BSS Examination Checking Procedures

Core Checks for privately owned and managed vessels
And Parts 2-9 of Hire Boat Requirements examination.

Non-controlled Review Version
28 Sept 21 – 31 March 22

Edition 4 Version 0.2 – 28 September 2021

This review version of the core Examination Checking Procedures (ECP) is to be used as a non-controlled document interim version for review and checking by BSS Examiners from 28 September 2021 to 31 March 2022.

The document may be subject to possible change before it is published as a controlled document in April 2022

There are no extra requirements since the introduction of mandatory Carbon Monoxide alarms in April 2019.

There have been changes to assist with clarity, delivery, and improved guidance.

Introduction

The checking procedures contained in this book detail the methods by which the Boat Safety Scheme (BSS) and its owners, the Navigation Authorities, require BSS Examinations to be performed on privately owned and privately managed vessels, and on hire boats.

Parts 2 to 9 of these Core Checks apply to privately owned and privately managed vessels and to hire boats. Within Parts 3, 6 and 8 there are a total of 14 Check items that are Advice checks for privately owned and managed vessels, but these checks are mandatory Requirements for as checks in the Hire Boat Requirements.

Until further notice, other classes of commercial boat are likely to need to be assessed against all BSS Check Items listed in the BSS Examination Checking Procedures Edition 1, dated April 2002 to support their registration or licensing as stipulated to the boat's operators by the relevant navigation or harbour authority.

In respect of privately owned and managed boats and hire boats, BSS Examiners are required to follow these fourth edition Examination Checking Procedures and satisfactory performance of BSS Examiners will be assessed against them. It is critical that BSS Examiners are familiar with the contents of this document to help ensure that the application of the BSS Requirements is consistent and fair.

This document is a non-controlled interim version. It remains the property of the BSS Office and must be returned upon request. Loss, theft or damage requiring replacement must be reported without delay.

After the review period, controlled versions of this document will be distributed by the BSS Office in response to changes in the BSS Requirements and associated checking procedures. It is the responsibility of the holder to ensure that it is kept up to date.

Any questions or comments about this document or its contents, or any suggestions for revision or improvement, can be directed to the BSS Office.

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General Guidance

Before the Examination

Don't forget that it is the owner's responsibility to always maintain the boat's compliance with the BSS Requirements the boat is on the water as a condition of their navigation authority licence, mooring or registration. The only two roles that a BSS Examiner has are, to check compliance against the Requirements, and pass on BSS advice and guidance as appropriate.

Owners have a responsibility to prepare the boat for Examination, including: -

- ❑ full access to any system or feature that requires inspection: and,
- ❑ organising supporting documents where required as evidence of compliance; and,
- ❑ the supply of fuel and/or power as needed.

Try to remember to discuss this when you are making the Examination arrangements with your customer. There is more information on the BSS websites that should be helpful in this regard.

Carrying out the Examination

The navigation authorities are relying on the fact that boats are checked against procedures and are certificated appropriately.

Examinations must be carried out methodically in accordance with the procedures, instructions and guidance as published in this document and on the BSS Examiner website. Examiners are required to use a checklist during all Examinations to ensure Check items (a.k.a. Checks) are not missed.

You will need to approach each Examination with resolve and determination. Some physical effort or even discomfort may be required to achieve some of the Checks, but not to such an extent that may result in damage to your health, the boat or boat system components.

You may need to search for items you are required to see, such as portable fire extinguishers or LPG line joints. You will also need to look for items that should not be stowed inappropriately such as spare LPG cylinders or self-contained LPG appliances or spare petrol containers. Make every effort to look in any lockers or cupboards where such items are likely to be stored including cockpit and galley cupboards, engine spaces, etc.

Ultimately, it is your duty is to apply these checking procedures diligently. Please remember that if you are unsure whether or not some aspect to a boat is compliant, you can contact the BSS Office for assistance. The BSS Office supports you without assuming your responsibility to carry out the Examination diligently.

Health and safety

Examiners have responsibility for their own personal health and safety whilst carrying out Examinations. The BSS Examiner website points to some good advice in this respect.

If on arrival on site it is apparent the boat is in a dangerous condition, or if you identify a dangerous condition during the Examination, leave the boat safe but do not proceed with the Examination, ensure you record your decision, and inform the BSS Office.

Examiners must apply the learning from the Core LPG and Electrical Knowledge training course.

Examiners are guided to follow the recommended BSS 230V AV Safe Disconnection Process as set out at Appendix F of this document prior to starting Examinations on boats with permanently installed 230V AC systems on board.

Recording and reporting the Examination

You must keep records of BSS Examinations in accordance with the instructions and guidance as published in the BSS Examiner help centre.

You must report each BSS Examination using the BSS Database in accordance with the instructions on the BSS Examiner help centre.

How These Procedures Are Laid Out

The following Check Item structure and layout has been adopted throughout.

Check Item number e.g. 7.3.1 locker drain check A unique reference with part number (7), section number (3) and then item number of section (1).	**Check Item text** A précis of the Requirement posed in the form of a question to which the answer must be 'yes' in order to pass.	**Status of Check Item** **R** = Requirement **A** = Advice check (only relevant to privately owned and managed vessels)
Checking action to be performed When to apply the Check and when it is not applicable. What must be examined and how it must be checked. [For example, check the location or perhaps markings, or another example, look and feel to assess the condition of the item.]	**Requirements that must be met for a pass** What criteria must be applied to establish whether the Check Item is passed or failed. Under what circumstances a date specific Requirement is to be applied. Each Requirement is applied within the limitations of the Checking action carried out by the Examiner. [For example, the description of the required location or marking, or, a statement that the item must show no signs of fuel leaks or missing components. etc.]	
Supplementary information [As examples shown below, where relevant this component includes supplementary information needed by Examiners to be able to apply the Check Item] **Applicability** [Information relating to the applicability of the Check Item and any reporting implications and actions that the Examiner should take account of in the event of non-compliance] **Safety advice** [Specific safety advice for Examiners related to the Check Item] **Guidance for owners** [Guidance that may steer owners towards added safety] **Examiner action** [Guidance for Examiners, particularly regarding the extent and order of their Checking actions and their personal safety]		

Glossary Of Terms

accessible for inspection	Made available for inspection and capable of being seen and reached.
accommodation space	Space surrounded by permanent boat structure in which there is provision for any of the following activities: sleeping, cooking, eating, washing/toilet, navigation, steering. Spaces intended exclusively for storage, open cockpits with or without canvas enclosures and engine rooms are not included.
appliance	A device or piece of equipment designed for a particular use, used for performing or for facilitating the performance of a particular function. (Examples include but are not limited to: heaters; boilers; cookers; refrigerators; lights; and, 'bullseye' decklights).
appliance with continuously-burning flame	Appliances designed to be left unattended with the main burners operating over long periods. Examples include LPG fridges, cooker ovens, central heating boilers and space heaters.
battery space or box	An enclosure specifically designed to contain the batteries only.
damage or deterioration	Damage or deterioration materially affecting, or likely to affect, the integrity, efficiency or operation of the item or device. *[For example, a crack through the bowl of a clear bowl filter would constitute damage warranting a fail but damaged paint or a torn label on the filter would not]*
electrical equipment space	A dedicated space used to contain electrical equipment e.g. distribution boards, invertors, etc., and nothing else.
engine space	Space or compartment of the boat containing main or auxiliary engine(s).
ventilation	**fixed ventilation** – Ventilation that cannot be closed without the use of tools. **total effective area of fixed ventilation** – The total area of fixed ventilation provision, as measured. **calculated fixed ventilation** – The ventilation Requirement as calculated using the formula at Appendix K.
interior of the vessel	Anywhere within the confines of the hull apart from: • those areas where the arrangements of a self-draining cockpit helps prevent leaked fuel or escaping LPG vapour entering any space, including accommodation, engine and bilge spaces [see Check Item 7.1.1 for full criteria]; • open locations on deck or on a cabin roof where leaked fuel would flow directly overboard unimpeded and where any openings into any space or any source of ignition are not within 0.5m metre distance.

light manual force	The application of a minimum manual force entirely proportionate to the potential for movement of the item being checked.
lines, pipes and hoses	**Line** is a generic term referring to the overall facility, i.e. fuel-filling line. **Pipe** refers to rigid metallic lines, i.e. fuel filling pipe. **Hose** refers to a line made of flexible material, i.e. fuel filling hose.
open-flue appliances	Open-flue appliances take their air for combustion from the space in which they are installed. Open-flue appliances will always be fitted with a draught diverter, which provides a draught break between the primary flue on the appliance and the secondary flue connecting the draught diverter and the flue terminal.
open vessel	A vessel in which all the accommodation is completely open to the elements.
portable appliance	An appliance which is not permanently connected to a fuel supply and/or where its location is not permanent.
pre-made	Where an item or connection, such as on a hose assembly or electrical cable, has been made within the intention that it will be permanent. It will not be possible to take apart any such items or connections without causing permanent damage
readily accessible	Capable of being reached for operation, inspection or maintenance without removal of any craft structure or use of any tools or removal of any item of portable equipment stowed in places intended for storage of portable equipment such as lockers, drawers or shelves.
sanitation system	A system comprising equipment designed for installation on board a vessel, to receive, retain, treat or discharge sewage, and equipment using any process to treat such sewage.
sea-going boat	A boat that is used on tidal waters.
seen, reached	**Seen -** Where an item can be assessed with the naked eye, or by the use of a mirror. **Reached** - Where an item can be touched and assessed by hand.
suitable proprietary manufacture	An item or device that is, on the face of it, manufactured for the purpose determined during the examination. [For example, a solenoid-controlled valve in the LPG cylinder locker must be presumed suitable, but Examiners must not accept valves marked not suitable for use with LPG or DIY arrangements with 'home-fashioned'- style linkages or exposed motors]

BSS Examination Checking Procedures – Part 2

Permanently installed fuel systems and fixed engines

There are seven relevant BSS General Requirements:

1. **All permanently installed fuel systems and fixed engines must be designed, installed and maintained in a way that minimises the risks of explosion, or of fire starting or spreading.**
2. **Fuel filling arrangements must prevent any overflow from entering the interior of the vessel.**
3. **All fuel filling points must clearly identify the fuel in use.**
4. **Marking must be provided to identify the location of fuel system emergency shut-off devices, or their means of operation, which are not in open view.**
5. **All permanently installed fuel systems must be designed, installed and maintained to ensure fuel-tight integrity.**
6. **All permanently installed fuel tanks and fuel system connections must be accessible for inspection.**
7. **The pressure systems of steam-powered installations must have a current inspection certificate issued by a recognised competent person.**

2.1 Fuel filling points

2.1.1	Does the location and condition of the fuel filling point ensure that any fuel overflow is prevented from entering the interior of the vessel?	R

Check the location of fuel filling points and assess the potential for any overflowing fuel to enter the interior of the vessel. Check the condition of fuel filling points where they can be seen or reached, and assess the potential for any overflowing fuel to enter the interior of the vessel around the filling point.	Fuel overflowing from filling points must be prevented from entering any part of the interior of the vessel. Accordingly, fuel filling points must be positioned so that… • the camber or configuration of the deck; **or,** • a coaming; **or**, • a diverter arrangement; … prevents overflowing fuel from entering the interior of the vessel. Fuel filling points must be secure, and free of signs of damage or deterioration which could lead to overflowing fuel entering the interior of the vessel.

Applicability – this Requirement does not apply to the following provided there is no risk of unseen spillage:

- historic (i.e. bona fide ex-working) diesel-engined boats (Examiners should seek guidance from the BSS Office when determining whether a boat is a bona fide ex-working boat); or
- diesel tanks, of up to a maximum capacity of 30 litres.

Applicability – open vessels such as RIBs having a continuous deck or sole that is fuel-tight to the interior of the vessel and bilge spaces, meet this Requirement.

Guidance for owners – in order to address the potential for explosion and/or fire:

i) petrol overflowing from filling points must be avoided through careful fuel handling; and,

ii) beware of the accumulation of petrol vapour where petrol filling points are located in self draining cockpits.

2.1.2	Is the fuel in use correctly and clearly marked on or adjacent to the fuel filling point?	R
Check for markings on or adjacent to fuel filling points.	The specific fuel type in use must be correctly and clearly marked on or adjacent to all fuel filling points: • 'Diesel', 'Fuel Oil', 'Gas Oil', 'DERV', or 'Biodiesel'; **or**, • 'Petrol', or 'Gasoline'; **or**, • 'LPG Butane/Propane' as appropriate; **or**, • 'Paraffin' or 'Kerosene'; **or**, • 'Petroil'.	
Examiner action – Examiners must refer to Section 1 of Appendix 2 for essential information on internationally accepted fuel symbols. The marking of a fuel filling point with an appropriate international symbol is acceptable. Applicability – the use of embossed tape (e.g. Dymo) is not acceptable. The marking must be legible with all lettering complete. Applicability – marking fuel filling points solely with 'fuel' or 'gas' is not acceptable.		

2.1.3	Are all disused fuel filling points disabled?	R
Check all fuel filling points and other deck connections. Identify any that are marked as fuel filling points, or that may be taken to be fuel filling points but are no longer connected to a fuel tank. Check for signs of disabling.	Fuel filling points that are no longer connected to a tank must be permanently disabled to such an extent that it would require the use of tools to remove the disabling method.	
Applicability – the use of a suitable proprietary adhesive to secure filling point caps or plugs in place etc meets this Requirement.		

2.1.4	Does the internal diameter of the fuel filling point meet the specified requirements?	R
Measure the internal diameter of each fuel filling point.	Fuel filling points must have a minimum internal diameter of: • 31.5mm (1¼in) where they are connected to a filling hose; **or** • 28.5mm (1 1/8in) where they are connected to a filling pipe; **or** • 28.5mm (1 1/8in) where they open directly into a tank.	
Safety advice – metallic measuring devices are not to be used on metallic petrol filling points. Applicability – if it is not practicable to measure the internal diameter at fuel filling points, an estimate based upon the external diameter of the fuel filling line can be made.		

2.2 Fuel filling lines

2.2.1	**Are the fuel filling line connections free of signs of leaks and in good condition, and are all fuel filling hose connections accessible for inspection?**	R
Check the accessibility of fuel filling hose connections, and check their condition by sight and touch. Check the condition of fuel filling pipe connections where they can be seen or reached.	All fuel filling hose connections must be: • accessible for inspection; **and** • secure; **and** • free of signs of leaks; **and** • free of signs of damage or deterioration. Fuel filling pipe connections must be: • secure; **and** • free of signs of leaks; **and** • free of signs of damage or deterioration.	
Applicability – where hose connections are not accessible for inspection, Check 2.2.1 must be recorded as 'not verified' on your checklist, and it must be considered that the Check has not been completed until such time as the condition has been verified.		

2.2.2	**Is the fuel filling line self-draining so that fuel is not retained and is it free of kinks or other restrictions?**	R
Check the fall of each fuel filling line where it can be seen or reached. Check for any kinks or other obvious restrictions in fuel filling lines where they can be seen or reached.	Fuel filling lines must be connected to the top of the fuel tank and be 'self-draining' i.e. fall continuously from the filling point to the fuel tank connection so that fuel is not retained. Fuel filling lines must not be kinked or restricted.	
Applicability – fuel filling lines must not have their internal bore diameter restricted to less than 28.5mm (1 ⅛in) for pipe or 31.5mm (1¼in) for hose. Applicability - petrol filling pipes connected to the sides of metal petrol tanks are acceptable provided that the tank spigot is welded to the tank and extends above the top of the tank. Applicability – diesel fuel filling lines into the sides of fuel tanks are acceptable provided the arrangements comply with the Requirements at 2.10 and 2.11. Applicability – diesel fuel filling lines into fuel tank balance lines are acceptable provided the arrangements comply with the Requirements at 2.9, 2.10 and 2.11.		

2.2.3	**Is the material of the fuel filling line suitable and in good condition?**	R
Check the material and condition of fuel filling lines which can be seen or reached. Check the markings on any fuel filling hose.	Fuel filling lines must not show signs of fuel leaks, damage or deterioration. Fuel filling hose must be marked as suitable for the fuel in use or supported by an appropriate declaration.	
Applicability – diesel filling hose in good condition may be accepted without marking or declaration, provided it can be examined over its entire length. Applicability- hoses marked ISO 7840, ISO 8469, ISO 15540, SAE J 1527, DIN 4798 or RINA DIP/66/96 may be accepted as being suitable for use with petrol or diesel. Applicability – in cases where the filling hose is suitably marked, enough of the hose must be accessed in order that the Examiner can make a reasonable assessment as to its general condition.		

2.3 Fuel tank vents

2.3.1	Does every fuel tank have a vent facility?	R
Check all fuel tanks for the provision of a vent facility.	A vent line must be fitted to each fuel tank, or a vent must be fitted to either the filling cap, filling line, or tank top.	
Applicability – multiple diesel fuel tank arrangements having a shared vent facility are acceptable provided the arrangements comply with all other Requirements at 2.3 and 2.4. Supporting information on fuel tank vent facility arrangements is provided at Appendix 2.		

2.3.2	Does the fuel tank vent line have a minimum internal diameter of 9.5mm (⅜in)?	R
Measure the outside diameter of fuel vent lines.	The internal diameter of vent lines must be at least 9.5mm (⅜in).	
Applicability – the internal diameter may be verified by measuring the outside diameter and estimating wall thickness. Applicability – where the internal diameter of a vent line is found to be less than 9.5mm and the boat is CE marked according to the Recreational Craft Directive, Examiners should contact the BSS Office for guidance.		

2.3.3	Are the fuel tank vent line connections free of signs of leaks and in good condition, and are all vent hose connections accessible for inspection?	R
Check the accessibility of fuel tank vent hose connections, and check their condition by sight and touch. Check the condition of fuel tank vent pipe connections where they can be seen or reached.	All vent hose connections must be: • accessible for inspection; **and,** • secure; **and,** • free of signs of leaks; **and,** • free of signs of damage or deterioration. Vent pipe connections must be: • secure; **and,** • free of signs of leaks; **and,** • free of signs of damage or deterioration.	
Applicability – where hose connections are not accessible for inspection, Check 2.3.3 must be recorded as 'not verified' on your checklist, and it must be considered that the Check has not been completed until such time as their condition has been verified.		

2.3.4	Is the fuel tank vent line self-draining so that fuel is not retained, and is it free of kinks or other restrictions?	R
Check the fall of each vent line where it can be seen or reached. Check for any kinks or other obvious restrictions in any vent lines where they can be seen or reached.	Vent lines must be connected to the top of the tank and be 'self-draining', i.e. fall continuously from the vent outlet to the tank, or, where a swan neck is installed, from the top of the swan neck down to the vent outlet and the fuel tank connection. Vent lines must not be kinked or restricted.	
Applicability – vent lines must not have their internal bore diameter restricted to less than 9.5mm ($^3/_8$ in). Applicability – 'top of the tank' means the top plate of the fuel tank or the highest part of the side of the tank.		

2.3.5	Is the material of the fuel tank vent line suitable and in good condition?	R
Check the material and condition of vent lines which can be seen or reached. Check the markings on any vent hose.	Vent lines must not show signs of fuel leaks, damage or deterioration. Vent hose must be marked as suitable for the fuel in use or supported by an appropriate declaration.	
Applicability – diesel tank vent hose in good condition may be accepted without marking or declaration provided it can be examined over its entire length. Applicability- hoses marked ISO 7840, ISO 8469, ISO 15540, SAE J 1527, DIN 4798 or RINA DIP/66/96 may be accepted as being suitable for use with petrol or diesel. Applicability – in cases where the vent hose is suitably marked, enough of the hose must be accessed in order that the Examiner can make a reasonable assessment as to its general condition.		

2.4 Fuel tank vent outlets

2.4.1	Does the fuel tank vent outlet, or the vent line swan neck, rise at least as high as the filling point?	R
Check the rise of each vent line.	Fuel tank vent outlets, or the vent line swan neck must rise to a height at least that of the fuel filling point.	
Applicability – where the filling point is mounted on a deck a swan neck in the vent line to the underside of the deck meets this Requirement.		

2.4.2	Are petrol tank vent outlets fitted with a suitable proprietary flame arrester in good condition?	R
Check each petrol tank vent outlet for the presence of a suitable proprietary flame arrester. Check the condition of the suitable proprietary flame arrestor(s) including the flame arresting gauze.	Petrol tank vent outlets must be fitted with a suitable proprietary flame arrester. Suitable proprietary flame arresters and their flame arresting gauze must be free of signs of restrictions, or other damage or deterioration.	
Applicability – flame arresters not recognised as being of suitable proprietary manufacture may be supported by satisfactory documentation. Examiners must be careful not to mistake a water tank vent outlet for a suitable proprietary flame arrestor; supporting information is provided at Appendix 2. Applicability – the small hole in the filler cap as provided by the original engine or fuel tank manufacturer, on fuel tanks of no more than 30 litres capacity, is deemed to meet this Requirement.		

2.4.3	Is the fuel tank vent outlet in a position where no danger will be incurred from leaking fuel or escaping vapour?	R
Check the position of each vent outlet.	Vent outlets must be clear of any potential sources of ignition and must be in a position where no danger will be incurred from leaking fuel or escaping vapour into the interior of the vessel.	
Applicability – vent outlets located within open vessels such as RIBs having no accommodation and having a continuous deck or sole which is fuel-tight to the interior of the vessel, including bilge spaces, meet this Requirement. Applicability – diesel vent outlets within self-draining cockpits having a continuous deck or sole that are fuel-tight to the interior of the vessel, including bilge spaces, meet this Requirement.		

2.5 Fuel tank design and condition

2.5.1	Are non-integral fuel tanks incapable of movement under light manual force?	R
Where enough of the tank can be reached, assess the extent of possible movement by applying light manual force to each non-integral tank.	Non-integral fuel tanks must be incapable of unintended movement under light manual force.	
Examiner action – light manual force should only be applied to the main tank structure and not to tank spigots or attached fuel filler, vent, supply or return lines. Applicability – Examiners need not apply light manual force to fuel tanks assessed to be too heavy to move. Applicability – slight movement is acceptable on tanks of up to 30 litres providing there are no pipe connections to the tank and providing there is no evidence that any movement is putting strain on connected hoses or other fittings. Guidance for owners – although not a BSS Requirement, it is recommended that all fuel tanks are permanently secured by boat structures, brackets, straps etc, and that any existing securing arrangements are kept in good condition.		

2.5.2	Are fuel tanks made of suitable materials?	R
At each fuel tank check the material and check for evidence of obvious suitability.	Fuel tanks must not be manufactured with obviously unsuitable materials. Materials obviously suitable for diesel include: • aluminium alloy • 'CE' marked plastic • FRP • mild steel • stainless steel. Materials obviously suitable for petrol include: • aluminium alloy • brass • 'CE' marked plastic • stainless steel.	
Examiner action – Examiners must refer to Section 1 of Appendix 2 for essential information on unsuitable materials and examining plastic fuel tanks. Applicability – the fuel tank must be accessible enough to allow a general assessment of material. Tanks not accessible to assess the material must be recorded as 'not verified' on your checklist, and it must be considered that the Check has not been completed until such time as the suitability of the material has been verified. Applicability – Examiners are not required to identify whether fuel tanks are lined or otherwise internally coated. A judgement must be made as to a tank's suitability from a visual assessment of the tank's external surfaces. Applicability – where after assessment of the tank material its suitability cannot be verified, and where the material is not obviously unsuitable, apply the condition Checks at 2.5.3. If the condition Requirements are met mark your checklist as being a pass at 2.5.2 and 2.5.3. If the condition Requirements at 2.5.3 are not met mark your checklist as a fail at 2.5.2 and 2.5.3. This Applicability does not apply to plastic tanks; plastic tanks that are not CE marked, or not otherwise recognised as being suitable, must be recorded as non-compliant.		

2.5.3	**Are fuel tanks, including seams and openings, in good condition and free of signs of leaks?**	**R**
Check the condition of all fuel tank surfaces, seams and openings which can be seen and reached.	Fuel tanks including seams and openings must be free of signs of damage or deterioration, including: • leaks; **or,** • heavy corrosion (including deep pitting); **or,** • chafing, irregular indentations or punctures on plastic tanks; **or,** • softening or environmental stress cracking on plastic tanks. All inspection and cleaning access plates and other external fittings such as fuel gauge sender units must be secured in place and free of signs of leaks.	
Examiner action – Examiners must refer to Section 1 of Appendix 2 for essential information on examining plastic fuel tanks. Applicability – the fuel tank must be accessible enough to allow a general assessment of condition. Tanks not accessible to assess condition must be recorded as 'not verified' on your checklist, and it must be considered that the Check has not been completed until such time as their general condition has been verified. Applicability – where accessible, pay particular attention to areas under dipsticks/sounding pipes for evidence of damage from dipstick 'bounce'.		

2.5.4	**Are fuel tanks within engine spaces suitably fire resistant or otherwise protected against the effects of fire?**	**R**
Identify fuel tanks located within engine spaces. If present, at each non-metallic fuel tank look for the manufacturer's plate for evidence of intrinsic fire resistance or verify this by examining any presented declaration from the manufacturer or supplier. At each metallic fuel tank check for signs of soft-soldered seams where these can be seen or reached.	Non-metallic fuel tanks must have intrinsic fire resistance of at least 2.5 minutes at 650˚C or be otherwise protected from fire. Metallic tanks must not have soft-soldered seams.	
Examiner action – Examiners must refer to Section 1 of Appendix 2 for essential information on examining plastic fuel tanks. Applicability – non-metallic fuel tanks CE marked and marked ISO 21487 may be accepted as having an intrinsic fire resistance of at least 2.5 minutes at 650°C.		

2.5.5	**Are petrol tanks installed at the required distances from heat sources or protected by a heat baffle?**	**R**
Measure the distance from any petrol tank to any engine, exhaust system or other heat source. Check for the presence of a fire-resistant baffle between any such petrol tank and heat source.	Petrol tanks must be located: • at least 100mm (4in) from general heat sources; **and**, • at least 250mm (10in) from a dry exhaust. If the distances are less than those prescribed a fire-resistant baffle in good condition must protect the tank from radiated heat.	

2.6 Fuel gauges

2.6.1	Are petrol tanks free of glass or plastic tube or strip-type fuel gauges?	R
Check each petrol tank for glass or plastic tube or strip-type fuel gauges.	Petrol tanks must not be fitted with glass or plastic tube or strip-type fuel gauges.	

2.6.2	Are any glass or plastic tube or strip-type fuel gauges closely coupled to the tank, fitted with a self-closing valve and in good condition?	R
Check each diesel tank for the provision of glass or plastic tube or strip-type fuel gauges. If provided check the installation arrangements.	Glass or plastic tube or strip-type fuel gauges must be: • closely coupled to the tank; **and,** • fitted with self-closing valves at the bottom; **and,** • complete and free of signs of leaks and other signs of damage or deterioration.	
Applicability – self-closing valves are not required for fuel gauges on any diesel-fuelled vessel formerly used for the commercial carriage of freight or passengers or as a tug or as an icebreaker and which is to be licensed for use as a pleasure vessel, or registered for use as a houseboat, unless used for the purposes of hire or reward. Documentary evidence of former use addressed to the BSS manager is required to enjoy this exception. Applicability – self-closing valves are not required on sight gauge arrangements on day tanks having a maximum capacity of up to 30 litres.		

2.6.3	Are all fuel gauges and level-indicators in good condition and free of signs of leaks?	R
Check any fuel tank fuel gauge and level-indicator for condition.	Fuel gauges and fuel level-indicators: • must be free of signs of leaks and/or signs of damage or deterioration or missing components and fixings that could lead to a leak; **and,** • must not have fuel behind any transparent cover.	
Applicability – loose or damaged gauge needles, or other such level-indicators, mounted behind any glass or transparent cover do not constitute a failure.		

2.6.4	Are fuel tank openings for dipsticks closed by a fuel-tight cap or fitting?	R
Identify any fuel tank openings intended to be used for dipsticks and check for a fuel-tight cap or fitting, and for indications of fuel leaks.	Fuel tank openings used for dipsticks must be closed by a cap or fitting and must be free of signs of leaks.	

2.7 Petrol fuel system electrical bonding

2.7.1	**Are all metallic components in the petrol filling and tank system electrically bonded to earth?**	**R**
Check all petrol filling and tank systems for the presence of electrical bonding.	Where petrol filling lines have non-conducting sections, an electrical bond between all metallic parts, e.g. tank, filling point and any intermediate hose connectors, must be fitted. Where the deck and hull are non-conducting, or where the filling point is non-conducting, all metallic petrol tanks, and all metallic petrol filling components, must be electrically bonded to an earth point in direct electrical contact with the surrounding water.	
Guidance for owners – a bonding cable of at least 2.5mm² is recommended.		

2.7.2	**Are all parts of electrical bonding systems in good condition?**	**R**
Check the condition of the electrical bonding connections by sight or touch. Check the condition of bonding cables where they can be seen or reached.	The electrical bonding system must show: • no movement at any of the connections; **and,** • no signs of damage or deterioration, along the cables or at their connections.	
Applicability – all necessary electrical bonding connections must be seen or reached in order to be able to establish the existence of adequate bonding provision.		

2.8 Fuel tank connections

2.8.1	**Are any fuel tank drains closed with a plug or cap, or valve, which can only be opened with tools, and are the drains and their connections in good condition and free of signs of leaks?**	**R**
Check each fuel tank for the presence of a fuel drain facility. Check fuel tank drains by sight and touch for: • the presence of a 'tools to remove' plug or cap on the outlet; and/or, • a 'tools to operate' shut-off valve. Check the condition of fuel tank drains, their connections and any valves by sight and touch.	If present, fuel tank drains must be closed by either: • a 'tools-to-remove' plug or cap on the outlet; **or**, • a 'tools-to-operate' shut-off valve at the tank connection. Fuel tank drains, their connections and any valves must be: • secure; **and**, • free of signs of leaks; **and**, • free of signs of damage or deterioration.	
Applicability – where compliance is achieved using a plug or cap it must be of suitable proprietary manufacture and/or be metallic and it must be fixed in place by a screw mechanism which requires a tool to remove it.		

2.8.2	Are the petrol feed line connections in lift-pump systems made to the top of the tank?	R
Check for the presence of a petrol fuel system with a lift-pump supply. If present, check all petrol feed line connections are made to the top of the tank.	Petrol feed lines must be connected to the top of the fuel tank on lift-pump feed systems.	
Applicability – 'top of the tank' means the top plate of the fuel tank or the highest part of the side of the tank. Applicability – the Requirement also applies to petrol return lines where these are fitted.		

2.8.3	Is the petrol feed line on a gravity system fitted with a valve directly attached to the tank?	R
Check for the presence of a gravity-fed petrol installation and check for the presence of a valve in the petrol feed line directly attached to the tank.	The petrol feed line on gravity-fed petrol installations must be protected by a valve directly attached to the tank.	
Applicability – a gravity-fed petrol installation is one where there is no lift-pump to move the fuel from the tank to the engine and the height of the tank is above that of the engine.		

2.8.4	Are fuel tank connections accessible for inspection?	R
Check the accessibility of tank connections by sight **and** touch.	Fuel tank connections must be accessible for inspection.	
Applicability – this Requirement applies to all fuel supply and return line, fuel filling line, vent lines and balance line connections.		

2.8.5	Are any unused tank connections closed with a plug or cap which can only be opened with tools, and are unused connections in good condition and free of signs of leaks?	R
Where it can be seen or reached, check each fuel tank for the presence of unused connections. If present, check each unused tank connection for the presence of a 'tools to remove' plug or cap, and check its condition.	Unused tank connections must be: • closed with a 'tools-to-remove' plug or cap; **and**, • secure; **and**, • free of signs of leaks; **and**, • free of signs of damage or deterioration.	
Applicability – each plug or cap must be of suitable proprietary manufacture and/or be metallic and must be fixed in place by a screw mechanism which requires a tool to remove it. Applicability – unused fuel lines connected to tanks must be closed with a 'tool-to-remove' plug or cap and be in good condition and free of signs of leaks.		

2.9 Fuel tank balance lines

2.9.1	Are multiple petrol tank systems free of balance lines?	R
Check for the presence of multi-petrol tank systems and check for the presence of balance lines.	Petrol systems must not be fitted with balance lines.	

2.9.2	Are balance lines on diesel tank systems made of suitable materials and are they in good condition and free of signs of leaks?	R
Check the material of all diesel balance lines that can be seen and check for evidence of suitability. Check the markings on any hose used as a balance line. Check the condition of each balance line and its connections where they can be seen or reached.	Diesel system balance lines must be made of suitable materials. Metallic materials suitable include: • aluminium alloy • copper • mild steel • stainless steel Non-metallic materials suitable include: • FRP • Hose marked to denote both suitability for the fuel used, and fire resistance, to BS EN ISO 7840 or an equivalent standard. Diesel system balance lines must be free of signs of leaks and signs of damage or deterioration.	
Applicability – where after assessment of any metallic or FRP balance line material its suitability cannot be verified, and where the material is not obviously unsuitable apply the condition Checks only. Applicability – balance line connections must comply with the Requirements at 2.11 (Fuel line connections). If not compliant with all the Requirements at 2.11 a fault shall be recorded at 2.9.2. Applicability – when fuel filler hose is connected to a balance line, it must be checked in the same way as a hose permanently charged with fuel – see 2.10 and 2.11.		

2.10 Fuel feed, return, and on-engine lines

2.10.1	Are all fuel feed, return and on-engine pipes made of suitable materials?	R
Check the material of all fuel feed, return and on-engine pipes that can be seen and check for evidence of suitability.	Fuel pipes must be made of suitable materials. Suitable materials include: • aluminium alloy • copper • mild steel (for diesel only) • stainless steel.	
Applicability – where after assessment of the material its suitability cannot be verified, and where the material is not obviously unsuitable apply the condition Checks at 2.10.3. If the condition requirements are met mark your checklist as being a pass at 2.10.1 and 2.10.3. If the condition requirements at 2.10.3 are not met mark your checklist as a fail at 2.10.1 and 2.10.3. Applicability – the use of hose and other non-metallic components within high-pressure diesel fuel lines between injection pumps and injectors is not permitted. Where such lines are obviously not metallic or where the material type cannot be identified mark your checklist as a fail. Applicability – fuel lines connecting small capacity diesel containers to the cold start facility on older diesel engines are exempt from this Requirement.		

2.10.2	Are all fuel feed, return and on-engine hoses suitable for the fuel used and fire resistant?	R
Check the marking on all fuel feed, return and on-engine hoses.	Fuel feed, return and on-engine hoses must be marked, to denote both suitability for the fuel used and fire resistance, to BS EN ISO 7840 or an equivalent standard.	
Applicability – hoses marked to SAE J 1527, DIN 4798 or RINA DIP/66/96 are acceptable. Applicability – the presence of armoured or other external braiding is not evidence of hose suitability or fire resistance. Such hoses must be marked as above. Applicability – fuel-hose suitability may be supported by a written declaration from the hose manufacturer or supplier or, if appropriate, from the engine manufacturer/supplier or mariniser. Applicability – fuel lines connecting small capacity diesel containers to the cold start facility on older diesel engines are exempt from this Requirement. Applicability – fuel hoses in permanently installed fuel systems to outboard engines may be to type B1 or B2 of ISO 8469 (or be suitable proprietary outboard engine fuel hose), provided the hose and its connections are located in the open air and where any fuel spillage would drain overboard (e.g. self-draining cockpits or outboard wells not enclosed by a canopy or other cover). Open vessels such as RIBs having a continuous deck or sole that is fuel-tight to the interior of the vessel and bilge spaces, meet this Requirement. Supporting information on permanently installed fuel systems to outboard engines is provided at Appendix 5.		

2.10.3	Are all feed, return and on-engine pipes secure and in good condition?	R
Check the condition of all fuel feed, return and on-engine pipes which can be seen or reached. Apply light manual force to check security of all fuel feed, return and on-engine pipes that can be reached.	Fuel feed, return and on-engine pipes must be free of signs of leaks, signs of damage or deterioration. Fuel feed, return and on-engine pipes must not move under light manual force.	

2.10.4	Are all fuel feed, return and on-engine hoses properly supported and in good condition?	R
Check the condition of all fuel feed, return and on-engine hoses which can be seen or reached. Check fuel feed, return and on-engine hoses where they can be seen or reached for support and protection.	All fuel feed, return and on-engine hoses must be free of signs of leaks or damage or deterioration including flaws, brittleness, cracking, abrasion, kinking and 'soft spots'. On hoses covered with metal braiding the braiding must be free of signs of damage or deterioration including corrosion and kinking. Fuel feed, return and on-engine hoses must be supported clear of anything likely to damage them, or be otherwise protected.	

2.10.5	Do the diesel injector leak-off (spill rail) arrangements meet specified Requirements?	R
Apply the Checking actions from Checks 2.10.1–4 and 2.11.1-3 to the diesel injector leak-off arrangements and refer to Appendix 2a if necessary.	Diesel injector leak-off (spill-rail) arrangements must meet: • all the relevant Requirements at Checks 2.10.1–4 and 2.11.1-3; **or,** • one of the alternative compliance options listed in Appendix 2a.	
Applicability – vintage and traditional engines designed to return the injector leak-off fuel to a catch pot are acceptable provided the catch pot is securely mounted and is free of signs of leaks, signs of damage or deterioration. Applicability – injector leak-off hoses fitted by the manufacturer within an enclosure on the engine meet this Requirement.		

2.11 Fuel feed, return, and on-engine fuel line connections

2.11.1	Are all fuel line connections of the correct type and free of signs of leaks?	R
Check the type of fuel line connections that can be seen or reached and check for signs of leaks by sight or touch.	Fuel pipe connections must be screwed, compression, cone, brazed or flanged. Fuel hose connections must be either pre-made end fittings on hose assemblies or hose clips/clamps onto hose nozzles or formed pipe-ends. Fuel line connections must be free of signs of leaks, signs of damage or deterioration.	
Applicability – soft-soldered joints are not acceptable. Examiners concerned that particular joints may have been made using soft solder must require the owner to provide proof that this is not the case. Applicability – injector leak-off (spill rail) arrangements having push-on connections on flexible fuel lines are acceptable for options covered by the alternative compliance options set out in Appendix 2a. Applicability – the push-fit end connections on the fuel lines connecting small capacity diesel containers to the cold start facility on older diesel engines should be considered as meeting this Requirement if the connections are free of signs of leaks. Applicability – fuel hoses in permanently installed fuel systems to outboard engines may terminate at the outboard with a proprietary quick-release self-closing connector conforming to 5.2.1.		

2.11.2	**Are fuel hose connections made with hose clips or clamps effective and in good condition?**	**R**
Check the effectiveness and condition of all fuel hose connections made with hose clips or clamps that can be seen or reached. Pull using light manual force to check security of all hose connections that can be reached.	Fuel hose connections made with hose clips or clamps must: • be suitably sized, that is, not so oversized that the band forms an elliptical shape or so undersized that no tightness is achieved; **and,** • be appropriately tight, that is, not so loose that the connection can be pulled forward or back under light manual force, nor so tight that the hose is excessively pinched; **and,** • show no signs of damage or deterioration at the clip or clamp; **and,** • show no signs of damage or deterioration at the hose caused by the clips or clamps.	
Applicability – the light manual force Check must not be applied to injector leak-off (spill rail) arrangements having push-on connections.		

2.11.3	**Are all fuel line connections, valves, fittings and other components secure?**	**R**
Apply light manual force to check security of all fuel line connections, valves, fittings and other components that can be reached.	Fuel line connections, valves, fittings and other components must not move under light manual force.	
Applicability – at connections between pipe and hose it is acceptable for there to be some movement at the connection provided the pipe is fixed in place within 100mm of the connection and there is no movement of the pipe at its fixing point.		

2.12 Fuel filters

2.12.1	**Are fuel filters in good condition?**	**R**
Check the condition of all fuel filters.	Fuel filters must be free of signs of leaks and signs of damage or deterioration to any part of the filter assembly.	
Applicability – the Requirements at Section 2.12 must be applied to all forms of fuel filters.		

2.12.2	**Are all fuel filters inside engine spaces fire resistant?**	**R**
Check all fuel filters (including drain plugs) located inside engine spaces are marked or recognised as fire resistant. If not marked or recognised as being suitably fire resistant, verify this by examining any presented declaration from the manufacturer or supplier.	Fuel filters (including drain plugs) located inside engine spaces must have intrinsic fire resistance of at least 2.5 minutes at 650˚C.	
Applicability – all-metal fuel filters are accepted as being sufficiently fire resistant. Applicability – fuel filters marked with ISO 10088 are acceptable.		

2.13 Fuel shut-offs

2.13.1	Is an emergency fuel shut-off installed in every fuel feed line?	R
Check the means to shut off the fuel in the fuel feed line from every fuel tank.	An effective emergency shut-off must be installed in all fuel feed lines. Any of the following methods are acceptable: • a manual shut-off valve as close as practical to the tank; **or,** • all fuel lines, including those on the engine, being above the level of the top of the tank; **or,** • an anti-siphon valve at the tank; **or,** • an electrically operated valve at the tank activated to open only during engine starting or running, provided that a manual emergency operating or bypassing device is present.	
Applicability – in regard to manual shut-off valves, accessibility takes precedence over proximity to the tank. Applicability – if an Examiner cannot verify a claim from an owner that the emergency shut-off facility is provided by way of an anti-siphon valve or an electrically operated valve, they should contact the BSS Office for help verifying the claim.		

2.13.2	Are all fuel shutoff valves, or their means of operation, in a readily accessible position?	R
Check for the presence of fuel shut-off valves. If present, check their accessibility or the accessibility of their means of operation.	Fuel shut-off valves, or their means of operation, must be installed in a readily accessible position.	

2.13.3	Are all fuel shut-off valves, or their means of operation, in open view or their location clearly marked?	R
Check for the presence of fuel shut-off valves. If present, check that fuel shut-off valves, or their means of operation, are in open view with all removable lids, deck boards, curtains, doors etc. in place. If not in open view check their location is clearly marked in open view.	Fuel shut-off valves, **or** the means to operate them, must • be in open view with all removable lids, deck boards, curtains, doors etc. in place; **or,** • have their location clearly marked in open view.	
Applicability – the use of embossed tape (e.g. Dymo) is not acceptable. The marking must be legible with all lettering complete.		

2.13.4	Are petrol gravity-fed fuel lines provided with the required fuel shut-off facilities?	R
Check for the presence of a gravity-fed petrol installation. If present, check that a second shut-off valve, or a means of operating the main emergency fuel shut-off valve, can be reached from the steering position and check its accessibility.	Gravity-fed petrol installations must have a second shut-off valve, or a means of operating the main emergency fuel shut-off valve, in a readily accessible position within approximately 2m of the steering position.	

2.14 Carburettors

2.14.1	Are all non down-draught carburettors fitted with a drip tray?	R
Check for the presence of a non down-draught type carburettor. If present, check for the presence of a drip tray.	Non down-draught carburettors must be provided with a drip tray.	
Applicability – certain down-draught carburettors may also be capable of overflowing. Examiners concerned that a particular down-draught carburettor may be of an overflowing type should contact the BSS Office for verification.		

2.14.2	Is the carburettor drip tray in good condition, free of signs of leaks, and easily emptied?	R
Check the condition of any carburettor drip tray. Check that it is removable or fitted with an emptying facility.	Carburettor drip trays must be: • removable, or fitted with an emptying facility; **and**, • free of signs of leaks, signs of damage or deterioration.	

2.14.3	Is the carburettor drip tray fitted with effective flame arresting gauze permanently attached along all edges?	R
Check the carburettor drip tray gauze for effectiveness by comparing it with a sample of gauze of the correct mesh. Check the condition of the gauze and the method of attachment to the tray.	Carburettor drip tray gauze must have a mesh of at least 11 wires per linear cm (28 wires per inch). Gauze must be complete and free of restrictions, damage, and must be permanently and continuously attached to the tray along all edges.	

2.14.4	Is the petrol engine air intake fitted with flame trap or air filter?	R
Identify the air intake of petrol engines and look for the presence of a flame trap or air filter. Check the flame trap or air filter for condition and completeness where they can be seen.	Petrol engines must have a flame trap or air filter fitted to the air intake. Flame traps and air filters must show no signs of damage or deterioration, or obviously missing sections or components.	
Applicability – there is no Requirement for Examiners to dismantle the air filter to establish the nature of the filter element.		

2.15 Engine installation

2.15.1	Are all parts of engine mounting systems secure and in good condition?	R
Check engine mounting systems for condition and completeness where they can be seen or reached.	Engine mounting systems must: • show no signs of fractured engine mounting brackets; **and,** • not have loose, missing or fractured bolts or nuts; **and,** • show no evidence of significant deterioration of any flexible mounts; **and,** • show no signs of damaged or heavily corroded metal bearers or rotten timber bearers.	
Applicability – for internal combustion engines housed in the original equipment manufacturer's cocoon, this Check applies to the cocoon's mounting system.		

2.15.2	Are the structures and surfaces surrounding exhaust system components free of signs of heat damage?	R
Check all structures and surrounding surfaces near all exhaust system components which can be seen for signs of heat damage.	The structures and surrounding surfaces near all exhaust system components must not show signs of heat damage such as scorching, melting or burning.	
Applicability – this Check covers all types of exhaust system components including those on 'wet' or 'dry' exhaust systems including those parts of 'dry' systems that are lagged or shielded. Guidance for owners – 'Dry' exhaust systems, or those parts of 'wet' exhaust systems not cooled by water, located in 'walk through' engine spaces or cabins/deck spaces or other areas where normal crew movement about the vessel can be anticipated, should be effectively lagged, shielded or otherwise protected by craft structures.		

2.15.3	Are all fuel system components in fixed inboard engine spaces permanently installed?	R
Check for the presence of a fixed inboard engine. Check the type of fuel system supplying the fixed inboard engine.	All fuel system components in fixed inboard engine spaces must be permanently installed.	
Applicability – in the event a fixed inboard engine's fuel supply system includes portable components, all such components and the connection between the portable fuel system and the permanently installed system must be located outside of the engine space. In addition, the point of connection of the permanently installed fuel supply to the portable fuel system must be made with a proprietary quick-release, self-closing connector. All portable fuel system components must comply with the applicable BSS Requirements at 5.2.1 and 5.2.2.		

2.16 Steam engines

2.16.1	Is the steam engine pressure system supported by an inspection certificate issued by a competent person?	R
Read carefully the steam engine pressure-system inspection certificate. Check the validity of the certificate and check the terminology indicates the pressure system is in a satisfactory condition.	Steam engine pressure systems must be supported by an inspection certificate. Pressure system inspection certificates must: • relate to the vessel being examined; **and,** • be completed by a competent person; **and,** • indicate satisfactory condition; **and,** • must be less than 14 months old or within any 'run-out' date.	
Supporting information on the assessment of pressure system inspection certificates is provided at Appendix 2b.		

2.17 LPG engines

2.17.1	**Are fuel supply arrangements to LPG-fuelled propulsion engines compliant with BS EN ISO 15609, or an equivalent standard, and are any dual-fuel petrol/LPG arrangements of an acceptable type?**	**R**

[LPG-fuelled propulsion engines can only be checked for compliance by prior arrangement by the owner with the BSS Office] Check the fuel supply type to propulsion engines and identify those fuelled by LPG or dual-fuel petrol/LPG.	The fuel supply arrangements to LPG-fuelled propulsion engines must comply with BS EN ISO 15609, or an equivalent standard. Any dual-fuel arrangements must be installed and maintained in accordance with the engine manufacturer's guidelines for marine applications.

Examiner action - during initial dealings with customers, Examiners should seek to establish whether the propulsion engines are fuelled by LPG. In cases where LPG-fuelled engines are identified, customers should be advised to contact the BSS Office. It will arrange for a full examination of the vessel to be undertaken by an Examiner competent to apply BS EN ISO 15609.

Applicability – Examiners may establish compliance of portable LPG-fuelled generators to applicable BSS Requirements.

Applicability – steam-propelled vessels having boilers fuelled by LPG are not covered by this Check.

BSS Examination Checking Procedures – Part 3

Electrical systems

There are four relevant BSS General Requirements:

8. All electrical systems must be designed, installed and maintained in a way that minimises the risks of explosion or of fire starting and spreading.
9. All electrical systems must be capable of being safely and quickly disconnected from their power source(s) in an emergency.
10. Control and emergency devices, or their means of operation, must be marked when not in clear view or when their function is not clear.
11. All battery compartments containing unsealed or open-vented batteries must be adequately ventilated to prevent a build-up of a flammable mix of gases.

3.1 Battery storage

3.1.1	Are all unsealed or open-vented batteries ventilated to prevent risk of explosion through hydrogen accumulation?	R

Identify the location of all batteries. If batteries are stored within an engine, accommodation or other non-dedicated battery space, check that the space is ventilated. If batteries are stored within a dedicated battery space or box: • check if the space or box has any ventilation; and, • check the height of the ventilation provision and the route of any ducted ventilation. Check the ventilation pathway from all battery storage locations leads to the outside of the hull or superstructure.	All unsealed or open-vented batteries must be stored within a ventilated space. Dedicated battery spaces or boxes for unsealed or open-vented batteries must be ventilated at the top or the highest point of the sides of the space or box and any ductwork used must run horizontally or upwards. The ventilation pathway from all battery storage locations must lead to the outside of the hull or superstructure.

Examiner action – Examiners must refer to Section 1 of Appendix 3 for essential information on recognising unsealed or open-vented batteries.

Applicability - if batteries of a 'sealed' type are stored in a non-ventilated space verify that storage in unventilated spaces meets with the battery manufacturer's recommendations by reference to presented documentation from the manufacturer.

Applicability – ventilation pathways into accommodation spaces having fixed high-level ventilation or into canopied areas are acceptable.

Applicability – battery covers must not allow the accumulation of hydrogen gas.

Guidance for owners – the above are minimum Requirements and boat owners should refer to the battery manufacturer for guidance on the correct minimum ventilation specification. However, where this information is not available owners may calculate a generic minimum ventilation provision using the following formula. Ventilation (mm^2) = number of cells x capacity in Ah x 1.935.

Guidance for owners – if any batteries are connected to an alternator, or alternative battery charging source, having a maximum charge rate in excess of 2kW (approx. 150 Amps at 13.8 volts) it is strongly recommended to install a suitable fan-assisted ducted ventilation system that reflects the battery manufacturer's recommendations.

Guidance for owners – batteries should be located away from heat sources.

Supporting information on recommended minimum ventilation for unsealed and open-vented batteries is provided at Appendix 3.

3.1.2	Are batteries secure against excessive movement in any direction?	R
Check by visual assessment the extent all batteries, battery boxes, cradles, frameworks etc, can move. Apply light manual force to all battery boxes, cradles, frameworks etc, to verify the extent of possible movement.	All battery boxes, cradles, frameworks etc, must be free of signs of movement or possible movement, and must not move under the application of light manual force. All batteries must be incapable of movement in excess of 10mm in any direction.	
Applicability – restraint against vertical movement is generally required. However, batteries may be secured by means of a cradle or framework sufficient to ensure batteries remain secure under any condition up to 45˚ to the horizontal. Recesses, cradles or frameworks extending to half the height of the battery meet this allowance.		

3.1.3	Are battery terminals correctly insulated or protected?	R
Check for the presence of a battery cover or terminal covers. Check material and condition of any battery cover or terminal covers.	All metal parts of battery terminals and connections must be insulated or protected by battery covers or terminal covers. All battery covers or terminal covers: • must be made of insulating material; **and**, • must not allow any metal part of the terminal or connection to be exposed; **and**, • must be free of signs of damage or deterioration.	
Applicability – deck boards, locker lids, etc, made from or lined with insulating material may only be considered as battery covers where they will not be removed for any purpose other than gaining access to the batteries.		

3.1.4	Are batteries installed away from metallic petrol and LPG system components?	R
Measure the distance between battery tops and any metallic petrol or LPG system components installed above them. Where battery tops are installed within 300mm (12in) under metallic petrol or LPG system components, check the components for the presence of a conduit, shield or enclosure made of insulating material.	All battery tops must: • be at least 300mm (12in) away from all metallic petrol and LPG system components installed above them; **or,** • the components must be contained within a conduit, shield or enclosure made of insulating material.	
Applicability – all metallic petrol and LPG system components are covered by this Check including tanks, cylinders, pipes, valves, filters, connectors etc. Supporting information on the spacing between battery tops and metallic petrol or LPG system components is provided at Appendix 3.		

3.2 Cable specifications and condition

3.2.1	Are all electrical cables insulated?	R
Check all electrical cables which can be seen for the presence of outer insulation.	All electrical cables must be insulated.	
Applicability – this Check applies to both AC and DC cables.		

3.2.2	Are battery cables of a sufficient current-carrying capacity?	R
Check the size of the following cables by comparing them against a typical sample cable. • battery to battery isolator; • battery or battery isolator to starter solenoid; • battery to battery; • engine return to battery or battery isolator; • battery to bow thruster motor; • battery to anchor winch motor; • battery to inverter system (over 1000w size); • battery to electric-propulsion motor.	The battery cables prescribed in the Checking action must have a minimum cross-sectional area of 25mm^2.	
Applicability - outboard engines having the engine manufacturer's original loom are not required to meet these dimensions. Applicability – cables between batteries and battery isolators are permitted to have a cross-sectional area of less than 25mm^2 where it can be confirmed that the circuit only supplies low current domestic and/or navigation equipment (e.g. lighting, fridges, pumps, radios, etc). Guidance for owners – the above are the minimum Requirements. Systems may call for larger cable sizes, depending upon the loads encountered.		

3.2.3	Are all electrical cables free of damage or deterioration?	R
Check the condition of all electrical cable insulation and sheathing which can be seen.	All electrical cable insulation and sheathing must not show signs of damage or deterioration, including: • overheating; **or,** • chafing; **or**, • reaction with water or fuel.	
Applicability – this Check applies to both AC and DC cables. Applicability – in the event significant overheating is seen on cable insulation and/or sheathing take the actions described in Appendix A and B.		

3.3 Cable location

3.3.1	Are all electrical cables supported in a safe position?	R
Check the run of all electrical cables which can be seen, and identify any structure or item of equipment likely to cause impact or abrasion damage. Identify any cables subject to the possibility of impact or abrasion damage and check for means of protection or support. Check arrangements where cables can be seen passing through bulkheads or structural members. Check the condition of all cable conduit, trays or trunking which can be seen.	All electrical cables must be: • located where they will not be susceptible to impact or abrasion damage; **or**, • supported away from any structure or item of equipment likely to cause impact or abrasion damage; **or**, • contained in a cable conduit, tray or trunking. Cables passing through bulkheads or structural members must be protected against chafing damage by the use of grommets, glands, sleeves or sealant used effectively. Cable conduit, trays and trunking must be free of signs of overheating or damage.	
Applicability – this Check applies to both AC and DC cables. Applicability – cables passing through wooden bulkheads or structural members and that are free of signs of chafing damage, are not subject to this Check. Applicability – where sheathed cables pass through bulkheads and other structural members, the sheathing should be considered as providing adequate protection as long as it is in good condition.		

3.3.2	Are all electrical cables clear of LPG and fuel pipes?	R
Check the clearance of all electrical cables which can be seen from LPG or fuel pipes. If cables are seen touching LPG or fuel pipes check whether the cable is sheathed with a non-conducting material. If a conduit, tray or trunking is seen touching an LPG or fuel pipe check whether the conduit, tray or trunking is made from a non-conducting material.	Electrical cables must be installed clear of LPG and fuel pipes unless the cables are sheathed with a non-conducting material. Cable conduit, trays or trunking touching LPG or fuel pipes must be made of non-conducting material.	
Applicability – this Check applies to both AC and DC cables.		

3.3.3	Are spark plug leads free of damage or deterioration and properly supported?	R
Check the support and condition of spark plug leads.	Spark plug leads must be: • free of signs of damage or deterioration; **and**, • properly supported away from the engine block or cylinder head.	

3.4 Cable connections

3.4.1	Are all battery cable connections effective and in good condition?	R
For the cables listed at Check Item 3.2.2, visually check the type and condition of all the cable connections (including those at the batteries, battery isolators, and the engine/equipment, etc), where they can be seen.	All battery cables listed at Check Item 3.2.2 must be fitted with soldered or crimped lug connectors or other connections of suitable proprietary manufacture. All battery cable connections on cables listed at Check Item 3.2.2 must not show signs of damage or deterioration, including: • missing or loose components; **or**, • excessively exposed and/or damaged cable strands; **or** • heat damage; **or**, • corrosion.	
Applicability – battery terminals fitted with screw clamps are acceptable if the cable strands are protected by the use of spreader plates or tinned cable ends in the terminal. Applicability – 'crocodile' type clips are not acceptable as battery connections for permanently installed cables. Applicability – in the event significant overheating is seen on battery cable connections take the actions described in Appendix A and B.		

3.4.2	Are all electrical circuit cable connections effective and in good condition?	R
Check the type and condition of all electrical circuit cable connections which can be seen.	All electrical circuit cable connections must not show signs of damage or deterioration, including: • missing or loose components; **or**, • excessively exposed and/or damaged cable strands; **or** • heat damage; **or**, • corrosion.	
Applicability – this Check applies to both AC and DC cables. Applicability – in the event significant overheating is seen on circuit cable connections take the actions described in Appendix A and B.		

3.4.3	Are all electrical cable connections above bilge water level or suitably protected?	R
Check the position of all electrical cable connections which can be seen. Where cable connections are below bilge water level check for the presence of watertight enclosures marked as compliant with IP 67 or greater.	All electrical cable connections must be above bilge water level or be protected by a watertight enclosure at least meeting the IP 67 standard.	
Applicability – this Check applies to connections on both AC and DC cables. Applicability – the final cable connection to submersible bilge pumps and transducers or any other equipment intended for operation below bilge water level must be presumed to comply. Applicability – bilge water level can be established by any apparent bilge water tidemark.		

3.5 Fuses and circuit breakers

3.5.1	Are all AC and DC fuses and circuit-breakers complete and in good condition?	R
Check the completeness and condition of all circuit-breakers and fuses which can be seen.	Fuses and circuit breakers must not show signs of damage or deterioration, including: • being insecurely fitted; **or**, • missing or loose components; **or**, • heat damage; **or**, • corrosion. Fuse holders must contain appropriate fuses or fuse wire and not nails, silver paper, etc. Circuit breakers must not be held closed by the use of tape or other devices.	
Applicability - Examiners are encouraged to confirm during prior dealings with the owner, the location of the fuse box/distribution board and any in-line fuses, and to encourage their accessibility for Examination. Applicability - except on battery charge circuits, and on load circuits requiring a continuous supply which are connected directly to the battery(s), the lack of a fuse or circuit breaker on DC systems is not in itself a fail point – AC systems are subject to a check for the presence of a consumer unit or acceptable alternative, see Check 3.9.2. Applicability – Examiners are not to remove/unscrew fuses or fuse wire holders or remove circuit breakers. The Checking action for fuses and circuit breakers which cannot be seen without their removal should be confined to the Checks for completeness and condition. Applicability – in the event significant overheating is seen on fuses or circuit breakers take the actions described in Appendix A and B.		

3.5.2	Are all fuse panels, boxes, holders and consumer units in good condition and complete?	R
Check the condition of all fuse panels, boxes, holders and consumer units which can be seen. Where they are designed to have one, check all fuse panels, boxes, holders and consumer units which can be seen for the presence of lids or covers covering exposed terminals.	All fuse panels, boxes, holders and consumer units must: • be free of signs of damage or deterioration; **and**, • be fitted with a lid or cover over exposed terminals where they are designed to have one.	
Applicability – this Check applies to both AC and DC supplies. Applicability – in the event significant overheating is seen on fuse panels, boxes, holders or consumer units take the actions described in Appendix A and B.		

3.5.3	**Are DC charge circuits that are connected directly to the battery(s) protected by a fuse or circuit-breaker?**	**R**

Identify whether DC charge circuits from any of the following sources are connected directly to the battery(s), including the unswitched (battery) side of the battery isolator(s) where they can be seen: • battery charger outputs (including combination inverter/chargers); **or,** • solar panels; **or,** • wind turbines. If such circuits are identified check the charging equipment, and the charge circuits where they can be seen, for the presence of a fuse or circuit breaker:	Battery charge circuits connected directly to the battery(s), including the unswitched (battery) side of the battery isolator(s), from: • battery charger outputs (including combination inverter/chargers); **and,** • solar panels; **and,** • wind turbines. must be protected by a fuse or circuit-breaker.
Examiner action – Examiners must refer to Section 1 of Appendix 3 for essential information on charge circuits connected directly to batteries or to the unswitched side of the battery isolator(s). Applicability – charge circuits from engine-driven alternators, including those routed through split charge relays, diodes, etc, are not covered by this Check. Applicability – if the fuse or circuit-breaker protecting the specified charge circuits cannot be found in places where the circuit can be seen, mark your checklist as a fail. This because it is extremely unlikely that the fuse or circuit-breaker will be located where the circuit is hidden. Guidance for owners – although not a BSS Requirement at this time, charge circuits connected to the switched (circuit/equipment) side of battery isolators should also be protected by a fuse or circuit breaker. Furthermore, charge circuits should only be connected to the switched (circuit/equipment) side of battery isolators where this is recommended by the charge equipment manufacturer and/or following guidance from a competent marine electrician.	

3.6 Battery isolators

3.6.1	**Are suitable battery isolator(s) fitted and are they as close as practicable to the battery?**	**R**

Check for the presence of one or more suitable battery isolators at each battery or bank of batteries. Check the distance of battery isolators from batteries.	Battery isolators of suitable proprietary manufacture must be fitted to each battery or bank of batteries. Battery isolators must be located as close as practicable to the batteries.
Applicability - accessibility takes precedence over proximity to the batteries. Applicability – if there are separate circuits connected to separate batteries, each of them must have a battery isolation switch. A combined-switch can be used, for example, in two battery system, where one battery is used for starting the boat's engine and the other used for domestic services. Applicability – solenoid operated battery isolators may be accepted as a suitable battery isolator. Applicability – quick-release battery terminal clamps may not be accepted as suitable battery isolators.	

3.6.2	**Do all DC electrical load circuits pass through a battery isolator, or are those requiring a continuous supply otherwise protected?**	**R**

Identify whether any DC load circuits are connected directly to the battery(s), or to the unswitched side of the battery isolator(s) where they can be seen. If DC electrical load circuits are found connected directly to the battery(s), or to the unswitched side of the battery isolator(s), check whether they are connected to the following equipment (which may be taken as requiring a continuous supply): • automatic bilge pumps; **or,** • security alarms (including marine radios); **or,** • fire pumps; **or,** • electronic navigation equipment with memories; **or**, • inverters, or combination inverter/chargers (DC input); **or,** • solenoid, on a solenoid activated battery isolator; **or** • any other equipment where the manufacturer's instructions indicate or specifically require direct connection to a battery, such as diesel-fired central heating boilers. Check electrical circuits supplying any equipment on the specified list, and which are connected directly to the battery(s) or to the unswitched side of the battery isolator(s), for the presence of a fuse or circuit-breaker, where the circuit can be seen.	Except those which feed equipment requiring a continuous supply, all DC electrical load circuits must pass through a battery isolator. Circuits which feed equipment requiring a continuous supply which do not pass through a battery isolator must be protected by a suitable fuse or circuit-breaker.

Examiner action – Examiners must refer to Section 1 of Appendix 3 for essential information on how to check for DC load circuits that do not pass through a battery isolator.

Applicability – in cases where the cable connections to battery isolator(s) cannot be seen Examiners are recommended to make a note on their checklist accordingly, but the lack of access is not a BSS fail.

Applicability – in cases where load circuits which do not lie in the specified list are found bypassing the battery isolator(s) Examiners may verify compliance by examining any presented declaration from the manufacturer or supplier. Continues/

Applicability – if the fuse or circuit-breaker protecting specified equipment bypassing a battery isolator cannot be found in places where the circuit can be seen, mark your checklist as a fail. This because it is extremely unlikely that the fuse or circuit-breaker will be either located where the circuit is hidden, or be more than a short distance from the battery.

3.6.3	**Are battery isolators, or the means to operate them, in readily accessible positions?**	**R**

Check the accessibility of battery isolators, or the means to operate them.	Battery isolators, or their means of operation, must be installed in readily accessible positions.

3.6.4	Are battery isolators securely mounted and in good condition?	R
Check the securing arrangements and condition of all battery isolators where they can be seen.	Battery isolators must be securely mounted, and not show signs of damage or deterioration, including: • missing components; **or**, • heat damage.	
Applicability – in the event significant overheating is seen on battery isolators take the actions described in Appendix A and B.		

3.6.5	Is the location of all battery isolators, or the means to operate them, in open view, or their location clearly marked?	R
Check that all battery isolators, or their means of operation, are in open view with all removable lids, deck boards, curtains, doors, etc in place. If not in open view check their location is clearly marked in open view.	Battery isolators, or the means to operate them, must: • be in open view with all removable lids, deck boards, doors, etc in place; **or,** • have their location clearly marked in open view.	

3.7 Two-wire DC systems

3.7.1	Is the DC electrical system made up of 'two-wire' circuits?	A/R
Check any DC wiring that can be seen to a suitable device such as a horn, headlamp, or navigation light for the presence of a 'two-wire' circuit.	Direct current (DC) electrical systems must be made up of 'two-wire' circuits, and must not use the boat's structure as a circuit conductor.	
Applicability – 3.7.1 is an Advice check for privately owned and managed vessels, but is a mandatory Requirement for hire boats.		

3.7.2	Is a low resistance return cable provided from the engine or starter motor to the battery?	R
Identify the low resistance return cable from the engine or starter motor to the battery (or battery master switch in systems having negative switching). Apply the cable sizing Checks at 3.2.2.	A low resistance return cable (with a minimum cross-sectional area of 25mm^2) from the engine or starter motor to the battery must be provided on all installations.	

3.8 Shore-power and other alternating current (AC) electrical inlet and lead connections

3.8.1	Are all AC shore-power lead inlet connections of the correct type in good condition, and suitably protected from the weather?	A/R
Check the type, condition and location of all AC shore-power inlet connections where they can be seen.	Shore-power inlet connections must be of suitable proprietary manufacture and must be a plug (male) type. Shore-power inlet connections must be securely fitted and free of signs of damage or deterioration including: • missing components; **or,** • cracked or broken components; **or** • heat damage; **or** • corrosion. Shore-power inlet connections not obviously splash-proof must not be located where they are likely to be subject to the weather or splashing.	
Applicability – 3.8.1 is an Advice check for privately owned and managed vessels, but is a mandatory Requirement for hire boats. Applicability – shore-power inlet connections marked with an IP rating (e.g. IP44) where the second figure is '4' or higher, provides acceptable evidence of suitable proprietary manufacture and splash-proof design. Applicability – do not disconnect shore power leads, but if present the owner should be invited to, providing they first make the system safe to do so. Applicability – if an obvious risk of electrocution is identified take the actions described in Appendix A. Applicability – in the event significant overheating is seen on inlet connections take the actions described in Appendix A and B.		

3.8.2	Are all shore-power and other AC power source lead connections of a suitable type?	A/R
Check the type of any shore-power or other AC lead connections where they can be seen. Check for the presence of any alternating current leads used to connect individual power sources (e.g. generators and inverters) to the alternating current distribution system. Where such leads are present check the type (e.g. male plug, or female socket) of the lead connections.	Shore-power leads must be fitted with a female type socket at the end which connects to the vessel's inlet connection. Alternating current leads within the vessel used to connect individual power sources to the vessel's alternating current distribution system must be fitted with a male type plug (or be permanently connected) at the end which connects to the power source, and a female type socket at the end which connects to the distribution system.	
Applicability – 3.8.2 is an Advice check for privately owned and managed vessels, but is a mandatory Requirement for hire boats. Applicability - do not disconnect alternating current leads, but if present the owner should be invited to, providing they first make the system safe to do so. Applicability – if an obvious risk of electrocution is identified take the actions described in Appendix A.		

3.8.3	Are all shore-power and other AC power source leads and connectors in good condition?	A/R
Check the condition of any shore-power and other AC power source lead cables where they can be seen. Check the condition of the connectors fitted to the cable/s.	Shore-power and other AC power source lead cables must be free of: • signs of damage or deterioration; **and,** • repairs. Shore-power and other AC power source lead connectors must be complete, secured onto the cable with no inner conductors visible, and be free of: • signs of damage or deterioration; **and,** • repairs.	
Applicability – 3.8.3 is an Advice check for privately owned and managed vessels, but is a mandatory Requirement for hire boats. Applicability – do not disconnect shore-power and other AC power source leads, but if present the owner should be invited to, providing they first make the system safe to do so. Applicability – if an obvious risk of electrocution is identified take the actions described in Appendix A. Applicability – in the event significant overheating is seen on shore-power leads or other AC power source leads or their connections take the actions described in Appendix A and B.		

3.9 Alternating current (AC) systems – multiple power sources and consumer units

3.9.1	Is it impossible to connect simultaneously more than one power source to the AC distribution system?	A/R
Check for the presence of one or more AC shore-power inlet connections. Check for the presence of additional AC power sources (e.g. generators and inverters). If two or more power sources are identified, visually check for the presence of one or more means of selection between all the identified power sources.	Only one power source may be connected to the AC distribution system at any one time. The male pins on shore-power inlet connections must not be 'live' when an alternative power source is connected to the alternating current distribution system.	
Applicability – 3.9.1 is an Advice check for privately owned and managed vessels, but is a mandatory Requirement for hire boats. Applicability – the Requirement for only one power source to be connected does not apply to synchronised multiple power sources. In cases where the boat owner claims that multiple power sources are synchronised but this cannot be verified, the Examiner should contact the BSS Office for guidance. Applicability – power source selectors may comprise of a multi-position manual switch, an electronic switch, or a single (male type) plug connector on the alternating current distribution system and a range of leads with corresponding (female) sockets attached to the individual power sources (see Check 3.8.2). It is also possible there may be more than one selection facility. Applicability – Examiners are only required to identify whether AC power source selector(s) are present, they are not required to establish whether the power source selector(s) prevent more than one power source being connected to the AC distribution system at any one time. Examiners must not operate power source selectors. Applicability – in the event a fault is identified take the actions described in Appendix A.		

3.9.2	Do all AC electrical circuits pass through a consumer unit?	A/R
Check, where they can be seen, that all AC electrical circuits pass through a consumer unit (also known as fuse/circuit-breaker box or distribution board).	All AC circuits must pass through a consumer unit.	
Applicability – 3.9.2 is an Advice check for privately owned and managed vessels, but is a mandatory Requirement for hire boats. Applicability - Examiners are encouraged to confirm during prior dealings with the owner, the location of the consumer unit(s). Applicability – for the purpose of this Check, residual current breakers with overcurrent protection (RCBOs) may be considered an acceptable alternative to a consumer unit. Applicability – in cases where the only power source is via a shore-power lead, an acceptable alternative to a consumer unit is an RCD, MCB or RCBO incorporated within the lead. Guidance for owners – there is no BSS Requirement for a Residual Current Device (RCD) to be incorporated within the main consumer unit or otherwise installed. However, it is strongly recommended that a Residual Current Device (RCD) is installed to provide appropriate electric shock protection on AC systems.		

BSS Examination Checking Procedures – Part 4

Electrical propulsion systems

There is one relevant BSS General Requirement:

12.	**All motors, controller equipment and charging equipment relating to electrical propulsion must be adequately ventilated.**

BSS General Requirements 1, 8, 9, 10 and 11 are relevant to the power supply or the securing of the engine.

4.1 Electrically propelled boats

4.1.1	Check Item 4.1.1 is intentionally not used.	

4.2 Electrical propulsion motor and controller

4.2.1	**Are all parts of the electric-propulsion motor mounting systems secure and in good condition?**	**R**
Check electrical-propulsion motor mounting systems for condition and completeness where they can be seen or reached. Apply light manual force to check the extent of any electric outboard motor movement.	Electrical-propulsion motor mounting systems must not show signs of damage or deterioration, including: • fractured engine mounting brackets; **or**, • loose, missing or fractured bolts or nuts; **or**, • evidence of significant breakdown of any flexible mounts; **or**, • damaged, rusted or rotten motor bearers. Electric outboard motors must be securely mounted so that there is no movement in any direction at the mounting points.	
Applicability – the Check for condition and completeness includes mounting systems to electric outboard motors. Applicability – Examiners need not apply light manual force to electric outboard motors assessed to be too heavy to move.		

4.2.2	Is the motor and controller equipment adequately ventilated and in good condition?	R
Check for any means to dissipate heat from the motor and controller equipment. Check the condition of the motor and controller equipment and the surrounding surfaces where they can be seen.	Electric-propulsion motor and controller equipment spaces must be adequately ventilated by: • the volume of the space being 10 or more times greater than the volume of the equipment; **or,** • the provision of ventilation into the space. Electric-propulsion motor and controller equipment must not show signs of damage or deterioration, including: • any obviously missing components; **or**, • water ingress; **or**, • overheating on the equipment or the surrounding surfaces.	
Applicability – liquid-cooled electric propulsion motors, and liquid cooled controllers, are not subject to the Requirements for adequate ventilation at this Check. Applicability – this Check does not apply to outboard electric motors. Applicability – where the ventilation of the electric motor or controller equipment is found not to comply with the Requirements set out above and the boat is CE marked according to the Recreational Craft Directive, Examiners should contact the BSS Office for guidance. Guidance for owners – although not a BSS Requirement, controller equipment spaces should be ventilated at high and low level to ensure the adequate dispersion of heat from the controller.		

4.3 Battery charging equipment

4.3.1	Is the battery charging equipment ventilated, complete and in good condition?	R
Check for any means to dissipate heat from the battery charging equipment. Check the condition of battery charging equipment and the surrounding surfaces where they can be seen.	Battery-charging equipment spaces must be adequately ventilated by: • the volume of the space being 10 or more times greater than the volume of the equipment; **or**, • the provision of ventilation into the space. Battery-charging equipment must not show signs of damage or deterioration, including: • obviously missing components; **or**, • water ingress; **or**, • overheating on the equipment or the surrounding surfaces.	
Applicability – this Check does not require the removal of covers provided by the battery charging equipment manufacturer. Guidance for owners – although not a BSS Requirement, battery-charging equipment spaces should be ventilated at high and low level, to ensure the adequate dispersion of heat from the charger.		

BSS Examination Checking Procedures – Part 5

Outboard and portable combustion engines, portable fuel systems and spare fuel

There are three relevant BSS General Requirements:

13.	**All portable and outboard engines and portable fuel systems must be designed, installed and maintained in a way that minimises the risks of explosion or of fire starting and spreading.**
14.	**All spare petrol must be stored in a way that minimises the risk of fire and explosion.**
15.	**All portable and outboard engines with integral petrol or LPG tanks, and all portable petrol tanks, must be stored in a way that minimises the risks of fire or explosion when not in use.**

5.1 Permanently installed fuel systems supplying outboard and portable engines

5.1.1	**Do permanently installed fuel systems supplying outboard and portable combustion engines comply with the applicable BSS Requirements for the fuel supply system?**	**R**
Identify permanently installed fuel systems supplying outboard and portable combustion engines. Apply the relevant Part of the BSS Examination Checking Procedures to the permanently installed fuel system.	Permanently installed fuel systems supplying outboard and portable combustion engines must be compliant with the applicable BSS Requirements of Part 2 or Part 7.	
Applicability – outboard engines supplied with fuel from permanently installed LPG systems are assessed by special arrangement with the BSS Office. See Check Item 5.5.1. Applicability – in the event an Examiner identifies a portable combustion engine other than an outboard engine (e.g. a portable LPG or petrol generator) supplied with fuel from a permanently installed fuel system the BSS Office should be contacted for guidance. Applicability – fuel hoses in permanently installed fuel systems to outboard engines may be to type B1 or B2 of ISO 8469 (or be suitable proprietary outboard engine fuel hose), provided the hose and its connections are located where any fuel spillage would drain overboard (e.g. self-draining cockpits or outboard wells). Open vessels such as RIBs having a continuous deck or sole that is fuel-tight to the interior of the vessel and bilge spaces, meet this Requirement. On such fuel system installations, the Checks at Part 2, sections 10 and 11 apply to the hose and its connections. Supporting information on permanently installed fuel systems supplying outboard engines is provided at Appendix 5.		

5.2 Portable fuel systems

5.2.1	Are all components of portable fuel systems of suitable proprietary manufacture?	R

Check the type of all components of portable fuel systems including the tank, fuel hose and priming bulb, and hose connections. Where individual components cannot be identified as being of suitable proprietary manufacture from visual assessment alone, examine any presented declaration from the manufacturer or supplier.	Portable fuel system components must be of suitable proprietary manufacture, for example: • tanks must be intended for use with the fuel in use; • the maximum capacity of tanks must not exceed 30 litres, and they must be fitted with a carrying handle; • it must be possible to disconnect tanks from the fuel system or engine without the use of tools, in a way that prevents spillage of fuel, for removal and filling outside the vessel; • hoses and other fuel components must be intended for use with the fuel in use; • hose connections must be secured with proprietary clamps, clips or ties. Portable fuel system components not identified through visual assessment to be of suitable proprietary manufacture may be supported by an appropriate declaration from the manufacturer or supplier.

Examiner action – Examiners must refer to Section 1 of Appendix 5 for essential information on portable fuel systems of suitable proprietary manufacture.

Applicability – where an outboard or portable combustion engine intended to be supplied with fuel from a portable fuel system is present during an Examination, a complete portable fuel system must also be present. In such circumstances, where a complete portable fuel system is not present mark your checklist at Part 5 as 'not verified'. It must be considered that the Part 5 Checks have not been completed until such time as a complete portable fuel system can be examined.

Applicability – where outboard engine fuel lines across outboard wells are routed through trunking of suitable proprietary manufacture, with tools to remove connections at the engine and outboard well bulkhead, Examiners are not required to apply the Checking action to the enclosed fuel line. However, in such cases Examiners must check the trunking for signs of fuel leaks. A fuel leak should be recorded as a non-compliance at Check 5.2.2.

Applicability – In the event an Examiner identifies a portable fuel system supplying a permanently installed inboard engine, refer to Check 2.15.3.

5.2.2	Are all components of portable fuel systems complete and in good condition?	R

Check the completeness and condition of all portable fuel system components including the tank, fuel hose and priming bulb, and hose connections by sight and touch. Check the completeness and condition of support structures and fixings on transom-mounted tank arrangements where they can be seen or reached.	Portable fuel system components must be complete including the fuel tank cap, the hose, and hose clamps/clips/ties. Components of portable fuel systems must be free of: • fuel leaks; **and**, • signs of damage or deterioration; **and**, • signs of repair**.** The support structures and fixings on transom-mounted tank arrangements must be complete and free of signs of damage or deterioration.

Examiner action – Examiners must refer to Section 1 of Appendix 5 for essential information on damage or deterioration of portable fuel systems components.

Applicability – all external surfaces and seams on components, including tank undersides, should be examined.

5.3 Spare fuel containers and spare portable petrol tanks

5.3.1	Are all spare fuel containers in good condition?	R
Check the condition of spare fuel containers by sight and touch.	All spare fuel containers must be free of: • fuel leaks; **and,** • signs of damage or deterioration; **and,** • signs of repair**.**	
Examiner action – Examiners must refer to Section 1 of Appendix 5 for essential information on damage or deterioration of spare fuel containers. Applicability – the condition of any spare portable petrol tank is covered at Check 5.2.2. Applicability – this Check covers spare petrol and spare diesel containers.		

5.3.2	Are all spare petrol containers suitable for the purpose?	R
Check the markings on all spare petrol containers.	Spare petrol containers must be marked as suitable for the purpose. Markings must be in an indelible form and legible and include: • the words 'PETROL' and 'HIGHLY FLAMMABLE'; • an appropriate hazard warning sign; • the capacity marked in litres or gallons. Individual spare petrol containers made from plastic must have a marked capacity of no more than 10-litres. Individual spare petrol containers made from metal must have a marked capacity of no more than 20-litres.	
Applicability – providing all the other required markings are present, suitable spare petrol containers that are not marked with an appropriate hazard warning sign may be accepted. Applicability - the suitability of any spare portable petrol tank is covered at Check 5.2.1. Guidance for owners – the marked capacity of spare petrol containers allows for the expansion of fuel with changes in temperature; boat owners should be careful not to overfill containers beyond their marked capacity. Guidance for owners – to be compliant with the Petroleum (Consolidation) Regulations 2014 boat owners must ensure all portable petrol storage containers are legibly and indelibly marked/labelled with i) an appropriate hazard warning sign, ii) manufacturer's name and iii) the date and month of manufacture. The Regulations apply to all boat owners and it is the responsibility of individual boat owners to ensure compliance. Supporting information on the Petroleum (Consolidation) Regulations 2014 is provided at Appendix 5.		

5.3.3	**Are all spare petrol containers, and any spare portable petrol tank, limited to the permitted number and capacity?**	**R**
Check the number of spare petrol containers and check their individual and combined marked capacity. Check for the presence of a spare portable petrol tank and check its marked capacity.	The number and capacity of spare petrol containers, and any spare portable petrol tank, must be limited to a total of 30 litres using one of the following options: • Only one spare portable petrol tank with a marked capacity of no more than 30 litres; **or,** • One spare portable petrol tank with a marked capacity of no more than 30 litres (which the boat owner may fill up to 20 litres) **and** up to two spare petrol containers with an individual or combined marked capacity of no more than 10 litres, **or,** • Two spare petrol containers with a combined marked capacity of no more than 30 litres	
Applicability – spare portable petrol tanks are those not connected to the engine. Applicability – Examiners are not required to measure or estimate the actual capacity of petrol in any spare portable petrol tank or container. Applicability – the carriage of spare diesel is not restricted by volume. Guidance for owners - The Petroleum (Consolidation) Regulations 2014 stipulate that the amount of spare petrol carried on a boat is limited to a maximum of 30 litres. The Regulations apply to all boat owners and it is the responsibility of individual boat owners to ensure compliance.		

5.3.4	**Are all spare petrol containers and any spare portable petrol tank, stored to ensure that any leaking fuel or escaping vapour will not enter the interior of the vessel?**	**R**
Check the storage arrangements of spare petrol containers. Check the storage arrangements of any spare portable petrol tank.	Spare petrol containers, and any spare portable petrol tank, must be stored in: • an open location complying with the open location specifications at Check item 7.1.1; **or,** • a locker complying with the Requirements at the Check items in sections 7.2 to 7.5.	
Applicability – where the stowage arrangements for spare petrol containers, and any spare portable petrol tank, are found not to comply with this Requirement, but the vessel is CE marked according to the Recreational Craft Directive, Examiners should contact the BSS Office for guidance.		

Outboard and portable combustion engines

5.4.1	**Are all outboard and portable combustion engines free of fuel leaks?**	**R**
Check for the presence of leaking fuel on or around all outboard and portable combustion engines by sight and touch.	Outboard and portable combustion engines must be free of fuel leaks.	
Applicability – this Check covers all outboard and portable combustion engines, including such items as chainsaws, but when applying the Checking action Examiners are not required to remove the manufacturer's outboard covers or generator hush covers.		

5.4.2	**Are all outboard and portable combustion engines with integral petrol tanks or LPG cartridges stored to ensure that leaking fuel or escaping vapour will not enter the interior of the vessel?**	**R**
Check the storage arrangements of outboard and portable combustion engines with integral petrol tanks or LPG cartridges.	Outboard and portable combustion engines with integral petrol tanks or LPG cartridges must be stored in: • an open location complying with the open location specifications at Check item 7.1.1; **or,** • a locker complying with the Requirements at the Check items in sections 7.2 to 7.5.	
Applicability – this Check only applies to outboard and portable combustion engines with integral petrol tanks, or LPG cartridges, that are being stored at the time of the Examination. Engines that are running or connected (e.g. outboards mounted on the craft's transom, or portable generators connected to the craft's electrical system) at the time of the Examination are not subject to this Check. Examiner action – where the stowage arrangements for outboard and portable combustion engines with integral petrol tanks or LPG cartridges not in use are found not to comply with this Requirement, but the vessel is CE marked according to the Recreational Craft Directive, Examiners should contact the BSS Office for guidance.		

5.4.3	**Are outboard engine mounting systems in good condition?**	**R**
Check the condition of outboard engine mounting systems where they can be seen or reached. Assess the extent of any movement by applying light manual force to the outboard engine.	Outboard engine mounting systems must be free of signs of damage or deterioration. Outboard engines must be securely mounted so that there is no movement in any direction at the mounting points.	
Applicability – Examiners need not apply light manual force to outboards assessed to be too heavy to move.		

LPG-fuelled outboard propulsion engines

5.5.1	**Do the fuel supply arrangements to LPG-fuelled outboard engines comply with BS EN ISO 15609 or equivalent standard and are any dual-fuel petrol/LPG arrangements of an acceptable type?**	**R**
[LPG-fuelled outboard engines can only be checked for compliance by prior arrangement by the owner with the BSS Office] Check the fuel supply type to outboard engines and identify those fuelled by LPG or dual-fuel petrol/LPG.	The fuel supply arrangements to LPG-fuelled outboard engines must comply with BS EN ISO 15609 or an equivalent standard. Any dual-fuel arrangements must be installed and maintained in accordance with the engine manufacturer's guidelines for marine applications.	
Applicability - Examiners should seek to establish engines fuelled by LPG during initial dealings with customers and in cases where LPG fuelled outboard engines are identified customers should be advised to contact the BSS Office who can arrange for an Examiner competent to apply BS EN ISO 15609 to undertake a full examination of the boat. Applicability – all Examiners may determine compliance of portable LPG-fuelled generators, and outboard engines powered solely by LPG cartridges, to applicable BSS Requirements.		

BSS Examination Checking Procedures – Part 6

Fire Extinguishing, Escape and Carbon Monoxide Alarms

There are two relevant BSS General Requirements:

16. **All vessels must carry specified fire fighting equipment.**
17. **All fire fighting equipment must be maintained in good condition and kept readily accessible for safe use in an emergency.**

6.1 Portable fire extinguishers

6.1.1	**Are the correct number of suitable portable fire extinguishers provided, and do they have the correct combined fire ratings?**	**R**

Identify all portable fire extinguishers on board.

Check all portable fire extinguishers for their individual fire ratings, accredited third-party certification marks, and condition.

The minimum number of suitable portable fire extinguishers and their minimum combined fire ratings must be as prescribed in the following table.

To be considered as suitable, portable fire extinguishers must:

- have an individual fire rating of 5A/34B or greater; **and**,
- be marked with at least one accredited third-party certification mark; **and**,
- not show any of the following indicators of poor condition:
  - missing safety pin;
  - dents; gouges; significant rust or other form of corrosion;
  - perished hose;
  - pressure gauge (where fitted) indicator in the 'red' sector;
  - obvious under-weight indicating whole or partial discharge;
  - signs of damage or deterioration to trigger assembly, including deterioration caused by ultraviolet light and heat.

The minimum number of suitable portable fire extinguishers may be reduced by a maximum of one 5A/34B rated extinguisher where the vessel has either no internal combustion engines, or no fuel-burning appliances.

Length of vessel	Minimum number	Minimum combined fire rating
Under 7m (23ft)	2	10A/68B
7–11m (23–36ft)	2	13A/89B
Over 11m (36ft)	3	21A/144B

Examiner action – Examiners must refer to Section 1 of Appendix 6 for essential information on accredited third-party certification marks for portable fire extinguishers.

Examiner action - Examiners are not required to check the standard to which extinguishers have been manufactured. Extinguishers carrying one of the accredited third-party certification marks may have been manufactured to either the previous British Standard BS 5423 or the current standard BS EN3.

Applicability – a portable fire extinguisher having passed the manufacturer's warranty date is not an indicator of poor condition.

Applicability – portable fire extinguishers manufactured prior to 1980 may not have fire ratings marked on the extinguisher. In cases where the boat owner claims such an extinguisher has been previously accepted by the BSS as compliant under a navigation authority's former requirements, and the extinguisher is found to carry an accredited third-party certification mark and be in good condition, the Examiner should contact the BSS Office.

Applicability – fuel-burning appliances include those fuelled by LPG, diesel, paraffin, spirit and solid fuels.

Supporting information on portable fire extinguishers is provided at Appendix 6.

6.1.2	**Are portable fire extinguishers distributed around the vessel in readily accessible and safe locations adjacent to escape routes?**	**R**
Check the accessibility and location of the portable fire extinguishers identified as contributing to the required complement at 6.1.1.	Portable fire extinguishers must be readily accessible. Portable fire extinguishers must be distributed around the vessel adjacent to escape routes. Portable fire extinguishers must not be mounted in a position that requires the user to reach over a cooking appliance.	
Applicability – 'adjacent to escape routes' means a location on the way out from the accommodation space. Applicability – the location of any fixed portable fire extinguisher brackets may be used to determine the normal location of any extinguishers found lying loose at the time of an Examination. Guidance for owners – extinguishers are best placed on escape routes to allow occupants to decide whether it is safe to fight a fire or escape. Guidance for owners – although not a BSS Requirement, it is strongly recommended that portable fire extinguishers are mounted on fixed brackets.		

6.1.3	**Are all portable fire extinguishers in open view or their location clearly marked?**	**R**
Identify the location of all portable fire extinguishers identified as contributing to the required complement at 6.1.1. Where portable fire extinguishers are not in open view with all removable lids, doors, curtains etc in place, check for the presence of a label in open view indicating their location.	Portable fire extinguishers, must: • be in open view with all removable lids, doors, curtains etc in place; **or**, • have their location clearly marked by a label in open view.	
Guidance for owners – the preferred label may be available from local chandlers, internet based suppliers, builders merchants, hardware and DIY stores and has a red background and white image (or off-white luminous) extinguisher. Examples of proprietary designs are shown here. 		

6.2 Fire blankets

6.2.1	**If the vessel has permanently installed cooking facilities, is a fire blanket of the correct specification provided?**	**R**
Check for the presence of permanently installed cooking facilities and, if present, check for the provision of a fire blanket. Check any markings on the fire blanket container.	If permanently installed cooking facilities are present a fire blanket marked to indicate conformity to BS EN 1869, or to BS 6575, must be provided.	
Applicability – permanently installed cooking facilities are those which would require tools to disconnect and/or remove them. Microwave ovens are not permanently installed cooking facilities in the context of this Check. Applicability – if no markings are present on the fire blanket container, conformity to the listed standards may be supported by the boat owner or their representative removing the blanket and confirming the blanket itself is marked. Conformity may also be supported by a written declaration from the blanket manufacturer or supplier. Applicability – occasional use of solid fuel stoves for cooking does not require the provision of a fire blanket. In cases where a solid fuel stove is the only potential permanently installed cooking facility Examiners should establish from the boat owner or their representative whether the stove is used for cooking on a regular basis. Supporting information on fire blankets, including manufacturing standards is provided at Appendix 6.		

6.2.2	**Is the fire blanket located close to the main cooking appliance in a safe and ready-to-use location?**	**R**
Check the location of the fire blanket.	Fire blankets must be located in a readily accessible position within approximately 2m of the main cooking appliance, and not mounted in a position that requires the user to reach over the cooking appliance.	
Applicability – the main cooking appliance should normally be taken as the hob. Guidance for owners – although not a BSS Requirement, it is strongly recommended that fire blanket mountings should be fixed permanently in position to allow rapid access and use.		

6.3 Emergency escape

6.3.1	Is the vessel provided with adequate means of escape?	A/R
Check each accommodation space for the means to escape. Measure the minimum dimensions of clear openings used as a means of escape such as hatches, windows or ports. If a fixed window or port is designated an escape route, check that a means of 'breaking-out' is present.	Each accommodation space must have at least two means of escape. The minimum clear opening for a means to escape is 0.18 m^2.and all openings must accommodate a 380mm diameter circle. A means of 'breaking out' any fixed window or port designated as an escape route must be stored adjacent to it.	

Applicability – 6.3.1 is an Advice check for privately owned and managed vessels, but is a mandatory Requirement for hire boats.

Applicability – individual accommodation spaces (cabins), with one door opening into a fore-aft passageway need not have a second means of escape so long as the passageway allows escape at each end.

Applicability – where a hire boat is CE marked according to the Recreational Craft Directive but there are not two means of escape from each accommodation space Examiners should contact the BSS Office for guidance.

Guidance for owners – on boats where a means of escape is locked from the outside, it should remain unlocked at all times when the boat is in use. Furthermore, means of escape should never be obstructed, particularly from outside the accommodation space (e.g. by storing items within the forward well deck on a narrowboat).

Guidance for owners – avoid cutting or removing of structural members, e.g. deck beams, frames or stiffeners, to achieve a second means of escape.

Guidance for owners – if a window or hatch is the secondary means of escape, if one is not already fitted, owners are guided to fit a proprietary label to help people not familiar with the craft to escape in the event of an emergency.

Supporting information on means of escape is provided at Appendix 6.

6.4 Carbon monoxide alarms

6.4.1	If the vessel has one or more accommodation space(s), are the correct number of carbon monoxide alarms provided?	R

Identify the presence of one or more accommodation space(s). If present, check for the presence and location of carbon monoxide alarm(s). Check by visual assessment and, if necessary, measure the distance between carbon monoxide alarm(s) and any door that links accommodation spaces.	All vessels having one or more accommodation space(s) must be provided with at least one carbon monoxide alarm. A carbon monoxide alarm must be located within 10m of any door that links accommodation spaces.

Examiner action – Examiners must refer to Section 1 of Appendix 6 for essential information on measuring the distance between a carbon monoxide alarm and any door that links accommodation spaces.

Applicability – where there is only a single, open-plan accommodation space only one carbon monoxide alarm is required irrespective of the size of the space.

Guidance for owners – this is a minimum safety requirement, intended to provide a warning that is audible throughout the boat, related to carbon monoxide entering the boat from outside sources. For the best protection from carbon monoxide entering the boat from sources outside and inside the boat follow the carbon monoxide alarm manufacturer's or supplier's advice about the number and placement of alarms as far as the space and nature of the boat allow. Make sure alarms are audible to all craft occupants. More information about staying safe from carbon monoxide on boats is available at www.boatsafetyscheme.org/co and within the CoGDEM/BSS CO Safety on Boats leaflet.

Supporting information on carbon monoxide alarms is provided at Appendix 6.

6.4.2	If any solid fuel stoves are installed, and if the vessel has berths present within any accommodation space, is a carbon monoxide alarm provided within the same accommodation space(s) as the solid fuel stove(s)?	A/R

Identify the presence of any solid fuel stove and whether berths are present within any accommodation space. If any solid fuel stove(s) and berths within any accommodation space(s) are present, check for the presence and location of carbon monoxide alarm(s).	All vessels having one or more solid fuel stove(s) installed, and where berths are present within one or more accommodation space(s), must be provided with a carbon monoxide alarm within each accommodation space that contains a solid fuel stove.

Applicability – 6.4.2 is an Advice check for privately owned and managed vessels, but is a mandatory Requirement for hire boats.

Applicability – the provision of a carbon monoxide alarm(s) in support of the Requirement at Check 6.4.2 does not have to be in addition to the provision at Check 6.4.1. Depending on the configuration of the accommodation spaces (see 2nd Requirement at Check 6.4.1) one correctly located alarm might be all that is required to comply with Checks 6.4.1 and 6.4.2.

6.4.3	Are carbon monoxide alarms in open view and of a suitable type?	R
Where one or more carbon monoxide alarms have been found to be necessary at Checks 6.4.1 and/or 6.4.2, check the location of each required alarm. Check the markings on each required carbon monoxide alarm. Identify the test function button on each required carbon monoxide alarm.	Carbon monoxide alarms must be in open view with all cabin doors, cupboard doors, curtains and loose furniture etc in place. Carbon monoxide alarms must be marked as being certified by an accredited third-party certification body to BS EN 50291 or equivalent. Carbon monoxide alarms must be provided with a test function button.	
Examiner action – Examiners must refer to Section 1 of Appendix 6 for essential information on accredited third-party certification marks for carbon monoxide alarms. Applicability – the main accredited third-party certification bodies in the UK are BSI and LPCB. For the following makes of carbon monoxide alarm accredited third-party certification to BS EN 50291 can be assumed – BRK, Dicon, Ei Electronics, Fire Angel, FireHawk Alarms, First Alert, Honeywell and Kidde. For other makes, removing the alarm from its base may be necessary to view labels and approval marking on the base. Permission for removal should be sought from the owner (or representative). Documentary evidence of accredited third-party certification to BS EN 50291 is acceptable. Guidance for owners – although not a BSS Requirement, carbon monoxide alarms marked to the 'BS EN 50291-2' are the best choice for boats. They have been tested to meet the more onerous conditions found in boats. Supporting information on accredited third-party certification is provided at Appendix 6.		

6.4.4	Are carbon monoxide alarms in good condition?	R
Where one or more carbon monoxide alarms have been found to be necessary at Checks 6.4.1 and/or 6.4.2, visually check the condition of each required carbon monoxide alarm. Operate the test function button on each required carbon monoxide alarm.	Carbon monoxide alarms must be in good general condition, and must not show signs of any of the following indicators of poor condition: • damage or deterioration to the body of the alarm or the fixing mechanism; • having passed any manufacturer's express replacement date; • failing the test function test.	
Applicability – Examiners are not required to open up alarms to check for internal damage or deterioration or for manufacturer's express replacement dates. Applicability – some CO alarms have a manufacturer's label stating, for example, 'Replace 10 years after installation' and if the installation date has not been added to the label, then the express replacement date should be taken as 10 years after the stated manufacturing date.		

BSS Examination Checking Procedures – Part 7

Liquefied Petroleum Gas (LPG) systems

There are seven relevant BSS General Requirements:

18.	**All LPG systems must be designed, installed and maintained in a way that minimises the risks of explosion or of fire starting and spreading.**
19.	**All LPG containers and high-pressure components must be secured in a position where escaping gas does not enter the interior of the vessel.**
20.	**All LPG systems must be designed, installed and maintained to ensure gas-tight integrity.**
21.	**All LPG system connections and flexible hoses must be accessible for inspection.**
22.	**All LPG control and shut-off devices, or the means to operate them must be readily accessible.**
23.	**LPG shut-off valves, or their means of operation, must be marked when not in clear view or when their function is not clear.**
24.	**All LPG systems must have a suitable means to test that the system is gas-tight.**

7.1 LPG cylinder storage

7.1.1	**Are all cylinders and cartridges stored in a position where any escaping LPG vapour will be directed safely overboard?**	**R**

Check for the presence of any cylinders or cartridges. If present, check whether their location is either in a cylinder locker, a housing, or an open location. If located in a cylinder locker apply the relevant Check Items at sections 7.2-7.5. If located in a cylinder housing apply the relevant Check Items at sections 7.2 - 7.4. If cylinders or cartridges are to be examined as being in an 'open location', check: • for any barriers that might prevent escaping LPG vapour flowing overboard unimpeded; and, • for any openings into the interior of the vessel, or any source of ignition, within 0.5m distance; and, • if the cylinders or cartridges are in a cockpit, determine if the cockpit is 'self-draining' as set out in section 1 of Appendix 7.	All cylinders and cartridges, whether full, part full or empty must be stored either: • in a cylinder locker complying with the relevant Requirements of the Check Items in sections 7.2-7.5; **or,** • in a cylinder housing complying with the relevant Requirements at Check Items 7.2 - 7.4; **or,** • in an open location. To be accepted as being stored in an 'open location' cylinders and cartridges must: • be in a position where any escaping LPG vapour would flow overboard unimpeded; **and,** • be where there is no opening into the interior of the vessel, or any source of ignition, within 0.5m distance. For cylinders or cartridges to be accepted as being in an 'open location' in a cockpit, the cockpit must comply with the 'self-draining' specifications set out in section 1 of Appendix 7.

Examiner action – Examiners must refer to section 1 of Appendix 7 for essential information on 'self-draining'
cockpits.
Examiner action – Examiners must refer to section 1 of Appendix 7 for essential information on measuring the
minimum separation between cylinders in the open and openings into the interior of the vessel or sources of ignition.

Applicability – sources of ignition include open-flame or spark-inducing equipment. Solenoid LPG system shut-off valves of suitable proprietary manufacture should be presumed not to be a source of ignition. Outboard motors within 0.5m of cylinders are not to be considered a source of ignition.

Supporting information on the difference between lockers and housings is provided at Appendix 7.

7.1.2	**Are all self-contained portable LPG appliances stored so that any escaping LPG vapour will be directed safely overboard?**	**R**
Check for the presence of self-contained portable appliances having cylinders or cartridges attached. If present, apply Check Item 7.1.1	All self-contained portable appliances having cylinders or cartridges attached must be stored in accordance with the Requirements of Check Item 7.1.1.	
Applicability – this Check applies to camping-style appliances but not items such as refillable butane gas hob lighters. Guidance for owners – self-contained portable appliances should never be used on board boats as during use there is a risk of fire and/or explosion. Supporting information on self-contained portable appliances is provided at Appendix 7.		

7.2 LPG cylinder locker and housing LPG-tightness

7.2.1	**Is the cylinder locker, up to the level of the top of the cylinder valves or other high-pressure components, free of any path for escaping LPG vapour to enter the interior of the vessel?**	**R**
Determine the level of the top of the cylinder valves, or other high-pressure components where these are located higher. Determine the height of the cylinder locker sides. Determine which parts of the locker structure if holed or damaged could create a path for escaping LPG vapour to enter the interior of the vessel. Visually check the condition of the internal surfaces and seams of all cylinder lockers. Visually check the condition of the external surfaces and seams of all cylinder lockers where they can be seen.	The sides of every cylinder locker must extend at least up to the level of the top of the cylinder valves, or other high-pressure components where these are higher. Up to the level of the top of the cylinder valves, or other high-pressure components where these are higher, the bottom, sides, and seams of every cylinder locker must be free of any: • holes, e.g. caused by drilling, rust or cutting; **or,** • cracks, splits or de-laminations; **or,** • missing or damaged welds at seams; **or,** • other signs of damage or deterioration… …. that can be identified by visual examination to penetrate the locker to the interior of the vessel.	
Examiner action – prior to checking the condition of cylinder lockers Examiners must ensure all loose portable items are removed. Examiner action – where a part of the locker is obstructed, e.g. by the cylinders themselves, a false base or mat, or ponded water, then the Check cannot be completed until the obstruction has been removed, moved aside or cleared. Examiners should not disconnect cylinders connected to the LPG system, but where cylinders prevent the condition of the locker being verified the Check cannot be completed until the cylinders have been moved to allow access. Lockers not accessible enough to allow an assessment of condition must be recorded as 'not verified' on your checklist, and it must be considered that the Check has not been completed until such time as their condition has been verified. Applicability – hatches and any similar temporary openings, however constructed or sealed, are not permitted within the area of cylinder lockers covered by this Check. Guidance for owners – locker corrosion may lead to a leak path for LPG vapour to enter the interior of the vessel. Cylinder lockers should be maintained in good condition.		

7.2.2	**Are the sealing arrangements on LPG pipework exiting the cylinder locker of the correct type to ensure LPG-tightness and in good condition?**	**R**

Visually check the position, type and condition of sealing arrangements on LPG pipework exiting cylinder lockers. Where the pipework exits a locker below the highest point of the high-pressure components apply light manual force to the pipework and check for signs of movement at the sealing arrangement.	LPG pipework that exits cylinder lockers below the highest point of the high-pressure stage components must be sealed by either: • a bulkhead fitting; **or,** • a cable gland fitting; **or,** • sealant. The sealing arrangements must be free of signs of gaps or other forms of damage or deterioration. There must be no movement of the pipework within the sealing arrangement when light manual force is applied to the pipework. Where sealant is used it must completely fill the area between the pipe and the adjacent locker structure, and it must not noticeably move or dislodge, and gaps must not open when light manual force is applied to the LPG pipework.

Applicability – it is acceptable for pipework to exit a locker into a conduit with the gap between the pipework and the conduit sealed with sealant. The conduit must also be sealed to the locker structure.

Applicability – the Requirements also apply to electrical cables routed to ignition protected solenoid shut-off valves, where they pass through locker sides below the highest point of the high-pressure stage components.

7.2.3	**Are side-opening cylinder locker doors located where any escaping LPG vapour would flow overboard unimpeded?**	**R**

Check that any side-opening cylinder locker door is located where any escaping LPG vapour would flow overboard unimpeded. If the side-opening locker door is in a cockpit check the arrangements against the specifications for 'self-draining' cockpits and 'open transom' cockpits in section 1 of Appendix 7.	Side-opening cylinder locker doors must only be openable where any escaping LPG vapour would flow overboard unimpeded. For side-opening locker doors in cockpits to be accepted as being located where any escaping LPG vapour would flow overboard unimpeded the cockpit must comply with the: • 'self-draining'; **or**, • 'open transom' … … specifications set out in section 1 of Appendix 7.

Examiner action – Examiners must refer to section 1 of Appendix 7 for essential information on 'self-draining' and 'open transom' cockpits.

Applicability - where side-opening cylinder locker arrangements are found not to comply with this Requirement, but the vessel is CE marked according to the Recreational Craft Directive, Examiners should contact the BSS Office for guidance.

7.2.4	**Where required, are side-opening locker door seals continuous, in good condition and effective?**	**R**

For side-opening lockers where the door opening is in a cockpit with an 'open-transom' (other than those that are also 'self-draining'), check for the presence of a continuous seal around the door or opening, and check the condition of the seal. For side-opening lockers where the door opening is within 0.5m of any opening into the interior of the vessel, or any source of ignition, check for the presence of a continuous seal around the door or opening, and check the condition of the seal. With the door shut, visually check for signs of gaps between the door seal and the locker body.	Side-opening lockers located in cockpits with 'open transoms' (other than those that are also 'self-draining') must be fitted with a continuous seal around the whole door. Side-opening lockers with door openings within 0.5m of an opening into the interior of the vessel, or any source of ignition, must be fitted with a continuous seal around the whole door. On side-opening doors where seals are required, the seals must be free of signs of: • damage or deterioration; **and**, • gaps with the locker body when the door is closed.

Examiner action – Examiners must refer to section 1 of Appendix 7 for essential information on 'self-draining' and 'open transom' cockpits.

Examiner action – Examiners must refer to section 1 of Appendix 7 for essential information on measuring the minimum separation between side-opening cylinder lockers and openings into the interior of the vessel or sources of ignition.

Applicability – sources of ignition include open flame or spark inducing equipment. Solenoid LPG system shut-off valves of suitable proprietary manufacture should be presumed not to be a source of ignition.

7.2.5	**Is the cylinder housing opening(s) in an 'open location', and is the housing ventilated to the outside?**	**R**

Identify any cylinders or cartridges stored in housings. Determine whether the housing opening is in an 'open location' by checking: • for any barriers that might prevent escaping LPG vapour flowing overboard unimpeded; • for any openings into the interior of the vessel, or any source of ignition, within 0.5m distance; and, • if the cylinders or cartridges are in a cockpit determine if the cockpit is 'self-draining' as set out in section 1 of Appendix 7. Where the housing opening is fitted with a door(s), check for the presence of fixed ventilation to the outside when the door(s) is shut.	Cylinder housing openings must be in an 'open location'. To be accepted as being in an 'open location' housing openings must: • be in a position where any escaping LPG vapour would flow overboard unimpeded; **and,** • be where there is no opening into the interior of the vessel, or any source of ignition, within 0.5m distance. For housing openings to be accepted as being in an 'open location' in a cockpit, the cockpit must comply with the 'self-draining' specifications set out in section 1 of Appendix 7. Housings must be provided with fixed ventilation to the outside when any door(s) are shut.

Examiner action – Examiners must refer to section 1 of Appendix 7 for essential information on 'self-draining' cockpits.

Examiner action – Examiners must refer to section 1 of Appendix 7 for essential information on measuring the minimum separation between cylinder housing openings and openings into the interior of the vessel or sources of ignition.

Applicability - where cylinder housing arrangements are found not to comply with this Requirement, but the vessel is CE marked according to the Recreational Craft Directive, Examiners should contact the BSS Office for guidance.

Applicability - the nature and precise location of fixed ventilation for housings is not assessed.

Supporting information on the difference between lockers and housings is provided at Appendix 7.

7.2.6	**Is the cylinder housing free of any path for escaping LPG vapour to enter the interior of the vessel?**	**R**

Visually check the condition of the internal surfaces and seams of cylinder housings. Visually check the condition of the external surfaces and seams of cylinder housings where they can be seen. Determine which parts of the housing structure if holed or damaged could create a path for escaping LPG vapour to enter the interior of the vessel.	Housing sides, top and bottom must be free of: • holes, e.g. caused by drilling, rust or cutting; **or,** • cracks, splits or de-laminations; **or,** • missing or damaged welds at seams; **or,** • other signs of damage or deterioration… …. that can be determined by visual examination to penetrate the housing to the interior of the vessel.
Examiner action – prior to checking the condition of cylinder housings Examiners must ensure all loose portable items are removed. Examiner action – where a part of the housing is obstructed, e.g. by the cylinders themselves or a mat, then the Check cannot be completed until the obstruction has been removed, moved aside or cleared. Examiners should not disconnect cylinders connected to the LPG system, but where cylinders prevent the condition of the housing being verified the Check cannot be completed until the cylinders have been moved to allow access. Housings not accessible enough to allow an assessment of condition must be recorded as 'not verified' on your checklist, and it must be considered that the Check has not been completed until such time as their condition has been verified. Applicability – hatches and any similar temporary openings, however constructed or sealed, that open into the interior of the vessel are not permitted within housings.	

7.2.7	**Are the sealing arrangements on LPG pipework exiting the cylinder housing of the correct type to ensure LPG-tightness to the interior of the vessel?**	**R**

Determine whether LPG pipework exiting cylinder housings does so into the interior of the vessel. Where pipework exits cylinder housings into the interior of the vessel, visually check the type and condition of the sealing arrangements. Apply light manual force to the pipework and check for signs of movement at the sealing arrangement.	LPG pipework exiting cylinder housings into the interior of the vessel must exit through either: • a bulkhead fitting; **or,** • a cable gland fitting; **or,** • sealant**.** The sealing arrangements must be free of signs of gaps or other forms of damage and deterioration. There must be no movement of the pipework within the sealing arrangement when light manual force is applied to the pipework. Where sealant is used it must completely fill the area between the pipe and the adjacent housing structure, and it must not noticeably move or dislodge and gaps must not open when light manual force is applied to the LPG pipework.
Applicability – it is acceptable for pipework to exit a housing into a conduit with the gap between the pipework and the conduit sealed with sealant. The conduit must also be sealed to the housing structure. Applicability – the Requirements also apply to electrical cables routed to ignition protected solenoid shut-off valves where they pass through housing structures into the interior of the vessel.	

7.3 LPG cylinder locker drains

7.3.1	Is there a drain in the cylinder locker and is the drain outlet above the waterline?	R
Identify the presence of a cylinder locker drain in each cylinder locker. Identify the cylinder locker drain outlet on the outside of the hull and verify that it is above the normal laden waterline.	All cylinder lockers must be fitted with a drain facility. Cylinder locker drain outlets must be on the outside of the hull above the normal laden waterline.	
Applicability - on lockers where there is no drain line and the drain outlet is the hole through the locker side, if for any reason canal/river water can enter the cylinder locker through the drain outlet there must always be a higher drain outlet above water level. The area of the drain outlet above water level must be compliant with the drain aperture sizing Requirements at Check 7.3.6. Guidance for owners – on boats where river/canal water can enter a cylinder locker through a locker drain, boat owners are advised to regularly assess the condition of the locker for signs of damage or deterioration, Corrosion on steel lockers can create a path for water to enter the interior of the vessel. Owners are also advised to consider changing such cylinder locker arrangements to prevent river/canal water entering the drain and/or locker. Supporting information on cylinder lockers with openings below the normal laden waterline is provided at Appendix 7.		

7.3.2	Is the drain opening at or close to the bottom of the cylinder locker?	R
Check the location of the cylinder locker drain opening(s).	Cylinder locker drain openings must be located not greater than 30mm above the lowest point of the locker.	
Applicability – where drain openings are greater than 30mm above the lowest point of the locker structure it is acceptable for the space below the drain opening to be filled with a suitable material. Supporting information on the proximity of drain openings to the lowest point of cylinder lockers, and on filling space below cylinders, is provided at Appendix 7. Guidance for owners - on boats where the space below the drain opening is filled with a suitable material, boat owners are advised to occasionally remove the material and assess the condition of the locker material for signs of damage or deterioration.		

7.3.3	Is the cylinder locker clear of any items that could block the drain?	R
Check cylinder lockers for any items which could block the drain.	Cylinder lockers must be clear of any item which could block the drain.	

7.3.4	Does the drain line fall continuously from the cylinder locker to the drain outlet and are both ends clear of blockage?	R
Check the completeness and fall of the cylinder locker drain line to the drain outlet where it can be seen or reached. Check the drain openings in the cylinder locker and at the drain outlet for obstruction.	Cylinder locker drain lines must be continuous and must fall continuously to the drain outlet in the hull so as not to retain escaping LPG vapour. Drain openings in the cylinder locker and at the drain outlet must not be blocked.	
Examiner action – with the consent of the owner, a bucket of water can be used to aid verification of Check Items 7.3.4 to 7.3.6. Supporting information on drain line fall is provided at Appendix 7.		

7.3.5	Is the drain line material, including the connections, in good condition?	R
Check the condition of all cylinder locker drain line material that can be seen or reached. Check the condition of all drain line connections that can be seen or reached. Where connections can be reached, pull using light manual force to check the security of all drain line connections.	The material of drain lines must be free of signs of damage or deterioration. All connections must be complete and free of signs of damage or deterioration. Drain pipe connections must be appropriately tight, that is, not so loose that the connection or pipe moves under light manual force. Drain hoses must be free of any signs of damage or deterioration, including 'soft' spots or kinking of the walls. Drain hose connections made with hose clips or clamps must: • be suitably sized, that is, not so oversized that the band forms an elliptical shape or so undersized that no tightness is achieved; **and,** • be appropriately tight, that is, not so loose that the hose can be pulled forward or back under light manual force nor so tight that the hose is excessively pinched; **and,** • show no signs of damage or deterioration at the clip or clamp; **and,** • show no signs of damage or deterioration at the hose.	

7.3.6	Does the drain facility have a minimum appropriate internal diameter or equivalent area?			R
Measure the internal diameter, or area, of each cylinder locker drain opening. Where it can be seen or reached, check any drain line for no obvious reductions in its diameter.	Cylinder locker drains must have a minimum internal diameter of 12mm (½in) or increased pro-rata up to 19mm (¾in), or have an equivalent area.			
	Total capacity	Minimum internal diameter of drain opening or equivalent area		
	1-18kg	12mm (½in)	113mm²	
	19-29kg	14mm (9/16 in)	154mm²	
	30-37kg	17mm (⅝in)	227mm²	
	38kg or greater	19mm (¾ in)	283mm²	
Applicability - total capacity must be calculated from the sum of all cylinders and any cartridges housed in the same drained cylinder locker. Applicability - if two or more drains exist in one locker, their internal diameters or equivalent areas should be added together when checking for compliance.				

7.4 Protecting LPG cylinders and components against damage

7.4.1	Are all cylinders secured and stored upright with the valve at the top?	R
Check all cylinders are secured in the upright position with the valve uppermost. Determine by moving the cylinders carefully the extent of any movement. Check that all cylinders are secured to prevent potential damage to regulators or pipework. Check the completeness and condition of support structures and fixings on any transom-mounted cylinder arrangements where they can be seen or reached.	Cylinders, whether full or empty, must be secured in the upright position with the valve uppermost so that: • the extent of any cylinder movement cannot cause any pulling of pipework or pulling tight of hose; **and**, • the possibility of cylinders damaging low-pressure regulators, pipework or other LPG system components is minimised. The support structures and fixings on transom-mounted LPG cylinder arrangements must be complete and free of signs of damage or deterioration.	

7.4.2	Is the cylinder locker or housing secured against unintended movement?	R
Apply light manual force to check that cylinder lockers and housings are secured against unintended movement.	Cylinder lockers and housings must be secured against unintended movement under light manual force.	
Applicability – Examiners need not apply light manual force to cylinder lockers or housings that are integral to the boat's hull or superstructure.		

7.4.3	Are cylinders in a locker protected against falling objects?	R
Check for the presence of a lid or cover on all top-opening cylinder lockers. If not present check that the cylinders, regulators and associated equipment are otherwise protected.	Top-opening cylinder lockers must either have: • a lid or cover; **or**, • cylinders, and other LPG system components within the locker must be otherwise protected against falling objects.	

7.4.4	Is the cylinder locker or housing clear of any items that could damage the LPG equipment or ignite escaping LPG vapour?	R
Check the contents of all cylinder lockers and housings.	Cylinder lockers and housings must not contain loose sharp or heavy items such as anchors or mooring pins that could damage the cylinders or other LPG system components. Cylinder lockers and housings must not contain any item that could ignite escaping LPG vapour.	
Applicability – sources of ignition include open flame or spark inducing equipment. Solenoid LPG system shut-off valves of suitable proprietary manufacture should be presumed not to be a source of ignition. Guidance for owners – when purchasing solenoid controlled shut-off valves an assurance should be sought from the supplier as to their suitability for use with LPG.		

7.4.5	**Is the cylinder locker or housing of suitable proprietary manufacture, and has it been maintained to ensure its integrity is retained?**	**R**

Determine whether the cylinder locker or housing is of suitable proprietary manufacture. Where lockers or housings are not obviously of suitable proprietary manufacture, determine the material type, estimate the thickness, and determine how the seams have been made. Determine the materials used in any repair to cylinder lockers and housings.	Cylinder lockers and housings must be of suitable proprietary manufacture. Cylinder lockers and housings may be accepted as being of suitable proprietary manufacture if they are constructed of materials that are either: • the same material and thickness of the surrounding hull structure; **or,** • metal of minimum thickness of approximately 1mm with fully welded or brazed seams; **or,** • FRP of minimum thickness of approximately 5mm thickness. The integrity of cylinder locker and housing seams must not rely upon glue or sealant. To ensure the original integrity is retained, any repairs to cylinder lockers or housings must meet the material thickness Requirements above; **and:** • metal locker or housing repairs must be made using a plate of similar metal and must be seam welded or brazed; • FRP locker or housing repairs must be made using fiberglass fabric/matting and resin.

Applicability – lockers and housings of suitable proprietary manufacture made from moulded plastic are considered as replacement items and therefore if damage or deterioration has affected their integrity they should be replaced with new and not repaired.

Applicability - it is acceptable for lockers or housings made from the same material as the surrounding hull structure, metal or FRP to be repaired, but it is recognised that it is sometimes difficult to identify the repair method if the repair has been covered in paint. If the method of repair is in doubt but otherwise looks sound, Examiners should pass the arrangements and record notes of their findings on their checklist.

Applicability – the above Requirements only apply where a failure of the locker or housing structure could lead to gas escaping from the cylinder or system components within the locker or housing flowing directly into the interior of the vessel, or where the locker or housing structure is within 0.5m of openings into the interior of the vessel or any source of ignition.

Applicability – a combination of wooden cylinder lockers lined with FRP of a lesser thickness than 5mm may be estimated as equivalent.

Supporting information on lockers and housings of suitable proprietary manufacture is provided at Appendix 7.

7.5 Cylinder locker openings

7.5.1	Is the cylinder locker opening outside of any engine or battery space?	R
Check the location of the cylinder locker opening.	Cylinder lockers must not open into any: • engine space; **or**, • battery space.	
Examiner action - where a cylinder locker is found to open into an engine space the Examiner should contact the BSS Office for guidance to determine whether there is a known acceptable compliance option available for the model of boat.		

7.6 LPG system main shut-off valves

7.6.1	Is the LPG system main shut-off valve, or its means of operation, in a readily accessible position?	R
Identify the LPG system main shut-off valve and check the accessibility of the valve or its means of operation.	The LPG system main shut-off valve, or its means of operation, must be installed in a readily accessible position.	
Applicability –the LPG system main shut-off valve(s) should normally be taken as being the cylinder valve(s). Applicability – systems with clip-on regulators do not require an additional system main shut-off valve.		

7.6.2	Is the LPG system main shut-off valve, or its means of operation, in open view, or is the location of the valve or its means of operation clearly marked?	R
Check whether the LPG system main shut-off valve, or the means to operate it, is in open view with all removable lids, deck boards, curtains, doors etc in place. Where LPG system main shut-off valve, or the means to operate it, is not in open view, check for the presence of marking in open view indicating the location of the valve or the means to operate it.	The LPG system main shut-off valve, or the means to operate it must: • be in open view with all removable lids, deck boards, curtains, doors etc in place; **or,** • the location of the valve, or its means of operation, must be clearly marked in open view.	

7.7 LPG high-pressure system components

7.7.1	**Are all high-pressure LPG system components accessible for inspection and either inside a cylinder locker or in an open location?**	**R**
Check the location and accessibility of all high-pressure LPG system components.	All high-pressure components must be accessible for inspection and located in: • a cylinder locker; **or** • a cylinder housing; **or** • an open location To be accepted as being located in an 'open location' high-pressure components must: • be in a position where any escaping LPG vapour would flow overboard unimpeded; and, • be where there is no opening into the interior of the vessel, or any source of ignition, within 0.5m distance. For all high-pressure components to be accepted as being in an 'open location' in a cockpit, the cockpit must comply with the 'self-draining' specifications set out in section 1 of Appendix 7.	
Examiner action – Examiners must refer to section 1 of Appendix 7 for essential information on 'self-draining' cockpits.		

7.7.2	**Where two or more cylinders are connected on the high-pressure side, does each connection have a non-return valve fitted?**	**R**
Identify the presence of cylinders connected on the high-pressure side. If present, check for a non-return valve fitted in each high-pressure connection.	Two or more cylinders connected on the high-pressure side must be protected by a non-return valve fitted in each connection.	

7.7.3	**Are all hoses on the high-pressure side of pre-assembled lengths not exceeding 1m and to the correct specification?**	**R**
Identify the presence of hose on the high-pressure side. Check the type of hose end fittings. Measure the length of hose. Check the hose markings.	All LPG hoses on the high-pressure side: • must consist of pre-made hose assemblies of suitable proprietary manufacture; **and,** • must not exceed 1m in length; **and,** • must be marked to BS EN 16436 Class 3; or BS 3212 type 2.	
Applicability - steel hose assemblies marked to BS EN ISO 10380 can be regarded as equivalent.		

7.7.4	Are all high-pressure LPG system components secure and in good condition?	R
Check the security and condition of all regulators and associated high-pressure equipment and hoses and hose connections by sight and touch. Check fixings for signs of damage or deterioration.	All high-pressure components, including regulators and associated equipment, hoses and hose connections, must be secure and free from signs of damage or deterioration. Hose must be free of leaks, flaws, brittleness, cracking, abrasion, kinking, 'soft' spots, or joins. On hoses covered with metal braiding the braiding must be free of signs of damage or deterioration including corrosion and kinking. Hose connections: • must not be made using hose clamps fixed by spring tension; **and,** • must be free of any missing components, cracks, burrs or rough edges or signs of other damage or deterioration; **and,** • must not be so narrow as to cut into the hose; **and,** • must be suitably sized, that is, not so oversized that the band forms an elliptical shape, or so undersized that inadequate compression is achieved; **and,** • must be appropriately tight, that is, not so loose that the hose can be pulled forward or back under light manual force nor so tight that the hose is excessively pinched. Fixings for high-pressure LPG equipment must be free of signs of damage or deterioration.	

7.7.5	Are non-cylinder mounted regulators located to prevent damage?	R
Check the location of regulators not mounted directly on cylinders and check whether they are exposed to possible damage when the cylinders are changed or when cylinders are subjected to the extent of any possible movement or rocking whilst in situ. Check that the vent holes of high-pressure stage components are protected from the ingress of debris or water.	Regulators not mounted directly on cylinders must be located in a position where they are not exposed to possible damage when changing cylinders and/or from possible movement of cylinders in situ, or they must be protected from such possible damage. The vent holes of high-pressure stage components must be protected from the ingress of debris or water.	

7.7.6	Is the installation free of manually-adjustable regulators?	R
Check for the presence of any manually-adjustable regulators.	LPG regulators must not be of the manually-adjustable type.	
Applicability – manually-adjustable regulators are acceptable for steam boiler or blowlamp engine-start LPG supply systems. Applicability – regulators able to be adjusted upon removal of a 'tools-to-remove' dust cap are acceptable.		

7.8 LPG pipework, joints and connections

7.8.1	Are all LPG pipes made of a suitable material, adequately secured and free from damage?	R
Visually check type of material for all LPG pipes that can be seen. Apply light manual force to check the security of LPG pipes that can be reached. Check condition of all LPG pipes that can be seen or reached.	LPG pipes must be made of either seamless copper, stainless steel or copper nickel alloy tube. LPG pipes must not move under light manual force. LPG pipes must be free of kinks, restrictions, abrasion damage or deterioration.	
Applicability – Pliable Corrugated Tubing (PCT) to BS EN 15266 and/or BS 7838 can be considered as stainless steel pipework for the purposes of BSS examinations. Applicability – a little movement at the final connection to an appliance is acceptable but any such unsecured pipe should be kept to a minimum and should generally not be more than 500mm in length. Applicability – pay particular attention to the potential for abrasion damage on pipes passing through bulkheads.		

7.8.2	Is the LPG pipe protected where it passes through metal bulkheads or decks?	R
Check the protection of LPG pipes passing through metallic bulkheads or decks that can be seen or reached.	LPG pipes passing through metallic bulkheads or decks must be protected by the use of sleeves, grommets, cable glands, bulkhead fittings, or equivalent.	
Applicability - it is acceptable for pipe to be protected by sealant provided the sealant is in good condition and that it completely seals the area between the pipe and the surrounding material, and provided the sealant does not noticeably move or dislodge when the pipe is subject to light manual force.		

7.8.3	Are all LPG pipe joints accessible for inspection and of the correct type?	R
Check the accessibility and type of all pipe joints.	All LPG pipe joints must be accessible for inspection. All LPG pipe joints used on copper or copper nickel alloy pipe must be: • brass compression joints; **or,** • brass threaded joints. All LPG pipe joints used on stainless steel pipe must be: • stainless steel compression joints; **or,** • stainless steel threaded joints; **or,** • stainless steel welded joints.	
Applicability – joints not accessible for inspection must be recorded as 'not verified' on your checklist, and it must be considered that the Check has not been completed until such time as their type has been verified. Applicability – brazed joints are also permitted, but examiners must take particular care when endeavouring to determine whether such connections are brazed or soft-soldered (which are not permitted). If in doubt Examiners should contact the BSS Office for guidance. Applicability – the material of type of some appliance connection joints may not be identifiable. Provided such joints appear to be original to the appliance, Examiners should consider the joint material compliant.		

7.8.4	Are all LPG pipe joints secure, in good condition and competently made?	R
Measure the distance fixing clips are attached from all joint connections. Apply light manual force to check the security of each joint. Check condition and completeness of fixings and joints. Check all joints for the presence of unnecessary components.	All LPG pipe joints: • must have fixing clips attached no more than 150mm from each joint connection and must not move under light manual force; **and,** • must have fixings that are free of signs of damage or deterioration or missing components; **and,** • must be free of any signs of missing components, cracks or other signs of damage or deterioration; **and,** • must be made with a minimum number of individual components.	
Applicability – fixings are required on all sides of joints. Applicability – joints secured by proprietary integral fixings such as mounting plates or bulkhead fittings can be considered as meeting this Requirement. The pipework adjacent to such joints does not need to be provided with additional securing within 150mm of each joint connection. Applicability – joints not accessible for inspection must be recorded as 'not verified' on your checklist, and it must be considered that the Check has not been completed until such time as their general condition has been verified. Applicability – the minimum number of components is usually interpreted as two, however, where LPG joints are identified having more than two components, Examiners should contact the BSS Office for guidance.		

7.8.5	Are all pipework spurs that are no longer connected to an appliance properly capped or plugged?	R
Identify any pipework spurs that are no longer connected to an appliance and check they are closed with a 'tools-to-remove' proprietary stop-end	All pipework that are no longer connected to an appliance must be closed with a 'tools-to-remove' proprietary stop-end.	
Applicability – if a fault is identified take the actions described in Appendix A, and Appendix B if appropriate.		

7.8.6	**Are all LPG pipes running through petrol engine spaces jointless and adequately supported?**	**R**
Check for any LPG pipes running through petrol engine spaces. Within such spaces, and where they can be seen or reached, check the pipes for any joints and for the presence of conduit, trunking or other means of support.	LPG pipes running through petrol engine spaces must be: • jointless; **and,** • routed within a conduit or trunking, **or** supported by fixing clips which are no more than 300mm apart.	
Applicability – as it is not possible for an Examiner to determine whether a proprietary bulkhead fitting is being used as a pipe joint, or as a sleeve for a continuous pipe, such fittings are exempt from this Requirement. Applicability – for the purposes of this Check, an LPG pipework joint will be deemed to be within the petrol engine space where there is a pathway for LPG to travel from the joint to the petrol engine unimpeded. Guidance for owners – at the time of introducing or amending a gas system, proprietary bulkhead fittings should not be used to join LPG pipes within petrol engine spaces.		

7.8.7	**Is the LPG pipe at least 75mm from exhaust system and flue components?**	**R**
Measure the distance that any LPG pipes are from exhaust system and flue components.	LPG pipes must be at least 75mm from exhaust system and flue components.	

7.9 Low-pressure LPG hoses and hose connections

7.9.1	**Are all low-pressure LPG hoses accessible for inspection, of the correct material and in good condition?**	**R**
Check the accessibility of all low-pressure LPG hoses. Check the markings of all LPG hoses. Check the condition of hoses.	All LPG hoses on the low-pressure side: • must be accessible for inspection along their entire length; **and,** • must be marked to BS EN 16436 Class 2; or BS EN 16436 Class 3; or BS 3212 type 2; **and,** • must be free of flaws, brittleness, cracking, abrasion, kinking, 'soft' spots or joins. On hoses covered with metal braiding the braiding must be free of signs of damage or deterioration including corrosion and kinking.	
Applicability – hoses not accessible for inspection along their entire length must be recorded as 'not verified' on your checklist, and it must be considered that the Check has not been completed until such time as their general condition has been verified. Applicability – pre-made hose assemblies conforming to BS 669 or EN 14800 may be used to connect free-standing cookers to LPG supply pipework. BS 669 hoses usually have a red stripe running along the length of the hose but may not be marked with BS 669. EN 14800 hoses are usually coloured yellow, or have a yellow stripe running along the length of the hose, and should be marked EN 14800. The connections on such hoses must terminate with self-sealing bayonet connections at the connection points to the LPG supply pipework. The portable appliance connection Checks at 7.10 also apply.		

7.9.2	**Is all low-pressure LPG hose protected against damage where it passes through bulkheads, decks or partitions?**	**R**
Check the protection for low pressure LPG hoses passing through bulkheads, decks or partitions.	Low pressure LPG hose passing through bulkheads, decks or partitions must be protected by the use of sleeves, grommets, cable glands, etc.	
Applicability – hose which itself is covered by a proprietary metal braiding does not require additional protection. Applicability - it is acceptable for hose to be protected by sealant provided the sealant is in good condition and that it completely seals the area between the hose and the surrounding material, and provided the sealant does not noticeably move or dislodge when the hose is subject to light manual force.		

7.9.3	**Is all low-pressure LPG hose at least 75mm from exhaust system and flue components?**	**R**
Measure the distance that any low-pressure LPG hoses are from exhaust system and flue components.	Low pressure LPG hoses must be at least 75mm from exhaust system and flue components.	

7.9.4	**Are all low-pressure LPG hoses used to connect regulators or appliances to LPG supply pipework only, and are they a maximum of 1m in length?**	**R**
Check the location of all LPG low pressure hoses. Measure the length of any LPG hoses used to connect appliances or regulators to LPG supply pipework.	Except on 'all-hose' systems, low pressure LPG hoses may only be used to connect a cylinder regulator and/or appliances to the LPG supply pipework. LPG hoses used to connect appliances or regulators to LPG supply pipework must not exceed 1m in length.	
Applicability - where there is a single appliance located very close to the cylinder installation it is permissible for hose to run from the cylinder installation to the appliance without pipework provided the hose length does not exceed 1m. Applicability - for 'all-hose' systems apply Check 7.9.6		

7.9.5	**Are all low-pressure LPG hose connections accessible for inspection, of the correct type, secure and in good condition?**	**R**
Check the accessibility of all low-pressure hose connections. Check the type, condition, and completeness of all hose connections. Pull using light manual force to check the security of all hose connections.	All low-pressure LPG hose connections: • must be accessible for inspection; **and,** • must be part of pre-made hose assemblies of suitable proprietary manufacture or use suitable nozzles secured by crimped or worm-drive clamps; **and,** • must not be made using hose clamps fixed by spring tension; **and** • must be free of any missing components, cracks, burrs or rough edges or signs of other damage or deterioration; **and,** • where made with crimped or worm-drive clamps, the clamps must be suitably sized, that is, not so oversized that the band forms an elliptical shape, or so undersized that inadequate compression is achieved; **and,** • be appropriately tight, that is, not so loose that the hose can be pulled forward or back under light manual force nor so tight that the hose is excessively pinched.	
Examiner action – when checking the security of hose connections Examiners must not attempt to twist the hose against the connection. Applicability – hose connections not accessible for inspection must be marked as 'not verified' on your checklist, and it must be considered that the Check has not been completed until such time as their condition has been verified.		

7.9.6	**Do 'all-hose' systems comply with ISO 10239?**	**R**
Check for the presence of an 'all-hose' system. If present: • Check the routing of all hoses. • Check the type and accessibility of all hose connections. • Check the hose support. • Check for the presence of any LPG pipes	In addition to the general hose Requirements at Checks 7.9.1, 7.9.2, 7.9.3 and 7.9.5 'all-hose' hose assemblies must comply with ISO 10239 as follows: • each length of hose must be jointless from within the cylinder locker or housing directly to the individual appliance or appliance isolation valve; **and,** • hoses must have permanently attached end fittings, such as swaged sleeve or sleeve and threaded insert (worm-drive clamps are not permitted); **and,** • hose connections must be readily accessible; **and,** • hoses must not be routed through an engine space; **and,** • hoses must be supported at least at 1m intervals. On 'all-hose' systems there must be no LPG pipes. All hose systems are only permitted where the cylinder(s) is located within a locker or housing.	
Applicability – 'all-hose' systems will generally be found on imported boats, CE marked to the RCD, where the builder has chosen to apply ISO 10239. Applicability – for multi-appliance systems to ISO 10239, anticipate a manifold arrangement within the cylinder locker or housing. Applicability – single cooking appliances connected by hose of no more than 1m in length directly to a regulator are acceptable and need not be assessed against this Check.		

7.10 Portable appliance connections

7.10.1	Are all portable appliance connection points provided with an isolation valve?	R
Identify all portable appliance connection points and check for the presence of an isolation valve.	All portable appliance connection points must be fitted with an isolation valve.	

7.10.2	Are portable appliance hoses connected with bayonet, plug or screwed fittings, complete and in good condition?	R
Identify the type of appliance hose connection to the isolation valve. Check all connections for completeness and condition.	All hose connections to the isolation valves of portable appliances must be made with a bayonet, plug-in or screwed fitting. All bayonet, plug-in or screwed fittings must not be missing any components and must be free of corrosion, signs of damage or deterioration.	

7.10.3	Are all unused screwed portable appliance connection points properly capped or plugged?	R
Identify any unused screwed appliance connection points and determine how they are plugged or capped.	All unused screwed appliance connection points must be closed with a 'tools-to-remove' proprietary plug or cap.	

7.11 Appliance isolation valves

7.11.1	Can all appliance supply hoses be isolated through individual appliance isolation valves?	R
Identify every appliance connected by hose and confirm the presence of an individual shut-off valve at the connection point to the LPG supply pipework.	Appliances connected by hose must be provided with an individual appliance isolation valve at the connection point to the LPG supply pipework.	
Applicability – for an installation with a single appliance the cylinder valve(s) may be classed as the appliance isolation valve irrespective of the distance between the appliance and the cylinder(s). Applicability - individual appliance isolation valves in the same LPG pipework spur as the appliance connected by hose, can be considered as meeting this Requirement. Applicability – hob/oven arrangements may be deemed one appliance for the purposes of this Check. Supporting information on the positioning of appliance isolation valves is provided at Appendix 7.		

7.11.2	Are appliance isolation valves of suitable proprietary manufacture?	R
Identify the type of all appliance isolation valves.	Appliance isolation valves must be of suitable proprietary manufacture**, and:** • Any tapered-plug type valves used as isolation valves must be spring loaded. • Appliance isolation valves at floor level must either be of the drop fan or loose-key type or of a type that cannot be operated inadvertently.	
Applicability – the Requirements apply to portable appliance connection isolation valves as well as to isolation valves for permanently installed appliances. Applicability - needle-type valves are not considered to be of suitable proprietary manufacture. Applicability – if the spring on a spring-loaded tapered-plug valve is found to be touching the surface behind it, then the valve is not to be considered as being spring-loaded. Supporting information on appliance isolation valves of suitable proprietary manufacture is provided at Appendix 7.		

7.11.3	Are appliance isolation valves, or the means of operating them, readily accessible?	R
Check the accessibility of all isolation valves, or the means of operating them.	Appliance isolation valves, or the means of operating the valves, must be readily accessible.	
Applicability – the Requirements apply to portable appliance connection isolation valves as well as to isolation valves for permanently installed appliances. Applicability - isolation valves located behind free-standing LPG cookers that are restrained from tilting are acceptable provided the restraining method can be unfastened without the use of tools. Guidance for owners – the LPG system main shut-off valve should be considered as the primary emergency shut-off.		

7.12 Testing for LPG system tightness

7.12.1	Is there an LPG test point in the system, or a bubble leak detector in the cylinder locker or housing?	R
Check for the presence and location and accessibility of a means to determine the LPG system tightness.	All LPG systems must be fitted with one of the following means to determine gas-tightness: • a readily accessible proprietary test point fitted in the pipework; **or,** • a readily accessible proprietary test point on an appliance; **or,** • a bubble leak detector installed in a cylinder locker or cylinder housing.	

7.12.2	Is the LPG system free of leaks as defined in the tightness test?	R
Verify the LPG system is free of leaks by carrying out the appropriate tightness test at Appendix C or Appendix D or D1.	All LPG systems must be free of leaks when tested in accordance with the appropriate tightness test procedure.	
Applicability – if for any reason a tightness test cannot be completed your checklist must be marked as 'not verified' and the item considered as non-compliant until such time as verification of tightness is achieved. The reason for non-completion must be recorded. Applicability – if a leak is identified take the actions described in Appendix A. The criteria for a 'hazardous boat' notification (Appendix B) to be actioned is set out in Appendix C and D or D1. Examiner action - where, during a tightness test undertaken using a suitable pressure gauge (Appendix C) a regulator is found not to lock-up within industry recommended tolerances, take the actions described in Appendix A, or A and B, and make a note on the BSS Warning Notice about the performance of the regulator. Where it can be established, also note the age of the regulator if it is over 10 years old. Guidance for owners - where, during a tightness test undertaken using a suitable pressure gauge (Appendix C), a regulator is found not to lock-up within industry recommended tolerances owners are guided to have the regulator tested by a Gas Safe registered LPG in boats installer. Replacement regulators should incorporate a means of protecting the downstream pipework and appliances from overpressure in the event of regulator malfunction. It is recommended that regulators over 10 years old should be replaced.		

BSS Examination Checking Procedures – Part 8

Appliances and flues

There are five relevant BSS General Requirements:

25.	**All appliances must be designed, installed and maintained in a way that minimises the risks of explosion or of fire starting and spreading.**
26.	**All liquid-fuelled appliances must have an emergency shut-off valve located at a safe distance from the appliance.**
27.	**a) LPG and liquid-fuel burning appliances installed from 3 January 2000.** **All burners and pilot lights shall be fitted with a device that automatically shuts off the fuel supply if the burner flame fails.** **b) LPG and liquid-fuel burning appliances installed before 3 January 2000** **Burners on catalytic appliances, appliances with continuously-burning flames and pilot light burners shall be fitted with a device that automatically shuts off the fuel supply if the burner flame fails.**
28.	**All appliance flues must be designed, installed and maintained in a way that minimises the risk of fire.**
29.	**All fuel and power supply systems for appliances must meet these General Requirements where relevant.**

8.1 Appliance fuel and power supply

8.1.1	Check Item 8.1.1 is intentionally not used	**R**

8.1.2	**Are all liquid-fuelled appliances fitted with shut-off valves, and are the valves or their means of operation, in a readily accessible and safe position?**	**R**

Identify all fuel supplies to liquid-fuelled appliances and check for the presence of shut-off valves. Check the position and accessibility of the shut-off valves, or their means of operation.	Liquid-fuelled appliances must be provided with a shut-off valve to shut off the fuel supply. All shut-off valves, or their means of operation, must be installed in a readily accessible position. All shut-off valves, or their means of operation, must be installed within reach of the appliance but not in a position that requires the user to reach over or around the appliance to operate them.

Applicability – on installations where the fuel tank is located in close proximity to the appliance the supply valve close to the tank (as required at Check 2.13.1) may be accepted as the appliance shut-off valve. However, for installations where the fuel tank is not located near the appliance (e.g. where the tank also supplies an internal combustion engine and/or is located in an engine space) an appliance shut-off valve is likely to be required in addition to the tank valve at Check 2.13.1.

Applicability – the valve should normally be situated in the same compartment as the appliance. However, there may be installations where it is not physically possible or safe to do so. For example: where the appliance is installed on a bulkhead between compartments; or, if there is less than approximately 1m of fuel pipe in the same compartment. In these cases it is acceptable for the valve to be installed at the nearest practicable point.

Applicability – automatic fire valves of suitable proprietary manufacture are an acceptable alternative to manually operated valves. Where fire valves are fitted these may be located immediately adjacent to the appliance.

Applicability – appliances fitted with electrical fuel-supply pumps that shut off the fuel supply when the pump is not in use, are an acceptable alternative to manually operated valves.

8.2 LPG refrigerators on vessels with petrol propulsion engines

8.2.1	**Where the vessel has a petrol propulsion engine, is any LPG refrigerator of a proprietary room-sealed type, or a Wilderness Boats conversion of an Electrolux RM 212?**	**R**

If an LPG refrigerator is present on a petrol-engined boat, determine if it is a proprietary room sealed type, or a Wilderness Boats conversion of an Electrolux RM212.	On petrol-engined boats, any LPG refrigerator must be either: • a proprietary room sealed type; **or**, • a Wilderness Boats conversion of an Electrolux RM212.

Examiner action – Examiners must refer to section 1 of Appendix 8 for essential information on recognising Wilderness Boats' converted Electrolux RM212 LPG fridges.

Applicability – known room-sealed LPG fridge models include the Electrolux RB180, RB182, RM4213 LSC and RM6401 LSC models.

Applicability – this Check is limited to petrol engines, including petrol outboard motors, used as the means of propulsion.

Applicability – if the suitability of the fridge cannot be verified from visual assessment and the owner has no declaration from an equipment manufacturer or supplier, mark your checklist 'not verified'. In such cases, the fridge must be considered as non-compliant until such time as its suitability has been verified.

Applicability – in the event a paraffin fridge is found on board a petrol-engined boat Examiners should contact the BSS Office for guidance.

Applicability – in the event a fault is determined take the actions described in Appendix A and B.

8.2.2	**On petrol-engined vessels with a Wilderness Boats conversion of an Electrolux RM 212 refrigerator on board, are the burner enclosure and the flame arrestor at the 'lazy tee' in place, and is there suitable documentary evidence of recent servicing?**	**R**

On petrol-engined vessels with a Wilderness Boats conversion of an Electrolux RM 212 on board, check for the presence of: • a not less than 11 wires per linear cm mesh fitted to the 'lazy tee' on the flue pipe; **and,** • a not less than 11 wires per linear cm mesh enclosure around the burner; **and**, • documentation confirming that the refrigerator has been serviced by Wilderness Boats or a Gas Safe registered engineer within the previous 12 months.	On petrol-engined vessels with a Wilderness Boats conversion of an Electrolux RM 212 on board: • a not less than 11 wires per linear cm mesh must be fitted to the 'lazy tee' on the flue pipe; **and**, • a not less than 11 wires per linear cm mesh enclosure must be fitted around the burner; **and**, • there must be documentary evidence that the refrigerator has been serviced by Wilderness Boats or a Gas Safe registered engineer within the previous 12 months of the date of the Examination.

Examiner action – Examiners must refer to section 1 of Appendix 8 for essential information on recognising the flame arresting components of Wilderness Boats converted fridges.

Applicability – Examiners should take a photograph/retain a copy of the presented documentation to be kept on file with the Examination checklist.

Applicability – if the flame arresting mesh on the 'lazy tee' and/or the burner enclosure cannot be seen, Examiners should mark their checklist 'not verified'. In such cases, the fridge must be considered as non-compliant until such time as its suitability has been verified.

Applicability – if any part of the flue appears damaged, record a fault at Check 8.10.2 and take the actions described in Appendix A and B.

Applicability – in the event a fault is determined at this Check take the actions described in Appendix A and B.

8.3 Installation of appliances in petrol engine spaces

8.3.1	Are petrol-engine spaces free of LPG and/or liquid-fuelled appliances?	R
Check petrol engine spaces for the presence of LPG and/or liquid-fuelled appliances.	LPG and/or liquid-fuelled appliances must not be installed in petrol-engine spaces.	
Applicability – for the purposes of this Check, an LPG and/or liquid-fuelled appliances will be deemed to be within the petrol engine space where there is a direct pathway for LPG to travel from any LPG appliance to the petrol engine or, where there is a direct pathway for any escaped petrol vapour to travel from the petrol engine to the LPG and/or liquid-fuelled appliance. Applicability – in certain circumstances LPG and/or liquid-fuelled appliances may be located in petrol engine spaces where they are installed in a separate vapour-tight compartment. In the event such an installation is identified, or where an owner is claiming compliance or equivalence, Examiners should contact the BSS Office. Applicability – if the appliance is located outside of the engine space, but the air intake to that appliance is located within the space then a fault is to be recorded.		

8.4 Protection against fire risks from appliance installations

8.4.1	Are appliances and surrounding surfaces clear of signs of heat damage and leaking fuel?	R
Check all appliances and all their surrounding surfaces for signs of heat damage and leaking fuel, where they can be seen.	Appliances and all their surrounding surfaces must not show signs of: • scorching, blistering or discolouration; or, • fuel leakage; or, • heat damage or deterioration to appliance structure.	
Applicability – this Check applies to all fuel-burning appliances and 'bullseye' (also known as 'domed') decklights and their surrounding and adjacent surfaces.		

8.4.2	Are all curtains, blinds and other textile materials near to appliances free of heat damage?	R
Check all curtains, blinds and other textile materials near appliances for signs of heat damage, where they can be seen.	Curtains, blinds and other textile materials near all appliances must not show signs of heat damage such as scorching or burning.	
Applicability - this Check applies to curtains, blinds and other textile materials near all fuel-burning appliances and 'bullseye' (domed) decklights.		

8.4.3	Are non-portable appliances secured against unintended movement?	R
Check for the presence of securing systems on all non-portable appliances. Where they can be seen or reached, check the condition of the securing systems. Where practicable, apply light manual force to check the security of all non-portable appliances.	Securing systems must be installed on all non-portable appliances, and the securing systems and their fixing points must: • be suitable, such as screw/bolt fastenings directly through the appliance's frame (or additional metal brackets) into adjacent boat structure; **and**, • show no signs of damage or deterioration, including fractured mounting brackets, missing, loose or fractured bolts or nuts. Non-portable appliances must be secured against unintended movement under light manual force.	
Applicability – appliances in gimbals may tilt, but the retaining mechanism must be secure. Applicability – appliances connected to the fuel supply by hoses or electrical cables may be retained using fixed chains provided there is no possibility of strain on the hose and/or cable connections. Applicability - this Check applies to all fuel-burning appliances but does not apply to electrical appliances.		

8.5 Protection against fire risks from appliance flues and exhausts

8.5.1	Are all vessel structures, equipment, and curtains, blinds and other textile materials near all appliance flues and exhausts free of signs of heat damage?	R
Check vessel structures, equipment, and curtains, blinds and other textile materials near all appliance flues and exhausts for signs of heat damage, where they can be seen.	Vessel structures, equipment, and curtains, blinds and other textile materials near all appliance flues and exhausts must not show signs of heat damage such as scorching, blistering or discolouration.	
Applicability – this Check applies to all fuel-burning appliances with flues or exhausts.		

8.6 LPG catalytic heaters

8.6.1	Are all LPG catalytic heaters compliant with a suitable manufacturing standard?	R
Identify any LPG catalytic heaters and check for the presence of a guard over the heating elements and check the control tap arrangements.	LPG catalytic heating appliances must comply with the elements of: • BS 5258-11; **or**, • BS EN 449 as prescribed below: For compliance with BS 5258-11: • the provision of a guard over the heating elements; **and,** • a three position on-off tap. For compliance with BS EN 449: • the provision of a guard over the heating elements; **and**, • legible and durable marking of open, closed and any reduced rate positions on control taps; **and,** • clear marking of any special position of the control tap for ignition.	

8.7 Flame supervision devices

8.7.1	Are flame supervision devices fitted to all LPG and liquid-fuelled appliances that require them?	R

Check all LPG and liquid-fuelled appliances for the presence of flame supervision devices, where the burners or pilot lights can be seen. For any LPG appliance not fitted with flame supervision device(s) seek to determine from the owner, or from available documentary evidence, the date the appliance was installed. For any liquid-fuelled appliance not fitted with flame supervision device(s), seek to determine from the owner, or from available documentary evidence, whether the appliance manufacturer requires such a device to be fitted.	For LPG appliances: All the burners and pilot lights of LPG appliances installed on or after 3 January 2000 must be fitted with a device that automatically shuts off the LPG supply if the burner flame fails. LPG appliances installed before 3 January 2000 must be fitted with a device that automatically shuts off the LPG supply if the burner flame fails on: • the burners on catalytic appliances; and, • appliances with continuously-burning flames; and, • pilot light burners. For liquid-fuelled appliances: Flame supervision devices must be fitted to all liquid-fuelled appliances where the appliance manufacture requires such a device to be fitted.
Applicability – Examiners unsure of whether a particular liquid-fuelled appliance should be fitted with a flame failure device, or seeking clarification as to the suitability of such a device, should contact the BSS Office. Applicability – engine-start blowlamps are not required to have flame supervision devices.	

8.8 LPG appliance burner operation

8.8.1	Are all LPG appliance burners delivering a proper flame?	R

Light all LPG appliance burners and operate them at their maximum setting at the same time.	A satisfactory flame picture must be present at each LPG appliance burner when all burners in the system are operating at their maximum setting at the same time.
Examiner action – Examiners must compare flame pictures at each burner to the 'burner flame trouble chart' at section 1 of Appendix 8. Examiner action - before operating the burners on any flued appliances, carry out the Checks at 8.10.1/2/3. The flame picture assessment should not be carried out if a fault at 8.10.1/2/3 is recorded. Applicability – any appliances with 'hidden' burners must be ignited as part of this Check but there is no Requirement to see the burner flame picture. Applicability – in the event any appliance burner cannot be lit mark your checklist 'not verified' and note the reason why. In such cases the burner must be considered as non-compliant until such time as a satisfactory flame picture has been verified. Examiner action - in the event of a poor flame picture, take the actions described in Appendix A or A and B, and if the regulator is found not to lock-up within industry recommended tolerances, take the actions described in Appendix A, or A and B, and make a note on the BSS Warning Notice about the performance of the regulator. Where it can be established, also note the age of the regulator if it is over 10 years old.	

8.9 Ventilation

8.9.1	Is the vessel provided with adequate fixed ventilation?	A/R
Calculate the fixed ventilation requirements in accordance with Appendix 8a. Measure the total effective area of fixed ventilation. Confirm that the total effective area of fixed ventilation (at least up to the calculated fixed ventilation requirement) is divided as equally as practicable between high and low level.	Fixed ventilation must be in accordance with Appendix 8a.	
Applicability – 8.9.1 is an Advice check for privately owned and managed vessels, but is a mandatory Requirement for hire boats. Applicability – ventilators, doors, windows and hatches that can be closed without the use of tools must not be included in the calculations as these are not considered fixed ventilation. Applicability – permanent and measurable gaps around doors and windows when the windows or doors are fully closed can be taken into account as part of the fixed ventilation provision. Applicability – in the event significant shortfalls in fixed ventilation are determined take the actions described in Appendix A. A significant shortfall is: • where the total effective area of fixed ventilation is 50%, or less, of the calculated fixed ventilation requirement; **or,** • where the total effective area of fixed ventilation is less than the calculated fixed ventilation requirement for appliances with continuous-burning flames; **or,** • where there is no high or no low-level fixed ventilation. Guidance for owners – on privately owned boats which have closable ventilators because they proceed to sea, owners are recommended to affix warning notices on or near all non-room-sealed fuel-burning appliances. The warning notice should read: '*WARNING – Open ventilator(s) before use',* or equivalent.		

8.10 Appliance flues and exhausts

8.10.1	Are all appliances requiring a flue or exhaust fitted with one?	A/R
Where they can be seen or reached, check the flueing or exhaust arrangements on all appliances designed exclusively for use with a flue or exhaust.	A flue or exhaust must be fitted to all appliances designed exclusively for use with one. In particular: • a flue and draught diverter must be fitted to all multi-point instantaneous water heaters and those single point instantaneous water heaters supplying a shower or bath; **and,** • a flue or exhaust must be fitted to any appliance fitted with a flue or exhaust spigot and any solid fuel or oil burning appliance; **and,** • flue components including air intake and flue ductwork and terminals must be fitted to all room-sealed appliances; **and,** • flues must not serve more than one appliance.	
Applicability – 8.10.1 is an Advice check for privately owned and managed vessels, but is a mandatory Requirement for hire boats. Applicability – in the event a fault is determined take the actions described in Appendix A.		

8.10.2	Are all appliance flues and exhausts complete and in good condition?	A/R
Check the condition of all appliance flues and exhausts, including ductwork, flue/exhaust terminals and flue/exhaust joints and securing mechanisms that can be seen or reached.	All appliance flues and exhausts must be complete, properly fitted and maintained and must show no obvious signs of: • obstruction or flue diameter restriction; **or,** • crushed or blocked terminals; **or,** • modifications to the flue/exhaust not in accordance with the appliance manufacturer's recommendations; **or,** • damage or deterioration; **or,** • evidence of flue/exhaust gases escaping into cabin areas (soot deposits etc).	
Applicability – 8.10.2 is an Advice check for privately owned and managed vessels, but is a mandatory Requirement for hire boats. Applicability – LPG fridges in non-petrol-engined boats may be installed without comment, to open-vent into the boat's interior providing no flue components are added to the appliance's integral flue stack. Applicability – instantaneous water heater flue length and terminal suitability will be determined by the flue spillage test at Check 8.10.4. Applicability – in the event a fault is determined take the actions described in Appendix A. Guidance for owners – Examiners only check the condition of flues and exhausts where they can be seen or reached. As deterioration often develops hidden from view, owners are recommended to have flues and exhausts checked annually, or as recommended by the appliance manufacturer, by a competent person.		

8.10.3	Do all appliance flues and exhausts terminate directly to outside air?	A/R
Check the location of all flue and exhaust terminals. Check for the presence of a canopy or canopy fixings where a flue/exhaust terminates at any part of the vessel which could be enclosed by a canopy.	Appliance flue and exhaust terminals must be located outside the interior of the vessel and outside of any areas which may be enclosed by a canopy.	
Applicability – 8.10.3 is an Advice check for privately owned and managed vessels, but is a mandatory Requirement for hire boats. Applicability – in the event a fault is determined take the actions described in Appendix A.		

8.10.4	Are all open flues to LPG appliances operating effectively?	A/R
Carry out a flue spillage test on all open flues connected to LPG appliances as described in Appendix E.	Open flues to LPG appliances must ensure safe transfer of flue gases to the outside of the boat.	
Applicability – 8.10.4 is an Advice check for privately owned and managed vessels, but is a mandatory Requirement for hire boats. Examiner action - before operating the burners on any open-flued appliances such as instantaneous water heaters carry out the Checks at 8.10.2 and 8.10.3. The flue spillage test should not be carried out if a fault at 8.10.2/3 is recorded. Applicability – Examiners are not required to undertake a flue spillage test on fridges with open-flues. Applicability – if for any reason the flue spillage test cannot be completed mark your checklist 'not verified' and note the reason why. Applicability – in the event a fault is determined, take the actions described in Appendix A.		

8.10.5	Are all solid fuel appliances free of unintended gaps?	A/R
Check the condition of solid fuel appliance surfaces, seams and openings which can be seen.	Solid fuel appliances must show no obvious signs of: • unintended gaps or cracks in the outside surface or seams of the stove; or, • unintended gaps greater than 2mm in the loading door seal or door glass; or, • loose, damaged or missing cover plates.	
Applicability – 8.10.5 is an Advice check for privately owned and managed vessels, but is a mandatory Requirement for hire boats. Applicability - some designs of solid fuel appliance have deliberate gaps, commonly above or around the door (to allow air in and help keep the window clean) or below the fuel bed (often by way of a deliberately loose air control) to help keep the fire alight, but where it is clear that components were designed to seal to each other, the above Requirement applies. Applicability – in the event a fault is determined take the actions described in Appendix A.		

BSS Examination Checking Procedures – Part 9

Pollution prevention

There are two relevant BSS General Requirements:

30. Any leakage of oil from engine equipment must be contained and prevented from being avoidably discharged overboard.
31. Bilge pumping and toilet systems must be designed, installed and maintained in a way that minimises the risk of avoidable pollution.

9.1 Engine/gearbox oil leak collection

9.1.1	**Will all oil leaks from the engine/s or gearbox/es be collected in an engine tray or oil-tight area?**	**R**
Check for the presence and condition of an engine tray or oil-tight area under all fixed internal combustion engines and gearboxes. Check the type and condition of the materials that make up the engine tray or oil-tight area where they can be seen. Estimate the volume of any engine tray and the capacity of the protected engine and gearbox.	All fixed internal combustion engine and gearbox installations must have an engine tray or oil-tight area. Each engine tray or oil-tight area must be at least as long and as wide as the combined length/width of the engine and gearbox. The material of each engine tray or oil-tight area must be non-porous and oil resistant. All engine trays or oil-tight areas, including joints and seams, must be free of signs of leaks, damage and deterioration. The volume of each engine tray or oil-tight area must be sufficient to retain the estimated capacity of the engine/gearbox sumps.	
Applicability – oil-tight areas must collect from within the engine space and must not extend into other parts of the vessel.		

9.1.2	Does the bilge pumping system minimise the risk of avoidable pollution?	R
Check for presence of a fixed bilge pump or fixed bilge suction line within an engine tray or oil-tight area. If present, check for the presence of a bilge water filter installed in the overboard discharge line or the facility to discharge to a holding tank. If a bilge water filter is present, verify the discharge level performance by examining any markings on the filter, or if necessary, any presented declaration from the manufacturer or supplier.	Fixed bilge pumps and fixed bilge suction lines must not draw from an engine tray or oil-tight area, unless the: • discharge is through a bilge water filter capable of a 5ppm discharge performance level, as verified by markings on the filter or an appropriate declaration from the manufacturer or supplier; or, • there is a facility to discharge to a holding tank.	
Applicability – if a portable bilge pump or bilge suction line is discovered within an engine tray or oil-tight area, the owner should be advised to remove it, but no fault recorded. Applicability – for the following makes of bilge water filter a 5ppm discharge performance level can be assumed – Wavestream and Bilgeaway. For all other makes, in cases where the discharge performance level of a bilge water filter cannot be verified, 'not verified' must be marked on your checklist, and the filter must be considered as non-compliant until such time as the performance level is verified. Applicability – if a significant quantity of fuel or oil is found to be escaping into the watercourse, take the actions described in Appendix A and B. Guidance for owners – the effectiveness of bilge water filters is entirely dependent on the element/cartridge being unclogged. To help ensure contaminated bilge water is not pumped into the watercourse, boat owners must ensure the element/cartridge is replaced as required. Supporting information on recognising 5ppm bilge water filters is provided at Appendix 9.		

9.2 Sanitation systems

9.2.1	Is a closable valve fitted in the discharge line of any toilet or toilet holding tank with overboard discharge?	R
Check all toilets and toilet holding tanks for the presence of an overboard discharge line. If present, check for the presence of a closable valve installed in the discharge line and check its condition and completeness.	All toilets and toilet holding tanks having an overboard discharge line must have a closable valve fitted in the discharge line. The valve and connections must be complete and leak-free.	
Applicability – Examiners must not operate sanitation system valves. Applicability – depending on the system's actual configuration, on installations with a direct overboard discharge and a holding tank the diverter valve may function as the closable valve. Examiner action – if toilet waste is found to be escaping into the watercourse contact the BSS Office and take the relevant actions described in Appendix B. Supporting information on toilet and holding tank configurations with overboard discharge is provided at Appendix 9.		