

BOILER CODE OF  
PRACTICE (BCOP)



## GUIDANCE NOTE

## SAFETY VALVES

### Purpose

This document describes good practice in relation to its subject to be followed by Heritage Railways, Tramways and similar bodies to whom this document applies.

### Development

This document has been developed by boiler experts in consultation with His Majesty's Railway Inspectorate (HMRI) a directorate of the Office of Rail and Road (ORR). The document HGR B9000 sets out the background to setting up the Boiler Code of Practice Committee (BCOP).

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## **1. Introduction**

This Guidance Note is one of a series dealing with Locomotive Boilers that were produced by the “Steam Locomotive Boiler Codes of Practice” practitioners’ meetings.

Railway locomotive boilers are designed to create, store and distribute steam at high pressure. The working life of such a boiler can be considerably shortened if due care is not taken at all stages of inspection, repair, running maintenance and day-to-day running.

In the past there have been a series of accidents and explosions due to work being undertaken without having due regard to the inherent risks involved. It is with that in mind that HMRI and HRA set up the series of meetings of boiler practitioners to discuss the issues; distil good practice and codify it into this series of Guidance Notes.

This guidance is written for the assistance of people competent to perform these tasks. In places the terminology used may be specific to such practitioners.

This guidance will also be useful to those in a supervisory or more general role, however no work should be undertaken unless the people concerned are deemed competent to do so.

Where managements decide to take actions that are not in agreement with these recommendations, following appropriate risk assessments or for other reasons, it is recommended that those decisions are reviewed by the senior management body of the organisation and a formal minute is recorded of both the reasons for and the decision reached.

## **2. Dimensional Notation**

The dimensions in this document are variously described in a mixture of imperial and metric units. Where practical equivalent dimensions have been shown but in some cases the dimensions do not easily equate and so the units in force at the time the original designs were documented have been used.

The term “psi.” is used to indicate pressures in pounds per square inch.

## **3. Personal Protective Equipment**

Before undertaking any works a risk assessment must be conducted.

Protective equipment is to be supplied and used at work wherever there are risks to health and safety that cannot be adequately controlled in other ways.

The equipment must be

- In accordance with the latest Personal Protective Equipment regulations;
- Properly assessed before use to ensure it is suitable;
- Maintained and stored properly;
- Provided with instructions on how to use it safely; and
- Used correctly by those undertaking the work.

## **4. General**

Safety valves are the most critical and necessary protective device on any pressure system and must always be maintained in such condition to ensure that a pressure system is limited to the safe operating limit at all times.

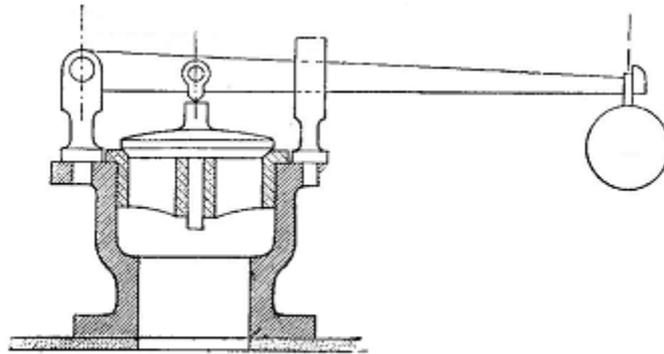
In the steam era, the repair and adjustment of locomotive safety valves was confined to specialists in the main works who, after the final adjustment, sealed the valve with a lead seal as well as stamping on the valve casting its authorised working pressure and registered number. A certificate to this effect was also issued and attached to the history card of the engine to which it was fitted.

Over the early development period of pressure systems, many failures were caused by either not understanding the strength limits of the materials being used at the time (cast and wrought iron) or through the human element with the ability to increase the pressure setting in order to obtain more power, sometimes with disastrous results. It was quite easy, a turn of a spanner or adding extra weight to the lever or jamming with wood or metal.

## 5. Types of Safety Valves used on Locomotive Boilers

### Weighted Safety Valves:

These can be either Deadweight (directly loaded) or a weighted lever type where the weight can be moved backwards and forwards along a lever to attain the correct pressure setting as shown in Fig 1. These valves are rarely used in normal operation and are representative of early historical types. These are not considered in this code of practice.



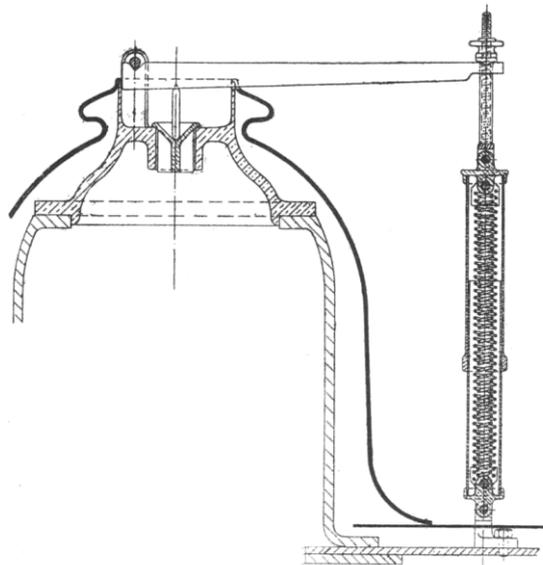
**Fig 1 – Basic Weighted Lever Safety Valve**

### Spring loaded safety valves:

These are the most common type fitted to locomotive boilers almost to the exclusion of other types, the exceptions being some replicas of early locomotive designs. They are to be found in various configurations.

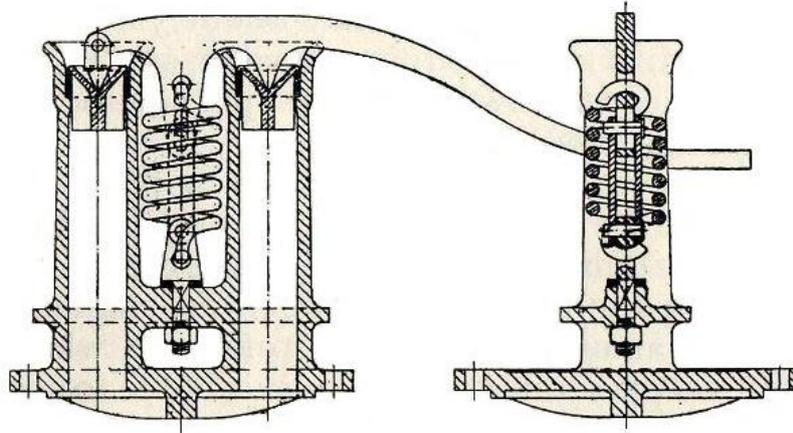
### Indirectly spring loaded Safety Valves:

The "Salter" Fig 2, which is indirectly loaded, has a spring tensioned lever with the spring contained in a tube usually with thumb screw adjustment. These valves were invented prior to the adoption of dial pressure gauges and the brass cases were graduated to indicate the boiler pressure at which the valve would lift.



**Fig 2 – "Salter" type safety valve**

The "Ramsbottom" Fig 3, is basically a U tube with the inlet at the base of the U, each arm of which contains a valve. The valves are retained on their seats by a cross bar tensioned by a spring between the valve bodies and adjustment is achieved by altering the tension in the spring by interposing a solid washer between the lower spring retainer and the main casting. There are also safety straps fitted so that in the event of the spring failing, the valves and lever are retained. An extension of the cross bar can be used by the driver to test or ease either valve.



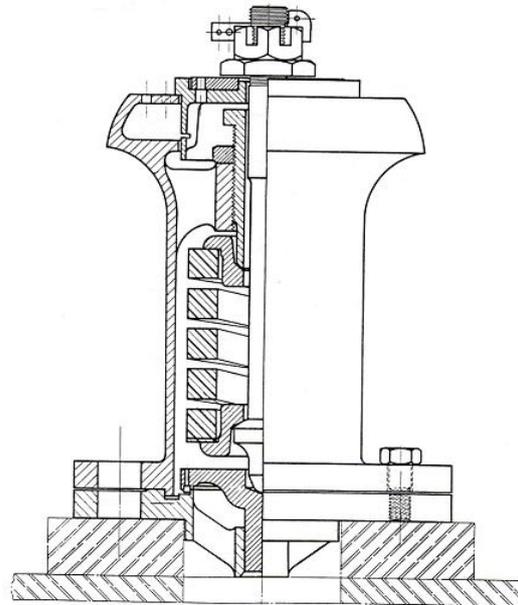
**Fig 3 – “Ramsbottom” type safety valve**

### Directly spring loaded Safety Valves:

Wastage of heat energy and thus increasing coal consumption was always an irksome problem for the Chief Mechanical Engineers of the former railway companies. The constant feathering of early safety valve types represented a source of such waste. On a single locomotive this amounts to but a little, however, over a fleet it becomes a significant cost. Experiments were undertaken principally by private engineering companies and particularly by the private locomotive builders to try to allay this problem. What was needed was a valve that did not waste heat due to feathering, opened quickly, released the excess steam and shut off promptly with minimum loss of pressure.

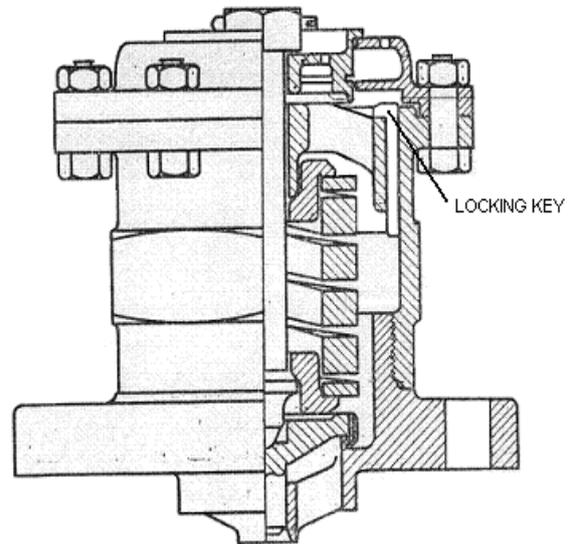
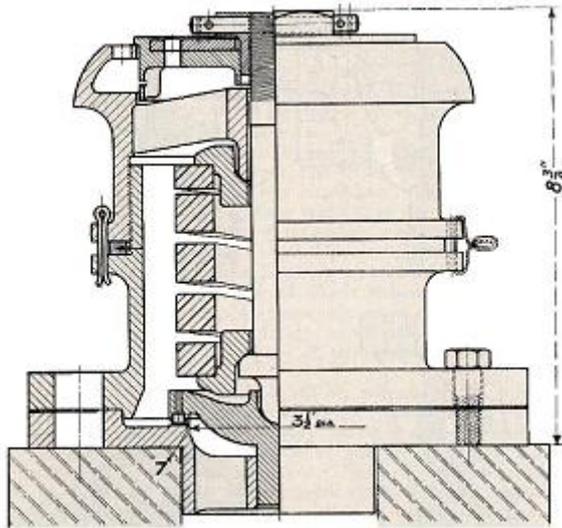
The "Ross Pop" type valves were the answer. They not only fulfilled the requirements but their physical size was small compared with all previous types. They came in a range of sizes from 1.5 to 4 inch diameter seats. The essential feature of these valves is the 'top cap' unit which regulates the amount of steam released at each discharge. There are two basic Ross "Pop" variants.

The smaller ones Fig 4, comprise two main castings, the base-plate which incorporates the valve seat and the body which houses a spider with its internally screwed and lock-nutted spring adjuster. The top cap fits in the top of the casing and is retained by a lock nutted arrangement.



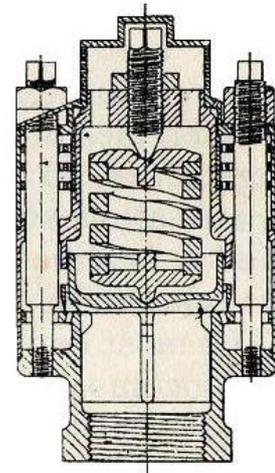
**Fig 4 – Small pattern “Ross Pop” safety valve**

The larger valves Fig 5a, of 3.5 and 4 inch seat diameter, were developed to suit boilers where gauge clearance constraints became critical and are of reduced height. These utilise three main castings including the base plate, the lower body and the upper body. This type loads the spring by screwing the upper body externally onto the lower body with a spacer ring between to lock the spring compression to the desired level. The top cap fits in the top casing and is retained by a nut and cotter pin. Fig 5b shows the BR variant. With this type, the valve spring compression is locked by fitting a gib head key into coincident radial slots in the body and in the spider. Note, the head of the key must be facing inwards in order to facilitate fitting the top cap.



**Fig 5a – Large capacity, low height “Ross Pop” safety valve**      **Fig 5b – BR Type Safety Valve**

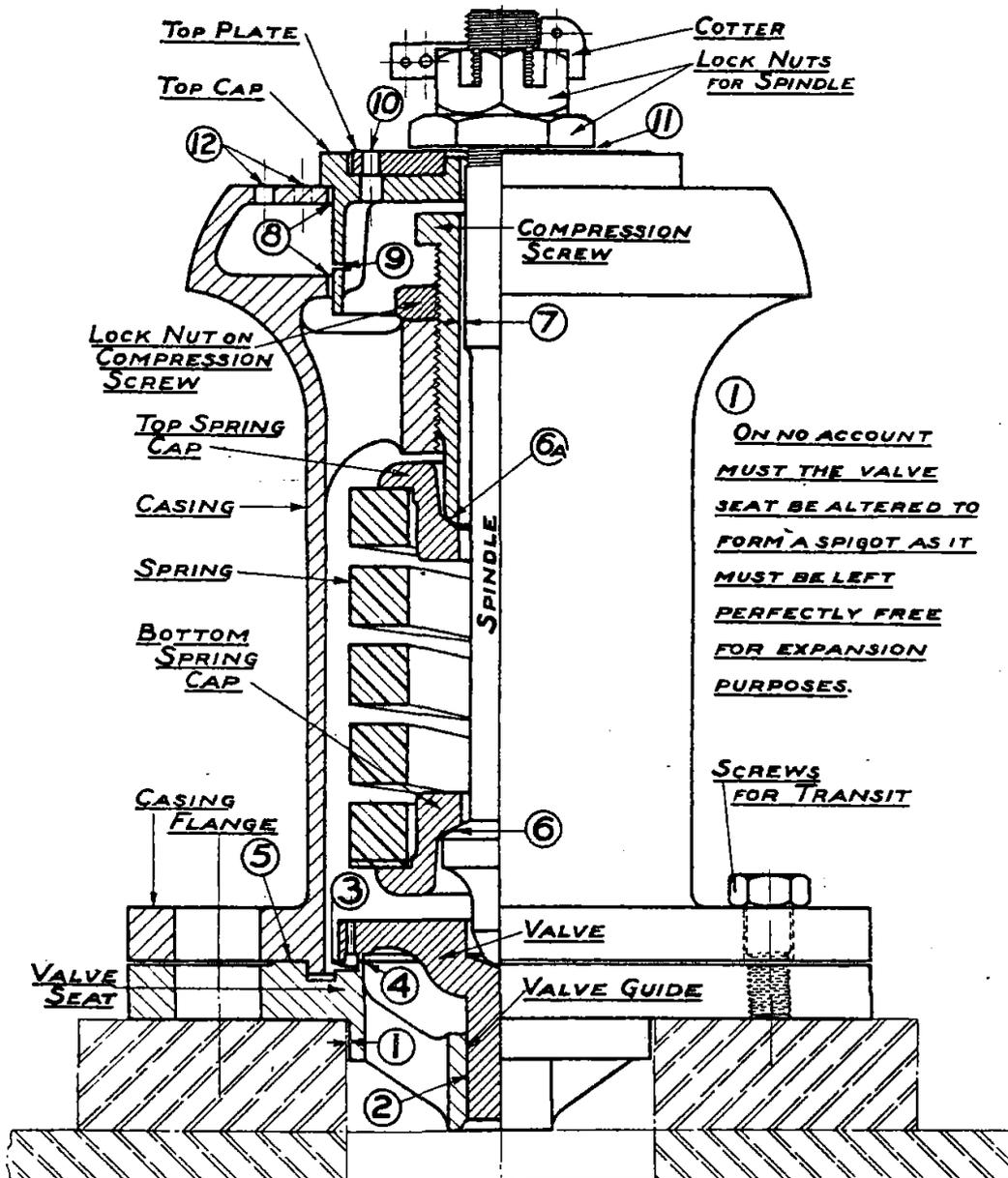
Fig 6 depicts another type of “pop” action valve found more commonly on the continent.



**Fig 6 – Continental type “Pop” safety valve**

When "Pop" type valves were in their early stages of development, difficulties were experienced with achieving re-seating of the valves. As much as 50 psi could be lost from the boiler due to the action of the steam on the increased area of the valve after the valve had opened. The special pop valve recess together with its chamfered edge (see Section 8) and the 'top cap' were developed which overcame this problem. The top cap serves two functions. Firstly, the steam pressure inside the casing and acting on its underside, provides additional lift to open the valve and thus affords a more effective relief of excess pressure. The second function is to partially restrict the steam outlet from the body to partially build up pressure above the valve to assist in its closing. With the optimum setting achieved by adjusting the number of open exhaust holes in the top cap, the boiler pressure loss may be limited to typically 3 psi each time the valve lifts.

6. Ross POP Safety Valve Set-up and Adjustment Procedure



The following has been extracted from the 'Ross Patent Muffled Pop Safety Valve' handbook; R. L. Ross & Co Ltd 1955.

Fig 7 – "Ross Pop" safety valve – annotated diagram as referred to in the following text

General Remarks

- 1 Special attention should be given to the note on the Drawing relative to the expansion of the valve seat.
- 2 The Valve guide should be a free and easy fit in the boss of the valve seat.
- 3 The lip of the valve, which acts as the pop chamber, should be about .008" clear of the valve seat.
- 4 The valve face, which is the primary joint between the valve and the valve seat, is a ground flat joint.
- 5 The joint between the casing flange and the flange of the valve seat is a machined joint, and no jointing material of any sort should be used. The act of tightening down the main studs to make the joint between the valve seat and the seating of the boiler also makes, at the same time, the joint

between the casing flange and the valve seat. The screws for transit purposes are simply for holding the various parts in place, while the valve is off the boiler.

- 6 The spring is held between the top and bottom springs caps, which are made with internal radial faces so that the spring can take up its natural vertical position.
- 7 A clearance is necessary between the spindle and the hole in the compression stud, so as to allow it to have a perfectly free motion.
- 8 A clearance is necessary between the outer rim of the top cap and the hole in the casing, so as to allow a free escape for part of the steam.
- 9 A slot is made in the top cap so that part of the steam can escape freely, and hence through the holes (12) in the top of the casing to atmosphere.
- 10 The holes in the top plate are so arranged as to be adjustable over the holes in the top cap. A peg is provided in the top plate so that it can be located in different positions with the holes in the top cap, thus, allowing a variable number of holes to be shut and open.
- 11 A clearance of say 1/32" is necessary between the bottom lock nut and the top plate so as to make sure that the whole of the downward pressure exerted by the spring is transmitted to the valve itself.

## Repairs

The only repairs which should be necessary under ordinary working conditions are those to the primary seating of the valve and valve seat, i.e. No.4

If either of these faces get scored or damaged due to chips or foreign matter lodging in same, they should be put in the lathe and a light skim taken off, after which they should be well ground in.

The clearance of .008" should be arranged at (3).

## Adjustments

Assuming that the valve has been taken off for repairs, and it is required to reset it under steam test, work as follows, after mounting on the boiler or testing plant:

Remove the cotter, lock nuts, top cap and top plate (before getting pressure up). Slack back the lock nut on the compression screw and then screw down the compression screw until the valve is popping at about 2 lbs. per square inch over the blowing off pressure; then tighten up the lock nut on the compression screw. To make sure that the spindle is in a perfectly free and vertical position, and that the spring has taken up its natural vertical position, it is advisable to lap the spindle lightly sideways with a piece of wood until the steam escaping causes the valve to give a practically continuous popping action. As soon as the valve is set according to the above, lower the pressure in the boiler by at least 20 lbs. psi, by means of the injector or blowing of steam, and then put on the top cap, top plate and lock nuts. It is advisable when putting on these parts to make sure that the pressure is kept well below blowing off pressure, as the valve is so sensitive that the fact of putting these parts on the spindle might cause it to blow and scald the person carrying out the adjustments.

The maximum blowing off pressure is settled by the adjustment of the compression screw.

The actual loss of steam, after the valve commences to blow, is regulated by adjusting the holes in the top cap and top plate. The more holes which are shut will cause a greater loss of steam, and vice versa, the less holes shut a smaller loss of steam.

When the valves are tested at the Maker's Works the top caps and top plates are marked with a centre punch, according to the position found satisfactory; this being a loss of about 3 lbs. psi of steam.

If by any chance after all the holes in the top plate and top cap are opened, and the loss of steam pressure is still too great, this can be remedied by reducing the diameter of the top cap say 1/32" where it fits into the casing. By doing this the passage at (8) for a free escape of steam is enlarged, and therefore the blow exerted on the top cap by the escaping steam is not so great. Very probably after making this alteration it may be found that the valve then will not lose quite enough steam; this can then be easily remedied by shutting some of the holes.

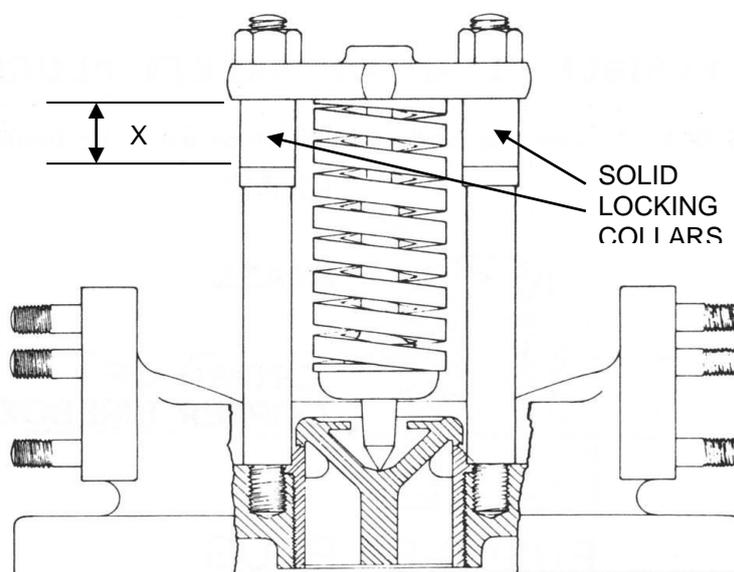
## 7. Major Company Variations

The "LMS" and BR type "pop" valve variant consists of four main castings, the base which incorporates the valve seat and is externally screwed at its top end, the body which is internally screwed to allow for fixing to the base and also for the accommodation of the adjusting spider at the upper end. It has a flange on the top end to which is bolted the top plate which in turn contains the governor.

The Southern railway used Ross valves although the vast majority were almost exact copies made in their own works with slight detail differences in the outer casings. The exceptions to this were some of the Drummond classes which were fitted with their own design of pop valves.

The Great Western Railway fitted their own design of safety valve consisting of a pillar type valve with the compression spring tensioned by a strong back mounted between two threaded supports and bearing on the valve cap via the spring in the centre. Adjustment was achieved by screwing up or unscrewing the nuts bearing on the strong back. Fig 8 shows this type of valve having solid 'locking collars' interposed between the strong back and the support studs. Following adjustment and setting, the distance 'x' is measured and a set of solid machined collars are turned up to this dimension and inserted such that when the complete assembly is reassembled and fully tightened, the valve setting is locked to the blowing off pressure (safe operating limit).

***Fig 8 – Great Western combined safety valve and top feed assembly***



## 8. Characteristics of different types of safety valves under working conditions

All safety valves other than the "pop" types are set to feather at pressures below the blow off pressure, some more than others depending on the design of the valve and its seat.

The valves that have the longest run up or feathering period are the deadweight, lever loaded type, Salter and Ramsbottom which have conical type valves and seats. This is because there is no effective extension of the valve area beyond its seat for the steam to act upon and provide additional lifting action. This type of valve was quite wasteful as it had to be set to feather ten to fifteen psi below working pressure otherwise the boiler would exceed its blowing off pressure.

The same types of valves, if fitted with flat rather than conical seats on the valve and seat tend to lift higher due to the steam acting on the increased area when the valve initially lifts.

## 9. Design Requirements

The capacity of the safety valves to be fitted to a boiler depends principally on the volume of steam they require to pass at the maximum steaming rate. This in turn is related to the combined heating surface area and the blowing off pressure (safe operating limit). The size, basically the diameter of the valve, can be

established from empirical formulae or appropriate nomograms. The steam escape area is the product of the circumference of the valve seat and the lift of the valve.

The rating of the spring in spring loaded valves is critical. It should be sufficient to allow the valve to attain adequate lift to release surplus steam to the atmosphere without becoming coil bound. The spring load is determined by calculating the area of the valve and multiplying this by the pressure at which the valve is required to lift.

The Spring Rate is the applied load divided by the deflection, often stated as lb per inch. Safety valves that are designed for limited gauge clearances are much shorter in height (see Fig 5). These must be fitted with the correct section springs and it is not permissible to substitute circular section material. The reason for this is that square section material has a spring rate between 25 and 30% higher than equivalent round section and thus a shorter spring can be employed within the limited height. Circular section springs of appropriate diameter section may be employed where the working length is comparatively longer.

Safety Valves and their component parts should be permanently marked with a unique identification to enable traceability and aid correct assembly.

## **10. Maintenance**

Safety valves should be removed from the boiler, stripped and restored periodically if they become defective in service or if a boiler has been out of service or stored for over a year. The periodic removal should also be used to check the integrity of the fasteners for breakage or wastage. The frequency of the periodic examinations should be determined in conjunction with the competent person.

Great Western and some other type safety valves are not normally removed from the boiler for examination as all their parts can be inspected in situ by removal of the bonnet. If necessary, the strong backs, springs and valves may be removed if suspect.

The effect of expansion on the working parts can affect the correct functioning of a safety valve. All materials used and working clearances must be consistent with minimising the adverse effects of expansion. To this end, the materials and manufacturing tolerances must be carefully specified and subsequently maintained within prescribed limits.

### **The Examination should consist of the following:**

The persons who are charged with the examination and overhaul of safety valves must have demonstrated their competence to the Railway's Responsible Person and documentary evidence of this placed on record.

It should be appreciated that the deflection of a coil spring is essentially governed by the fourth power of its effective spring section (diameter/cross section). It will thus be evident that relatively little wastage of the spring coils will result in a correspondingly higher deflection which may be evidenced by the valves lifting at lower pressures. Where valves exhibit this condition, they must be examined.

All mechanical parts should be examined visually for cracking, wastage or wear. Particular attention should be paid to the spring for general or local wastage. Depending on the extent of wastage on the spring it should be renewed or load tested. This will ascertain its suitability to maintain its prescribed working performance without restricting the lift of the valve due to coil binding. All springs must be checked to ensure that their ends are ground flat and are truly at right angles to the axis of the spring.

On Indirectly loaded safety valves such as the Salter and Ramsbottom types, the condition of the spring tension / cross bar lever and pivot assembly should be checked for signs of distortion, cracking, corrosion, or seizure which could restrict freedom of operation. The pivots (that bear downwards into the coned recesses in the tops of the valves) should align evenly and centrally on the valve and corresponding seat axes. The distance between centres of the pivots/fulcrum points and valve seat centres must be checked and compared to ensure correct set up without deviation from design. Close attention to these matters normally improves the valve's performance and minimises the feathering period.

The springs of indirectly loaded valves should be checked for wear on both fixing hooks, the holes in the fixing lugs and the holes and pins in the restraining strap/s. Local wear is caused by fretting of the spring at these points.

“Pop” safety valves depend, to a large extent, for their prompt opening and closing performance on the clearance between the chamfered edge of the valve outer lip and the valve base. If the clearance exceeds the dimensions nominated in section 6; or those stipulated in the working drawings, (this clearance varies between different varieties of valve) or if the chamfer is incorrectly machined, the valve will tend to feather before opening and again after shutting.

All directly applied valves must be checked to ensure that the spring force is applied normally to the valve with the point of contact of the spindle below that of the valve seat. The valve spindle must be straight and true and not be deflected from its line of action (tip to one side). Neglect of these requirements will lead to sluggish performance.

## Replacement Springs

When purchasing a new spring, it is essential that a credible spring manufacturer be chosen. The correct spring section and dimensions must be determined, preferably from the manufacturing drawings or where these are not available, from a known new spring of the same type, size and for the identical working pressure. The following specification details should be quoted to the manufacturer and a Certificate of Conformity obtained:

- Spring material dimensions (for square or round);
- Mean diameter of the spring;
- Number of working coils;
- Free length;
- Spring Rate\* (or compressed length under full load);
- Finished condition of wire (polished or black as applicable);
- The ends to be close coiled and ground flat normal to the axis of the spring (the flat area of the spring end should extend approximately between 70 and 80% of the circumference);
- A non intrusive means of identifying the traceability of the spring (e.g. by affixing an embossed tag); and
- The spring must be “scragged” \*\* at least three times.

Notes:

\* The spring manufacturer should select the grade of spring section material and the heat treatment to ensure the specified spring rate is achieved. It must also be ensured that for square or rectangular sectioned springs that the spring material is of trapezoidal section to eliminate the possibility of coil binding. A copy of the Certificate of Conformance of the spring material should be requested and kept on file.

\*\* “Scragging” is the term used to describe the process whereby a spring is rapidly compressed (using a specialised machine) to its full amplitude and then released. After the springs have been deflected three times, they are measured to ensure that no permanent set has taken place and the free height remains the same as originally measured.

## Assembly and setting of safety valves

***Any repair or the final setting of a safety valve (protective device) must be made under the supervision of a competent person who will also be responsible for witnessing its testing. In exceptional cases and with the agreement of the competent person, the “Responsible Person” nominated by the Railway Company as competent may undertake these responsibilities.***

When assembling safety valve components, care must be taken to ensure the correct fitting of the parts. They must be clean and any critical passages and ports checked to confirm their compliance with the drawings. The importance of the fit of the top cap in a “pop” safety valve is described in Fig 8 & (General remarks).

When bench testing a spring, it should be loaded to correspond to the blowing off pressure (safe operating limit). As a guide, it should not have deflected by more than a quarter of its free length. With the test load applied, it must be evident that there is adequate reserve such that the lift of the valve cannot be restricted due to coil binding. This observation, the date tested, the applied load and deflection should be recoded and filed for future reference.

No undue force should be necessary when assembling parts and the correct means of fitting the springs must be adopted. The alignment of springs is critical to ensure a clean shut off and several valve spindle types employ hemispherical type thrust seats to accommodate minor inaccuracies in the springs. These seats must be clean and free from burrs. The valve seats themselves should be lapped with fine abrasive paste, all traces of which must be removed prior to assembly. The nominated clearances between parts, especially the areas of sliding contact of the valves in the bodies must be maintained correctly to avoid jamming due to expansion.

The competent person must witness the setting of each valve, the lift pressure and accumulation tests in accordance with the particular design details of the locomotive concerned. He shall ensure that any spacer washers or other safety features, such as the safety straps on Ramsbottom valves, are correctly fitted and secured following adjustment of the valve.

Where practicable, the Insurance surveyor or competent person shall be invited to seal the adjusting mechanism of each valve to detect alterations made thereafter.

All safety valve setting shall be carried out by using a calibrated (traceable to National Standards) test pressure gauge having a full scale deflection of at least 25% more (BS 1790:1955) than the working pressure of the boiler. It may be fitted to the tail cock connection of a water gauge column.

During safety valve setting, caution must be exercised to ensure that any adjustments are not carried out in conditions that may result in the safety valve blowing off so as to cause danger to the person carrying out the adjustment either by scalding or by parts being projected due to the valve lifting.

With the boiler in steam, turn the tail cock on and check that no leaks occur in the connection to the test gauge. Compare the readings on the boiler gauge and the test gauge and ensure that within the normal working pressure range of the boiler, the boiler gauge reads within + or – 5 psi of the test gauge. If the boiler gauge does not read within these limits change gauge and retest.

Carry out tests to determine the setting of all fitted safety valves. With the locomotive producing steam at a gentle rate, check that one safety valve lifts when the pressure reaches the safe operating limit of the boiler. It is normal practice for the other safety valve/s to lift at slightly higher pressure typically up to 5 psi above the safe operating limit.

When two or more safety valves are fitted, in order to prevent one safety valve lifting whilst adjusting the other, it is possible to fit a temporary gag to the valve which is not being adjusted. A "gag" is a clamp type device used to keep a safety valve closed whilst testing another. Where such practice is adopted, it is essential that the gag be removed immediately following completion of the setting operation.

For directly loaded safety valves with the boiler producing steam at a rate approaching its total capacity and the safety valves fully lifted over a period of at least five minutes, check that the boiler pressure does not accumulate under static testing conditions more than 5% above its blowing off pressure (safe working limit). It is acceptable, under dynamic test conditions, to allow this margin to reach up to 10% for a short period whilst the injectors are started in the case where steam is suddenly shut off (e.g. to simulate an emergency condition).

In order to prove the operation of the safety valves in such a manner that exposure to undue overpressure is suitably limited, an accumulation test must be carried out. This test shall be carried out at the request of the competent person who will be present - normally following safety valve overhaul or boiler modification. Such test may be completed by a responsible person where a safety valve is re-set for any reason, however, with the prior agreement of the competent person

For indirectly loaded safety valves such as the Ramsbottom type, the accumulation during a static test must not rise above 10% of its blowing off pressure.

If the safety valves fail to meet the standard set out above, they must be stripped for examination and repair as necessary and then re-set as detailed in Section 6 for Ross Pop Safety valves or as follows:

- Assemble the safety valves without locking washers etc. so as to allow the setting to be altered and with the screw down adjustment such that the valve will lift at a low setting.
- Fit the valve to the boiler and put into steam, carefully raising the pressure until either the safety valve lifts or the rated boiler pressure is reached. If adjustment is required, use the injector to reduce the boiler pressure by at least 20 p.s.i. before any adjustment is carried out, repeat the procedure until the correct setting is achieved for both valves.
- When the valves are correctly set, determine the dimensions for any spacers etc required taking the boiler out of steam, if necessary, to do so. Assemble the valves complete with spacers and locking mechanism and retest the safety valves to ensure that the correct setting has been maintained.
- Remove test pressure gauge and return it to storage.

## **11. Records**

It is essential that records are created and kept on file that documents the traceability and specification of any new materials, any maintenance attention received and the testing of safety valves.

As a guide, the ex-BR documents which are used for this purpose for mainline engines are detailed in MT276. Generalised versions are included as specimens in the next section overleaf. Form G records the details of the maintenance received and the person completing the maintenance. Form H, records the details of the testing completed. Both forms bear the signatures of the insurance company's boiler inspector or competent person.

Records on this basis should be retained throughout the service life of a steam locomotive or other steam powered rail vehicle.

12. Specimen Forms “G” and “H”

FORM “G” (Equivalent)

PRESERVED STEAM LOCOMOTIVE –  
 CERTIFICATE OF OVERHAUL AND TESTING OF SAFETY VALVES

Safety Valve Identification No/s. \_\_\_\_\_

For Locomotive Number: \_\_\_\_\_

Boiler No. : \_\_\_\_\_

Working Pressure. \_\_\_\_\_

The Above Safety Valve/s have been:

Overhauled at: \_\_\_\_\_

Overhauled/repaired

Tested and Sealed \*

(\* Delete as applicable)

Overhauled By: \_\_\_\_\_

Print Name

Signed: \_\_\_\_\_

Date: \_\_\_\_\_

Countersigned by Preserved Railway’s “Responsible Person”

Print Name: \_\_\_\_\_

Signed: \_\_\_\_\_

Date: \_\_\_\_\_

Endorsed by “Competent Person”

Print Name: \_\_\_\_\_

Signed: \_\_\_\_\_

Date: \_\_\_\_\_

FORM “H” (Equivalent)

PRESERVED STEAM LOCOMOTIVE – CERTIFICATE OF EXAMINATION OF SAFETY VALVES

(VALID ONLY WITH ASSOCIATED OVERHAUL/TEST CERTIFICATE FORM “G”)

Safety Valve Identification No/s. \_\_\_\_\_

For Locomotive Number: \_\_\_\_\_

Boiler No. : \_\_\_\_\_

Working Pressure. \_\_\_\_\_

The above Safety Valve/s have been:

1) Verified as previously tested and the seal is intact \*

2) The locomotive boiler pressure gauge has been tested against a Master Gauge to its working pressure and is correct.

Serial Number of Master Gauge: \_\_\_\_\_

3) The Safety Valves blow off at the correct Pressure of \_\_\_\_\_ pounds per square inch on the locomotive

(\* Delete as applicable)

Tested By: \_\_\_\_\_

Print Name

Organisation: \_\_\_\_\_

Signed: \_\_\_\_\_

Date: \_\_\_\_\_

Countersigned by “Competent Person”

Print Name: \_\_\_\_\_

Organisation: \_\_\_\_\_

Signed: \_\_\_\_\_

Date: \_\_\_\_\_

\_\_\_\_\_ end of document \_\_\_\_\_