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TECHNICAL SPECIFICATION – FOUR WHEELERS AND ABOVE PART D – BRAKES		
Clause No.	Description	
D1.0	Service brakes :	
D1.1	Make	
D1.2	Type (Mechanical/hydraulic/air/air assisted/vacuum assisted/others)	
D1.3	Control system & braking wheel	
D1.4	Schematic layout indicating method of split of brake system, location of valves, reservoirs, ABS components etc. (Attach drawing and indicate the drawing number)	
D1.5	Anti-Lock braking system Provided (Yes/No/Optional)	
D1.5.1	If yes, details of ABS	
D1.5.2	Make	
D1.5.3	Category of ABS	
D1.5.4	Nos. of directly controlled wheel(s)	
D1.5.5	Brief description of failure warning tell–tale	
D1.5.6	Wheel Speed Sensors	
D1.5.6.1	No. of sensors	
D1.5.6.2	Make of sensors	
D1.5.6.3	Type of sensors	
D1.5.7	Modulator	
D1.5.7.1	Nos. of Modulators	
D1.5.7.2	Make of Modulators	
D1.5.7.3	Identification No. / Part No. of Modulator	
D1.5.7.4	Brief description and features	
D1.5.8	Controller	
D1.5.8.1	Nos. of Controller	
D1.5.8.2	Make of Controller	
D1.5.8.3	Identification No. / Part No. of Controller	
D1.5.8.4	Brief description and features	
D1.5.9	Height of Center of Gravity (mm)	

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D1.5.9.1	Un laden condition	
D1.5.9.2	Laden condition	
D 1.5.10	Slack adjuster	
D 1.5.10.1	Front (Automatic / Manual)	
D 1.5.10.1.1	Make of slack adjuster	
D 1.5.10.1.2	Model and Type	
D 1.5.10.2	Rear (Automatic / Manual)	
D 1.5.10.2.1	Make of slack adjuster	
D 1.5.10.2.2	Model and type	
D 1.6	The vehicle fulfils the requirement of Annex E of AIS-151 or IS 15986:2015: Yes/No	
D2.0	Brake lining or pad	
D2.1	Nominal Dimensions, (mm) (Length x Width x thickness)	
D2.1.1	Front wheel	
D2.1.2	Rear wheel	
D2.1.3	Others	
D2.1.4	Type of liner wear indicator (window/ acoustic/ optical/ any other)	
D2.2	Effective area per axle (cm ²)	
D2.2.1	Front	
D2.2.2	Rear	
D2.2.3	Others	
D 2.3	Make and material designation	
D2.3.1	Front wheel / axle	
D2.3.2	Rear wheel / axle	
D2.3.3	Others	
D2.3.4	Whether asbestos or asbestos-free	
D3.0	Brake drum or disc	
D3.1	Front axle (Disc / Drum)	
D3.1.1	Effective Diameter (mm)	
D3.2	Rear axle (Disc / drum)	
D3.2.1	Effective Diameter (mm)	

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D3.3	Other axle (Disc / Drum)		
D3.3.1	Effective diameter (mm)		
D 3.4	Material (if the braking surface is not ferrous)	Requirement as per clause 12.2 of Annex A of AIS-150	
D 3.4.1	Front wheel		
D 3.4.1	Rear wheel		
D 3.5	Others		
D 4.0	Master cylinder or brake valve		
D 4.1	Make		
D 4.2	Type (only applicable for M2, M3, N and T category of vehicles.)		
D 4.3	Inner diameter of the master cylinder (mm)		
D 4.4	Operating stroke (mm)		
D 4.5	Type of supply tank (only applicable for M2, M3, N and T category of vehicles.)		
D5.0	Wheel cylinder / Wheel Chamber		
D5.1	Diameter (mm)		
D5.1.1	Front		
D5.1.2	Rear		
D5.1.3	Others		
D5.2	Type (single acting/double acting)		
D5.2.1	Front		
D5.2.2	Rear		
D5.2.3	Others		
D5.2.4	Make of wheel cylinder / slave cylinder		
D6.0	Booster :		
D6.1	Make		
D6.2	Type		
D6.3	Boost ratio		
D6.4	Size of the booster (mm) (diameter)		
D7.0	Vacuum or air assistance		
D7.1	Pressure		

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D7.1.1	Nominal (P2 as per IS 11852)					
D7.1.2	Cut in					
D7.1.3	Cut out					
D7.2	Type of vacuum pump or air compressor					
D 7.2.1	Air compressor cubic capacity (cc)					
D 7.2.2	Free air delivery, l/min					
D7.3	Type of pressure regulator					
D7.4	No. of tanks					
D7.5	Tank	Capacity (l)	Description	Capacity		
D7.5.1	Tank 1					
D7.5.2	Tank 2					
D7.5.3	Tank 3					
D7.5.4	Tank 4					
D7.6	Brake Chamber	Front	Rear	Parking		
D7.6.1	Make and type					
D7.6.2	Size mm					
D7.6.3	Inner diameter mm					
D7.6.4	Stroke mm					
D7.6.5	Pressure test connectors (As per ISO 3583)					
D7.6.5.1	Make & Part Numbers					
D7.6.5.2	No. of Pressure test connectors					
D7.6.5.3	Location of Pressure test connectors along with layout					
D8.0	Brake hose (if Hydraulic)					
D8.1	Make					
D8.1.1	Part Number of the hose assembly					
D8.2	Free Length of hoses					
D8.3	Thickness of lining (mm)					
D8.4	Nominal bore dia. (mm)					
D9.0	Failure Warning device for braking					
D9.1	Type (Visual display/ audible/others)					

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D9.2	Operation pressure (kg/cm ² / bar / kPa)	
D9.3	Type of safety device	
D10.0	Parking brake	
D10.1	Make	
D10.2	Type (Mechanical/Spring Brake/Electronic)	
D10.3	Acting on Transmission/wheel	
D10.4	Control System & Braking wheel	
D10.5	Lining/pad	
D10.6	Name of producer	
D10.7	Dimension (mm)	
D10.8	Area (cm ²)	
D10.9	Material	
D10.10	Diameter of brake drum/disc (mm)	
D11.0	Secondary brake	
D11.1	Type	
D11.2	Description	
D12.0	Additional retarding devices	
D12.1	Type	
D12.2	Description	
D12.3	Deceleration at 30 km/h, m/s ² as per IS 11852 / AIS 150	
D13.0	Brake fluid	
D13.1	Make	
D13.2	Trade name	
D13.3	Specification/ grade as per Indian standard	
D 13.4	Brake fluid level indicator (Yes/No)	
D 13.5	Brake adjustment	
D 13.5.1	Type (Manual/Auto) Front and Rear	
D 13.5.2	Lever length	
D 13.6	Pneumatic Brake Actuator	
D 13.6.1	Type (as per IS)	

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D14.0	Load distribution :			
		Laden kg	Unladen kg	Unladen F/R Ratio
	Front axle			
	Rear axle			
	Other axle			
	Total			
D15.0	Proportioning valve			
D15.1	Make			
D15.2	Characteristics			
D15.3	Identification			
D16.0	Apportioning valve			
D16.1	Make			
D16.2	Characteristics			
D16.3	Identification			
D17.0	Load sensing valve			
D17.1	Make			
D17.2	Characteristics			
D17.3	Identification			
D18.0	Valve			
D18.1	Make			
D18.2	Characteristics			
D18.3	Identification			
D19.0	Other valves			
D19.1	Function			
D19.2	Make			
D19.3	Characteristics			
D19.4	Identification			

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D 20.0	TECHNICAL SPECIFICATION ADDITIONAL INFORMATION FOR M1 AND N1 CATEGORY OF VEHICLES	
D 20.1	Tyre dimensions	
D 20.1.1	Temporary-use spare wheel/tyre dimensions:	
D 20.1.2	Vehicle meets the technical requirements of AIS 110: Yes/No	
D 20.2	Brake Assist System (Fitted : Yes/No)	
D 20.2.1	Category of Brake Assist System A / B	
D 20.2.1.1	For category A systems, define the force threshold at which the ratio between pedal force and brake pressure increases	
D 20.2.1.2	For category B systems, define the brake pedal speed which must be achieved in order to activate the Brake Assist System (e.g. pedal stroke speed (mm/s) during a given time interval)	
D 20.3	Relevant documentation according to Annex S of IS 11852 / AIS 150 (Complex electronics vehicle control systems) provided in respect of the following system(s):	
D 20.3.1	List of complex functions covered:	
D 20.3.2	Manufacturer's documents contain information showing the interaction of complex braking functions with other vehicle systems and/or how the system directly controls output variables.	
D 20.3.3	Manufacturer's documents explain the functionality and safety concept of the system and describe how the operational status may be checked.	
D 20.3.4	A list of input and output variables, including their working range, is provided.	
D 20.3.5	Documentation includes an inventory of components, outlines the function of each unit, its interconnection/interaction with other systems and defines signal flow priorities.	

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D 20.3.6	Each unit of the system is clearly identified in a manner which defines clearly the hardware and software version as appropriate.	
D 20.3.7	Safety concept statement verifies that the system will not prejudice the safe operation of the braking system under non-fault conditions.	
D 20.3.8	System architecture, design methods and tools identified.	
D 20.3.9	Information regarding design provisions in case of failure is provided including any error messages, warning signals, partial performance conditions, back-up modes and/or removal of high-level functions.	
D 20.3.10	Additional material and analysis (FMEA, FTA) of fault conditions made available for inspection and maintained by the manufacturer.	
D 20.3.11	Document reference and date of inspection:	
D 20.3.12	Vehicle complies with all other performance requirements of IS 15986 : 2015 and meets manufacturer's specifications under non-fault conditions.	
D 20.3.13	Under fault conditions, vehicle response corresponds to that described in the manufacturer's documents / failure analysis and safety concept is verified.	
	(see annex 4 of this report for test data)	
D 20.4	Electronic Stability Control system as per AIS:133 (Fitted : Yes/No)	
D 20.4.1	If yes, details of ESC	
D 20.4.2	ESC System Technical Documentation. To ensure a vehicle is equipped with an ESC system that meets the definition of "ESC System" in paragraph 2.0, the vehicle manufacturer shall make available to the test agency, upon request, the documentation specified below.	
D 20.4.3	System diagram identifying all ESC system hardware.	

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D 20.4.4	A brief written explanation sufficient to describe the ESC system basic operational characteristics.	
D 20.4.4.1	Logic diagram	
D 20.4.4.2	Understeer information.	
D 20.4.4.3	Static Stability Factor	
D 20.4.4.4	Make and Country of manufacturer(if imported)	
D 20.4.5	Software Id / version	
D 20.4.6	Hardware Id	
D 20.4.7	Brief description of failure warning tell-tale	
D 20.4.8	Control function (Directional / Roll / Directional and Roll)	
D 20.4.9	Steering Angle Sensor	
D 20.4.9.1	Make and Country of manufacturer(if imported)	
D 20.4.9.2	Identification No. / Part No.	
D 20.4.9.3	Brief description and features	
D 20.4.10	Yaw Rate Sensor	
D 20.4.10.1	Make and Country of manufacturer(if imported)	
D 20.4.10.2	Identification No. / Part No.	
D 20.4.10.3	Brief description and features	
D 20.5	Additional Component details, if any	
D 20.5.1	Component 1	
D 20.5.1.1	Make and Country of manufacturer(if imported)	
D 20.5.1.2	Identification No. / Part No.	
D 20.5.2	Component 2	
D 20.5.2.1	Make and Country of manufacturer(if imported)	
D 20.5.2.2	Identification No. / Part No.	
D 20.5.3	Component 3	

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D 20.5.3.1	Make and Country of manufacturer(if imported)	
D 20.5.3.2	Identification No. / Part No.	
D 21.0	TECHNICAL SPECIFICATION – ADDITIONAL INFORMATION FOR OTHER THAN M1 CATEGORY OF VEHICLES	
D 21.1	Motor Vehicle stability function information document	
D 21.1.1	System	
D 21.1.2	System variants	
D 21.1.3	System options	
D 21.1.3.1	Control function (directional/roll-over/both) including an explanation of the basic function and/or philosophy of the control	
D 21.1.4	System configurations (where appropriate)	
D 21.1.5	System identification including software level identifier	
D 21.2	Applications:	
D 21.2.1	List of motor vehicles by description and configuration that are covered by the information document	
D 21.2.2	Schematic diagrams of the respective configurations installed on the motor vehicles defined in item 2.1. above with consideration given to the following:	
D 21.2.2.1	Lift axles	
D 21.2.2.2	Steering axles	
D 21.2.2.3	Anti-lock braking configurations	
D 21.2.3	Scope of application with respect to suspension:	
D 21.2.3.1	Air	
D 21.2.3.2	Mechanical	
D 21.2.3.3	Rubber	
D 21.2.3.4	Mixed	
D 21.2.3.5	Anti-roll bar	

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D 21.2.4	Additional information (if applicable) to the application of the directional control and roll-over control functions, for example:	
D 21.2.4.1	Wheelbase, track, centre of gravity height	
D 21.2.4.2	Wheel type (single or twin) and tyre type (e.g. structure, category of use, size)	
D 21.2.4.3	Gearbox type (e.g. manual, automated manual, semi-automatic, automatic)	
D 21.2.4.4	Drive train options (e.g. retarder)	
D 21.2.4.5	Differential type/differential lock(s) (e.g. standard or self-locking, automatic or driver selected)	
D 21.2.4.1	Management of the engine or any other source(s) of motive power e.g. Torque Management, control of fuel supply etc.	
D 21.3	Component description:	
D 21.3.1	Sensor(s) External to the Controller	
D 21.3.1.1	Function	
D 21.3.1.2	Limitations on the location of the sensors	
D 21.3.1.3	Identification (e.g. part numbers)	
D 21.3.2	Controller(s)	
D 21.3.2.1	General description and function	
D 21.3.2.2	Functionality of internal sensors (if applicable)	
D 21.3.2.3	Hardware identification (e.g. part numbers)	
D 21.3.3.4	Software identification	
D 21.3.3.5	Limitations on the location of the controller(s)	
D 21.3.3.6	Additional features	
D 21.3.3	Modulators	
D 21.3.3.1	General description and function	
D 21.3.3.2	Hardware identification (e.g. part numbers)	
D 21.3.3.3	Software identification (if applicable)	
D 21.3.3.4	Limitations	
D 21.3.4	Electrical Equipment	
D 21.3.4.1	Circuit diagrams	

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D 21.3.4.2	Powering methods	
D 21.3.5	Pneumatic circuits	
D 21.3.6	Safety aspects of the electronic system in accordance with Annex S of IS 11852	
D 21.3.6.1	List of complex functions covered:	
D 21.3.6.2	Manufacturer's documents contain information showing the interaction of complex braking functions with other vehicle systems and/or how the system directly controls output variables.	
D 21.3.6.3	Manufacturer's documents explain the functionality and safety concept of the system and describe how the operational status may be checked.	
D 21.3.6.4	A list of input and output variables, including their working range, is provided.	
D 21.3.6.5	Documentation includes an inventory of components, outlines the function of each unit, its interconnection/interaction with other systems and defines signal flow priorities.	
D 21.3.6.6	Each unit of the system is clearly identified in a manner which defines clearly the hardware and software version as appropriate.	
D 21.3.6.7	Safety concept statement verifies that the system will not prejudice the safe operation of the braking system under non-fault conditions.	
D 21.3.6.8	System architecture, design methods and tools identified.	
D 21.3.6.9	Information regarding design provisions in case of failure is provided including any error messages, warning signals, partial performance conditions, back-up modes and/or removal of high-level functions.	
D 21.3.6.10	Additional material and analysis (FMEA, FTA) of fault conditions made available for inspection and maintained by the manufacturer.	
D 21.3.6.11	Document reference and date of inspection:	
D 21.3.6.12	Vehicle complies with all other performance requirements of IS 15986:2015 and	

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	meets manufacturer’s specifications under non-fault conditions.	
D 21.3.6.13	Under fault conditions, vehicle response corresponds to that described in the manufacturer’s documents / failure analysis and safety concept is verified.	
	(see annex 4 of this report for test data)	
D 21.3.7	Electro-magnetic compatibility	
D 21.3.7.1	Documentation demonstrating compliance with AIS-004(Part 3).	
D 22.0	TECHNICAL SPECIFICATION – ADDITIONAL INFORMATION (For other than M1 and N1)	
D 22.1	Name of manufacturer	
D 22.2	System name	
D 22.3	System variations	
D 22.4	Control function (directional/roll-over/both) including an explanation of the basic function and/or philosophy of the control	
D 22.5	System configurations (where appropriate)	
D 22.6	System identification	
D 22.7	Additional information (if applicable) to the application of the directional control and/or the roll-over control function(s)	
D 22.8	Component description	
D 22.9	Sensors external to the controller (a) Function; (b) Limitations on the location of the sensors; (c) Identification, e.g. part numbers.	
D 22.10	Controller(s) (a) General description and function; (b) Identification e.g. part numbers; (c) Limitations on the location of the controller(s); (d) Additional features.	

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D 22.11	<p>Modulators</p> <p>(a) General description and function;</p> <p>(b) Identification;</p> <p>(c) Limitations.</p>	
D 22.12	<p>Electrical equipment</p> <p>(a) Circuit diagrams;</p> <p>(b) Powering methods.</p>	
D 22.13	<p>Pneumatic circuits</p> <p>System schematics including anti-lock braking configurations associated with the trailer types defined in paragraph 6.2.1. of this annex.</p>	
D 22.14	<p>Safety aspects of the electronic system in accordance with Annex S of IS 11852</p>	
D 22.14.1	<p>List of complex functions covered:</p>	
D 22.14.2	<p>Manufacturer's documents contain information showing the interaction of complex braking functions with other vehicle systems and/or how the system directly controls output variables.</p>	
D 22.14.3	<p>Manufacturer's documents explain the functionality and safety concept of the system and describe how the operational status may be checked.</p>	
D 22.14.4	<p>A list of input and output variables, including their working range, is provided.</p>	
D 22.14.5	<p>Documentation includes an inventory of components, outlines the function of each unit, its interconnection/interaction with other systems and defines signal flow priorities.</p>	
D 22.14.6	<p>Each unit of the system is clearly identified in a manner which defines clearly the hardware and software version as appropriate.</p>	
D 22.14.7	<p>Safety concept statement verifies that the system will not prejudice the safe operation of the braking system under non-fault conditions.</p>	
D 22.14.8	<p>System architecture, design methods and tools identified.</p>	

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D 22.14.9	Information regarding design provisions in case of failure is provided including any error messages, warning signals, partial performance conditions, back-up modes and/or removal of high-level functions.	
D 22.14.10	Additional material and analysis (FMEA, FTA) of fault conditions made available for inspection and maintained by the manufacturer.	
D 22.14.11	Document reference and date of inspection:	
D 22.14.12	Vehicle complies with all other performance requirements of IS 15986 : 2015 and meets manufacturer's specifications under non-fault conditions.	
D 22.14.13	Under fault conditions, vehicle response corresponds to that described in the manufacturer's documents / failure analysis and safety concept is verified.	
D 22.15	Electro-magnetic compatibility	
D 22.16	Documentation demonstrating compliance with AIS-004(Part 3).	
D 23.0	Vehicle is/ is not equipped to tow a trailer with electric braking system (Yes/No)	

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