

# Information Bulletin

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## Guideline for Front Door Closure Systems on Heavy Buses providing Public Passenger Services

This Guideline is provided for operators of public passenger services in Queensland who provide services using a heavy bus. The purpose of the Guideline is to provide advice about front door closure systems that would minimise the chance of a person becoming entrapped in the front door of a bus. Compliance with this Guideline is compulsory for all operators providing public passenger services under a service contract with the Department of Transport and Main Roads (TMR) and is recommended for all other operators of heavy buses.

### Definitions

The following terms are defined for the purposes of this Guideline.

**Entrapment prevention** means that the bus door will automatically reopen when it comes up against an object before full closure

**Heavy bus** means a bus with a Gross Vehicle Mass (GVM) of more than 5t.

### Background

Workplace Health and Safety Queensland (WHSQ) has conducted an investigation into a fatal workplace incident which occurred where a bus driver was trapped between the door and the frame of a bus.

There were no witnesses to the event, however given the driver was discovered trapped between the door and bus frame, it was concluded that the driver was trying to manipulate the manual bus door emergency release mechanism from outside the bus and had become trapped. The intended use of the mechanism is to operate the door in emergency situations rather than general operational use such as securing the bus when the driver is leaving the vehicle for a period of time or at the end of the shift.

WHSQ also reported that their research indicated there had been similar incidents in other States, of drivers or workers being trapped in the doors which had resulted in fatalities and recommended that *“the dangers presented by some bus door closing systems be addressed by the regulator”*.

TMR has given due consideration to this issue and has produced this Guideline in relation to entrapment prevention in front door closure systems. This Guideline requires TMR contracted heavy bus operators to:

- (a) ensure that a person cannot operate the front door in such a way that they could become trapped, or
- (b) ensure that the force of the door closing system is such that the person is unlikely to be injured or trapped if the door closes.

The provisions in this Guideline are not aimed at incidents where a passenger boarding or disembarking the bus is trapped in the door. In such cases the driver is able to take some action to reopen the doors or to assist in some other way. This Guideline has been produced to reduce the risks of entrapment of drivers and other workers where there is no other person in the vicinity who may be able to assist should the doors close on the person.

## Options

To minimise the chances of entrapment in the front passenger door, a heavy bus used to supply services should:

- (a) have the front passenger doors fitted with a high / low pressure system which can be regulated so that the maximum force during the closing movement does not exceed 150 Newtons and the force used to keep the door closed when the bus is moving does not exceed 300 Newtons; or
- (b) include an entrapment prevention device within the front passenger door system to ensure that, should a person's presence in the doorway obstruct the door closing, the movement of the door is reversed; or
- (c) have all passenger door controls/switches that are located inside the vehicle near any door (including door controls which can initiate automatic closing) protected by an appropriately constructed cover so that the switch cannot be operated by a person except by breaking the protective cover.

**Note:** This Guideline does not apply to buses which, by design, have a door operating system designed in such a way that it prevents any possibility of entrapment such that it does not need to meet (a), (b) or (c) above. These door systems would include those where an air pressure dump valve operates purely as an emergency door opening mechanism and cannot be used to initiate automatic door closing. In these instances the switch is not required to be covered as mentioned in option (c) above of the Guideline. Such a design should be able to be demonstrated to confirm that it meets the intention of this Guideline.

Similarly, where a bus is designed to allow the driver to access the bus through a driver side door (similar to a car door) and this side door does not have any automatic closing mechanism, no modifications are required as there is no possibility of entrapment occurring with this design.

## Explanation of each option

The options listed in this Guideline are chosen as the optimal response to manage the risk associated with heavy buses that are currently operating.

A bus operator may choose the option best suited for the age of the bus, the residual service life and the cost of implementation. Regardless of which system is used, it should be tested and inspected on a regular basis as part of a service regime.

**Option (a)** – have the front passenger doors fitted with a high / low pressure system which can be regulated so that the maximum force during the closing movement does not exceed 150 Newtons and the force used to keep the door closed when the bus is moving does not exceed 300 Newtons.

This option allows operators to have a valve system fitted to the front door closure system to ensure that the closing force of the doors does not exceed 150 Newtons. The effect of this would be that if the doors did close on a person, the closing force would not be enough to cause a serious injury or to trap the person between the door and the frame. This feature makes it possible to push the door open again by hand or by placing some body weight against the door. Once in the closed position, the operating pressure must rise in order to keep the door closed during travel and this holding force must not exceed 300 Newtons.

This option is similar to the New South Wales Road Transport Authority (RTA) Technical Specification 146 which required every heavy bus built after 1 August 1997 providing public passenger services in NSW to meet that requirement. This is also likely to be the basis of any future mandatory requirement that may be specified in ADR 58/00.

Other issues addressed by the RTA Technical Specification 146, such as requiring the bus not to move while someone was trapped in the doors, are NOT relevant to this Guideline.

**Option (b)** – include an entrapment prevention device within the front passenger door system to ensure that, should a person’s presence in the doorway obstruct the door closing, the movement of the door is reversed.

This option provides maximum safety as the door will automatically reopen without any human intervention.

In some instances, this option may be more practical than option (a), which requires limiting the door closing force to a maximum of 150 Newtons, when the door closing system needs to have design features to ensure the doors remain closed during travel at high speeds and on turns.

Door re-opening systems need to be configured such that they don’t create greater unsafe situations when the bus is in operation, such as the re-opening system activating when the bus is travelling, or when a passenger is pushing on the door. In such situations, passengers can fall from the bus so any re-opening systems need to be isolated at speed.

**Option (c)** – have all passenger door controls/switches that are located inside the vehicle near any door (including door air pressure dump valves which can also operate as a closing device) protected by an appropriately constructed cover so that the switch cannot be operated by a person except by breaking the protective cover.

Any switch/control which is located in the passenger entry area of the bus (accessible to a person standing in the vicinity of the front passenger door) which can be used to close the door of the bus, should be completely covered to render it inaccessible except by breaking the cover in the case of an emergency. The cover should be constructed and mounted in such a way that the switch can only be operated when the cover has been broken. A warning label stating that the cover should be broken in case of emergency should be prominently displayed in the vicinity of the cover.

An additional warning sign should be displayed in the vicinity of such switch/control stating that the switch/control should only be used to open the passenger door in an emergency. Examples of appropriate warning signs and cover are included below. Any operator wishing to purchase the cover or warning signs may like to contact either the Queensland Bus Industry Council or the Queensland School Bus Alliance for further advice.

All drivers and service staff should be trained to be aware of the purpose and proper use of such a switch/control.



## **Additional information**

Clarification of any information in this bulletin may be obtained from the Department of Transport and Main Roads by contacting your local Passenger Transport office.