

Hazard ID



HA-001
HA-002
HA-003
HA-004

INSTRUCTIONS:

Fill out the hazard analysis and risk assessment below.

HA-001 should be for the lane departure warning function as discussed in the lecture.

HA-002 should be for the lane keeping assistance function as discussed in the lecture.

Then come up with your own situations and hazards for the lane assistance system. Fill in the HA-003 and H

When finished, export your spreadsheet as a pdf file so that a reviewer can easily see your work.

Operational Mode
Normal driving
Normal driving
Towing (passive)
Towing (passive)

IA-004 rows.

Situational Analysis				
Operational Scenario	Environmental Details	Situation Details	Other Details (optional)	Item Usage (function)
Highway	Rain (slippery road)	High speed		Correctly used
Country Road	Normal conditions	High speed		Incorrectly used
Country Road	Normal conditions	Low speed		Correctly used
Country Road	Normal conditions	Low speed		Incorrectly used

Situation Description
Normal driving on a highway during rain(slippery road) with high speed and correctly used system
Normal driving on country roads during normal conditions with high speed (the driver is misusing the lane keeping
Towing (passive) on a Country Road during Normal conditions with low speed and correctly used system
Towing (passive) on a Country Road during Normal conditions with low speed and incorrectly used system

Function
Lane Departure Warning (LDW) function shall apply an oscillating steering torque to provide the driver with haptic
Lane Keeping Assistance (LKA) function shall apply the steering torque when active in order to stay in ego lane
Lane Departure Warning (LDW) function shall apply an oscillating steering torque to provide the driver with haptic
Lane Keeping Assistance (LKA) function shall apply the steering torque when active in order to stay in ego lane

Deviation
Actor effect is too much
Function always activated
Function unexpectedly activated
Function unexpectedly activated

Hazard Identification	
Deviation Details	
The LDW function applies an oscillating torque with very high torque (above limit).	
The lane keeping assistance function adds extra steering torque and does not stop providing the extra torque after	
In towing (passive) mode the LDW function should not activate but it unexpectedly activated	
In towing (passive) mode the LKA function should not activate but it unexpectedly activated	

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Hazardous Event (resulting effect)
Collision with other vehicle
Collision with other vehicle
Collision with other vehicle
Car spins out of control

Event Details
High haptic feedback can affect driver's ability to steer as intended. The driver could lose control of the vehicle and c
the driver treats the function as if it were meant for fully autonomous driving.
The haptic feedback can affect driver's ability to steer as intended. The towing (avtive) car can lose control of the ve
the driver treats the function as if it were meant for the towing situation.

Hazardous Event Description
The LDW function applies too high an oscillating torque to the steering wheel (above limit).
The LKA function applies constant torque to the steering wheel.
The LDW function applies an oscillating torque to the steering wheel without the need to do so.
The LKA function applies torque to the steering wheel without the need to do so.

Hazardous	
Exposure (of situation)	Rationale (for exposure)
E3	these condition may occure in range of 1 % to 10 % of average operating time
E2	That combination probably does not happen often
E2	That combination probably does not happen often
E2	That combination probably does not happen often

is Event Classification

Severity (of potential harm)	Rationale (for severity)	Controllability (of hazardous event)	Rationale (for controllability)
S3	Because the driver is traveling at	C3	Most drivers will have
S3	Because the driver is traveling at	C3	The malfunction was that
S1	Because the driver is traveling at low	C2	because we are at low
S1	Because the driver is traveling at low	C2	because we are at low

Determination of ASIL and Safety Goals	
ASIL Determination	Safety Goal
C	The oscillating steering wheel from the LDW function shall be limited
B	The LKA function shall be time limited and the additional steering
QM	The LDW function shall check regularly on its status and turn it off if the
QM	The LKA function shall check regularly on its status and turn it off if the