

Transport for London

door safety

BUS SAFETY STANDARD
TFL 2.6 2025

Obstruction detection

Drag detection

Misuse prevention

Redundancy

innovative door systems
for urban transport

VENTURA
SYSTEMS

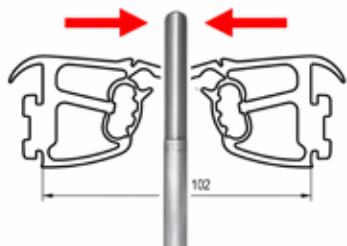
bus door safety

With the release of Transport for London's Specification for New Buses version 2.6 in April 2025, new requirements for bus door safety are helping shape the next generation of buses in London and across the United Kingdom. Ventura Systems has updated its door system technology to comply with the latest specification, ensuring customers are prepared to meet these new requirements while delivering safe, reliable and comfortable passenger journeys. We outline the main requirements of the new specification and show how we have adapted our door solutions accordingly.

updated door technology

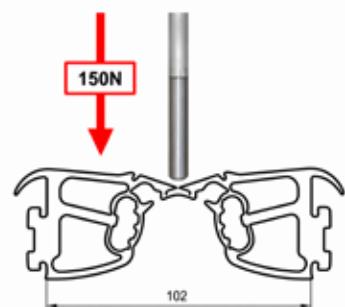
To comply with the updated requirements, we have further developed our rubber design. This updated design supports the latest safety requirements while maintaining the reliability, durability and sealing our door solutions are known for. We highlight the key features of the updated rubber design and show how it contributes to compliance with the new bus specification.

Obstruction detection during closing



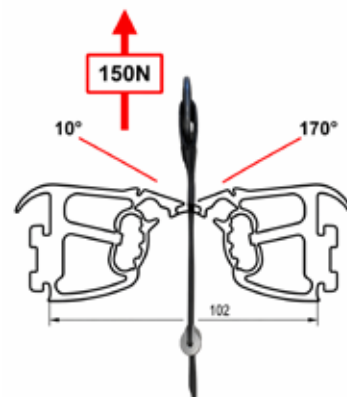
- Goal is to detect obstruction
- Ambient temperature of 20 degrees
- Digital log of the event in vehicle
- Obstruction detection should detect round test bar of 11mm

Resistance to unwanted activation



- Goal is to reduce risk of tampering anti-drag system
- Round test bar with diameter of 15mm
- Test tip is spherical, R15
- Test with force of ≥ 150 N
- Anti-drag system should not detect an object when forces lower than 150 N are applied

Limit risk of dragging



- Goal is to minimise risk of dragging
- Test tool is a flexible strap, 0.7 mm thick
- Force limit is ≤ 150 N
- Test angle range is 10° to 170°, forward / reverse
- Environmental range is -20°C to +50°C
- Static test and in-motion test ≤ 5 km/h and at > 5 km/h to ≤ 15 km/h
- Anti-drag system should detect an object

Current

New

Inward Gliding door system - front door



Plug Sliding door system - rear door



The updated rubber profiles shown above have been specifically designed to comply with the new requirements and have been thoroughly tested for this purpose. They are developed to support effective obstruction detection during closing, reduce the risk of unintended activation of the anti-drag system, and to minimise the risk of dragging. In addition, we have updated the software and adapted the door system to comply with the full specification. This ensures safe, reliable and compliant door operation.

The following list gives a high-level overview of the remaining requirements within the specification and serves as a practical guide for compliance review. It is intended to support a clear and structured assessment, while the full specification should always be consulted for detailed requirements, definitions and applicable test conditions.

Checklist

Goal	Description requirement
Standard door leaf configuration	Standard London layout is a 2-door bus with the entrance door forward of the front axle and the exit door between front and rear axle. Front entrance door shall be inward glider or outward glider type. Centre and rear doors shall be outward glider type
Set minimum doorway dimensions for passenger flow	Entrance and exit doors shall provide a minimum individual clear width of 1200 mm using an equal-width 2-leaf closure. If reduced under UNECE Regulation 107, the minimum clear width must still be 1030 mm across the full height of the door
Prevent vehicle movement with an unsafe door state	Halt brake must engage immediately whenever any passenger door is not fully closed or locked due to driver command, emergency command, safety-edge activation, or opening under a fault condition. Applies when stationary and at speeds ≤ 5 km/h. A digital log of door-commanded halt-brake activations must be stored
Prevent trapping during closing	If closing is blocked between fully open and within 11 mm from fully closed, the door must stop and fully reopen automatically. The system shall detect an 11 mm round test bar at 20°C, and the event must be logged and readable by diagnostics
Prevent dragging a person or object after door closure	An anti-drag system is required for items under 11 mm wide. The functionality shall be enabled while driving. It may deactivate once speed exceeds 15 km/h until the next door cycle
Control door cycle timing	Door opening or closing movement must complete within 3-4 seconds, excluding delay between command and motion
Control emergency/fault overrides.	Interior and exterior emergency passenger door controls must be protected against accidental, unintended, or misuse conditions by suitable positioning, labelling, and a movable cover/flap
Ensure mechanical strength and passenger containment	A closed and locked door, including glazing, must withstand a 1 kN per linear metre inward push at 1300 mm height, distributed over 200 mm around the door-height centreline, without loss of operation or non-elastic deformation. A closed locked door leaf retained by the top and bottom guidance system must withstand a 68 kg impact at 2.5 m/s at the centre of the leaf without fracture, loss of containment, or permanent non-elastic deformation. A closed sliding-door lock must withstand 1200 N in the opening direction
Avoid unsafe single-point failure	In the event of system fault, mechanical failure, or grossly out-of-tolerance setup, normal door operation must be prohibited and the driver must be notified. Door mechanisms and control logic must be designed so that at least 2 independent faults are required before a door can detach, open uncommanded, or allow movement with the door not fully closed or unlocked
Prevention of water and wind ingress	The door must prevent water and wind ingress when closed and remain adequate during a standard depot drive-through bus wash
Prevention of tampering with drag detection system	Anti-tampering rule: the anti-drag system shall not detect a 15 mm diameter object with spherical front radius of 15 mm pressed perpendicularly onto both inner and outer rubber surfaces with force up to 150 N. For the front door, this is only required when the force is applied from the outside. For the rear door, it is required for both inside and outside.
Optimal door operation	There must be a 1.5-2.0 second delay between an open/close command and any door movement
Audible and visual warnings	An audible warning device is required on all centre and rear doors: beeping sound, max 75 dBA measured at 1 m height on the bus centreline at the exit door. A visual interior warning lamp/beacon near the opening must follow the 1.5-2.0 second pre-movement timing and switch off once movement is complete