



# Engineering Procedure

## Signalling

### CRN SM 010

# INSTALLATION OF SWITCH ROLLERS

Version 2.0

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## Document control

Revision	Date of Approval	Summary of change
1.1	September 2004.	RIC Standard SC 07 37 00 06 EQ Version 1.1 September 2004.
1.0	June 2011	Conversion to CRN Signalling Standard CRN SM 010.
2.0	January 2016	Name change to include all point types

## Summary of changes from previous version

Section	Summary of change
Cover Sheet	Rename – remove Clawlock and make a general standard
1.1	Typo update

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# 1 Introduction and Description

## 1.1 Purpose of Switch Rollers

Switch rollers are used when it is no longer necessary to regularly lubricate switch plates. The rollers lift the switch 1 – 4mm above the switch plate surface as the switch moves between the open and the closed positions so that there is no contact between switch and plate while the switch is moving.

In the open position the switch is held clear of the plates but in the closed position the rollers must be adjusted so that the wheel load from passing trains is carried by the switch plates and not the roller assembly.

As there is no longer friction between plates and switch, the forces required to move the switch are lower reducing the load on the switch operating mechanism.

## 1.2 Application of Switch Rollers

Switch rollers can be fitted to 60kg tangential turnouts with asymmetric (half height) switches, 60kg turnouts with full height switches and 53kg turnouts.

Rollers for asymmetric switches can either be fitted into the bay between sleepers or built into sleeper plates.

Rollers for 60kg full height switches and 53kg switches fit into the bay between sleepers whether built into sleeper plates or not.

All types of roller can be retrofitted to existing turnouts but this may require changes to sleeper plates depending on which type of roller is used.

## 1.3 Types of Switch Roller

Apart from a small number of rollers used on mechanical trailable points, which are described in the Mechanical Trailable Points Manual, there are two types of switch roller being used in NSW.

The Schreck-Mieves type manufactured by Schreck-Mieves GmbH in Germany and supplied in Australia by Teksol International Pty Ltd

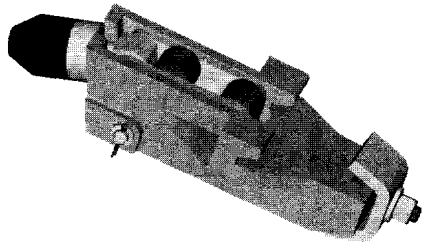
The CDP in plate type manufactured by Peddinghaus Group in Germany and supplied with new turnouts by VAE Australia and Pacific Rail Engineering and supplied by CDP Australia for retrofit application.

## 1.4 Description

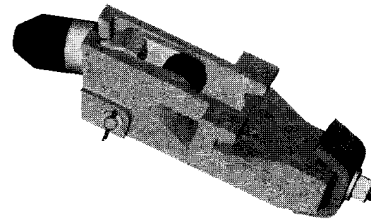
### 1.4.1 The Schreck-Mieves (Teksol) Roller for Asymmetric Switches

This roller consists of one, two or three rollers mounted in a cast box that is pivoted on a frame that clamps to the foot of the stockrail. Roller height and switch clearance above plates is adjusted by a spring loaded bolt.

As the wheel passes over the switch, the bellville washer spring is further compressed until the switch bears on the switch plates. Full wheel loads are therefore taken on the switch plates, not on the roller assembly.



**EKOS®-V200**



**EKOS®-Z 200**

**Schreck-Mieves EKOS Switch Rollers for Asymmetric Switches**

**1.4.2 The Schreck-Mieves (Teksol) Roller for 60kg Switches**

This roller consists of two rollers mounted in a cast box that is pivoted on a frame which is in turn mounted to a fabricated steel frame. This hooks over the foot of the stockrail in the six foot and is attached to the sleepers or beams in the four foot.

Adjustment and operation are as for the asymmetric roller.

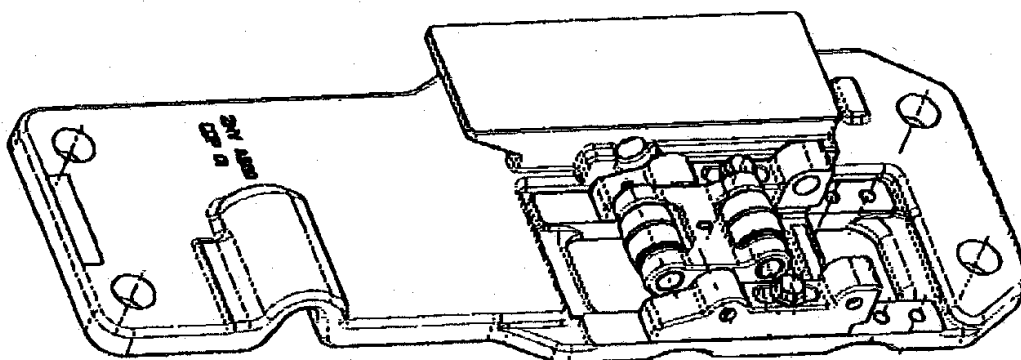
**1.4.3 The Schreck-Mieves (Teksol) Roller for 53kg Switches**

This assembly has three rollers mounted in a triangular formation to compensate for the narrow foot on the 53kg switch.

Otherwise, it is similar to, but not interchangeable with, the 60 kg assembly.

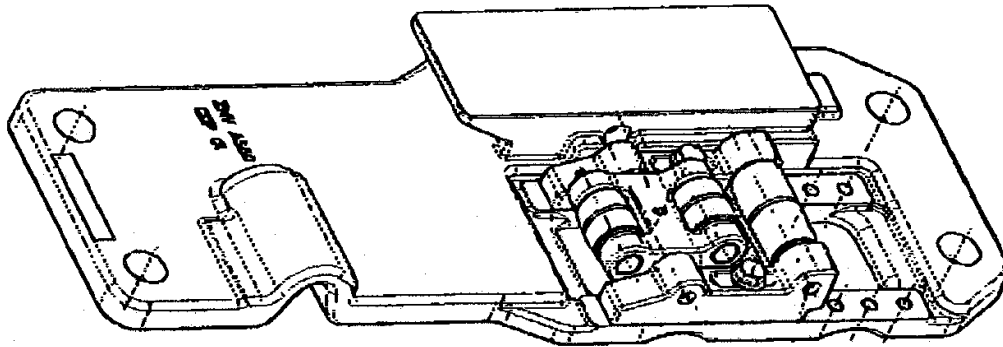
**1.4.4 The CDP in-Plate Roller for Asymmetric Switches**

Two assemblies are used. One consists of two rollers mounted in a rocker that is bolted to the sleeper plate, the other consists of two rollers mounted in a rocker and one fixed roller, also mounted to the sleeper plate. The sleeper plate is made so that the switch can bear on one half of the plate while the other half of the plate is recessed to accept the switch rollers.



**CDP Roller Assembly ZHV3**

This assembly is used where the switch movement is less than 60 mm



**CDP Switch Roller Assembly ZHV2**

This assembly is used towards the tip of the switch where movement is up to 150 mm.

#### 1.4.5 The CDP In-Plate Roller for 60kg Switches

The roller assembly is as for the asymmetric assembly but the sleeper plate has an outrigger to carry the roller assembly. This outrigger extends past the edge of the sleeper into the bay between sleepers.

There is insufficient height in the rail plate for full height switches to allow mounting of the roller assembly on top of the sleeper.

## 2 Schrek-Mieves (Teksol) Switch Rollers

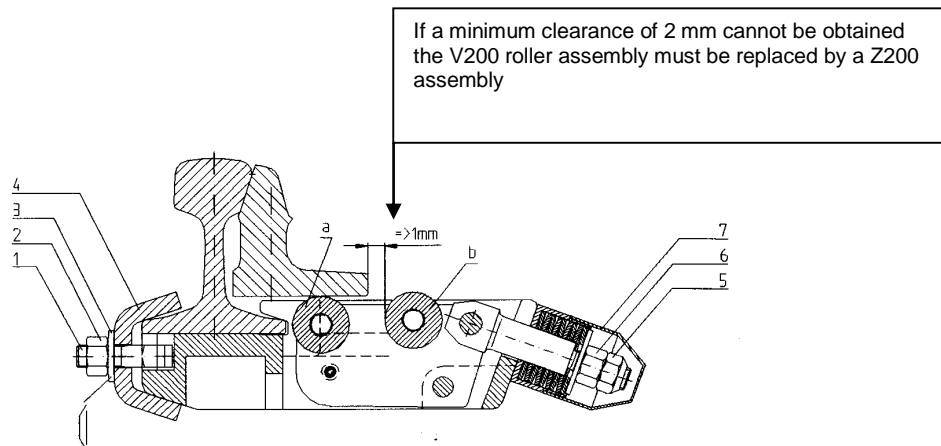
### 2.1 Installation

#### 2.1.1 Asymmetric Switches

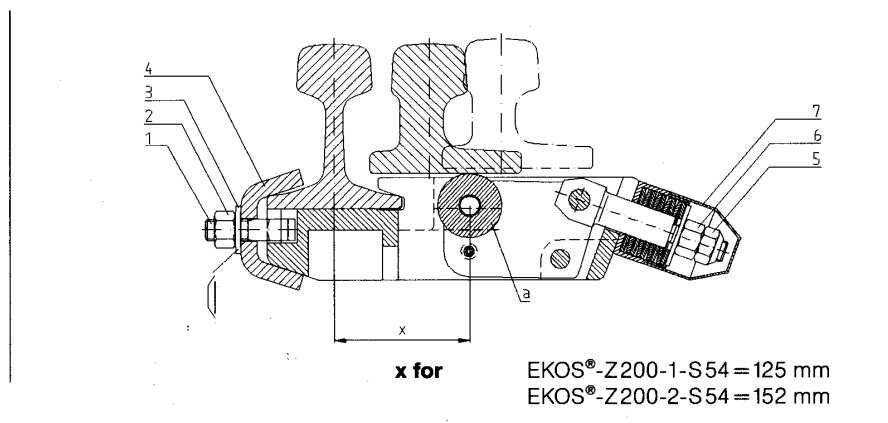
Select the sleeper bays into which the rollers are to be placed. Recommended locations are given in Table 2.1. However these locations may need to be varied by one bay in either direction to suit individual turnouts.

Turnout Type	Roller Locations		Roller Type
	Beam Nos	Signalling Terminology	
190	3 and 4 - 10 and 11	B and C - I and J	V200 - Z200
250	3 and 4 - 11 and 12	B and C - J and K	V20 - Z200
300	3 and 4 - 11 and 12	B and C - J and K	V200 - Z200
500	3 and 4 - 10 and 11 - 17 and 18	B and C - I and J - P and Q	V200 - V200 - Z200
800	4 and 5 - 14 and 15 - 25 and 26	C and D - M and N	V200 - V200 - Z200
1200	5 and 6 - 15 and 16 - 24 and 25 - 33 and 34	D and E - N and O	V200 - V200 - Z200 - Z200

- Close one switch.
- Start with the roller closest to the tip of the switch.
- Remove the cover (7) from the adjusting nut.
- Remove the camp plate (4), washer (3) and nut (2).
- Slacken off the locknut (5).
- Slacken the adjusting nut (6) until the assembly will slide under the switch and engage with the foot of the stockrail.



**V200 Roller Assembly**

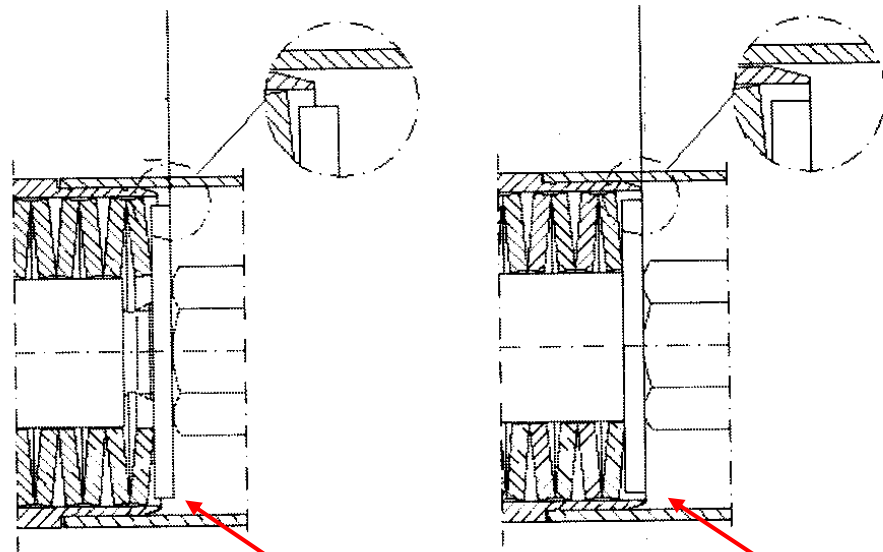


**Z200 Roller Assembly**

Note different roller positions for Z200-1-S54 and Z200-2-S54.

- Fit the clamp plate, nut and washer and tighten. Ensure that the assembly is properly seated on the foot of the rail.

- Tighten the adjusting nut until the switch is 1 mm clear of the slide chair next to the roller toward the tip of the switch.



*Preferred position – washer slightly outside sleeve.*

*The adjusting nut must not be tightened past the point where the washer is flush with the end of the sleeve.*

### Maximum Spring Tension Adjustment

Adjustment beyond the maximum position shown will result in roller damage.

- Check that the tip of the switch is not more than 1 mm clear of the first slide chair. Adjust the roller if necessary
- Repeat steps 3 to 7 with the other roller(s) on that switch
- Tighten the adjusting nut until the switch is 2 - 3 mm clear of the slide chairs either side of the roller(s)
- Check the clearance between switch and slide chairs between the rollers and for 4 or 5 chairs toward the heel. Clearance should be 1mm or more between rollers and should taper off to zero after about 5 or 6 chairs towards the heel.
- Repeat steps 1 to 11 for the opposite switch
- Operate the switches over and back four to five times
- Check the clearance between the foot of the switch and slide chairs and adjust if necessary
- Tighten locknuts on all assemblies
- Refit covers to all assemblies.



### 3 CDP Switch Rollers

#### 3.1 Installation

##### 3.1.1 Asymmetric Switches – New Turnouts

**CAUTION**

With new turnouts where the switch roller plate assemblies are supplied installed in the turnout, ensure that rollers are positioned so that the outer roller on the rocker is clear of the base of the closed switch before any rail vehicle is permitted to run over the turnout.

**CAUTION**

Ballasting, tamping and lining of the turnout must be completed  
and

The switch operating mechanism must be installed, adjusted and operating (at least by emergency hand throw lever or crank) before the switch rollers are adjusted.

**Note:**

Since the switch rollers may not be effective while the operating mechanism is being set up, a minimal amount of a light lubricating oil (SAE 20 –30) may be used on the slide chairs to assist operation during set up. Ensure that no oil is allowed into the roller assemblies.

##### 3.1.1.1 Set Up Adjustment

- Close one switch.
- Remove the protective cap from the roller assembly
- Allow the switch to lay in the position it is driven to by the operating mechanism. If the switch is lying slightly off the stockrail back towards the heel do not force it closed with a switch clip.
- Adjust each of the roller assemblies along that switch so that the foot of the switch is 1 – 1.5mm clear of the outer roller in the rocker assembly.
- Open the switch
- Check that the clearance between the foot of the switch and the slide chairs is 2 to 3 mm.
- If the clearance is less than 1 mm on any slide chair, insert 1mm shims between the roller bracket and the slide chair on the roller assemblies closest to the chair with minimal clearance. (Clearance between switch and slide chair may vary along the turnout depending on whether the turnout has a slightly convex or slightly concave vertical curve.)
- Do not shim more than 6mm.
- After shimming close the switch and re-adjust the roller assembly position so that the outer roller in the rocker is 1 to 1.5 mm clear of the foot of the switch.
- Repeat these operations for the opposite switch.

##### 3.1.2 Asymmetric Switches - Retrofit

Determine on which beams (sleepers) rollers are to be placed.

Turnout Type	Roller Locations		Roller Type
	Beam No	Signalling Terminology	

190	3 - 10	B - I	ZHV3 - ZHV3
250	3 - 11	B - J	ZHV3 - ZHV3
300	3 - 11	B - J	ZHV3 - ZHV3
500	3 - 10 - 17	B - I - P	ZHV3 - ZHV3 - ZHV2
800	4 - 14 - 25	C - M	ZHV3 - ZHV3 - ZHV2
1200	5 - 15 - 24 - 33	D - N	ZHV3 - ZHV3 - ZHV2 - ZHV2

Roller location may need to be varied one beam either side of that recommended above to obtain optimum results for a particular turnout. For 800 and 1200 metre turnouts, an additional roller may be required if there is a vertical curve in the turnout.

- Remove the existing slide chairs on those beams
- Remove the roller assemblies from the new slide chairs
- Place and fix the new slide chairs onto the beams (sleepers)
- Close one switch – use the operating mechanism, not a point clip
- Refit the roller assemblies to the slide chairs
- Adjust the roller assemblies so that the foot of the switch is 1 to 1.5mm clear of the outer roller in the rocker assembly.
- Open the switch
- Check that the clearance between the foot of the switch and the slide chairs is 2 to 3 mm.
- If the clearance is less than 1 mm on any slide chair, insert 1mm shims between the roller bracket and the slide chair on the roller assemblies closest to the chair with minimal clearance. (Clearance between switch and slide chair may vary along the turnout depending on whether the turnout has a slightly convex or slightly concave vertical curve.)
- Do not shim more than 6mm.
- After shimming close the switch and re-adjust the roller assembly position so that the outer roller in the rocker is 1 to 1.5 mm clear of the foot of the switch.
- Repeat for the opposite switch.

## 4 Special Inspection one Month after Turnout Commissioning or Roller Installation – New Turnouts and Retrofit

- With switches open, check the clearance between each slide chair and the foot of the switch. On new turnouts in particular, this clearance is likely to have changed. Add or remove shims as required to maintain clearance between 1 and 4 mm. Note that the clearance should not exceed 3mm on the slide chair to which the rollers are fitted. If it does, the rollers on that chair will be ineffective and load will be transferred to the assemblies on either side.
- With switches closed, check the clearance (adjust if height has been changed) between the foot of the switch and the outer roller in the rocker assembly. It is likely that, towards the back of the switch, this clearance will have increased. If the clearance exceeds 2mm, adjust the roller assembly.
- Check that the bolts holding the roller assemblies to the slide chairs are tightened to the specified torque.