

DOCUMENT IDENTIFICATION NUMBER



# Individual Vehicle Approval (IVA) Manual for Vehicle Categories **M2** and **M3** (Bus and Coach)

## 45 Safety Glass

**Application:** All Vehicles (except Armoured)


Method of Inspection	Required Standard
<p>Ensure that all windscreens, windows, internal glazed panels and side screens are securely attached to the vehicle and are constructed from approved materials.</p> <p>The inspection of internally glazed panels applies to a partition or screen divider used for the separation of driver to passenger area or for passenger protection. It does not apply to such items like; break glass hammer panels, fire extinguisher panels or L.E.D information screens etc. This is not an exhaustive list but is provided as guidance.</p> <p><b>Note 1:</b> “Safety Glazing” made from glass or plastic must be so constructed or treated that if fractured it does not fly into fragments likely to cause severe cuts. Each piece of glazing must display the relevant permanent marking applied by the glazing manufacturer.</p> <p>Example of a marking </p> <p><b>Note 2:</b> This only applies to those windows or parts of window affording the driver a view of the road</p>	<ol style="list-style-type: none"> <li>1. Windscreens, windows, internal glazed panels and side-screens where fitted must be securely attached to the vehicle.</li> <li>2. Windscreens, windows, internal glazed panels and side-screens where fitted must be suitable for its use. (see Table 1)</li> <li>3. Windscreens and windows wholly or partly on either side of the drivers seat must be “Safety Glazing” made from glass and display the relevant markings. (see note 1 and table 1)</li> <li>4. All other windows (including sunroofs internal glazed panels and removable glass panels) and side-screens must be “Safety Glazing” (which may be made from glass, or from plastic) and display the relevant markings. (see note 1, and table 1)</li> <li>5. Windscreens and windows wholly or partly on either side of the drivers seat must allow a visual transmission of at least 70%, (see note 2)</li> </ol>

Table 1

Type of window	Relevant Markings (Mandatory) In addition to "e" approval	Markings (Not Allowed)
Windscreen	<b>II</b> -for ordinary laminated glass <b>III</b> -for treated laminated glass <b>IV</b> -for glass-plastics glazing.	<b>V</b> - safety glazing having a regular light transmittance less than 70 per cent. <b>VI</b> - double-glazed unit <b>VII</b> - uniformly-toughened glass which can <b>only</b> be used as windscreens for slow-moving vehicles which, by construction, cannot exceed 40 km/h. <b>VIII</b> -In the case of rigid plastic glazing.
Windows wholly or partly on either side of the drivers seat	<b>VIII</b> -In the case of rigid plastic glazing. In addition the appropriate application will be signified by: <b>/B</b> for side, rear and roof glazing	<b>V</b> -in the case of safety glazing having a regular light transmittance less than 70 per cent. <b>VII</b> - uniformly-toughened glass which can <b>only</b> be used as windscreens for slow-moving vehicles which, by construction, cannot exceed 40 km/h. <b>VIII</b> -In the case of rigid plastic glazing. In addition the appropriate application will be signified by: <b>/A</b> for forward facing panels, <b>/C</b> in locations where there is little or no chance of head impact.
Other windows and other glazed panels	None	<b>VII</b> - uniformly-toughened glass which can <b>only</b> be used as windscreens for slow-moving vehicles which, by construction, cannot exceed 40 km/h.
Break Glass exits	None	<b>II</b> -for ordinary laminated glass, <b>III</b> -for treated laminated glass, <b>IV</b> -for glass-plastics glazing

These symbols may be marked down in a different format i.e **II - IV**

### Laminated-glass

Means a glass pane consisting of two or more layers of glass held together by one or more interlayers of plastics material; it may be:

"**ordinary**", when none of the layers of glass of which it is composed has been treated; **or**

"**treated**", when at least one of the layers of glass of which it is composed has been specially treated to increase its mechanical strength and to condition its fragmentation after shattering;

### Glass-plastics glazing

Means a pane of laminated glass having one layer of glass and one or more layers of plastics material, at least one of which acts as interlayer. The plastics layer(s) shall be on the inner face when the glazing is fitted on the vehicle;

### Rigid plastic glazing

Means a plastic glazing material which does not deflect vertically more than 50 mm in the flexibility test as shown in **UNECE Regulation 43**

## Safety Glass 45

## Record of Revision

Revision	Date	Description of Change
1	24/04/2009	
2	22/01/2010	Add new paragraph to the MOI
3	30/11/2011	Add exemption to application for armoured vehicles, removes all references to AV in Mol and RS, combine original notes 1 & 2 and renumber remaining note
4	30/04/2012	Add the text 'Example of Marking' to Mol

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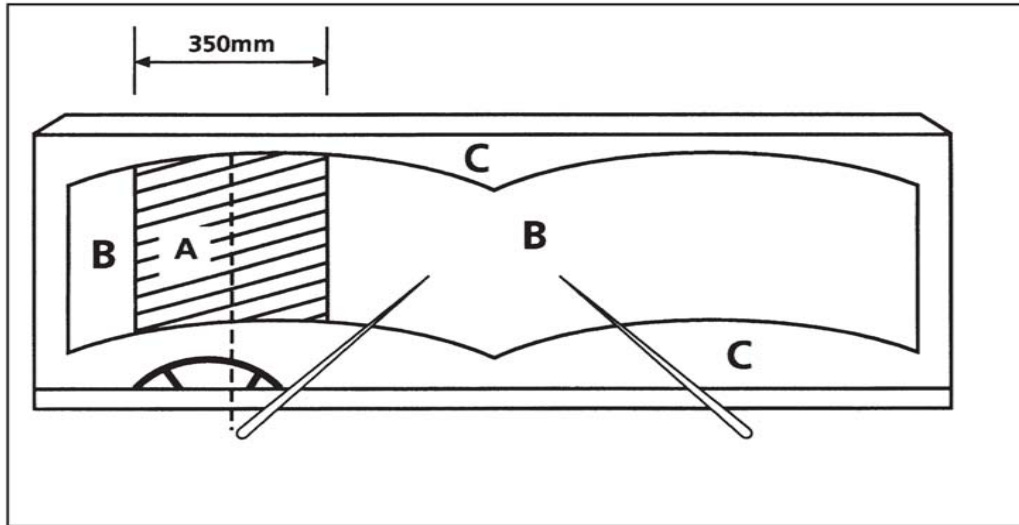
# **Public Service Vehicle Inspection Manual**

Consolidated Edition 2012

**23 Glass and View of the Road****Application**

This inspection applies to all vehicles.

When checking the windscreen refer to the diagram below.



**Zone "A"** is 350mm wide, in the swept area of the screen and centred on the centre of the steering wheel.

**Zone "B"** is the remainder of the swept area.

**Zone "C"** is the remainder of the screen not covered by Zones "A" or "B".

**Windscreen.**

Examiners should have regard for the three separate "zones" when assessing damage or discolouration. A greater amount of damage or discolouration could be accepted in zone "C" than in zone "B". Likewise a greater amount can be accepted in zone "B" than in zone "A" where relatively minor damage would be a Reason for Failure.

**When assessing damage, light surface scratches**, are not to be considered as damage. However, an area of concentrated scratches such as those caused by prolonged use of a defective wiper blade which significantly obscures vision is to be considered a Reason for Failure if it meets the fail criteria

**Repaired windscreens must be inspected to the same criteria as original** unrepared screens. Repairs must be judged as to whether they interfere with vision. An invisible or barely detectable repair, finished flush with the surrounding glass, does not count as damage even if the repair exceeds the limits of damage allowed in the test.

**Swept area means** the area swept by the wipers in their normal operation and does not include any additional area of the screen covered by the wipers to reach the parked position or which the original manufacturer has designed as opaque.

**23 Glass and View of the Road****Application**

Check that the correct type of glass or safety glazing is fitted to the windows specified in the table below.

VEHICLE FIRST USE	WINDSCREEN	WINDOW AT EITHER SIDE OF THE DRIVER	FRORWARD FACING WINDOW OTHER THAN A WINSCREEN	OTHER WINDOWS	WINDOWS IN INTERNAL PARTITIONS SCREENS AND DOORS
From 1 April 1988	Safety glass	Safety glass	Safety glass or safety glazing	Safety glass or safety glazing	Safety glass or safety glazing
From 1 June 1978	Safety glass	Safety glass	Safety glass or safety glazing	Safety glass or safety glazing	No requirement
From 1 January 1959	Safety glass if glass is fitted	Safety glass if glass is fitted	Safety glass if glass is fitted	Safety Glass if glass is fitted	No requirement
Before 1 January 1959	Safety glass if glass is fitted	No requirement	Safety glass if glass is fitted. The glass fitted to the upper deck of a double decker need not be safety glass.	No requirement	No requirement

**Plastic safety glazing or laminated glass** is not suitable for use in "Break Glass" emergency exits.

Check that all safety glass is properly marked (marking of glass is not required for vehicles first used before 1 June 1978). Acceptable markings include:

- BS857
- BS AU 178
- An "e" mark followed by a number in a square
- BS 5282 (only on vehicles first used before April 1985)
- TP GS or TPGSE (Glass made in France only acceptable on vehicles on vehicles first used before October 1986)
- An "E" mark including the number 43R



**23 Glass and View of the Road**

**Application**

**Normally glass marked only with a kite mark and BS6206 is not acceptable**, the glass must be marked with one of the other acceptable markings. In the past some buses were certified where the only marking on the glass was a kite mark. If a bus has glass marked in this way and there is no reason to believe it is not safety glass this is acceptable.

**If an acceptable mark has become faint or deteriorated** this is not a reason for failure.

**LDV Convoys front door window glass markings are situated below the trim** and are not visible. This model should not be failed for failure to display an appropriate mark.

**Side window with a marking of M416 is acceptable**, it is not acceptable for windscreens.

**Where glass is replaced with a piece from a stock sheet** and the repairer has evidence of the standard to which the stock sheet complied, it is acceptable for them to mark the glass with the standard reference number but must be accompanied by a permanent mark which the person/company can be identified.

**“Safety glazing”** means material (other than glass) which is so constructed or treated that if fractured it does not fly into fragments likely to cause severe cuts. There is a large range of materials which can be fitted as safety glazing and it is not possible to identify these positively at the test, as there is no requirement for marking.

Check the view of the road from the driver’s seat. The view must not be obstructed by any changes to the original design such as the addition of stickers, pennants, cab decorations, stone-guards or other items which encroach more than 40mm in any direction into the swept area.

**Some vehicles have very large screens** and have windscreen wipers which cover an area that have no practical use. For the purpose of the annual test the area of screen above a horizontal line taken from the driver’s eye position, assessed with the driver seated, looking forward in a comfortable upright driving position and with the seat, if adjustable in its highest position can be ignored.

## 23 Glass and View of the Road

### Application

**As a general rule nothing should be placed in the swept area of the wipers.** However, some official stickers and road safety items are permitted provided they do not seriously impair the driver's view of the road. Official stickers are those that have a mandatory requirement to be in the windscreen for road enforcement, security or crime prevention.

Examples of these are:

**Official stickers** are permitted to encroach more than 40mm if this is necessary to comply with other regulations, and include:

- Roadfund licence
- Operators licence
- Section 19 permits
- Vehicle anti-theft scheme stickers issued by the Police Authority
- Toll payment tag/stickers and security passes

*These should only be considered a reason for failure if they seriously impair the view to the front.*

**Where non official stickers encroach into the swept area** of the wipers by more than 40mm this is a Reason for Failure (the 40mm is to be taken in any direction).

**Other items which may intrude** into the swept area of the wipers provided they do not seriously impair the drivers view are:

- Vehicle distance or lane indicator lenses
- Automatic windscreen wiper detectors
- Grooves in the windscreen designed to clean wiper blades
- Drivers blinds and their mountings including manufacturers exterior fixed sun visors
- Fresnel lens
- Split windscreens
- Wipers which park adjacent to the central pillar
- DDA handrails
- Anti vandal screens and their associated poles
- Ticket machines and fare collection equipment are allowed into the swept area of the wipers provided they do not seriously impair the view of the road. Seriously impair with regards to ticket machines or fare collection equipment means; a person 1.07m (3ft 6ins) tall 300mm wide is not totally concealed by the ticket machine or other fare collection equipment 2m in front of the vehicle

**23 Glass and View of the Road**  
**Application**

On many vehicles the original design will place things like instrument panel clusters inside the 40mm limits. Intrusions such as this which are original design features can be ignored, as can stickers placed inside the 40mm limit but which are hidden by a feature of the original design.

**Examples of unacceptable features** are:

- No smoking signs
- Maximum height signs
- Satellite navigation if not chassis makers original equipment (see example below)
- Maintenance information stickers
- Monitors which show the activities at the rear of the vehicle if not chassis makers original equipment.



Chassis makers original equipment - Pass

Not chassis makers original equipment - Fail

Public Service Vehicle Inspection Manual

<b>23 Glass and View of the Road</b>	
<b>Method of Inspection</b>	<b>Reason for Failure</b>
<p>1. Check windscreen for:</p> <ul style="list-style-type: none"> <li>a. damage or discolouration which impairs the drivers view of the road.</li> <li>b. crack(s) passing through the swept area which renders the screen insecure or which impairs the drivers view.</li> <li>c. an obstruction which encroaches more than 40mm into the swept area (see note).</li> <li>d. crack(s) where there is noticeable displacement of the surfaces on either side which has an adverse effect on the condition and operation of the windscreen wipers.</li> <li>e. damage which exposes the inner layer of a laminated screen.</li> </ul> <p>2. Check a windscreen or window:</p> <ul style="list-style-type: none"> <li>a. is made of safety glass or safety glazing</li> <li>b. if made of safety glass has an acceptable mark.</li> <li>c. does not allow the ingress of water.</li> <li>d. for presence.</li> <li>e. any windscreen window interior screens and partitions for security and condition.</li> </ul> <p>3. check the presence security and condition of a guard rail at a window internal screen or partition.</p> <p>4. check there is no damage or obstruction of a side window which impairs the drivers view through a mandatory mirror.</p>	<p>1. A Windscreen:</p> <ul style="list-style-type: none"> <li>a. with damage or discolouration which impairs the drivers view of the road.</li> <li>b. with a crack passing through the swept area which renders the screen insecure or which impairs the drivers view.</li> <li>c. with an obstruction which encroaches more than 40mm into the swept area.</li> <li>d. with any crack where there is noticeable displacement of the surfaces on either side which has an adverse effect on the condition and operation of the windscreen wipers.</li> <li>e. with damage which exposes the inner layer of a laminated screen.</li> </ul> <p>2. A windscreen or window:</p> <ul style="list-style-type: none"> <li>a. not made from safety glass or safety glazing as specified in the table in the applications column.</li> <li>b. made of safety glass which does not show an acceptable marking.</li> <li>c. which allows water to leak into passenger areas.</li> <li>d. a windscreen or any other outside window missing,</li> <li>e. any windscreen window, internal screen or partition so insecure that it is likely to fall out in normal use or cause injury to any person on the vehicle.</li> </ul> <p>3. a guard rail or barrier at a window, internal screen or partition missing, insecure or damaged to the extent that injury to a passenger is likely.</p> <p>4. damage or obstruction of a side window which impair the drivers view through a mandatory mirror.</p>

Vehicle & Operator Services Agency

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# Categorisation of Defects

Description of Defect	Severity of Defect	Action	Notes
<p><b>View to the front</b></p> <p><b>1</b> Driver's view to the front impaired having regard to the original design of the vehicle (See Notes 1 - 7)</p>	<p>Any object seriously impairing driver's view through the area swept by the windscreen wipers</p> <p>Otherwise than above</p>	<p>I</p> <p>IN</p>	<ol style="list-style-type: none"> <li>1. Reversing monitors and navigation screens may be acceptable, provided they do not impair the drivers view to the road and are of manufacturers original equipment</li> <li>2. As a general rule nothing should be placed in the swept area of the wipers. Some official stickers and road safety items are permitted provided they do not seriously impair the drivers view of the road. Official stickers are those that have a mandatory requirement to be in the windscreen for enforcement, security or crime prevention E.g. Tax disc, 'O' licence,, Police authority vehicle anti theft scheme stickers, security passes, disabled driver permits / badges etc.</li> <li>3. Swept area means the area swept by the wipers in their normal operation not including any area covered to reach the parked position or which the manufacturer deems as 'opaque'</li> <li>4. Acceptable items for PSVs : DDA hand rails, anti-vandal screens and their poles. Ticket machine/fare collection equipment is allowed as as long as a person 1.07m (3ft 6 ins) tall, 300mm wide is not totally concealed at 2m in front of the vehicle.</li> </ol>

Description of Defect	Severity of Defect	Action	Notes
		<p>I</p> <p>IN</p>	<p>5. Some vehicles have very large screens whose wipers cover an area that serves no particular use. The area above the horizontal line taken from the eye position assessed with the driver seated looking forward in the usual driving position, with the seat in it's highest position can be ignored, other than the area required to view the rear view mirror where applicable)</p> <p>6. Features which may intrude into the swept area provided they do not seriously impair the drivers view are: Vehicle distance or lane indicator lenses, automatic windscreen wiper detectors, wiper blade cleaning grooves, fresnel lens, split windcreens, central parking wipers.</p> <p>7. Features which are not permitted are: no smoking signs, maximum height signs, sat nav if not vehicle original equipment maintenance information stickers, monitors which show activities at the rear if NOT vehicle original equipment</p> <p>Examples used are not a definitive list.</p>

Description of Defect	Severity of Defect	Action	Notes
<b>Windscreen and Windows</b>			
1 Windscreen cracked/ scratched/ discoloured	Driver's view of the road seriously impaired/presents a danger to occupants of the vehicle/ detachment likely	I	2. On vehicles first used before 1 January 1959, if glass is fitted to windcreens and windows facing to the front on the outside of any motor vehicle, except the upper deck of a double decked vehicle, it must be safety glass.
	Otherwise than above	IN	
Windscreen not of safety glass	(See Notes 2, 3, 4 and 5)	I	3. On PSVs first used between 1 January 1959 and 31 May 1978, if glass is fitted to windcreens or any windows on the outside it must be safety glass.
Driver's side window not of safety glass	(See Notes 2, 3, 4 and 5)	D	
PSV driver's interior door/ screen not of safety glass or of a safety glazing material	(See Notes 3, 5, 6 and 8)	D	4. Safety glass on vehicles first used before 1 June 1978 need not be marked as such. Where markings have been applied, these can fade with time.
PSV window not of safety glass or of a safety glazing material	(See Notes 2, 3, 4 and 5)	D	
PSV window glazing missing/insecure/ cracked	Missing, detachment likely and/or presents a danger	I	5. On vehicles first used on or after 1 June 1978, windcreens and other windows wholly or partly on either side of the driver's seat must be of specified safety glass. All other windows must be specified safety glass or glazing.
Relevant vehicle (See Note 4) with glass not marked with an acceptable mark.	-	IN	
Windscreen and front side windows excessively tinted	Average light transmission <30%	I	6. On PSVs first used on or after 1 April 1959 and before 1 April 1988, transverse windows or transparent partitions not of safety glass or safety glazing must be adequately protected against breakage should a passenger be thrown against them.
	Average light transmission $\bar{\geq}$ 30% <45%	D	
	Average light transmission $\bar{\geq}$ 45% <65%	IN	



Description of Defect	Severity of Defect	Action	Notes
<p><b>PSV Windows</b></p> <p>Window louvres cracked/broken/insecure</p> <p>Weather strip damaged/deteriorated</p> <p>Window dirty</p>	<p>Detachment likely and/or presents a danger</p> <p>Otherwise than above</p> <p>-</p> <p>Affecting vision and/or light</p>	<p>I</p> <p>IN</p> <p>IN</p> <p>IN</p>	<p>7. On PSVs first used on or after 1 April 1988, all transverse windows or transparent partitions must be of safety glass or safety glazing.</p> <p>On PSVs first used before 1 April 1959, transverse windows or transparent partitions not of safety glass or safety glazing must be adequately protected against breakage if they face transverse seats.</p> <p>8. Safety glazing is permissible for windows forming all or part of a door fitted in the interior of a PSV at the side of the driver's seat so as to form a compartment for the driver.</p>