



AUSTRALIAN RAIL TRACK CORPORATION LTD

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## Engineering Practices Manual Civil Engineering

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# Inspection and Maintenance of Rail Lubricators - Procedure

## RAP 5140

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### 1. General

This instruction details procedures for rail lubricator inspection and maintenance in all areas.

Rail Lubricators are used to reduce rail wear from contact forces between the rail gauge face and wheel flanges of travelling vehicles. They deliver a metered quantity of lubricant from a reservoir to a location on the gauge face of the rail head where it is picked up by wheel flanges of passing vehicles. The lubricant must be picked up by the wheel flange and deposited further along the gauge face as the wheel progresses in the direction of travel, providing lubrication in the contact area of the wheel flange and the gauge face of the rail.

The distribution of grease must be performed efficiently, so that the grease is carried by the wheels as far as possible along the rail in the direction of travel with a minimum of grease wastage at the greasing plate and along the track.

The selection of rail lubricator type, main container capacity, installation location, installation of the rail lubricator and its regular maintenance is the responsibility of nominated trained maintenance staff.

### 2. Reason and nature of change

Document reissued as ARTC Engineering Practice Manual.

### 3. Lubricator types

The information in this document is specific to the three common lubricator types in use on ARTC's network. They are:

1. P&M (Fessl) – the most common older type lubricator which exists as a bolt-on or more recently as a clamp-on type.

2. Tamper – no longer used except in some areas of the Metropolitan system
3. RTE 25 – an improved version of the P&M lubricator.

Where differences exist in inspection and maintenance or installation procedures, they are noted in the following sections.

#### **4. Inspection Procedure**

The examination is carried out both visually and physically at the lubricator and visually in the curve being lubricated in accordance with the requirements of ARTC Standard TEP 08. Inspections should be undertaken in accordance with the elements of Table 1.

#### **5. Maintenance Procedure**

Maintenance servicing and repair of lubricators is carried out at regular intervals related, generally to the density of rail traffic and the size of the lubricant reservoir. Maintenance servicing should be undertaken in accordance with the elements of Table 1. Limits on blade and plunger heights are indicated in Table 2.

#### **6. Removal and re-installation of lubricators for track maintenance**

Rail lubricators can suffer considerable damage during ballasting, re-railing and other mechanised track maintenance operations such as tamping, re-sleepering, sledding, ballast cleaning and ballast regulating etc.

Procedures for removal and installation of lubricators are detailed in Appendix 1.

**Table 1 – Inspection and maintenance actions**

Inspection	Maintenance
<b>At the lubricator:</b>	
<b>Main Container</b>	
Check the grease status of the main container. Does it need filling?	Fill main container.
Check main container for signs of damage especially for cracks around bolts holes in back cover.  Check that filler valve is clean and has cover fitted.	Check for leaks at the hose connections. Leaks can be the result of loose hose fittings or damaged hoses. Tighten all back cover bolts. Check reservoir for damage such as cracks especially near the back cover bolts.
<b>Pump Assembly</b>	
Check plunger condition	Check plunger condition, replace plungers if necessary, if pump not operating replace assembly with exchange service unit.
Check plunger height above rail.	Check plunger heights and adjust as required. Check height of plungers to establish that passing wheels actuate pumps. If plunger height is too low adjust pump casting to obtain correct height.
Activate plungers to ensure grease is being delivered to blade.	Activate plungers to ensure grease is delivered to the greasing plate. This may require the pump to be primed to remove air locks.
<b>Greasing Plate Assembly</b>	
Check blade for signs of wear	Inspect condition of blade(s) for wear and leaks around cork stops. Repair or replace damaged parts. Check plates for loose fittings and faulty gaskets. Tighten fittings and replace gaskets if necessary. Adjust grease plate to correct height after service is complete
Check blade height below rail head	Adjust blade height and tighten bolts.
Observe rail around lubricator grease plate for excessive grease delivery to the rail head and adjacent track structure.	Visually examine the greasing plate for wear and/or damage. Check height of greasing plate. Adjust as required. Remove excessive grease and prime greasing plate.
Observe rail around lubricator greasing plate for insufficient grease delivery.	Adjust greasing plate height as required.
<b>General</b>	
Check hoses for obvious damage.	Replace any damaged hoses.
Check all hoses, blade ends and pumps for grease leakages.	Tighten all rail clamps, hose clamps and bolts.
	Clean waste material from rail and rail lubricator. Wash the Greasing Plate, Anchor Block and Pumps and Main Container.

<b>Rail adjacent to lubricator in the curve:</b>	
Check that grease is being carried around curve providing an adequate lubrication to protect the curve.	
Observe for excessive curve wear; such as shiny wear marks on the gauge face.	
Look for steel shavings along the rail foot and around rail anchors.	

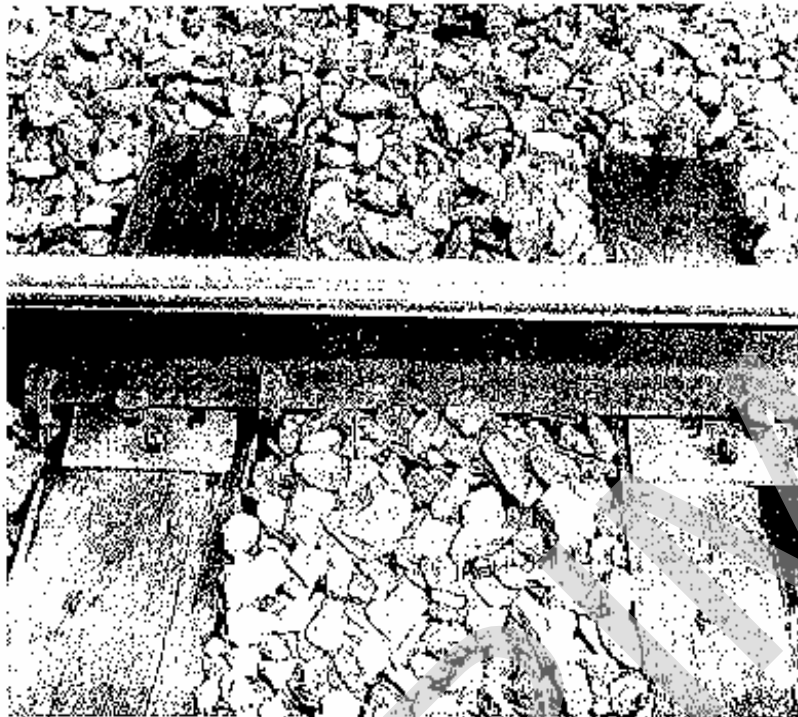
When a rail lubricator fault has been identified, the examiner is to repair the lubricator if possible or otherwise arrange for repairs.

**Table 2 - Plunger and blade settings**

	P&M	RTE25
Plunger height (above top of rail head)	1-3mm	2-3mm
Blade height (below top of rail head)	20-23mm	15-20mm



*Figure 1 – Leaking Fitting on Lubricator*



*Figure 2 – Result of Ineffective Rail Lubrication*



*Figure 3 – Portable Track Mounted Lubricator*

## Appendix

### Removal and re-installation of lubricators for track maintenance

Regardless of lubricator type, lubricators do not require removal for ballasting operations. Minor adjustment is necessary for P & M type lubricators. No adjustments are required for Tamper lubricators.

#### For P&M Type Lubricators

The only requirement is to lower the plungers and pump casting below the top of the rail head to avoid fouling ballast ploughs etc.

To achieve this:

1. Loosen the two (2) pump casting retaining bolts on each side of the anchor block.
2. Lower plungers below top rail head.
3. Tighten retaining bolts.

After ballasting is completed, plunger heights need to be readjusted to the correct height.

### Removal and installation of lubricators for rerailing and major track maintenance activities

<b>P&amp;M Type Lubricators</b>	
For bolt on lubricators:	For clamp on lubricators:
Removal	
	Loosen grease delivery hose clamps and remove grease delivery hose(s) from blade(s).
	Remove blade(s) by loosening blade retaining bolts and rail clamps.
	Loosen anchor block retaining clamps and rail clamps and withdraw anchor block and main container.  Note: Main container is still attached to the anchor block.
	Remove rail clamps from foot of rail.
Installation	
After rerailing, determine whether the rail size and lubricator components are compatible. 60lb rail lubricators and components cannot be used with larger rail sections. 80lb (40Kg) anchor blocks can be used on larger rail sections by changing the two chairs on the underside of the anchor block. This is achieved by removing the two allen screws retaining the chairs and fitting two appropriate size chairs. The correct size blades are then used and all other components are interchangeable.	

Determine the correct location to fit the lubricator in relation to Tangent Point (T.P.) on the correct rail.	
Remove excess ballast and position main container into correct location.	
Position the lubricator and mark the location of the two (2) holes for the main attachment bolts on the web of the rail.	Fit two (2) rail clamps to the foot of the rail. Do not tighten.
Drill the two (2) holes (30mm dia).	Fit anchor block and tighten rail clamps.
With main container positioned on the field side of the rail line up holes in the rail and main container. (Note: Main container on C4 includes anchor block).	Tighten anchor block retaining bolts.
	Position and fit rail clamps for blade(s). Do not tighten.
Fit blade(s). Fit millboard packing between the rail and the greasing plate assembly and assemble to rail. (when re-installing always fit new packing)	
The two (2) main attachment bolts pass through the greasing plate assembly, millboard packing, rail web and into the main container. Two (2) cork stops should be used in this operation. The cork stops are fitted into the grooves in each end of the greasing plate assembly. The two (2) main attachment bolts are securely tightened.	Fit new cork stops between blade assembly and rail in the grooves provided. Partially tighten blade retaining bolts.
Blade height is adjusted to 20-23mm below the top of the rail.  This is achieved by loosening the two (2) large retaining bolts near the end of the blade. Once the correct blade height is obtained, tighten the two bolts.	Adjust height of blade(s) by loosening the four (4) height adjusting bolts and moving the blade(s) up or down.  Tighten blade retaining bolts and blade height adjusting bolts.
Replace bolt head covers and retaining bolts and secure.	Fit grease delivery hose(s).
Check pump plunger heights and adjust if necessary.  This is done by releasing the two retaining bolts in each pump and moving the complete pump casting up or down. When correctly positioned, tighten retaining bolts.  The correct plunger height setting is between 1 mm and 5mm (for C4) or between 2mm and 4mm (for M4, M5, M6, M7 and M30).	
Fill main container with approved grease. Filling is carried out either by mechanical or pneumatic operation of pumping grease into the main container via a non-return valve.	
Activate plungers by striking rapidly with a ball peen hammer. This should deliver a bead of grease along the greasing plate. If no grease is present, pumps are likely to contain air and this MUST be bled. (Note: Pump can be primed while filling if assistance is available to depress plungers).  Loosen both bolts securing pumps to main container (or anchor block) and allow air to be dispelled. Reset plunger heights and re-tighten bolts. This procedure may need to be repeated until all air is expelled	
Clean up worksite after lubricator is operating correctly.	

<b>Tamper Clamp-on C20 type lubricator</b>
<b>Removal</b>
Remove grease delivery hose(s) from main container and blade(s).
Loosen blade retaining bolts one (1) each end of each blade. Remove blade(s).
Remove pump activating shaft (flexible or universal type) from main container and actuating arm assembly.
Remove actuating arm assembly complete with height adjusting shims.
Remove rail clamps from under actuating arm assembly and also the two outer rail clamps for blade assembly.
Remove main container. The main container may have to be emptied of grease to allow the main container to be moved.
Place all components in a secure location away from worksite
<b>Installation</b>
Fit rail clamps to the foot of the rail to mount actuating arm assembly
Mount actuating arm assembly - adjust height of actuating arm by the use of shims between rail clamps and assembly. Tighten all bolts.
Determine correct distance and height for main container and dig hole. Place main container in hole.
Fit pump activating shaft to main container and actuating arm assembly.
Back fill hole to secure main container.
Determine correct location and fit outer rail clamps for blades
Fit blades to rail clamps. DO NOT TENSION BOLTS
The blade height is adjusted by rotating the allen screws on end of blade (height adjustment screws).
Adjust blade to just contact rail on gauge face. Tighten blade retaining bolts
Fit grease delivery hoses to blades and main container
Fill main container with approved grease
Prime pumps and blades.
Fine tune grease delivery at pump adjustment height directly above pump in main container.