**IADS标准新工作提案表**

|  |  |
| --- | --- |
| **提案名称** | 汽车大倾角座椅乘员保护测评方法 |
| **涉及专利情况** | 发明专利：一种汽车大倾角座椅正面碰撞乘员保护测评方法 | **计划项目周期（月）** | 12 |
| **牵头单位** | 中国汽车工程研究院股份有限公司 | **项目所属TC** | 行驶安全 |
| **负责人姓名** | 刘煜 | **所在单位** | 中国汽车工程研究院股份有限公司 |
| **负责人电话** | 17843761276 | **负责人邮箱** | liuyu@caeri.com.cn |
| **范围** | *（注：请简述标准的范围，明确本标准所涉及的技术边界）*本标准规定了汽车大倾角座椅在正面100%重叠刚性壁障碰撞（以下简称“FRB”）和正面50%重叠移动渐进变形壁障碰撞(以下简称“MPDB”)中乘员保护的技术要求和试验方法。本标准适用于配备汽车大倾角座椅，且在车辆行驶过程中，大倾角座椅可调节至坐垫角大于等于15°，躯干角大于等于35°进行使用的M1、N1类汽车。其他安装有此类大倾角座椅的车型可参考本标准。 |
| **立项目的** | *（注：请从标准拟解决的市场需求、前瞻问题、客户受众价值等方面以及后续的应用路径，描述本标准拟立项目的）*1.**市场需求：**随着智能汽车发展，大倾角座椅因其舒适性被广泛应用，但现有约束系统（安全带、气囊等）基于传统坐姿设计，无法有效保护大倾角姿态下的乘员。2023年调研了主流的32家主机厂，有28家配备了零重力座椅，配置率接近88%；据CIDAS数据库显示，大倾角座椅乘员的KSI（重伤及死亡）率约为其他座椅角度的3倍。本标准旨在填补国际大倾角座椅乘员安全标准的空白，规范产品设计，降低事故伤亡率。2.**前瞻问题：**智能座舱技术推动座椅设计多样化，乘员姿态趋向半躺或躺姿。若不建立统一的安全技术规范，未来大规模应用可能加剧乘员腰椎、骨盆等部位的损伤风险，威胁公共交通安全。本标准通过制定碰撞保护技术要求，前瞻性应对智能座舱发展趋势下的新型安全挑战。3.**客户受众价值：**为整车厂、零部件供应商等提供设计依据，降低研发试错成本，推动汽车安全技术创新；增强大倾角座椅产品的安全信任度，保障消费者人身安全权益。在测评规程推出的同时企业应对保护策略同步出台。4.**后续的应用路径：**通过台车试验模拟FRB（100%刚性壁障）和MPDB（50%偏置变形壁障）工况正面碰撞，规定标准波形、假人定位方法及伤害指标阈值。企业可依据本标准优化座椅结构、约束系统匹配，国家或第三方机构纳入标准测评体系，推动行业技术升级。 |
| **立项必要性** | *（注：请从市场需求、技术需求、标准需求等方面分析标准立项的必要性）*1.**市场需求迫切：**国内外无针对大倾角座椅的乘员保护标准，企业开发缺乏技术依据，产品质量参差不齐，消费者安全无法保障。智能座舱市场快速增长，搭载大倾角座椅车型比例急速上升，但安全开发亟需标准化引导。2.**技术需求明确：**现有约束系统在大倾角姿态下易导致乘员下潜、腰椎受力过高等问题，需通过限力装置、座椅集成式安全带等技术改进。缺乏统一的试验方法及评价体系，导致测试结果不可比，阻碍技术迭代，亟需明确的试验方法和技术要求。3.**标准需求紧迫：**ISO等国际化标准组织尚未发布相关标准，中国利用市场及技术优势率先制定国际性团体标准，提升国际竞争力。 |
| **标准分析** | *（注：简要分析国内外相关技术标准现状，特别是ISO/IEC/ITU以及其他国际团体标准，说明本项标准与主要国际性标准的区别，主要区别应逐条列出）*ISO/IEC/ITU以及其他国际团体标准体系暂未大倾角座椅下乘员碰撞安全相关的标准。 |

**注**：

（1）项目所属TC请填写：“行驶安全/本质安全/控制安全/交互安全/健康安全”中其一

**IADS NEW STANDARD PROPOSAL**

|  |  |
| --- | --- |
| **Proposal title** | Test and Assessment Methods for Automotive Reclined Seat Occupant Protection |
| **Patent involvement** | **A Method for Evaluating Occupant Protection in Automobile High-reclined Seats During Frontal Collisions** | **Proposed Project Duration (month)** | 12 |
| **Entity name** | China Automotive Engineering Research Institute Co., Ltd. | **TC** | Driving Safety |
| **Name** | Yu Liu | **Affiliation** | China Automotive Engineering Research Institute Co., Ltd. |
| **Phone number** | 17843761276 | **E-mail** | liuyu@caeri.com.cn |
| **Scope to which the standard applies** | *[briefly describe the scope of the standard and clarify the technical boundaries involved in this standard]*This standard specifies the technical requirements and test methods for occupant protection of reclined seats in frontal rigid barrier (hereinafter referred to as "FRB") and frontal 50% overlap moving progressive deformable barrier (hereinafter referred to as "MPDB") sled collisions.This standard applies to M1 and N1 category vehicles equipped with reclined seats that can be adjusted to a seat cushion angle ≥15° and torso angle ≥35° during vehicle driving scenario. Other vehicle types equipped with such reclined seats may refer to this standard. |
| **Purpose of the standard** | *[Please describe the purpose of this standard from the aspects of market demand, prospective problems to be solved, customer value and subsequent application path by the standard]*1.**Market Demand:** With the development of intelligent vehicles, reclined seats are widely adopted for their comfort. However, existing restraint systems, designed for traditional upright seating postures, fail to effectively protect occupants in reclined positions. In 2023, a survey of 32 mainstream OEMs revealed that 28 were equipped with zero-gravity seats, reflecting a near 88% adoption rate among the surveyed manufacturers. According to CIDAS database, the KSI (serious injury and fatality) rate for occupants in reclined seats is approximately three times higher than in other seating configurations. This standard aims to fill the international gap in safety standards for reclined seats safety, regulate product design, and reduce accident casualties.2.**Prospective problems to be solved:** Intelligent cockpit technologies drive diversified seat designs, with occupant postures trending toward semi-reclined or fully reclined positions. Without unified safety specifications, widespread adoption of such designs may exacerbate risks of lumbar and pelvic injuries, threatening public traffic safety. This standard proactively addresses emerging safety challenges in intelligent cockpit development by establishing collision protection requirements.3.**Customer value:** Provides design guidelines for OEMs and suppliers, reduces R&D costs, and promotes automotive safety technology innovation. Enhances consumers’ trust in the safety of reclined seat products and safeguards personal safety rights. **The protective measures should be implemented by OEMs in parallel with the publish of the test and assessment protocols.**4.**Subsequent application path:** Conduct sled tests simulating FRB and MPDB collision scenarios, define standardized acceleration pulses, dummy positioning methods, and injury criteria thresholds. Enable enterprises to optimize seat structures and restraint system integration based on this standard. Incorporate the standard into national or third-party assessment systems to drive industry-wide technological upgrades. |
| **Requirements of the standard** | *[Please analyze the necessity of the proposed standard from the aspects of market demand, technical demand and standard demand]*1.**Urgent Market Demand:** No international standards exist for occupant protection in reclined seats, leading to inconsistent product quality and compromised consumer safety. Rapid growth in the intelligent cockpit market has accelerated the adoption of reclined seats, yet safety development urgently requires standardized guidance.2.**Clear Technical Demand:** Current restraint systems in reclined configurations risk occupant submarining and excessive lumbar forces, necessitating improvements such as force-limiting devices and integrated seatbelt systems. The lack of unified test methods and assessment systems hinders technology iteration, demanding explicit technical specifications.3.**Critical Standard Demand:** International organizations (e.g., ISO/IEC/ITU) have not yet released standards for reclined seat occupant safety. China’s leadership in establishing this group standard leverages its market and technological advantages to enhance global competitiveness. |
| **Analysis of related technical fields at domestic and abroad** | *[Briefly analyze the relevant standards domestic and abroad, especially ISO/IEC/ITU and other international association standards, and explain the differences between these standards. The main differences should be listed]*The ISO/IEC/ITU and other international association standards currently lack standards addressing reclined occupant collision safety. |

**NOTE:**

1. Please fill in **TC** blanket using one of the following Names of Technical Committee: **Driving Safety**, **Intrinsic Safety**, **Control Safety**, **Interactive Safety or Wellness Safety**