

# CLOSED CIRCUIT TV ON ROAD GOING VEHICLES

The attached operational circular OC 803/70 is equally relevant to both HSE/LA enforcement officers.

Health and Safety Executive		Operational Circular	
		OC 803/70	
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To  
FOD Inspectors  
HID inspectors CD and LD 1-5

## CLOSED CIRCUIT TV ON ROAD GOING VEHICLES

This OC describes the application of closed circuit television systems (CCTV) to vehicles, principally large goods vehicles (LGVs), designed for normal road use.

### BACKGROUND

1 The prevention of workplace transport accidents requires a combination of approaches comprising safe driver, safe site and safe vehicle. When considering how to prevent pedestrians being struck by vehicles, inspectors should look first at the two principal control measures - segregation of pedestrians from moving vehicles and elimination or reduction of vehicle reversing. In both cases site layout will be critical. Most vehicles have reduced visibility for the driver when travelling in reverse and this is of major significance for LGVs. CCTV is a useful additional measure to allow drivers to view the rear of the vehicle before reversing and may attract the driver's attention if a person or object comes into the field of view of the CCTV while reversing. An appropriate test for the adequacy of any CCTV arrangement would be to check the visibility of a one metre high stick at one metre distant from the rear of the vehicle, exceptionally, where this is unachievable a 1.5 m high stick may be used.

2 Information on the application of CCTV to large earth moving vehicles is in SIM 02/1999/04. BS EN 1501-1:1998, Part 1 for rear loaded Refuse Collection Vehicles requires the provision of CCTV on vehicles manufactured since 1999. The reason for the requirement in this standard is to enable the driver to see colleagues loading at the rear of the vehicle but it is likely that CCTV equipment will be of benefit before and during reversing.

3 Accident statistics: approximately 40% of all workplace fatal accidents where pedestrians are struck by a vehicle involve a LGV and of these approximately 30% involve a reversing LGV. Over the past three years, about 12 fatal accidents involving reversing large road vehicles may have been prevented if CCTV reversing aids had been fitted.

### EQUIPMENT

4 HSE has examined the use of radar and other proximity sensing devices and their use is not recommended for preventing accidents to pedestrians where the level of unwanted alarms would be intolerable to the drivers or the range of the system may not be sufficient. Sensing systems may have a role to play on open sites where the likelihood and frequency of unwanted alarms is low and where the driver may not have the time or is unlikely to use CCTV. Sensing systems are being increasingly used on road going vehicles as parking aids, however the range of such systems is limited, typically in the order of two metres. Reversing alarms are of limited value as they may be drowned out by ambient noise and/or they may be so common on a busy site that pedestrians do not take any notice and additionally deaf people cannot hear them. They may also give rise to complaints from local residents about nuisance noise. Road going vehicles will be fitted with conventional side mirrors and it is often worthwhile augmenting these with additional convex mirrors to improve side visibility but there can still be significant blind spots when reversing and especially when turning at the same time.

5 CCTV can eliminate the blindspots. CCTV systems have essentially three elements - the camera, the signal transmission link, and the monitor in the drivers cab. Modern CCTV cameras are very small (of the order of 100 mm square), and should if possible be positioned high up in the centre of the rear of the vehicle. (This will raise work at height issues for maintenance.) In this position the camera will be less affected by dirt and spray from travelling on the road and will be out of reach of thieves and vandals. In addition positioning the camera high up allows a good angle of view for judgement of distance. For some designs of vehicles, eg skip lorries and tippers this will be less straightforward. Cameras are usually fixed, but for certain temporary applications magnetic clamps are available to make them demountable. The normal signal link will be via a cable and in the case of a vehicle with a trailer, via a plug and socket connector that will need to be connected at the same time as the trailer air and lighting connections are made. Making this connection only adds a few seconds to the coupling/de-coupling operation. Systems are available which are readily detachable to stop vandalism and theft.

6 The monitor should be fitted in the cab outside the swept area of the windscreen wipers and not obscure the view of the side mirrors. A common position is at mirror height on the driver's side corner pillar, but different positions have their own advantages and disadvantages. Inspectors should be aware that distraction and glare from a monitor, especially on the road at night-time, may be important considerations for vehicle operators to take into account when installing CCTV, and inspectors should generally avoid recommending particular positions for monitors. Monitors are available with manual or automatic dimming to match cab lighting conditions. The image should be reversed so that it is presented in the same way as the mirrors. Depending on the precise locations, the camera and monitor may need to be shielded from the sun by hoods. The monitor should be adjustable to give optimal contrast and resolution in the widely differing lighting conditions that are likely to be encountered. The image on a colour monitor may be easier to interpret than that on a monochrome monitor under poor contrast conditions, but monochrome systems can generally work in lower light levels than colour systems.

7 The cost of providing CCTV systems on vehicles has fallen significantly in recent years, and technical improvements in the hardware now make reliable, robust systems readily available. Prices are still falling as the technology becomes cheaper and more commonplace. Costs vary, depending on the equipment used and the supplier. Generally, colour systems are more expensive than monochrome; compact 'flat' monitors are more expensive than traditional, deeper CRT (cathode ray tube) monitors; systems for articulated vehicles are more expensive than for rigid vehicles, due to the extra connector and the extra labour involved in fitting.

8 Installing a basic monochrome CCTV system can significantly reduce the risks from any unavoidable reversing. A basic monochrome system for a **rigid** vehicle costs approximately £400 fitted (£250 parts, £150 labour).

9 The price of fitting a similar basic monochrome system onto an **articulated** vehicle depends on whether an existing electrical connection between tractor unit and trailer can be used. If it can, a basic fitted system costs about £450 (extra fitting labour compared to rigid vehicle). If a new electrical connection has to be fitted, total fitted cost is about £600. The same systems are available for £50 extra with an integral infrared light source, giving the ability to operate in total darkness. The appendix gives details of suppliers of suitable equipment.

10 Wireless links between camera and monitor are available but these are believed to be less reliable than a wired connection at present. However, wireless systems, coupled with a removable magnetic camera, may be useful for certain applications. For instance, if the majority of a fleet's reversing manoeuvres are during shunting operations of articulated vehicles in their own premises, a monitor in the shunting vehicle with a wireless link to a magnetic, detachable camera which can easily be clamped to each trailer may reduce risks substantially and make the task much easier.

11 Discussions with firms who have fitted CCTV systems reveal that the systems are a very useful aid for precise positioning of the vehicle, removing the need for signallers in many cases. Users have also found that installing CCTV can significantly reduce the number of reversing incidents. This significantly reduces costs from these incidents, the majority of which do not involve injury but which are costly in terms of damage to vehicles and structures involved, and in terms of downtime caused by repairs, etc. The savings can pay for the equipment within one to two years. The greater the number of reversing movements, the greater the potential benefit and this may encourage use of CCTV on delivery vans as well as larger vehicles.

## **LAW**

12 The Provision and Use of Work Equipment Regs 1998 (PUWER) will apply to road going vehicles for use at work. Guidance at paragraph 316 of HSE booklet L22 states 'Where vehicles are designed primarily for travel on public roads, compliance with the Road Vehicles (Construction and Use) Regulations 1986 will normally be sufficient to comply with Part III of PUWER 1998'. However, there may often be situations where the frequency and difficulty of reversing movements, especially for LGVs, creates a significant workplace risk to pedestrians, where measures additional to those in the Road Traffic (Construction and Use) Regulations, eg CCTV, are needed and are reasonably practicable.

13 For **workplace** vehicles supplied for use mainly **off** the road, the Supply of Machinery (Safety) Regulations 1992 (SMSR) apply, and hence such vehicles are subject to the Essential Health and Safety Requirements (EHSRs) including EHSR 3.2.1 which concerns visibility from the driving position. It is important to note that this is not the case for vehicles designed for normal road use. SMSR Schedule 5 specifically **excludes** from the requirements of SMSR: "...vehicles and their trailers intended solely for transporting passengers by...road...as well as means of transport...designed for transporting goods on public road...networks", though "vehicles used in the mineral extraction industry shall **not** be excluded". Therefore, vehicles mainly travelling on the road are exempted from SMSR with the exception of those vehicles used in the mineral extraction industry (Metals & Minerals Sector can advise on vehicle safety issues in this industry).

14 PUWER Regulations 17(3)(a) and 28(e) both apply to road going vehicles used on work sites, and both are qualified by the phrase "so far as is reasonably practicable". Regulation 17(3)(a) can already be used to require the provision of CCTV or other reversing aids where site conditions warrant it. Regulation 28(e) is aimed specifically at mobile work equipment but is subject to the transitional arrangements for Part III of PUWER which will end on 5 December 2002.

15 The Health and Safety at Work etc. Act and the Management of Health and Safety at Work Regulations will apply to the use of vehicles on a work site and on the road, although in most cases the provisions of the Road Traffic Act and subsidiary Regulations will have primacy as far as use on the road is concerned. See PUWER AcoP and Guidance (L22) para 65 and OM 2000/124 (LAC 22/16) for more information. The specific provisions of the Workplace (Health, Safety & Welfare) Regulations reg.17 will apply to the use of road going vehicles on work sites (or in the case of construction sites, the Construction (Health Safety and Welfare) Regulations 1996 regs.15 and 17).

16 Enforcement Management Model. With a good degree of pedestrian separation in place, effective monitoring of driver and pedestrian behaviour, and with competent drivers of LGVs fitted with CCTV the benchmark is a remote likelihood of serious personal injury. The risk gap for frequently reversing vehicles on a site where there is no or little pedestrian segregation is moderate, as outlined below:

Actual risk:	Serious personal injury	Possible
Benchmark:	Serious personal injury	Remote
Risk Gap	Moderate	

## **ACTION BY INSPECTORS**

17 **Segregation of pedestrians from vehicles should normally be the first priority.** However, inspectors should consider requiring the provision of CCTV as part of a safe system of work where the site specific risks justify it - this is likely to be necessary where pedestrians are not segregated from frequent reversing movements and banksmen are not used. It is for site operators to carry out an assessment of the risks arising from vehicle activities and to decide on the control measures that are appropriate. This will need in some cases to include liaison and instruction on site rules for those in control of visiting vehicles. Inspectors should encourage the provision of CCTV with general haulage contractors as part of their proactive visits. The economic arguments mentioned in para 11 above should be used although it may be that due to the nature of the business the economic benefits are less persuasive.

18 The need for vehicle operators and those in control of workplaces to cooperate in controlling the risks from reversing vehicles was emphasised by a recent prosecution. Following a reversing fatality which CCTV could have prevented, the vehicle operators were fined £75 000 and the principal contractors in overall control of the site were fined £100 000.

## **CONSULTATION**

19 The contents of this OC have been discussed with representatives of site operators, road hauliers, suppliers, trades unions and other interested parties.

20 For further information FOD inspectors should contact FOD Safety Unit in Manchester and Local Authority Enforcement Officers should contact their Environmental Health Officer. FOD Safety Unit would be pleased to learn of successful and unsuccessful implementation of CCTV on vehicle fleets or visiting delivery vehicles.

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