



Driver & Vehicle  
Standards  
Agency

# Public Service Vehicle Inspection Manual

consolidated edition 2013

## Public Service Vehicle Revision Record 2013

Section Number	Section Title	Description of Change	Revision Date	Revision Number
	Consolidated 2013 PSV Inspection Manual	New consolidated 2013 version issued	01/01/2013	1.
16	Passenger Doors, Drivers Doors and Emergency Exits	Page 4 RfF 1d the wording "missing/" has been added to the sentence.	01/01/2013	2.
26	Speedometer/Tachograph	Page 2 paragraph for vehicles not requiring a tachograph which have a tachograogh fitted used as a speedometer has been amended from: "Check installation/calibration plaque for presence and condition, and the date of calibration is clearly visible." to read Only where the tachograph is marked in KPH alone, will you be required to check the installation/calibration plaque for presence and condition, and the date of calibration is clearly visible.	01/01/2013	3.
63	Lamps	Page 3, lamp requirements summary table, has the information on Main beam lamps amended. The words "No closer to the side than the dipped beam lamp Being a matched pair" have been removed from the column for maximum distance from the side.	01/01/2013	4.
71	Service Brake Performance	Page 1, electric/hybrid vehicle information for vehicles requiring decelerometer testing has been updated. Optare models can now be tested on RBT.	01/01/2013	5.
	Standards for Prohibition	IM38 - Vacuum assistance is not working – this now has a single asterisk.	20/03/2013	6.
01	Registration Plate	RfF 1 and 2 font now in black.	20/03/2013	7.
03	03 Seat Belts & Supplementary Restraint Systems	RfF 9, 10 and 11 font now in black.	20/03/2013	8.
18	Driver's seat	RfF 2 font now in black.	20/03/2013	9.
22	Mirrors and Indirect Vision Devices	RfF 1, 2, 3 and 5 references to indirect vision devices and cameras font now in black.	20/03/2013	10.

Section Number	Section Title	Description of Change	Revision Date	Revision Number
26	Speedometer/Tachograph	RfF 3d font now in black.	20/03/2013	11.
36	Hand Lever Operating Mechanical Brakes	RfF 1i and j font now in black.	20/03/2013	12.
37	Service Brake Pedal	RfF 2c and d font now in black.	20/03/2013	13.
38	Service Brake Operation	RfF 5 (ESC reference), 6 and 7 font now in black. RfF 3 now has only a single asterisk.	20/03/2013	14.
42	Electrical Wiring and Equipment	RfF 7 font now in black.	20/03/2013	15.
48	Suspension	RfF 1j and k font now in black.	20/03/2013	16.
54	Steering	RfF 1 d, i, j and k font now in black. RfF 2k, t, u and v font now in black.	20/03/2013	17.
59	Brake System Components	RfF 1 h font now in black. RfF 5g, h and l font now in black. RfF 6 font now in black.	20/03/2013	18.
63	Lamps	RfF 4e and 5 font now in black.	20/03/2013	19.
	Front cover	New corporate logo added	01/07/2013	20.
	About this manual	Page 4, Training information updated	01/07/2013	21.
01	Registration Plate	Application amended to clarify section only applies to registered vehicles.	01/07/2013	22.
16	Passenger Doors, Drivers Doors and Emergency Exits	Page 1 application the paragraph for power operated doors with safety systems has been amended including removing the measurements of 50 & 30 mm for certain door re-opening requirements.	01/07/2013	23.
38	Service Brake Operation	Page 1 and 2 Information for ABS, ABS/EBS & EBS/ESC requirements reworded for clarity and ABS warning lamp procedure removed from page 1. Page 3 and 4 MOI and RfF 5,6 & 7 wording amended for clarity now MOI & RfF 5,6,7 and 8.	01/07/2013	24.

Section Number	Section Title	Description of Change	Revision Date	Revision Number
45	Fuel Tanks and System	Page 1 application information amended – “VTG12” references now “VTP12”	01/07/2013	25.
53	Axles, Stub Axles and Wheel Bearings	Page 1 application - Mercedes Sprinter information updated. Mercedes sprinters play and radial movement acceptable up to 3mm.	01/07/2013	26.
58	Additional Braking devices	<p>Further information added to the application section:</p> <ul style="list-style-type: none"> <li>“If the device has been removed and it is mandatory this will be a reason for failure. If the device is not mandatory but is shown on the vehicles technical record the operator should submit a notifiable alteration form VTP5 to PSV Section so that its removal can be confirmed and any reference to the device can be deleted from the vehicle record. Where an exhaust brake operating cylinder and lever are completely removed. The housing containing the butterfly may be retained with the butterfly fixed in the open position.</li> <li><b>The check of operation is made by visual assessment</b>, failure is justified only when it is obvious that a device is inoperative i.e. a disconnected linkage.</li> </ul>	01/07/2013	27.
59	Brake Systems and Components	RfF 5h amended “or indicates low fluid level” has been removed as this is duplication of 5g.	01/07/2013	28.
66	Direction Indicators and Hazard Warning Lamps	Page 2 – MOI and RfF 1b amended the words “and that it is visible to the rear” removed from MOI and “or not visible to the rear.” removed from RfF.	01/07/2013	29.
38	Service Brake Operation	Pages 1 and 2 – minor update to titles for ABS, ABS/EBS and ABS/EBS/ESC paragraphs.	01/10/2013	30.
53	Axles, Stub Axles and Wheel Bearings	Page 1 & 2 application – MOI and RfF sections reworded to cater for option to jack.	01/10/2013	31.
54	Steering	Page 1 application sections reworded to cater for option to jack.	01/10/2013	32.
05	Exhaust Emissions	Page 5 MOI & RfF 5 added to include a check on the presence of emission control systems fitted as standard.	16/02/2014	33.

Section Number	Section Title	Description of Change	Revision Date	Revision Number
	Front cover page	Corporate logo updated.	01/10/2014	34.
	Foreword	VOSA updated to DVSA and information re production of hard copy documents removed.	01/10/2014	35.
	About this Manual	Pages 2 and 4 updated VOSA to DVSA	01/10/2014	36.
	Standards for Prohibition Issue at Annual Test	Page 4, defect descriptions for “missing filler cap” and “continuous fuel leak” swapped over to align with correct RfFs. RfF 4a, b and c amended to twin asterisks. Page 6 – IM71 RfF 2di – has been amended to a single asterisk.	01/10/2014	37.
03	Seat Belts & Supplementary Restraint Systems	Page 2 note added for clarification “ <b>Where a belt is fitted with no corresponding seat</b> or if there is a buckle/stalk but no corresponding belt, it is NOT to be considered a seat belt for the purpose of this inspection.”	01/10/2014	38.
06	Road Wheels and Hubs	Page 1 VOSA updated to DVSA	01/10/2014	39.
08	Condition of Tyres	Page 2 VOSA updated to DVSA	01/10/2014	40.
26	Speedometer/Tachograph	Page 3 application section – note added – “ <b>Where a print out from a digital tachograph cannot be obtained</b> initially (because of a jammed or depleted roll) the presenter should be given the opportunity to rectify this before leaving the test station and the use of PRS would not be appropriate if the defect is rectified.”	01/10/2014	41.
33	Speed Limiter	Pages 5 and 6 - VOSA updated to DVSA	01/10/2014	42.
38	Service Brake Operation	Page 1 – ABS only vehicles first paragraph, clarification for MIL illumination added “(ignition on)” changed to “(ignition or battery master switch on)”.	01/10/2014	43.
45	Fuel Tanks and System	Page 2 RfF 4a,b and c now have twin asterisks.	01/10/2014	44.
58	Additional Braking devices	Application section note for visual assessment and the check of operation reworded.	01/10/2014	45.

Section Number	Section Title	Description of Change	Revision Date	Revision Number
63	Lamps	Page 1 - note added to application " <b>The rear position lamps are permitted to be reciprocally incorporated with the rear fog lamp</b> providing the positional requirements are met (when the fog lamp is switched on the rear position lamps intensity increases to become the fog lamp)."  Page 3 - Rear fog lamp maximum height raised from 1000mm to 1200mm.	01/10/2014	46.
71	Service Brake Performance	Page 4 - RfF 2.d.i has been amended to a single asterisks.	01/10/2014	47.
	About this Manual	Page 3 updated Vehicle and Operator Services Agency to Driver and Vehicle Standards Agency	01/04/2015	48.
	Interpretation of Terms used in the Manual	Page 8 Type approved note - second paragraph amended to address circumstances where a component or system is claimed to be type approved.	01/04/2015	49.
07	Size and Type of Tyres	Page 1 & 12 updated Vehicle and Operator Services Agency to Driver and Vehicle Standards Agency  Page 5 Minor correction to single LI 108 and single LI 132	01/04/2015	50.
11	Vehicle to Trailer Coupling	Page 2 MOI and RfF 2b and c (condition & integrity) have been combined into one item with the RfF now worded "so damaged or deteriorated that injury to passengers or other persons is likely."	01/04/2015	51.
16	Passenger Doors, Drivers Doors and Emergency Exits	Page 3 note " <b>The exact wording of exit markings may vary</b> but variations are acceptable as long as it is clear that it is an emergency exit and the means of operation are clear" has been amended – the word "clear" has been replaced with "present".  Page 5 MOI and RfF 4 b has been removed (numbering amended accordingly) to align with 2014.45 EU requirements. Illegible emergency exit marking is now only advisory.	01/04/2015	52.
66	Direction Indicators and Hazard Warning Lamps	Page 1 application section, note added " <b>If more than one bulb or LED</b> is fitted in the lamp at least 50% must work.	01/04/2015	53.
67	Aim of Headlamps	Page 2 RfF 1, 2 and 3 have been revised and the aiming screen image replaced.	01/04/2015	54.

Section Number	Section Title	Description of Change	Revision Date	Revision Number
71	Service Brake Performance	<p>Page 2/3 Note for power hydraulic systems moved from page 3 to page 2.</p> <p>Page 3, further information added to note for vehicles with hydrostatic drives - "Prior to roller brake testing any vehicle with hydrostatic drive and a transmission parking brake it may be necessary when the wheels are in the roller set to select neutral, switch off the ignition and restart the vehicle. Engaging this mode will prevent any hydrostatic retardation showing as excessive levels of bind."</p> <p>Page 4 "V.O.S.A" replaced with "a"</p>	01/04/2015	55.
72	Secondary Brake Performance	Page 2 "V.O.S.A" replaced with "a"	01/04/2015	56.
73	Parking Brake Performance	Page 2 "V.O.S.A" replaced with "a"	01/04/2015	57.
23	Glass and view of the Road	Page 1, application section. Minor amendment, the word "barley" is replaced with the word "barely".	01/10/2015	58.
63	Lamps	Application section page 2, "If more than two lamps are fitted..." replaced with " If two or more lamps are fitted.."	01/10/2015	59.
66	Direction Indicators and Hazard Warning Lamps	Application section page 1, "If more than two lamps are fitted..." replaced with " If two or more lamps are fitted.."	01/10/2015	60.
71	Service Brake Performance	Page 4 MOI & RfF 2 the word "Other" has been replaced by "All".	01/10/2015	61.
72	Secondary Brake Performance	<p>Page 1 application amended to apply only to vehicles where the designated secondary is independent of the service brake.</p> <p>Page 1 paragraph for split systems removed and paragraph for alternative secondary options also removed.</p> <p>Page 2 MOI &amp; RfF 2 the word "Other" has been replaced by "All".</p>	01/10/2015	62.

## Foreword

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Welcome to this new edition of the Public Service Vehicle Inspection Manual. I would first like to acknowledge the members of DVSA staff whose efforts have resulted in this comprehensive reference for annual testing. I hope that they will derive satisfaction from having their work acknowledged.

This edition incorporates changes as a result of the latest testing directive (2010/48) as well as clarification on all test standards enquiries raised since the last edition and will result in fewer occasions when the test standard is unclear. This edition will also be available electronically in an Adobe™ (.pdf) format and be down-loadable from the internet free of charge. This will make it more accessible to industry and enable more frequent updating.

The primary purpose of the Manual is to support DVSA staff in conducting the annual testing of vehicles. Our aim is to provide customers with a consistent testing service with the correct outcome according to the vehicle condition. It will be useful to industry to provide assurance that the service that is being provided is to the published standard and improve the level of accountability that DVSA has to our customers.

The Manual will also be useful to those responsible for the maintenance of public service vehicles so that they remain well informed on the current minimum legal standards for roadworthiness. Its publication and ease of availability demonstrates DVSA's ongoing commitment to improving road safety and environmental protection whilst supporting industry to fulfil its obligations to maintain the roadworthiness of vehicles at all times.

Alan Wilson  
Head of Testing Schemes Management



## **About this Manual**

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### **Purpose**

This manual explains to everyone engaged in the practical work of vehicle examination and maintenance:

- The application of specific relevant requirements.
- The procedures and standards to be used.
- The reasons for failure.

The manual is not a legal interpretation of Regulations, nor does it necessarily lay down standards for rejection elsewhere.

### **Layout of Inspection Manual**

The page layout for each inspection item consists of an application section across the whole width of the page; this section will contain the application criteria and may also contain notes relevant to the inspection. The remainder of the inspection item page(s) will be split between both a Method of Inspection and Reason for Failure columns.

### **Procedures**

The procedures given here assume that only parts of a vehicle which can readily be seen without dismantling are to be examined. However, it may be necessary to ask the driver to remove wheel embellishers or panels where it is not otherwise possible to inspect safety critical items.

### **Minimum Standards**

It must be emphasised that these are minimum acceptable standards, which do not necessarily allow for further deterioration when the vehicle is in service.

## About this Manual

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### Acceptance For Test

Conditions for accepting vehicle for test include:

- The vehicle chassis number must be permanently fixed to the vehicle in an accessible, easy to read, position.
- The vehicle must be clean enough to allow the component parts to be inspected.
- The vehicle must not present a health and safety hazard to inspect.

If you are in doubt regarding any of the above, it is recommended that you contact your local Driver and Vehicle Standards Agency Test Station or DVSA Contact Centre for advice.

### The Inspection

Each inspection has been allocated a number, which is given at the top of the page.

Not all inspection numbers have been allocated.

The requirements of each inspection will be found in Schedule 2 of The Motor Vehicle (Test) Regulations 1981 as amended.

### After The Test

On completion of the test, copies of the smoke test and brake test reports are issued (if applicable) along with either a pass certificate or a refusal to issue a certificate. The refusal will refer to the items considered to be below the minimum standard.

## **About this Manual**

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### **Limits of Wear and Tolerance**

Because it is not practicable to lay down limits of wear or tolerance for components of all types of vehicles, the following points should be considered when making an assessment:

- The function of the component and its contribution to the road safety of the vehicle.
- Whether the component has clearly reached the stage where repair, replacement or adjustment is necessary to ensure the road safety of the vehicle.
- Whether the condition of the component appears to contravene the law.

### **Scope of Inspections**

The scope of the inspections in this manual does not cover all the requirements of The Road Vehicles (Construction and Use) Regulations and The Road Vehicles Lighting Regulations.

### **Health and Safety**

Drivers presenting vehicles for test must follow the instructions given by Driver and Vehicle Standards Agency staff. Radios and telephones must not be used whilst vehicles are undergoing test.

## **About this Manual**

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### **Training**

Courses on inspection procedures and standards incorporating the use of this manual are held by The Driver and Vehicle Standards Agency in Avonmouth and Chadderton.

Courses can also be held at operator's premises.

Details of these courses can be obtained from:

Driver & Vehicle Standards Agency  
Berkeley House  
Croydon Street  
Bristol  
BS5 0DA

0300 123 9000

email enquiries to: [commercial.training@vosa.gov.uk](mailto:commercial.training@vosa.gov.uk)

## **Interpretation of Terms used in the Manual**

### **Annex VII**

This means Annex VII to the Bus Directive 2001/85/EC and 'Annex VII vehicle' means a Bus Directive vehicle required to comply with Annex VII.

### **Articulated Bus**

An articulated bus is one which can be divided into two or more parts, normally by the use of workshop facilities. Passengers can move freely from one part of the bus to the other.

### **Automatically Operated Service Door**

'Automatically operated service door' means a power operated service door which can be opened (other than means of an emergency controls) only after a control is operated by a passenger and after activation of the controls by the driver, and which close again automatically.

### **Bus Directive Vehicle**

This means a bus or coach which meets the requirements of the Bus Directive EC/2001/85. The vehicle may have a full type approval or may have been inspected to the required directive. The technical print for the vehicle will indicate "Bus Directive" vehicle.

### **Coach**

A large bus with a maximum gross weight of more than 7500kg and a maximum speed exceeding 60m.p.h.

## **Interpretation of Terms used in the Manual**

### **Corrosion**

The effect of corrosion on the safety of the vehicle depends on:

- Its extent.
- The function of the section on which it has occurred.

A small amount of corrosion on an important part of the vehicle structure can make a vehicle unsafe where it destroys the continuity of the load bearing structure.

On the other hand, heavy corrosion of unimportant sections may have no effect on the vehicle safety.

### **Corrosion Assessment**

The inspection should determine whether excessive corrosion exists first by visual inspection and then by finger and thumb pressure.

If necessary careful scraping or light tapping of the area is permitted.

Corrosion affected heavy gauge metal may be tapped harder than light gauge, but unwarranted force and damage must be avoided.

### **Corrosion Failure Criteria**

Any part of a load bearing member or load bearing panelling should be rejected if it is weakened by corrosion to the extent that:

- By finger and thumb pressure it does not feel rigid, or
- It crumbles to leave a hole, or
- When tapped there is penetration, or It causes the metal to crumble or disintegrate.

## **Interpretation of Terms used in the Manual**

### **Cracked**

A flaw or split in a component.

### **Damage**

When assessing the extent of damage it is important to consider whether the performance of the component/system will be impaired or if the component/system is likely to fail prematurely.

Damage fulfilling either of these criteria is not acceptable and will be a reason for failure.

### **Deteriorated**

This will be a reason for failure if the component or system is weakened to such an extent that it can no longer adequately perform its function.

### **Distorted**

This will be a reason for failure if the component or system is distorted to such an extent that it can no longer adequately perform its function.

### **ECE Regulation vehicle**

This means a bus which has been built or approved to ECE regulation 36 (buses with more than 22 passengers), ECE regulation 52 (buses with not more than 22 passengers) or ECE regulation 107 (Double Deck buses).

### **EV (Electric Vehicle)**

A vehicle that is powered by electric power train only. A vehicle with a hydrogen fuel cell should be considered an electric vehicle.

## **Interpretation of Terms used in the Manual**

### **Excessive travel**

An abnormal amount of movement which clearly indicates that a component has reached a stage when it requires remedial action to enable it to either:

- a. operate effectively as designed, or
- b. prevent it from reaching the end of its permitted travel, or
- c. prevent it from exceeding manufacturer's known maximum permitted limits

### **Excessive wear**

A component which is worn to such an extent that it is either:

- a. likely to fail, or
- b. clearly not functioning effectively as designed, or
- c. visibly worn beyond manufacturers' known permitted limits, or
- d. likely to affect the operation or condition of another safety related component.



## **Interpretation of Terms used in the Manual**

### **First use dates**

Throughout this manual we have used the terms “before” and “from” when referring to first use dates. The term “from” should be regarded to be on or after a certain date. Where there is a first use date quoted for a motor vehicle this will not normally apply if the vehicle was built more than 6 months before that date.

### **Fouling**

This will only be a Reason for Failure if contact of two parts is likely to cause damage to, or restrict the movement of a component.

### **Fractured/broken**

Gap, opening or rupture where separation has taken place.

### **HEV (Hybrid Electric Vehicle)**

A vehicle powered by a power train that consists of both an internal combustion engine and an electrical energy/power storage device.

### **Inappropriate Repair or Modification**

Repairs and modifications to vehicles must be assessed on their merits, taking account of the nature and function of the component.

The main criterion to be used when assessing repairs is whether the repair is obviously likely to adversely affect the roadworthiness of the vehicle. In respect of modifications, the main criterion should be whether the modification has seriously weakened the component.

## **Interpretation of Terms used in the Manual**

### **Insecure**

The term “insecure” is used many times throughout this manual to describe a defective condition. This term should be taken by vehicle inspectors to mean either:

- That a component on the vehicle has relative movement (looseness) either at its fixings or in relation to an associated component where there should be none, or
- That a component is not safely or completely attached either at its fixing or to an associated component.

All components on a vehicle need to be safely attached while it is in use on the road, however, how safe a component needs to be attached depends on its function.

Areas of the vehicle which are considered critical in terms of the ability of the vehicle to endanger the driver, any passengers and other users of the road, can tolerate fewer fixings which are broken, loose, missing or otherwise ineffective than those in a less critical part of the vehicle.

The proportion will depend on factors such as the design of the component etc, but as a general rule, no more than 20% (1 in 5) of the fixing devices should be loose etc. More than this proportion means that the remaining fixing devices could be over-stressed and could therefore fail at any time.

## **Interpretation of Terms used in the Manual**

Examples of critical systems include (this is **not** an exhaustive list):

- steering.
  - brakes.
  - suspension linkages.
  - leaf spring anchors.
  - trailer couplings.
  - live (i.e. moving) transmission components.
  - wheel and hubs.
- } Except those components not subject to heavy loads  
or forces e.g. power steering reservoirs or brake  
relay valves.

The proportion suggested above does not apply to:

- components in a critical area or system secured by a **single** fixing device. If this device is loose, broken etc then the component is to be considered insecure.
- components in a critical area or system where detailed instructions are given in the manual (e.g. wheel studs/nuts). In such cases, these instructions must be used in preference.

Components that are not part of a critical system e.g. some body panels can tolerate a higher proportion of their fixings either loose, broken etc. Again the proportion will depend on the design of the component but as a general rule no more than 33% (1 in 3) of the fixing devices should be loose, broken missing or otherwise ineffective.

A component secured by a non-standard temporary means should be judged as if the temporary fixing was not fitted.

## **Interpretation of Terms used in the Manual**

### **Large Bus**

A vehicle constructed or adapted to carry more than 16 passengers in addition to the driver.

### **Minibus**

A motor vehicle which is constructed or adapted to carry more than 8 but not more than 16 seated passengers in addition to the driver.

### **Obligatory**

Required to be fitted by law.

### **Schedule 6**

Where a requirement in this manual refers to Schedule 6 minibus this means a minibus first used from 1 April 1988.

### **Service Door**

Means a door intended for use by passengers in normal circumstances with the driver seated.

### **Type Approved**

A component or system fitted to a vehicle which has been issued with a Type Approval Certificate or Certificate of Conformity which shows that the system or component complies with the requirements of an EU Directive or ECE regulation.

If the presenter claims that the vehicle is fitted with type approved equipment which complies with the requirements of an EC directive and has no documentary evidence, consideration must be given to the following:

- annual test standards should not exceed those of type approval
- does the component or system appear to have been modified, replaced or damaged

Where doubt exists, the benefit should be given to the presenter.

## **Interpretation of Terms used in the Manual**

### **Vehicle category (Definition used in the Community Directive)**

**Category M2:** Vehicles used for the carriage of passengers and comprising of more than eight seats in addition to the driver's seat, and having a maximum mass **not** exceeding 5000kg.

**Category M3:** Vehicles used for the carriage of passengers and comprising of more than eight seats in addition to the driver's seat, and having a maximum mass exceeding 5000kg.

## **List of Inspections**

1	Registration Plate	26	Speedometer/Tachographs
2	Not allocated	27	Horn
3	Seat Belts & Supplementary Restraint Systems	28	Driving Controls
4	Not allocated	29	Not allocated
5	Emissions Exhaust	30	Steering Control
6	Road Wheels and Hubs	31	Not allocated
7	Size and Type of Tyres	32	Not allocated
8	Condition of Tyres	33	Speed Limiter
9	Bumper Bars	34	Pressure/Vacuum Warning and Build Up
10	Spare Wheel and Carrier	35	Not allocated
11	Vehicle to Trailer Coupling	36	Hand Lever Operating Mechanical Brakes
12	Not allocated	37	Service Brake Pedal
13	Not allocated	38	Service Brake Operation
14	Wings and Wheel Arches	39	Hand Operated Brake Control Valves
15	Not allocated	40	Not allocated
16	Passenger Doors, Drivers Doors and Emergency Exits	41	Condition of Chassis
17	Drivers Accommodation	42	Electrical Wiring and Equipment
18	Driver's Seat	43	Engine and Transmission Mountings
19	Security of Body	44	Oil and Waste Leaks
20	Exterior of Body, including Luggage Compartment	45	Fuel Tanks and Systems
21	Interior of Body, Passenger Entrance, Exits Steps and Platforms	46	Exhaust and Waste Systems
22	Mirrors and Indirect Vision Devices	47	Not allocated
23	Glass and View of the Road	48	Suspension
24	Accessibility Features	49	Not allocated
25	Windscreen Washers and Wipers	50	Not allocated
		51	Not allocated
		52	Not allocated

## **List of Inspections**

- 53 Axles, Stub Axles and Wheel Bearings
- 54 Steering Mechanism
- 55 Not allocated
- 56 Not allocated
- 57 Transmission
- 58 Additional Braking Devices
- 59 Brake System and Components
- 60 Not allocated
- 61 Not allocated
- 62 Reflectors and Rear Markings
- 63 Lamps
- 64 Not allocated
- 65 Not allocated
- 66 Direction Indicators and Hazard Warning Lamps
- 67 Aim of Headlamps
- 68 Not allocated
- 69 Not allocated
- 70 Not allocated
- 71 Service Brake Performance
- 72 Secondary Brake Performance
- 73 Parking Brake Performance
- 74 Other dangerous defects

## **Standards for Prohibition Issue at Annual Test**

This provides a standard for the issue of Prohibition Notices where serious defects are observed during statutory tests.

The aim of the policy is to:

- Protect the public from vehicles returning from annual test where extremely serious defects have been observed.
- Provide information about such occurrences to the enforcement wing of the organisation and to Traffic Commissioners.
- Improve the consistency of the treatment of operators.
- Let operators know the rules so that they know and understand our standards for prohibition issue at annual test.
- Preserve a balance between providing a flexible, customer focused, testing service and providing the general public with protection from loss or injury from vehicles returning from test with serious roadworthiness defects.

The approach, in principle, is to apply the immediate prohibition criteria in the Categorisation of Defects to a core of safety critical items.

### **Note:**

Where a Reason for Failure in the accompanying table is marked with \*\* this means that any failure for this item will result in the issue of an immediate prohibition.

Where a Reason for Failure is marked with \* the examiner will need to assess the severity of the defect in line with the Categorisation of Defects criteria (outlined in the defects column of the table in the following pages) before deciding whether to issue an immediate prohibition.



**Standards for Prohibition** (continued)

Manual Reference	Defect	Reason for Failure
IM 6 Road Wheels and Hubs	More than one wheel nut/stud is missing, loose or obviously not clamping or locating in the road wheel taper. Failure of the road wheel imminent. Detachment of a road wheel or hub imminent or a half shaft bolt, stud or nut missing.	2a* 2g* 3a*
IM8 Condition of Tyres	Tyre bulging caused by separation/failure of the tyre structure A tyre so severely damaged that failure of the tyre is likely Tyre tread worn below the legal minimum on tyre fitted to a steered wheel	1b** 1c* 1h*
IM18 Driver's Seat	A driver's seat so insecure or in such a condition that it could cause the driver to lose control of the vehicle.	1*
IM11 Vehicle to Trailer Coupling	Failure of the coupling and detachment of the trailer likely	1c* 4c*
IM28 Driving Controls	Driving control defective to the extent that it is incapable of fulfilling its function and affect the control of the vehicle	1e*
IM30 Steering Controls	Controls so defective that direction control of the vehicle is affected	1c* 1d* 2a*

**Standards for Prohibition** (continued)

Manual Reference	Defect	Reason for Failure
IM34 Pressure/Vacuum Warning	Warning device fails to cease operating (indicating reservoirs not filling) – within 6 minutes for a rigid vehicle, 9 for vehicle/trailer combinations	3*
IM36 Hand Lever Operating Mechanical Brakes	Cannot be operated to perform its function  Cannot be set or likely to disengage	1d*  1f**
IM37 Service Brake Pedal	Cannot be operated to perform its function	1c* 2b*
IM38 Service Brake Operation	Vacuum assistance is not working	3*
IM39 Hand Operated Brake Control Valve	Valve unable to be set in the on position or moved over its original full travel	1d* 1g*
IM44 Oil Leaks	Continuous flow of oil or serious risk of fire	1* 2* 3*

**Standards for Prohibition** (continued)

Manual Reference	Defect	Reason for Failure
IM45 Fuel Tanks and Systems	Detachment of tank imminent  Continuous fuel leak or a leak constituting a hazard to other road users  Filler cap missing or defective such as to prevent gushing	1** 2b** 3a* 4a** 4b** 4c**
IM48 Suspension	Failure of a major suspension component imminent which would affect the control of the vehicle	This item covers all Reasons for Failure. Examiners will need to consider will the defect affect the control of the vehicle.
IM53 Axles, stub axles and wheel bearings	A main component so defective that failure is imminent and likely to affect the steering	This item covers all Reasons for Failure. Examiners will need to consider will the defect affect the control of the vehicle.

**Standards for Prohibition** (continued)

Manual Reference	Defect	Reason for Failure
IM54 Steering Mechanism	Steering mechanism so stiff or rough in operation that its operation is restricted  Mechanism fractured or twisted to the extent that failure or detachment is imminent	1a*  2a* 2i* 2j* 2o*
IM59 Brake Systems and Components	Any defect likely to lead to a total failure of a braking system	This item covers all Reasons for Failure. Examiners will need to consider will the defect affect the control of the vehicle
IM63 Lamps	Any defect or combination of defects which make all the stop lamps inoperative	1a – 1g* 3*

**Standards for Prohibition** (continued)

Manual Reference	Defect	Reason for Failure
IM71 Service Brake Performance	<p>With the service brake applied:</p> <p>There is little or no brake effort at any wheel</p> <p>Braking effort from any wheel on a steered axle is less than 70% of the brake effort from another wheel on the same axle</p> <p>Efficiency significantly below legal requirements (before issuing the examiner must consider whether the vehicle, as presented, would pose an immediate danger to road safety)</p>	<p>2d.i*</p> <p>2d.ii*</p> <p>2d.iii*</p> <p>3*</p>
IM72 Secondary Brake	Efficiency significantly below legal requirements (before issuing the examiner must consider whether the vehicle, as presented, would pose an immediate danger to road safety)	2b*
IM73 Parking Brake	Efficiency significantly below legal requirements (before issuing the examiner must consider whether the vehicle, as presented, would pose an immediate danger to road safety)	2b* 3b* 4b*
IM74 Other Dangerous Defects	A defect not described elsewhere in the Inspection Manual such that the use of the vehicle on the road would involve a danger of injury to any person	1**

## Public Service Vehicle Inspection Manual

### 01 Registration Plate

#### Application

This inspection applies to all registered motorised vehicles.

A registration plate should be easily legible to a person standing approx 20m from the front/rear of the vehicle.

Method of Inspection	Reason for Failure
<p>1. Check the registration plates, at both the front and the rear of the vehicle, for:</p> <ul style="list-style-type: none"><li>a. presence.</li><li>b. security.</li></ul> <p>2. Check the registration mark for:</p> <ul style="list-style-type: none"><li>a. presence.</li><li>b. legibility.</li></ul>	<p>1. A registration plate:</p> <ul style="list-style-type: none"><li>a. missing.</li><li>b. insecure.</li></ul> <p>2. A registration mark:</p> <ul style="list-style-type: none"><li>a. missing.</li><li>b. illegible.</li></ul>

## Public Service Vehicle Inspection Manual

### 03 Seat Belts & Supplementary Restraint Systems

#### Application

This inspection applies to all buses which have seat belts fitted.

Certain buses require seat belts regardless of their use (Obligatory belts). These are shown in the tables to the rear of the application section, along with the seat belts which are required. These must be checked to ensure that seat belts are fitted to the seats on which they were determined to be needed at the time of certification.

Seat belts may be fitted to all types of minibuses, buses and coaches, both single and double decked, and may be in addition to those required in the tables at the end of this section. It will not be necessary to carry out the installation check unless extra belts have been fitted since the last test, but the condition check must be carried out on all belts and fittings on the vehicle.

First used	Inspection required
Before 1 October 2001	Condition check and standard installation check where seat belts or extra seat belts added since last test.
From 1 October 2001	Condition check Installation checks are not required on vehicles that have not been modified since certification. If the number of seats fitted with seatbelts is greater than the number shown on the technical record for the vehicle see the section below on the Enhanced Installation Check.

#### Condition inspection of all seat belts fitted

As far as is practicable without dismantling, check the condition of the vehicle structure around the seat belt anchorage points (i.e. within 300mm (12") of the anchorage. Where a seat belt is mounted to a seat frame this will apply to all seat mounting points. The floor-mounted anchorage points might need to be inspected from underneath the vehicle.

**For seats with integral seat belts**, it might not be possible to examine the fixing of the seat belt to the seat.

**Some types of retracting belt** might need manual help before they retract.

**Operate the release mechanism while pulling on the belt** to check that the mechanism releases when required.

## Public Service Vehicle Inspection Manual

### 03 Seat Belts & Supplementary Restraint Systems

#### Application

**Where a belt is fitted with no corresponding seat** or if there is a buckle/stalk but no corresponding belt, it is NOT to be considered a seat belt for the purpose of this inspection.

**The inspection of Supplementary Restraint Systems (SRS)** applies to airbags, seat belt pre-tensioners and seat belt load limiters when fitted as standard.

The SRS malfunction indicator lamp (MIL) may display a symbol similar to that below, one depicting a person wearing a seat belt or alternatively the letters 'SRS'.



**A passenger air bag which has been switched off** is not a reason for failure.



03 Seat Belts & Supplementary Restraint Systems

Application

**Standard Installation Check**

All belts should be checked for installation, operation and wear, except for the following categories which shall be checked for operation and wear only:

1. Seat belts provided for rear or side facing seats.
2. Disabled person's belts which are permanently attached to the vehicle.
3. Child restraints which are permanently attached to the vehicle.
4. Obligatory seat belts as specified at the rear of the application section.

**No check is required for disabled person's belts or child restraints** which are not permanently attached to the vehicle.

It will be necessary to ask the operator to remove seat cushions and to open any access flap or luggage locker door, which was designed to be capable of being readily opened, to allow as much as possible of the seat belt installation to be seen. Some parts of the installation may only be visible with the vehicle on a pit or hoist.

Where a vehicle is fitted with a type approved belt installation it will not be necessary to carry out an installation check. These belts are at present only likely to be fitted to buses with factory installed belts. Details of the vehicles which are fitted with type approved seat belts are shown at the end of this section.

The seats and seat frames should be checked for security and damage. The seat belt anchorages should be checked for security.

If an operator has been provided with documentary evidence to show that a seat belt installation complies with type approval standards (but has not been fully type approved) or that is traceable to an installation tested and shown to meet the requirements of ECE Regulation 14 or Community Directive 76/115 it should be produced at the time of test. It should show registration number or chassis number of the vehicle and the name and address of the installer. It should also show the test number, date and location of the test of the installation (Original certificates are required, photocopies are not acceptable). Presentation of the certificate would not replace the need for the examination to be conducted but it may support the quality of the installation and help resolve differences over the acceptability of the installation, e.g. reinforcement plates used.

Diagram 1 at the end of the section shows typical methods of attaching seat belts.

**Where the word close is used** it should generally be regarded as 50mm or less.

## Public Service Vehicle Inspection Manual

### 03 Seat Belts & Supplementary Restraint Systems

#### Application

- A. Check that on all belts the buckle operates correctly and the seat belt adjusts satisfactorily. Subsequent cutting or reworking of the webbing will be a reason for failure. It is acceptable for the free end of looped belts or static belts to be reworked to the extent of folding and stitching the webbing so that it cannot pass back through the buckle to prevent the buckle from being dismantled. Any knots in the belt webbing are unacceptable.
- B. Seat squabs should be removed, to aid the inspection of the condition of the belt and mountings. They must be replaced before the end of the test to allow inspection of the complete belt installation.
- C. Check for the presence of any sharp edges which the belt could rub on or pull across during use.
- D. Where seat belts, other than looped belts, are anchored to the seat frame or the vehicle floor they must be secured with mounting bolts in accordance with the following:

#### Minimum Acceptable Size and Grade of Bolts for Seat Belt Anchorages

Type of anchorage	Minibus	Coach or large bus
Single anchorage	M10 Standard material	M8 high tensile steel M10 standard material
Double anchorage	7/16" Standard material M10 High tensile steel	7/16" Standard material M10 High tensile steel

#### Bolt head marks:

Standard Material = P, 4.6 or SAE equivalent

High Tensile Steel = S, 8.8, or SAE equivalent

No Markings = Standard Material

If the examiner cannot determine the grade of bolt it must be assumed to be of Standard Grade.

It is paramount that the appropriate sized bolt is used in the seat belt anchorage, i.e. an 8mm bolt should not be used in an 11.5mm diameter hole. The only exception to this is where a "stepped washer" or collar is used to eliminate the excessive clearance and a suitable washer is fitted between the bolt head and the anchorage to prevent the bolt pulling through. The use of smaller bolts, self tapping screws or wood screws is not acceptable.

## Public Service Vehicle Inspection Manual

### 03 Seat Belts & Supplementary Restraint Systems

#### Application

- E. It is not acceptable to drill tubular seat frames to allow belts to be bolted to the frame except in cases where a manufacturer has approved the installation and the operator presents a certificate issued by the manufacturer or his agent declaring that the installation is satisfactory.
- F. Clamp type brackets are acceptable provided that they are properly secured (see Diagram 2).
- G. On seats constructed with a wooden frame it is unacceptable to mount the belts either directly to the frame or to a metal base which is attached to the frame only by wood screws. Unless there are additional reinforcement brackets fitted that provide a direct load path to the seat leg and side mounting the installation would be rejected. This reinforcement could take the form of steel angle sections or plates, alternative materials may be used provided that they are of comparable strength (see Diagrams 3 & 4 for details of a typical installation).
- H. Where seat belts are attached to thin sheet metal seat frames the bolts anchoring the belt must be of the minimum dimensions shown in paragraph D and must be adequately supported by the use of load spreading washers between the frame and the nut. Typically this would be 25 mm in diameter and 2 mm thick. If two belts are attached at the same point with a single bolt then a larger reinforcement plate 35mm diameter x 3mm thick (or a rectangular plate of minimum dimensions 21 x 46 x 3 mm) must be used. The sizes quoted are for steel reinforcement plates, alternative materials may be used but must provide comparable strength.
- I. Where seat belts are fitted to the rear seats of a vehicle check the anchorage to ensure that it is not anchored solely to the thin metal sheet which separates the boot area from the passenger compartment. It is essential that seat belt anchorages are secured to a strong cross member connected to the structural members of the vehicle. The connection should be to such a standard that there is confidence that it will be able to transfer the seat belt loads into the structure of the vehicle. This may involve the fabrication of an additional framework at the rear of the vehicle. An example of typical reinforcement of this area would be by the use of additional square section tubing 40 x 40 x 3mm, or angle plate 50 x 50 x 4 mm across the full width of the vehicle. The sizes quoted are for steel reinforcement, alternative materials may be used but must provide comparable strength. A full width reinforcement that is only attached to the thin metal sheet is unacceptable and would be a reason for failure.

## Public Service Vehicle Inspection Manual

### 03 Seat Belts & Supplementary Restraint Systems

#### Application

J. Three point belts will only be accepted under the following circumstances:

If the seat utilises tubular frames or tubular “H” pattern legs:

- The seats have been reinforced as detailed in Paragraph K or
- A purpose built structure to which belts are attached is fitted to the vehicle, an example is shown in diagram 5. Alternatively the belts may be attached to solid bodywork

or

If purpose made seats designed with integral three point belts as standard have been fitted.

K. Where seats that are permanently mounted in the vehicle have been fitted with lap belts or 3 point belts integral to the seat, then, if the seat utilises tubular frames or tubular “H “ pattern legs it must be reinforced. This will include welding metal buttresses, of similar thickness material as the foot, between the foot and the leg (see diagram 6). Also the welding of a diagonal brace, either in compression or tension, between the foot and the seat base attachment of each leg. Alternatively documentary evidence of compliance with Directive 76/115 or ECE Regulation 14 can be presented.

On quick release seats where the feet are mounted directly to tracking by a coupling it may not be practical to weld a buttress to the leg or a diagonal brace to the foot due to the presence of the coupling (see diagram 7).

The coupling would prevent any reinforcement being placed in an effective position; also the coupling could be damaged if welding occurred close to it. On this type of installation the belts can be attached directly to the tracking with quick release mounts or the legs should be modified to use an alternative method of attachment to the tracking.

On seats where the feet are mounted to a metal bar or tube which is then connected to tracking by a quick release coupling, then the seat has to be reinforced with buttresses and diagonal brace as detailed above.

On vehicles with floor mounted seat belts where the belt is anchored close to the seat mounting bolt then the rear foot of each leg must be buttressed to the leg.

L. If lap belts are fitted and there is the possibility of passengers hitting their heads on any harsh object such as a grab rail or seat stanchion, padding or other suitable protection must be provided on these objects. The protection does not need to cover the full length of a seat grab rail but should cover a length of at least 300mm directly in front of each passenger. Padding must be compressible and of a depth of at least 50 mm, measured to the surface of the bar and not compress more than 25mm under reasonable thumb pressure, or 25mm thick and not compress more than 5mm. Ordinary seat foam or pipe lagging foam is unlikely to be of sufficient density for this purpose.

## Public Service Vehicle Inspection Manual

### 03 Seat Belts & Supplementary Restraint Systems

#### Application

- M. Lower anchorages should be at least 320 mm apart. This need not be the distance between the anchorage points of the belt but it can be between two structural parts of the seat that the belt is routed round. If the measurement is between mounting bolts it should be measured between bolt centres. Check that the belt will not raise or significantly compress the seat cushion when subjected to a load. There will always be a small amount of compression which is acceptable.
- N. Where belts are attached directly to a metal floor a load spreading washer must be used between the nut and the floor. The bolts must be at least the sizes specified in paragraph D. Typically this would be 25 mm in diameter and 2 mm thick. If two belts are attached at the same point with a single bolt then a larger reinforcement plate of minimum dimensions 35mm diameter x 3mm thick (or a rectangular plate of minimum dimensions 21 x 46 x 3 mm) must be used. The sizes quoted are for a steel reinforcement plates, alternative materials may be used but must provide comparable strength. Reinforcement plates should follow, as far as practicable, any contours in the floor to which they are attached.
- O. Where a belt is attached directly to a wooden floor each anchorage must be reinforced with a plate of minimum dimensions 35mm diameter x 3mm thick (or a rectangular plate of minimum dimensions 21 x 46 x 3 mm). If two belts are attached at the same point with a single bolt then the reinforcement plate must have minimum dimensions of 92mm diameter x 3mm thick (or a rectangular plate of minimum dimensions 65x 100 x 3 mm). If two belts are attached in close proximity to each other, then a single reinforcement plate of minimum dimensions of 92mm diameter x 3mm thick (or a rectangular plate of minimum dimensions 65x 100 x 3 mm) should be used ensuring that the bolt holes are not too close to the plate edge. Alternatively two steel reinforcement plates may be used, but they must be of minimum dimensions 52mm diameter x 3mm thick (or a rectangular plate of minimum dimensions 46x 46 x 3 mm). The sizes quoted are for a steel reinforcement plates, alternative materials may be used but must provide comparable strength. Reinforcement plates should follow, as far as practicable, any contours in the floor to which they are attached.
- P. Where mounting rails designed for the adjustment of seat pitch are fitted and utilise an angled claw type clamp (see Diagram 8) with a clamping face of less than 15mm wide it is not acceptable for a seat on which a belt is mounted to be merely clamped to the rail. The clamp to the rear foot of each leg must be modified by fitting a bolt which passes through the claw fitting, the rail, floor and a suitable structural member (as in most vehicles). The bolts must have appropriately sized load spreading washers fitted beneath the bolt head and underneath the retaining nut. A single bolt should be not less than 8 mm (5/16") diameter. Any alternative to this is only acceptable if documentary evidence is provided.
- Q. Parallel type claw fittings, for a seat on which a belt is mounted, will be considered satisfactory provided that the securing bolts are fully tightened. (see Diagram 9).
- R. If a seat, on which a belt is mounted, is bolted to a flat rail the bolts must pass through the leg, rail, floor and a suitable structural member.

## Public Service Vehicle Inspection Manual

### 03 Seat Belts & Supplementary Restraint Systems

#### Application

- S. It is acceptable for seats to be attached to a purpose built tracking (e.g. keyhole, "T" slot) designed for securing seats and wheel chairs, providing the tracking are securely attached to the vehicle structure with bolts or fasteners in all the retaining holes or marks provided by the manufacturers.
- T. It is unacceptable to fit seats, with seat belts, directly to unsupported wooden floors unless additional reinforcement is provided. This will involve the fitting of steel reinforcement plates of minimum dimensions 92mm diameter x 3mm thick (or a rectangular plate of minimum dimensions 65x 100 x 3 mm), between the under side of the floor and the securing nut below the floor of the rear leg and between the leg and the topside of the floor of the front leg. If the area of the foot of the front leg is greater than 65 x 100 mm, then the front reinforcement plate is unnecessary.
- U. A "looped" type seat belt fitting is acceptable provided it is not free to float along any part of the seat structure. Any free movement in excess of 25mm is a reason for failure.
- V. The upper anchorage point should be at least 475mm above the height of an uncompressed seat cushion. This dimension is to be measured parallel to the backrest. The upper anchorage point should be a minimum of 110mm from the centre line of the seat back to the side of the seat.
- W. A lap belt or the lap section of a 3 point belt must be positioned to lie across the wearer's pelvis and not the stomach. This is to reduce the risk of abdominal injury and to prevent "submarining". In practice this may result in the belt lying across the top quarter of the thigh.
- X. Seat belt components should not be fitted to seats in such a way that they significantly intrude into the gangway space and are likely to cause injury to passengers either by tripping or by hitting the component.

**There may be occasions when carrying out the condition check**, on a vehicle which had an installation check on a previous test, that obvious defects are found in an installation item. This will be a reason for failure.

#### Enhanced Installation Check

Vehicles certified from 1 November 2002 have either had evidence that they comply with directive requirements regarding anchorages, including the results of a pull test or have had an Enhanced Visual Inspection. In addition some altered vehicles which have had seats and or seat belts added will require this type of installation check rather than the original installation check specified on pages 3 to 8 of the application section. Only certifying officers will carry out the enhanced inspection or interpret the results of pull tests. Details of which vehicle requires which type of installation inspection following the fitting of additional seats and/or seat belts are in the table on the following page.

Where an alteration involves the installation of seat belts, or an increase in the number of seat belts fitted, care must be taken to ascertain the relevant dates. This is vital in determining the action to take.

## Public Service Vehicle Inspection Manual

### 03 Seat Belts & Supplementary Restraint Systems

#### Application

First Used	Installation Check
From 1 October 2001 with additional obligatory seat belts fitted	Check whether any additional seats have been fitted since the vehicle was certified. This can be done by checking the technical record or the operator's certificate of initial fitness (PSV 418) or carrying capacity authorisation (PSV445).
	If the vehicle has had additional seats fitted and there is no evidence that the seat belt installation has been checked the vehicle should be refused a test certificate using the Reason for Failure 8(w).
	Advise operator to submit a notifiable alteration (VTP5) and to arrange to have the installation checked by a certifying officer.
	The certifying officer, following a satisfactory inspection, will issue a revised carrying capacity authorisation (PSV445). When the operator represents the vehicle for retest check the new carrying capacity authorisation to ensure the number of seats corresponds with the number of seats on the vehicle.
From 1 October 2001 Check whether extra seats and/or seat belts have been fitted	<p>Check whether extra seats and/or seat belts have been fitted seat since the last annual test. This can be done by checking the technical record or the operators certificate of initial fitness (PSV 418) or carrying capacity authorisation (PSV445) or the seat belt inspection form SB1 or SB2.</p> <p>The SB1 was used prior to November 2002 when it was superseded by the SB2.</p> <p>If fitted before 1 November 2002 carry out Standard Installation Check.</p> <p>If fitted after 1 November 2002 it will be necessary to submit a VTP5 notifiable alteration form. The operator/presenter will have to provide evidence to a Certifying Officer that the installation has been subjected to a pull test or will have to have a Certifying Officer carry out a satisfactory visual check to the enhanced requirements. Following a satisfactory check a form SB2 will be issued showing the number of seats fitted with belts.</p> <p>A test certificate should be refused if there is no SB2 form or other evidence that the seat belt anchorages have been checked under Reason for Failure 8(w).</p>

## Public Service Vehicle Inspection Manual

### 03 Seat Belts & Supplementary Restraint Systems

#### Application

##### Seat Belt Installation Check - Exempt Vehicles

**Ford Transits** with type approved seat belt installations can be identified as follows:

- 12, 14, 15, 16 and 17 seat (including the driver) Transits manufactured after 1 October 1991 where the fourth character of the VIN Number is “E”.
- 17 seat (including the driver) Transits where there is a six figure code EJA \*CL or EJJ \*CL marked in the box on the top right hand of the manufacturer’s plate (in the type code box). In the code the fourth digit marked \* may be any character.

**LDV 200 & 400 series** models with type approved seat belt installations can be identified as follows:

- chassis number from 933478 onwards and the seventh character of the VIN number is “S”.

**LDV Pilot and Convoy** models with type approved seat belt installations can be identified as follows:

- chassis number from 000001 onwards and the seventh character of the VIN number is “S”, “X”, or “Z”.

**LDV Maxus** models with type approved seat belt installations can be identified as follows:

- the 7<sup>th</sup> digit of the VIN number should be either a ‘6’ or ‘X’

**Mellor bodied Renault Masters** which have been issued with a PSV Certificate of Conformity (PSV 408) in place of a Certificate of Initial Fitness. This can be checked on the vehicle’s technical record.

**Berkhof bodied coaches** – Excellence 3000, Axial 30, 50 and 70 and Radial model coaches with body numbers from 2852 onwards.

Information on other makes will be circulated when it becomes available.

**Important note: To be exempt from the check vehicles must have been fitted with the seat belt installation by the vehicle manufacturer when new. If you are aware that a vehicle with a chassis number shown above has had any seats / seat belts fitted by any other installer, e.g. where it has been adapted to carry wheelchairs and has removable seats on tracking, it will not be exempt and will require an installation check.**



## Public Service Vehicle Inspection Manual

### 03 Seat Belts & Supplementary Restraint Systems

#### Application

#### **Obligatory belts**

Minibuses with 9-12 passenger seats and with unladen weight not exceeding 2540kg first used before 1 October 1988:

Date of first use	Seat position	Type of belt
From 1 January 1965 to 31 March 1982	Driver's and any specified passenger's seat	Three point adult belt or body restraining belt
From 1 April 1982 to 30 September 1988	Driver's and any specified passenger's seat	Three point adult belt

Minibuses (not exceeding 3500 kg design gross weight) and coaches first used from 1 October 1988 until 30 September 2001:

Seat position	Minibus not exceeding 3500kg design gross weight.	Coach
Driver's	Three point adult belt. Must be able to be locked and released by a single action. (Exempt for disabled drivers.)	Three point adult belt or lap belt designed for an adult or a disabled persons belt. Must be able to be locked and released by a single action. (Exempt for disabled drivers.)
Specified Passenger's	Three point adult belt. If alongside the driver must lock and release with a single action.	
Any other foremost forward facing front	Three point adult belt or lap belt designed for an adult.	Three point adult belt or lap belt designed for an adult or a disabled persons belt
Other forward facing (not protected by high backed seats) and crew seats		Three point adult belt or lap belt designed for an adult or a disabled persons belt

## Public Service Vehicle Inspection Manual

### 03 Seat Belts & Supplementary Restraint Systems

#### Application

#### **Obligatory belts continued**

Buses, coaches and minibuses first used from 1 October 2001 which are not authorised to carry standing passengers:

Seat position	Not exceeding 3500kg design gross weight	Exceeding 3500kg design gross weight
All forward and rearward facing seats including the driver's seat	<p>An inertia reel 3 point belt or</p> <p>A retractable lap belt (on rearward facing seats only) or</p> <p>A disabled person's belt or</p> <p>A child restraint</p> <p>Seat belts for the driver and specified passenger alongside the driver must be able to be locked and released by a single action. (Exemption for a disabled person's belt)</p>	<p>An inertia reel 3 point belt or</p> <p>A retractable lap belt or</p> <p>A disabled person's belt or</p> <p>A child restraint</p> <p><u>Buses</u></p> <p>Seat belts for the driver and specified passenger alongside the driver must be able to be locked and released by a single action. (Exemption for a disabled person's belt)</p> <p><u>Coaches</u></p> <p>Driver's seat belt must be able to be locked and released with a single action (Exemption for a disabled person's belt)</p>
On vehicles constructed for the secure transport of prisoners the driver's seat and any seat for front seat passengers	<p>An inertia reel 3 point belt</p> <p>Seat belts for the driver and specified passenger alongside the driver must be able to be locked and released by a single action (Exemption for a disabled person's belt)</p>	<p>An inertia reel 3 point belt</p> <p>Seat belts for the driver and specified passenger alongside the driver must be able to be locked and released by a single action (Exemption for a disabled person's belt)</p>

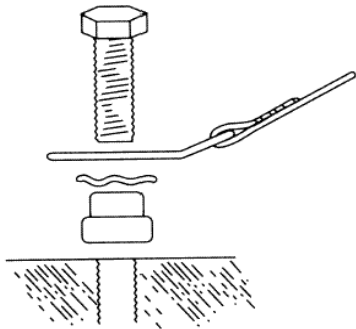
**A harness belt** may be used as an alternative to a three point or lap belt. The requirement for a buckle to lock with a single action does not apply to harness belts.

03 Seat Belts & Supplementary Restraint Systems

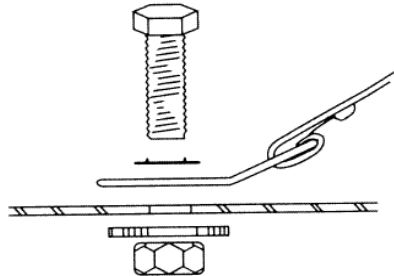
Application

Diagram 1 - Typical Methods of attaching seat belts

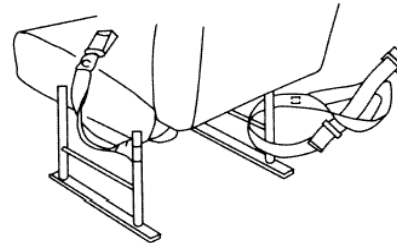
Direct attachment to floor



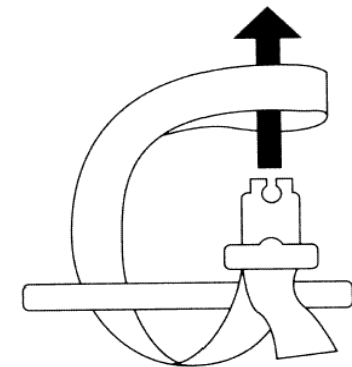
Direct attachment to seat frame



Installation of looped seat belt



Method of attaching looped seat belt

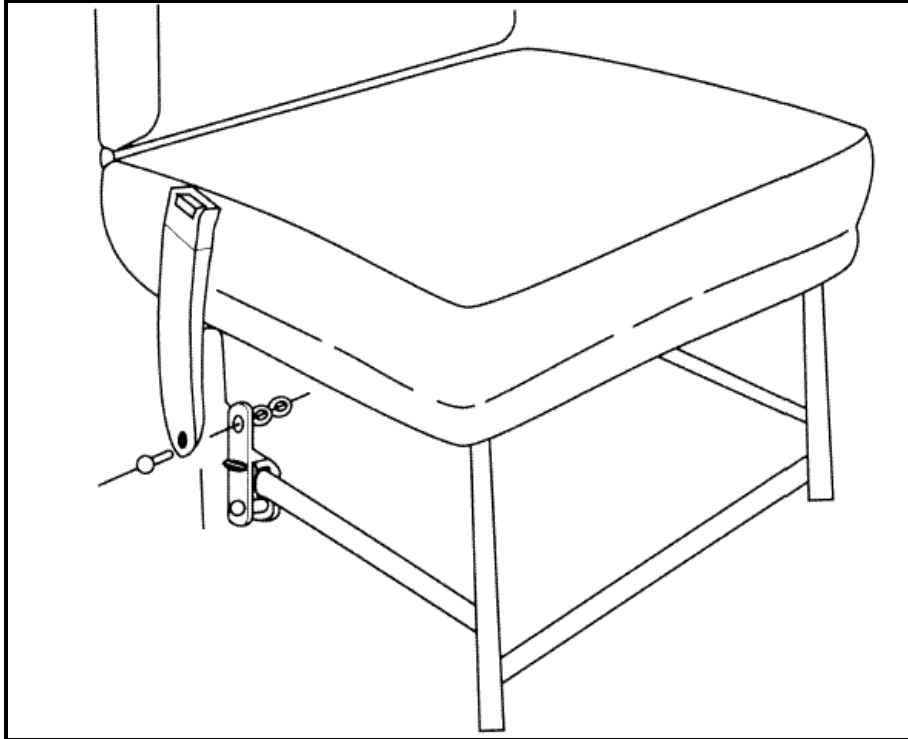


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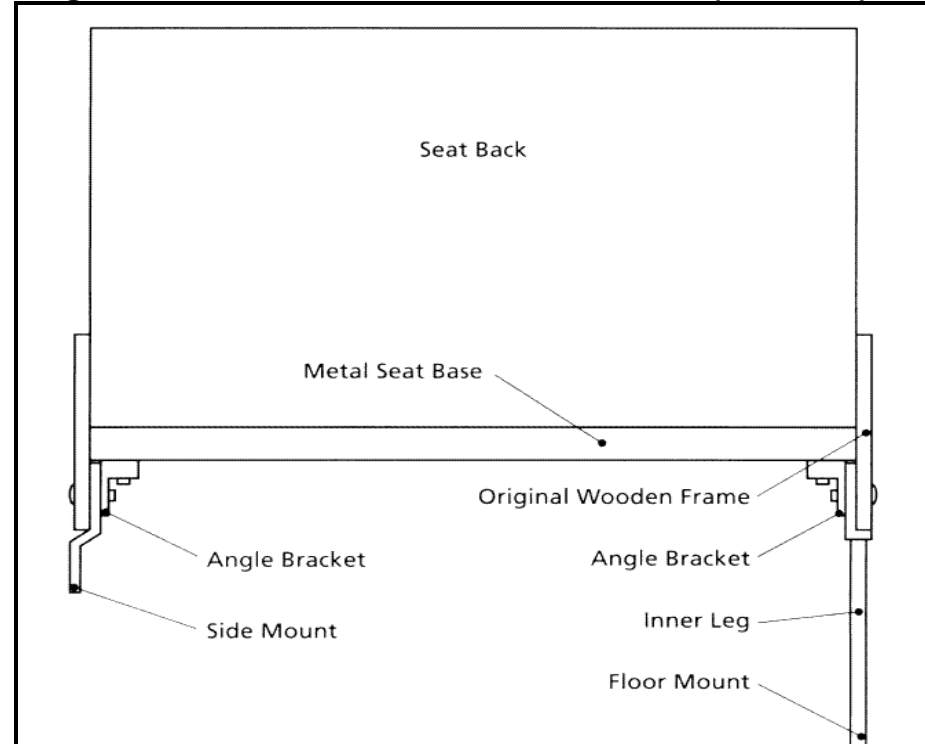
### 03 Seat Belts & Supplementary Restraint Systems

#### Application

**Diagram 2 – Example of a typical clamp bracket**



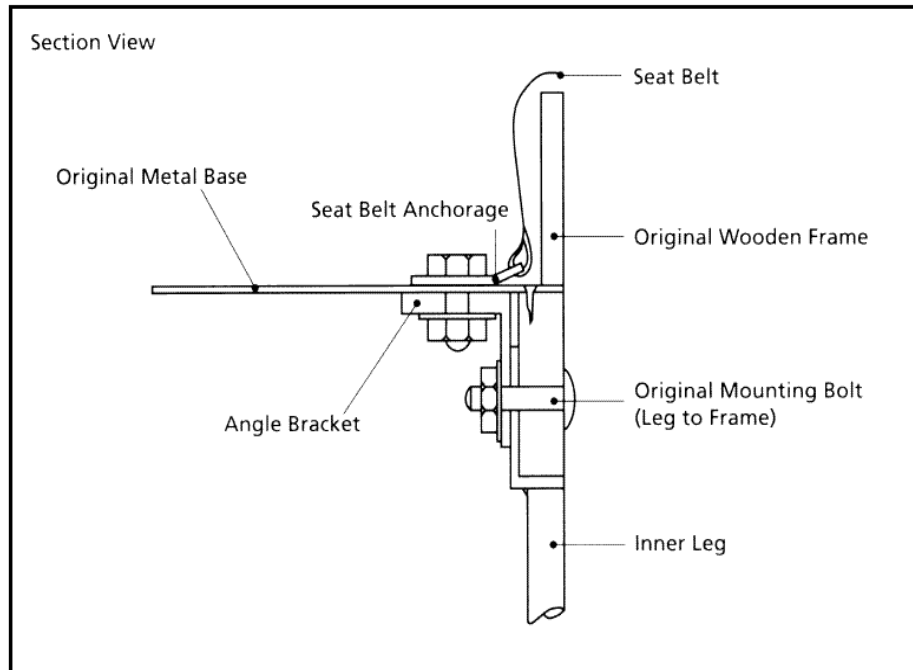
**Diagram 3 – Wooden frame with a metal base (rear view)**



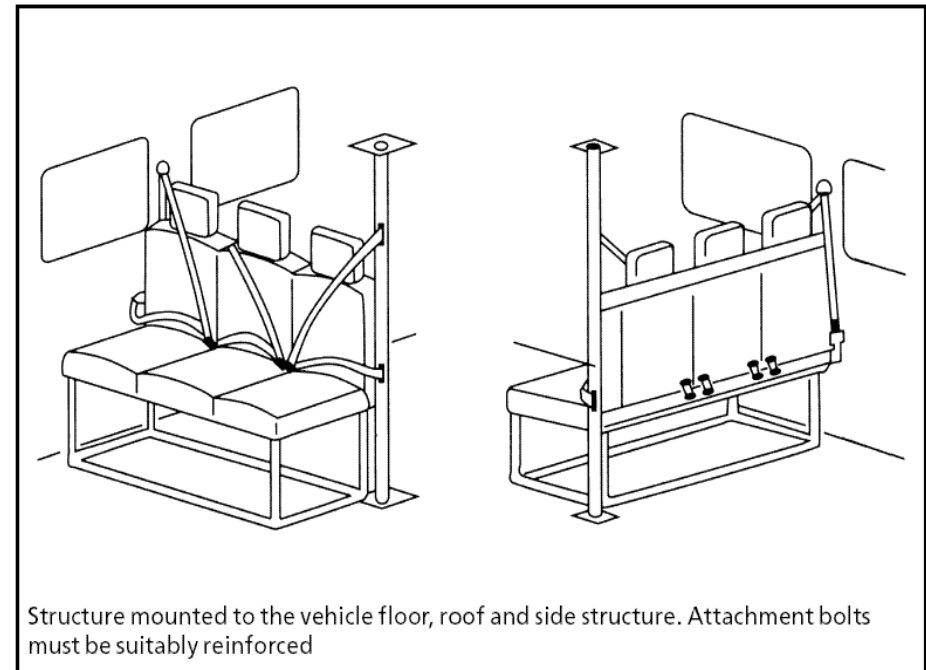
03 Seat Belts & Supplementary Restraint Systems

Application

**Diagram 4 - Wooden framed seats with a metal base  
(enlargement of reinforcement)**



**Diagram 5 - Example of additional structure for support of  
upper anchorage points**

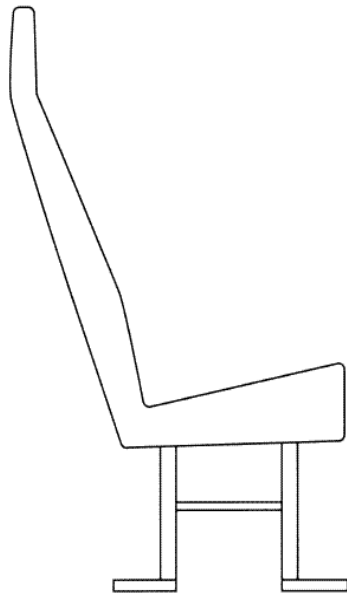


03 Seat Belts & Supplementary Restraint Systems

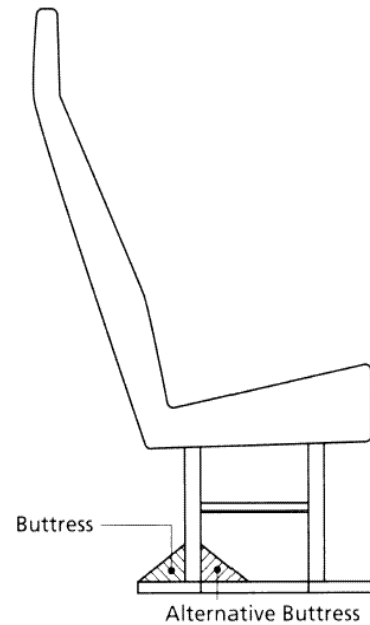
Application

Diagram 6 – “H” leg examples

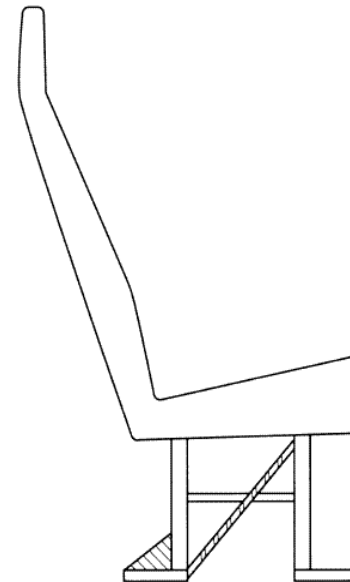
Typical Minibus seat with standard “H” leg



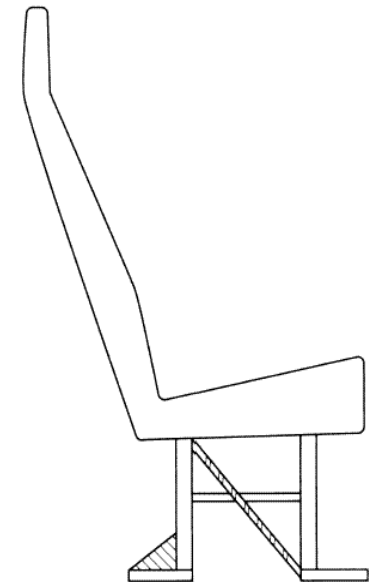
Minibus seat with buttress to “H” leg



Typical example of diagonal brace



Alternative example of diagonal brace

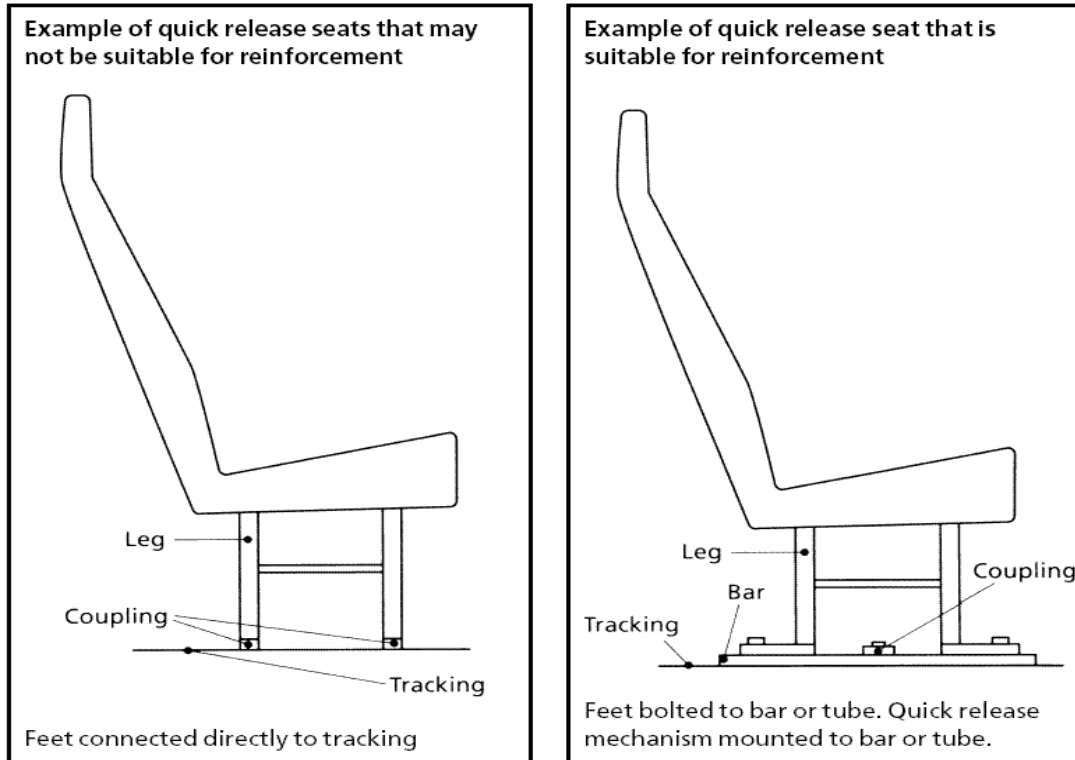


## Public Service Vehicle Inspection Manual

### 03 Seat Belts & Supplementary Restraint Systems

#### Application

**Diagram 7 – Quick release seat examples**



03 Seat Belts & Supplementary Restraint Systems

Application

Diagram 8 – Typical angled Claw fitting

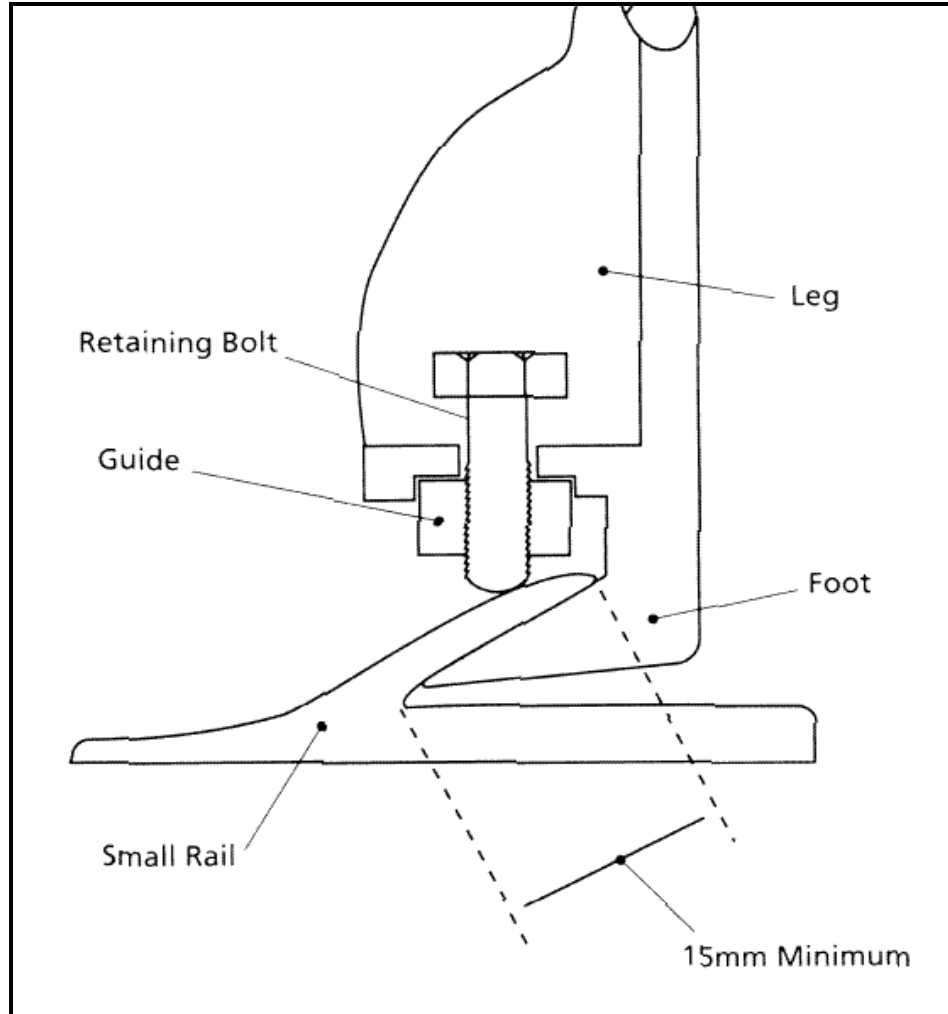
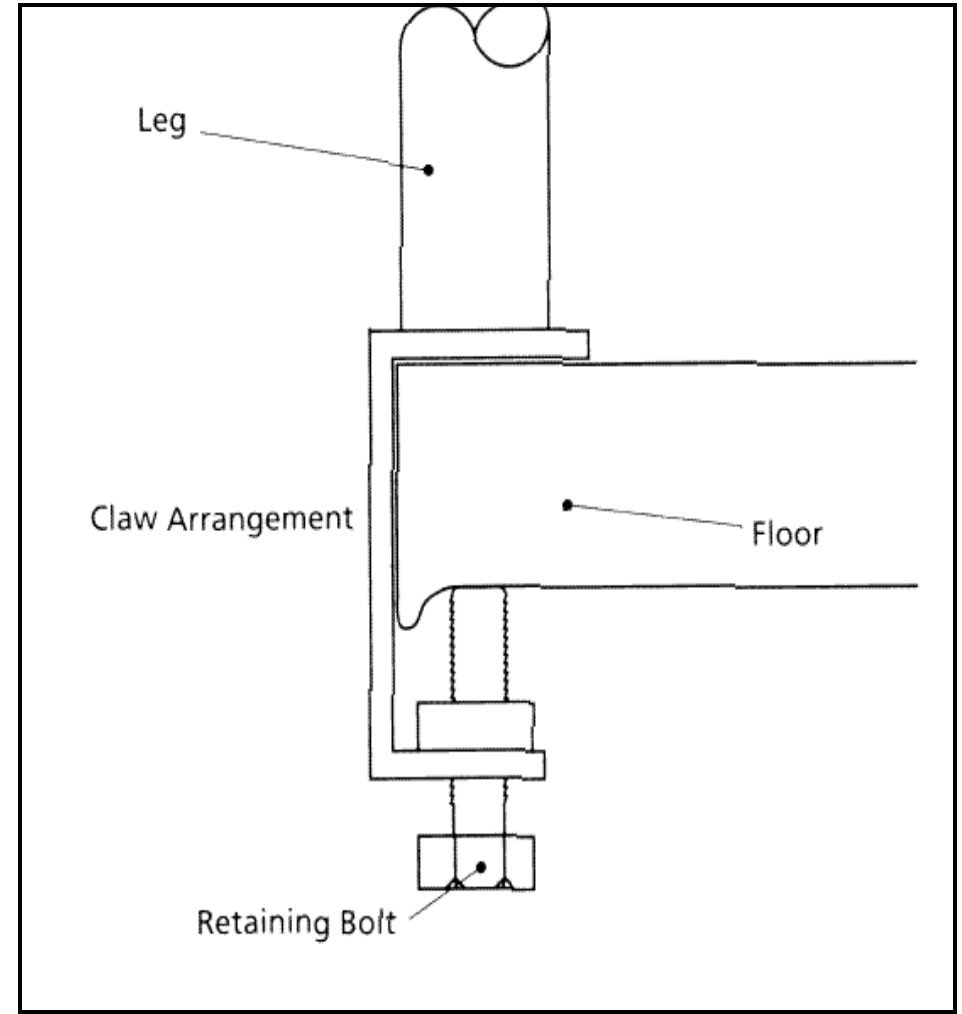


Diagram 9 – Typical parallel Claw fitting





## Public Service Vehicle Inspection Manual

03 Seat Belts & Supplementary Restraint Systems	
Method of Inspection	Reason for Failure
<p>1. Check Obligatory Seat Belts for (see table in the application section):</p> <ul style="list-style-type: none"> <li>a. presence.</li> <li>b. the correct type.</li> <li>c. either a lap or lap and diagonal belt fixed at 3 points.</li> <li>d. restraining the upper part of the body.</li> </ul> <p>2. Check Anchorages for:</p> <ul style="list-style-type: none"> <li>a. excessive corrosion, serious deterioration or a fracture in a load bearing member of the vehicle structure within 30cm (12") of the anchorage (where a seat belt is attached to a seat frame this will apply to all seat mounting points).</li> <li>b. seat belts being securely fixed to the seat or to the vehicle structure.</li> </ul> <p>3. Check Locking Mechanism, Stalks, Retracting Mechanism and Fittings:</p> <ul style="list-style-type: none"> <li>a. for the locking mechanism of a seat belt securing or releasing as intended.</li> <li>b. for the condition and operation of attachments or adjustment fittings.</li> <li>c. for corrosion and deterioration of a flexible stalk pull sheaths aside, if this can be done without damage.</li> <li>d. there are no broken flexible stalk strands.</li> <li>e. with the seat belt fastened in an unoccupied seat, ensure excessive seat belt webbing can be rewound into the retracting unit (see application note).</li> </ul>	<p>1. Obligatory Seat Belt (see table in the application section):</p> <ul style="list-style-type: none"> <li>a. missing.</li> <li>b. of an incorrect type.</li> <li>c. is not a lap or lap and diagonal belt fixed at 3 points (vehicles first used from 1 April 1982).</li> <li>d. does not restrain the upper part of the body (vehicles first used before 1 April 1982).</li> </ul> <p>2. Anchorages:</p> <ul style="list-style-type: none"> <li>a. with excessive corrosion, serious deterioration or a fracture in a load bearing member of the vehicle structure within 30cm (12") of the anchorage (where a seat belt is attached to a seat frame this will apply to all seat mounting points).</li> <li>b. a seat belt not securely fixed to the seat or on the vehicle structure.</li> </ul> <p>3. Locking Mechanism, Stalks, Retracting Mechanism and Fittings:</p> <ul style="list-style-type: none"> <li>a. locking mechanism of a seat belt does not secure or release as intended.</li> <li>b. an attachment or adjustment fitting fractured, badly deteriorated or not operating effectively.</li> <li>c. corrosion or deterioration of a flexible stalk likely to lead to failure under load.</li> <li>d. broken flexible stalk strands.</li> <li>e. a retracting mechanism that does not retract the webbing sufficiently to remove all of the slack from the belt with the locking mechanism fastened and the seat unoccupied.</li> </ul>

## Public Service Vehicle Inspection Manual

### 03 Seat Belts & Supplementary Restraint Systems

Method of Inspection	Reason for Failure
<p>4. Check Webbing for:</p> <ul style="list-style-type: none"> <li>a. cuts which cause the fibres to part.</li> <li>b. fluffing or fraying which obstructs the operation of the belt or which has weakened the webbing.</li> <li>c. condition of the stitching, its security, completeness and for repairs.</li> <li>d. Cleanliness.</li> </ul> <p>5. Check seat belt fittings such as guides, stalks and pivots for structural integrity.</p> <p>6. Check seat or seats which have seat belts attached for:</p> <ul style="list-style-type: none"> <li>a. security.</li> <li>b. condition.</li> </ul> <p>7. Check Installation: ensure there are no obvious installation defects.</p> <p>8. Check Installation for:</p> <ul style="list-style-type: none"> <li>a. modifications or repairs to the webbing.</li> <li>b. sharp edges which may damage the webbing.</li> <li>c. a directly attached anchorage secured by bolts and washers as detailed in paragraph D.</li> <li>d. anchorages security.</li> <li>e. Tubular seat frame condition.</li> <li>f. a directly attached anchorage point to the vehicle structure.</li> </ul>	<p>4. Condition of Webbing:</p> <ul style="list-style-type: none"> <li>a. a cut which causes the fibres to separate.</li> <li>b. fluffing or fraying sufficient to obstruct correct operation of the belt or which has clearly weakened the webbing.</li> <li>c. stitching badly frayed, insecure, incomplete or repaired.</li> <li>d. so dirty that it is likely to soil passengers' clothing.</li> </ul> <p>5. Any seat Belt Fittings such as guides, stalks or pivots with obvious signs of structural weakness such that failure is likely.</p> <p>6. Seat or seats to which seat belts are attached:</p> <ul style="list-style-type: none"> <li>a. insecure.</li> <li>b. with a cracked or fractured leg or frame.</li> </ul> <p>7. Installation defect found on annual test: any obvious installation defect found during the inspection.</p> <p>8. Installation inspection:</p> <ul style="list-style-type: none"> <li>a. evidence that original webbing has been cut and/or reworked. (e.g. belts knotted, fraying or fluffing removed /sealed by burning etc.)</li> <li>b. any part of the installation which has a sharp edge which could or is likely to cut or abrade the webbing.</li> <li>c. a directly attached anchorage not secured by standard seat belt mounting bolts and washers as detailed in paragraph D.</li> <li>d. an anchorage insecure.</li> <li>e. a tubular seat frame that has been drilled for the purpose of attaching a seat belt.</li> <li>f. a directly attached anchorage not attached to a load bearing member or without suitable reinforcement.</li> </ul>

## Public Service Vehicle Inspection Manual

### 03 Seat Belts & Supplementary Restraint Systems

Method of Inspection	Reason for Failure
<p>8 continued.</p> <ul style="list-style-type: none"> <li>g. retro-fitted three point belt fitted to a suitable structure.</li> <li>h. tubular frame or “H” tubular pattern legs are fitted with buttressing and diagonal bracing, or buttressing where a floor mounted belt is fitted close to a seat leg.</li> <li>i. suitable reinforcement seats with a belt fitted.</li> <li>j. with suitable padding as detailed in paragraph L.</li> <li>k. lower anchorage at least 320mm apart.</li> <li>l. in such a position that loading the belt does not causes the cushion to raise or significantly compress allowing the occupant to effectively move forward.</li> <li>m. all anchorage attached to the floor with reinforcement plates of a suitable size and contour.</li> <li>n. anchorage bolts spreader plate present (see installation information sections N &amp; O).</li> <li>o. claw type seat mounting with an adequate means of securing claw. (See installation information section P &amp; Q).</li> <li>p. on a seat fitted to a flat rail the bolt must pass through the leg, rail, floor and a suitable structural member or the floor which has been suitably reinforced.</li> <li>q. tracking for securing seats and wheelchairs is secure.</li> <li>r. no more than 25mm free movement for a looped belt at the anchorage.</li> </ul>	<p>8 continued.</p> <ul style="list-style-type: none"> <li>g. retro-fitted three point belt which is not mounted on a suitable structure.</li> <li>h. tubular frame legs or tubular “H” pattern legs which have not been reinforced with buttressing and diagonal bracing, or buttressing where a floor mounted belt is fitted close to a seat leg.</li> <li>i. belt fitted to a seat which has not been suitably reinforced or modified.</li> <li>j. without suitable padding as detailed in paragraph L.</li> <li>k. lower anchorages less than 320 mm apart.</li> <li>l. in such a position that loading the belt causes the cushion to be raised or significantly compressed thus allowing the occupant to effectively move forward.</li> <li>m. an anchorage attached to the floor without reinforcement plates of a suitable size and contour.</li> <li>n. with load spreading washer(s) missing from anchorage bolt.</li> <li>o. claw type seat mounting with inadequate means of securing claw.</li> <li>p. on a seat fitted to a flat rail the bolt does not pass through the leg, rail, floor and a suitable structural member or the floor has not been suitably reinforced.</li> <li>q. tracking for securing seats and wheelchairs insecure.</li> <li>r. free movement for a looped belt more than 25mm at the anchorage.</li> </ul>

## Public Service Vehicle Inspection Manual

### 03 Seat Belts & Supplementary Restraint Systems

Method of Inspection	Reason for Failure
<p>8. continued.</p> <ul style="list-style-type: none"> <li>s. upper anchorage of three point belt at least 475 mm above uncompressed seat cushion measured parallel to the seat back.</li> <li>t. upper anchorage of three point belt(s) at least 110 mm from centre line of seat.</li> <li>u. correct positioning of a lap belt or lap section of a three point belt.</li> <li>v. seat belt component intruding into a gangway.</li> <li>w. for vehicles subject to enhanced seat belt requirements evidence that seat belt anchorages are likely to meet the strength requirements of EC directive 76/115/EC as amended by directive 96/38/EC.</li> </ul> <p>9. Check the presence and condition of any seat belt load limiters and/or pretensioners fitted as original equipment.</p> <p>10. As far as practicable, check that:</p> <ul style="list-style-type: none"> <li>a. all driver and passenger airbags fitted as original equipment, are present and,</li> <li>b. are not obviously defective.</li> </ul> <p>11. Check the SRS warning light does not indicate a fault.</p>	<p>8. continued.</p> <ul style="list-style-type: none"> <li>s. upper anchorage of three point belt less than 475 mm above uncompressed seat cushion measured parallel to the seat back.</li> <li>t. upper anchorage of three point belt(s) less than 110 mm from centre line of seat.</li> <li>u. incorrect positioning of a lap belt or lap section of a three point belt. i.e. the belt lies across the stomach or forward of the top quarter of the thigh.</li> <li>v. a seat belt component fitted to a seat significantly intrudes into a gangway and is likely to cause injury to a passenger.</li> <li>w. for vehicles subject to enhanced seat belt requirements no evidence that seat belt anchorages are likely to meet the strength requirements of EC directive 76/115/EC as amended by directive 96/38/EC.</li> </ul> <p>9. A seat belt:</p> <ul style="list-style-type: none"> <li>a. load limiter or pretensioner obviously missing where fitted as original equipment.</li> <li>b. pretensioner or a 'folded type' webbing load limiter obviously deployed.</li> </ul> <p>10. An airbag:</p> <ul style="list-style-type: none"> <li>a. missing.</li> <li>b. obviously defective.</li> </ul> <p>11. The SRS warning lamp indicates any kind of failure in the system.</p>

## Public Service Vehicle Inspection Manual

### 05 Exhaust Emissions

#### Application

This inspection applies to all Diesel and other Compression Ignition engine vehicles (diesel engine vehicles first registered prior to 1 August 1979 this will be a visual examination only see item 2 Mol for more details). For Hybrid Electric Vehicles see below ninth bullet point.

This inspection also applies to all Spark Ignition engine vehicles; all are subject to a visual assessment with Spark Ignition engine vehicles used from 1 August 1975 being subject to a metered test as well using an approved and calibrated exhaust gas analyser to determine the hydrocarbon and carbon monoxide content.

**If a vehicle fails the test because the exhaust is holed** the emissions must be rechecked when the vehicle is retested.

**Remember** to issue a printout.

#### Diesel Compression Ignition Engines

- Exhaust emissions must be tested using an approved and calibrated smoke meter.
- **Only in exceptional circumstances where it is not possible to use a smoke meter will a visual check be carried out** (Visual tests will not apply to Fast Pass or vehicles submitted for **Reduced Pollution Certification**).
- If the exhaust has been deliberately modified to prevent the smoke meter from being used a VTP 12 must be issued refusing to complete the test because the exhaust smoke emissions test cannot be carried out.
- Twin exhaust systems, **without a balance pipe**. Both systems must be individually tested for smoke emissions. It may be necessary to purge the exhaust system again prior to the second check.
- Supercharged engines should be tested by selecting the non-turbocharged option on the smoke meter.
- The test procedure for turbocharged and non-turbocharged engines is the same.
- It is not normally sufficient to run the engine with the vehicle stationary to warm it up to temperature, so the emissions should be tested as soon as possible after the vehicle arrives at the test station.
- With some types of smoke meter care must be taken to ensure that the probe is correctly aligned to the exhaust gas flow (reference to meter manufacturer's instruction may be necessary).
- Hybrid Electric Vehicles (HEVs) do not require a metered smoke test or a visual smoke test as described in MOI 2. However where there is a supplementary engine used, this should be observed that it does not emit excessive smoke. If excessive smoke is observed this is a RfF under item 2b.

## Public Service Vehicle Inspection Manual

### 05 Exhaust Emissions

#### Application

**Some smoke meters (DSM) may fail to trigger a reading** when testing modern vehicles fitted with low emission diesel engines which produce very low levels of smoke. If the smoke meter does not register a reading or shows an error reading follow step one or two below as appropriate:

1. If the DSM produces a print out, this should be marked showing that the emissions limits were tested and met but the DSM could not register the reading. This should be attached to the test card in the normal way.
2. If the DSM will not produce a printout, the tester should make a note on the bottom of the **test card** stating that the emissions limits were tested and met but the DSM could not register the reading.

#### Spark Ignition Engines

1. Visual Check (all Spark Ignition engined vehicles).

Ensure that the engine is at normal idling speed and operating temperature and is not subject to significant electrical loading. An Assistant may apply light throttle pedal pressure if the engine will not idle.

Raise the engine speed to around 2500rpm or half engine speed if this is lower and hold steady for 20 seconds to purge the exhaust system. Allow the engine speed to return to idle and allow the emissions to stabilise.

Assess the colour of the exhaust smoke.

2. Exhaust Gas Analyser Test (all Spark Ignition engine vehicles used from 1 August 1975)

Follow the analyser manufacturer's instructions and carry out the full test procedure to determine the proportions of carbon monoxide (CO) and hydrocarbon (HC).

On LPG vehicles the HC result obtained must be divided by the PEF (propane/hexane equivalency factor) marked on the analyser to obtain the figure required to assess the test result. Some machines do this automatically.

Residual hydrocarbons, which are indicated by the analyser when it is sampling clean air, must be deducted from the HC reading for the vehicle.

If a vehicle meets the CO requirement at its **normal idling speed** but fails the HC check, recheck the HC level at a high idle speed of 2000rpm. If the HC reading is then 1200ppm or less, the vehicle will have met the CO and HC requirements. Light pedal pressure should be used to achieve the high idle speed. Cold start/cold running devices must not be used.

Some vehicles give unstable readings due to their fuel system design. Before failing a limit must have been exceeded constantly for at least 5 seconds.

## Public Service Vehicle Inspection Manual

05 Exhaust Emissions	
Method of Inspection	Reason for Failure
<p><b>1. Free acceleration test using smoke meter</b></p> <p>1a</p> <ul style="list-style-type: none"> <li>i. Check that the engine is at or near normal operating temperature.</li> <li>ii. Purge the inlet and exhaust systems fully by holding the engine speed steady at just below maximum governed speed for 30 seconds.</li> <li>iii. Select the appropriate test programme on the smoke meter.</li> <li>iv. Follow the meter prompts; depress the accelerator pedal quickly but not violently, to reach full fuel position in less than 1 second. Hold it there until a release prompt is given. If, at the end of the 1<sup>st</sup> acceleration, the smoke meter value is no more than <math>1.50\text{m}^{-1}</math> the vehicle will have met the fast pass limit.</li> <li>v. If the 1<sup>st</sup> meter reading is more than <math>1.50\text{m}^{-1}</math> further accelerations will be required, following meter prompts, up to a maximum of 6 accelerations.</li> <li>vi. For vehicles first registered from 1 July 2008. If they fail the fast pass test you will need to choose the most appropriate programme for the meter to perform a full metered smoke test, should the meter only allow 3 accelerations you may need to repeat the exercise to gain the 6 accelerations required and then look for 3 consecutive results from both printouts before deciding whether the vehicle should pass or fail (it is recommended that RPC4 is chosen for this operation).</li> </ul> <p>1b.</p> <p>Assess visually whether the smoke emitted from the exhaust regardless of the measured density, is likely to obscure the vision of other road users.</p>	<p><b>1. Statutory Smoke Meter Test</b></p> <p>1a</p> <p>After a total of six accelerations have been completed, the average smoke opacity recorded for accelerations 4, 5 and 6 is more than:</p> <p>For diesel vehicles registered prior to 1 July 2008:</p> <p><math>2.5\text{m}^{-1}</math> for non-turbocharged engines <math>3.0\text{m}^{-1}</math> for turbocharged engines.</p> <p>For vehicles first registered from 1 July 2008:</p> <p><math>1.5\text{m}^{-1}</math> for all diesel engines.</p> <p>1b.</p> <p>The exhaust emits excessive smoke or vapour of any colour, to an extent likely to obscure vision.</p>

## Public Service Vehicle Inspection Manual

05 Exhaust Emissions	
Method of Inspection	Reason for Failure
<p><b>2. Visual emission test</b></p> <p>2a</p> <ul style="list-style-type: none"> <li>i. Applicable to diesel engine vehicles first registered prior to 1 August 1979 and in exceptional circumstances where it is not possible to use a smoke meter or where a risk to health and safety would arise. The procedure is the same for supercharged, turbocharged and non-turbocharged engines.</li> <li>ii. With the engine at or near normal operating temperature check the density of the exhaust emission visually.</li> <li>iii. Ask the driver to depress the accelerator pedal quickly but not violently, to reach full fuel position in less than 1 second. Immediately release when the engine reaches its maximum governed speed, allow the engine to return to idle speed.</li> <li>iv. Ignore smoke from the first acceleration.</li> <li>v. Repeat up to a maximum of six times if necessary until the exhaust smoke is considered to be acceptable for two successive accelerations.</li> </ul> <p>2b.</p> <p>Assess whether the smoke emitted from the exhaust regardless of the measured density is likely to obscure the vision of other road users.</p>	<p><b>2 Statutory visual test</b></p> <p>2a</p> <p>After a maximum of six accelerations the exhaust emits smoke of a level greater than that of equivalent metered levels.</p> <p>2b.</p> <p>The exhaust emits excessive smoke or vapour of any colour, to an extent likely to obscure vision.</p> <p><b>NOTE:</b> The criterion is density and not volume of smoke. The description 'dense smoke' includes any smoke or vapour which largely obscures vision.</p>



05 Exhaust Emissions	
Method of Inspection	Reason for Failure
<p><b>Spark Ignition Engines</b></p> <p>3. Visual Check:</p> <ul style="list-style-type: none"> <li>a. assess the engine idle speed.</li> <li>b. assess the smoke emitted from the tail pipe</li> </ul> <p>4. Exhaust Gas Analyser Check:</p> <ul style="list-style-type: none"> <li>a. HC content.</li> <li>b. CO content.</li> </ul> <p><b>All vehicles</b></p> <p>5. Check the vehicle for presence of emission control systems fitted as standard.</p>	<p><b>Spark Ignition Engines</b></p> <p>3. Visual Check:</p> <ul style="list-style-type: none"> <li>a. The engine is idling at a speed clearly above the normal idling speed.</li> <li>b. The exhaust emits dense blue or clearly visible black smoke for a continuous period of 5 seconds at idling speed.</li> </ul> <p>4. Exhaust Gas Analyser Check:</p> <ul style="list-style-type: none"> <li>a. HC content greater than 1200ppm a vehicle first used from 1 August 1975.</li> <li>b. CO content greater than: <ul style="list-style-type: none"> <li>• 3.5% for a vehicle first used from 1 August 1986.</li> <li>• 4.5% for a vehicle first used from 1 August 1975 to 31 July 1986.</li> </ul> </li> </ul> <p><b>All vehicles</b></p> <p>5. A Catalytic converter, particulate filter or selective catalytic reduction system missing where it was fitted as standard.</p>

## 05 Exhaust Emissions

### Method of Inspection

#### Reduced Pollution Certificate (RPC) Smoke meter test

The RPC check is **not** part of the statutory test requirement.

- a. Select appropriate RPC limit. Carry out Method of Inspections listed at 1.a procedures I, II and III only.
- b. Following meter prompts carry out three acceleration tests. Depress the accelerator pedal quickly but not violently, to reach full fuel position **in less than 1 second**. Hold it there  
Until a release prompt is given. At the end of the 3<sup>rd</sup> acceleration the smoke meter will display the average smoke value and test result. If the RPC value is not met and the meter readings are above the statutory limits, further accelerations up to a maximum of six may be prompted by the meter.

Note: A vehicle will pass the RPC metered test if the opacity level is no greater than:

- 0.2m<sup>-1</sup> for all vehicles fitted with a particulate trap.
- 0.4m<sup>-1</sup> vehicles fitted with an unmodified Euro -2 engine.
- 0.8m<sup>-1</sup> vehicles fitted with an unmodified Euro -1 engine.
- 1.0m<sup>-1</sup> vehicle retro-fitted with a Euro -2 engine.

## Public Service Vehicle Inspection Manual

### 06 Road Wheels and Hubs

#### Application

This inspection applies to all road wheels and hubs apart from spare wheels.

**Where possible wheel nuts will be lightly tapped** with a hammer to check for looseness, but any other evidence such as rust marks or elongation of bolt/stud holes must also be taken into account.

**A nut or stud is considered to be “loose”** if it is not obviously carrying out its function of clamping the wheel to the hub.

**With some vehicles it is not possible to see the road wheels completely** from ground level, especially with twin wheels and where the body hides part of the wheels. In such cases the vehicle must be moved to expose hidden parts of the wheels, or examined from underneath.

**Whenever possible, presenters should remove wheel embellishers**; remove visual security indicators, if they prevent a full examination. Where this can not be accomplished, continue to inspect the vehicle and annotate the test card to state that the embellishers were not removed.

#### **Capacity Limitations of 11.75 x 22.5 Alcoa Aluminium Wheels.**

Wheels with the part number 813520/813523 may be stamped on the inside of the wheel, opposite the valve, with a maximum load rating of 4250kg or 4500kg and those with part number 813530/813533 with a rating of 4500kg. It has been agreed that wheels with these part numbers and maximum load ratings are suitable for a maximum axle weight of 9150kg.

**Kronprinz wheels fitted** to the Dennis range of vehicles specifically the Trident 2 and the Enviro 400 identified by an ‘X’ as the 12<sup>th</sup> character of the VIN, are capable of carrying higher loads than those shown on the wheels. The wheels can be identified by the following markings on the wheel face:

848MGF and 848SAF  
148/145      149/145  
KpZ          KpZ

The 148 and 149 indexes in single configuration are normally only good for 6300kg and 6500kg respectively. Kronprinz have informed DVSA that these wheels are actually good for 7100kg and 7500kg respectively. If you come across these wheels at annual test please be aware of the increase in weight.

06 Road Wheels and Hubs

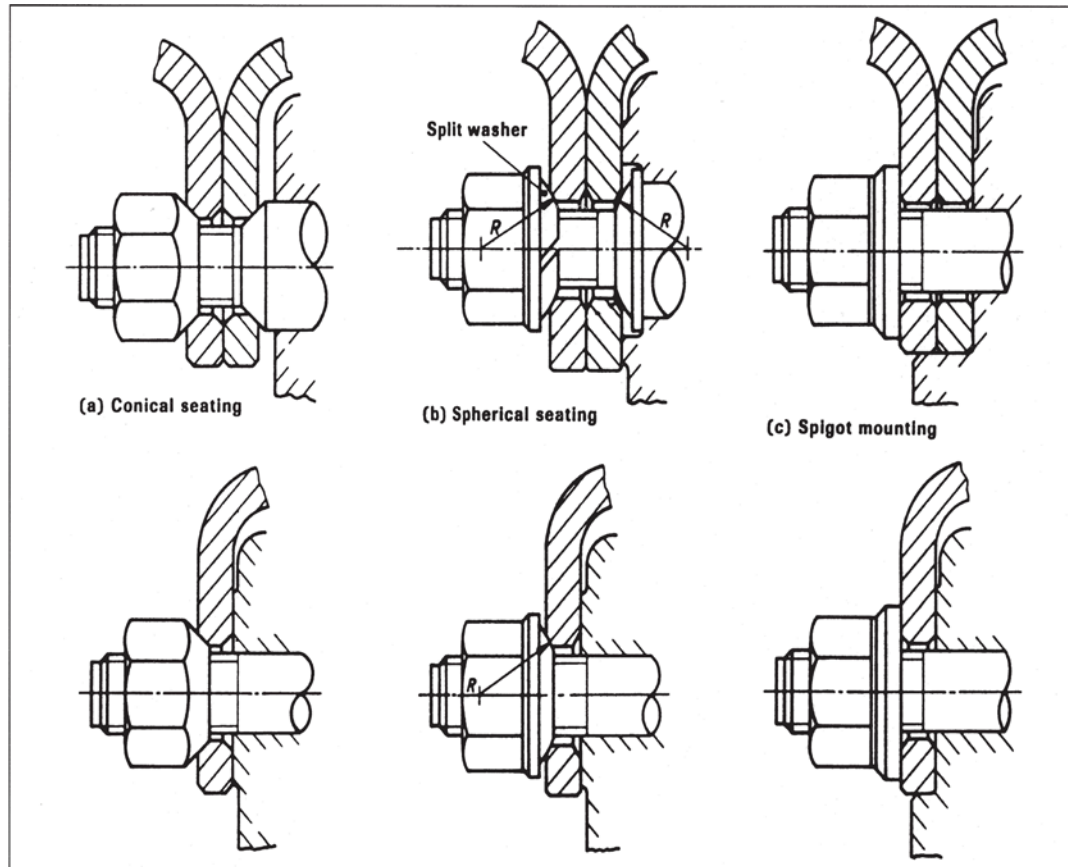
Application

**Capacity limitation of a wheel marked with a load index**

If a wheel is marked with a load index which indicates that the maximum load is lower than is required to support the axle load, the vehicle should be failed under Reason for Failure 2.i.

**Wheels not marked with a load index or load marking** must be assumed to be capable of carrying the axle weight.

**Compatibility of Wheel Fixings**



Vehicles with conical wheel fixings **MUST NOT** be fitted with wheels from vehicles designed for use with spherical fixings. (British built vehicles normally have conical wheel fixings).

Vehicles with spherical wheel fixings **MUST NOT** be fitted with wheels from vehicles which are designed for use with conical fixings.

Volvo wheels of the original spigot-mounting design **WILL NOT** interchange with another type. Volvo wheels designed for later type spigot mounting may be used in an emergency on British built trailers.

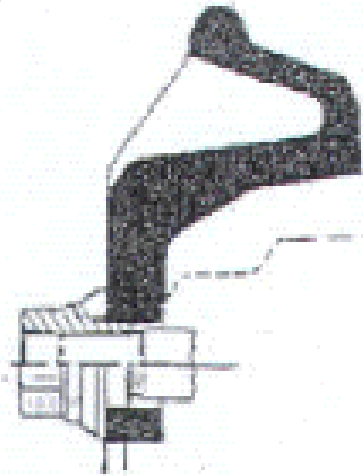
Wheels with conical fixings **MUST NOT** be used on Volvo vehicles because they do not have a machine centre bore to fit hub

Spigots must extend to the outer wheel where twin wheels are fitted

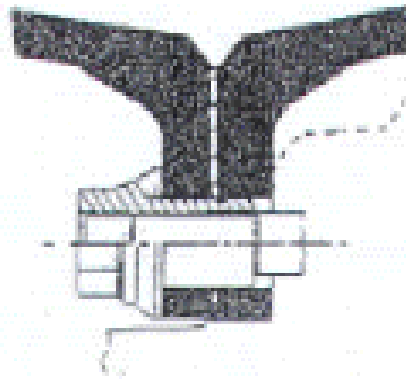
06 Road Wheels and Hubs

Application

Sleeved two piece flange nut fixing



Single wheel location



Twin Wheel Spigot Mounting

Sleeved two piece flange nut fixing, this fixing method of utilising a sleeved nut has been adopted primarily to allow the retro fitting of aluminium wheels which incorporate a thicker flange.

**Where wheel trim brackets are secured by the wheel retaining nuts** it is acceptable provided the bracket does not stop the wheel nut from seating correctly in the taper of the stud hole. For spigot mounted wheels there may be some overlap between the washer and bracket, failure will only be justified where the nut clamping force is obviously ineffective.

**Some wheel nut studs do not protrude all the way through the wheel** nut this is acceptable provided there is no sign of insecurity.

**Where twin wheels are fitted** the spigots must extend to the outer wheel to locate this.

## Public Service Vehicle Inspection Manual

06 Road Wheels and Hubs	
Method of Inspection	Reason for Failure
<p><b>1. Check tyre retaining rings for:</b></p> <ul style="list-style-type: none"> <li>a. fractures.</li> <li>b. clearance, (butting of the ends is acceptable with lift on the flange up to 1.5mm from the rim).</li> </ul> <p><b>2. Check all road wheels for:</b></p> <ul style="list-style-type: none"> <li>a. presence, security and function of all retaining nuts and studs.</li> <li>b. elongation of a stud hole.</li> <li>c. the condition of spigot wheel nut washers.</li> <li>d. damage or distortion and the presence of the locating spigot or dowel.</li> <li>e. damage caused by wheel nuts.</li> <li>f. compatible fixings.</li> <li>g. condition, cracks (except at the bridge over the valve), welds and repairs.</li> <li>h. repairs by welding to aluminium alloy wheels.</li> <li>i. the correct load rating that is required to support the maximum permissible (GB) axle load.</li> </ul> <p><b>3. Check hubs for:</b></p> <ul style="list-style-type: none"> <li>a. condition, and that the half shaft bolts, studs or nuts are secure.</li> <li>b. clearance between a spigot mounted wheel and the hub spigots.</li> </ul>	<p><b>1. A tyre retaining ring:</b></p> <ul style="list-style-type: none"> <li>a. fractured.</li> <li>b. butting causing the flange to lift more than 1.5mm from the rim.</li> </ul> <p><b>2. A wheel:</b></p> <ul style="list-style-type: none"> <li>*a. nut or stud missing or loose or obviously not fulfilling the function of clamping the wheel to the hub.</li> <li>b. with any visible elongation of a stud hole.</li> <li>c. with a spigot wheel nut washer cracked.</li> <li>d. badly damaged or distorted or with a locating spigot or dowel missing.</li> <li>e. damaged by the corners of a wheel nut cutting into the material of the wheel.</li> <li>f. and its fixings not compatible.</li> <li>*g. cracked (except at the bridge over the valve), weld breaking away or an inadequate repair.</li> <li>h. made of aluminium alloy repaired by welding.</li> <li>i. with a load rating less than that required to support the maximum permissible (GB) axle load.</li> </ul> <p><b>3. A hub:</b></p> <ul style="list-style-type: none"> <li>*a. cracked, badly damaged, or with a half shaft bolt, stud or nut loose or missing.</li> <li>b. with clearance between a spigot mounted wheel and the hub spigots that exceeds 3mm across the diameter.</li> </ul>

**07 Size and Type of Tyres****Application**

This inspection applies to all tyres, apart from spare tyres.

**The use markings most likely to be encountered** are "FRT" which indicates that the tyre is not suitable for use on a driven axle and "TRAILER USE ONLY". Tyres marked with a direction arrow pointing in the wrong direction should not be failed.

**Tyres are usually identified by their nominal section size followed by the rim diameter** e.g. 10.00-20, 750-16, etc (the majority of modern tyres carry millimetric markings e.g. 205-16 etc). For identification of sidewall markings refer to the diagram at the end of this section. All tyres on an axle must be of the same nominal size. If a tyre is dual marked one of the markings must be the same as the markings on the other tyres on the axle.

**There are still a number of high load capacity tyres in use** which are marked with a code to indicate the tyre size and capacity e.g. a 10.00-20 16 ply tyre may be marked D20 or 4-20 (a full list of these tyres is given at Table 1).

**If tyres marked with a load capacity index are fitted** the maximum permissible axle Load for normal use can be found in Table 2 at the end of this section. The Load Index (LI) may consist of one or two numbers e.g. 154 or 146/143. Where two numbers are displayed the first refers to the use of the tyre in single formation and the second in twin formation. Reference to the table shows that the maximum loads for this tyre are 6000kg in single formation and 10900 in twin formation.

**If a load index is not shown** the carrying capacity of a tyre can be determined from the Ply Rating. The load capacity of ply rated tyres is shown at Table 3. If no ply rating can be found on the tyre it should be assumed to have the lowest load capacity listed for that size of tyre.

This information relates to tyres used without any restriction. There are two other categories of vehicle use which allow tyres to be operated at lower speeds and higher loads. These are Local Service Bus and Restricted Speed Vehicle (i.e. a vehicle displaying a 50 plate ), both of which are restricted to a maximum speed of 50 mph. The details of the axle loads for these vehicles are in the Tyre Tables obtainable from the Driver and Vehicle Standards Agency, Ellipse, Padley Road, Swansea SA1 8AN.

**SPEED SYMBOLS**

The speed capability is represented by a letter which is displayed adjacent to the LI marking e.g. 146/143J. This indicates the speed at which the tyre can carry the load(s) indicated by the LI marking(s). In the above example the tyres carry a load of 6000/10900kg at 62mph.

**07 Size and Type of Tyres****Application**

The minimum required speed ratings are :

CLASS OF VEHICLE	PERMITTED SPEED (MPH)	MINIMUM SPEED SYMBOL
Any bus not exceeding 12 metres in length other than a "Local Service Bus" or a "Restricted speed vehicle"	70	L
Any bus exceeding 12 metres in length other than a "Local Service Bus" or a "Restricted speed vehicle"	60	J
A "Local Service Bus" or a "Restricted speed vehicle"	50	F

**Alternative Speed Rating**

Certain vehicles can be fitted with tyres showing a lower speed rating than those shown above but the maximum axle loads will be reduced as shown below.

CLASS OF VEHICLE	NORMAL SPEED RATING	ALTERNATIVE SPEED RATING	CHANGE IN AXLE LOADS
A bus not exceeding 12 metres in length other than a "Local Service Bus" or a "Restricted speed vehicle"	L	J	-7%
		K	-3%
Any bus exceeding 12 metres in length other than a "Local Service Bus" or a "Restricted speed vehicle"	J	F	-15%
		G	-5%
A "Local Service Bus" or a "Restricted speed vehicle"	F	J or higher	+10% (+15 % for vehicles approved under 92/23/EEC)

Details of the reduced axle loads which tyres can carry are shown in Table 4.



**07 Size and Type of Tyres****Application****STRUCTURE**

Examine all the tyres fitted and note the type of structure (radial, cross-ply or bias-belted) and the nominal size of tyres.

All tyres on an axle must be of the same structure and nominal size.

Tyres on an axle may be of different structures and nominal sizes to those on another axle with the following exceptions:

- All tyres on all steered axles must have the same structure.
- All tyres on all driven axles must have the same structure.
- On two axle motor vehicles where each axle is fitted with single wheels, if all the tyres are not of the same structure, the type of structure which is allowed to be fitted to each axle is shown in the table.

Axle 1	Axle 2
Cross-ply	Bias-belted
Cross-ply	Radial
Bias-belted	Radial

This does not apply to an axle on which wide single tyres with a road contact width of more than 300mm are fitted.

**07 Size and Type of Tyres****Application****TABLE 1**

CODE	TYRE SIZE
A16 or 1 — 16	750 — 16 — 12 PR
B16 or 2 — 16	825 — 16 — 14PR
C16 or 3 — 16	900 — 16 — 14 PR
B17 or 2 — 17	825 — 17 — 14 PR
A20 or 1 — 20	750 — 20 — 12 PR
B20 or 2 — 20	825 — 20 — 14 PR
C20 or 3 — 20	900 — 20 — 14 PR
D20 or 4 — 20	1000 — 20 — 16 PR
E20 or 5 — 20	1100 — 20 — 16 PR
F20	1200 — 20 — 18 PR
G20	1400 — 20 — 22 PR
E22 or 5 — 22	1100 — 22 — 16 PR
B22.5 or 2 — 22.5	9 — 22.5 — 14 PR
C22.5 or 3 — 22.5	10 — 22.5 — 14 PR
D22.5 or 4 — 22.5	11 — 22.5 — 16 PR
E22.5	12 — 22.5 — 16 PR
C24 or 3 — 24	900 — 24 — 14 PR
E24	1100 — 24 — 16 PR

**07 Size and Type of Tyres****Application****Table 2** Load capacity index table

Extract from ECE Reg 54: "Load index" Table amended to show axle loads

Load Index	Single Kg	Dual Kg	Load Index	Single Kg	Dual Kg	Load Index	Single Kg	Dual Kg
70	670	1340	100	1600	3200	130	3800	7600
71	690	1380	101	1650	3300	131	3900	7800
72	710	1420	102	1700	3400	132	4000	8000
73	730	1460	103	1750	3500	133	4120	8240
74	750	1500	104	1800	3600	134	4240	8480
75	774	1548	105	1850	3700	135	4360	8720
76	800	1600	106	1900	3800	136	4480	8960
77	824	1648	107	1950	3900	137	4600	9200
78	850	1700	108	2000	4000	138	4720	9440
79	874	1748	109	2060	4120	139	4860	9720
80	900	1800	110	2120	4240	140	5000	10000
81	924	1848	111	2180	4360	141	5150	10300
82	950	1900	112	2240	4480	142	5300	10600
83	974	1948	113	2300	4600	143	5450	10900
84	1000	2000	114	2360	4720	144	5600	11200
85	1030	2060	115	2430	4860	145	5800	11600
86	1060	2120	116	2500	5000	146	6000	12000
87	1090	2180	117	2570	5140	147	6150	12300
88	1120	2240	118	2640	5280	148	6300	12600
89	1160	2320	119	2720	5440	149	6500	13000
90	1200	2400	120	2800	5600	150	6700	13400
91	1230	2460	121	2900	5800	151	6900	13800
92	1260	2520	122	3000	6000	152	7100	14200
93	1300	2600	123	3100	6200	153	7300	14600
94	1340	2680	124	3200	6400	154	7500	15000
95	1380	2760	125	3300	6600	155	7750	15500
96	1420	2840	126	3400	6800	156	8000	16000
97	1460	2920	127	3500	7000	157	8250	16500
98	1500	3000	128	3600	7200	158	8500	17000
99	1550	3100	129	3700	7400	159	8750	17500

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**07 Size and Type of Tyres**

**Application**

**Table 2** (Continued) Load capacity index table  
Extract from ECE Reg 54: "Load index" Table amended to show axle loads

Load Index	Single Kg	Dual Kg	Load Index	Single Kg	Dual Kg	Load Index	Single Kg	Dual Kg
160	9000	18000						
161	9250	18500						
162	9500	19000						
163	9750	19500						
164	10000	20000						
165	10300	20600						
166	10600	21200						
167	10900	21800						
168	11200	22400						
169	11600	23200						
170	12000	24000						
171	12300	24600						
172	12600	25200						
173	13000	26000						
174	13400	26800						
175	13800	27600						
176	14200	28400						
177	14600	29200						
178	15000	30000						
179	15500	31000						

## 07 Size and Type of Tyres

### Application

#### 1. Ply Rating Marked Tyres

##### How to use this table:

1. Locate the line entry corresponding to the size and ply rating marked on the tyre sidewall;
2. Read off the maximum axle load (kg) for these tyres in 'SINGLE' or 'TWIN' formation, as appropriate.

TABLE 3

Nominal Tyre Size	Ply Rating	Maximum Axle Load (Kg)	
		Single Tyres ┌───┐	Twin Tyres ┌───┐┌───┐
145 - 13C	6	970	1840
145 - 13C	8	1120	2120
560 - 13C	6	1020	1940
590 - 13C	6	1070	2090
640 - 13C	6	1280	2240
640 - 13C	8	1430	2750
670 - 13C	6	1380	2650
670 - 13C	8	1580	3050
1050 - 13	12	4320	7880
1050 - 13	14	4830	8900
155 - 14C	6	1070	2040
165 - 14C	6	1300	2460
165 - 14C	8	1460	2760
175 - 14C	6	1430	2680
175 - 14C	8	1550	3000
185 - 14	RADIAL REINFORCED RAD	1200	2300
185 - 14		1340	2560
185 - 14		1340	2560
185 - 14C		1550	2920
185 - 14C	8	1700	3200
195 - 14	RADIAL REINFORCED RAD	1300	2490
195 - 14		1500	2870
195 - 14C		1700	3210
195 - 14C		1900	3600
205 - 14	RADIAL REINFORCED RAD	1420	2720
205 - 14		1650	3160
205 - 14C		1850	3510
205 - 14C		2060	3900
215 - 14C	8	2240	4240
590 - 14C	6	1170	2240
600 - 14C	8	1260	2400

Nominal Tyre Size	Ply Rating	Maximum Axle Load (Kg)	
		Single Tyres ┌───┐	Twin Tyres ┌───┐┌───┐
640 - 14C	6	1330	2550
650 - 14	4	970	1860
650 - 14C	6	1300	2460
650 - 14C	8	1500	2840
670 - 14C	6	1430	2750
670 - 14C	8	1680	3160
700 - 14	4	1070	2050
700 - 14C	6	1380	2650
750 - 14	4	1200	2300
750 - 14C	6	1530	2950
750 - 14C	8	1730	3360
11-15	6	2240	—
145 - 15C	8	1230	2320
185 - 15C	8	1750	3400
590 - 15C	6	1220	2340
640 - 15C	6	1380	2650
670 - 15C	6	1530	2900
670 - 15C	8	1780	3460
670 - 15	10	2000	3900
700 - 15C	6	1750	3400
700 - 15C	8	1940	3760
700 - 15	12	2440	4580
750 - 15C	6	1830	3560
750 - 15C	8	2060	3970
750 - 15	10	2340	4370
750 - 15	12	2750	5340
750 - 15	14	3150	6100
750 - 15	16	3660	6860
825 - 15	12	3050	5590
825 - 15	14	3360	6360
825 - 15	18	4680	8540
825 - 15	20	5000	9440
1000 - 15	12	3870	7120
1000 - 15	14	4320	8130
1000 - 15	16	5020	9580
1000 - 15	18	5400	10170

Nominal Tyre Size	Ply Rating	Maximum Axle Load (Kg)	
		Single Tyres ┌───┐	Twin Tyres ┌───┐┌───┐
175 - 16C	6	1500	2840
175 - 16C	8	1650	3100
185 - 16C	8	1800	3400
195 - 16C	8	1950	3700
205 - 16C	6	1900	3610
205 - 16C	8	2120	4000
215 - 16C	6	2120	4000
215 - 16C	8	2300	4360
235 - 85 - 16	10	2760	5040
600 - 16	6	1380	2550
600 - 16	8	1530	2920
600 - 16	10	1830	3300
650 - 16	6	1530	2920
650 - 16	8	1830	3460
650 - 16	10	2040	3900
700 - 16	6	1730	3260
700 - 16	8	2040	3870
700 - 16	10	2340	4480
700 - 16	12	2650	5000
750 - 16	6	2040	3870
750 - 16	8	2240	4270
750 - 16	10	2500	4720
750 - 16	12	2900	5600
825 - 16	8	2650	4880
825 - 16	10	2850	5440
825 - 16	12	3300	6400
825 - 16	14	3600	6800
900 - 16	6	2360	4360
900 - 16	8	2720	5140
900 - 16	10	3050	5600
900 - 16	12	4070	7200
900 - 16	14	4320	7800
1050 - 15	12	4580	8130

## 07 Size and Type of Tyres

## Application

TABLE 3 (continued)

Nominal Tyre Size	Ply Rating	Maximum Axle Load (Kg)	
		Single Tyres ⎓	Twin Tyres ⎓⎓
1400 - 16	18	7880	—
1400 - 16	20	8390	—
1400 - 16	22	9150	—
9.50 - 16.5	6	2130	3750
825 - 17	10	3260	5850
825 - 17	12	3560	6200
825 - 17	14	3820	7200
8 - 17.5C	8	2300	4480
8 - 17.5	10	2570	5000
8.5 - 17.5	RADIAL	2900	5600
9.5 - 17.5	RADIAL	3400	6400
8 - 19.5	RADIAL	3100	6000
9 - 19.5	RADIAL	3800	7200
9.5 - 19.5	RADIAL	4240	7800
600 - 20	6	1430	2750
600 - 20	8	1630	3100
600 - 20	10	1830	3460
650 - 20	6	1830	3460
650 - 20	8	2240	4070
650 - 20	10	2440	4680
700 - 20	8	2240	4480
700 - 20	10	2650	4880
700 - 20	12	2850	5340
750 - 20	8	2850	5340
750 - 20	10	3260	6000
750 - 20	12	3600	7000
825 - 20	10	3560	6610
825 - 20	12	3820	7200
825 - 20	14	4120	7800
900 - 20	10	4070	7630
900 - 20	12	4580	8240
900 - 20	14	5000	9200

Nominal Tyre Size	Ply Rating	Maximum Axle Load (Kg)	
		Single Tyres ⎓	Twin Tyres ⎓⎓
1000 - 20	12	4830	8640
1000 - 20	14	5340	9720
1000 - 20	16	6100	10900
10.5 - 20	6	2800	—
1100 - 20	12	5340	9660
1100 - 20	14	6100	10900
1100 - 20	16	6610	11600
1200 - 20	14	6100	10600
1200 - 20	16	6860	12000
1200 - 20	18	7630	13010
12.5 - 20	10	3700	—
1300 - 20	16	7800	—
1300 - 20	18	8900	—
1300 - 20	20	*9300	—
1400 - 20	18	9150	—
1400 - 20	20	*9510	—
1400 - 20	22	*10000	—
14.5 - 20	10	4000	—
1500 - 20	20	10600	—
1500 - 20	22	11600	—
1500 - 20	24	12600	—
1600 - 20	14	6100	—
1600 - 20	20	11400	—
1600 - 20	22	12500	—
1600 - 20	24	13600	—
13/80 - 20	18	7300	13000
14/80 - 20	18	8250	—
1100 - 22	12	5590	10170
1100 - 22	14	6100	10810
1100 - 22	16	6860	12000

Nominal Tyre Size	Ply Rating	Maximum Axle Load (Kg)	
		Single Tyres ⎓	Twin Tyres ⎓⎓
9 - 22.5	10	3560	6610
9 - 22.5	12	3820	7200
9 - 22.5	14	4120	7800
10 - 22.5	10	4070	7630
10 - 22.5	12	4580	8240
10 - 22.5	14	5000	9200
11 - 22.5	12	4830	8640
11 - 22.5	14	5340	9720
11 - 22.5	16	6100	10900
13 - 22.5	18	7500	13000
10/70 - 22.5	14	5000	9200
11/70 - 22.5	12	5300	9720
11/70 - 22.5	14	5600	10300
11/70 - 22.5	16	6100	10900
12/70 - 22.5	16	6610	11600
13/70 - 22.5	18	7630	13010
275/20 - 22.5	RADIAL	5000	9200
275/70 - 22.5	16	6100	—
315/70 - 22.5	16	6610	11600
900 - 24	12	5090	9150
900 - 24	14	5340	10170
1000 - 24	14	6100	10500
1100 - 24	12	5850	10300
1100 - 24	14	6610	11200
1100 - 24	16	7120	12300
1200 - 24	14	6610	—
1200 - 24	16	7370	—
1200 - 24	18	8130	—
1200 - 24	20	9000	—
1400 - 24	18	10000	—
1400 - 24	22	11200	—
11 - 24.5	14	5830	10800

**Note:** Items marked “\*” are not suitable in UK over 9200kg due to minimum tread width requirement of 300mm

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**07 Size and Type of Tyres****Application****TABLE 4 MAX AXLE LOADS FOR “UNRESTRICTED” SPEED VEHICLES**

Tyre load Index	Trailers permitted to exceed 50mph (up to 60mph)				Motor vehicles permitted to exceed 60mph (up to 70mph)			
	Speed Symbol F (-15%)		Speed Symbol G (-5%)		Speed Symbol J (-7%)		Speed Symbol K (-3%)	
	Single Kg	Dual Kg	Single Kg	Dual Kg	Single Kg	Dual Kg	Single Kg	Dual Kg
70	570	1140	640	1280	630	1250	650	1300
71	590	1180	660	1320	650	1290	670	1340
72	610	1210	680	1350	660	1330	690	1380
73	630	1250	700	1390	680	1360	710	1420
74	640	1280	720	1430	700	1400	730	1460
75	660	1320	740	1480	720	1440	760	1510
76	680	1360	760	1520	750	1490	780	1560
77	700	1410	790	1570	770	1540	800	1600
78	730	1450	810	1620	800	1590	830	1650
79	750	1490	830	1670	820	1630	850	1700
80	770	1530	860	1710	840	1680	880	1750
81	790	1580	880	1760	860	1720	900	1800
82	810	1620	910	1810	890	1770	930	1850
83	830	1660	930	1860	910	1820	950	1890
84	850	1700	950	1900	930	1860	970	1940
85	880	1760	980	1960	960	1920	1000	2000
86	910	1810	1010	2020	990	1980	1030	2060
87	930	1860	1040	2080	1020	2030	1060	2120
88	960	1910	1070	2130	1050	2090	1090	2180
89	990	1980	1110	2210	1080	2160	1130	2250
90	1020	2040	1140	2280	1120	2240	1170	2330
91	1050	2100	1170	2340	1150	2290	1200	2390
92	1080	2150	1200	2400	1180	2350	1230	2450
93	1110	2210	1240	2470	1210	2420	1270	2530
94	1140	2280	1280	2550	1250	2500	1300	2600
95	1180	2350	1320	2630	1290	2570	1340	2680
96	1210	2420	1350	2700	1330	2650	1380	2760
97	1250	2490	1390	2780	1360	2720	1420	2840
98	1280	2550	1430	2850	1400	2790	1460	2910

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07 Size and Type of Tyres								
Application								
TABLE 4 (continued) MAX AXLE LOADS FOR “UNRESTRICTED” SPEED VEHICLES								
Tyre load Index	Trailers permitted to exceed 50mph (up to 60mph)				Motor vehicles permitted to exceed 60mph (up to 70mph)			
	Speed Symbol F (-15%)		Speed Symbol G (-5%)		Speed Symbol J (-7%)		Speed Symbol K (-3%)	
	Single Kg	Dual Kg	Single Kg	Dual Kg	Single Kg	Dual Kg	Single Kg	Dual Kg
99	1320	2640	1480	2950	1450	2890	1510	3010
100	1360	2720	1520	3040	1490	2980	1560	3110
101	1410	2810	1570	3140	1540	3070	1610	3210
102	1450	2890	1620	3230	1590	3170	1650	3300
103	1490	2980	1670	3330	1630	3260	1700	3400
104	1530	3060	1710	3420	1680	3350	1750	3500
105	1580	3150	1760	3520	1730	3450	1800	3590
106	1620	3230	1810	3610	1770	3540	1850	3690
107	1660	3320	1860	3710	1820	3630	1900	3790
108	1700	3400	1900	3800	1860	3720	1940	3880
109	1760	3510	1960	3920	1920	3840	2000	4000
110	1810	3610	2020	4030	1980	3950	2060	4120
111	1860	3710	2080	4150	2030	4060	2120	4230
112	1910	3810	2130	4260	2090	4170	2180	4350
113	1960	3910	2190	4370	2140	4280	2240	4470
114	2010	4020	2250	4580	2200	4390	2290	4580
115	2070	4140	2310	4620	2260	4520	2360	4720
116	2130	4250	2380	4750	2330	4650	2430	4850
117	2190	4370	2450	4890	2390	4780	2500	4990
118	2250	4490	2510	5020	2460	4910	2570	5130
119	2320	4630	2590	5170	2530	5060	2640	5280
120	2380	4760	2660	5320	2610	5210	2720	5440
121	2470	4930	2760	5510	2700	5400	2820	5626
122	2550	5100	2850	5700	2790	5580	2910	5820
123	2640	5270	2950	5890	2890	5770	3010	6020
124	2720	5440	3040	6080	2980	5960	3110	6210
125	2810	5610	3140	6270	3070	6140	3210	6410



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07 Size and Type of Tyres								
Application								
TABLE 4 (continued) MAX AXLE LOADS FOR “UNRESTRICTED” SPEED VEHICLES								
Tyre load Index	Trailers permitted to exceed 50mph (up to 60mph)				Motor vehicles permitted to exceed 60mph (up to 70mph)			
	Speed Symbol F (-15%)		Speed Symbol G (-5%)		Speed Symbol J (-7%)		Speed Symbol K (-3%)	
	Single Kg	Dual Kg	Single Kg	Dual Kg	Single Kg	Dual Kg	Single Kg	Dual Kg
126	2890	5780	3230	6460	3170	6330	3300	6600
127	2980	5950	3330	6650	3260	6510	3400	6790
128	3060	6120	3420	6840	3350	6700	3500	6990
129	3150	6290	3520	7030	3450	6890	3590	7180
130	3230	6460	3610	7220	3540	7070	3690	7380
131	3320	6630	3710	7410	3630	7260	3790	7570
132	3400	6800	3800	7600	3720	7440	3880	7760
133	3510	7010	3920	7830	3840	7670	4000	8000
134	3610	7210	4030	8060	3950	7890	4120	8230
135	3710	7420	4150	8290	4060	8110	4230	8460
136	3810	7620	4260	8520	4170	8340	4350	8700
137	3910	7820	4370	8740	4280	8560	4470	8930
138	4020	8030	4490	8970	4390	8780	4580	9160
139	4140	8270	4620	9240	4520	9040	4720	9430
140	4250	8500	4750	9500	4650	9300	4850	9700
141	4380	8760	4900	9790	4790	9580	5000	10000
142	4510	9010	5040	10070	4930	9860	5150	10290
143	4640	9270	5180	10360	5070	10140	5290	10580
144	4760	9520	5320	10640	5210	10420	5420	10870
145	4930	9860	5510	11020	5400	10790	5630	11260
146	5100	10200	5700	11400	5580	11160	5820	11640
147	5230	10460	5850	11690	5720	11440	5970	11940
148	5360	10710	5990	11970	5860	11720	6120	12230
149	5530	11050	6180	12350	6050	12090	6310	12610
150	5700	11390	6370	12730	6240	12470	6500	13000
151	5870	11730	6560	13110	6420	12840	6700	13390
152	6040	12070	6750	13490	6610	13210	6890	13780
153	6210	12140	6940	13870	6790	13580	7090	14170

**07 Size and Type of Tyres****Application****TABLE 4 (continued) MAX AXLE LOADS FOR “UNRESTRICTED” SPEED VEHICLES**

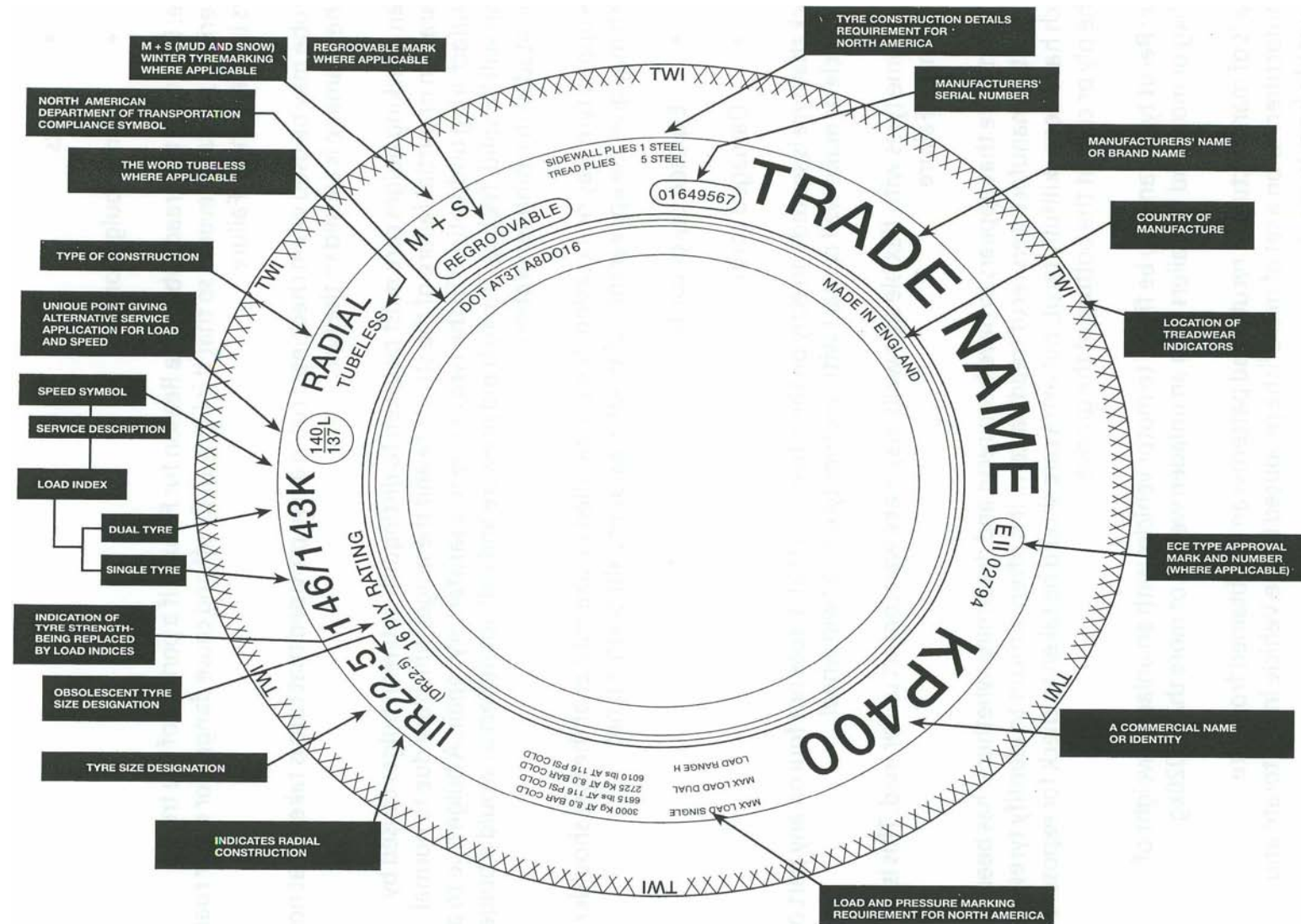
Tyre load Index	Trailers permitted to exceed 50mph (up to 60mph)				Motor vehicles permitted to exceed 60mph (up to 70mph)			
	Speed Symbol F (-15%)		Speed Symbol G (-5%)		Speed Symbol J (-7%)		Speed Symbol K (-3%)	
	Single Kg	Dual Kg	Single Kg	Dual Kg	Single Kg	Dual Kg	Single Kg	Dual Kg
154	6380	12750	7130	14250	6980	13950	7280	14550
155	6590	13180	7370	14730	7210	14420	7520	15040
156	6800	13600	7600	15200	7440	14880	7760	15520
157	7020	14030	7840	15680	7680	15350	8010	16010
158	7230	14450	8080	16150	7910	15810	8250	16490
159	7440	14880	8320	16630	8140	16280	8490	16980
160	7650	15300	8550	17100	8370	16740	8730	17460
161	7870	15730	8790	17580	8610	17210	8980	17950
162	8080	16150	9030	18050	8840	17670	9220	18430
163	8290	16580	9270	18530	9070	18140	9460	18920
164	8500	17000	9500	19000	9300	18600	9700	19400
165	8760	17510	9790	19570	9580	19160	10000	19990
166	9010	18020	10070	20140	9860	19720	10290	20570
167	9270	18530	70360	20710	10140	20280	10580	21150
168	9520	19040	10640	21280	10420	20840	10870	21730
169	9860	19720	11020	22040	10790	21580	11260	22510
170	10200	20400	11400	22800	11160	22320	11640	23280
171	10460	20910	11690	23370	11440	22880	11940	23870
172	10710	21420	11970	23940	11720	23440	12230	24450
173	11050	22100	12350	24700	12090	24180	12610	25220
174	11390	22780	12730	25460	12470	24930	13000	26000
175	11730	23460	13110	26220	12840	25670	13390	26780
176	12070	24140	13490	26980	13210	26420	13780	27550
177	12410	24820	13870	27740	13580	27160	14170	28330
178	12750	25500	14250	28500	13950	27900	14550	29100
179	13180	26350	14730	29450	14420	28830	15040	30070

Note: If axle loads for 'unrestricted' speed vehicles required - contact Driver and Vehicle Standards Agency, Ellipse, Padley Road, Swansea SA1 8AN.

## 07 Size and Type of Tyres

## Application

REPRODUCED BY COURTESY OF THE BRITISH RUBBER MANUFACTURERS ASSOCIATION



A tyre may not necessarily carry all of the markings.

07 Size and Type of Tyres	
Method of Inspection	Reason for Failure
<p>1. Check each tyre to ensure:</p> <ul style="list-style-type: none"> <li>a. check the nominal size, ply rating, load index or speed rating of any tyre is appropriate for the axle weight.</li> <li>b. check a tyre use marking is appropriate for the type of axle or vehicle to which it is fitted.</li> <li>c. check the nominal size of a tyre to any other on the same axle.</li> <li>d. check the structure of a tyre to any other on the same axle.</li> <li>e. check the structure on a steerable axle is of the same structure as any other tyre on any steerable axle.</li> <li>f. check the structure on a drive axle is of the same structure as any other tyre on any driven axle.</li> </ul> <p>2. Check on a two axle motor vehicle fitted with single tyres on both axles the combination of tyres with structures which are shown as acceptable in the table.</p>	<p>1. A tyre:</p> <ul style="list-style-type: none"> <li>a. of which the nominal size, ply rating, load index or speed rating of any tyre is below that appropriate for the axle weight.</li> <li>b. which has a tyre use marking inappropriate for the type of axle or vehicle to which it is fitted.</li> <li>c. of a different nominal size to another on the same axle.</li> <li>d. of a different structure to another on the same axle.</li> <li>e. on a steerable axle which is not of the same structure as any other tyre on any steerable axle.</li> <li>f. on a driven axle which is not of the same structure as any other tyre on any driven axle.</li> </ul> <p>2. On a two axle motor vehicle fitted with single tyres on both axles a combination of tyres with structures which are not shown as acceptable in the table.</p>

**08 Condition of Tyres****Application**

This examination applies to all tyres apart from spare tyres.

**Lifting of the tread rubber** is a Reason for Failure.

**If a portion of the tread material is partially severed** so that it is likely to fly off and cause danger for other road users it is a Reason for Failure.

**A probe may be used when checking a cut in a tyre** for exposed ply or cords provided that care is taken that no further damage is caused to the tyre. Exposed, for this purpose, means the cords are visible as seen with the naked eye (RfF1c) or in the case of a cut more than 25mm or 10% of the section width, can be made visible with the use of a probe (RfF 1a).

Where a cut in a tyre requires the use of a probe to check for cord exposure remember, if during investigation cords can be felt but not seen, **pass & advise**. A cut which is deep enough to expose the ply or cords, and is more than 25mm long, or 10% of the section width, whichever is greater should fail under RfF 1a (the overriding factor is that the cords themselves must be exposed not merely felt).

**When checking bulges care must be taken** to distinguish between bulges caused by separation or partial failure of the structure and the bulges which are due to normal manufacturing undulations in the tyre or due to a satisfactory repair. A bulge due to a repair will be solid, feeling firm to hand pressure and will not deflect as would a bulge associated with casing separation.

**A recapped tyre may on occasions have unbonded surplus** rubber at the tyre shoulder which may give the appearance of tread separation, although it is not.

**Some tyres with flexible side walls may show signs of wall contact** under load, this is not a Reason for Failure.

**When checking any tyre that appears to have been recut** to determine whether it has been recut to the manufacturers recut tread pattern. It is often difficult to identify tyres which have been skilfully recut, but extra care should be taken to check for exposure of the ply or cord at the bottom of the grooves.

Recut tyres can only be fitted to motor vehicles with an unladen weight of 2540kg or more and to trailers with an unladen weight of more than 1020kg.

**08 Condition of Tyres****Application**

Details of manufacturers' recut tread patterns can be obtained either from the DVSA internal Intranet or the Driver and Vehicle Standards Agency, Technical Services, Ellipse, Swansea, SA1 8AN.

Note: The original tread pattern means:

- On a re-treaded tyre the tread pattern immediately after the tyre was retreaded.
- On a recut tyre the manufacturer's recut tread pattern.
- On a partly recut tyre, the part which has been recut the manufacturer's recut tread pattern, on the other part the tread pattern when new.
- On any other tyre the tread pattern of the tyre when new.

When checking the tread pattern the "Breadth of Tread" is to be taken as that part of the tyre which can contact the road, under normal use, measured across the tyre.

The following should be disregarded when deciding which grooves need to be checked in regard to the "original tread pattern".

- Grooves which wear out before the main grooves are worn.
- Other minor features such as sipes, small lateral extensions to the circumferential grooves and minor lateral grooving on the shoulders.

**Minimum tread depths for passenger vehicles constructed or adapted to carry more than 8 seated passengers**

Minimum tread depth	1mm, excluding any tie bar or tread wear indicator
Position of minimum tread depth band	Form a continuous band covering at least any <b>3/4</b> of the breadth of the tread around the entire circumference

The following diagrams show acceptable positions of the minimum tread depth band, for the vehicles shown in the table above, which must be measured at right angles to the axis of the wheel. Figures 1-4 show cambered wear and Figure 5 shows more detail of how the tread band is measured.

Figure 6 shows that for certain cross country tyres that may be necessary to accept that the band of acceptable tread pattern may include a plain portion in the centre.

## 08 Condition of Tyres

### Application

Figures (1), (2), (3) and (4) T = Breadth of Tread  
 $\frac{3}{4} T$  = Minimum width of continuous band.

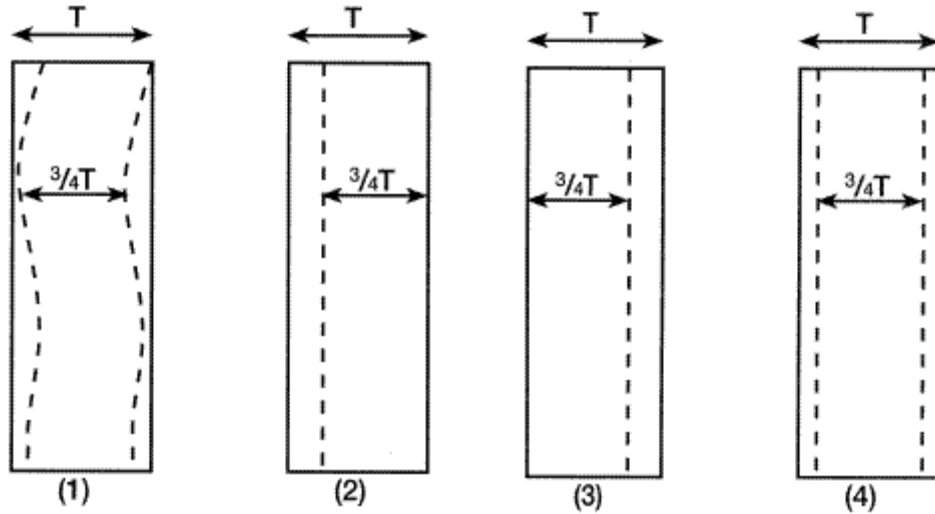
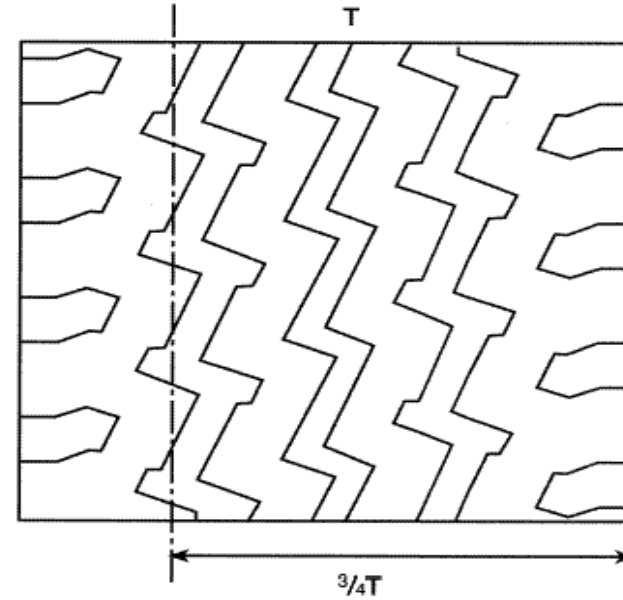


Fig 5



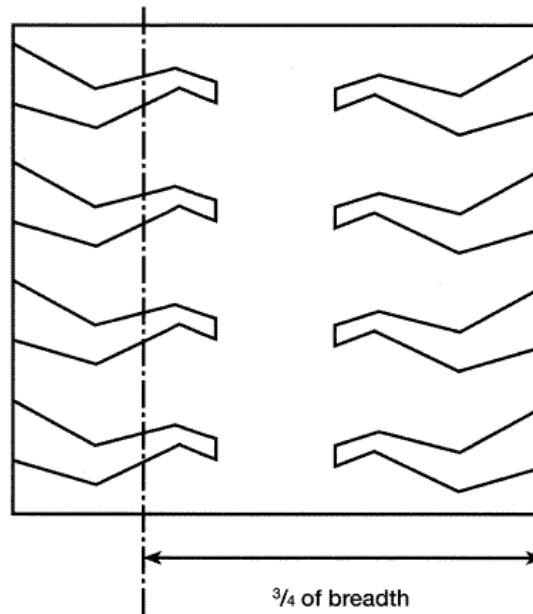
In this case the lateral grooves are the same depth as the circumferential groove and are included in the  $\frac{3}{4}$  measurement.

The breadth of the tread is 'T'.

The  $\frac{3}{4}$  of 'T' measurement can be taken over 'T' as in figure 1 to 4.

**08 Condition of Tyres**  
**Application**

Fig 6



This tyre only has lateral grooving

The band of acceptable tread pattern includes the plain portion which existed when the tyre wall was new. The remaining tread area should contain grooves to the depth of 1 mm.



08 Condition of Tyres	
Method of Inspection	Reason for Failure
<p>1. Check each tyre for:</p> <ul style="list-style-type: none"> <li>a. cuts.</li> <li>b. A lump, bulge or tear.</li> <li>c. exposed ply or cord.</li> <li>d. fouling on any part of the vehicle.</li> <li>e. correct seating on the wheel.</li> <li>f. wall contact with another tyre on a twin wheel.</li> <li>g. the base of any groove of the original tread pattern is clearly visible.</li> <li>h. the minimum tread depth and tread band requirement.</li> </ul> <p>2. A recut tyre:</p> <ul style="list-style-type: none"> <li>a. fitted to a vehicle which is legally acceptable.</li> <li>b. wholly or partly recut tread pattern is to the manufacturer's recut tread pattern.</li> </ul>	<p>1. A tyre:</p> <ul style="list-style-type: none"> <li>a. with a cut which is deep enough to reach the ply or cords, and is more than 25mm long, or 10% of the section width, whichever is greater.</li> <li>**b. with a lump, bulge or tear caused by separation or partial failure of its structure, including any lifting of the tread rubber.</li> <li>*c. with exposed ply or cord.</li> <li>d. fouling on any part of the vehicle.</li> <li>e. incorrectly seated on its wheel.</li> <li>f. on a twin wheel making wall contact with another tyre.</li> <li>g. where the base of any groove of the original tread pattern is not clearly visible.</li> <li>*h where the minimum tread depth and tread band requirements are not met.</li> </ul> <p>2. A recut tyre:</p> <ul style="list-style-type: none"> <li>a. fitted to a vehicle which should not have one.</li> <li>b. on which the wholly or partly recut tread pattern is not to the manufacturer's recut tread pattern.</li> </ul>

09 Bumper Bars	
Application	
<b>Bumper Bars</b> This inspection applies to all vehicles.  <b>Vehicles are not required to have separate bumper bars</b> , these may be incorporated with the body in some cases.	
Method of Inspection	Reason for Failure
1. Check bumper bars and brackets for: a. security.  b. jagged or projecting edges.	1. A bumper bar or bracket which is: a. insecure.  b. has a jagged or projecting edge likely to cause injury.

Public Service Vehicle Inspection Manual

10 Spare Wheel & Carrier	
Application	
This inspection applies to all vehicles fitted with a spare wheel or carrier.	
Method of Inspection	Reason for Failure
<ol style="list-style-type: none"><li>1. Check the spare wheel and carrier are secure, free from damage, and are correctly positioned.</li><li>2. Check the spare wheel is positioned and restrained correctly so that it is unlikely to cause damage to:<ol style="list-style-type: none"><li>a. electrical wiring.</li><li>b. other vehicle components.</li><li>c. passenger luggage, or is likely to injure occupants.</li></ol></li></ol>	<ol style="list-style-type: none"><li>1. A spare wheel or carrier so insecure, damaged or positioned so that either is likely to fall from the vehicle.</li><li>2. A spare wheel positioned or not sufficiently restrained that it is likely to cause damage to the:<ol style="list-style-type: none"><li>a. electrical wiring.</li><li>b. other vehicle components.</li><li>c. passenger luggage, or is likely to injure occupants.</li></ol></li></ol>

**11 Vehicle to Trailer Coupling****Application**

This examination applies to all articulated buses and to all buses fitted with a trailer coupling.

The inspection is limited to those parts which can be seen without dismantling or uncoupling. There is no requirement to lift trapdoors or remove floor sections for this inspection. Visible signs of abnormal movement adjacent to the turntable should be taken as evidence of excessive wear in an operating member.

Pleats of bellows should be spread using hand pressure for inspection.

There is no requirement to remove retaining fixings.

**Buses fitted with a trailer coupling**

If the vehicle has a coupled trailer it must not be uncoupled.

**Wear in a pin, hitch or hook should be regarded as excessive if** the thickness of the metal at any point is reduced to 3/4 of the original thickness.

Method of Inspection	Reason for Failure
<p><b>Articulated buses</b></p> <p>1. Check the coupling articulating bracket, operating member and safety device for:</p> <ul style="list-style-type: none"> <li>a. security.</li> <li>b. wear.</li> <li>c. integrity of load bearing members.</li> </ul>	<p><b>Articulated buses</b></p> <p>1. Coupling articulating bracket, operating member or safety device:</p> <ul style="list-style-type: none"> <li>a. insecure.</li> <li>b. excessively worn.</li> <li>*c. load bearing member cracked or fractured.</li> </ul>

Public Service Vehicle Inspection Manual

11 Vehicle to Trailer Coupling	
Method of Inspection	Reason for Failure
<p><b>Articulated buses (continued)</b></p> <p>2. Check Bellows for:</p> <ul style="list-style-type: none"> <li>a. security.</li> <li>b. Condition/integrity.</li> </ul> <p>3. Turntable floor:</p> <ul style="list-style-type: none"> <li>a. security.</li> <li>b. condition, so that it will not cause a slipping or tripping hazard.</li> </ul> <p><b>Buses fitted with a trailer coupling</b></p> <p>4. A drawing hitch, bar, hook, eye, ball or ball socket:</p> <ul style="list-style-type: none"> <li>a. wear.</li> <li>b. effectiveness and strength.</li> <li>c. condition.</li> <li>d. security.</li> <li>e. presence, condition, operation and a safety or locking device.</li> </ul>	<p><b>Articulated buses (continued)</b></p> <p>2. Bellows:</p> <ul style="list-style-type: none"> <li>a. insecure.</li> <li>b. so damaged or deteriorated that injury to passengers or other persons is likely.</li> </ul> <p>3. Turntable floor:</p> <ul style="list-style-type: none"> <li>a. insecure.</li> <li>b. covering in such a condition that it could cause slipping or tripping.</li> </ul> <p><b>Buses fitted with a trailer coupling</b></p> <p>4. A drawing hitch, bar, hook, eye, ball or ball socket:</p> <ul style="list-style-type: none"> <li>a. excessively worn.</li> <li>b. seriously deformed impairing its effectiveness and or weakens the component.</li> <li>*c. cracked or fractured.</li> <li>d. insecure.</li> <li>e. has a missing, damaged, inoperative and or inadequate safety or locking device.</li> </ul>

14 Wings and Wheel Arches	
Application	
<p>This inspection applies to all vehicles.</p> <p>Road wheels must have associated with them equipment or part of the body which, as far as practicable, catches mud or water thrown up by the wheels.</p> <p>If a mudflap is an extension to a wing or similar fitting, a missing or damaged mud flap <b>is not</b> a Reason for Failure.</p>	
Method of Inspection	Reason for Failure
<p><b>Wings and Wheel Arches.</b></p> <p>1. Check all Wings or Wheel Arches for:</p> <ul style="list-style-type: none"> <li>a. presence and security.</li> <li>b. corrosion or distortion.</li> <li>c. sharp edges likely to cause injury.</li> <li>d. rubbing on a tyre.</li> <li>e. covering the whole width of a tyre when the wheel is in the straight ahead position.</li> </ul>	<p><b>Wings and Wheel Arches.</b></p> <p>1. A Wing or Wheel Arch:</p> <ul style="list-style-type: none"> <li>a. missing or insecure.</li> <li>b. so badly corroded or distorted to stop it acting as an adequate shield.</li> <li>c. that has sharp edges that are likely to cause injury.</li> <li>d. which is rubbing on a tyre.</li> <li>e. which does not cover the whole width of a tyre when the wheel is in the straight ahead position.</li> </ul>

## 16 Passenger Doors, Drivers Doors and Emergency Exits

### Application

This inspection applies to all vehicles and includes:

- All drivers and passenger doors including “continental doors” (for use when coaches are driven on the right hand side of the road).
- all emergency exits including crew emergency exits where there is separate crew accommodation.

**On Bus Directive and ECE Regulation vehicles there may not be a primary emergency exit** if the vehicle has two service doors and on Bus Directive vehicles the primary emergency exit may be power operated. Floor hatches may be used as emergency exits on Bus Directive vehicles.

**For power operated emergency exits** only the driver’s control will close the exit.

**A driver’s door with one handle missing is acceptable provided** that the door can be opened by the remaining handle(s) from the inside and outside.

**Power operated doors should be operated 5 times** to check that they consistently open fully. If on one occasion the doors fail to open to their fullest extent they should be operated a further 5 times and if the doors fail to open fully on one further attempt this is a reason for failure. Ensure that sufficient air is available to allow this check to be carried out correctly.

Whilst carrying out the above, which should be done with the engine switched off, check, by observing the air gauges, that the continued operation of air operated doors does not deplete the braking system.

**In general safety systems for preventing a passenger from being trapped are required on:**

- All schedule 6 minibuses.
- Doors more than 500mm to the rear of the drivers seat on post 1 October 1990 vehicles (other than minibuses). These doors must re-open.
- On any power operated doors without a soft rubber edge large enough to prevent passengers from being trapped.

**For vehicles that require a door safety system** check the system operates by applying a resistance to the door edge in its operational cycle. Power operated doors will not stop or reopen if they are almost closed. Ensure when checking there is no risk of entrapment or injury to the examiner.

## 16 Passenger Doors, Drivers Doors and Emergency Exits

### Application

**Where sliding doors are fitted** the condition of runners, tracks and catches should be checked in both the “open” and “closed” positions.

**There is no requirement for the means of operation for a break glass window** to be shown on the outside of the bus.

**There is no requirement to mark the exterior of a continental door** where an alternative seating plan renders it inaccessible.

**Check that if an all over advert has been fitted over a break glass emergency exit**, that a gap exists between the advert and the window frame or bonding surface and that no mandatory markings are obscured or no longer contrast with background.

**Door or emergency exit “open” warning devices must be fitted to:**

- Schedule 6 minibuses which do not have two stage slam locks.
- Buses with more than 20 passenger seats which are certified for one person operation and used on local services. A warning device must be fitted to each emergency door and hinged emergency window which is outside the driver’s direct line of sight.
- Any external door or hinged exit (including any emergency exit) which is outside the driver’s direct line of sight on a vehicle certified on or after 1 January 1997. This does not apply to a door of a minibus if that door is fitted with a two stage lock.
- “Continental doors”.
- On any power operated door fitted more than 500mm behind the driver’s seat on a vehicle registered after 1 October 1990. This must be a visual device.
- On any emergency door or floor hatch on a Bus Directive or ECE regulation vehicle. This must be an audible device
- On any hinged emergency window which is not clearly visible to the driver on a Bus Directive or ECE regulation vehicle. This must be an audible device.
- On any emergency control for a power operated door fitted to a Bus Directive or ECE Regulation vehicle. This must be a visual and audible Device.



**16 Passenger Doors, Drivers Doors and Emergency Exits****Application**

**Door or emergency exit “open” warning devices must be fitted to** (continued):

- Service Doors on Bus Directive and ECE Regulation vehicles.
- Automatically operated service doors on Bus Directive and ECE regulation vehicles.

**The function of activating or deactivating may be done by either** operating the door control switches or by an independent switch.

**For power operated doors fitted with safety systems** to prevent passengers from being trapped. If the vehicle has double leaf type doors the dimension where the doors should stop and reopen should be taken for each door separately.

**Break glass hammers enclosed behind glass** do not require the glass shot blasted. The requirement is that the glass is easily broken, however, if the glass is shot blasted this area should be on the inside of the glass. RfF7a.

**Tethered break glass hammers are required to** clear the minimum size for an emergency exit. This size is 910mm x530mm for a secondary exit and 70cm x 50cm with a minimum area of 4,000sq cm for an additional exit. If this is not possible this is a RfF1b.

**The exact wording of exit markings may vary** but variations are acceptable as long as it is clear that it is an emergency exit and the means of operation are present.

**The minimum requirements for an emergency door, window or roof hatch are:**

1. Primary or Secondary exit:

- i) the emergency exit shall be clearly marked as such inside and outside the vehicle.
- ii) the means of operation of the doors and hinged windows fitted to the emergency exit shall be clearly indicated.

2. Additional emergency exit situated in either the front, rear face or the roof:

be clearly marked as an emergency exit –

- i) on the inside of the vehicle, and
- ii) in a case where the emergency exit can be opened from the outside, must be marked on the outside of the vehicle.
- iii) be clearly marked with its means of operation.

**16 Passenger Doors, Drivers Doors and Emergency Exits**

Method of Inspection	Reason for Failure
<p>1. Check doors and emergency exits:</p> <ul style="list-style-type: none"> <li>a. are complete and present.</li> <li>b. can be opened to its fullest extent.</li> <li>c. will remain securely closed and not open inadvertently.</li> <li>d. for any device to hold a door, or on a Bus Directive or ECE Regulation vehicle a door or top hinged emergency window open at its fullest extent is effective.</li> <li>e. hinges and pins for security, wear and fractures and door pillars for security.</li> <li>f. supplementary locking devices operation can be overridden by all of the associated interior door controls.</li> <li>g. release handle guard for security and presence where originally fitted to prevent accidental opening.</li> <li>h. "Open" warning device is present and operates on vehicles that require them (See application for details).</li> <li>i. break glass windows for correct glazing type.</li> </ul>	<p>1. A door or emergency exit:</p> <ul style="list-style-type: none"> <li>a. incomplete or missing.</li> <li>b. cannot be opened to its fullest extent. Jammed or secured so that it can not be opened.</li> <li>c. will not remain securely closed or is likely to open inadvertently.</li> <li>d. with a missing/defective device for holding a door, or on a Bus Directive or ECE vehicle a door or top hinged emergency window, open.</li> <li>e. with insecure, excessively worn or fractured hinges or pins or insecure door pillars which could adversely affect operation.</li> <li>f. with a supplementary locking device which can not be overridden.</li> <li>g. with a release handle guard insecure or missing.</li> <li>h. "Open" warning device missing or inoperative.</li> <li>i. a break glass window fitted with laminated glass or other unbreakable glazing.</li> </ul>

<b>16 Passenger Doors, Drivers Doors and Emergency Exits</b>	
<b>Method of Inspection</b>	<b>Reason for Failure</b>
<p>2. Check sliding doors:</p> <ul style="list-style-type: none"> <li>a. for security and attachments.</li> <li>b. for the effort taken to operate.</li> </ul> <p>3. Check a door or emergency exit opening or closing mechanism:</p> <ul style="list-style-type: none"> <li>a. for operation, wear and condition.</li> <li>b. control buttons are secure, operate correctly and travel.</li> </ul> <p>4. Check a door and emergency exit marking for:</p> <ul style="list-style-type: none"> <li>a. presence inside and outside the vehicle.</li> <li>b. method of operation displayed either on or adjacent to the exit.</li> </ul> <p>5. Check power operated doors and emergency exit:</p> <ul style="list-style-type: none"> <li>a. that repeated operation does not deplete the brake system below the level at which the circuit protection operates.</li> <li>b. emergency controls will open the door from both inside and outside the vehicle.</li> <li>c. soft edge for presence and condition.</li> <li>d. safety system that prevent a passenger from being trapped operates correctly.</li> </ul>	<p>2. A sliding door:</p> <ul style="list-style-type: none"> <li>a. insecure or likely to become detached from a runner.</li> <li>b. cannot be operated without undue effort.</li> </ul> <p>3. A door or emergency exit opening or closing mechanism:</p> <ul style="list-style-type: none"> <li>a. defective, excessively worn or damaged so that it is difficult to open or close the door or exit.</li> <li>b. control buttons loose, sticking or with excessive movement before operating.</li> </ul> <p>4. A door and emergency exit marking:</p> <ul style="list-style-type: none"> <li>a. missing.</li> <li>b. method of operation not shown. (Not applicable to schedule 6 apart from the emergency door.)</li> </ul> <p>5. Power operated doors and emergency exits:</p> <ul style="list-style-type: none"> <li>a. repeated operation of the doors depletes the braking system(s) pressure below the level at which the circuit protection valve should operate.</li> <li>b. cannot be opened from inside or outside the vehicle using the emergency controls.</li> <li>c. soft edge missing deteriorated or damaged so that injury could be caused to any person.</li> <li>d. safety system does not operate correctly.</li> </ul>

<b>16 Passenger Doors, Drivers Doors and Emergency Exits</b>	
<b>Method of Inspection</b>	<b>Reason for Failure</b>
6. Check a Plug door; operates in a smooth and controlled manner and is not likely to injure persons outside the vehicle.	6. Plug door; opens or closes suddenly or with excessive force and is likely to injure persons outside the vehicle.
7. Check Emergency Exits; tools or devices needed to open “break glass” or ejectable windows are present and secured in a readily accessible position which can be broken or opened by reasonable force.	7. Emergency Exits with an opening tool or device missing or not secured in a readily accessible place.
8. Check automatically operated service doors; to ensure that the driver can activate and deactivate the operation.	8. Driver cannot activate or deactivate the operation of an automatically operated service door.

Public Service Vehicle Inspection Manual

17 Drivers Accommodation	
Application	
<p>This inspection applies to all vehicles.</p> <p><b>If a step ring has been removed</b> to allow examination of a wheel in conjunction with IM 6, this shall not be a Reason for Failure.</p>	
Method of Inspection	Reason for Failure
<ol style="list-style-type: none"> <li>1. Check cab, floor including wheel arches for condition and security.</li> <li>2. Check steps and drivers grab handle for condition and security.</li> <li>3. Check drivers escape window for: <ol style="list-style-type: none"> <li>a. presence.</li> <li>b. operation.</li> </ol> </li> </ol>	<ol style="list-style-type: none"> <li>1. Cab floor in the drivers area or wheel arch so badly deteriorated it is likely to impair the drivers control of the vehicle or is likely to cause injury.</li> <li>2. Step, step ring or grab handle which is so insecure or in such a condition it is likely to cause injury.</li> <li>3. Drivers escape window: <ol style="list-style-type: none"> <li>a. not provided.</li> <li>b. cannot be opened.</li> </ol> </li> </ol>

18 Driver's Seat	
Application	
<p>This inspection applies to all vehicles and only relates to the <b>driver's seat</b>.</p> <p><b>When checking the driver's seat adjustment</b> it is not necessary to check that the seat can be secured in all possible positions.</p> <p><b>In the case of electrically adjusted seats</b>, it is not necessary to check any 'memory position' function.</p>	
Method of Inspection	Reason for Failure
<ol style="list-style-type: none"><li>1. Check the driver's seat for condition and security.</li><li>2. Check that the driver's seat position can be adjusted forwards and backwards and secured in the selected positions.</li></ol>	<ol style="list-style-type: none"><li>*1. A driver's seat so insecure or in such a condition that it could cause the driver to lose control of the vehicle.</li><li>2. The driver's seat fore and aft adjustment mechanism not functioning as intended.</li></ol>

## 19 Security of Body Application

This inspection applies to all vehicles.

The inspection covers:

- all fixings (e.g. brackets) securing the body to the chassis or to a sub-frame or supporting members.
- fastenings e.g. securing bolts, rivets or welds for the fixings.
- structural (stressed) panels.

**Defective fastenings do not necessarily mean that the body is insecure.** The whole structure must be assessed and a failure will only be justified where sufficient bolts, rivets and welds etc are loose or defective to allow the body to move enough to cause a hazard for other road users.

**Some designs of body mounting allow a limited amount of flexing** between the body and chassis. This must not be confused with insecurity.

**Coach bolt failure due to corrosion may not be obvious** as the failed section may be in a position where it cannot be seen. Care should be taken to check with this type of fixing that there is no sign of abnormal movement of the structure which would indicate coach bolt failure.

**Check the condition of the load bearing body members for** corrosion, cracks or damage which could seriously weaken their strength.

Method of Inspection	Reason for Failure
Check Body for: <ol style="list-style-type: none"> <li>1. security.</li> <li>2. fractures, distortion, wear and presence.</li> </ol>	Body: <ol style="list-style-type: none"> <li>1. insecure.</li> <li>2. load bearing member so cracked, corroded or damaged that the body is seriously weakened.</li> </ol>

**20 Exterior of Body including Luggage Compartments****Application**

This inspection applies to all vehicles.

Method of Inspection	Reason for Failure
<ol style="list-style-type: none"> <li>1. Check Body panels, frame members, fittings or components:               <ol style="list-style-type: none"> <li>a. security</li> <li>b. condition</li> </ol> </li> <li>2. Check Body underparts for security, condition and corrosion.</li> <li>3. Check Luggage compartment for condition.</li> <li>4. Check Luggage compartment access doors for:               <ol style="list-style-type: none"> <li>a. security.</li> <li>b. can be retained in the open and closed position.</li> <li>c. not obscuring a position lamp, direction indicator or retro reflector when secured in the open position.</li> </ol> </li> </ol>	<ol style="list-style-type: none"> <li>1. Body panels, frame members, fittings or components:               <ol style="list-style-type: none"> <li>a. insecure and/or likely to fall from the vehicle.</li> <li>b. with jagged edges likely to cause injury.</li> </ol> </li> <li>2. Body underparts so insecure, corroded or deteriorated that they are likely to endanger passengers, other road users or affect control of the vehicle.</li> <li>3. Luggage compartment structure defective allowing contents to protrude or fall onto a road, or in a condition to damage or soil luggage.</li> <li>4. Luggage compartment access doors:               <ol style="list-style-type: none"> <li>a. likely to become detached.</li> <li>b. which cannot be secured in open or closed position.</li> <li>c. which when secured in the open position obscures a position lamp, direction indicator or rear retro reflector.</li> </ol> </li> </ol>



**21 Interior of Body, Passenger Entrances, Exit Steps and Platforms****Application**

This inspection applies to all vehicles.

**Buses which have an accessibility certificate or a DDA special authorisation** will have wheelchair facilities and disabled access examined under IM 24.

**Manual retractable steps on Bus Directive and ECE Regulation vehicles must be fitted with an audible warning** to indicate that the steps have not been fully retracted into the travelling position. Power operated steps on these vehicles must have an interlock to prevent the vehicle being driven with the steps in the down position.

**Crew seats should be marked “for crew use only” or similar.** On Bus Directive and ECE Regulation vehicles the seat only needs to be identified for crew use and the wording is not specified.

**Removal of a parcel rack from a vehicle will not be a Reason for Failure unless** a communication control or grab rail is an integral part of the parcel rack, and there are not sufficient alternatives to these items.

**Failure of forced air ventilation will only be a Reason for Failure if** more than 50% of the system is ineffective. Alternatively if there are adequate side opening windows or roof vents, failure, or partial failure of the forced ventilation system will not be a Reason for Failure. The requirement for ventilation does not apply to Schedule 6 minibuses, or to the toilet compartment on any vehicle.

**Audible and visual devices to request the driver to stop** are not required on buses with less than 13 passenger seats or Schedule 6 minibuses. If a visual and an audible system are fitted only one needs to operate, so long as it operates throughout the vehicle.

**Bus Directive and ECE regulation vehicles which do not have provision for standing passengers** do not require a communication device. All Bus Directive and ECE regulation vehicles which carry standing passengers must have at least one illuminated sign which may be text or a pictogram to indicate to passengers that the bus is stopping.

**Some early vehicles were fitted with muted bells,** these vehicles should not be failed at annual test (Muted bells only work once until they are reset).

**If the first aid kit receptacle is in a sealed compartment or closed glove box;** the compartment or glove box should be clearly marked to indicate the position of the first aid kit. If the first aid kit is behind a glass panel the panel should not be removed for this inspection. If a break glass panel is fitted the shot blasted area should face inward to allow the glass to be easily broken. If it is facing outward this will be a Reason for Failure.

**21 Interior of Body, Passenger Entrances, Exit Steps and Platforms****Application**

**An empty first aid box** will be considered as missing.

**First aid kits are required for all large buses** (apart from those used on local services) and on Schedule 6 Minibuses. There is no requirement to inspect the contents of a first aid kit.

**If a large bus used on local services is presented for test with markings showing the presence of a first aid kit** but no kit is carried this is a reason for failure unless the sign is removed or covered.

**Fire extinguishers must contain water or foam and be marked** BS 5423 or EN3 and have a minimum fire rating of at least 8A or 21B.

**If the extinguisher is behind a glass panel the panel should not be removed** for this inspection. A glass panel with a shot blasted area is only readily breakable if the shot blasted surface faces inwards (i.e. towards the fire extinguisher). If a shot blasted area faces outwards this is a reason for failure. If the glass has been shot blasted in accordance with the above paragraph, then no other device for breaking the glass is required.

**Other acceptable means of gaining access to fire extinguishers or first aid kits covered by a glass panel**, that we are currently aware of, are:

- A ring pull which allows the easy removal of the glazing panel, or
- Toughened glass with a break glass hammer provided.

**There may be other acceptable methods** which have been approved by certifying officers.

**There is no requirement to check for safety markings on the glass covers** of a first aid and fire extinguisher.

**There are no requirements with regards to the height** at which the fire extinguisher is placed.

**Where a gauge is fitted to a fire extinguisher** the reading shown should not be used to determine the condition of the extinguisher.

## 21 Interior of Body, Passenger Entrances, Exit Steps and Platforms

### Application

**Examine all “other facilities”** If any “other facility” is clearly inoperative and is not causing any danger to passengers this is not a Reason for Failure. Those most likely to be seen are:

- Wheelchair lifts and ramps (if fitted to a bus with an accessibility certificate or a DDA special authorisation examine under Inspection Manual item 24).
- Wheelchair fixings and features (if fitted to a bus with an accessibility certificate or DDA special authorisation examine under Inspection Manual item 24).
- Combustion heaters.
- Cookers/refrigerators.
- Drinks dispensers.
- Televisions/video monitors.

**When inspecting separately fuelled appliances such as combustion heaters or cookers** any signs of scorching charring or melting will be a Reason for Failure.

**If a vehicle is presented with a different seating arrangement** to that on the technical print (either more seats or less). This is not a reason for refusal to test but may be a failure if the seating arrangements endanger passengers RfF 3b. Issue a VTP 57 and give the operator a VTP5, inform enforcement of the failure to comply with regulations.

<b>21 Interior of Body, Passenger Entrances, Exit Steps and Platforms</b>	
<b>Method of Inspection</b>	<b>Reason for Failure</b>
<p>1. Check Body Interior for:</p> <ul style="list-style-type: none"> <li>a. unobstructed access to any exit.</li> <li>b. the security and condition of steps and stairways, retractable steps, gangways, platforms or floor traps.</li> <li>c. condition of any floor and/or covering which is likely to endanger passengers.</li> <li>d. a floor trap locking device condition and effectiveness.</li> </ul> <p>2. Check Retractable Steps:</p> <ul style="list-style-type: none"> <li>a. retract and remain retracted.</li> <li>b. for operation.</li> <li>c. are not in the down/use position without the driver being aware.</li> <li>d. audible warning operation when a manually operated step is not fully retracted on Bus Directive and ECE regulation vehicle.</li> <li>e. For an effective safety device to prevent the power operated steps from operating with the vehicle in motion on Bus Directive and ECE regulation vehicles. (This does not require movement of the vehicle but inspection of anything obvious which may allow this.)</li> <li>f. are secure.</li> <li>g. non-slip material condition.</li> </ul>	<p>1. Body Interior:</p> <ul style="list-style-type: none"> <li>a. access to any exit obstructed.</li> <li>b. steps and stairways, retractable steps, gangways, platforms or floor traps so insecure or in such a condition that they are likely to collapse in normal use.</li> <li>c. condition of any floor and/or covering which is likely to endanger passengers.</li> <li>d. a floor trap locking device worn or ineffective so that the trap may become displaced.</li> </ul> <p>2. Retractable Steps with:</p> <ul style="list-style-type: none"> <li>a. a step which will not retract or remain retracted.</li> <li>b. a step which will not operate or operates incorrectly.</li> <li>c. driver able to move vehicle without being aware that the step is in the down position, e.g. direct sight or mirror or warning device or interlock.</li> <li>d. driver able to move vehicle without being given an audible warning when a manually operated step is not fully retracted on Bus Directive and ECE regulation vehicles.</li> <li>e. driver able to move vehicle when a power operated step is in the down position on Bus Directive and ECE regulation vehicles, without an effective safety device to prevent the power operated steps from operating with the vehicle in motion on Bus Directive and ECE regulation vehicles.</li> <li>f. a step insecure.</li> <li>g. non-slip material defective.</li> </ul>

**21 Interior of Body, Passenger Entrances, Exit Steps and Platforms**

Method of Inspection	Reason for Failure
<p>3. Check Seats for:</p> <ul style="list-style-type: none"> <li>a. security and condition.</li> <li>b. position.</li> <li>c. cleanliness.</li> </ul> <p>4. Check Crew seats:</p> <ul style="list-style-type: none"> <li>a. if a crew seat encroaches into the gangway, it folds automatically when not in use.</li> <li>b. have an obligatory notice saying “<b>for crew use only</b>” or <b>similar</b> on or adjacent to the seat or identified as for crew use on a Bus Directive and ECE regulation vehicle.</li> </ul> <p>5. Check grab rails, straps, stanchions, guard rails and barriers for presence, security and condition.</p> <p>6. Check parcel racks for security and condition.</p> <p>7. Check ventilation:</p> <ul style="list-style-type: none"> <li>a. forced ventilation equipment is effective. (not Schedule 6 minibuses)</li> <li>b. security.</li> <li>c. condition.</li> </ul>	<p>3. A Seat:</p> <ul style="list-style-type: none"> <li>a. insecure, damaged or weakened so that the damaged seat structure or covering could endanger passengers or damage their clothing.</li> <li>b. layout which has been changed without approval and which could endanger passengers.</li> <li>c. with covering(s) in such a condition that they are likely to soil passengers clothing.</li> </ul> <p>4. Crew Seats:</p> <ul style="list-style-type: none"> <li>a. which encroach into gangways and do not automatically retract when not in use.</li> <li>b. without a legible notice saying “<b>for crew use only</b>” or <b>similar</b> on or adjacent to the seat or not identified as for crew use on a Bus Directive and ECE regulation vehicle.</li> </ul> <p>5. Grab rails, straps, stanchions, guard rails and barriers: Missing, insecure or likely to endanger passengers.</p> <p>6. Parcel racks constructed in such a manner that allows articles to fall onto the driver or passengers.</p> <p>7. Ventilation:</p> <ul style="list-style-type: none"> <li>a. forced ventilation equipment ineffective. (not Schedule 6 minibuses.)</li> <li>b. any ventilator, opening windows or roof hatches insecure.</li> <li>c. more than 50% of the ventilator system (i.e. opening windows, ventilators and roof hatches) inoperative where forced air ventilation is not available.</li> </ul>

**21 Interior of Body, Passenger Entrances, Exit Steps and Platforms**

Method of Inspection	Reason for Failure
<p>8. Check engine interior covers for presence and condition.</p> <p>9. Check interior lights for illumination of saloon interior, steps, platform, staircase and other facilities (interior lights only apply to steps for Schedule 6 minibuses).</p> <p>10. Check passenger communication with driver:</p> <ul style="list-style-type: none"> <li>a. present and operates.</li> <li>b. gives a visual indication to passengers that the bus is stopping on Bus Directive and ECE regulation vehicles which carry standing passengers.</li> </ul> <p>11. Check interior surfaces for:</p> <ul style="list-style-type: none"> <li>a. security and condition.</li> <li>b. cleanliness.</li> </ul> <p>12. Check first aid kit for:</p> <ul style="list-style-type: none"> <li>a. presence, accessibility and condition.</li> <li>b. receptacle marked.</li> </ul> <p>13. Check fire extinguisher for; presence, accessibility, suitably charged, of the correct type and its condition.</p> <p>14. Check any "other facility" (including those listed in 15-19 below) which is complete, secure and functions correctly.</p>	<p>8. Engine interior covers; missing, contaminated to a degree which constitutes a fire risk, or which allow fumes to penetrate passenger saloon.</p> <p>9. Interior lights; inadequate illumination of saloon interior, steps, platform, staircase and other facilities (interior lights only apply to steps for Schedule 6 minibuses).</p> <p>10. Passenger Communication with driver:</p> <ul style="list-style-type: none"> <li>a. missing or inoperative.</li> <li>b. does not give a visual indication to passengers that the bus is stopping on Bus Directive and ECE regulation vehicles which carry standing passengers.</li> </ul> <p>11. Interior surfaces:</p> <ul style="list-style-type: none"> <li>a. insecure or damaged so that it is likely to cause injury to passengers.</li> <li>b. contaminated so that they are likely to soil passengers clothing.</li> </ul> <p>12. First aid kit:</p> <ul style="list-style-type: none"> <li>a. missing, inaccessible or in poor or contaminated condition.</li> <li>b. receptacle not marked.</li> </ul> <p>13. Fire extinguisher; missing, inaccessible, discharged, incorrect type or in an obviously poor condition.</p> <p>14. Any "other facility" (including those listed in 15-19 below) which is; incomplete, insecure and/or incorrect function and is likely to endanger passengers.</p>

**21 Interior of Body, Passenger Entrances, Exit Steps and Platforms**

Method of Inspection	Reason for Failure
<p>15. Check wheelchair lifts/ramps:</p> <ul style="list-style-type: none"> <li>a. lift and/or ramp.</li> <li>b. for sharp edges or other protrusions.</li> <li>c. operation.</li> <li>d. non-slip surface.</li> <li>e. can be secured in stored position.</li> </ul> <p>16. Check wheelchair spaces:</p> <ul style="list-style-type: none"> <li>a. for security of wheelchair floor fittings and that they do not cause a passengers to trip.</li> <li>b. padded backrest for presence, security and condition.</li> <li>c. any stanchion, retractable rail/movable device, partition or panel relating to the wheelchair area is present, secure and its condition.</li> </ul> <p>17. Check combustion heater fuel filler.</p> <p>18. Check cookers/refrigerators/drinks dispenser for condition.</p> <p>19. Check television/video for passenger entertainment that the screen is placed where driver can not view whilst driving (Information monitors for driver information are not to be considered as RfF).</p>	<p>15. Wheelchair lifts/ramps:</p> <ul style="list-style-type: none"> <li>a. the strength of the lift or ramp is significantly impaired.</li> <li>b. there are sharp edges or other protrusions on a lift or ramp which are likely to cause injury.</li> <li>c. defective in operation to the extent that it is likely to injure passengers, pedestrians or other road users.</li> <li>d. non-slip surface on ramp defective.</li> <li>e. a lift or ramp which cannot be secured in stored position.</li> </ul> <p>16. Wheelchair spaces:</p> <ul style="list-style-type: none"> <li>a. any wheelchair floor fitting loose or likely to cause passengers to trip.</li> <li>b. any padded backrest missing (when known to be an original fitting), insecure or in a condition which is likely to cause injury to passengers.</li> <li>c. any stanchion, retractable rail/movable device, partition or panel relating to the wheelchair area missing, insecure or in a condition which is likely to cause injury to passengers.</li> </ul> <p>17. Combustion Heater with fuel filler inside vehicle.</p> <p>18. Cookers/refrigerators/drinks dispenser in such a condition that they are likely to endanger passengers.</p> <p>19. Television/Video for passenger entertainment with the screen placed where driver can view whilst driving.</p>

**22 Mirrors and Indirect Vision Devices****Application**

This inspection applies to all vehicles and the number and type of mirrors and or indirect vision devices (excluding periscopes) which have to be fitted are shown below.

DATE OF FIRST USE	REQUIREMENTS
Before 1 April 1983	An exterior mirror on the offside and either an interior mirror (unless this would not give a view to the rear) or an exterior mirror on the nearside.
From 1 April 1983	A main exterior mirror on both the offside and the nearside.

"Indirect vision device " means a device to observe the traffic area adjacent to the vehicle which cannot be observed by direct vision. This can be a conventional mirror(s), camera-monitor(s) or other device(s) (but not a periscope) able to present information about the indirect field of vision to the driver.

"Interior mirror" means a device as defined in the above paragraph, which can be fitted in the passenger compartment of a vehicle.

Internal mirrors must be checked to see that the edges are surrounded by protective material. This does not apply to a vehicle registered before April 1 1969.

A cracked mirror is not a RfF unless the vision is obscured or it is in such a condition that the glass is likely to fall out.

"Exterior mirror" means a device as defined in the above paragraph, which can be mounted on the external surface of a vehicle.

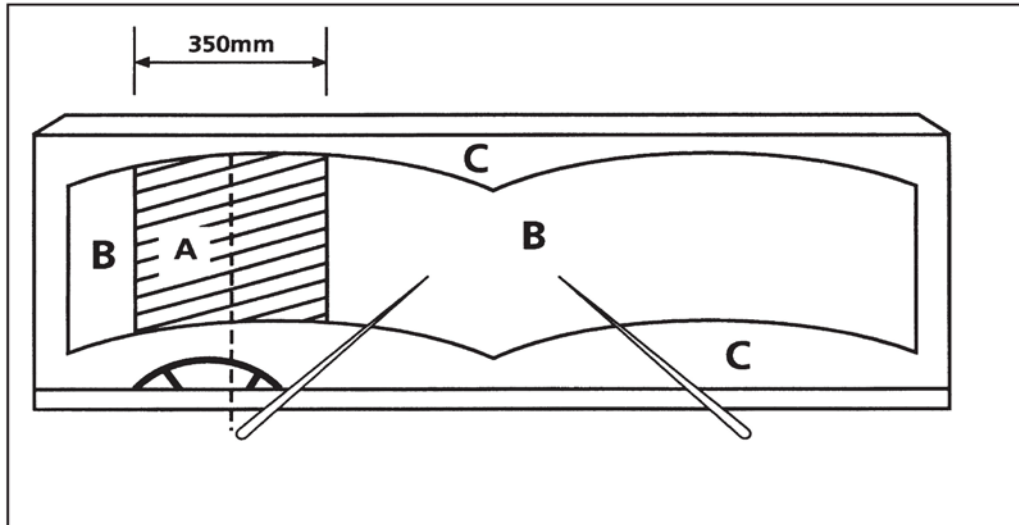
Method of Inspection	Reason for Failure
1. Check that the correct number and type(s) of mirror, or other indirect vision device are fitted.	1. Not fitted with the correct number or type(s) of mirror, or other indirect vision device.
2. Check that a required mirror/indirect vision device is in such a condition that anyone sitting in the driving seat can see clearly towards the rear or nearside.	2. A required mirror/ indirect vision device in such a condition that anyone sitting in the driving seat cannot see clearly towards the rear or nearside.
3. Check mirrors/indirect vision device, and their mounting brackets for security and condition.	3. A mirror/indirect vision device or its mounting bracket insecure or structurally deteriorated.
4. Check the internal mirror edge is surrounded by protective material.	4. An internal mirror edge not surrounded by protective material or with damaged protective material.
5. Check mirrors/indirect vision devices and periscopes for security and condition.	5. A mirror/indirect vision device or periscope insecure and in such a condition that it is likely to injure the driver or passengers.



**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 WINSCEEN	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

23 Glass and View of the Road	
Method of Inspection	Reason for Failure
<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>

**24 Accessibility Features****Application**

This inspection applies to all vehicles, which have been issued with an Accessibility Certificate or a (DDA) Special Authorisation. As an alternative to Schedules 1, 2 or 3 some vehicles with accessibility certificates will be Bus Directive vehicles and will include compliance with Annex VII and the route and destination requirements of Schedule 2 or 3. These will have been issued with a Notification Form PSV501. This will have been noted on the technical record for the vehicle.

**Restraints**

Wheelchair and wheelchair user restraints may form part of a combined restraint system.

**Padded backrests**

On Annex VII vehicles the backrest need not be padded and, as an alternative to a backrest, a device which acts as a support for the wheels of the wheelchair may be provided.

**Ramp operations**

For operation, the ramp or lift can be deployed or lowered to the surface on which the vehicle is sitting. On an Annex VII vehicle a ramp need not lower to the surface on which the vehicle is sitting but must lower to within 150mm above that surface.

**Bands of contrasting colour**

On an annex VII vehicle this is only required on a powered ramp and it may be red and white striped or a single band of contrasting colour.

**Stowage systems**

Any means to retain the device in the stowed position can easily be released and if the means requires any form of power, the device can be easily released in the event of a power failure, if necessary with the use of a tool carried on the vehicle.

**Portable ramps**

Any portable ramp with a positive means to prevent the ramp being easily detached from the vehicle when driven (e.g. locating pins) must comply with the requirement that a vehicle can not be driven normally unless the lift or ramp is at its normal position for vehicle travel. Portable ramps without this positive means to prevent easy detachment do not have to meet this requirement.

**24 Accessibility Features****Application****Power operated lifts and ramps**

- When checking for correct operation, this includes all internal and external controls relating to the operation or stopping of the lift or ramp. Where controls are available adjacent to the lift or ramp check that controls that initiate operation can be isolated by a control in the driver's cab.
- If there is more than one lift or ramp only one need to operate manually.
- In the case of a lift, once stopped it must be capable of being reversed. Safety devices are not required for a ramp if the force of the ramp is unlikely to cause injury or a lift if the operating control is adjacent to the lift.

**Entrance and exits**

Where fitted with a power operated lift or ramp that is not within the driver's direct field of vision, and where the operating control is not adjacent to the lift or ramp. The driver when seated in the driver's seat must have a clear unobstructed view of the inside and outside of the door area in which the lift or ramp operates either through mirrors or another optical device such as CCTV or optical cable.

**Signs and markings**

For each wheelchair space there must be a sign or instruction indicating the direction a wheelchair and user should face during travel. In the case of an Annex VII vehicle a sign need not indicate the direction that a wheelchair should face. There must be safety instructions explaining the use of the wheelchair space including any wheelchair restraint system and wheelchair occupant restraint system. This does not apply to Annex VII vehicles.

**Lighting**

The operation of accessibility lighting may be operated by the general interior lighting control(s), separate control(s) or automatically by opening the doors.

**Steps**

In the case of a step which projects beyond the body of the vehicle and is likely to injure pedestrians, check that the step can fold or retract and the vehicle is not capable of being driven normally unless the step is folded or retracted. In the case of Annex VII vehicles this last requirement is only for vehicles fitted with power operated steps.

In the case of a power operated step, the step must be incapable of being operated with the vehicle in motion and any malfunction of any safety device, which stops the motion of the step to prevent injury is a Reason for Failure. Safety devices are not required if the force of the step is unlikely to cause injury.

**If there is reason to believe a vehicle has had accessibility features changed or removed** since being approved, please report it centrally using the VTP57 system.



**24 Accessibility Features**

Method of Inspection	Reason for Failure
<p><b>A: Vehicles which comply with Schedule 1 (Wheelchair Accessibility) of The PSV Accessibility Regulations 2000 or with Annex VII</b></p> <p>1. For each wheelchair space designed for a forward facing wheelchair check:</p> <ul style="list-style-type: none"> <li>a. wheelchair restraints for presence, condition, security and function including ease of release.</li> <li>b. wheelchair user restraint for presence, security, condition and function including ease of release (not required on Annex VII vehicles if the passenger seats in the vehicle are not required to be fitted with any form of occupant restraint).</li> </ul> <p>2. Check each wheelchair space designed for a rearward facing wheelchair for:</p> <ul style="list-style-type: none"> <li>a. presence, security and condition of a padded backrest.</li> <li>b. presence, security, function and condition of any stanchion, fixed rail retractable rail/movable device, partition or panel relating to the wheelchair area.</li> </ul> <p>3. Check boarding lifts and boarding ramps for:</p> <ul style="list-style-type: none"> <li>a. presence, security and condition (<b>Security should be excluded when considering portable ramps</b>).</li> <li>b. functionality and operation.</li> <li>c. sharp edges or other protrusions.</li> <li>d. a band of contrasting colour around the abutting edges of the ramp surface.</li> </ul>	<p>1. Wheelchair spaces:</p> <ul style="list-style-type: none"> <li>a. any wheelchair restraint components missing, badly deteriorated, insecure or defective.</li> <li>b. any wheelchair user restraint components missing, badly deteriorated, insecure or defective.</li> </ul> <p>2. For each wheelchair space designed for a rearward facing wheelchair:</p> <ul style="list-style-type: none"> <li>a. any padded backrest missing, insecure or in a condition which is likely to cause injury to passengers (see note).</li> <li>b. any stanchion, fixed rail, retractable rail/movable device, partition or panel relating to the wheelchair area missing, insecure or in a condition which is likely to cause injury to passengers.</li> </ul> <p>3. Boarding lifts and boarding ramps:</p> <ul style="list-style-type: none"> <li>a. a lift or ramp missing, insecure or the strength of the lift or ramp is significantly impaired.</li> <li>b. a lift or ramp which does not function as intended or does not operate through the required range of movement.</li> <li>c. there are sharp edges or other protrusions on a lift or ramp which are likely to cause injury.</li> <li>d. the band of contrasting colour on a lift or ramp surface edge is missing or has deteriorated to the extent that it is visually ineffective.</li> </ul>

24 Accessibility Features	
Method of Inspection	Reason for Failure
<p>3. Check boarding lifts and boarding ramps for (continued):</p> <p>e. the surface having an effective device for preventing wheelchairs from rolling off and any device is effective.</p> <p>f. operation and safety of the stowage system.</p> <p>g. an effective safety device to prevent the vehicle from being driven when the device is not correctly stowed (see note).</p> <p>4. Check power operated lift or ramp for (additional requirements):</p> <p>a. correct operation so that it is unlikely to injure passengers, pedestrians or other road users (see note).</p> <p>b. operation of an audible warning device.</p> <p>c. operation of a yellow warning light on an Annex VII vehicle fitted with a powered ramp.</p> <p>d. operation manually in the event of a power failure. Not applicable if a portable ramp is carried.</p> <p>e. an effective safety device to prevent the lift or ramp operating whilst the vehicle is in motion. (This is a visual inspection and does not require movement of the vehicle.)</p> <p>f. operation of the safety device to stop extension or retraction of a ramp or lift.</p>	<p>3. Boarding lifts and boarding ramps (continued):</p> <p>e. a lift surface does not have an effective device for preventing wheelchairs from rolling off or the device is ineffective.</p> <p>f. cannot be safely stowed or failure or malfunction of any stowage retaining device including failure to release without power supplied where appropriate.</p> <p>g. the safety device intended to prevent the vehicle being driven normally when the lift or ramp is not in its intended position for vehicle travel, is ineffective.</p> <p>4. A power operated lift or ramp (additional requirements):</p> <p>a. defective in operation to the extent that it is likely to injure passengers, pedestrians or other road users.</p> <p>b. with an audible device missing or inoperative (except an Annex VII vehicle with a powered lift).</p> <p>c. on an Annex VII vehicle with a powered ramp the yellow warning lights are missing or defective.</p> <p>d. incapable of being operated manually and the vehicle does not have a portable ramp.</p> <p>e. without an effective safety device to prevent the lift or ramp from operating with the vehicle in motion.</p> <p>f. safety device to stop the extension or retraction of a ramp or lift on meeting an obstruction inoperative and is likely to cause injury.</p>

# Public Service Vehicle Inspection Manual

24 Accessibility Features	
Method of Inspection	Reason for Failure
5. Check Portable Ramp (additional requirements) for a suitable position for storage.	5. Portable Ramp (additional requirements) with no suitable storage stowage position and likely to cause injury to any passenger or crew.
6. Check entrance and exit optical devices to allow driver to view wheelchair entrances and exits for:  a. presence, security, condition and operation.  b. effectiveness.	6. Entrance and exit optical device to allow driver to view wheelchair entrances and exits:  a. missing, insecure or defective.  b. ineffective.
7. Check signs, markings and instructions for presence and legibility.	7. A required sign/markings or safety instruction missing or illegible.
8. Check communication devices: a. for any wheelchair space is present and operates. (This may be Visual or audible.)  b. every entrance for a wheelchair user outside the direct view of the driver must have an external communication device check for presence and operation.	8. Communication devices: a. any internal wheelchair space communication device missing or inoperative.  b. any external communication device missing or inoperative.
9. Check lighting specifically intended for wheelchair users to board or alight in safety for presence and operation.	9. Lighting specifically intended for wheelchair users to board or alight in safety: missing, inoperative or deteriorated to the extent that the illumination is significantly reduced (See note).

24 Accessibility Features	
Method of Inspection	Reason for Failure
<p><b>B: Vehicles, which comply with Schedules 2 or 3 (General Accessibility) of The PSV Accessibility Regulations 2000 and Annex VII vehicles</b></p> <p>10. Check floors and gangways for an effective slip resistant surface.</p> <p>11. Check steps for:</p> <ul style="list-style-type: none"> <li>a. an effective slip resistant surface.</li> <li>b. presence, condition and visibility of a band of contrasting colour on the front edge of each step. Bus Directive and ECE Regulation vehicles will have had this checked under IM 21.</li> <li>c. operation of an interlock.</li> </ul> <p>12. Check kneeling suspension for:</p> <ul style="list-style-type: none"> <li>a. any operating controls are adequately marked.</li> <li>b. controls which are capable of stopping and reversing the lowering process.</li> <li>c. has an effective interlock to prevent the vehicle from being driven at speeds in excess of 5km/h with the vehicle lower than normal height.</li> </ul>	<p>10. Floors and gangways slip resistant material deteriorated to the extent that it is no longer effective.</p> <p>11. Steps with:</p> <ul style="list-style-type: none"> <li>a. slip resistant material deteriorated to the extent that it is no longer effective.</li> <li>b. band of contrasting colour is missing or deteriorated to the extent that it is no longer visually effective.</li> <li>c. any interlock and / or safety device applicable to folding, extendable and/ or power steps is inoperative.</li> </ul> <p>12. Kneeling suspension which:</p> <ul style="list-style-type: none"> <li>a. has an operating control, which is inadequately marked.</li> <li>b. has controls which are incapable of stopping and reversing the lowering process.</li> <li>c. does not have an effective interlock to prevent the vehicle from being driven at speeds in excess of 5km/h with the vehicle lower than normal height.</li> </ul>

**25 Windscreen Wipers and Washers****Application**

This inspection applies to all vehicles except those with an opening windscreen or where an adequate view can be obtained by some other means.

**PSVs used for “local service”** operation do not require windscreen washers.

**Wipers must be able to clear an adequate area** of the screen to give the driver a view of the road to the front and in front of both sides of the vehicle.

**Washers must provide enough water** to enable the wipers to clear the screen effectively.

**Frozen washers** are to be considered ineffective.

**There is no requirement** to check that wipers self park.

Method of Inspection	Reason for Failure
<ol style="list-style-type: none"> <li>1. Check that a switch(es) are fitted and operational.</li> <li>2. Check Wipers:               <ol style="list-style-type: none"> <li>a. cover an adequate area.</li> <li>b. work continually when switched on.</li> <li>c. blade(s) are fitted, secure and in an effective condition to clear the screen.</li> </ol> </li> <li>3. Check Windscreen Washers are effective.</li> </ol>	<ol style="list-style-type: none"> <li>1. Switch(es) controlling windscreen wipers and or washers missing or defective.</li> <li>2. Wipers:               <ol style="list-style-type: none"> <li>a. do not move over an adequate area.</li> <li>b. do not work continually when switched on.</li> <li>c. a blade missing, insecure or so deteriorated that it cannot clear the screen effectively.</li> </ol> </li> <li>3. Windscreen Washers ineffective.</li> </ol>

**26 Speedometer/Tachograph****Application**

This inspection applies to all vehicles.

A vehicle must have a tachograph fitted unless the presenter claims that it is exempt from the tachograph regulations. Exempt vehicles may have either a tachograph or a speedometer fitted.

**The check of tachograph seals** is by visual assessment only.

**All vehicles**

**A tachograph exemption form** must be completed for all vehicles deemed as tachograph exempt, unless the vehicle technical record shows the vehicle is exempt or it is declared on the application form.

**If the glass dial is cracked** and this does not affect operation this is not a Reason for Failure but the presenter should be advised of the defect.

**For vehicles fitted with a tachograph**

**If the tachograph head cannot be opened** or if the calibration plaque does not match the vehicle to which it is fitted it should be treated as if the plaque and any relevant seals were not there.

If the vehicle identification on the calibration plaque does not correspond to the vehicle it is fitted to, the vehicle should be failed under RfF 2a. Should the identification refer to the registration mark, the technical record must be checked to ensure it was not a previous registration for the same vehicle. If no vehicle identification is displayed this is not a RfF, there is no requirement to display the registration mark on the calibration plaque.

**For vehicles required to be fitted with a tachograph**

**If the time clock is inoperative** this is a reason for failure under 1b (for the tachograph only not the speedometer).

**Tachograph heads must** only be opened with the steering wheel in the straight ahead position and with the engine switched off.

**Installation/calibration plaques** expire after 6 years for analogue, 2 years for digital.

**It is acceptable for the plaque to contain additional information** (e.g. Registration Number, tyre pressures etc.). The plaque is designed to be tamper proof and should show signs of damage if it has been tampered with. The 2 year check is not part of this inspection for analogue tachographs only. However if the examiner notices this plaque is not displayed the presenter must be advised.

**26 Speedometer/Tachograph****Application****Analogue tachographs**

The electronic check of the indicated 'K' factor is conducted under IM33 but if it differs from the prescribed factor by more than + or – 50 it may be a reason for failure under this section, unless it complies with a further check contained in IM 33.

Check tachograph DIL switch covers and all seals. It will be sufficient to check that they have an approved marking. It is not necessary to identify the sealer.

**Digital tachographs**

Do not use the Stoneridge speed limiter test gear on vehicles fitted with digital tachographs.

**For vehicles not required to be fitted with a tachograph where a tachograph is used as a speedometer**

If a tachograph is used in place of a speedometer (even if the vehicle is tachograph exempt) it is only required to be marked in kilometres per hour, although it may be dual marked in miles per hour also.

Only where the tachograph is marked in KPH alone, will you be required to check the installation/calibration plaque for presence and condition, and the date of calibration is clearly visible.

There is no requirement for a re-calibration of these systems after 6 years provided that the system has been initially calibrated and sealed, and that the calibration plaque and necessary seals remain intact.

Check DIL switch covers and seals for presence and condition and that they are the correct type. It will be sufficient to check that they have an approved marking. It is not necessary to identify the sealer.

**If a speed limiter is NOT required, or the speed limiter does not** receive the speed signal from the tachograph head, it is only necessary to check the seals inside the tachograph head. There is no requirement for the gearbox sender unit to be sealed. The vehicle technical record will show if a vehicle is speed limiter exempt.

**Vehicles fitted with Modular Tachographs**

There are presently two types of modular tachograph using encrypted sender units. They are VDO Keinzl 1324 and Stoneridge Electronics (formerly TVI) and are easily identified as they are shaped like a car radio.

**Vehicles fitted with Modular Tachograph systems** have received type approval that permits the use of a 4 wire data transmission cable instead of an armoured cable provided it is used to connect an encrypted sender unit to the tachograph. When used in this arrangement the approval also does not require the cable end connections to be sealed. However, the sender unit itself is still required to be sealed to the gearbox.

**26 Speedometer/Tachograph****Application**

**Where a print out from a digital tachograph cannot be obtained initially** (because of a jammed or depleted roll) the presenter should be given the opportunity to rectify this before leaving the test station and the use of PRS would not be appropriate if the defect is rectified.

**Identification of Encrypted Sender Units**

These appear similar to other sender units and can be positively identified by the cream/beige colour of the sender unit 4 pin bayonet connector. This colour is the same whether the sender unit is the rotating type or a proximity type. It should be noted that when the cable is connected that only a small part of the cream/beige coloured connector is visible.

**For the VDO Keinzle 1324 that there is an exception to the above colour code when the vehicle is fitted with a TELMA retarder, the socket housing will be red.**

The electronic check of the K Factor will be carried out as part of the procedure for IM 33 but any failure where the electronically indicated figure differs from prescribed 'K' factor by more than + or - 50 may be a Reason for Failure under 3.g, unless it complies with a further check contained in IM 33.

**If a vehicle is fitted with more than one tachograph** and a speed limiter, the speed limiter should operate off all tachographs.



**Plastic sleeve seals are acceptable but** will require an embossed identification, (see example to left).

**Tachograph plaques are required to be tamperproof**, this is not a reason for Failure at annual test if they are not tamperproof.



**26 Speedometer/Tachograph**

Method of Inspection	Reason for Failure
<p>1. For all vehicles, check a speedometer or tachograph is:</p> <ol style="list-style-type: none"> <li>fitted.</li> <li>complete and operative (this does not involve moving the vehicle for confirmation).</li> <li>able to be illuminated.</li> </ol> <p>2. Check all vehicles fitted with a tachograph have:</p> <ol style="list-style-type: none"> <li>tachograph installation/calibration plaque present and complete.</li> <li>a DIL switch cover present, complete and for condition.</li> </ol> <p>3. For vehicles required to be fitted with a tachograph check:</p> <ol style="list-style-type: none"> <li>tachograph scale is marked in kilometres per hour.</li> <li>tachograph manufacturer's serial number/data plaque present and showing an "e" marking.</li> <li>tachograph installation/calibration plaque is in date.</li> <li>where a digital tachograph is fitted that the size of drive axle road tyres comply with calibration plaque.</li> <li>"K" factor plaque present.</li> <li>seal(s) are present, intact and of the mandatory type.</li> <li>an analogue or modular tachograph, that the electronically indicated figure does not differ from prescribed 'K' factor by more than + or – 50.</li> <li>a printout can be obtained from a digital tachograph.</li> </ol>	<p>1. A speedometer or tachograph (where required):</p> <ol style="list-style-type: none"> <li>not fitted.</li> <li>incomplete, clearly inoperative, or with dial glass broken or missing (see note in application).</li> <li>cannot be illuminated.</li> </ol> <p>2. For all vehicles fitted with a tachograph:</p> <ol style="list-style-type: none"> <li>tachograph installation/calibration plaque missing, damaged.</li> <li>DIL switch cover missing, broken or damaged through interference.</li> </ol> <p>3. For vehicles required to be fitted with a tachograph:</p> <ol style="list-style-type: none"> <li>tachograph scale not marked in kilometres per hour. (There is no requirement for tachographs to be marked in m.p.h.).</li> <li>tachograph manufacturer's serial number/data plaque missing or not showing an "e" marking.</li> <li>tachograph installation/calibration plaque out of date.</li> <li>where a digital tachograph is fitted the size of drive axle road tyres do not comply with calibration plaque.</li> <li>"K" factor plaque missing.</li> <li>seal missing, broken or where a clearly "non mandatory" seal has been fitted in place of an "official" seal.</li> <li>an analogue or modular tachograph where the electronically indicated figure differs from prescribed 'K' factor by more than + or – 50.</li> <li>Unable to obtain a printout from a digital tachograph.</li> </ol>

26 Speedometer/Tachograph	
Method of Inspection	Reason for Failure
<p>3. For vehicles required to be fitted with a tachograph check (continued):</p> <ul style="list-style-type: none"> <li>i. the digital tachograph displays a 'K' factor reading the same as that shown on the calibration plaque (there is no allowance/tolerance as with analogue type tachographs).</li> </ul> <p>4. For vehicles not required to be fitted with a tachograph, where a tachograph is fitted in place of a speedometer check:</p> <ul style="list-style-type: none"> <li>a. <b>If a speed limiter is required (which is sensed from the tachograph head):</b> the presence of a seal, it is complete and of a mandatory type.</li> <li>b. <b>If a speed limiter is <u>not</u> required:</b> the presence of a seal (within the tachograph head) and it is complete. <b>Note:</b> There is no requirement for the gearbox sender unit to be sealed.</li> </ul>	<p>3. For vehicles required to be fitted with a tachograph (continued):</p> <ul style="list-style-type: none"> <li>i. a digital tachograph that displays a 'K' factor reading different to that shown on the calibration plaque (there is no allowance/tolerance as with analogue type tachographs).</li> </ul> <p>4. For vehicles not required to be fitted with a tachograph, where a tachograph is fitted in place of a speedometer:</p> <ul style="list-style-type: none"> <li>a. <b>If a speed limiter is required (which is sensed from the tachograph head):</b> seal missing, broken or where a clearly "non-mandatory seal has been fitted in place of an "official seal".</li> <li>b. <b>If a speed limiter is <u>not</u> required:</b> a seal (within the tachograph head) missing, broken, or where a clearly "non mandatory" seal has been fitted in place of an "official" seal. There is no requirement for the gearbox sender unit to be sealed.</li> </ul>

## 27 Horn Application

This inspection applies to all vehicles.

Vehicles first used from 1 August 1973 must have a horn that produces a continuous or uniform sound.

**If vehicles are fitted with more than one horn** only one has to work.

**If air horns are connected to the braking system** of a vehicle the presenter should be made aware of the possible dangers as well as advising of any leaks from the air horns (there is no requirement to check if air horns operations deplete the braking system).

**If more than one horn control is fitted** at least one must operate the horn.

Method of Inspection	Reason for Failure
<p>Operate the horn, listen to the sound emitted and:</p> <p>1. Check the Horn control is:</p> <ul style="list-style-type: none"> <li>a. fitted.</li> <li>b. reached easily from the driving seat.</li> <li>c. secure.</li> </ul> <p>2. Check the Horn:</p> <ul style="list-style-type: none"> <li>a. operates.</li> <li>b. is loud enough to be heard by other road users.</li> <li>c. sound is continuous or uniform.</li> <li>d. is secure.</li> </ul>	<p>1. Horn control:</p> <ul style="list-style-type: none"> <li>a. missing.</li> <li>b. cannot be reached easily from the driving seat.</li> <li>c. insecure.</li> </ul> <p>2. Horn:</p> <ul style="list-style-type: none"> <li>a. does not work.</li> <li>b. is not loud enough to be heard by other road users.</li> <li>c. sound not continuous or uniform.</li> <li>d. insecure.</li> </ul>

**28 Driving Controls****Application**

This inspection applies to all vehicles.

From the drivers seat operate driving controls, except those for brakes and steering which are checked under other items, to see that they function correctly and are complete.

Other driving controls which need to be inspected which are not mentioned in The Mol are:

1. Gear control.
2. Accelerator pedal.

The list is not exhaustive.

**An air leak from a gear valve** is not an RfF.

**An accelerator pedal anti slip provision** missing or worn smooth is not an RfF.

Method of Inspection	Reason for Failure
1. Check driving controls for: <ol style="list-style-type: none"> <li>a. security.</li> <li>b. completeness.</li> <li>c. fractures, cracks and corrosion.</li> <li>d. obstructions or Impediments in its travel.</li> <li>e. functioning correctly.</li> <li>f. the presence of rubbish or other items likely to interfere with the proper control of the vehicle.</li> <li>g. The presence of a pedal anti-slip provision, its security and completeness (not applicable to the accelerator pedal).</li> </ol>	1. A driving control: <ol style="list-style-type: none"> <li>a. insecure.</li> <li>b. Incomplete.</li> <li>c. fractured, cracked or excessively corroded.</li> <li>d. obstructed or impeded in its travel.</li> <li>*e. obviously not functioning correctly.</li> <li>f. with the presence of rubbish or other items likely to interfere with the proper control of the vehicle.</li> <li>g. pedal anti-slip provision missing, loose or incomplete.</li> </ol>
2. Check engine stop control for presence and operation.	2. Engine stop control missing or inoperative.

**30 Steering Control****Application**

This inspection applies to all vehicles.

**Cracks in the plastic covering** do not necessarily mean that a spoke is fractured.

**This inspection does not apply to** drivers' aid steering wheel knobs.

**Unless specified by the manufacturer** vehicles fitted with power steering must be checked with the engine running.

**"Free Play" must not be confused with** movement caused by the compression of steering joints etc. This operation should be carried out with light finger pressure to distinguish the feel of the steering wheel when it meets a resistance.

**Certain types of steering column might show some movement** not due to excessive wear, e.g. those fitted with universal joints or flexible couplings.

**Free play at the steering rim in excess of** 1/30 of the steering wheel diameter for a rack and pinion mechanism is considered a reason for failure. For other types of mechanism free play in excess of 1/5 of the wheel's diameter is considered a Reason for Failure. The acceptable free play for a range of wheels is shown below.

WHEEL DIAMETER	RACK AND PINION STEERING		OTHER TYPES OF STEERING
	CONVENTIONAL	WITH STEERING WHEEL AHEAD OF THE RACK AND WITH A NUMBER OF JOINTS	
380mm (15")	13mm (0.5")	48mm (1.9")	76mm (3")
455mm (18")	16mm (0.6")	57mm (2.3")	90mm (3.6")
530mm (21")	18mm (0.7")	67mm (2.6")	106mm (4.2")
610mm (24")	21mm (0.8")	77mm (3.3")	122mm (4.8")

30 Steering Control	
Method of Inspection	Reason for Failure
<p>1. Check the steering column:</p> <ul style="list-style-type: none"> <li>a. has no excessive end float, when applying an upward and downward pressure to the steering wheel inline with the column.</li> <li>b. has no excessive side play indicating a badly worn top bearing or insecure top mounting bracket, by pulling and pushing the rim.</li> <li>c. flexible coupling and universal joint for condition and security.</li> <li>d. coupling clamp bolt or locking device is present and secure.</li> <li>e. adjustment device condition.</li> </ul> <p>2. Check the Steering Wheel:</p> <ul style="list-style-type: none"> <li>a. security.</li> <li>b. condition.</li> <li>c. hub retaining device is present and secure.</li> </ul> <p>3. With the steered wheels in the straight ahead position lightly rotate the steering wheel to the left and right and note the amount of free play.</p>	<p>1. Steering column:</p> <ul style="list-style-type: none"> <li>a. with excessive movement of centre of steering wheel in line with the column (end float).</li> <li>b. with excessive side play indicating a badly worn top bearing or insecure top mounting bracket.</li> <li>*c flexible coupling or universal joint deteriorated, with excessive wear or insecure.</li> <li>*d coupling clamp bolt or locking device missing or loose.</li> <li>e with an adjustment device worn to such an extent that it would render the column insecure.</li> </ul> <p>2. Steering Wheel:</p> <ul style="list-style-type: none"> <li>*a loose.</li> <li>b. hub, spoke or rim fractured or cracked. The cover torn with jagged edges which may injure the driver.</li> <li>c. hub retaining device not fitted or loose.</li> </ul> <p>3. Free play in system which is outside the prescribed limits.</p>

### 33 Speed Limiter

#### Application

This inspection applies to all vehicles which are required to be fitted with a speed limiter.

**Vehicles required to be fitted with a speed limiter are:**

A. A vehicle first used from 1 April 1974 until 31 December 1987 with:

- more than 16 passenger seats and
- a design gross weight of more than 7500kg and
- a maximum speed capability exceeding 70mph (112.65km/h), if a speed limiter were not fitted must be fitted with a speed limiter set at a maximum speed of 70mph (112.65km/h).

B. A vehicle first used from 1 January 1988 until 30 September 2001 with:

- more than 8 passenger seats and
- a design gross weight of more than 7500kg and less than 10001kg
- a maximum speed capability exceeding 100km/h (62.14mph) if a speed limiter were not fitted must be fitted with a speed limiter set at a maximum of 100km/h.

C. A vehicle first used from 1 October 2001 with:

- more than 8 passenger seats and
- a design gross weight of more than 7500kg and less than 10001kg
- a maximum speed capability exceeding 100km/h (62.14mph) if a speed limiter were not fitted must be fitted with a speed limiter set at a maximum stabilised speed of 100 km/h.

D. A vehicle first used from 1 January 1988 until 31 December 2004 with:

- more than 8 passenger seats and
- a design gross weight of more than 10000kg
- a maximum speed capability exceeding 100km/h (62.14mph) if a speed limiter were not fitted
- must be fitted with a speed limiter set at a maximum of 100km/h.

**33 Speed Limiter  
Application****Vehicles required to be fitted with a speed limiter are** (continued):

E. A vehicle first used from 1 October 2001 and 31 December 2004 with a Euro 3 diesel or gas engine (see note) and:

- more than 8 passenger seats and
  - a design gross weight of less than 7501kg and
  - a maximum speed capability exceeding 100km/h if a speed limiter were not fitted
- must be fitted with a speed limiter set at a maximum stabilised speed of 100 km/h

F. A vehicle first used from 1 January 2005 with:

- more than 8 passenger seats and
  - a design gross weight up to 5000kg
  - a maximum speed capability exceeding 100km/h if a speed limiter were not fitted
- must be fitted with a speed limiter set at a maximum stabilised speed of 100 km/h.

G. A vehicle first used from 1 January 2005 with:

- more than 8 passenger seats and
  - a design gross weight from 5001kg to 7500kg
  - a maximum speed capability exceeding 100km/h, if a speed limiter were not fitted
- must be fitted with a speed limiter set at a maximum stabilized speed of 100km/h.

H. A vehicle first used from 1 January 2005 with:

- more than 8 passenger seats
  - a design gross weight in excess of 10000kg
  - a maximum speed capability exceeding 100km/h, if a speed limiter were not fitted
- must be fitted with a speed limiter set at a maximum stabilized speed of 100km/h.



**33 Speed Limiter****Application**

**Some vehicles first used from 1 October 2001 until 31 December 2004 may have been approved to Directive 70/220/EC** or fitted with Euro 2 engines. These vehicles are exempt from the speed limiter fitting requirements for Group E. Where exemption is claimed at time of test this should be accompanied by an operator's declaration of exemption and where necessary supported by manufacturer's confirmation of emission test standard, unless the vehicle is marked speed limiter exempt on the technical record.

**All the following listed vehicles have already been confirmed by their manufacturers as being exempt and no further proof is required for these vehicles:**

**Any** Petrol engine or petrol engine converted to run on LPG

**Citroen Relay** 2.0 litre and 2.2 litre HDi engines

**DAF 45**, 7.5 ton vehicles (all) except DAF 45 marked as LF. (LF is marked on the N/S of the radiator grill.)

**Fiat Ducato** with 2.0 litre engines (engine code RHV).

**Ford Transit** (all).

**Isuzu** models NPR, NQR, and NKR with T, V, W, X or 1(one) as the 10<sup>th</sup> VIN character.

**Iveco Cargo** all, except vehicles with engine code F4AE---

**Iveco Daily** all, except vehicles with engine code F1CE---, 8140.43B, 8140.43N and 8140.43S with a PIC code 'G.' (the PIC code is applicable to the 8140.43S only, the PIC code can be found on the ID plate on the shut panel for the bonnet identified by the third character.)

**LDV** (all).

**Mitsubishi Canter** with 'R' as the 12<sup>th</sup> VIN character.

**Nissan Interstar** all, except vehicles with engine code ZD3-A202, G9U-A754 & G9U-A724.

**Nissan Primastar** All models.

**Peugeot Boxer** 2.0 litre and 2.2 litre HDi engines.

**Renault Master** all, except vehicles with engine code ZD3-A202, G9U-A754 & G9U-A724.

**Renault Traffic** All models.

**Vauxhall/Opel Movano** with E, F, G, J, K, L, M, N, P, T or W as the 7th VIN character. **Vauxhall/Opel Vivaro** (all).

**Volkswagen** (all except 2.5lt/2.8lt 109bhp/158bhp engine codes AVR & AUH respectively).

**33 Speed Limiter****Application****Other vehicles which are exempted by regulations are:**

Vehicles owned or used by the Secretary of State for Defence and used for naval, military or air force purposes. If the vehicle is being used the driver must be under the direct orders of a member of the armed forces of the Crown.

Vehicles being used for fire brigade (in England and Wales fire and rescue authority), ambulance and police purposes.

Vehicles which are operated on behalf of Her Majesty's Prison Service and used primarily for the purpose of moving category A prisoners (Category A prisoners means that prison security category which is applied to prisoners whose escape would be highly dangerous to the public, police or the security of the state, no matter how unlikely that escape might be, and from whom the aim must be to make escape impossible).

**If for any other reason the vehicle presenter claims a valid exemption** that is different from the technical record, form VOSA 73 V2 must be completed.

**When checking a speed limiter plate is securely fitted** in the driver's compartment it is acceptable for the plate to be fitted in the driver's door jamb. If fitted on a window and facing outward the details must be able to be read by a person of average height.

**The character and composition of the plate and size** of the lettering are not important provided the details are legible.

**It is acceptable for the limiter to be wired through the "ignition"** switch but any other device which would allow disconnection of the speed limiter whilst driving is unacceptable.

**Early tachographs had covers with a masked area** over the access port to interrogate tachograph . These are still to be found although the tachograph scheme has been instructed to cease the fitting of such. Do not remove this type of DIL switch cover at the time of test as it is easy to inadvertently make contact with one of the switches and completely alter the 'K' factor. This means that the test equipment cannot be used and the presenter should be asked to provide tachograph chart evidence of speed limiter operation as described below.

**Clear DIL switch covers are acceptable at the time of test**, although once again they are no longer acceptable under the Tachograph approved scheme and centres should no longer fit them.

**33 Speed Limiter****Application**

**Speed Limiter Integrity Check Using Electronic Device.** Not applicable to vehicles fitted with digital tachographs. Refer to section 26 headed digital tachographs.

1. Open the tachograph head. If seals need to be removed from within the tachograph head then do so. Plug the speed simulator jack plug into the tachograph head and close the head. Seals can only be removed and replaced by approved tachograph sealing centres or authorised DVSA staff.
2. The machine will establish the pre set 'K' factor. Check that this is within + or - 50 digits of the 'K' factor displayed on the tachograph calibration plaque. A number of manufacturers have dual marked plaques where the 'W' factor and the 'K' factor are the same and are in the format "W =K= " followed by the associated figure. Other configurations found are no 'W' or 'K' on the plaque but marked Imps / km or Impulses per kilometre, as the K factor is the number of electronic impulses required to record the distance of one kilometre travelled, this is acceptable.
3. Start engine and run at 1200-1500 rpm. Input a simulated speed to 80km/h. Check that the tachograph indicates the same speed. Gradually increase the simulated speed in 1 km/h steps. Note the speed indicated on simulator's digital display when the speed limiter operates. This can be identified by a reduction in the engine RPM, or a change in the engine note, or vibration indicating that the fuel supply is being reduced.

If it is found that the indicated figure differs by more than  $\pm 50$  from the prescribed "K" factor a further check should be made.

In line with normal procedures where the 'K' factor indicated by the electronic device does not exactly match the displayed 'K' factor, input the displayed 'K' from the plaque into the electronic device.

**It is imperative that the tachograph head is closed before the remainder of the test is conducted** so that no damage to the tachograph can take place should the vehicle's steering wheel be accidentally turned.

Set the simulated speed to 80 km/h and check the speed indicated by the tachograph. Note the difference, if any, in speed between that displayed on the electronic device and the tachograph.

If there is a difference in the electronic device's simulated speed and the speed indicated on the tachograph, and this difference is greater than 5km/h, either higher or lower, then the vehicle should be failed under Reason for Failure 3g of IM 26 as this defect relates to the tachograph rather than the speed limiter.

Continue to undertake a check of the vehicle's speed limiter. Remember to use the electronic device's simulated speed as the indication of the true road speed at which the road speed limiter operates.

**33 Speed Limiter****Application**

On some vehicles, the electronic device will be unable to indicate the speed at which the speed limiter operates. Under these circumstances tachograph chart evidence of the vehicle while in service can be used to verify the operation of the speed limiter. The voluntary submission of 5 consecutive tachograph charts from the previous 28 working days can be used to establish the maximum operational speed. The vehicle should be failed for Reason for Failure 3a, 3b or 3c if the tachograph chart shows a speed trace of more than 110 km/h for vehicles in Groups B, C, D, E, F and G and of more than 123 km/h for vehicles in Group A. The vehicle must have exceeded this speed for at least ten minutes.

If the speed simulator is unable to be used, and there are no tachograph charts available for inspection, the vehicle should be passed. DVSA Enforcement should be advised of the inability to check this test item.

**Only speed limiter calibration certificates are acceptable at retest.** If a certificate relating to the tachograph is presented the vehicle must be physically rechecked.

**The inspection of speed limiters is only for the parts** which are visible without dismantling.

**It is acceptable to receive verification from a speed limiter calibrator** that a vehicle cannot exceed the speed requirement for the installation of a speed limiter. A relevant exemption form should be completed and forwarded to record section at Ellipse Swansea.

**Speed limiter inspections should not be carried out on** vehicles with AS Tronic/Optidrive gearboxes

**'K' plaques placed over seals.** Do not remove these plaques and use tachograph charts as evidence of the speed. Inform the enforcement staff so they can contact the tachograph centre of the incorrect practice.

**The 13-18 tachograph can suffer from earth problems,** this can be cured by moving the vehicle, ensure the presenter moves the vehicle if this is required.

**When performing the speed limiter check. If the tachograph seals are missing** from the head do not perform the speed limiter inspection and fail the vehicle under IM 26.3.f.

**Because of the way the Romatic Speed Limiter operates** if you encounter an over speed situation please use the tachograph charts of confirmation that the limiter is defective before failing vehicles fitted with this device.

33 Speed Limiter	
Method of Inspection	Reason for Failure
<p>1. Check the Speed Limiter Plate is:</p> <ul style="list-style-type: none"> <li>a. fitted.</li> <li>b. secure.</li> <li>c. conspicuously positioned.</li> <li>d. clearly and indelibly marked with the speed at which the speed limiter has been set. Acceptable in mph or km/h.</li> </ul> <p>2. Check the Set Speed marked on Speed Limiter Plate:</p> <ul style="list-style-type: none"> <li>a. 70 mph (113 km/h) for a vehicle described in paragraph A of the Application section.</li> <li>b. 100 km/h (62.14 mph) for a vehicle described in paragraph B, C, D, E, F, G &amp; H in the Application section.</li> </ul> <p>3. Check the response speed of the limiter does not attain the relevant speeds in the RfF section.</p>	<p>1. Speed Limiter Plate:</p> <ul style="list-style-type: none"> <li>a. missing.</li> <li>b. insecure.</li> <li>c. not in a conspicuous position.</li> <li>d. not clearly and indelibly marked with the set speed.</li> </ul> <p>2. Set Speed marked on Speed Limiter Plate greater than:</p> <ul style="list-style-type: none"> <li>a. 70mph (113 km/h) for a vehicle described in paragraph A in the Applications section.</li> <li>b. 100 km/h (62.14 mph) for a vehicle described in paragraph B, C, D, E, F, G &amp; H in the Application section.</li> </ul> <p>3. Response speed of</p> <ul style="list-style-type: none"> <li>a. 107 km/h or more for a vehicle described in Paragraph B &amp; D in the Application section.</li> <li>b. 118 km/h or more for a vehicle described in paragraph A in the Application section.</li> <li>c. 102 km/h or more for a vehicle described in paragraph C, E, F, G &amp; H in the Applications section.</li> </ul>

Public Service Vehicle Inspection Manual

33 Speed Limiter	
Method of Inspection	Reason for Failure
4. Check the Speed Limiter is: a. fitted.  b. secure.  c. operating correctly and actuating rods/cables are connected and not damaged.  d. connected by authorised means and the wiring is not easily disconnected.  e. tamperproof, a device is fitted and is not defective and has not been interfered with.	4. Speed Limiter: a. not fitted.  b. insecure.  c. actuating rods/cables disconnected or damaged so that the operation is obviously affected.  d. wiring disconnected or can easily be disconnected by unauthorised means.  e. tamperproof device missing or defective or showing obvious signs of interference.

**34 Pressure/Vacuum Warning and Build Up****Application**

This inspection applies to all vehicles, except those with an unladen weight of less than 3050kg where the vacuum reservoir is coupled direct to the engine induction manifold. These vehicles do not require a pressure/vacuum warning device (if it is not possible to determine the unladen weight of a vehicle, the presenter should be given the opportunity to produce some evidence of the unladen weight before failing the vehicle).

Vehicles used from 1 April 1983 can be fitted with either a visual warning device or an audible warning device. If both are fitted only one need work. Vehicles first used before 1 April 1983 must be fitted with a visual warning device. If an audible warning device is also fitted this is considered to be an addition to the mandatory requirement.

A Number of vehicles, among them Mercedes 515, 609, 612, 614, 709 and Iveco Daily models were approved without a warning device and should not be failed for a warning device not fitted.

If there is no reservoir in a vacuum system a warning device is not required.

**If the vehicle has full power hydraulic brakes** gauges are not normally fitted and there are no appreciable sounds when the brakes are applied. To check for the compliance with item 2 in MoI use the procedure shown in Item 71.

**If gauges are not marked**, take 3 bar (45 psi) for air systems and 25 to 30cm (10 to 12 Inches) for vacuum systems as indicating minimum effective working condition.

**The time to reach minimum effective working pressure** should normally be within 3 minutes for pressure systems and 1 minute for vacuum systems.

34 Pressure/Vacuum Warning and Build Up	
Method of Inspection	Reason for Failure
<ol style="list-style-type: none"><li>1. Check the mandatory visual warning device:<ol style="list-style-type: none"><li>a. can be seen by the driver in all lighting conditions.</li><li>b. is fitted and is working correctly.</li></ol></li><li>2. Deplete the air or vacuum system by applying the foot brake, when the warning device operates there must be two further assisted brake applications.</li><li>3. Fully deplete the system and run the engine at just below governed speed and note the time for the warning device to show minimum effective working condition.</li></ol>	<ol style="list-style-type: none"><li>1. A mandatory visual warning device:<ol style="list-style-type: none"><li>a. Can not be seen by the driver in all lighting conditions.</li><li>b. not fitted or not working correctly.</li></ol></li><li>2. Not enough pressure or vacuum to give at least two fully assisted brake applications after the warning device has indicated minimum effective working conditions.</li><li>*3. Time to reach minimum effective working pressure is more than 3 minutes for pressure systems and 1 minute for vacuum systems.</li></ol>



# Public Service Vehicle Inspection Manual

## 36 Hand Lever Operating Mechanical Brakes

### Application

This examination applies to all vehicles fitted with a mechanical parking brake.

Method of Inspection	Reason for Failure
<p>1. Check the Brake lever:</p> <ul style="list-style-type: none"> <li>a. for fractures or cracks.</li> <li>b. for excessive corrosion.</li> <li>c. security.</li> <li>d. position so that it can be operated satisfactorily.</li> <li>e. by applying the brake slowly and checking that it is not impeded in its travel.</li> <li>f. when fully applied in the “on” position remains there when knocked on each side and the top.</li> <li>g. is not at the end of its working travel.</li> <li>h. does not have excessive side play within a pivot.</li> <li>i. pivot operation.</li> <li>j. releases correctly.</li> </ul> <p>2. Check the Pawl mechanism:</p> <ul style="list-style-type: none"> <li>a. and mountings for condition.</li> <li>b. spring is pushing teeth into positive engagement with ratchet teeth.</li> </ul> <p>3. Check locking and/or retaining devices for presence and security.</p>	<p>1. Brake lever:</p> <ul style="list-style-type: none"> <li>a. fractured or cracked.</li> <li>b. excessively corroded.</li> <li>c. insecure.</li> <li>*d so positioned that it cannot be operated satisfactorily.</li> <li>e. impeded in its travel.</li> <li>**f is not held in the “on” position when knocked.</li> <li>g has no further possible travel when the brake is fully applied.</li> <li>h. pivot with side play such that it is likely to fail.</li> <li>i. pivot is tight in operation.</li> <li>j. does not release correctly.</li> </ul> <p>2. Pawl mechanism:</p> <ul style="list-style-type: none"> <li>a. and/or mountings in such a condition that early failure is likely.</li> <li>b. pawl spring is not pushing teeth into positive engagement with ratchet teeth.</li> </ul> <p>3. Locking and/or retaining devices missing or insecure.</p>

37 Service Brake Pedal	
Application	
<p>This examination applies to all vehicles.</p> <p><b>Power operated braking systems</b> where the foot valve is fully open before the pedal is fully depressed do not require any reserve travel.</p>	
Method of Inspection	Reason for Failure
<p>1. Check Brake pedal:</p> <ul style="list-style-type: none"> <li>a. anti-slip provision is present, secure and complete.</li> <li>b. condition.</li> <li>c. does not foul other parts of the vehicle.</li> <li>d. has sufficient reserve travel when fully depressed.</li> </ul> <p>2. Check Brake pedal and assembly is:</p> <ul style="list-style-type: none"> <li>a. secure.</li> <li>b. complete, with no fractures, cracks, or corrosion.</li> <li>c. pivot operation.</li> <li>d. releases correctly.</li> </ul>	<p>1. Brake pedal:</p> <ul style="list-style-type: none"> <li>a. anti-slip provision missing, loose or incomplete.</li> <li>b. has excessive side play.</li> <li>*c. fouling other parts of the vehicle.</li> <li>d. insufficient reserve travel when fully depressed.</li> </ul> <p>2. Brake pedal or assembly:</p> <ul style="list-style-type: none"> <li>a. insecure.</li> <li>*b. incomplete, fractured, cracked, or corroded.</li> <li>c. pivot is tight in operation.</li> <li>d. does not release correctly.</li> </ul>

## 38 Service Brake Operation

### Application

This examination applies to all vehicles.

**Anti-lock brakes are mandatory on coaches first used from 1 April 1992 with design GVW greater than 12000kg, and all passenger carrying vehicles with more than eight passenger seats in addition to the driver first used from 1<sup>st</sup> May 2002.**

**For some brake systems a small amount of brake pedal creep** may be due to elasticity in the brake components.

#### **ABS, ABS/EBS and ABS/EBS/ESC requirements**

##### **ABS only vehicles**

Vehicles fitted with ABS only must have a mandatory warning malfunction indicator lamp (MIL) that illuminates when the system is energised (ignition or battery master switch on). It can be any colour, though they are usually red, yellow or amber. It must go out after a short period or when the engine is started but can then come back on and remain on until the vehicle speed exceeds approximately 5 kph (3 mph). It is not necessary to move the vehicle to check the speed-activated function provided the lamp does go off momentarily.

Other lamps of the same or different colours showing e.g. that trailers are not connected, or are not fitted with ABS may also be fitted to motor vehicles. These are not mandatory and are for information purposes only. If these are illuminated it is not an RfF. It is important to establish that a lit warning lamp is actually showing an ABS defect, and is not an ABS information lamp. The Driver Handbook may be used to establish the function of a lamp.

**38 Service Brake Operation****Application****ABS/EBS equipped vehicles**

Vehicles fitted with ABS and EBS must have mandatory red and amber/yellow MILs fitted. The red MIL illuminates if there is a foundation brake fault or the prescribed minimum brake performance cannot be met. The red MIL must illuminate with system initialisation though this may not be clearly evident as in some cases the sequence is extremely fast and may be missed. In this circumstance if modulator cycling can be heard it is acceptable to pass the vehicle. If a red MIL stays lit or is flashing this is a reason for failure.

The amber/yellow lamp illuminates if there is an electronic fault.

The amber/yellow MILs must illuminate with system initialisation though this may not be clearly evident as in some cases the sequence is extremely fast and may be missed. In this circumstance if modulator cycling can be heard it is acceptable to pass the vehicle. If the MIL stays lit this is a reason for failure. If the MIL illuminates on system initialisation then goes out and then flashes this should be advised

**ABS/EBS/ESC equipped vehicles**

Motor vehicles fitted with ESC must have a separate amber/yellow MIL fitted apart from those used to signal EBS electronic faults. One lamp covers both the motor vehicle and any trailer fitted with ESC towed.

The ESC lamp will be illuminated when the system is switched off, when the system is operating or if a fault is present. It is not required to light up on system energisation, but if it does this is acceptable provided it then goes out after a short period or when the engine is started.

If the vehicle has a switch to manually disable the ESC function, it must not be possible for the switch to be left in the “off” position and the ESC function must be automatically reinstated every time the system is re-energised (ignition turned on.)

Electronic Stability Control Systems are commonly referred to as ESC, but may also be known as ESP/RSC or some other acronym. The MIL for these systems may take various forms and a vehicle should only be failed when the tester is certain that an illuminated lamp indicates an ESC malfunction. This may require reference to the owner's handbook if one is available.

38 Service Brake Operation	
Method of Inspection	Reason for Failure
<p>1. Air pressure or vacuum systems: With reservoir at maximum pressure or vacuum, fully depress the pedal and note the change in gauge readings to see if they give indications of a leak in the system.</p> <p>2. Hydraulic systems (other than full power systems): Fully depress the pedal and keep it depressed under steady pressure.</p> <ol style="list-style-type: none"> <li>check that the pedal does not creep down under full pressure.</li> <li>check there is no sponginess.</li> </ol> <p>3. Brake systems assisted by engine vacuum: Deplete the vacuum, partly depress the pedal, start the engine, and check if the pedal can be felt to dip.</p> <p>4. Full pressure hydraulic systems: Check that the system pressure is maintained for at least 10 minutes when the brakes are off and the engine is stopped. Loss of pressure will be indicated by the operation of the low pressure warning device (warning light or appearance of semaphore "flag" device).</p> <p>5. If the vehicle is fitted with an ABS or ABS/EBS or ESC system, check that required warning lamps:</p> <ol style="list-style-type: none"> <li>are fitted.</li> <li>illuminate as required when ignition switched on.</li> <li>does not indicate a fault.</li> </ol>	<p>1. Air pressure or vacuum systems gauge reading drops when pedal depressed indicating a leak in the system.</p> <p>2. Hydraulic systems (other than full power systems):</p> <ol style="list-style-type: none"> <li>pedal creeps down when depressed.</li> <li>sponginess when pedal depressed.</li> </ol> <p>*3. Brake systems assisted by engine vacuum, the pedal does not dip when engine started, indicating lack of assistance.</p> <p>4. Full pressure hydraulic systems, the system pressure is not maintained for 10 minutes when the brakes are off and the engine is stopped.</p> <p>5. Any of the required ABS or ABS/EBS or ESC warning lamps:</p> <ol style="list-style-type: none"> <li>are missing.</li> <li>do not illuminate as required when ignition switched on.</li> <li>indicate a fault.</li> </ol>

38 Service Brake Operation	
Method of Inspection	Reason for Failure
<p>6. Vehicles fitted with ABS or ABS/EBS or ESC check:</p> <ul style="list-style-type: none"> <li>a. the presence and condition of all visible system components.</li> <li>b. the condition of all visible system wiring.</li> <li>c. all system components for any inappropriate repair or modification.</li> <li>d. the condition and operation of any switch fitted to turn the ESC system on and off.</li> </ul> <p>7. On Vehicles and trailers both fitted with ISO 7638 (ABS/EBS) lead sockets check an ISO 7638 connecting lead is fitted and being used.</p> <p>8. On a vehicle or trailer on which anti-lock brakes are mandatory check that an ABS system is fitted.</p>	<p>6. Vehicles fitted with ABS or ABS/EBS or ESC:</p> <ul style="list-style-type: none"> <li>a. a system component obviously missing or excessively damaged.</li> <li>b. system wiring excessively damaged.</li> <li>c. a system component inappropriately repaired or modified.</li> <li>d. an ESC system switch insecure or faulty or which does not allow automatic resetting of the ESC function to “on” at system energisation.</li> </ul> <p>7. On vehicles and trailers both fitted with ISO 7638 (ABS/EBS) lead sockets an ISO 7638 connecting lead not fitted or being used.</p> <p>8. A system not fitted to a vehicle where it is mandatory.</p>

**39 Hand Operated Brake Control Valves****Application**

This examination applies to all hand operated valves on vehicles which operate secondary brakes, trailer brakes, spring brakes and lock actuators. It also applies to trailers fitted with hand operated spring brake valves.

**Certain air valves are subject to a slight** amount of leakage and this is not a reason for failure.

Method of Inspection	Reason for Failure
<p>1. Check the Control valve:</p> <ul style="list-style-type: none"> <li>a. on a motor vehicle is capable of being operated from the driving position.</li> <li>b. is secure.</li> <li>c. condition.</li> <li>d. is unimpeded in its travel.</li> <li>e. does not leak.</li> <li>f. condition of gate or lever locating mechanism.</li> <li>g. functions correctly.</li> </ul>	<p>1. Control valve:</p> <ul style="list-style-type: none"> <li>a. on a motor vehicle unable to be operated from the driving position.</li> <li>b. insecure.</li> <li>c. fractured, cracked, damaged or excessively corroded.</li> <li>*d. impeded in its travel.</li> <li>e. leaking.</li> <li>f. excessive wear in the gate or lever locating mechanism.</li> <li>*g. malfunctioning.</li> </ul>

**41 Condition of Chassis****Application**

This inspection applies to all vehicles.

**For integral construction the term chassis** should also be taken to apply to the underframe. For vehicles without a chassis those parts of the body must be examined which take the place of the chassis.

**When assessing corrosion it must only be regarded as a failure if** it is sufficiently advanced to obviously impair the strength of a load bearing member.

Method of Inspection	Reason for Failure
<p>1. Check all main members and cross members for:</p> <ul style="list-style-type: none"> <li>a. fractures or cracks</li> <li>b. advanced corrosion.</li> <li>c. deformation.</li> </ul> <p>2. Check the security of fastenings between the frame and cross members including securing bolts, rivets and welding for:</p> <ul style="list-style-type: none"> <li>a. security of flitch plates and fastenings.</li> <li>b. condition of welding.</li> </ul> <p>3. On integral bodied vehicles where the body panels provide an important part of the strength of the vehicle check any Integral body replacement panels:</p> <ul style="list-style-type: none"> <li>a. are of a suitable material.</li> <li>b. are adequately secured by an appropriate method.</li> </ul>	<p>1. Any main or cross member:</p> <ul style="list-style-type: none"> <li>a. fractured or cracked or</li> <li>b. with advanced corrosion or</li> <li>c. deformed.</li> </ul> <p>so that the control of the vehicle is likely to be affected.</p> <p>2. Frame and/or cross member fastenings:</p> <ul style="list-style-type: none"> <li>a. insecure flitch plates and/or fastenings or</li> <li>b. a weld breaking away.</li> </ul> <p>so that the control of the vehicle is likely to be affected.</p> <p>3. Integral body replacement panels:</p> <ul style="list-style-type: none"> <li>a. of an obviously unsuitable material.</li> <li>b. not adequately secured by an appropriate method.</li> </ul>



## 42 Electrical Wiring and Equipment

### Application

This inspection applies to all vehicles.

**If the battery is only held in place by the cables and by a lip on the carrier** this cannot be considered to be secure.

**Switches not on the main switch or control panel** and which are not likely to confuse the driver by their presence are not required to be marked.

**There is no need to remove destination box panels, as a matter of course.** The inspection requires a check on all **visible** wiring for condition, position and security. The test is generally limited to those parts which can be seen without dismantling and is based on the assumption that panels will only be removed where it is not possible to inspect safety critical items. We wouldn't normally consider that this would apply to wiring contained in destination box panels unless there was reason to suspect seriously defective wiring.

**The check on electrical circuits** over 100 volts for protection by double pole switches or isolating switches and located inside the vehicle and accessible to the driver or crew also includes any external mains power supplied to the vehicle.

Where it is not possible to inspect batteries for condition and leaks every effort should be made to inspect the area where the batteries are installed to confirm there are no signs of leakage.

When checking the condition and security of the wiring, care needs to be taken when inspecting the high voltage systems of Hybrid Electric Vehicles and Electric Vehicles. These high voltage wires are colour coded orange.

Method of Inspection	Reason for Failure
1. Check all visible wiring for: <ul style="list-style-type: none"> <li>a. condition and security.</li> <li>b. positioning so that it is unlikely to be chafed or damaged by heat.</li> </ul> 2. Check the battery and carrier for: <ul style="list-style-type: none"> <li>a. security.</li> <li>b. condition.</li> <li>c. ventilation of container.</li> <li>d. cell closure presence and security.</li> </ul>	1. Wiring: <ul style="list-style-type: none"> <li>a. not adequately insulated or secured.</li> <li>b. positioned so that it is chafing or likely to be damaged by heat.</li> </ul> 2. Battery: <ul style="list-style-type: none"> <li>a. and/or carrier insecure and likely to become displaced.</li> <li>b. case leaking.</li> <li>c. container inadequately vented.</li> <li>d. cell closures missing or insecure.</li> </ul>

42 Electrical Wiring and Equipment	
Method of Inspection	Reason for Failure
<p>3. Check switches controlling obligatory lights for security and function.</p> <p>4. Check that circuits of over 100 volts are:</p> <ul style="list-style-type: none"> <li>a. protected by double pole switches or isolating switches.</li> <li>b. situated inside the vehicle.</li> <li>c. accessible to the driver or crew.</li> </ul> <p>5. Check the television receiver is not visible to the driver whilst driving. This requirement is not applicable to monitors used to aid manoeuvring or driver aids.</p> <p>6. Check the ignition or charging system is suppressed so as not to interfere with TV or radio reception.</p> <p>7. Check trailer electrical sockets for:</p> <ul style="list-style-type: none"> <li>a. security.</li> <li>b. damage or deterioration.</li> </ul> <p>8. Check all power train equipment for:</p> <ul style="list-style-type: none"> <li>a. security.</li> <li>b. risk of fire or injury.</li> </ul>	<p>3. Switch controlling an obligatory light insecure or malfunctioning.</p> <p>4. Circuits of over 100 volts are not:</p> <ul style="list-style-type: none"> <li>a. protected by double pole switches or isolating switches.</li> <li>b. situated inside the vehicle.</li> <li>c. accessible to the driver or crew.</li> </ul> <p>5. Television receiver visible to the driver whilst driving.</p> <p>6. Ignition or charging system not adequately suppressed.</p> <p>7. A trailer electrical socket:</p> <ul style="list-style-type: none"> <li>a. Insecure.</li> <li>b. damaged or deteriorated to the extent that the connecting lead could not be securely connected.</li> </ul> <p>8. Power train:</p> <ul style="list-style-type: none"> <li>a. insecure.</li> <li>b. presents a risk of fire or injury.</li> </ul>

**43 Engine and Transmission Mountings****Application**

This inspection applies to all vehicles, including Hybrid Electric Vehicles and Electric Vehicles. Where there is separate power train equipment, this should be treated as an engine/transmission.

**There will only be a failure under this item if** a mounting is no longer capable of performing its function of location and support.

**Serious fractures in clutch or bell housings** which affect the security of the engine or gearbox are a reason for failure.

Method of Inspection	Reason for Failure
<p>1. Check condition of mountings and subframes and their installation to the chassis or underframe for:</p> <ul style="list-style-type: none"><li>a. security.</li><li>b. cracks or fractures.</li><li>c. deterioration.</li></ul>	<p>1. Any mounting or subframe:</p> <ul style="list-style-type: none"><li>a. loose.</li><li>b. cracked or fractured.</li><li>c. badly deteriorated.</li></ul>

**44 Oil and Waste Leaks****Application**

This inspection applies to all vehicles.

Check without operating any equipment other than the engine which may be run at tick-over speed.

**Very bad oil leaks are a reason for refusing to carry out the test.** If the test is suspended for this reason the presenter will be notified of this using form VTP12.

**Oil deposited onto body work**, exhaust or brake systems should not result in failure unless the leak causing the deposit exists at the time of test.

**Temporary means of preventing leaked oil** reaching the ground such as fabricated drip trays consisting of sheet metal supported by wire strands are not acceptable.

**Fabricated repairs to an oil pipe** which effectively stop an oil leak are acceptable.

**“Waste” includes effluent from toilets** and other devices but does not include water from sinks.

Method of Inspection	Reason for Failure
1. Check for leakage of any type of oil other than fuel oil.	*1. Any oil leak or combination of leaks from any assembly which can create a pool 75mm in diameter in 5 minutes or a number of leaks which collectively would deposit oil at the same rate.
2. Check for leakage of waste which is likely to cause unpleasant or dangerous conditions for other road users or damage road surfaces.	*2. Leakage of waste which is likely to cause unpleasant or dangerous conditions for other road users or damage road surfaces.
3. Check for leakages which, when the vehicle is in motion, can heavily contaminate the vehicle such that it causes a health or fire risk.	*3. Leakages which, when the vehicle is in motion, can heavily contaminate the vehicle such that it causes a health or fire risk.

**45 Fuel Tanks and System****Application**

This inspection applies to **all fuel tanks** which are permanently attached to vehicles and to trailers, including gas cylinders, bottles and other types of fuel container.

**Seepage** is not a reason for failure.

**Fabricated and "emergency" fuel caps** are acceptable provided that they function correctly. Where possible the tank cap should be opened to check the sealing arrangements.

**Very bad fuel leaks are a reason for refusing** to carry out the test. If the test is suspended for this reason the presenter will be notified of this using form VTP12.

**If the vehicle is powered by gas and suffers a leak** this should be treated in the same manner as a normal fuel leak and VTP12 action taken. The vehicle should be moved to a well ventilated area away from people and buildings. If the leak is of a serious nature evacuate the building and call Health and Safety Branch.

**It is not necessary to run the engine but if a leak** is present when the engine is running the vehicle should be failed under RfF3a.

**It is not necessary to run combustion heaters** as part of this inspection.

Method of Inspection	Reason for Failure
1. Check the fuel tanks this includes gas containers for security.	<b>**1.</b> Tank so insecure on its mountings that it is likely to drop away partially or completely when the vehicle is used.
2. Check tank strap and supports for: a. condition and presence.	2. A tank strap or support: a. broken or missing.
b. security and strength.	<b>**b</b> so insecure or weakened that the tank is likely to drop away partially or completely when the vehicle is used.

**45 Fuel Tanks and System**

Method of Inspection	Reason for Failure
<p>3. Check Fuel System:</p> <ul style="list-style-type: none"> <li>a. for leaks.</li> <li>b. for condition of pipes and that they are complete and secure.</li> <li>c. for positioning of pipes so that they are unlikely to be fouled by moving parts.</li> <li>d. other than on diesel powered vehicles, confirm that the fuel line is not in contact with or run adjacent to electrical wiring, unless the wiring is encased in a sleeve or is protected so that the insulation of the wiring is not in direct contact with the pipe.</li> <li>e. for any spilled or leaked fuel accumulating or contaminating inside the vehicle or on the bodywork.</li> <li>f. to ensure petrol engined vehicles are fitted with a carburettor drip tray and drain pipe, (N/A on schedule 6 vehicles).</li> </ul> <p>4. Check Filler Cap for:</p> <ul style="list-style-type: none"> <li>a. presence.</li> <li>b. security.</li> <li>c. presence and condition of the sealing washer and that the mounting flange/sealing method is effective.</li> </ul>	<p>3. Fuel System:</p> <ul style="list-style-type: none"> <li>*a leaking.</li> <li>b. pipes so damaged (restricted/chafed) insecure or with an inadequate repair such that they are likely to fail and leak which would cause danger to persons on the vehicle or to other road users.</li> <li>c. pipes damaged or so positioned that they are fouled by moving parts of the vehicle.</li> <li>d. with a pipe or pipes immediately adjacent to or in contact with electrical wiring.</li> <li>e. where spilt or leaking fuel can contaminate or accumulate inside the vehicle or on the bodywork.</li> <li>f. carburettor drip tray and/or drain pipe missing.</li> </ul> <p>4. Filler Cap:</p> <ul style="list-style-type: none"> <li>**a missing.</li> <li>**b does not fasten securely. <ul style="list-style-type: none"> <li>• by a positive means, or</li> <li>• such that pressure is not maintained on the sealing arrangement.</li> </ul> </li> <li>**c sealing washer torn, deteriorated or missing, or a mounting flange/sealing method defective such that leakage of fuel is possible.</li> </ul>

**46 Exhaust Systems and Waste Systems****Application**

This inspection applies to all vehicles.

This inspection includes ancillary equipment such as toilets, cooking, heating, catering, entertaining and any other special features.

**Where a vehicle is failed for exhaust system leaking**, the emission test could be affected by the induction of air into the exhaust system. When presented for retest the emission test should be rechecked.

**Slight leaks** are acceptable.

**The position of exhaust outlets should be at the rear or offside** of the vehicle. This is not a requirement for Bus directive or ECE Regulation vehicles.

**The inspection of grease shields is only concerned with** those approved at the time the vehicle was certified, or where there is evidence that grease is being thrown onto the hot part of the exhaust pipe. There is no requirement for schedule 6 minibuses to be fitted with exhaust grease shields.

**An excessively deteriorated exhaust** is not a reason for failure providing RfF 1.a and 1.b do not apply.

Method of Inspection	Reason for Failure
<ol style="list-style-type: none"> <li>1. Check the condition of the exhaust pipes and silencers for:               <ol style="list-style-type: none"> <li>a. security.</li> <li>b. Leaks.</li> <li>c. position, so that fumes are unlikely to enter the driver's or passenger area.</li> <li>d. likelihood to be a fire hazard.</li> </ol> </li> <li>2. Check the exhaust silencer for:               <ol style="list-style-type: none"> <li>a. presence.</li> <li>b. effectiveness.</li> </ol> </li> <li>3. Check any exhaust or waste systems do not foul and are not likely to contaminate, or be a fume hazard.</li> <li>4. Check for the presence and adequacy of grease shields to hot exhausts (see application).</li> </ol>	<ol style="list-style-type: none"> <li>1. An exhaust system:               <ol style="list-style-type: none"> <li>a. so insecure that it might fall away partially or completely when the vehicle is in use.</li> <li>b. Leaking.</li> <li>c. wrongly positioned, or positioned so that fumes are likely to enter the driver's or passengers' area.</li> <li>d. likely to cause a fire.</li> </ol> </li> <li>2. An exhaust silencer:               <ol style="list-style-type: none"> <li>a. missing.</li> <li>b. ineffective.</li> </ol> </li> <li>3. Any exhaust or waste system fouling or likely to cause a fume hazard.</li> <li>4. Missing or inadequate grease shields to hot exhausts.</li> </ol>

**48 Suspension****Application**

This inspection applies to all vehicles.

**Insecurity of attachment points can best be assessed** when the steering and/or brakes are operated.

**Leaf spring systems:**

- The fail criterion is that the leaves are so misaligned that each leaf is not taking a reasonable proportion of the load.
- A leaf spring with a fracture or crack on the curled section which prevents the axle moving in the event of main leaf failure is a reason for failure.
- A "U" bolt should only be regarded as loose if there is clear visual evidence that it is not properly fulfilling its function of securing a spring and before it can do so it needs remedial action.
- Surface cracks on laminated semi-elliptical springs are not a RfF.
- It is permissible to have a larger road spring on one side of a vehicle than the other.

**Spring Pins:**

- The maximum permissible wear in a pin and/or bush is 2mm for a 12mm diameter pin and 1/8 of the diameter for larger assemblies. For a threaded pin it is the diameter of the threaded part which should be taken into account when assessing wear. These criteria should not be used when checking rubber bushes which should be checked for deterioration of the rubber which could result in excessive movement.
- The maximum side play must not exceed 6mm. This does not apply to a threaded pin and bush assembly or to rubber bushes or to single spring bogie suspensions.
- Where an anchor/shackle pin is secured at one end the maximum amount of movement at the free end should not exceed 1mm for smaller assemblies, increasing to 2mm for larger assemblies.

**Slipper brackets:**

- Rebound pins where fitted as standard should be correctly located.
- Worn slipper brackets are a RfF when worn to the extent they could, at the time of the inspection, clearly affect the movement or correct location of the road spring (or have allowed the spring leaf to damage the chassis).



**48 Suspension****Application****Air/Fluid systems:**

- When assessing the significance of leaks it should be remembered that certain pneumatic components are subject to some degree of leakage. Slight seepage producing a thin film of oil on the component is not a Reason for Failure but any sign of dripping is unacceptable.
- Exposure of air bag structural cords is acceptable providing that they are not damaged to such an extent the unit is likely to fail.
- An air bag for holding a lift axle in the raised position must be considered against the same criteria as any other suspension air bag.

**A fractured and or repaired air bag pedestal** if performing satisfactorily and not damaging the air bag is not a RfF.

**Independent suspension** must be jacked to remove the weight from the suspension joints (suspension hanging freely).

**Scania vehicles with air suspension** have attachment points for a retaining chain, the omission of the chain is not a RfF.

**Shock Absorbers/Anti Roll Bars:**

- Slight seepage producing a thin film of fluid on a shock absorber is not a reason for failure but any sign of dripping is unacceptable.
- Anti roll bar bushes repaired with resin are acceptable providing the repair is adequate resulting in the removal of the excess wear.

**48 Suspension**

Method of Inspection	Reason for Failure
<p>1. All suspension types.</p> <p>Check all suspension components and their attachment points for:</p> <ul style="list-style-type: none"> <li>a. security.</li> <li>b. attachment.</li> <li>c. condition.</li> <li>d. general condition which may affect the control of the vehicle.</li> <li>e. correct fitment.</li> <li>f. fitment of all bolts and rivets.</li> <li>g. completeness of rubber and bonded bushes.</li> <li>h. defects which would allow a road wheel to foul another part of the vehicle.</li> <li>i. condition of pins, bushes or mountings.</li> <li>j. condition of ball joint dust covers.</li> <li>k. inappropriate repairs or modifications.</li> </ul>	<p>1. All suspension types.</p> <p>A suspension component or its attachment point:</p> <ul style="list-style-type: none"> <li>*a insecure.</li> <li>*b disconnected.</li> <li>*c fractured or cracked.</li> <li>*d so damaged, worn, distorted or corroded that it adversely affects its function.</li> <li>*e incorrectly located or fitted.</li> <li>*f bolt or rivet missing.</li> <li>*g rubber or bonded bush deteriorated.</li> <li>*h defective such that a wheel could foul any other part of the vehicle.</li> <li>*i with wear in a pin, bush or mounting exceeding the prescribed limit.</li> <li>*j. a ball joint dust cover missing, insecure, excessively damaged or severely deteriorated to the extent that it would no longer prevent the ingress of dirt etc.</li> <li>*k. with an inappropriate repair or modification which has seriously weakened the component.</li> </ul>

**48 Suspension**

Method of Inspection	Reason for Failure
<p>2. Check Leaf Springs and Fixings for:</p> <ul style="list-style-type: none"> <li>a. condition of pins/bushes and mountings</li> <li>b. condition of leaves, repairs by welding are not acceptable.</li> <li>c. correct alignment of leaves.</li> <li>d. condition of spring fixing pins.</li> <li>e. presence of slipper bracket rebound pin.</li> <li>f. security between a spring and the axle.</li> <li>g. presence of shackles or anchor pins.</li> <li>h. condition of slipper brackets.</li> <li>i. general condition.</li> <li>j. security and presence of a locking device from a shackle or anchor pin.</li> </ul>	<p>2. Leaf Springs and Fixings:</p> <ul style="list-style-type: none"> <li>*a. wear in spring pins/bushes or mountings exceeding the prescribed limit.</li> <li>*b. a fractured or cracked leaf or one repaired by welding.</li> <li>*c. spring leaves splayed beyond the prescribed limits or fouling any other part of the vehicle.</li> <li>*d. movement in a spring fixing pin in excess of the prescribed limits.</li> <li>*e. slipper bracket rebound pin missing or incorrectly located.</li> <li>*f. relative movement or displacement between a spring and the axle.</li> <li>*g. a missing shackle or anchor pin.</li> <li>*h. a worn slipper bracket.</li> <li>*i. so corroded, pitted or seriously weakened that it is likely to fail.</li> <li>*j. an insecure or missing locking device from a shackle or anchor pin.</li> </ul>

**48 Suspension**

Method of Inspection	Reason for Failure
<p>3. Check Coil Springs and Torsion Bars for:</p> <ul style="list-style-type: none"> <li>a. completeness.</li> <li>b. condition (repairs by welding are not acceptable).</li> <li>c. general condition that it is likely to fail.</li> <li>d. condition and security of torsion bar fixings, any adjustment assemblies correctly fitted and securely locked.</li> <li>e. check for correct location and fitment.</li> </ul> <p>4. Air/Fluid Suspension Systems. Check Valves, pipes, Valve linkage, Bellows and Displacer/ Accumulator Unit for:</p> <ul style="list-style-type: none"> <li>a. correct positioning, inflation and/or condition that it is unlikely to fail.</li> <li>b. fouling by other parts or leaking.</li> <li>c. presence of check straps and their condition.</li> <li>d. secure.</li> <li>e. pipe security.</li> <li>f. leaking.</li> </ul> <p>5. Check Bonded Suspension Units for:</p> <ul style="list-style-type: none"> <li>a. condition of the bonding between flexible element and metal so that part of the unit is unlikely to fail.</li> <li>b. condition of unit so that it is capable of carrying out its proper function.</li> </ul>	<p>3. Coil Spring or Torsion Bar:</p> <ul style="list-style-type: none"> <li>*a. incomplete.</li> <li>*b. fractured, cracked or repaired by welding.</li> <li>*c. corroded, pitted, or seriously weakened so it is likely to fail.</li> <li>*d. torsion bar fixings with excessive free play, insecure, or an adjustment assembly incorrectly fitted and/or insecurely locked.</li> <li>*e. incorrectly located or fitted.</li> </ul> <p>4. Air/Fluid Suspension Systems. Valves, pipes, Valve linkage, Bellows and Displacer/ Accumulator Unit:</p> <ul style="list-style-type: none"> <li>*a. displaced, deflated, kinked and/or so damaged/ deteriorated that it is likely to fail.</li> <li>*b. fouled by other parts or leaking.</li> <li>*c. with check strap missing or defective.</li> <li>*d. insecure.</li> <li>*e. pipe insecure.</li> <li>*f. leaking.</li> </ul> <p>5. Bonded Suspension Unit:</p> <ul style="list-style-type: none"> <li>*a. with failure of bonding between flexible element and metal so that part of the unit is likely to fail.</li> <li>*b. unit is so damaged or deteriorated that it is no longer capable of carrying out its proper function.</li> </ul>

**48 Suspension**

Method of Inspection	Reason for Failure
<p>6. Check Shock Absorbers for:</p> <ul style="list-style-type: none"> <li>a. presence.</li> <li>b. condition and security.</li> <li>c. leaks.</li> <li>d. condition of the rubber bush or pivot.</li> <li>e. presence and condition of linkage and bracket.</li> </ul> <p>7. Check Anti roll bar for:</p> <ul style="list-style-type: none"> <li>a. presence.</li> <li>b. security.</li> <li>c. condition.</li> </ul> <p>8. Check anti roll bar linkage/bracket or bushes for:</p> <ul style="list-style-type: none"> <li>a. presence.</li> <li>b. condition.</li> </ul> <p>9. Check all suspension types for condition and function.</p>	<p>6. Shock Absorber:</p> <ul style="list-style-type: none"> <li>*a. missing from a vehicle on which it is a standard component.</li> <li>*b. with an anchorage fractured, unit insecure or with a sleeve damaged so that the unit is not functioning correctly.</li> <li>*c. leaking .</li> <li>*d. with an excessively worn rubber bush or pivot.</li> <li>*e. linkage missing, linkage bracket cracked so that it is likely to fail, fractured or cracked or excessively worn.</li> </ul> <p>7. Anti roll bar:</p> <ul style="list-style-type: none"> <li>*a. missing from a vehicle on which it is a standard component.</li> <li>*b. insecure.</li> <li>*c. fractured, cracked, severely distorted or so corroded or worn that its strength is seriously reduced.</li> </ul> <p>8. Anti roll bar linkage/bracket or bushes:</p> <ul style="list-style-type: none"> <li>*a. missing.</li> <li>*b. fractured or cracked and likely to fail, or excessively worn.</li> </ul> <p>*9. A suspension unit so weak that the body or other part of the vehicle is fouling the road wheels or is likely to do so if the vehicle is laden.</p>

**53 Axles, Stub Axles and Wheel Bearings****Application**

This inspection applies to the steered wheels of all vehicles.

**A steered axle is** one which has a king pin or ball joints and can be turned to a left and right lock. An axle ceases being steered when it is fixed in the straight ahead position.

**When assessing excessive wear, play or king pin clearance (lift)** account must be taken of any information given below and/or manufacturers' data.

With the wheels on the ground king pin clearance is assessed between the stub axle upper yoke and beam axle using feeler gauges

With the wheels off the ground king pin clearance may be measured between the stub axle lower yoke and beam axle.

**For vehicles fitted with a "Hives" type thrust bearing** any clearance greater than 1.6mm would be considered excessive and in the case of any other type of bearing lift greater than 1.0mm.

**King pin and bushes.** Any movement greater than 10mm on a 500mm diameter wheel is considered excessive. For wheels of different diameter the maximum allowable movement should be in proportion to this figure.

**Wheel bearing free play can be isolated** by applying the service brake.

**Mercedes Sprinter range of vehicles have front suspension ball joints without springs**, these joints are allowed up to 3.0 mm of axial play (lift) and 3.0 mm of radial play. Rejection is only justified when play exceeds the manufacturer's limits.

**Steered axles manufactured by BPW** have a maximum clearance of 12 mm.

**Renault Mascot vehicles** with a design weight of 3.5 to 6.5 tonnes have a maximum king pin clearance of 1.2 mm.

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53 Axles, Stub Axles and Wheel Bearings	
Method of Inspection	Reason for Failure
<p>1. Check the:</p> <ul style="list-style-type: none"> <li>a. clearance between stub axle and axle beam.</li> <li>b. stub axle and axle beam for cracks.</li> </ul> <p>2. Check king pin for:</p> <ul style="list-style-type: none"> <li>a. security in axle beam.</li> <li>b. condition of king pin or bush.</li> <li>c. presence and security of retaining device.</li> </ul> <p>3. Check Swivel joints for:</p> <ul style="list-style-type: none"> <li>a. wear.</li> <li>b. security.</li> <li>c. presence and security of locking device.</li> </ul> <p>4. While a wheel is rocked using wheel play detector plates in the side to side mode Check Wheel bearings for free play.</p>	<p>1. Stub axle and axle:</p> <ul style="list-style-type: none"> <li>*a. excessive clearance between stub axle and axle beam.</li> <li>*b. cracked.</li> </ul> <p>2. King pin:</p> <ul style="list-style-type: none"> <li>*a. excessively loose in axle beam.</li> <li>*b. king pin or bush excessively worn.</li> <li>*c. retaining device missing or insecure.</li> </ul> <p>3. Swivel joint:</p> <ul style="list-style-type: none"> <li>*a. excessively worn.</li> <li>*b. insecure.</li> <li>*c. retaining or locking device missing or insecure.</li> </ul> <p>*4. Wheel bearing with excessive free play.</p>

**54 Steering****Application**

This inspection applies to all vehicles.

**A steered axle** is one which has a king pin or ball joints and can be turned to a left and right lock. An axle ceases being steered when it is fixed in the straight ahead position.

**Power steering must be inspected** with the engine running. If vehicles are fitted with additional equipment, belt driven from the engine, where the belt may cause a hazard to the inspector they should be tested without the engine running. Examples are belt driven refrigeration compressors and air conditioning.

**Exposure of structural cords on power steering hoses** is acceptable provided that these cords are not damaged.

**The hydraulic fluid level check** only applies to readily visible reservoirs which can be checked without removing the reservoir cap.

**Any leakage from a power steering system** is a Reason for Failure.

**For articulated buses** with steered wheels on the trailer and on any self steered axle, visually check joints and components for wear and condition.

**With the road wheels on the ground** rock the steering and check all steering joints and fixings.

Instruct the driver to rotate the steering wheel through its full working range. If a lock stop, which is known to be a standard fitment, is missing this is a Reason for Failure. It should be noted however that in some cases there is provision for extra lock stops which are not a standard item. Where two are fitted only one needs to fulfil the function **on each lock**. They may be integral with the steering mechanism.

**If carrying out a steering full lock check with the wheels raised;** any steering component, road wheel or tyre fouls any part of the vehicle when the vehicle is raised but does not foul any of these items when the vehicle is on the ground under normal running conditions, this is not a RfF

**Vehicles with independent front suspension** should be checked with the suspension in the normal running position.

**Common means of acceptable locking devices are:**

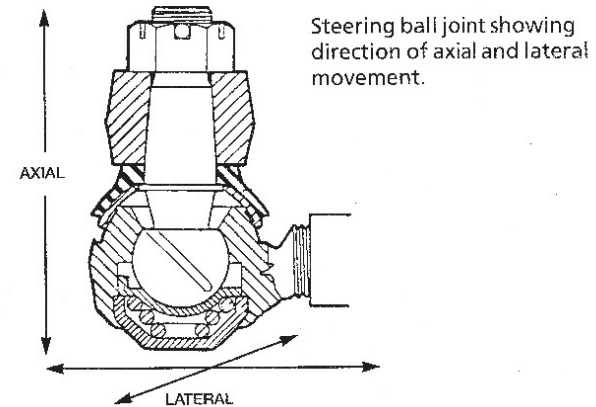
Anti-rattle washers, split pins, lock wire, spring washers, nyloc nuts, liquid locking compounds and self locking castle type nuts.

**If a plain flat washer is used with a spring washer** the locking action of the spring washer becomes ineffective.

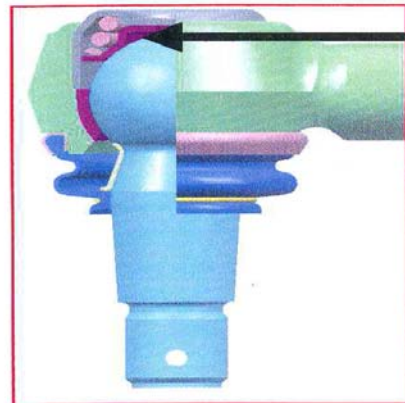
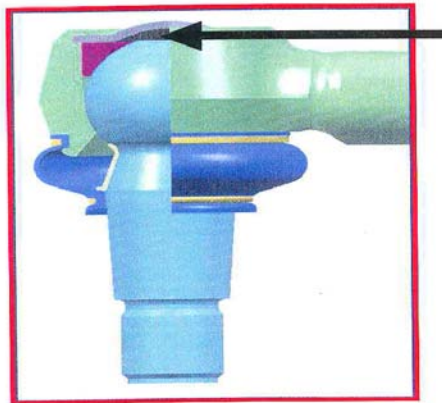


**54 Steering****Application**

Visually check for axial and lateral movement of all ball joints. Where a ball joint is fitted with a spring to take up such movement, the compression of the spring must not be mistaken for excessive wear. If excessive wear is suspected check by using hand pressure.



An increasing number of vehicles are now fitted with different types of ball joint, spring loaded or rubber mounted type each having different wear limits (some vehicle may be fitted with both types of joint). The rubber mounted type has a smaller wear limit than the spring loaded type.



**Manufacturers with conventional ball joints** have stated that axial movement up to 2mm is acceptable.

54 Steering	
Method of Inspection	Reason for Failure
<p>1. Check all types of Power steering for:</p> <ul style="list-style-type: none"> <li>a. correct operation.</li> <li>b. presence and completeness.</li> <li>c. air or fluid leaks.</li> <li>d. hydraulic fluid level.</li> <li>e. pump security and any drive system for presence and condition.</li> <li>f. condition of pipes and hoses, and for fouling of other parts of the vehicle.</li> <li>g. condition of ram and/or ram body anchorage, free play at ram anchorage.</li> <li>h. free play between ball and valve.</li> <li>i. cables damaged, excessively corroded.</li> <li>j. inappropriate repair or modification.</li> <li>k. malfunction Indicator lamp does not indicate a fault.</li> </ul> <p>2. Check Steering:</p> <ul style="list-style-type: none"> <li>a. ball pin shank for security.</li> <li>b. neck of a ball pin, for condition.</li> <li>c. track rod or drag link end for security.</li> <li>d. joints for abnormal movement.</li> </ul>	<p>1. Power steering:</p> <ul style="list-style-type: none"> <li>*a. not working correctly.</li> <li>b. removed or disconnected when a standard fitment.</li> <li>c. with an air/fluid leak from any part of the system.</li> <li>d. reservoir is empty or fluid is below minimum level.</li> <li>e. pump insecure or its drive system missing or defective.</li> <li>f. pipe or hose excessively corroded, damaged, bulging or fouling other parts of the vehicle.</li> <li>g. with a cracked or damaged ram and/or ram body anchorage, any excessive free play at ram anchorage.</li> <li>h. with excessive free play between ball and valve to the extent that separation is likely.</li> <li>i. with cables damaged, excessively corroded.</li> <li>j. with an inappropriate repair or modification.</li> <li>k. malfunction Indicator lamp indicates a fault.</li> </ul> <p>2. Steering with:</p> <ul style="list-style-type: none"> <li>*a. a ball pin shank loose.</li> <li>b. a sharp or deep groove at the neck of a ball pin.</li> <li>c. a track rod or drag link end insecure.</li> <li>d. any abnormal movement in a joint.</li> </ul>

54 Steering	
Method of Inspection	Reason for Failure
<p>2. Check Steering (continued) :</p> <ul style="list-style-type: none"> <li>e. sector shaft and drop arm has no movement.</li> <li>f. pivot point condition (e.g. an intermediate drop arm).</li> <li>g. parts fixed to the chassis for security (e.g. an intermediate drop arm, pivot housing, steering box, ram arm).</li> <li>h. arm and fixings has no movement between them.</li> <li>i. components for fractures, cracks or damage, wear, misaligned and deformation.</li> <li>j. retaining or locking device for installation and security.</li> <li>k. lock stops for installation, security and function.</li> <li>l. components have not been modified and or repaired inappropriately by welding or showing signs of excessive heat being applied.</li> <li>m. component, road wheels or tyres are not fouling any part of the vehicle.</li> <li>n. track rod is not excessively deformed.</li> <li>o. is smooth and free in operation.</li> </ul>	<p>2. Steering with (continued):</p> <ul style="list-style-type: none"> <li>e. movement between sector shaft and drop arm.</li> <li>f. excessive wear in a pivot point (e.g. an intermediate drop arm).</li> <li>g. a part fixed to the chassis insecure (e.g. an intermediate drop arm, pivot housing, steering box, ram arm).</li> <li>h. movement between a steering arm and its fixings.</li> <li>*i. a component fractured or so cracked, damaged, misaligned, deformed or so worn that it is likely to fail.</li> <li>*j a retaining or locking device ineffective, not fitted or insecure.</li> <li>k. a steering lock stop missing, insecure or not fulfilling its function.</li> <li>l. a component inappropriately modified, repaired by welding and or showing signs of excessive heat being applied.</li> <li>m. any steering component, road wheel or tyre fouling any part of the vehicle.</li> <li>n. track rod excessively deformed.</li> <li>*o roughness or undue stiffness in the operation of the steering.</li> </ul>

# Public Service Vehicle Inspection Manual

54 Steering	
Method of Inspection	Reason for Failure
<p>2. Check Steering (continued) :</p> <ul style="list-style-type: none"> <li>p. lift and end float of a sector shaft.</li> <li>q. rack for wear.</li> <li>r. rack housing for movement in bushes.</li> <li>s. rack gaiters are complete, undamaged and not displaced.</li> <li>t. ball joint dust covers for presence and condition.</li> <li>u. for leaks.</li> <li>v. gear casing for fractures.</li> </ul>	<p>2. Steering with (continued):</p> <ul style="list-style-type: none"> <li>p. excessive lift or end float of a sector shaft.</li> <li>q. excessive wear in the steering rack.</li> <li>r. excessive movement of rack housing in mounting bushes.</li> <li>s. a rack gaiter (if rack originally fitted with gaiters) split, damaged, missing or displaced.</li> <li>t. a ball joint dust cover missing, insecure, excessively damaged or severely deteriorated to the extent that it would no longer prevent the ingress of dirt etc.</li> <li>u. leak of oil or grease.</li> <li>v. gear casing fractured.</li> </ul>

**57 Transmission****Application**

This inspection applies to all vehicles, including Hybrid Electric Vehicles (HEVs) and Electric Vehicles (EVs).

**Vehicles must be in neutral gear** and with any transmission brake released during this inspection.

**The presenter should be advised if any shaft** or carrier locking device is missing or ineffective.

**Failure for excessive wear of a universal joint is only justified** when radial movement indicates that needle roller bearings are missing from one or more cups.

**Transmission shafts include those shafts that** transmit drive for HEV and EV.

**Propeller shaft spline wear** is not a Reason for Failure.

**A power take off prop shaft universal joint** is not subject to this inspection.

Method of Inspection	Reason for Failure
<p>1. Check all vehicles for:</p> <ul style="list-style-type: none"> <li>a. propshaft flange bolt(s) for security and presence.</li> <li>b. condition of any flange and its security.</li> <li>c. condition of a shaft bearing.</li> <li>d. condition of a bearing housing and its security.</li> <li>e. condition of universal joints.</li> <li>f. condition of flexible couplings.</li> <li>g. condition of shaft(s).</li> <li>h. condition of a bearing housing flexible mounting.</li> <li>i. transmission shaft(s) fouling another component.</li> </ul>	<p>1. All vehicles with:</p> <ul style="list-style-type: none"> <li>a. a loose or missing propshaft flange bolt.</li> <li>b. any flange cracked or loose.</li> <li>c. excessive wear in a shaft bearing.</li> <li>d. a bearing housing insecure, cracked or fractured.</li> <li>e. excessive wear in a universal joint.</li> <li>f. deterioration of a flexible coupling such that failure is imminent.</li> <li>g. a seriously damaged or cracked shaft.</li> <li>h. deterioration of a bearing housing flexible mounting such that failure is imminent.</li> <li>i. evidence of a transmission shaft fouling on another component.</li> </ul>

Public Service Vehicle Inspection Manual

57 Transmission	
Method of Inspection	Reason for Failure
2. Check Front Wheel Drive for: <ul style="list-style-type: none"><li>a. condition and security of constant velocity or universal joints.</li><li>b. condition, of the flexible coupling.</li><li>c. condition presence and security of gaiters protecting a constant velocity joint.</li></ul>	2. Front Wheel Drive with: <ul style="list-style-type: none"><li>a. a constant velocity or universal joint excessively worn or insecure.</li><li>b. a flexible coupling severely cracked, softened or breaking up such that failure is imminent.</li><li>c. a constant velocity gaiter missing, insecure, excessively damaged or severely deteriorated to the extent that it would no longer prevent the ingress of dirt etc.</li></ul>

**58 Additional Braking Devices****Application**

This inspection applies to most buses (not local service buses) with a maximum gross weight greater than 10000kg first used from 1 April 1983 or 5000kg first registered 1 May 2002. A small but significant number of buses have been approved without additional braking devices due to the engine developing sufficient retardation without the need for an additional braking device. Whether the bus requires an additional braking device will have been determined at certification and will be recorded on the technical record for the vehicle. The particular requirements can be confirmed by Testing and Support Services, Ellipse, Swansea.

**If the device has been removed and it is mandatory** this will be a reason for failure. If the device is not mandatory but is shown on the vehicles technical record the operator should submit a notifiable alteration form VTP5 to PSV Section so that its removal can be confirmed and any reference to the device can be deleted from the vehicle record. Where an exhaust brake operating cylinder and lever are completely removed. The housing containing the butterfly may be retained with the butterfly fixed in the open position.

**Hybrid Electric Vehicles (HEVs) and Electric Vehicles (EVs)** where the power train equipment acts as a regenerative brake to comply with the additional braking requirements the unit(s) should be inspected as if it is an additional braking device. This will be marked on the technical record.

**The check of operation is made by visual assessment** to establish the likelihood of correct fitment and function, rather than to see actual operation. Failure is justified only when it is obvious that a device is inoperative i.e. a disconnected linkage.

**Any inoperative device will be a reason for failure irrespective of whether it is mandatory or not.**

**Air leaks for operating mechanisms of hydraulic retarders or exhaust brakes should be tested under item 59 and only fail if the leak is affecting the braking system.**

**If a vehicle is fitted with an electric retarder and the warning lamp does not illuminate** when the retarder is operated, this is not a reason for failure.

Method of Inspection	Reason for Failure
1. Check Additional Braking Devices for: <ul style="list-style-type: none"> <li>a. installation when known to be a mandatory fitment.</li> <li>b. operation, condition completeness, contamination and security.</li> <li>c. adequate clearance from other components.</li> <li>d. presence of a heat shield where required.</li> <li>e. signs of overheating of components or the surroundings.</li> <li>f. exhaust gas or oil leaks.</li> <li>g. security, positioning and condition of wiring.</li> </ul>	1. Additional Braking Device: <ul style="list-style-type: none"> <li>a. missing when known to be a mandatory item.</li> <li>b. inoperative, damaged, component missing, contaminated or insecure.</li> <li>c. with inadequate clearance with other components.</li> <li>d. heat shield missing.</li> <li>e. component or its surroundings overheating.</li> <li>f. with exhaust gas or oil leaks from the device.</li> <li>g. wiring insecure, badly positioned or damaged.</li> </ul>

**59 Brake Systems and Components****Application**

This inspection applies to all vehicles.

Automatic slack adjusters must be fitted to motor vehicles first used from 1 April 1995.

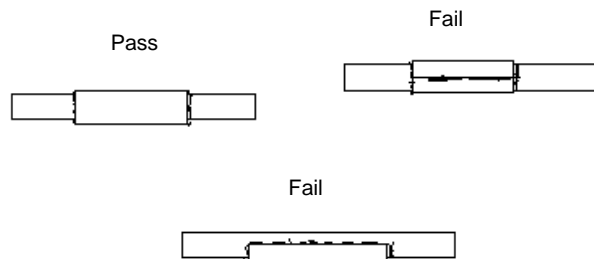
**A rod or lever reduced by more than one third** of its original diameter is considered a failure.

**A pipe with its wall thickness reduced** by more than one third of its original thickness is considered a failure.

**Cables with less than 10% of the wires fractured** are not regarded as a reason for failure unless there is bunching, or likelihood of bunching, where the cable enters an outer cable, guide or sleeve.

**A hose should be rejected** for surface cracking or damage by chafing only if the reinforcement is visible.

**Repairs to metal air brake pipes by sleeving** are acceptable, providing the repair appears to be good and sound. A pipe repaired in-situ by brazing is not considered acceptable. Repairs to hydraulic brake pipes are not acceptable. Compression joints of the type using separate ferrules are not considered suitable for joints on hydraulic pressure lines.



**Guidance on sleeved repairs** of metal brake pipes (sleeving is not acceptable on plastic brake pipes).

**The air pipe between the compressor and the reservoir** is to be taken as a brake pipe.

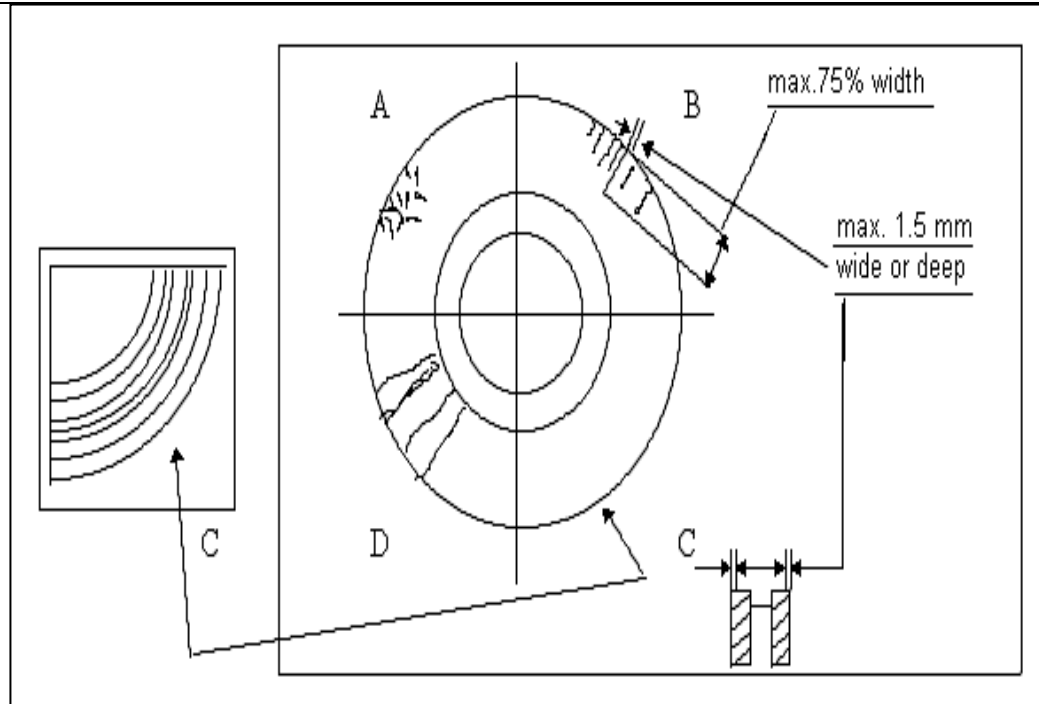
**Lever slack adjusters**; up to a total of 9.5mm radial movement at a radius of 150mm is considered acceptable within the slack adjuster and between the slack adjuster and cam cross shaft. Slack adjusters must have a secure fastening to the cross shaft including a locking device.

**Slack adjusters with different lever lengths** on the same axle are not a reason for failure, but the presenter needs to be informed to complete a VTP 5 notifiable alteration form.



## 59 Brake Systems and Components

## Application

**Disc Brakes**

The diagram to the left shows the types of damage which are likely to be found on brake discs and gives guidance on how much damage is acceptable before failing the vehicle. This should be a visual assessment.

A. Interlinked cracks or surface crazing = acceptable.

B. Cracks running towards hub centre up to max. 75% of the width of the friction surface, and a maximum of 1.5mm wide or deep = acceptable.

C. Unevenness in the disc surfaces less than 1.5 mm = acceptable.

D. Cracks running from edge to centre = not acceptable.

*The above diagram is for reference only.*

**Damp patches around valves** or adjacent components are not a Reason for Failure. Only where there is evidence of heavy discharge of oil from the valve at the time of test should there be a failure.

**To check the condition of brake pipes** including the output side of the compressor, valves, hydraulic master & wheel cylinders it will be necessary to ask the driver to pressurise the braking systems. There is no requirement for a specific check on the operation of all valves, however where it is obvious that a valve is malfunctioning during any stage of the test, this is a Reason for Failure.

**When assessing the significance of leaks**, it should be remembered that certain pneumatic components are subject to leakage to some degree.

**Vented master cylinders** as fitted in particular to some Bedford vehicles may be subject to some dampness around the vent, due to fluid in the bores of the cylinder used to lubricate the piston seals; this should not be treated as a defect.

## 59 Brake Systems and Components

### Application

**If spring brake actuators are fitted to the vehicle** inspect the components of this system with the park brake in the “off” position.

**Care should be taken when inspecting BPW axles** as the brake calliper may have 6 holes and only 5 bolts fitted.

**Reservoirs can be repaired by welding**, the term reservoir includes accumulators and other types of vacuum & pressure vessels.

**Missing or illegible LSV plate** only applies to PSVs registered on or after 29th October 2011.

**It is not a requirement for Load Sensing Valves (LSV) to be moved** manually to check their operation. In most cases a slight movement can be detected when the service brake is applied which is sufficient evidence that the LSV is operating. Only in the minority of cases where, in the opinion of the tester, the LSV appears seized and it is the type of valve that can be checked easily by hand without the possibility of causing damage should this be carried out.

**Pre 1995 vehicle which were fitted with automatic brake slack adjusters** that have been removed and replaced with manual ones. If the automatic slack adjuster brackets have not been removed and not being used this is acceptable.

**If a brake chamber is attached to a chassis cross member and the cross member is fractured** and parted at one end this is a reason for failure.

**Some manufacturers use different sizes of brake chambers in addition to the standard sizes** that have been used for many years and some manufacturers use common castings. For example a Type 22 can be made from a Type 24 casting. To avoid confusion the manufacturer fits a tag to confirm the chamber size. The first two digits are the service chamber size, if it is a spring brake the second two digits are the parking brake chamber size. This is an acceptable method of identifying chamber sizes.

**The hydraulic fluid level check** only applies to readily visible reservoirs which can be checked without removing the reservoir cap.

**There is a potential safety issue when performing a brake roller test on certain Scania vehicles fitted with a ‘Halt Brake.’** The Halt Brake applies the rear axle brakes each time the foot brake is depressed, and the brake is not released until the vehicle throttle is pressed as if to drive away. If the following procedure is adopted, it should overcome the need to attempt to move the vehicle during the brake test and the possibility of having to reverse back while on the brake rollers.

First axle test as normal, then follow steps 1 – 8 for the second axle:

- |   |                        |
|---|------------------------|
| 1. place rear wheels into brake rollers     | 2. apply park brake    |
| 3. ensure air pressure is at maximum        | 4. stop engine         |
| 5. switch off Ignition                      | 6. release park brake  |
| 7. switch ignition on (DO NOT START ENGINE) | 8. perform brake test. |

There should be no effects from the “Halt Brake” at any other stage of the inspection.

**59 Brake Systems and Components**

Method of Inspection	Reason for Failure
<p><b>Brake Components:</b></p> <ol style="list-style-type: none"> <li>1. Check brake rods, clevis joints, linkages, relays, levers, pins, pivots, slack adjusters or cables for:               <ol style="list-style-type: none"> <li>a. condition.</li> <li>b. correct adjustment.</li> <li>c. a locking device which is effective, secure and present.</li> <li>d. the condition and completeness of a brake cable.</li> <li>e. the condition; fitment completeness, security and operation of components of an automatic slack adjuster.</li> <li>f. mandatory automatic slack adjuster fitted.</li> <li>g. the travel of a brake fitted with an automatic slack adjuster, compare the travel of the automatic slack adjusters across the same axle, the slack adjuster lever returns fully when the brakes are released.</li> <li>h. condition of cable guide.</li> </ol> </li> <li>2. Check brake pipes and flexible hoses for:               <ol style="list-style-type: none"> <li>a. clearance of moving parts.</li> <li>b. condition.</li> </ol> </li> </ol>	<p><b>Brake Components</b></p> <ol style="list-style-type: none"> <li>1. A brake rod, clevis joint, linkage, relay, lever, pin, pivot, slack adjuster or cable:               <ol style="list-style-type: none"> <li>*a. seriously weakened by excessive wear, corrosion, damage or reduced in diameter by more than the prescribed limit.</li> <li>*b. with abnormal movement indicating incorrect adjustment or excessive radial free play.</li> <li>*c. with an ineffective, insecure or missing locking device.</li> <li>*d. a brake cable knotted, or with more wires broken than permitted by the specified standard.</li> <li>*e. automatic slack adjuster component missing, is disconnected, insecure, distorted, fractured or inoperative.</li> <li>*f. mandatory automatic slack adjuster not fitted.</li> <li>*g. a brake fitted with an automatic slack adjuster exceeding two-thirds of the travel of the brake actuator, or obviously having a different travel from another brake on the same axle, or not returning fully when brakes are released.</li> <li>*h. cable guide is defective.</li> </ol> </li> <li>2. Brake pipes and flexible hoses:               <ol style="list-style-type: none"> <li>*a. fouled by moving parts.</li> <li>*b. excessively chafed, cracked with reinforcement cords exposed, excessively corroded, deteriorated, damaged, leaking, bulging, kinked, stretched or twisted.</li> </ol> </li> </ol>

**59 Brake Systems and Components**

Method of Inspection	Reason for Failure
<p>2. continued...</p> <ul style="list-style-type: none"> <li>c. adequately clipped or otherwise adequately supported.</li> <li>d. repairs and suitable joint fittings.</li> <li>e. non-metallic pipe(s) condition.</li> </ul> <p>3. Check brake drums, back plates &amp; shoes, discs, callipers &amp; pads including friction material for:</p> <ul style="list-style-type: none"> <li>a. security and condition.</li> <li>b. brake back plate or calliper security bolt(s) secure and complete.</li> <li>c. brake lining(s) or pad(s) are secure and not less than 1.5mm thick at any one point.</li> <li>d. no restriction with the movement of a brake component.</li> </ul> <p>4. Check reservoirs for:</p> <ul style="list-style-type: none"> <li>a. security, condition and leaks.</li> <li>b. damage.</li> <li>c. the condition of the securing strap.</li> <li>d. Presence.</li> </ul> <p>5. Check air actuators, hydraulic master &amp; wheel cylinders, valves &amp; servos for:</p> <ul style="list-style-type: none"> <li>a. operation.</li> <li>b. security.</li> <li>c. condition.</li> <li>d. a locking device fitted and secure.</li> </ul>	<p>2. continued...</p> <ul style="list-style-type: none"> <li>*c inadequately clipped or otherwise inadequately supported.</li> <li>*d. inadequately repaired or with unsuitable joint fittings.</li> <li>*e non-metallic pipe(s) exposed to excessive heat.</li> </ul> <p>3. Brake drums, back plates &amp; shoes, discs, callipers &amp; pads including friction material with:</p> <ul style="list-style-type: none"> <li>*a. a brake back plate, disc or drum in such a condition that it is seriously weakened or insecure.</li> <li>*b. a brake back plate or calliper securing bolt loose or missing.</li> <li>*c. a brake lining or pad insecure or less than 1.5mm thick at any point.</li> <li>*d. restricted movement of a brake component.</li> </ul> <p>4. A reservoir:</p> <ul style="list-style-type: none"> <li>*a. insecure, excessively corroded, or leaking.</li> <li>*b With dents that reduce the capacity or with angled dents.</li> <li>*c. with a securing strap fractured, cracked, excessively corroded or chafing on the reservoir or other mounting.</li> <li>*d. Missing where it is known to be a standard fitting.</li> </ul> <p>5. Air actuators, hydraulic master &amp; wheel cylinders, valves &amp; servos:</p> <ul style="list-style-type: none"> <li>*a defective in operation.</li> <li>*b insecure.</li> <li>*c. leaking air or fluid, fractured, cracked, excessively damaged or corroded.</li> <li>*d. with a locking device missing or insecure.</li> </ul>

**59 Brake Systems and Components**

Method of Inspection	Reason for Failure
<p>5. continued...</p> <ul style="list-style-type: none"> <li>e. travel of operating mechanism.</li> <li>f. the cap is fitted to a hydraulic master cylinder.</li> <li>g. sufficient brake fluid.</li> <li>h. fluid level device.</li> <li>i. a discharge of oil.</li> <li>j. a load sensing valve fitted, and connected when it is known to be a standard fitment.</li> <li>k. a load sensing valve, linkage and brackets for condition, movement and adjustment.</li> <li>l. dust cover presence and condition (only applicable to hydraulic brake actuators).</li> </ul> <p>6. Check the load sensing valve data plate for:</p> <ul style="list-style-type: none"> <li>a. presence.</li> <li>b. legibility.</li> </ul> <p>7. Where an air compressor is belt driven, check the drive for:</p> <ul style="list-style-type: none"> <li>a. fitment of a drive belt, its condition and adjustment.</li> <li>b. security of the pulley, its condition and presence.</li> </ul>	<p>5. continued...</p> <ul style="list-style-type: none"> <li>*e. with excessive travel of operating mechanism indicating a need for adjustment.</li> <li>*f. with a cap missing from a hydraulic master cylinder.</li> <li>*g fluid below minimum level or level warning device activated.</li> <li>*h fluid level warning device defective.</li> <li>*i. with a valve with excessive discharge of oil.</li> <li>*j. a load sensing valve removed or disconnected when it is known to be a standard fitment.</li> <li>*k. a load sensing valve obviously seized or restricted in its free movement, linkage or brackets cracked, defective or out of adjustment.</li> <li>*l. hydraulic brake actuator dust cover, missing, insecure, excessively damaged or deteriorated to the extent that it would no longer prevent the ingress of dirt etc.</li> </ul> <p>6. A load sensing data plate:</p> <ul style="list-style-type: none"> <li>*a. missing.</li> <li>*b. illegible.</li> </ul> <p>7. Air Compressor Drive:</p> <ul style="list-style-type: none"> <li>*a. a drive belt missing, badly deteriorated and/ or so loose that it is likely to slip.</li> <li>*b. a compressor drive pulley loose, cracked or missing.</li> </ul>

**62 Rear Markings and Reflectors****Application****Reflectors**

This inspection applies to all motor vehicles but only obligatory reflectors are to be checked.  
Every vehicle requires two red reflectors facing to the rear.

**Rear markings**

This inspection applies only to articulated buses. The type of marking which is acceptable is shown in the table below. The type numbers refer to the diagram on the following pages.

Overall length	Acceptable type of markings for vehicles first used before 1 April 1996	Acceptable markings for vehicles first used from 1 April 1996
More than 13m	4,,5,10,11,12 or 13	10,11,12 or 13

A rear marker board must not be more than 10% obliterated or obstructed.

Rear markings must be fitted with the lower edge between 400mm and 1700mm from the ground.

**Reflectors**

The inspection does not include a check that the reflectors have the appropriate approval mark. Reflective plates or tape are not acceptable as a substitute for a reflector. The check for position should be visual and only vehicles with reflectors and markings obviously out of position should be failed for this reason.

**Rear Reflectors**

The maximum height from the ground is 900mm. There are some exceptions:

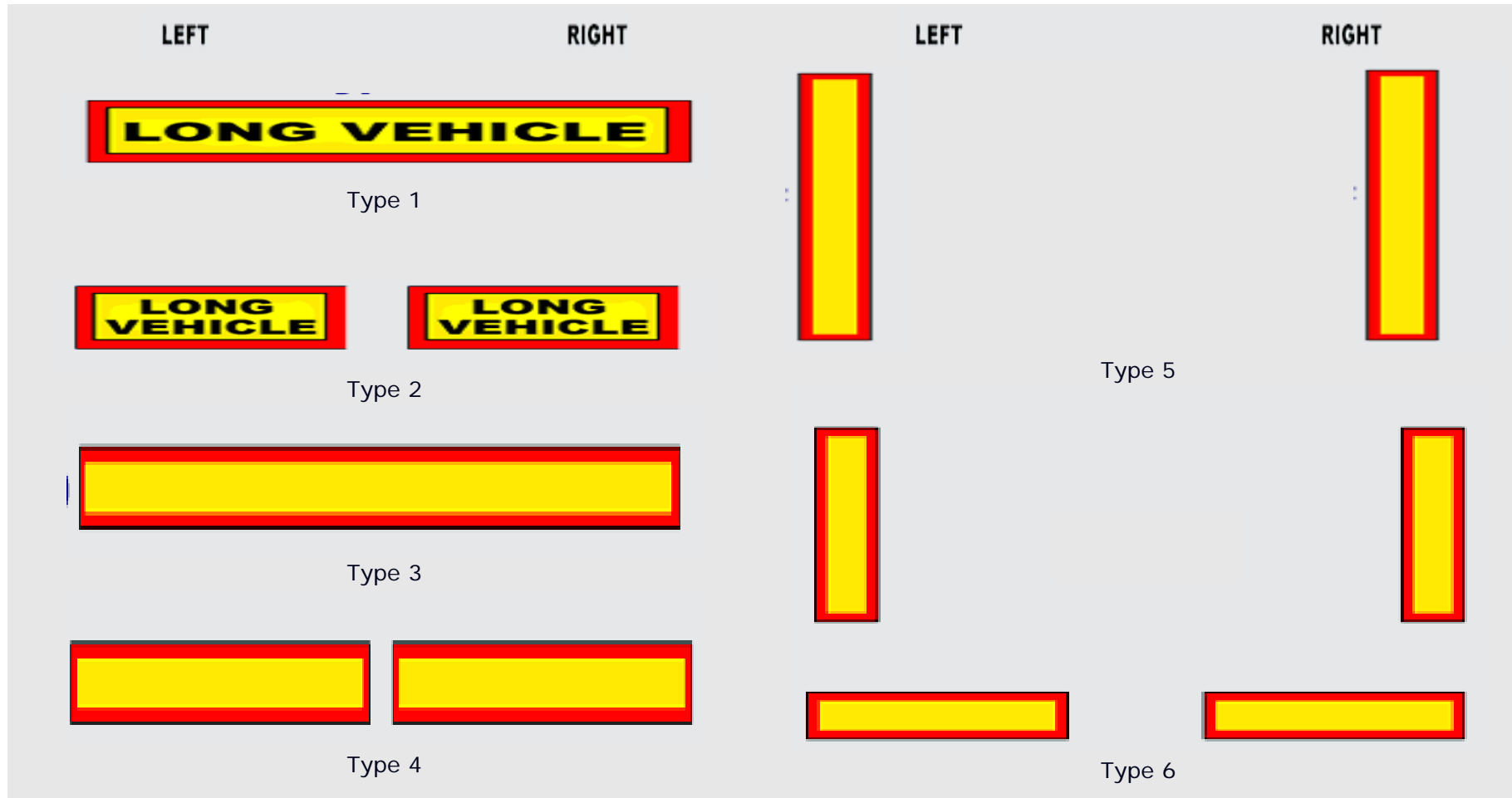
- If 900mm is impractical it can be 1500mm.
- For vehicles used before 1 April 1986 and trailers manufactured before 1 October 1985 the maximum height is 1525mm.

**If less than 50% of a reflector is visible**, this is a reason for failure.

**Triangular reflectors** can only be fitted to trailers and if fitted to a vehicle this is a failure under RfF 1f.

**62 Rear Markings and Reflectors  
Application**

Acceptable approval marks for rear marker boards are either BSAU152 (diagrams 1 - 2), 'E' or 'e' (diagrams 3 - 6).



Public Service Vehicle Inspection Manual

62 Rear Markings and Reflectors	
Method of Inspection	Reason for Failure
<p>1. Check reflectors and rear markings are:</p> <ul style="list-style-type: none"> <li>a. correctly positioned.</li> <li>b. fitted.</li> <li>c. secure.</li> <li>d. clearly visible.</li> <li>e. facing the appropriate direction.</li> <li>f. of the correct type fitted.</li> <li>g. clean and effective and their function is clear.</li> <li>h. complete.</li> </ul> <p>2. Check reflectors for the appropriate colour.</p>	<p>1. Reflectors and or rear markings:</p> <ul style="list-style-type: none"> <li>a. incorrectly positioned.</li> <li>b. missing.</li> <li>c. insecure.</li> <li>d. not clearly visible.</li> <li>e. not facing to the appropriate direction.</li> <li>f. of the incorrect type fitted.</li> <li>g. so dirty or ineffective that its function is impaired.</li> <li>h. broken, damaged or incomplete to the extent that the reflecting area is significantly reduced.</li> </ul> <p>2. A reflector not of the appropriate colour.</p>



**63 Lamps****Application**

The inspection of front position lamps, headlamps, rear position lamps and registration plate lamps applies to all the obligatory lamps fitted.

**Stop Lamps**

The inspection of stop lamps applies to any stop lamp fitted.

**End Outline Marker Lamps**

The inspection of end outline marker lamps applies to the obligatory marker lamps fitted to vehicles first used from 1 April 1991 which are more than 2.1m wide.

**The front and the rear end out line markers lamps may be** combined

**It is not acceptable for a position light to be used** additionally as a marker lamp. A separate lamp must be fitted.

**Rear Fog Lamps**

The inspection of rear fog lamps applies to any vehicle fitted with a rear fog lamp.

Rear fog lamps must be fitted to vehicles first used from 1 April 1980.

**The rear fog lamps are permitted to be reciprocally incorporated with the rear position lamps** providing the positional requirements are met (when the fog lamp is switched on the rear position lamps intensity increases to become the fog lamp).

**Inspection of non-obligatory rear fog lamps is restricted to** a check of colour (RfF 1.d) and whether operation of the brakes affects the fog lamp (RfF 1.g).

**No more than two rear fog lamps** may be fitted.

**Headlamps**

The plain looking covers fitted to some vehicle headlamps should be treated as a lens.

**Rear Registration Plate Lamps**

Clear covers for registration lamp bulbs are not to be classed as a lens and would only constitute a RfF when the lamp can not illuminate the registration plate.

The registration plate lamp must be fitted in a position where it can illuminate the registration plate. A lamp fitted in a position where it cannot do this is not a registration plate lamp and this should be dealt with under Reason for Failure 1(a).

**63 Lamps****Application**

**Matched Pair**, this means that the lamps emit light of the same colour; intensity and that both lamps are of the same size and are symmetrical to one another.

**If there is more than 1 bulb or LED** in the lamp at least 50% must work.

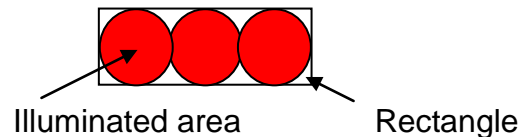
**The check for position** should be visual and only vehicles with lamps obviously out of position should be failed for this reason. A summary of the main requirements for each type of lamp is shown at the end of the application section.

**Before failing for the operation of a lamp being** affected by the operation of another lamp. The engine should be run to charge the electrical system.

**Light that bleeds through from an adjacent lamp** is acceptable provided the illuminated light lens does not change colour.

**Obscuration of lamps**, provided at least 50% of a lamp is visible this is not a RfF.

**If two or more lamps are fitted** and the aggregated illuminated area occupies 60% or more of the area of the smallest rectangle circumscribing the illuminated area this should be treated as one lamp.



**Gas discharge lamps, blue tint bulbs and lamps with neutral colour lenses** are acceptable providing when lit the light emitted is white or; if it is a direction indicator is amber or in the case of a stop lamp red.

**Vehicles equipped with dim dip** require the front position lamps to be checked for operation with the ignition switched off.

**Main beam warning lamps** are required on vehicles first used on or after 1 April 1986.

# Public Service Vehicle Inspection Manual

## 63 Lamps

### Application

A summary of the main requirements for each type of lamp is shown below.

TYPE	DATE OF FIRST USED	POSITION			COLOUR
		MAX DISTANCE FROM SIDE (MM)	MAX HEIGHT (MM)	MINIMUM HEIGHT (MM)	
Front Position Lamps	From April 1986	400	-		White or yellow if in a headlamp which shows yellow light
	Before April 1986	510	-	-	
Front End Outline Marker Lamp	From April 1991	400	-	The top of the lamp shall be no lower than the top of the windscreen	White
Dipped Beam Headlamp	From 1972 (refer to Lighting regulations for earlier vehicles)	400 Being a matched pair	1200	500	White or Yellow
Main Beam Headlamp			-	-	White or Yellow
Rear Position Lamps	From April 1986	400	1500 or if impracticable 2100	350	Red
	Before April 1986	800	2100	-	
Rear End Outline Marker Lamps	From April 1991	400	-	As high as possible with regard to the lateral position, and the use for which the vehicle is constructed	Red
Stop Lamps	From 1971 (refer to Lighting regulations for earlier vehicles)	One on each side with a minimum separation distance of 400mm	1500 or if impracticable 2100	350	Red
Rear Registration Plate Lamp	All vehicles	-	-	-	White
Rear Fog Lamp	From April 1980	Where one lamp is fitted: On centre line or offside of vehicle.	1200	250	Red

# Public Service Vehicle Inspection Manual

63 Lamps	
Method of Inspection	Reason for Failure
<p>1. Check lamps for:</p> <ul style="list-style-type: none"> <li>a. presence and security of an obligatory lamp.</li> <li>b. correct illumination and function.</li> <li>c. presence of the lens, its visibility, security and condition.</li> <li>d. showing a light of the right colour.</li> <li>e. correctly positioned.</li> <li>f. a steady light when lightly tapped by hand.</li> <li>g. not being affected by the operation of any other lamp.</li> </ul> <p>2. Check (in addition to the above):</p> <ul style="list-style-type: none"> <li>a. the fog lamp has a tell tale fitted, working and visible to the driver.</li> <li>b. the number of rear fog lamps fitted.</li> </ul> <p>3. Check the stop lamp shows (in addition to the above) a steady red light when the brakes are applied, and goes out when the brakes are released.</p>	<p>1. For all lamps:</p> <ul style="list-style-type: none"> <li>*a an obligatory lamp missing or insecure.</li> <li>*b a lamp dim or not working.</li> <li>*c a lens missing, obscured, insecure, or damaged so it is likely to fall apart.</li> <li>*d not showing a light of the right colour.</li> <li>*e incorrectly positioned.</li> <li>*f flickers when lightly tapped by hand.</li> <li>*g is affected by the operation of any other lamp.</li> </ul> <p>2. Fog lamp (in addition to the above):</p> <ul style="list-style-type: none"> <li>a. tell-tale not fitted, not working or cannot be seen by the driver.</li> <li>b. more than two rear fog lamps are fitted.</li> </ul> <p>*3. Stop lamp does not show a steady red light when the brakes are applied, or does not go out when the brakes are released.</p>

63 Lamps	
Method of Inspection	Reason for Failure
<p>4. Check a headlamp for (in addition to the above):</p> <ul style="list-style-type: none"> <li>a. forming part of a matched pair.</li> <li>b. being positioned symmetrically in relation to the other lamp.</li> <li>c. a lamp of a matched pair showing a light of the same intensity and colour as the other.</li> <li>d. a main beam headlamp that can be switched off by the operation of one switch which at the same time leaves a pair of dipped beams.</li> <li>e. a main beam warning light illuminates when main beam is selected and extinguishes when dipped beam is selected.</li> </ul> <p>5. Check the rear registration plate lamp (in addition to the above) does not throw direct light to the rear.</p>	<p>4. Headlamp (in addition to the above):</p> <ul style="list-style-type: none"> <li>a. not forming part of a matched pair.</li> <li>b. not positioned symmetrically in relation to the other lamp.</li> <li>c. one of a matched pair does not show a light of the same intensity and colour as the other.</li> <li>d. a main beam headlamp cannot be switched off by operating one switch which at the same time leaves a pair of dipped beams.</li> <li>e. main beam warning lamp does not illuminate when main beam is selected and extinguish when dipped beam is selected.</li> </ul> <p>5. A rear registration plate lamp throws direct light to the rear.</p>

**66 Direction Indicators and Hazard Warning Lamps****Application****Direction indicators**

This inspection applies to all vehicles first used after 1 January 1936.

Side repeaters are required on vehicles first used from 1 April 1986.

**All indicators fitted must work. These must show amber light unless** fitted to a vehicle first used before 1 September 1965 when both indicators may show white to the front or red to the rear.

**The tell-tale on direction indicators may be audible rather than visual but** for hazard warning lamps it must be a flashing light. A tell tale is not required if the operation of one or more indicators on each side can be seen from the driver's seat.

**If the flash rate is below 60 times per minute**, recheck with the engine running.

**A semaphore indicator is acceptable.** It must illuminate when in operation, and is not required to flash.

**Hazard warning lamps**

This inspection applies to all vehicles fitted with hazard warning lamps.

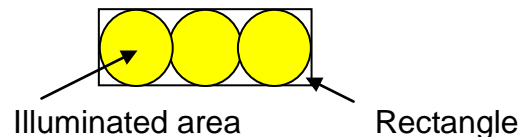
They need not be fitted to vehicles first used before 1 April 1986.

The tell-tale shall be a flashing light which may operate in conjunction with any direction indicator tell-tale, with the ignition on and off.

**Where red neutral direction indicator lenses** with an amber bulb are fitted, the assessment made must be against the colour of the light emitted not the colour of the lens.

**Some vehicles are fitted with obligatory indicator/side repeater lamps**, these remain illuminated when the side lights are switched on. This is not a RfF provided the lamp flashes when required.

**If two or more lamps are fitted** and the aggregated illuminated area occupies 60% or more of the area of the smallest rectangle circumscribing the illuminated area this should be treated as one lamp.



**If more than one bulb or LED** is fitted in the lamp at least 50% must work.

**66 Direction Indicators and Hazard Warning Lamps**

Method of Inspection	Reason for Failure
<p>1. Check direction indicators for:</p> <ul style="list-style-type: none"> <li>a. presence, operation, condition and are visible to the front and rear.</li> <li>b. presence of a side repeater.</li> <li>c. the presence of the lens, its security and condition.</li> <li>d. flashing at between 60 to 120 times a minute.</li> <li>e. a light of the right colour.</li> <li>f. presence of a tell-tale, its operation and can be seen/heard by the driver.</li> <li>g. the rate of flash and illumination is not affected by any other lamp.</li> <li>h. the operation of a semaphore indicator.</li> </ul> <p>2. Check hazard warning lamps for:</p> <ul style="list-style-type: none"> <li>a. operation with the engine stopped and the ignition switched off and on.</li> <li>b. all the direction indicator lamps operating simultaneously when switched on by one switch.</li> <li>c. presence of a tell-tale, its operation and that it can be seen by the driver.</li> </ul>	<p>1. Direction indicator:</p> <ul style="list-style-type: none"> <li>a. missing, inoperative, dim or not visible either to the front or to the rear.</li> <li>b. side repeater missing.</li> <li>c. lens missing, insecure or damaged so that it is likely to fall apart.</li> <li>d. does not flash at between 60 to 120 times a minute.</li> <li>e. does not show a light of the right colour.</li> <li>f. tell-tale not fitted, is inoperative or cannot be seen/heard by the driver.</li> <li>g. rate of flash or illumination is affected by any other lamp.</li> <li>h. a semaphore indicator sticking.</li> </ul> <p>2. Hazard warning lamp:</p> <ul style="list-style-type: none"> <li>a. does not operate with the engine stopped and the ignition switched off and on.</li> <li>b. all the direction indicator lamps do not operate simultaneously when switched on by one switch.</li> <li>c. tell-tale not fitted, is inoperative or cannot be seen by the driver.</li> </ul>

**67 Aim of Headlamps****Application**

The headlamp aim criterion is applicable to all dipped beam headlamps.

**Headlamp beam converters fitted to right hand dipping headlamps** which effectively mask/deflect the beam are acceptable provided that the pass criteria are met.

**Some vehicles may be fitted with an "in-cab" headlamp adjustment** device. If the vehicle is presented for test unladen, the in cab headlamp adjustment device must be set relative to this condition. In all other cases this may be adjusted to enable both headlamps to meet the criteria, however both headlamps must comply with the requirements with the device set in one position.

**The headlamp control in the cab is allowed** to be used to align the headlamps without failing the vehicle.

**Most modern vehicles are fitted with European headlamps.** Dipped beam headlamps can be identified from the marking on the lamps. There will be a "C" shown above an "E" or "e" mark.

**Repairs must not be carried out during a test however;** minor adjustments to the headlamp aim are acceptable.

**If the beam pattern is blurred due to condensation** and does not show a distinctive cut-off point for the examiner to determine whether the alignment is correct this will be a failure under Reason for Failure 1.

In all cases, PSVs first used before 1 October 1969 are only required to have the beam checked to see that it does not cause undue dazzle or discomfort to other road users. These vehicles must be tested non-electronically.

**Some vehicles with complex headlamp systems** (with the dipped beam and main beam having separate pockets) may be encountered. It is essential that the headlamp aim test equipment is aligned exactly on the centre of the dipped beam pocket. At this point it may not be possible to see a clearly defined headlamp pattern, in order to see the full beam pattern, it may be necessary to move the vehicle closer to the test equipment. Once this has been done, the beam pattern should be clearly visible on the aiming screen. When a full pattern can be seen, the normal assessment of headlamp aim should be followed.

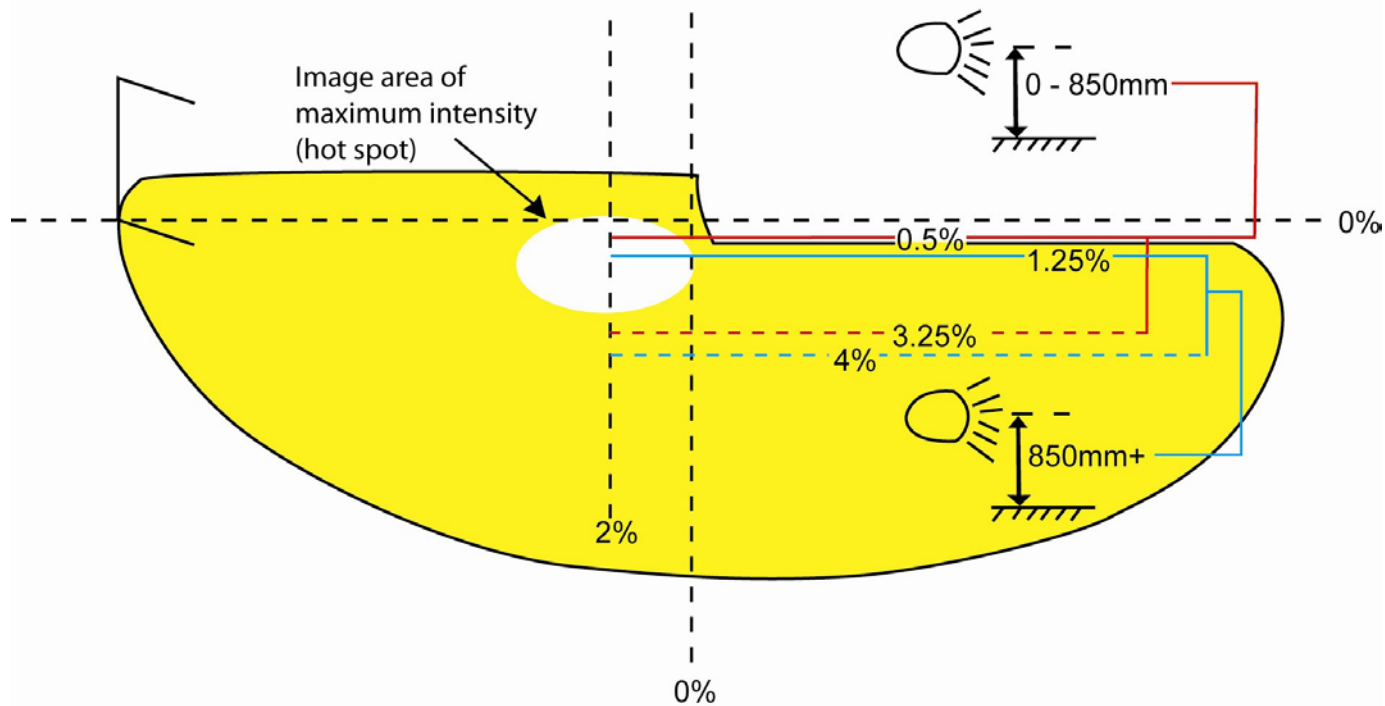
The standards to be applied are shown above the beam patterns likely to be encountered on the following pages.



67 Aim of Headlamps	
Method of Inspection	Reason for Failure
<p><b><u>European checked on Dipped Beam</u></b> Align the headlamp aim testing equipment to the vehicle in accordance with the manufacturer's instructions.</p>	<p>1. In relation to the 0% Horizontal line, the beam horizontal cut-off line is not between the limits listed below.</p> <p><b>Headlamp centres up to and including 850mm high</b> Upper limit: All vehicles. 0.5%      Lower limit: All vehicles 4.0%</p> <p><b>Headlamp centres over 850mm high</b> Upper limit: All vehicles. 1.25%      Lower limit: All vehicles 4.0%</p> <p>2. The beam image contains a "Kick up" that is not visible on the screen</p> <p>3. White light shows in the zone formed by the 0% vertical and 0.5% horizontal lines</p>

**67 Aim of Headlamps**

Method of Inspection	Reason for Failure
<p><b><u>British American Checked on Dipped Beam</u></b></p> <p>Align the headlamp aim testing equipment to the vehicle in accordance with the manufacturer's instructions.</p>	<p>4. In relation to the 0% Horizontal line, <b>the upper edge</b> of the "Hot Spot" is not between the limits listed below.</p> <p><b>All headlamp heights</b>  Upper limit: All vehicles. 0%  Lower limit: All vehicles 4.0%</p> <p>5. The right hand edge of the "Hot Spot" is to the right of the vertical 0% line, or more than 2% to the left of it.</p> <p>6. All - A Headlamp dips to the right. (See note in Applications).</p>



67 Aim of Headlamps	
Method of Inspection	Reason for Failure
<p><b><u>British American Checked on Main Beam</u></b></p> <p>Align the headlamp aim testing equipment to the vehicle in accordance with the manufacturer's instructions.</p>	<p>7. In relation to the 0% Horizontal line, <b>the centre</b> of the "Hot Spot" is not between the limits listed below.</p> <p><b>Headlamp centres up to and including 850mm high</b>  Upper limit: All vehicles. 0%  Lower limit: All vehicles. 2.0%</p> <p><b>Headlamp centres over 850mm high</b>  Upper limit: All vehicles. 0%  Lower limit: All vehicles. 2.75%</p> <p>8. In any case the centre of the "Hot Spot" is to the right of the vertical 0% line or more than 2% to the left of it.</p> <p>9. A Headlamp dips to the right. (See note in Applications).</p>

**71 Service Brake Performance****Application**

This inspection applies to all vehicles.

**To avoid damage to the vehicle or the equipment**, no tyre must be obviously underinflated.

**Articulated buses** should be treated as one vehicle.

**In this section of the manual, the term "drum"** includes "discs".

Attention must be paid to Hybrid Electric Vehicles (HEVs) and Electric Vehicles (EVs). Due to the nature of the control systems some vehicles can not be tested on the Roller Brake Tester and must receive a decelerometer brake test.

Some vehicles have a regenerative braking system connected to the service brake system. If the regenerative system can not be disconnected from the service brake, a decelerometer brake test is required. If the regenerative system can be disconnected and the vehicle control system allows a roller brake test this must be carried out.

If you are in any doubt whether a vehicle can be roller brake tested, if the presenter does not know contact T.S.S. Swansea.

Brake testing HEVs and EVs, with a regenerative brake system must be appropriately charged (appropriately in this context means the red warning light showing there is a defect is not illuminated).

**Vehicles that require decelerometer testing are:**

Any vehicle where regenerative braking can not be disconnected.

**Vehicles that can be tested on the brake rollers are:**

Alexander Dennis – There is a switch which needs to be turned off, instruct the driver to do it.

Optare Solo EV, HEV, Versa EV and Versa HEV – Transmission in neutral with ignition off.

Wrights – Ensure the vehicle is in neutral.

## 71 Service Brake Performance

### Application

**Before failing a vehicle for binding**, examiners should be aware that drag at a wheel may be recorded which is not necessarily due to brakes, but may be due to transmission drag, or by the deformation of the tyres on the rollers, which on a fully laden 10,000 kg axle could be as much as 250kg. A recorded bind in excess of 4% of the measured axle weight should be considered a Reason for Failure.

**Brake effort fluctuation of more than 70%** of the higher brake effort recorded at a steady pedal pressure is a Reason for Failure. For ease of calculation if the higher brake effort divided by the lower brake effort is greater than 3.3 this is a Reason for Failure.

**The highest reading obtained should be recorded** when the brake force from any one wheel is fluctuating in a regular manner between two readings, (eg, 1850kg should be recorded where the needle reading was fluctuating between 1750kg and 1850kg).

**Using the maximum recorded forces for each wheel on an axle**, check that the braking effort from any wheel is 70% or more of the effort of the other wheel on the same axle. When wheels lock, this Reason for Failure will not apply if both the wheels lock, or if one wheel locks and the braking effort of the locked wheel is less than that of the other.

**Little or no brake effort recorded at any road wheel** should be considered a Reason for Failure if less than 5% of the measured axle weight is not attained.

**If more than half the number of wheels lock**, the specified brake effort can be considered to be met. Wheels on the verge of locking are not acceptable, they must fully lock.

**If the vehicle cannot be roller brake tested**, or for any other reason a decelerometer test is required, proceed as MOI.

**If drop off of brake effort is noted during the roller brake test**, first confirm that it is drop off and not simply due to the driver releasing the brake pedal or brake effort fluctuation. If drop off is confirmed it will be appropriate to consider a failure under Inspection Manual item 59.

#### **Vehicles with full power hydraulic braking systems**

If necessary to confirm compliance with Test Item 34 for vehicles with full powered hydraulic braking systems the following additional tests should be made:

- Position the vehicle so that each axle in turn is located on the roller brake tester.
- With the engine stopped, deplete the brake pressure by repeated application of the service brake pedal until commencement of operation of the low pressure warning device.
- With the roller brake test machine driving the wheels of each axle in turn;
  - a. apply the service brake slowly and check for first indications of braking effort. Release brake immediately. Re-apply the brake, check for second time for indication of braking effort, and release immediately.
  - b. repeat test sequence for each axle in turn.

**71 Service Brake Performance****Application**

**For vehicles with Hydrostatic drives** if the brake performance is not met on the brake rollers, perform a decelerometer test before making a decision on the pass fail requirements. Prior to roller brake testing any vehicle with hydrostatic drive and a transmission parking brake it may be necessary when the wheels are in the roller set to select the vehicles mode which disengages/bypasses the hydrostatic drive. Engaging this mode will prevent any hydrostatic retardation showing as excessive levels of bind.

**Switching the ignition off on vehicles equipped with EBS** is to be taken as the same as vehicles having their LSV disconnected. **The brake force requirements for each individual vehicle** can be normally found on the PSV technical prints, from the Computer technical records or from TASS Branch at Swansea. If this information is not available the adequacy of the braking performance is established in one of three ways depending on the number of wheels which lock during the roller brake test, as follows:

<b>PSV SERVICE BRAKE EFFICIENCY REQUIREMENTS</b>			
First used	First used before 1 January 1968	First used from 1 January 1968 and before the 1 April 1982	Any other vehicle
Specified Efficiency	45% of Calculated Gross Vehicle Weight	50% Calculated Gross Vehicle Weight	50% Design Gross Vehicle Weight

Calculated Gross Vehicle Weight (CGVW) is found by using the formula  $CGVW = X + 63.5 (Y+Z)$  where:

X is the unladen weight.

Y is the number of passengers that the bus is constructed to carry (in addition to the driver).

Z is for a bus with standing capacity more than 8, the number of standing passengers minus 8.

All weights are in kilograms.

**71 Service Brake Performance**

Method of Inspection	Reason for Failure
<p><b>1. Roller Brake Test Machines Operating With a Computer Controlled Brake Test</b></p> <p>Follow the sequence of instructions as displayed and prompted on screen. On completion of the test a result sheet is printed indicating the test result.</p> <p><b>2. All Roller Brake Test Machines</b></p> <ul style="list-style-type: none"> <li>a. Check no brake on any wheel is binding.</li> <li>b. Apply brake slowly and check for abnormal time lag in operation of the brake on any wheel.</li> <li>c. On a (vehicle) steered axle with the service brake applied at a steady pedal pressure, check there is no indication of brake effort fluctuations regularly with each revolution of the road wheel, (this check is not applicable to any other axle.)</li> </ul> <p><b>Note:</b> The ovality check does not apply to trailers.</p> <ul style="list-style-type: none"> <li>d. Continue to apply the brake until the road wheel is just at the point of slip relative to the rollers, or until the service brake is fully applied, whichever occurs first. Note the maximum recorded brake effort.</li> </ul>	<p><b>1. Roller Brake Test Machines Operating With a Computer Controlled Brake Test</b></p> <p>As computer prompt instructions (unless overruled).</p> <p><b>2. All Roller Brake Test Machines</b></p> <ul style="list-style-type: none"> <li>a. A brake on any wheel binding.</li> <li>b. Brake mechanism on any wheel sticking, indicated by an abnormal time lag before, an increased reading is obtained.</li> <li>c. With service brake applied at a steady pedal pressure, the indication of brake effort fluctuates regularly with each revolution of the road wheel, on a steered axle, so much that the ovality of any brake drum is obvious. A fluctuation of recorded reading in excess of 70%, between highest and lowest indicated readings is to be considered a Reason for Failure.</li> <li>d. With the service brake fully applied: <ul style="list-style-type: none"> <li>*i there is little or no brake effort at any wheel.</li> <li>*ii braking effort from any wheel on an axle is less than 70% of the brake effort from another wheel on the same axle.</li> <li>*iii the specified brake effort is not met.</li> </ul> </li> </ul>

71 Service Brake Performance	
Method of Inspection	Reason for Failure
<b>3. Decelerometer test</b>  Set the decelerometer on the vehicle in accordance with the instrument manufacturer's instructions. At a speed of approximately 20mph, have the service brake applied, note the reading on the decelerometer and whether the vehicle deviates from a straight line.	<b>*3. Decelerometer test</b>  The braking efficiency recorded by decelerometer is below the specified efficiency for the vehicle under test, or the vehicle deviates appreciably from a straight line.



**72 Secondary Brake Performance****Application**

This inspection applies to all vehicles where the designated secondary brake operates independently of the service brake.

The notes relating to Electrical and Hybrid Electrical Vehicles under Inspection 71 also apply to this inspection particularly where the designated secondary brake is the parking brake, refer to these notes before deciding what type of brake test should be performed.

**To avoid damage to the vehicle or the equipment**, no tyre must be obviously under inflated.

**There may be occasions where the specified brake effort is met but**, if the brake effort from any wheel on an axle is one third or less than the brake effort from another wheel on the same axle, it may be necessary to consider Reason for Failure 1a, 1b or 5a of Inspection 59. The notes relating to Locked Wheels and Load Simulation under Inspection 71 also apply to this inspection.

<b>PSV SECONDARY BRAKE EFFICIENCY REQUIREMENTS</b>			
First used	First used before 1 January 1968	First used from 1 January 1968 and before the 1 April 1982	Any other vehicle
Specified Efficiency	20% Calculated Gross Weight	25% Calculated Gross Vehicle Weight	25% Design Gross Vehicle Weight

Calculated Gross Vehicle Weight (CGVW) is found by using the formula  $CGVW = X + 63.5(Y+Z)$  where:

X is the unladen weight

Y is the number of passengers that the bus is constructed to carry (in addition to the driver).

Z is for a bus with standing capacity more than 8, the number of standing passengers minus 8.

All weights are in kilograms.

<b>72 Secondary Brake Performance</b>	
<b>Method of Inspection</b>	<b>Reason for Failure</b>
<p><b>1. Roller Brake Test Machines Operating With a Computer Controlled Brake Test</b> Follow the sequence of instructions as displayed and prompted on screen. On completion of the test a result sheet is printed indicating the test result.</p> <p><b>2. All Roller Brake Test Machines</b> For each road wheel in turn apply the secondary brake until the:</p> <ul style="list-style-type: none"> <li>a. road wheel is just at the point of slip relative to the rollers, or</li> <li>b. the secondary brake is fully applied, whichever occurs first.</li> </ul> <p>Note the maximum braking effort indicated from the brake of each road wheel.</p>	<p><b>1. Roller Brake Test Machines Operating With a Computer Controlled Brake Test</b> As computer prompt instructions. (unless overruled).</p> <p><b>2. All Roller Brake Test Machines</b> With the secondary brake fully applied:</p> <ul style="list-style-type: none"> <li>a. there is little or no braking effort at any wheel equipped with a brake operated by the secondary brake system.</li> <li>*b the specified brake effort is not met.</li> </ul>

**73 Parking Brake Performance****Application**

This inspection applies to all vehicles First used from 1 January 1968.

The notes relating to Electrical and Hybrid Electrical Vehicles under Inspection 71 also apply to this inspection particularly where the designated secondary brake is the parking brake, refer to these notes before deciding what type of brake test should be performed.

**To avoid damage to the vehicle or the equipment**, no tyre must be obviously under-inflated.

**It is necessary to use an applied brake method of testing as described in the MOI**, except for vehicles with transmission parking brakes, or if the R.B.T. is not capable of carrying out an applied test. In these cases it is necessary to use the ALTERNATIVE method as described in the MOI.

**There may be occasions where the specified brake effort is met but**, if the brake effort from any wheel on an axle is one third or less than the brake effort from another wheel on the same axle, it may be necessary to consider Reason for Failure 1a, 1b or 5a of Inspection 59. The notes relating to Locked Wheels under Inspection 71 also apply to this inspection.

**If more than half the number of wheels lock**, the specified brake effort can be considered to be met. Wheels on the verge of locking are not acceptable, they must fully lock.

The brake force for each individual vehicle can normally be found on the PSV technical prints, from the computer technical records or from Technical and Support Services Swansea. If this information is not available the adequacy of braking performance is established in one of 3 ways depending on the number of wheels which have locked during the roller brake test as follows:

<b>PSV PARKING BRAKE EFFICIENCY REQUIREMENTS</b>			
First used	First used before 1 January 1968	First used from 1 January 1968 and before the 1 April 1982	Any other vehicle
Specified Efficiency	No requirement	16% Calculated Gross Vehicle Weight	16% Design Gross Vehicle Weight

**Calculated Gross Vehicle Weight (CGVW)** is found by using the formula  $CGVW = X + 63.5(Y+Z)$  where:

**X** is the unladen weight

**Y** is the number of passengers that the bus is constructed to carry (in addition to the driver).

**Z** is for a bus with standing capacity more than 8, the number of standing passengers minus 8.

All weights are in kilograms.

**73 Parking Brake Performance**

Method of Inspection	Reason for Failure
<p><b>1. Roller Brake Test Machines Operating With a Computer Controlled Brake Test</b> Follow the sequence of instructions as displayed and prompted on screen. On completion of the test a result sheet is printed indicating the test result.</p> <p><b>2. Applied Brake Test on a Roller Brake Tester</b> Apply the parking brake fully and release any power assistance. The service brake may be used at this stage in setting the park brake. Start each brake machine roller in turn and note the maximum braking effort indicated for each wheel in turn.</p> <p><b>3. Alternative method</b> With the roller brake test machine driving each road wheel in turn, apply the parking brake slowly until each road wheel is just at the point of slip relative to the rollers, or until the parking brake is fully applied, whichever occurs first. Note the braking maximum effort indicated from the brake of each road wheel.</p> <p><b>Transmission Parking Brakes</b> If the parking brake is a transmission brake, all wheels on the same axle braked by it must be driven by the roller test machine at the same time.</p> <p><b>4. Roller Brake Test</b> With the roller brake machine driving both road wheels together, instruct the driver to apply the transmission brake as slowly as possible, constantly keeping the release button depressed, until any road wheel is just at the point of slip relative to the rollers, then release the brake quickly. Note the braking effort indicated from the brake of each wheel.</p>	<p><b>1. Roller Brake Test Machines Operating With a Computer Controlled Brake Test</b> As computer prompt instructions (unless overruled).</p> <p><b>2. Applied Brake Test on a Roller Brake Tester</b> With the parking brake fully applied:</p> <ul style="list-style-type: none"> <li>a. there is little or no braking effort at any wheel equipped with a brake operated by the parking brake system.</li> <li>*b. the specified brake effort is not met.</li> </ul> <p><b>3. Alternative method</b> With the parking brake fully applied:</p> <ul style="list-style-type: none"> <li>a. there is little or no braking effort on any wheel equipped with a parking brake, or</li> <li>*b. the specified brake effort is not met.</li> </ul> <p><b>4. Roller Brake Test</b> With the transmission parking brake full applied:</p> <ul style="list-style-type: none"> <li>a. there is little or no brake effort, or</li> <li>*b. the specified brake effort is not met.</li> </ul>

**74 Other Dangerous Defects****Application**

This applies to all vehicles.

Whilst this manual attempts to be comprehensive and cover all reasons for failure which could be dangerous it is inevitable that due to changes in design, or other reasons, from time to time dangerous defects may be found which are not described in any of the reasons for failure in the other items in this manual. If a defect of this type is found, which is such that the use of the vehicle on the road would involve a danger of injury to any person, this would justify a failure under this item. In addition it would be appropriate to issue an Immediate Prohibition for a defect of this nature.

It is not intended that this item should be used as a matter of routine but only for exceptional cases. If a failure is recorded under this item full details must be shown on the test card and a copy should be sent to Testing and Support Services so that any trends can be noted and amendments made to the manual if necessary.

Method of Inspection	Reason for Failure
	**1. A defect not described elsewhere in the manual such that the use of the vehicle on the road would involve a danger of injury to any person.