

NEW ZEALAND GOVERNMENT RAILWAYS	BOILER OPERATION AND MAINTENANCE	CODE No. 73
LOCOMOTIVE BRANCH	Cancelled Issue No 4 31/3/67	Page No. 1 of 3 Issue No 3 Date Issued 1/5/47

EXISTING LOCOMOTIVE CODES TO BE CANCELLED: 142, 143, 144, 145, 146, 150, 171, 174, 187, 188, 189, 190, 191, 193, 195, 196, 204, 206, 207, 208, 210, 211, 213, 214, 322

(1) EXAMINATIONS

Members shall not be placed in charge of any type of boiler unless they have passed the prescribed examination for the operation of the unit to which the boiler is fitted. The examinations are as follow.:-

- (a) Employees placed in charge of stationary boilers, with the exception of Cleaners and Acting Firemen placed in charge of boilers at Locomotive Depots, shall require to have passed the Stationary Enginedrivers Examination.
- (b) Employees placed in charge of steam-cranes or coaling-grabs shall require to have passed the Steam Crane-driver's Examination.
- (c) Before employees are placed in charge of locomotive boilers they shall require to have passed the preliminary examination prescribed by the Chief Mechanical Engineer, and at a later date they shall be called upon to pass the examination for Locomotive Fireman.

(NOTE.—The above instructions shall not apply to members conducting trials on locomotives at Workshops after the completion of repairs. Such trials shall be supervised by a responsible officer holding a Stationary Engine-driver's Certificate, who has been authorized by the Chief Mechanical Engineer to carry out this work.)

(2) TESTING WATER-LEVEL

Employees in charge of boilers must test the water-level before any fire is lighted. When a boiler is in steam the water-level must be tested at frequent intervals to ensure that there is sufficient water in the boiler and that the water columns are functioning correctly, and when fires are banked and locomotives put away the water-levels must be tested again and the gauge must register a "full glass" of water.

When any boiler in steam is handed over from one attendant to another, both members must test the water-level together before the original attendant ceases duty.

The correct method of testing the water-level is as follows —

- (a) Open try-cock and blow through; see that water returns quickly to glass.
- (b) Close steam-cock, open water-cock and try-cock; see that water blows through freely.
- (c) Close water-cock, open steam-cock and try-cock; see that steam blows through freely.
- (d) Repeat test with other glass.
- (e) Check water-level in both glasses.

(3) "BOILER EMPTY" NOTICE

When the water is drained from a boiler, a "boiler empty" notice must be hung over the firehole door, and such notices must not be removed until the boilers are filled.

(4) STORING BOILERS

When a boiler is stored or is only used intermittently, the water must be drained and sufficient plugs removed to allow a current of air to pass freely through the boiler when it is not in use.

(5) DISCHARGE FROM WATER-COLUMN DRAIN-COCKS

The discharge-pipes from the water-column drain-cocks must be situated so that there is no possibility of the water coming in contact with the boiler-shell.

(6) REMOVAL OF BRICK ARCH STUDS

When boilers are shopped for Class A repairs, all brick arch studs must be renewed. The threads of each stud hole in the plate must be carefully examined, and, if defective in any way, the holes must be retapped.

In new fireboxes, or in cases where fireboxes are patched, the diameter of the holes for the brick arch studs in the new plates must not exceed $\frac{3}{4}$ in tapping. Details of brick arch studs are shown on B.P. Z. 7429.

(7) PATCHING BOILER OR FIREBOX PLATES

The nature of the repairs to be effected shall be determined by the Chief Mechanical Engineer after the consideration of the Boiler Inspector's report, and shall be specified on the Loco./59 report. Full details of the repairs effected and patches applied must be included in the Loco./57A reports.

(8) CLEANING AND PRESERVING THE INTERIOR OF BOILERS

At the completion of boiler repairs and before the replacement of tubes and flues, all scale and loose material must be removed from the interior of the boiler, and the bottom of the barrel and the bottom of the tubeplates must be painted to approximately 18 in. above the centre-line of the boiler with a preservative approved by the Chief Mechanical Engineer. No descaling compounds or other substances shall be introduced into any boiler without the authority of the Chief Mechanical Engineer.

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(9) RENEWING PORTIONS OF OLD BOILERS

When any portion of a boiler is renewed, a description of the new material used, together with the maker's name and brand, must be included in the Loco./57A report. The material used for renewal purposes must be of similar quality to that used in the construction of new boilers, and, where possible, the same types and pitch of rivets and stays must be observed.

For materials used in boiler and firebox construction or repairs refer to Drawings W16296 to W16299 inclusive (Materials Used For Loco. Work, &c.) compiled in book form.

(10) AVOIDING EXTRA SEAMS

When defective firebox plates require patching and it is necessary to cut away some of the existing plates, the defective plates should be cut away to the nearest seam to avoid making more seams than are actually required.

(11) CAULKING AND DRILLING

All caulking must be done with a broad-faced tool and on no occasion must the breadth of the caulking-tool be less than the thickness of the boiler plate. All holes must be drilled and reamed out if necessary and on no occasion must holes in boiler plates be punched. Drifting must be reduced to a minimum, and caulking must not be effected while boilers are in steam.

(12) BOILER AND FIREBOX EXPANSION

To ensure that the expansion is not restricted in any direction, particular care must be exercised when fitting sling stays, firebars, and expansion brackets. Longitudinal stays should also receive particular attention and all such stays in any boiler must have the same rigidity when fitted.

(13) SCREWED STAYS

Screwed stays must be of standard lengths and riveted cold with a light hammer. Should any stay project too far, it must not be chipped while in place, but must be taken out and shortened. When any broken stays or stays with small heads are located they must be removed and replaced and details of the replacements must be recorded on the Loco/57A reports.

(14) LAGGING BOILERS

Boilers shall not be permitted to work until they have been lagged in such a way that no external portion of the boiler is exposed to the action of rain, exhaust steam, damp ashes, or coal.

(15) CLEANING ASHPANS

Ashpans must be cleaned at every available opportunity, and damp ashes or coal must not be permitted to accumulate against any portion of a boiler.

(16) BRICK ARCHES AND BAFFLE PLATES

Brick arches and baffle plates must be maintained in good condition and renewed as soon as defects occur.

(17) RECORDS OF NEW BOILERS

When new boilers are manufactured in Workshops, a detailed description of the material used in every portion of the boiler, together with the maker's name and brands, must be enumerated on the Loco./57A report forwarded to the Chief Mechanical Engineer.

(18) MAINTENANCE AND REPORTING DEFECTS

Officers in Charge must ensure that all stationary, crane, and locomotive boilers under their supervision are maintained in the best condition possible, and that all defects are reported and attended to immediately they are detected.

(19) UNAUTHORIZED WORK

When a boiler is in shops for repairs, no alterations or repairs other than those authorized on the covering Loco./59 report for the boiler concerned shall be effected without the Chief Mechanical Engineer's authority.

Note.— For instructions *re* Boiler Cleaning, see Code No. 74.

For instructions *re* Boiler Testing, see Code No. 75.

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23/547

26 March 1964

Works Manager,
HUTT HILLSIDE

STAYBOLT STEEL

From time to time both the Boilershop Foremen at Hutt and Hillside complain about the quality of staybolt steel supplied to Chief Mechanical Engineer's Specification No. 380/2.

The complaint is that cracks develop on the outer edges of these stays when they are rivetted over. A comparison of our specification with that of the British Standard recommended by the Locomotive Manufacturers' Association and the A.S.T.W. Specification shows that the steel purchased to our specification has considerably more elongation and reduction in area than does steel meeting the requirements of the other specifications.

Enquiry has been made from the British Railways and two manufacturers of locomotive boilers, all of whom use steel that is less ductile than that used here. As a result of these replies I am satisfied that any trouble experienced here is due to a failure to leave on the stay the correct amount necessary for rivetting. The practice is to check all stays before they are rivetted and to ensure that the correct amount is projecting.

The following is the amount recommended to be left for rivetting :-

On stays $\frac{7}{8}$ " and 1" diameter - $\frac{3}{8}$ "
 " " $1\frac{1}{8}$ " and $1\frac{1}{4}$ " " - $\frac{1}{4}$ "

Please have this practice followed, being particular to check the stay with a gauge before rivetting commences.

ACTING CHIEF MECHANICAL ENGINEER