



SYSTEM INSTALLATION CHECKLIST
SMALL CRAFT - LIQUEFIED PETROLEUM GAS (LPG) SYSTEMS
Ref.: ISO 10239:2014

FOR INTERNAL USE ONLY
Report No.:

Manufacturer: _____

Signatory, Name: _____

Signatory, Title: _____

Phone: _____

Fax: _____

Email: _____

Boat Model Name: _____

Boat Model Year: _____

Note: The scope does not cover devices used for LPG-fuelled propulsion engines or LPG-driven generators.

Subject to check	Clause	Requirements	Checked ?
1 The system and all components withstand storage from -30° to +60°C	4.1	[Yes ?]	_____
2 The system is of a vapour withdrawal type, i.e. LPG released only under gas phase conditions	4.2	[Yes ?]	_____
3 All appliances installed on a single LPG system shall be designed for use at the same operating pressure and the same LPG type, e.g. propane, butane, or a mixture of the two.	4.3	[Yes ?]	_____
4 The operating pressure is clearly labelled in the vicinity of the cylinder shut-off valve.	4.3	[Yes ?]	_____
5 The cylinder(s) selected and other supply equipment has sufficient capacity to ensure safe and satisfactory operation of all appliances simultaneously. Cylinder locker or cylinder housing is capable of accommodating the capacity of cylinders needed.	4.3	[Yes ?]	_____
6 Where an additional LPG system is installed there is no connection between each of the LPG supplies. The cylinder(s) for each gas supply may be installed in the same cylinder locker or cylinder housing.	4.4	[Yes / NA ?]	_____
7 If an additional cylinder locker or cylinder housing is used, each cylinder locker or cylinder housing has a warning sign inside which indicates that there is an additional LPG supply.	4.4	[Yes / NA ?]	_____
8 In case of additional LPG Systems, inside the cylinder locker or cylinder housing is a clear indication which appliances are supplied by each LPG supply. This shall also be stated in the owner's manual.	4.4	[Yes / NA ?]	_____
9 Each LPG system is fitted with simple means to test the LPG system for leakage before use of any appliances (e.g. a pressure gauge, bubble leak tester).	4.5	[Yes ?]	_____
10 Where a bubble leak detector is fitted in the LPG system, it shall be securely mounted in the low pressure side of the LPG system and in the cylinder housing or cylinder locker.	4.5	[Yes / NA ?]	_____
11 If pressure gauges are used, they shall read the cylinder pressure side of the pressure regulation device. The gauge scale shall have a pressure range from 0 kPa to a maximum of between 1000 kPa and 1600 kPa to be able to show pressure drops during the LPG system check.	4.5	[Yes / NA ?]	_____
12 System is equipped with, or have provision for the installation of a pressure regulation system	5.1	[Yes ?]	_____
13 Regulating system is designed to provide a fixed nominal pressure suitable for the consuming appliances, but not more than 5 kPa	5.1	[Yes ?]	_____
14 Label indicating the working pressure of the LPG appliances installed is affixed in the vicinity of the LPG cylinder installation	5.1	[Yes ?]	_____
15 If installed, the LPG pressure reduction system has an overpressure device to prevent uncontrolled pressure increase in the low pressure side to a value above 5 kPa	5.2	[Yes ?]	_____
16 Any gas discharge of the LPG pressure reduction system is inside the cylinder locker or housing or separately vented outside the craft	5.2	[Yes ?]	_____
17 LPG pressure reduction system is a pressure relief governor, a pressure relief valve or an automatic safety shut off valve.	5.2	[Yes ?]	_____

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19 The pressure regulator indicates the nominal working pressure	5.3	[Yes ?]	_____
20 The pressure regulator is not of the external manual adjustment type	5.4	[Yes ?]	_____
21 The pressure regulator is located within the cylinder housing	5.5	[Yes ?]	_____
22 Pressure regulator, not supported by the cylinder connection, is separately secured within the cylinder locker or cylinder housing for protection, dirt and water. It is mounted above the cylinder valve for a continuous rise from the cylinder valve to the regulator.	5.6	[Yes / NA ?]	_____
23 The pressure regulator and its fastener are made of corrosion-resistant metallic material or have an effective coating against external corrosion	5.7	[Yes ?]	_____
24 The LPG supply line system is either a solid piping system (except for short hose connection to gimballed stoves) or continuous hose in accordance with 6.3	6.1.1	[Yes ?]	_____
25 Hoses are used to connect gimballed stove(s) with their LPG supply.	6.1.2	[Yes / NA ?]	_____
26 Hoses are used to connect supply piping to the pressure regulation device within the cylinder locker or cylinder housing.	6.1.2	[Yes ?]	_____
27 The piping and hose are sized not to drop working pressure below required operating pressure at any appliance below that required by the appliance manufacturer when all appliances are operating simultaneously.	6.1.3	[Yes ?]	_____
28 Only solid drawn copper or drawn stainless steel piping is used. Materials are galvanically compatible when connected.	6.2.1	[Yes ?]	_____
29 The minimum wall thickness for piping with outside diameter ≤ 12 mm is 0,6 mm, and 0,9 mm for diameters > 12 mm	6.2.1	[Yes / NA ?]	_____
30 Semi-rigid, pliable corrugated stainless steel tubing (PCT) shall conform to EN 15266, or equivalent.	6.2.1	[Yes / NA ?]	_____
31 There shall be no joints or fittings in piping passing through engine compartments.	6.2.2	[Yes / NA ?]	_____
32 LPG supply piping routed through engine compartments shall be protected by conduit or trunking, or supported by non-abrasive attachments which are no more than 300 mm apart.	6.2.3	[Yes / NA ?]	_____
33 Fittings for connections and joints in piping shall be metallic and of a proper type in accordance with the standard	6.2.4	[Yes / NA ?]	_____
34 Jointing compound for flared fittings or flared rings and gas tightness by compression of ductile joints (except connections in accordance with EN 16129:2013, Annex M) shall not be used.	6.2.4	[Yes / NA ?]	_____
35 Piping is installed as high as practical above bilge water level	6.2.5	[Yes / NA ?]	_____
36 Piping has as few fittings as practical. Joints and fittings are readily accessible	6.2.6	[Yes / NA ?]	_____
37 Materials and components of hose assemblies are designed to be suitable for LPG and to withstand the stresses and exposures found in the marine environment.	6.3.1	[Yes ?]	_____
38 Hoses are routed through the engine compartment	6.3.2	[No ?]	_____
39 Hoses have a minimum practical length	6.3.2	[Yes ?]	_____
40 Hoses shall have permanently attached end fittings, such as swaged sleeve or sleeve and threaded insert.	6.3.3	[Yes / NA ?]	_____
41 Hoses are capable of being reached for inspection, removal or maintenance without removal of a permanent craft structure.	6.3.3	[Yes / NA ?]	_____
42 Hoses shall be installed so as to avoid stress or tight radius turns.	6.3.3	[Yes / NA ?]	_____
43 Hose connections shall be readily accessible and stress free, i.e. not subjected to tension or kinking under any conditions of use.	6.3.4	[Yes / NA ?]	_____
44 Hoses used for LPG supply line are continuous from within the cylinder locker or cylinder housing to the appliances, or the readily accessible shut off valve near the appliance (see 6.6.3), except where metallic supply piping is connected to flexible hose leading to a movable appliance, such as a gimballed stove.	6.3.5	[Yes / NA ?]	_____
45 The melting point of materials at welded or brazed connections is below 450 °C	6.4.1	[Yes ?]	_____
46 Fittings through which LPG passes are compatible with LPG and galvanically compatible with the metallic piping to which they are connected.	6.4.2	[Yes ?]	_____



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47 Hose clamps, if used to secure cylinder locker vent hoses, are corrosion resistant and reusable	6.4.3	[Yes / NA ?]	_____
48 End connection fittings are corrosion resistant	6.4.4	[Yes ?]	_____
49 Where cutting ring fittings are used in conjunction with copper piping, a brass insertion sleeve and brass cutting ring shall be fitted. All components match to avoid galvanic corrosion.	6.4.5	[Yes / NA ?]	_____
50 Piping does not have direct contact with metallic parts of craft structure of higher galvanic nobility than the piping.	6.5.1	[Yes / NA ?]	_____
51 Supply lines and components are routed 30 mm away from electrical conductors unless the LPG line is run jointless through a conduit, or the conductors are sheathed in conduit or trunking according to ISO 10133 and ISO 13297	6.5.2	[Yes ?]	_____
52 Metallic supply lines are at least 100 mm from engine exhaust system	6.5.2	[Yes ?]	_____
53 LPG lines are at least 100 mm from exposed electrical terminals	6.5.3	[Yes / NA ?]	_____
54 Support of LPG supply lines in order to prevent damage from chafing or vibration. - copper or stainless steel piping, spaced at intervals not exceeding 0,5 m; - for hoses, the intervals shall not exceed 1 m.	6.5.4	[Yes ?]	_____
55 LPG supply line fixing devices are corrosion-resistant, non-abrasive, designed to prevent cutting or other damage to the lines and galvanically compatible with the supply line material. In the case of conduit it shall be vented and non-metallic. All joints shall have at least one fixing device per line no more than 150 mm away from the joint.	6.5.4	[Yes ?]	_____
56 No undue stress is created at the fittings at joints and connections	6.5.5	[Yes ?]	_____
57 Penetrations through watertight bulkheads maintain watertight integrity	6.5.6	[Yes / NA ?]	_____
58 Line is protected from abrasion at through-bulkhead or wall penetrations	6.5.7	[Yes / NA ?]	_____
59 Threaded gas tight connections are of the taper pipe thread type conforming to ISO 7-1, or fittings conforming to EN 1949	6.5.8	[Yes ?]	_____
60 For threaded gas tight connections sealants are used conforming to EN 751-2 or EN 751-3	6.5.8	[Yes ?]	_____
61 A readily accessible manually operated main shut off valve is provided in the high pressure side. This may be the cylinder valve.	6.6.1	[Yes ?]	_____
62 Dual cylinder system is provided with an automatic or manual change over device (selector valve), with non-return valves fitted, in addition to each cylinder shut-off valve, to prevent the escape of gas when either cylinder is disconnected	6.6.2	[Yes / NA ?]	_____
63 A shut-off valve is installed in the low pressure supply line to each appliance. This may be a solenoid valve located within the cylinder locker or cylinder housing on the high or low pressure side of the pressure regulation device, operable from the vicinity of the appliance. Solenoid valves shall be closed in cases of lack of tension, i.e. loss of electrical actuating energy.	6.6.3	[Yes ?]	_____
64 Each shut-off valve is in vicinity of the appliance and operable without reaching over the top of open flames	6.6.3	[Yes ?]	_____
65 Identification of open/closed position of shut-off valves are clearly identified	6.6.4	[Yes ?]	_____
66 Identification of controlled appliance at shut-off valves placed away from the appliance is provided and if not visible the location of the valve is labelled	6.6.5	[Yes / NA ?]	_____
67 Taper plug valves are only used in low pressure side and are spring loaded	6.6.6	[Yes / NA ?]	_____
68 Shutt off valves are located to avoid inadvertent or accidental operation	6.6.7	[Yes ?]	_____
69 Needle valves are used as shut-off valves in low pressure side of system	6.6.8	[No ?]	_____
70 Gate valves are used as shut-off valve	6.6.8	[No ?]	_____
71 Only appliances for use in marine environment are used in the LPG system	7.1	[Yes ?]	_____
72 The appliances are fitted in accordance with the manufacturers instructions	7.1	[Yes ?]	_____
73 Each appliance is securely fixed as to eliminate undue stress to piping, hoses and fittings	7.2	[Yes ?]	_____
74 Each appliance has a flame supervision devices for each burner and/or pilot lights	7.3	[Yes ?]	_____
75 All unattended appliances are of the room sealant type with air intake ducting and flues for outgoing combustion products to outside the craft	7.4	[Yes / NA ?]	_____

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76 All unattended appliances shall have a combustion system in which either: - incoming combustion air passes through sealed ductwork connected to the enclosed combustion chamber and terminating outside the craft, including any areas that can be enclosed by canopies, or - mechanisms are incorporated in the appliance to prevent backdrafting from the exhaust and oxygen depletion in interior spaces.	7.4	[Yes / NA ?]	
77 If the incoming air is not delivered through sealed ductwork terminating outside the craft, and if the appliance is installed in interior spaces, ventilation shall be provided that allows outside air to pass through fixed openings (Annex B).	7.4	[Yes / NA ?]	
78 Each appliance is labelled indicating the type of LPG to be used and this label is referred to in the owners manual	7.5	[Yes ?]	
79 Each cooking appliance has permanent warning label with a minimum character height of 4 mm	7.6	[Yes / NA ?]	
80 Materials adjacent to appliances are in accordance with ISO 9094	7.7	[Yes ?]	
81 The exposed hot working surfaces of space heaters and water heaters are located to prevent risk of injury	7.8	[Yes / NA ?]	
82 The free area around appliances is according to ISO 9094 and complies to the manufacturer's instructions.	7.9	[Yes ?]	
83 Manufacturers instructions are provided preventing overheating of surfaces and allowing inspection/servicing	7.9	[Yes ?]	
84 For monohull sailing craft: Sliding of cooking utensils across the stove is prevented up to 15° pitch and 30° roll	7.10	[Yes / NA ?]	
85 For monohull engine driven and multihull sailing craft: Sliding of cooking utensils across the stove is prevented for 15° pitch and roll	7.10	[Yes / NA ?]	
86 Cylinders, regulators and safety devices are secured for marine environment	8.1	[Yes ?]	
87 Cylinders, regulators and safety devices are installed in lockers or housings	8.1	[Yes ?]	
88 Cylinders, pressure regulators, regulation devices and safety devices located below decks or in cockpits shall be mounted in cylinder lockers.	8.1	[Yes / NA ?]	
89 Craft design and openings of cylinder lockers and cylinder housings shall be such that escaping vapours can only flow to the outside of the craft.	8.2		
90 Cylinder lockers inside enclosed cockpits are only be accessible from the top; in case of a cockpit with open transoms it may also be accessible from the side;	8.3	[Yes ?]	
A cylinder locker shall be vented at the bottom by a drain with not less than 19 mm internal diameter; flanges or welded joints 30 mm above the lowest point of the locker are accepted	8.3	[Yes ?]	
91 The locker drain runs outboard without sumps which can retain water	8.3	[Yes ?]	
92 The locker drain runs outboard with outlet lower than locker bottom, not less than 75 mm above waterline at fully loaded condition	8.3	[Yes ?]	
93 All hoses and metal piping penetrating the locker wall are sealed vapour tight	8.4	[Yes / NA ?]	
94 Locker drains and housing vents are located at least 500 mm away from any opening to the interior of the craft	8.5	[Yes / NA ?]	
95 No store for loose storage or components is provided in the locker	8.6	[Yes ?]	
96 Cylinders, valves and pressure regulators are readily accessible and secured rigidly allowing only withdrawal of gas in vapour condition	8.7	[Yes ?]	
97 Ventilation is provided in accommodation spaces where open flame unflued appliances are used or to which compartments containing such appliances are connected by open passageways. Minimum sizing and locations of ventilation openings complies with Annex B.	9	[Yes ?]	
98 Prior to charging the system with LPG, the supply line and fittings have been tested with air; test pressure three times the nominal pressure but not more than 15 kPa	10.	[Yes ?]	
99 No pressure drop was indicated after a period of 10 min; in case that any leakage has been indicated by a drop in pressure, the entire LPG system has been checked.	10.	[Yes ?]	
100 If the pressure regulating device is not rigidly connected to, and supported by, the cylinder connection, high pressure side components are checked for leakage	10.	[Yes / NA ?]	



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101 All electrical devices in cylinder lockers, housings or compartments comply with ISO 8846 for ignition protection	11	[Yes ?]	_____
102 Information and instructions are included in the Owner's Manual	12	[Yes ?]	_____
103 Flue components are installed with the manufacturer's instructions	13.1	[Yes / NA ?]	_____
104 Flues are routed and sized to ensure complete discharge outside craft, including areas that maybe enclosed by canopies and as not to be obstructed by water	13.2	[Yes / NA ?]	_____
105 The flue and air-intake duct system is continuous and vapour tight from the appliance to its terminal outside the craft	13.3	[Yes / NA ?]	_____
106 Dampers (shut-off valves) are not used in the flue system	13.4	[Yes / NA ?]	_____
107 The entire flue system is accessible for inspection	13.5	[Yes / NA ?]	_____
108 Flue terminals for exhaust discharge are not within 500 mm of a ventilator, opening port, window, refuelling fitting or fuel tank vent	13.6	[Yes / NA ?]	_____
109 Flue terminals are constructed with guard to prevent damage and injury by accidental contact with hot surfaces	13.7	[Yes / NA ?]	_____
110 The minimum effective area of ventilation is given	Annex B	[Yes / NA ?]	_____
111 The instructions are included with the owner's manual	Annex C	[Yes ?]	_____
112 Cooking appliances with integral LPG cartridges with a capacity of 225 g or less	Annex D	[Yes ?]	_____
113 Cooking appliances is suitable for use with LPG in a marine environment and installed in accordance with the manufacturer's instructions.	D.1	[Yes ?]	_____
114 ISO 9094 is met regarding the proximity and flammability of materials	D.1	[Yes ?]	_____
115 Maximum capacity for appliance intended in interior space is 225 g LPG	D.2	[Yes ?]	_____
116 Cartridge has a self-closing device to enable its removal for storage when not in use	D.2	[Yes ?]	_____
117 The owner's manual instructs the operator to remove and to replace cartridges in the open air and away from sources of ignition.	D.2	[Yes ?]	_____
118 The cooking appliance is complies with the design specifications	D.3.	[Yes ?]	_____
119 Operating controls shall be readily accessible, and located to minimize possible injury from burners or elements when being used.	D.4	[Yes ?]	_____
120 Burner controls shall be equipped or designed to require two-stage operation when going from the "off" to "on" position to prevent unintentional or accidental opening of valves during handling and storage.		[Yes ?]	_____
121 Appliance has a continuously burning pilot light.	D.6	[No ?]	_____
122 Cooking appliances in use shall have a positive means of mechanical retention and be secured in a location designated by the boat manufacturer.	D.7	[Yes ?]	_____
123 Means shall be provided on or adjacent to stove top cooking surfaces to prevent both deep and shallow cooking pans from sliding across or off the stove during craft motion; see also 7.9	D.7	[Yes ?]	_____
124 Alternatively, guidance shall be provided to use the cooking appliance only when safe to do so.	D.7		_____
125 Reserve or empty cartridges are not stored inside the boat but only on the boat exterior, protected from the weather and mechanical damage, and where escaping vapours can only flow towards the outside.	D.8	[Yes ?]	_____
126 Printed instructions are provided with each cooking appliance	D.9	[Yes ?]	_____

Comments:

Date and Signature: _____