Hazard ID	
	Operational Mode
HA-001	OM03 – Normal driving
HA-002	OM03 – Normal driving
HA-003	OM03 – Normal driving
HA-004	OM03 – Normal driving

	Operational Scenario	Environmental Details
	OS04 – Highway	EN06 – Rain (slippery road)
	OS03 – Country Road	EN01 – Normal conditions
	OS02 – City road	EN01 – Normal conditions
	OS10 – Road with construction site	EN04 – Snowfall (degraded view)

Situational Analysis

	Situation Details	Other Details (optional)
	SD02 – High speed	N/A
	SD02 – High speed	N/A
	SD01 – Low speed	N/A
	SD02 – High speed	N/A

	Item Usage (function)	Situat
	IU01 – Correctly used	Normal driving on road) with high sp
	IU02 – Incorrectly used	Normal driving o conditions with h system (the drive assistance fun
	IU01 – Correctly used	Normal driving conditions with
	IU01 – Correctly used	Normal driving on during snowfall (and co

ion Description	**Function**
a highway during rain (slippery peed and correctly used system.	Lane Departure Warning (LDW) function shall apply an oscillating steering torque to provide the driver with haptic feedback.
on country roads during normal igh speed and incorrectly used r is misusing the lane keeping ction as a fully autonomous function).	Lane Keeping Assistance (LKA) function shall apply the steering torque when active in order to stay in ego lane.
on a city road during normal low speed and correctly used system.	Lane Departure Warning (LDW) function shall apply an oscillating steering torque to provide the driver with haptic feedback.
a road with construction site degraded view) with high speed rrectly used system.	Lane Keeping Assistance (LKA) function shall apply the steering torque when active in order to stay in ego lane.

Hazard

Deviation	Deviation Details
DV04 – Actor effect is too much	The LDW function applies an oscillating to with very high torque (above limit).
DV03 – Function always activated	The LKA function is always activated.
DV12 – Sensor sensitivity is too high	The LDW function applies an oscillating to too often, even in situations when the displacement from the center of the lane within acceptable bounds.
DV15 – Sensor detection too late	The LKA function does not detect the driv intervention on time and applies the steer torque in reverse of the driver’s intenti

Identification

	Hazardous Event (resulting effect)	Event De
rque	EV00 – Collision with other vehicle	High haptic feedback can a to steer as intended. Th control of the vehicle and vehicle or with road
	EV00 – Collision with other vehicle	The driver can misuse the f hands off the wheel and in car as a fully auto
rque is	EV-02 – Side collision with other traffic	Due to the very high sen steering wheel vibration wrongly, which may lead to driver may ignore
ver ring on.	EV-04 – Front collision with obstacle	The LKA function fails to intervention on time and torque in the opposite d intention, which prevents lane before the collisio

etails	**Hazardous Event Description**	
ffect driver’s ability e driver could loose d collide with another infrastructure.	The LDW function applies too high an oscillating torque to the steering wheel (above limit).	
function by taking both correctly treating the nomous vehicle.	The LKA function is always activated that causes the driver to treat the function as if it were meant for fully autonomous driving and stop focusing on the road.	
sor sensitivity, the may often be applied the situation when the the warning.	The LDW function is too often false-positively activated, and the driver starts ignoring its notifications.	
o detect the driver’s applies the steering irection of driver’s him from leaving the n with the obstacle.	The LKA function detects the driver’s intervention too late and applies the torque in reverse of the driver’s intention.	

Exposure (of situation)	**Rationale (for exposure)**
E3 – Medium probability	A high speed driving on a highway often occurs at least once a month for an average driver.
E2 – Low probability	The misuse of the LKA function on country roads may occur no more than a few times a year for the great majority of drivers.
E4 – High probability	A low speed driving on a city road occurs almost every day for an average driver.
E2 – Low probability	During the winter, there are some days with heavy snowfall with degraded view and there are some constructions on roads. Driving on such roads in such weather may occur a few times a year with an average driver.

Hazardous Event Classification

Severity (of potential harm)	Rationale (for severity)
S3 – Life-threatening injuries	On highways the car speed is expected to be hig In case of crash it may lead to fatal injuries
S3 – Life-threatening injuries	On country roads the car speed is expected to b high. In case of crash it may lead to fatal injuries.
S1 – Light and moderate injuries	Even if vehicles in other lanes move significantly faster than the ego car, in case the side collision the angle between cars woul be sharp and there would not be much harm to th driver.
S3 – Life-threatening injuries	Front collision with an obstacle with a high speed is most likely to cause very severe life threatening injuries or death of the driver.

	Controllability (of hazardous event)	Rationale (for controllability)
h. .	C3 – Difficult to control or uncontrollable	Due to excessive vibration, the wild swi the steering wheel may cause difficulty f drivers controlling the vehicle.
be	C3 – Difficult to control or uncontrollable	With both hands off the steering wheel a speed, a vehicle accident would not controllable.
of d he	C1 – Simply controllable	The driver is expected to keep his hands steering wheel but his attention may distracted and in some cases he may not properly.
-	C3 – Difficult to control or uncontrollable	A torque applied by the driver may not be to overcome the steering torque applie reverse direction by the LKA function beca LKA function is not able to detect the d intervention on time.

	Determination of ASIL and Safety Goals	
	ASIL Determination	**Safety Goal**
ngs of or most	C	The oscillating steering torque from the lane departure warning function shall be limited.
t high be	B	The LKA function shall be time limited and the additional steering torque shall end after a given time interval so that the driver cannot misuse the system for autonomous driving.
on the be react	QM	The hyper sensor sensitivity from the LDW function shall be prevented.
enough d in ause the rivers	B	The steering torque applied by the LKA function shall be limited, and the LKA function sensors shall detect the driver’s intervention on time.