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DEVELOPMENT TEST REPORT

1. Test report No.	: ARAI/VEL/2020-2021/TA/3000013468/0579	
2. Client	: **M/s. Tapco Pneumatics Pvt. Ltd.**	
3. Client's Address	: No.296, Sector-II, Second street, North phase Ambattur Industrial estate, Ambattur, Tiruvallur, Chennai-600098.	
4. Client's Letter and date	: E-mail	Dated 03-09-2020
Request ref. and date	: SO/20-21/3000013468	Dated 18-09-2020
5. Vehicle tested		
(a) Model	: **ELEKTRA SL650**	
(b) Type	: ***Fully Built Bus***	
(c) Category	: ***M3***	
(d) Manufacturer	: M/s. Tapco Pneumatics Pvt. Ltd.	
6. Test requirement	: Performance and Installation requirements of Wheel chair Lift Mechanism as per the Tapco Pneumatics Test Procedure Doc. No. TP001	
7. Initiated by	: V. Satish Engineer	
8. Verified by	: P.D. Betgeri Deputy Director	
9. Authorized by	: A.A. Badusha Sr. Deputy Director & Head	
10. Place of Issue	: Pune	
11. Issue date	: October 07, 2020	
12. Total No. of pages	: Ten	

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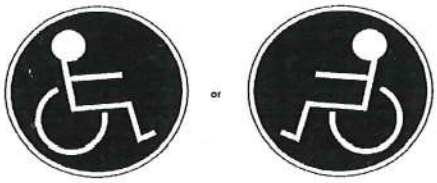
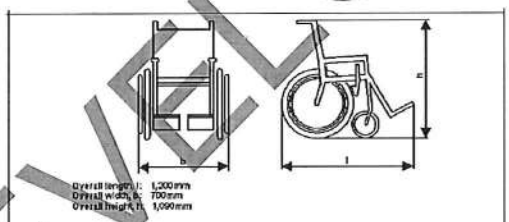
Chassis No.:	MYN6N44G1LB000309	Manufacturer :	M/s. Tapco Pneumatics Pvt. Ltd.
Test Site :	Olectra Greentech Limited. Premises, Jadcherla, Hyderabad	Reference vehicle specification Document No.:	Nil

Installation and Performance Requirements:

Sr. No.	Clause Description	Observation	Remarks
1	Pictogram for Wheelchair Users as per Clause 3.6.6 in accordance with AIS-153 for easy identification wheelchair lifter position  **Figure 9** **Pictogram for Wheelchair Users** One of these pictograms shall be placed internally adjacent to each wheelchair space indicating whether the wheelchair is to be positioned facing the front or the rear of the bus. Colour: blue basis with white symbol Size: at least 130 mm diameter Reference for the design principles of safety symbols: ISO 3864-1:2002	The pictograms provided at wheel chair position area visible clearly in the bus. The pictograms were provided in accordance with Figure 9.	Complies with the stated requirement.
2	Clause 3.6.4 (AIS-153) It shall be possible for a wheelchair user to move freely and easily from the outside of the bus through at least one of the doors for wheelchair access into the special area(s) with a reference wheelchair, the dimensions of which are shown.  Overall length, l: 1,200mm Overall width, b: 700mm Overall height, h: 1,090mm **Note:** A wheelchair user seated in the wheelchair adds 50mm to the overall length and makes a height of 1,350mm above the ground **Figure 8** **Reference Wheelchair**	The accessibility of wheel chair area verified with a reference wheel chair and found to be satisfactory.	Complies with the stated requirement.

Sr. No.	Clause Description	Observation	Remarks
3	Clause 3.6.4.1.1 (AIS-153) Sufficient space available for the wheelchair user to manoeuvre without the assistance of a person	Requirements of this clause were verified and found to be satisfactory.	Complies with the stated requirement.
4	Clause 3.6.1 (AIS-153) The floor surface of the special area shall be slip resistant and the maximum slope in any direction shall not exceed 5%.	Anti-skid rubber used to make the platform slip resistance. The slope is not more than 5% in any direction.	Complies with the stated requirement.
5	Provisions for Boarding Devices		
5.1	Clause 3.11.1.1 (AIS-153) The controls actuating the boarding devices shall be clearly marked as such. The extended or lowered position of the boarding device shall be indicated by a tell-tale to the driver.	The controls actuating the boarding device (lift) is clearly marked. The extended position of the boarding device is indicated by a tell-tale to the driver.	Complies with the stated requirement.
5.2	Clause 3.11.1.2 (AIS-153) In the event of the failure of a safety device, lifts, ramps and kneeling systems shall be incapable of operation, unless they can be safely operated by manual effort. The type and location of the emergency operating mechanism shall be clearly marked. In the event of power failure, lifts and ramps shall be capable of manual operation.	In the event of power failure, the lift is capable of manual operation. The emergency operating mechanism is clearly marked.	Complies with the stated requirement.
5.3	The boarding device does not obstruct the handle or other device for opening the door.	The lift in operation does not obstruct the handle for opening the service door.	Complies with the stated requirement.
5.4	The boarding device can be readily moved to leave the doorway clear for use in an emergency.	The lift can be readily moved to leave the doorway clear for use in an emergency.	Complies with the stated requirement.
6	Clause 3.11.3 - Lift		
6.1	Clause 3.11.3.1 - General Provisions		
6.2	Clause 3.11.3.1.1 (AIS-153) Lifts shall only be capable of operation when the bus is at standstill. Any movement of the platform shall be prevented unless a device preventing the wheelchair from rolling off has been activated or has automatically come into operation.	The Lift is able to operate only when the bus is at standstill. End flaps provided to prevent the wheelchair from rolling off while the lift is in operation.	Complies with the stated requirement.

Sr. No.	Clause Description	Observation	Remarks
6.3	Clause 3.11.3.1.2 (AIS-153)The lift platform shall not be less than 800mm wide, and not less than 1,200mm long and shall be capable of operating when carrying a mass of at least 300kg.	The Lift Platform is 810 mm wide and 1240 mm long. The lift is able to operate when carrying a mass of 300kg.	Complies with the stated requirement.
6.4	Clause 3.11.3.2 (AIS-153) Additional technical requirements for power-operated lifts		
6.5	Clause 3.11.3.2.1 (AIS-153)The operating control shall be designed in such a way that, if released, it automatically returns to the off position. As it does so the movement of the lift shall immediately be stopped and it shall be possible to initiate a movement in either direction.	The operating control is designed in such a way that, if released, it automatically comes to the off position. The movement of the lift can be immediately stopped and it is possible to initiate a movement in either direction.	Complies with the stated requirement.
6.6	Clause 3.11.3.2.2 (AIS-153) A safety device (e.g. reversing mechanism) shall protect areas not visible to the operator, where the movement of the lift might trap or crush objects.	The Safety device (pressure sensor) fitted to the system. The sensor detects the object beneath the lift and movement of the lift is immediately stopped.	Complies with the stated requirement.
6.7	Clause 3.11.3.2.3 (AIS-153) In the event of one of these safety devices coming into operation, the movement of the lift shall immediately be stopped and movement in the opposite direction initiated.	In the event of the safety device coming into operation, the movement of the lift is immediately stopped and movement in the opposite direction is initiated through operating device.	Complies with the stated requirement.
7	Clause3.11.3.3(AIS-153) Operation of power operated lifts		
7.1	Where the lift is at a service door situated within the direct field of vision of the driver of the bus, the lift may be operated by the driver when in the driver's seat.	The lift is placed at the rear service door, which is not within the direct field of vision of the driver of the bus.	Not applicable.
7.2	In all others cases, the controls shall be adjacent to the lift. They shall be capable of being activated and deactivated only by the driver from his seat.	The controls operating the lift are placed adjacent to the lift. At the driver seat, a switch provided for activation and deactivation of the lift operating controls.	Complies with the stated requirement.

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Sr. No.	Clause Description	Observation	Remarks
8	Cycle Time:		
8.1	Loading time 90~100 seconds	Loading time is within 90 sec. Verified and found to be satisfactory.	Complies with the stated requirement.
8.2	Unloading time 90~100 seconds	Unloading time is within 80 sec. Verified and found to be satisfactory.	Complies with the stated requirement.
9	Dimensions		
9.1	Closed Condition (LxWxH) in mm - 620 x 810 x 120	Verified and found to be satisfactory.	Complies with the stated requirement.
9.2	Open Condition (LxWxH) in mm - 1240 x 810 x 120	Verified and found to be satisfactory.	Complies with the stated requirement.

Remarks :

1) The vehicle model 'ELEKTRA SL650' bus complies with the stated requirements as per the Tapco Pneumatics Test Procedure Doc. No. TP001
2) Refer Annexure - 1 for Vehicle Photographs.
2) Refer Annexure - 2 for "Test Procedure Doc. No. TP001"

	Initiated by	Verified by	Authorized by
07-10-2020			
DATE	V. SATISH ENGINEER	P.D. BETGERI DEPUTY DIRECTOR	A.A. BADUSHA SR. DEPUTY DIRECTOR & HEAD

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ANNEXURE - 1 (Photographs)

Service Door Side View

Service door and steps with the Lift Provision

Lift platform at Ground level



End flap, Grab rail & Operating device




Manual operating provision, Driver operating switch, Indicating Buzzer

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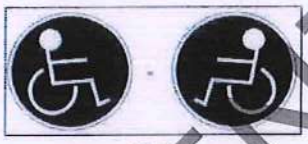
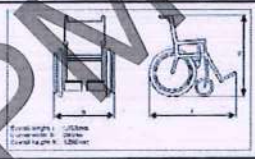
ANNEXURE - 2

Tapco ENDLESS POSSIBILITIES	ELEKTRA SL650 Wheelchair lift Inspection report	Doc. No.:- TP001 Revision:- # Inspection date:- 12-09-2020
Customer name :-	Olectra Greentech Limited	Inspected by:- Shyama Charan Shukla
Customer address :-	S-22, 2nd & 3rd Floor, Technocrat Industrial Estate, Balanagar, Hyderabad-500037	Approved by:- Ashita Sudhakar
Place of inspection :-	L-19 To L-29, Green Industrial Park, Rajapur, Jadcherla, Mahabubnagar, Telangana, 509302, India	
Chassis No. :-	-	
Body No. :-	-	
Model No. :-	K7 650 model	

Sl. No.	Description	Testing parameters/ Features/Specification	Electra Remarks
1	Pictogram for Wheelchair Users as per Clause 3.6.6 in accordance with AIS-153 for easy identification wheelchair lifter position	 Figure 6 Pictogram for Wheelchair Users Colour: blue based with white symbol Size: at least 150 mm diameter Reference for the design principles of safety symbols: ISO 3864-1:2002	OK
2	Clause 3.6.4 (AIS-153) It shall be possible for a wheelchair user to move freely and easily from the outside of the bus through at least one of the doors for wheelchair access into the special area(s) with a reference wheelchair, the dimensions of which are shown.		For reference only
3	Clause 3.6.4.1.1 (AIS-153) Sufficient space available for the wheelchair user to manoeuvre without the assistance of a person		All the dimension is controlled as per clause 3.11.3.1.2 (AIS-153)
4	Clause 3.6.1 (AIS-153) The floor surface of the special area shall be slip resistant and the maximum slope in any direction shall not exceed 5%.		Anti-skid rubber used to make the platform slip resistance The slope is not more than 2% in any direction
5	Provisions for Boarding Devices		
5.1	Clause3.11.1.1(AIS-153)The controls actuating the boarding devices shall be clearly marked as such. The extended or lowered position of the boarding device shall be indicated by a tell-tale to the driver.		Electrical buzzer is fitted to the system, as the motion of the wheelchair lift initiated the buzzer will work and it will get off until the platform will not Reach to the home position

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5.2	Clause3.11.1.2(AIS-153)In the event of the failure of a safety device, lifts, ramps and kneeling systems shall be incapable of operation, unless they can be safely operated by manual effort. The type and location of the emergency operating mechanism shall be clearly marked. In the event of power failure, lifts and ramps shall be capable of manual operation.		In the event of the power failure the lift is capable to move by up and down by means of manual pump and manual lowering valve
5.3	Clause3.11.1.3.1(AIS-153)The boarding device does not obstruct the handle or other device for opening the door.		It is not obstructing any other components on the bus
5.4	Clause3.11.1.3.2(AIS-153)The boarding device can be readily moved to leave the doorway clear for use in an emergency.		It is not affecting any doorway in case of emergency
6	3.11.3 Lift		
6.1	3.11.3.1 General Provisions		
6.2	Clause 3.11.3.1.1 (AIS-153)Lifts shall only be capable of operation when the bus is at standstill. Any movement of the platform shall be prevented unless a device preventing the wheelchair from rolling off has been activated or has automatically come into operation.		OK
6.3	Clause 3.11.3.1.2 (AIS-153)The lift platform shall not be less than 800mm wide, and not less than 1,200mm long and shall be capable of operating when carrying a mass of at least 300kg		Width - 810 mm Length - 1240 mm Load capacity - 300 Kg
6.4	Clause 3.11.3.2 (AIS-153)Additional technical requirements for power-operated lifts		Power operated lift
6.5	Clause 3.11.3.2.1(AIS-153)The operating control shall be designed in such a way that, if released, it automatically returns to the off position. As it does so the movement of the lift shall immediately be stopped and it shall be possible to initiate a movement in either direction.		Designed in such a way that if we continuously press the button on the pendent box then only wheelchair lift move, if we released the button it will stop on that position itself

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6.6	Clause 3.11.3.2.2(AIS-153)A safety device (e.g. reversing mechanism) shall protect areas not visible to the operator, where the movement of the lift might trap or crush objects.		Pressure sensor is used to sense the object on the area which is not visible to the operator
6.7	Clause3.11.3.2.3(AIS-153)In the event of one of these safety devices coming into operation, the movement of the lift shall immediately be stopped and movement in the opposite direction initiated.		If any object will be there in non-visible area, the pressure sensor will get activate and it will send the feedback to the control system and the platform motion will be stopped and movement of the platform can be initiated by using pendent box button
7	Clause3.11.3.3(AIS-153)Operation of power operated lifts		
7.1	Clause3.11.3.3.1(AIS-153)Where the lift is at a service door situated within the direct field of vision of the driver of the bus, the lift may be operated by the driver when in the driver's seat.		Not applicable, the wheelchair lift is mounted to the rear door i.e. indirect vision of the driver
7.2	Clause3.11.3.3.2(AIS-153)In all others cases, the controls shall be adjacent to the lift. They shall be capable of being activated and deactivated only by the driver from his seat.		Pendent box is mounted adjacent to the lift Wheelchair lift is activated and deactivate by the driver by using power control to the control system
8	Cycle Time:		
8.1	Loading time 90-100 seconds		90 sec
8.2	Unloading time 90-100 seconds		80 sec
9	Dimensions:		
9.1	Closed Condition(LxWXH)		620 X 810 X 120 mm
9.2	Open Condition(LxWXH)		1240 X 810 X 60 mm
Conclusion: The Wheel Chair Lift Model specified above is meeting all the AIS153 requirements			

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