
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 revokes Airworthiness Directive (AD) AD/GAS/1 Amdt 7 and issues the following AD under subregulation 39.001(1) of CASR 1998. The AD requires that the action set out in the requirement section (being action that the delegate considers necessary to correct the 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 8**

Inspection, Test and Retirement

4/2006

Applicability: All rechargeable compressed gas cylinders except for those used:

- (a) as fire extinguishers installed or intended to be installed in an aircraft, or
- (b) in a hot air balloon,

for which a system of maintenance detailing the procedures for inspection, test and retirement of compressed gas cylinders and valves and/or regulators has not been approved.

- Requirement:
1. Applicable compressed gas cylinders shall be emptied. The gas cylinder assembly, which includes the valve, must be inspected. The gas cylinders are to hydrostatically tested and have their markings updated to conform with their manufacturer's, Australian Standards or DOT specification by an appropriate Certificate of Approval holder except as varied below:
 - (a) Cylinders with a working pressure of less than 1MPa are exempted from hydrostatic testing.
 - (b) U.S.A. cylinders which have an outside diameter of less than 51 mm and length less than 610 mm are exempted from 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 CGA Pamphlet does not adequately define damage limits, 50% of the damage tolerances stated in AS2030 shall be applied.
 - (e) USA cylinders marked 3HT must be inspected and tested in accordance with the USA Compressed Gas Association Pamphlet C-8. Code of Federal Regulations 49 180.209 (k) and 180.213(c)(2) refers.

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- (f) A hydrostatic proof test is an acceptable alternative to a hydrostatic stretch test only where permitted by a particular cylinder specification.
2. Inspect and test of the valve and/or the regulator in accordance with the manufacturer's specifications. If no manufacturer's specification is available then the valve is to be inspected in accordance with AS2337.1-2004 paragraph 10.2.2.
3. Retire cylinder from service.
4. Cylinders which do not comply with their scheduled inspection limits or test requirements shall be rendered unfit for further use in accordance with AS2030.

Compliance:

1. Unless it can be positively established and certified when the last hydrostatic testing was carried out and is again due, testing should be carried out within one year after 31 August 1986 and thereafter at intervals not exceeding five years except for:
 - (a) 3HT cylinders are to be tested at intervals not exceeding three years, and
 - (b) DOT-E type cylinders are to be tested in accordance with the latest revision of the applicable DOT Exemption or three years.
2. In accordance with the manufacturer's requirements or at the same time as the cylinder inspection which ever 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, or
 - (ii) 15 years from the date of manufacture.

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4. Immediately following Requirement 3.

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 one cycle every two 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 one cycle each day since the date of manufacture.*

Note 3: Appropriate Certificate of Approval means a holder of a CAR 30 maintenance organisation approval which holds appropriate technical data, suitable facilities and trained personnel to carry out maintenance on valves and regulators who is, or has an arrangement with a certificated Gas Cylinder Test Station, complying to Australian Standard 2337, to carry out hydrostatic testing of cylinders.

This Amendment becomes effective on 13 April 2006.

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.

This Amendment aligns the Airworthiness 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.



David Villiers
Delegate of the Civil Aviation Safety Authority

24 February 2006