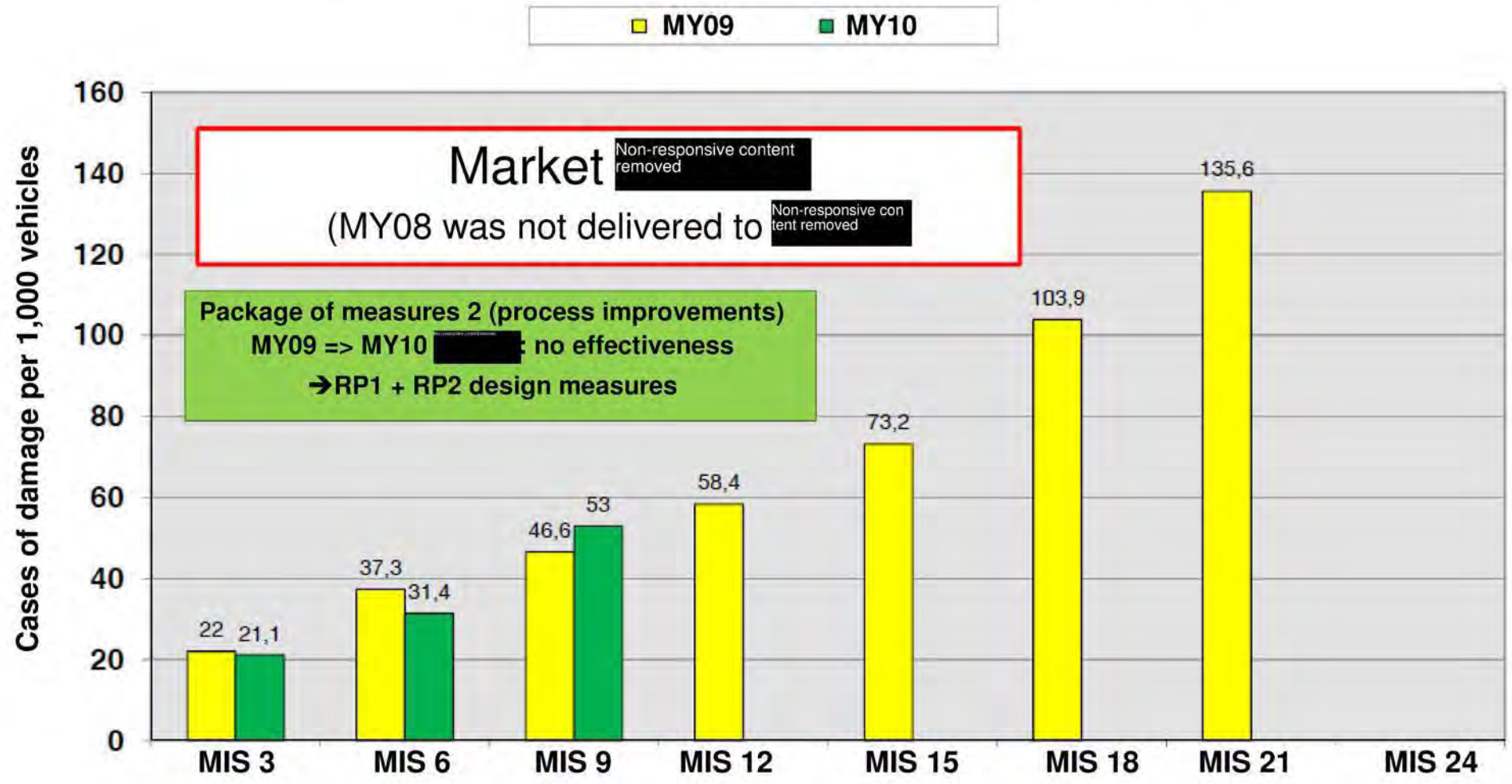
with drivetrain damage



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Drivetrain damage high-pressure diesel fuel pump CP4.2

CP4.2 all Audi V6-TDI - model year comparison by MIS



Drivetrain damage high-pressure diesel fuel pump CP4.2

AQUA: Active quality analysis

Status 10/08-11.09 10.09:54

Source / User Non-responsive content removed

Audi, Audi Q7, market: [REDACTED]

MY 2008 - 2010, Offset: all (Max: 5)

CNR / Groups: High-pressure fuel pump

CASA|CASB|CASC|CASD|CATA|CATB|CCMA

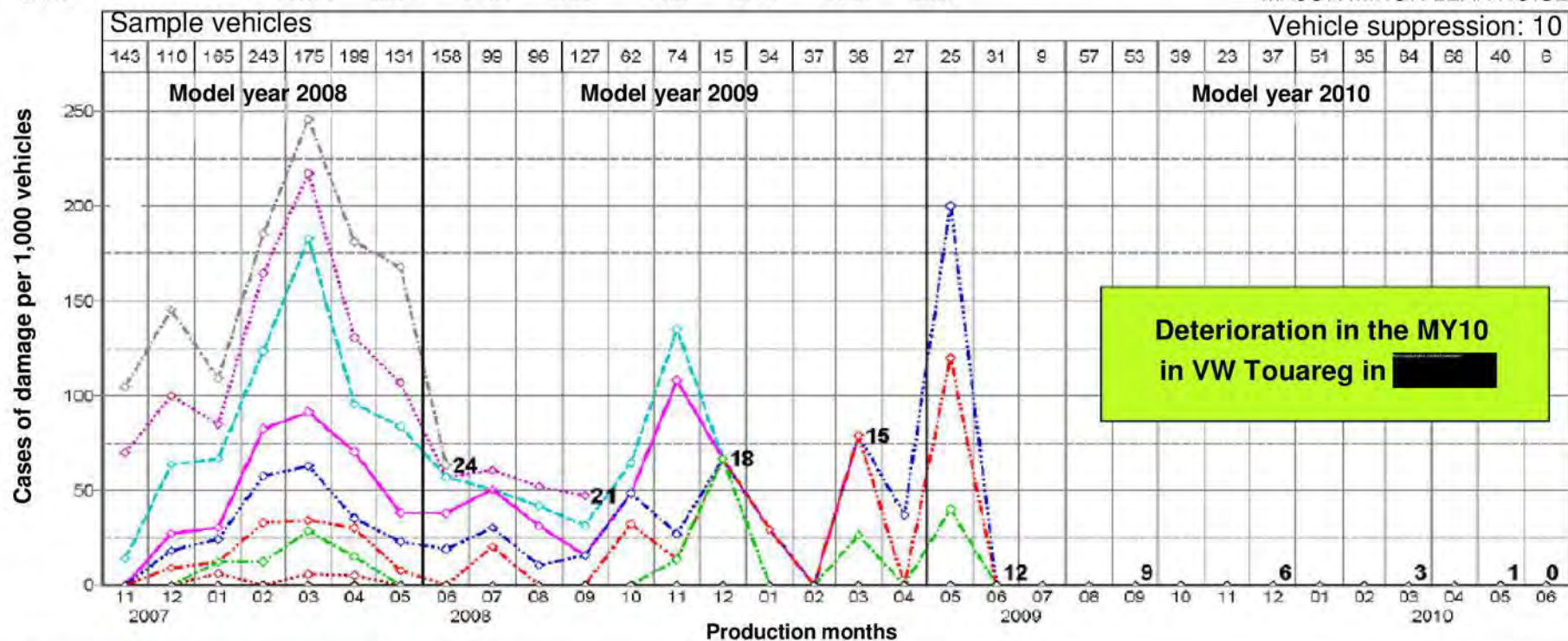
Confidential

Without PR numbers

CNR 2374

| MY | MIS0 | MIS1 | MIS3 | MIS6 | MIS9 | MIS12 | MIS15 | MIS18 | MIS21 | MIS24 | MY | Replacement | BD SA 17 | SA 18 | SA 50 | SA 20 | |
|-------|------|------|---------|--------|--------|-------|--------|--------|--------|--------|------|-------------|----------|--------|--------|-------|-------|
| 2008 | 0,0 | 0,0 | 2,6 | 11,4 | 20,2 | 35,1 | 54,4 | 97,4 | 132,5 | 169,3 | 2008 | 100,0 % | 85,5 % | 76,5 % | 14,0 % | 4,5 % | 4,1 % |
| 2009 | 0,0 | 0,0 | 0,0 | 4,9 | 17,2 | 31,9 | 48,5 | 61,2 | 71,2 | 79,1 | 2009 | 98,3 % | 94,8 % | 74,1 % | 24,1 % | 1,7 % | |
| Diff% | | | -100,00 | -56,96 | -14,86 | -9,08 | -10,81 | -37,11 | -46,24 | -53,27 | | | | | | | |

MAJOR MINOR LEAK NOISE



Vehicles: 1.661+1.711+1.031=4.403; Sold: 1.660+1.711+988=4.359; UP.: 1.140+815+516=2.471; MY: 2008+2009+2010=Total

CP42 aMKB V6 [REDACTED] 80

Drivetrain damage high-pressure diesel fuel pump CP4.2

AQUA: Active quality analysis

Status 10/08-14.09 10.18:14

Source / User Non-responsive content removed

Audi, Audi Q7, Market: Non-responsive content removed

MY 2008 - 2010, Offset: all (Max: 4)

CNR / Groups: High-pressure fuel pump

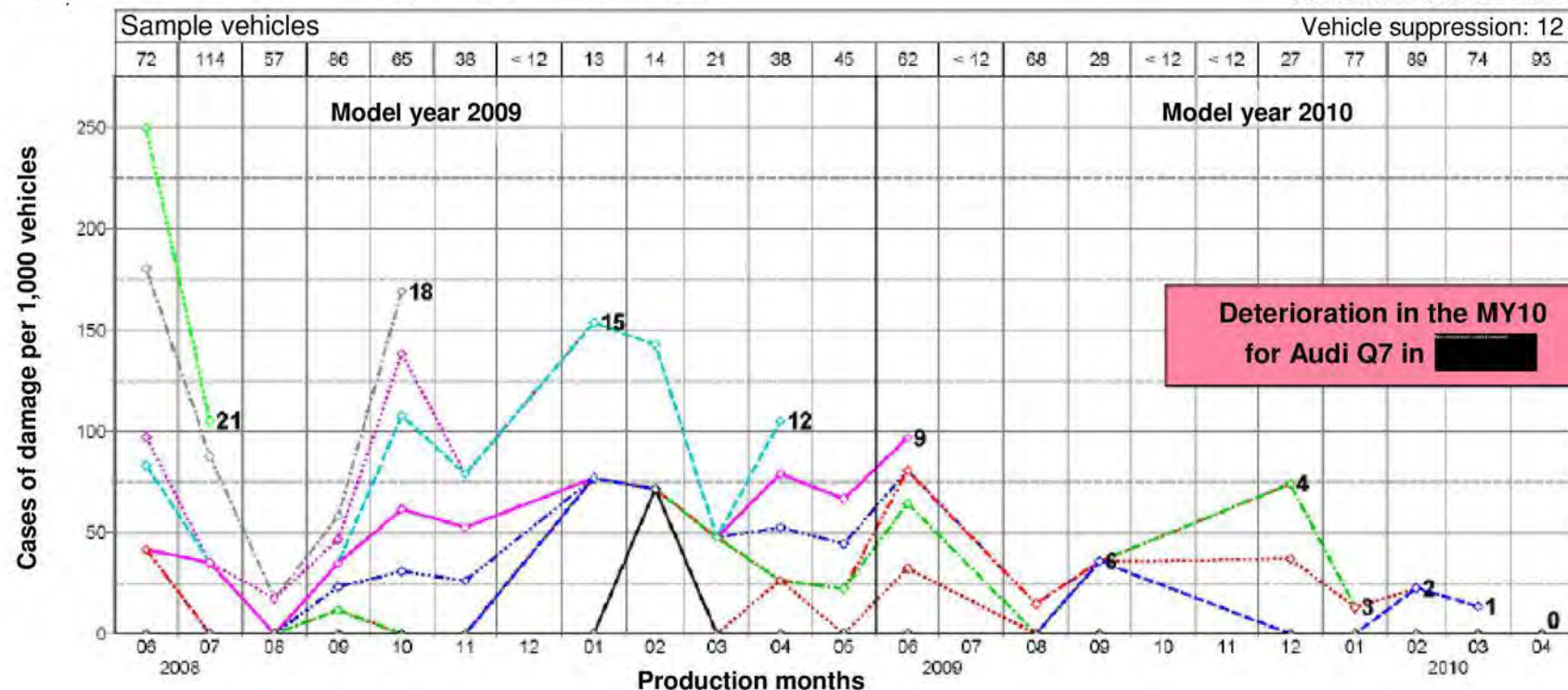
Confidential

Without PR numbers

CNR 2374

| | CASA CASB CASC CASD CATA CATB CCMA | | | | | | | | | | | | MY | Replacement | BD | SA 10 | SA 17 | SA 50 |
|-------|------------------------------------|--------|--------|--------|--------|--------|--------|-------|-------|-------|-------|------|---------|-------------|--------|--------|-------|-------|
| MY | MIS0 | MIS1 | MIS2 | MIS3 | MIS4 | MIS6 | MIS9 | MIS12 | MIS15 | MIS18 | MIS21 | | | | | | | |
| 2009 | 1,8 | 3,6 | 5,3 | 10,7 | 16,0 | 26,7 | 44,5 | 65,8 | 80,5 | 117,2 | 153,5 | 2009 | 87,5 % | 22,5 % | 52,5 % | 31,3 % | 6,3 % | |
| 2010 | 0,0 | 8,9 | 19,5 | 30,0 | 39,5 | 56,3 | 96,3 | | | | | 2010 | 100,0 % | 44,0 % | 60 % | 32 % | 4 % | |
| Diff% | -100,00 | 149,78 | 265,81 | 180,81 | 146,68 | 111,06 | 116,50 | | | | | | | | | | | |

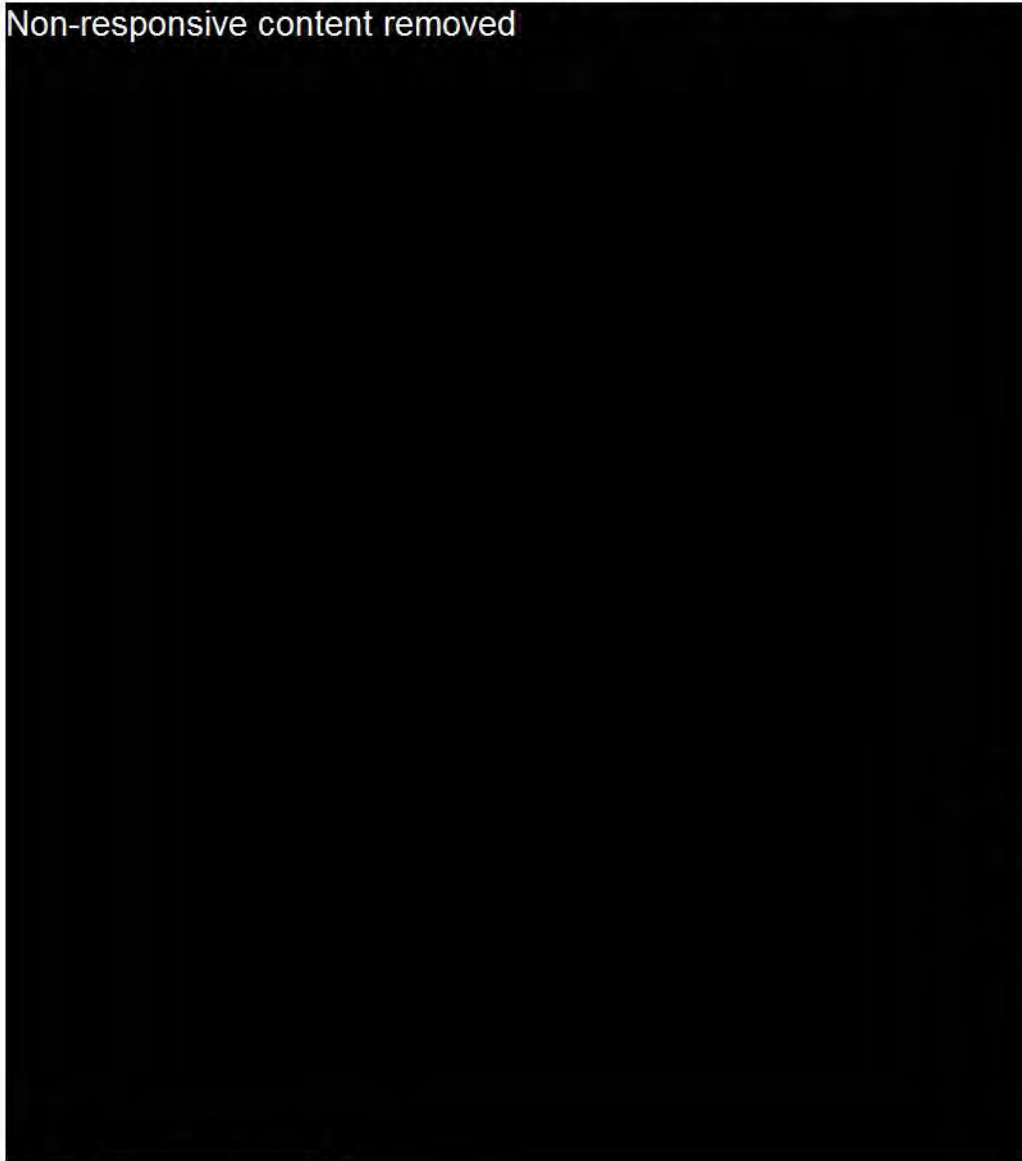
MECFAULT MAJOR LEAK



Vehicles: 1,191+941=2,132; Sold: 1,190+923=2,113; UP: 562+642=1,204; MY: 2009+2010=total

CP42 aMKB V6 [redacted] 80

Drivetrain damage high-pressure diesel fuel pump CP4.2



Failure after previous repair:

- A6 = ●
- Q5 = ●
- Q7 = ●

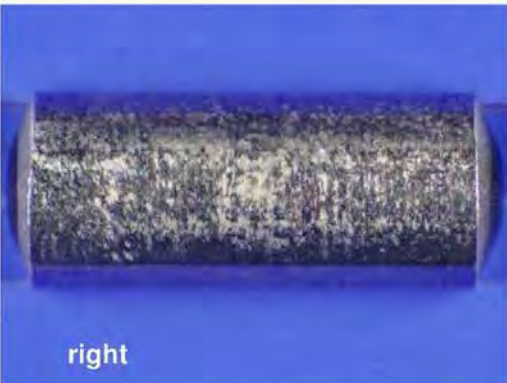
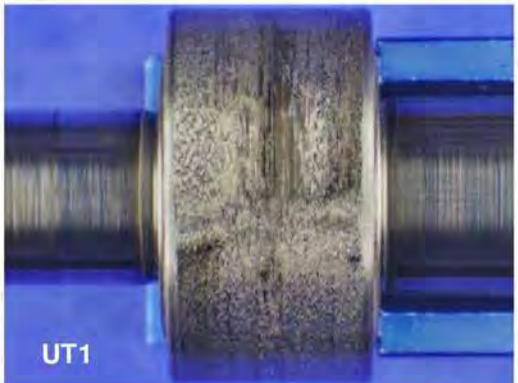
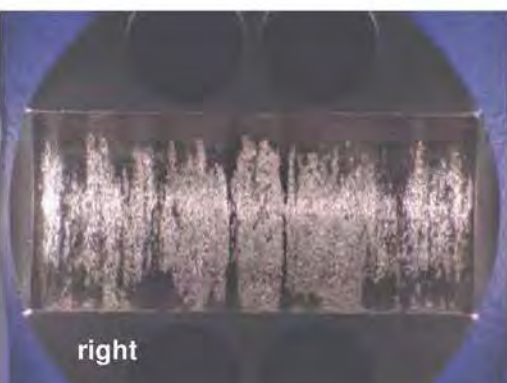
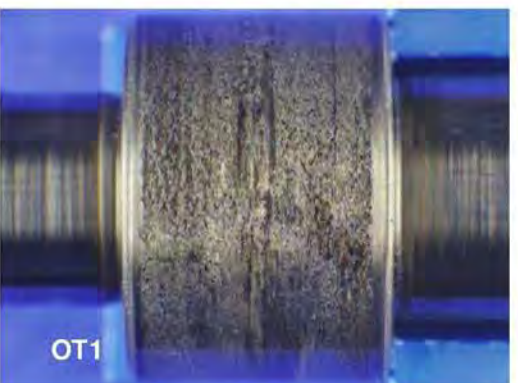
Failure of original equipment ex factory:

-
-
-

Drivetrain damage high pressure diesel fuel pump CP4

2010-CP4_0644

Failed field pump Non-responsive content removed RT not known (**handing over at KAF** Non-responsive content removed)
0 445 010 611; DM: 100121 BPT 1190; C-Index 05; 059 130 755 AH (without RP1)



Drivetrain damage high pressure diesel fuel pump CP4

Analysis by Bosch:

Pump shows typical drivetrain damage.

Right roller support first destroyed by abrasive wear.

Left roller support, consequential damage with turned tappet.

Abrasive wear can be attributed to the low-viscosity fuel market in Non-responsive content removed

Drivetrain damage high-pressure diesel fuel pump CP4.2

Anti-wear package 1

Task

Increasing the lubrication film between the roller support and the roller for fuels with lower viscosity (reduction of mixed friction fraction and temperatures)

Measures

- Reduction in roughness in the roller support due to changeover to C2 coating
- Prevention of metal splashes (process-related there are no metal splashes with C2)
- Reduction of play between roller and roller support (smaller roller support bore)
- Reducing the roughness of the roller
- Optimization of edge taper on the roller (slender taper)

Result

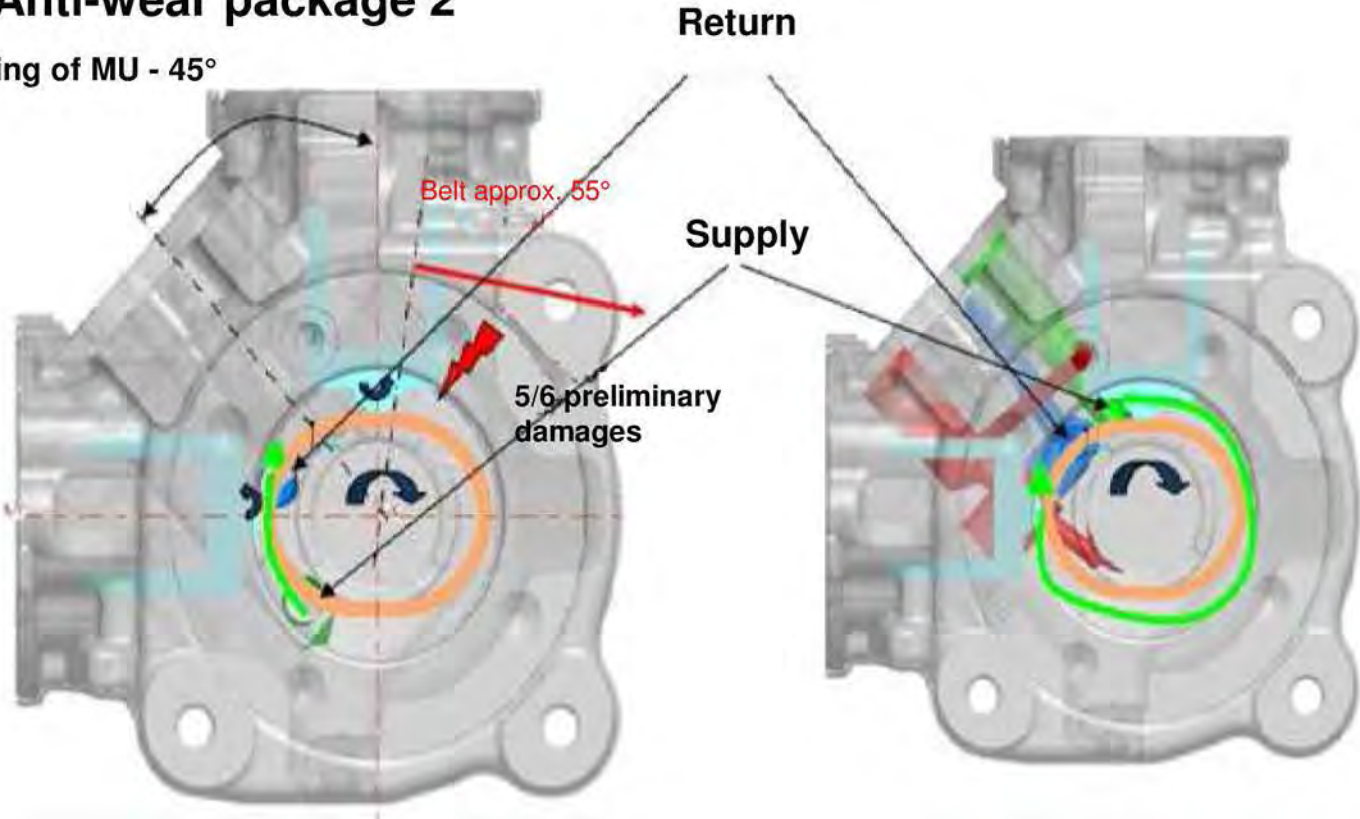
RP1 increases lubricating film by factor of 2 (derived from diagnosis results)

RP1 for all CP4.2 since WK15 at Audi in series

Drivetrain damage high-pressure diesel fuel pump CP4.2

Anti-wear package 2

Mounting of MU - 45°



Fuel goes direct to return
CP4.2-EFP cw Audi W19

Fuel is pumped around once
CP4.2 EFP cw **RP2** for Audi W19

Drivetrain damage high pressure diesel fuel pump CP4.1

Anti-wear package 2

Task

Reduction of local temperature in the right roller support to the level of CP4.1

→Prevention of fuel degradation, deposit formation → reduced lubrication, increased friction

Measures

- Opt. Arrangement of inflow/return position (swapping of the inflow / return connections)
- Introduction of a robust flange (large overflow cross-sections)

Result

Reduction of temp. in the lubrication gap by 24°C (from 136° C to 111°C @ 80l/h @ 70°C supply)

→The level is thus the same as CP4.1

→Significantly lower deposit formation on roller support

Test at R.B. passed; testing / verification at Audi in progress

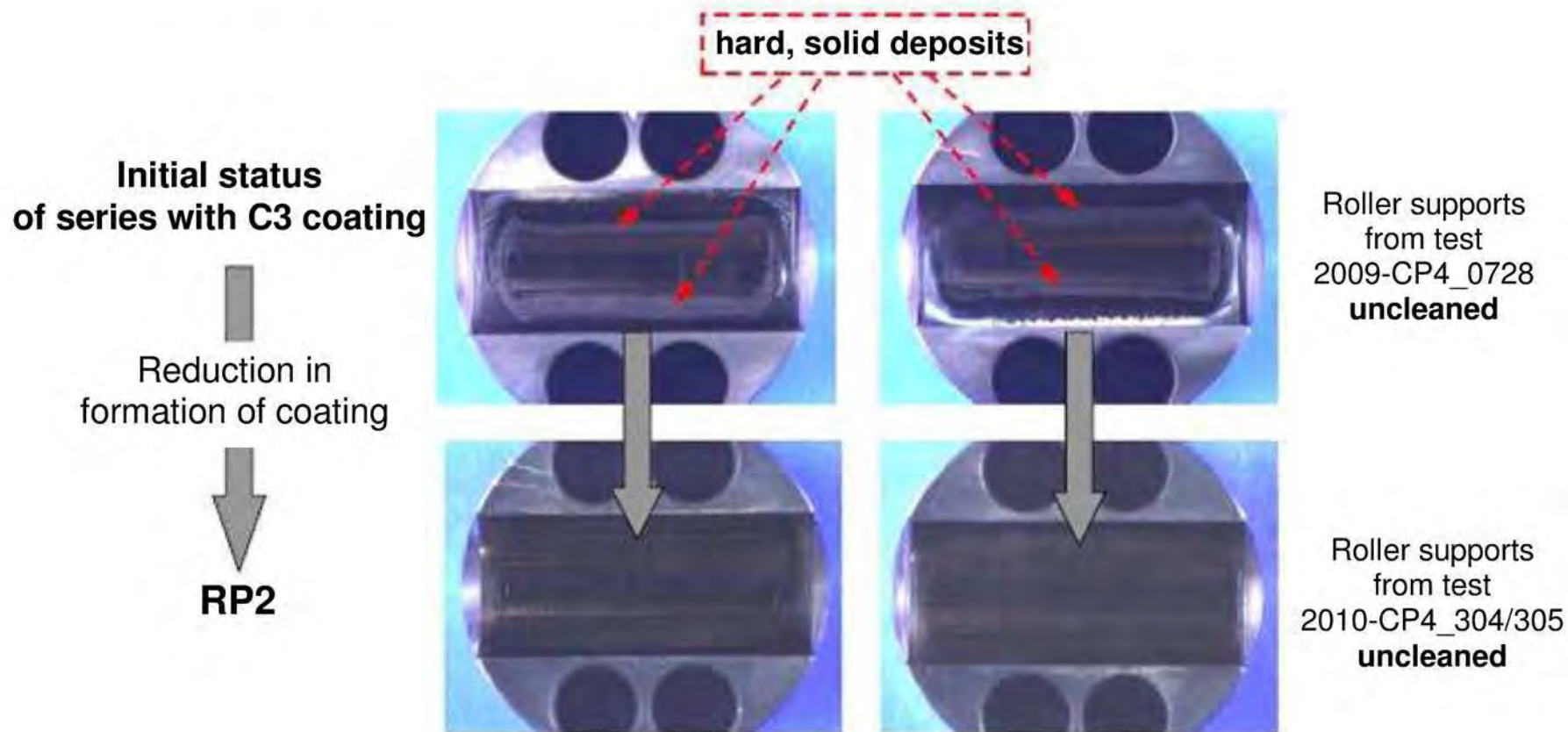
Series launch of all V6-TDI (due to changed inflow and return lines)

WK45/2010

Drivetrain damage high-pressure diesel fuel pump CP4.2

Anti-wear package RP2

Proof of effectiveness by overload test (150 h with low viscosity)

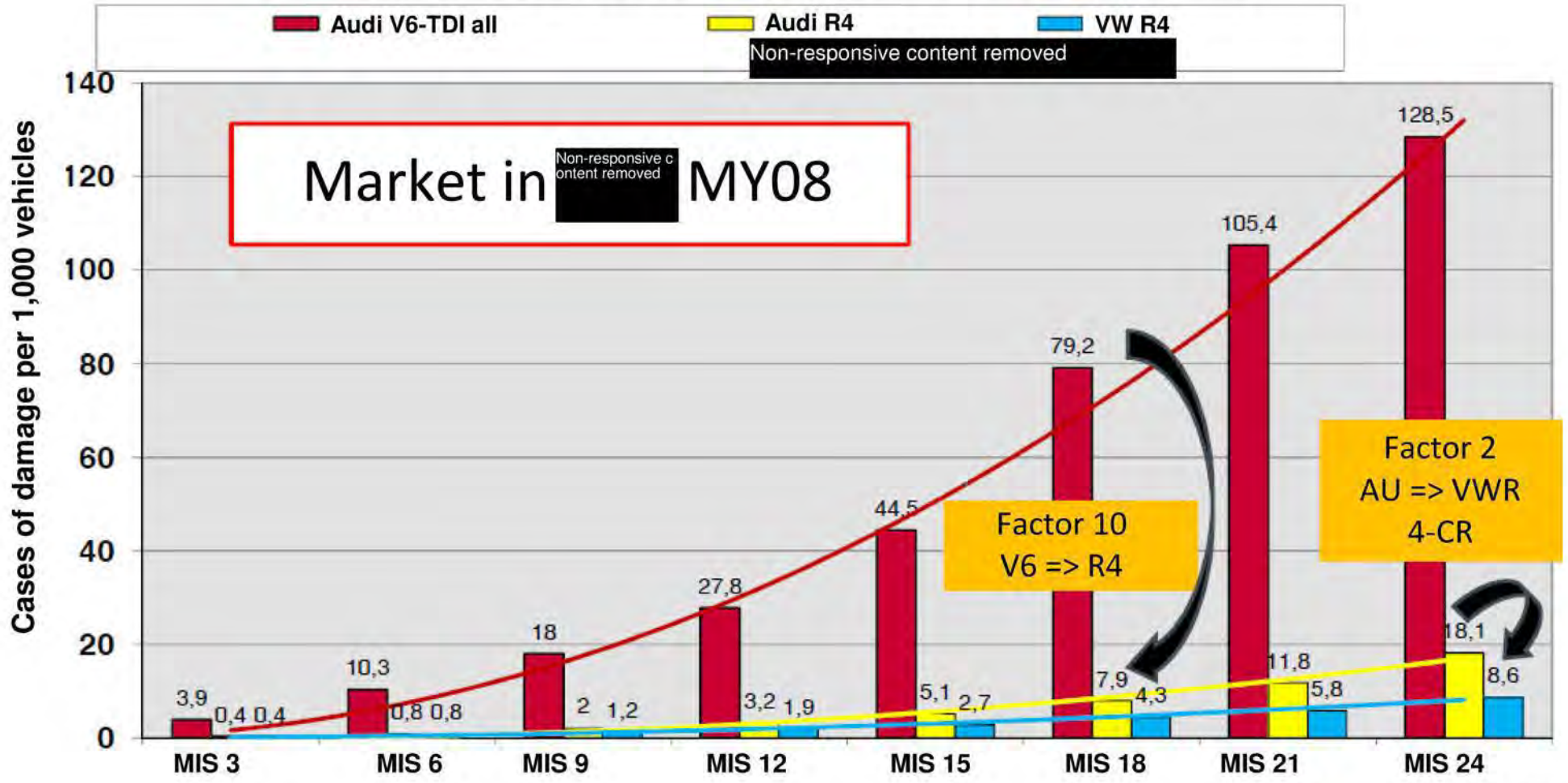


Drivetrain damage high-pressure diesel fuel pump CP4.2

Backup

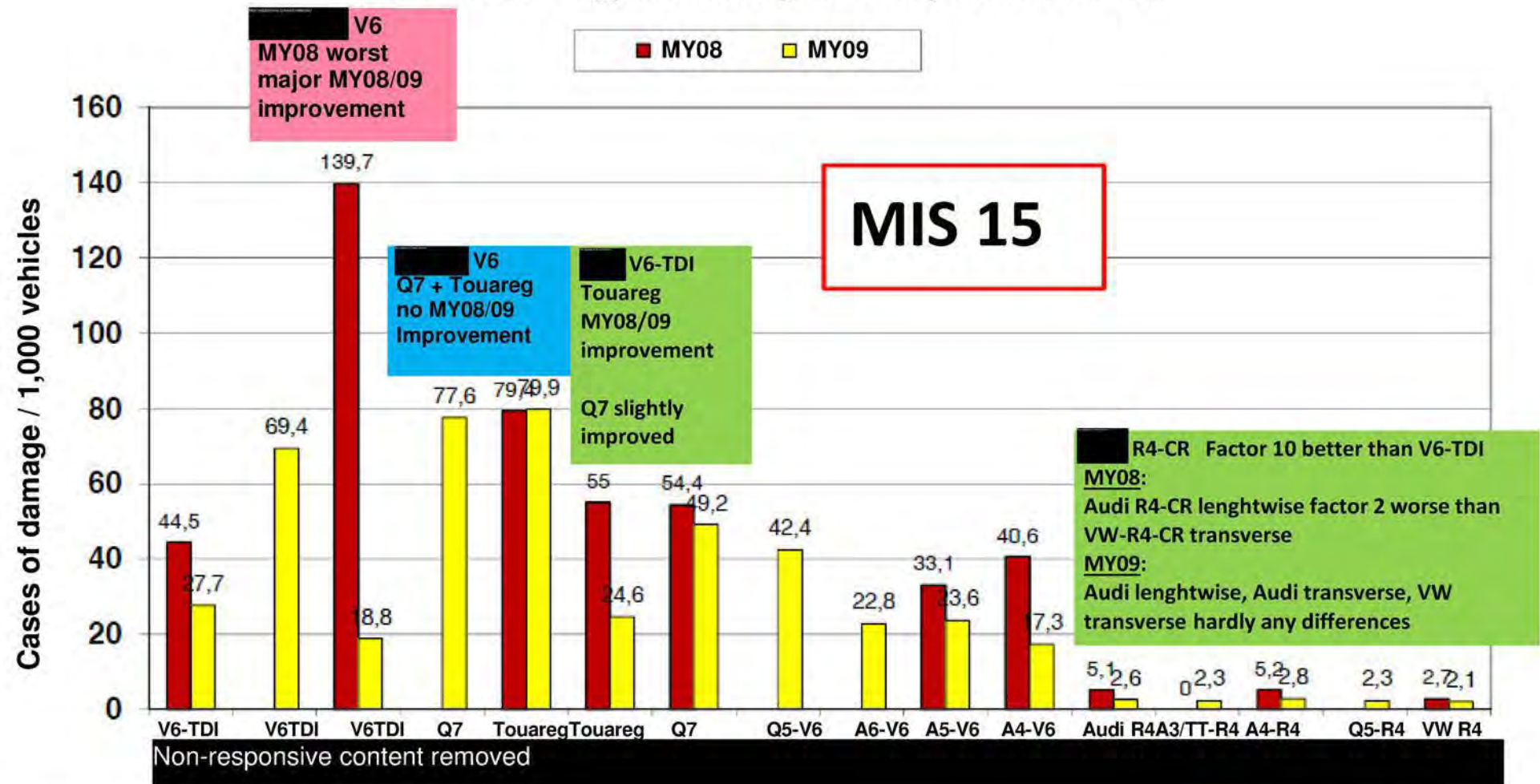
Drivetrain damage Diesel high-pressure fuel pump CP4.2

Comparison CP4.2 / CP4.1 - V6-/R4-TDI - Audi/VW by MIS



Drivetrain damage Diesel high-pressure fuel pump CP4.2

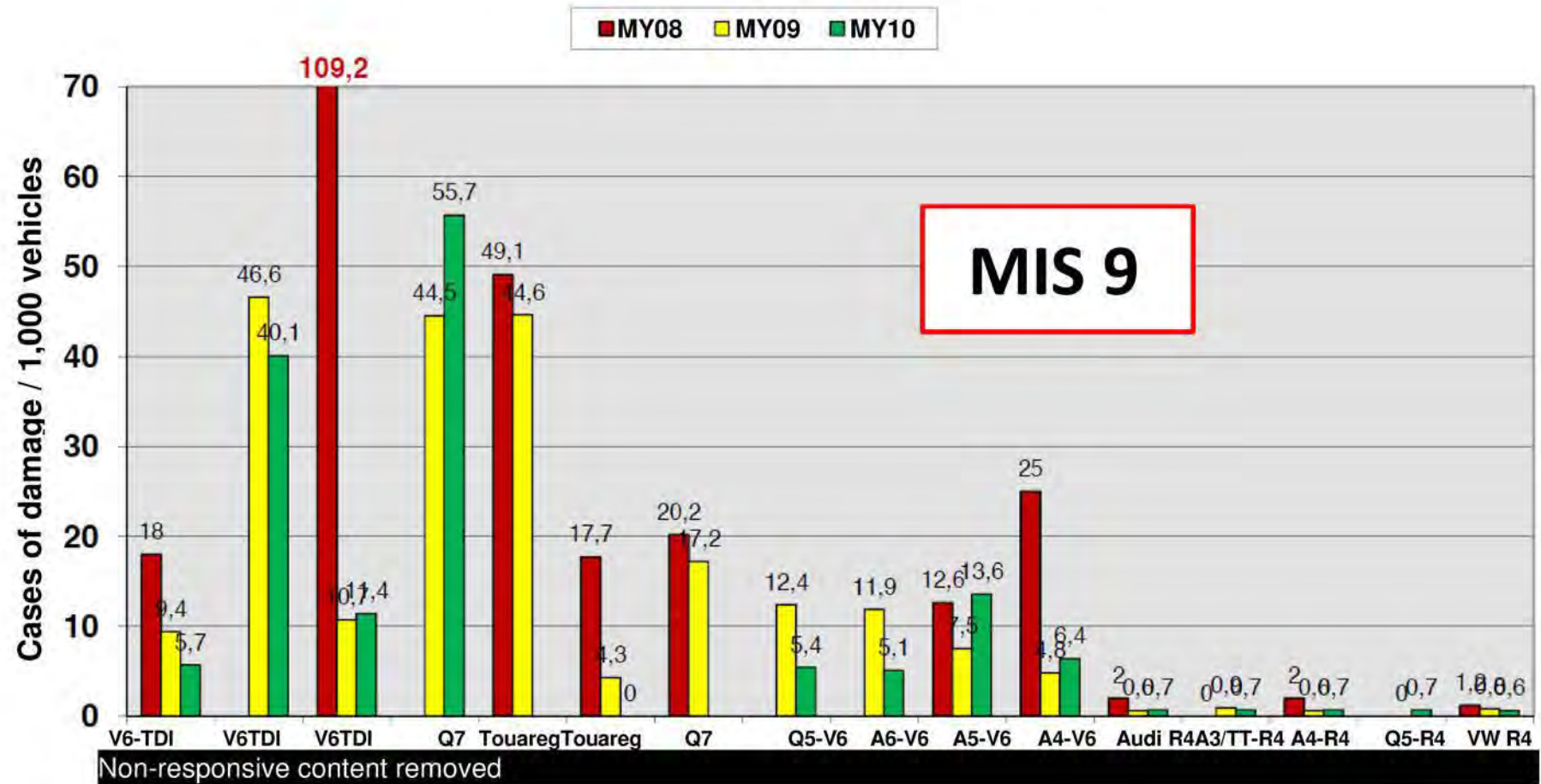
CP4.2 + CP4.1 - Type/ Model year comparison MIS15



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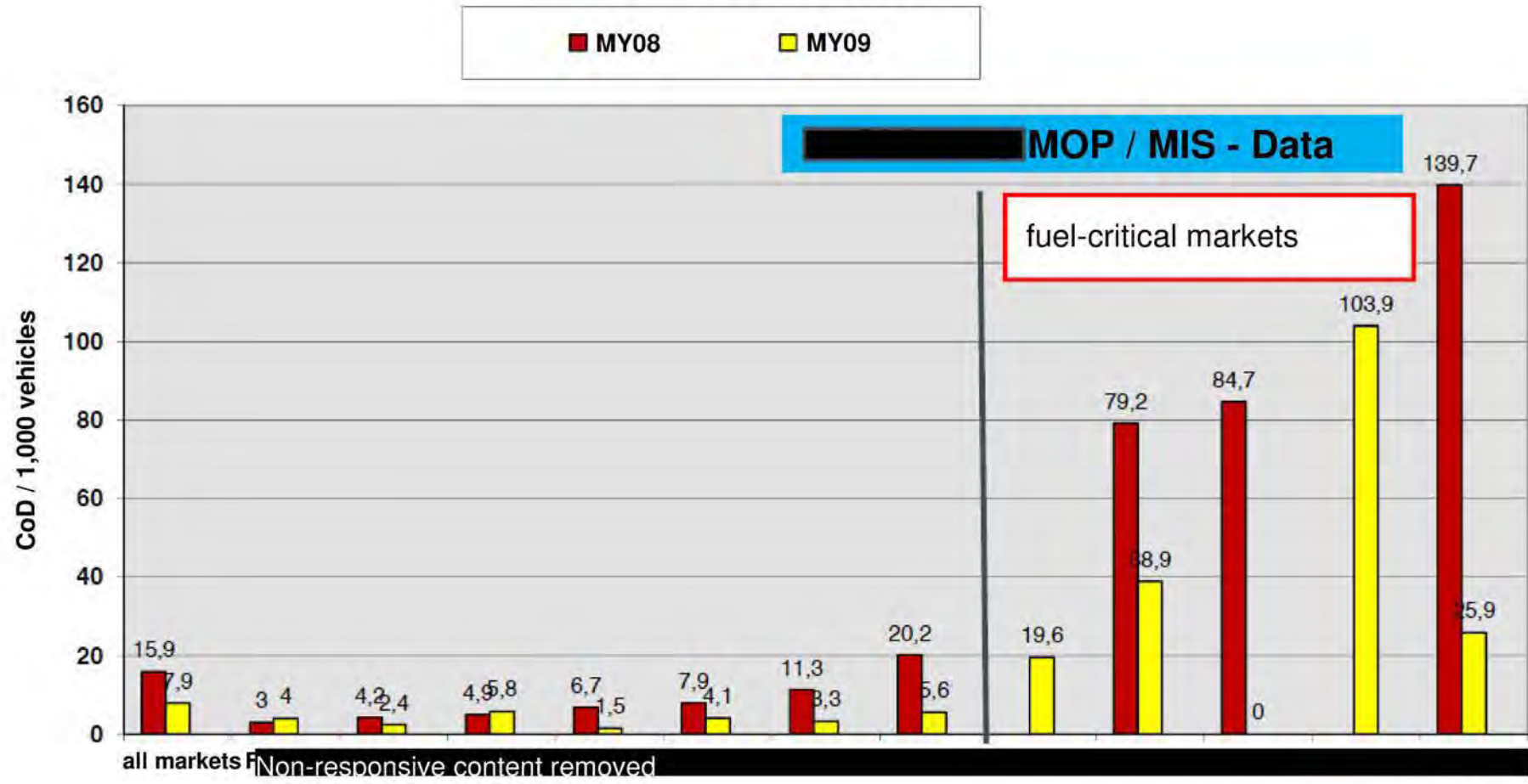
Drivetrain damage Diesel high-pressure fuel pump CP4.2

CP4.2 + CP4.1 - Type/Model year comparison MIS9



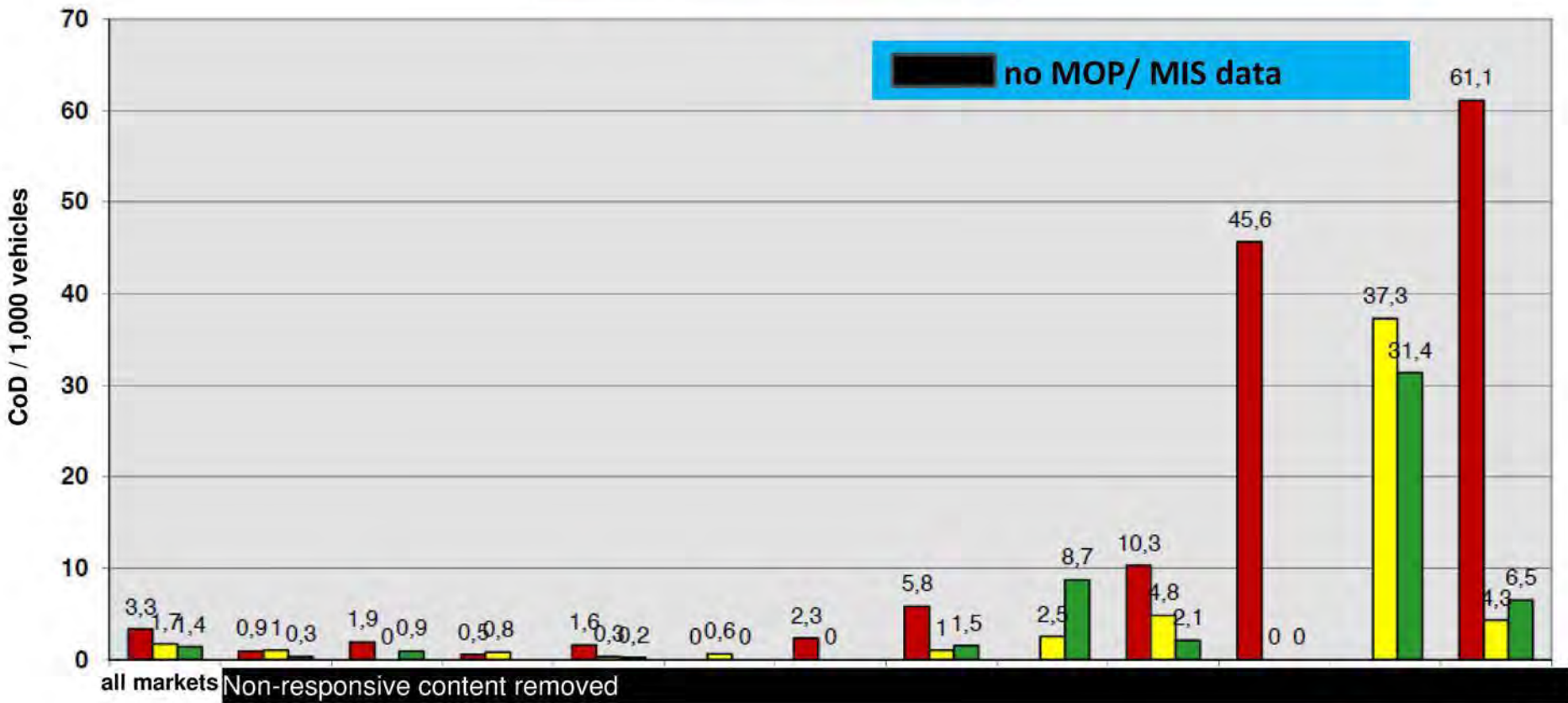
Drivetrain damage Diesel high-pressure fuel pump CP4.2

MIS 18 NEW



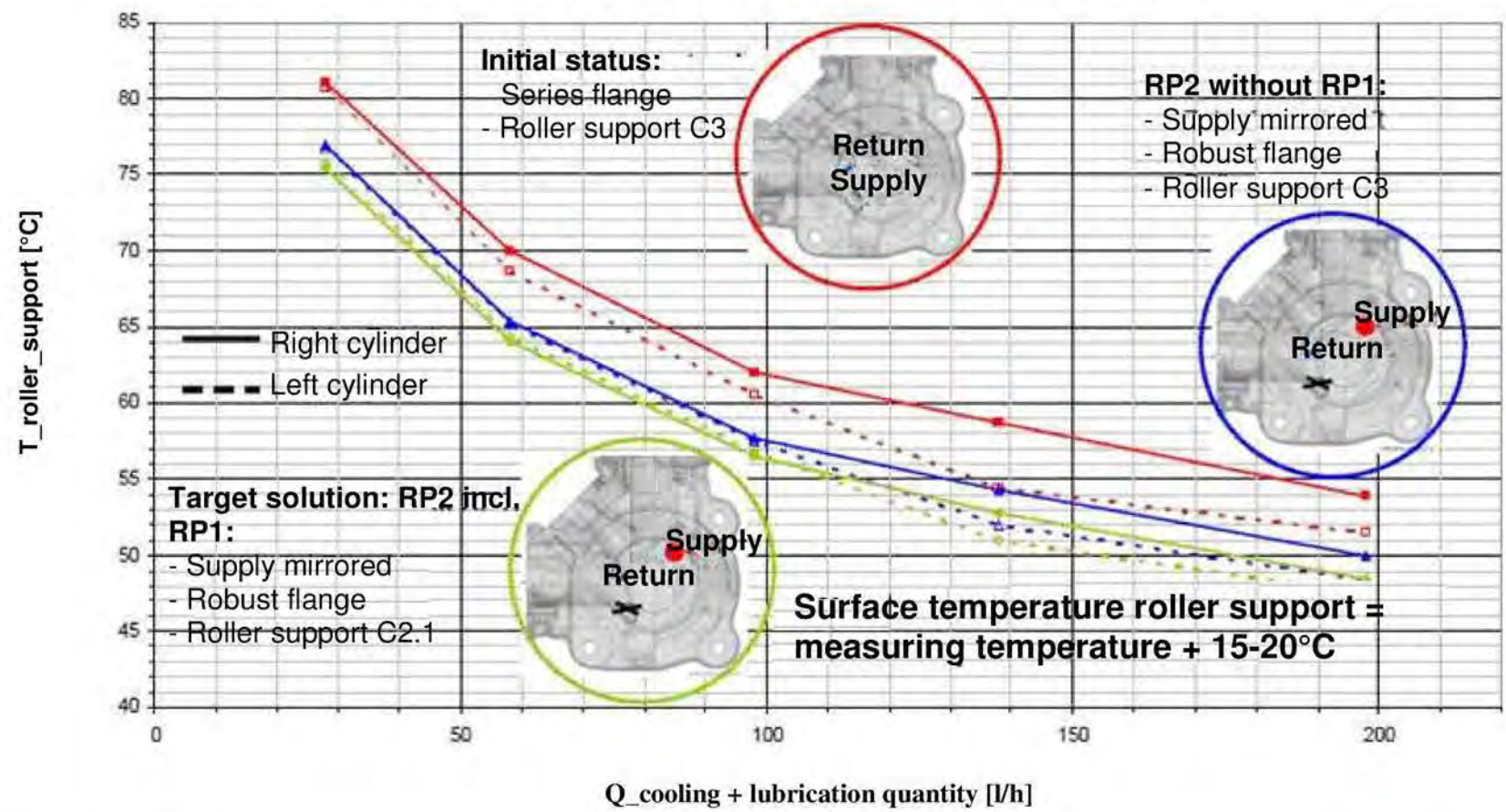
Drivetrain damage Diesel high-pressure fuel pump CP4.2

MIS 6 NEW



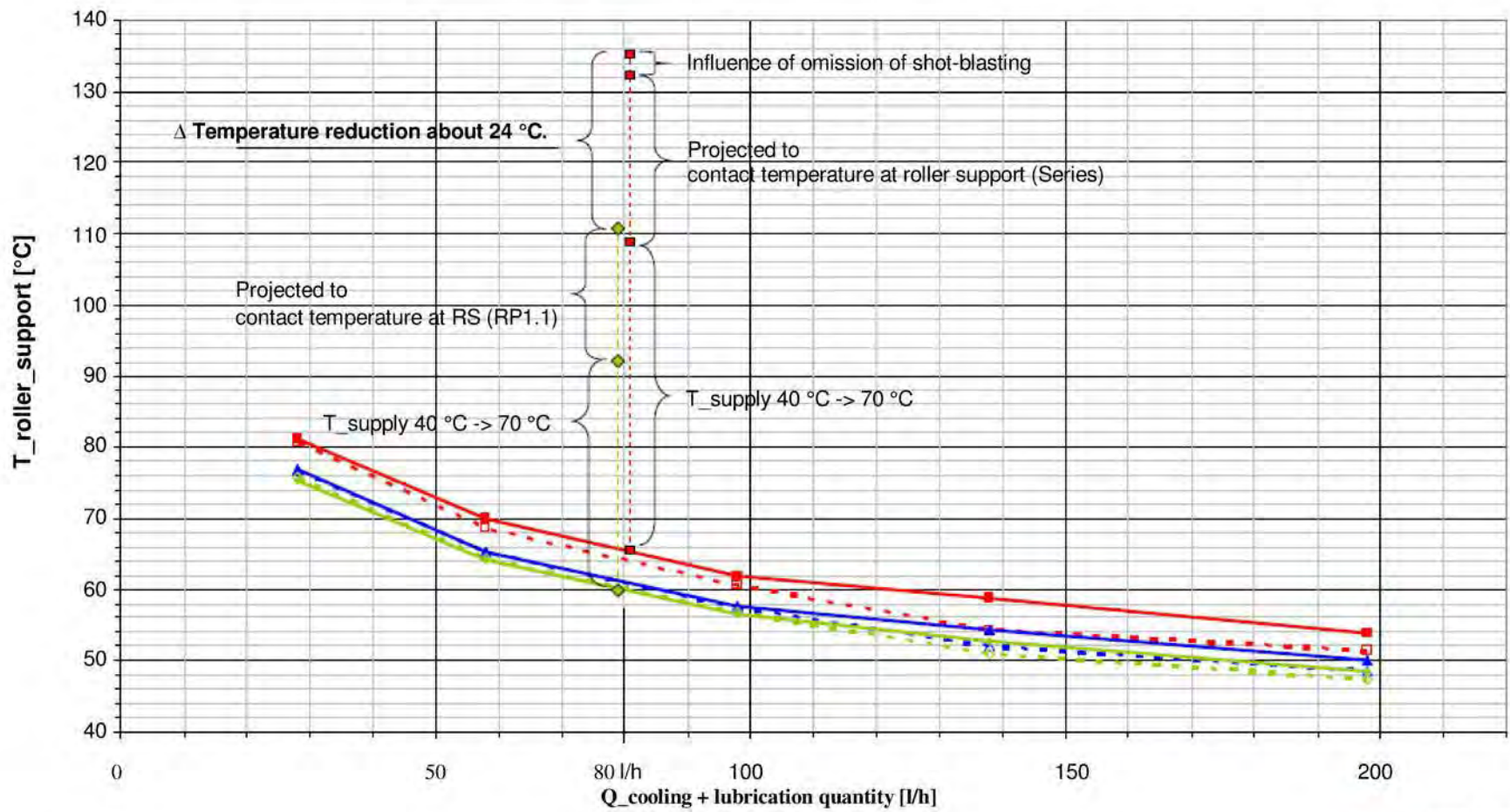
Drivetrain damage Diesel high-pressure fuel pump CP4.2

CP4.2 Audi W19: roller support temperature as f (cooling and lubrication quantity)
Robust flange; n=1,000 rpm; p_Rail= 2,300 bar; T_All=40°C



Drivetrain damage Dieselhigh-pressure fuel pump CP4.2

CP4.2 Audi W19: Roller support temperature as f(cooling and lubrication quantity)
Robust fl anges = 1,000rpm; p_Rail=2,300 bar; T_All = 40°C



Audi
Vorsprung durch Technik



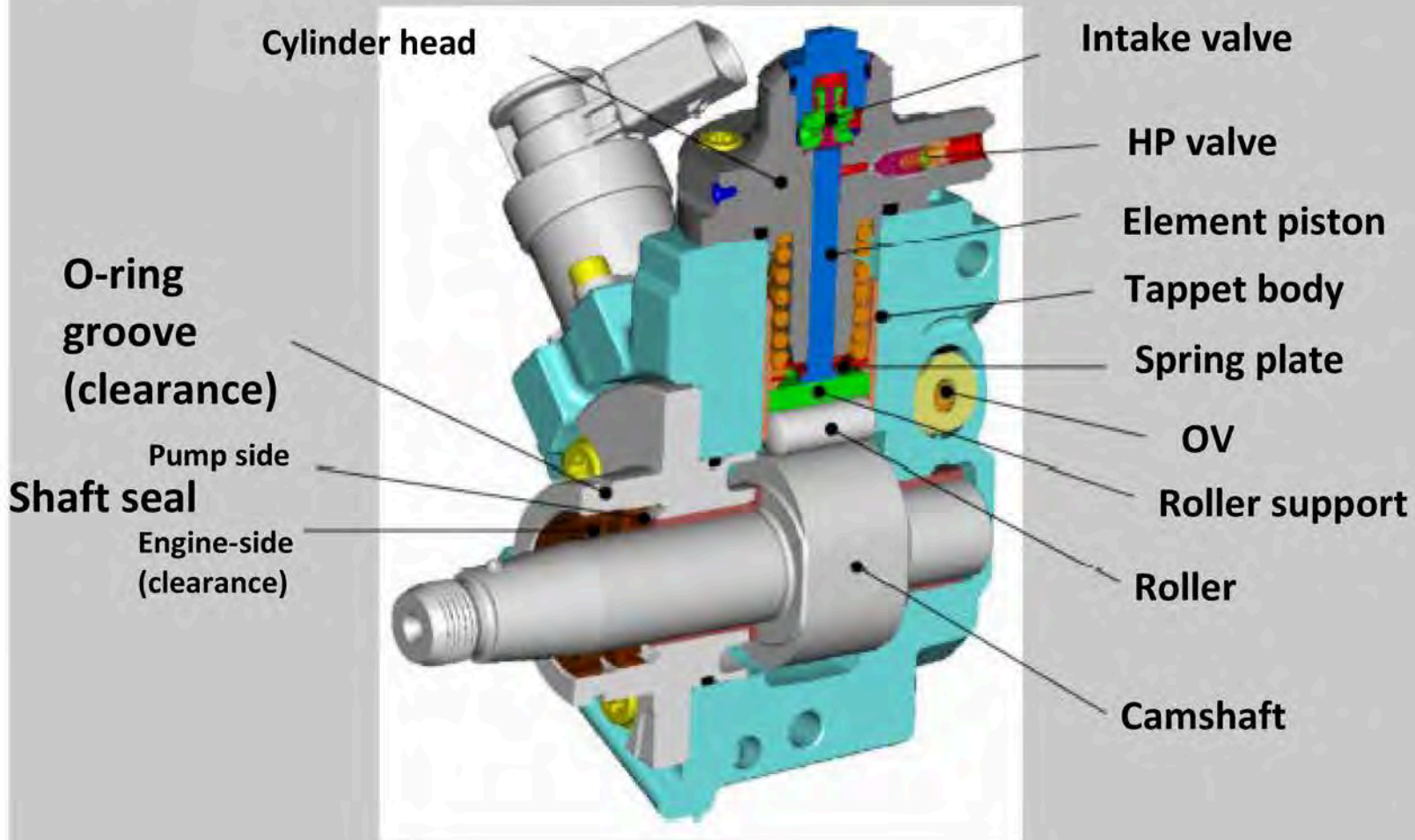
Drivetrain damage high pressure diesel fuel pump CP4

09.29.2010



Drivetrain damage high-pressure diesel fuel pump CP4.2

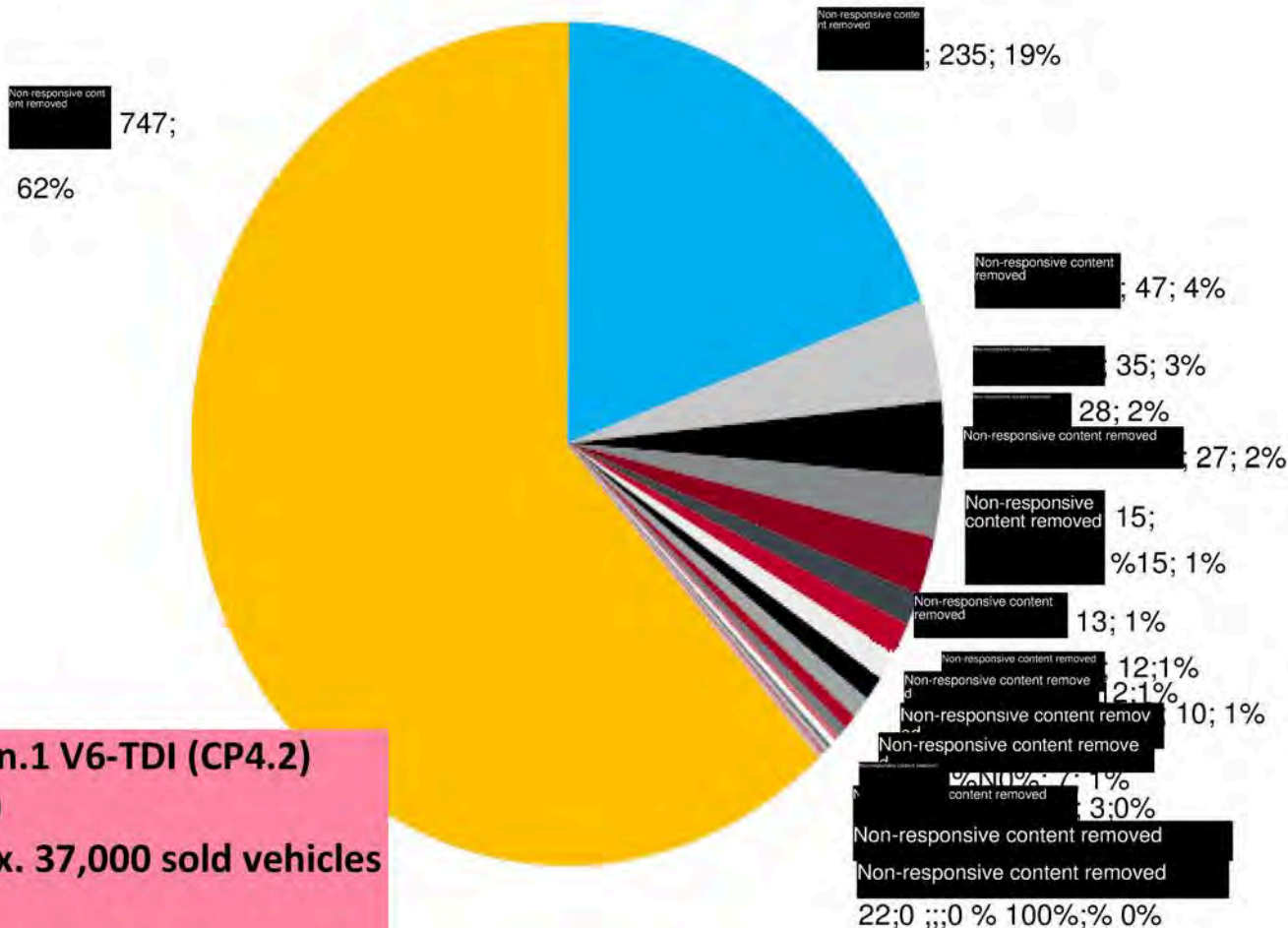
Technical information CP4.1



Drivetrain damage high-pressure diesel fuel pump CP4.2



Drivetrain damage high-pressure diesel fuel pump CP4.2

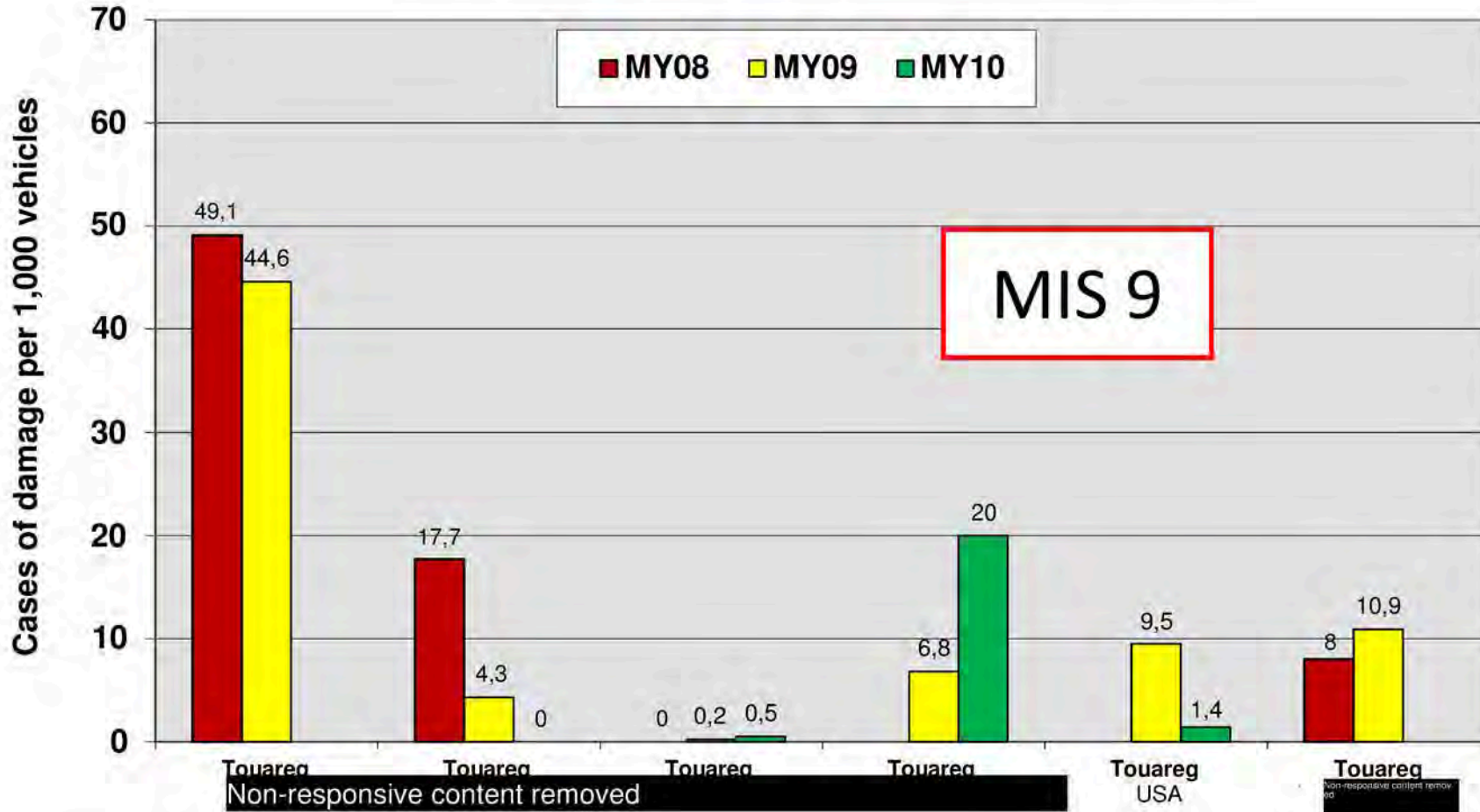


VW Touareg Gen.1 V6-TDI (CP4.2)
MY 2008 – 2010
based on approx. 37,000 sold vehicles

1,210 failures worldwide
(Pump replacement) - AQUA

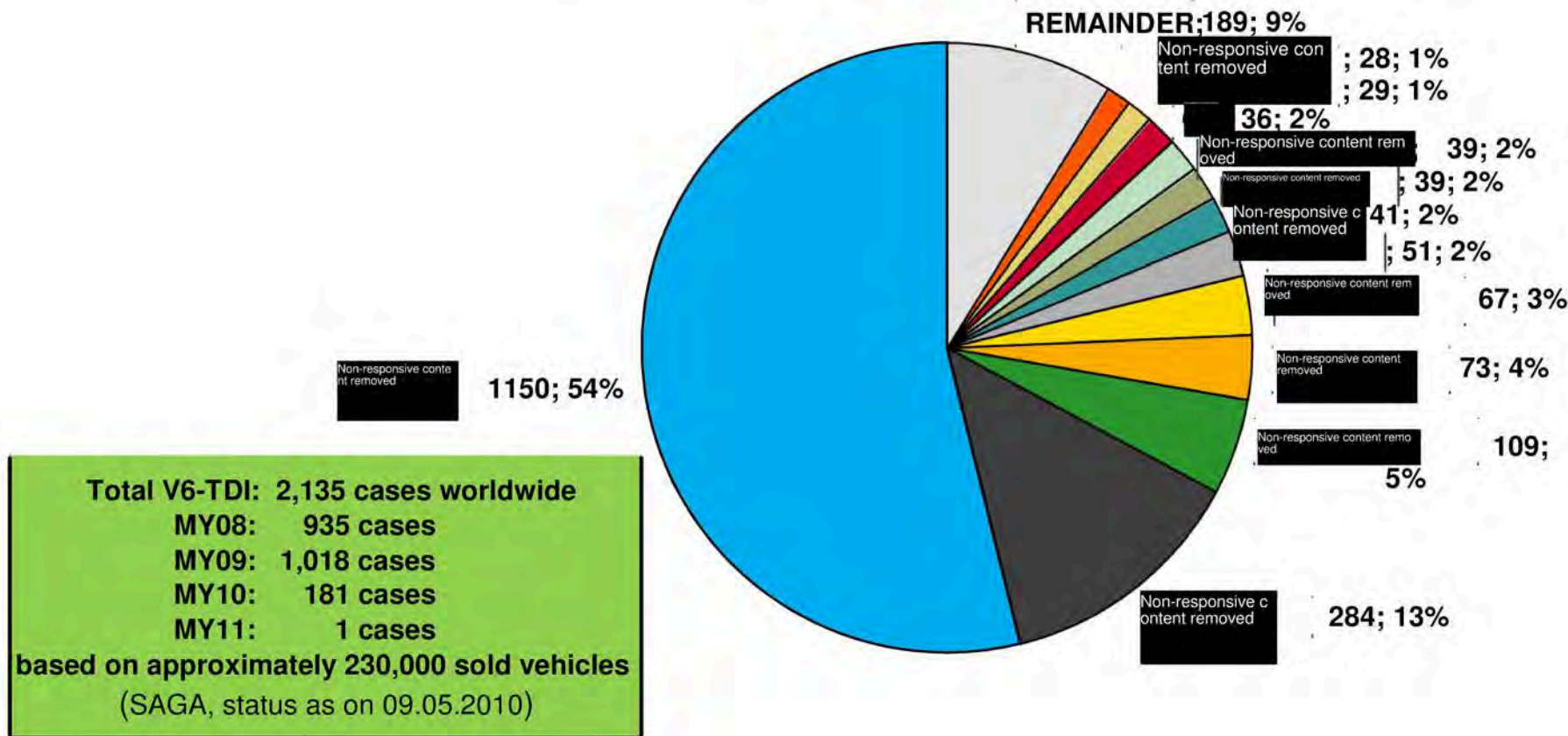
Drivetrain damage high-pressure diesel fuel pump CP4.2

CP4.2 VW Touareg country comparison MIS9



Drivetrain damage high-pressure diesel fuel pump CP4.2

Audi V6-TDI failures in the field, broken down by country (SAGA – replaced pumps only, 059A_/B_)



Drivetrain damage, high pressure diesel fuel pump CP4

AQUA: active quality analysis

Status as on 07/10-09.13.10 5.27PM

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Audi, *, market: AUDI (approved markets)

MY 2008 - 2010, Offset: all (max: 6)

CNR / groups: High-pressure fuel pump

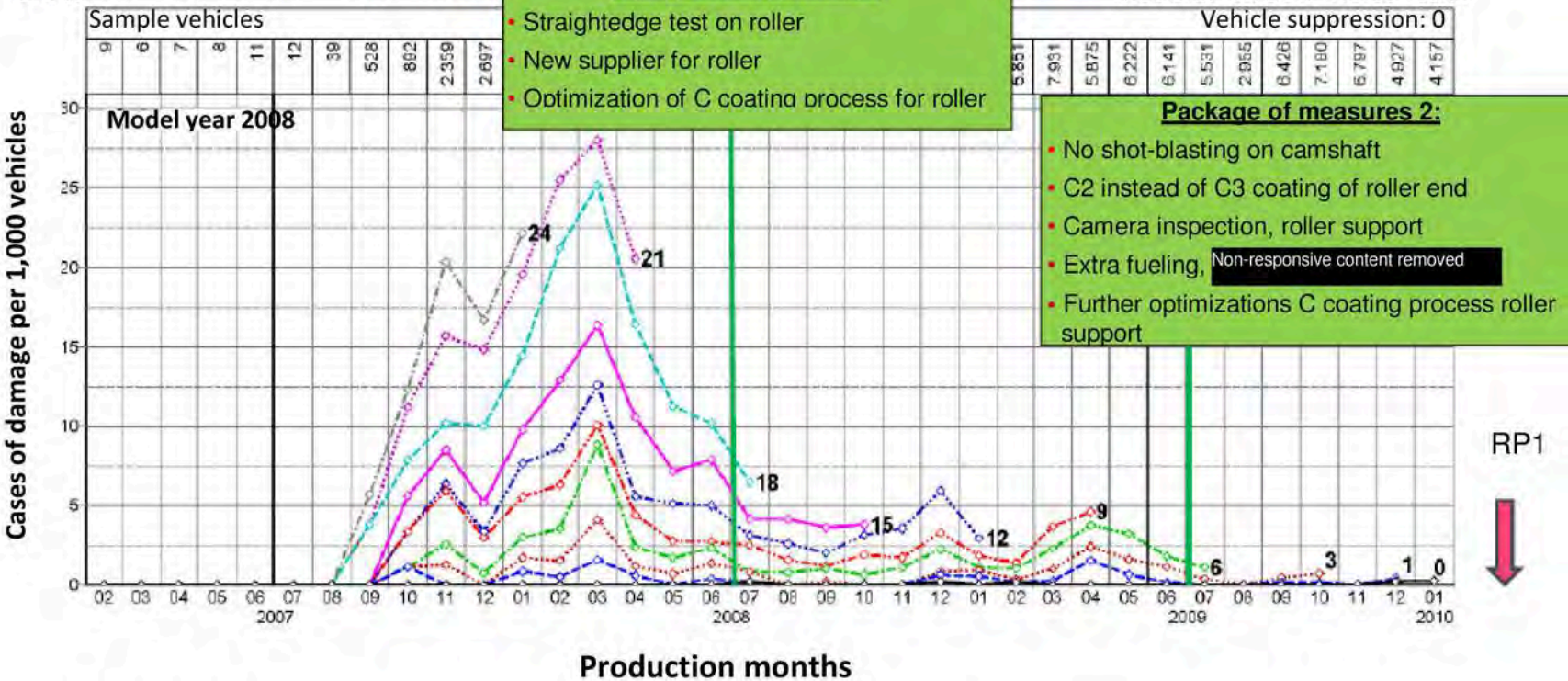
Confidential

Without PR numbers

CNR 2374

CAMA | CAMB | CAMD | CANA | CANB | CANC | CAND | CASA | CASB | CASC | CASD | CATA | CATB | CCLA | CCMA | CCWA | CCWB | CDYA | CDYB | CDYC | CGK

| MY | MIS0 | MIS1 | MIS3 | MIS6 | MIS9 | MIS12 | MIS15 | MIS18 | MIS21 | MIS24 | MY | Replacement | BD SA10 | SA17 | SA20 | SA50 | |
|--------|------|--------|-------|--------|--------|-------|-------|-------|-------|-------|------|-------------|---------|--------|--------|-------|-------|
| 2008 | 0,0 | 0,6 | 1,5 | 3,3 | 5,4 | 7,0 | 10,2 | 15,9 | 20,2 | 23,1 | 2008 | 98,2 % | 66,3 % | 79,2 % | 10,9 % | 1,6 % | 5,6 % |
| 2009 | 0,0 | 0,3 | 0,7 | 1,7 | 2,6 | 4,1 | 5,6 | 7,9 | 12,6 | | 2009 | 96,2 % | 56,0 % | 76,5 % | 15,1 % | 1,4 % | 3,2 % |
| 2010 | 0,0 | 0,2 | 0,7 | 1,4 | 1,6 | | | | | | 2010 | 95,8 % | 47,9 % | 73,9 % | 16,9 % | 4,2 % | 2,8 % |
| Diff % | 0,31 | -53,03 | -8,16 | -15,94 | -36,75 | | | | | | | | | | | | |

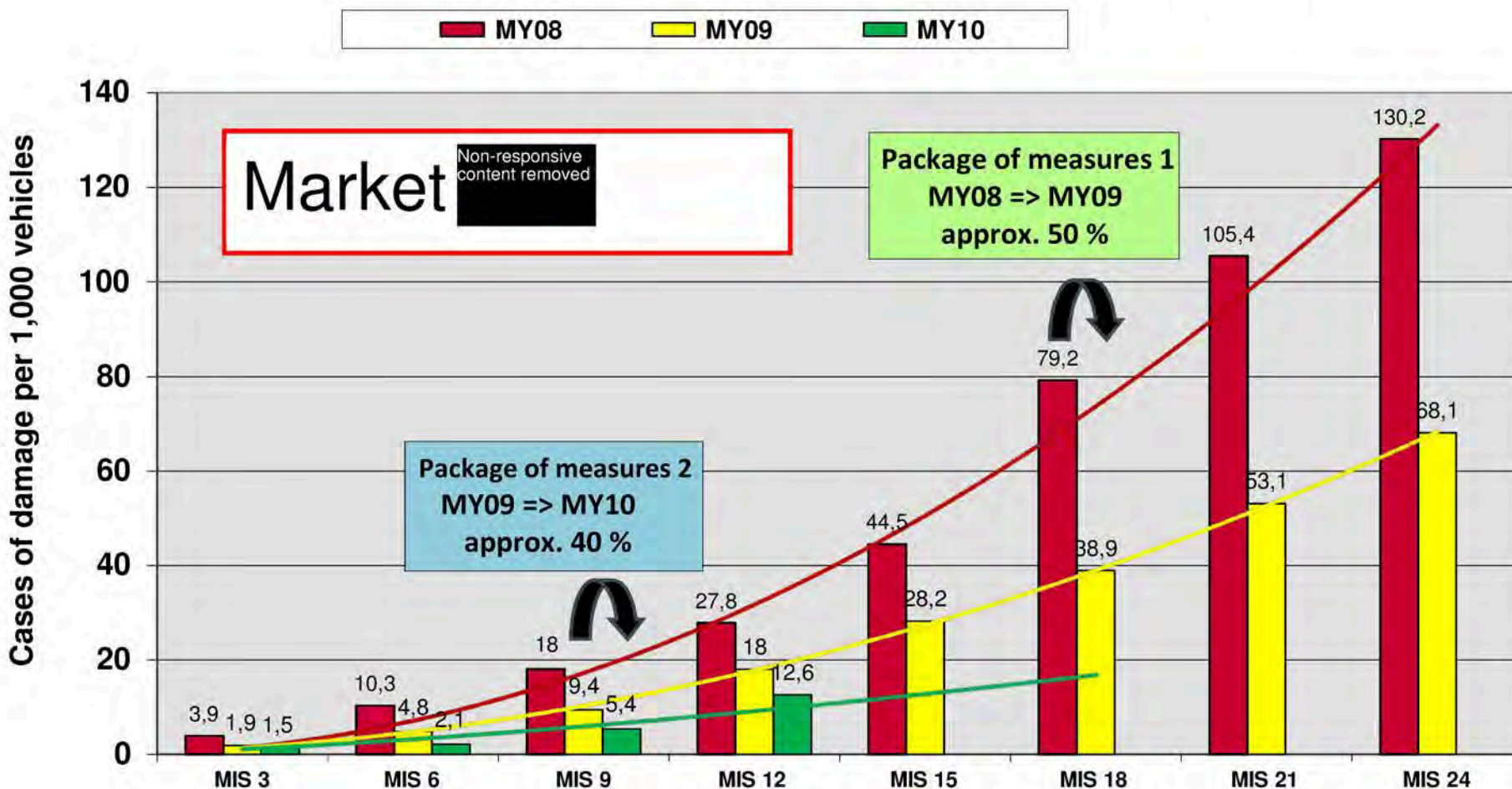


Vehicles: 30,307+95,859+94,361 +19,471=239,998; sold: 30,272+95,618+91,977+12,210=230,077; UP: 21,584+ 69,860+72,772+11,154=175,370 MY:2008+2009= total CP42 A4, A5, Q5, A6,Q7fECL free81

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Drivetrain damage high-pressure diesel fuel pump CP4.2

CP4.2 all Audi V6-TDI - model year comparison by MIS



Drivetrain damage high-pressure diesel fuel pump CP4.2

AQUA: active quality analysis

Status as on 08/10-09.11.10 09.49 AM

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VW, Touareg, market: [REDACTED]

MY 2008 – 2010, Offset: all (Max: 2)

CNR / groups: High-pressure fuel pump

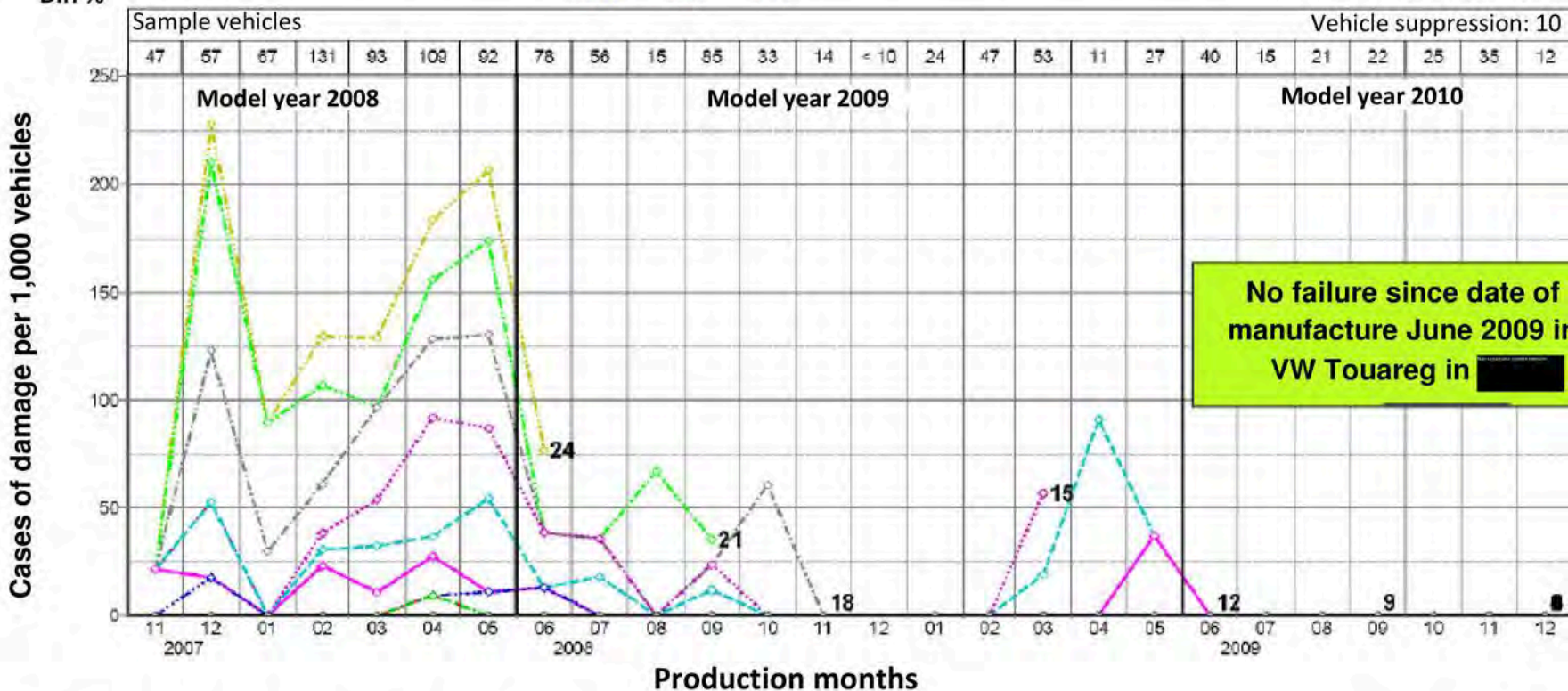
CASA | CASB | CASC | CASD | CATA | CATB | CCMA

Confidential

Without PR numbers

CNR 2374

| MY | MISO | MIS1 | MIS2 | MIS3 | MIS4 | MIS6 | MIS9 | MIS12 | MIS15 | MIS18 | MIS21 | MIS24 | MY | replacement | BD SA10 | SA17 | |
|--------|------|------|------|------|------|---------|---------|-------|-------|-------|-------|-------|------|-------------|---------|--------|---------------|
| 2008 | 0,0 | 0,0 | 0,0 | 1,8 | 1,8 | 5,3 | 17,7 | 33,7 | 55,0 | 92,2 | 125,9 | 148,9 | 2008 | 99,1 % | 52,8 % | 76,9 % | |
| 2009 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 2,1 | 4,3 | 14,9 | 28,4 | 34,6 | 54,9 | 81,6 | 2009 | 100,0 % | 79,3 % | 75,9 % | |
| 2010 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 24,1 | | | | | 2010 | 100,0 % | 33,3 % | 100 % | |
| Diff % | | | | | | -100,00 | -100,00 | 61,79 | | | | | | | | | MEC ERR MAJOR |



Vehicles: 993+916+486=2,395; Sold: 992+916+486=2,394; UP: 564+470+177=1,211; MY: 2008+2009+2010=total

CP42 VW Touareg aMKB [REDACTED] 80

9 Non-responsive content removed

Drivetrain damage high-pressure diesel fuel pump CP4.2

AQUA: active quality analysis

Status as on 08/10-09.11.10 07.08 AM

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Audi, Audi Q7, Market: [REDACTED]

MY 2008 – 2010, Offset: all (Max: 2)

CNR / groups: High-pressure fuel pump

CASA | CASB | CASC | CASD | CATA | CATB | CCMA

Confidential

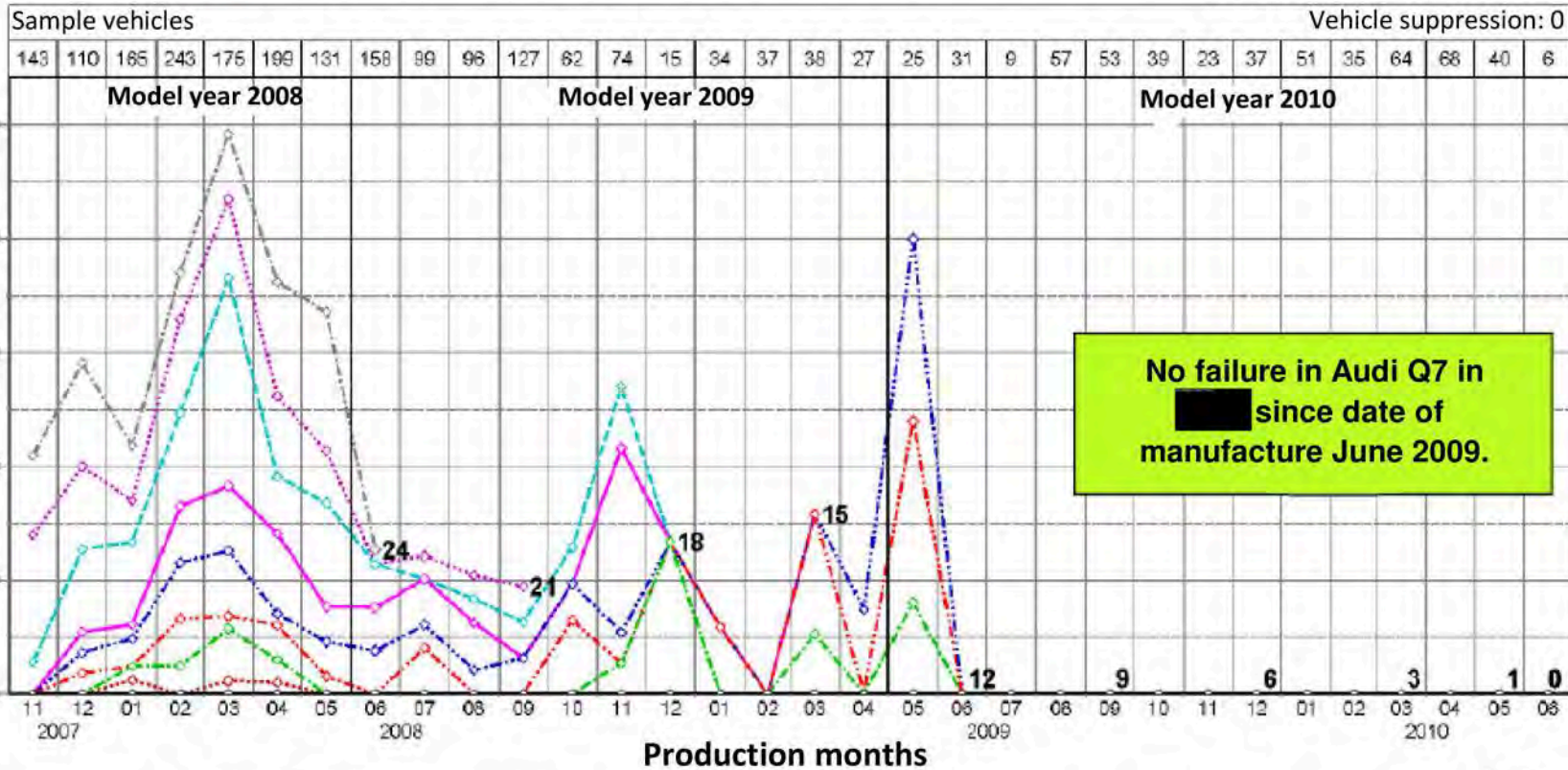
Without PR numbers

CNR 2374

| MY | MIS0 | MIS1 | MIS3 | MIS6 | MIS9 | MIS12 | MIS15 | MIS18 | MIS21 | MIS24 | MY | replacement | BD SA10 | SA17 | SA18 | SA50 | |
|--------|------|------|---------|--------|--------|-------|--------|--------|--------|--------|------|-------------|---------|--------|--------|-------|-------|
| 2008 | 0,0 | 0,0 | 2,6 | 11,4 | 20,2 | 36,1 | 54,4 | 97,4 | 132,5 | 169,3 | 2008 | 100,0 % | 85,5 % | 76,5 % | 14,0 % | 4,5 % | 4,1 % |
| 2009 | 0,0 | 0,0 | 0,0 | 4,9 | 17,2 | 31,9 | 48,5 | 61,2 | 71,2 | 79,1 | 2009 | 98,3 % | 94,8 % | 74,1 % | 24,1 % | 1,7 % | |
| Diff % | | | -100,00 | -56,96 | -14,86 | -9,08 | -10,81 | -37,11 | -46,24 | -53,27 | | | | | | | |

MEC ERR MAJOR MINOR LEAK

Cases of damage per 1,000 vehicles



No failure in Audi Q7 in [REDACTED] since date of manufacture June 2009.

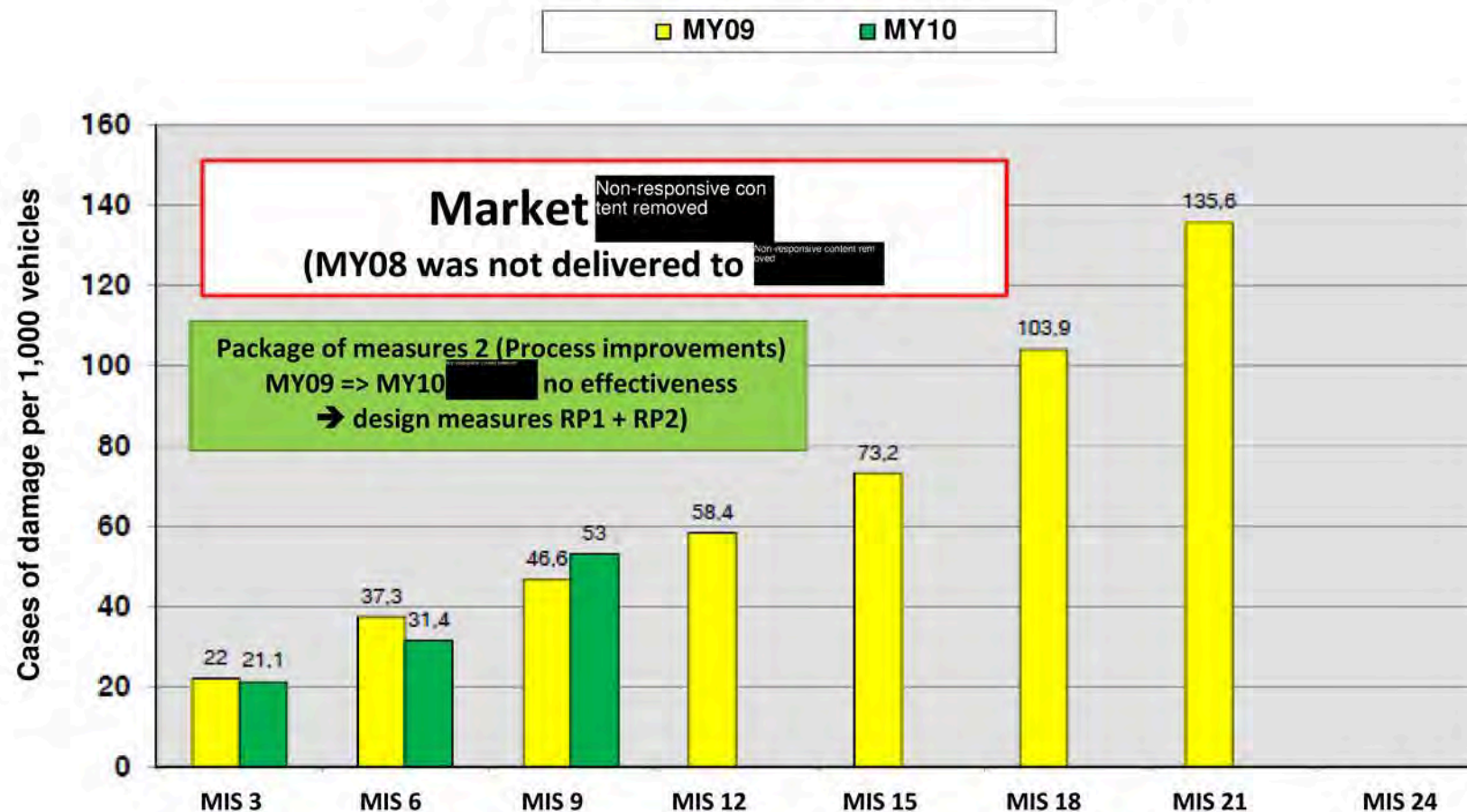
Vehicles: 1.661+1.711+1.031=4,403; sold: 1.660+1.711+988=4,359; UP: 1.140+815=516=2,471; MY: 2008+2009+2010=total

CP4.2 Q7 aMKB V6 [REDACTED] 80

10 Non-responsive content removed

Drivetrain damage high-pressure diesel fuel pump CP4.2

CP4.2 all Audi V6-TDI - model year comparison by MIS



Drivetrain damage high-pressure diesel fuel pump CP4.2

AQUA: active quality analysis

Status as on 08/10-09.11.10 09.54 AM

Source/User Non-responsive content removed

VW, Touareg, market: [REDACTED]

MY 2008 – 2010, Offset: all (Max: 5)

CNR / groups: High-pressure fuel pump

Confidential

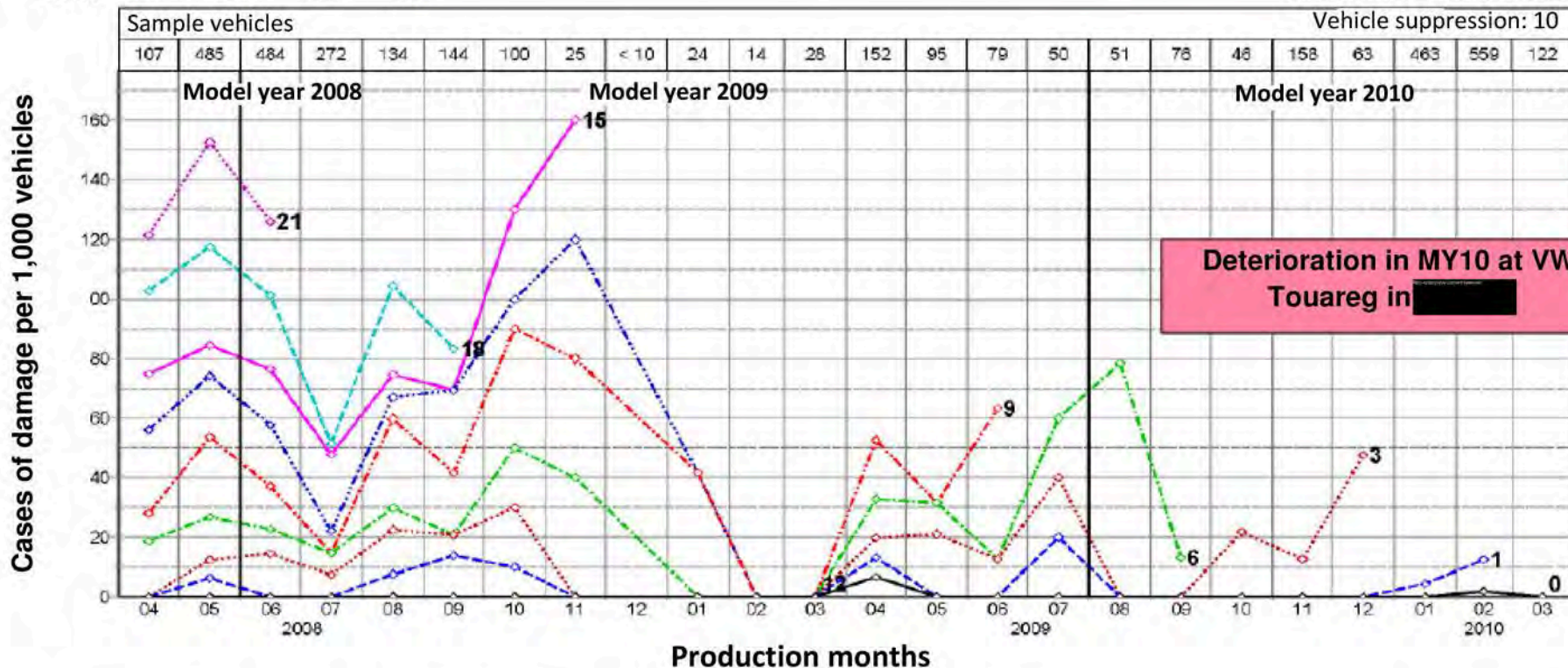
Without PR numbers

CNR 2374

| MY | MIS0 | MIS1 | MIS3 | MIS6 | MIS9 | MIS12 | MIS15 | MIS18 | MIS21 |
|--------|------|------|-------|-------|------|-------|-------|-------|-------|
| 2008 | 0,0 | 0,0 | 2,3 | 23,4 | 49,1 | 70,1 | 79,4 | 119,2 | 154,2 |
| 2009 | 0,6 | 5,8 | 18,0 | 26,8 | 45,5 | 63,8 | 81,6 | 99,6 | 123,8 |
| 2010 | 0,6 | 6,2 | 21,3 | 50,3 | | | | | |
| Diff % | 9,77 | 6,21 | 18,15 | 88,07 | | | | | |

| MY | Replacement | BD SA17 | SA18 | SA50 | SA20 |
|------|-------------|---------|--------|--------|-------|
| 2008 | 97,4 % | 35,1 % | 72,7 % | 15,6 % | 2,6 % |
| 2009 | 99,1 % | 34,1 % | 68,7 % | 10,6 % | 4,1 % |
| 2010 | 100,0 % | 38,5 % | 82,7 % | 13,5 % | 1,9 % |

MAJOR MINOR LEAK NOISE



Vehicles: 1.108+4.245+2.119=7,472; sold: 1.108+4.238+2.074=7,420; UP: 428+1,719+1,588=3,735; MY: 2008+2009+2010=total

CP4.2 VW Touareg aMKB [REDACTED] 80

Drivetrain damage high-pressure diesel fuel pump CP4.2

AQUA: active quality analysis

Status as on 08/10-09.14.10 6:14 PM

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Audi, Audi Q7, Market: [REDACTED]

MY 2008 – 2010, Offset: all (Max: 4)

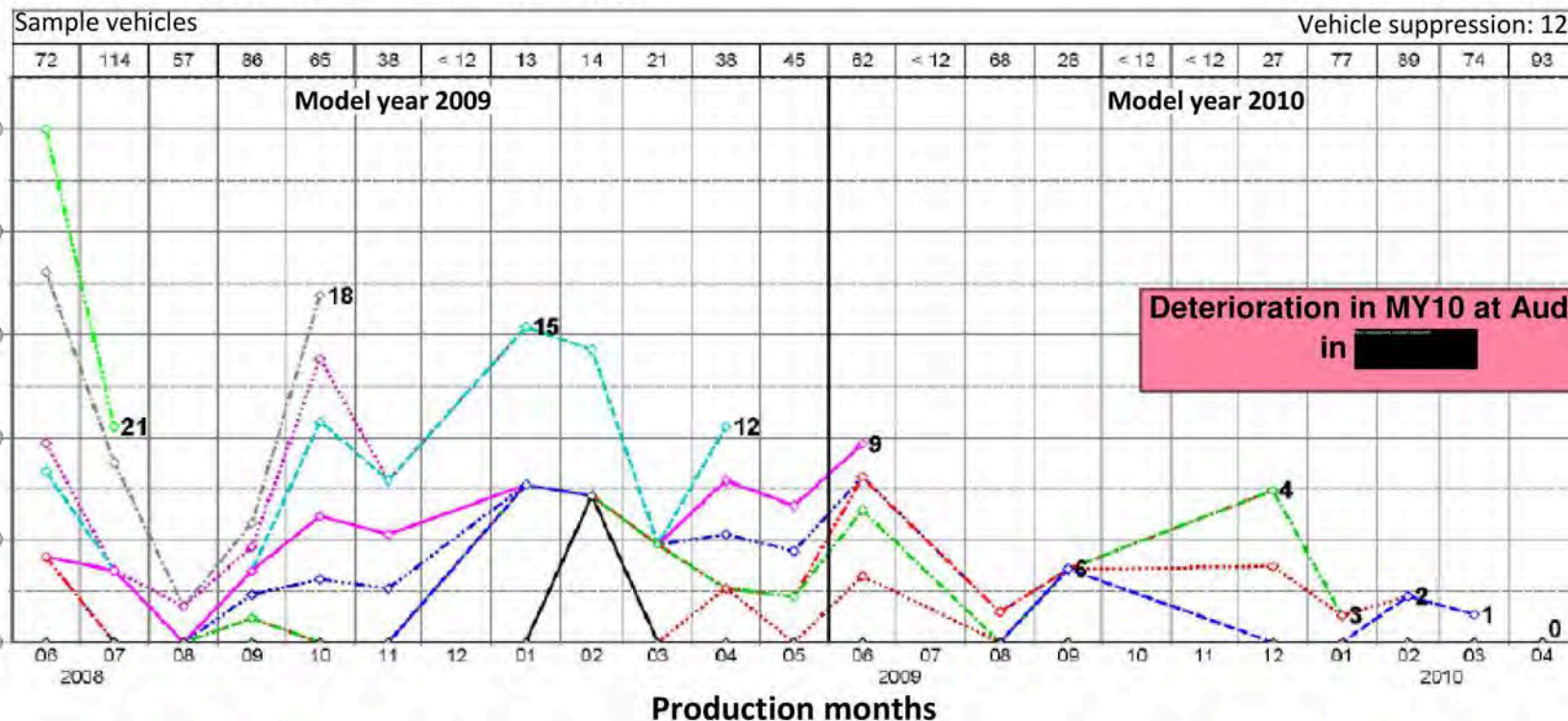
CNR / groups: High-pressure fuel pump
CASA|CASB|CASC|CASD|CATA|CATB|CCMA

Confidential
Without PR numbers
CNR 2374

| MY | MIS0 | MIS1 | MIS2 | MIS3 | MIS4 | MIS6 | MIS9 | MIS12 | MIS15 | MIS18 | MIS21 | MY | Replacement | BD SA10 | SA17 | SA50 | | |
|--------|---------|--------|--------|--------|--------|--------|--------|-------|-------|-------|-------|------|-------------|---------|--------|--------|-------|--|
| 2009 | 1,8 | 3,6 | 5,3 | 10,7 | 16,0 | 26,7 | 44,5 | 65,8 | 80,5 | 117,2 | 153,5 | 2009 | 87,5 % | 22,5 % | 52,5 % | 31,3 % | 6,3 % | |
| 2010 | 0,0 | 8,9 | 19,5 | 30,0 | 39,5 | 56,3 | 96,3 | | | | | 2010 | 100,0 % | 44,0 % | 60 % | 32 % | 4 % | |
| Diff % | -100,00 | 149,78 | 265,81 | 180,81 | 146,68 | 111,06 | 116,50 | | | | | | | | | | | |

MEC ERR MAJOR LEAK

Cases of damage per 1,000 vehicles



Deterioration in MY10 at Audi Q7 in [REDACTED]

Vehicles: 1,191+941=2,132; Sold: 1,190+923=2,113; UP: 562+642=1,204; MY: 2009+2010=total

CP42 Q7 aMKB V6 [REDACTED] 80

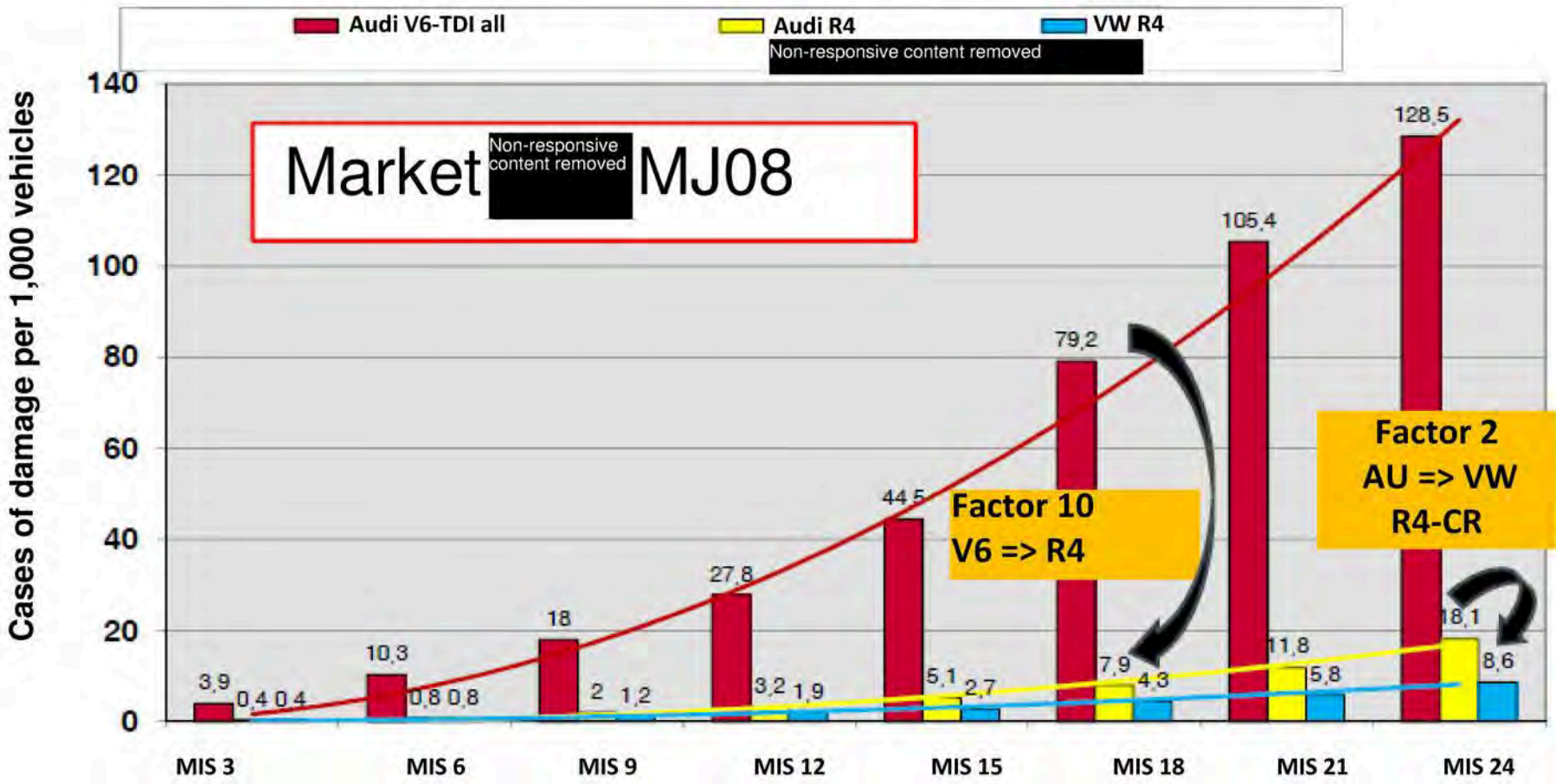
13 Non-responsive content removed

Drivetrain damage high-pressure diesel fuel pump CP4.2

Backup

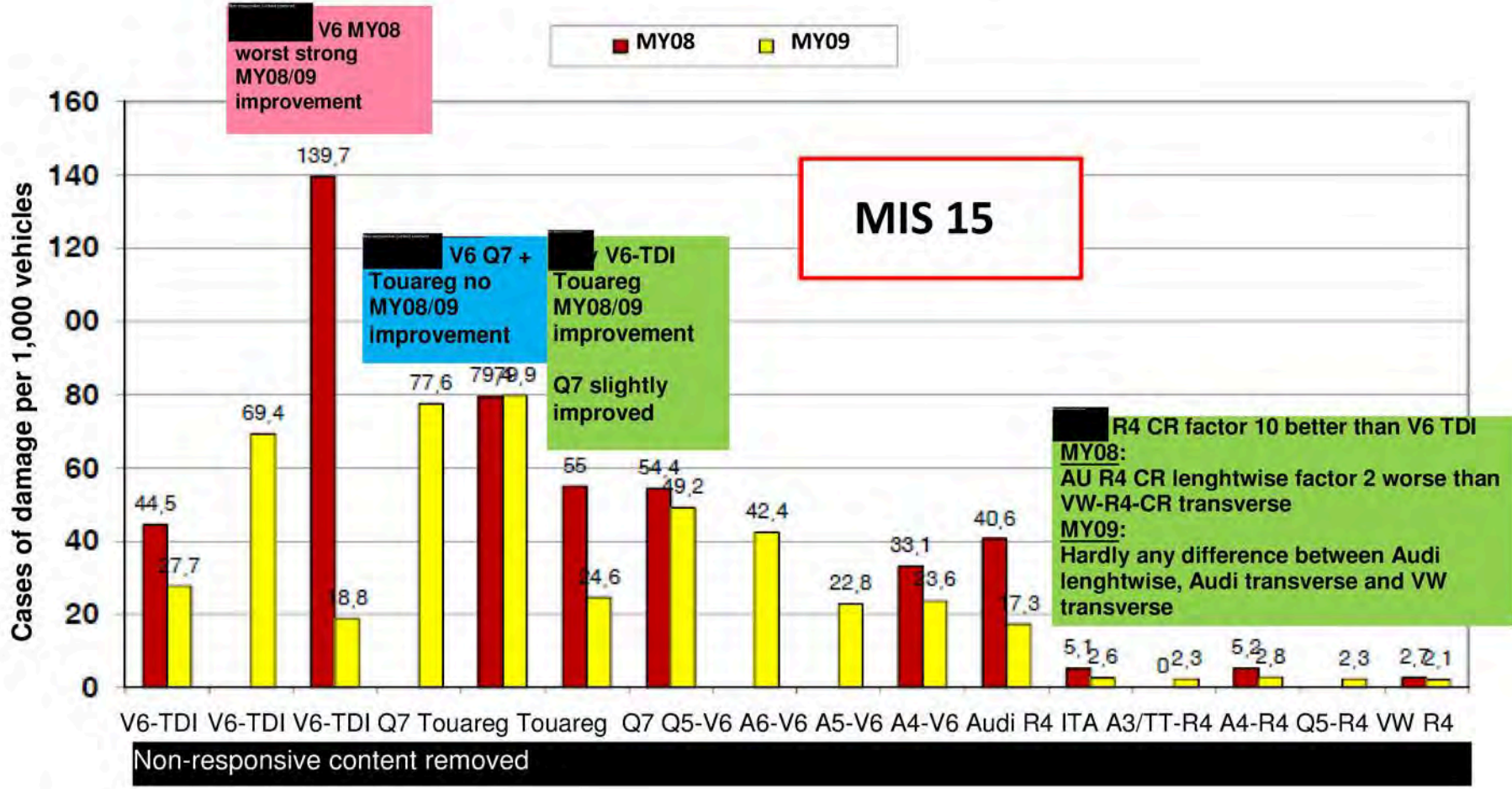
Drivetrain damage high-pressure diesel fuel pump CP4.2

Comparison between CP4.2 / CP4.1 - V6-/R4-TDI - Audi/VW by MIS



Drivetrain damage high-pressure diesel fuel pump CP4.2

CP4.2 + CP4.1 - Type / model year comparison MIS15



16 Non-responsive content removed

From: Non-responsive content removed
To: [Redacted]
CC: [Redacted]
Date: 09.29.2010 09:46:00 AM
Subject: Re: Touareg gewechselte CP4.2 freie Märkte KDNR_VW.xls
Attachments: [Pkt. 70 Hochdruckpumpe Feldsituation 7 9 2010.pdf](#)

From: Non-responsive content removed
Sent: Wednesday, September 29, 2010 09:36 AM

Non-responsive content removed
[Redacted]

Subject: Re: Touareg gewechselte CP4.2 freie Märkte KDNR_VW.xls

Hello [Redacted]

Figures are probably from the AUDI presentation for the [Redacted] on 09.21.2010.

[Redacted] was included via VICO.

Document cannot be delivered because your mailbox size limit has been exceeded

We started with the following field situation:

Some other people may also juggle with figures here. However, this is beyond my knowledge.

With best regards

Non-responsive content removed
[Redacted]

From: Non-responsive content removed
Sent: Wednesday, September 29, 2010 08:49 AM

Non-responsive content removed
[Redacted]

Subject: Re: Touareg gewechselte CP4.2 freie Märkte KDNR_VW.xls

Hello [Non-responsive content removed]

[Non-responsive content removed] has called [Non-responsive content removed] from Bosch and mentioned the figures:

3,600 failures
25% Failure rate

Are they from you? If not, where else would they come from?

We want to clarify this a bit more for the [Non-responsive content removed] this evening, and to [Non-responsive content removed]

Tomorrow, [Non-responsive content removed] will meet [Non-responsive content removed] in [Non-responsive content removed]

With best regards

[Non-responsive content removed]

Sitz/Domicile: Ingolstadt

Registergericht/Court of Registry: Local District Court Ingolstadt

HRB Nr./Commercial Register No.: 1

Vorsitzender des Aufsichtsrats/Chairman of the Supervisory Board: Martin Winterkorn

Vorstand/Board of Management: Rupert Stadler (Vorsitzender/Chairman), Ulf Berkenhagen, Michael Dick, Frank Dreves, Peter Schwarzenbauer, Axel Strotbek, Werner Widuckel

Wichtiger Hinweis: Die vorgenannten Angaben werden jeder E-Mail automatisch hinzugefügt und lassen keine Rückschlüsse auf den Rechtscharakter der E-Mail zu.

Important Notice: The above information is automatically added to this e-mail. This addition does not constitute a representation that the content of this e-mail is legally relevant and/or is intended to be legally binding upon AUDI AG.

From: [Non-responsive content removed]

Sent: Wednesday, September 29, 2010 08:25 AM

[Non-responsive content removed]

Subject: ANS: Touareg gewechselte CP4.2 freie Märkte KDNR_VW.xls

Hello [Non-responsive content removed]

Alright. Macht Non-responsive content removed

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From: Non-responsive content removed

Sent: Tuesday, September 28, 2010 07:03 PM

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Subject: Touareg gewechselte CP4.2 freie Märkte KDNR_VW.xls

< File: Touareg gewechselte CP4.2 freie Märkte KDNR_VW.xls >>

Hello Non-responsive content removed

Attached is the AQUA evaluation of Touareg generation. 1 by CNR, only parts replacement (believe me, almost no defect coding), sorted by importers and dealers.

As discussed, please assign the dealer number of Non-responsive content removed on a map, preferably graphic with dots per case.

Folder 1 is edited.

Folder 2 are raw data from AQUA.

Folder 3 country totals by MY

Thank you.

Best wishes

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Diesel high pressure pump

State of damage field

GP replacement Part number

Data source AQUA Status August 2010 Group worldwide



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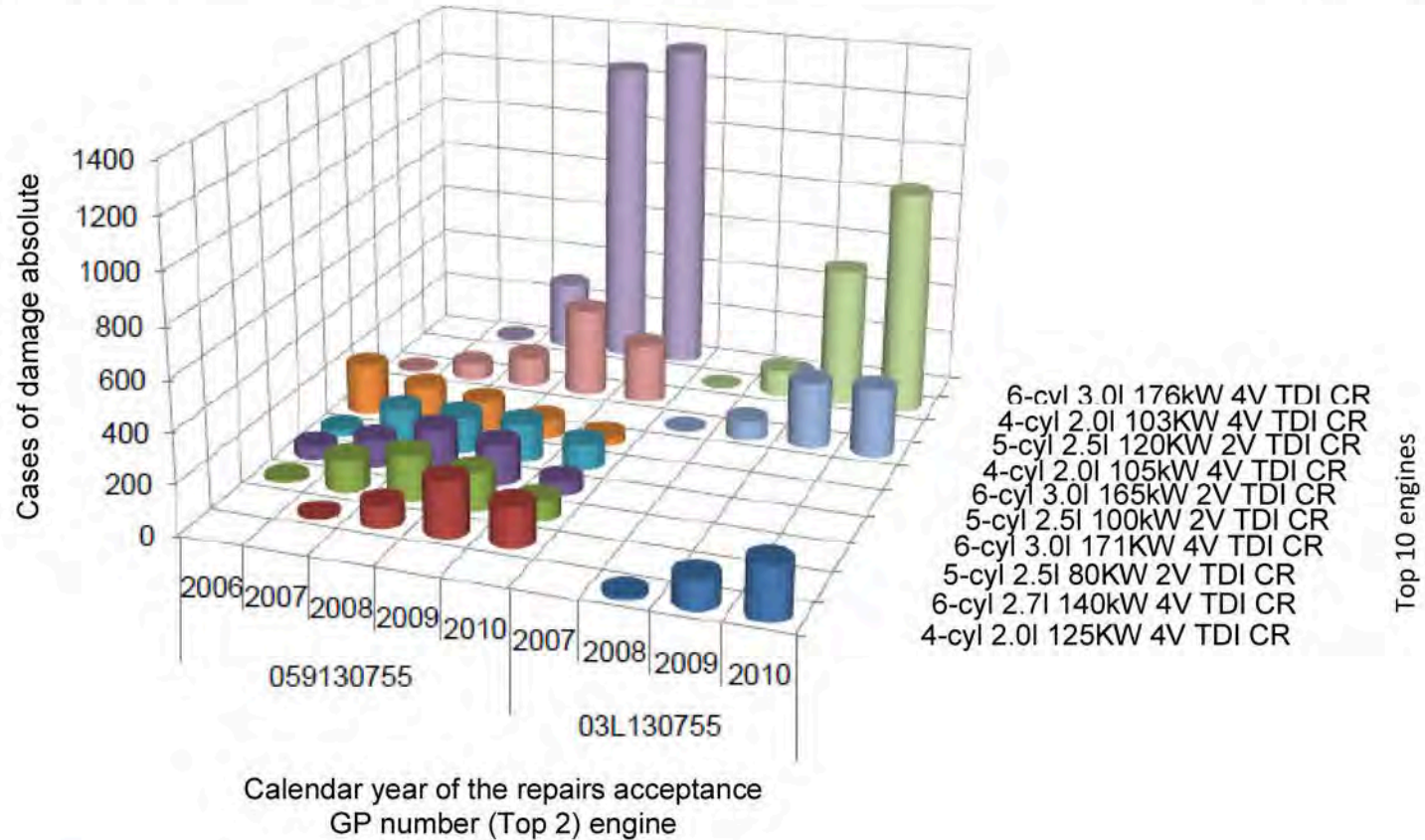
9/7/2010



Development of the high-pressure fuel pump cases of damage / diesel engines

Group worldwide Top 10 engines

GP replacement



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9/7/2010

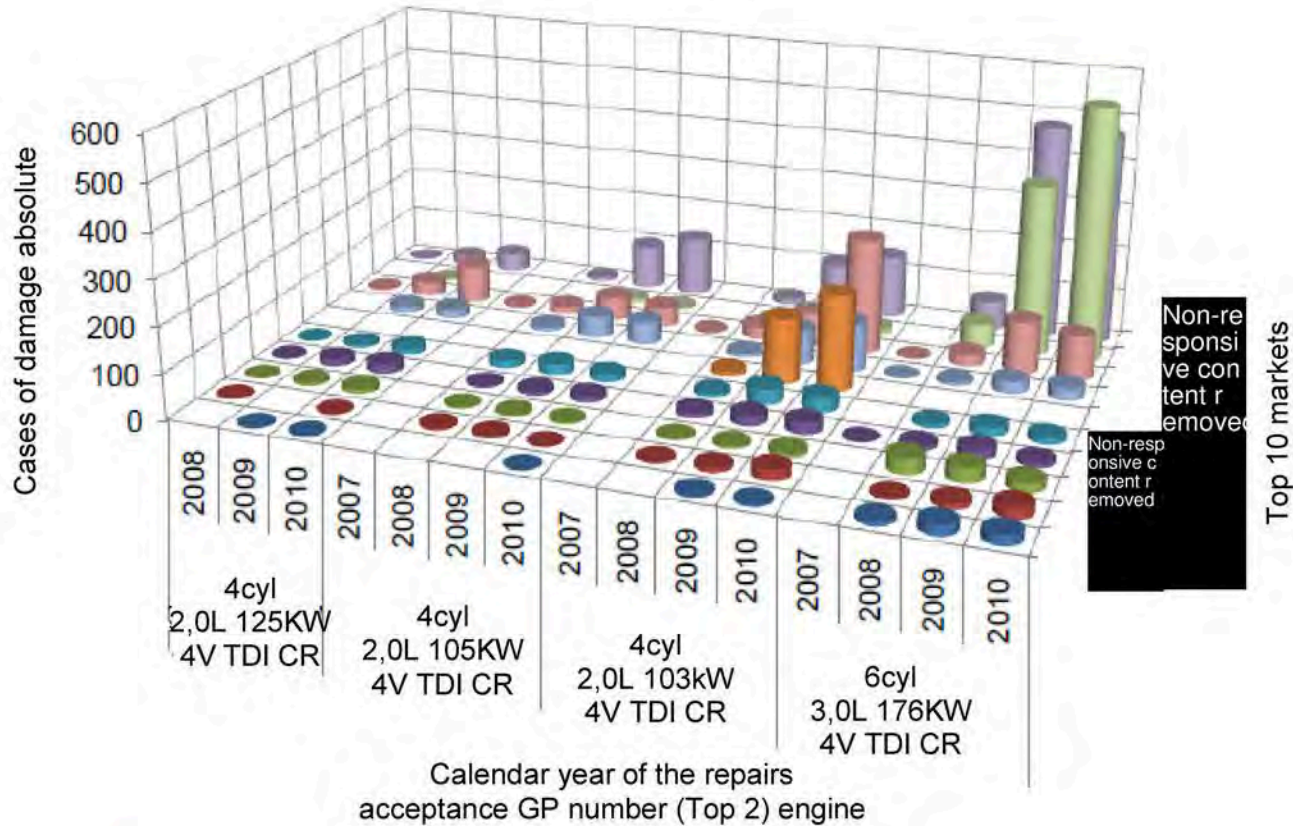
Page 2



Development of the high-pressure fuel pump cases of damage / diesel engines

Group worldwide Top 10 engines selection

GP replacement



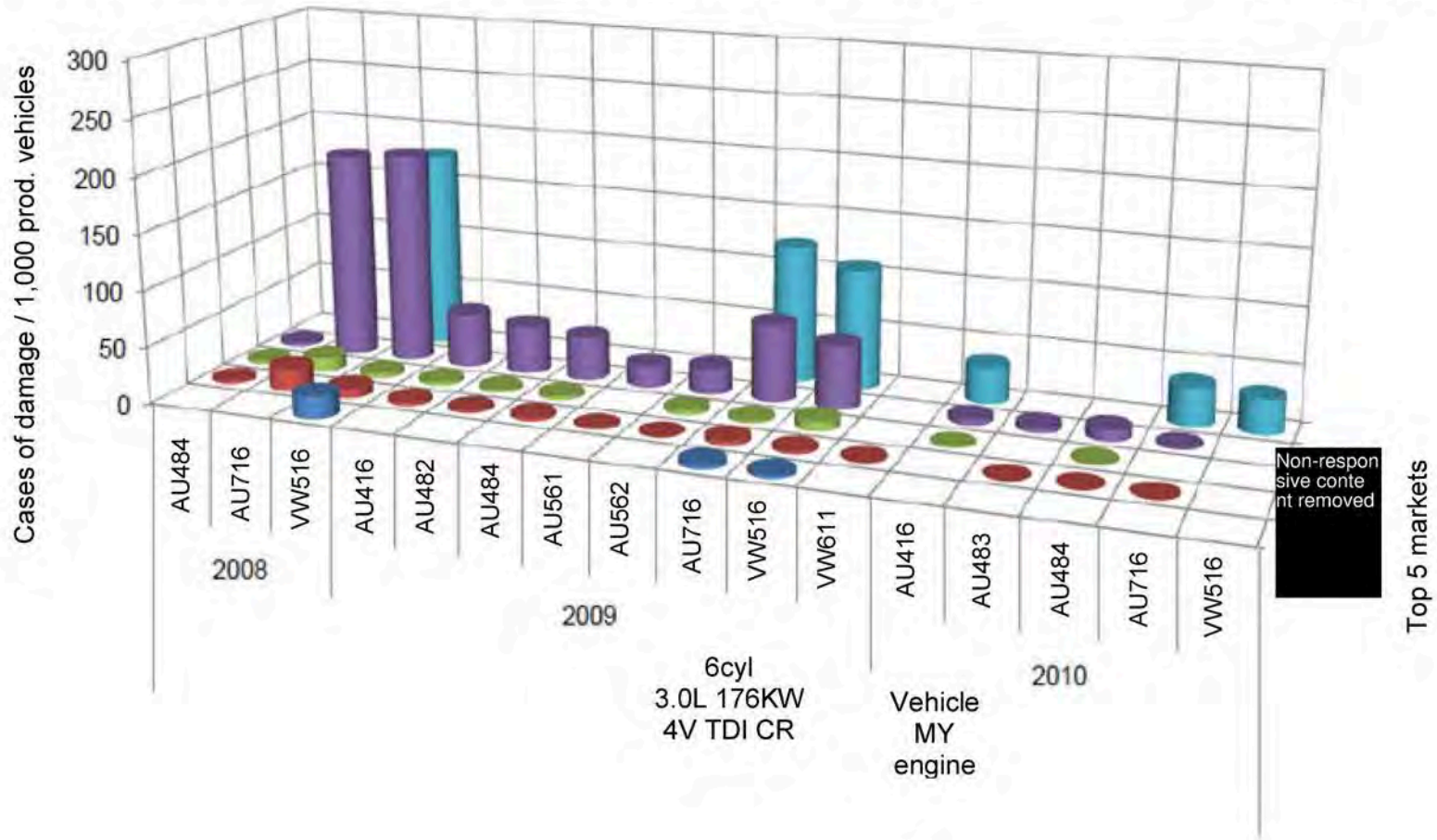
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9/7/2010



High-pressure fuel pump
Group worldwide Top 5 markets 6-cylinder 176kW

Cases of damage MY
GP replacement



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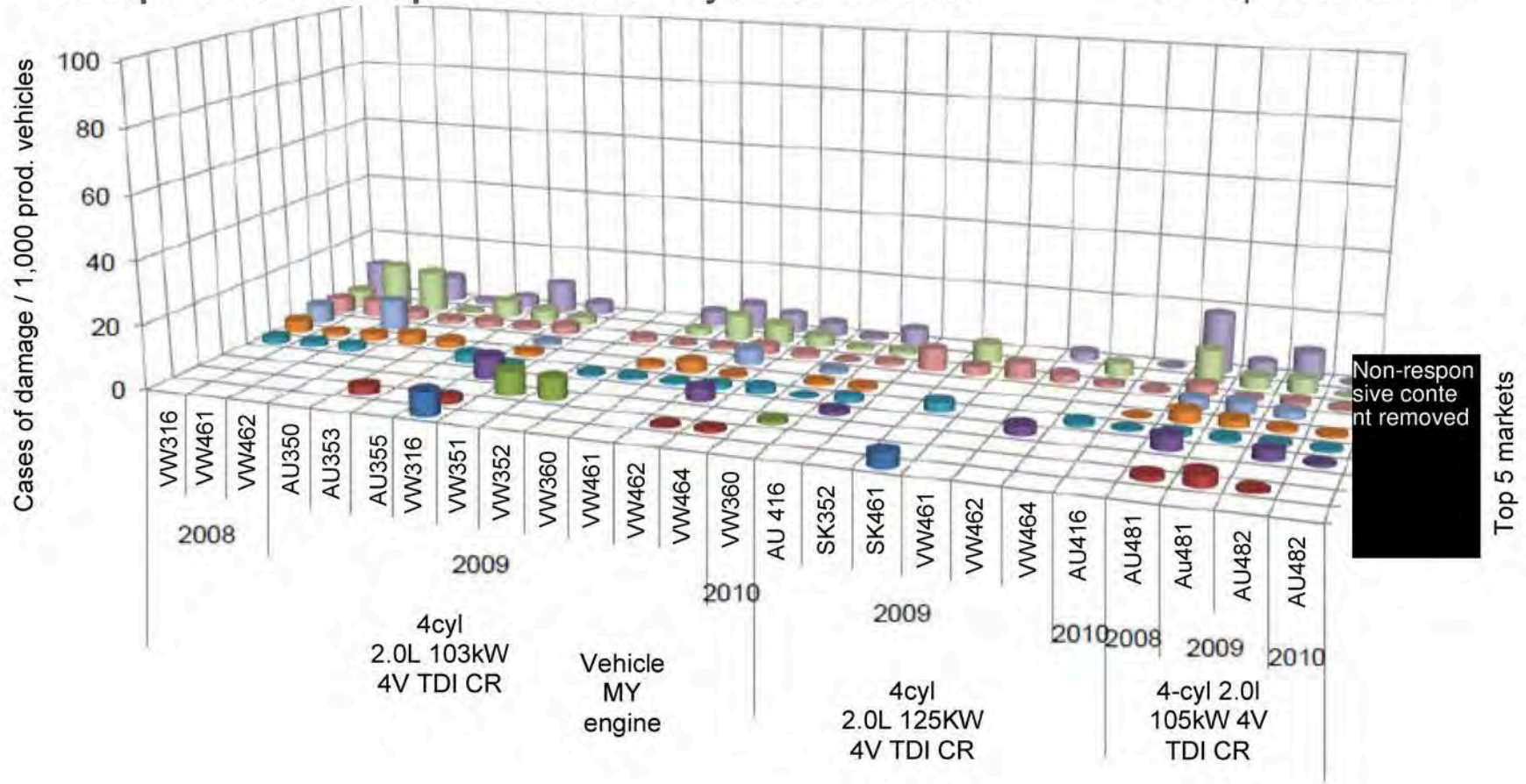
9/7/2010

Page 4



High-pressure fuel pump Group worldwide Top 10 markets 4cylinder Selection

Cases of damage MY GP replacement



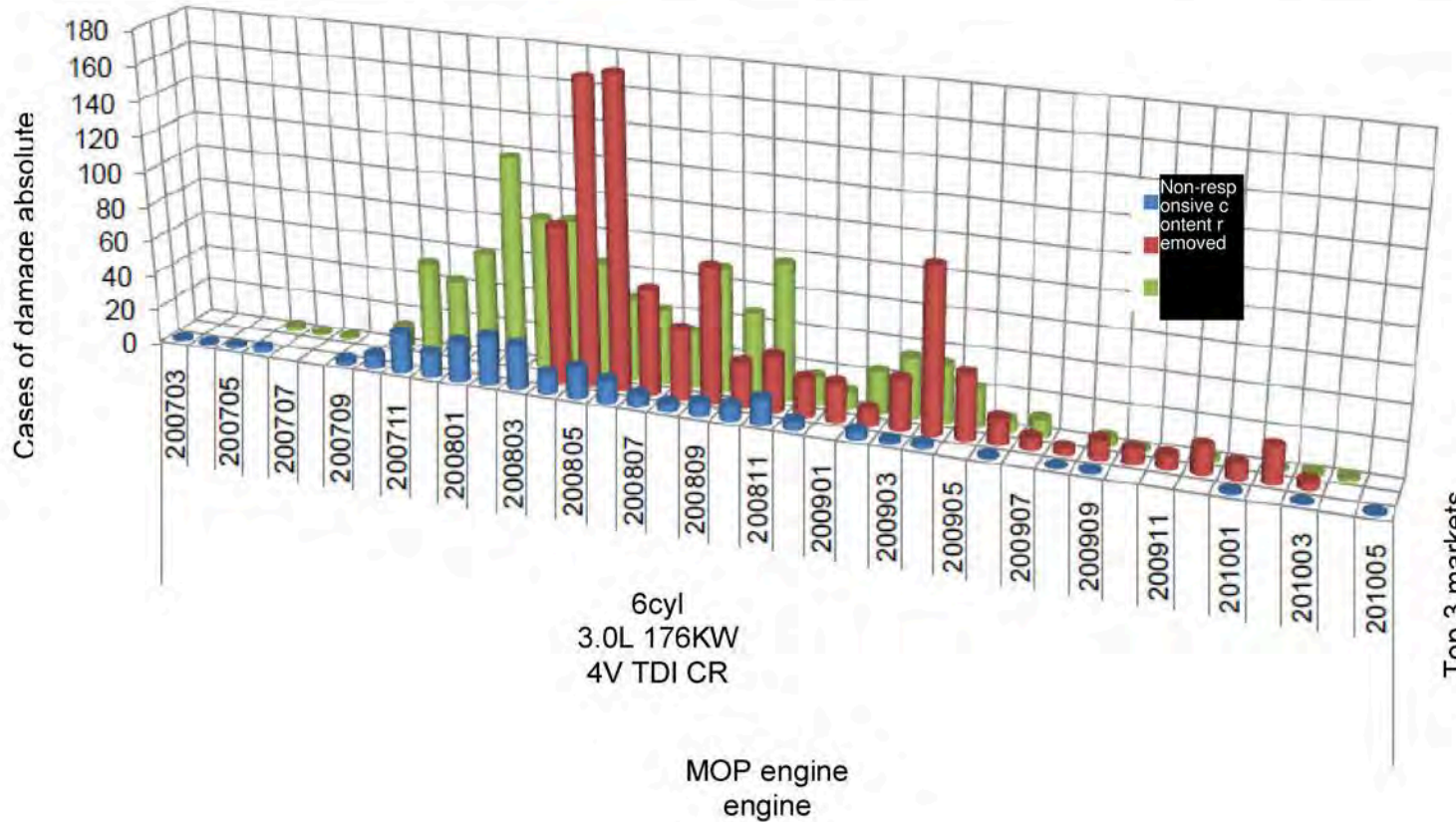
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High-pressure fuel pump Top 3 VW markets

6cylinder

Cases of damage MOP engine GP replacement



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9/7/2010



High-pressure fuel pump VW Market

AQUA: Active quality analysis
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6cylinder

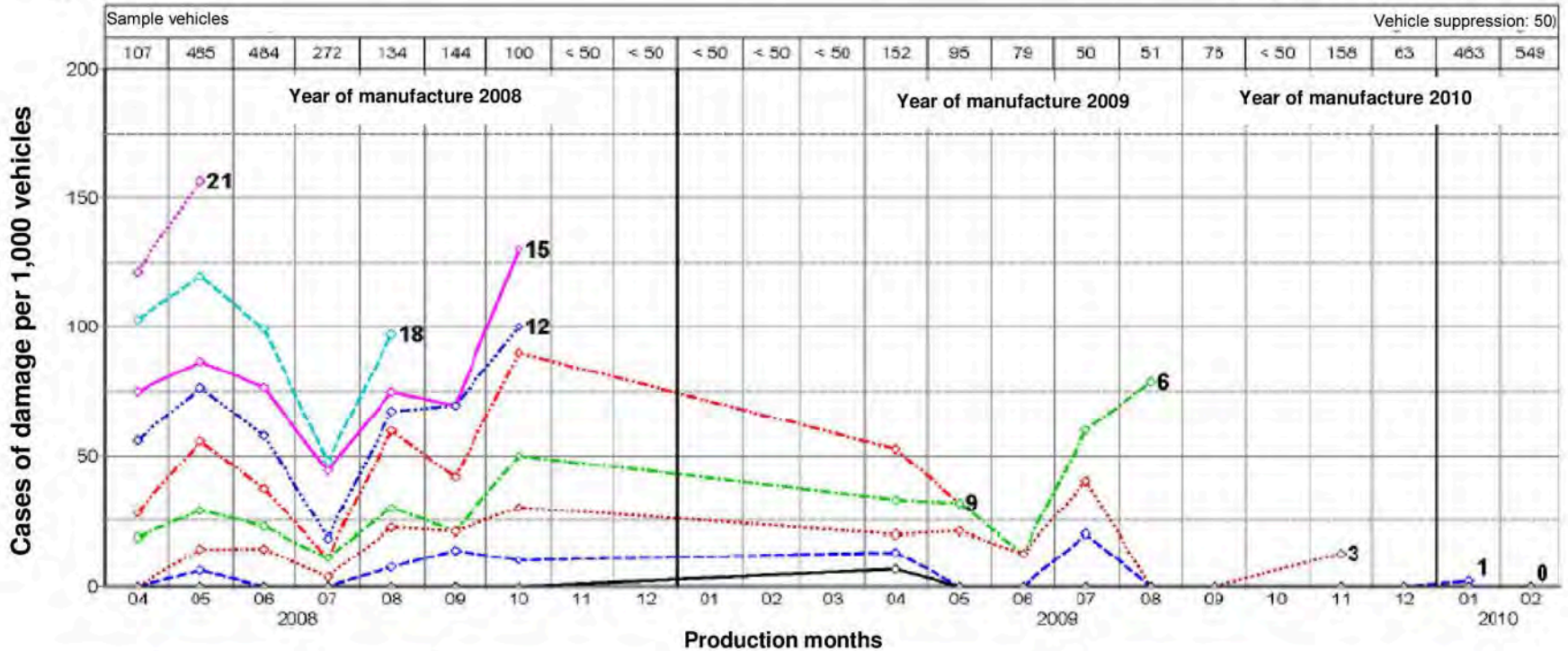
VW, VW516, market:
 HY 2007 – 2010, Offset: all (max: 5)
 Part number: 059130755%
 176 kW turbodiesel CR 6-cylinder 4 valves 3.0l

Cases of damage MOP MIS GP replacement

Confidential
 Without PR numbers
 Part number 059130755%%

| HY | MIS0 | MIS1 | MIS3 | MIS6 | MIS9 | MIS12 | MIS15 | MIS18 | MIS21 | HY | Replacement | BD | SA 17 | SA 18 | SA10 | SA50 |
|-------|---------|--------|------|------|------|-------|-------|-------|-------|------|-------------|-------|-------|-------|-------|------|
| 2008 | 0.0 | 4.0 | 13.7 | 24.5 | 43.3 | 61.5 | 77.5 | 98.6 | 124.9 | 2008 | 100.0% | 31.7% | 66.5% | 11.7% | 14.3% | 4.8% |
| 2009 | 1.2 | 3.6 | 14.7 | 31.3 | 50.1 | 59.3 | | | | 2009 | 100.0% | 50.0% | 80% | 14% | 6% | |
| 2010 | 0.0 | 2.2 | | | | | | | | 2010 | 100.0% | 40.0% | 93.3% | 6.7% | | |
| Diff% | -100.00 | -39.81 | | | | | | | | | | | | | | |

MAJ OR MINOR MEC ERR LEAK



Vehicles: 4,221+1,984+1,357=7,472; sold: 4,221+1,836+1,264=7,348; UP: 1,755+836+1,130=3,721; HY 2008+2009+2010 = Total

HP fuel pump MOPMIS



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9/7/2010

Page 7



High-pressure fuel pump

VW Market

AQUA: Active quality analysis
 Status as on 07/10-09/08/10 5:31 PM
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6cylinder

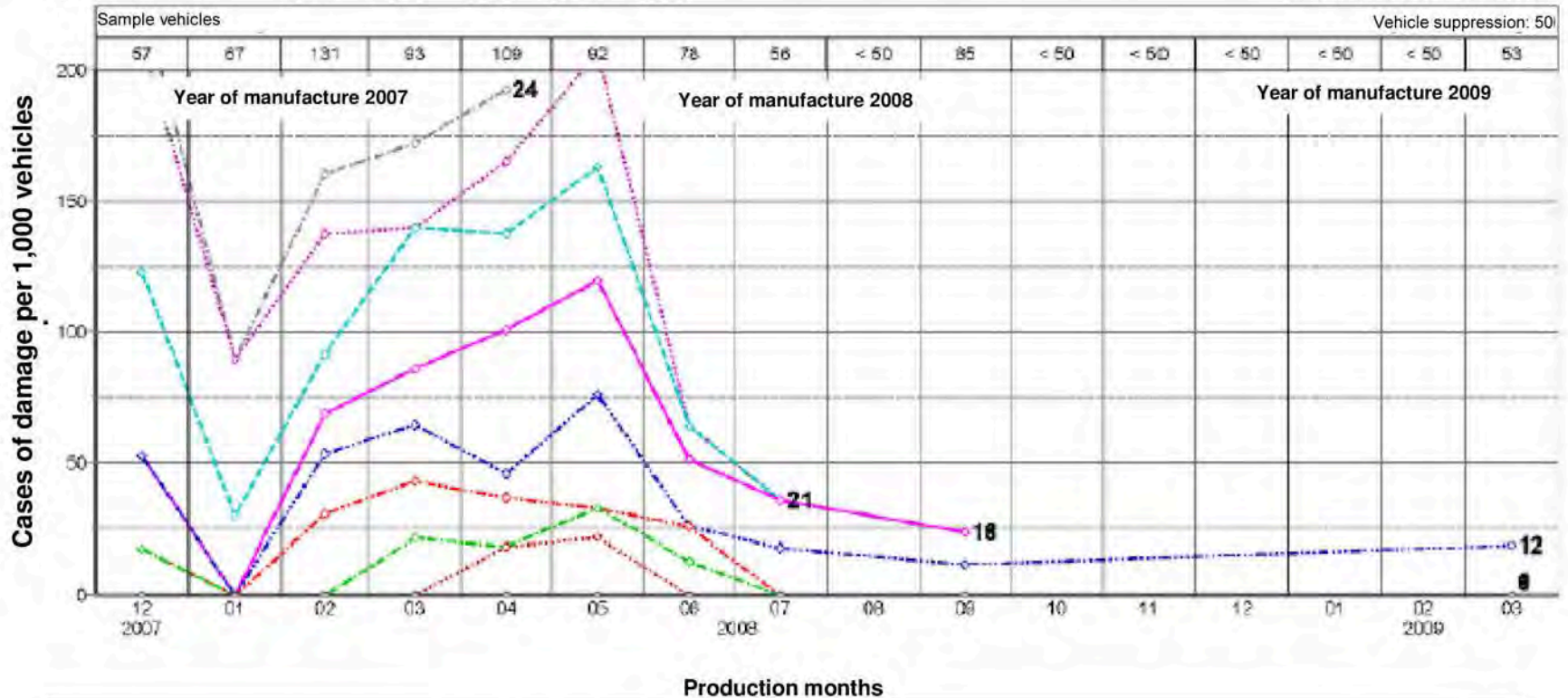
VW, VW516, market: [redacted]
 HY 2007 – 2010, Offset: all (max: 3)
 Part number: 059130755%
 176 kW turbodiesel CR 6-cylinder 4 valves 3.0l

Cases of damage MOP MIS

GP replacement

Confidential
 Without PR numbers
 Part number 059130755%%

| HY | MIS0 | MIS1 | MIS3 | MIS6 | MIS9 | MIS12 | MIS15 | MIS18 | MIS21 | MIS24 | HY | Replacement | BD | SA 10 | SA 17 | SA50 | SA15 | |
|-------|------|------|--------|---------|--------|--------|--------|-------|-------|-------|------|-------------|-------|-------|-------|------|------|--------------------------|
| 2007 | 0.0 | 0.0 | 0.0 | 9.6 | 19.2 | 38.5 | 38.5 | 76.9 | 125.0 | 134.6 | 2007 | 100.0% | 40.0% | 60% | 35% | 5% | | |
| 2008 | 0.0 | 0.0 | 5.2 | 10.3 | 21.9 | 37.4 | 60.6 | 87.9 | 112.9 | 136.0 | 2008 | 97.4% | 57.3% | 70.9% | 14.5% | 3.4% | 8.5% | |
| 2009 | 0.0 | 0.0 | 0.0 | 0.0 | 3.8 | 18.7 | 26.7 | | | | 2009 | 100.0% | 75.0% | 87.5% | 12.5% | | | |
| Diff% | | | -100.0 | -100.00 | -82.47 | -50.13 | -55.93 | | | | | | | | | | | MEC ERR MAJOR LEAK CRACK |



Vehicles: 218+1,460+717=2,395; sold: 218+1,459+712=2,389; UP: 104+775+332=1,211; HY 2007+2008+2009 = Total

HP fuel pump MOPMIS



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9/7/2010

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Quality report high-pressure fuel pump 3+4 Cyl. CR

August 2010



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09.28.2010

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Page 1



C.C.:

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Page 2



Structure of the report

1. TOP points of the months for the high-pressure fuel pump
2. Situation in the **engine business field**
 - 2.1 Non-responsive content removed (hall complaints / CP 7)
 - 2.2 Non-responsive content removed (hall complaints / CP7)
 - 2.3 Non-responsive content removed (hall complaints / CP7)
3. Field situation in **Europe**
 - 3.1 TOP 5 Cases of damage
4. Field situation **worldwide**
5. Current **repair solutions**
6. Current status of HPP **projects**
7. Development **W&G costs** for high-pressure fuel pumps June 2010



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09.28.2010

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Page 3



1. TOP points of the month regarding the CR high-pressure fuel pump

- Shaft seal (SS) has cracked in the 2.0l Bosch CR high-pressure fuel pumps (HPPs). This led to fuel leakage on the camshaft. Cause. 6 equipment troubles because of exceeding the temperature in the manufacturing process of the PTFE blank / green part (07.02 - 07.19.2010) at the supplier Bruss. [Hall complaint]
- Drivetrain damage 2.0l Bosch CR HPP CP4.1 US07 (USA market). Poor quality fuels lead to formation of deposits on the roller support or camshaft, which also lead to mixed friction and thus, to drivetrain damage. [Field complaint]



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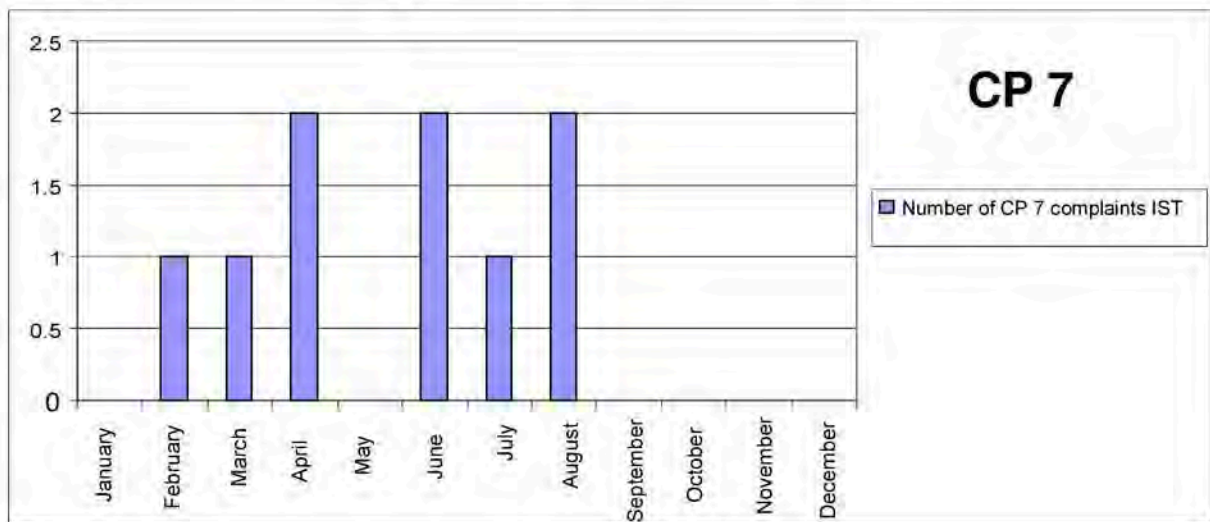
09.28.2010

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Page 4



2.1 Non-responsive content removed Motor (hall complaints / CP 7)



CP 7 complaints

New faults in August: 2

Engine doesn't start up – under analysis
Bosch

Shaft seal leaking
Bosch

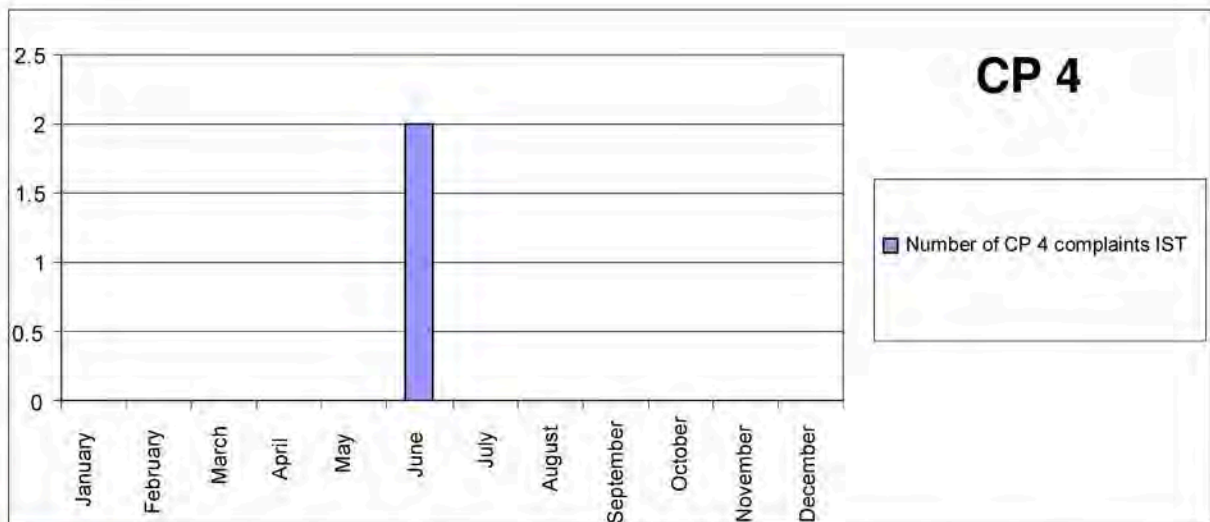
Hall up to CP4

New faults in June: 2

Thread NOK

Design cap missing

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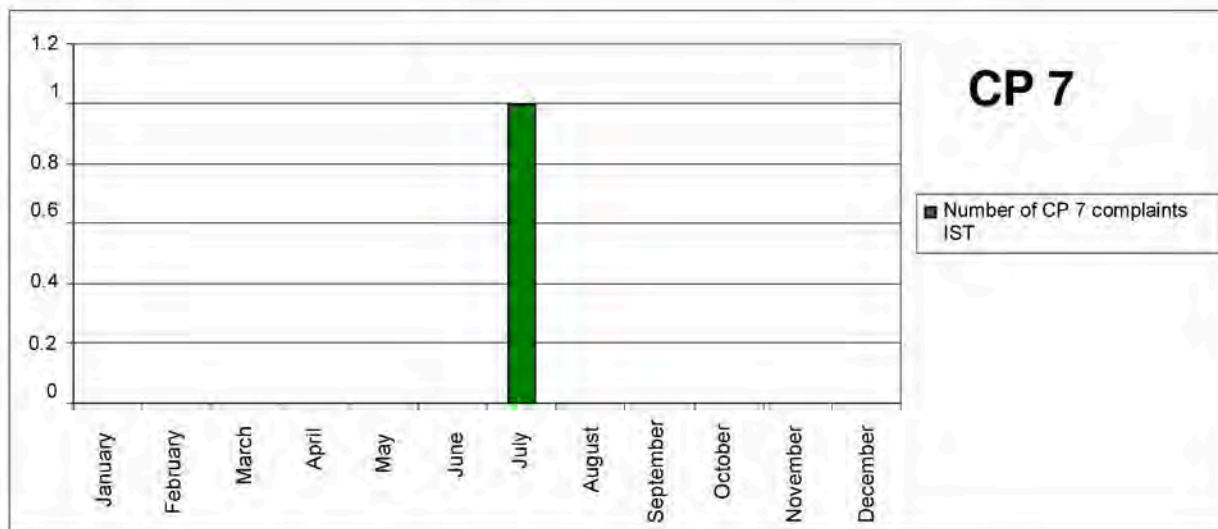
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2.2 Non-responsive content removed Motor (hall complaints / CP 7)



CP 7 complaints

New faults in July: 1

Particles – Cause unclear

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Hall up to CP4

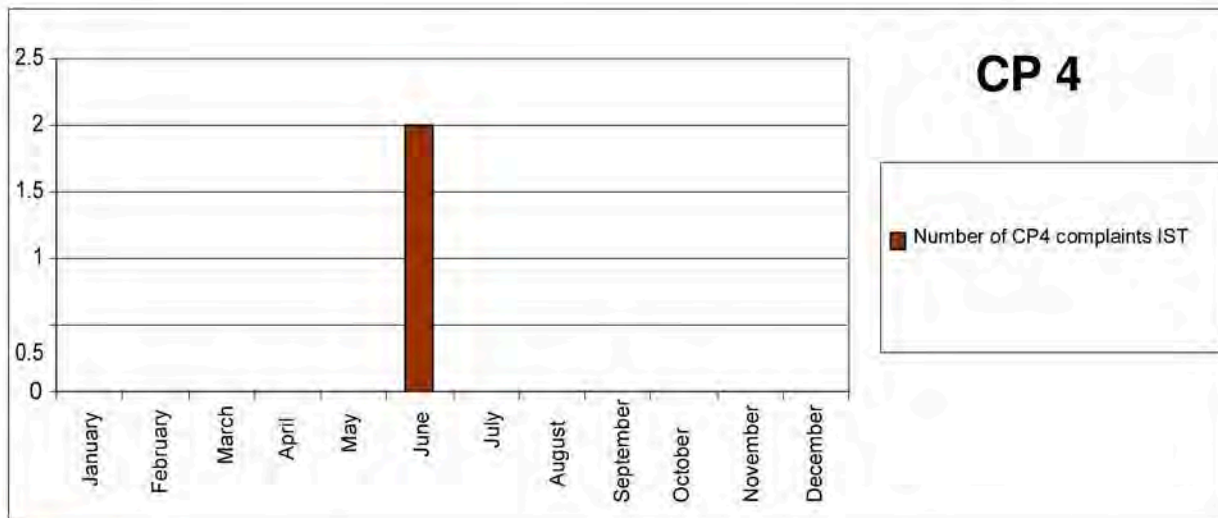
New faults in August: 2

Leaking – seal is missing

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Leaking – shaft seal wrapped around

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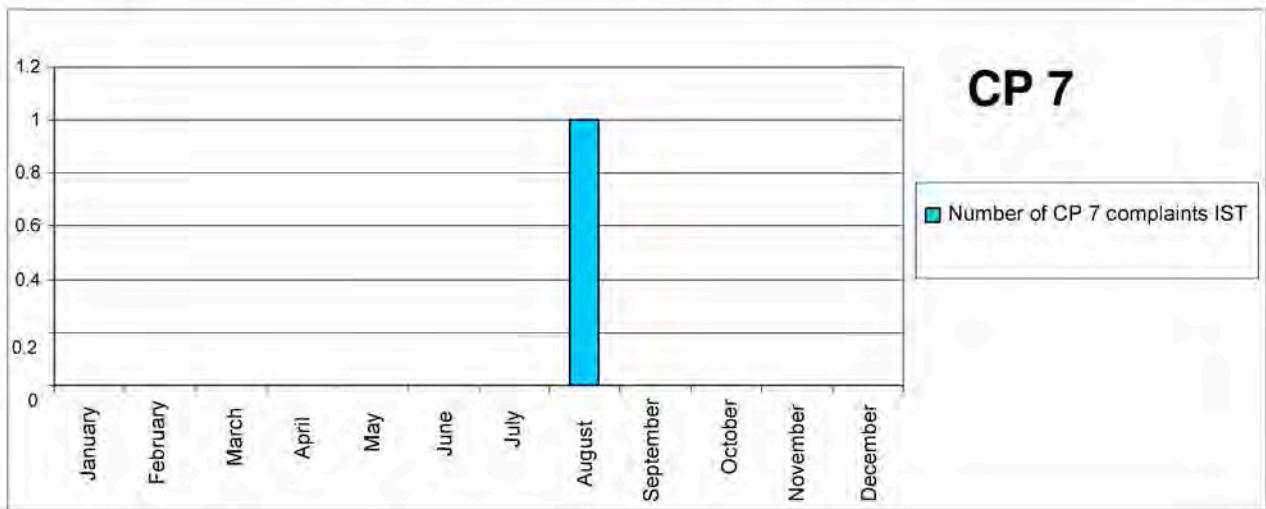
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2.3

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Motor (hall complaints / CP 7) installation only for US07

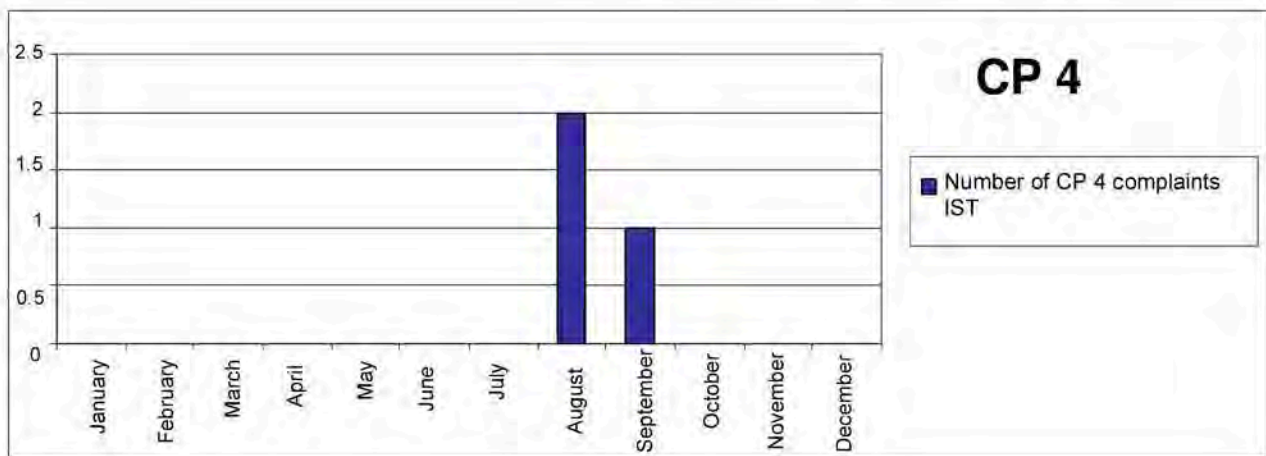


CP 7 complaints

New faults in August: 1

Shaft seal leaking

Bosch



Hall up to CP4

New fault in Aug/Sept: 2

Shaft seal leaking

Bosch

Overflow valve leaking

Bosch

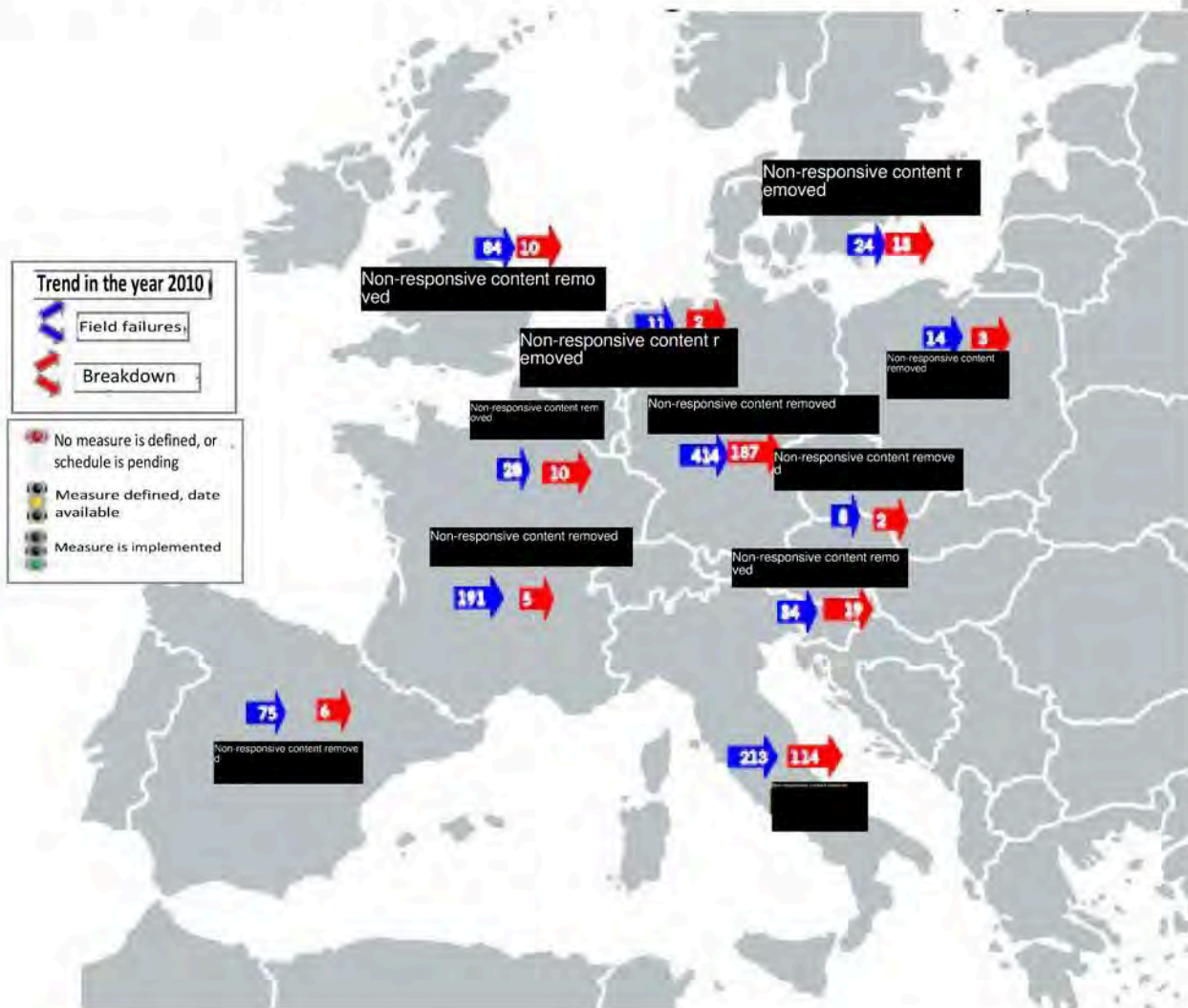


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TOP 5 cases of damage:

3. Field situation in Europe Number of HPP complaints in 2010 (HY)



TOP 1 – 2.0l CR 103/120 kW (HPP Bosch) fault pattern:
Fault symptom:
 Drivetrain damage 2.0l Bosch CR HPP CP4.1
Immediate measure:
 Cleanliness package: Several measures in production to avoid contamination. Permanent optimization process.
Measure:
 Modification of the C coating Increase in the load capacity of hydrodynamic lubricant film between the roller / roller support at lower viscosity and poor lubricity



Breakdown VW

| German | English |
|--------------------------------|--------------------------------|
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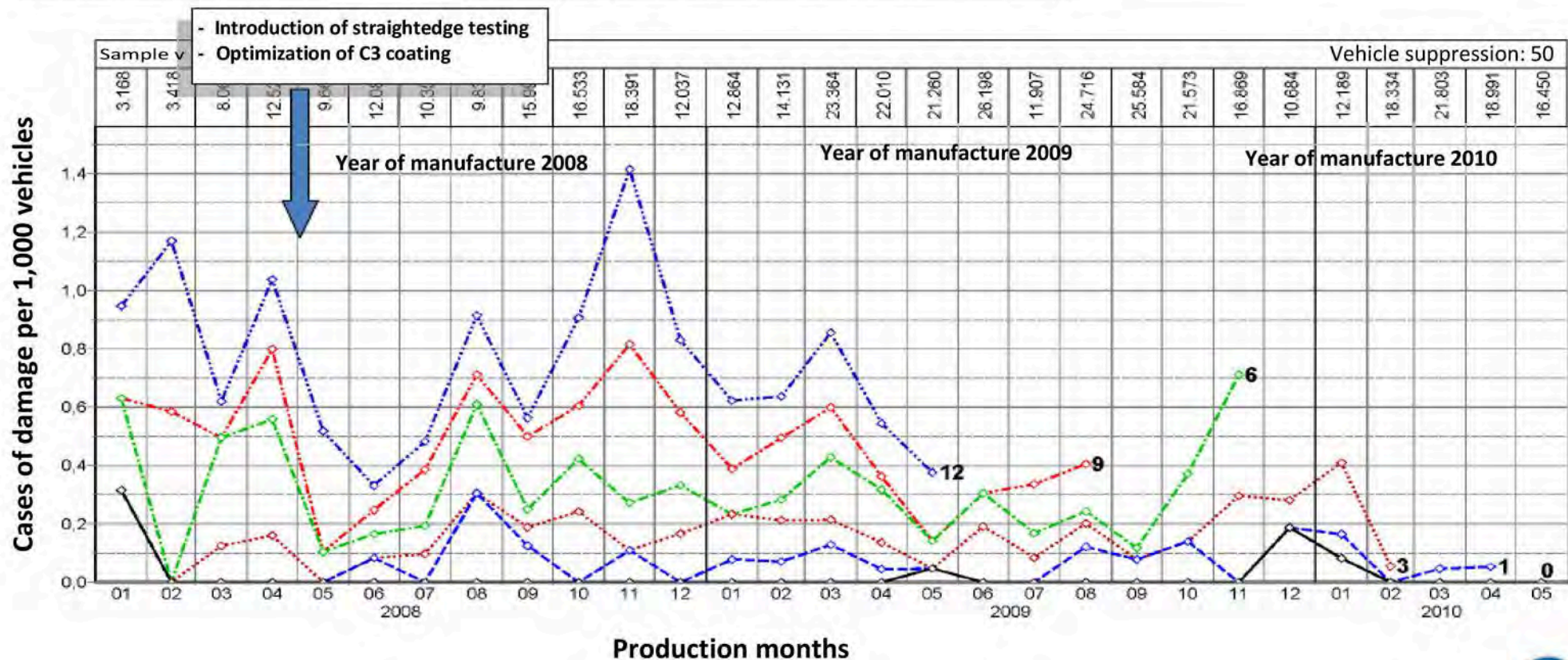
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Page 8



3.1 TOP 5 cases of damage - Measures

TOP 1 – 2.0 l CR 103/120 kW (HPP Bosch)
Fault pattern:
 Drivetrain damage 2.0l Bosch CR HPP CP4.1
Immediate measure:
 Cleanliness package: Several measures in production to avoid contamination. Permanent optimization process.
Measure:
 Modification of the C coating Increase in the load capacity of hydrodynamic lubricating film between the roller / roller support at lower viscosity and poor lubricity



5. Current repair solutions


For technical reasons, no repairs are carried out on high-pressure fuel pumps.



| German | English |
|--------------------------------|---------|
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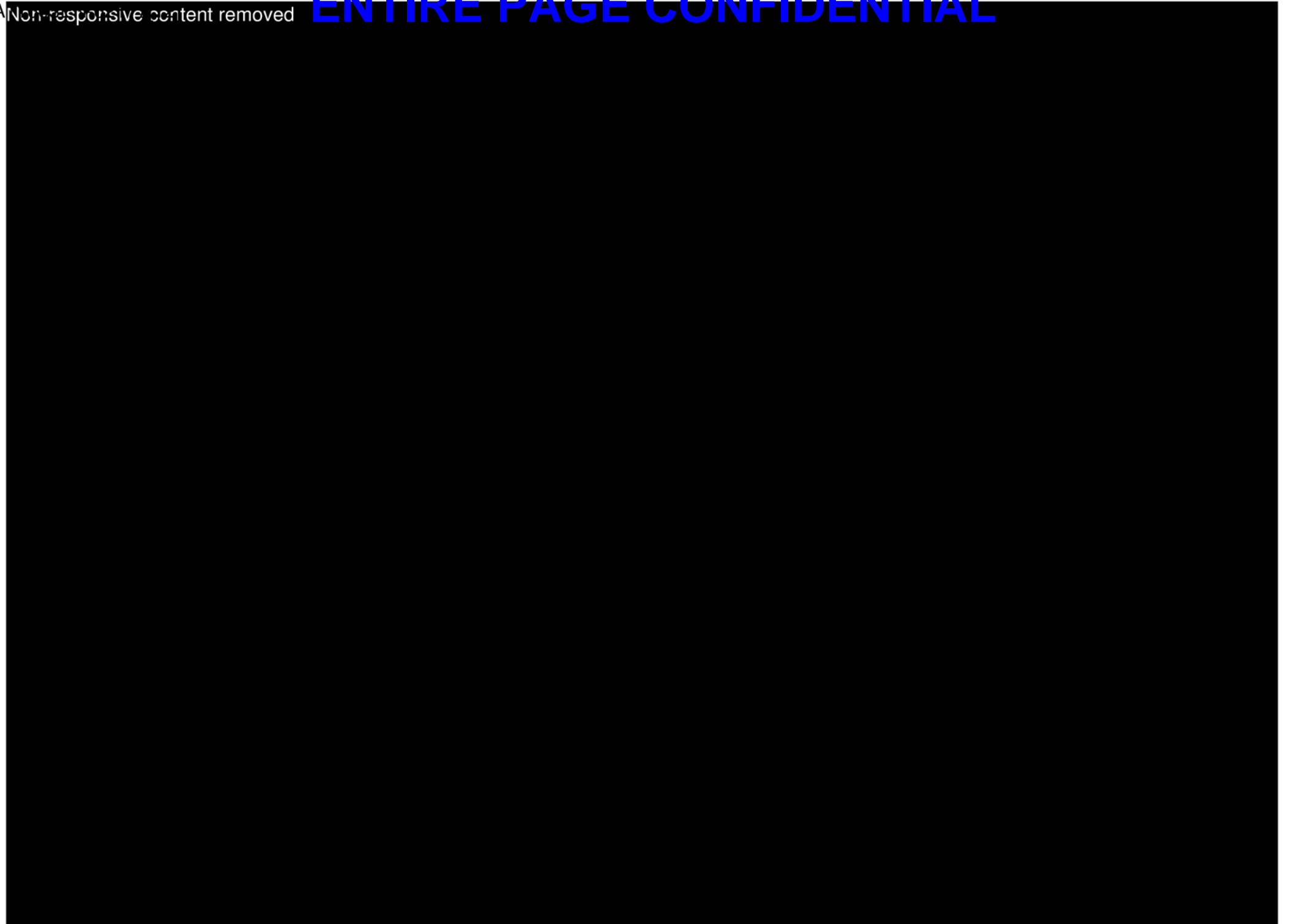


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Appendix



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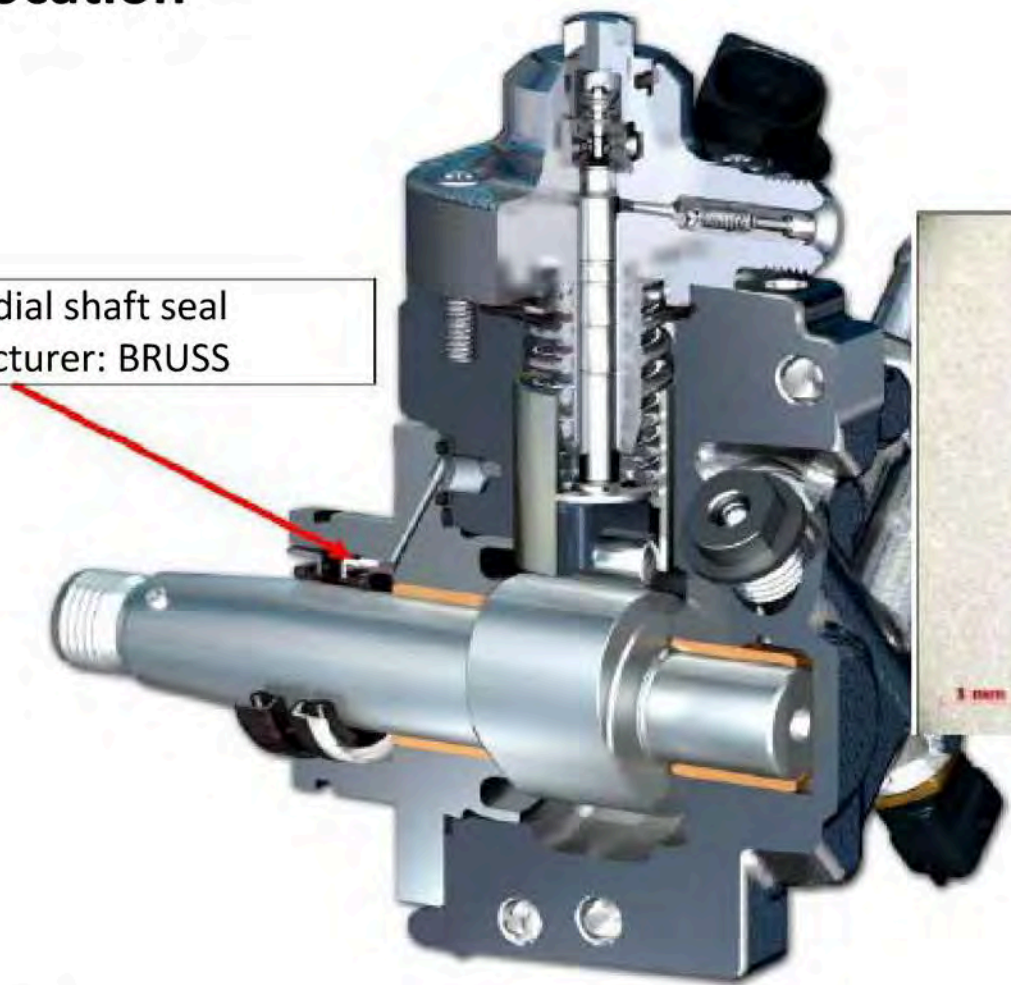
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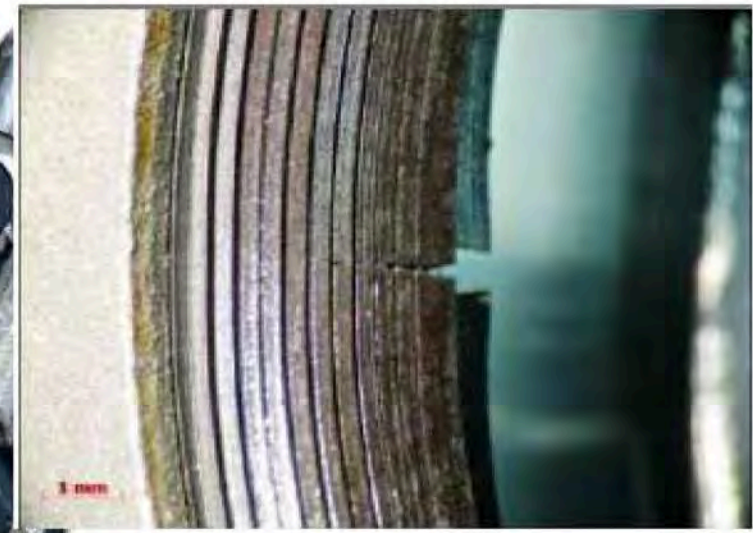
Status report HPP 2.0l CR shaft seal leaking

Fault location

Inner radial shaft seal
Manufacturer: BRUSS



Fault pattern



Status report HPP 2.0l CR shaft seal leaking

Status HPP 2.0l CR shaft seal (SS) leaking

Complaint: Leaking pumps in [redacted] => SS torn (Information from [redacted]) 08.20.10

Cause: Increased temperature during the manufacturing of the blanks for the SS

Scope: 250,000 pumps in total (all customers) corresponds to 480 affected SS
330 found at Bosch / Bruss
150 affected all OEMs

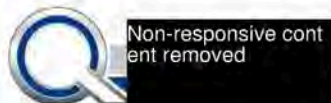
90,000 VW which are risky
34,000 Audi VW and Audi **75 units**

Immediate measures: Rotating stock and goods in stock blocked 08.20.10
100% bubble test (4 bar, impulses)

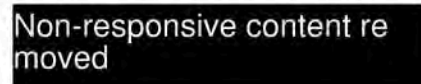
| Result: | Work | sorting overall | unchecked gods in stock | failed in test | Status |
|---------|--------|--|-------------------------|----------------|-----------------------|
| | SZ | 46265 | 6048 | 34 | 09.09.10 |
| | | Supply from Bosch 4,032 up to and including 09.15.10 | | | 8 HPP from veh. plant |
| | Györ | 27774 | 0 | 23 | 09.09.10 |
| | Saxony | 4163 | 0 | 3 | 09.09.10 |
| | Field | (Prod. date before sorting) | | <u>1</u> | 09.09.10 |
| | | | Total: | 69 | 09.10.10 |

Pumps with potentially leaking SSI as of date of manufacture: 07/12/10

Production OK pumps from Bosch as of production date: 08.25.10



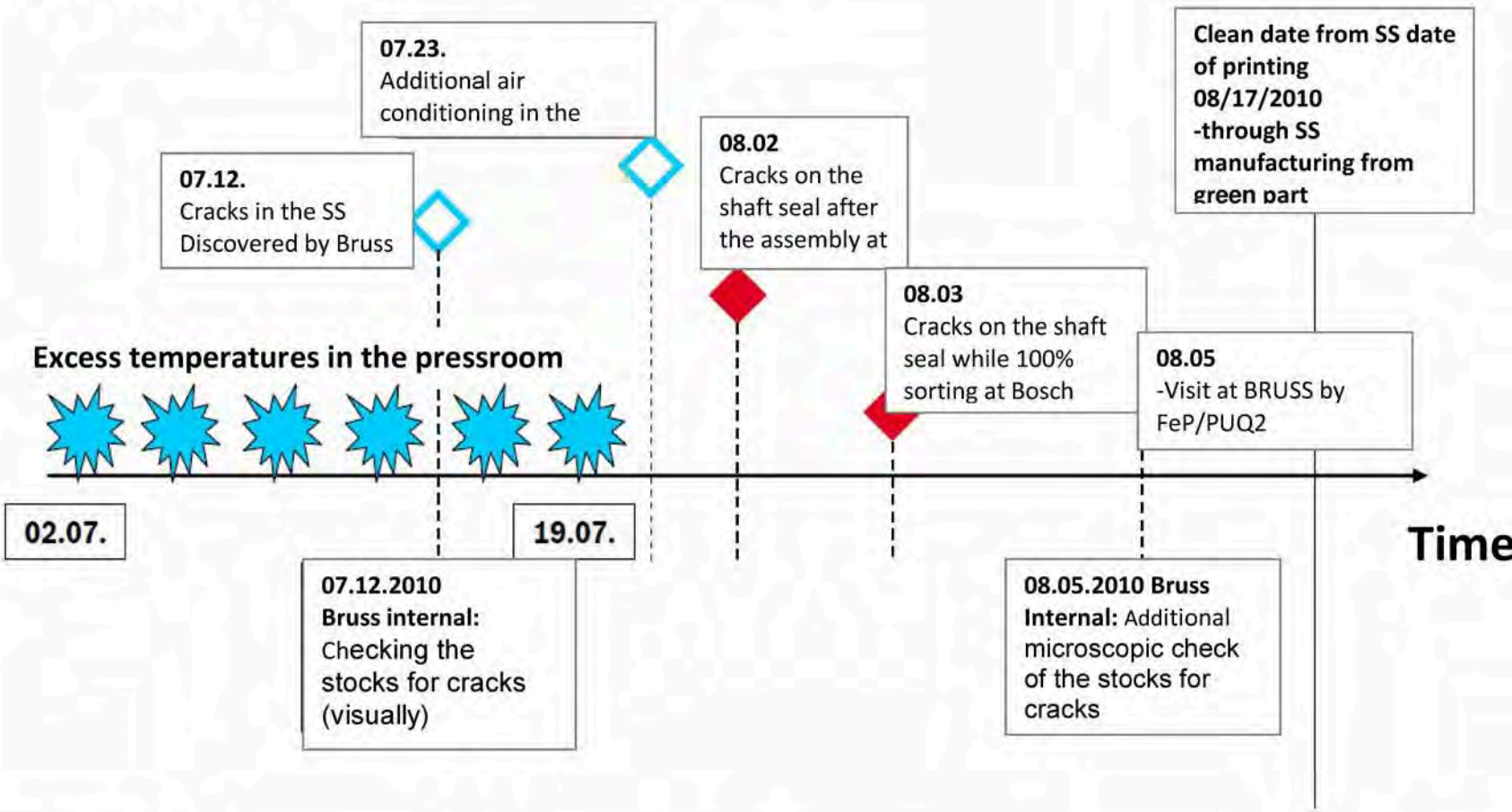
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Status report HPP 2.0I CR shaft seal leaking

Failure history

Timeline



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09.28.2010

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Status report HPP 2.0I CR shaft seal leaking

Further procedure:

- Bosch:

- => The blocking of the HPPs built with SS at risk in the Bosch plants
- => Checking supplier Bruss
- => Materials inspection regarding the statement about the long-term behavior of the SS: at what stress does the SS crack if this material problem occurs?
- => Determining the failure probability over the running time

Deadline:

- is finished
- on-site
- In progress
- in progress

- Volkswagen:

- => Checking the SS in the laboratory
- => Invitation by Bosch for Q meeting in Non-responsive content removed
- => Process investigation at Bruss
- => Invitation by Bosch for Q meeting in Non-responsive content removed
- => Daily coordination with Bosch (Bosch resident is on site when required)

- 08.26.2010
- 08.31.2010
- 08.31.2010
- 09.17.2010
- daily



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09.28.2010

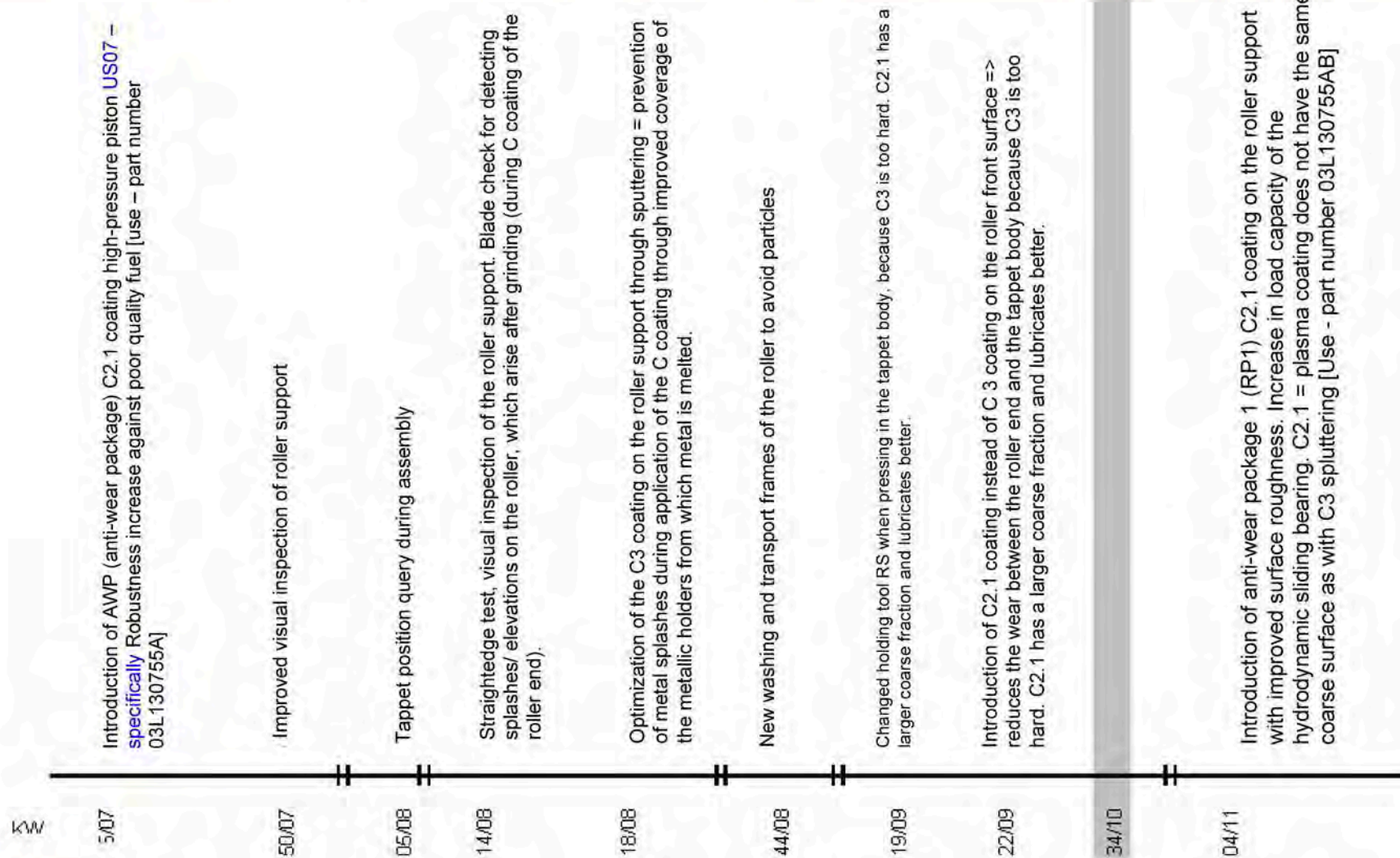
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Overview of measures US07- and EU- HDP 2.0I CR

Measures implemented at Bosch US07 - and EU – HPP

Future measures



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09.28.2010


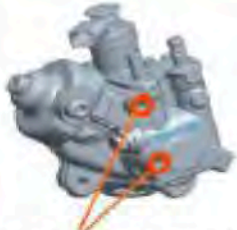

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Overview of measures US07- and EU- HPP 2.0l CR

HPP Bosch (1,800 bar / 6 mm stroke) for 2.0 CR Gen 2)

Status as on 07.26.2010

| CDe/Status | Series | Series production VT03276 (approved) Support Passat/Sharan | VP11702 (approved) Anti-wear package for EU4 7 US07 | VT03599 (not yet approved) AWE VT03751E (approved) for 6 bar fuel system with overflow valve | VT11902 (not yet approved) AWE VT03751E (approved) for 6 bar fuel system with overflow valve |
|-----------------|---|--|--|---|---|
| EU5 | 03L.130.755.D All without support without overflow valve | 03L.130.755.L Passat/Sharan (superseded by AF) without support without overflow valve 03L.130.755.D Other vehicles without support without overflow valve | | 03L.130.755.AF Passat/Sharan (after approval) with support with overflow valve 03L.130.755.AC AU 03(23/11) without support with overflow valve | 03L.130.755.AC EU 5 Tiguan (MP 22/11) without support with overflow valve |
| EU4 | 03L.130.755.F All (superseded by M) without support without overflow valve without anti-wear package | 03L.130.755.M Passat (superseded by AA) with support without overflow valve without anti-wear package | 03L.130.755.AA Passat (gradually after Q verification) with support without overflow valve 03L.130.755.AB Tiguan/ AU 03 (superseded by AE) without support without overflow valve Anti-wear package 1 | 03L.130.755.AF AU 03(45/11) Carried out a long time ago without support with overflow valve Anti-wear package 1 | 03L.130.755.AE Tiguan (MP 22/11) without support with overflow valve Anti-wear package 1 |
| US07 | 03L.130.755.F All (superseded by AB) without support without overflow valve without anti-wear package | | 03L.130.755.AB NMS (41/10) without support without overflow valve without anti-wear package | | |
| Scope of change | Series  |  Connection of support | Anti-wear package 1: >Roller support coating with reduced roughness >Reduction in tolerance play >opt. roller texture >opt. Roller hardness | Overflow valve damping bore  The high-pressure fuel pump in combination with the 6-bar tank system (EC pump > controlled tank pump) produces howling from the HPP after a cold start | |



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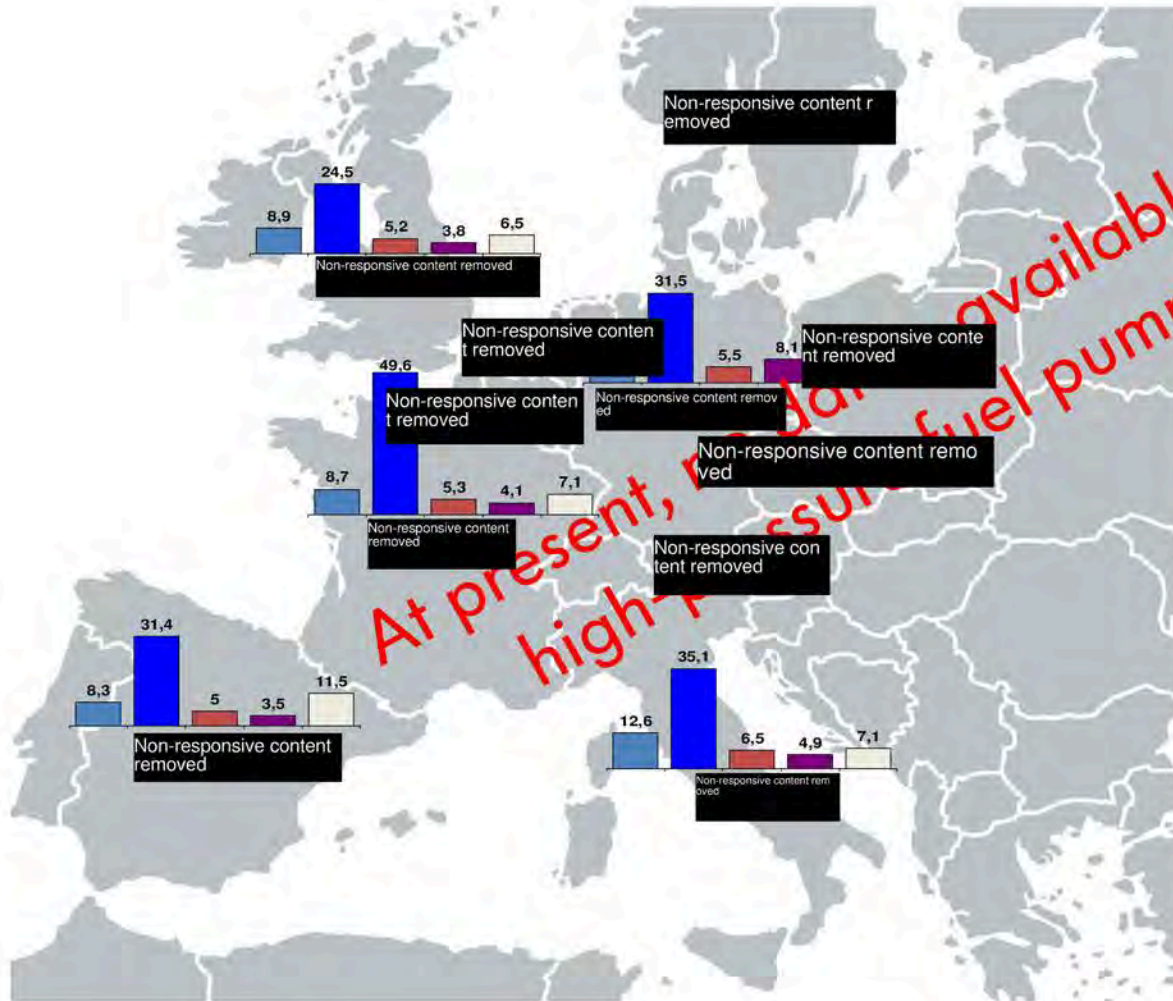
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Page 20

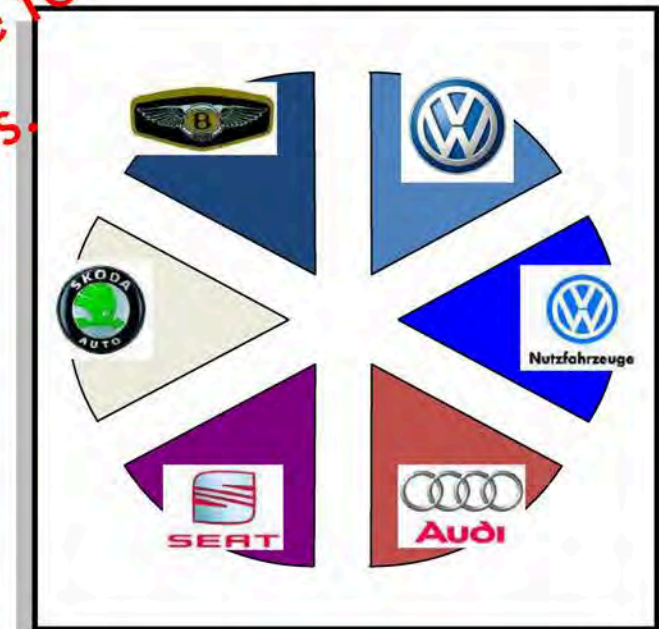


Presentation of the HPP field failures relating to brands

5 main markets/ Europe / July 2010 / CoD/1000 MIS24



Legend



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Seite 21



Current Field Issue:

EA896_2,0L CR HDP CP4.2

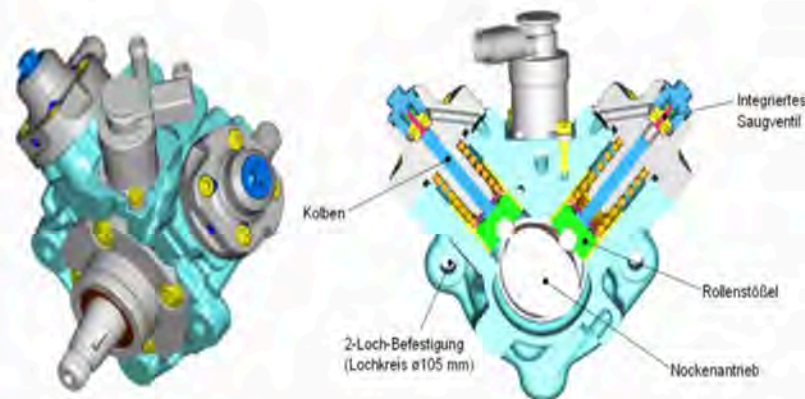
| | | | |
|-------------|----------|-------------|----------|
| KPM:diverse | | Status: 0-5 | |
| Status 1 | Status 2 | Status 3 | Status 4 |
| Today | | | |
| weeks | | | |
| | | | |

| | |
|---------------------------|---|
| Customer Complaint | Engine stalls while driving, dies not restart, fuel leakage, noise, ... |
| Workshop Finding | chips, leakings, noise, ... |
| Service-Activities | Repair per repair manual. |

| Field data (VW approved markets) | |
|----------------------------------|---|
| Complaints total | 1.977 (replaced parts) |
| Fail./ 1.000 veh (MIS12) | 14,5 (manufacturing year 09) |
| breakdowns / repeat | 132 hard / 705 soft / 262 repeat |
| €/ incident | approx. [redacted] / incident |
| €/ vehicle (MIS 12) | [redacted] / veichle (mfr 09) |
| Affected scope | EA896_3,0L CR |
| Most recent measure | Robustness Package 2 (RP2) 11/2010 Optimized Electr. Fuel Pump-Control (Early 2011) |
| Failures after measure | 4 |
| Failed parts | yes |

PID 2374 (also 2045, 2066, 2329, ...)

HPFP 059130755xx



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1: in progress; 2: Analysis finalized;
3: Measure defined; 4: Measure implemented;
5: Measure successful

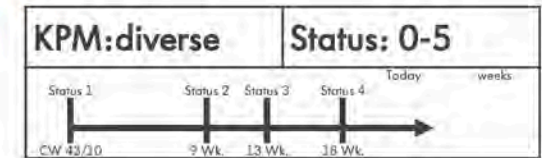


Back-up



Current Field Issue:

EA896_2,0L CR HDP CP4.2



| KPM-No. | record date | Status |
|---------|-------------|--------|
| 5349524 | 13.03.2011 | 6 |
| 5222925 | 10.08.2010 | 2 |
| 4914966 | 13.03.2009 | 5 |
| 2514165 | 26.06.2008 | 1 |
| 4831907 | 09.04.2008 | 6 |

EA896_2,0L CR HDP CP4.2

AQUA: Aktive Qualitäts-Analyse

Stand 03/11-13.05.11 18:18

Quelle/User SAGA-Gew

VW, Markt: VW (freigegebene Maerkte)

HJ 2008 - 2011, Offset: alle (Max: 6)

Teilenummer: 059130755%

896|896G2 3,0I

Vertraulich

ohne PR-Nummern

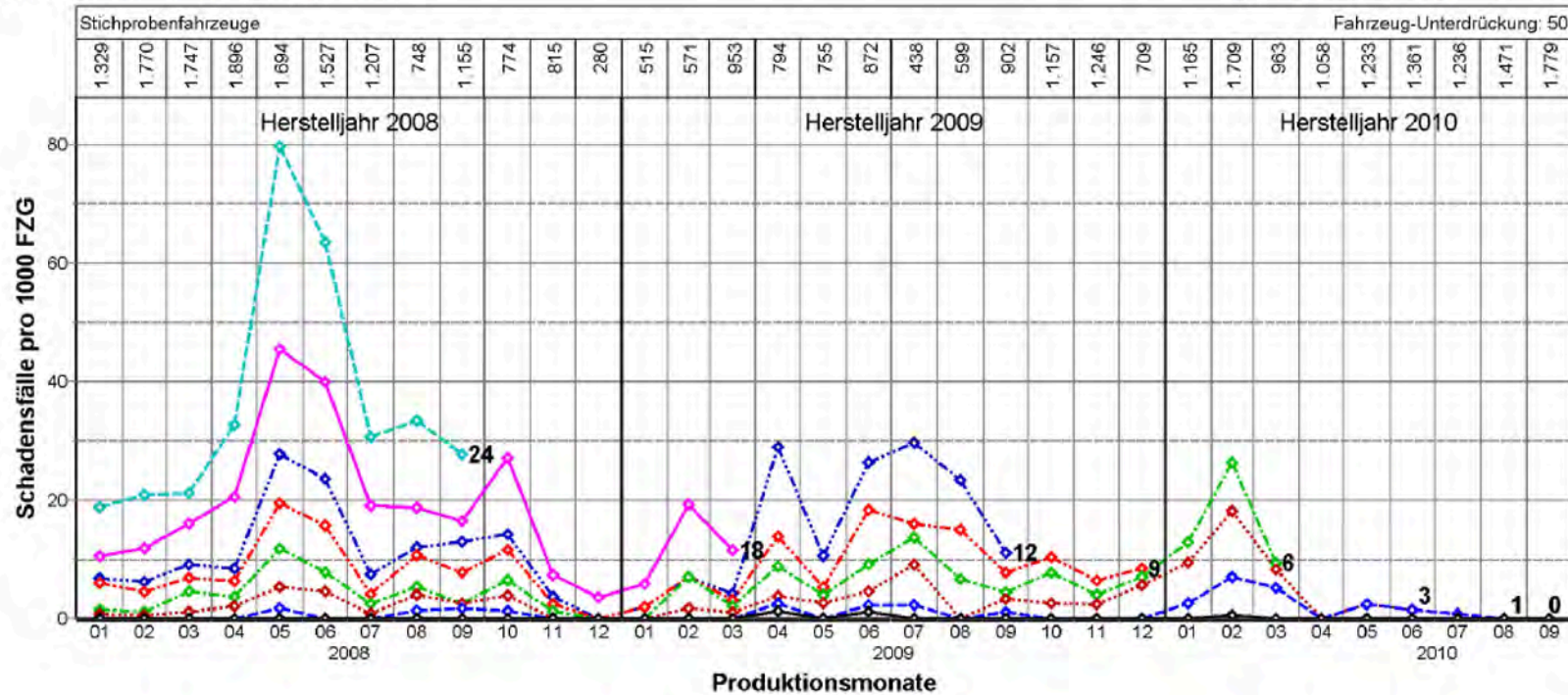
Teilenummer

059130755%

| HJ | MIS0 | MIS1 | MIS3 | MIS6 | MIS9 | MIS12 | MIS18 | MIS24 |
|-------|--------|--------|--------|-------|------|-------|-------|-------|
| 2008 | 0,0 | 0,5 | 2,3 | 4,5 | 8,7 | 12,2 | 21,7 | 35,7 |
| 2009 | 0,2 | 0,6 | 2,9 | 6,0 | 9,3 | 14,5 | 25,2 | |
| 2010 | 0,1 | 2,5 | 6,2 | 10,0 | | | | |
| Diff% | -60,29 | 301,91 | 111,91 | 66,88 | | | | |

| HJ | Tausch | LB | SA 17 | SA 10 | SA 18 | SA 50 |
|------|---------|--------|--------|--------|-------|-------|
| 2008 | 99,2 % | 43,4 % | 42,8 % | 41,0 % | 6,3 % | 4,9 % |
| 2009 | 99,5 % | 35,6 % | 46,6 % | 41,3 % | 4,8 % | 1,9 % |
| 2010 | 100,0 % | 26,6 % | 63,3 % | 26,6 % | 6,4 % | 1,8 % |

SCHWER MECFEH LEICHT UNDICHT



AQUA: Aktive Qualitäts-Analyse

Issue 04/11-17.05.11 15:57
Source/User SAGA-Gew / [REDACTED]

VW, Market: VW (freigegebene Märkte)

HJ 2008 - 2011, Offset: alle (Max.: 6)

Confidential

ohne PR-Nummern

Part Number 059130755%

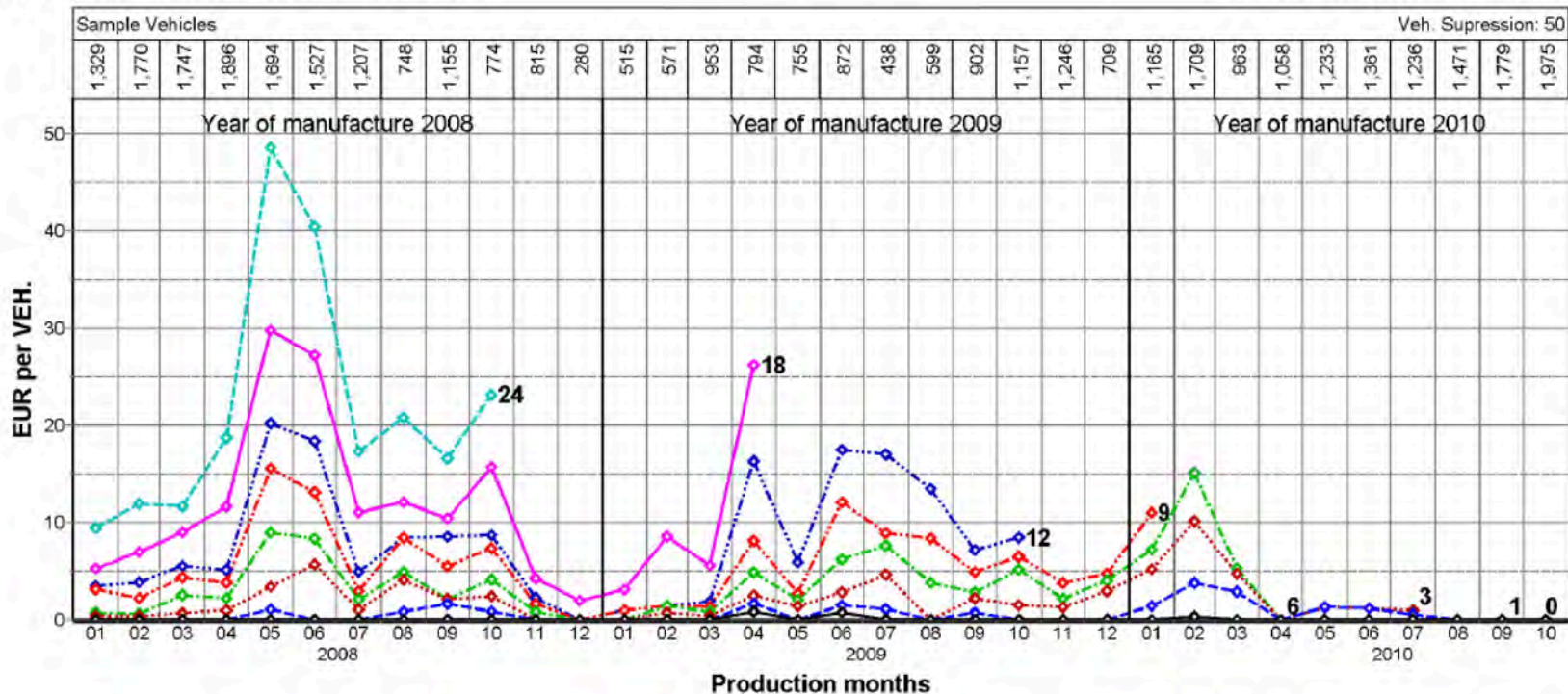
Part Number: 059130755%

896|896G2 3,0I

| Y. of | MIS0 | MIS1 | MIS3 | MIS6 | MIS9 | MIS12 | MIS18 | MIS24 |
|-------|--------|--------|-------|-------|-------|-------|-------|-------|
| 2008 | 0,00 | 0,33 | 1,83 | 3,43 | 6,21 | 8,29 | 13,37 | 21,04 |
| 2009 | 0,14 | 0,40 | 1,66 | 3,38 | 5,32 | 8,43 | 13,92 | |
| 2010 | 0,04 | 1,23 | 3,08 | 4,96 | 8,92 | | | |
| Diff% | -71,31 | 209,61 | 85,84 | 46,48 | 67,54 | | | |

| Y. of | Exchang | Breakdo | DC 17 | DC 10 | DC 18 | DC 50 |
|-------|---------|---------|--------|--------|-------|-------|
| 2008 | 99,2 % | 43,9 % | 42,2 % | 41,8 % | 6,4 % | 4,8 % |
| 2009 | 99,6 % | 35,5 % | 44,6 % | 44,2 % | 4,8 % | 1,7 % |
| 2010 | 100,0 % | 27,9 % | 59,0 % | 32,0 % | 5,7 % | 1,6 % |

SCHWER MECFEH LEICHT UNDIC



Vehicles: 27,452+15,206+29,009+12,730=84,397; Sold: 27,400+15,151+27,331+6,672=76,554; Stp.: 14,942+9,511+16,645+5,803=46,901; HJ: 2008+2009+2010+2011=Total

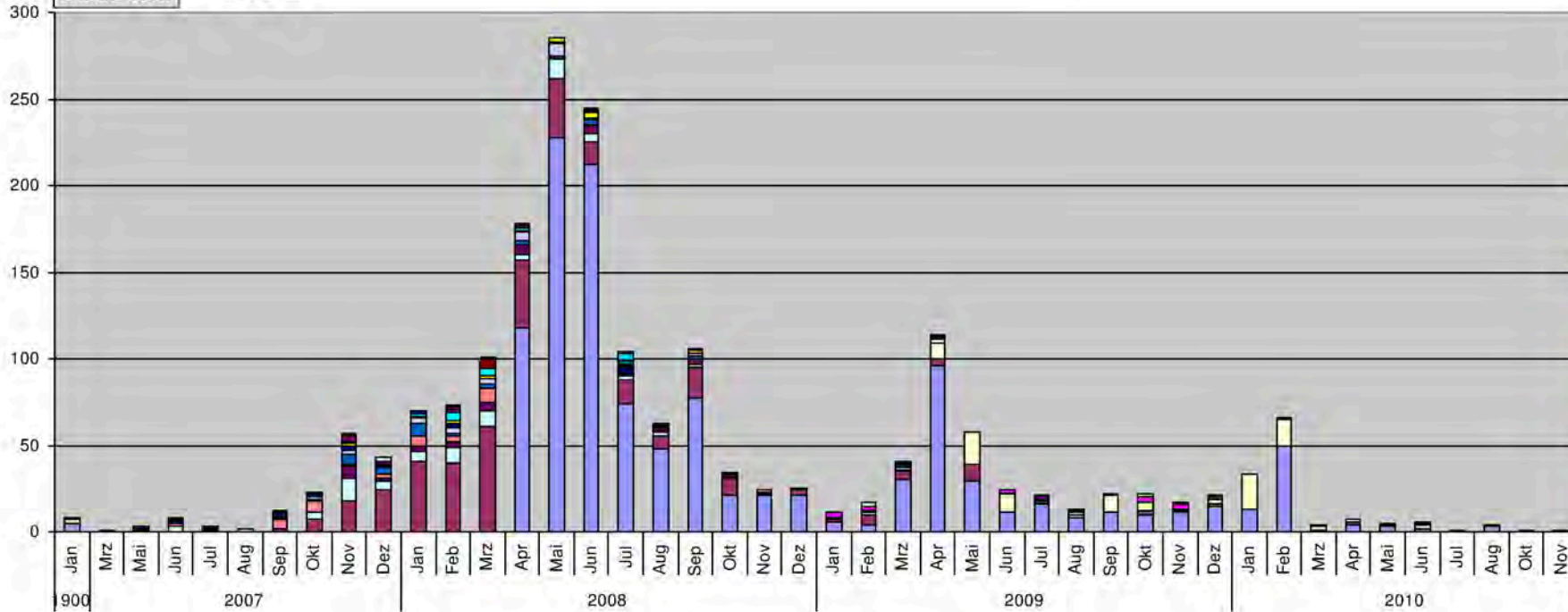
V6 TDI HDP | Fzg



Breakdowns: All
 LIEGENBLEIBER (Alle)

VW approved markets

Summe von SF Sum of failures



Country: ISO_LAND

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- USA
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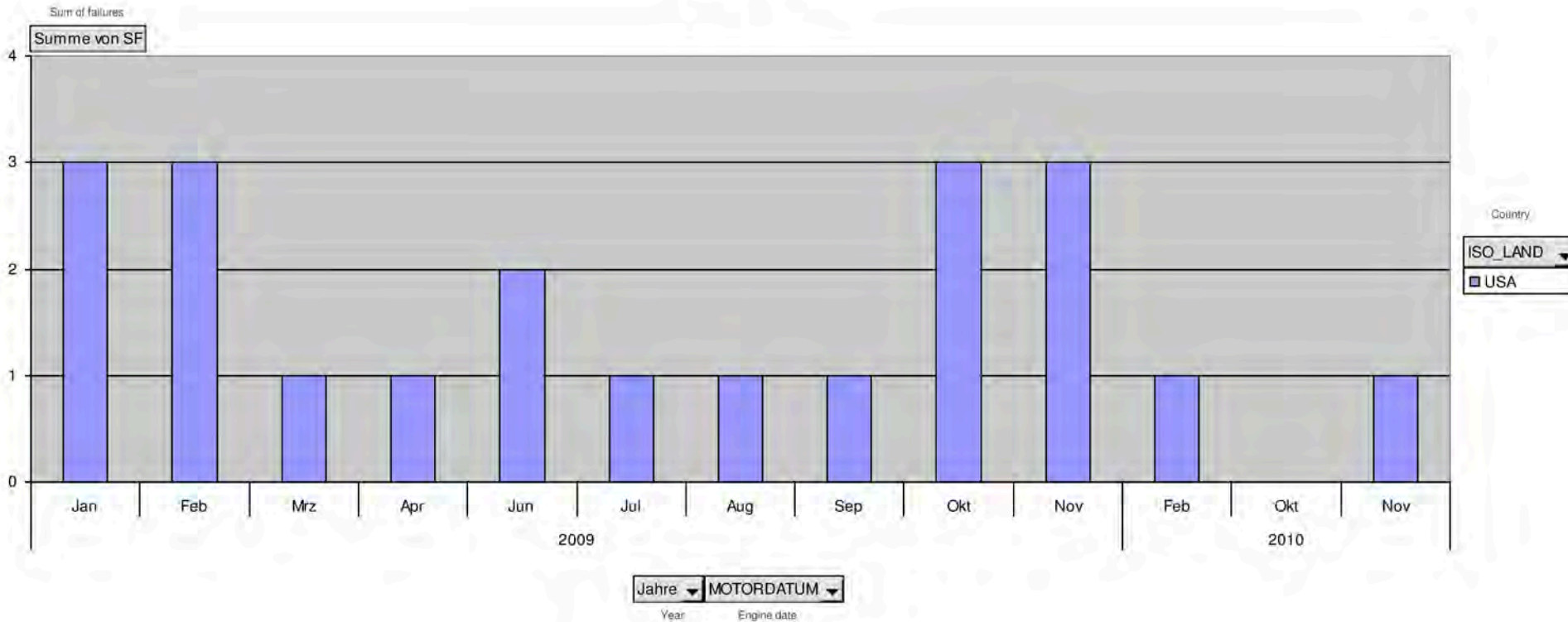
Jahre: MOTORDATUM
 Year: Engine date

Sold vehicles.:
 HJ06-07-08: 83.587
 HJ09-10-11: 46.695

LIEGENBLEIBER (Alle)

Breakdowns All

USA market



Sold vehicles (HJ09-10-11): 3.815

