



Question 7a: Provide the following information related to the subject system:

- a. Provide a detailed description of the design and operation of the subject system in all crash modes, including system capability in intersection or road junction crossing path collisions over the full range of object detection (e.g., pedestrian, bicycle, various vehicle types) and closing speeds;

Response 7a: The Tesla driver assistance system (“DAS”) uses signals from the radar and camera systems to determine when to issue a Forward Collision Warning (“FCW”) or apply Automatic Emergency Braking (AEB). [REDACTED]

The FCW / AEB system is designed to detect slow, decelerating, and stopped vehicles moving in the same general direction as the ego vehicle. The system’s braking interventions are chosen to minimize the risk that an AEB event would prevent the driver from executing his / her own evasive maneuver. As part of this, the system is disabled when it determines that the driver may be actively trying to avoid the accident through steering and / or brake pedal input.

FCW Operation Overview

- Tesla FCW provides notification that a front-to-rear collision is imminent.
- FCW is intended to provide the driver with sufficient warning such that that he or she can take corrective action and avoid or mitigate a collision.
- User interface:
 - Audible and visual alert
 - Driver can select timing of FCW on Driver Assistance page:
 - Early, Medium, Late, OFF

FCW Functional Operation

- Check input data [REDACTED]



[Redacted]

- Forward Collision Warning is issued under the following conditions (see response to Question 7g for additional details):

[Redacted]

AEB Operation Overview

- AEB system is an intervening safety system that is designed to mitigate front-to-rear collisions.
- User interface:
 - Vehicle will brake automatically
 - Driver can switch AEB ON/OFF on Driver Assist page
 - AEB is default ON after each ignition cycle

AEB Functional Operation

- Check input data

[Redacted]

- AEB is issued if (see 7g for details):

[Redacted]

[Redacted]

[Redacted]



Question 7b: Describe and provide copies of all documents related to system requirements documents and specifications for all features and functions including detailed descriptions of system design and operation and all associated sensor/camera technologies and specifications;

Response 7b: See question 7.c for sensor information and question 7.g for system operation information.



Question 7c: Provide a list of all end-to-end system suppliers, sensor/camera types, and locations on the vehicle. For each sensor/camera used by the subject system, state the operational range and field of vision ("FOV");

Response 7c: [Redacted]

[Redacted]

[Redacted]



[Redacted]

[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]
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[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

[REDACTED]



Question 7d: Describe the object recognition and classification process used for both rear-end collision scenarios and intersection or road junction crossing path collisions including monitoring time, sensor fusion logic, track maturity and overall system reaction planning and situation assessment;

Response 7d: [Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]



[Redacted text block 1]

[Redacted text block 2]

[Redacted text block 3]

[Redacted text block 4]

[Redacted text block 5]



Question 7e: Describe how the AEB and Autosteer systems detect faults that may affect system performance (e.g., compromised or degraded sensor/camera signals) and provide the following information about the fault detection logic and failsafe operation for each system:

i) A general description of the fault detection logic for each system, including how the subject systems detect compromised or degraded sensor signals (camera or radar) and a description of the different levels of fault severity used in Tesla's functional safety architecture;

ii) Describe when and how fault detection information is communicated to the driver, including all visual, audible and haptic messages/communications provided to the driver for different levels of fault severity occurring while in: 1) manual control; and 2) in Autosteer mode (include a description of the timing of the transition from automated to manual control for each fault condition occurring in Autosteer mode); and

iii) Describe how sensor fault detection, or other system faults, affect 1) the fusion logic for object recognition/classification and automatic braking function in manual control and Autosteer modes; and 2) the ability of the vehicle to determine steering/ directional control when in Autosteer mode;

Response 7e:


[Redacted response content]



[Redacted]

[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]
[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]
[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]
[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]
[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]
[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]
[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]	[Redacted]

Communication of fault detection to the driver

- When Autosteer is cancelled:
 - Visual warning message: *Take Over Immediately*
 Take Over Immediately
 - Audible warning: Warning chime
- When ACC is cancelled for camera visibility reasons:
 - Visual warning message: *Cruise Not Available - Reduced Front Camera Visibility*
 - Audible warning: Single chime
 - Haptic feedback: Vehicle slows down
- When ACC is cancelled for radar visibility reasons:
 - Visual warning message: *Cruise Not Available - Reduced Front Radar Visibility*
 - Audible warning: Single chime
 - Haptic feedback: Vehicle slows down
- When ACC is cancelled due to other faults:
 - Visual warning message: *Cruise Not Available*
 - Audible warning: Single chime
 - Haptic feedback: Vehicle slows down
- When AEB faults (includes non-recoverable faults)
 - Visual warning message: *Automatic Emergency Braking is Disabled*
[Redacted]
- When AEB is cancelled (recoverable fault that is generally due to environmental conditions):
 - No notification
[Redacted]



[Redacted text block]

Autosteer Behavior during Fault Conditions

[Redacted text block]



Question 7f: Describe all kinematic models used by the subject system for judging collision risk, calculating time to collision, and/or making decisions about braking for target/threat objects in intersection or road junction crossing path collisions;

Response 7f: [REDACTED]



Question 7g: Explain all inhibit and override/suppression conditions and operation points for the subject system, including minimum activation speed thresholds (mph), maximum operational speed (mph), brake pedal cancel threshold (mm, m/sec, kPa), steering wheel cancel threshold (force, displacement, and steering angle rate);

Response 7g: [Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]



[REDACTED]



Question 7h: Provide a detailed description of all designed-in system diagnostic and ad-hoc data logging including event images, event locations, sampling rates, trigger thresholds, data elements, recording controllers, and data retrieval methods;

Response 7h: [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]



[Redacted line of text]

[Redacted line of text]

[Redacted line of text]

[Redacted line of text]

[Redacted line of text]

[Redacted line of text]

[Redacted line of text]

[Redacted line of text]

[Redacted line of text]



1. 2019年12月31日，公司总资产为1,234,567.89元，较年初增加12.34%。其中，流动资产为890,123.45元，非流动资产为344,444.44元。

2. 2019年12月31日，公司净资产为567,890.12元，较年初增加8.90%。其中，实收资本为345,678.90元，未分配利润为222,211.22元。

3. 2019年12月31日，公司负债总额为666,677.77元，较年初增加15.67%。其中，流动负债为456,789.01元，非流动负债为209,888.76元。

4. 2019年12月31日，公司应收账款余额为123,456.78元，较年初增加5.67%。其中，账龄在1年以内的应收账款为112,345.67元。

5. 2019年12月31日，公司存货余额为345,678.90元，较年初增加10.12%。其中，原材料为234,567.89元，库存商品为111,111.01元。

6. 2019年12月31日，公司固定资产原值为1,234,567.89元，累计折旧为567,890.12元，账面价值为666,677.77元。



[REDACTED]

[REDACTED]

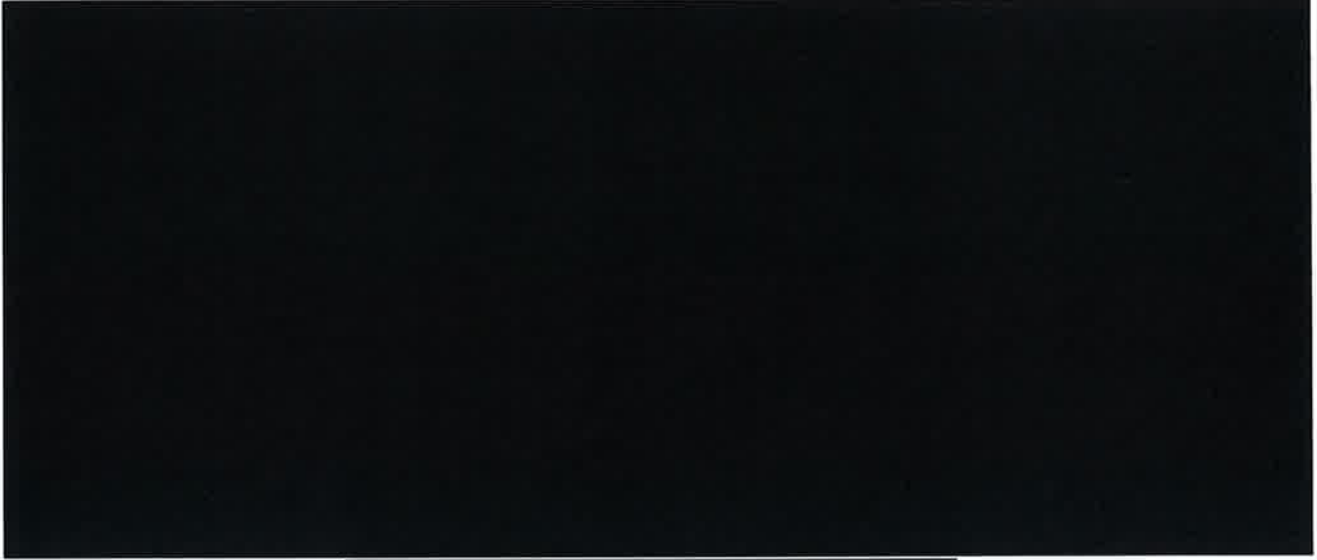
[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]





Question 7i: State the maximum braking authority and describe the sequence and timing of the cascade of events in an AEB activation (e.g., warning, pre-braking, full-braking);

Response 7i: [Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

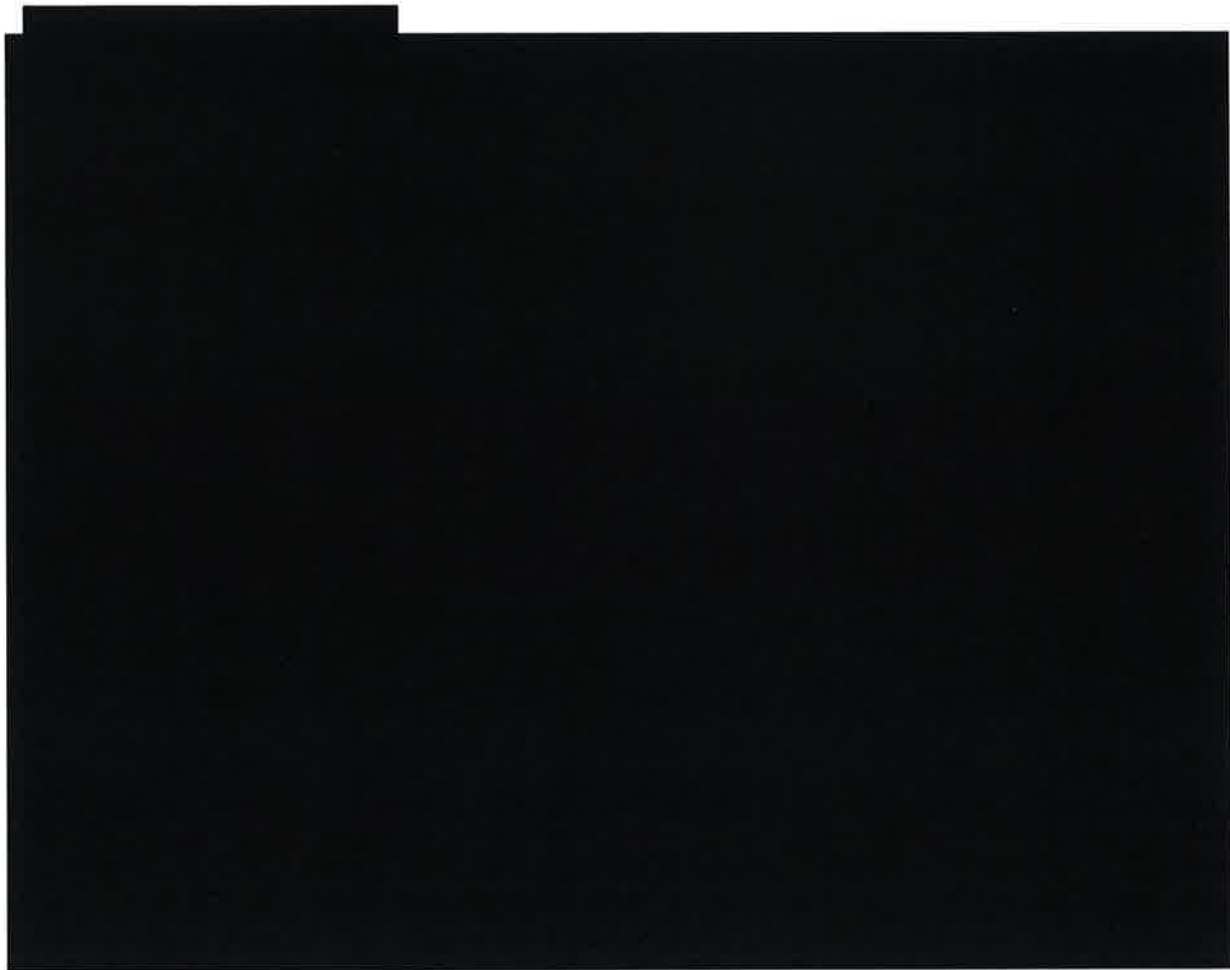
[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]





Question 7j: All vehicle-level testing and system simulations related to crossing traffic at-an intersection (pedestrians, bicyclists, passing vehicle, passing truck, etc.), left-turn across path, and automatic rear-end emergency braking on straight roadways;

Response 7j:

Automatic Emergency Braking has been validated for its intended use case of front-to-rear collisions following [REDACTED]. The Question 7 folder on the USB Drive contains the following test reports: [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]



Question 7k: All camera and sensor evaluations related to horizontal performance, vertical performance, ranging and detection, relative speed assessment, relative acceleration assessment, acquisition delay, update rates, and maximum number of tracked targets; and

Response 7k: [Redacted]



Question 71: Explain all design and testing methodologies employed to filter false positive events and interventions while preserving true events overall system accuracy.

Response 71: [Redacted text block containing multiple lines of blacked-out content]