

NEW ZEALAND GOVERNMENT RAILWAYS	<b>DRAWGEAR ON LOCOMOTIVES AND ROLLING STOCK BROKEN DRAWGEAR</b>	<b>CODE No. 45</b>
<b>MECHANICAL BRANCH</b>		Page No. 1 of 3 Issue No 3 Date Issued 7/3/60 Cancelled; Issue 4; 1/4/74

**(1) MATERIAL**

The materials used for the manufacture of drawgear components must conform to the drawings and specifications issued by the Chief Mechanical Engineer.

**(2) APPLICATION**

All drawgear components must be manufactured and applied strictly in accordance with drawings and specifications issued by the Chief Mechanical Engineer.

**(3) ANNEALING AND HEAT TREATMENT OF DRAWGEAR COMPONENTS**

- (i) Apart from the items specifically mentioned below in this clause, no annealing or heat treatment of drawgear components is necessary or is to be carried out. ~~Where, however, dirt, rust, or grease is present and the inspection of parts (see clause 9) will be facilitated, parts may be put through the fire to burn off the surface dirt.~~

[C.M.E.'s 24/563 of 5.10.64]

- (ii) *Drawbar Pins*- Manganese molybdenum drawbar pins are to be annealed on completion of any repairs involving heating of the pin and then heat treated.

Note- The heat treatment for manganese molybdenum steel is given on B.P. Y21183

- (iii) *"Alliance" Drawgear*- When worn parts of "Alliance" drawgear are repaired by welding the castings must be preheated before welding ~~and annealed after welding.~~

- (iv) *"Goodall" Drawbars* must be normalised after heating.

- (v) *"Alliance" Coupler Transition Heads*- See clause (9).

**(4) CLASSIFICATION**

The headstocks on all rolling stock must be branded immediately above the drawbar with the symbol letters denoting the dimensions of drawbars. Details of the method of branding and the alphabetical symbols used are set out on B.P. Y35353.

**(5) "JANNY YOKE" DRAWGEAR**

Because of the small tolerances permitted it is essential, when manufacturing or repairing Janny yoke drawgear, for the keys, springs, and buffer shanks to be in strict accordance with drawings and specifications.

The tolerance on the cross sectional dimensions for Janny yoke keys is 0.006 in., and key slots must be cut to the exact size shown on B.P. X27065.

**(6) "GOODALL" DRAWGEAR- "C" CLASS LOCOMOTIVES**

The rubbing blocks on "Goodall" drawgear must be lubricated at frequent intervals and the castle nuts greased to facilitate removal. The material used in the manufacture of drawbars must be normalised after heating.

**(7) "ALLIANCE" COUPLERS**

Officers must ensure that their staff are acquainted with the method of assembling "Alliance" couplers as set out on B.P. Y35041.

Adapters must be provided on all vehicles fitted with "Alliance" couplers, for coupling to vehicles with standard drawgear. Only manganese molybdenum steel or axle steel may be used for the manufacture of knuckle pins for "Alliance" couplers when renewals are required.

**(8) OPERATION OF "ALLIANCE" COUPLERS**

*(A) To Make the Coupling-* (a) Fully open the coupler knuckle on one vehicle and fully close the coupler head on the other.

- (b) Bring the two vehicles together so that the coupler heads make firm contact.

- (a) Observe that the lock lifter has dropped to its full extent, i.e., level with the bottom of the indicator chain.

- (d) Secure the uncoupling lever in its clip on the headstock.

Note- Unless the lock lifter drops to its full extent a correct coupling has not been made. In this case remake the coupling.

*(B) To Break the Coupling-* Remove the uncoupling lever from its clip, pull it up, and draw one of the vehicles away

**WARNING:**

- (1) When the coupling is being made, do not interfere with the uncoupling lever.

- (2) After making the coupling, it is then necessary only to secure the uncoupling lever in its clip.

(3) Unless the bottom end of the locklifter is in line with the end of the indicator chain (this is the only visible indication) a correct coupling has not been made.

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To avoid making a faulty coupling all members concerned must be made familiar with the operation of "Alliance" couplers.

Transition coupling heads, where provided on locomotives, must be used when the leading car has automatic couplers.

An *adaptor head* may be used for such a coupling only when a transition head is not available, or when it cannot be used satisfactorily owing to some defect in the drawbar.

**IMPORTANT:** When it is necessary to use an adaptor hook to couple the automatic coupler to a standard drawbar, the adaptor hook must be manipulated from the car. To do this it is necessary to open the end car door in order to lie along the floor of the vestibule, and insert the coupling pin in the tender drawbar from this position.

No attempt may be made to effect the coupling from a standing position between the tender and the car (or between two cars). There is insufficient clearance for this to be done, and cases have occurred where locomotive assistants have been crushed when attempting to couple up in this manner.

Enginedrivers are responsible for ensuring that their locomotive assistants rigidly observe this instruction.

### (9) EXAMINATION, MAINTENANCE, LIMITS OF WEAR

All drawgear components, including side chains, are to be thoroughly inspected for defects and wear when vehicles are being overhauled.

The *side chains* on all vehicles must be long enough for the drawbars to take all the weight under normal running conditions, but sufficiently short to ensure that, in the event of a drawgear failure, the amount of slack that requires to be taken up before the weight is transferred to the side chains, is a minimum.

Special attention must be given to side chain hooks to ensure that they are not stretched.

"Alliance" Coupler Transition Heads (B.P. X25578)-- When the coupling pinhole becomes enlarged to  $1\frac{7}{8}$  in. diameter, the hole is to be built up by welding and rebored to  $1\frac{1}{4}$  in. diameter, correctly located. The bearing face may also be built up by welding and re-machined. In all cases, welding is to be used only for reconditioning worn transition heads and not for repairing defects. Transition heads must be preheated prior to welding and annealed subsequently.

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*Adaptor Hooks* (to B.P. W30645) are to be scrapped when the following wear has taken place: -

- (a) Wear on  $1\frac{5}{8}$  in. diameter hole adjacent to lifter exceeds  $\frac{3}{8}$  in.
- (b) Wear on elongated hole at boss end (length or width) exceeds  $\frac{1}{4}$  in.
- (c) Wear on flanks at boss end exceeds  $\frac{1}{4}$  in.

Welding of adaptor books is prohibited.

*Drawbar Hooks and Bridles*- Gauges are provided (drawing W31184) to show the maximum permissible wear from gullet to pinhole in drawbar hooks and the maximum extension allowed for bridles.

If hooks or bridles that do not pass the gauges cannot be repaired to bring them back to the original dimension they are to be scrapped.

Hook- Drawing Y6582.

Bridle- Drawing Z/X 27069/7.

"Alliance" Coupler Lock Blocks- Clearance between the block and knuckle is not to exceed  $\frac{1}{8}$  in. When the bottom corner of the lock block becomes rounded by wear it is to be built up by welding (see also clause 3(iii)).

Knuckle Hinge Pin and Hole:

Limits allowed:    New  $\frac{1}{32}$  in.  
Max.  $\frac{5}{32}$ ? in.

*Janny Yoke Spring Plates:*

Maximum wear allowed  $\frac{1}{8}$  in.  
Build up when wear reaches this limit.

*Janny Drawbars*- The butt end is to be built up as necessary to compensate for wear.

*Drawbar Hooks*- Worn books must be scrapped except in cases where the only wear that has taken place is at the hole [or gullet].

### (10) DRAWBAR HEIGHTS

The distance between rail level and the centre line of drawbar on locomotives and rolling stock when passed out from Workshops must be in accordance with the following:

*New Vehicles:*

Locomotives .... 2 ft  $5\frac{1}{2}$  in.  $\pm$   $\frac{1}{4}$  in.  
Other vehicles    2 ft 6 in.  $\pm$   $\frac{1}{4}$  in.

*Repaired Vehicles:*

*Locomotives:*

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Maximum ... As shown on arrangement drawings.

Minimum      Maximum less ½ in.

*Vestibule-ended cars:*

Maximum      2 ft 6 in.

Minimum      2 ft 5 ½ in.

*Other stock:*

Maximum      As shown on vehicle diagrams.

Minimum      Maximum less ½ in.

The minimum drawgear height to be allowed on vestibule-ended cars in service is 2 ft 5 in. and 2 ft 4 in. on other vehicles. In the case of rolling stock this is to be measured in the tare condition. In the case of locomotives, in running order.

[Bogie centres shall be packed with steel packing plates of not less than ¼" thickness. No more than three loose packing plates shall be fitted and their total thickness shall be such that the bogie spigot engages in the bolster or transom by not less than ½ ".

Each packing plate shall be a single piece. The use of slotted packing which can be slipped under the bogie centre is prohibited.

The use of wood packing is prohibited.

Where roller bearing axleboxes are reversed to increase underframe height the distance from the axle centre to the top of the axlebox must be the same at each wheel of the bogie.

See Code 82 Clause, 5 for the packing of float-blocks.]

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

#### **(11) REPORTING DRAWGEAR FAILURES**

Train Examiners must render Loco. 70 reports in duplicate to the Car and Wagon Inspector, covering all drawgear failures. The Car and Wagon Inspector will, after certifying, forward the original Loco. 70 reports to the District Mechanical Engineer and retain the duplicate copies for reference.

Where the drawgear fracture is clean and there is no evidence of faulty material the District Mechanical Engineer is to make inquiries to ascertain whether there has been any rough shunting or handling of the train.

In cases of drawgear failures on locomotives the Locomotive Supervisor will submit a Loco. 70 report to the District Mechanical Engineer and retain a copy for reference. Where there is no evidence of faulty material the Locomotive Supervisor will obtain a Loco. 55 report from the enginedriver concerned and forward it, together with the Loco. 70 report to the District Mechanical Engineer.

When Loco. 55 reports are required for drawgear failures, enginedrivers must include the following information:

- (a) Class and number of vehicle.
- (b) Date of failure.
- (c) Train number, where failure occurred, and particulars of failure.
- (d) Weight of train, position of vehicle from engine, and weight ahead of and behind fractured drawgear.
- (e) Cause of failure.
- (f) Any delay to train and time recovered subsequently.

In all cases where drawgear failures occur, enginedrivers will arrange for the broken components to be conveyed to the nearest train examining station for inspection.

As soon as possible after the close of each period, District Mechanical Engineer: will forward to the Chief Mechanical Engineer, a return showing the number of drawgear failures during the period, listed under the following subheadings:

Drawbar (on square)	Cradle
Drawbar (on round)	Collar
Drawbar head	Dragrods
Drawbar thread	Coupling Hooks
Drawbar Pins	Side chains.