

Hazard ID	Situational Analysis				
	Operational Mode	Operational Scenario	Environmental Details	Situation Details	Other Details (optional)
HA-001	OM03 - Normal driving	OS04 - Highway	EN06 - Rain (slippery road)	SD02 - High speed	Slippery road
HA-002	OM03 - Normal driving	OS03 - Country Road	EN01 - Normal conditions	SD02 - High speed	The driver is misusing the lane keeping assistance function as a fully autonomous function
HA-003	OM03 - Normal driving	OS04 - Highway	EN02 - Sun blares (degraded view)	SD02 - High speed	Direct sunlight to the lens of lane detection camera.
HA-004	OM03 - Normal driving	OS03 - Country Road	EN01 - Normal conditions	SD02 - High speed	-

		Hazard Identification			
Item Usage (function)	Situation Description	Function	Deviation	Deviation Details	Hazardous Event (resulting effect)
IU01 - Correctly used	Normal driving on highway during rain (slippery road) with high speed and correctly used system	Lane Departure Warning (LDW) function shall apply an oscillating steering torque to provide the driver with haptic feedback	DV04 - Actor effect is too much	The LDW function applies an oscillating torque with very high torque (above limit).	EV00 - Collision with other vehicle
IU02 - Incorrectly used	Normal driving on country roads during normal conditions with high speed (the driver is misusing the lane keeping assistance function as an autonomous function)	Lane Keeping Assistance (LKA) function shall apply the steering torque when active in order to stay in ego lane	DV03 - Function always activated	The LKA function applies steering torque constantly and tries to steer towards lane center.	EV-06 - Front collision with oncoming traffic
IU01 - Correctly used	Normal driving on highway during direct sunlight (to lens of the lane detection camera) with high speed and correctly used system.	Lane Keeping Assistance (LKA) function shall apply the steering torque when active in order to stay in ego lane	DV01 - Function not activated	The LDW function is not activated in the situation where the driver expects it is active.	EV00 - Collision with other vehicle
IU01 - Correctly used	Normal driving on country roads during normal conditions with high speed and correctly used system.	Lane Keeping Assistance (LKA) function shall apply the steering torque when active in order to stay in ego lane	DV10 - Actor effect is reverse	The LKA function applies steering torque to the opposite direction than it should.	EV04 - Car comes off the road

		Hazardous Event		
Event Details	Hazardous Event Description	Exposure (of situation)	Rationale (for exposure)	Severity (of potential harm)
High haptic feedback can affect driver's ability to steer as intended. The driver could lose control of the vehicle and collide with another vehicle or with road infrastructure.	The LDW function applies too high an oscillating torque to the steering wheel (above limit).	E3 - Medium probability	Wet road	S3 - Life-threatening or fatal injuries
User may misleadingly consider LKA as autonomous driving feature. When lane detection fails, the vehicle may drift out of the lane and collide with the oncoming traffic.	The LKA function applies steering torque longer than expected.	E2 - Low probability	Misuse not common	S3 - Life-threatening or fatal injuries
Driver does not notice car drifting out of the lane, and it collides with the adjacent traffic.	Sun shining directly to the camera lens prevents lane detection algorithm to work correctly. This is unexpected from the driver's point of view and the car may drift to the adjacent lane.	E2 - Low probability	Combination of environmental situation (sunlight) and unattended driving is not common. Normally driver increase attention to road in challenging visibility situations.	S3 - Life-threatening or fatal injuries
If car is drifting towards road edge, then applying steering torque to drift direction may lead to car coming off the road.	The LKA function applies steering torque to the opposite direction than it should causing the car come off the road.	E4 - High probability	Highway driving, normal conditions	S3 - Life-threatening or fatal injuries

Hazard Classification			Determination of ASIL and Safety Goals	
Rationale (for severity)	Controllability (of hazardous event)	Rationale (for controllability)	ASIL Determination	Safety Goal
High speed	C3 - Difficult to control or uncontrollable	Steering wheel vibrates excessively which is difficult to control for most drivers.	C	The oscillating steering torque from the LDW function shall be limited.
High speed	C3 - Difficult to control or uncontrollable	Driver not steering when moving on high speed.	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.
High speed	C0 - Controllable in general	Driver assistance function unavailable. Most drivers are able to control the vehicle without assistance.	QM	-
High speed	C1 - Simply controllable	The steering torque applied by the LKA function is not so high that >90% of drivers could not overdrive it.	B	The corrective steering torque of the LKA function must always be towards the centre of the ego lane.