

# **The Boiler Test Code 2018**

## **VOLUME 2 - Boilers under 3 bar litres**

**Effective from 1<sup>st</sup> March 2018**

**Frequently**

**Asked**

**Questions**

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**Question**

Can TIG welded copper boilers be tested?

**Answer**

Yes, TIG welded copper boilers can be tested. At the time of drafting it was not apparent that TIG welded boilers under 3 bar litres were available. It should also be mentioned that the Test Code does not exclude the use of welding.

**Question**

The difficulty we have is in determining what tests are applied to the different types of boiler described in Volume 2 of the 2018 code. The reason for the confusion is:

Section 3 defines SHALL as a mandatory requirement, it also defines the three class of boiler, LO, LS and high pressure but does not make any reference to different testing requirements for them. It also defines what constitutes a Copper and a Brass boiler, but again makes no reference to different testing requirements. In Section 5.6 the code states 'The boiler SHALL be subjected to a hydraulic test as described in Section 10 .....

In Section 6.5 the code states 'The boiler SHALL be subjected to an initial hydraulic pressure test of twice Working Pressure.....' and Section 6.6 states 'A repeat hydraulic test SHALL be conducted after the working components.....'

In Section 7.3 the code states 'The boiler will be subjected to an initial hydraulic shell pressure test of twice Working Pressure ....'

In none of these Sections is there any reference given to the class of the boiler, therefore we are assuming it applies to ALL boilers below 3 bar litre, however when you get to Section 14 it states that class LO boilers have NO Hydraulic test, and we can't see how this complies with the requirements of Sections 5,6 or 7. Further confusion then arises when Section 14.2 states that for BRASS boilers the Initial Hydraulic test SHALL be at twice working pressure, and the subsequent tests valid for 3 years only and these SHALL be at 1.5 times working pressure. As the vast majority of Mamod / MSS type locos have brass boilers and these are Class LO, should these be hydraulically tested every 3 years or not at all?

**Answer**

The Test Code needs to be read in its entirety. In retrospect Section 14 (Testing standards by boiler type) should have come before Section 5 (Examination of new boilers). This will be implemented in a future revision to the Test Code. Section 14.1.1 deals with testing standards for LO boilers and Section 14.2 deals with testing standards for brass boilers.

**Question**

Could I ask for clarification with regard to brass boilers i.e. Wilesco or Mamod type. My query is that these commercially available boilers do not come with a 2xPw shell certificate, do not come with material certificates, and do not have a pressure gauge, nor do they refer in the instructions to any working pressure, so how is anyone expected to do any form of hydraulic test? They are classified I believe as a LO rating. Is it necessary for a Mamod boiler to be engraved with a number? These things have been around for many years used by children on the kitchen floor with no certification. Are we really asking for testing so it can be used at a club / public event? There are many steam shows where there are displays of the mamod type none of which have a test certificate.

**Answer**

Class LO and LS boilers operate at a pressure of less than 2 bar. Class LO boilers are not fitted with a regulator, whereas class LS boilers are fitted with a regulator. The Code is

not retrospective so a boiler which was not permanently marked at manufacture does not need to be marked retrospectively. Event organisers decide whether persons running a locomotive need to demonstrate evidence of testing. The Code offers a framework within which testing may be demonstrated if the event organiser deems this necessary. The Model Engineering Liaison Group considers the Code to be best practice for model engineering applications.

### **Question**

I have issues regarding small boiler testing and the procedures, especially very low pressure boilers where a safety valve and pressure gauge cannot easily be fitted. I also question the wisdom of self certification.

### **Answer**

Self-certification as referred to in this question applies only to the annual safety checks and steam test. To be clear, it does not apply to hydraulic testing either when a boiler is first brought into use or after a repair. Insofar as the principle aims of these tests are to verify correct operation of the safety valve and pressure gauge, if fitted, then the Model Engineering Liaison Group's view is that these tests can safely be left in the hands of the owner and witnessed by another member of the member's club, association or Federation.

### **Question**

Does "not retrospective" mean that a boiler built before 1<sup>st</sup> May 2018 that does not have evidence of a 2xPw hydraulic test can continue to be used without subjecting it to a hydraulic test provided the annual safety checks and steam tests (and the 3-yearly 1.5xPw test for brass boilers) are carried out in accordance with this code?

### **Answer**

Yes.

### **Question**

Section 3.12 says that, at the discretion of the inspector, the witness may be the owner. Is this correct?

### **Answer**

Yes – the witness may be the owner

### **Question**

Section 3.14.1 says Class LO shall be fitted with a safety valve. As they are spring-loaded oscillating valve engines the safety valve is the spring-loaded oscillating valve. Why does the boiler need another safety valve?

### **Answer**

Spring-loaded oscillating valves are not an adequate pressure release system and therefore a 'true' safety valve is required.

**Question**

Does the Southern Federation keep records/statistics of test failures?

**Answer**

The Southern Federation does not keep records/statistics of test failures under Volume 2 of the Test Code

**Question**

Section 4.4 says 'decisions taken by boiler inspectors shall be taken as final' but Section 19.3 says the matter should be referred .... Either the inspector's decision is final or it isn't – it can't be both.

**Answer**

The words 'Except for the provisions of Section 19' should have been added to the end of Section 4.4. Future editions of the Test Code will be amended accordingly.

**Question**

I do not understand Section 4.5. If another inspector has tested and passed a boiler it does not need doing again. Does it mean that an Inspector can do his own annual safety & steam checks, but not the hydraulic or first steam test?

**Answer**

The intention is that that an Inspector can do his own annual safety & steam checks, but not the hydraulic or first steam test. We should have followed the wording in Volume 1 (3.9a) and included 'equipment in their ownership'. This change will be made in a future release of the Code.

**Question**

Is Section 5 intended to cover commercially made boilers? If it does, Section 5.2 is not consistent with Section 7.1, which does not require removal of lagging provided there exists an appropriate manufacturer's certificate.

**Answer**

Section 5 is intended to apply to privately made boilers. Perhaps the wording which opens Section 6 should also open Section 5. This will be applied in future editions.

**Question**

Does a commercially made boiler that is put into a "home-built" locomotive require a 1.5xPw hydraulic test? I ask because Section 6 specifically states it only applies to home-built boilers. I think a 1.5xPw test should be carried out in such cases, but it is not clearly stated in this Code.

**Answer**

The Test Code does not intend that the 1.5x Pw test be applied if the boiler is commercially built. The model is subject to the tests in Section 13.

**Question**

Does Section 6.7 only apply to home built boilers “in the style of” Aster boilers or does it include Aster built boilers (in which case the requirement should not be in Section 6 which only covers home-built boilers)?

**Answer**

Yes – applies only to home built boilers. The example used is incorrect and will be deleted in future editions.

**Question**

Does Section 7.3 mean that a new commercially-made boiler must be subjected to another 2xPw hydraulic test under this Test Code, even if it comes with a manufacturer’s certificate of test to the appropriate pressure?

**Answer**

No - a new commercially made boiler does not need another 2xPw hydraulic test - unless the commercially made boiler does not have a shell certificate when a 2xPw hydraulic test will be required.

**Question**

Section 9.1 states that the test gauge must be calibrated to within +/- 2%. 2% of what?

**Answer**

+/- 2% across the range of the gauge as per normal practice.

**Question**

In Section 9.2 should it be ‘The test gauge range’ not ‘The gauge range’?

**Answer**

Yes, a typographical error – it should be ‘The test gauge range’.

**Question**

Section 9.4 mentions ‘keeping a log book’. What log book is this? A log book has not previously been mentioned.

**Answer**

The bodies represented on the Model Engineering Liaison Group use different systems for recording test gauge calibrations. In the absence of a recommended system any suitable book may be used as a log book.

**Question**

Section 11.1 says that no leaks are permissible on a new boiler. Presumably this means from any brazed joint, not a minor leak from a fitting or blanking plug?

**Answer**

Yes – not a minor leak from a fitting or blanking plug.

**Question**

Section 11.5 would be better placed in Section 5, as you would not proceed with a hydraulic test if the quality of construction were severely in doubt.

**Answer**

Agreed - this will be applied in future editions.

**Question**

The words 'pressure does exceed the....' in line 6 of Section 13.1.6 should surely read ... 'pressure does not exceed the....'

**Answer**

Agreed - this will be applied in future editions.

**Question**

The words 'steam tests performed....' in line 1 of Section 13.2 should surely read ... 'steam tests may be performed....'? If that is correct does this mean that the owner can do his own annual inspection?

**Answer**

Yes – the words 'may be' were omitted in error. Will be applied in future editions.

Yes – the owner can do his own safety check and steam test.

**Question**

Section 13.2 seems to say that the annual safety and steam test can be carried out by owner and recorded. Is this right? Where is it recorded?

**Answer**

Yes – the owner can do his own safety check and steam test. The Test Code expects that the items listed in 16.4 are captured on the sister document to this code document name 'Pressure Vessel Certificate 2018'.

**Question**

I am confused by Sections 13.2.2, 13.2.2.1 and 13.2.2.2. Is it the intention that the pressure gauge will *not* be routinely calibrated at the annual steam test? Instead, the safety valve will be set hydraulically off the boiler and the pressure gauge "proved" against the safety valve release pressure? If my interpretation is correct, why does Section 13.1.2 call for pressure gauge calibration? Step 13.1.5(b) would then be satisfied by "verifying" the pressure gauge against a calibrated safety valve.

**Answer**

Yes - it is the intention that the pressure gauge will *not* be routinely calibrated at the annual steam test. Section 13.1.2 is part of the first safety check after the initial hydraulic test. Section 13.2.2 will be reworded to make clear that Section 13.1.2 is not performed as part of the annual inspection. This will be changed in future editions.

**Question**

Does Section 13.2.2 mean that an "Examination Certificate of a Pressure System" is not required? Do we prepare our own "Annual Inspection and Steam Test" document?

**Answer**

The Test Code expects that the items listed in Section 16.4 are captured on the sister document to this Test Code document name 'Pressure Vessel Certificate 2018'.

**Question**

Sections 13.2.2.1 and 13.2.2.2 assume that the safety valves have been set hydraulically. Safety valves perform differently under hydraulic pressure and steam pressure. Is this a safe way to set check the pressure gauge?

**Answer**

Refer to Section 12 (Model pressure gauge calibration).

**Question**

There is no mention in Sections 14.1 to 14.2 of the need for a 1.5xPw test. I am not clear which “class” of boiler requires the 1.5xPw test; presumably Class LO does not, but what about the other three classes?

**Answer**

Section 14 should have appeared earlier in the document. A future release of the Test Code will move it before the current Section 5 (Examination of a new boiler) and will reword it to differentiate the class of boiler from the material from which the boiler is made.

**Question**

Do not agree with Sections 14.1.2 and 14.1.3. These boilers should be subject to a 1.5xPw hydraulic test every 4 years due to possible deterioration of parts associated with the boiler in particular dezincification, unrecorded damage etc.

**Answer**

The Model Engineering Liaison Group’s view is that only boilers made of brass should be subject to repeat 1.5xPw testing at three yearly intervals. The risk of dezincification in fittings associated with a copper boiler when combined with the low pressure volume product of boilers covered by Volume 2 of the Test Code leads the Model Engineering Liaison Group to the view that there is a sufficiently low risk that repeat hydraulic testing is not needed.

**Question**

What is the personal identification number referred to in Section 18 and what is “the relevant association”? Do these pre-numbered certificates mean the “Examination Certificate of a Pressure System” is not used? What form should this document take?

**Answer**

Personal identification numbers are used by G1MRA and the Association of 16mm Narrow Gauge Modellers. Northern Association and Southern Federation use pre-numbered certificates, the sister document to this code document name ‘Pressure Vessel Certificate 2018’.

**Question**

The Test Code Volume 1 Section 12.4 states:- Certification Records should be retained by the boiler inspector and/or the Club or Society. The Test Code Volume 2 Section 18.2 states: Inspectors....shall.... record....in a record book. Why the difference?

**Answer**

Certificates issued under Volume 1 are in a pad format with retained copies. Certificates issued under Volume 2 by Northern Association and Southern Federation are in a pad format with retained copies whereas certificates issued under Volume 2 by G1MRA and Association of 16mm Narrow Gauge Modellers are not in a pad format and do not have retained copies.

**Question**

Section 19.3 contradicts Section 4.4 and appears to allow the owner to “shop around” to find an Inspector who will pass the boiler.

**Answer**

The words ‘Except for the provisions of Section 19’ should have been added to the end of Section 4.4. Future editions of the Test Code will be amended accordingly.



