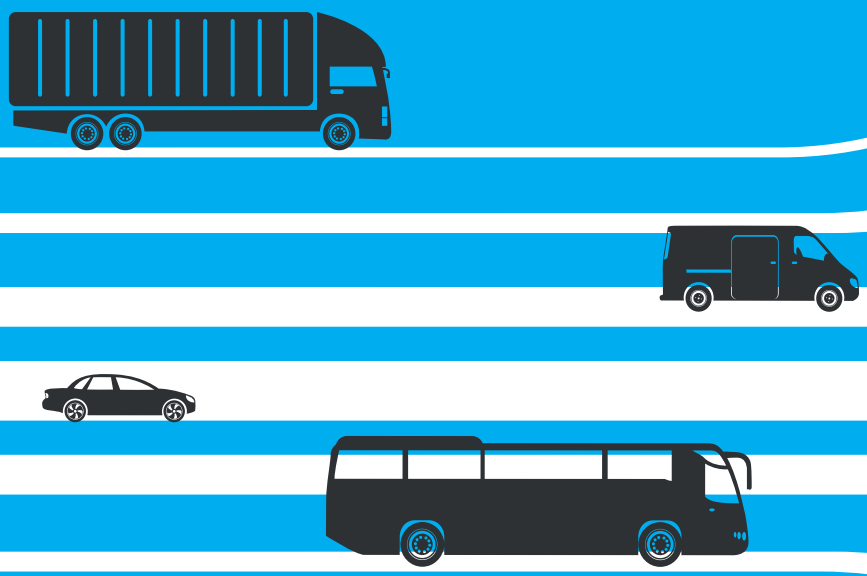
FORS
FLEET OPERATOR
RECOGNITION SCHEME



Fleet Operator Recognition Scheme Vehicle Safety Equipment Guide

Supports the FORS Standard Version 4.1.iii

About FORS

The Fleet Operator Recognition Scheme (FORS) encourages and incentivises the safe and sustainable operation of commercial vehicles. From car-derived vans to articulated trucks, the scheme commits fleet operators to progressively achieve managerial, operational, vehicle and driving standards relating to road safety, legal compliance and environmental performance. FORS raises the bar, promotes best practice and provides a recognisable credential through an independent audit, staff training and support material. FORS is now regarded as 'the' accreditation scheme by fleet operators, their clients and enforcement agencies alike.

Acknowledgements

This document has been produced by the Fleet Operator Recognition Scheme, with the help and support of FITAS - The Federation of Communication Services (FCS) Installer Training and Accreditation Scheme.

FITAS is a training programme for engineers who wish to install equipment to the recommended standard of FCS 1362. FITAS has developed a training module for installers, which specifically guides engineers in the installation of vehicle equipment to meet the FORS Standard. For more information on the FITAS scheme, please visit: http://www.fcs.org.uk/fors or email fors@fcs.org.uk

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Terminology

Shall – to indicate something which is mandatory as part of the FORS requirement or in order to achieve the requirement

Should – to indicate something which is recommended as emerging practice

May – to indicate permission or an emerging best practice option

Associate – an associate is a person, organisation, company or business who provides an exclusive offer / discount on products and services aligned to the requirements of the FORS Standard

Blind spots – areas around a vehicle which are neither directly nor indirectly visible by the driver

Blind spot minimisation – the complete elimination or reduction as far as practical and possible of blind spots using a combination of direct and indirect vision aids

Direct vision – direct vision is what the driver can see through windows rather than using mirrors or cameras

Devices for indirect vision – 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 able to present information about the indirect field of vision to the driver

Fleet operator – any individual or organisation that operates one or more hired, leased or owned vehicles as part of their business or working activity

Indirect vision – indirect vision is what the driver can see through mirrors and cameras

Side under-run protection – lateral guards which can be fitted between vehicle axles to minimise the severity of side under-run collisions, also known as sideguards

Vehicle manoeuvring warnings – enhanced audible warnings to alert other road users to a left turning, right turning or reversing vehicle

Vehicle nearside – the side of the vehicle nearest to the kerb in the forward parked/driving condition

Vehicle offside – the side of the vehicle furthest from the kerb in the forward parked/driving condition

Vehicle safety equipment – equipment which assists the driver in seeing or detecting other road users or obstacles and also reduces the incidence and severity of collisions, particularly with vulnerable road users (VRUs). This type of equipment can be fitted by vehicle manufacturers, dealers or retrofitted

Vulnerable road user (VRU) – applies to cyclists, pedestrians, motorbike / scooter riders, horse riders, pedal taxi drivers and car drivers

Warning signage – prominent signage used to warn vulnerable road users (VRUs) not to get too close to vehicles when stationary (not parked) or in motion

1. Introduction

Purpose of this guide

This guide is designed to help you meet the vehicle safety equipment requirements of the FORS Standard version 4.1.iii. It provides guidance on each requirement including the equipment that can be used, advice on the specification that this equipment should meet and who can provide this equipment.

The specific FORS Standard requirements for vehicle safety equipment are:

- Bronze V7 – Vulnerable road user safety
- Silver S3 – Audible warning systems
- Silver S4 – Blind spot minimisation

This guide is structured as follows:

- Section 2 outlines where the safety equipment shall be installed on a right hand drive vehicle
- Section 3 outlines the FORS Bronze vehicle requirements, the equipment that shall be fitted, and which vehicles it applies to
- Section 4 outlines the FORS Silver vehicle requirements, the equipment that shall be fitted, and what vehicles it applies to
- Section 5 outlines which FORS Associates can supply the equipment for each requirement
- Section 6 outlines further information about equipment specification and installation.

What vehicles are subject to the requirements?

The FORS Standard requirements (V7, S3 and S4) stipulate that vehicle safety equipment applies to vehicles over 3.5 tonnes gross vehicle weight, including exempt vehicles. These requirements do not apply to vehicles with a gross vehicle weight of 3.5 tonnes and under.

Who should read this guide?

This guide is aimed at:

- Individuals within fleet operating companies who are directly involved or have a professional interest in the decision making process for vehicle safety equipment
- Those responsible for ensuring that their fleet meets the requirements of the FORS Standard
- Individuals in client organisations responsible for setting up and carrying out compliance checking processes
- Safety equipment manufacturers / providers so they can see the specification their equipment will need to meet

What are the benefits of fitting vehicle safety equipment?

The main benefits of fitting vehicle safety equipment include:

- Improving drivers' ability to see or detect vulnerable road users (VRUs), other road users and obstacles
- Warning VRUs of dangers of being in close proximity to vehicles

- Warning VRUs and other road users of a vehicle's manoeuvre
- Reducing the incidence and potential severity of collisions
- Potential to assist collision investigations and counter fraudulent insurance claims

Driver training

Drivers shall be made aware of the importance of each piece of equipment and the purpose for which it has been installed. They should be trained in the correct use of the equipment, and recognise that activation and deactivation of the system – where it might be applicable, appropriate or necessary - is an integral part of their job. Drivers shall also be aware of how to report any breakdowns and shall ensure that equipment is properly maintained and fully operational at all times. These items should be included on the drivers' daily walk around check sheets.

2. Vehicle safety equipment compliance

This section will help identify which safety equipment shall be installed to help you meet the FORS vehicle safety requirements. It outlines where the safety equipment shall be fitted and gives a pictorial representation of a right hand drive vehicle which complies with the FORS vehicle safety equipment requirements.

Bronze				
V7 - Vulnerable road user safety				
Mirrors		Side under-run protection		Prominent warning signage
Class V mirror	Class VI mirror	Sideguard	Ancillary devices*	Warning signage and markings
Shall be fitted to all vehicles where they can be mounted, with no part of the mirror being less than two metres from the ground.		Shall be fitted on both sides of the vehicle with a gross weight of over 3.5 tonnes, including mixers, tippers and waste vehicles that are currently exempt from side under-run fitment, unless this is proved to be impractical or impossible.		Located at the rear of the vehicle (where practicable) to visually warn other road users not to get too close to the vehicle. Signage shall warn the vulnerable road user of the potential danger, advising people to take appropriate action, and shall not be offensive or give instructional advice. Warning signage shall be prominent, clean and clearly visible to the road user.

Table 1: Bronze vehicle safety equipment compliance summary

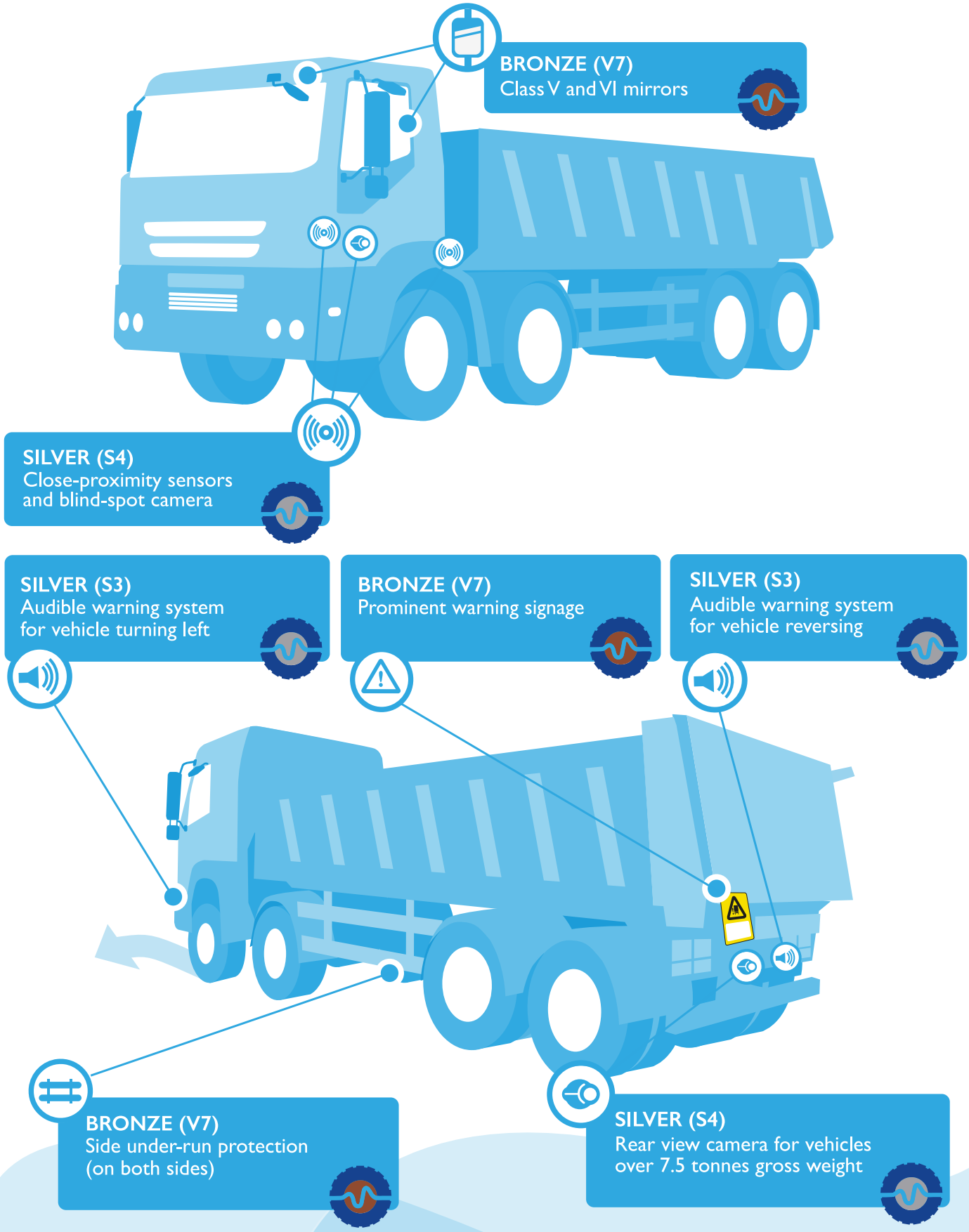
*Ancillary devices achieving the same objective as sideguard (fuel tank, locker box etc.)

Silver**				
S3 - Audible warning systems		S4 - Blind spot minimisation		
		Direct and indirect vision aids		Driver audible alerts
Reversing audible system	Left-turn audible system	Fresnel Lens	Camera system	Close proximity sensor
Audible warning devices fitted to warn VRUs when a vehicle is turning left and for when the vehicle is reversing. Turning and reversing devices should be fitted with a manual push to silent override switch for circumstances, such as working at night, where it may be appropriate or necessary to deactivate the device.		Examples include but are not limited to: Fresnel lenses/ camera systems and close proximity sensors. All vision aids and audible alerts shall be fully operational where fitted. For left-hand drive vehicles these vision aids and audible alerts shall be fitted to the front right of vehicles over 3.5 tonnes gross vehicle weight. Appropriate rear indirect vision aids (e.g. rear facing cameras) shall be fitted on vehicles over 7.5 tonnes gross vehicle weight and be fully operational.		

Table 2: Silver vehicle safety equipment Silver compliance summary

**Silver fleet operators shall maintain the FORS Bronze vehicle safety requirement V7.

FORS VEHICLE SAFETY EQUIPMENT REQUIREMENTS



3. FORS Bronze vehicle requirements

V7 - Vulnerable road user safety Requirement

Fleet operators shall ensure that all vehicles over 3.5 tonnes gross vehicle weight are fitted with safety equipment to help protect vulnerable road users. This shall include:

- Prominent warning signage to the rear of the vehicle (where practicable) to visually warn other road users not to get too close to the vehicle
- Side-under run protection to all vehicles over 3.5 tonnes gross vehicle weight (where practicable) that are legally exempt from fitment
- Class V and Class VI mirrors fitted to all vehicles where they can be mounted, with no part of the mirror being less than two metres from the ground

Equipment and guidance

Warning signage

Vehicles over 3.5 tonnes gross vehicle weight shall display, on the rear of the vehicle signage to warn vulnerable road users about getting too close to the vehicle. Signage shall warn the vulnerable road user of the potential danger, advising people to take appropriate action, and shall not be offensive or give instructional advice to the vulnerable road user.

Signage that is considered instructional such as ‘Stay Back’ or ‘No Entry’ is not recommended. FORS guidance is that all existing ‘Cyclists Stay Back’ warning signs should be replaced with the FORS approved signage which has been designed in conjunction with the cycling community. Instructional signage fitted to vehicles will result in a Minor Action Point at FORS audit.

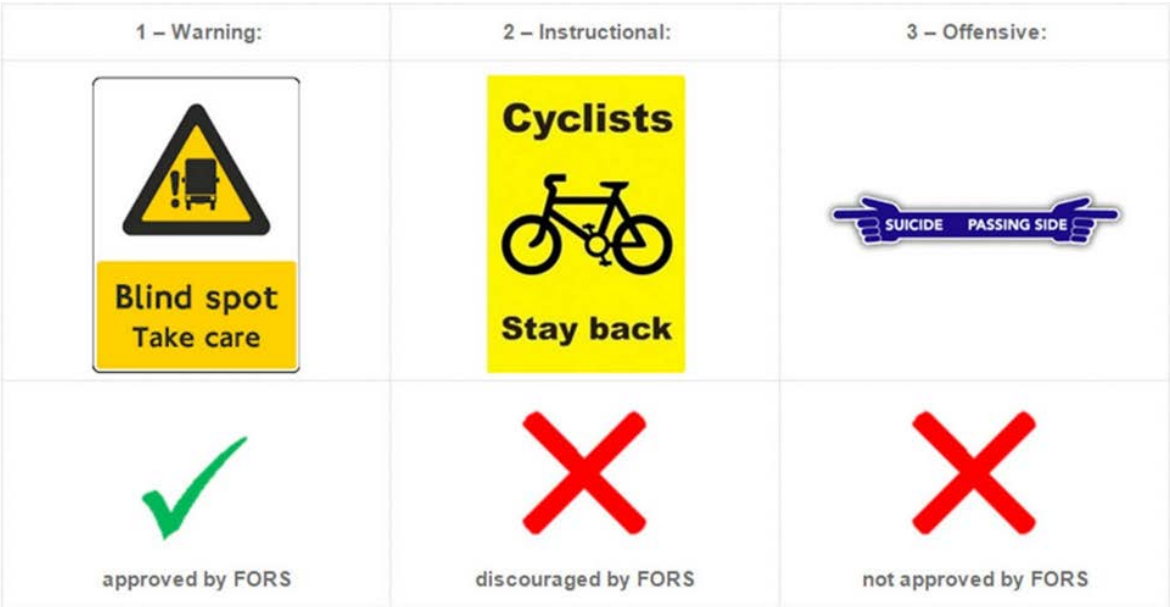


Figure 1: Warning signage guidance

Any accredited company that displays signage that is considered offensive or distasteful may receive a request from FORS for the signage to be removed or replaced. Failure to remove such signage will result in suspension from FORS until it is removed or replaced.

Warning signage shall be prominent, clean and clearly visible to the road user.

Warning signage shall be A4 or equivalent size unless this is not practical in which case an appropriately sized warning sign may be used instead. Signage of A4 (210mm x 297mm) and also landscape (420mm x 148mm) dimensions can be ordered via the FORS website. Artwork can also be downloaded and given to a printer of your choice.

Where it is impractical to display this signage on the rear of the vehicle (e.g. obstruction caused by beaver-tail or similar), the sign should be placed in a prominent position clearly visible to cyclists and other road users.

Vehicles of 3.5 tonnes gross vehicle weight and under (such as vans) do not need to be equipped with warning signage and markings unless the operator is contractually obliged to do so. However, if the vans already display the warning signage and markings then there is no need to remove them.

Illuminated panels or LED warning signs may also be fitted at the rear of the vehicle to alert cyclists to the blind spot on a heavy goods vehicle. Panels can flash in conjunction with the directional indicators, and only operate when the vehicle is stationary (not parked) or manoeuvring below 15 mph.

As LED warning signs are illuminated they can be read at night. Some types of LED warning signage are re-programmable and will allow you to change the warning message as required.

Side under-run protection

Fleet operators shall provide evidence that all vehicles over 3.5 tonnes gross vehicle weight are fitted with side under-run protection, and that it is fitted on both sides of the vehicle unless this is proved to be impractical or impossible. Side under-run protection can be demonstrated by the fitment of sideguards, vehicle design and/or ancillary devices (fuel tank, locker box etc.) which achieve the same objective.

Figure 2: Side under-run protection

Sideguards should be specified when procuring a vehicle and are commonly fitted during the bodybuilding stage.

Sideguards shall also be retrofitted to some existing vehicles where they are not fitted. Commercial vehicle bodybuilders are able to supply and install sideguards to new, existing and exempt vehicles.

Alternatively, some bodybuilders will supply the side-guard components along with the instructions for fitment enabling an appropriately skilled person in your organisation to fit the sideguards.

Figure 3: Example of fuel tank achieving the same objective as sideguards

Once fitted, you shall ensure that sideguards are kept in a serviceable condition. A vehicle exempt from sideguards under the Construction and Use Regulations but which has them fitted can still fail its annual test if the sideguard or bracket is insecure; has exposed surfaces which are not smooth (e.g. it has jagged edges or bolt heads that are not domed shape); or increases the overall width of the vehicle.

For further information:

The Road Vehicles (Construction and Use) Regulations 1986: Regulation 51, sideguards

Sideguards that are lower than the regulated height from the road and / or are fitted with a covering panel are recommended to further reduce the risk of under-run collisions.

Warning signage should be displayed on the panel. These sideguards will warn vulnerable road users when adjacent to the vehicle nearside and offer greater protection than the minimum legal requirement in the event of a collision.

Class V and Class VI mirrors

Fleet operators shall ensure that all forward control vehicles over 3.5 tonnes gross vehicle weight are fitted with Class V and VI mirrors.

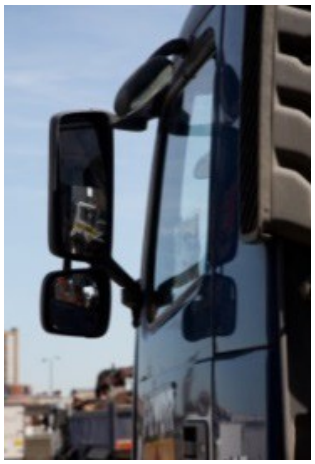


Figure 4: Class V mirrors

Forward control vehicles are defined as having the steering wheel in the first quarter of the vehicles length (vehicle only, not vehicle and trailer) and having 50% or more of the engine located rearward of the furthest reaching part of the windscreen.

Class V mirrors

Class V mirrors help to minimise the blind spot immediately to the side and front corner of the vehicle passenger door.

Class V mirrors are a legal requirement on non-exempt vehicles and shall be retrofitted, when required, on existing vehicles over 3.5 tonnes gross vehicle weight in order to meet the FORS requirement. A Class V mirror may also be retrofitted to the driver's side.

Class V mirrors shall be fitted, with no part of the mirror and its mounting bracket being less than 2 metres from the ground.

Some vehicles are / will be exempt from this requirement where the two metre height from the ground requirement cannot be achieved, for example on low cabs.

Blind spot cameras may be used instead of a Class V mirror, but the image shall cover the same field of view.

Class VI mirrors

Class VI mirrors help to minimise the blind spot immediately in front of the drivers cab.

Class VI mirrors are a legal requirement on all new vehicles over 7.5 tonnes gross vehicle weight and shall be retrofitted on existing vehicles.

Class VI mirrors shall be fitted, with no part of the mirror and its mounting bracket being less than two metres from the ground.

Some vehicles are / will be exempt from this requirement where the two metre height from the ground requirement cannot be achieved, for example on low cabs.

Figure 5: Class VI mirrors

The improved driver's field of view achieved with fitment of Class V and Class VI mirrors shall conform to DVSA MOT test requirements and the relevant UK regulation.

Devices for indirect vision such as blind spot cameras can be used instead of a Class VI mirror, but the image shall cover the same field of view.

4. FORS Silver vehicle requirements

S3 – Audible warning systems Requirement

Fleet operators shall ensure that all vehicles over 3.5 tonnes gross vehicle weight are equipped with an audible means to warn other road users of a vehicle's left turn manoeuvre and reversing movement.

Equipment and guidance

Audible warning systems

Audible warnings systems alert VRUs and other road users to a vehicle's intended manoeuvre. Warnings for a vehicle's left turn are particularly important as the nearside blind spot on right hand drive vehicles presents one of the greatest areas of risk to cyclists.

Left-hand drive vehicles:

For left-hand drive vehicles the blind spot is on the right side and will affect the vehicle when turning right. Audible warnings shall therefore be activated when the vehicle is about to make a right turn.

Audible warning devices should be fitted with a push to silent override switch for circumstances, such as working between 23.30 and 07.00, where it may be appropriate or necessary to deactivate the device.

External audible warning systems should present the following features:

- Left turn system

- The system shall be fitted to the front nearside of right hand drive vehicle
- The system should activate when the driver switches on their indicator at a low speed (less than 20 mph)
- The system should sound a voice message indicating that the vehicle is turning left

Figure 6: Audible warning system for left-turning

- Reversing system

- The system shall be fitted to the rear of the vehicle
- The reversing audible system should activate when the vehicle is reversing
- The system should either sound a buzzer, bleeper or audible voice message to indicate that the vehicle is reversing

Audible warning systems:

- Shall comply as appropriate with The Road Vehicles (Construction and Use) Regulations – 96/1078
- May include additional directional indicators that comply with UNECE Regulation 48

S4 – Blind spot minimisation Requirement

Fleet operators shall ensure that all vehicles over 3.5 tonnes gross vehicle weight have front, side and rear blind spots eliminated or minimised as far as is practical / possible, through a combination of active and operational direct and indirect vision aids and driver audible alerts.

Equipment and guidance

Fleet operators shall ensure that appropriate vision aids and driver audible alerts are fitted to the front left of vehicles over 3.5 tonnes gross vehicle weight.

Left-hand drive vehicles:

For left-hand drive vehicles, vision aids and audible alerts shall be fitted to the front right of vehicles over 3.5 tonnes gross vehicle weight.

In addition, appropriate indirect vision aids shall also be fitted to the rear of rigid vehicles over 7.5 tonnes gross vehicle weight to assist the driver when reversing.

Fresnel lens

A Fresnel lens consists of a clear thin plastic lens that is press fitted to the front left vehicle window and helps the driver to see what is in the vehicle's blind spot. The fitment of Fresnel lenses helps to reduce blind spots and contributes to decreasing the number of side-swiping incidents.

Fresnel lenses should meet the following general criteria:

- Be CE marked. Further information about CE marking is provided in Section 6
- Able to attach to side window glass by capillary attraction
- Flexible and not able to shatter or cause injury in the range of temperature/ humidity -20ºc and +45ºc / 10% and 100%
- Size minimum A4
- Be UV stable

Camera system

Camera systems consist of externally fitted cameras and an in-cab monitor to provide more visual information than conventional mirrors can. These can cover blind spots and, in some cases, full 360° view around the vehicle which aids slow speed manoeuvring.

Camera and monitor systems are widely available from a range of suppliers. Systems differ in complexity depending on quality of image and recording and monitoring options. In order to minimise the nearside blind spot, cameras should be placed so as to cover the blind spots and area of greatest risk and as a minimum covering the front nearside of vehicles over 3.5 tonnes gross vehicle weight.

Fleet operators can opt for a complete camera system which utilises either one monitor and switches view to the rear of the vehicle when reverse gear is engaged or one which shows a split display.

When deciding which system to use, be aware that the following features can vary:

- Quality of the image
- Performance in situations with limited lighting
- Performance during hours of darkness
- Performance in various weather conditions
- Maintenance regime for the system
- Driver capability to safely view the images in the urban traffic environment

Table 3 will help you identify minimum and recommended specification when choosing your camera and monitor system.

Section 6 provides further guidance on equipment specification and installation.

		Minimum specification	Recommended specification	Notes
Camera	**Ingress Protection (IP) Rating**	IP67	IP69K	Advisable to install to the recommended level if vehicle is steam washed
	Lens	¼" CMOS		CMOS – Complementary metal oxide semiconductor Like the retina area of the eye. Converts the light into signal
	Infrared (IR) Distance	8 metres		Cameras should have good night vision capability. An effective level of IR LEDs is required for night vision. The minimum distance for the driver to see would be 8 metres
	View Angle	120°	130°	
	Operation Temperature	-20°C to 70°C	-30°C to 80°	
	Resolution	420 TVL Analogue	720p AHD	TVL – TV Lines AHD – Analogue High Definition
Monitors	**Size**	Minimum 7"	9"	Screen will show a split screen reversing/nearside as a default
	Inputs	2 switchable		Inputs switchable on manoeuvre – turning aft and reversing

Table 3: Recommended camera and monitor specifications

Driver audible alerts

Driver audible alert systems consist of close proximity sensors which detect objects in a vehicle's blind spot and alert the driver via in-cab audible or visual stimuli. Some systems have been designed to alert the driver when it has assessed the vehicle to be on a collision path with another road user.

Figure 7: Close proximity sensor

Proximity sensors should be placed around the front nearside of right hand drive vehicles (front offside of left hand drive vehicles), with consideration of the area of greatest risk at an appropriate height to pick up cyclists and pedestrians. Additionally, although not a FORS requirement, rigid vehicles over 7.5 tonnes gross vehicle weight may also have rear sensors fitted which should activate when the vehicle is reversing.

Sensors should be kept clean at all times in order to keep them in good operational order.

Both the side sensor and reversing sensor systems should have a self-test mode to enable the driver to check that the systems are working correctly.

Types of sensor or detection systems include:

- Ultrasonic detection system (side and front)
- Radar detection system (side and front)

When choosing your equipment, be aware that features such as false alarms rate and detection zone size can vary. Table 4 summarises minimum and recommended specification for proximity sensors.

Section 6 provides further guidance on equipment specification and installation.

		Minimum specification	Recommended specification	Notes
Proximity Sensors	**IP Rating**	• IP67 for sensor • IP65 for control box if mounted internally and IP68 if mounted externally	• IP68 for sensor • IP69K for control box	Advisable to install to the recommended level if vehicle is steam washed
	Operation Temperature	-20°C to 70°C	-30°C to 80°	

Table 4: Recommended proximity sensors specifications

5. FORS Associate equipment providers

Table 5 shows a list of all FORS Associates that provide equipment to help you meet the FORS Standard. Some of these Associates will have offers and discounts available exclusively to FORS members. Please visit www.fors-online.org.uk/cms/suppliers/ for more details about offers and discounts and contact details for the Associates. Some specialist vehicles such as emergency service vehicles, Petroleum Regulation Vehicles and military vehicles may require a specialist installation or specialist equipment. More information can be obtained from FCS.

FORS Associate	V7		S3	S4	
	Class V & VI mirrors	Side under-run protection	Audible warning systems for vehicle manoeuvring	Camera and monitor systems	Close proximity sensors
Amber Valley Development			✓	✓	
Auto Electrical Services (AES)				✓	
Back Watch			✓	✓	✓
Brigade Electronics			✓	✓	✓
Brite Sparks Auto Electrical			✓	✓	✓
Centrad				✓	
C-KO			✓	✓	✓
Commercial Body Fittings		✓	✓	✓	
Dawes Highway Safety Ltd		✓			
Durite	✓		✓	✓	✓
ECCO Safety Group Europe / Premier Hazard Ltd					✓
Exeros Technologies			✓	✓	✓
Fleet Focus	✓		✓	✓	✓
Fleet Safe Solutions Ltd			✓	✓	✓
Handsfree Group			✓	✓	✓
Kits-n-Bits Ltd			✓	✓	✓
Mobile Auto Electrics			✓	✓	✓
Provision Vehicle Cameras			✓	✓	✓
Re-tech UK				✓	✓
RS Connect				✓	
Safety Shield Systems			✓	✓	✓
Sentinel Systems		✓	✓	✓	✓
TrafficAngel			✓	✓	✓
Transport Support			✓	✓	✓
Vehicle Proximity Cameras Ltd			✓	✓	✓
VisionTrack			✓	✓	✓
Vtech Systems Ltd			✓	✓	✓
Xvision Safety Systems			✓	✓	✓

Table 5: FORS Associate equipment providers

6. Further information on safety equipment specification and installation

The following advice will help you to make sure that anything that is installed will be as reliable and functional as the vehicle it is installed to.

CE and E Marking

There is a vast amount of electronics present in modern vehicles, controlling everything from the cabin temperature to more safety critical devices such as anti-lock braking systems.

To make sure that the device will not interfere with the vehicle or any other device installed, the fleet operator should make sure that the device is CE marked.

An extra level of protection of assurance would be E marking which is an added assurance that the device has met a threshold of interference level. Devices that have the potential to distract the driver are included in the safety-relevant category.

IP Ratings

IP stands for Ingress Protection. This rating ensures that the device will be protected for the type of application and environment it is asked to work in.

A two-digit number established by the International Electro Technical Commission is used to provide an Ingress Protection rating to a piece of electronic equipment or to an enclosure for electronic equipment.

The protection class after the international standard of EN60529 are indicated by short symbols that consist of the two code letters IP and a code numeral for the protection it provides.

For example: IP65
The two digits represent different forms of environmental influence:
- The first digit represents protection

IP..	First digit: Ingress of solid objects	Second digit: Ingress of liquids
0	No protection	No protection
1	Protected against solid objects over 50mm e.g. hands, large tools	Protected against vertically falling drops of water or condensation
2	Protected against solid objects over 12.5mm e.g. hands, large tools	Protected against falling drops of water, if the case is disposed up to 15 from vertical
3	Protected against solid objects over 2.5mm e.g. wire, small tools	Protected against sprays of water from any direction, even if the case is disposed up to 60from vertical
4	Protected against solid objects over 1.0mm e.g. wires	Protected against splash water from any direction
5	Limited protection against dust ingress (no harmful deposit)	Protected against low pressure water jets from any direction. Limited ingress permitted
6	Totally protected against dust ingress	Protected against high pressure water jets from any direction. Limited ingress permitted
7	N/A	Protected against short periods of immersion in water
8	N/A	Protected against long, durable periods of immersion in water
9k	N/A	Protected against close-range high pressure, high temperature spray downs

Table 6: Description of the protection provided by IP ratings

against ingress of solid objects
- The second digit represents protection against ingress of liquids

The larger the value of each digit, the greater the protection. As an example, a camera rated IP69k would be better protected against environmental factors such a pressure washer, than another similar product rated as IP67.

Camera

Image quality – the minimum suggested resolution for an analogue system is 420TVL (Television Lines). A lower resolution camera will not provide the clarity at distance. The recommended resolution level is the High Definition Standard (AHD) which will be 720p.

Field view – the field view is the width of the angle of view displayed on the screen. Having a wide view, especially for a rear-view camera is essential. The minimum field of view required is 120°; the recommended field of view is 130°.

Ingress Protection – having the ability to withstand moisture and dust is probably one of the important requirements of a camera. The minimum for cameras is IP67 and the recommended, especially for a vehicle to be steam washed, is IP69k.

System supply voltage – 10 to 32V DC. This means it can be installed on any vehicle and can handle supply voltage fluctuations.

Night vision – the cameras should have good night vision capability for the driver to view their blind spots efficiently. An effective level of IR LEDs is required for night vision. The minimum distance for the driver to see would be eight metres

Temperature range – the camera will have the ability to operate between be -20°C to +70°C.

Monitor

Size – the minimum recommended size of the monitor is seven inches.

Default view – the default view for the driver to see should be a split view of the rear and nearside of the vehicle.

Override view – when the vehicle is turning left or reversing, the screen should switch to a large screen version of the respective camera view and the return to the default view, once the manoeuvre has been completed.

Position – the monitor should be clear to view but not obstruct driver’s view of the road.

Sensor and audible systems

When deciding which system to use, be aware that the following features can vary:

- The rate of false alarms
- The size of the detection zone
- Maintenance regime for the system

Whether the system is standalone or relies on additional equipment over which the operator does not have control (e.g. tags fitted to bicycles)

Warranty

Having an extensive warranty will guarantee the quality of the components that make up the installation. Therefore, to be as resilient as the vehicle, a minimum of two years' warranty is recommended with a three year warranty being best practice.

Specialist Vehicles

Some specialist vehicles such as emergency service vehicles, Petroleum Regulation Vehicles and military vehicles, may require a specialist installation or specialist equipment. More information can be obtained from FCS.

Installation

Fleet operators should take appropriate steps to make sure that the electrical devices are installed to an acceptable standard.

All cabling installed must be of the correct standard. When the cabling is routed outside the passenger compartment, it must be protected by an appropriate method of protection. The external connections must be water resistant or made water resistant by the installer.

The installation of the components that make up the electrical vehicle solution should follow a Code of Practice. The code of practice generally used to ensure quality of electrical installations in vehicles is the UK Code of Practice for the Installation of Mobile Radio and Related Ancillary Equipment in Land Based Vehicles FCS1362:2016.

Disclaimer

Please note that all information provided is correct at the time of publication. Please visit www.fors-online.org.uk/cms/suppliers-and-supporters-offers/ for the latest offers.

This guide should be used as a reference document to support operators to fit the correct types of equipment to meet the FORS Standard. The guide makes reference to FORS Associates who offer relevant offers and discounts to FORS members but other equipment providers are available. It remains the responsibility of the operator to choose the best equipment for their operation to meet the requirements of the Standard. This document has been created solely to increase awareness on the type and availability of products. For further information on any product, please contact the manufacturer directly.

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