Backeye™
Camera Monitor Systems

Vehicle Safety Solutions
Camera Monitor Systems

Eliminating blind spots

Vehicle blind spots are a huge contributory factor in collisions in all industries. The substantial height and length of many vehicles and machines greatly limit driver visibility. Operator positions, bodywork panels, absent rear windows and bulkheads all create further restrictions.

There has been much debate about mirrors creating further blind spots and an “information overload” for drivers who don’t know where to look first. Knocked and broken mirrors have added to the question of suitability.

Camera monitor systems have brought driver vision into the twenty first century offering wider angles of view, clearer pictures and the ability to view multiple images on a single monitor.

The cost of limited visibility

The Health & Safety Executive (HSE) warned about the dangers of limited visibility after a banksman was killed when a motor grader reversed over him. He could not be seen by the driver due to a blind spot behind the machine. The company was fined £25,000. HSE inspector David Jordan said, “the driver should have been more aware of the location of his banksman. The company could have done a lot more to prevent this death.”

Every year 400 people are killed in EU countries when drivers fail to detect pedestrians, cyclists and other vehicles in their blind spots when manoeuvring.

How Brigade’s camera monitor systems can help

Camera monitor systems are used in a wide range of on-road and off-road applications to meet a host of health and safety and legislative requirements. They can eliminate blind spots to prevent costly vehicle damage and ultimately save lives.

Operational and cost benefits

✓ Can cover multiple blind spots on a single monitor.
✓ Can reduce vehicle damage and downtime.
✓ Can help reduce insurance premiums.
✓ Improvement on mirrors:
  Wider angle of view.
  Clearer visibility in low light conditions.
  Less likely to be damaged or broken.

Meet health and safety requirements

✓ Management of Health and Safety at Work Regulations (MHSWR) - requires all employees to identify risk and eliminate where possible.
✓ Provision & Use of Work Equipment Regulations (PUWER) - no person should be in a place where their health and safety is at risk as a result of operational control. (i.e. due to blind spots).

On-Road Applications

✓ EU directive 2007/38/EC - compulsory vision in class IV & V blind spots.
✓ EU directive 2003/97/EC - compulsory vision in class VI blind spot.

Off-Road Applications

✓ ISO 5006 – standard for earth-moving equipment which addresses the problem of blind spots around a vehicle.
✓ The Supply of Machinery (Safety) Regulations 1992 - appropriate devices must be provided to remedy hazards due to inadequate direct vision.
Reversing of commercial vehicles is a major problem accounting for one claim in every six.”
Association of British Insurers

Reverse in Safety
The rear blind spot is a huge problem regardless of vehicle/machine, and according to the Health and Safety Executive a quarter of all workplace accidents are caused by reversing. The University of Huddersfield highlighted in their report ‘Reversing Accidents in UK Transport Fleets’ found that a massive 90% of reversing accidents occur OFF the road (loading bays, lorry parks, private roads, quarry sites, warehouses etc).

Rear view camera benefits:
✓ Prevents reversing collisions with people, property or vehicles
✓ Reduces vehicle damage to the rear
✓ Reduced insurance premiums
✓ Assists safe and easier manoeuvring

According to the Department for Transport, more than half of all cyclist deaths in London are caused by collisions with goods’ vehicles due to the nearside blind spot.

Benefits:
✓ Meets side view requirements of EU blind spot directive 2007/38/EC & 2003/97/EC (Class IV & V)
✓ Removes the nearside blind spot
✓ Reduces risk of collisions with cyclists and pedestrians
✓ Reduces risk of sideswipe collisions with other vehicles
✓ Provides full side view of trailer when reversing on full lock, including near side rear corner
✓ Reduced nearside vehicle damage

Eliminating the Nearside Blind Spot
Most cyclist fatalities happen at low speeds, typically at road junctions and when moving off from a stationary position. A flush mount side view camera, triggered by the indicator solves this problem by giving a clear view of the nearside blind spot, where vulnerable cyclists and pedestrians are often hidden from the driver’s view. Sideswipe collisions on motorways are another common result of poor visibility. This problem is especially acute for continental drivers in the UK, where the driver position is on the left hand side, and vice versa, when UK drivers are abroad.

Rear View

Side View

Rear view cameras are available in the following ranges:
Elite, Select and Essential
Features include:
• IP69K
• Heated
• Shutter
• Compact and flush mount
• LED’s for ultra-low light performance
• Up to 15m illumination distance
Please see the Brigade product catalogue for individual model specifications.

Camera view covers near side rear of trailer when on full lock
Camera view
Camera view

Required viewing area of directive 2007/38/EC & 2003/97/EC (Class IV & V)

Camera view

Side view cameras are available in the following ranges:
Elite, Select
Features include:
• Flush mount
• Eyeball with adjustable lens position
• R46 approved for indirect vision
Please see the Brigade product catalogue for individual model specifications.
**Front View**

**Forward Vision**

Due to the size of machinery and elevated operator positions, a blind spot often exists to the front. ISO 5006 states that ‘a driver must be able to detect the presence of a standing person, of short stature [approx. 1.5m], 1m out from the perimeter of the machine’. A camera monitor system is the best solution for all round visibility.

**Benefits:**
- ☑ Meets front view requirements of EU blind spot directive 2003/97/EC (Class VI)
- ☑ Reduced front vehicle damage
- ☑ Prevents collisions with workers or pedestrians

**Front View Multiple View Camera**

Camera views are available in the following ranges:
- Elite, Select

Features include:
- IP69K
- Mini
- Flush mount
- Eyeball with adjustable lens position
- Infrared LED’s for ultra-low light performance
- R46 approved for indirect vision

Please see the Brigade product catalogue for individual model specifications.

Additionally, trucks with tall cabs and/or high windscreen can lose sight of pedestrians in their front blind spot. Brigade’s front view cameras meet the requirements of blind spot directive 2003/97/EC (Class VI), where front view is mandatory at forward speeds below 30kph.

**Brigade’s Select, Elite and Extreme camera monitor ranges are all suitable for multiple view applications. Up to four camera images can be displayed on a single monitor with in-built single, split, triple and quad screen function or in conjunction with Brigade’s screen splitter.**

**On-road applications**

All-round visibility is vital but mirrors can create further blind spots and drivers can only look in one direction at a time. By combining multiple cameras to view all blind spots on a single monitor, this problem is eradicated.

- Camera 1: Front view
- Camera 2: Side view
- Camera 3: Rear view

The side view image can be shown permanently or triggered by the indicator circuit. At speeds of up to 30kph, the front view image can be simultaneously displayed using a multi-view monitor or a screen splitter. The rear view image is triggered by reverse gear.

If triggers are set up appropriately and the monitor has split screen functionality, this 3 camera configuration complies with all current blind spot legislation.

**Off-road applications**

It is essential for operators of agricultural machines to check produce is picked efficiently, whilst also ensuring safety. From the cab, visibility is limited, especially when the land is dry and dusty.

A bespoke, three-camera solution eliminates the problem.

- Camera 1: Installed at the bottom of the pick-up element, viewing the level of the machine.
- Camera 2: Positioned to look into the trailer of the adjacent collection vehicle.
- Camera 3: Provides a panoramic rear view.

Images of the collection and transfer processes are shown on the monitor by default. The rear view is triggered by reverse gear.
Internal cameras are increasingly used as a deterrent against vandalism and violence. Attacks on passengers account for a quarter of all crime on London's buses. By using an in-cab monitor, drivers can observe activities in the vehicle and raise the alarm if necessary.

If a mobile digital recorder is installed, camera monitor systems can help reduce personal injury claims by deterring fraud. Evidence makes it easier for operators to refute any dubious claims that arise and prove whether a claimant was or was not on the bus concerned.

Internal cameras can be used to monitor driver behaviour by capturing footage of those who flout company regulations or are suspected of theft.

Ensuring passenger safety
Internal cameras are available in the following range.
Elite
Features include:
• Mini
• Dome
• Flush
Please see the Brigade product catalogue for individual model specifications.

Liability for vehicle related incidents is accepted on a daily basis by local authorities and large companies who have no way of disproving a false claim.

Mobile Digital Recording

Brigade’s intuitive, affordable Mobile Digital Recorder captures real-time footage from up to four vehicle mounted cameras.

Optional GPS and G-force sensor provides vital additional information such as vehicle location, speed, time and impact data. Recording can be activated or flagged by a trigger (such as a door opening, selecting reverse or indicating) or motion detection, useful for surveillance when the vehicle is unmanned. Offering selectable levels of image quality and recording between 2 to 30 frames per second, the hard disk can store up to 780 hours of footage.

Compatible with Brigade’s wide range of camera monitor systems including rear, side, front and internal cameras, the MDR-304 is simple to install and data access is simple yet secure. The lockable hard drive is easily removed by authorised personnel for connection to PC or laptop for data download and interrogation.

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A robust range of camera monitor systems (CMS) especially suited to heavy duty applications, rugged terrain or where the cab is exposed to the elements.

Features include:
- Water and dust proof to IP69K
- Single/split/triple/quad/picture in picture screen function
- Certified to ISO 13766:2006 standard for earth moving equipment
- Backlit touch screen button panel

Camera Monitor System Ranges and Suggested Vehicle Compatibility

Extreme
A superior, high quality CMS range for comprehensive blind spot coverage. Suitable for large road going vehicles and specialist applications.

Features include:
- Single/split/triple/quad/picture in picture screen function
- Certified to ISO 13766:2006 standard for earth moving equipment

Select
Our mid range CMS offer added choice, camera inputs and features at a cost effective price. Suitable for medium to large road going vehicles.

Essential
A low cost, entry level reversing camera monitor kit. Ideally suited to light commercial vehicles and vans where only one camera is required.

Features include:
- Water and dust proof to IP69K
- Single/split/triple/quad/picture in picture screen function
- Certified to ISO 13766:2006 standard for earth moving equipment

Under the image, it states:
Online at brigade-electronics.com  Call on +44 (0)1322 420300 or visit your local stockist
To order or for more information on Brigade’s vehicle safety solutions;

brigade-electronics.com

+44 (0)1322 420300

or visit your local stockist

Brigade’s extensive portfolio of safety systems includes:

- **Smarteye™ 360° Camera monitor systems**
- **Camera monitor systems**
- ‘White sound’ reversing and warning alarms
- **Pulsed radar obstacle detection systems**
- **Mobile digital recording**
- **Ultrasonic obstacle detection systems**