

---

## AIRWORTHINESS DIRECTIVE

---

On the effective date specified below, and for the reasons set out in the background section, the CASA delegate whose signature appears below repeals Airworthiness Directive (AD) AD/GAS/1 Amdt 11 and issues the following AD under subregulation 39.001 (1) of CASR 1998 and subsection 33 (3) of the *Acts Interpretation Act 1901*. The AD requires that the action set out in the requirement section (being action that the delegate considers necessary to correct an unsafe condition) be taken in relation to the aircraft or aeronautical product mentioned in the applicability section: (a) in the circumstances mentioned in the requirement section; and (b) in accordance with the instructions set out in the requirement section; and (c) at the time mentioned in the compliance section.

---

### Compressed Gas Cylinders

**AD/GAS/1  
Amdt 12**

**Inspection, Test and Retirement**

**26/2016**

**Applicability:** Aircraft to which Part 42 of CASR 1998 applies which carry rechargeable compressed gas cylinders that are not fire extinguishers.

This AD is not applicable if the aircraft's Approved Maintenance Program includes procedures for inspection, test and retirement of compressed gas cylinders, valves and regulators.

**Requirement:**

1. The compressed gas cylinders shall be emptied. Except as varied below, the gas cylinders must be hydrostatically tested and have their markings updated to conform with the applicable manufacturer's, Australian Standard (AS) or United States Department of Transportation (DOT) specification, as set out below:
  - (a) Cylinders with a working pressure of less than 1MPa are not required to be subject to hydrostatic testing.
  - (b) Cylinders manufactured in the USA which have an outside diameter of less than 51 mm and length less than 610 mm are not required to be subject to hydrostatic testing.
  - (c) The retest of aircraft compressed gas cylinders must include a visual internal and external inspection together with a test by interior hydrostatic pressure in a water jacket or other apparatus of suitable form for the determination of the expansion of the cylinder. Permanent volumetric expansion must not exceed 10% of total volumetric expansion at test pressure or a permanent increase in volume of more than 1/5000 of its original volume.
  - (d) Where a cylinder specification or applicable CGA Publication does not adequately define damage limits, 50% of the damage tolerances stated in AS2030 shall be applied.
  - (e) Cylinders manufactured in the USA marked 3HT must be inspected and tested in accordance with the USA Compressed Gas Association Publication C-8, as in force from time to time (*Standards for Visual Inspection of Compressed Gas Cylinders* (1972), 49 CFR §180.209 and 180.213(c) (2) refer).

## Compressed Gas Cylinders

AD/GAS/1 Amdt 12 (continued)

(f) A hydrostatic proof test can be performed as an alternative to a hydrostatic stretch test, but only where permitted by a particular cylinder specification.

2. Inspect and test the valve and/or the regulator in accordance with the manufacturer's specifications. If no manufacturer's specification are available then the valve must be inspected in accordance with paragraph 10.2.2 of AS2337.1-2004, as in force from time to time.
3. Retire cylinder from service.
4. Cylinders which do not comply with their scheduled inspection limits or test requirements must be rendered unfit for further use in accordance with AS2030, as in force from time to time.

Compliance:

1. Unless it can be positively established and certified when the last hydrostatic test was carried out and is again due, emptying and testing should be carried out within 1 year after 31 August 1986 and thereafter at intervals not exceeding 5 years except for:
  - (a) 3HT cylinders, which must be tested at intervals not exceeding 3 years, and
  - (b) DOT-E type cylinders, which must be tested in accordance with the DOT Special Permit, as in force from time to time, or 3 years.
2. In accordance with the manufacturer's requirements or at the same time as the cylinder inspection whichever is the lesser.
3. In accordance with whichever of the following occurs first:
  - (a) the manufacturer's specification,
  - (b) for 3HT cylinders:
    - (i) 4 380 pressurisations (cycles), or
    - (ii) 24 years from date of manufacture; or
  - (c) HOLASW 1\*\* cylinders:
    - (i) 5 000 pressurisations (cycles), or
    - (ii) 25 years from date of manufacture.
  - (d) for fibrewrapped cylinders:
    - (i) the limit specified in the applicable DOT-Exemption, as in force from time to time, or
    - (ii) 15 years from the date of manufacture.

## Compressed Gas Cylinders

AD/GAS/1 Amdt 12 (continued)

4. Immediately.

*Note 1: Not all specifications include a retirement requirement.*

*Note 2: From the effective date of this amendment, and where the number of pressurisation cycles prior to this amendment have not been recorded, or cannot be substantiated, and where a cylinder is, or has been:*

- (a) installed only for emergency purposes, it is to be assumed to have consumed 1 cycle every 2 days since date of manufacture; or*
- (b) installed or used for the normal provision of supplementary oxygen above an altitude, or cabin altitude of 10 000 feet, it is to be assumed to have consumed 1 cycle each day since the date of manufacture.*

*Note 3: A reference in this AD to a document being in force from time to time, is a reference only to the latest / current version of the document.*

This AD commences on 6 January 2017.

### Background:

Amendment 7 recognised the cycle life limit of USA 3HT, and UK HOLASW cylinders. It has been established for emergency oxygen systems that the normal frequency of topping up, and only cycling pressure from despatch limits to maximum, will allow this class of cylinder where applicable, to retain its full remaining calendar life. However, where no records exist, cylinders for routine high altitude use must be assumed to have been fully cycled from empty to full, and on a regular basis.

Amendment 8 aligned the Directive with the change in the Australia Standard AS 2337.1 which requires the valve to be inspected along with the gas cylinder and regulator.

Amendment 9 was issued because US DOT Exemption E 8162 had been superseded by US DOT Special Permit SP 8162 dated 11 May 2007. US DOT-SP 8162 changes the hydrostatic test interval of lightweight composite oxygen cylinders from 3 years to 5 years for cylinders that have been tested after 1 July 2006.

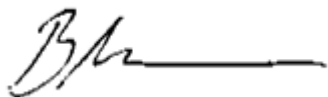
Amendment 10 was issued to limit the applicability of the AD to CASR Part 42 aircraft only. This AD will be repealed after the requirements are incorporated into a future amendment of the Part 42 Manual of Standards.

Amendment 11 was issued to clarify the applicability under CASR Subpart 42.J.

## Compressed Gas Cylinders

AD/GAS/1 Amdt 12 (continued)

Amendment 12 is issued to make minor editorial changes.

A handwritten signature in black ink, appearing to be 'B Wilson', followed by a horizontal line extending to the right.

Ben Wilson  
Delegate of the Civil Aviation Safety Authority

12 December 2016