

NEW ZEALAND GOVERNMENT RAILWAYS	AXLEBOXES FOR LOCOMOTIVES AND ROLLING STOCK: HOT AXLEBOXES	CODE No. 37
MECHANICAL BRANCH		Page No. 1 of 5 Issue No 4 Date Issued 11/2/60 Cancelled; Issue 5; 1/12/70

(1) Definitions

For the purpose of this Code the following definitions will apply.

Axlebox Horns- The vertical faces on the axlebox that engage the horn guides on the underframe.

Axlebox Horn Liner- The U-shaped liners welded to the inside of the axlebox horn.

*Horn Guide Liner**- As shown on drawing Y.35650.

*Horn Guide**- As shown on drawing Y.35650.

*Horn Plate**- As shown on drawing Y.35650.

*In bogies, the corresponding parts.

Axlebox End play-- The total longitudinal movement of the axlebox in the horn guides, i.e., ~~along the line of~~ [at right angles to] the axle.

Axlebox Side Play-- The total sideward movement of the axlebox in the horn guides, i.e., ~~at right angles to~~ [along the line of] the axle.

GENERAL INSTRUCTIONS

(2) Application

The types of axleboxes, brasses, and dust shields to be used on various classes of locomotives and rolling stock are as set out in the Blue Prints enumerated below:

Car and Wagon Axleboxes	Y.35931
Locomotive Axleboxes	Y.21531
Rope Dust Shields	X.25311

(3) Axlebox Covers

All axlebox covers must fit tightly on the axlebox faces when closed. Badly fitting or broken covers must receive immediate attention to reduce the occurrence of hot boxes caused by the entry of dust or water.

"Isothermos" and roller bearing axlebox covers must be fitted securely to prevent leakage of oil or grease.

(4) Liners

The use of loose liners between axleboxes and horns is prohibited.

Four wheel wagon axleboxes less than 7¼ in. between axlebox horn faces or more than 2¾ in. between lugs must be scrapped if they cannot be brought back to standard by the use of axlebox horn liners welded to the box. Drawing Y.36004 shows how these liners are to be welded to cast iron axleboxes and X.26329 to cast steel axleboxes.

(5) Manufacture, Branding, and Cleaning of Axleboxes

The width over axlebox horn faces of four wheel wagon axleboxes as cast is to be $7 \frac{7}{16}$ in. (maximum) $-7 \frac{3}{8}$ in. (minimum).

Locomotive axleboxes must be branded ("L.L.", "R.D.", etc.) on the outer face to denote their positions. The brands are to be made in locations that will be readily visible when the axleboxes are in position.

Before axleboxes are issued to Stores or placed direct into service they must be thoroughly cleaned and all sand, core nails, protruding fins, and scale must be removed. Before axleboxes are stored they must be given an internal and external coating of suitable rust preventive.

(6) Lubricants

The types of oil and grease to be used in axleboxes are as follows:

Locomotive plain bearings	Locomotive bearing oil.
Roller bearings- Grease lubricated	Roller bearing grease.
Oil lubricated	"Timken" roller bearing axlebox oil.
Car and Van bearings (plain or "Isothermos")	New car and wagon axle oil.
Wagon bearings-plain	(1) Used diesel engine lubricating oil.
	(2) New car and wagon axle oil.

Only the currently approved brands of the above lubricants are to be used.

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**ROLLER BEARING AXLEBOXES
GENERAL INSTRUCTIONS**

(7) Inspection: Examination

- (1) *Before a roller bearing axlebox cover is removed, the front of the axlebox and the cover must be thoroughly cleaned and care taken to prevent the entry of dirt or dust.*
- (2) The inspection of roller bearing axleboxes is to be undertaken only at Workshops. *Axlebox covers must not be removed elsewhere than in Workshops, except in the following circumstances:*
- (i) If any locomotive or vehicle with roller bearing axleboxes is derailed or damaged and it is evident that one or more axleboxes have been damaged, Car and Wagon Inspectors or Locomotive Supervisors may authorise removal of the covers to examine the bearings to ensure that the axleboxes concerned are in a fit condition to run to Workshops.
- The wheels must be jacked up and spun in the axleboxes to see if the bearings make any unusual noise or restrict rotation of the wheels. Before being returned to service the vehicles must be given a trial run and the axleboxes carefully tested for heating.
- (ii) If a locomotive or vehicle with roller bearing axleboxes is involved in a minor derailment and an external examination reveals no bent axles or apparent defects in the axleboxes, Locomotive Supervisors or Car and Wagon Inspectors may authorise removal of the covers to ensure that the bearings are in good condition before the vehicle returns to service.
- If any doubt exists concerning the condition of axleboxes or if axles are bent the wheelset must be sent to Shops immediately for inspection and under no circumstances must repairs to the interior of roller bearing axleboxes be attempted by Depot staff.
- (iii) In order to carry out a supersonic flaw detector test on an axle or to attend to the tachometer fitted to the axle.
- (iv) For turning tyres- At Auckland Diesel and Railcar Depot only.

(8) Running Temperature

The normal running temperature of roller bearing axleboxes is about 50°C (122°F) and if the bare hand can be held against the front of the axlebox the temperature is satisfactory. If this is exceeded the vehicle must be forwarded to the nearest Depot for attention. The wheelset will be replaced there or the axlebox will be relubricated so that the vehicle can be run to the nearest main workshop.

If a roller bearing axlebox runs hot the vehicle or wheelset concerned must be shopped for examination.

Water must not be applied to roller bearing axleboxes.

(9) Maintenance

Locomotive Supervisors and Car and Wagon Inspectors must arrange for the frequent external examination of all roller bearing axleboxes under their supervision to detect any leakage of lubricant.

(10) Overhaul

Roller bearing axleboxes are to be overhauled at Otahuhu, Hutt, Addington. and Hillside Workshops only.

[When a wheelset fitted with roller bearings has the tyres turned, the axleboxes must be checked, greased or oiled, as the case may be, before the wheelset is returned to service or forwarded to a depot.]

[24/563 of 30.10.1962]

S.K.F ROLLER BEARING AXLEBOXES

(Refer also to the General Instructions, Clauses 3, 4, ~10.)

(11) Special Instructions

(1) The inside journal roller bearing axleboxes on Ab. and Wab. locomotives are to be greased every three months. The cannon box roller bearings on locomotive coupled wheels are to be greased every 12,000 miles.

Locomotive Supervisors must arrange for a record to be kept of the greasing of these axleboxes.

When using power greasing guns grease must be fed in slowly to prevent excessive pressures being built up.

(2) The outside journal S.K.F. roller bearing axleboxes fitted to locomotive and rolling stock bogies are to be lubricated, at main workshops only, during overhaul or lift, or top overhaul in the case of diesel electric locomotives.

(3) The roller bearing axleboxes fitted to diesel shunters are to be lubricated as instructed in the Loco. 30 DS Inspection and Servicing Report.

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(4) Axlebox greasing points on the classes of stock listed below are to be attended to as instructed in the drawings quoted.

Class	Drawing
J. Jb.	X.12490
Ja (S.K.F.)	X.12822
Ka. Kb	X.12089
Articulated railcars	X.14726

(5) All cars, vans, and wagons (except "UI") fitted with S.K.F. roller bearing axleboxes are to have small brass plates bearing the following inscription, attached to the covers by the two bolts, or by set screws in the case of the "Vs" wagons

This Axlebox to be Lubricated at Workshops only.	
Name of Shop	Date

(6) The following information is to be recorded after new S.K.F. axleboxes are assembled and after each subsequent internal inspection:

- (a) Number of axlebox and roller bearing.
- (b) General condition of bearing.
- (c) Diametral slackness between rollers and race prior to and after assembly of race on journal

OIL-LUBRICATED ROLLER BEARING AXLEBOXES ("HYATT" and "TIMKEN")

(Refer also to the General Instructions Clauses 4, 6-10.)

(12) Special Instructions

(1) "Hyatt" and "Timken" oil-lubricated roller bearing axleboxes are to be checked with the oil level gauges provided and the oil "topped-up", if necessary, at the following times:

	(1)	(2)	(3)
Rolling Stock	At lift	One month after lift	} Every three months subsequently.
Ja. class locomotives	At overhaul	One month after overhaul	
Da. class locomotives	Every 5,000 miles		
Articulated railcars	Every 8,000 miles		

(2) Axlebox covers and oil feeders must be thoroughly cleaned before lubrication is commenced. Precautions must be taken to ensure that dust and dirt are prevented from entering the axleboxes.

At each oiling between lift or overhaul the drain plugs must be removed and any water in the bottom of the axlebox run off.

Axleboxes should be filled to the maximum oil level, the plugs replaced loosely, and the oil allowed to settle for approximately half an hour before the boxes are finally filled and the plugs sealed.

Oil and drain plugs must be cleaned and sealed immediately on completion of work

(3) "Timken" axlebox greasing points on the Ja class locomotives must be attended to as instructed in drawing X.12825.

"ISOTHERMOS" AXLEBOXES

(13) Special Instructions

(1) "Isothermos" axleboxes must be fitted with new car and wagon axlebox oil up to the level of the oil plug at the side of the axlebox. After the first run, the level should be checked and more oil added, if necessary.

Oiling should be carried out at monthly intervals thereafter and the oiling tablet must be stamped with the Depot symbol.

(2) Car and Wagon staff must examine "Isothermos" axleboxes frequently and have the oil replenished if leakage develops.

(3) Should, a serious leakage of oil develop the wheelset must be replaced.

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PLAIN BEARING AXLEBOXES

(14) Locomotives

All locomotive plain bearing axlebox cellars (except those of C. and K. locomotives, which are fitted with "Franklin" solidified grease lubrication, and some diesel shunters with Armstrong oiler pads) are to be packed with flax hemp worked into pads and saturated with locomotive bearing oil. The hemp is to be drained until in a resilient condition without the appearance of excess oil on the surface of the pads.

(15) Rolling Stock

When vehicles are lifted, all axleboxes are to be repacked with newly prepared packing of approved thrum. The thrum is to be soaked in clean oil in dust-proof containers for at least four days to ensure thorough saturation. The skeins are then to be drained until all excess oil has drained off and the thrum is in a resilient condition. Oil should not drip from prepared thrum but should flow when pressure is applied. Prepared thrum that has been stored should be turned over daily. Thrum removed from axleboxes, if free from impurities and not discoloured, may be used for repacking after being resaturated with clean lubricating oil.

If, after lifting, it is necessary for any vehicle to stand for more than two days before being passed out, the top of the thrum must be given additional oil before the vehicle concerned goes into service.

Wagons must not be passed out with non parallel horn guides. The standard gap between horn guides is 7½ in.

(16) Dust Shields

Dust shields must be a neat fit on the axle to prevent the entry of foreign matter. ~~Special care must be exercised when fitting rope dust shields to ensure that the correct types shown on B.P. X.25311 are utilised and that there is no distortion of the shield when axleboxes are placed on the journals.~~

The type of dust shield to be used with each class of axlebox is set out on B.P.'s ~~Y.21531 and 35931~~ [Y35931]

[24/563 of 3.5.1967]

(17) Limits of Wear In Axlebox Horns

Clearance between axleboxes and horns must not exceed the limits set out in the following table when vehicles are passed out after lift or overhaul.

	END PLAY			SIDE PLAY		
	After Overhaul (Min.)	Maximum Out of Shops*	Maximum in Service	After Overhaul (Min.)	Maximum Out of Shops*	Maximum In Service
	in.	in.	in.	in.	in.	in.
Four wheel vehicles	1/8	1/4	3/8	1/8	1/4	7/16
Bogie vehicles						
Plain bearings	1/8	3/16	5/16	1/8	1/4	3/8
Roller bearings	1/16	1/8	1/4	3/16	1/4	3/8
Articulated railcars	1/16	1/8	1/4	5/16	7/16	1/2

* Vehicles not lifted

HOT AXLEBOXES

(18) Definition

A hot axlebox occurs when:

- (1) The defect necessitate repacking the axlebox, renewal of the brass or removal of the *vehicle* from the train, OR
- (2) If the defect causes a train delay.

If a brass is changed in a hot axlebox for the sole purpose of getting the vehicle to its destination or to the repair siding and the axle again runs hot, then the second incident is not to be treated as a second hot box. In all other cases, if a brass is changed on an axlebox that has run hot and that axlebox later runs hot again, then it is to be treated as a second hot box

When axleboxes become overheated but do not subsequently require any repairs or do not cause train delay they do not constitute "Hot Boxes".

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[A hot axlebox occurs when overheating necessitates repacking or renewal of the brass. When an axlebox is repacked or a brass is renewed for the sole purpose of getting a vehicle to its destination or to a repair siding for further attention a completed Loco. 58 card must be placed in the waybill clip. If the axlebox subsequently runs hot before it can receive further attention it is not then to be recorded as a further hot box.

When an axlebox becomes overheated but does not subsequently require any attention other than oiling, it does not constitute a hot box.]

[24/563 of 30.10.1962]

(3) In the case of locomotives:

- (i) When the defect necessitates the dropping of wheels or attention to the axlebox brass and/or journal, OR
- (ii) When the defect causes a train delay.

Water must not be applied to roller bearing axleboxes.

19) Reporting of Hot Boxes -

~~All hot axleboxes on *rolling stock* are to be reported to the Car and Wagon Inspector as they occur, in duplicate, on Loco. 71 forms by Train Examiners. After certification, the Car and Wagon Inspector will forward the original Loco. 71 form to the District Mechanical Engineer.~~

[All hot axleboxes are to be reported to the Car and Wagon Inspector in duplicate on Loco. 71 forms as soon as the Loco. 58 card is removed on completion of permanent repairs to the hot axlebox.

Details of repairs received en route as stated on the Loco. 58 card are to be entered on the Loco 71 form.

After certification, the Car and Wagon Inspector will forward the original Loco. 71 form to the District Mechanical Engineer]

[C.M.E.,s 24/563 of 27 October 1966]

At the close of each period Locomotive Supervisors will render a return of all hot axleboxes that occurred on *locomotives* under their supervision during the period to the District Mechanical Engineer. The quantity of each brand of locomotive bearing oil and grease issued during the period must also be shown.