

Useful Notes:

RCM Point Alarm Investigation Guide

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PCM 'Point Condition Monitoring': Possible causes and rectification methods

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Possible fault	Caused by/possible causes	Rectification method
Schwihags out of adjustment	Incorrectly set up/loose	Set to spec using SMS PF03
Schwihag flat-spots	Schwihags originally set too high or seized or switch rail hogged and bouncing on rollers	Flat Schwihags must be renewed and then set correctly
Seized Schwihags	Lack of lubricant/dirt ingress	Check they rotate with finger, remove and lubricate with grease if not, (don't assume it's just frost)
Dry slides	Lack of lubricant/sand or coal in points	Thoroughly clean slides and lubricate with interflon
Voiding (riding on front only slides, or few slides)	Insufficient or inadequately packed ballast under sleepers	Pway need to L&P the points
Binding kicking straps on stretchers (usually front)	Incorrectly drilled stretchers, kicking strap not trimmed, schwihags set too high, voiding (<i>one or all of above</i>)	Rectify incorrectly drilled/trimmed stretchers, set schwihags to spec, pway to L&P [<i>spec: 3-6mm non schwihags/6-9mm for schwihags</i>]
Binding clamp lock tie bar	Incorrect thrust bracket or bent down thrust bracket.	Check thrust bracket to CL HB; fit correct if req'd. Fit thrust bracket packing plate [^] to lift, gap should be 3mm min. Renew if bent
Dry Clamplock drive lock slides	Lack of lubricant, coal or sand in slides	Thoroughly clean, apply approved lubricant
Extremely dry machine slides/gearing	Lack of lubricant (usually not applied at installation)	Apply approved lubricant
Switches obstructed	Obstructed by debris or excessive ballast	Clear all obstructions, ballast should be 30mm below stretchers and clamp lock equipment
Tight backdrive	Look first why it is not correctly set up: is it to mask a problem? i.e. is the switch rail too tight at the front, and BD needs to be backed off? Tight drive rod in lug.	Set BD to spec if no obvious causes. If problem with switches, you can have a 'RSO' at 4mm* MAX. Check rear rod enters lug straight, rectify if not.
Loose backdrive	Worn parts, worn mountings, loose coach screws (<i>if fitted direct to sleeper</i>)	Check and replace any worn parts, fit new coach screws (pway plastic hilti coils can be used as plugs), Ideally the BD should be on plates.
Seized backdrive	Lack of lubrication from installation (usually found by hard to pump/wind, or squeaking noise)	The seized part must be removed, clean and greased or replaced (with fresh grease)
Lipping	Rail worn	Grinders need to reprofile
Chair Gaul (Slide chairs have a step close to stock rail)	Usually caused by large RSO and/or crippled switch rail	Step can be ground off, but cause needs to be investigated or it will return.

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Possible fault	Caused by/possible causes	Rectification method
faulty clutch/noisy clutch/slipping clutch	Incorrectly set up clutch, carbon build up, worn clutch plates (dry clutch only), clutch control contacts (HW2000), faulty plug coupler to clutch (HW2000), no/low voltage (HW2000)	Check clutch readings (12a +/- 2a) adjust if reqd (HW), Adjust clutch tension springs (dry clutch). Replace worn clutch plates (dry clutch), Check/set up control contacts. Check plug coupler (apply switch cleaner), (Carbon build up may be removed by putting an obstruction** in the points and allowing clutch to slip to remove any build up).
Faulty (high resistant) HW plug couplers	Loose couplers, dirty/wet pins	Remove coupler, check, apply switch cleaner & tighten
Dirty or damaged commutator	Lack of maintenance, worn/incorrect brushes	Clean commutator with switch cleaner and clean with cloth (<i>allow to dry before powering points</i>), check brushes for correct type. (<i>SGE points are more susceptible to slow operation due to a dirty commutator</i>)
Incorrectly tensioned belt drive (M63 points only)	Poor/lack of maintenance, worn belt	Set up belt using SMS or replace if worn
Worn/burnt motor contacts	Excessive burning due to incorrect gap	Replace contacts and set to correct gap, check clutch current to SMS
Tight lock (<i>could be on beginning <u>or</u> end of trace</i>)	Incorrectly set FPL, movement in track causing loss of 1.5mm clearance, lipping, poorly fitting switch rail, over-length front stretcher (Clamplock only)	Check and set up FPL, check gauge from last reading, check and arrange for lipping to be removed, check switch rail fit-up, escalate if poor. For stretcher: See notes ***
Low power to points motor (<i>will show on trace as excessive time to power over</i>)	Faulty cable, faulty battery, high resistant contact in relay, faulty power pack, faulty brushes (<i>see above</i>)HR motor cut-out contact	Check cable, check battery, test outgoing/incoming voltage (30v: No less than 25v, 50v: no less than 45v, 110v: no less than 95v). Check and replace power pack if suspect to be faulty, check/clean/adjust motor cut-out contact
Worn motor brushes	Worn out or incorrect brushes fitted	Replace with correct type
Lack of gear box oil (M3a only) <i>resulting in seized gearing</i>	Lack of maintenance, worn missing sump seals	Check for reason for loss. Replace oil up to 'OIL LEVEL' indicator on side (gear oil only)
Incorrectly set snubbing (M3a & M63 only)	Maintenance issue	Set snubbing contacts to 'TAN 001' spec

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Possible fault	Caused by/possible causes	Rectification method
Frost/frozen points or snow	NA	Remove all frost and snow with heat gun (be careful not to burn schwihag roller plastic/rubber gaiters), apply anti-frost solution, check schwihags (<i>see page one</i>) also check inside machine – are the heaters working?
Track movement	Many reasons, obvious is loose bolts, rotten sleepers etc	Have Pway check over the points, check gauge/FWC/FWP/RSO from last visit to see if any change
Faulty Clamplock pump unit solenoid	Lack of use/faulty	Hard to check if it is working on arrival. Is oil level OK? Carry out all other checks, replace PU if still failing.
Loose/faulty wiring	Poor/lack of maintenance/General age of cable/mechanical damage	Loose/damaged wiring can set off a PCM alarm if the points lose detection or fail to detect straight away. Check all wiring to detection and motor circuit inc relays/fuses etc

Notes:

'CLHB': Clamplock handbook

* You **MUST** check first to see if the FWC is large enough to increase the RSO to 4mm.

** The obstruction should be a 3.5mm gauge, larger obstructions will severely bend the stretcher and may crack it.

*** (*Clamplocks only*): if points seem to jolt when unlocking or fail to unlock; try undoing bolts on stretcher (bar bolts, not rail) and slacken stretcher bar, if they unlock better, arrange for stretcher to be renewed; [Caused by stretcher being adjusted without adjusting tie bar]. **REMEMBER TO RETIGHTEN AND RE-TORQUE BOLTS AFTER CHECKING.**

^ Plain lead thrust brackets only (not for switch diamonds).

There are many faults on clamplocks that will cause poor/slow operation, usually incorrect parts fitted; especially adaptor blocks, there are too many parts to list here, consult the CLHB if you suspect a part is wrong.

It is best practise to check out all of the points as some possible causes may not be listed or currently not known. Please advise me of any not shown and I will add it to the list to help others in locating sometimes difficult causes of RCM alarms.

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Basic use of PCM alarm in RR/Loc:

- **Have points put in 'maintenance mode'**
- Find the PCM for your points (*some PCM have multiple ends and track circuits*)
- Press **MENU** button
- Click on **EVENTS**
- Find your points in the list (*several sets may be on one PCM*)
- Highlight **'Trace'** for your points, i.e. "2345A trace"
- Click **TRACE** button
- Brings up trace for last movement (*time along bottom, amps on side*)
- Scroll to the trace that flagged up the alarm using < > buttons
- Once found, click on **'SET AS PREFERENCE'**
- This will put a black graph trace line mimicking that faulty trace, this will now be visible on all traces to show differences
- Work on points to solve reason for trace
- Go back to PCM and use reference line to see if improvements have been made
- Try points several times.
- Consult tech support desk in NRCC, if they are happy with trace, book fault in. If you cannot find a cause and alarm trace is still showing, they have steps in which to follow with regards to advising supervisor, monitoring etc.
- **DO NOT** book in points until you have consulted the tech support desk first.
- If all OK, and tech support give permission to book in, have points taken out of maintenance mode.

When an alarm is received, NRCC should provide the trace and possible suspected causes, however, there could be many reasons for that trace. These checks could help in locating the possible cause.

The SMTH and/or SMS's MUST be used when renewing or setting up any equipment. This document is uncontrolled and is NOT Network Rail endorsed.

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