Department for Transport

GUIDANCE NOTE 27

GUIDANCE FOR THE CARRIAGE OF GAS CYLINDERS ON VEHICLES

REVISION 1: 2015

British Compressed Gases Association

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PREFACE

The British Compressed Gases Association (BCGA) was established in l971, formed out of the British Acetylene Association, which existed since l901. BCGA members include gas producers, suppliers of gas handling equipment and users operating in the compressed gas field.

The main objectives of the Association are to further technology, to enhance safe practice, and to prioritise environmental protection in the supply and use of industrial gases, and we produce a host of publications to this end. BCGA also provides advice and makes representations on behalf of its Members to regulatory bodies, including the UK Government.

Policy is determined by a Council elected from Member Companies, with detailed technical studies being undertaken by a Technical Committee and its specialist Sub-Committees appointed for this purpose.

BCGA makes strenuous efforts to ensure the accuracy and current relevance of its publications, which are intended for use by technically competent persons. However this does not remove the need for technical and managerial judgement in practical situations. Nor do they confer any immunity or exemption from relevant legal requirements, including by-laws.

For the assistance of users, references are given, either in the text or Appendices, to publications such as British, European and International Standards and Codes of Practice, and current legislation that may be applicable but no representation or warranty can be given that these references are complete or current.

BCGA publications are reviewed, and revised if necessary, at five-yearly intervals, or sooner where the need is recognised. Readers are advised to check the Association's website to ensure that the copy in their possession is the current version.

This document has been prepared by BCGA Technical Sub-Committee 4. This document replaces BCGA Guidance Note 27: 2013. It was approved for publication at BCGA Technical Committee 151. This document was first published on 11/02/2015. For comments on this document contact the Association via the website www.bcga.co.uk.

CONTENTS

* Throughout this publication the numbers in brackets refer to references in Section 11. Documents referenced are the edition current at the time of publication, unless otherwise stated.

TERMINOLOGY AND DEFINITIONS

May	Indicates an option available to the user of this Guidance Note.
Shall	Indicates a mandatory requirement for compliance with this Guidance Note and may also indicate a mandatory requirement within UK law.
Should	Indicates a preferred requirement but is not mandatory for compliance with this Guidance Note

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GUIDANCE FOR THE CARRIAGE OF GAS CYLINDERS ON VEHICLES

1. INTRODUCTION

Many thousands of gas cylinders are transported every day without incident. To ensure that you transport cylinders safely at all times there are certain measures you should take. This guidance note explains what you should do to be safe and comply with the law.

In 1996 the UK Carriage of Dangerous Goods legislation was changed to harmonise with Europe. In 2009 the Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations (CDG Regulations) (4) came into force, and were subsequently amended in 2011. These regulations implement the European Agreement Concerning the International Carriage of Dangerous Goods by Road (ADR) (5), which provides a framework for dangerous goods to be carried internationally in road vehicles subject to compliance with standards for the packaging and labelling of the dangerous goods, and appropriate construction and operating standards for the vehicles and crew. Gases are classified as Class 2 dangerous goods.

The purpose of this guidance note is to highlight the key safety information necessary for drivers transporting gas cylinders in a vehicle whilst at work. This information is also valid when carrying small quantities of gas cylinders for personal, domestic, leisure or sporting use, but is not mandatory.

The content of this publication is in line with advice from the Department for Transport (DfT).

ADR (5) protects everyone either directly involved, or who might become involved in the carriage of dangerous goods (such as members of the emergency services and the public).

The British Compressed Gases Association (BCGA) provide additional advice in BCGA Leaflet 1 (18), *The carriage of small quantities of gas cylinders on vehicles.*

2. SCOPE

This Guidance Note gives simplified guidance on safely transporting gas cylinders in order to comply with ADR (5) and provides a method for calculating the threshold level for the quantity for the gas cylinders being carried.

Whilst this document can be used for Liquefied Petroleum Gas (LPG) cylinders advice is also available from the UKLPG Trade Association and their Code of Practice 27 (20), C*arriage of LPG cylinders by road.*

Gases being transported in an emergency vehicle e.g. ambulance or fire engine, or the carriage of medical oxygen by patients who need it for their treatment during the journey, or medical and para-medical staff where it is carried as part of a “ready to use” set is outside the scope of this Guidance Note. However, there is still a requirement to prevent leakage and to carry cylinders securely. Refer to BCGA Leaflet 13 (19), *Medical oxygen in a vehicle.*

3. GENERAL REQUIREMENTS

Everyone carrying gas cylinders in a vehicle, in the course of their work, has to follow basic legal safety requirements and, unless specifically exempted, has to comply with ADR (5). The driver of the vehicle is legally responsible for the safety of the vehicle and any load being carried. The insurance policy for the vehicle should include cover for the carriage of dangerous goods.

It is a legal requirement that the gas supplier provides a Safety Data Sheet to the customer for each product. The Safety Data Sheet will provide vital information about the product, which will include advice on transportation.

NOTE: It is not necessary to provide a Safety Data Sheet for medical gases.

BCGA Technical Information Sheet 26 (16), *Model risk assessment for the transport of gas cylinders*, assists users with identifying and managing the safety hazards associated with the transportation of gas cylinders.

BCGA Technical Information Sheet 8 (14), *Information for customers collecting gas cylinders (flammable, inert and oxidising gases)*, provides advice for customers collecting gas cylinders from their gas supplier.

Gases supplied in cylinders are in compressed, liquefied or dissolved form. The cylinders vary in weight, size and shape. These variations can give rise to potential manual handling hazards. Appropriate risk assessment, training and handling aids are required. Refer to Section 9.2.

ADR (5) defines a threshold level for the quantity of dangerous goods being carried. Above the threshold level you have to comply with the full requirements of ADR (5). If you are below the threshold level you are exempt from some of the requirements of ADR (5). The full requirements of ADR (5) do not apply, for example:

- When private individuals carry dangerous goods, which are packaged for retail sale and are intended for personal use, or

- When dangerous goods are carried only incidentally to the enterprise's main activity e.g. a plumber carrying propane on his way to a job or a technician taking refrigerant gas to repair a refrigeration system. The total quantity of dangerous goods must also be below the threshold level.

If you are carrying cylinders, particularly those containing toxic gases, you may be above the threshold level. You should consult your supply note or perform the threshold quantity calculation (refer to Section 4) to determine if you need to follow ADR (5) in full. It is the driver's responsibility to know whether the load being carried is above the threshold level.

A nominally empty cylinder containing residual gas (empty unclean) is to be treated the same as a full cylinder and is therefore subject to all the relevant regulations.

Additional advice is available from the European Industrial Gases Association (EIGA) through their series of Transport Safety Information Leaflets and from Safety Leaflet 3 (9), *Safe transport of gas*.

All dangerous goods transported by air are to comply with the International Air Transport Association (IATA) Dangerous Goods Regulations (7).

All dangerous goods transported by sea are to comply with the regulations within the International Maritime Dangerous Goods (IMDG) Code (6).

4. THE THRESHOLD QUANTITY CALCULATION

To calculate the threshold level of a load, carry out the following actions:

- Determine what **transport category** the gas you are transporting is in. Refer to Section 4.1.

- Determine the quantity of gas you are carrying for each category and translate this into **Points**. Refer to Section 4.2.

- **Use the correct calculation** for your load to identify whether you are above or below the threshold level. Refer to Section 4.3. If you are below the threshold level, comply with the basic safety requirements in Section 5. If above the threshold level then you shall comply with the full requirements of ADR (5), refer to Section 6.

4.1 Transport categories

All gases have been classified by ADR (5) into four transport categories. Table 1 shows the transport categories together with the corresponding hazard labels and lists some of the main industrial gases in each category.

Transport category 1

Transport category 2

Transport category 3

Transport category	Gas category	UN Division	Examples of industrial gases in category
1	Toxic	2.3	N/A
2	Flammable	2.1	Acetylene, hydrogen, propane, propylene.
3	Asphyxiant	2.2	Argon, carbon dioxide, compressed air, helium, nitrogen
	Oxidizing		Oxygen
4	Empty cylinders		

Table 1: Transport categories.

The classifications relate directly to the hazard labels (warning diamonds) for each product. If there are two hazard labels, the left most label will indicate the primary category. For gases not listed and mixed gases read the contents label on the cylinder and check the hazard label to determine the relevant category. Refer also to the Safety Data Sheet.

NOTE: Transport category 4 refers to an empty cylinder. A nominally empty cylinder does contain residual gas (and is to be treated as a full cylinder) and will therefore come under transport category 1, 2 or 3 as appropriate. ADR (5), Clause 1.1.3.5 states that *"... Classes 2 ... are not subject to the conditions of ADR if adequate measures have been taken to nullify any hazard. ..."* For a cylinder to be categorised as transport category 4, it will have to contain no gas product other than ambient air at atmospheric pressure.

4.2 Points

To determine the quantity of the gas in a cylinder the following rules apply.

Compressed gases	=	Water capacity of cylinder in litres
Liquefied gases	=	Nett mass of gas in kg
Dissolved gases	=	Nett mass of gas in kg

The water capacity is the amount of water the cylinder can carry. The nett mass of the gas is the total mass of the gas contained in the cylinder, this excludes the cylinder and cylinder valve.

Each litre / kg you carry represents a Point. The Point is used in each load calculation.

4.3 The calculation

The calculation you perform will depend on whether you are transporting gases from one category or a combination of categories.

For a load containing one transport category only:

Points per cylinder x Number of cylinders = Total load Points

From Table 2 identify which limit applies to the load you are carrying.

Transport category	Hazard label	Gas	Point limit
1	2.3	Toxic	20
1	2.3	Ammonia and Chlorine	50
2	2.1	Flammable	333
3	2.2	Asphyxiant and Oxidizing	1000
4		Empty cylinders	Unlimited load exemption

Table 2: Point limits

For mixed loads:

For each category of gas carried there is an associated calculation. This calculation must be performed for individual categories of gases; the Points for each category must then be added together. There are five steps:

Step 1. Calculate the total of toxic gas Points (T Points) and multiply by 50.

Ammonia and chlorine have a special concession to be multiplied only by 20.

NOTE: Toxic gases are regarded as the most potentially hazardous gases, so the quantity allowed is only a fiftieth of the amount of asphyxiant / oxidising gases. Therefore in mixed loads the toxic gas quantity is multiplied by 50 before it is added to the other categories.

Points per cylinder x Number of cylinders x 50 = T Points

Step 2. Calculate the total of flammable gas Points (F Points) and multiply by 3.

NOTE: Flammable gases are considered more potentially hazardous than asphyxiant or oxidising gases so you can only carry one third of the amount. Therefore, to calculate for mixed loads, the flammable gas quantity is multiplied by 3 before it is added to the other gases.

Points per cylinder x Number of cylinders x 3 = F Points

Step 3. Calculate the total of asphyxiant / oxidant gas Points (A Points).

Points per cylinder x Number of cylinders = A Points

Step 4. Add the three values together to acquire Points for total load.

T Points + F Points + A Points = Total Points for mixed load.

Step 5. Check whether the total is below or above 1000. If the total Points for a load is below 1000 then carry out the basic legal safety requirements in Section 5. If above 1000 Points, full compliance with ADR (5) is required, refer to Section 6 for more information.

4.4 Example calculation

You are carrying one large propane cylinder (47 kg), one small argon / CO_2 (10 litres) and 2 large oxygen cylinders (50 litres).

Product	Cylinder size	Number of gas cylinders (a)	Points per cylinder (b)	Transport category	Multiplying factor (c)	Total Points (a) x (b) x (c)
Propane	47 kg	1	47	2	3	141
Argon / CO_2	10 litre	1	10	3	1	10
Oxygen	50 litre	2	50	3	1	100
					Total Points for load carried	251

Table 3: Worked example.

The total number of points does not exceed 1000, therefore this load is below the threshold level. Follow the basic legal safety requirements in Section 5.

5. BASIC LEGAL AND SAFETY REQUIREMENTS

If you are below the threshold level, comply with these basic safety requirements.

Training. Drivers should be trained in:

- The potential hazards and dangers of the goods.
- Safe handling of gas cylinders. Refer to section 9.2.
- Emergency procedures, including the use of fire-fighting appliances. Refer to Section 10.

All training should be verified upon commencement of employment. A record should be kept of all training. The training should be periodically supplemented with refresher training to take account of regulation changes.

Vehicles. Gas cylinders should be transported in open vehicles, open containers or trailers. The vehicle should have a gas tight bulkhead separating the driver from the load. Toxic gases shall not be carried in a closed vehicle unless specifically designed for the purpose. If gas cylinders are required to be carried inside a vehicle it shall be well ventilated.

Ventilation. Where gas cylinders are carried inside a vehicle, in the same space as people, the windows should be kept open to allow air to circulate. The vehicle ventilation system should be

set to allow fresh air to enter (rather than to recirculate). The ventilation fan should be turned to high speed. In all spaces, the use of roof ventilators along with side vents will increase the quantity of ventilated air in the vehicle.

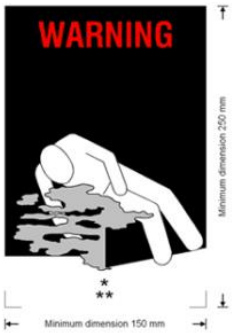
NOTE: Modern vehicle designs tend to have better sealing and are less likely to benefit from natural ventilation through leakage.

If an **unventilated vehicle** is used the cargo door(s) shall be marked with the following notice:

WARNING
NO VENTILATION
OPEN WITH CAUTION

NOTE: The letters are to be a minimum of 25 mm high. The words are to be in an appropriate language.

Dry ice. If carrying dry ice then a warning label is to be displayed at all access points highlighting the danger of asphyxiation. For further information on the carriage of dry ice refer to BCGA TIS 7 (13), *Guidelines for the safe transportation, storage, use and disposal of dry ice products*.



Cylinders are to be secured so that they cannot move during transport. They shall not project beyond the sides or ends of the vehicle. It is recommended that cylinders are transported vertically, secured in an appropriate pallet.

NOTE: Other items in the vehicle should also be secured such that they do not come into contact with gas cylinders during the journey.

Cylinder valves are to be closed whilst in transit. A check should be made to ensure there are no leaks. Where supplied, fit suitable protective valve caps and covers to cylinders before transporting. Cylinders should not be transported with equipment attached to the valve outlet; disconnect regulators, hoses etc.

NOTE: Caps and covers help prevent contaminants, such as moisture and dirt, from gathering in the valve outlet of the cylinder, in addition to providing protection during transport.

Fire extinguisher. A fire extinguisher is required on all vehicles carrying gas cylinders. When below the threshold level a single fire extinguisher with a minimum capacity of 2 kg dry powder is required. The fire extinguisher shall be kept in good working order, be protected against the effects of the weather and be easily accessible to the vehicle crew.

Inspection and test. Gas cylinders are only allowed to be transported if they are in-date for their periodic inspection and test, however they may be transported after the expiry of the time-limit for purposes of performing inspection or disposal, including the intermediate carriage operations. The next test date may be indicated by the use of plastic cylinder test date rings fitted between the valve and the cylinder. For examples refer to Appendix 2.

Smoking. Do not smoke inside vehicles carrying gas cylinders.

Cleanliness. The areas within a vehicle where gas cylinders are stowed are to be clean. Do not allow gas cylinders to come into contact with hydrocarbons, such as fuel, oil and grease, or any other chemicals which could adversely affect a gas cylinder.

Temperature. Keep cylinders cool (at ambient temperatures). Do not stow gas cylinders in areas where they will be affected by sources of excessive heat.

Product identification labels are attached to all cylinders. These identify the contents and provide safety advice. The labels are produced in accordance with current legislation, and you must never remove or deface these labels.

NOTE: The LPG industry routinely paint this information directly on to the external wall of LPG cylinders.

Damage or corrosion to gas cylinders that might impair their safety, or cylinders involved in a fire, shall not be transported. Seek advice from your gas supplier to determine a safe way of returning these cylinders.

Documentation. Drivers do not need to carry documents detailing the load they carry, but in the event of an accident it would help the emergency services if you can provide appropriate information on the products being carried. It is useful for the driver to have the gas suppliers contact information. This will allow the driver to contact the gas supplier and seek advice in the event of an incident. Refer to Section 10.

NOTE: The product Safety Data Sheet will have all this information.

Vehicle hazard labels. If carrying dangerous goods below the threshold level it is not necessary to mark and label your vehicle, but the use of hazard labels can assist the emergency services and they may be displayed. However, all hazard labels have to be removed if you are not carrying dangerous goods.

Acetylene cylinders. EIGA Safety Leaflet 4 (10), *The safe transport, use and storage of acetylene cylinders*, provides additional advice on the transport of acetylene cylinders.

If a leak is suspected. The driver should have an understanding of the basic procedures to follow to make the vehicle safe and prevent the incident deteriorating. Park the vehicle in a safe place and carry out the actions in Section 10.1.

If you are involved in an incident. As soon as practical advise the emergency services about the incident and inform them that you are carrying dangerous goods. Refer to Section 10.

When the journey is complete the gas cylinders should be immediately unloaded from the vehicle. Do not leave cylinders inside the boot or in an unventilated space.

NOTE: If cylinders are left in a closed vehicle ensure the vehicle is thoroughly ventilated before entering.

6. LOADS ABOVE THE THRESHOLD LEVEL

If your load is above the Quantity Threshold full compliance with ADR (5) is required.

EIGA Document 52 (8), *Load securing of Class 2 receptacles*, provides information concerning the necessary requirements for transporting individual gas cylinders, bundles, pallets of gas cylinders and cryogenic receptacles.

BCGA CP 29 (11), *The design and operation of cylinder and tube trailers (battery vehicles) and multiple-element gas containers for the safe transport of compressed gases by road*, provides additional practical guidance on the carriage of compressed gases.

As well as the requirements of Section 5 there are six main points you should consider:

6.1 Information

At the start of the journey the driver shall have in his possession:

- A transport document, with specific information on each dangerous substance being carried, as prescribed in ADR (5), Clause 5.4.1. To be kept for at least 3 months after the journey.

- Instructions in Writing as specified in ADR (5), Clause 5.4.3. Refer to Appendix 1.

- A means of photo identification. In the UK this may be a current ADR licence or an ADR driver training photo card. This combines the requirement to provide the drivers training certificate.

A certificate of approval for the vehicle carrying the dangerous goods may be required. ADR (5), Clause 9.1.3.

The gas supplier will provide you with all the necessary information for their products. It is useful for the driver to have the gas suppliers' contact information. This will allow the driver to contact the gas supplier and seek advice in the event of an incident. Refer to Section 10.

6.2 Vehicle marking

The vehicle shall have the necessary marking and placarding, refer to ADR (5), Clause 5.3. The driver must ensure that an orange plate is displayed at the front and rear of the vehicle. The plates must always be removed or covered up if the vehicle is not carrying any dangerous goods.

6.3 Equipment

A range of additional equipment shall be carried on the vehicle. This will include any emergency equipment specified in the Instructions in Writing, taking note of the exemptions allowed in the footnotes. Refer to Appendix 1.

Fire-fighting equipment
All vehicles shall carry fire extinguishers:

- Vehicles up to and including 3.5 tonnes gross vehicle weight. The vehicle must have a minimum of two dry powder fire extinguishers with a minimum total capacity of 4 kg, this includes the 2 kg extinguisher detailed in Section 5.

- Vehicles between 3.5 and 7.5 tonnes gross vehicle weight. The vehicle must have a minimum of two dry powder fire extinguishers with a minimum total capacity of 8 kg, of which at least one shall have a minimum capacity of 6 kg.

- Vehicles above 7.5 tonnes gross vehicle weight. The vehicle must have a minimum of two dry powder fire extinguishers with a minimum total capacity of 12 kg, of which at least one shall have a minimum capacity of 6 kg.

At least one wheel chock of a size suited to the weight of the vehicle and to the diameter of the wheels.

Two self-standing warning signs.

Portable lighting apparatus for each member of the crew, which shall not exhibit any metal surface liable to produce sparks.

Personal Protective Equipment, for each member of the vehicle crew, including a warning vest, a pair of protective gloves and eye protection. If transporting Class 2.3 gases, an emergency escape mask. Refer to Section 9.1.

6.4 Training

All drivers of vehicles carrying dangerous goods must have completed an approved training course, passed an approved examination and been issued an ADR Training Certificate.

6.5 Dangerous goods safety adviser

Your employer (or you if self-employed) must appoint a specially qualified Dangerous Goods Safety Adviser (DGSA) to advise, check and report on the enterprise's compliance with ADR (5).

6.6 Other duties

- No unauthorised passengers are allowed to be carried on vehicles transporting dangerous goods.

- Smoking is prohibited inside the vehicle and in the vicinity during loading and un-loading.

- The engine is to be shut-off during loading and un-loading, unless it is necessary for the actual process.

7. ROADSIDE INSPECTIONS

The police and the Driver and Vehicle Standards Agency (DVSA) routinely carry out roadside inspections on vehicles, their cargo and crew. Working with guidance from the Department of Transport (DfT) and the HSE they will be looking for breaches of legislation. If identified offenders may be prosecuted. Typically they will be ensuring that the ADR (5) regulations have been applied, the load quantity is appropriate, the products are correctly identified, there are no leaks and that the load is secure. They will also satisfy themselves that the driver has received appropriate training, understands the hazards and knows what to do in an emergency.

8. OTHER REGULATIONS ASSOCIATED WITH GAS FUELLED VEHICLES

There is a requirement within European Directives for the type-approval of hydrogen-powered motor vehicles. These require the use of mandatory labels to be displayed on the vehicle.
The label is diamond shaped, green in colour with a white border, and the text "H2 Gas" or "LIQUID H2" displayed. The labels are 40 x 40 mm or 125 x 125 mm dependant on location.

NOTE: There is no similar regulatory requirement for vehicles powered by LPG.

9. PERSONAL SAFETY

9.1 Personal protective equipment

Personal Protective Equipment (PPE) is to be provided as required by the Personal Protective Equipment at Work Regulations (2). PPE may only be considered as a control to achieve an acceptable level of residual risk after other levels of control have been addressed. The risk assessment will determine the requirement for the use of PPE. Where PPE is required a PPE Assessment is to be carried out. Due regard is to be given to the requirements of the Control of Substances Hazardous to Health (COSHH) Regulations (3), any relevant equipment publications, manufacturers information and the product Safety Data Sheet. The PPE selected is for a particular task and location and must be appropriate and chosen to reduce the overall risk effectively. Thus there are different PPE requirements for differing products and different tasks.

There are specific requirements for PPE detailed in the Instructions in Writing as specified in ADR (5), Clause 5.4.3. Refer to Appendix 1.

9.2 Cylinder handling

The Manual Handling Operations Regulations (1) require first that an assessment of manual handling operations is conducted. Following the assessments, training should take place. Where the assessment indicates that the work exceeds guideline limits, wherever practicable the operation should be mechanised or handling aids provided. BCGA Guidance Note 3 (12) *Safe cylinder handling and the application of the manual handling operations regulations to gas cylinders*, defines the principles of safe practice for handling and moving cylinders and provides a basic understanding of the Manual Handling Operations Regulations (1) relating to gas cylinders. BCGA Technical Information Sheet 17 (15),

Model risk assessment for manual handling activities in the industrial gas industry, can be used to assist in developing an appropriate risk assessment.

10. ACTIONS IN THE EVENT OF AN INCIDENT

10.1 Suspected cylinder leak

If you suspect that there is a leak from your cylinder, take the following immediate actions:

- If driving, stop and park the vehicle as soon as practical in a safe place, away from naked flames and flammable substances. Turn off the ignition.
- Do not smoke or allow anybody to smoke in the vicinity of the vehicle.
- Check the cylinder valve. If it is open, close the cylinder valve immediately (if safe to do so).
- Increase the ventilation in the vehicle. Open all doors, windows, luggage areas etc.
- If you have a leak of liquefied gas, do not touch the liquid as it will give you cold burns.
- If the cylinder continues to leak, and it is safe to do so, remove the leaking cylinder from the vehicle and place in a safe, well-ventilated area. Consider notifying the emergency services.
- Ensure that the vehicle has been adequately ventilated before continuing with the journey.
- If you cannot stop the leak, do not return a leaking cylinder into the vehicle.

If additional help is required, contact your gas supplier for advice, for this to be practicable the driver must be in possession of the gas supplier's contact phone number.

NOTE: If using mobile phones stay clear of the vehicle and/ or a leaking cylinder.

10.2 Vehicle incident

In the event of an incident requiring you to contact the emergency services, the attending personnel should be advised that the vehicle is carrying dangerous goods. They will want to know:

- What products you are carrying.
- How many cylinders you are carrying and their size.
- Their position within the vehicle.

The emergency services will ask for any appropriate documentation and are likely to ask for the gas suppliers contact details. This they may use for specialist advice on the gas cylinders and/or to help with the recovery of cylinders which may have been damaged,

10.3 Key actions for dealing with cylinders in the event of fire

- KEEP AWAY, do NOT approach or attempt to move the cylinder or open the valve.
- Raise the alarm.
- Evacuate the area if possible and safe to do so.
- Contact the Fire and Rescue Service.

If gas cylinders are directly involved in a fire, keep well clear until the Fire and Rescue Service arrive and then follow their instructions.

Inform the Fire and Rescue Service immediately of:

- What products you are carrying.
- How many cylinders you are carrying and their size.
- Their position within the vehicle.

Do not approach the vehicle or cylinders until the fire is out and the area has been declared safe by the Fire and Rescue Service.

Do not use any fire-damaged cylinders. Quarantine any fire-damaged cylinders in a safe place. Mark or label fire-damaged cylinders to clearly show that they have been in a fire. Inform your gas supplier whenever a cylinder is involved in a fire. The gas supplier will arrange collection of fire-damaged cylinders at a convenient date.

Contact numbers for the gas supplier are available on the product Safety Data Sheet. Refer also to BCGA Leaflet 6 (17), *Cylinders in fire.*

11. REFERENCES

	Document Number	Title
1.	SI 2002 No. 2793	The Manual Handling Operations Regulations 1992.
2.	SI 2002 No. 1144	The Personal Protective Equipment Regulations 2002.
3.	SI 2002 No. 2677	The Control of Substances Hazardous to Health Regulations 2002 (COSHH).
4.	SI 2009 No. 1348	The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 (as amended).
5.	ECE/TRANS/215	European Agreement concerning the international carriage of dangerous goods by road (ADR).
6.	IMO 1H200E	International Maritime Organization. International Maritime Dangerous Goods (IMDG) Code.
7.	IATA 9869	International Air Transport Association (IATA). Dangerous Goods Regulations.
8.	EIGA IGC Document 52	Load securing of Class 2 receptacles.
9.	EIGA Safety Leaflet 3	Safe transport of gas.
10.	EIGA Safety Leaflet 4	The safe transport, use and storage of acetylene cylinders.
11.	BCGA Code of Practice 29	The design and operation of cylinder and tube trailers (battery vehicles) and multiple-element gas containers for the safe transport of compressed gases by road.
12.	BCGA Guidance Note 3	Safe cylinder handling and the application of the manual handling operations regulations.
13.	BCGA Technical Information Sheet 7	Guidelines for the safe transportation, storage, use and disposal of dry ice products.
14.	BCGA Technical Information Sheet 8	Information for customers collecting gas cylinders (flammable, inert and oxidising gases).
15.	BCGA Technical Information Sheet 17	Model risk assessment for manual handling activities in the industrial gas industry.
16.	BCGA Technical Information Sheet 26	Model risk assessment for the transport of gas cylinders

Document Number		Title
17.	BCGA Leaflet 6	Cylinders in fire.
18.	BCGA Leaflet 1	The carriage of small quantities of gas cylinders on vehicles.
19.	BCGA Leaflet 13	Medical oxygen in a vehicle.
20.	UKLPG Code of Practice 27	Carriage of LPG cylinders by road.

Further information can be obtained from:

Health and Safety Executive	www.hse.gov.uk
UK Legislation	www.legislation.gov.uk
Department for Transport (DfT)	www.gov.uk/government/policies/providing-effective-regulation-of-freight-transport/supporting-pages/safe-carriage-of-dangerous-goods
United Nations Economic Commision for Europe (Home page for ADR)	www.unece.org/trans/danger/publi/adr/adr_e.html
British Standards Institute (BSI)	www.bsigroup.co.uk
European Industrial Gases Association (EIGA)	www.eiga.eu
British Compressed Gases Association (BCGA)	www.bcga.co.uk
The UK LPG trade association (UKLPG)	www.uklpg.org

INSTRUCTIONS IN WRITING

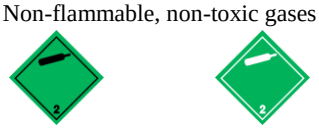
Required for all loads above the threshold quantity. All 4 pages of Appendix 1 are required. This appendix is copied from ADR (5), Chapter 5.4.3.

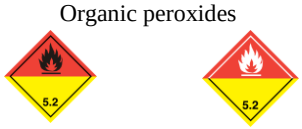
INSTRUCTIONS IN WRITING ACCORDING TO ADR

Actions in the event of an accident or emergency

In the event of an accident or emergency that may occur or arise during carriage, the members of the vehicle crew shall take the following actions where safe and practicable to do so:

- Apply the braking system, stop the engine and isolate the battery by activating the master switch where available;
- Avoid sources of ignition, in particular, do not smoke, use electronic cigarettes or similar devices or switch on any electrical equipment;
- Inform the appropriate emergency services, giving as much information about the incident or accident and substances involved as possible;
- Put on the warning vest and place the self-standing warning signs as appropriate;
- Keep the transport documents readily available for responders on arrival;
- Do not walk into or touch spilled substances and avoid inhalation of fumes, smoke, dusts and vapours by staying up wind;
- Where appropriate and safe to do so, use the fire extinguishers to put out small/initial fires in tyres, brakes and engine compartments;
- Fires in load compartments shall not be tackled by members of the vehicle crew;
- Where appropriate and safe to do so, use on-board equipment to prevent leakages into the aquatic environment or the sewage system and to contain spillages;
- Move away from the vicinity of the accident or emergency, advise other persons to move away and follow the advice of the emergency services;
- Remove any contaminated clothing and used contaminated protective equipment and dispose of it safely.

Additional guidance to members of the vehicle crew on the hazard characteristics of dangerous goods by class and on actions subject to prevailing circumstances		
Danger labels and placards	**Hazard characteristics**	**Additional guidance**
(1)	**(2)**	**(3)**
Explosive substances and articles  1 1. 5 1.6	May have a range of properties and effects such as mass detonation; projection of fragments; intense fire/heat flux; formation of bright light, loud noise or smoke. Sensitive to shocks and/or impacts and/or heat.	Take cover but stay away from windows.
Explosive substances and articles  1.4	Slight risk of explosion and fire.	Take cover.
Flammable gases  2.1	Risk of fire. Risk of explosion. May be under pressure. Risk of asphyxiation. May cause burns and/or frostbite. Containments may explode when heated.	Take cover. Keep out of low areas.
Non-flammable, non-toxic gases  2.2	Risk of asphyxiation. May be under pressure. May cause frostbite. Containments may explode when heated.	Take cover. Keep out of low areas.
Toxic gases  2.3	Risk of intoxication. May be under pressure. May cause burns and/or frostbite. Containments may explode when heated.	Use emergency escape mask. Take cover. Keep out of low areas.
Flammable liquids  3	Risk of fire. Risk of explosion. Containments may explode when heated.	Take cover. Keep out of low areas.
Flammable solids, self-reactive substances and solid desensitized explosives  4.1	Risk of fire. Flammable or combustible, may be ignited by heat, sparks or flames. May contain self-reactive substances that are liable to exothermic decomposition in the case of heat supply, contact with other substances (such as acids, heavy-metal compounds or amines), friction or shock. This may result in the evolution of harmful and flammable gases or vapours or self-ignition. Containments may explode when heated. Risk of explosion of desensitized explosives after loss of desensitizer.	
Substances liable to spontaneous combustion  4.2	Risk of fire by spontaneous combustion if packages are damaged or contents are spilled. May react vigorously with water	
Substances which, in contact with water, emit flammable gases  4.3	Risk of fire and explosion in contact with water.	Spilled substances should be kept dry by covering the spillages.

Danger labels and placards	Hazard characteristics	Additional guidance
(1)	(2)	(3)
Oxidizing substances  5.1	Risk of vigorous reaction, ignition and explosion in contact with combustible or flammable substances.	Avoid mixing with flammable or combustible substances (e.g. sawdust).
Organic peroxides  5.2	Risk of exothermic decomposition at elevated temperatures, contact with other substances (such as acids, heavy-metal compounds or amines), friction or shock. This may result in the evolution of harmful and flammable gases or vapours or self-ignition.	Avoid mixing with flammable or combustible substances (e.g. sawdust).
Toxic substances  6.1	Risk of intoxication by inhalation, skin contact or ingestion. Risk to the aquatic environment or the sewage system.	Use emergency escape mask.
Infectious substances  6.2	Risk of infection. May cause serious disease in humans or animals. Risk to the aquatic environment or the sewage system.	
Radioactive material  7A  7B  7C  7D	Risk of intake and external radiation.	Limit time of exposure.
Fissile material  7E	Risk of nuclear chain reaction.	
Corrosive substances  8	Risk of burns by corrosion. May react vigorously with each other, with water and with other substances. Spilled substance may evolve corrosive vapours. Risk to the aquatic environment or the sewage system.	
Miscellaneous dangerous substances and articles  9	Risk of burns. Risk of fire. Risk of explosion. Risk to the aquatic environment or the sewage system.	

NOTE 1: *For dangerous goods with multiple risks and for mixed loads, each applicable entry shall be observed.*

NOTE 2: *Additional guidance shown above may be adapted to reflect the classes of dangerous goods to be carried and their means of transport.*

Additional guidance to members of the vehicle crew on the hazard characteristics of dangerous goods, indicated by marks, and on actions subject to prevailing circumstances		
Mark	**Hazard characteristics**	**Additional guidance**
(1)	**(2)**	**(3)**
 Environmentally hazardous substances	Risk to the aquatic environment or the sewage system.	
 Elevated temperature substances	Risk of burns by heat.	Avoid contact with hot parts of the transport unit and the spilled substance.

<u>Equipment for personal and general protection</u>
<u>to carry out general actions and hazard specific emergency actions</u>
<u>to be carried on board the vehicle in accordance with section 8.1.5 of ADR</u>

The following equipment shall be carried on board the transport unit:

- for each vehicle, a wheel chock of a size suited to the maximum mass of the vehicle and to the diameter of the wheel;
- two self-standing warning signs;
- eye rinsing liquid [a]; and

for each member of the vehicle crew

- a warning vest;
- portable lighting apparatus;
- a pair of protective gloves; and
- eye protection.

Additional equipment required for certain classes:

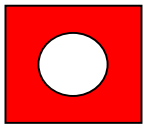
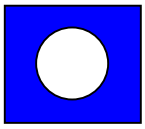
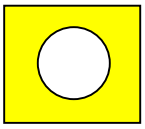
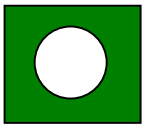
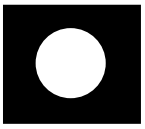
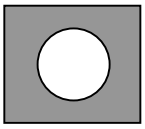
- an emergency escape mask for each member of the vehicle crew shall be carried on board the vehicle for danger label numbers 2.3 or 6.1;
- a shovel [b];
- a drain seal [b];
- a collecting container [b].

[a] *Not required for danger label numbers 1, 1.4, 1.5, 1.6, 2.1, 2.2 and 2.3.*
[b] *Only required for solids and liquids with danger label numbers 3, 4.1, 4.3, 8 or 9.*

A GUIDE TO GAS CYLINDER TEST DATE RINGS

It is mandatory for every cylinder to have an initial inspection and test to ensure its serviceability before use, this is followed by regular periodic inspection and tests to ensure its continued serviceability whilst in service. The date that these inspection and tests are carried out is stamp-marked on the cylinder.

Following an inspection and test each cylinder is allocated a life before its next periodic inspection and test. Cylinder test date rings are not mandatory, but where used they provide a quick, visual reference that shows when a cylinder is due for its next periodic inspection and test. They consist of a plastic disc, fitted between the cylinder and the valve, colour coded and shaped to indicate the year when the next periodic inspection and test is due. This ring may also give an indication of the month. Some companies use two separate plastic rings to indicate the month and year.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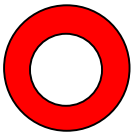	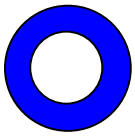		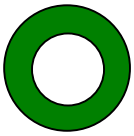	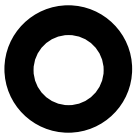	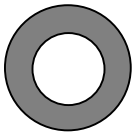
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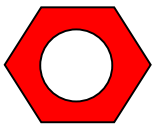	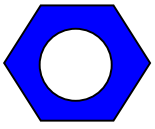	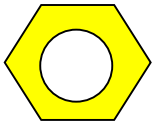	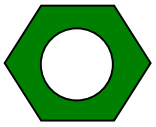		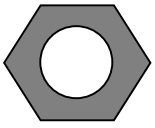
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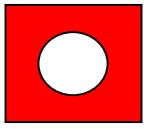	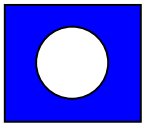	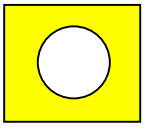	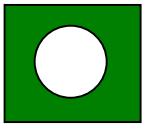	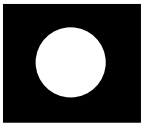	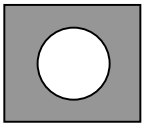
2025	**2026**	**2027**	**2028**	**2029**	**2030**

Only complete cylinder rings are allowed to be used.

The sequence of colour and shape of the annual cylinder test date rings is repeated on an 18-year cycle, hence 2025 is a repeat of 2007.

British Compressed Gases Association

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