Purpose

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

- The application of specific relevant requirements.
- The reasons for failure (RfF).
- The explanatory notes

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

Layout of Inspection Manual

The layout for each inspection item consists of:

- Application section; this section will contain the application criteria.
- Reasons for Failure (RfF).
- Explanatory Notes section where any procedures specific to the section will be contained as well as any notes relevant to the standards to apply

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 will be necessary to ask the driver to remove wheel embellishers or panels where it is not otherwise possible to inspect safety critical items.

Vehicle combinations will not normally be separated for the purposes of the test although it will be necessary to disconnect and reconnect air lines as directed.

Minimum Standards

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

How the standards are applied.

The annual test is carried out by Vehicle Inspectors employed by the Department of Infrastructure.

The test will be carried out by one inspector who will assess each testable item against the criteria set out in the manual. The Inspector's opinion of the item at Test will determine whether the item passes or fails.

The inspector retains some discretion and flexibility to allow a simple repair to be carried out to allow a component to meet the test standard. The Inspectors will also provide verbal advice where they are of the opinion that a testable item only just meets the standard.

There will be occasions where the standard of a testable item falls far below the minimum standards set out in the manual. In those circumstances a vehicle may not be allowed to return to the Public Highway. In those circumstances a vehicle may need to be taken from the site on a recovery vehicle.

Where a vehicle is in a dangerous condition it is usually where one of the following statements can be added to the Reason for Failure. This is not an exhaustive list.

- Detachment is likely/ Imminent
- Secure fixing is affected
- Weld is breaking away
- Not fulfilling its function
- Inappropriate rating
- Failure of structure
- Safe driving is impaired
- Effectiveness reduced
- Likely to fall from the vehicle
- Component fundamentally weakened
- Likely to affect the stability of the vehicle
- Seriously affects road safety
- Seriously reduces the strength
- Impairs the driver's control of the vehicle or is likely to cause injury
- Could cause the driver to lose control of the vehicle
- Unlikely to be secured/ supported
- Would not adequately retain
- Obviously dangerous to other road users, passengers or pedestrians
- Very serious risk to road users
- Safe operation of the vehicle obviously affected
- Load will become insecure
- Stability impaired
- Risk of fire
- Likely to touch hot parts of vehicle
- Likely to come into contact with live rotation parts
- Fumes will enter vehicle's cab
- Will affect directional stability
- Will render a component inoperative
- System inoperable
- Obviously affecting steering control
- Likely to fail
- Obviously affecting braking performance
- Fluid levels empty
- Zero braking effort

Where a vehicle fails the Annual Test because it is in a dangerous condition this information will be passed directly to RTLC who may consider taking regulatory action.

Acceptance for Test

The requirements relating to a Goods Vehicle Plate (MIM1) are a condition for accepting the vehicle for test which therefore cannot be started without a satisfactory plate being available.

This does not apply however to trailers presented for their first ever annual test. Plating documents for these trailers will be issued on successful completion of this "first test".

Other conditions for accepting vehicles for test include:

- A trailer must be accompanied by a suitable drawing vehicle.
- The vehicle chassis number or trailer identification mark must be permanently fixed to the vehicle in an accessible, easy to read position.
- The vehicle/trailer must be clean enough to allow the component parts to be inspected.
- The vehicle/trailer must not present a health & safety hazard to inspect.
- The vehicle/trailer must be laden.

If you are in doubt regarding any of the above, it is recommended that you contact VTC for advice

Vehicles normally fitted with permanent bodies and which have had them removed, fall outside the classification of a goods vehicle and should not be accepted for test. This does not include bin carriers, skeletal vehicles for carrying containers or demountable bodied vehicles.

The Inspection

Each inspection has been allocated Manx Inspection Manual (MIM) number, which is given at the top of the page.

The requirements of each inspection will be found in Schedule 2 of the Licensing and Registration of Vehicles Regulations 2015.

After the Test

On completion of the test, 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.

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 (Maintenance and Use) Regulations 2012, The Road Vehicles (Construction Equipment and Weights) Regulations 2012 and The Road Vehicles Lighting Regulations 2014.

Dual controls on vehicles will be inspected in the same manner as the primary controls although there will be no separate brake performance check.

Health and Safety

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

Interpretation of Terms used in the Manual

Articulated Vehicle

An articulated vehicle is a motor car or heavy motor car with a trailer so attached that part of the trailer is superimposed on the drawing vehicle and, when the trailer is uniformly loaded, not less than 20% of the weight of its load is borne by the drawing vehicle.

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.

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.

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.

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/trailer this will not normally apply if the vehicle/trailer was built more than 6 months before that date.

Forward Control Vehicle

Is a vehicle the configuration of which:

- more than half of the engine length is rearward of the foremost point of the windshield base and;
- the steering wheel hub is in the forward quarter of the vehicle length.

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

Repairs 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.

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.

Certain components, such as wheel studs/nuts, body mountings etc. have specific criteria detailed in the inspection manual.

MIL

Malfunction Indicator Light usually a Yellow, Orange or Red indicator lamp on the dashboard of the vehicle which shows when one of the vehicle or trailer's electronic systems has failed or is malfunctioning. Lights must illuminate before the engine is started and then extinguish shortly after. Any MIL that remains on or flashing indicated a fault with that system.

Obligatory

Required to be fitted by law.

Semi-trailer

A trailer which is constructed or adapted to form part of an articulated vehicle.

Trailer

Where the term trailer is used in this manual it refers to all types of trailers and semi-trailers.

Type Approved Vehicle

A vehicle manufactured from 1 October 1982 and first used from 1 April 1983 and has been issued with a Type Approval Certificate of Conformity, a Ministers Approval Certificate or a Type Approval Certificate issued by an EU Member State.

Type Approved

A component or system fitted to a vehicle which has been issued with a Type Approval Certificate or Certificate of Conformity or built to an approval standard 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.

Unsafe Modification

Modifications to vehicles must be assessed on their merits, taking account of the nature and function of the component. Unsafe modification means a modification that adversely affects the road safety of the vehicle or has a disproportionately adverse effect on the environment.

VTC	Vehicle Testing Centre, Ballafletcher Road, Tromode, Douglas, Isle of Man IM4 4QJ
Vehicle	Where the term vehicle is used in the application section of this manual it refers to all types of **motor vehicle.**
Vehicle Category (Definition used in the Community Directive)	**N2:** Vehicles used for the carriage of goods and having a maximum mass exceeding 3500 kg but not exceeding 12,000kg. **N3:** Vehicles used for the carriage of goods and having a maximum mass exceeding 12,000kg. **O2:** Trailers with a maximum mass exceeding 750 kg but not exceeding 3,500kg. **O3:** Trailers with a maximum mass exceeding 3,500 kg but not exceeding 10,000kg. **O4:** Trailers with a maximum mass exceeding 10,000kg.

MIM No.	Inspection Item
1	Registration Plate /Department Plate
2	Markers and Reflectors
3	Lamps
4	Direction Indicators and Hazard Warning Lamps
5	Condition of Tyres
6	Size and Type of Tyres
7	Seat Belts and Supplementary Restraint Systems
8	Mirrors and Indirect Vision Devices
9	Glass and View of the Road
10	Speedometer
11	Horn
12	Driving Controls
13	Pressure/ Vacuum Warning and Build Up
14	Hand Lever operating Mechanical Brakes
15	Hand Operated Brake Control Valves
16	Service Brake Operation
17	Windscreen Washers and Wipers
18	Seats
19	Steering Control
20	Cab Doors
21	Cab Floors and Steps
22	Cab Security
23	Electrical Wiring and Equipment
24	Road Wheels and Hubs
25	Sideguards, Rear Underrun Devices and Bumper Bars
26	Sparewheel and Carrier
27	Spray Suppression, Wings and Wheel Arches
28	Security of Body, Containers and Crane Support Legs
29	Condition of Body
30	Fuel Tanks and Systems
31	Steering Mechanism
32	Exhaust Systems
33	Oil Leaks
34	Suspension
35	Axles Stub Axles and Wheel Bearings
36	Additional Braking Systems
37	Brake System and Components
38	Transmission
39	Engine and Transmission Mountings
40	Condition of Chassis
41	Aim of Headlamps
42	Service Brake Performance
43	Secondary Brake Performance
44	Parking Brake Performance
45	Exhaust Emissions
46	Vehicle to Trailer Coupling
47	Trailer parking and emergency brake and Airline Connections
48	Trailer Landing Legs
49	Other Dangerous Defects

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Registration Plate & Plating Certificate

Application

This inspection applies to all registered motorised vehicles and all trailers.

Reasons for Failure (RfF)

1. **A registration plate:**
   a. missing.
   b. insecure.
2. **A registration mark:**
   a. missing.
   b. illegible.
3. **A Goods Vehicle Plate missing**

Explanatory Notes

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

The registration plate must be checked for presence and security at the front and rear of the vehicle. The registration mark must be checked for presence and legibility.

Plates displayed on the front of a vehicle must be Black lettering on a White background

Plates displayed on the rear of the vehicle must be Black Lettering on a Yellow background

The Legal requirement for Number plates to show hyphens was removed in 2012. It is not a reason to fail the test if the hyphens are present or not.

Letters and Numbers should either be 79mm to 89mm in Height

A Trailer should display the Registration Number of the towing vehicle in a secure manner.

Goods Vehicle/ Trailer Plate.

When a Goods Vehicle is registered in the Isle of Man a Goods Vehicle Plating Certificate and a Goods Vehicle Plate are issued.

The Goods Vehicle Plate must be displayed in the vehicle at all times. It should be fixed to the vehicle.

The Goods Vehicle Plating Certificate should be kept at your operating centre in the vehicle's file.

It is not a reason for failure if the vehicle has yet to be Manx registered provided the GB Goods Vehicle Plate is displayed.

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Markers and Reflectors

Application

This Inspection applies to all vehicles and trailers. Please refer to explanatory notes for the age requirements for different marking schemes

Reasons for Failure (RfF)

1. Reflectors, conspicuity markings and/or rear markers:

a. incorrectly positioned.

b. missing, incorrectly positioned and the red colour is reflected to the front or the white to the rear.

c. insecure.

d. not clearly visible.

e. of the incorrect type.

f. dirty or ineffective.

g. broken, damaged or incomplete

h. not of the appropriate colour.

Explanatory Notes

Rear Markings

This inspection applies to the vehicles and trailers listed below which must be fitted with rear markers. They are not required with rear conspicuity markings but may be incorporated into the conspicuity markings (See page 3). The type of marking which is acceptable is shown in the table below. The type numbers refer to diagrams (1 to 13) on page 3. Rear conspicuity marking is an acceptable alternative to marker boards, if fitted it must comply with the conspicuity requirements (see page 5).

Motor vehicles with a maximum gross weight exceeding 7500kg (not articulated tractors and vehicles constructed or adapted for transporting two or more boats, vehicles or vehicle bodies).

Overall length	Acceptable type of markings for vehicle first used before 1 January 2000	Acceptable markings for vehicle first used from 1 January 2000
13m or less	1,2,3,6,7,8 or 9	6,7,8 or 9
more than 13m	4,5,10,11,12 or 13	10,11,12 or 13

Trailers with a maximum gross weight exceeding 3500kg (not trailers constructed or adapted for transporting two or more boats, vehicles or vehicle bodies).

Overall length of combination	Acceptable type of markings for trailers manufactured before 1 October 1995	Acceptable markings for trailers manufactured from 1 October 1995
11m or less	1,2,3,6,7,8 or 9	6,7,8 or 9
more than 11m but not more than 13m	Any type shown in the diagrams	6,7,8,9,10,11,12 or 13
more than 13m	4,5,10,11,12 or 13	10,11,12 or 13

Reflectors

This inspection applies to all motor vehicles and trailers but only obligatory reflectors are to be checked.

- Every motor vehicle and trailer requires 2 red reflectors facing to the rear.
- Trailers manufactured from 1 July 1993 require two white reflectors facing to the front.

Must be fitted with the lower edge between 400mm and 1700mm from the ground.
A rear marker must not be more than 10% obliterated or obstructed.

Side reflectors

This inspection applies to a motor vehicle.

- first used before 1 April 1986 with an overall length of more than 8m first used from 1 April 1986 with an overall length of more than 6m.
- This inspection applies to trailers with an overall length of more than 5m excluding any drawbar.

Conspicuity Markings

This inspection applies to Goods Vehicles with a gross weight exceeding 7500kg first used from 10 July 2011 and Trailers with a gross weight exceeding 3,500 kgs manufactured from 10 July 2011

Exemptions:

- Chassis cabs, incomplete vehicles and articulated tractors for semi-trailers
- Vehicles and trailers not exceeding 6 metres overall length (these are exempt from the white or yellow side markings)
- Vehicles and trailers not exceeding 2.1 metres overall width (these are exempt from the red or yellow rear markings)

Rear Markings

Must be fitted with the lower edge between 400mm and 1700mm from the ground.

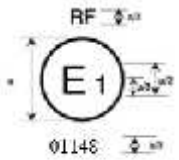
A rear marker must not be more than 10% obliterated or obstructed.

If the rear marker boards chevrons are fitted the opposite way around than shown below this is not a RfF.

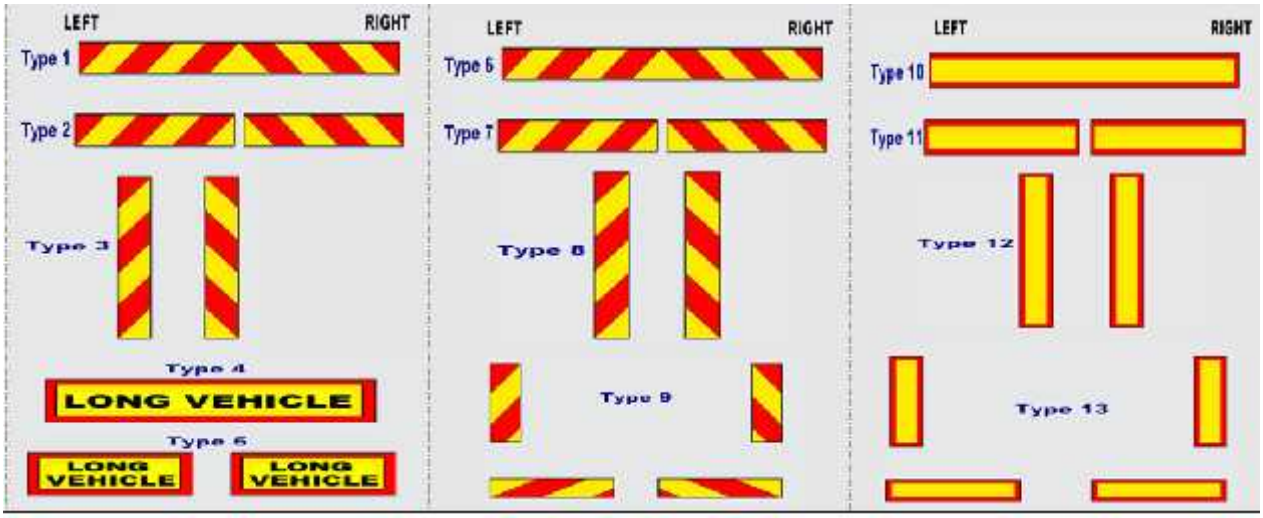
When a demountable fork lift is carried on the rear of a vehicle/trailer, the fork lift is not included into the overall length of the vehicle/trailer to establish what the correct type of marking fitted is. This would also apply to refuse vehicles with bin lifting equipment fitted to the rear of the vehicle.

Rear markings on a retractable rear under-run device are not a reason for failure if the vehicle is presented towing a trailer and the vehicle rear markings are not visible.

Acceptable approval marks for rear marker boards are either BSAU152 (diagrams 1 - 5), ‘E’ or ‘e’ (diagrams 6 - 13).



An example of the E approval mark. The numbers will differ



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.

Front Reflectors [trailers only]

The maximum height from the ground is 900mm, if this is impractical it can be 1500mm.

White front reflectors must be fitted to the front of each section of a combination trailer.

Rear Reflectors

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

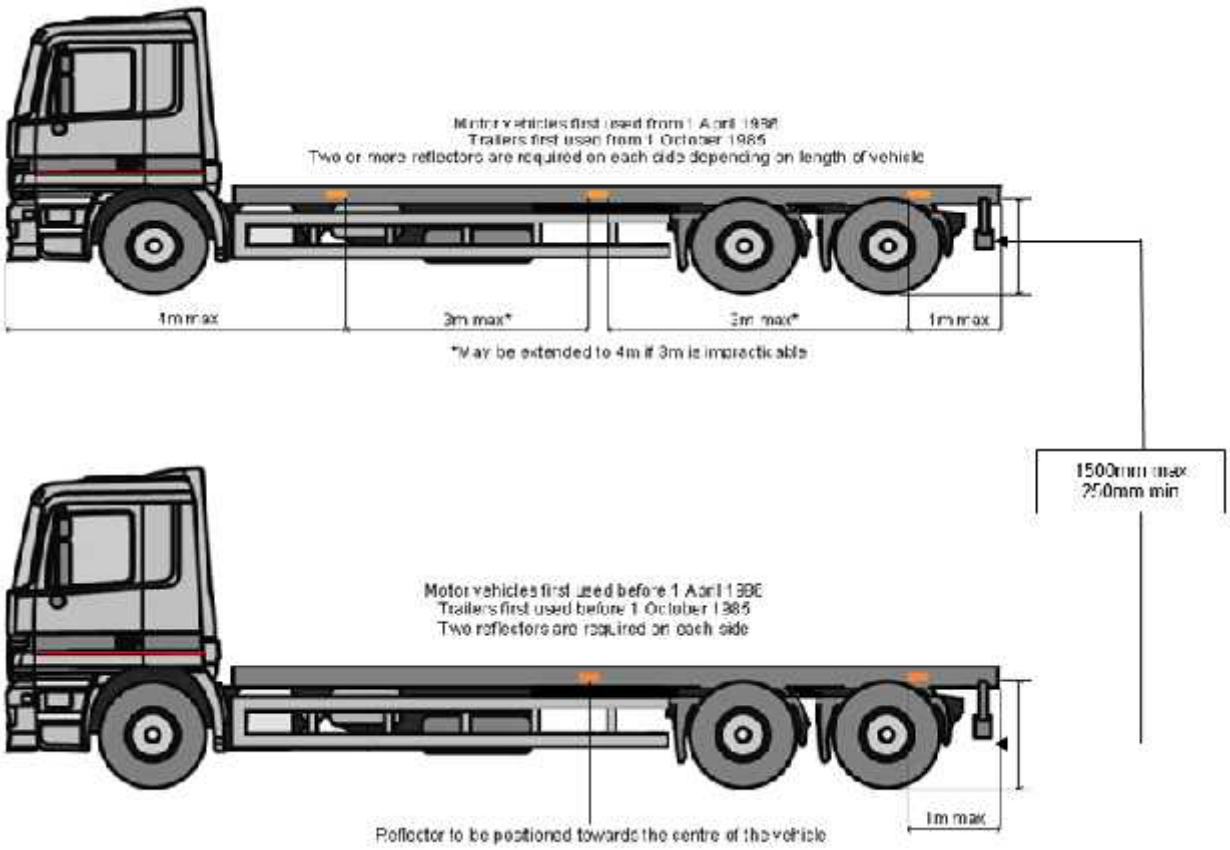
- If 900mm is impractical it can be 1500mm.
- For vehicles used before 1 April 1986 and trailers manufactured before 1 October 1985 the maximum height is 1525mm.

Trailers must be fitted with triangular (rear) reflectors, these are not acceptable on motor vehicles and must be failed using RfF 1e.

Side Reflectors

Side Reflectors must be positioned as shown in one of the two diagrams on the following below They must be amber in colour unless within 1m of the rear of the vehicle or trailer when they may be red.

Side Reflector Positional Requirements



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

Conspicuity Markings

Configurations (see pages 5 & 6)

Markings should be continuous but may be broken, staggered or set back.

Vehicles and trailers may be presented with various markings, the minimum requirement (for annual test) is a line marking intended to indicate the horizontal dimensions of a vehicle by a continuous line.

Due to design characteristics it may not be possible for some vehicles to comply with all of the requirements.

The diagrams on pages 7 & 8 are only possible examples of variations.

Vehicles and trailers which have a chassis designed for demountable bodies should, ideally, be treated as skeletals. However they may be presented for test with a body fitted which has conspicuity markings instead of the chassis. Provided the markings comply with the requirements this is acceptable though the presenter should be advised that the vehicle or trailer would not meet the requirements if used without an appropriately marked body.

Rear conspicuity markings must:

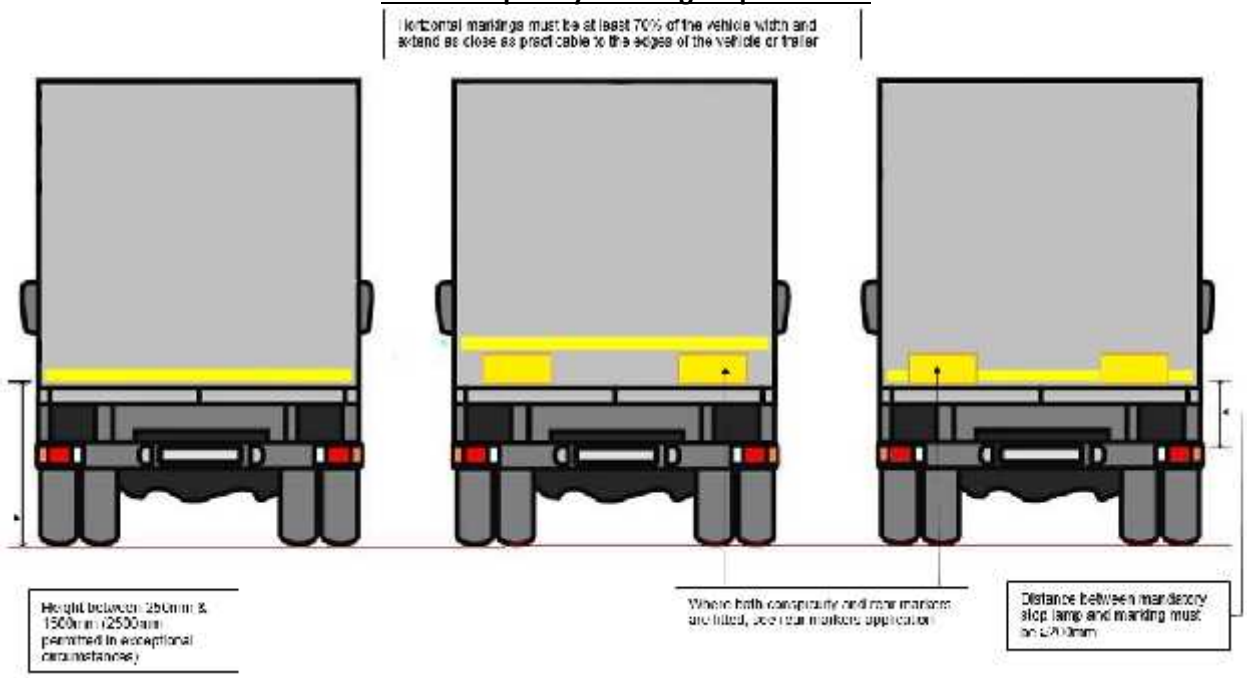
- not be fitted within 200mm of a mandatory stop lamp.
- be coloured either red or yellow

  and
- be at least 70% of the vehicle width and extend as close as practicable to the edges of the vehicle or trailer.

- position the lowest edge between 250mm and 1500mm from the ground. If 1500mm is not practicable this can be increased to 2500mm.

(See below)

Rear Conspicuity Marking Requirements



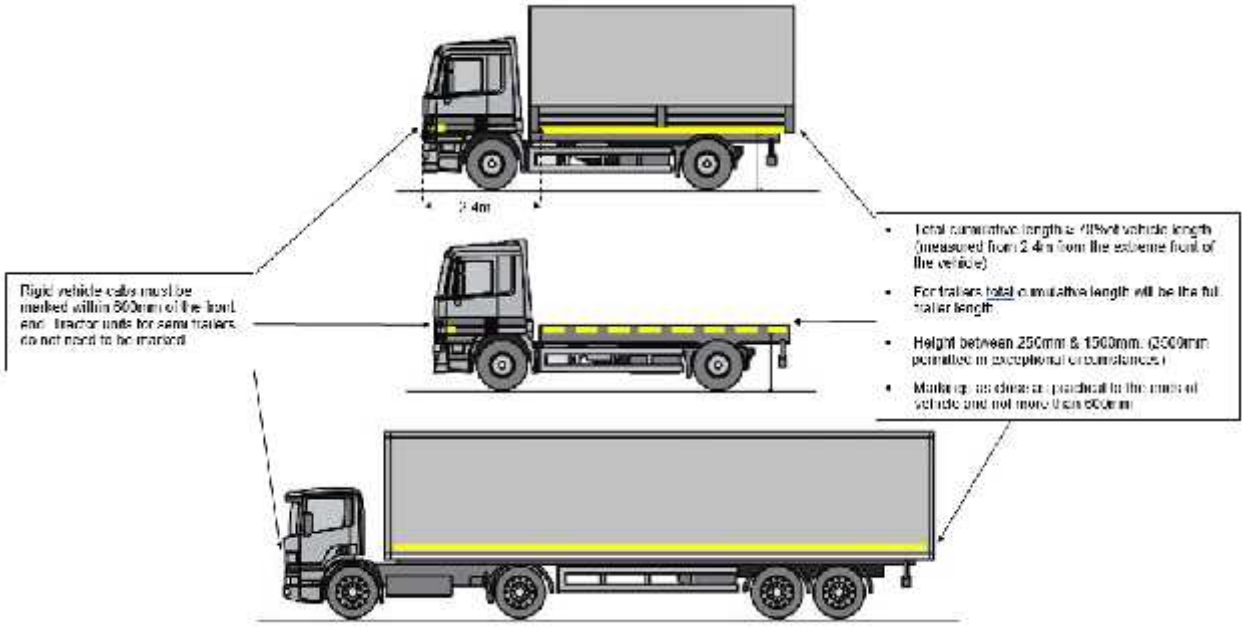
Side Conspicuity markings must:

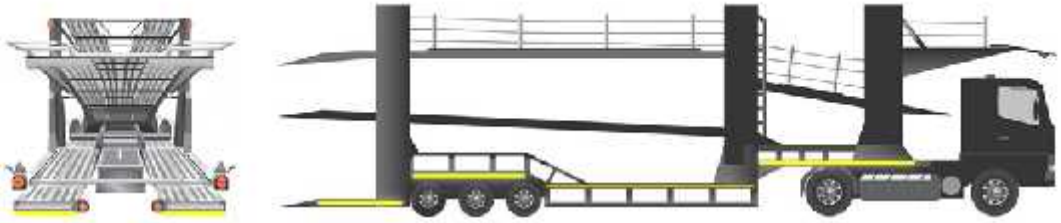
- extend to within 600mm of each end of the vehicle/trailer (or for articulated vehicles, the trailer).
- for rigid vehicles, be at least 70% of the vehicle length measured from 2.4m from the extreme front of the vehicle. Where side markings on a rigid vehicle meet the 70% requirement of the vehicle length on the body alone the cab must still be marked within 600mm of the front of the vehicle with a minimum marking size of 50 mm high by 50mm wide. Where this requirement is met any gaps between the cab markings and body markings must be disregarded.
- for semi and drawbar trailers, be at least 70% of the trailer length.
- be coloured white or yellow.
- position the lowest edge between 250mm and 1500mm from the ground. If 1500mm is not practicable this can be increased to 2500mm.

(See Page 9)

Note: As an alternative cab marking from using a 50mm X 50mm conspicuity marking within 600mm of the cab front, the cab may be marked using side reflectors with a minimum spacing of 600mm to within 600mm from the front of the cab.

Side Conspicuity Marking Requirements



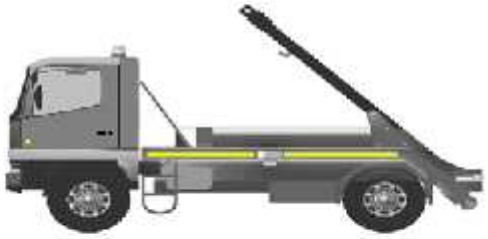


Car Transporter

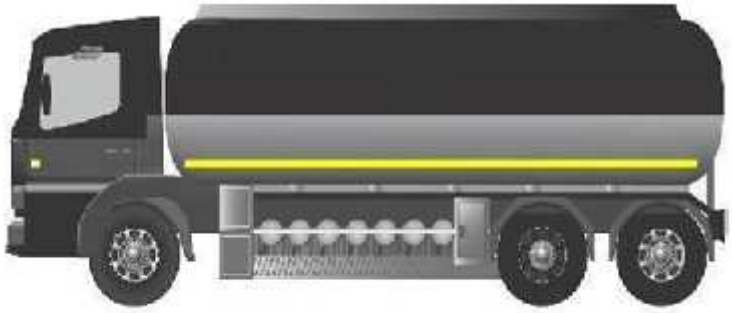
Concrete Mixer

Skeletal

Skip Wagon



Refuse Wagon



Tanker

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Application

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

Reasons for Failure (RfF)

1. **For all lamps:**
   a. an obligatory lamp missing inoperative or insecure.
   b. a lamp dim, due to dirt or internal deterioration.
   c. a lens missing, obscured, insecure, or damaged.
   d. not showing a light of the right colour with red light shown to the front or white light shown to the rear.
   e. incorrectly positioned.
   f. is affected by the operation of any other lamp.
2. **Fog lamp tell-tale light not fitted, not working or cannot be seen by the driver.**
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.**
4. **Headlamp:**
   a. not forming part of a matched pair.
   b. not positioned symmetrically in relation to the other lamp.
   c. one of a matched pair does not show a light of the same intensity and colour as the other.
   d. a main beam headlamp cannot be switched off by operating one switch which at the same time leaves a pair of dipped beams.
   e. main beam warning lamp does not illuminate when main beam is selected and extinguish when dipped beam is selected.
5. **A rear registration plate lamp throws direct light to the rear.**

Explanatory Notes

Stop lamps

The inspection of stop lamps applies to any stop lamp fitted to vehicles and trailers.

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.
- trailers manufactured from 1 July 1993.

and which in both cases are more than 2.1m wide.

End outline marker lamps are not required on vehicles designed to carry demountable bodies if the overall width without the body fitted is less than 2.1 m.

The front and the rear end out line markers lamps may be combined as for example on an articulated tractor.

The rear marker lamps on vehicles such as tippers and tankers and those designed to carry demountable bodies may be fitted at chassis level.

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

The end outline marker lamps fitted to the rear of a vehicle can also act as the rear most side marker lamp provided it is of the correct colour and position. It is not acceptable for a side marker lamp to operate as an outline marker lamp.

Front marker lamps are not required to be fitted to the front section of the rear half of a combination trailer.

Rear fog lamps

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

Rear fog lamps must be fitted to vehicles first used, and trailers manufactured 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).

Fog lamps are not needed on modern trailers when drawn by old vehicles (see above for dates).

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

No more than two rear fog lamps may be fitted.

If two fog lamps are fitted to a vehicle first used on or after 1 April 1986 or to a trailer manufactured on or after 1 October 1985 they must form a matched pair.

It is not a RfF if the vehicle's rear fog lamp does not operate when a trailer is towed. However the electrical connections to the trailer must be disconnected to confirm that the rear fog lamp(s) operate when the vehicle is not towing a trailer.

Headlamps

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

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

Side marker lamps

The inspection of side marker lamps applies to all obligatory side marker lamps fitted to vehicles and trailers.

Side marker lamps must be fitted to:

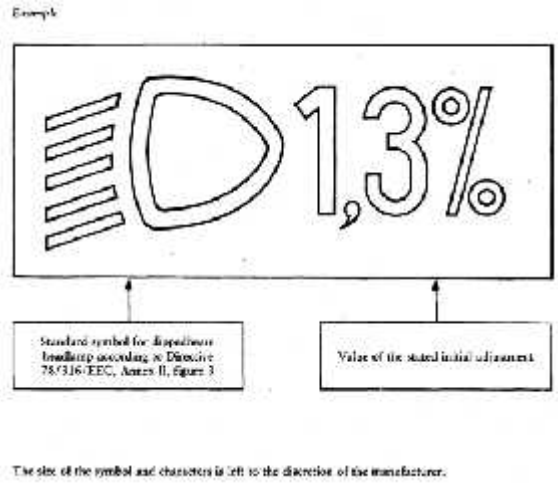
- vehicles with an overall length exceeding 6m first used from 1 April 1991
- trailers with an overall length exceeding 6m
- trailers with an overall length exceeding 9.15m manufactured on or after 1 July 1993

Two or more marker lamps must be fitted at each side to ensure that the following is complied with:

Maximum distance of the foremost marker lamp from the front of the vehicle or trailer, including any drawbar	4m
Maximum distance of the rearmost marker lamp from the rear of the vehicle or trailer	1m
Maximum distance between the light emitting surfaces of adjacent marker lamps	3m or if this is not practicable 4m

Vehicles first used before 1 January 2000 and Trailers manufactured after on or after 1st July 1999 are exempt from the need to fit side marker lamps if they are fitted with all of the lighting and light signalling devices listed in items 1.5.7 to 1.5.20 of Annex 1 of Community Directive 89/278 or 91/663 .

Motor vehicles which comply with these requirements will be fitted with a label showing a dipped headlamp and a percentage dip figure or/and a manual headlamp height adjuster control readily accessible from the driver's seat and which operates both lamps simultaneously.



Rear registration plate lamps

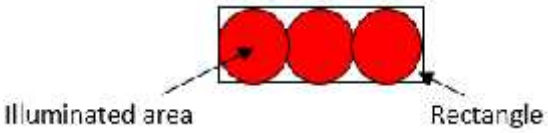
The clear cover for the bulb is not a lens. Colour: White
The registration plate lamp must be fitted in a position where it can illuminate the registration plate. A lamp fitted in a position where it cannot do this is not a registration plate lamp and this should be dealt with under RfF 1e.

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

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

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

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.



Vehicles with fork lifts fitted to the rear of the vehicle. If the fork lift has lights to replace the vehicles which may be obscured, the lights on the fork lift must comply with the annual test standards.

The check for position should be visual and only vehicles with lamps obviously out of position should be failed for this reason (not applicable to lamps fitted to rear under-run devices that fold underneath the load deck to accommodate the attachment of a trailer).

Before failing 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.

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.

Normally plastic cable ties are not acceptable as the only means of securing a lamp or lamp lens however Crane Fruehauf have a side marker lamp arrangement which includes a cable tie as an integral part of the design to provide some flexibility and to avoid damage to the marker lights. This arrangement is acceptable on Crane Fruehauf trailers and on any other makes of vehicle or trailer where a similar lamp system is fitted.

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

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

TYPE		DATE OF FIRST USE (MANUFACTURE FOR TRAILERS)	POSITION			COLOUR
			MAX DISTANCE FROM SIDE (MM)	MAX HEIGHT (MM)	MINIMUM HEIGHT (MM)	
Front Position Lamps	Motor Vehicles	From April 1986	400	1500 or if impracticable 2100	-	White or yellow if in a headlamp which shows yellow light
		Before April 1986	510	2300	-	
	Trailers	From October 1985	150	1500 or if impracticable 2100	-	White
		Before October 1985	510	2300	-	
Front End Outline Marker Lamp	Motor Vehicles	From April 1991	400	-	The top of the lamp shall be no lower than the top of the windscreen	White
	Trailers	From 1 July 1993	400	-	As high as possible with regard to the lateral position, and the use for which the vehicle is constructed	
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		From 1 January 1931		-	-	White or Yellow
Rear Position Lamps	Motor Vehicles	From April 1986	400	1500 or if impracticable 2100	350	Red
	Trailers	From October 1985				
	Motor Vehicles	Before April 1986	800	2100	-	
	Trailers	Before October 1985				
Rear End Outline Marker Lamps	Motor Vehicles	From 1 April 1991	400	-	As high as possible with regard to the lateral position, and the use for which the vehicle is constructed	Red
	Trailers	From 1 July 1993				
Stop Lamps		From 1 January 1951	One on each side with a minimum separation distance of 400mm	1500 or if impracticable 2100	350	Red
Rear Registration Plate Lamp		All vehicles and trailers	-	-	-	White
Rear Fog Lamp	Motor vehicles and trailers	From April 1980	Where one lamp is fitted: On centre line or offside of vehicle.	1000	250	Red

Lamps

TYPE		DATE OF FIRST USE (MANUFACTURE FOR TRAILERS)	POSITION			COLOUR
			MAX DISTANCE FROM SIDE (MM)	MAX HEIGHT (MM)	MINIMUM HEIGHT (MM)	
Side Marker Lamps	Motor vehicles	1 April 1991	-	2300	-	Amber or red if within 1m of the rear of the vehicle.
	Trailers	1 July 1993	-	2300	-	Amber or red if within 1m of the rear of the trailer or if fitted to a trailer built before October 1990 exceeding 9.15m in length one side marker lamp on each side, positioned longitudinally such that no part of the light emitting surface is forward of, or more than 1530mm to the rear of, the centre point of the overall length of the trailer. The lamp may show a white light to the front and a red light to the rear, or alternatively amber.

Direction Indicators and Hazard Warning Lamps

Application

This inspection applies to all vehicles and trailers

Reasons for Failure (RfF)

1. **Direction indicator:**
   a. missing, inoperative, operating on the wrong side of a vehicle/trailer, dim or not visible either to the front or to the rear.
   b. a lamp dim due to dirt or internal deterioration.
   c. lens missing, insecure or damaged so that it is likely to fall apart.
   d. does not flash at between 60 to 120 times a minute.
   e. does not show a light of the right colour.
   f. tell-tale not fitted, is inoperative or cannot be seen/heard by the driver.
   g. rate of flash or illumination is affected by any other lamp.
2. **Hazard warning lamp:**
   a. does not operate with the engine stopped and the ignition switched off and on.
   b. all the direction indicator lamps do not operate simultaneously when switched on by one switch.
   c. tell-tale not fitted, is inoperative or cannot be seen by the driver.

Explanatory Notes

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.

Hazard warning lamps

This inspection applies to all vehicles fitted with hazard warning lamps

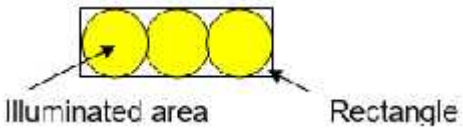
They need not be fitted to vehicles first used before 1 April 1986.

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 side marker lamps/indicator side repeater lamps, these remain illuminated when the side lights are switched on. This is not an 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.

Condition of Tyres

Application

This examination applies to all tyres fitted to vehicles and trailers apart from spare tyres.

Reasons for Failure (RfF)

1. **A tyre:**
   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.
   b. with a lump, bulge or tear caused by separation or partial failure of its structure, including any lifting of the tread rubber.
   c. with exposed ply or cord.
   d. fouling on any part of the vehicle and safe driving not impaired.
   e. incorrectly seated on its wheel.
   f. underinflated.
   g. where the base of any groove of the original tread pattern is not clearly visible (vehicles with DGVW greater than 3500kg).
   h. where the minimum tread depth and tread band requirements are not met.
2. **A recut tyre:**
   a. fitted to a vehicle which should not have one.
   b. on which the wholly or partly recut tread pattern is not to the manufacturer's recut tread pattern.

Explanatory Note

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 (RfF 1c) 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 is a Reason for Failure**.** 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.

Condition of Tyres

When checking any tyre that appears to have been recut, it must be determined 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.

Details of manufacturers' recut tread patterns can be obtained either from the VTC or your tyre's manufacturer.

The original tread pattern means:

- On a re-treaded tyre the tread pattern immediately after the tyre was re-treaded.
- 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 applicable are shown in the table below:

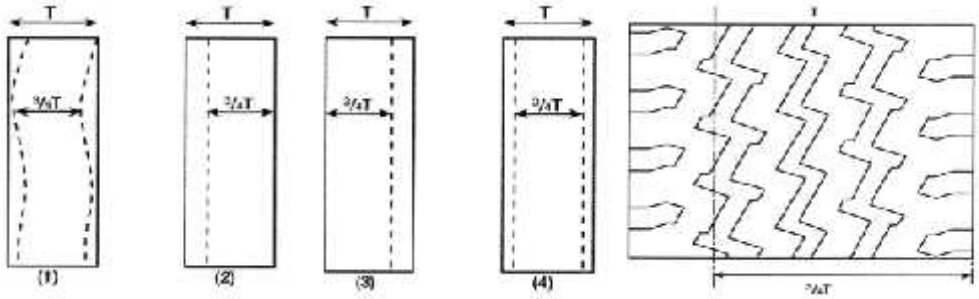
Design gross weight of vehicle or trailer	Over 3500kg	3500kg or less
Minimum tread depth	1mm, excluding any tie bar or tread wear indicator	1.6mm, excluding any tie bar or tread wear indicator
Position of minimum tread depth band	Form a continuous band covering at least any **3/4** of the breadth of the tread around the entire circumference	Across the entire breadth of the tyre (no shoulder wear is permitted)

The following diagrams show acceptable positions of the minimum tread depth band, for vehicles over 3500kg design gross weight, 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. For vehicles of 3500kg or less the band is the central 3/4 of the breadth of tread and it is not necessary for tread depth to be visible on the remainder.

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.

Figures (1), (2), (3) and (4) T= Breadth of Tread

¾ T = Minimum width of continuous band.

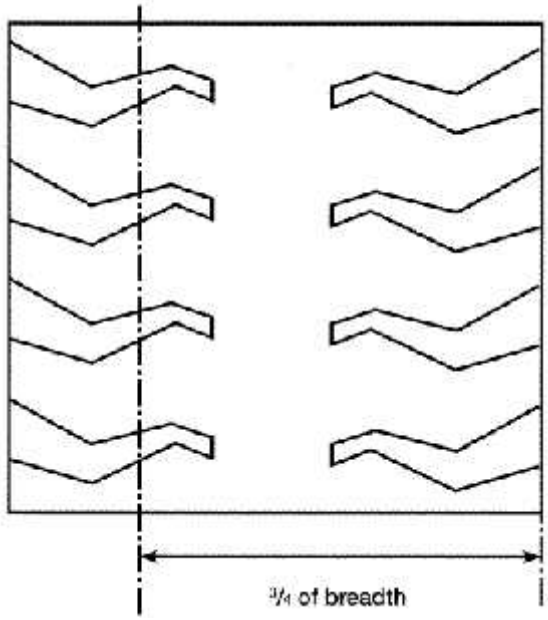


In this case the lateral grooves are the same depth as the circumferential groove and are included in the ¾ measurement.

The breadth of the tread is 'T'.

The ¾ of 'T' measurement can be taken over 'T' as in figure 1 to 4.

Fig 6.



This tyre only has lateral grooving

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

If any tread wear indicator is level with corresponding tread, measure tread depth and only fail if below the legal limit.

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Size and Type of Tyres

Application

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

Reasons for Failure (RfF)

1. A tyre:

a. of which the nominal size, ply rating, load index or speed rating of any tyre is below that appropriate for the plated axle weight.

b. which has a tyre use marking inappropriate for the type of axle or vehicle to which it is fitted.

c. of a different nominal size to another on the same axle.

d. of a different structure to another on the same axle.

e. on a steerable axle which is not of the same structure as any other tyre on any steerable axle.

f. on a driven axle which is not of the same structure as any other tyre on any driven axle.

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.

Explanatory Notes

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 (i.e. with tyre use symbol 2B indicated on the plate or plating certificate). There are three other categories of vehicle use which allow tyres to be operated at lower speeds and higher loads. The details of the axle loads are in the Tyre Tables obtainable from the VTC

2J SPEED RESTRICTED TO 40MPH

This category is applicable to "Municipal vehicles". "Municipal vehicles" means a motor vehicle or trailer limited at all times to use by a local authority, or a person acting in pursuance of a contract with a local authority, for road cleansing, road watering or the collection and disposal of refuse, night soil or the contents of cesspools, or the purposes of the enactments relating to weights and measures or the sale of food and drugs:

OR "Multi-stop local collection and delivery vehicles" being a motor vehicle or trailer used for multi-stop collection and delivery services to be used only within a radius of 25 miles from the permanent base at which it is normally kept.

2M SPEED RESTRICTED TO 40MPH

This category is applicable to a "low platform trailer" being a trailer fitted with tyres with a rim diameter size code of less than 20 and displaying a rectangular plate which is at least 225mm wide and at least 175mm high and bears two black letters "L'' at least 125mm high and 90mm wide with a stroke width of 12mm.

2R SPEED RESTRICTED TO 50MPH

This category is applicable to any vehicle where its speed is restricted to 50mph

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.

The minimum required speed ratings are :

CLASS OF VEHICLE	PERMITTED SPEED (MPH)	MINIMUM SPEED SYMBOL
Rigid goods vehicles with maximum laden weight not exceeding 7.5 tonnes	70	L
Rigid goods vehicles with maximum laden weight exceeding 7.5 tonnes	60	J
Articulated vehicles	60	J
Trailers	60	J
Goods vehicles and trailers operating under 2J or 2M tyre use conditions	40	D
Restricted speed vehicles operating under 2R tyre use conditions	50	F

ALTERNATIVE SPEED RATINGS

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	REDUCTION IN AXLE LOADS
Motor vehicle not exceeding 7500kg plated weight	L	J	7%
		K	3%
Trailers	J	F	15%
		G	5%

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

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.

TABLE 1

CODE	TYRE SIZE
A16 or 1 — 16	750 — 16 — 12 PR
B16 or 2 — 16	825 — 16 — 14 PR
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

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	Load Index	Single Kg	Dual Kg
70	670	1340	100	1600	3200	130	3800	7600	160	9000	18000
71	690	1380	101	1650	3300	131	3900	7800	161	9250	18500
72	710	1420	102	1700	3400	132	4000	8000	162	9500	19000
73	730	1460	103	1750	3500	133	4120	8240	163	9750	19500
74	750	1500	104	1800	3600	134	4240	8480	164	10000	20000
75	774	1548	105	1850	3700	135	4360	8720	165	10300	20600
76	800	1600	106	1900	3800	136	4480	8960	166	10600	21200
77	824	1648	107	1950	3900	137	4600	9200	167	10900	21800
78	850	1700	108	2000	4000	138	4720	9440	168	11200	22400
79	874	1748	109	2060	4120	139	4860	9720	169	11600	23200
80	900	1800	110	2120	4240	140	5000	10000	170	12000	24000
81	924	1848	111	2180	4360	141	5150	10300	171	12300	24600
82	950	1900	112	2240	4480	142	5300	10600	172	12600	25200
83	974	1948	113	2300	4600	143	5450	10900	173	13000	26000
84	1000	2000	114	2360	4720	144	5600	11200	174	13400	26800
85	1030	2060	115	2430	4860	145	5800	11600	175	13800	27600
86	1060	2120	116	2500	5000	146	6000	12000	176	14200	28400
87	1090	2180	117	2570	5140	147	6150	12300	177	14600	29200
88	1120	2240	118	2640	5280	148	6300	12600	178	15000	30000
89	1160	2320	119	2720	5440	149	6500	13000	179	15500	31000
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			

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	2060
640 - 13C	6	1280	2240
640 - 13C	8	1430	2750
670 - 13C	6	1380	2650
670 - 13C	8	1580	3040
1050 - 13	12	4020	7080
1050 - 13	14	4830	8900
155 - 14C	6	1070	2040
165 - 14C	6	1200	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	4	1340	2560
185 - 14	6	1580	2560
185 - 14C	6	1550	2920
185 - 14C	8	1700	3200
195 - 14	RADIAL REINFORCED RAD	1300	2490
195 - 14	4	1500	2870
195 - 14C	6	1790	3210
195 - 14C	8	1800	3600
205 - 14	RADIAL REINFORCED RAD	1420	2720
205 - 14	4	1650	3160
205 - 14C	6	1850	3510
205 - 14C	8	2060	3900
215 - 14C	8	2240	4240
500 - 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	1220	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	1520	2950
750 - 14C	8	1730	3360
11-15	6	2240	—
185 - 15C	8	1230	2320
185 - 15C	8	1750	3400
600 - 15C	6	1220	2340
640 - 15C	6	1380	2650
670 - 15C	6	1530	2930
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	1820	3540
750 - 15C	8	2060	3970
750 - 15	10	2340	4370
750 - 15	12	2750	5340
750 - 15	14	3150	6130
750 - 15	16	3660	6860
825 - 15	12	3050	5930
825 - 15	14	3560	6960
825 - 15	16	4080	8040
825 - 15	20	5000	9440
1000 - 15	12	3870	7120
1000 - 15	14	4520	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	3160
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	1600	2920
600 - 16	10	1830	3300
650 - 16	6	1520	2920
650 - 16	8	1820	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	2340	4270
750 - 16	10	2600	4720
750 - 16	12	2900	5600
825 - 16	8	2650	4880
825 - 16	10	2950	5480
825 - 16	12	3300	6400
825 - 16	14	3600	6800
900 - 16	6	2360	4360
900 - 16	8	2720	5140
900 - 16	10	3060	5600
900 - 16	12	4070	7200
900 - 16	14	4320	7600
1060 - 16	12	4880	8120

Nominal Tyre Size	Ply Rating	Maximum Axle Load (Kg) Single Tyres	Twin Tyres
1400 - 16	18	7880	—
1400 - 16	20	8390	—
1400 - 16	22	8950	—
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	3300	6000
9 - 19.5	RADIAL	3800	7200
9.5 - 19.5	RADIAL	4240	7800
600 - 20	6	1420	2750
600 - 20	8	1630	3100
600 - 20	10	1830	3400
650 - 20	6	1830	3460
650 - 20	8	2240	4070
650 - 20	10	2440	4680
700 - 20	8	2240	4480
700 - 20	10	2650	4280
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	9600
1100 - 20	14	6100	10900
1100 - 20	16	6630	11600
1200 - 20	14	6100	10900
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	8150	—
1400 - 20	20	*9510	—
1400 - 20	22	*10000	—
14.5 - 20	10	4000	—
1500 - 20	20	10600	—
1500 - 20	22	11400	—
1500 - 20	24	12600	—
1600 - 20	14	6100	—
1600 - 20	20	11400	—
1600 - 20	22	12500	—
1600 - 20	24	13600	—
1300 - 20	18	7300	13000
1400 - 20	18	8250	—
1100 - 22	12	5530	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
12 - 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	10200
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	10900
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

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
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
126	2890	5780	3230	6460	3170	6330	3300	6600

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
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
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

If axle loads for 'unrestricted' speed vehicles are required - contact VTC.

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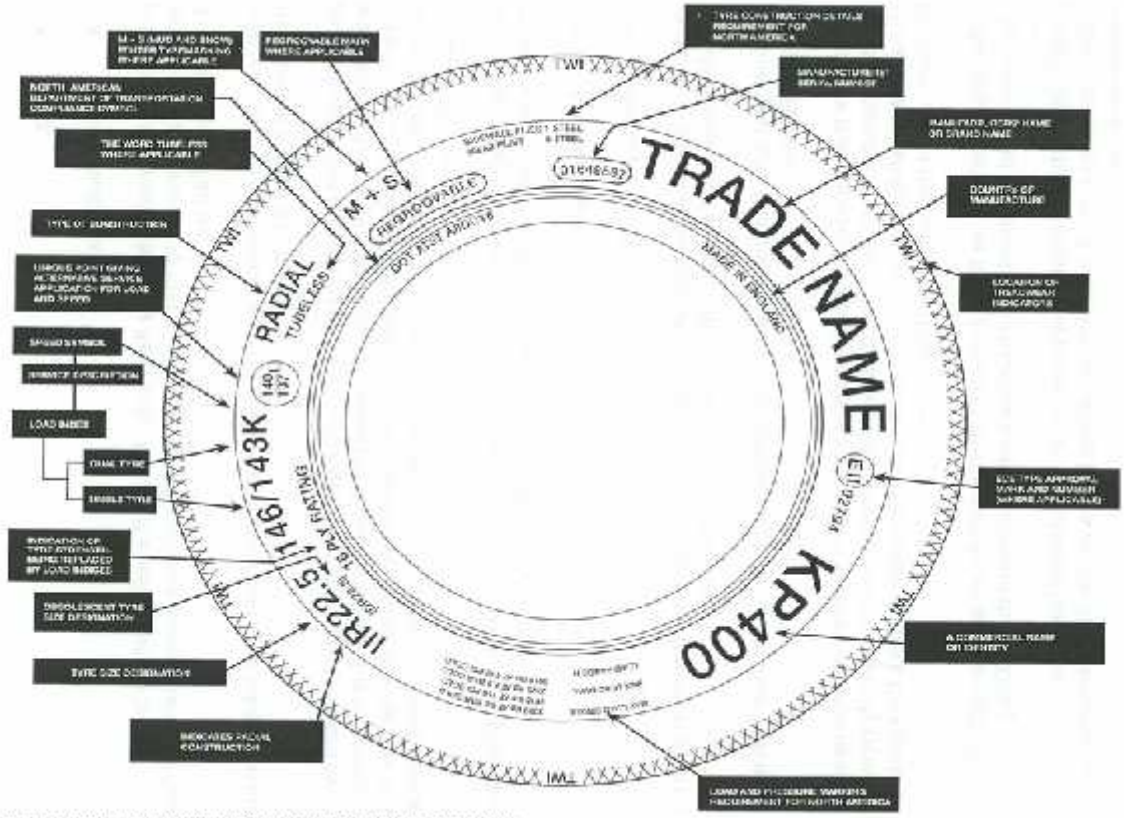

A tyre may not necessarily carry all of the markings.

Seat Belts and Supplementary Restraint Systems

Application

This inspection applies to all vehicles with seat belts and/or Supplementary restraint systems (SRS) fitted.

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

Reasons for Failure (RfF)

1. **Obligatory Seat Belt (see Table):**
   a. missing.
   b. of an incorrect type.
2. **Anchorages:**
   a. with excessive corrosion, serious deterioration or a fracture in a load bearing member of the vehicle structure within 300mm (12”) of the anchorage (where a seat belt is attached to a seat frame this will apply to all seat mounting points).
   b. a seat belt not securely fixed to the seat or to the vehicle structure.
3. **Locking Mechanism, Stalks, Retracting Mechanism and Fittings:**
   a. a locking mechanism of a seat belt does not secure or release as intended.
   b. an attachment or adjustment fitting fractured, badly deteriorated or not operating effectively.
   c. corrosion or deterioration of a flexible stalk likely to lead to failure under load.
   d. broken flexible stalk strands.
   e. a retracting mechanism does not retract the webbing sufficiently to remove all the slack from the belt with the locking mechanism fastened.
4. **Condition of Webbing:**
   a. a cut or damage or fluffing or fraying or overstretching sufficient to obstruct the correct operation of the belt or significantly weaken the webbing.
   b. stitching badly frayed, insecure, incomplete or repaired.
5. **Obvious signs of structural weakness in a Seat belt; fitting, guide, stalk or pivot such that failure is likely.**
6. **Seats with seat belts attached to them:**
   a. insecure.
   b. with a cracked or fractured leg or frame.
7. **A seat belt:**
   a. load limiter or pre-tensioner obviously missing where fitted as original equipment
   b. pre-tensioner or a ‘folded type’ webbing load limiter obviously deployed.
8. **An airbag:**
   a. missing.
   b. obviously defective.
9. **The SRS warning lamp indicates any kind of failure in the system.**

Explanatory Notes

The minimum requirement for the fitment of seat belts is detailed in the tables below.

The only goods vehicles up to and including 3500kg DGW likely to be subject to this inspection are mini-articulated vehicles.

Minimum Requirements for Forward Facing Seats on Vehicles First Used from 1 November 2001 with A DGW in Excess of 3500kg

Driver's seat	Front passenger seats	Rear passenger seats
3 point belt (lap and diagonal) or lap belt	3 point belt (lap and diagonal), lap belt or disabled person's belt	No belt required

Vehicles First Used from 1 April 1980 up to and Including 3500kg DGW

Vehicle first used:	Driver's and specified front passenger seat (furthest from driver)	Other front passengers	Rear passengers
1/4/1967 to 31/3/1980	2 point belt (diagonal body restraining)	No belt required	No belt required
1/4/1980 to 30/9/1988	3 point belt (lap and diagonal	No belt required	No belt required
From 1/04/1987	3 point belt (lap and diagonal)	3 point belt (lap and diagonal), lap belt or disabled person's belt	No belt required

Seat belts are not required on light goods vehicles with an ULW exceeding 1525kg, if the model of vehicle was first manufactured before 1 October 1979 and the vehicle was manufactured before 1 October 1981, or first used before 1 April 1982.

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

On retracting seat belts, check that with the mechanism fastened and the seat adjusted to its rearmost position, excess webbing is wound into the retracting unit. If there is doubt about the operation of the retracting unit, this check should be carried out with the seat unoccupied.

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.

Pull the sheaths aside if this can be done without damage

Some vehicles have seat belts which will not release the inertia aspect of the seat belt unless the ignition is switched on. Ensure the park brake is applied and the gears are in the neutral position before switching on the ignition. Owing to the height of cabs on many commercial vehicles this inspection should be performed with the inspector sat in the appropriate seat.

Floor mounted anchorages may need to be inspected from underneath the vehicle.

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.

Seat belt load limiters are used on some vehicles to minimise seat belt inflicted injury in particularly violent collisions.

This is generally achieved by releasing a little more excess belt webbing when a great deal of force is applied to the belt.

The simplest type of load limiter is a fold sewn into the belt webbing. The stitches holding the fold in place are designed to come apart when a high amount of force is applied to the belt, thereby releasing an extra bit of webbing.

More advanced load limiters rely on a torsion bar in the retractor mechanism, which cannot usually be readily seen or tested.

Seat belt pre-tensioners may be fitted to some seat belts. Once activated a warning device may display.

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Mirrors and Indirect Vision Devices

Application

This inspection applies to all vehicles.

Reasons for Failure (RfF)

1. Not fitted with the correct number or type(s) of mirror, or other indirect vision device.
2. Part of any required close proximity, front mirror or camera for an indirect visual device is fitted less than 2 metres from the ground.
3. A required mirror or indirect vision device with a crack in the glass.
4. A mirror, indirect vision device or its mounting bracket insecure or structurally deteriorated.
5. An internal mirror edge not surrounded by protective material or with damaged protective material.

Explanatory Notes

DATE OF FIRST USE	REQUIREMENTS
Before 1 April 1985	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 1985	A main exterior mirror on both the offside and nearside
From 1 October 1988 with DGVW greater than 12000 kg	A close proximity mirror on the nearside in addition to those shown above
From 1 October 1988 articulated vehicles with DGVW greater than 12000 kg	A wide angle mirror on the nearside in addition to those shown above
From 1 January 2000 with a DGVW exceeding 3500kg	A main exterior mirror on both the offside and the nearside A wide angle mirror on the passenger side. A close proximity mirror on the passenger side.
From the 26 January 2007 with a DGVW exceeding 7500 kg	A main exterior mirror on both the offside and the nearside. A wide angle mirror on both the offside and the nearside A close proximity mirror on the passenger side. A front mirror

Vehicles registered from 26 January 2007 but before 26 January 2008 in excess of 7500kg may not have a front mirror, these vehicles should be treated as if derogated and therefore pass and advise for this aspect of the inspection.

Any vehicle registered from 26 January 2008 in excess of 7500kg must have a front mirror, provided it can be fitted more than 2m from the ground.

"Indirect vision devices " means devices to observe the traffic area adjacent to the vehicle which cannot be observed by direct vision. These can be conventional mirrors, camera-monitors or other devices (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.

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

For vehicles up to 7500kg if the close-proximity mirror cannot be fitted at least 2m from the ground. The vehicle does not require either the wide angle or close-proximity mirrors.

Known makes and models over 3500kg that do not require wide angle or close-proximity mirrors are:

- Iveco Daily
- Johnston Sweepers 5000 series
- Mercedes Chassis Cab Vario with two wheel drive and all Sprinters
- Mitsubushi Fuso Canter
- Nissan Cabstar
- Isuzu N Series this is any Isuzu up to 7500kg
- Renault Mascot and Maxity
- Volkswagen LT and Crafter

There are a minority of vehicles which can achieve the view to the front without a front mirror, if you are in any doubt about the necessity for a front mirror contact VTC.

The retro fitting of mirrors from 1 January 2000 does not include the front mirror.

Internal mirrors must be surrounded by protective material, this does not apply to vehicles registered before April 1969.

For the purpose of this inspection on a left hand drive vehicle the nearside is at the right and the offside at the left.

Close proximity and front mirrors must be at least 2m from the ground. If a vehicle is fitted with a low mounted cab so that the mirror cannot be fitted at this height it is exempt from the requirement to fit a close proximity and front mirror. Some Mercedes Unimogs fall into this category or the category of not being a forward control vehicle the U300, U400, U500 & U3000, U4000, U5000, Zetro 1833A and Zetro 2733A are exempt the front mirror but the U20 is not exempt and requires a front mirror.

RfF 2 will not apply to cameras replacing front and or close proximity mirrors fitted less than 2 metres from the ground where the camera is hidden within the body contour.

Application

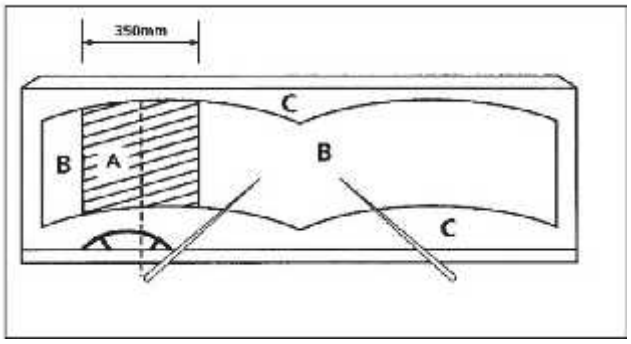
This inspection applies to all vehicles.

Reasons for Failure (RfF)

1. **A Windscreen:**
   a. with damage or discolouration which impairs the driver's view of the road through the swept area of the windscreen.
   b. with a crack, weakness which renders the screen insecure or which impairs the driver's view.
   c. with an obstruction which encroaches more than 40mm into the swept area.
   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.
   e. with damage which exposes the inner layer of a laminated screen.
2. **A windscreen or window so insecure that it is likely to fall out or damaged to the extent that it presents a danger to occupants or to other road users.**
3. **Damage or obstruction of any window, which impairs the driver's view through a mandatory mirror.**

Explanatory Notes

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 unrepaired 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.

When checking 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 into the swept area.
Video monitors when fitted in the area at the top of the screen to give a view to the rear are acceptable provided they do not obstruct the swept area more than a rear-view mirror would. Monitors fitted onto

the dash must not encroach into the swept area by more than 40 mm.

Official stickers are permitted to encroach more than 40mm if this is necessary to comply with other regulations, and include road fund licence, operator's licence, vehicle anti-theft scheme stickers issued by the Police Authority, toll payment tag/stickers, vehicle distance or lane indicator lenses and security passes. These should only be considered a reason for failure if they seriously restrict the view to the front.

On many vehicles the original design will place things like instrument panel clusters inside the 40mm area swept by the wipers. Intrusions such as this which are original design features can be ignored, as can damage or unofficial stickers placed inside the 40mm limit but which are hidden by that feature.

Some commercial vehicles have very large screens and have windscreen wipers which cover an area that have no practical use. For the purposes of the annual test, the area of the 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 other than the area through which the driver is required to view a mirror (front mirrors on HGVs are not required to be viewed through the area swept by the wipers).

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.

Examples of acceptable features which may intrude into the swept area of the wipers provided they do not seriously impair the driver's view are:

- Vehicle distance or lane indicator lenses
- Automatic windscreen wiper detectors
- Grooves in the windscreen designed to clean wiper blades
- Fresnel lens
- Split windscreens
- Wipers which park adjacent to a central pillar
- Driver's aids such as blinds and their mountings. This includes manufacturer's exterior fixed sun visors.

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 manufacturer's original equipment.

Speedometer

Application

This inspection applies to all vehicles.

Reasons for Failure (RfF)

1. For all vehicles, a speedometer:

a. not fitted.

b. incomplete, clearly inoperative, or with dial glass broken.

c. cannot be illuminated.

d. not displaying miles per hour

Explanatory Notes

Speedometer

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Horn

Application

This inspection applies to all vehicles.

Reasons for Failure (RfF)

1. **Horn control:**
   a. missing.
   b. cannot be reached easily from the driving seat.
   c. insecure.
2. **Horn:**
   a. does not work.
   b. is not loud enough to be heard by other road users.
   c. sound not continuous or uniform.
   d. insecure.

Explanatory Notes

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.

Horn

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Driving Controls

Application

This inspection applies to all vehicles.

Reasons for Failure (RfF)

1. **A driving control:**
   a. insecure.
   b. incomplete.
   c. fractured, cracked or excessively corroded.
   d. obstructed or impeded in its travel.
   e. obviously not functioning correctly.
   f. pivot is tight in operation.
   g. does not release correctly.
   h. with the presence of rubbish or other items likely to interfere with the proper control of the vehicle.
   i. clutch or brake pedal anti-slip provision missing, loose, incomplete or ineffective.
2. **Brake pedal:**
   a. has excessive side play.
   b. fouling other parts of the vehicle
   c. insufficient reserve travel when fully depressed.

Explanatory Notes

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

Examples of driving controls which need to be inspected are:

1. Gear control.
2. Accelerator pedal.
3. Clutch pedal.
4. Brake 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.

Power operated braking systems where the foot valve is fully open before the pedal is fully depressed do not require any reserve travel.

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Pressure/ Vacuum and Building Up

Application

This inspection applies to all vehicles fitted with a pressure/vacuum Braking System, 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).

Reasons for Failure (RfF)

1. **A mandatory visual warning device:**
   a. cannot be seen by the driver in all lighting conditions.
   b. not fitted or not working correctly.
2. **Not enough pressure or vacuum to give at least four fully assisted brake applications after the warning device has indicated minimum effective working conditions.**
3. **Time to reach minimum effective working pressure is more than 3 minutes for pressure systems and 1 minute for vacuum systems (6 minutes for type approved vehicles designed to draw a trailer).**

Explanatory Notes

Deplete the air or vacuum system by applying the foot brake, when the warning device operates there must be four further assisted brake applications.

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.

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 RfF 2 use the procedure shown in MIM42 Service Brake Performance.

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. With Type Approved vehicles designed to draw a trailer a build-up time of 6 minutes is acceptable. If, however, the time recorded for the vehicle is appreciable longer than expected from that type of vehicle, this should be taken to indicate undue wear or a defect in the equipment.

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Hand Lever Operating Mechanical Brakes

Application

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

Reasons for Failure (RfF)

1. **Brake lever:**
   a. fractured or cracked.
   b. excessively corroded.
   c. insecure.
   d. positioned so that it cannot be operated satisfactorily.
   e. impeded in its travel.
   f. is not held in the “on” position when knocked.
   g. excessive or insufficient reserve travel.
   h. pivot with side play such that it is likely to fail.
   i. pivot is tight in operation.
   j. does not release correctly.
2. **Pawl mechanism:**
   a. and/or mountings in such a condition that early failure is likely.
   b. pawl spring is not pushing teeth into positive engagement with ratchet teeth.
3. **Locking and/or retaining devices missing or insecure.**
4. **Electronic Park Brake Control:**
   a. activator missing, damaged or inoperative.
   b. incorrect functionality, warning indicator shows malfunction.

Explanatory Notes

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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.

Reasons for Failure (RfF)

1. **Control valve:**
   a. on a motor vehicle unable to be operated from the driving position.
   b. insecure.
   c. fractured, cracked, damaged or excessively corroded.
   d. impeded in its travel.
   e. leaking.
   f. excessive wear in the gate or lever locating mechanism.
   g. malfunctioning.

Explanatory Notes

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Application

This examination applies to all vehicles and trailers.

Reasons for Failure (RfF)

1. **Air pressure or vacuum systems gauge reading drops when pedal depressed indicating a leak in the system.**
2. **Hydraulic systems (other than full power systems):**
   a. pedal creeps down when depressed.
   b. sponginess when pedal depressed.
3. **Servo unit: defective or ineffective.**
4. **Pedal does not dip when engine started, indicating lack of assistance for brake systems assisted by engine vacuum.**
5. **Full pressure hydraulic system pressure is not maintained for 10 minutes when the brakes are off and the engine is stopped.**
6. **Any of the required ABS or ABS/EBS or ESC warning lamps:**
   a. are missing.
   b. do not illuminate as required when ignition switched on.
   c. indicate a fault.
7. **Vehicles and trailers fitted with ABS or ABS/EBS or ESC:**
   a. a system component obviously missing or excessively damaged.
   b. system wiring excessively damaged.
   c. a system component with an inappropriate or unsafe modification.
   d. an ESC system switch insecure or faulty or which does not allow automatic resetting of the ESC function to “on” at system energisation.
8. **On vehicles and trailers both fitted with ISO 7638 (ABS/EBS) lead sockets an ISO 7638 connecting lead not fitted or being used.**
9. **A system not fitted to a vehicle where it is mandatory.**

Explanatory Notes

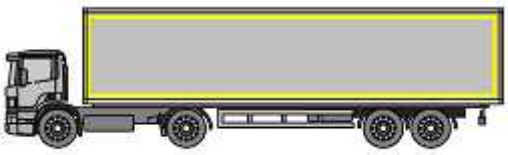
Vehicles and trailers on which anti-lock brakes are mandatory	
Type of Vehicle	**Date**
Motor vehicles with design GVW greater than 16000kg and authorised to tow a semi-trailer or a centre axle drawbar trailer with total design axle weights greater than 10000kg or a drawbar trailer with design GVW greater than 10000kg. (an O4 trailer) See examples 1 and 2 below to determine whether a motor vehicle needs antilock brakes	First used from 1 April 1992 and up to 30 April 2002
Motor vehicle with design GVW greater than 3500kg	First used from 1 May 2002
Semi-trailers and centre axle drawbar trailers with a design total axle weight of more than 10000kg	Manufactured from 1 October 1991
Semi-trailers and centre axle drawbar trailers with a design total axle weight of more than 10000kg and which do not have a load sensing valve	Manufactured from 1 October 1982 to 30 September 1991
Semi-trailers and centre axle drawbar trailers with a design total axle weight of more than 3500kg	Manufactured from 1 May 2002
Full drawbar trailers (turntable type) with a design GVW of more than 10000kg	Manufactured from 1 October 1991
Full drawbar trailers (turntable type) with a design GVW of more than 10000kg and which do not have a load sensing valve	Manufactured from 1 October 1982 to 30 September 1991
Full drawbar trailers (turntable type) with a design GVW of more than 3500kg	Manufactured from 1 May 2002

Anti-lock Brake exempt vehicles

A public works vehicle which has a maximum design GVW of 7500kg and which is specifically designed for use and used solely for the purpose of street cleansing.

How to determine if a drawing vehicle first used from 1st April 1992 and before 1 May 2002 needs antilock brakes.

Example 1



Semi-Trailer

or

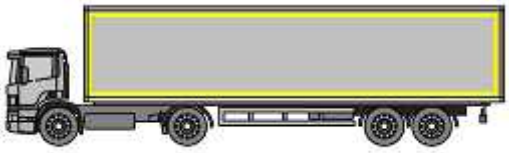
Rigid and Drawbar Trailer

DGVW 18000kg

DGTW greater than 28000 - (DGTW-DGVW>10000)

Anti-lock brakes required.

Example 2



Semi-Trailer or

Rigid and Drawbar Trailer

DGVW 18000kg GTW 27000kg (DGTW-DGVW<10000)

Anti-lock brakes may be required if:

1. the drawing hitch is rated at more than 10000kg or
2. the tractor is presented for test with a semi-trailer which has Total Axle Weight greater than 10000kg or
3. the drawing vehicle is presented for test with a trailer which has DGVW greater than 10000kg

The tow hitch should have a manufacturer's identification plate showing the hitch capacity.

For some brake systems a small amount of creep may be due to elasticity in the brake components. **For test purposes it will only be possible to check the static part** of the warning light sequence. Some systems require movement of the vehicle but this is not part of the test.

If a trailer is submitted for test coupled to a motor vehicle which has no power supply for the trailer anti-lock system the test should be suspended on the grounds that the trailer has not been accompanied by a suitable drawing vehicle.

If a trailer does not have a warning light, this is acceptable provided that the drawing vehicle has a trailer warning light fitted in the cab. If neither the tractor nor trailer has a warning light and there is a separate connector for the anti-lock system the test should be suspended as described above. If neither has a warning light and the trailer anti-lock is operated through the stop lamp circuit the trailer should be failed under Reason for Failure 6a.

Vehicles and trailers fitted with ABS are not required to have a LSV. However, if an LSV is fitted and known to be a standard fitment this is a RfF if it is removed or disconnected refer to MIM37.

There is no requirement to check the colour of Malfunction Indicator system warning lamps MIL.

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.

Trailers fitted with ABS must have either; a warning lamp (usually green and fitted on the trailer headboard), or if this is not present then there must be a trailer ABS warning lamp in the motor vehicle cab of any colour separate from the vehicle warning lamp. If trailer ABS warning lamps are fitted to both vehicle and trailer both systems must work (on some trailers the trailer warning lamp may be extinguished when the ISO7638 cable is fitted).

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.

ABS/EBS equipped vehicles

Vehicles fitted with ABS and EBS must have mandatory red and amber/yellow MILs fitted. Drawing vehicles must be fitted with a separate amber/yellow MIL for the trailer, though one red MIL may be shared between tractor and trailer. If separate tractor and trailer red MILs are fitted they are both required to work.

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.

Windscreen Washers and Wipers

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.

Reasons for Failure (RfF)

1. **Switches missing or defective.**
2. **Wipers:**
   a. do not move over an adequate area.
   b. do not work continually when switched on.
   c. a blade missing, insecure or so deteriorated that it cannot clear the screen effectively.
3. **Washers:**
   a. ineffective (lack of fluid but pump operates or jets misaligned).
   b. Inoperative.

Explanatory Notes

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 inoperative.

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

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Seats

Application

This inspection applies to all vehicles.

Reasons for Failure (RfF)

1. **Any seat**
   a. structure defective.
   b. insecure.
   c. fore and aft adjustment mechanism not functioning as intended.
   d. the back rest cannot be secured in the upright position.

Explanatory Notes

When checking the seat adjustment, it is not necessary to check that the seat can be secured in all possible positions.

In the case of electrically adjusted seats, it is not necessary to check any 'memory position' function.

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Steering Control

Application

This inspection applies to all vehicles.

Reasons for Failure (RfF)

1. **Steering column:**
   a. with excessive movement of centre of steering wheel in line with the column (end float).
   b. with excessive side play indicating a badly worn top bearing or insecure top mounting bracket.
   c. flexible coupling or universal joint deteriorated, with excessive wear or insecure.
   d. coupling clamp bolt or locking device missing or loose.
   e. with an adjustment device worn to such an extent that it would render the column insecure.
   f. with an unsafe modification
2. **Steering Wheel:**
   a. loose.
   b. the cover torn with jagged edges which may injure the driver.
   c. hub, spoke or rim fractured or cracked.
   d. hub retaining device not fitted or loose.
3. **Free play in system which is outside the prescribed limits.**

Explanatory Notes

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

This inspection does not apply to driver's 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.

Steering Control

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”)

Check the steering column has no excessive end float, when applying an upward and downward pressure to the steering wheel in line with the column.

Check the steering column has no excessive side play indicating a badly worn top bearing or insecure top mounting bracket, by pulling and pushing the rim.

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.

Cab Doors

Application

This application applies to all vehicles

Reasons for Failure (RfF)

1. A Door which:

a. is missing.

b. cannot be opened.

c. is worn or damaged so that it is difficult to open or close.

d. has a sliding action, will not remain closed or is likely to fly open inadvertently.

e. has a hinged action, will not remain closed or is likely to fly open inadvertently.

Explanatory Notes

On security vehicles this door may be fitted so that it does not open directly into the cab.

If a door, fitted with a two position catch, will only engage in the first or semi-shut position this will be regarded as a RfF.

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Cab Floor and Steps

Application

This inspection applies to all vehicles.

Reasons for Failure (RfF)

1. **A cab floor or internal wheel arch** which is badly deteriorated or insecure
2. **Any step or step ring insecure**

Explanatory Notes

Examine the cab floor, internal wheel arches and cab steps for condition and security.

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Cab Security

Application

This inspection applies to all vehicles.

Reasons for Failure (RfF)

1. **Cab insecure.**
2. **A retention and/or locking device on a tilt cab missing or defective.**
3. **Cab:**
   a. not located squarely on chassis.
   b. air suspension leaking.
   c. leaning to one side.
4. **Excessive corrosion or damage to a load bearing member which seriously reduces its strength near the cab mountings.**

Explanatory Notes

All means of securing the cab are to be inspected where practical.

Movement which is designed into mountings should not be confused with excessive wear.

Cab security inspection applies to the primary and secondary locking devices for tilt cabs.

Cabs should be level in line with the chassis when no person is present in the cab. Air leaks and other obvious defects to airbags such as cords showing or bulges will be a RfF.

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Application

This inspection applies to all vehicles and trailers.

Reasons for Failure (RfF)

1. **Wiring:**
   a. chafing, damaged or deteriorated insulation.
   b. not adequately secured.
2. **Battery and/or carrier:**
   a. insecure.
   b. case leaking.
   c. switch or fuse defective.
3. **A trailer electrical socket:**
   a. insecure.
   b. damaged or deteriorated.
4. **A power train:**
   a. insecure.
   b. presents a risk of fire or injury.

Explanatory Notes

If the battery is only held in place by the cables and by a lip on the carrier it is insecure.

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. These high voltage wires are colour coded orange.

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Road Wheels and Hubs

Application

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

Reasons for Failure (RfF)

1. **A tyre retaining ring:**
   a. fractured.
   b. butting causing the flange to lift more than 1.5mm from the rim.
2. **A wheel:**
   a. with any visible elongation of a stud hole.
   b. badly damaged or distorted (including damaged by the corners of a wheel nut cutting into the material of the wheel).
   c. not compatible with fixings.
   d. cracked (except at the bridge over the valve), weld breaking away or an inadequate repair.
   e. made of aluminium alloy repaired by welding.
   f. with a load rating less than that required to support the maximum permissible Manx axle load.
3. **A hub:**
   a. cracked, badly damaged, or with a half shaft bolt, stud or nut loose or missing.
   b. with clearance between a spigot mounted wheel and the hub spigots that exceeds 3mm across the diameter.
   c. with a retaining nut or stud missing or loose or obviously not fulfilling the function of clamping the wheel to the hub.
   d. with a spigot wheel nut washer cracked.
   e. with a wheel locating spigot or dowel missing.

Explanatory Notes

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.

Presenters must remove wheel embellishers and visual security indicators.

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 Volvo FL L 4x2 rigid and FL 6H 4x2 rigid, are capable of carrying higher loads than those shown on the wheels. The wheels can be identified by the following markings stamped on the wheel:

Wheel brand name	Kronprinz
Clamping type	M20
Place of manufacture	Made in France
Designation	19.5 x 7.50HOS56 E-DOT
Wheel load index	144/142
Volvo part number	20946506

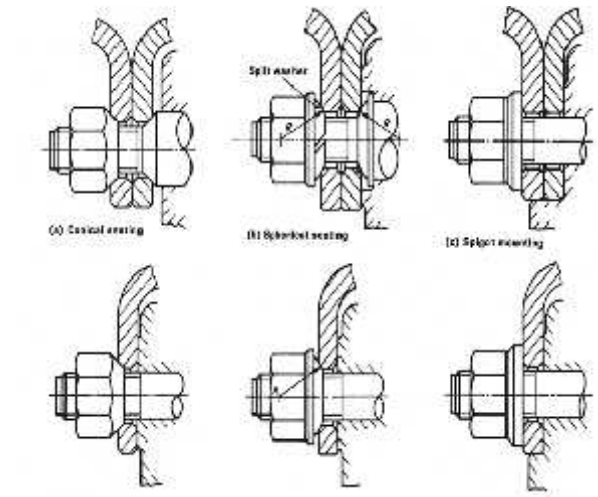
The wheel is capable of carrying a load equivalent to a 145/143. Please be aware of the increased load capacity should you observe these wheels at annual test. This weight increase is applicable to all vehicles equipped with these wheels not just Volvo.

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 RfF 2f.

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



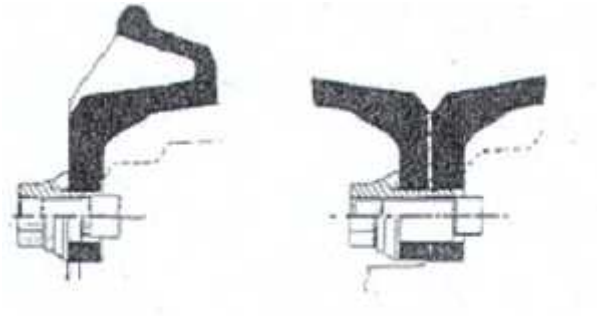
Vehicles with conical wheel fixings MUST NOT be fitted with wheels from vehicles designed for use with spherical fixings. (British built vehicles normally have conical wheel fixings).

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

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.

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Application

Sideguards are applicable to:
Motor Vehicles first used from 1 January 1999 with a design gross weight exceeding 3,500kg

Trailers manufactured from 1 July 1998 with an unladen weight exceeding 1,020kg

Rear Under-run Devices are applicable to:
Motor Vehicles with a gross design weight exceeding 3,500kg and first used from 1 January 1999; or

Trailers manufactured from 1 July 1998 with an unladen weight exceeding 1,020kg

Bumper Bars are applicable to:
All vehicles and trailers.

Reasons for Failure (RfF)

1. Sideguards:

a. not fitted to a vehicle required to have them fitted.

b. insecure.

c. cracked, fractured, corroded or damaged so that its effectiveness is reduced.

d. with exposed surfaces which are not smooth (e.g. projecting brackets, jagged edges, bolt heads that are not dome shaped).

e. with external edges that are not radiused.

f. with incorrect dimensions.

g. that is not continuous along the vehicle length in other than accepted circumstances.

h. that increases the overall width of the vehicle.

i. with more than 55cm height from the ground to the lowest edge of the guard. (vehicle unladen or semi-trailer load platform horizontal).

2. Rear under-run device:

a. not fitted to a vehicle required to have one fitted.

b. insecure.

c. cracked, fractured, corroded or damaged so that its effectiveness is reduced.

d. that has a jagged edge.

e. with more than 55 cm ground clearance.

f. which extends beyond the outer edge of the outermost rear tyre (See note).

g. With the outer edge of the device more than 10cm inboard of the outer edge of the outermost rear tyre (or more than 30cm inboard where a demountable body is fitted).

h. Extends beyond the outermost width of the vehicle which is fitted with a tail lift.

i. incomplete.

3. Bumper Bar or Bracket:

a. insecure.

b. has a jagged edge or projecting edge likely to cause injury.

Explanatory Notes

Sideguard Exempted Vehicles:

- Tractor units.
- A trailer specially designed and constructed, and not merely adapted, to carry round timber, beams or girders, being items of exceptional length.
- A trailer with a load platform which is not more than 75cm from the ground throughout that part of its length under which a sideguard would have to be fitted.
- A vehicle or trailer constructed so that it can be unloaded by part of the vehicle being tipped sideways or rearwards.
- A vehicle or trailer designed solely for use in connection with street cleaning, the collection/disposal of refuse or the contents of gullies/cesspools. (Skip carrying vehicles are classed as refuse vehicles and as such are exempt).
- A vehicle or trailer specially designed and constructed, and not merely adapted, to carry other vehicles loaded onto it from the front or rear (*Vehicles with a standard flat body fitted with a "beaver tail" are not exempt*).
- A semi-trailer incorporating a sliding bogie.
- A **rigid motor vehicle** or **trailer** designed for and constructed for the special purpose of carrying long (but not exceptionally long) timbers from an off road location in a forest.

  To fulfil this definition the vehicle must meet the following criteria:

  a. It must be of skeletal construction.
  b. It must have a minimum of two upright side supports (side bolsters) fitted to each side of the vehicle.
  c. It must not be fitted with a load platform, other than chassis rails, cross bearers and the minimum amount of flooring necessary to protect wiring or brake line components.

  It is permissible for the vehicle to be fitted with the following:

  - Loading equipment i.e. a Hiab crane or similar device.
  - Cross bearers that do not have upright side supports.

This list is not exhaustive but covers the vehicles likely to be encountered within the testing scheme.

Side guards can be manufactured & tested to any of the following standards:

- Road Vehicles (Construction, Equipment and Weights) Regulations 2012
- Directive 89/297/EEC or
- The technical requirements of Directive 89/297/EEC

REAR UNDER-RUN DEVICES

Exempted vehicles:

- Tractor units.
- A vehicle or trailer fitted at the rear with apparatus specially designed for spreading material on a road.
- A vehicle or trailer so constructed that it can be unloaded by part of the vehicle being tipped rearwards.
- A vehicle or trailer specially designed and constructed, and not merely adapted, to carry other vehicles loaded onto it from the rear. (Vehicles with a standard flat body fitted with a “beaver tail” are not exempt.)
- A trailer specially designed and constructed, and not merely adapted, to carry round timber,

beams or girders, being items of exceptional length.

- A vehicle or trailer fitted with a tail lift so constructed that a lift platform, with a minimum length of 1m, forms part of the floor of the vehicle.
- A vehicle specially designed, and not merely adapted, for the carriage and mixing of concrete.

This list is not exhaustive but covers the vehicles likely to be encountered within the testing scheme.

BUMPER BARS

Vehicles are not required to have separate bumper bars, these may be incorporated into the body in some cases.

SIDEGUARDS

Vehicles equipped with cranes, it is not practicable to fit sideguards in the area of the crane and its controls. Before reaching a decision on its pass/fail criteria for vehicles/trailers you need to take account of the following;

Vehicles fitted with an extendible device or leg to provide stability during loading, and equipped with loading devices and controls, which makes it impracticable to fully comply with the sideguard legislation, will be deemed compliant provided sideguards are in place to the fullest extent practicable. All vehicles must be presented for statutory test with any such devices in the stowed position.

Vehicles with access and a working platform adjacent to, and necessary for, the operation of a loading device, shall be regarded as a load carrying platform for sideguard compliance forward of the extendable device or leg.

Acceptable circumstances are when other items on the vehicle such as fuel tanks, work boxes etc which by virtue of their shape and characteristics conform to the requirements of a sideguard.

Trailers manufactured before 1 July 1998 will not be failed if sideguards are not fitted, but the driver/operator notified that they may be required under certain circumstances.

Sideguards fitted to vehicles/trailers that do not require them will only be checked for RfF1b, 1d, 1h (security, jagged edges and width)

The continuous vertical rail or turn in may not be required if the front edge of the sideguard is within 10cm of a permanent structure of the vehicle (vehicle cab/wheel arch).

Sideguard Construction

- The guard should be as continuous as possible and the outermost surface smooth, essentially rigid and either flat or horizontally corrugated, but can be split into rails. Rails must be flat faced on the outside, (N2/O3 vehicles/trailers) minimum 5cm, (N3/O4 vehicle/trailers) minimum 10cm (but can be wider), and the distance between them not more than 30cm. Parts of the guard may be detachable for access, but must be securely fixed when the vehicle is in use.
- The front edge of the guard must have a continuous surface extending back for (N2/O3 vehicles/trailers) minimum 5cm; (N3/O4 vehicle/trailers) minimum 10cm, for both ranges of vehicles the turning inwards is 10cm.
- On occasions a single rail may fulfil this requirement and it will be sufficient that the forward face only covers the depth of the rail.

N_2 vehicles are vehicles over 3500kg but does not exceed 12000kg DGVW.
N_3 vehicles are vehicles that exceed 12000kg DGVW.
O_3 trailers are trailers over 3500kg but does not exceed 10,000kg TAW.
O_4 trailer are trailers which exceed 10,000kg TAW.

DGVW = Design Gross Vehicle Weight TAW = Total Axle Weight

Distance of Guard from Front Wheels (or landing legs) and Rear Wheels

Motor Vehicles

The front edge of the guard must not be more than 30cm from the tyre on the front wheel (or second wheel if two front axles) and the guard must extend to within 30cm of the tyre on the first rear axle.

Draw-Bar Trailer

The front edge of the guard must not be more than 50cm from the tyre on the front wheel and the guard must extend to within 30cm of the tyre on the rear wheel.

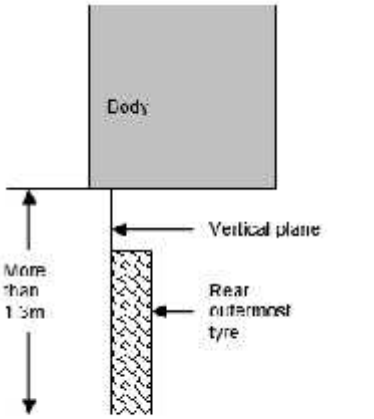
Semi-Trailer

The front edge of the guard can be up to 25cm behind the centre line of the landing legs, but never more than 3m behind the centre of the king pin (in its rearmost position) and the guard must extend to within 30cm of the tyre on the first rear axle.

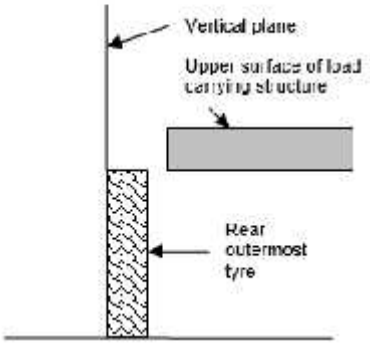
Minimum Height to Top Edge

To determine the height to the top edge, it is necessary to imagine a vertical plane parallel to the vehicle centre line and just touching the outer edge of the outermost rear tyre (neglecting the bulge). The line where the vertical plane cuts the structure of the vehicle is taken as the datum and may not be straight, but will move up and down as the plane cuts through transverse floor members etc.

The upper edge of a sideguard shall not be more than 35cm below that part of the structure of the vehicle, cut or contacted by a vertical plane tangential to the outer surface of the tyres, excluding any bulging close to the ground except in the following cases.



Where the tangential plane cuts the structure of the vehicle at more than 1.3m above the ground, then the upper edge of the sideguard shall not be less than 95cm above the ground.



Where the tangential plane does not cut the structure of the vehicle, the upper edge shall be level with the surface of the load carrying platform, or 95cm from the ground, whichever is the less.

Tangential plane should be taken as a line from the outermost edge of the rear tyre(s) excluding the bulge due to the weight of the vehicle.

Lateral Projection

The guard must not project beyond the outside edge of the vehicle, and it must not be more than 15cm inside the outermost plane of the vehicle (Maximum width). The last 25cm of the sideguard, at the rear, must be no more than 3cm from the outer edge of the outermost rear tyre.

Components in the Sideguard Area

In general, the regulations do not allow for the sideguard run to be broken, if components such as fuel tanks and air reservoirs intrude, the components should be sited such that they do not interfere with the sideguard run. However, components may be incorporated if, by virtue of their shape and characteristics, they conform in all respects to the sideguard requirements. Where the guard is not continuous from front to rear; adjacent parts can overlap provided that the overlapping edge faces rearwards or downwards; or a gap of not more than 25mm measured longitudinally may be left, provided that the rearward part does not protrude outboard of the forward part.

Note: Protrusions from such components within the sideguard run must conform to all the side guard requirements. Protrusions from these components not within the side guard run (i.e. between the sideguard gaps do not need to conform to the standards.

If the sides of the vehicle are so designed and/or equipped, that by virtue of their shape and characteristics the component parts together meet the requirements, they may be regarded as replacing the sideguards.

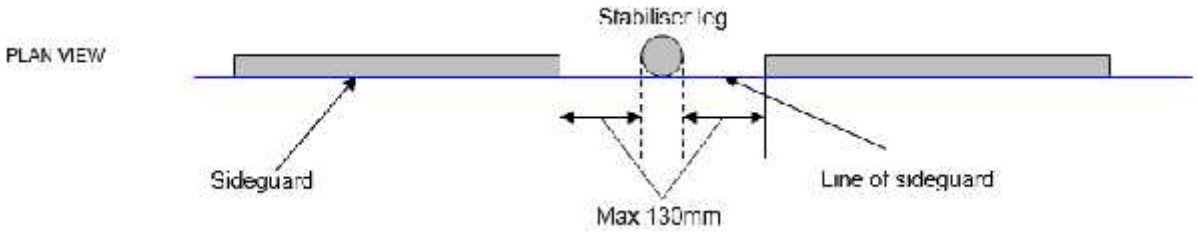
Where a vehicles body meets the dimensional requirements (dimensional being, min. & max. height from the ground, plus the distance from rear of front wheel or landing leg and front of rear wheel) for sideguards these will be deemed to be met, however where only part of the body meets the requirements, side guards must be fitted in the remaining appropriate areas.

Chassis Mounted Cranes

Where cranes are fitted across the chassis the extendible legs are normally stowed and operate through the sideguard run.

The sideguard rail or rails are required to come within a distance of 13cm of the leg at each side, thus allowing working room.

Before deciding on the pass/fail criteria, consideration must be given to the crane and platform explained on page 2 above.



The diagram is only to illustrate the dimensions allowed between the stabiliser leg and a sideguard; it is not the intention that the stabiliser leg should be stowed in this position.

Sideguard Material

There is no legislation regarding the materials used for sideguards although there are regulations covering strength and deflection of these components. None of these however are subject to test.

Protrusions

Protrusions (on the side guard outer faces) such as rivet or bolt heads are acceptable provided that they do not exceed 1cm and are suitably domed.

External corners and edges must be rounded.

Orange reflective strips are acceptable if fitted to sideguards provided that the front edge is rounded and it does not protrude more than 1cm.

Short Bodied Vehicles

Vehicles which have shortened bodies to facilitate the fitting of plant equipment usually have a large gap between the back of the cab and the body. There may therefore be a considerable length of sideguard area not covered by the body. In these cases the height of the guard covered by the body is the normal 35cm max below the structure, but the height of the guard in the area not covered by the body must be no lower than the body floor or 95cm whichever is the lowest and may require more than 1 rail.

Type Approved Sideguards

If the presenter claims that the vehicle or trailer is fitted with type approved sideguards (this will most often be on an imported trailer) which comply with the requirements of the EC directive, the presenter should be asked to provide documentary evidence. Although the standards are to accept sideguards made to the directive but not necessarily approved it may assist to identify those vehicles/trailers which are known to be approved, these are:

Trailer Make	**Model**
Hellbender	EUT, KIP, KIS, TSA, MUL, CONC.
Magyar	All models type approved.

Vehicle Make	**Model**
Mercedes-Benz	Atego.

Tankers

It is recognised that there are practical problems in the fitting of sideguards to some tankers and there can be differing views over what constitutes "so far as is practicable".

A. Tankers which Convey Dangerous Substances

Vehicle Safety Division, the Society of Motor Manufacturers and Traders and the British Tank Manufacturers Technical Committee agreed on the design layout specification for sideguards on these vehicles. This agreement is summarised in the drawings that follow. In all other respects the guards must conform to the regulations.

B. Skeletal Trailers Carrying Frameless Tanks

(i.e. a tank or container which does not have a lower side rail or rave).

Sideguards fitted to skeletal trailers carrying frameless tanks must incorporate a top rail, the upper edge of which should be at least 95cm from the ground or to the height of the trailers upper tank carrying surface (e.g. twist locks) if this is less than 95cm.

C. Milk Tankers with External Cylindrical Tubes for Stowage of Hoses

An external cylindrical tube permanently fitted longitudinally to the side of a vehicle and intended for the stowage of a hose, can for the purpose of the sideguard positional requirements be considered part of the body.

This only applies to that side of the vehicle fitted with the cylindrical tube and where the tube completely extends over the length of the vehicle required to be fitted with sideguards. Any other type of hose support, e.g. rack or tray, should not be considered part of the bodywork.

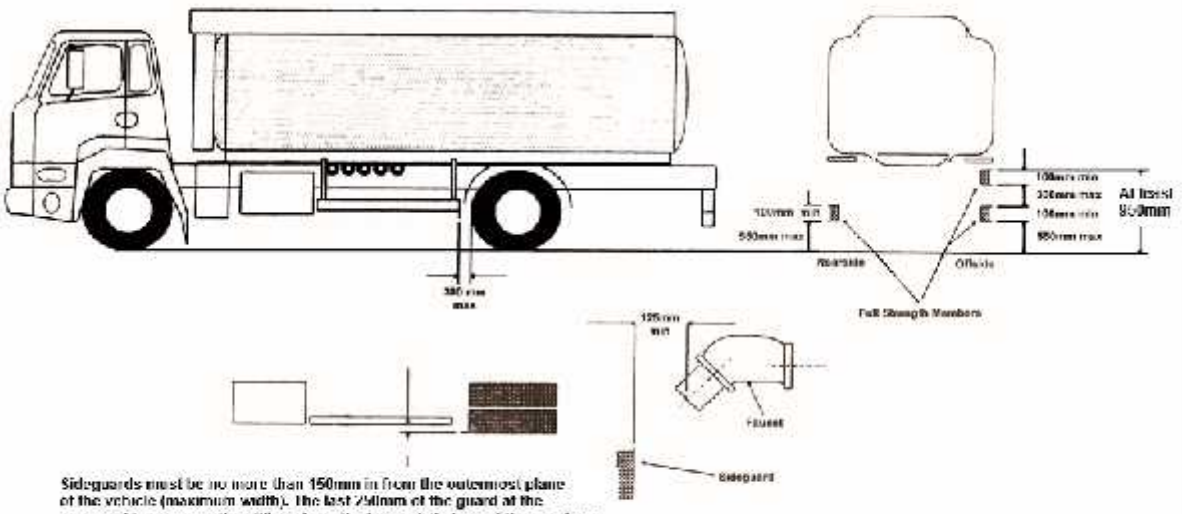
D. Hose Racks

With the exception stated at "C" above, a hose rack fitted to a vehicle or trailer should be disregarded when making an assessment as to whether the body cuts the vertical plane as in the section dealing with Maximum Height to Top Edge.

It is however permissible for the hose rack to be taken as part of the sideguard if it meets the dimensional requirements.

Figure 1

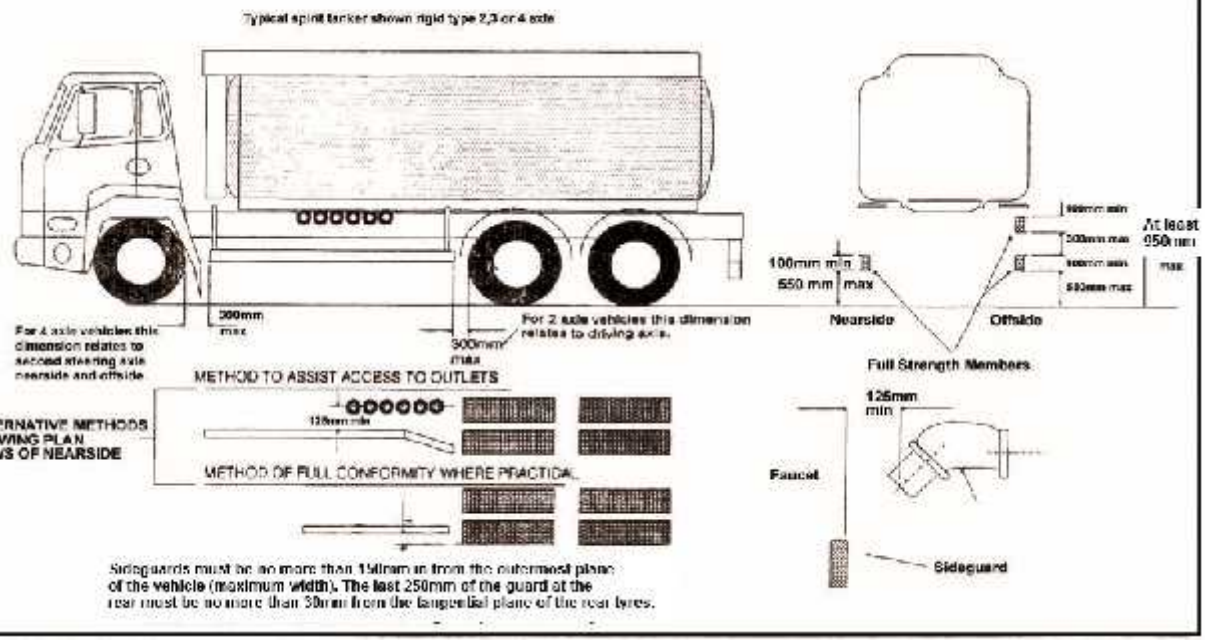
Fitting Sideguards to N/S when Battery Box and Meter Equipment Fitted.



Sideguards must be no more than 150mm in from the outermost plane of the vehicle (maximum width). The last 250mm of the guard at the rear must be no more than 50mm from the tangential plane of the rear tyres.

Figure 2

Fitting Sideguards - Maximum Section Tanks - Side Outlets



Sideguards must be no more than 150mm in from the outermost plane of the vehicle (maximum width). The last 250mm of the guard at the rear must be no more than 50mm from the tangential plane of the rear tyres.

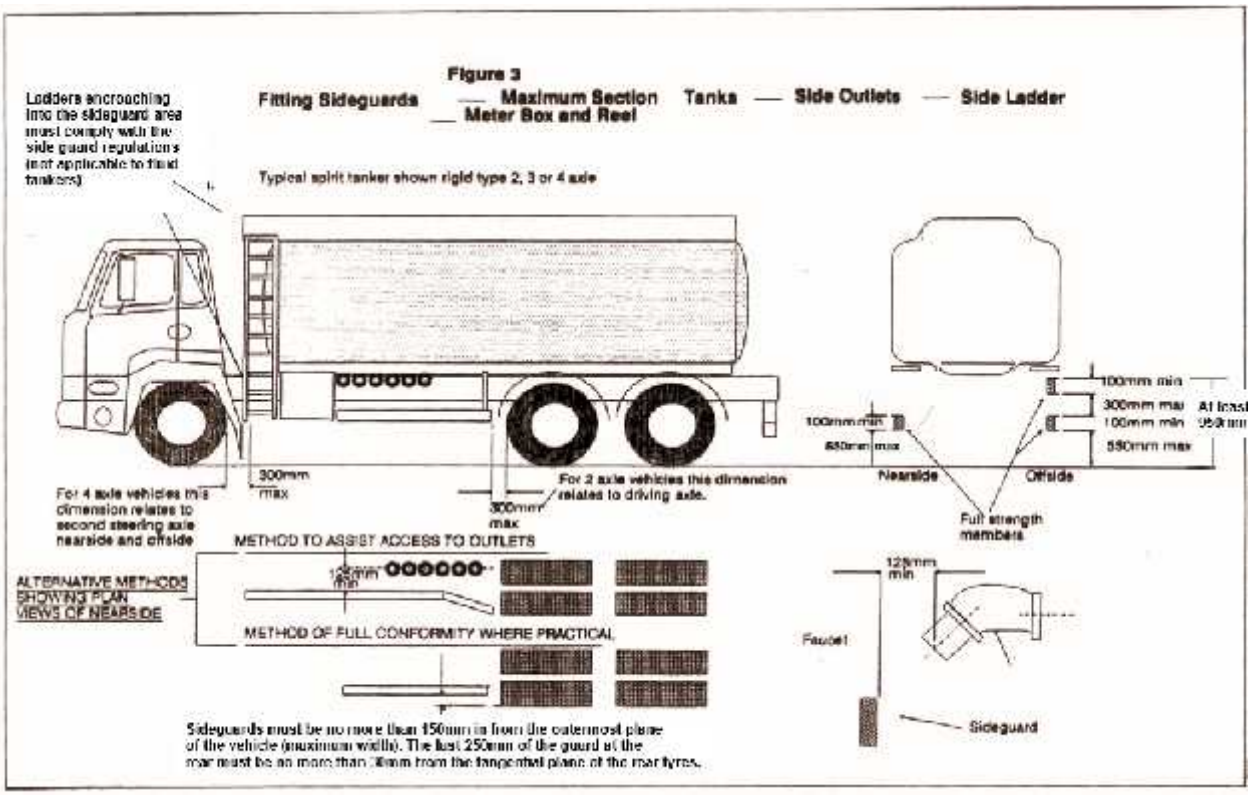


Figure 3
Fitting Sideguards — Maximum Section Tanks — Side Outlets — Side Ladder
— Meter Box and Reel
Ladders encroaching into the sideguard area must comply with the side guard regulations (not applicable to fluid tankers)
Typical spirit tanker shown rigid type 2, 3 or 4 axle
300mm max
For 4 axle vehicles this dimension relates to second steering axle nearside and offside
300mm max
For 2 axle vehicles this dimension relates to driving axle.
100mm min
300mm max
100mm min
550mm max
Nearside
Offside
Full strength members
METHOD TO ASSIST ACCESS TO OUTLETS
ALTERNATIVE METHODS SHOWING PLAN VIEWS OF NEARSIDE
METHOD OF FULL CONFORMITY WHERE PRACTICAL
125mm min
Faucet
Sideguard
Sideguards must be no more than 150mm in from the outermost plane of the vehicle (maximum width). The last 250mm of the guard at the rear must be no more than 30mm from the tangential plane of the rear tyres.

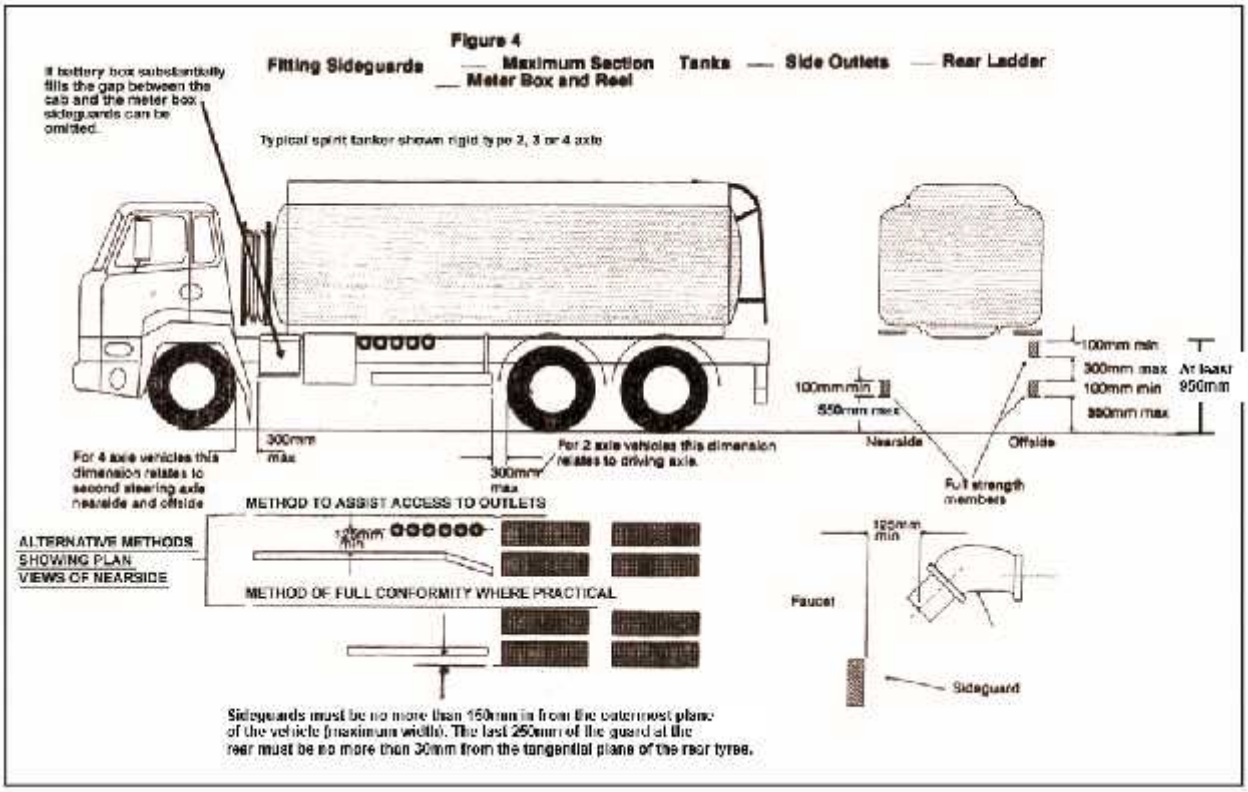
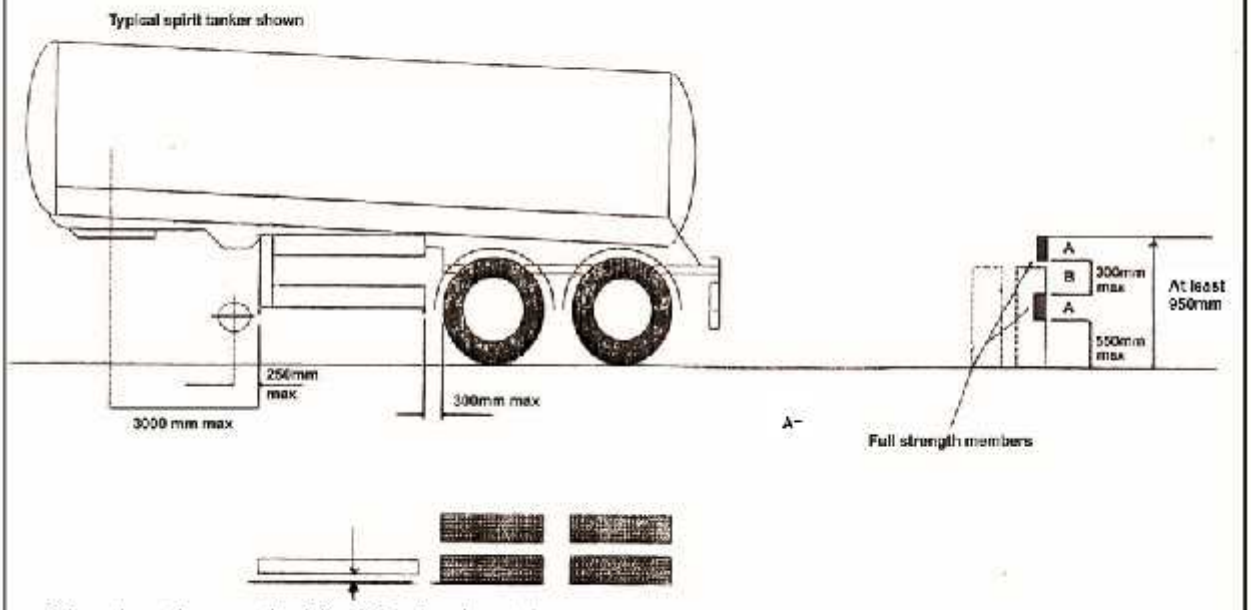


Figure 4
Fitting Sideguards — Maximum Section Tanks — Side Outlets — Rear Ladder
— Meter Box and Reel
If battery box substantially fills the gap between the cab and the meter box sideguards can be omitted.
Typical spirit tanker shown rigid type 2, 3 or 4 axle
300mm max
For 4 axle vehicles this dimension relates to second steering axle nearside and offside
300mm max
For 2 axle vehicles this dimension relates to driving axle.
100mm min
300mm max
100mm min
550mm max
Nearside
Offside
Full strength members
METHOD TO ASSIST ACCESS TO OUTLETS
ALTERNATIVE METHODS SHOWING PLAN VIEWS OF NEARSIDE
METHOD OF FULL CONFORMITY WHERE PRACTICAL
125mm min
Faucet
Sideguard
Sideguards must be no more than 150mm in from the outermost plane of the vehicle (maximum width). The last 250mm of the guard at the rear must be no more than 30mm from the tangential plane of the rear tyres.

Figure 5

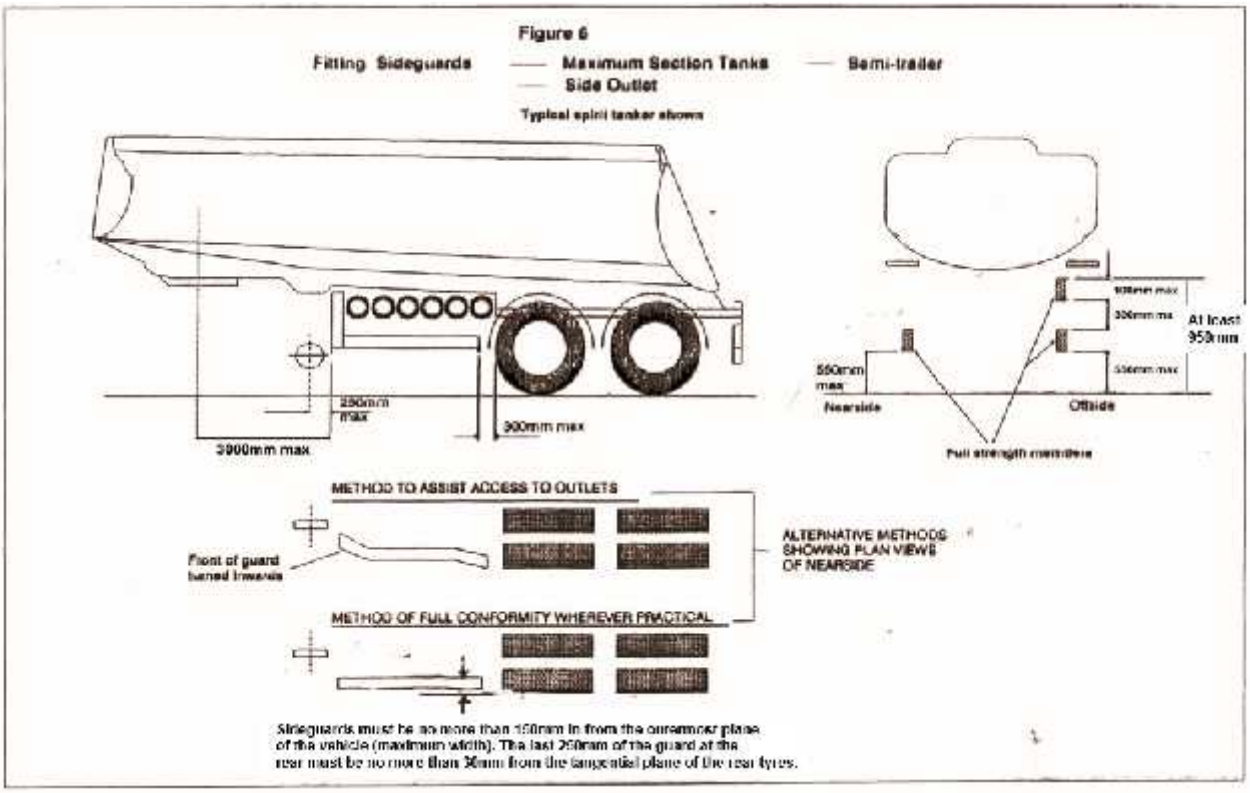
Fitting Sideguards — Narrow Section Tanks — Semi-trailer



Sideguards must be no more than 150mm in from the outermost plane of the vehicle (maximum width). The last 250mm of the guard at the rear must be no more than 30mm from the tangential plane of the rear tyres.

Figure 6

Fitting Sideguards — Maximum Section Tanks — Semi-trailer — Side Outlet



Sideguards must be no more than 150mm in from the outermost plane of the vehicle (maximum width). The last 250mm of the guard at the rear must be no more than 30mm from the tangential plane of the rear tyres.

Spare Wheel and Carrier

Application

This inspection applies to all vehicles and trailers fitted with a spare wheel or carrier.

Reasons for Failure (RfF)

1. **A spare wheel carrier:**
    a. Insecure.
    b. damaged or positioned so that it is likely to fall from the vehicle.
2. **A spare wheel:**
    a. insecure.
    b. damaged or positioned so that it is likely to fall from the vehicle.

Explanatory Notes

Check the spare wheel and carrier are secure, free from damage and are correctly positioned.

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Spray Suppression, Wings and Wheel Arches

Application

Wings and Wheel Arches
This inspection applies to all vehicles and trailers.

Spray Suppression
Motor Vehicles exceeding 12 tonnes design GVW, and first used from 1 January 1999.
Trailers exceeding 3.5 tonnes design GVW and manufactured from 1 July 1998.

Reasons for Failure (RfF)

1. A Wing or Wheel Arch:

a. missing or so badly corroded or distorted to stop it acting as an adequate shield or in the case of a mud flap fitted as a wing, it is not restrained or constructed to stop wind lift.

b. so badly corroded or distorted or so insecure that it can fall off or rub on the tyre.

c. that has sharp edges that are likely to cause injury.

d. which is rubbing on a tyre.

e. which does not cover the whole width of a tyre when the wheel is in the straight ahead position.

2. Spray Suppression:

a. insecure to such an extent that it is likely to drop off.

b. not fitted where required.

c. incomplete or seriously defective.

d. dimensions do not comply with requirements.

e. with a wheel flap not restrained or stiff enough to stop excessive movement or wind lift in normal use.

f. with more than 25% of the minimum required wheel flap or spray suppression material area clogged with mud or debris.

Explanatory Notes

Spray Suppression Exempted Vehicles:

- Motor vehicle where the driving power of its engine is, or can by use of its controls be, transmitted to all the wheels on at least one front axle and on at least one rear axle.
- Vehicles with a high ground clearance (400mm minimum).
- A vehicle or trailer designed solely for use in connection with street cleaning, the collection/disposal of refuse or the contents of gullies/cesspools (skip carrying vehicles are classed as refuse vehicles and as such are exempt).
- A trailer specially designed and constructed, not merely adapted, to carry round timber, beams or girders being items of exceptional length.
- A vehicle or trailer constructed so that it can be unloaded by part of the vehicle being tipped sideways or rearwards.
- A vehicle specially designed and not merely adapted for the carriage and mixing of concrete.

This list is not exhaustive but covers the vehicles likely to be encountered within the testing scheme.

Wings and Wheel Arches

Road wheels must have associated with them equipment or part of the body which, as far as is practicable, catches mud or water thrown up by the wheels as they rotate. Check that the wing covers the whole width of the tyre especially where wide "Super Single" tyres are fitted to the front axle.

A trailer used for or in connection with the carriage of round timber does not require the fitment of wings.

With regard to the requirements for wings and wheel arches, a vehicle may be passed without wings when a semi-trailer/body/ container is carried which fulfils the requirements of a wing i.e. a vehicle presented for annual test towing a trailer and the wing tops are not fitted on the vehicle due to the trailer being very close to the tyres.

This is not a reason for failure for wings or spray suppression providing the rotation of the wheels does not permit mud or water to be thrown directly on the road surface.

Mudflaps

If a mudflap is an extension to a wing or similar fitting, a missing or damaged mud flap **is not** a Reason for Failure, unless the vehicle is required to have one to comply with spray suppression requirements.

Where a mudflap is fitted in place of a wing, i.e. it serves the purpose of a wing (as on some semi-trailers) it must be treated as a wing and be securely fixed to prevent excessive movement.

Spray Suppression

Tractor units drawing exempt trailers are not themselves exempt.

The test on spray suppression includes only a basic visual check for general compliance and it will normally not be necessary to take measurements.

Tractor units and Skeletal Vehicles/ Trailers must be fitted with complete wings to fulfil the spray suppression requirements.

Lifting axles are not exempt from the requirements and are therefore treated as a normal axle.

Type Approved Vehicles exempt from spray suppression

If the presenter claims that the vehicle or trailer is type approved with an exemption from spray suppression (this will most often be on an imported trailer) which comply with the requirements of the EC directive 91/226, the presenter should be asked to provide documentary evidence.

Vehicles/Trailers with Demountable Bodies

1. These are **not** exempt from the requirements. In some cases it will therefore be necessary for the body to be in place since the mudwing or valance is often attached.
2. Some **demountable bodies** can be unloaded by tipping, using a conventional ram attached to the vehicle. These are classed as tippers and are therefore exempt from the spray suppression requirements.

The 200mm flap height can be increased to 300mm for:

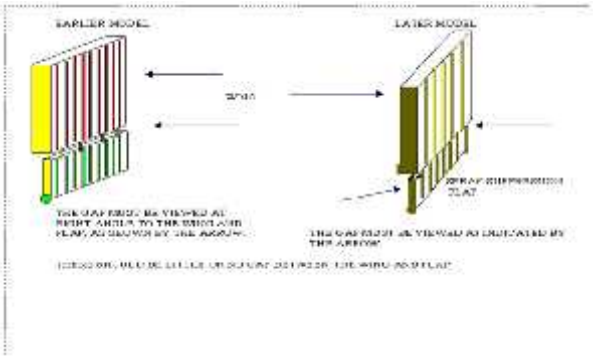
- any vehicle or trailer equipped with road friendly suspension.
- the rear most flap height only, for trailers claimed to be used on Ro-Ro ferry operations.
- any axle where the radial dimension to the lower edge of the valancing, or wheel guard, is not greater than the radius of the tyre.

Deliberate modifications for attachment points for rope hooks are not acceptable and should fail as incomplete.

The *width* of the flap should cover the full breadth of the tyre(s).

Vehicles/trailers first used from 1 April 2000 must have spray suppression that covers the whole width of the tyres. It is acceptable for vehicles/trailers before 1 April 2000 that the spray suppression will only cover the tyre tread breadth.

Earlier Mercedes Actros model ranges had gaps between the spray suppression flap top edge and the mud wing bottom edge (the edges were not parallel with each other); these do not comply with the spray suppression requirements and should be failed. The later models do comply because the gap is at the same level as the mud wing thus containing the spray thrown up by the rotation of the wheel (see below).

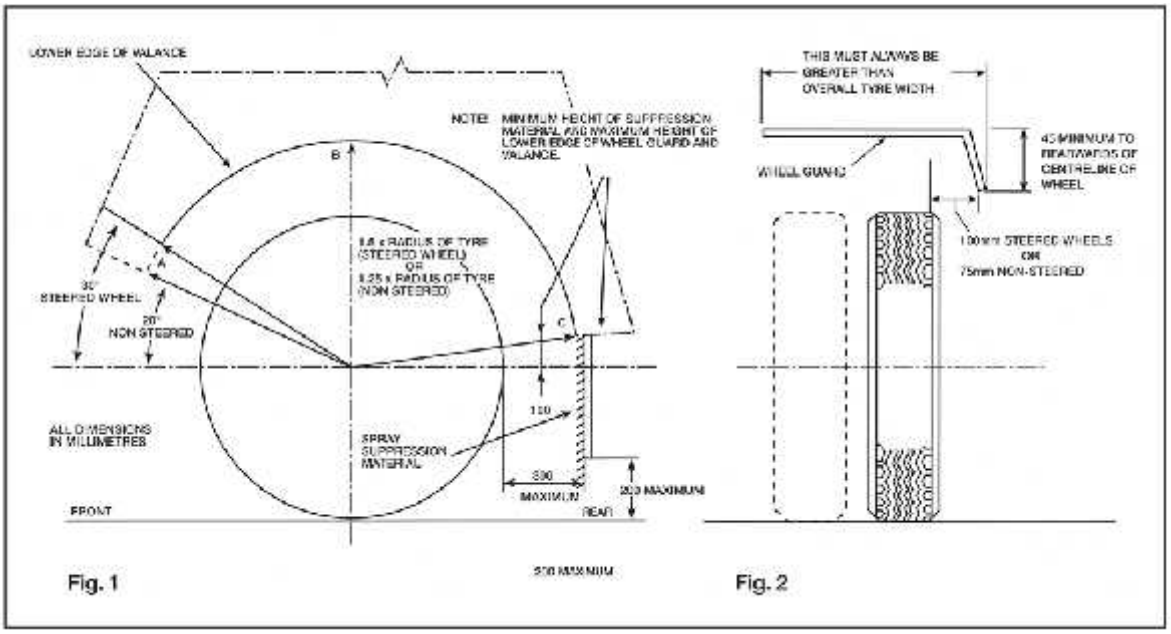


On trailers where all the wheels steer, it may appear to be incompatible to fit spray suppression, these vehicles are not exempt but spray suppression only needs fitting as far as it is practicable.

Conventional Mud Wing Types of Wheel Guards

Single axle arrangements or Multi-axle arrangements where distance between wheels is greater than 300mm.

The lower edge of the outer valance shall not exceed 1.5 x tyre radius on steerable wheels or 1.25 x tyre radius on non-steerable wheels at points A, B and C.



Wheel Flaps

Wheel flaps must be fitted behind each wheel and should cover the full breadth of the tyre(s) and be mounted to the wing without gaps that would permit the exit of spray.

Suppression material must be fitted to:

a. the forward face of the flap and
b. to the forward face of that part of the wing (guard) if it reaches below a line 100mm above a line projected from the wheel centre line.

Wheel Guards

Where the wheel guard consists of several components there should be no gaps between or within individual parts when assembled that will permit the exit of spray when the vehicle is in motion.

Multi-axle arrangements where distance between wheels is 300mm or less

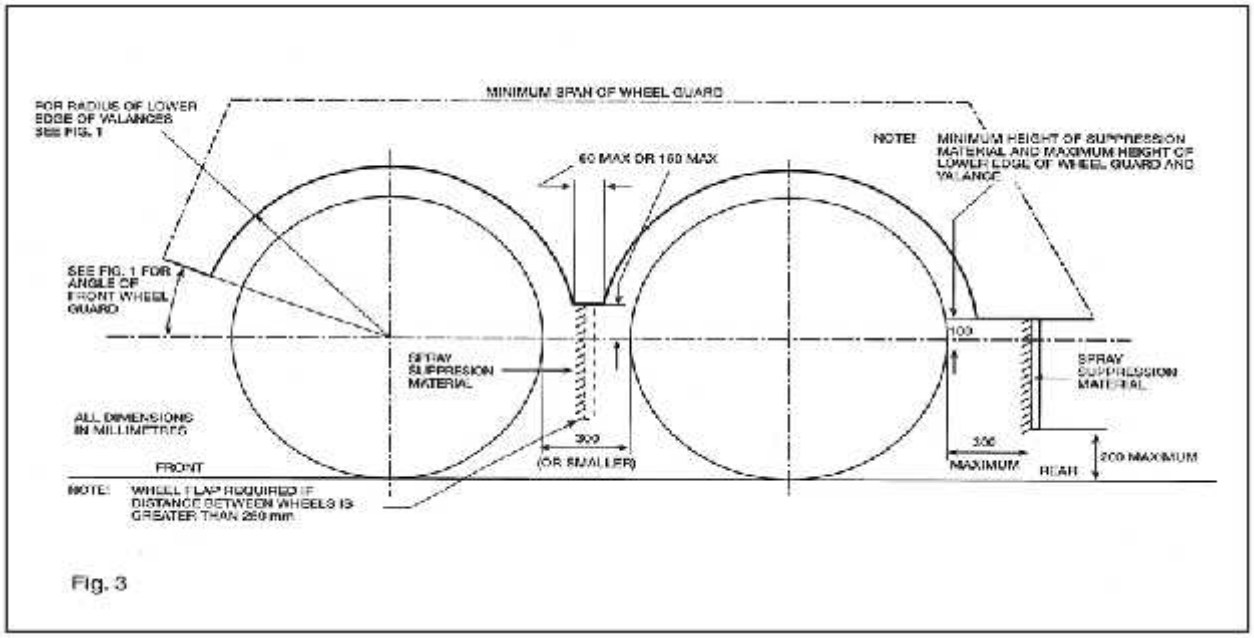


Fig. 3

The lower edge of the outer valance shall not exceed 1.5 x tyre radius on steerable wheels or 1.25 x tyre radius on non-steerable wheels at points A,B and C as in the single axle diagram.

Wheel Flaps

Wheel flaps should cover the full breadth of the tyre(s) and be mounted to the wing without gaps that would permit the exit of spray.

Wheel flaps are required behind each wheel where the distance between tyres on a group of multiple axles is 250mm or more. Up to 290mm can be accepted where it is clear that the limit of 249mm is exceeded only by tyre wear.

Where the distance between tyres on a group of axles is less than 250mm, wheel flaps are only required on the rearmost axle of each group.

Suppression material must be fitted to:

- The forward face of the flap and
- The forward face of that part of the wing (guard) if it reaches below a line 100mm above a line projected from the wheel centre line.

Wheel Guards

Where the wheel guard consists of several components there should be no gaps between or within individual parts when assembled that will permit the exit of spray when the vehicle is in motion.

Single or Multi-axle arrangements using Half Wing and Valances.

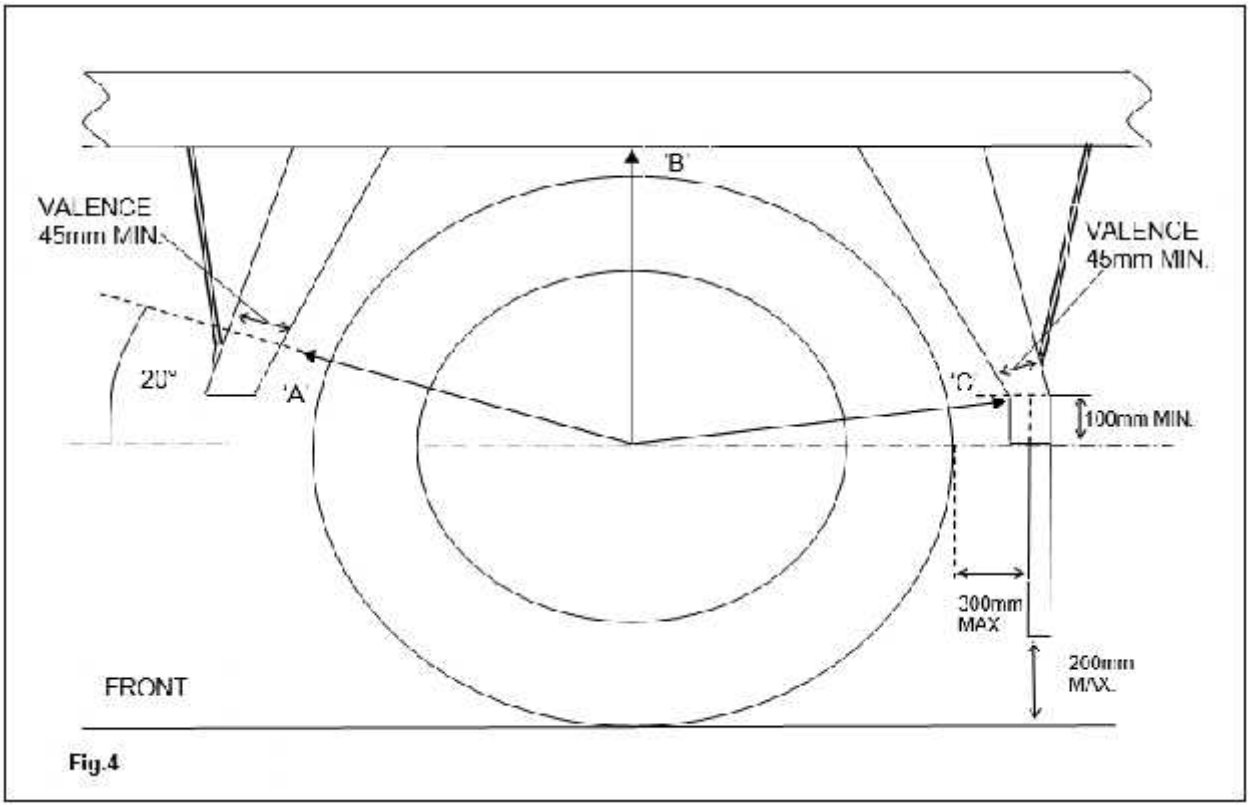


Fig.4

The lower edge of the outer valance shall not exceed 1.5 x tyre radius on steerable wheels or 1.25 x tyre radius on non-steerable wheels at points A, B and C.

Wheel Flaps

Wheel flaps must be fitted behind each wheel and should cover the full breadth of the tyre(s) and be mounted to the wing without gaps that would permit the exit of spray.

Where the distance between tyres on a group of axles is less than 250mm, wheel flaps are only required on the rearmost axle of each group. Up to 290mm can be accepted if it is clear that the limit of 249mm is exceeded only by tyre wear.

Suppression material must be fitted to:

- the forward face of the flap and
- to the forward face of that part of the wing (guard) if it reaches below a line 100mm above a line projected from the wheel centre line.

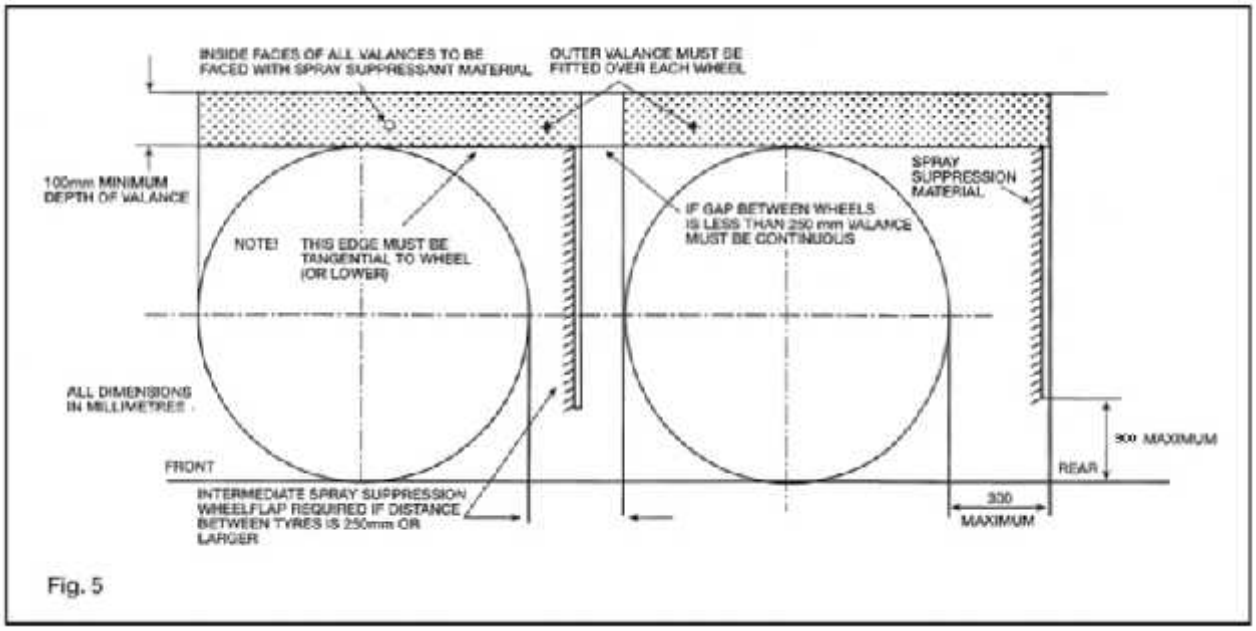
Wheel Guards

Where the wheel guard consists of several components there should be no gaps between or within individual parts when assembled that will permit the exit of spray when the vehicle is in motion.

Note that in the case of steerable wheels the 20 Deg. angle is increased to 30 Deg.

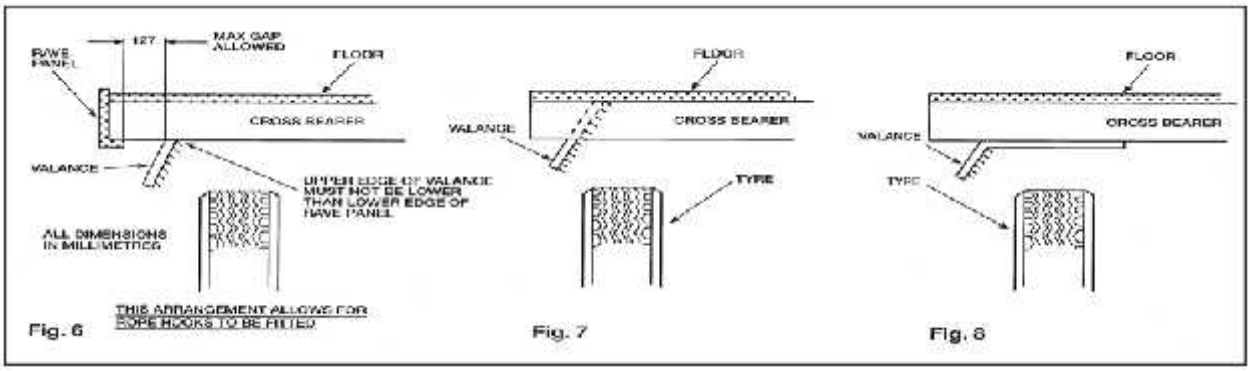
The breadth of the wing valance at points A and C must be at least 45mm as must be the body valance depth at point B.

Flap and Valance System for Non-Steered Axles



The valance should cover the area extending from the underside of the body to at least a line formed by the tangent to the top of the tyres and between the outer edge of the wheel flap, with which it should form a seal and the vertical plane formed by the tangent at the front of the tyre. An outer valance must be fitted over each wheel.
The whole inner face of the outer valance, the depth of which should not be less than 100mm, must be fitted with a suppression material.

Wheel Flaps



Wheel flaps should extend to the underside of the vehicle structure. The whole of the forward-facing part of the wheel flap should be fitted with a suppression material or device. There should be no gaps that would permit the exit of spray.

Suppression material must be fitted to

- the forward face of the flap and
- to the forward face of that part of the wing (guard) if it reaches below a line 100mm above a line projected from the wheel centre line.

Spray Suppression Systems with Air/Water Separation Devices on the Lower Edge of Valances ("Cats Whiskers" or "Netlon") Single axle and Multi-axle arrangements.

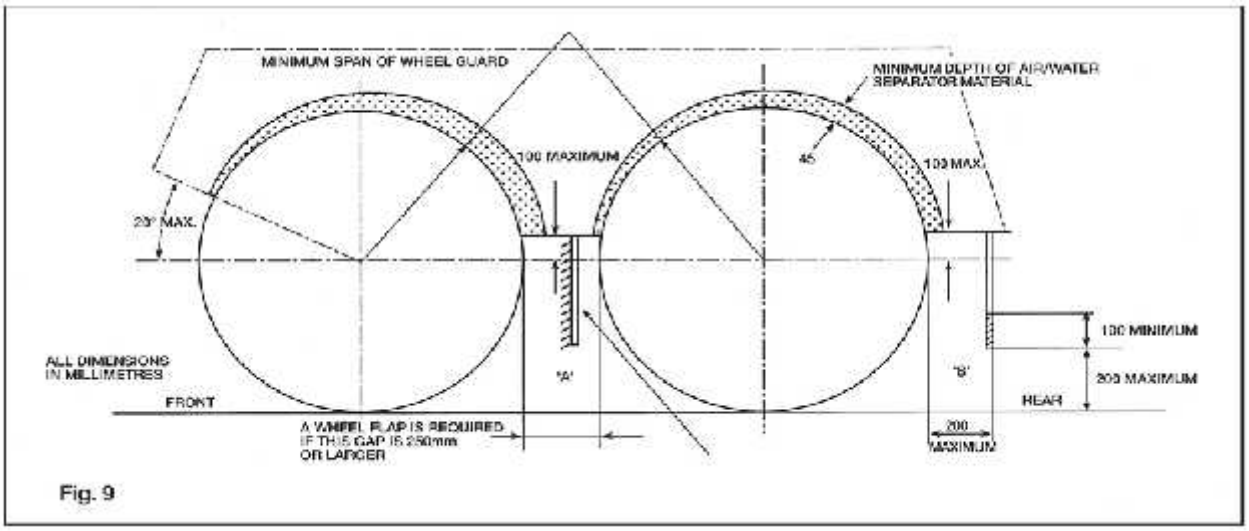


Fig. 9

The **Wheel Guards** should comply in all respects with the requirements given for the conventional mud wing system.

Valances should have air/water separating material on their lower edges to a depth of not less than 45mm to the rear of the vertical centre line of the wheel. This depth may be progressively reduced forward of the centre line.

There should be no openings in outer valances or between outer valances or wheel guards that would allow spray to be emitted.

For non-steered wheels, the radius of the lower edge of the valance, including the air/water separating device, must not be greater than the radius of the tyre. With steered wheels however, the radius of the lower edge can be up to approximately 25mm larger than the radius of the tyre.

Wheel flaps must be either

Fitted with suppression material to:

- the forward face of the flap and
- to the forward face of that part of the wing (guard) if it reaches below a line 100mm above a line projected from the wheel centre line (as at "A" in the diagram above).

or

- the lower part should consist of an air/water separator, the length of which shall be at least 100mm. The maximum height of the bottom edge should not exceed 200mm and the maximum distance behind the tyre is reduced to 200mm (as at "B" in the diagram above).

Where the distance between tyres on a group of axles is less than 250mm, wheel flaps are only required on the rearmost axle of each group. Up to 290mm can be accepted if it is clear that the limit of 249mm is exceeded only by tyre wear.

Security of Body, Containers and Crane Support Legs

Application

Security of Body
This inspection applies to all vehicles and trailers fitted with a body.

Security of Containers
This inspection applies to all vehicles and trailers constructed or adapted to carry removable shipping containers, whether a container is mounted or not.

Security of Crane Support Legs
This inspection applies to all vehicles and trailers fitted with supporting legs for loading cranes.

Reasons for Failure (RfF)

1. Body

a. excessively displaced relative to the chassis.

b. insecure.

c. a load bearing member so cracked, corroded or damaged that the body is seriously weakened.

2. A container fastening device:

a. missing when another of a matched pair is present.

b. insecure.

c. incomplete.

d. seized.

e. not fitted with an effective secondary locking device.

f. in such a condition that a container is unlikely to be secured by it.

3. A support bolster or structure:

a. insecure, cracked, corroded or damaged such that a container is unlikely to be supported and secured by it.

b. not fitted with locking pins or other securing method incorporating an effective secondary locking device.

4. A crane support leg

a. insecure.

b. retaining device missing, insecure or in a condition that it would not adequately retain the leg.

c. In cab tell-tale warning system defective.

Explanatory Notes

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.

Security of Body, Containers and Crane Support Legs

Some designs of body mounting allow a limited amount of flexing between the body and chassis. This must not be confused with insecurity. On body mountings with tie-bars the securing nut on the tie-bar is correctly secured with a relatively low torque setting and this should not be mistaken for looseness.

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 that there is no sign of an abnormal movement of the structure which would indicate coach bolt failure.

Security of Containers

A secondary locking device is something that stops the primary fastening device coming open accidentally when the vehicle is in motion. To be effective it must give enough resistance to light hand pressure to remain closed.

A dual purpose flatbed trailer from which all twistlocks have been removed is not subject to this inspection.

Support Bolsters and Structures

Presenters should be asked to set any moveable supports or bolsters to a deployed position wherever possible prior to the commencement of the test to assist inspection. The presenter should reset them after the test within Manx legal length requirements before leaving the test station.

Security of Crane Support Legs

This inspection only applies where retaining devices were originally fitted. A suitable alternative retaining device is acceptable provided the support leg is adequately secured.

There should be a warning system in the Cab of the Vehicle which identifies when the support legs are not in the locked for travelling position. If the system is defective it is a RfF

Condition of Body

Application

This inspection applies to all vehicles and trailers with bodies fitted.

Reasons for Failure (RfF)

1. **Any headboard, rave, cross or longitudinal member, hinge or retaining device, tipping gear, glass panel or any part of the body designed to carry or contain the load (including the floor and main support pillars):**
   a. insecure.
   b. fractured or cracked.
   c. distorted, worn or corroded, damaged or modified.
2. **A leak from the load carrying compartment which poses a risk to other road users.**
3. **A wind deflector or other accessory so obviously insecure that it is likely to become detached.**
4. **Unsafe modification of the body work.**

Explanatory Notes

Check for defective items which would make the vehicle dangerous to other road users and pedestrians. The cumulative effect of any defects found must be considered or their influence on other items.

Superficial damage which does not affect the strength of a component or which does not pose a danger to other road users is not a reason for failure.

Check for any insecurity of glass panels or sharp-edged glass on vehicles such as mobile shops and ice cream vans.

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Application

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

Reasons for Failure (RfF)

1. **Tank:**
   a. so insecure on its mountings that it is likely to drop away partially or completely when the vehicle is used.
   b. strap or support broken or missing.

2. **Fuel System:**
   a. leaking.
   b. pipes damaged (restricted or chafed) or so positioned that they are fouled by moving parts of the vehicle.
   c. pipes so damaged (restricted/chafed), insecure or with an inadequate repair.

3. **Filler Cap:**
   a. missing.
   b. does not fasten securely:
      - by a positive means, or
      - such that pressure is not maintained on the sealing arrangement.
   c. sealing washer torn, deteriorated or missing, or a mounting flange/sealing method defective such that leakage of fuel is possible.

Explanatory Notes

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 vehicle is powered by gas and suffers a leak this should be treated in the same manner as a normal fuel leak. The Test will be suspended. 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.

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 RfF 2a.

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

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Application

This inspection applies to all vehicles and to trailers with steered axles.

Reasons for Failure (RfF)

1. Power steering:

a. not working correctly.

b. removed or disconnected when a standard fitment.

c. with an air/fluid leak from any part of the system.

d. reservoir is empty or fluid is below minimum level.

e. pump insecure or its drive system missing or defective.

f. pipe or hose excessively corroded, damaged, bulging or fouling other parts of the vehicle.

g. with a cracked or damaged ram and/or ram body anchorage, any excessive free play at ram anchorage.

h. with excessive free play between ball and valve to the extent that separation is likely.

i. with cables damaged, excessively corroded.

j. with a system component with an inappropriate modification.

k. EPS malfunction indicator lamp indicates a fault.

l. unsafe modification.

2. Steering with:

a. a ball pin shank loose.

b. a sharp or deep groove at the neck of a ball pin.

c. a track rod or drag link end insecure.

d. any abnormal movement in a joint.

e. movement between sector shaft and drop arm.

f. excessive wear in a pivot point (e.g. an intermediate drop arm).

g. a part fixed to the chassis insecure (e.g. an intermediate drop arm, pivot housing, steering box, ram arm).

h. movement between a steering arm and its fixings.

i. a component fractured, cracked, damaged, misaligned, deformed or worn.

j. a retaining or locking device ineffective, not fitted or insecure.

k. a steering lock stop missing, insecure or not fulfilling its function.

l. a component inappropriately modified, repaired by welding and or showing signs of excessive heat being applied.

m. any steering component, road wheel or tyre fouling any part of the vehicle.

n. track rod excessively deformed.

o. roughness or undue stiffness in the operation of the steering.

p. excessive lift or end float of a sector shaft.

q. excessive wear in the steering rack.

r. excessive movement of rack housing in mounting bushes.

s. a rack gaiter (if rack originally fitted with gaiters) split, damaged, missing or displaced.

t. a ball joint cover missing, insecure, excessively damaged or severely deteriorated.

u. leak of oil or grease.

v. gear casing fractured.

w. unsafe modification

Explanatory Notes

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.

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 steered wheels on trailers 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.

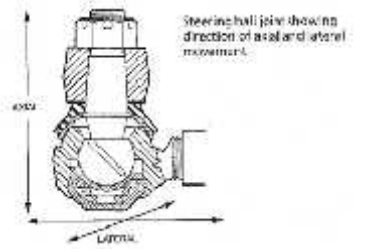
Instruct the driver to rotate the steering wheel through its full working range. If a lock stop, which is known to be a standard fitment, is missing this is a Reason for Failure. It should be noted however that in some cases there is provision for extra lock stops which are not a standard item. Where 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.

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 vehicles may be fitted with both types of joint). The rubber mounted type has a smaller wear limit than the spring loaded type.	
 Rubber mounted type	 Spring loaded type

Certain ball joints are designed only to swivel fore and aft and not side to side (front drag link ball joints only, fitted on Volvo FE range and Post 2006 Renault Magnum Dxi, Premium Dxi and Kerax Dxi). In an attempt to swivel the joint you may hear a knocking sound this is normal as this is the device to stop it swivelling. The only wear limits that should be taken into account for the annual test is axial movement. Where lateral movement is evident in the ball joint it must be confirmed that axial movement in excess of 2mm exists before failure is justified.

Other manufacturers with conventional ball joints have also stated that axial movement up to 2mm is acceptable.

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Application

This inspection applies to all vehicles.

Reasons for Failure (RfF)

1. An exhaust system:

a. Insecure.

b. leaking.

c. positioned so that fumes are likely to enter the driver's cab.

d. positioned so that fumes are entering the driver's cab.

2. An exhaust silencer:

a. missing.

b. obviously ineffective.

Explanatory Notes

Slight leaks are acceptable.

Check for the presence of the silencer and assess its effectiveness in reducing, so far as is reasonable, noise caused by the exhaust.

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Oil Leaks

Application

This inspection applies to all vehicles and trailers.

Reasons for Failure (RfF)

1. **Any oil leak which causes a drop of oil to fall on the floor.**

Explanatory Notes

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**.

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. This does not apply to permanent fittings such as drip trays for feed pipes on tankers.

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

Oil leaks from ancillary equipment (generators, refrigeration motors, hydraulic cranes, etc.) fitted to vehicles and trailers would also be a RfF.

Oil Leaks

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Application

This inspection applies to all vehicles and trailers.

Reasons for Failure (RfF)

1. A suspension component or its attachment point:

a. insecure.

b. disconnected.

c. fractured or cracked.

d. damaged, worn, distorted or corroded so that it adversely affects its function.

e. incorrectly located or fitted or a secondary leaf missing.

f. a main spring leaf, multiple spring leaves or any other type of suspension spring assembly missing.

g. bolt or rivet missing.

h. rubber or bonded bush deteriorated.

i. defective such that a wheel could foul any other part of the vehicle.

j. with wear in a pin, bush or mounting exceeding the prescribed limit.

k. 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.

l. with an inappropriate repair or modification which has seriously weakened the component.

m. unsafe modification.

2. Leaf Springs and Fixings:

a. a fractured or cracked leaf or one repaired by welding.

b. spring leaves splayed beyond the prescribed limits or fouling any other part of the vehicle.

c. movement in a spring fixing pin in excess of the prescribed limits.

d. slipper bracket rebound pin missing or incorrectly located and/ or with the spring displaced.

e. relative movement or displacement between a spring and the axle.

f. a missing shackle or anchor pin.

g. a worn slipper bracket.

h. so corroded, pitted or seriously weakened that it is likely to fail.

i. an insecure or missing locking device from a shackle or anchor pin.

3. Coil Spring or Torsion Bar:

a. incomplete.

b. fractured, cracked or repaired by welding.

c. corroded, pitted, or seriously weakened so it is likely to fail.

d. torsion bar fixings with excessive free play, insecure, or an adjustment assembly incorrectly fitted and/or insecurely locked.

e. incorrectly located or fitted.

4. **Air/Fluid Suspension System valves, pipes, valve linkage, bellows and displacer/ accumulator unit:**
   a. displaced, deflated, kinked and/or so damaged/deteriorated that it is likely to fail.
   b. fouled by other parts or leaking.
   c. with check strap missing or defective.
   d. insecure.
   e. pipe insecure.
   f. leaking.
5. **Bonded Suspension Unit:**
   a. with failure of bonding between flexible element and metal so that part of the unit is likely to fail.
   b. unit is so damaged or deteriorated that it is no longer capable of carrying out its proper function.
6. **Shock Absorber:**
   a. missing from a vehicle on which it is a standard component.
   b. with an anchorage fractured, unit insecure or with a sleeve damaged so that the unit is not functioning correctly.
   c. leaking.
   d. with an excessively worn rubber bush or pivot.
   e. linkage missing, linkage bracket cracked so that it is likely to fail, fractured or cracked or excessively worn.
7. **Anti-roll bar assembly:**
   a. missing from a vehicle on which it is a standard component or any of its associated linkages/brackets or bushes missing.
   b. insecure.
   c. fractured, cracked, severely distorted or so corroded or worn that its strength is seriously reduced.

Explanatory Notes

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 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 mounting 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 mounting 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.

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).

Trailers fitted with HD shock absorbers are not required to be fitted with check straps.

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

Tag axles with disabled lift facilities are not an RfF, these may also have the lift operation air bag removed.

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.

A comprehensive list of vehicles where shock absorbers and/or anti- roll bars are standard fitment is available from the VTC.

On some unladen vehicles the suspension air bellows on one side may be deflated. This is a natural characteristic that occurs after certain types of operation of the electronically governed suspension system. This ensures the chassis frame remains at a constant height at all times.

Before failing a vehicle, attempt to re-inflate the bellows by **using** the driver control to raise/lower the vehicle's suspension before resetting the suspension to the normal ride height. Ensure this operation is only performed under supervision.

If this operation does not re-inflate the bellows then the vehicle should fail.

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).

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 RfF but any sign of dripping is unacceptable.

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.

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Axles, Stub Axles and Wheel Bearings

Application

This inspection applies to the steered wheels of all vehicles and trailers.

Reasons for Failure (RfF)

1. **Stub axle and axle:**
   a. excessive clearance between stub axle and axle beam.
   b. fractured, cracked or deformed.
   c. unsafe modification to an axle.
2. **King pin:**
   a. excessively loose in axle beam.
   b. king pin or bush excessively worn.
   c. retaining device missing or insecure.
3. **Swivel joint:**
   a. excessively worn.
   b. insecure.
   c. retaining or locking device missing or insecure.
4. **Wheel Bearing excessive free-play.**

Explanatory Notes

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.

On a trailer steered axle where the axle has been welded in the straight ahead position this is not a Reason for Failure. If steered axles are permanently locked in the straight ahead position a notification of alteration is required.

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.

Additional Braking Devices

Application

This inspection applies to vehicles where a device is fitted or required.

Reasons for Failure (RfF)

1. **An additional braking device:**
   a. missing when known to be a mandatory item.
   b. components missing, insecure or damaged.
   c. wiring insecure or damaged.

Explanatory Notes

Air leaks for operating mechanisms of hydraulic retarders or exhaust brakes should be tested under MIM37 and only fail if the leak is affecting the braking system.

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

If the device has been removed and it is mandatory this will be a reason for failure, if the device is not mandatory the operator should be informed to complete a notification of alteration form. 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.

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.

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

Additional Braking Devices

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Application

This inspection applies to all vehicles and trailers.

Reasons for Failure (RfF)

1. **A brake rod, clevis joint, linkage, relay, lever, pin, pivot, slack adjuster or cable:**
   a. seriously weakened by excessive wear, corrosion, damage or reduced in diameter by more than the prescribed limit.
   b. with abnormal movement indicating incorrect adjustment, or excessive radial free play.
   c. with an ineffective, insecure or missing locking device.
   d. a brake cable knotted, or with more wires broken than permitted by the specified standard.
   e. cable guide is defective.
   f. automatic slack adjuster component missing, disconnected, insecure, distorted, fractured or inoperative.
   g. mandatory automatic slack adjuster not fitted.
   h. 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.
2. **Brake pipes and flexible hoses:**
   a. misplaced and fouled or chafed by moving parts.
   b. chafed, cracked with no reinforcement cords exposed, corroded, stretched or twisted.
   c. excessively chafed, cracked with reinforcement cords exposed, excessively corroded, deteriorated, damaged, leaking, bulging, kinked, stretched or twisted.
   d. inadequately clipped or otherwise inadequately supported.
   e. inadequately repaired or with unsuitable joint fittings.
   f. non-metallic pipe(s) exposed to excessive heat.
   g. leaking air from a pipe or connection.
   h. leaking hydraulic fluid from a pipe or connection.
3. **Brake drums, back plates & shoes, discs, callipers & pads including friction material with:**
   a. a brake disc or drum excessively worn.
   b. a brake back plate, disc or drum in such a condition that it is seriously weakened or insecure.
   c. a brake back plate or calliper securing bolt loose or missing.
   d. a brake lining or pad less than 1.5mm thick at any point.
   e. a brake lining or pad missing, incorrectly fitted, insecure or with the lining no longer visible.
   f. restricted movement of a brake component.
   g. a brake drum, disc, lining or pad contaminated by oil or grease.
4. **Reservoir:**
   a. lightly corroded.
   b. insecure, excessively corroded, or leaking.
   c. with dents that obviously reduce the capacity.

d. with a securing strap fractured, cracked, excessively corroded or chafing on the reservoir or other mounting.

e. missing where it is known to be a standard fitting.

5. Air actuators, hydraulic master & wheel cylinders, valves and servos:

a. defective in operation.

b. defective in operation and brake performance affected.

c. insecure but still operational.

d. insecure and brake performance affected.

e. leaking air or fluid, fractured, cracked, excessively damaged or corroded.

f. with a locking device missing or insecure.

g. with excessive travel of operating mechanism indicating a need for adjustment.

h. with a cap missing from a hydraulic master cylinder.

i. fluid below minimum level or level warning device defective/deactivated.

j. no brake fluid visible.

k. with a valve with excessive discharge of oil.

l. a load sensing valve removed or disconnected when it is known to be a standard fitment.

m. a load sensing valve obviously seized or restricted in its free movement, linkage or brackets cracked, defective or out of adjustment.

n. hydraulic brake actuator dust cover, damaged or deteriorated.

6. A load sensing data plate is missing or illegible.

7. Air Compressor Drive:

a. a drive belt missing, badly deteriorated and/ or so loose that it is likely to slip.

b. a compressor drive pulley loose, cracked or missing.

8. Trailer Secondary Brake defective in operation.

9. Unsafe Modification to any part of the braking system.

Explanatory Notes

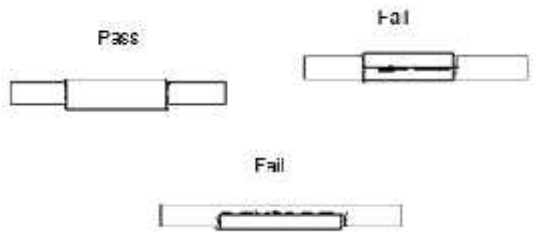
Automatic slack adjusters must be fitted to motor vehicles first used from and trailers manufactured from 1 April 1995.

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.

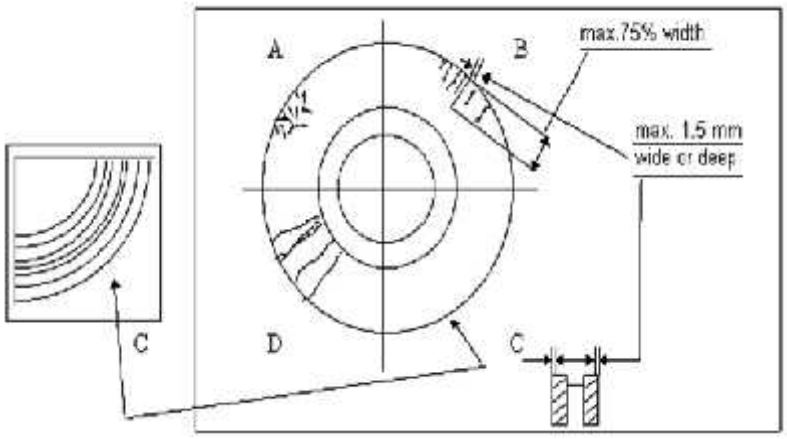


Guidance on sleeved repairs of metal brake pipes (sleeving is not acceptable on plastic brake pipes).

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 notification of alteration form.



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.

Quick Release Valves/Spring Brake Systems; On trailers fitted with spring brake systems a controlled discharge of air may occur from the quick release valve when the service brake is applied with the spring brakes in the off position, this is acceptable and should not be treated as a defect.

The following vehicle/trailer types require an adapter to be fitted to inspect the trailer secondary brake operation:

- Two line drawing vehicles coupled to three line trailers.
- Three line drawing vehicles with no separate secondary control coupled to three line trailers.

The following procedure should be carried out:

- Supply a suitable adapter and request the driver to connect the tractor/drawing vehicle service line to the trailer secondary line and request the driver to operate the brake (If spring brake actuators are fitted to the vehicle/trailer inspect the components of this system with the park brake in the "off" position).
- Instruct the driver to remove the adapter and reconnect the brake lines. Check the reconnection by instructing the driver to apply the footbrake and note the operation.

If the secondary brake (blue line) has been disconnected without approval, this is not a failure. The presenter must be advised to submit a Notification of Alteration Form.

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

Two line trailers are not fitted with secondary brakes. Some drawing vehicles where the nominated secondary brake is the split service brake do not operate the trailer brakes when the hand park brake control is applied. This is not a reason for failure.

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

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

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 vehicles 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 are 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.

The following list gives guidance on when trailers manufactured before October 1 1982 may be required to have a load sensing valve or ABS as a mandatory fitment.

1. Pre 1982 and post 1968 semi or draw bar trailer with three line braking (service yellow line, secondary/auxiliary blue line and emergency red line) LSV and ABS are not required.
2. Pre 1968 trailer with any number of brake lines LSV or ABS are not required.
3. A post 1968 semi-trailer with a gross weight over 3500kg and converted to two line braking (type approved braking system) LSV or ABS required.
4. A post 1968 draw bar trailer with axle/s weight over 3500kg and converted to two line braking (type approved braking system) LSV or ABS required.
5. A trailer of any age with two brake lines and with an unladen weight 60% or less of the gross weight and can be demonstrated by calculations that the brakes comply with the requirements of the braking directive, LSV or ABS are not required.
6. Foreign trailers pre 1982 with two line brakes LSV or ABS may be required.
7. If you are not sure if a trailer is required to have LSV or ABS fitted contact VTC

Missing or illegible LSV plate only applies to the following;

- Vehicles first used on or after 29th October 2014.
- Trailers first used on or after 29th October 2013.

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.

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Application

This inspection applies to all vehicles including Hybrid Electric Vehicles (HEVs) and to trailers with driven axles.

Reasons for Failure (RfF)

1. All vehicles with:

a. a loose or missing propshaft flange bolt.

b. any flange cracked or loose.

c. excessive wear in a shaft bearing.

d. a bearing housing insecure, cracked or fractured.

e. excessive wear in a universal joint.

f. deterioration of a flexible coupling.

g. a seriously damaged or cracked shaft or a shaft which is fouling on other components.

h. deterioration, fracture or insecurity of a bearing housing flexible mounting.

i. evidence of a transmission shaft fouling on another component.

2. Front wheel drive shafts with:

a. a constant velocity or universal joint excessively worn or insecure.

b. a flexible coupling severely cracked, softened or breaking up.

c. a constant velocity gaiter, insecure, damaged or deteriorated.

Explanatory Notes

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 HEVs.

Propeller shaft spline wear is not a Reason for Failure.

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

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Engine and Transmission Mountings

Application

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

Reasons for Failure (RfF)

1. **Any mounting or subframe:**
   a. securing bolts/nuts loose or missing.
   b. cracked or fractured.
   c. badly deteriorated.

Explanatory Notes

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.

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Condition of Chassis

Application

This inspection applies to all vehicles and trailers.

Reasons for Failure (RfF)

1. **Any main or cross member or outrigger which has a load restraining device attached fractured, cracked, corroded or deformed.**
2. **Frame and/or cross member fastenings with insecure flitch plates and/or fastenings or welds breaking away.**
3. **Integral body replacement panels:**
   a. of an unsuitable material.
   b. not adequately secured by an appropriate method.

Explanatory Notes

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.

A missing chassis crossmember is not a reason for failure but the vehicle may need to be re-assessed to confirm the vehicle is fit for purpose, and the vehicle plating certificate reviewed may result in a vehicle being down plated.

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.

RfF 2 also includes sliding bogies and their locking mechanisms. It does not include the operating mechanism to move the bogie (these are normally air brake chambers) unless detachment is likely when MIM49 should be used.

Seddon 6 x 2 has a 'H' section crossmember fitted forward of the drive axle, there are 2 holes in the bottom flange on each side of the chassis frame and crossmember which were originally for securing the steel spring suspension front spring bracket to the chassis frame. When air suspension is fitted there is no requirement to fit bolts in these 2 holes.

Condition of Chassis

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Application

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

Reasons for Failure (RfF)

European checked on Dipped Beam

1. In relation to the 0% horizontal line, the beam horizontal cut-off line is not between the limits listed below.

   Headlamp centres up to and including 850mm high
   Upper limit: All vehicles. 0.5%
   Lower limit: All vehicles 4.0%

   Headlamp centres over 850mm high
   Upper limit: All vehicles. 1.25%
   Lower limit: All vehicles 4.0%

2. The beam image contains a "Kick up" that is not visible on the screen.

3. White light shows in the zone formed by the 0% vertical and 0.5% horizontal lines

British American checked on Dipped Beam

4. In relation to the 0% horizontal line, **the upper edge** of the “Hot Spot” is not between the limits listed below.

   All headlamp heights
   Upper limit: All vehicles. 0%
   Lower limit: All vehicles 4.0%

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.

6. A Headlamp dips to the right.

British American Checked on Main Beam

7. In relation to the 0% horizontal line, **the centre** of the “Hot Spot” is not between the limits listed below.

   Headlamp centres up to and including 850mm high
   Upper limit: All vehicles. 0%
   Lower limit: All vehicles. 2.0%

   Headlamp centres over 850mm high
   Upper limit: All vehicles. 0%
   Lower limit: All vehicles. 2.75%

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.

9. A Headlamp dips to the right.

Explanatory Notes

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

Aim of Headlamps

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.

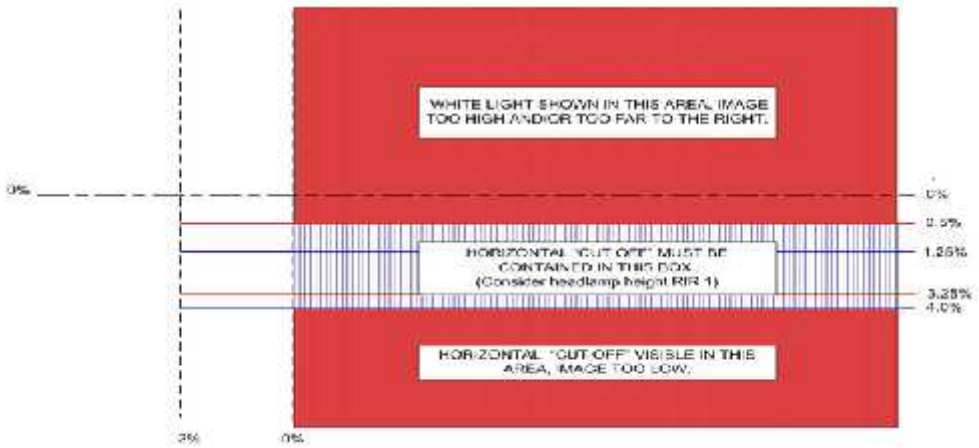
If the beam pattern is blurred due to condensation and does not show a distinctive cut-off point for the examiner to determine whether the alignment is correct this will be a failure under RfF 1.

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.

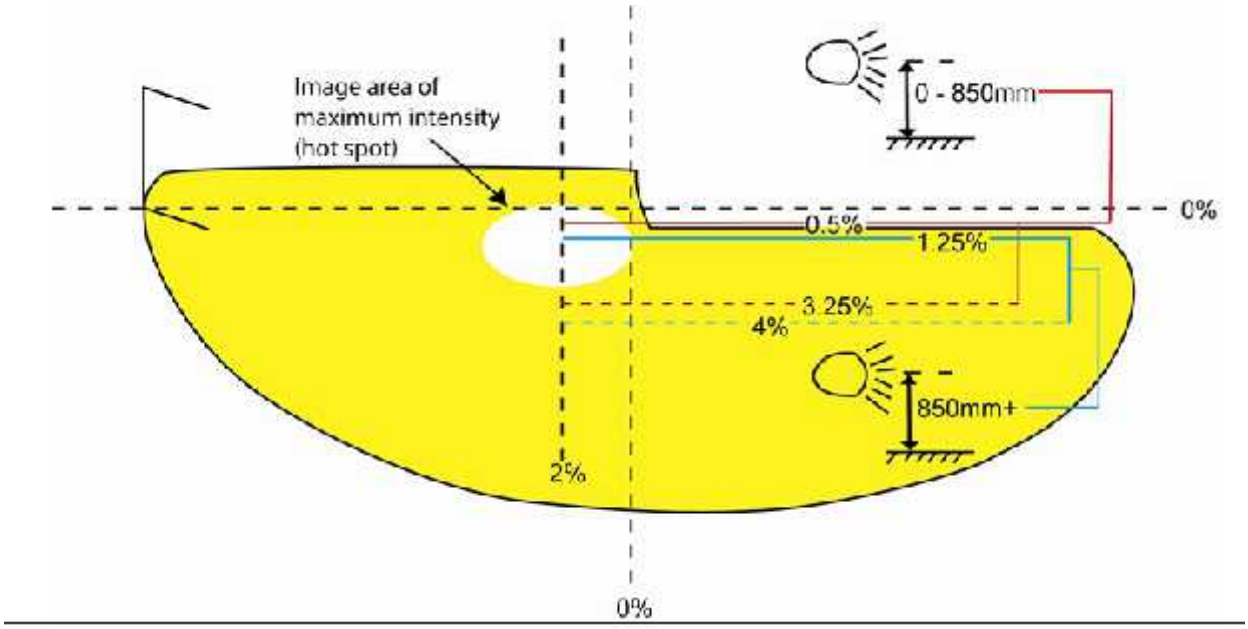
<u>European checked on Dipped Beam</u>

Align the headlamp aim testing equipment to the vehicle in accordance with the manufacturer's instructions.



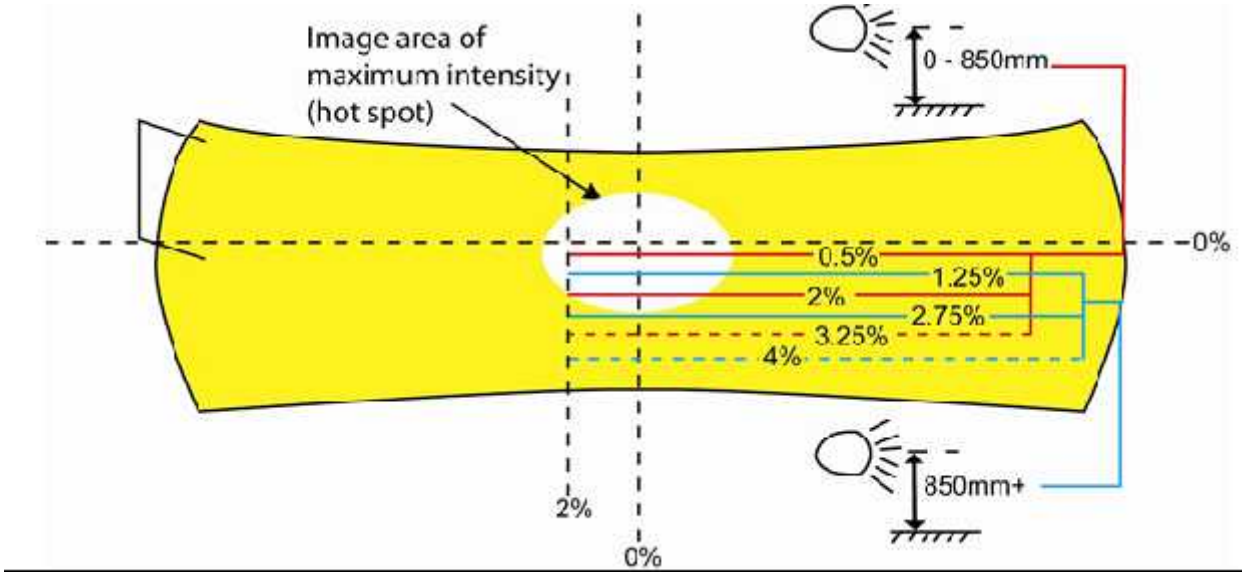
British American checked on Dipped Beam

Align the headlamp aim testing equipment to the vehicle in accordance with the manufacturer's instructions.



British American checked on Main Beam

Align the headlamp aim testing equipment to the vehicle in accordance with the manufacturer's instructions.



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Service Brake Performance

Application

This inspection applies to all vehicles and trailers.

Reasons for Failure (RfF)

1. **Roller Brake Test Machines:**
   a. A brake on any wheel binding.
   b. brake mechanism on any wheel sticking, indicated by an abnormal time lag, before an increased reading is obtained.
   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.
2. **With the service brake fully applied:**
   a. there is very little brake effort at any wheel.
   b. braking effort from any wheel on an axle is less than 70% of the brake effort from another wheel on the same axle.
   c. the specified brake effort is not met.
3. **Decelerometer test.**
   a. The braking efficiency recorded by decelerometer is below the specified efficiency for the vehicle under test.
   b. the vehicle deviates appreciably from a straight line.

Explanatory Notes

Test Methods.

Roller Brake Test Machines Operating with a Computer-Controlled Brake Test

Follow the sequence of instructions as displayed and prompted on the screen. On completion of the test a result sheet is printed indicating the test result.

Roller Brake Test Machines Not Operating with a Computer-Controlled Brake Test

a. Check no brake on any wheel is binding.
b. Apply brake slowly and check for abnormal time lag in operation of the brake on any wheel.
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. **The Ovality check does not apply to trailers.**
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.

Decelerometer Test.
Set the decelerometer on the vehicle in accordance with the instrument manufacturer's instructions. At a speed of approximately 20 mph, have the service brake applied, note the reading on the decelerometer and whether the vehicle deviates from a straight line.

SERVICE BRAKE EFFICIENCY REQUIREMENTS				
Motor Vehicles	2 Axle Rigid vehicle first used before 1 January 1968 **and** with **no** manufacturer's plate	Rigid vehicle with more than 2 axles or any articulated tractor first used before 1 January 1968 **and** with **no** manufacturer's plate	Any other vehicle	
Specified Efficiency	45% DGVW	40% DGVW	50% DGVW	
Semitrailers and centre axle draw-bar trailers	Manufactured before 1 January 1968 with GVW 6100 kg or more	Manufactured before 1 January 1968 with GVW less than 6100 kg	Manufactured from 1 January 1968 to 30 September 1982	Manufactured from 1 October 1982
Specified Efficiency	35% DTAW	32% DTAW	40% DTAW	45% DTAW
Full drawbar trailers	Manufactured before 1 January 1968	Manufactured from 1 January 1968 to 30 September 1982	Manufactured from 1 October 1982	
Specified Efficiency	40% DGVW	50% DGVW	45% DGVW	

DGVW = Design Gross Vehicle Weight. DTAW = Design Total Axle(s) Weight.

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

In the case of vehicle and trailer combinations, each unit of the combination is considered separately.

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

Attention must be paid to Hybrid Electric Vehicles (HEVs). Due to the nature of the control systems some vehicles cannot 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 cannot 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.

Brake testing HEVs, 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:

Mercedes Axor Bluetec Hybrid.

Vehicles that can be tested on the brake rollers are:

Mitsubishi Canter	Transmission must be in neutral.
Smiths Electical	Light vehicles, ignition needs to be turned on and neutral selected.
	Heavy vehicles, high voltage system needs to be on and neutral selected.

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 10,000kg 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, (e.g.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.

In **the case of a motor vehicle the Brake data cards** should be used wherever possible.

Locked Wheels

If more than half the number of wheels lock, the specified brake effort can be considered to be met. On a motor vehicle where not more than half the wheels lock, where available the allowances contained in any data card information must be taken into account. Wheels on the verge of locking are not acceptable, they must fully lock.

Load Simulation

To obtain a higher reading for brake effort than is possible with the vehicle as presented, use a load simulator to apply a load whenever practicable, or have the vehicle loaded. Certain three axle tractor units can only be satisfactorily brake tested when presented coupled to a laden semi-trailer. Where this is the VTC must insist that the combination is suitably loaded so that axle weights are higher than 65% of the design axle weight.

Vehicles fitted with Load Sensing valves

Where possible the load simulator should be used to apply a load, so that the valve operates. Where it is not possible to apply a load, the driver may be allowed to temporarily disconnect the valve linkage, or otherwise by-pass the valve, immediately before the brake test, to allow the required braking force to be achieved. The driver must ensure that the valve has been restored to its proper working condition before the vehicle leaves the Testing Station. Failure to do so may break the law.

Deceleration Test

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

Set the decelerometer on the vehicle in accordance with the instrument manufacturer's instructions. At a speed of approximately 20 mph, have the service brake applied, note the reading on the decelerometer and whether the vehicle deviates from a straight line.

Double Drive Rear Axle - Interposing Differential

Before carrying out a brake test on a vehicle fitted with a double drive rear axle it will be necessary to establish whether an interposing differential is fitted or not. A check can be carried out by using the R.B.T. in the following manner:

- Instruct the driver to release all brakes and ensure the gear lever is in the neutral position.
- Start the nearside roller in the forward direction and observe the offside wheel, if this turns in the reverse direction no interposing differential is fitted and the brake test will need to be carried out as explained in paragraphs **# #** below.
- If the running of one wheel has no effect on the other on the same axle, then the test can be conducted as for a single drive axle.

If no interposing differential is fitted carry out the test as follows :

- Place chocks at front and rear of the wheels of the front axle.
- Press and hold on N/S forward and O/S reverse button simultaneously, the wheel under test must turn forward and the opposite wheel on the same axle must turn in the reverse direction.
- Carry out the brake test as described above.

Do not run the rollers any longer than necessary to obtain an accurate reading.
Release both buttons together:

- Change direction of rollers and carry out test on the O/S wheel brake.
- Repeat the above procedure for all brake systems at this axle.
- Move the vehicle forward and carry out the same procedure for the second driving axle.

A transmission brake fitted to a vehicle of this type cannot be tested on a roller brake tester.

Drop off of brake effort

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 MIM 37.

Vehicles with full power hydraulic braking systems

If necessary to confirm compliance with MIM 13 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 a second time for indication of braking effort, and release immediately.
  b. repeat test sequence for each axle in turn.

Skeletal vehicles with an empty body fitted should be treated as unladen.

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 vehicle's mode which disengages/bypasses the hydrostatic drive. Engaging this mode will prevent any hydrostatic retardation showing as excessive levels of bind.

With some DTP numbers the roller brake tester may request you check for brake effort drop off, you need to establish whether the vehicle has air over hydraulic brakes, if it has do the drop off test, if the system is full air ignore the request for the drop off test.

Ensure that the air suspension on tag/pusher axles that may have been jacked up are inflated should there be a problem achieving the brake efficiency for these axles (the inflation should only be done under supervision of VTC staff).

Switching the ignition off on vehicles equipped with EBS is to be taken as the same as vehicles having their LSV disconnected. **Tri-axle trailers equipped with Knorr Bremse EBS/ABS** should be driven to the RBT and not allowed to switch the ignition off while stationary on the brake rollers, if this circumstance occurs the following procedure must be followed:

A. Make sure the ignition is switched off, **B.** apply the parking brake, **C.** apply the footbrake, **D.** switch the ignition on, **E.** start the engine, **F.** release the foot brake and parking brake and carry out a full brake test on all axles using the appropriate unladen or laden tri-axle trailer criteria.

Vehicles and Trailers with Electronic Braking System (EBS)

1. Testing Vehicles with EBS Braking Systems

Vehicles with EBS that have load sensing on the front axle. If the minimum front axle brake figure is not achieved because the load sensing valve is regulated by the load imposed on the rear axle/s, re-test the front axle brakes in the following manner.

a. Build up the air reservoirs and stop the engine.
b. Switch the engine off to deactivate the load-sensing valve.
c. Carry out the brake performance test.

Switching the ignition off on a vehicle with EBS has the effect of by passing the load-sensing valve.

2. Testing Trailers with WABCO Trailer EBS (Electronic Braking System)

How to recognise EBS.

- No ABS warning lamp on the headboard.
- With the ignition on, definitive solenoid clicks from the trailer on each application of the footbrake should be heard.
- Plate with the heading "WABCO Trailer EBS" on the front of the trailer and a pictogram showing an X through LSV and ABS.
- ISO 7638 electrical connector fitted in addition to the electrical connector for the lights.
- Last digit of the DTp Reference number is an '8'. The brake computer has not been programmed to accept an 8 so this must be replaced with 7 as the last digit.

When presented, the tractor unit must be compatible with the trailer and have a warning lamp to indicate that trailer ABS is working (this may be a combined ABS/EBS warning light).

If presented with a compatible EBS tractor unit, if the red line is dropped **the brakes may not come on**. To apply the brakes disconnect the ISO 7638 electrical connection. Ensure that the handbrake is applied on the tractor unit before disconnecting the red line and that safe working practices are followed.

Brake Testing

Irrespective of whether the trailer is laden or unladen, before commencing the brake test, the EBS Processor must be conditioned **(not to be used for Knorr Bremse ABS/EBS equipped trailers see note on previous page)** this is done by:

a. Putting the first axle of the trailer in the RBT.
b. Switch off the engine/ignition and ensure no brake is applied.
c. Restart engine.
d. Continue the brake test as normal. This procedure only needs to be carried out once. The system will reset when the trailer is driven at a speed greater than 7 KMH.

Failure to do this will stop the Load Sensing Valve working, i.e. a full pressure brake reading on every application.

Secondary Brake Performance

Application

This inspection applies to all motor vehicles where the designated secondary brake operates independently of the service brake.

Reasons for Failure (RfF)

1. All Roller Brake Test Machines

With the secondary brake fully applied:

a. there is very little braking effort at any wheel equipped with a brake operated by the secondary brake system.

b. braking effort from any wheel on an axle is less than 50% of the brake effort from another wheel on the same axle in the case of steered axles.

c. the specified brake effort is not met.

Explanatory Notes

The notes relating to Electrical and Hybrid Electrical Vehicles under Inspection MIM 42 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.

SECONDARY BRAKE EFFICIENCY REQUIREMENTS			
Motor Vehicles	2 Axle Rigid vehicle first used before 1 January 1968 **and** with **no** manufacturer's plate	Rigid vehicle with more than 2 axles or any articulated tractor first used before 1 January 1968 **and** with **no** manufacturer's plate	Any other vehicle
Specified Efficiency	20% DGVW	15% DGVW	25% DGVW

DGVW = Design Gross Vehicle Weight.

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Parking Brake Performance

Application

This inspection applies to all vehicles and trailers.

Reasons for Failure (RfF)

1. **Applied Brake Test on a Roller Brake Tester**

   With the parking brake fully applied:

   a. There is very little braking offered at any wheel equipped with a brake operated by the parking brake system.

   b. The specified brake effort is not met.

2. **Alternative method**

   With the parking brake fully applied:

   a. There is very little braking offered at any wheel equipped with a brake operated by the parking brake system.

   b. The specified brake effort is not met.

3. **Transmission Parking Brakes Roller Brake Test.**

   With the transmission parking brake full applied:

   a. There is very little braking offered at any wheel equipped with a brake operated by the parking brake system.

   b. The specified brake effort is not met.

4. **The decelerometer test**

   a. The braking efficiency recorded by decelerometer is below the specified efficiency for the vehicle and the test.

   b. The vehicle deviates appreciably from a straight line.

Explanatory Notes

1. Applied Brake Test on a Roller Brake Tester

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.

2. Alternative method

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.

3. Transmission Parking Brakes

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.

(see overleaf)

Transmission Parking Brakes Roller Brake Test.

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.

PARKING BRAKE EFFICIENCY REQUIREMENTS			
Motor Vehicles	Any vehicle first used before 1 January 1968	Any vehicle first used from 1 January 1968 apart from a Type Approved articulated tractor or drawing vehicle	A Type Approved* articulated tractor or drawing vehicle
Specified Efficiency	–	16% DGVW	16% DGVW 12% DGTW
Semi-trailers and Draw-bar trailers	Manufactured before 1 January 1968	Any other trailer	
Specified Efficiency	–	16% DGVW	

DGVW = Design Gross Vehicle Weight. **DGTW** = Design Gross Train Weight.

The notes relating to Electrical and Hybrid Electrical Vehicles under MIM 42 also apply to this inspection, 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 and the brake rollers should not be continuously applied.

It is necessary to use an applied brake method of testing as described above, 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 above.

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 MIM37 depending on the operation controls of the system (e.g. cable, rods, air or hydraulic). The notes relating to Locked Wheels and Load Simulation under MIM 37 also apply to this inspection.

If a vehicle has had its DGTW reduced, the DTp number may not reflect this new weight. It may be necessary to calculate the park brake performance for the new DGTW at 12% or the DGVW at 16% whichever is the greater.

If a trailer has more than one parking brake fitted, each park brake must meet the minimum standard of efficiency.
Where a trailer has been permanently attached to a towing vehicle, it is still mandatory to have a park brake on the trailer.
*Type Approved - Manufactured from 1 October 1982 and first used from 1 April 1983 and has been issued with a Type Approval Certificate of Conformity, a Ministers Approval Certificate or a Type Approval Certificate issued by an EU member state.

Vehicle to Trailer Coupling

Application

This examination applies to all vehicles fitted with a trailer coupling (at the front or at the rear) and to all trailers. This inspection also covers fifth wheel couplings mounted on converter dollies.

Reasons for Failure (RfF)

1. **A drawing hitch, bar, hook, eye, ball or ball socket; or a fifth wheel king pin and its mounting or a turntable which:**
   a. is excessively worn.
   b. is seriously deformed impairing its effectiveness and or weakens the component.
   c. is cracked or fractured.
   d. is insecure.
   e. has excessive movement between the vehicle and trailer.
   f. has a turntable which has no clearance between mating surfaces, i.e. evidence of contact between the surfaces.
   g. has a missing, damaged, seized and/or inadequate safety or locking device.
   h. has a coupling too weak.
2. **A Fifth Wheel Coupling with:**
   a. insecurity between the fifth wheel and its mounting sub-frame and or chassis.
   b. a mandatory bolt loose or missing.
   c. jaws worn or out of adjustment.
   d. a safety locking device is inoperative.
   e. an articulating bracket or pivot excessively worn or insecure.
   f. any crack in a load bearing member.
   g. an operating member insecure or worn.

Explanatory Notes

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

To check for relative movement between the tractor and trailer apply the trailer brakes and ask the driver to lightly shunt the tractor back and forth.

When assessing wear/lift between bracket/bush or pin/bush consideration should be given to those bushes which have been designed to provide a cushioning effect in order to relieve shock loadings. The load when the bush is fully compressed is taken from the main plate directly onto the mounting bracket and therefore some degree of controlled lift, up to 8mm in some units is acceptable in the trunnion pin and bush (Up to 12mm lateral movement is acceptable in some cases in fifth wheel couplings, lateral movement of draw-bar turntable top plate movement relative to the lower plate should not exceed 10mm).

Wear should be considered excessive if a drawing hitch, bar, hook, eye, ball or ball socket has the metal reduced to ¾ of its original thickness.

If the inspection of the fifth wheel jaws is carried out without a trailer attached, then wear on the jaws in excess of 6mm would be considered a Reason for Failure.

Many manufacturers determine gross train weights by the number and size of bolts fitted to fifth wheel bed plates and sub-frames, these bolts are therefore considered to be mandatory.

Examples of secondary locking devices are:

a. A dog clip and chain.
b. Spring loaded pin between the operating handle and the body of the 5th wheel housing.
c. Lever dropped behind the operating handle.

An optional third 5th wheel locking device such as a dog clip with a chain or wire from the secondary clip to a hole in the handle could be fitted. The chain or wire may only be there to assist the operator to unlock the secondary device. The absence of a chain/wire is not a RfF if its only purpose is to prevent loss of the dog clip.

Trailer Parking & Emergency Brakes and Air Line Connections

Application

Parking and Emergency Brakes. This inspection applies to all trailers.

Air Line Connections. This inspection applies to **all trailers of whatever age** and to **drawing vehicles first used from 1 April 1989.**

Reasons for Failure (RfF)

1. **Trailer parking brake:**
   a. does not operate on at least two wheels.
   b. cannot be securely set.
   c. mechanism worn.
   d. mechanism insecure, cracked, excessively worn or badly corroded.
   e. when fully applied the mechanism is at the end of its working travel or it is fouling adjacent parts of the vehicle.
2. **Trailer emergency brake not applied automatically when the emergency (red) brake line is disconnected** (see explanatory note below).
3. **Operating adaptor, to open self-sealing coupling:**
   a. not fitted in service (yellow) line.
   b. produces incorrect amount of lift.
4. **An airline fitted with a manual shut off tap.**
5. **Tap or valve sealing valve:**
   a. insecure.
   b. inadequately mounted or defective.

Explanatory Notes

Emergency Brake and Air Line Connections:

- Ensure that the air reservoirs on the drawing vehicle are fully charged.
- With the vehicle parking brake on and the trailer parking brake **off**, ask the driver to disconnect the service (yellow) and emergency (red) brake lines.
- Check, on vehicles and trailers fitted with "C" type couplings, that the coupling in the service (yellow) line - either fitted to the trailer or in the line itself - is fitted with an operating adaptor which can open the self-sealing coupling in the connector from the drawing vehicle.
- Check that the operating adaptor lifts the indicator on the test coupling by the correct amount. The waisted portion (coloured section) of the indicator must be exposed, but no more than this. This does not include additional couplings which may be used on trailers such as extendable types.
- Check that any brake line on the drawing vehicle is not fitted with a manual shut-off tap. Additional taps fitted to extendable trailers are not included in this inspection.

The driver must be instructed to reconnect all couplings before the vehicle is moved

When presented, the tractor unit must be compatible with the trailer and have a warning lamp to indicate that trailer ABS is working (This may be a combined ABS/EBS warning light).

If presented with a compatible EBS tractor unit, if the red line is dropped, the brakes may not come on. To apply the brakes disconnect the ISO 7638 electrical connection. Ensure that the handbrake is applied on the tractor unit before disconnecting the red line and that safe working practices are followed.

Provided self-sealing couplings are used on the tractor couplings it does not matter whether the air adaptor couplings are the conventional way or reversed.

Some park brake controls also deplete the air suspension systems when the red airline is removed, this is acceptable provided it does not drain the air brake reservoir. If it does the vehicle must fail under RfF 5a of MIM37.

Exhaust Emissions

Application

This inspection applies to all Diesel and other Compression Ignition engine vehicles. For Hybrid Electric Vehicles with a supplementary engine.

Reasons for Failure (RfF)

1. **After a maximum of 6 accelerations the exhaust emits excessive smoke or vapour to an extent likely to obscure vision**
2. **Emission control equipment fitted by the manufacturer**
   a. absent, or obviously defective or shows signed of obvious tampering.
   b. Diesel Particulate Filter shows visible signs of smoke.
   c. Engine MIL inoperative or indication a malfunction.

Explanatory Notes

Visual emission test

- The procedure is the same for supercharged, turbocharged and non-turbocharged engines.
- With the engine at or near normal operating temperature check the density of the exhaust emission visually.
- 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.
- Ignore smoke from the first acceleration.
- Repeat up to a maximum of six times if necessary until the exhaust smoke is considered to be acceptable for two successive accelerations.
- Assess whether the smoke emitted from the exhaust, regardless of the measured density, is likely to obscure the vision of other road users.

For all vehicles: check the vehicle for presence and condition of any emission control systems fitted as standard.

An MIL indicating that the emissions systems fitted to the vehicle are not functioning correctly is a RfF

Fraudulent emissions systems.
Check for modifications and devices designed to stop the effective functioning of emissions control systems fitted to vehicles.

These may include:

- using devices designed to stop emissions control systems from working
- removing the diesel particulate filter or trap
- using cheap, fake emission reduction devices or diesel exhaust fluid
- using illegal engine modifications which result in excessive emissions
- removing or bypassing the exhaust gas recirculation valve

Diesel and other Compression Ignition Engines:

- **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.
- HEVs do not require a visual smoke test as described above. 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 1.

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Trailer Landing Legs

Application

This applies to all trailers.

Reasons for Failure (RfF)

1. A landing leg or any component part insecure.

Explanatory Notes

Check landing legs for security. Inspect fixing and chassis where the legs are attached.

Any component part that is likely to fall from the vehicle is a Reason for Failure.

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Other Dangerous Defects

Application

This applies to all vehicles and trailers.

Reasons for Failure (RfF)

1. A defect not described elsewhere in the manual such that the use of the vehicle or trailer on the road would involve a danger of injury to any person.

Explanatory Notes

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.

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. The VTC will monitor any trends and amendments made to the manual if necessary.

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