

NEW ZEALAND GOVERNMENT RAILWAYS	<b>BOILER CLEANING</b>	<b>CODE No. 74</b>
<b>LOCOMOTIVE BRANCH</b>		Page No. 1 of 2 Issue No 3      Date Issued 1/5/47

**EXISTING LOCOMOTIVE CODES TO BE CANCELLED: 148, 149, 173, 198**

**(1) WASHOUT PERIODS:** The number of days that boilers are to be worked between washout is dependent upon the purity of the water in the districts in which the boilers are located, the class of work performed, and the number of days in steam.

No set washout periods that are applicable to all locomotive districts can be determined, and District Mechanical Engineers will require to study the water conditions on individual locomotive districts and after considering the class of work performed and the nature of the country in the district, shall recommend to the Locomotive Foremen concerned the washout periods for each class of boiler under their supervision.

Officers in Charge at Workshops shall determine the periods at which boilers under their supervision are to be stopped for washout.

Locomotive Foremen and Officers in Charge at Workshops will be held responsible for the maintenance of the boilers under their supervision in the best possible condition, and must ensure that boilers are washed out at such intervals that the water is not permitted to become in a condition likely to cause priming. On no account must boilers be worked long enough between washouts to allow any undue amount of scale to accumulate.

**(2) RECORDING WASHOUT DETAILS:** The Assistant Locomotive Foremen shall record the particulars regarding the washing out of all boilers under their supervision. The details are to be entered in the washout register showing the dates on which boilers are washed out and the number of days the boilers are worked between washouts. In this connection the washout periods recommended by the District Mechanical Engineers shall be taken as a guide.

In cases where boilers are standing dead either for depot repairs or through traffic fluctuations, such days that the boilers are actually out of service shall not be included as running days between washouts.

When a boiler is stopped for a complete day for washout purposes, the details must be recorded on the ticking lists attached to the Loco./46 returns each period. These details shall also be shown on the Loco./175 return each period as a total number of days for each engine class.

When a boiler is washed out and placed in service on the same day, the locomotive concerned shall be considered to have been running on that day and the particulars will be recorded accordingly on the ticking lists and the Loco./175 returns. It will be necessary, however, in such cases for the Assistant Locomotive Foreman to record in the washout book, the dates boilers were washed out, irrespective of the additional work performed by the boilers on the same day.

**(3) WASHOUT INSTRUCTIONS:** Officers in Charge at Workshops and Locomotive Depots shall be held responsible for the application of the washout instructions contained in Instruction No. 60 of the handbook of Special Instructions to Engine-drivers, Firemen, and Cleaners.

**Preparation of Boiler for Cold-water Washout.**—If sufficient time is available, the boiler must be allowed to cool gradually until the temperature of the water has fallen to blood heat or lower. The boiler is then to be drained and washout operations commenced immediately.

If sufficient time is not available, authority must be obtained from the Officer in Charge before boilers are cooled by the addition of cold water.

Under these circumstances, draw the fire, operate the injector to fill boiler, and blow down steam to zero. The boiler must then stand for five hours in the case of G, J, JA, K, KA, and KB class locomotives and four hours for other classes.

Then insert cold-water hose at topmost front boiler plug-hole and at the same time open the blow-down cocks, equalizing the amount of water running out with that running in. Continue this operation until the boiler is cool.

Drain the boiler and commence washing out immediately.

**Preparation of Boiler for Hot-water Washout.**—Draw the fire and reduce steam pressure to zero. The boiler must then stand for three hours before the water is run off. The firehole and smoke-box doors and ash-pan dampers must be closed and a plate placed over the funnel.

Washout operations must be commenced immediately the boiler is empty and the boiler refilled with hot water as soon as the washout is completed.

**Procedure for Washout Operations.**—All washout plugs and mud-hole doors should be loosened while the boiler is draining and removed when it is empty.

The following sequence of operations must be adopted

- (a) First wash crown sheet and wrapper plate and stays between them.
- (b) Wash down waterspace between faceplate and backplate and take particular care to remove accumulations around the firehole.
- (c) Wash down side waterspaces.
- (d) Wash down tubes, flues, and both tubeplates, using upper plug-holes in boiler barrel and smokebox tubeplate.

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- (e) Wash barrel, commencing from smokebox tubeplate and working dislodged scale and mud towards the throatplate. At the same time, direct the stream of water up against the tubes and up the sides of the barrel as far as possible.
- (f) Wash waterspaces around combustion chamber and throatplate and finally around the foundation ring, always directing the stream of water towards the throatplate so that loose scale and sediment may be removed from the mud-hole and plug holes over the foundation ring.

On completion of the washout a careful inspection (by means of a light and mirror) must be carried out to ensure that all loose scale has been removed and that no blockages remain around the combustion chamber, throatplate, and firebox waterspaces. As often as possible, this inspection must be made by the depot boilermaker or authorized fitter (where no boilermaker is located), and this member must ensure that boilers under his care are effectively washed out.

A small application of graphite grease should be applied to the washout plugs before they are replaced, and care must be exercised during the replacement to ensure that cross-threading does not occur, and that no grease enters the boiler. Mud-hole doors must be screwed down tightly at the completion of washout operations and water columns and try-cocks examined and tested to ensure that they are functioning correctly.

Unless instructions are issued to the contrary, the boiler must be refilled and left ready for lighting up.

**(4) WASHOUT PLUGS:** Washout plugs must be examined at each removal and replaced if defective. All washout plugs must be manufactured from gun-metal the composition of which must comply with analysis shown for symbol "B" in clause (1) of Code No. 60.

Boiler plates that are wasted away at the plug holes must be built up with electric welding to provide additional metal for new threads.

**(5) CLEANING TUBES AND FLUES:** Locomotive boiler tubes and flues must be cleaned out at intervals at least not exceeding the washout periods for the respective locomotives.

**(6) USE OF BLOW-DOWN COCKS:** Frequent use must be made of blow-down cocks on locomotive boilers, especially in bad-water districts.

Five minutes blow down before a locomotive leaves the depot will remove any sludge that has accumulated in the boiler and Locomotive Foremen must ensure that the blow-down cocks on boilers under their supervision are used to the best advantage.

#### **[(7) LOCOMOTIVE TANKS AND STRAINERS**

- (i) Tender or tank water strainers, water wells and engine-tender water hose strainers are to be cleaned out at each washout unless otherwise instructed by District Mechanical Engineer. In any event this work must be done at intervals not exceeding four weeks.
- (ii) Water tanks are to be examined when a locomotive is stopped for washout and are to be cleaned out if necessary. If there is any appreciable blockage of strainers or wells the tanks must be cleaned out.
- (iii) Dates and details of work are to be recorded in the washout register.]

[C.M.E.'s 24/563 of 24/11/55]

#### **[(8) TIA BLOWDOWN EQUIPMENT.**

- (a) The blowdown valve is to be operated for two 30-second intervals before a locomotive goes out on to a train and again on returning to a locomotive depot. It is also to be operated for 30 seconds at intervals of about 30 miles, or hourly, whichever is the sooner, when running a train.
- (b) The charts on all locomotives which have been in service during the preceding week are to be changed on each Wednesday by the shed enginedriver. In the case of locomotives which will not return to their home depot on a Wednesday the charts are to be changed at the foreign depot and forwarded to the home depot.

The numbers of the trains worked and the standing periods are to be recorded on the charts, and at the end of the period all charts are to be forwarded to the District Mechanical Engineer.

- (c) Every three months, coinciding with the quarterly boiler inspection, the blowdown valve on the boiler is to be dismantled, examined cleaned and re-conditioned as necessary. Suitable records are to be kept of this work by the Sub-Foreman or Senior Fitter.
- (d) IMPORTANT. The blowdown valve is operated by a three-way valve in the cab. It is essential that this valve be in the closed position before steam pressure is raised in a boiler. If open, blow down will commence once steam is raised causing loss of water and fusing of the fusible plugs.

Members engaged on lighting up duties are to be instructed on this point before being placed on unsupervised work.

[C.M.E. 44/730/32L of 7/9/1960] [C.M.E. 24/563 of 9/1/1962]