Boat Safety Scheme

Part Three

Electrical systems

Part Three

Key Changes..

- Electrical Cables installed below bilge water level
- Calculate battery compartment ventilation
- Distance from fuel /LPG pipe work
- Main Starter leads soldered or crimped
- Ignition protection – electrical devices
- Effective suppression for TV & radio

Battery securing 3.1

- All batteries shall be securely installed
- Battery *compartments* are to be adequately ventilated
- Batteries are to be covered with insulating and non-corrosive material
- Batteries may not be fitted beneath **or within 0.5m** of any LPG or petrol pipe, cylinder, tank, filter or cock“

A “battery compartment” is an enclosure specifically designed to contain batteries only

Battery compartment 3.1

Battery Ventilation 3.1

For each battery *inside a battery compartment*, the area of the ventilation openings required is found by the formula:

V = no. cells X capacity in amp. hrs (Ah) X 1.935 = area in mm²

Example: 12 Volt battery of 105 Ah capacity

V = 6 X 105 X 1.935 = 1219 mm²

Battery Compartment Ventilation Ready Reckoner

Ah	L	W	H	No.Cells	Area mm^2	No.Holes
6V Battery						
105	293	169	222	3	609	2
160	245	169	330	3	929	2
12V Battery						
63	381	169	222	6	731	2
105	486	199	222	6	1219	3
160	477	169	330	6	1857	4
24V Battery						
63	381	169	222	12	1462	4
105	486	199	222	12	2438	6
160	477	169	330	12	3714	8

Main circuits 3.3

Main circuits shall be installed <u>above</u> bilge water level.

Circuits allowed to be in the bilge:

- bilge pumps / float switches
- transducers eg echo sounders, depth gauges
- security alarms
- fire pumps
- gas detectors

Bilge water level can be determined by:

- the presence of a “tidemark”
- the position of the bilge pump
- the level at which the float switch is set

Main circuits 3.3

Main circuits 3.3

Review & Discuss

Protection of cables against damage 3.4

Cables are to be run:

- as high as practicable
- clear of all sources of heat

It is <u>recommended</u> that PVC covered cables are not run in contact with polystyrene thermal insulation

Protection of cables against damage 3.4

Visually check single insulated electrical cables are supported 30mm clear of gas pipes.

Ref: ECP 3.4.4

Protection of cables against damage 3.4

Protection of cables against damage 3.4

Exemption 11.10

Vessels manufactured prior to 16 June 1998 and having PVC insulated or sheathed cables in direct contact with polystyrene thermal insulation are not required to comply with that part of Standard 3.4 which requires that PVC cables shall not run in direct contact with polystyrene insulation until such time that an insulation resistance test discloses an electrical fault in cables in direct contact with polystyrene thermal insulation

Protection of cables against damage 3.4

Note

Where visual examination is not possible, exemption 11.10 will be applied and the owner advised to have the installation tested by a competent electrician with experience in marine electrical environment

Ignition protection 3.7

BS EN 28846 (ISO 8846) “Small craft – Electrical devices – Protection against ignition of surrounding flammable gases”

Electrical devices which can generate sparks or arcs under operation are:

- switches
- relays
- generators
- fuses
- distributors
- cranking motors

Ignition protection 3.7

Items of compliant equipment are marked with:

- the ISO number
- the word “marine”

Any identifiable form of marking is acceptable

Ignition protection 3.7

Exemption 11.11

Vessels manufactured prior to 16 June 1998 are not required to comply with Standard 3.7 which requires that all electrical devices fitted in any compartment containing petrol or gas shall be ignition protected in accordance with BS EN 28846 where it is not practicable to comply

This exemption will be rescinded at some future date by amendment

Ignition protection 3.7

The Exemption will be applied at the request of the owner and surveyor/examiner will make a note in their records that this was done.

When any device is replaced or any modifications or additions are made, the new or replacement device must be ignition protected in accordance with BS EN 28846 or ISO 8846

Two wire systems 3.8

Mandatory check for commercial class vessels.

Visually check for presence of two wire installation on suitable device e.g. horn, headlamp, navigation light.

Electrical suppression 3.9

At present, the suppression of TV and radio interference will not be checked as part of the

Boat Safety Scheme examination

Electrical Systems

Review and Discuss

Boat Safety Scheme

End of Part 3

Electrical Systems