

**M9**

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## **Crankcase explosion relief valves for crankcases of internal combustion engines**

M9.1 Internal combustion engines having a cylinder bore of 200 mm and above or a crankcase volume of 0.6 m<sup>3</sup> and above shall be provided with crankcase explosion relief valves in accordance with UR M9.2 to UR M9.13 as follows:

M9.1.1 Engines having a cylinder bore not exceeding 250 mm are to have at least one valve near each end, but, over eight crankthrows, an additional valve is to be fitted near the middle of the engine.

M9.1.2 Engines having a cylinder bore exceeding 250 mm but not exceeding 300 mm are to have at least one valve in way of each alternate crankthrow, with a minimum of two valves.

M9.1.3 Engines having a cylinder bore exceeding 300 mm are to have at least one valve in way of each main crankthrow.

M9.2 The free area of each relief valve is to be not less than 45 cm<sup>2</sup>.

M9.3 The combined free area of the valves fitted on an engine must not be less than 115 cm<sup>2</sup> per cubic metre of the crankcase gross volume.

M9.4 Crankcase explosion relief valves are to be provided with lightweight spring-loaded valve discs or other quick-acting and self closing devices to relieve a crankcase of pressure in the event of an internal explosion and to prevent the inrush of air thereafter.

M9.5 The valve discs in crankcase explosion relief valves are to be made of ductile material capable of withstanding the shock of contact with stoppers at the full open position.

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### NOTE

1. The total volume of the stationary parts within the crankcase may be discounted in estimating the crankcase gross volume (rotating and reciprocating components are to be included in the gross volume).
2. Engines are to be fitted with components and arrangements complying with Revision 3 of this UR, except for M9.8, M9.9 and the second bullet point in M9.10, when:
  - 1) an application for certification of an engine is dated on/after 1 January 2006; or
  - 2) installed in new ships for which the date of contract for construction is on or after 1 January 2006.

The requirements of M9.8, M9.9 and the second bullet point in M9.10 apply, in both cases above, from 1 January 2008~~7~~.

3. The “contracted for construction” date means the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. For further details regarding the date of “contract for construction”, refer to IACS Procedural Requirement (PR) No. 29.

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M9.6 Crankcase explosion relief valves are to be designed and constructed to open quickly and be fully open at a pressure not greater than 0.02 N/mm<sup>2</sup> (0.2bar).

M9.7 Crankcase explosion relief valves are to be provided with a flame arrester that permits flow for crankcase pressure relief and prevents passage of flame following a crankcase explosion.

M9.8 Crankcase explosion relief valves are to be type tested in a configuration that represents the installation arrangements that will be used on an engine in accordance with UR M66.

M9.9 Where crankcase relief valves are provided with arrangements for shielding emissions from the valve following an explosion, the valve is to be type tested to demonstrate that the shielding does not adversely affect the operational effectiveness of the valve.

M9.10 Crankcase explosion relief valves are to be provided with a copy of the manufacturer's installation and maintenance manual that is pertinent to the size and type of valve being supplied for installation on a particular engine. The manual is to contain the following information:

- Description of valve with details of function and design limits.
- Copy of type test certification.
- Installation instructions.
- Maintenance in service instructions to include testing and renewal of any sealing arrangements.
- Actions required after a crankcase explosion.

M9.11 A copy of the installation and maintenance manual required by UR M9.10 is to be provided on board ship.

M9.12 Plans showing details and arrangements of crankcase explosion relief valves are to be submitted for approval in accordance with UR M44.

M9.13 Valves are to be provided with suitable markings that include the following information:

- Name and address of manufacturer
- Designation and size
- Month/Year of manufacture
- Approved installation orientation

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