BSS Examination Checking Procedures – Part 2 - Permanently installed fuel systems and fixed engines

Recommendations for change May 2012

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; …causes any overflow to discharge overboard; 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 boat) diesel-engined narrowboats; • diesel tanks, of up to a maximum capacity of 27 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. Applicability – diesel fuel fillers onto self-draining cockpits having a continuous deck or sole~~, with drain outlets above the normal laden water-line and that are~~ which is fuel tight to the interior of the vessel, including bilge spaces, meet this requirement.		
Rationale • check question, checking and requirement section changes – this is an enhanced check to address the potential for overflowing fuel entering the interior of the vessel through loose fitting filler points. The impact assessment is that is that this will affect perhaps one or two boats per year. The risk assessment is that for petrol boats the defect presents an immediate safety hazard and one which is known to have contributed to an explosion and injuries. For diesel vessels the need is to keep diesel from entering the interior of the craft. (General Requirement [GR] 2). • applicability - the amendment reverts to the 2002 ECP 2:1:2 text which reflects how this check was being applied in the field neutral impact change.		

2.2.1	**Are the fuel filling line connections ~~leak~~ free of signs of leaks and in good condition, and are all fuel filling hose connections accessible for inspection?**	**R**
Check for the presence of fuel filling hose connections, and the 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 must be secure and free of signs of leaks, signs of damage and/or deterioration. Fuel filling pipe connections must be secure and free of signs of leaks, signs of damage and/or deterioration.	
Applicability – hose connections not accessible for inspection must be recorded as 'not verified' on the BSS Checklist, and the check must be considered incomplete until such time as the condition has		

been verified.
Rationale – editorial change from 'leak-free' to 'free of signs of leaks'. This places an appropriate level of responsibility on examiners conducting examinations. i.e to check for 'signs of leaks' rather than to confirm a fuel system is 'leak-free'.

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. 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 31.5mm (1¼in). 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.		
Rationale – • requirement box – Enhanced check to address the loophole in the BSS requirements in that petrol feed and return lines are required to be made to the top of petrol tanks at 2.8.2, but no mention is made of filler and vent connections. 2.3.4 covers it for vent connections. The impact assessment is that this will not add cost to boat owners as petrol boats are invariably constructed with fuel filling connections to the top of the tank; possibly one or two boats per year may be affected. The risk assessment is the change is necessary to address the potential for petrol escape into the tank space. (GR 5) • applicabilities - to complement the inclusion above and the 'applicabilities' at 2.9.2 (editorial change) Note – there is a need to add a Glossary definition of 'top of the tank' - means the top plate of the fuel tank or the highest part of the side of the tank.		

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- hoses marked with the correct type of fuel in use are acceptable. Hoses marked ISO 7840, or equivalent, are recommended, and hoses marked to SAE J 1527, DIN 4798, RINA DIP/66/96 ~~or marked with the type of fuel in us~~ are ~~acceptable~~ equivalent to ISO 7840. Applicability – diesel filling hose in good condition may be accepted without marking or declaration, provided it can be examined over its entire length. 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.		
Rationale – • editorial change to add clarity that filler hoses marked 'petrol' or 'diesel' are accepted.. • neutral impact change to incorporate the agreed change accepting hoses to RINA DIP/66/96		

2.3.1	**Does every fuel tank have a ~~an effective~~ vent facility?**	R
Check all fuel tanks for the provision of a vent facility.	A vent line must be fitted to ~~the top of~~ each fuel tank, or a vent must be fitted to either the filling cap or filling line.	
Applicability – vents in filler caps, lines or tank tops must have their outlets at, or above the filling point level. Applicability – multiple diesel fuel tank arrangements having a shared vent facility are acceptable provided the arrangements comply with all other requirements at 2.3.		
Rationale: • check question – to simplify the check and avoid potential duplication with the following checks (editorial change). • requirement – 'top of the tank' is already covered at 2.3.4, where it is best placed (editorial change) • applicability– to reflect arrangement found in the field, as agreed at BSSTC (neutral impact change).		

2.3.3	**Are the fuel tank vent line connections free of signs of leaks ~~leak free~~ and in good condition, and are all vent hose connections accessible for inspection?**	R
Check for the presence of vent hose connections, and the condition by sight and touch. Check the condition of fuel tank vent ~~line~~ pipe connections where they can be seen or reached.	All vent hose connections must be accessible for inspection, secure and free of signs of leaks or other signs of damage and/or deterioration. Vent ~~line~~ pipe connections must be secure and free of signs of leaks, signs of damage and/or deterioration.	
Rationale – • check question, checking action and requirement sections – to address a loophole and for hose connection risk management consistency with fuel filler checks at 2.2.1. (enhanced check) The impact assessment is that this will not add cost to boat owners as boats are invariably constructed with vent line connections accessible; possibly one or two boats affected annually. The risk assessment is the change is necessary to address the potential for fuel escape into the tank and other spaces (GR 6). • check question and requirement sections - to change from 'leak-free' to 'free of signs of leaks'. (editorial change)		

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 it 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.		
Rationale - for consistency of approach with other equivalent checks (neutral impact change).		

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 – 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. Applicability- hoses marked with the correct type of fuel in use are acceptable. Hoses marked ISO 7840, or equivalent, are recommended, and hoses marked to SAE J 1527, DIN 4798, RINA DIP/66/96 ~~or marked with the type of fuel in us~~ are ~~acceptable~~ equivalent to ISO 7840..		
Rationale – • editorial change to add clarity that vent hoses marked 'petrol' or 'diesel' are accepted. • neutral impact change to incorporate the agreed change accepting hoses to RINA DIP/66/96		

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 – the small hole in the filler cap as provided by the original engine or fuel tank manufacturer, of diesel tanks of no more than 27 litres capacity meet this requirement. Applicability – vent outlets located within open vessels such as RIBs ~~with~~ 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.		
Rationale – to add clarity to the current applicability (editorial change)		

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.
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 the BSS 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 the BSS 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 the BSS Checklist as a fail at 2.5.2 and 2.5.3. Supplementary information on assessing plastic fuel tanks is provided at Appendix F	
Rationale – to sign-post to relevant additional information in the ECPs concerning plastic tanks (editorial change).	

2.5.3	**Are fuel tanks including seams and openings in good condition and ~~leak~~-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 leaks, heavy corrosion, deep pitting or any other signs of material failure. All inspection and cleaning access closing plates must be secured in place and ~~leak-~~free of signs of leaks.	
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 the BSS 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'. Supplementary information on assessing ~~deterioration of~~ plastic fuel tanks is provided at Appendix F.		
Rationale – • check question, checking action and requirement sections - to change from 'leak-free' to 'free of signs of leaks' (editorial change). • supplementary info - to be consistent with the applicability at 2.5.2 (editorial change)		

2.6.2	**Are any glass or plastic tube or strip-type fuel gauges protected against damage and by self-closing valves?**	R
Check each diesel or paraffin 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: • protected against physical damage; and, • closely coupled (connected) to the tank; and, • fitted with self-closing valves at top and bottom (note that the self-closing valve at the top is not required if the gauge connection is made to the top of the tank); and • complete and free of signs of leaks and other signs of damage.	
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 27 litres.
Rationale – • requirement section - to change from 'leak-free' to 'free of signs of leaks' (editorial change) • applicability - to support consistency in the field and to ensure appropriate risk management and to reflect decision at BSSTC #34 (neutral impact change).

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 missing components and fixings that could lead to a leak and must not have fuel behind any transparent cover, or damage to any glass or other 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.		
Rationale – • check question and requirement section - to change from 'leak-free' to 'free of signs of leaks'. (editorial change) • requirement section - to add clarity that the requirement addresses the potential for fuel leaks only (editorial change)		

2.6.4	**Are fuel tank ~~gauge~~ openings for dipsticks ~~etc~~ closed by a fuel-tight cap or fitting?**	**R**
Identify ~~Check~~ any fuel tank ~~dipstick~~ openings intended to be used for dipsticks and check for a fuel-tight cap or fitting, and ~~check~~ for indications of fuel leaks.	Fuel tank openings used for dipsticks ~~or sounding rods~~ must be closed by a cap or fitting and must be ~~leak~~ free of signs of leaks.	
Rationale – • check question, checking and requirements sections - to add clarity and remove unnecessary terms (editorial change) • requirement section - to change from 'leak-free' to 'free of signs of leaks' (editorial change)		

2.8.1	**Is the fuel tank drain fitted with a plug or cap which can only be removed with tools?**	**R**
Check each fuel tank for the presence of a fuel drain facility. If present, check the drain outlet for the presence of a plug, cap or blank.	If present, the outlets from fuel tank drains and drain valves must be terminated with a 'tools-to-remove' plug, cap or blank.	
Applicability – the provision of a fuel tank drain facility is not a requirement. Applicability - The plug, cap or blank must be of proprietary manufacture and/or metallic and it must be fixed in place by a screw mechanism which requires a tool to remove it.		
Rationale – enhanced check incorporates formal ECP Change (Ref TN01.07.ECP01), closing a		

loophole that allows wooden bungs to terminate a fuel tank drain facility. The impact assessment is that this will not add cost to boat owners because boats are invariably constructed with screwed metallic drain terminations. Possibly one or two boats may be affected annually. The risk assessment is the change is necessary to address the potential for fuel escape into the tank and other spaces. (GR 5)

2.8.4	**Are tank connections and tank valves accessible for inspection, in good condition and ~~leak~~ free of signs of leaks?**	**R**
Check the accessibility of tank connections and tank valves, and check condition by sight and touch.	Fuel tank connections and tank valves must be accessible for inspection, secure and free of signs of leaks, signs of damage or deterioration.	
Applicability – tank connections and tank valves not accessible for inspection must be recorded as 'not verified' on the BSS Checklist, and it must be considered that the check has not been completed until such time as their general condition has been verified. Applicability – this requirement applies to all tank connections and valves, including fuel supply and return lines, fuel filling lines, vent lines, balance pipes and any disused connections.		
Rationale • check question, checking and requirements sections - to change from 'leak-free' to 'free of signs of leaks' (editorial change) • applicability – for consistency of approach (editorial change)		

2.9 Fuel tank balance lines ~~pipes~~

2.9.1	**Are multiple petrol tank systems free of balance lines ~~pipes~~?**	**R**
Check for the presence of multi-petrol tank systems and check for the presence of balance lines ~~pipes~~.	Petrol systems must not be fitted with balance lines ~~pipes~~..	
Rationale – check question, checking and requirements sections - to ensure consistent term 'line' is employed (editorial change)		

2.9.2	**Are balance lines ~~pipes~~ on diesel tank systems made of suitable materials and are they in good condition and ~~leak~~ free of signs of leaks?**	**R**
Check the material of all diesel balance lines ~~pipes~~.that can be seen and check for evidence of suitability. Check the condition of each balance line ~~pipe~~. and its connections where they can be seen or reached. Check the markings on any hose used as a balance line.	Diesel system balance lines ~~pipes~~. must be made of suitable materials, and must be free of signs of leaks, signs of damage and/or deterioration. 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.~~Hose in accordance with Checklist Item 2.10.2.~~	
Applicability – where after assessment of any metallic or FRP ~~the~~ balance line ~~pipe~~. material its suitability cannot be verified, and where the material is not obviously unsuitable apply the condition		

checks only. Applicability – balance line ~~pipe~~. 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 ~~pipe~~., it must be checked in the same way as a hose permanently charged with fuel – see 2.10.
Rationale • check question, checking and requirements sections - 'Pipe' to 'line' - to ensure consistent terms are employed (editorial change) • check question and requirements sections - To change from 'leak-free' to 'free of signs of leaks' (editorial change) • requirements section - use of hose checking and requirements sections – to move the hose check from 2.10.2 to prevent the cross reference to 2.10.2 (editorial change)

2.10 Fuel feed, return, and on-engine fuel lines

2.10.1	**Are all ~~rigid~~ fuel feed and return and on-engine pipes ~~lines~~ made of suitable materials?**	**R**
Check the material of all ~~rigid~~ fuel feed and return and on-engine pipes ~~lines~~ that can be seen and check for evidence of suitability.	~~Rigid~~ Fuel pipes ~~lines~~ 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 the BSS 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 the BSS 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 determined mark the BSS Checklist as a fail.		
Rationale • check question, checking and requirements sections - 'lines' to 'pipes' and delete 'rigid' - to ensure consistent terms are employed (editorial change) • check question and checking sections 'on-engine pipes' – to align with section title (editorial change) • applicability – to incorporate agreement from BSSTC Meeting #32. Enhanced check addressing a significant potential risk of failure of high-pressure diesel fuel lines. The impact assessment is that this will affect perhaps one or two boat owners per year as boats found with hose in this application will be unreasonably be relying upon a 'get-me-home' temporary fix of a injector pipe fracture. The risk assessment is the change is necessary to address the potential for diesel spray over a hot engine leading to a fire (GR 1).		

2.10.2	**Are all flexible fuel feed, ~~and~~ return and on-engine hoses suitable for the fuel used and fire resistant?**	**R**
Check the marking on all fuel feed, ~~and~~ return and on-engine hoses.	Fuel feed, ~~and~~ 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, ~~and~~ 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 – where a hose is not marked to an accepted standard but the boat owner claims suitability the examiner should contact the BSS Office. 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 – the nylon type fuel hose material connecting small capacity diesel containers to the cold start facility on older diesel engines should be considered as 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.
Rationale • 'on-engine' – to align with section title (editorial change) • 1st Applicability - to incorporate existing ECP change Ref TN01.06.ECP01 concerning hoses to RINA DIP/66/96 (neutral impact change). • New 5th Applicability – a additional allowance to reflect Perkins 4-107 arrangements and appropriate risk management (neutral impact change). • New 6th Applicability – concerning hoses within permanently installed fuel systems supplying outboard motors the applicability makes an allowance for non-fire resistant fuel hose in self-draining cockpits or outboard wells or in RIBs. Accords with the outcome of 'crossover' project as agreed by BSSTC and aligns with RCD supporting standard (neutral impact change).

2.10.3	**Are all feed, ~~and~~ return and on-engine pipes ~~lines~~ secure and in good condition?**	R
Check the condition of all fuel feed, ~~and~~ return and on-engine pipes ~~lines~~ which can be seen or reached. Apply light manual force to check security of all ~~rigid~~ fuel feed, return and on-engine pipes ~~lines~~ that can be reached.	Fuel feed, ~~and~~ return and on-engine pipes ~~lines~~ must be free of signs of leaks, signs of damage or deterioration. ~~All fuel feed, return hoses must be free of leaks, flaws, brittleness, cracking, abrasion, kinking and 'soft spots'.~~ ~~Rigid~~ Fuel feed, ~~and~~ return and on-engine pipes ~~lines~~ must not move under light manual force.	
Applicability – pay particular attention to fuel pipes ~~lines~~ etc close to hot exhausts and other sources of heat, and to any high-pressure diesel fuel pipes between injection pumps and injectors.		
Rationale • 'on-engine' – to align with section title (editorial change) • 'lines' to 'pipes' and delete 'rigid' - to ensure consistent terms are employed (editorial change) • to rationalise 2.10.3 to cover fuel pipes and 2.10.4 to cover fuel hoses (editorial change) • to change from 'leak-free' to 'free of signs of leaks' (editorial change) • Applicability – to reflect the decision at BSSTC #32 (enhanced check) - see 2.10.1 above.		

2.10.4	**Are all ~~flexible~~ fuel feed, ~~and~~ 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 ~~flexible~~ fuel feed, ~~and~~ return	All fuel feed, return and on-engine hoses must be free of signs of leaks, flaws, brittleness, cracking, abrasion, kinking and 'soft spots'. On hoses covered with metal braiding the braiding must be	

and on-engine hoses where they can be seen or reached for support and protection.	free of signs of damage or deterioration including corrosion and kinking. Fuel feed, ~~and~~ return and on-engine hoses must be supported clear of anything likely to damage them, or be otherwise protected.
Applicability – pay particular attention to rotating engine components, sharp or hot engine and exhaust components, engine bearers and other vessel structures.	
Rationale • 'on-engine' – to align with section title (editorial change) • delete 'flexible' - to ensure consistent terms are employed (editorial change) • to rationalise 2.10.3 to cover fuel pipes and 2.10.4 to cover fuel hoses (editorial change) • to provide unambiguous guidance on the condition check to be applied to braided hose. This is no more than would have been covered under the 'damage and deterioration' requirement at 2.10.3 previously (editorial change) • Applicability – to better describe where to look (editorial change)	

2.10.5	**Do the injector leak-off (spill rail) arrangements meet specified requirements?**	**R**
Check the arrangements for the injector leak-off (spill rail).	Injector leak-off (spill rail) arrangements must meet all the requirements for fuel feed and return pipes, flexible hose and connections, or • utilise the direct return to tank, or • return to the fuel system through a non-return valve.	
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 – supplementary information on spill rail options is provided in the BSS Technical Update August 2003. Applicability – injector leak-off hoses fitted by the manufacturer within an enclosure on the engine meet this requirement.		
Rationale - to change from 'leak-free' to 'free of signs of leaks' (editorial change)		

2.11.1	**Are all fuel line connections of the correct type and ~~leak~~ 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 and touch.	Fuel line connections must be screwed, compression, cone, brazed or flanged. Flexible 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 bullet points at Checklist Item 2.10.5. 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 end with a proprietary quick-release self-closing connector conforming to 5.1.2.
Rationale – • to change from 'leak-free' to 'free of signs of leaks' (editorial change) • New 3rd Applicability– to reflect an allowance for Perkins 4-107 arrangements and appropriate risk management (see also 2.10.2, (neutral impact change). • New 4th Applicability - concerning hoses within permanently installed fuel systems supplying outboard motors the applicability introduces the allowance for bayonet connectors at the outboard engine end. Accords with the outcome of 'crossover' project as agreed by BSSTC. (neutral impact change).

2.11.3	**Are flexible fuel hose connections made with hose clips or clamps effective and in good condition?**	R
Check flexible fuel hose connections made with hose clips or clamps that can be seen and reached, assess their condition and look ~~and feel for leaks.~~ Pull using light manual force to check security of all hose connections.	Flexible 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. Supplementary information on spill rail options is provided in the BSS Technical Update August 2003.		
Rationale – deletes the checking action for fuel leaks already published at 2.11.1 (editorial change)		

~~2.12.2~~	~~**Are all fuel filters of a suitable proprietary marine type?**~~	~~R~~
~~Check that all fuel filters are marked or recognised as suitable proprietary marine filters. If not marked or recognised as suitable, verify this by examining any presented declaration from the manufacturer or supplier.~~	~~Fuel filters must be of a suitable proprietary marine type.~~	
Rationale – reflecting the fact that many filter types don't specify specific marine suitability, the risk assessment concluded that the check for a 'marine type' can be deleted in favour of reliance upon the existing checks at 2.12.1 for condition and 2.12.3 for fire resistance. (neutral impact change) In order to protect the BSS from any criticism, we should promote in appropriate publications, the use of filters suitable for marine use and fire resistant in accordance with ISO 10088.		

2.12.~~3~~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	Fuel filters (including drain plugs) located inside engine spaces must have intrinsic fire resistance of at least	

manufacturer or supplier.	2.5 minutes at 600 ˚C.
Applicability – all-metal fuel filters are accepted as being sufficiently fire resistant. Applicability – fuel filters marked with ISO 10088 are acceptable.	
Rationale – re-numbered following deletion of the existing check 2.12.2 (editorial change)	

2.14.2	**Is the carburettor drip tray in good condition, ~~leak~~ 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 cock.	Carburettor drip trays must be removable or fitted with an emptying cock, and must be free of signs of leaks, signs of damage or deterioration.	
Rationale – to change from 'leak-free' to 'free of signs of leaks' (editorial change)		

2.14.4	**Is a petrol, petroil or paraffin engine fitted with flame trap or air filter?**	**R**
Identify the air intake of petrol, petroil and paraffin 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, petroil and paraffin 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 determine the nature of the filter element~~, if any~~.		
Rationale – Enhanced check to address flame traps/air filters being fitted but obviously having gauze of filter elements missing and therefore having an obvious defect affecting the items ability to work effectively to control the backfire risk. In one sense this can be seen as an editorial change. The impact assessment is that replacement gauze and pleated-'paper' filter elements are an inherent maintenance cost and only a tiny proportion of petrol boats will not have them fitted. It is anticipated that between 10 - 20 boats per year subject to BSS examination may be affected. The risk assessment is that filters must have filter elements to be effective and that the change is necessary to address the potential for petrol backfire leading to a petrol vapour ignition and fire. (GR 1).		

~~**2.15.2**~~	~~**Are exhaust system components effectively cooled, lagged or shielded?**~~	~~**R**~~
~~Identify the presence of 'dry' exhaust systems, or parts of 'wet' exhaust systems not cooled by water, and check for the presence of lagging or shielding.~~ ~~Check the condition of lagging and check the surrounding structures or components for signs of heat damage.~~	~~'Dry' exhaust systems, or those parts of 'wet' exhaust systems between the manifold and the water injection elbow, must be effectively lagged or shielded.~~ ~~Lagging must be free of signs of damage or deterioration, and must not be loosely fitted.~~ ~~Lagging or shielding must provide complete coverage.~~	
~~Applicability – signs of heat damage on structures or components adjacent to exhaust systems may indicate that the exhaust lagging or shielding is not effective.~~ ~~Applicability – all parts of 'dry' exhaust systems must be lagged or shielded including silencers, silencer ends and system joints/connections, except for manifolds and flexible exhaust pipe sections, which do not.~~		
Rationale – it is proposed to delete the existing 2.15.2 and replace it with the version below (neutral impact change)		

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. Advice to 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.		
Rationale - The replacement check removes reference to lagging and opens up heat-damage check to all exhaust types and so removes the need for the 'applicabilities' in the current published check (see above). This change makes the application consistent with many other checks where signs of heat damage leads to a failure to meet the BSS check. The change is in line with the risk review carried out at BSSTC. The 'applicability' adds clarity concerning the scope of the check. The 'advice to owners' is included so that the personal injury aspect of lagging and shielding is not lost.(neutral impact change)		

2.15.3	**Are all fuel system components in fixed inboard engine spaces permanently installed and compliant with the applicable Part 2 BSS requirements?**	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 and must comply with the applicable BSS requirements in Part 2.	
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 5.1.2 - 5.1.4.		
Rationale – New check to reflect the outcome of the crossover project at BSSTC. This is a completely new check. The impact assessment is that it fills a potential loophole that would allow portable fuel tanks to be located in the engine space. Since 1997 the number of such installations recorded is very few (<5 in total). The risk assessment is the change is necessary to address the anticipated increase in portable tanks in engine spaces as a result of 'red' diesel tax, diesel bug and the high cost of replacing corroded tanks. The risk issue is that portable fuel tanks are not fire resistant as per all other fuel components in engine spaces, the use of the portable tank is not as the manufacturer intended (easy to see, reach, remove and refill = portable). It follows that if such arrangements were to be deemed acceptable, all BSS fire resistance checks for fuel systems would be compromised. (GR 1)		

2.17.1	**Do the fuel supply arrangements to LPG-fuelled propulsion engines comply with UKLPG ~~LPGA~~ CoP 18 or equivalent, and are any dual-fuel petrol/LPG arrangements of an acceptable type?**	R
[LPG-fuelled propulsion engines can	The fuel supply arrangements to LPG-fuelled propulsion	

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.	engines must comply with UKLPG ~~LPGA~~ Code of Practice (CoP) 18, or an equivalent standard. Any dual-fuel arrangements must be installed and maintained in accordance with the engine manufacturer's guidelines for marine applications.
Supplementary information - 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 UKLPG ~~LPGA~~ CoP 18. Applicability – installations in accordance with EN 15609 are equivalent. Applicability – examiners may determine 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.	
Rationale – • LPGA is now UKLPG and the CoP is still published and available through the new organisation. (editorial change) • *BS EN 15609:2012, LPG equipment and accessories. LPG propulsion systems for boats, yachts and other craft* has just been published (May 2012) and must be regarded as an equivalent to the UKLPG CoP (neutral impact change)	