

Hazard ID	Situational Analysis										Hazardous Event Classification										Determination of ASIL and Safety Goals	
	Operational Mode	Operational Scenario	Environmental Details	Situation Details	Other Details (optional)	Item Usage (if relevant)	Situation Description	Function	Deviation	Deviation Details	Hazardous Event (realistic effects)	Event Details	Hazardous Event Description	Exposure (if situation)	Rationale (for exposure)	Severity (for potential harm)	Rationale (for severity)	Controllability (for hazardous event)	Rationale (for controllability)	ASIL Determination	Safety Goal	
HA-001	Normal Driving	City road	Normal conditions	Low speed		Correctly Used	Cruising through the city center	Lane Departure Warning (LWD) shall apply an oscillating torque to provide haptic feedback	Actor effect is too much	Driver overreacts due too too intense vibration of the steering wheel	Potential loose of control	Vehicle drives through city, crosses lane and too intense feedback is created.	Potential crash with other car/obstacle	E4 - High probability	An everyday situation while driving through the city	S2 - Severe and life threatening injuries possible of other participants	Medium danger of other participants	C1 - Simply Controllable	Controllability should be easily regainable	ASIL A	The lane keeping item shall ensure the lane departure oscillating torque amplitude is below Max_Torque_Amplitude and verified.	
HA-002	Normal Driving	Highway	Snow	High Speed	Windshield slightly covered	Correctly Used	Driving through a road work site in the winter	Lane Keeping Assistance (LKA) function shall apply the steering torque when active in order to stay in ego lane	Actor effect is wrong	Crash is caused due to misinterpretation of slightly covered camera and snow covered road	Side collision with obstacle	Vehicles tried to drive through road work site	Vehicle crashes into obstacle of road work site	E2 - Low probability	Snow is quite rare (<2%) within western Europe	S2 - Severe and life threatening injuries possible of other participants	High chance of hitting a road work vehicle or concrete block	C3 - Difficult to control	Depending on the situation the distance to the obstacle is quite often very low so in many situation a crash can not be avoided but the control of the car could be restored	ASIL A	Under bad weather conditions the LKA should deny activation to prevent this situation. The driver should be made aware that the LGA is no autonomous system and that majorly road work sites can lead to uncontrollable situations.	
HA-003	Normal Driving	Country road	Normal conditions	High speed		Incorrectly used	The driver uses the car as if it were autonomous	Lane Keeping Assistance	Function Always Activated	Function should be deactivated when used abusively	Potential death through due to collision with obstacles close to the road.	Vehicle leaves the road at high speed	Vehicle leaves the road because it can not drive autonomous but the user thinks so	E4 - High probability	An everyday situation	S3 - Life threatening injuries	Very likely	C3 - Difficult to control	Difficult to regain control	ASIL D	User is not allowed to take his hands off the wheel for more than a given amount of seconds. User should be loudly alarmed if he does otherwise	
HA-004	Service	N/A	Car service	Stopped		Correctly Used	Vehicle is in a service center and causes an accident due to automatic steering	Lane Keeping Assistance	Function unexpectedly activated	Function was activated in a wrong situation	Potential damage of car and service removal	Vehicle steered while not driving	Vehicle steers in still-stand and causes accident	E2 - Low probability	Quite unlikely	S1 - Light and moderate injuries	Likely	C2 - Normally controllable	Control could be regained by counter-steering	QM	Lane Keeping needs to be deactivated in still-stand and deactivated to service mode	

ASIL

ASIL CALCULATION TABLE

		S1				S2				S3			
		E1	QM	QM	QM	QM	QM	QM	QM	QM	QM	QM	QM
C1	E1		QM		QM		QM		QM		QM		QM
	E2		QM		QM		QM		QM		QM		QM
	E3		QM		QM		ASIL A		ASIL A		ASIL B		ASIL B
	E4		QM		QM		ASIL A		ASIL A		ASIL B		ASIL B
C2	E1		QM		QM		QM		QM		QM		QM
	E2		QM		QM		ASIL A		ASIL A		ASIL B		ASIL B
	E3		QM		QM		ASIL A		ASIL A		ASIL B		ASIL B
	E4		ASIL A		ASIL B		ASIL C		ASIL C		ASIL D		ASIL D
C3	E1		QM		QM		ASIL A		ASIL A		ASIL B		ASIL B
	E2		QM		ASIL A		ASIL B		ASIL B		ASIL C		ASIL C
	E3		ASIL A		ASIL B		ASIL C		ASIL C		ASIL D		ASIL D
	E4		ASIL B		ASIL C		ASIL D		ASIL D				

ID	DESCRIPTION	REMARKS	PROBABILITY OF INJURIES
S0	No injuries	No injuries	ASIL 0 and less than 10% probability of AIS 1-6
S1	Light and moderate injuries	Light and moderate injuries	More than 10% probability of AIS 1-6 (and not S2 or S3)
S2	Severe and life-threatening injuries	Severe and life-threatening injuries (survival probable)	More than 10% probability of AIS 3-6 (and not S3)
S3	Life-threatening or fatal injuries	Life-threatening (survival uncertain), fatal injuries	More than 10% probability of AIS 5-6

ID	DESCRIPTION	REMARKS
C0	Controllable in general	Controllable in general
C1	Simply controllable	99% or more of all drivers or other traffic participants are usually able to avoid harm
C2	Normally controllable	90% or more of all drivers or other traffic participants are usually able to avoid harm
C3	Difficult to control or uncontrollable	Less than 90% or more of all drivers or other traffic participants are usually able, or barely able, to avoid harm

ID	DESCRIPTION	DURATION (OF SITUATION)	FREQUENCY (OF SITUATION)
E0	Incredible		
E1	Very low probability	Not specified	Occurs less often than once a year for the great majority of drivers
E2	Low probability	<1 % of average operating time	Occurs a few times a year for the great majority of drivers
E3	Medium probability	1% to 10% of average operating time	Occurs once a month or more often for an average driver
E4	High probability	>10% of average operating time	Occurs during almost every drive on average