

**INSTRUCTIONS:**

Fill out the hazard analysis and risk assessment below.

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

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

Then come up with your own situations and hazards for the lane assistance

When finished, export your spreadsheet as a pdf file so that a reviewer

Hazard ID			
	Operational Mode	Operational Scenario	Environmental Details
HA-001	OM03 - Normal driving	OS04 - Highway	EN01 - Normal conditions
HA-002	OM03 - Normal driving	OS03 - Country Road	EN01 - Normal conditions
HA-003	OM03 - Normal driving	OS04 - Highway	EN01 - Normal conditions
HA-004	OM03 - Normal driving	OS04 - Highway	EN01 - Normal conditions

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stance system. Fill in the HA-003 and HA-004 rows.  
er can easily see your work.

Situational Analysis			
Situation Details	Other Details (optional)	Item Usage (function)	Situation Description
SD02 - High speed	NA	IU01 - Correctly used	Normal driving high speed on highway
SD02 - High speed	NA	IU02 - Incorrectly used	Normal driving high speed on country road
SD02 - High speed	NA	IU01 - Correctly used	Normal driving high speed on highway
SD02 - High speed	NA	IU01 - Correctly used	Normal driving high speed on country road

Hazard Identification			
Function	Deviation	Deviation Details	Hazardous Event (resulting effect)
Lane Departure Warning (LDW) function shall apply an oscillating steering torque to inform the driver of the situation	DV04 - Actor effect is too much	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.	EV-06 - Front collision with oncoming traffic
Lane Keeping Assistance (LKA) function shall apply the steering torque when active in order to stay in ego lane	DV03 - Function always activated	Driver rely on the LKA to drive the car, driving at high speed and missusing the system	EV-06 - Front collision with oncoming traffic
Lane Departure Warning (LDW) function shall apply an oscillating steering torque to inform the driver of the situation	DV05 - Actor effect is too less	The weak feedback is unnoticed by the driver.	EV-06 - Front collision with oncoming traffic
Lane Keeping Assistance (LKA) function shall apply the steering torque when active in order to stay in ego lane	DV07 - Actor action too late	The LKA reaction time is too long to prevent the vehicle from leaving the lane.	EV-06 - Front collision with oncoming traffic

Event Details	Hazardous Event Description	Exposure (of situation)
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 loss of vehicle control result in a collision with incoming traffic	E3 - Medium probability
vehicle crashes with incoming traffic	the loss of vehicle control result in a collision with incoming traffic	E2 - Low probability
Driver is unaware of the line departure, vehicle crashes with incoming traffic	The driver not realising that the vehicle is leaving its lane result into a collision with incoming traffic.	E3 - Medium probability
The vehicle is departing from the lane.	the departure of the vehicle from its lane result in a collision with incoming traffic	E3 - Medium probability

Hazardous Event Classification			
Rationale (for exposure)	Severity (of potential harm)	Rationale (for severity)	Controllability (of hazardous event)
highway driving is a normal operation	S3 - Life-threatening or fatal injuries	On highway speed of vehicle is expected to be high	C3 - Difficult to control or uncontrollable
country road driving is a normal operation but miss using the system is not	S3 - Life-threatening or fatal injuries	high vehicle speed	C3 - Difficult to control or uncontrollable
Highway driving is a normal operation	S3 - Life-threatening or fatal injuries	high vehicle speed	C2 - Normally controllable
highway driving is a normal operation	S3 - Life-threatening or fatal injuries	high vehicle speed	C2 - Normally controllable

	Determination of ASIL and Safety Goals	
Rationale (for controllability)	ASIL Determination	Safety Goal
High speed amplifies the effect of steering oscillations and makes it less controllable	C	the oscillating steering wheel torque shall be within specified limits.
High speed makes the take over of the system by the driver difficult	B	The LKA function shall be time limited
Controllable in normal conditions, furthermore the line keeping assistance is still working	B	The oscillating steering wheel torque shall be within specified limits.
Controllable in normal conditions by the driver.	B	The LKA action time shall be lower than a specified threshold.