

SPECIAL PROCEDURES: GE. P.C.M. TRAMS 750 & 751 AND P.C.C. TRAM 980.

1. P.C.M. electro-pneumatic automatic equipment, fitted to trams 750 and 751.

CAUTION: At all times before driving these trams, ensure that the air pressure gauge registers at least 45 lb. per sq. inch. This is the minimum safe pressure at which the electrically controlled air operated equipment will work.

When air pressure falls below 45 lb. per square inch, the pneumatic part of the automatic equipment ceases to operate. Power then is available only on the switching notch of the controller and the reversing gear is inoperative; the tram can be pushed or towed only in the direction in which it was travelling before the defect occurred. Pushing or towing in the reverse direction will cause 4th emergency to operate unless steps are taken to prevent this. The quickest method of prevention is to cut out a pair of motors. Motor cut outs are located in the saloon and their position is indicated by the letter M on the advertisement moulding. Figure 1 shows the cut-outs and the method of their operation.

On arrival at the depot, the tram may be driven for berthing by operating the electrically controller air operated reversing gear by hand; this is located in a small metal box midway under the smoker's compartment. CAUTION The trolley pole must always be removed from the overhead wire and placed under the hook before removing the reversing box cover.

If the tram has stopped in a curve and has jammed, it frequently can be freed by cutting the controller to the 3rd notch, which gives a higher acceleration.



2. P.C.C. TRAM NO. 980:

The following are the procedures to be followed when faulty operation of tram 980 is encountered :-

Drum brakes failing to release: When this occurs, the red brake light remains on with the brake handle in the "off" position. Flick the master switch off and on several times. If the brakes still fail to release, break the glass cover protecting the reset switch located on the controller side of the motorman's bulkhead panelling, above the motorman's door, (see Figure 1) and hold the button depressed for three seconds. If the brakes still fail to release, connect a following tram, preferably by the reinforced tow bar from the Emergency Vehicle and use the brake drum brace, either from the Emergency Vehicle or from tram 980, remove the locking nuts and plates, then slacken the adjusting nuts six complete turns (See Figure 2) and then cut out a pair of motors. The brake drum brace on tram 980 is located in the motor cut out compartment under the first seat, No. 2 End, R.H.S., in the smokers compartment and is indicated by the letter 'M' on the advertisement mould (See Figure 3).

NOTE: If the reinforced tow bar is not available, use the standard draw bar stowed in the saloon of the tram used for towing.

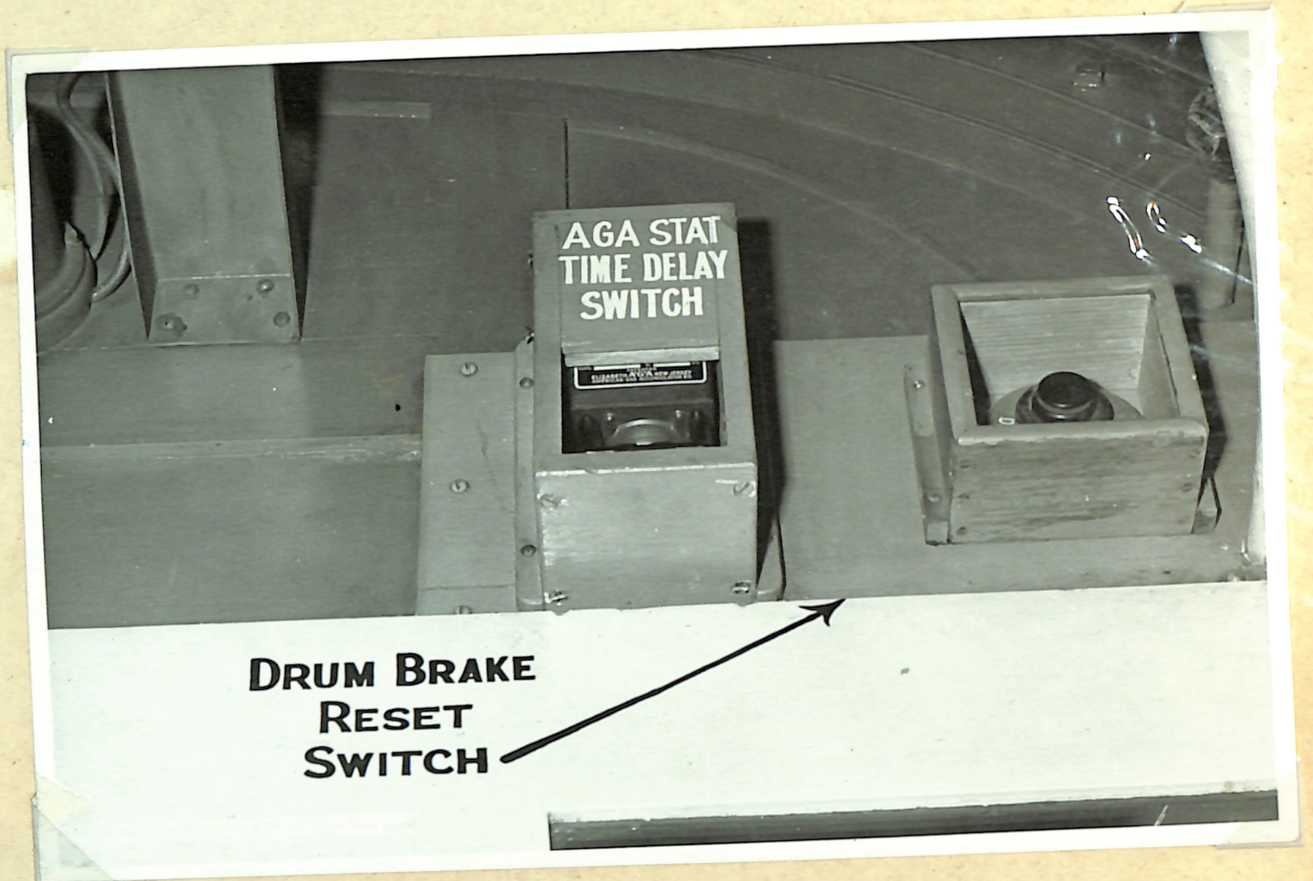


FIGURE 1.

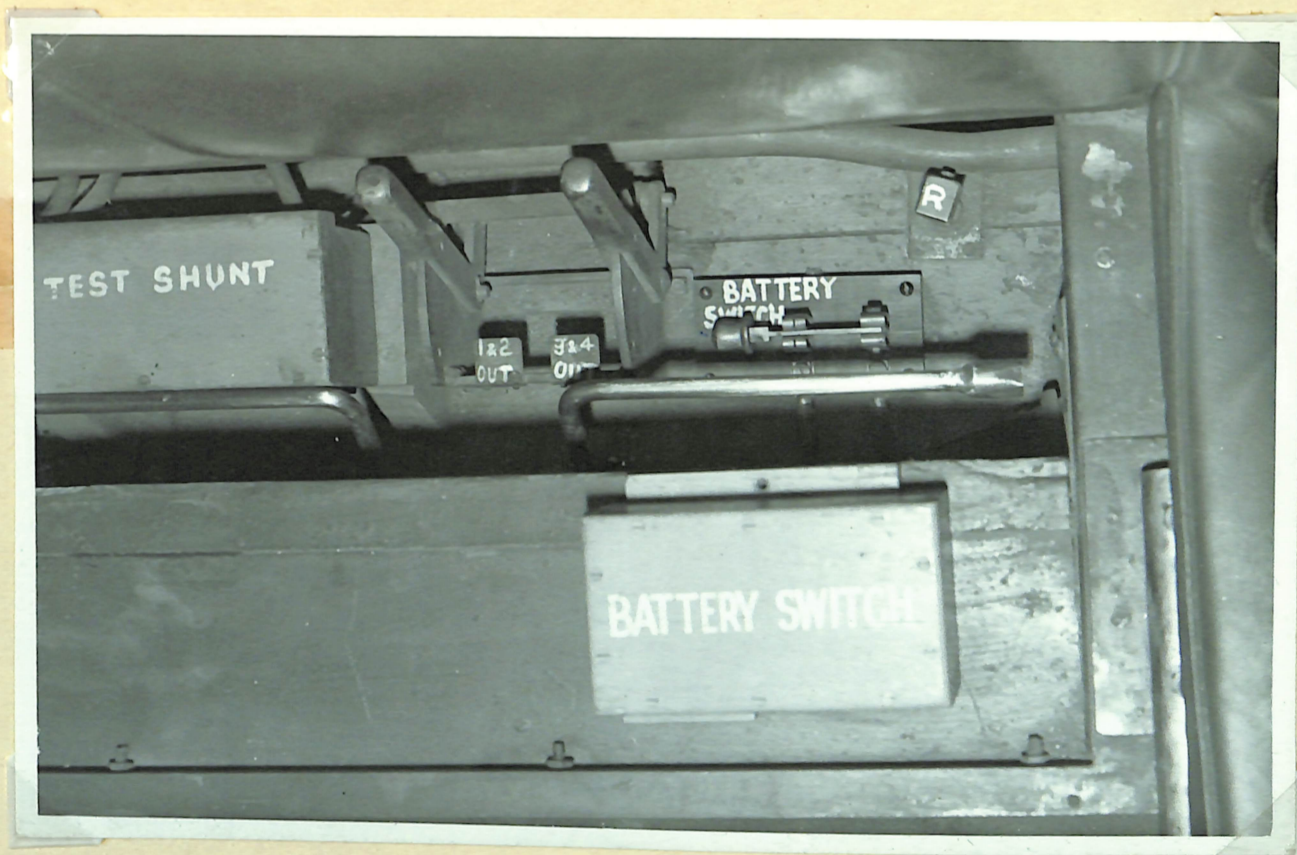




FIGURE 2.

Do not remove the trolley pole from the overhead wire and leave both master switches "on". The tram is then pushed or towed to the depot. In cases of Emergency or to assist with the braking of the tram, the magnetic track brakes may be used. After the tram has been berthed in the depot, the drum brake adjusting nuts must be tightened six complete turns.

All traffic rules regarding pushing or towing a tram must be observed, particularly the rule covering automatic points.





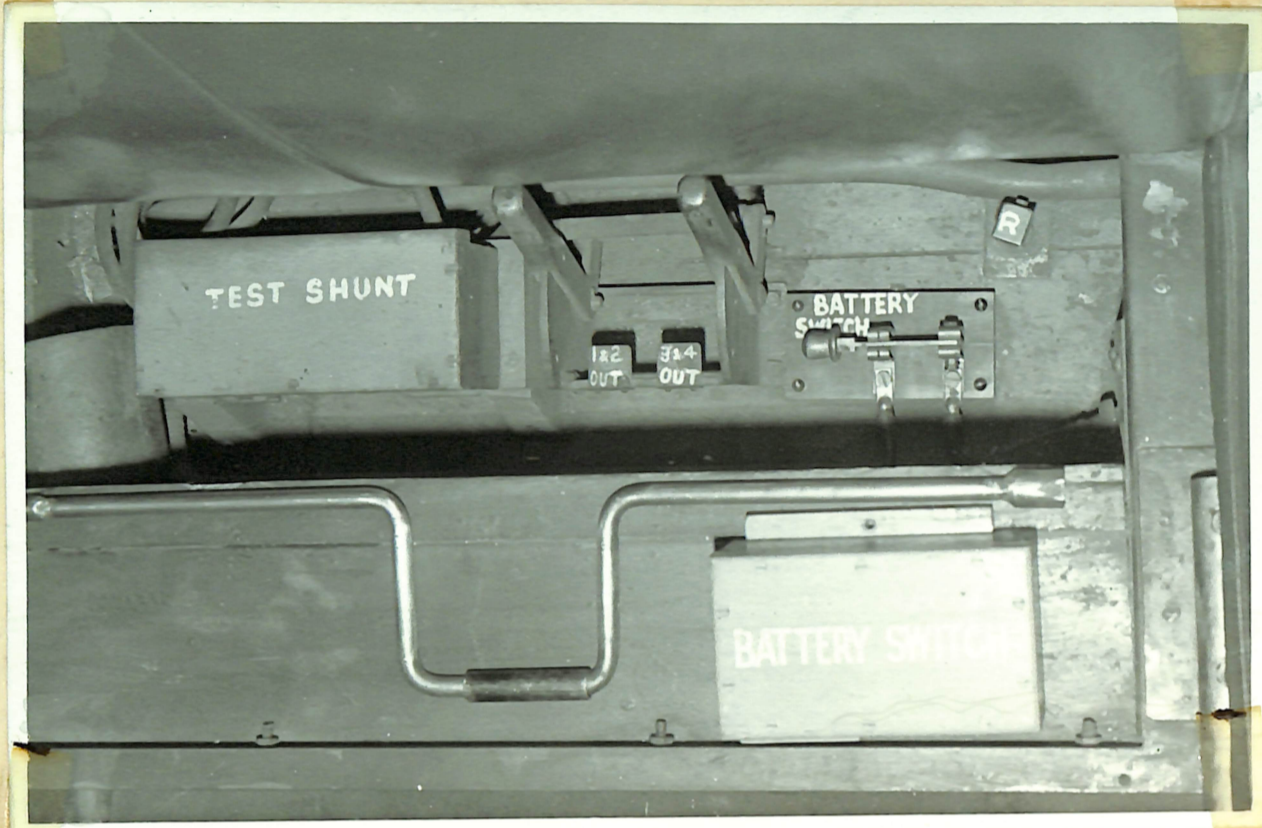


FIGURE 3.

Figure 3 shows the interior of the emergency switch box. The drum brake brace is normally retained in clips on the front vertical surface of the box.

MOTOR FAULTS: When an overload opens the linebreaker, cut out Nos. 1 & 2 motors. If the fault remains, restore 1 & 2 and cut out 3 & 4. If the fault still remains, cut out all motors but leave the trolley pole on the overhead and both master switches "on". The dynamic brake will be inoperative, but the drum brakes and magnetic track brakes will be available. Couple another tram and tow or push to the nearest depot, observing all traffic rules, particularly the rule covering automatic points.

REVERSER STICKING: This fault is indicated when, after changing ends at a terminus or a crossover, the tram fails to start. Station a man at the rear end of the tram to keep the track clear. Restore the reverse key and brake handle to the original end; if the tram travels in this direction but not in reverse, remove the reverse key and brake handle and use the reverse key to operate the reverser located in the emergency switch box (See Figure 3) by placing the key on the cap of the top of the reverser and turning the key with its end facing in the required direction of travel. Remove the reverse key and proceed to drive the tram. The tram must be changed over at the nearest depot.

NO POWER AFTER CHANGING ENDS: Examine the brake controller at the original end to see that the spindle is in the latch position. If turned, it can be placed in the correct position by moving the connecting link between the brake and the main controller. Instruct the driver to exercise care when removing the brake handle. If the brake handle is worn, replace it. The Depot Foreman must be notified of this fault.



Dynamic brakes surging when first applied: This fault is usually caused by the braking ballast lamps burning out. These are in the main control box and are not accessible. Arrange for the tram to be changed over at the nearest depot.

Excessive vibration not caused by flatted wheels: Examine the wheels for a collapsed rubber sandwich. If there is any doubt about the serviceability of any sandwich, arrange for the tram to be changed over at the nearest depot and warn the driver to reduce speed and exercise particular care over all special work.

Sliding doors or sand gear not operating: Check to ensure that the driver has placed the compressor switch "on". The Master switches are in series and are not fitted with fuses; both switches must be placed "on" to drive the tram. The only fuses which are permitted to be changed on the lighting fuses and the compressor fuses.

Use of the battery switch: The battery switch is located in the emergency switch box and is protected by a wooden cover, shown removed in Figure 3, and is intended for use when the equipment is being serviced in the depot. However, in the event of a fire involving or threatening to involve the main cables or any electrical equipment, it must be placed in the open position. (See methods of extinguishing fires on trams, Part III, Page 2).



CODE OF PROCEDURE FOR USE IN EMERGENCIES INVOLVING TRAMS.

PART II: METHODS OF USING EQUIPMENT.

INTRODUCTION:

Most of the special equipment used for dealing with emergencies involving trams has been designed from experience to suit certain conditions and must be used correctly to work efficiently.

The Emergency Vehicle Crew must be thoroughly conversant with the nature and use of this equipment; wrong choice or wrong use in a given emergency can only lead to further delays and, frequently, may threaten the safety of the crew or the public.

The methods described in this part of the Code have been carefully devised by experienced operators and cover most cases which will be met in practice.



METHOD OF USING THE STEEL TRUCK LOCKING BEAM.

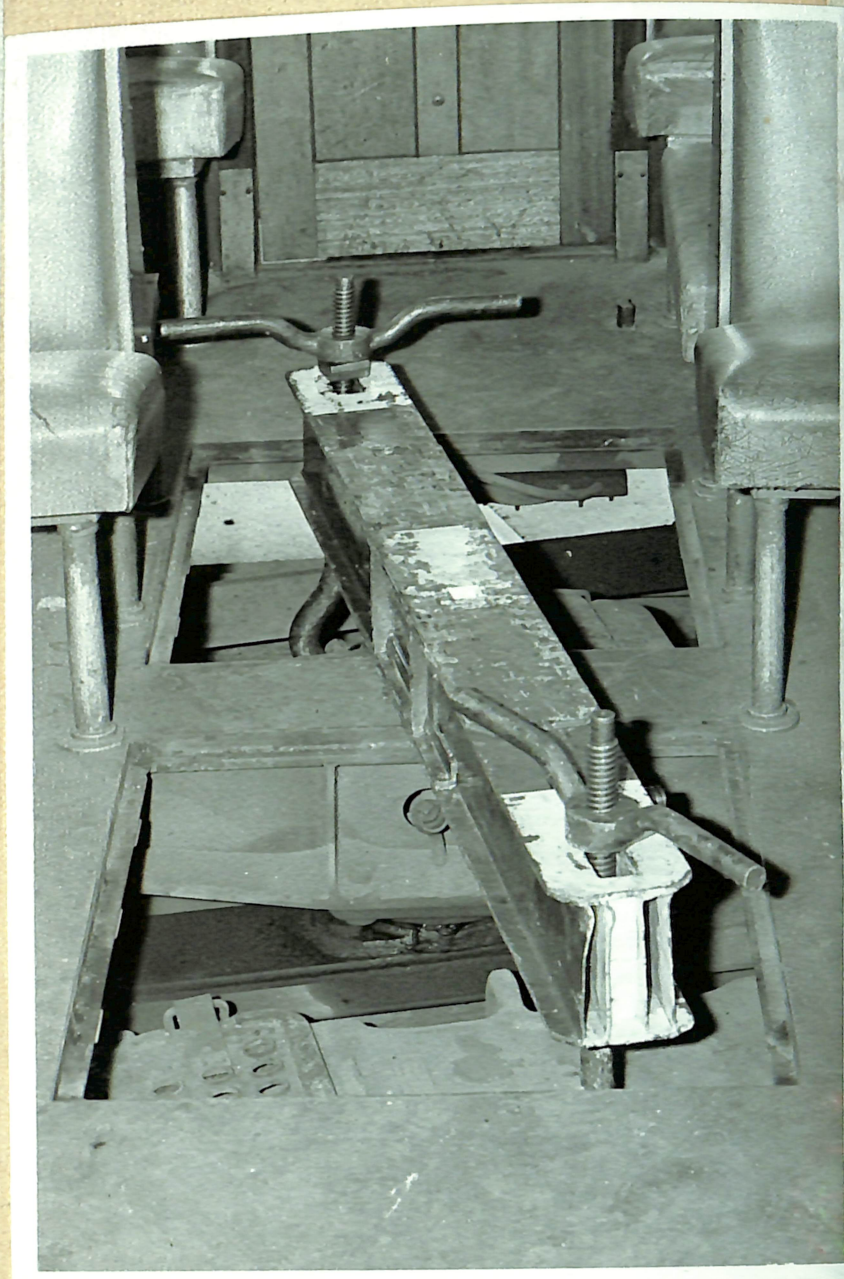
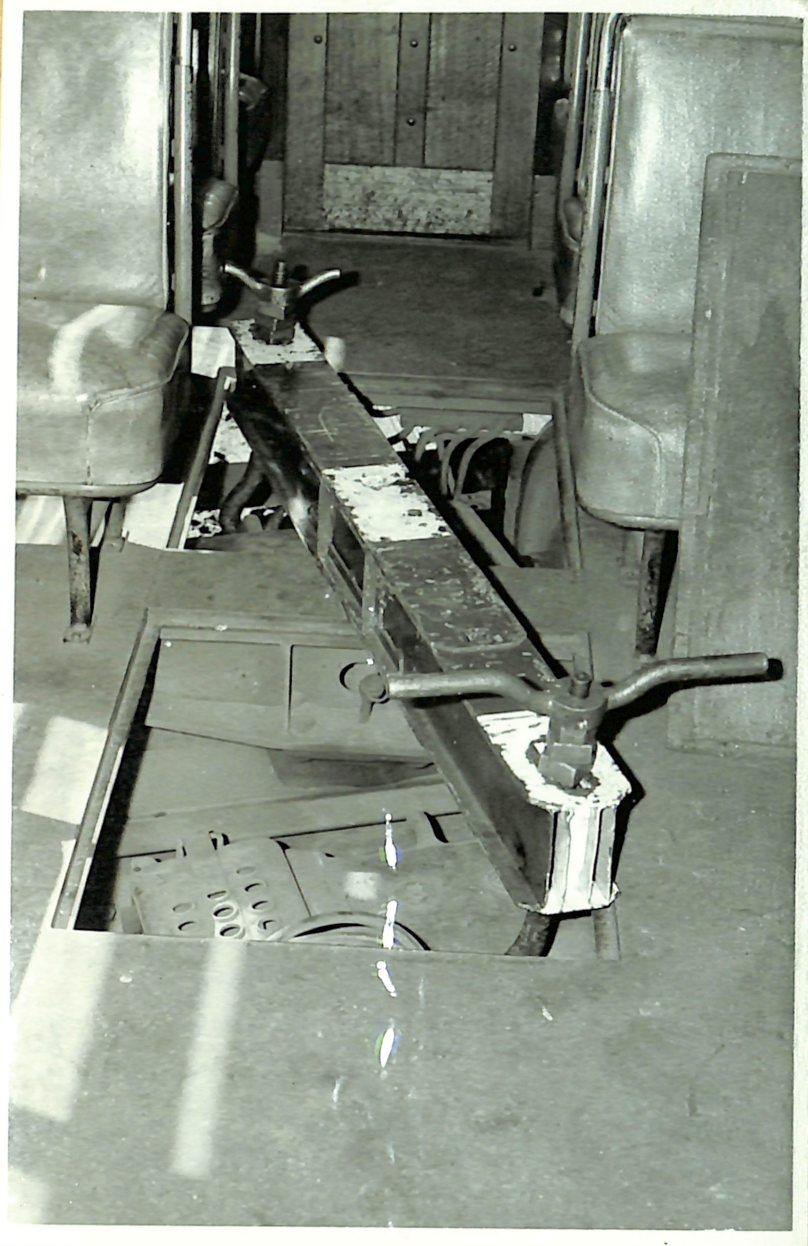


FIGURE I.

The steel truck locking beam is used to lock the truck to the tram body when it is necessary to lift the truck with the body.

Lift the inspection hatch covers in the saloon and stow them safely. Place one beam lifting hook in each outside motor lifting eye then feed the lifting hooks through the slotted end holes in the beam as the beam is placed in position. Note that the beam must be installed with the thrust race down. Start the lifting screw wing nuts on the threads of the lifting hooks and screw them tight with the beam sloping slightly down towards the centre of the tram.

Auxiliary equipment used with beam: Auxiliary equipment for use with the beam comprises shortened wing nuts, hook packing pieces and extension hooks and links, all of which are tied together when not in use and must be taken into the tram in case they are needed. In addition, a steel saddle is available for use in a W3 class tram.



The shortened wing nut is used in a tram fitted with cross seating and is fitted at the end of the beam nearer the Motorman's escape door where clearance between seat and hook is small (see figure 2). Tighten the short wing nut first and the standard wing nut last for maximum locking. Where the unit has run the full length of the thread without tightening the beam, use the packing pieces as illustrated (figure 1). If the beam hooks are too short, as often occurs in a derailment on open ballast, use the extension hooks and links, placing them in the outer motor eyes and engaging the beam hooks in the appropriate links, then tightening the beam as described.

The extension hooks and links are essential in an 'L' Class tram. Place a wooden block, 6" x 8" x 2'0", carried on the emergency vehicle, on top of the body bolster, use the extension hooks and links and engage the beam lifting hooks in the end links. Tighten the wing nuts so that the beam slopes down towards the centre of the tram. These hooks and links are also necessary in a 'Y' Class tram, where there is extra space between floor and motor lifting eyes.

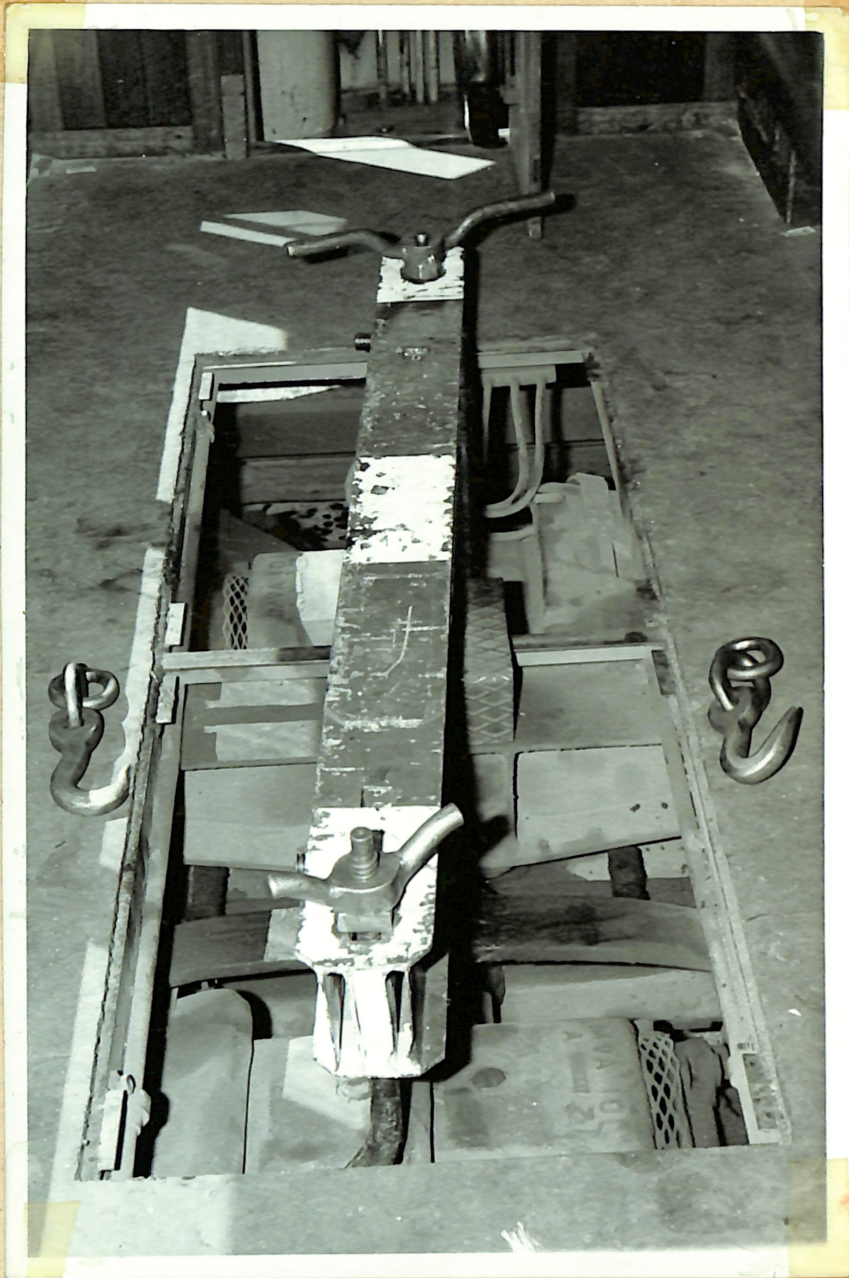


FIGURE 2.

Figure 2 illustrates the use of the steel saddle in a W3 class tram to give a firm seating for the beam and to protect the brake cylinder air pipes.



METHOD OF LOCKING THE TRUCKS ON P.C.C. TRAM 980.



FIGURE 1.

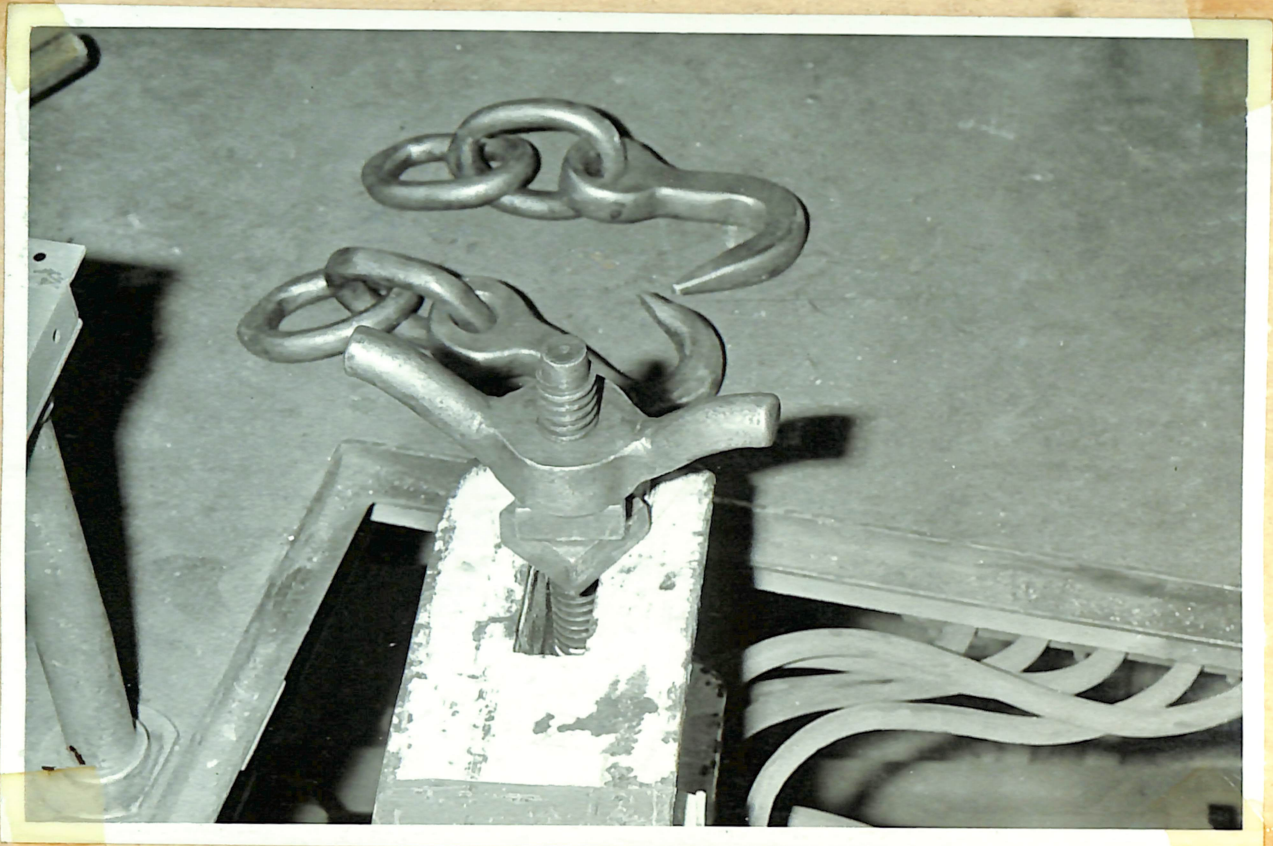


FIGURE 2.



The steel truck locking beam is not required to lock the trucks of P.C.C. tram 980. Instead, use the four steel "U" clamps carried on the tram in a locker beneath the saloon seat nearest the smoker bulkhead, No. 1 end, right hand side, (Figure 1) to limit the extension of the truck springs as the body is lifted.

Place two of the clamps on each side of the truck between truck bolster and truck frame as shown in figure 2. If the truck is twisted, it may be turned by hand after the tram has been lifted.





METHOD OF LIFTING A TRAM, USING 10 & 15 TON MECHANICAL JACKS.

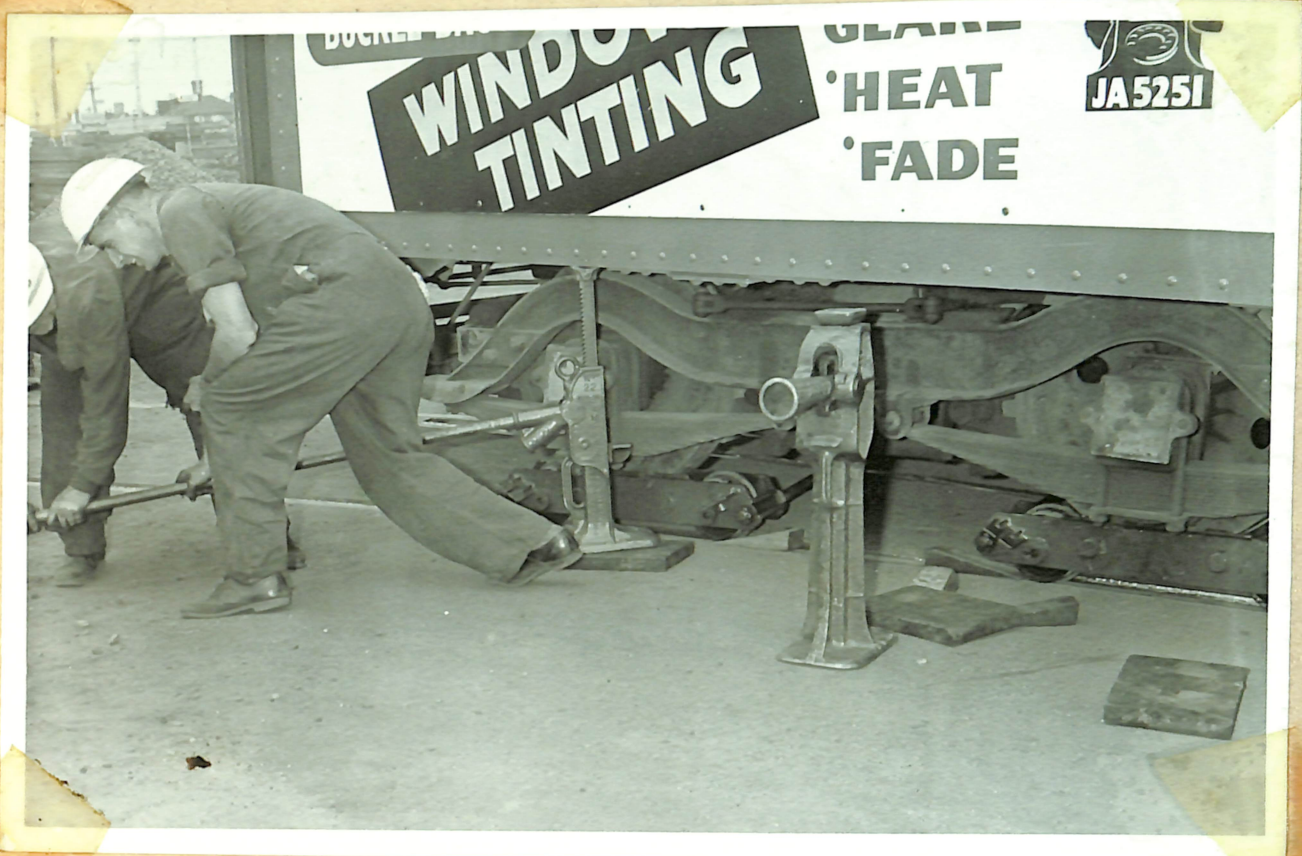


FIGURE 1.

Remove all passengers from the tram and warn all bystanders to keep clear.

Chock both sides of a pair of wheels of the unaffected truck, release the air brake and ensure that both handbrakes are free.

If necessary, lock the truck to the body with the steel truck locking beam.

Seat the 10 ton jacks on wooden base blocks and place them vertically under the side sills of the tram with the tops of the jacks level with the outside edges of the sills. If necessary use 3" x 3" x 6" wooden wedges under the base blocks to align the jacks vertically and to give a firm footing.

The jacks must be placed so that the handles will be angled towards the front of the tram at about 45 degrees. Position the jacks carefully as injury could result if the tram fell off the jacks.

Before operating the jacks, the Charge Hand must ensure that the directional control levers are in the correct positions, i.e., for lifting or for lowering.

Having ensured that the jacks are correctly positioned and that jacking may be conducted safely, the Charge Hand must direct the Crew from the front of the tram as illustrated in figure 1 and instruct them in a loud clear voice to "lift" or "lower" both jack handles.

After the tram has been lowered, apply the air brake and remove the wheel chocks. Also remove the jacks handles which must only be fitted to the jacks when the tram is actually being lifted or lowered.



METHOD OF USING PYRAMID PLATES FOR TURNING DERAILED TRUCKS.

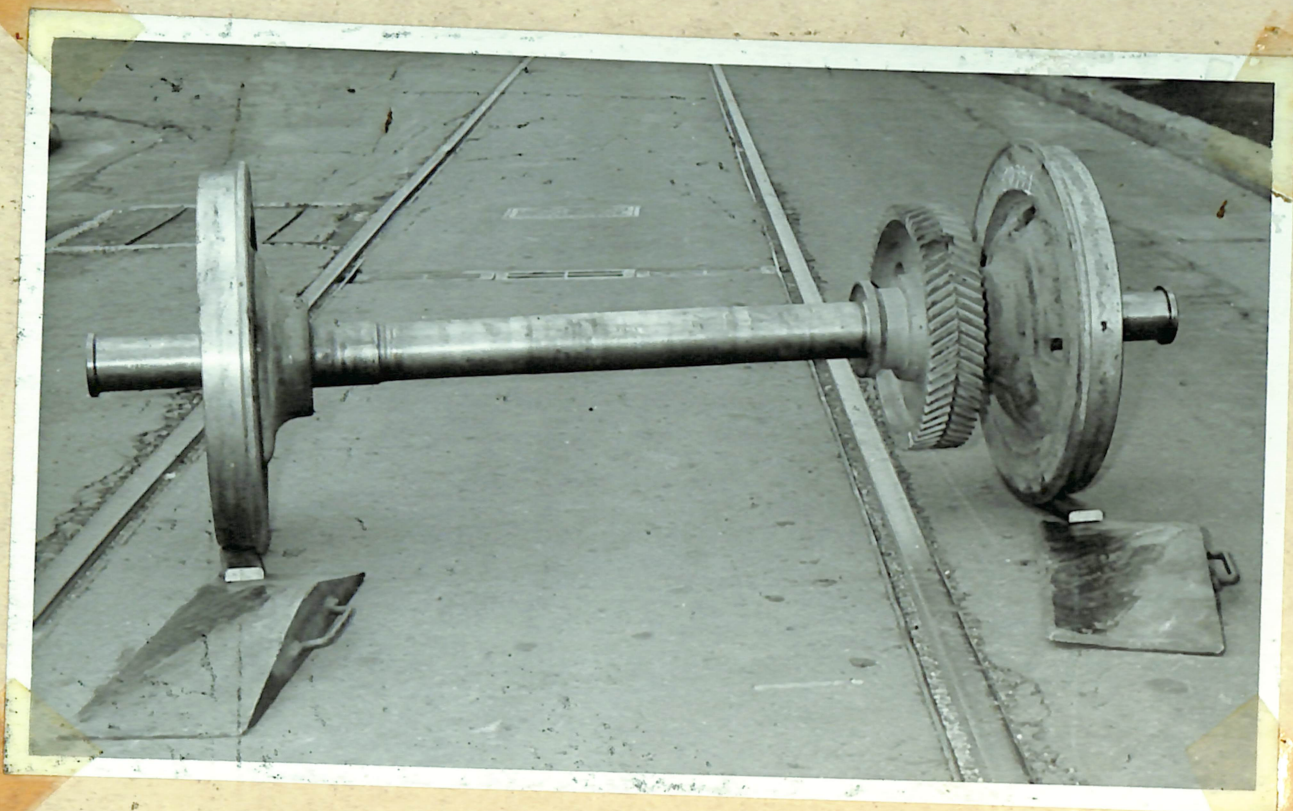


FIGURE 1.

Pyramid plates are used to turn derailed trucks so that the tram can be re-railed. In this procedure, the set of wheels to be "thrown" sideways are run up on to the greased, sloping surface of the pyramid plate where they then slide sideways down the slope to alter the alignment of the truck.

If possible, first drive the tram wheels close to the rails. If the truck is badly turned or the wheels or truck frame are jammed against the body, it may be necessary to first turn the truck before driving to the rails; the pyramid plates may need to be used several times to turn the truck sufficiently.

Pyramid plates must always be used as a pair - never singly. Set the plates at a slight angle (in the required direction to the alignment of the wheels as shown in Figure 1. Grease the side faces of the plates but not the forward or rear faces. Place a small block of wood (about 3" x 2" x 12") in front of each wheel tread, projecting on to the plate edge so that the weight of the tram holds the plate in position. If this is not done, the plate is likely to move out of position instead of being mounted by the wheel.

If a large "throw" is required, set the plates so that the wheels will contact the side slope not more than two thirds of the way up; for a smaller "throw", aim to contact the side slope lower down. Do not attempt too big a "throw" at the one time.

Re-align the plates between "throws" and repeat the operation as often as necessary.

If it is not possible to continue driving the tram in the same direction with consecutive "throws", reverse for a short distance to clear the plates after each "throw" - station a man at the rear of the tram to see that its path is kept clear.



When it is necessary to change from the 10 ton to the 15 ton jacks, do not remove the 10 ton units but leave them in position to save time when lowering.

Before stowing the jacks in the emergency vehicle, lower them fully and set the directional control levers to the lifting position.





METHOD OF USING A STEEL ANGLE PLATE FOR RE-RAILING.

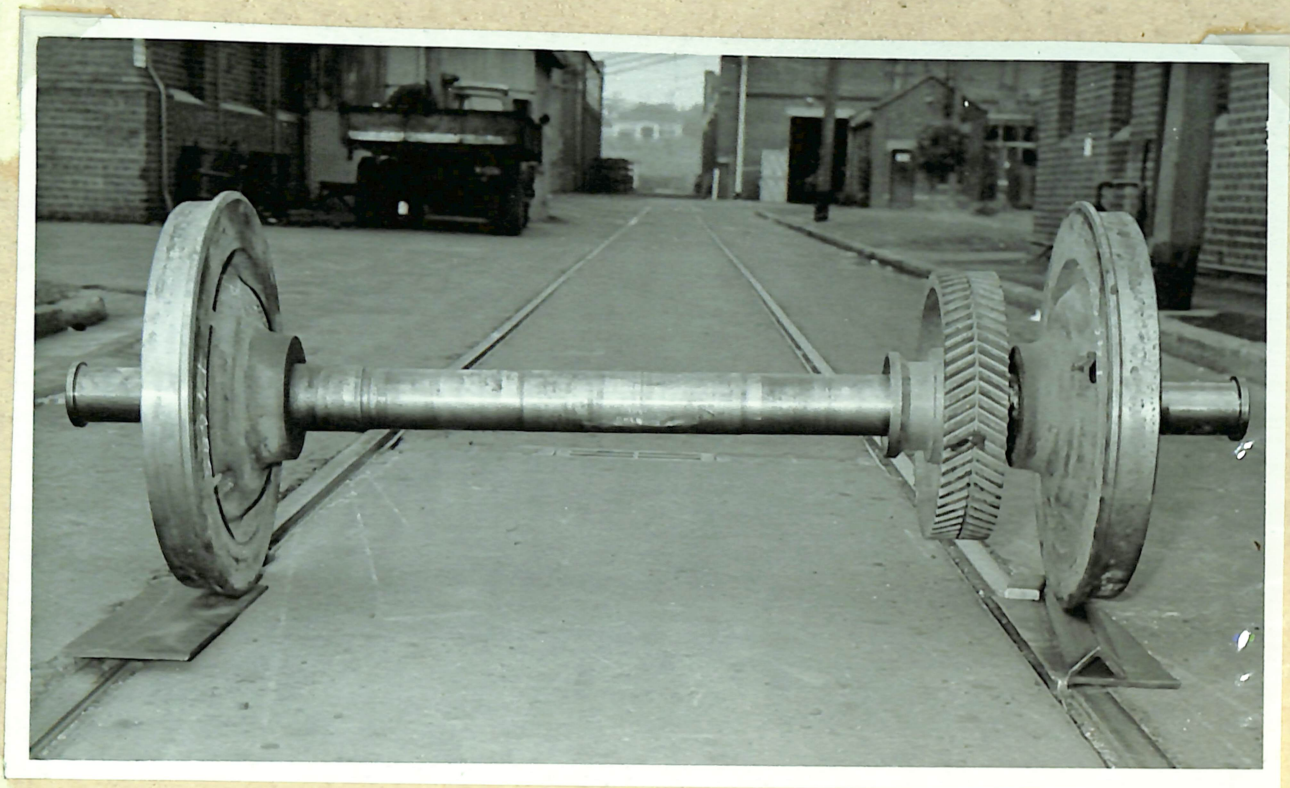


FIGURE 1.

If a derailed tram has been driven close to the rails or brought close by other means such as pyramid plates, and cannot then be directly re-railed by driving, a steel angle plate is used to re-rail the truck. This equipment is of particular use if the wheels are against the rails but checked by a protruding rail or sunk into soft ground, or at such an angle that the flanges cannot be dropped directly into the rail groove.

A steel angle plate, shown in Figure 1 under the gear side wheel, consists of a flat steel plate with a steel angle welded diagonally across it. Lugs are welded to the bottom of the plate, along one edge, to lock the plate to the rail groove. The plates are made left-hand or right-hand for use as required.

Select the appropriate plate and grease the inside edge of the angle. Locate the plate in front of the wheel with the bottom lugs in the rail groove and place a block of wood about 3" x 2" x 1/2" in front of the wheel tread, projecting on to the plate so that the weight of the tram will lock the plate in position. The steel angle plate must always be used in conjunction with a greased flat steel plate placed ahead of the other wheel of the pair, similarly locked with a small wooden block.

Drive the tram on to the plates slowly, with the air brake released.

Figure 1 illustrates the correct use of plates and wooden blocks.

The maximum angle to which a truck can be twisted and successfully re-railed using this equipment is shown in figure 2.



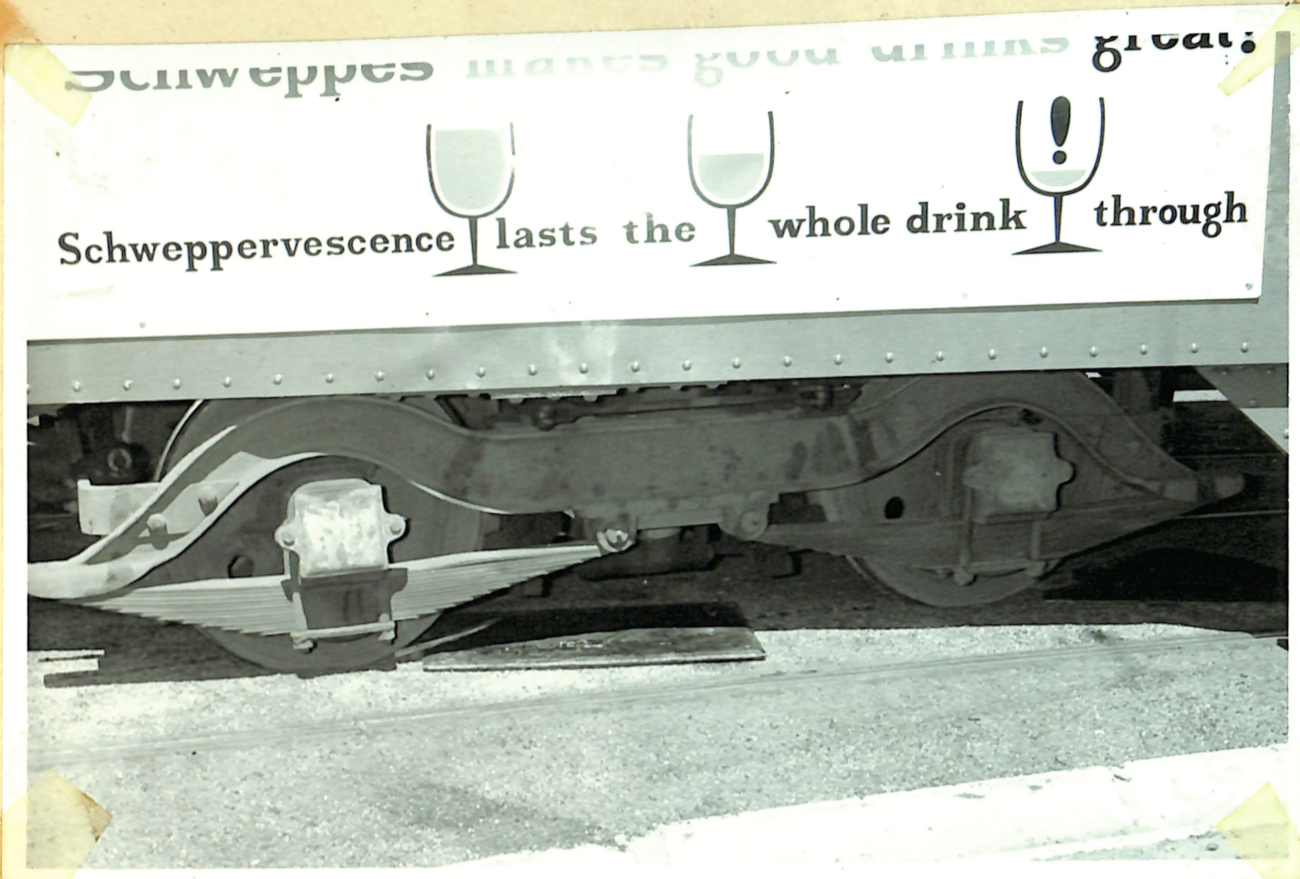


FIGURE 2.

If the rail protrudes above the paving or the wheel flanges have sunk into a soft track, position the pyramid plates in front of the wheels which are to be re-aligned and place greased flat steel plates in front of the other pair of wheels as illustrated in Figure 2. Steel angle plates (described later) could also be used to advantage to replace the wheel flanges in the rail groove in circumstances such as these.

Pyramid plates may also be used to de-rail wheels which have become positioned in the wrong rail grooves. It may be necessary to use packing under the side edges to prevent the plate rocking or sliding along the rail head - a cardboard "Sections and Fares" notice provides good packing.

After the tram is re-railed, do not drive it away until all plates and any other equipment and material which could foul have been removed.

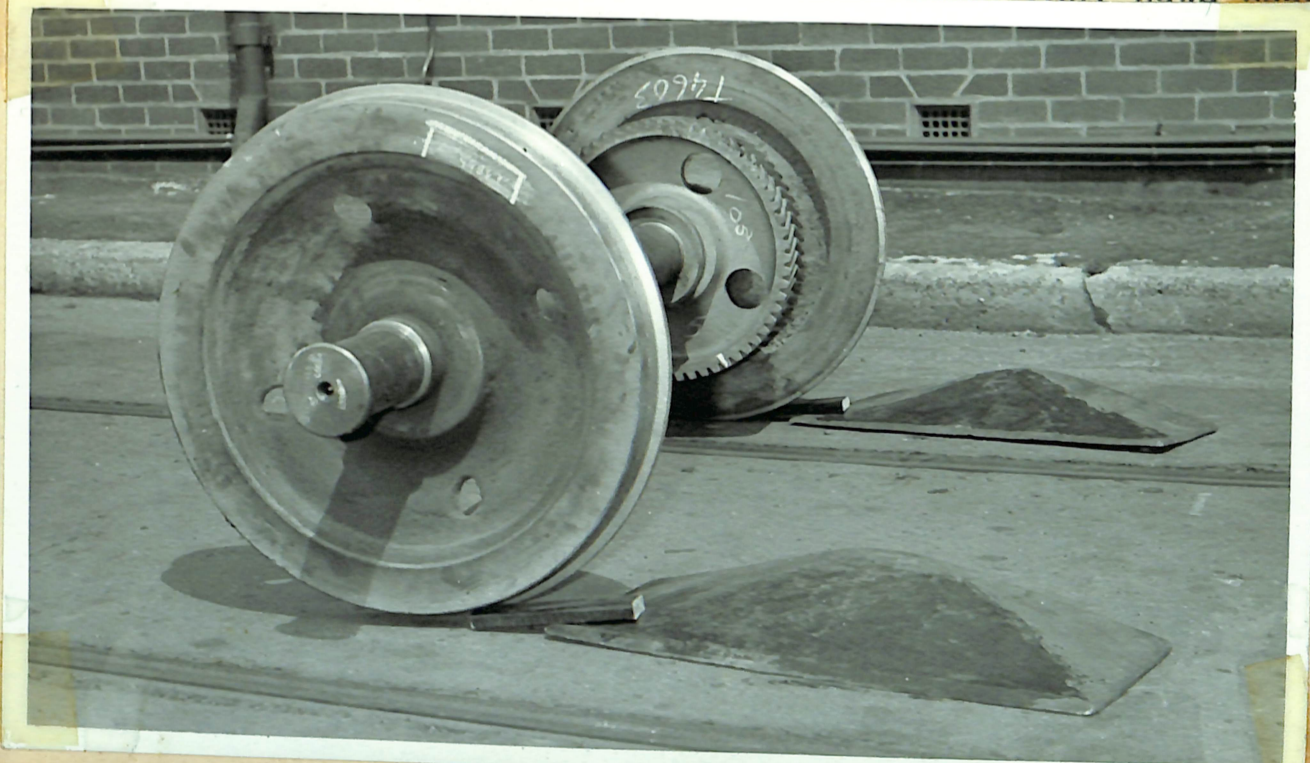




FIGURE 2.

