

SCHEDULE 12

Article 56

VEHICLES PROPELLED BY COMPRESSED NATURAL GAS SYSTEMS

Defined terms

1. In this Schedule—

“an accredited testing laboratory” means a testing laboratory which has been accredited by the United Kingdom Accreditation Service or by an equivalent body in another EEA State under European Standard EN 45001 : 1989 for general criteria for the operation of testing laboratories (British Standard BS 7501 : 1989);

“articulating connector” means a connector bridging the space between two separate and rigid vehicle structures;

“bar” means bar gauge;

“BS 5430 : Part I : 1990” means—

(a) Part I of the British Standard for the periodic inspection, testing and maintenance of transportable gas containers (excluding dissolved acetylene gas containers), published by the British Standards Institution under the reference BS 5430 : Part I : 1990; or

(b) any equivalent standard published by a recognised testing body in another EEA State; and, in a case falling within paragraph (b), a reference in this Schedule to any particular provision of the British Standard is to be taken as a reference to the equivalent provision of any such EEA equivalent standard;

“compressed natural gas” means natural gas stored at a pressure above 30 bar;

“design pressure” means the pressure that a part of a gas propulsion system has been designed to withstand;

“gas container” means a container for gas falling within paragraph 2(1);

“g” means gravity;

“high pressure” means a pressure exceeding 7 bar;

“large bus” means a vehicle constructed or adapted to carry more than 16 seated passengers in addition to the driver;

“low pressure” means a pressure not exceeding 75 millibars;

“medium pressure” means a pressure not exceeding 7 bar but exceeding 75 millibars;

“millibars” means millibars gauge;

“mm” means millimetres;

“mm²” means square millimetres;

“N” means newtons;

“°C” means degrees Celsius;

“pipeline” means any pipe or passage connecting any two parts of a gas propulsion system;

“pressure relief device” means a device to protect a gas container against over-pressure; and

“regulator” means a device that automatically reduces and controls the pressure of the gas flowing through it.

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Commencement Information

I1 Sch. 12 para. 1 in force at 25.8.2003, see [art. 1\(2\)](#)

Gas containers

2.—(1) This paragraph applies to any container for gas which is fitted to a motor vehicle or a trailer and which is intended for the storage of natural gas for the purpose of the propulsion of the vehicle or of the towing vehicle, as the case may be.

(2) Before its first use on a vehicle, every gas container must be pressure tested by an accredited testing laboratory at a pressure of 1.5 times the working pressure of the gas container.

(3) The pressure test must be carried out in accordance with the procedure set out in paragraph 4.7 of BS 5430 : Part I : 1990 or, where an equivalent procedure has been specified by the manufacturer, in accordance with that procedure.

Commencement Information

I2 Sch. 12 para. 2 in force at 25.8.2003, see [art. 1\(2\)](#)

3.—(1) The owner of any vehicle (or, if it is in the possession of a different person, that person) must ensure that any gas container used on that vehicle is subject to a periodic test by an accredited testing laboratory every three years, or with such greater frequency as the manufacturer specifies.

(2) The periodic test must include—

- (a) the pressure test specified in paragraph 2, and
- (b) an internal and external visual inspection carried out in accordance with paragraph 4.4.2 and 4.4.3 of BS 5430 : Part I : 1990 or, where an equivalent procedure has been specified by the manufacturer, in accordance with that procedure.

(3) Nothing in sub-paragraph (1) affects the obligation imposed by regulation 100 of the Construction and Use Regulations.

Commencement Information

I3 Sch. 12 para. 3 in force at 25.8.2003, see [art. 1\(2\)](#)

4.—(1) A gas container must—

- (a) be suitable to be fitted to the vehicle to which it is fitted and be constructed from suitable materials;
- (b) be capable of containing natural gas operating at a working pressure of 200 bar settled at 15°C with a maximum filling pressure of 260 bar;
- (c) be free from any visible damage or defect and not have been the subject of any alteration or repair subsequent to its manufacture;
- (d) be fitted with a manually operable isolation valve and a pressure relief device (but may in addition be fitted with an electrically operable isolation valve);
- (e) be used for no more than 30 years from the date of manufacture; and

- (f) be marked as follows in characters which, unless otherwise stated, are not less than 6mm high—
 - (i) “CNG ONLY” in letters at least 25mm high;
 - (ii) the date of manufacture;
 - (iii) “DO NOT USE AFTER ” in characters at least 25mm high, and specifying the month and year of expiry;
 - (iv) the design pressure at a temperature of 15°C;
 - (v) the month and year of the original pressure test carried out in accordance with paragraph 2, together with the identity of the testing station;
 - (vi) the month and year of any subsequent periodic pressure test carried out in accordance with paragraph 3, together with the identity of the testing station; and
 - (vii) the design life of the gas container if less than 30 years.
- (2) Where a gas container contains a mark from a previous pressure test carried out in accordance with paragraph 2 or 3, any additional test mark required by sub-paragraph (1)(f) must be placed adjacent to the previous test mark.
- (3) Any gas container crumple zone must be so mounted that—
 - (a) the effectiveness of any vehicle crumple zone is not impaired;
 - (b) it is securely attached to the vehicle by suitable mountings that will protect the gas container from displacement or damage due to vibration or other cause;
 - (c) the gas container and its mountings do not weaken the vehicle’s structure or affect the vehicle’s stability;
 - (d) it is placed in such a position that the risk of impact damage to the gas container and its isolation valve is, as far as is practicable, reduced and it is placed or shielded so that the effects of any impact are, as far as is practicable, reduced;
 - (e) it is placed in such a position or so shielded that the risk of damage from flying debris is minimised;
 - (f) it is placed in such a position or so insulated or shielded that the effects of any source of heat are minimised;
 - (g) it is suitably protected from external corrosion and abrasion; and
 - (h) except as stated in sub-paragraph (4), any leaking or vented gas will be directed safely to the atmosphere preventing, as far as is practicable, the possibility of its entering the engine, passenger, driver or living compartments.
- (4) Where a gas container is to be located in the driver, passenger or living compartment or in the vehicle boot, or in any space which is not so ventilated as to prevent the accumulation of gas, the valves, connections and pipework must be enclosed in order to contain any gas leakage, either by—
 - (a) placing the gas container and its fittings within a durable enclosure which is sealed so that it is gas tight to the compartment, vehicle boot or space, as the case may be, and which is provided with permanent direct ventilation to the outside of the vehicle; or
 - (b) enclosing the neck and fittings of the gas container within a durable envelope which is gas tight to the compartment, vehicle boot or space, as the case may be, and which is provided with permanent direct ventilation to the outside of the vehicle.
- (5) Any enclosure or envelope required for the purposes of sub-paragraph (4) must not contain any source of ignition.
- (6) Any ventilation opening required under sub-paragraph (4) must—
 - (a) have a free area of not less than 600mm²; and

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- (b) be terminated away from any openings into any vehicle compartment. away from any source of ignition and in a position where it is not liable to blockage.
- (7) Any pressure relief device contained within any enclosure must have a separate, dedicated vent line which may pass within the enclosure vent.
- (8) In relation to every gas container, there must be provided (either on the gas container itself or in documents which are readily available) information concerning—
 - (a) any particular installation requirements;
 - (b) details of any pressure relief devices fitted or required to be fitted to the gas container;
 - (c) recommended inspection intervals (which must not be more than 3 years); and
 - (d) any recommended inspection procedure.

Commencement Information

I4 Sch. 12 para. 4 in force at 25.8.2003, see [art. 1\(2\)](#)

Gas container isolation

- 5.—**(1) Any gas container must be capable of being isolated from its supply pipework by means of an isolation valve connected directly to each gas container but not between the gas container and its pressure relief device.
- (2) Any isolation valve must be capable of shutting off all the gas flow from the gas container, except through the pressure relief device.
 - (3) Any isolation valve must be marked clearly and permanently with the direction of operation.
 - (4) Any isolation valve must be so protected as to ensure that its operation is unaffected by the collection of moisture and other foreign matter.
 - (5) Any gas container valve assembly must be so placed as, so far as is practicable, to be protected from damage.
 - (6) In this paragraph “isolation valve” means a manually operable isolation valve.

Commencement Information

I5 Sch. 12 para. 5 in force at 25.8.2003, see [art. 1\(2\)](#)

Pressure relief devices

- 6.—**(1) Every gas container must be provided with a suitable pressure relief device that complies with sub-paragraphs (3) to (7).
- (2) Where a pressure regulator is fitted to a gas container, any pressure relief device attached to it must comply with sub-paragraphs (3) to (7).
 - (3) Any pressure relief device must be such that—
 - (a) there is an adequate discharge rate to ensure the safety of the system;
 - (b) any cooling effect of the gas during discharge will not affect the discharge rate;
 - (c) its relieving characteristics will not be impaired on exposure to fire;
 - (d) operation of the device will not inhibit the discharge rate from the device;

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- (e) its outlet size is not less than the size of inlet or outlet pipework of the gas container;
 - (f) it cannot be installed in the reverse flow direction;
 - (g) it is so protected as to ensure that its operation is unaffected by the collection of moisture and other foreign matter;
 - (h) if the device is adjustable, unauthorised interference with its settings is prevented; and
 - (i) it is marked clearly with the set pressure or temperature and with the flow direction.
- (4) Any pressure relief device must be placed so that—
- (a) as far as is practicable, the device and its outlets are protected from damage and blockage in the event of an accident;
 - (b) its discharge rate is not inhibited if an associated gas container is located within an enclosure; and
 - (c) it is away from any source of heat which could impair the designed operation of the device.
- (5) The discharge from a pressure relief device must terminate outside the vehicle and be directed or deflected away from any opening into the engine, driver, passenger or living compartment, vehicle boot, or any space which is not so ventilated as to prevent the accumulation of gas.
- (6) The discharge from a pressure relief device must not terminate near any source of heat or other potential source of ignition.
- (7) A pressure release device on any gas container or regulator located within the driver, passenger or living compartment, vehicle boot, or in any space which is not so ventilated as to prevent the accumulation of gas must have its discharge vented separately and directly to the outside of the vehicle.

Commencement Information

I6 Sch. 12 para. 6 in force at 25.8.2003, see [art. 1\(2\)](#)

Pipelines

- 7.—(1) Every pipeline must be fixed in such a manner and position that—
- (a) it will not be adversely affected by the heat of the exhaust system of any engine or by any other source of heat;
 - (b) it is protected from vibration and strain in excess of that which it can reasonably be expected to withstand;
 - (c) it is so placed or shielded as to minimise the risk from flying debris; and
 - (d) in the case of a medium or high pressure pipeline it is, so far as is practicable, accessible for inspection.
- (2) Except as stated in sub-paragraph (4), every medium or high pressure pipeline must be—
- (a) a rigid line of seamless steel of high pressure hydraulic grade, suitable for service on road vehicles and designed for the full range of operating temperatures, pressures and loading which may occur; and
 - (b) effectively protected against, or shielded from, or treated so as to be resistant to, external corrosion throughout its length unless it is made from material which is corrosion resistant under the conditions which it is likely to encounter in service.
- (3) No unsupported length of any medium or high pressure pipeline may exceed 600mm.
- (4) Flexible hose may be used in a medium or high pressure pipeline if—

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- (a) it is reinforced either by stainless steel wire braid or by textile braid; and
- (b) except in the case of a pipeline attached to a gas container for the purpose of filling that gas container, the flexibility which it provides is necessary for the construction or operation of the gas propulsion system of which it forms a part.

Commencement Information

I7 Sch. 12 para. 7 in force at 25.8.2003, see [art. 1\(2\)](#)

Unions and joints

8.—(1) Every union and joint on a pipeline or gas container must be constructed and fitted so that it will—

- (a) not be liable to work loose or leak when in use; and
- (b) be readily accessible for inspection and maintenance.

(2) Every union on a medium or high pressure pipeline or on a gas container must be made of suitable metal; but such a union may contain non-metal washers and seals provided that such washers and seals are supported and constrained by metal components.

Commencement Information

I8 Sch. 12 para. 8 in force at 25.8.2003, see [art. 1\(2\)](#)

Filling connectors

9.—(1) Any filling connector for the refuelling of the vehicle must be of a type which is used exclusively for natural gas filling and which is compatible with the filling nozzle without the use of an adapter fitting.

(2) Gas must be prevented from flowing back from the gas container to the filling connector.

(3) Any filling connector must be covered with a dust cap, which is secured permanently to the vehicle.

(4) Where a filling connector is placed on the outside of the vehicle, it must be protected against unauthorised interference.

(5) The filling connector must be located outside the driver or passenger compartment in a suitably protected, well-ventilated and readily accessible position, away from any openings in the driver, passenger or living compartment.

Commencement Information

I9 Sch. 12 para. 9 in force at 25.8.2003, see [art. 1\(2\)](#)

Valves, safety devices and control equipment

10.—(1) Every gas propulsion system must be so designed and constructed that—

- (a) the supply of gas to the engine is stopped by an automatic valve when—

- (i) the engine is not running at all;
 - (ii) the engine is not running on the supply of gas; or
 - (iii) the engine ignition is off;
- (b) where the valve mentioned in paragraph (a) is not integral with the regulator, it must be positioned upstream of the regulator so as to be able to isolate the gas container and filling point; and
- (c) in the event of a rapid deceleration of the vehicle in an accident or similar occurrence, the supply of gas to the engine is automatically stopped at a point as close as is possible to the gas container and may only be restored manually.
- (2) Where the engine or vehicle is constructed or adapted to run on one or more fuels as an alternative to gas or in addition to gas, the safety of the engine or the gas fuel system must not be impaired by the presence of any other fuel system.
- (3) Except as stated in sub-paragraph (4), every gas container must (in addition to the isolation valve required under paragraph 5 and the pressure relief device required under paragraph 6) be fitted with an automatically-operated valve to prevent gas escaping from the gas container in the event of a fracture or failure of the pipeline or of any component in the gas supply system.
- (4) In the case of a group of gas containers interconnected in such a manner that the pipework is protected in the event of an accident, the group of gas containers may be fitted with a single automatically-operated valve or device to prevent gas escaping from the group of gas containers in the event of a fracture or failure of the pipeline or of any component in the gas supply system.
- (5) Any electrically operated valve must be constructed so as to open when electrical power is applied and close when electrical power is removed.
- (6) Where the vehicle is equipped to operate at any one time on one only of two or more alternative fuels, a fuel selection system that complies with sub-paragraph (7) must be installed.
- (7) A fuel selection system complies with this sub-paragraph if—
- (a) it has a control switch that is readily accessible to the driver at all times and is clearly marked for the selection of each fuel;
 - (b) it has a change-over system, operated by the control switch mentioned in paragraph (a), which prevents the use at the same time of more than one of the alternative fuels, apart from where fuel remains in the common system during a change-over between alternatives; and
 - (c) it does not impair the safety of the engine or the fuel system.
- (8) All the parts of every valve or cock which are in contact with gas must be made of suitable metal; but they may contain non-metal washers and seals if those washers and seals are supported and constrained by metal components.

Commencement Information

I10 Sch. 12 para. 10 in force at 25.8.2003, see [art. 1\(2\)](#)

Regulators

- 11.**—(1) Any regulator fitted must be designed so that—
- (a) it has a pre-set pressure and flow rating suitable for the part of the system to which it is attached;
 - (b) it incorporates a means of protecting the system downstream of the regulator from the upstream pressure in the event of failure of or leakage from the regulator;

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- (c) it is marked clearly and permanently with the fuel type, pressure and flow direction; and
 - (d) if the engine cooling system is utilised within the regulator, passage of gas into the engine cooling system is prevented.
- (2) Any pressure relief device on a regulator must comply with the requirements of paragraph 6(3) to (7).
- (3) Any regulator must be so installed that—
- (a) it is in an accessible position for inspection and maintenance;
 - (b) it is in a position where it is protected from heat sources;
 - (c) it is in a position where, as far as is practicable, any ventilation holes are prevented from being blocked; and
 - (d) it is securely attached to a secure mounting.
- (4) Where a regulator is to be located in the driver, passenger or living compartment, or in the vehicle boot or in any other space which is not so ventilated as to prevent the accumulation of gas, it must be enclosed in order to contain any gas leakage, either by—
- (a) placing the gas container and its fittings within a durable enclosure which is—
 - (i) sealed so that it is gas tight to the compartment, vehicle boot or space, as the case may be; and
 - (ii) provided with permanent direct ventilation to the outside of the vehicle; or
 - (b) enclosing the neck and fittings of the gas container within a durable envelope which is—
 - (i) gas tight to the compartment, vehicle boot or space, as the case may be; and
 - (ii) provided with direct permanent ventilation to the outside of the vehicle.
- (5) A regulator may not be attached directly to the engine or to any part ancillary to the engine.

Commencement Information

I11 Sch. 12 para. 11 in force at 25.8.2003, see [art. 1\(2\)](#)

Special requirements for buses

- 12.** In the case of a large bus there must be fitted as near as practicable to the gas container a valve that stops the flow of gas into the gas supply pipeline in the event of—
- (a) the angle of tilt of the vehicle exceeding that mentioned in regulation 6 of the Public Service Vehicles (Conditions of Fitness, Equipment, Use and Certification) Regulations 1981(1); or
 - (b) the deceleration of the vehicle exceeding 5g.

Commencement Information

I12 Sch. 12 para. 12 in force at 25.8.2003, see [art. 1\(2\)](#)

Connections for articulated vehicles

- 13.—(1)** Where a trailer is used for the carriage of any part of the gas supply system—

(1) S.I.1981/257; a relevant amending instrument is S.I. 1982/1058.

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- (a) an articulating connector complying with sub-paragraphs (2) to (8) must be fitted between the part of the system on the vehicle and the part of the system on the trailer, and
 - (b) the articulating connector must not be subjected to more than medium pressure.
- (2) Any articulating connector must—
- (a) be of a type suitable for natural gas systems;
 - (b) be designed to accept a compatible nozzle without the use of adapter fittings; and
 - (c) not be interchangeable with connections for other services.
- (3) The gas supply pipework at the terminal on each section of the articulated unit must be capable of withstanding a force of at least 200N in any direction before deformation or failure occurs.
- (4) Any articulating connector must be designed so that separation can be achieved in a fail-safe manner, minimising the volume of gas released during the separation process and while the joint remains disconnected.
- (5) Disconnection devices must be designed to prevent unauthorised interference.
- (6) Dust caps must be fitted to exposed connections to keep out dirt and such dust caps must be attached to the system.
- (7) The articulating connector must be properly supported and protected at all times.
- (8) The articulating connector must incorporate a breakaway coupling which is designed to separate when a breakaway force of 200N (or greater) is applied in any direction and which has an automatic isolation system to minimise the release of gas in the event of the separation of the breakaway coupling.

Commencement Information

I13 Sch. 12 para. 13 in force at 25.8.2003, see [art. 1\(2\)](#)

Marking and labelling of the vehicle

14.—(1) Every vehicle which is equipped to be fuelled by natural gas must be fitted with a metal identification plate, located in a readily visible and accessible position, which is marked clearly and permanently to identify—

- (a) that the vehicle has been constructed or adapted to run on natural gas; and
- (b) the maximum system filling pressure.

This information is in addition to the information required by paragraph 4(1)(f) with respect to the gas container.

(2) The filling point for natural gas must be identified adjacent to the point by the words “NATURAL GAS” or other suitable wording.

Commencement Information

I14 Sch. 12 para. 14 in force at 25.8.2003, see [art. 1\(2\)](#)

General requirements

15. Every part of the gas system must—

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- (a) so far as is practicable, be so located and protected as not to be exposed to accidental damage;
- (b) be soundly and properly constructed of materials which are compatible with one another and with the gas used or likely to be used and which are capable of withstanding the loads or stresses likely to be met in operation; and
- (c) be so designed and constructed that the number of joints is kept to a minimum, and that leakage of gas is unlikely to occur.

Commencement Information

I15 Sch. 12 para. 15 in force at 25.8.2003, see [art. 1\(2\)](#)

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Changes and effects yet to be applied to the whole Instrument associated Parts and Chapters:

Whole provisions yet to be inserted into this Instrument (including any effects on those provisions):

- art. 57-63 inserted by [S.I. 2023/524 art. 4](#)