

## §5.2. User interactions

Green means no change to the text (including no numbering change)

Blue means an editorial proposal.

Orange means an open issue or substantive proposal for amendment.

Original Text	Proposals for Change(s)	Comments
5. ADS requirements		
5.2. Safety of ADS User Interactions with the ADS	5.2. Interactions between the ADS and its user(s)	“ADS user interactions with the ADS” indicates user-initiated interactions only. The provisions include ADS interactions with the user(s). “Interactions between ADS and user” covers both directions. “Safety” redundant since all provisions of the regulation concern safety.
5.2.1. General requirements		
5.2.1.3. The ADS HMI shall provide safety relevant information and signals clearly noticeable to the target user(s) under all operating conditions, multimodal (e.g., optical, acoustic, haptic) if needed, simply and unambiguously.	5.2.1.1. Safety-relevant information and signals shall be perceptible by the target user(s) under all operating conditions.	General requirement for all safety-relevant signals should precede requirements for specific kinds of signals.  Break down complex provision for clarity.
	5.2.1.1.1. The information provided shall be simple and unambiguous.	
	5.2.1.3.2. The signals may use optical, audible, and/or haptic means.	“if needed” signals permission to use multiple modes if needed to meet the primary requirement that signals shall be perceptible under all conditions.
5.2.1.1. The ADS shall signal its intention to place the vehicle in an MRC to the ADS user(s).	5.2.1.2. The ADS shall signal initiation of a fallback to an MRC to the ADS user(s).	Consistency of phrasing. The prevalent terminology is a “fallback to an MRC” and the timing would be at the initiation of the fallback (i.e., at the point

		when the ADS initiates the process for placing the vehicle in an MRC).
5.2.1.2. An ADS that controls the operation of doors shall provide an emergency override to the user.	5.2.1.3. The ADS user shall be permitted to override ADS operation of doors in the event of emergency.	Does the ADS provide the override? Move together with other provisions concerning “doors”?
5.2.2. ADS features that allow a user to take over manual control of the DDT	5.2.2. ADS features of Type 1?	<p>“permit” is preferable to “allow” since regulations concern permissions and requirements. “Performance of the DDT” for consistency across regulation. User performance of the DDT is manual control. Technically, the ADS permits user intervention in the DDT. Whether the ADS accepts the intervention as intentional and safe is a separate matter subject to the requirements. The heading specifically means that the feature is active but will permit user-initiated deactivation.</p> <p>Is this section impacted by the addition of ADS Feature Type 1 and Type 2 definitions?</p>
5.2.2.1 General requirements		
5.2.2.1.1 The ADS shall be designed to prevent misuse and errors in operation by the user.		To be verifiable, this provision requires provisions for identification of the risks of misuse or error (SMS) and description of the mitigations to prevent misuse or error (safety concept) with evidence of their effectiveness (safety case).
5.2.2.1.2 When an ADS feature is active, the vehicle driving controls, direct vision, devices for indirect vision, indicators, tell-tales, and DDT-related warnings may be disabled, suppressed, de-activated, inhibited or by other means made unavailable.	5.2.2.1.2. Driver controls, tell-tales, indicators, field of vision, devices for indirect vision, and DDT-related warnings may be restricted or disabled while an ADS feature is active.	Align with UN R121 “controls, tell-tales, and indicators”. Clarify that items concern “driver”. Align with UN R125 (and UN R176) “driver field of vision”. Simplify with “restricted” for various ways that the elements might be limited or made wholly or partially unavailable to the user. “While” rather than “when” for consistency across provisions.
5.2.2.1.3. The vehicle controls dedicated to the ADS shall be clearly identified and		

distinguishable to accommodate only the appropriate interactions. <sup>1</sup>		
5.2.2.1.4. While an ADS feature is active, it shall inform the user of:	5.2.2.1.4.	
(a) ADS status information.		
(b) The role of the fallback user, if applicable.		
(c) Adapted performance of the DDT consequent to some failure of the ADS.		
5.2.2.1.5. The ADS shall indicate the availability of a feature for activation.		
5.2.2.1.6. While active, features that have a system-initiated deactivation of the ADS to a fallback user shall:		
(a) Continuously assess whether the fallback user is available to assume the role of driver at the end of the deactivation procedure.		
(b) Provide effective procedures for re-engaging the fallback user who has been detected not to be available.		
(c) Trigger a fallback to an MRC where it has not been possible, feasible and/or safe to re-engage the fallback user.		
(d) In a nominal scenario, the beginning of a system-initiated deactivation process shall be	(d) In a nominal scenario, indicate in a timely manner the beginning of a system-initiated	Reword to fit structure:

<sup>1</sup> Through size, form, location, colour, type, action, spacing and/or control shape. The provision aims to promote correct use and is not intended to prohibit multifunction controls.

	indicated in a timely manner to support the fallback user re-engaging to the driving task.	deactivation process to support the fallback user re-engaging to the driving task	
5.2.2.1.7	The ADS shall have a monitoring system to support safe and appropriate engagement of the user as necessary		OPI: This requirement was in the Integration Document and somehow disappeared.
5.2.2.2.	ADS feature activation		
5.2.2.2.1.	The ADS shall ensure a safe ADS feature activation.		
5.2.2.2.2.	The ADS shall provide immediate feedback to indicate success or failure when the user attempts to enable an ADS feature.		
5.2.2.2.3.	The feature activation process (e.g., sequence of actions and states) shall take into account relevant recommendations or standards.		
5.2.2.2.4.	An ADS feature activation resulting in a user becoming a fallback user shall immediately and explicitly inform the fallback user of the consequent expectations on them to be ready to respond to a request to resume the DDT.		
5.2.2.3.	ADS feature deactivation to manual driving	5.2.2.3. User-initiated deactivation of ADS features	OPI: Don't change because a number of these requirements also refer to system-initiated deactivation.
5.2.2.3.1.	<del>In a nominal scenario, the beginning of a system initiated deactivation process shall be indicated in a timely manner to support the fallback user re-engaging to the driving task.</del>	OPI: Delete here and add to 5.2.2.1.6 as (d)	OPI: To keep 5.2.2.3 general this system initiated deactivation requirement needs to be placed elsewhere.

<p>5.2.2.3.2. Following the user requesting deactivation of the ADS feature, the ADS shall follow a deactivation process to safely transfer control of the DDT to the user.</p>	<p>5.2.2.3.1</p>	
<p>5.2.2.3.3. The ADS feature shall only respond to the user request to initiate a system deactivation process, if the ADS verifies that the user is in position to assume the role of the driver.</p>		
<p>5.2.2.3.4. ADS feature deactivation may be delayed if it is assessed by the ADS that the situation is unsuitable or unsafe for the subsequent mode of vehicle operation. In this case, the user shall be informed of this circumstance.</p>		
<p>5.2.2.3.5. The ADS feature shall remain active until the system deactivation process has been completed or the ADS vehicle reaches a minimal risk condition.</p>		
<p>5.2.2.3.6. The deactivation process (e.g., sequence of actions and states) shall take into account relevant recommendations or standards.</p>		
<p>5.2.2.3.7. The ADS shall assess if the user is suitably engaged to resume the DDT before completion of the deactivation process.</p>		
<p>5.2.2.3.8. The ADS shall provide a specific indication of the completion of the deactivation of the ADS.</p>		
<p>5.2.2.3.9. At the completion of the deactivation process, control shall be returned to the driver without any continuous lateral or longitudinal control assistance active.</p>		

5.2.2.3.10. If applicable, during the deactivation procedure, the vehicle controls, direct vision, devices for indirect vision, indicators, warnings, and tell-tales shall be set to an appropriate state for manual driving.		OPI: use procedure or process?
5.2.2.3.11. If applicable, ADS features operating control of closures shall no longer influence closures or the controls associated with closures.		
5.2.3. ADS features that do not allow a user to take manual control of the DDT		
5.2.3.1. The ADS shall provide the passenger(s) with means to request to stop the vehicle.		
5.2.3.2. The ADS vehicle shall provide safety-related information to the passengers.		
5.2.3.3. The ADS shall not initiate motion unless the safety risks to the passenger(s) have been mitigated.		
5.2.3.4. Controls provided for manual driving (e.g., steering, service brake, parking brake, accelerator, lighting) shall be designed to prevent any effect on the DDT whilst the ADS is performing the DDT, or reasonable safeguards shall be put in place to prevent access to controls.		
5.2.4. Information Provision to Users (as appropriate: owners, users, operators, etc.)	5.2.4. Information provision to users who can perform the role of drivers	
5.2.4.1. For the ADS users, means shall be provided that facilitates user understanding of the functionality and	5.2.4.1. For the ADS users who can perform the role of drivers, means shall be provided that facilitates user understanding of	"For the ADS users..." is redundant: The heading states that these provisions concern "users who can perform the role of drivers".

<p>operation of the system covering at least:</p>	<p>the functionality and operation of the system.</p>	
<p>(a) An operational description of the ADS features, capabilities, and limitations (the information should also refer to specific use cases and/or ODD);</p>	<p>5.2.4.1.1 An operational description of the ADS features, capabilities, and limitations shall be provided (the information shall also refer to specific use cases and/or ODD).</p>	<p>What is an “operational description”?                  What kinds of “use cases”?                  What “ODD”?                  What is the meaning of “and/or”?</p>
<p>(b) The proper use of the ADS feature(s);</p>	<p>Delete.</p>	
<p>(c) Any [expectations/requirements] on the fallback user to be ready to resume the DDT upon request;</p>	<p>Amended and moved to 5.2.4.1.4. below.</p>	
<p>(d) Instructions for the activation and deactivation of the ADS, with clear explanations of the distinctions between user-initiated deactivation and system-initiated deactivation where applicable</p>	<p>5.2.4.1.2 Instructions for the activation and deactivation of the ADS shall be provided, with clear explanations of the distinctions between user-initiated deactivation and system-initiated deactivation where applicable.</p>	<p>Sec: Is this referring to the ADS feature?</p>
<p>(e) Information on how the ADS feature responds to [user vehicle driving control inputs / vehicle driving control inputs by the user], if available;</p>	<p>Modified and moved to 5.2.4.1.8. below.</p>	
<p>(f) A description of the transitions of user roles and the procedure for those transitions, for example, reversion to manual driving following deactivation of the ADS feature;</p>	<p>5.2.4.1.3 A description of the transitions of user roles and the procedure for those transitions, for example, reversion to manual driving following deactivation of the ADS feature shall be provided.</p>	
	<p>5.2.4.1.4 Any expectations on the fallback user to be ready to resume the DDT upon request shall be explained.</p>	

(g) A general overview of non-driving-related activities (NDRA) allowed when an ADS feature is active where applicable;	5.2.4.1.5 A general overview of non-driving-related activities (NDRA) allowed when an ADS feature is active shall be provided to users who can perform the role of driver.	“to users...” is redundant: The section heading states that these provisions concern “users who can perform the role of drivers”.
(h) Safety precautions and safety-relevant information for the user;	Delete.	
(i) Information related to the HMI of the ADS feature(s) e.g.:	5.2.4.1.6 Information related to the ADS feature(s)’ signals shall be provided, covering e.g.:	Sec: wording can be improved.
(i) Visual tell-tales, icons		
(ii) Auditory signals	(ii) Acoustic signals	UN Regulations refer to “audible signals”. “Acoustic” refers to the sense of hearing or to the science of sounds. “Audible” means “able to be heard”.
(iii) Haptic signals;		
(j) Information on possible changes in the performance of the DDT by the ADS following a failure of the ADS;	5.2.4.1.7 Information on possible changes in the performance of the DDT by the ADS features following a failure of the ADS shall be provided.	
(k) Extent, timing and frequency of maintenance operations where applicable		OPI: deleted
	5.2.4.1.8 Information on how the ADS feature responds to inputs by the user into controls provided for manual driving (e.g., steering, service brake, parking brake, accelerator, lighting), if they are available, shall be provided.	
	5.2.4.1.9 Information on any additional safety precautions in using an ADS feature to be taken by the user shall be provided.	