Introductory Remarks

This letter represents an initial and partial response to the Information Request dated May 28, 2020 in relation to the above-captioned investigation on behalf of Volkswagen Group of America and Volkswagen AG (collectively referred to herein as "Volkswagen" or "VW"). We note that while the agency upgraded the investigation on July 3, 2018, after Volkswagen's response to the Information Request associated with the Preliminary Evaluation, Volkswagen believed in good faith that ODI was reviewing and considering the information previously provided, as well as Volkswagen's conclusion that the separation of the seat belt webbing that occurred in the *MY 2018 NCAP tests was an artifact of the way in which the ADT cable was routed and does not reflect a potential unreasonable risk to motor vehicle safety in the real world. ODI reached out to VW in May 2020, met with the company on May 28, and issued the current Information Request that same day. Volkswagen has endeavored to provide as much information as possible at this time. Volkswagen will provide more complete information according to the dates agreed to with ODI and will, beyond that, supplement its response with additional information, if necessary.

Below VW explains the sled testing series in more detail, noting that while the first two of the test series were intended to evaluate whether or not the ATD cable routing was the likely cause of the belt separation in the MY 2018 NCAP tests, the third series of test was aimed at collecting initial data should further countermeasure development be needed. The testing aimed at understanding the impact of the ATD cable confirms that the belt separation in two NHTSA NCAP tests was an artifact of the way in which the NCAP testing was conducted and is not representative of collision risks in consumer use. VW also understands, based on its conversation with ODI on May 28, 2020, that ODI has questions with regard to the efficacy of Crash Locking Tongues (CLT) – which is a relatively new technology – and some of the choices embedded in the VW design in particular. Below VW addresses ODI's questions and explains how various of the design choices in fact help reduce the potential for webbing bunching and/or adverse consequences should bunching occur.

Significantly, since ODI reached out to VW, the company has commissioned a comprehensive review of the field experience of the MY 2018 Tiguan and peer vehicles from a spectrum of manufacturers with competitor vehicles in the U.S. market (referred to herein as "Market Peers", as opposed to the "peer vehicles" defined in the current Information Request). That review has thus far found that the Tiguan compares favorably in real world and comparative testing with the Market Peers (see Response to Request No. 10 below). Volkswagen has received **NO** reports of any occurrences in the field similar to NHTSA's anomalous NCAP tests. VW has commissioned Exponent, Inc. to identify potential field crashes by reviewing salvage yard websites and obtaining (to the extent available) seat belt componentry from vehicles involved in frontal crashes. That review did not identify any indication of a real world failure replicating the results of the NHTSA's anomalous NCAP tests. These analyses have confirmed that the webbing separations from NHTSA's early MY 2018 NCAP tests are anomalies associated with the dynamic interaction of the ATD cable routed inboard and adjacent to the driver's seat belt buckle and latch plate; absent that dynamic interaction, the belt would not have experienced the incremental loading of the cable that led to the belt separation.

* The NCAP references the tests completed for model year (MY) 2018 for Volkswagen Tiguan, however, the actual testing dates were December 08, 2017 and December 13, 2017

Requests and Responses

Please repeat the applicable request verbatim above each response. After VW's response to each request, identify the source of the information and indicate the last date the information was gathered.

Request 1

State the number of subject and peer vehicles VW has manufactured for sale or lease in the United States. Separately, for the subject and peer vehicles manufactured to date by VW, state the following:

a. Make;
b. Model;
c. Model Year;
d. CLT part number;
e. CLT supplier;
f. Buckle stalk part number;
g. Buckle stalk flexible or solid;
h. Buckle stalk supplier;
i. Seat belt assembly part number;
j. Seat belt assembly supplier;
k. Driver or passenger side;
l. Production volume.

Response 1

In response to this inquiry, Volkswagen provides the population of both the subject and peer vehicles identified in EA18-005.

Population data is provided for 2018-2020 Model Year (MY) Volkswagen Tiguan and 2015-2021 Model Year Volkswagen and Audi models equipped with a CLT or flexible seat belt buckle stalk (a stalk comprised of 2 twisted metal cables covered by a plastic sheath) or both, manufactured for sale or lease in the United States, including, but not limited to, the District of Columbia and current U.S. territories and possessions.

Make	Carline	2015	2016	2017	2018	2019	2020	2021	Total Of VIN
Volkswagen	Tiguan LWB				105,170	110,213	72,277		287,660
	Total				**105,170**	**110,213**	**72,277**		**287,660**

Make	Carline	2015	2016	2017	2018	2019	2020	2021	Total Of VIN
Audi	Peer	207,907	194,557	212,266	333,483	239,813	105,009		1,293,035
Volkswagen	Peer	347,060	331,993	384,516	213,571	366,269	84,462	4,563	1,732,434
	Total	**554,967**	**526,550**	**596,782**	**547,054**	**606,082**	**189,471**	**4,563**	**3,025,469**

Separately, for responses to subparagraphs "a" through "l", please reference the table "CLT_non-CLT and Population.pdf" enclosed with this response.

Additionally, please reference Attachment A for the production information related to the subject 2018-2020 MY Tiguan vehicles and 2015-2021 MY Volkswagen and Audi peer vehicles.

Source: Business Objects Vehicles Universe Date Gathered: Through the date of the inquiry

Request 2

Identify the party who is responsible for the definition of the performance standards (e.g. configuration, component movement during crash sequence, durability, expected and maximum stresses applied to vehicle occupants, system tolerance of external loading) for seat belt assemblies and the components comprising said assemblies for the purpose of use in vehicles manufactured by VW for sale or lease in the United States in both subject and peer vehicles?

Response 2

Volkswagen AG and Audi AG technical development organizations are responsible for the definition of performance standards for seat belt assemblies and components comprising said assemblies for the purpose of use in both subject and peer vehicles manufactured for sale or lease in the United States.

Request 3

Describe in detail and supply documentation of the performance standards referenced in Request 2 for the seat belt assemblies and the individual components comprising the assemblies manufactured for use in vehicles manufactured by VW for sale or lease in the United States for both subject and peer vehicles.

Response 3

In response to this inquiry, Volkswagen provides a list of relevant requirement documents and performance standards referenced in Request 2 for the seat belt assemblies and the individual components comprising the assemblies manufactured for use in vehicles manufactured by VW for sale or lease in the United States for both subject and peer vehicles.

Some documents are the same as Volkswagen provided in response to PE18-001. These documents describe the general component specifications and requirements due to the different seat belt components in the car.

Response 3 cont'd.

The following table lists the specifications and their correlation between an individual vehicle and the document version applicable to that vehicle, described below. In order to be able to make an assignment, the individual assignment to the documents is made for each vehicle.

Model	Seat Belt Performance Specification - Vehicle Specific	LAH.DUM.857.D	TL 471	TL 52454	TL 82500	TL 82501	TL 82503
Atlas Cross Sport	LAH.DUM.857.CS__04-2017	LAH.DUM.857.D V4.1___08-2016	Issue 10-2011	Issue 04-2010	Issue 02-2011	Issue 05-2009	Issue 06-1998
Atlas	LAH.DUM.857.BT__07-2014	LAH.DUM.857.D V3.0.1__05-2014	Issue 10-2011	Issue 04-2010	Issue 02-2011	Issue 05-2009	Issue 06-1998
Atlas Facelift	LAH.DUM.857.CS__04-2017	LAH.DUM.857.D V4.1___08-2016	Issue 10-2011	Issue 04-2010	Issue 02-2011	Issue 05-2009	Issue 06-1998
Arteon	LAH.3G8.857_____09-2011	LAH.DUM.857.D V2.5___05-2011	Issue 11-2006	Issue 04-2010	Issue 02-2011	Issue 05-2009	Issue 06-1998
Tiguan LWB	LAH.5NL.857_____02-2015	LAH.DUM.857.D V3.0.1__05-2014	Issue 10-2011	Issue 04-2010	Issue 02-2011	Issue 05-2009	Issue 06-1998
Jetta A7	LAH.DUM.857.BT__07-2014	LAH.DUM.857.D V3.0.1__05-2014	Issue 10-2011	Issue 04-2010	Issue 02-2011	Issue 05-2009	Issue 06-1998
Golf R	LAH.5G0.857.J____02-2012 LAH.5G0.857_____02-2012	LAH.DUM.857.D V2.5___05-2011	Issue 10-2011	Issue 04-2010	Issue 02-2011	Issue 05-2009	Issue 06-1998
e-Golf	LAH.5G0.857.J____02-2012 LAH.5G0.857_____02-2012	LAH.DUM.857.D V2.5___05-2011	Issue 10-2011	Issue 04-2010	Issue 02-2011	Issue 05-2009	Issue 06-1998
Golf, GTI, Sportwagen, Alltrack	LAH.5G0.857.J____02-2012 LAH.5G0.857_____02-2012	LAH.DUM.857.D V2.5___05-2011	Issue 10-2011	Issue 04-2010	Issue 02-2011	Issue 05-2009	Issue 06-1998
Passat	LAH.561.857.A___09-2008	-	Issue 11-2006	Issue 06-2008	Issue 03-1996	Issue 05-2007	Issue 06-1998
Jetta A6	LAH.5C6.857.R___07-2012	LAH.DUM.857.D V2.6__07-2012	Issue 10-2011	Issue 04-2010	Issue 02-2011	Issue 05-2009	Issue 06-1998
Touareg 2	LAH.7P0.880_____01-2007	-	Issue 11-2006	Issue 04-2000	Issue 03-1996	Issue 10-2006	Issue 06-1998
Tiguan I / Limited	LAH.5N0.857_____07-2005	-	Issue 12-1990	Issue 04-2000	Issue 03-1996	Issue 01-2005	Issue 06-1998
CC	LAH.3C8.857_____03-2006	-	Issue 12-1990	Issue 04-2000	Issue 03-1996	Issue 01-2005	Issue 06-1998
EOS	LAH.1Q0.857_____08-2003	-	Issue 12-1990	Issue 04-2000	Issue 03-1996	Issue 12-1995	Issue 06-1998
Beetle / Convertible	LAH.5C5.857.A___02-2009	LAH.DUM.857.D V2.0___02-2009	Issue 11-2006	Issue 06-2008	Issue 03-1996	Issue 05-2007	Issue 06-1998
A3 Sedan A3 Sportback	LAH.8V0.85.7 F_31.07.2009	LAH.DUM.857.D V2.5___05-2011	Issue 10-2011	Issue 04-2010	Issue 02-2011	Issue 05-2009	Issue 06-1998
A3 Cabrio	LAH.8V0.857.F_31.07.2009	LAH.DUM.857.D V2.5___05-2011	Issue 10-2011	Issue 04-2010	Issue 02-2011	Issue 05-2009	Issue 06-1998
Q3	LAH.8U0.857.A_05.06.2008	general book of requirements for seat belt pretensioners and seat belt retractors / 20.Aug.2007	Issue 12-1990	Issue 04-2000	Issue 03-1996	Issue 01-2005	Issue 06-1998
A4 Sedan	LAH.8W0.857.D_11.07.2011	LAH.DUM.857.D V2.5___05-2011	Issue 10-2011	Issue 04-2010	Issue 02-2011	Issue 05-2009	Issue 06-1998
A4 Avant Allroad	LAH.8W0.857.D_11.07.2011	LAH.DUM.857.D V2.5___05-2011	Issue 10-2011	Issue 04-2010	Issue 02-2011	Issue 05-2009	Issue 06-1998
A5 Sportback	LAH.8W0.857.D_11.07.2011	LAH.DUM.857.D V2.5___05-2011	Issue 10-2011	Issue 04-2010	Issue 02-2011	Issue 05-2009	Issue 06-1998
A5 Coupe	LAH.8W0.857.D_11.07.2011	LAH.DUM.857.D V2.5___05-2011	Issue 10-2011	Issue 04-2010	Issue 02-2011	Issue 05-2009	Issue 06-1998
A5 Cabrio	LAH.8W0.857.D_11.07.2011	LAH.DUM.857.D V2.5___05-2011	Issue 10-2011	Issue 04-2010	Issue 02-2011	Issue 05-2009	Issue 06-1998
Q7	LAH.4M0.857.C_27.10.2011	LAH.DUM.857.D V2.5___05-2011	Issue 10-2011	Issue 04-2010	Issue 02-2011	Issue 05-2009	Issue 06-1998
Q5	LAH.80A.857.AA_31.05.2016	LAH.DUM.857.D_v3.0.1_05-2014	Issue 10-2011	Issue 04-2010	Issue 02-2011	Issue 05-2009	Issue 06-1998
Q5	LAH.80A.857.AA_31.05.2016	LAH.DUM.857.D_v3.0.1_05-2014	Issue 10-2011	Issue 04-2010	Issue 02-2011	Issue 05-2009	Issue 06-1998
Q8	LAH.4M0.857.BC_13.05.2014	LAH.DUM.857.D_v3.0.1_05-2014	Issue 10-2011	Issue 04-2010	Issue 02-2011	Issue 05-2009	Issue 06-1998
A6 Sedan	LAH.4G0.857.BK_07.2017	LAH.DUM.857.D_v3.0.1_05-2014	Issue 10-2011	Issue 04-2010	Issue 02-2011	Issue 05-2009	Issue 06-1998
A6 Avant Allroad	LAH.4G0.857.BK_07.2017	LAH.DUM.857.D_v3.0.1_05-2014	Issue 10-2011	Issue 04-2010	Issue 02-2011	Issue 05-2009	Issue 06-1998
A7; RS7	LAH.4G0.857.BK_07.2017	LAH.DUM.857.D_v3.0.1_05-2014	Issue 10-2011	Issue 04-2010	Issue 02-2011	Issue 05-2009	Issue 06-1998
etron	LAH.4KE.857.Q_18.02.2018	LAH.DUM.857.D_v3.0.1_05-2014	Issue 10-2011	Issue 04-2010	Issue 02-2011	Issue 05-2009	Issue 06-1998
etron Sportback	LAH.4KE.857.Q_18.02.2019	LAH.DUM.857.D_v3.0.1_05-2014	Issue 10-2011	Issue 04-2010	Issue 02-2011	Issue 05-2009	Issue 06-1998
Q3	LAH.83A.857.R_09.2016	LAH.DUM.857.D_v3.0.1_05-2014	Issue 10-2011	Issue 04-2010	Issue 02-2011	Issue 05-2009	Issue 06-1998

Response 3 cont'd.

The relevant performance and supply specifications are listed the following image:

VW TL471: **Seat Belt Systems and Height Adjustment ASSY** • Fastening parts and plastic parts • Locking parts • Retractors and belt tensioners • Height adjustment • Dynamic testing	**VW TL82500:** **Seat Belt Retractor** • Requirements and Tests	**VW TL82501:** **Seat Belt Tensioner** • Requirements and Tests • Performance data/ properties	**VW TL82503:** **Seat Belt Buckle and Latch Plate** • Requirements and Tests • Geometry Functional requirements • Enviromental requirements
VW TL52454: **Belt Webbing for Seat Belts** • Material Requirements	**LAH.DUM.857.D** **General Performance Specification seat belt components** • General Requirements • Techn. Requirements • Tests and Verification	**Seat Belt Performance Specification – Vehicle Specific** • Vehicle specific requirements	**ZF-TRW:** **Verification Plan and Report: Crash Locking Tongue** • Requirements and Tests

Overview of Requirements and performance standards.

- VW TL471 - Seat Belt Systems and Height Adjustment ASSY
  This technical supply specification describes in detail material and functional requirements for seat belt – and their height adjustment systems.
  There are general requirements and definitions for seat belt components, different testing setups like aging and dynamic sled tests. Details are also specified in the other requirement documents like TL82500, TL82501 and TL82503.
  The change log for this specification document will be provided at a later date.

- VW TL82500 – Seat Belt Retractor, Requirements and Test
  This technical supply specification deals with detailed requirements of retractors. This is the main requirement document for all retractors used in the entire Volkswagen group. All required test to fulfill all Volkswagen requirements are described.

- VW TL82501 - Seat-Belt Tensioner Restraint System, Requirements and test.
  This technical supply specification deals with detailed requirements and test specifications for Seat-Belt Tensioner Restraint System.

- VW TL82503 - Seat Belt Buckle and Latch Plate, Requirements and test.
  This technical supply specification deals with detailed functional requirements, geometries, and test specifications to seat belt buckles and latch plates.

- VW TL52454 – Belt Webbing for Seat Belts
  This technical supply specification defines the requirements for belt webbings used for seat belts.

Response 3 cont'd.

- ZF-TRW: Verification Plan and Report: Crash Locking Tongue
  The CLT in all vehicles responsive to request 1 utilize the design from ZF-TRW. There is no technical supply specification for the CLT at this time. Therefore, Volkswagen provides the "ZF-TRW Verification Plan and Report" for the initial release of the CLT, first equipped in the 2015 MY Volkswagen Golf.
  The "ZF-TRW Verification Plan and Report" represents the requirements and documentation of the tests that were conducted for the release of the CLT.

- LAH.DUM.857.D – Group Module Performance Specifications for Seat Belts and Seat Belt Buckles This specification describes the performance, requirements and testing conditions that must be fulfilled by the seat belt products to be developed by the supplier.
  The change log for this specification document will be provided at a later date.

- Seat Belt Performance Specification – Vehicle Specific:
  These specifications describe vehicle specific requirements.

Request 4

Identify the party who is responsible for seat belt assembly component design for use in the subject and peer vehicles:

a. Specifically describe that performance objectives and process that drove the design of the CLT, seat belt webbing, seat belt buckle stalk and standard seat belt latch plate for both subject and peer vehicles.

Response 4

The responsibility for component design is generally shared between Volkswagen AG and Audi AG technical development organizations and the supplier of the component. While the initial design for a component depends on the supplier's expertise and is therefore its responsibility, the adaptation to Volkswagen and Audi's individual requirements is a joint effort to enable system and component development and validation to VW's requirements and specifications, including performance objectives.

Performance objectives for the restraint systems are developed to satisfy requirements for each new vehicle program. The requirements are defined in the technical product description, and are driven by regulatory requirements (e.g., FMVSS 208), VW's internal requirements, and consumer needs (e.g., 5 star rating in US NCAP) of each market.

In developing the requirements, a systems approach is applied. Vehicle level requirements are broken down into technical requirements for individual components or systems and are specified in a "Lastenheft" or "LAH" ("book of requirements"), which incorporates the applicable technical supplier specifications (TLs).

Response 4 cont'd.

This system approach is part of the development process and includes the following general steps after the components of the vehicle and restraint system have been confirmed:

- In the first step, numerical simulations with finite element methods and numerical models for the ATDs are conducted in order to evaluate the performance of the components and the complete system within the overall vehicle design.
- Following the simulations, component, sled- and crash tests are performed with prototype parts and vehicles to validate the simulation models.
- Based on these simulations and tests, the overall component and system design is optimized, and a (pre-) release (parts release to purchase series tooling) is provided for supplier engineering development.
- During the development process, the components are tested and evaluated and the component design is optimized.
- Should the component design require additional tuning, additional validation (sled and/or crash tests) may be conducted.
- Finally, crash tests are conducted for the release of the vehicle in order to confirm the development results.

Response 4(a)

PART 1: DESIGN AND DEVELOPMENT PROCESS

A. Performance Objectives and Design

One of the primary performance objectives driving the design of the CLT was to achieve a 5-star rating under the new US NCAP performance criteria published in 2011. The existing frontal crash restraint systems were not expected to provide the needed frontal crash performance for an overall 5-star rating with the desired safety margin. In broad terms, the objective was to provide more restraint in the pelvis area where an occupant, represented by an ATD, can tolerate higher forces. Chest and upper torso deflection were also critical to the more stringent ratings under the new protocol.

In order to realize these performance objectives, a design was invented that allowed the belt to withstand high belt loads in the pelvis portion while the load in the torso portion is controlled and reduced by a switchable load limiter operating at two levels. The effect of this proposed design meant that a standard latch plate that allows a free webbing transfer from the torso belt onto the lap belt needed a device that switches under load into a mode where the webbing is clamped and greater loading is applied to the lap belt. General simulations confirmed the potential of this approach. The crash locking tongue was identified as an important element of an improved restraint system, and as referenced below, continued development, testing, and optimization ensued.

The following documents provided with Response 3 are also relevant here:

CLT –	Lastenheft DUM.857.DV.2.6, TL 471, TL52454, TL82503
Webbing –	TL52454, TL 471
Latch –	Lastenheft DUM857.D; TL 471; TL82503

B. Conceptual Design and Testing Phase

After the potential of the CLT design was identified, the next phase was the Conceptual Design Phase. In 2012, supplier ZF-TRW introduced their series production Crash Locking Tongue (CLT). Among other activities, VW R&D conducted overload tests on the ZF-TRW DLT-1 in accordance with VW Technical Delivery Standards (VW TL471) in Wolfsburg, Germany. These overload tests generally included a high pulse, up to 95% percentile dummies, and no support of airbags or even instrument panel/knee bolster. Additionally, some of the belts used were aged prior to testing.

Response 4(a) cont'd.

As a result of these conceptual overload tests, VW found that webbings with certain specific physical characteristics would have partial separation, and the aged webbings VW used fully separated under the VW overload test conditions. In these failed conceptual overload tests, the webbing got into trailing edge, bunched, and was ultimately torn apart by the standard ZF-TRW DLT-1 locking tongue. In order to counter these specific effects seen in the conceptual overload testing, VW and ZF-TRW discussed certain potential optimizations.

C. Optimization Phases

Prototypes of different concepts were tested in order to maintain clamping friction over as much travel path of the webbing through the locking device and also to minimize bunching. The ZF-TRW DLT-1 clamping length was reduced in order to allow more space for a bunched belt. Additionally, cut away sections in the corners were added to prototypes based upon proven design elements previously used in D-rings.

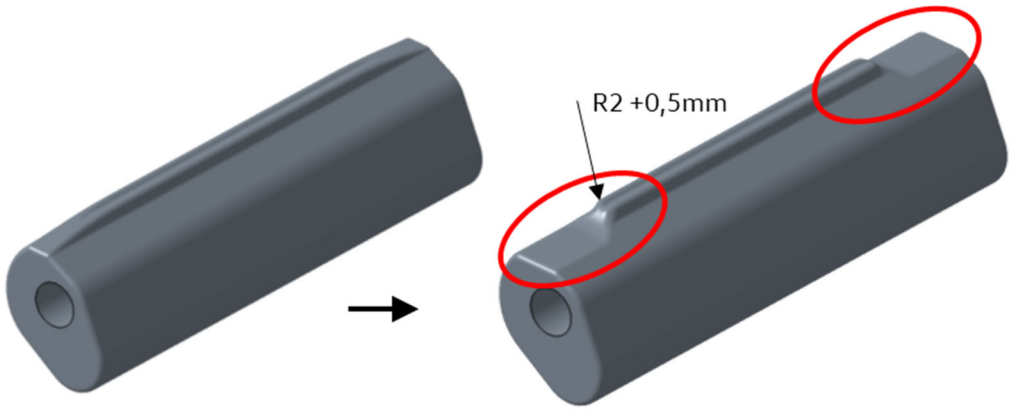
Sled tests were performed using these modified prototypes and demonstrated no abnormal webbing damage patterns in VW development testing. These modified prototypes went into prototype tooling later in 2012 that also included certain style-driven design changes. The new prototypes were tested in overload conditions (aged webbing, 95% Percentile ATD, no airbags, no instrument panel/knee bolster). One resulted in lateral displacement (bunching) and belt separation.

In response to those test results, a second optimization phase began. The changes of the second optimization (see pictures below) developed in several sled tests showed that the abnormal webbing damage presented in testing with earlier prototype designs was addressed and resolved. This VW DLT-1 was consequently made available for future application in vehicle projects. All test were conducted with a partially flexible latch stalk, dual pre-tensioners, and force limiters.

The intellectual property for the optimized VW DLT-1 was secured and covered by a US patent. (At a later point in time, a similar design was also used by Autoliv in its CLT- R Index "i" as "improved" and applied by various OEMs.)

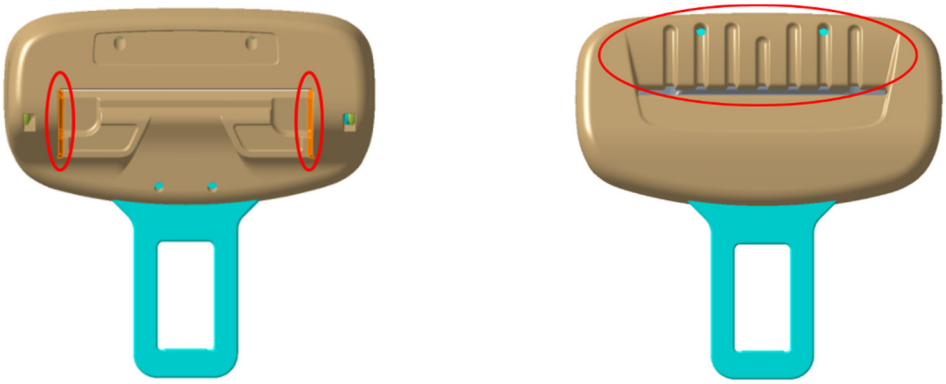
D. Verification Phase

In 2014, a series production VW DLT-1 part was released in the first Volkswagen brand vehicle, the Golf Mk7. VW performed additional overload testing and satisfied VW's performance requirements. Similarly, the other component, system, and crash tests met VW's requirements, so the VW DLT-1 was released for production.



Changes from ZF-TRW DLT-1 (1st optimization) to VW DLT-1: Reduced clamping length (2nd optimization phase)

Response 4(a) cont'd.



Changes from ZF-TRW DLT-1 to VW DLT-1: Cut-away zones extended and grooves added (2nd optimization phase)

PART 2: ADDRESSING ODI DESIGN CONCERNS

In May, 2020, ODI reached out to VW to inform VW that ODI was continuing to evaluate this issue, would be issuing an Information Request associated with the EA, and had particular technical questions with regard to the design of the seat belt webbing system and in particular on the propensity for the webbing to bunch. Based on the conversation between ODI and VW on May 28, 2020, Volkswagen provides the following additional information.

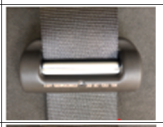
As noted above, in developing the design of the VW DLT-1, Volkswagen and the supplier (ZF-TRW) incorporated various design elements intended either to reduce any propensity for bunching or to address any consequences that could arise from bunching. The favorable performance of the Tiguan, as well as peer vehicles, in the real world demonstrates that these efforts have been successful in ensuring that the seat belt system, combined with the vehicle restraint system, provide high levels of crash protection and perform admirably in real world crashes.

A. Clamping Width

ODI stated its belief that a clamping width of 60% of the webbing width appears to be unique to the VW DLT-1 design, and that a full clamping width is preferable. During VW's development process, the opposite was found to be true – it was found that a full width clamping of the webbing could allow the webbing to tear more easily and to fray at the edges. The supplier (ZF-TRW) provided an improved, patented design to reduce the potential for tearing or fraying incorporating the more limited clamping width (Patent – US 2015/0314749 A1). Moreover, while the VW DLT-1 Volkswagen Group design is specific to the VW Group, the concept of limiting the clamping width is not. This is evidenced by the fact that Autoliv also has a patent covering a reduced clamping width design (Patent – US 2016/0206050 A1) and competitors vehicles have applied design features of the Autoliv patent.

Response 4(a) cont'd.

VW provides the following table as an overview of various CLT designs available. In this table, VW references the clamping width for the different CLT models.

Supplier	Model Name	Outside	Inside	Side	Clamping width	Relief area?	Vehicle	Remarks
Autoliv	CLT-R				100%	no	F-150 MY 2015+ according to replacement part documentation	CLT-R = Crash Locking Tongue-Reversible
Autoliv	CLT-Ri				~ 60%	small	Ford, BMW, Nissan, GM, VW, Subaru, Tesla, FCA, Honda according to Autoliv	Patent Autoliv (circa 2016) CLT-Ri = Crash Locking Tongue-Reversible improved
ZF	DLT-1				~ 88% (52mm - 2x3mm)	small	F-150 MY 2018+ according to replacement part documentation	NHTSA Part DLT = Dynamic Locking Tongue
ZF	VW DLT-1				~ 60% (52mm - 2x 10.5mm)	yes	VW Group	
JSS	J2				tbd	no	F-150 up to MY 2015/2016 according to JSS	Clamping width has to be determined

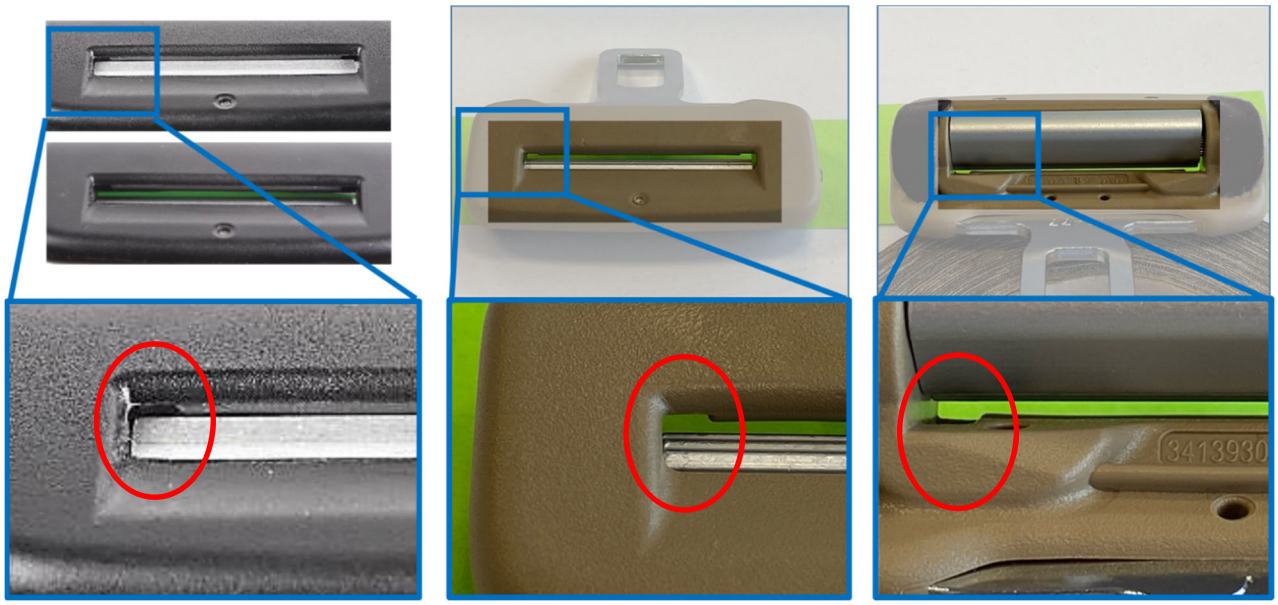
The Autoliv CLT-Ri has a clamping width that is comparable to the VW DLT-1 supplied by Volkswagen.

The DLT-1 from ZF-TRW, supplied to the Ford F-150 MY 2018 and younger, for example, is believed to have been shown by ODI during the meeting with VW on May, 28, 2020. The agency showed this DLT-1 from ZF-TRW as an example of a CLT with a 100% clamping width.

It is Volkswagens assessment, that the DLT-1 from ZF-TRW has notches in both ends of the webbing slot that can be seen in NHTSAs picture below, that have the effect that the counter support to the "100% cam" is shorter than the cam itself. The width of the notches are about 3 mm each, so that the cam width of 52mm results in an active clamping width of 46mm or 88%.

Response 4(a) cont'd.

In the pictures below, when viewed from a different angle, the notches can be observed. The picture on the left was shared by NHTSA during the May, 28, 2020 meeting; corresponding photographs (middle, right) are provided of an exemplar replacement DLT-1 from ZF-TRW (for F-150 MY 2018) and the backside of the same exemplar, as well as magnifications of the notches.



VW will investigate the JSS J2 clamping with and provide an update to the table above.

B. Cam Relief Area

VW understands ODI's concern about a less than complete clamping width to be that such a design could potentially provide more room for the webbing to bunch, thus increasing the potential for bunching. By providing the webbing with more space for insertion (reducing the clamp width, recesses in the housing), the design helps to reduce the load path concentrations.

Figure 1. Autoliv CLT-R (original design)

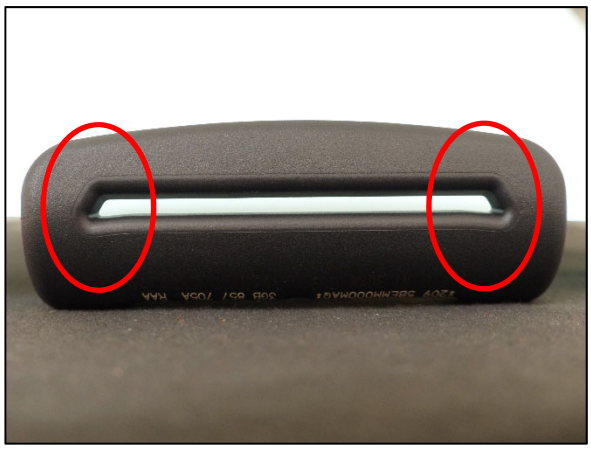


Figure 2. Autoliv CLT-Ri (new design)

The analysis of CLTs that are available in the market also indicate that Autoliv incorporated a wider opening at the outer side of the webbing slot, as can be seen in Figure 1 and Figure 2. (Which is used, for example, in GM, Daimler, FCA, BMW, Ford, Nissan, Subaru and Tesla vehicles of recent MYs.)

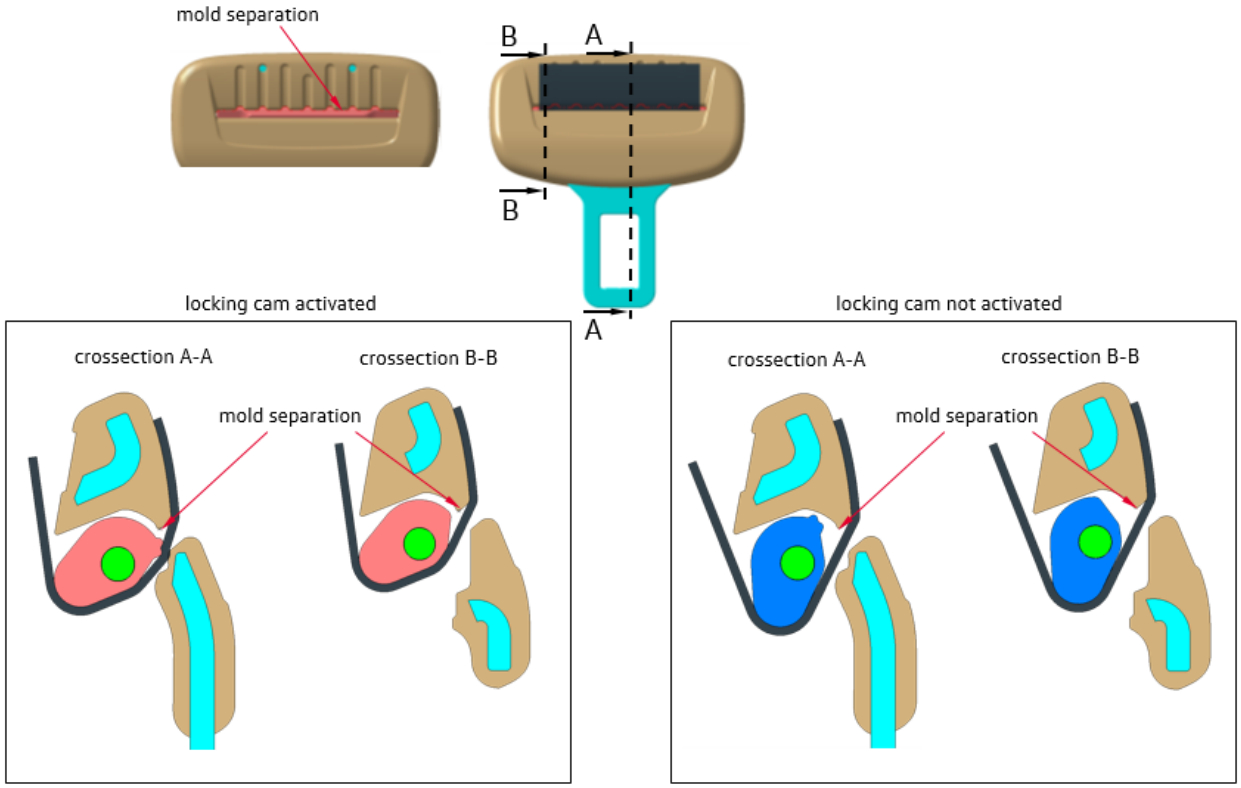
Response 4(a) cont'd.

C. Bent cam axle

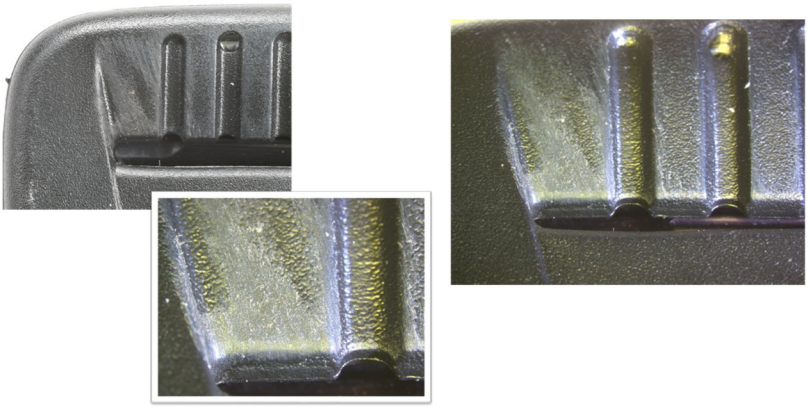
It was our understanding that ODI stated that a bent cam axle would have intensified bunching. VW's position is that the potential for bunching cannot be avoided and that webbing needs space. Therefore the bending of the axle provides more space for the bunched webbing and has no negative effect.

D. Mold Separation Ridge

ODI observed that the separation line (ridge) from the molding tools of the VW DLT-1 provides a sharp edge which may have cut the webbing during the NCAP crashes. The webbing does not touch the mold separation ridge in any of the cam positions and the separation line is not a factor in belt performance:



The polymer housing is not strong enough to damage the webbing. Photos from NHTSA's NCAP tests show abrasion and deformation on the working surface of the VW DLT-1 housing, not at the ridge.



Response 4(a) cont'd.

E. Guiding Grooves

ODI additionally raised questions about the "guiding grooves" molded into the polymer housing. Guiding grooves were added to reduce the lateral movement of the webbing during the longitudinal movement through the slot of the VW DLT-1. The guiding grooves increase the friction between the webbing and the insertion slot surroundings, reducing the lateral belt movement. The polymer is not strong enough to damage the webbing. Latch plate polymer housings are typically found deformed after a crash.

As there are no sharp edges that the belt webbing could have come in contact with, it is likely that the belt ruptured due to overload. ODI's theory of the microscopic images in zone 1 showing "cut" fibers seems unlikely. However, VW has not had the opportunity to examine the parts for in order to determine a root cause.

VW renews its request for an opportunity to inspect the vehicles and components housing and seat belts) used in both of NHTSA's NCAP tests.

F. Semi-flexible buckle

VW understood ODI to suggest that the flexible buckle stalk or stanchion may be a contributing factor to the results of NHTSA's NCAP tests. A survey of other vehicles in the market has thus far found that a flexible buckle stalk is also frequently used by competitors.

G. Summary

The VW DLT-1 design is robust and state-of-the-art. Several aspects of the VW DLT-1 design were implemented to minimize lateral shifting of the belt webbing and reduce load concentrations or changes in the load path. The guiding grooves increase lateral friction and the extra room at the ends of the insertion slot allows the webbing to bunch more safely by providing relief space.

Another variable influencing the amount of bunching is the initial lateral position of the webbing in the slot. The guiding grooves are designed to reduce the lateral movement of the webbing during the longitudinal movement through the slot when the occupant fastens the seat belt. Without the opportunity to examine the belts, VW is unable to determine a cause of the "cut" NHTSA identified in zone 1 of its microscopic inspection reported to VW. There are no sharp edges in the VW DLT-1 slot to initiate a "cut".

VW will of course answer any additional questions as discussions continue.

Request 5

Describe in detail and provide all documentation and reports for all, past, present and future, assessments, analyses, tests, test results, studies, surveys, simulations, investigations, inquiries and/or evaluations (collectively "actions") that assess the effect of the offset loading of the seat belt system when the webbing transitions to be concentrated at the "upper" end of the CLT. These actions should include those conducted by VW or any other entity on VW's behalf.

Response 5

Volkswagen is collecting this information and intends to provide supplemental information responsive to this request on or before July 10, 2020.

In addition to internal evaluations, Volkswagen has commissioned Exponent to conduct various analyses aimed at evaluating the extent to which the belt separation presented in NHTSA's NCAP tests are represented in real world crashes, the performance of the Tiguan seat belt webbing design in real world crashes in comparison to peer vehicles, and to compare the Tiguan belt components to those of peer vehicles. VW also asked Exponent to review VW's sled testing previously conducted in the Design of Experiment and other related sled tests.

As a preliminary measure, the Exponent analyses and reports cover the following topics:

a. Introduction and Background;
b. Vehicle Risk Assessment - A discussion of injury risk for front row belted occupants involved in frontal crashes for the 2018-2020 VW Tiguan and various other peer vehicles;
c. Analyses of Collision - Involved Vehicle Components – A census of parts removed from 2018-2020 VW Tiguan's that had been scrapped due to frontal collision involvement;
d. Observations on VW Sled Test Series - A discussion of the sled test program VW undertook in response to PE18-001;
e. Vehicle Performance in Crashworthiness Consumer Metrics Testing - A discussion of 2018 Tiguan and peer vehicle performance in IIHS consumer metrics testing;
f. Patent and Technical Literature Search - A discussion of publications related to the application of a seat belt latch plate that locks in position during a loading event;
g. Seat Belt Design Analysis - A comparison of VW Tiguan seat belt components to competitive vehicles.
h. Summary of Conclusions.

While some of Exponent's preliminary results have been incorporated throughout this response, VW anticipates that Exponent will shortly finalize its report and VW will submit it to the agency on or before July 10, 2020. In summary, Exponent has not found evidence of any belt webbing separation in real world frontal crashes, and the performance of the Tiguan in real world scenarios compares favorably with market peer vehicles. VW's sled testing supports VW's conclusion that the webbing separation seen in NHTSA's NCAP tests was a test artifact due to the effects of the ATD cable routing, conditions that cannot affect real world belt performance in front crashes.

Request 6

Describe in detail and provide all documentation for the Design of Experiments (DOE) that led to the 21 sled tests VW conducted whose results were submitted in response to an IR letter dated January 2018 from this agency to VW. What conclusions did VW draw from the results of the sled tests? Furnish any and all documentation on the assessment of the results of the sled tests.

Response 6

Volkswagen's sequence of sled tests was grouped into three series – some of which were designed with a Design of Experiment (DOE) in mind, and some of which were beyond the scope of the DOE to understand what led to the webbing tearing in the MY 2018 NCAP test.

A DOE typically contains three components:

1. Control variables – those elements of the experimental conditions that are to be held constant across the population of test events that make up the DOE. These variables are uniformly applied in each experimental event and each are subject to individual test-to-test variations, "noise" in the control variable.
2. A dependent variable – that feature or characteristic test outcome that is to be observed as a test result.
3. An independent variable – that feature or characteristic that is selected and set as an initial condition or boundary condition, variation of which is expected to influence or determine the test outcome of the dependent variable.

With regard to VW's testing, the control variables affecting the sled test results at least included:

a. Sled pulse,
b. Seat position,
c. Webbing strength,
d. Webbing bending resistance,
e. Air bag output,
f. Air bag firing time,
g. Belt pre-tensioners' firing times,
h. Load limiter firing time
i. ATD initial position,
j. Seat trim,
k. Initial belt position and geometry across the ATD,
l. Initial belt position in the latch plate,
m. Buckle dynamic response,
n. Data cable condition, unshielded bundle or bundle with protective covering (varying mass),
o. Data cable position with respect to the buckle/CLT couple (if present)

The dependent variable is the belt condition following the test. The independent variable was the ATD data cable location -- although it should be noted that when applied, there is noise in this variable as well. The ATD cable location is not simply dichotomous, it has an infinite range of placement and configuration variations.

The VW sled test series must be considered in light of the purposes of each test series. Some tests were conducted in an effort to study certain control variables and to replicate the conditions of the MY 2018 NCAP tests. This was the first test series.

Response 6 cont'd.

Because the first test series did not result in belt separation, VW made a further effort (the second test series) to achieve belt separation by increasing the dynamic loading on the seat belt and creating incremental stress conditions to evaluate the impact of the ATD cable routing in NHTSA's MY 2018 NCAP tests. The second test series represents a traditional DOE and is the appropriate

DOE to consider in this matter when reviewing testing aimed at determining whether the routing of the ATD cable was the contributing factor to the webbing separation. Finally, a third test series was conducted to evaluate the effects of changes in various control variables and to evaluate potential countermeasures.

This test series, although provided to the agency as part of the PE18-001 response, was not a part of the Design of Experiment to understand why NHTSA's MY 2018 NCAP tests resulted in web separation.

The Exponent Report will include a detailed analysis of each of the test series. For purposes of this response, we will focus on the test series one and two.

Test Series One included five tests (Tests G2170517 to G2170521). The purpose of the first test series was to replicate the NCAP belt failure condition using a sled test. VW recognized that use of the sled test approximated, but could not precisely replicate, restraint system dynamic loading in an NCAP test. This is because the test body for the sled was reinforced to enable repeated use without the necessity of structural parts replacement following each test. The reinforced structure places incremental load demand on the restraint system, including the belt and attachments, because the body structure absorbs none of the collision energy.

Test Series One started with an NCAP configuration: 50% HIII, seat position mid-track full down, production restraint system, pulse at 33.8 g to replicate the NCAP test dynamic, given the limitations of the sled test. (Tests G2170517 & G2170518). Control variables were modified to increase dynamic belt loading; seat pitch was added (23 mm at the rear) to simulate body pitch during a NCAP test; seat position was variably adjusted. (Tests G2170519 - G2170521). Buckle position was fixed to the seat with a bolt, coupling the buckle stanchion to the seat frame. (Test G2170521) The latch plate was rotated out-of-position and bypassed the buckle latch, the buckle failed in this test due to excessive eccentric loading on the out-of-position buckle that was prevented from self-aligning with movement of the latch plate.

Test Series Two was a DOE with control variables held constant. There were three tests: G2170527, G2180001, & G2180002. Each test was conducted with a stronger 38.4 g pulse, seat pitch (23 mm at the rear), and a weighted data cable jacket added. The results of these tests were as follows:

a. G2170527 – The buckle opened during the test. Belt damage was evident at edge fraying at the latch plate prior to buckle release.

b. G2180001 – Test with ATD cable routed inboard, similar to NHTSA's MY 2018 NCAP test - webbing fracture 40% - 50% on the upper edge and fiber fractures in the lower half of the belt.

c. G2180002 – Test without ATD cable – The upper edge of the webbing folded away from the occupant over about 20% of belt width; no tearing into the webbing.

This test series supported VW's conclusion, as set forth in response to the PE and as reiterated in response to the EA, that the ATD cable was the controlling factor resulting in webbing failure. The different independent variable selection (with and without the ATD cable), and the different test outcomes (webbing tear and no webbing tear) support VW's conclusion about the ATD cable's impact on the outcome of NHTSA's MY 2018 NCAP tests.

Response 6 cont'd.

This test series additionally mirrors the dichotomous results between NHTSA's NCAP tests (with ATD cable at the buckle/latch plate couple) and VW's NCAP tests (without ATD cable at the buckle/latch plate couple).

The sled test series one and two were designed to attempt to replicate and then to test the hypothesis that the routing of the ATD cable created a load path that was unanticipated and not a reflection of a test replicating real world conditions. While the initial testing simulating NCAP level loads did not reproduce the failure, testing with enhanced loads was able to show that with the ATD cable routed as in the NCAP test, webbing failure could result but without the ATD cable so routed webbing failure did not result.

The additional test series, Test Series Three, was not actually part of the DOE, and was instead intended to collect preliminary data towards potential countermeasures, should they become necessary.

Request 7

Specifically, for sled tests 20 (G2180023) and 21 (G2180024):

a. Describe the test set up;
b. Furnish VW's assessment of the contradictory results of these two (2) tests;
c. Furnish VW's assessment of the results of sled test 21 (G2180024) that appear to be incompatible with VW's promulgated theory that the dummy umbilical cable caused the seat belt failure in both NCAP tests conducted in December 2017 on 2018MY VW Tiguan vehicles.

Response 7

As set forth above, the tests conducted as part of Test Series Three were intended towards conducting research into the effects of control variable changes and possible remedies, and Test Series Three is not considered part of the initial Design of Experiment to determine the impact of the ATD cable routing. All tests in Series Three were conducted with the more severe 38.4 g pulse (a condition which exceeds the capacity of the Tiguan structure), with simulated seat pitch, and with a seat adjustment to move the driver chest forward in reference to mid-track to adjust chest-to-air bag spacing as reflected at seat level, at mid-position, and full-down.

Thirteen tests were conducted (G2180003, G2180004 and G2180014-G2180024). VW tested control variables including: webbing stock (non-production), latch plate (standard without the CLT feature also a non-production feature as applied to the Tiguan), switchable load limiter applied or not, variable firing time for the outboard pre-tensioner.

Seven test were conducted with the Tiguan production webbing. None of the tests was conducted with an ATD cable and do not fit a DOE structure. Within this group, a standard latch plate was used in tests G2180004 and G2180017-G2180021. The webbing folded away from the occupant in G2180004, G2180014, and G2180019. The other tests of this configuration had no webbing fold. This variance may reflect the effects of control variable noise.

One test, G2180015 conducted without the ATD cable changed a control variable, the switchable belt load limiter. The switchable belt load limiter feature was not activated and the webbing tore through the entire width of the belt. One test, G2180016 conducted without the ATD cable changed a control variable by delay in actuation of the lower anchor pre-tensioner; the belt folded over away from the occupant at the upper end of the latch plate belt pass-through slot. The webbing did not tear.

Response 7 cont'd.

Four tests, G2180003 and G2180022 - G2180024 were conducted with a control variable change, the belt webbing was from a different supplier whose web stock has not been used in US Tiguan production. Test results do not inform the issue concerning the Tiguan belt performance in the NCAP test as the crash pulse used in these tests exceeds the Tiguan structural capacity, and the webbing is different than the webbing in question. One test, G2180003 was conducted with an ATD cable; the other three tests were conducted without an ATD cable. In test G2180003, the cable bundle was covered by a fabric shield and placed low along the seat bolster adjacent to the buckle. It appears that the cable bundle remained outboard of the buckle/latch plate couple during the test and did not interact with the latch plate.

Five tests, G2180017 – G2180021 were common in use of the production belt webbing and a change in control variable by substitution of a standard (non-locking) latch plate in place of the production VW DLT-1 latch plate. None of the tests were conducted with an ATD cable. Four tests: G2180017, G2180018, G2180020, and G2180021 had no webbing fold at the latch plate. Test G2180019 post-test, presented a webbing fold at the latch plate. These tests illustrate effects of control variable noise.

Three tests: G2180022, G2180023, and G2180024 were conducted in the same manner and application of uniform control variables, but with control variables different than applied in most of the other tests in Test Series 3 -- the belt webbing was the non-production webbing stock manufactured by van Oerle. That webbing stock is not used in the US model Tiguan. For all three tests, the pulse was 38.4 g, there was no ATD cable, the belt webbing was non-production from van Oerle, the seat was pitched +23 mm at the rear to simulate body pitch in a NCAP test, the seat was adjusted rearward 12 mm from mid-track position to adjust the driver chest-to-air bag couple distance and replicate that in the NCAP test position, production VW DLT-1 latch plate, and conventional timing for the retractor pre-tensioner, lower anchor pre-tensioner, air bag, and force limiter.

Tests G2180022, G2180023 were performed in a uniform manner; both presented webbing folding at the latch plate, neither broke the webbing. Test G2180024 was performed in a manner similar to tests G2180022 and G2180023 however, in this test the webbing tore through the entire width of the webbing. The different outcomes among G2180022/G2180023 in contrast to G2180024 are likely due to: effects of control variable noise among the three tests, unique to each test; excess loading of the belt webbing due to the higher deceleration pulse applicable to all three tests; excess loading of the belt webbing due to the reinforced body structure applicable to all three tests; and the test series do not represent conditions of equivalence to the investigation of Tiguan belt webbing, because the test conditions are not equivalent to the conditions that pertain to a Tiguan NCAP test.

The result presented by sled test 21 (G2180024) does not inform an evaluation of the VW hypothesis that the NCAP belt separations are consequent to the interference of the ATD instrumentation cable bundle with the seat belt latch plate. Test G2180024 is unlike an NCAP test in that:

a. The restraint loadings are different due to the reinforced test body used in the sled test environment;
b. The restraint loadings are different due to the absence of dynamic pitch effects presented in a NCAP test and not fully replicated with a static seat pitch adjustment in a sled test; and
c. A higher deceleration pulse was prescribed for the sled test to stress the restraint system beyond that presented in a NCAP test. The higher pulse exceeds the capacity of the Tiguan structure.

Request 7 cont'd.

The best comparison testing available to test the VW hypothesis that the ATD data cable resulted in webbing separation are the test pairings made by NHTSA and VW. In the NHTSA NCAP tests, the ATD data cable was routed inboard and placed such that it could interfere with the buckle/latch plate coupling, dependent upon initial placement and collision dynamics; in both NHTSA NCAP tests, the webbing tore through the entire belt width.

VW conducted two NCAP tests with no data cable effects on the latch plate and the webbing did not tear.

Request 8

For the 21 sled tests referred to in Request 6, furnish VW's reasoning for conducting some of the tests with standard seat belt latch plates and what conclusions were drawn from the results of those tests.

Response 8

As noted above, the testing VW conducted was separated into two primary parts. First was testing conducted in an effort to evaluate and attempt to replicate the webbing separation from the MY 2018 NCAP tests. The second effort (Test Series Three) was not part of that same effort. Instead, Test Series Three was aimed at conducting various tests with differing configurations to obtain foundational information that could be built upon should additional countermeasures be considered. Seven of the thirteen tests in Series Three were conducted with standard seat belt latches in order to derive an initial assessment with regard to the general robustness of the restraint system design and dummy kinematics. Following the PE response, a full vehicle crash test using a standard seat belt latch was conducted in order to obtain initial measures on dynamic performance (such as chest deformation). The initial assessment from these tests was that the vehicle with the VW DLT-1 installed achieves overall better performance measures than without the VW DLT-1 installed.

Request 9

Describe in detail and provide all documentation for the Design of Experiments (DOE) that led to the full vehicle barrier impact tests VW conducted whose results were submitted in response to an IR letter dated January 2018 from this agency to VW.

Response 9

Repeat the NCAP test from December 2017 with adjusted test set up (dummy umbilical cord on the outside) to prove that this test fulfills all requirements. Volkswagen sought to confirm the theory that the dummy umbilical cord routing, via the center armrest, was the cause of the failure in MY 2018 NCAP test that led to this investigation.

Volkswagen has developed the Tiguan safety system with its components and its overall safety performance in the same careful manner as any other VW vehicle model. All release tests have fulfilled or exceeded the applicable requirements.

In 2017 Volkswagen was surprised by the results of the two NCAP Tests that have been conducted for NHTSA.

After the initial investigations that led to submissions to NHTSA in 2017 and in the beginning of 2018 it is/was Volkswagens conclusion that the dummy umbilical cord had an influence and caused the outcome of NHTSA's 2 NCAP Tests. Volkswagen's experience during the vehicle development was that the new Tiguan vehicle architecture performed well in NCAP with a cable routing that could not

Response 9 cont'd.

interact with the belt buckle and/or VW DLT-1 during the crash sequence. The DOE addressed the hypothesis: the routing of the ATD cable in NHTSA's NCAP tests created a load path that was unanticipated and not a reflection of a test replicating real world conditions. Absent the cable effects, the webbing will not fail in a frontal NCAP test.

Two additional crash tests were performed consistent with the NCAP configuration that showed no separated seat belt. One was a FMVSS 208 compliance test conducted for NHTSA (Test number – C20185807). The other one was a FMVSS 208 test done at VW's crash test facility in the course of the standard conformity of production tests that Volkswagen conducts on a regular basis for all product lines.

All VW tests showed that there was no webbing separation in 35 MPH full frontal barrier crash tests in an NCAP configuration.

Development Test for Releasing Vehicles/Systems

The test according to TL 471 - 8.3 "Dynamic testing with 95th percentile male in the vehicle" is usually performed at Volkswagen, due to the vehicle components required, e.g. body in white, seats, dashboard, steering wheel, air bag, etc.

While the tests are to be conducted by the seat belt supplier and, are designed to test the seat belt assembly, the restraint systems of new Volkswagen vehicles are subject to full scale crash tests conducted by Volkswagen for release in the US Market. The specific applicable tests are identified in the following table:

Make	Model	Safety	Vehicle	Target	Dummy		Test procedure	Test date	Facility	Result	Test identifier
					Driver position	Passenger position					
VW	Tiguan	USNCAP	35mph	rigid barrier 0°	50% male	5% female	USNCAP	23-Mar-17	Volkswagen WOB	i.O.	PG170099
VW	Tiguan	FMVSS 208	35mph	rigid barrier 0°	50% male	50% male	FMVSS 208	30-Mar-17	Volkswagen WOB	i.O.	PG170105
VW	Tiguan	USNCAP	35mph	rigid barrier 0°	50% male	5% female	USNCAP	26-Apr-17	Volkswagen WOB	i.O.	PG170140
VW	Tiguan	USNCAP	35mph	rigid barrier 0°	50% male	5% female	USNCAP	30-Jun-17	Volkswagen WOB	i.O.	PG170223

The following table represents the crash tests that were performed after the MY 2018 NCAP test with seat belt separation. All test results passed and did not experience a belt separation.

Make	Model	Safety	Vehicle	Target	Dummy		Test procedure	Test date	Facility	Result	Test identifier
					Driver position	Passenger position					
VW	Tiguan	USNCAP	35mph	rigid barrier 0°	50% male	5% female	USNCAP	11-Jan-18	Volkswagen WOB	i.O.	PG180006
VW	Tiguan	USNCAP	35mph	rigid barrier 0°	50% male	5% female	USNCAP	18-Jan-18	MGA	i.O.	PG187799
VW	Tiguan	FMVSS208	35mph	rigid barrier 0°	50% male	50% male	USNCAP	19-Nov-18	Volkswagen WOB	i.O.	PG180277

Request 10

State the number of each of the following, received by VW or of which VW is otherwise aware, which relate to, or may relate to, the alleged defect in the subject and peer vehicles and produce copies of all documents related to each item organized by category:

a. Consumer complaints, including those from fleet operators;
b. Field reports, including dealer field reports;
c. Reports involving a crash, injury or fatality;
d. Property damage claims;
e. Third-party arbitration proceedings where VW is or was a party to the arbitration;
f. Lawsuits, both pending and closed, in which VW is or was a defendant or codefendant.

Response 10

Volkswagen has not identified any field inputs – including those listed in the Request – which relate or may relate to the alleged defect in the subject and peer vehicles. Volkswagen notes that it previously reviewed a VOQ alleging a seat belt separation in a 2018 MY VW Atlas, which was determined to be due to improper stitching process. VW's assessment was conveyed to the agency in October, 2018 with regard to ODI record #11142623.

As part of its analysis, Volkswagen commissioned Exponent to review relevant field experience, search for such occurrences, and compare the Tiguan's field performance in comparison to market peer vehicles (in this case, "market peer" refers to peer vehicles used in the study and not "peer vehicles" as used in the IR.) As part of this assessment, Exponent reviewed FARS and certain state databases. For the MY 2018 and later Tiguan models, there are no fatally injured belted drivers or belted right front seat occupants in frontal crashes reported in the FARS. One frontal crash with a fatally injured Tiguan driver with unknown belt status was reported. A sensitivity analysis was also conducted, including frontal crashes with fatally injured drivers and right front occupants who were either belted or with belt use status unknown. In this analysis, the fatal injury with belt status unknown is included in the fatal risk calculation for Tiguan. The Tiguan does not have an elevated risk compared to other vehicles when unknown belt use cases are included.

Similarly, within the reviewed state databases, no Tiguan vehicles in frontal crashes with fatal or incapacitating injuries to belted drivers or right front occupants were identified in three of the five states reviewed, and vehicles with higher rates than the Tiguan were found in each of the reviewed databases. There were no fatal or incapacitating injuries in frontal crash Tiguan vehicles with unknown belt use status. There is, simply put, nothing in the FARS or the reviewed state databases to suggest that the Tiguan presents any elevated safety risk as compared to market peer vehicles.

In addition to the above analysis, Exponent is in the process of collecting (to the extent possible) seat belt components from collision-involved Tiguan vehicles found in salvage yards. Exponent to date has been able to identify and obtain components with regard to nine crashes. There is no physical data in the collection of seat belts from frontal collisions that the MY 2018-2020 VW Tiguan is experiencing seat belt separation or tearing damage in the collision event. Belts evidence expected loading effects after subjection to a front crash. There is no physical data from crashed cars that would indicate the MY 2018-2020 VW Tiguan belt system is likely to separate in a front crash due to dynamic collision loads on the belt.

The field evaluations provide further confirmation that the belt separation experienced in NHTSA's MY 2018 NCAP tests has not, and is not likely to, happen in real world crashes. Analyses of field crash data shows there is no elevated risk for front seat belted occupants in MY 2018-2020 VW Tiguans and confirms the test-induced belt separation was an artifact of an element of the testing not replicated in real world conditions.

Request 11

Describe any and all modifications or changes made by, or on behalf of VW in the design, material composition, manufacture, quality control, supply or installation of the subject component for the start of production to date, which relate to or may relate to the alleged defect in the subject and peer vehicles. For each modification or change, provide the following information:

a. The date or approximate date the modification or change was incorporated into vehicle production;
b. A detailed description of the modification or change;
c. The reason(s) for the modification or change.

Response 11

Additional Observations With Regard to the IR

In providing its responses to this Information Request, Volkswagen notes that it considers the definition of "document" in the Information Request to be unreasonably broad, vague, and ambiguous, and exceeds the scope of records that might reasonably be expected to bear relevant information.

Volkswagen's response to the Information Request is based on searches of locations currently in Volkswagen's custody and control, where documents determined to be responsive to the Information Request would normally be found, and in consultation with current personnel knowledgeable about the information requested. As a result, the scope of this search did not include, nor could it reasonably include, all of Volkswagen Group's "past and present officers and employees, whether assigned to its principal offices or any of its field or other locations, including all of its divisions, subsidiaries (whether or not incorporated) and affiliated enterprises and all of their headquarters, regional, zone and other offices and their employees, and all agents, contractors, consultants, attorneys and law firms and other persons engaged directly or indirectly (e.g., employee of a consultant) by or under the control of VW (including all business units and persons previously referred to), who are or, in or after 1995, were involved in any way with any of the following related to the alleged defect in the subject vehicles:

a. Design, engineering, analysis, modification or production (e.g. quality control);
b. Testing, assessment or evaluation;
c. Consideration, or recognition of potential or actual defects, reporting, record-keeping and information management, (e.g., complaints, field reports, warranty information, part sales), analysis, claims, or lawsuits; or
d. Communication to, from or intended for zone representatives, fleets, dealers, or other field locations, including but not limited to people who have the capacity to obtain information from dealers."

Volkswagen appreciates that, per agreement with ODI, the time period covered by the Information Request was changed to begin with MY 2015.

Volkswagen construes the Information Request as pertaining to vehicles manufactured for sale in the United States and its territories.

Conclusions

The belt separations experienced were due to loading effects from the ATD cable bundle interacting with the buckle/CLT coupling in NHTSA's NCAP tests. NCAP tests absent the ATD cable effects do not manifest webbing separation. Analyses of available real-world data presents no evidence of belt separations or elevated injury risk to front seat belted occupants in frontal crashes with MY 2018-2020 VW Tiguans.

Volkswagen will provide a more complete response in the coming days, both the testing previously conducted in response to NHTSA's MY 2018 NCAP tests and additional evaluations now in process to be reported by Exponent, confirm VW's assessment that the belt separations were the result of a test artifact and that the belt system does not present a defect or pose an unreasonable risk to motor vehicle safety.

Make	Carline	2015	2016	2017	2018	2019	2020	2021	Total Of VIN
Audi	A3 Cabriolet	4,550	2,951	1,350	2,013	920			11,784
Audi	A3 Etron		3,571	3,346	2,721				9,638
Audi	A3 Sedan	38,200	28,356	17,784	17,053	8,337	5,632		115,362
Audi	A3 Sportback		427						427
Audi	A4 Allroad	3,032	2,447	2,876	3,827	1,466	859		14,507
Audi	A4 Sedan	24,398	16,113	50,570	43,946	29,460	8,926		173,413
Audi	A5 Cabriolet	3,957	3,319	1,571	7,477	3,431	1,087		20,842
Audi	A5 Coupe	4,569	4,332	832	7,258	2,518	1,138		20,647
Audi	A5 Sportback				16,400	12,588	4,169		33,157
Audi	A6	15,424	28,314	15,395	14,972	18,639	5,691		98,435
Audi	A6 Allroad						642		642
Audi	A7	2,567	8,716	4,203	3,208	5,474	1,056		25,224
Audi	A8	6,444	3,480	3,641	735	4,497	1,804		20,601
Audi	e-tron					10,417	161		10,578
Audi	Q3	10,518	20,195	14,618	29,500	5,925	22,053		102,809
Audi	Q5	48,819	54,723	35,524	114,089	58,460	31,458		343,073
Audi	Q7	28,909		51,663	47,558	45,876	9,853		183,859
Audi	Q8					17,111	6,432		23,543
Audi	R8 Coupe	455		1,302	785		601		3,143
Audi	R8 Spyder	267		230	348		315		1,160
Audi	RS3			245	1,875	1,431	439		3,990
Audi	RS5 Cabriolet	213							213
Audi	RS5 Coupe	831			1,265	1,093			3,189
Audi	RS5 Sportback					3,184			3,184
Audi	RS7	542	1,107	767	235				2,651
Audi	S3 Sedan	3,983	4,106						8,089
Audi	S4 Sedan	4,279	1,930				1,147		7,356
Audi	S5 Cabriolet	1,280	805	434	2,784	1,107	373		6,783
Audi	S5 Coupe	2,324	1,909	405	3,032	1,120			8,790
Audi	S5 Sportback				7,974	5,319			13,293
Audi	S6	376	2,169	1,578	1,457				5,580
Audi	S7	523	1,520	1,174	826		604		4,647
Audi	S8	697	564	569	26				1,856
Audi	TT Coupe	444	2,799	1,599	959	654	304		6,759
Audi	TT Roadster	306	704	590	435	292	164		2,491
Audi	TTRS				725	494	101		1,320
Volkswagen	Arteon					4,088	2,235		6,323
Volkswagen	Atlas				84,211	101,104	6,214	4,563	196,092
Volkswagen	Atlas Cross Sport						14,453		14,453
Volkswagen	Beetle	11,713	12,059	9,638	8,365	8,990			50,765
Volkswagen	Beetle Convertible	8,641	5,690	7,488	5,568	11,022			38,409
Volkswagen	CC	5,254	3,859	1,837					10,950
Volkswagen	e-Golf	3,370	7,893	1,742	526	5,555			19,086

Make	Carline	2015	2016	2017	2018	2019	2020	2021	Total Of VIN
Volkswagen	Eos	2,742	1,136						3,878
Volkswagen	Golf	26,980	16,560	18,145	6,275	5,968	2,321		76,249
Volkswagen	Golf R	1,771	5,278	4,300	3,544	5,350			20,243
Volkswagen	Golf Sportwagen	16,407	19,123	34,379	10,517	16,095			96,521
Volkswagen	GTI	27,814	24,616	32,624	14,943	14,257	5,041		119,295
Volkswagen	Jetta	117,813	125,466	141,641	31,692	179,817	37,156		633,585
Volkswagen	Passat	98,078	57,437	76,536	41,809	14,023	17,042		304,925
Volkswagen	Tiguan	22,513	44,602	51,081	111,291	110,213	72,277		411,977
Volkswagen	Touareg	3,964	8,274	5,105					17,343
	Total	**554,967**	**526,550**	**596,782**	**652,224**	**716,295**	**261,748**	**4,563**	**3,313,129**