Pawl Device Fault Finding Guide

This guide is to assist in fault finding MRLi lifts that are equipped with the Pawl Device. Potential reliability issues associated with the pawl device would fall in to one of the following 4 categories:

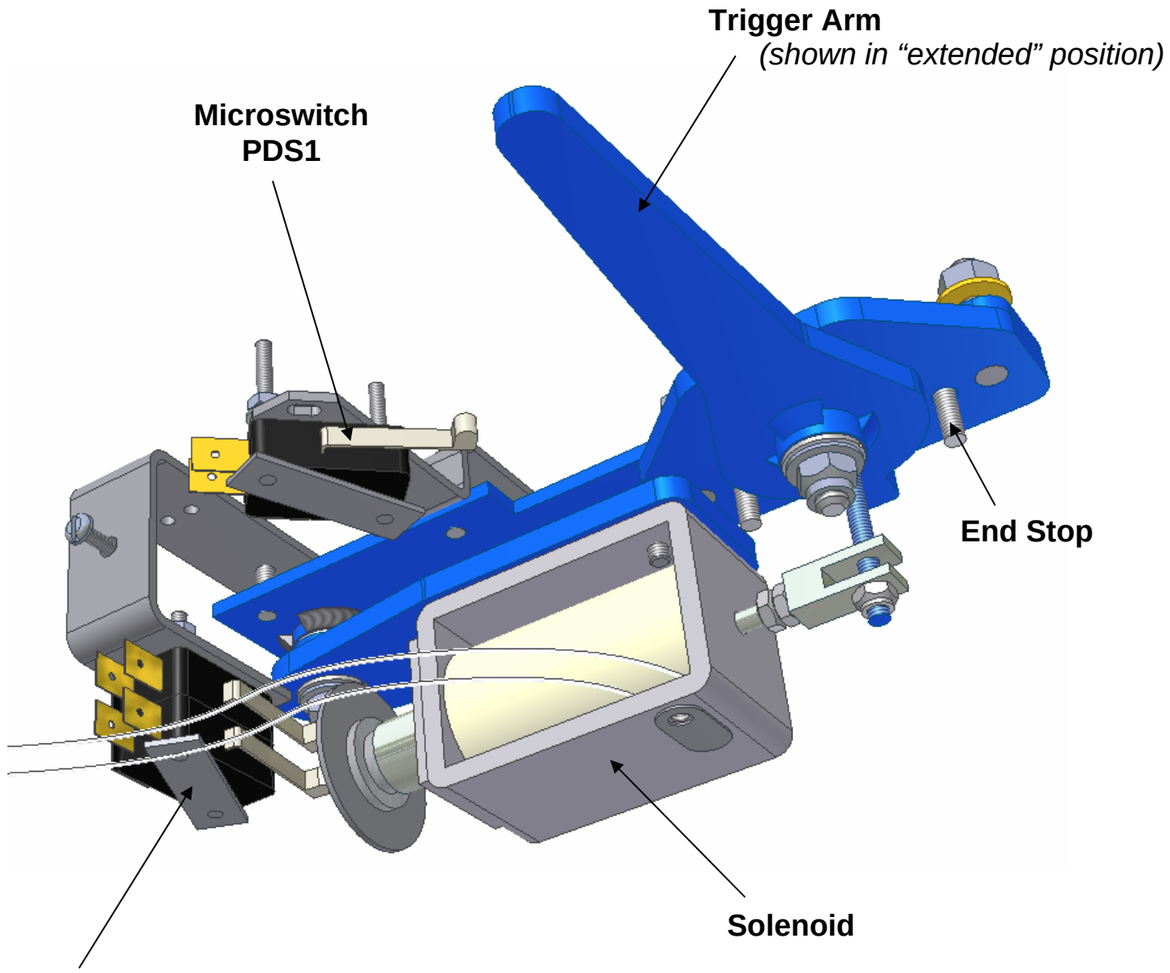
1. **Lift fails to run *(resulting in a JTT fault)***

2. **Safety gear triggered by pawl device *(resulting in an SCF fault)***

3. **Lift has run upwards with the pawl device not in its retracted position *(resulting in clash with activation plate and likely damage to pawl device, plate and or safety gear arm)***

4. **Doors fail to open**

When the fault is intermittent, tests 1 to 4 (detailed in the pawl device installation guide) must be carried out to verify that the device is correctly wired and functioning as intended BEFORE moving on to the fault finding table overleaf.



<u>Intermittent Faults</u>: If the lift has experienced a fault but now seems to be functioning correctly, please perform Tests 1 to 4 detailed in the "Pawl Device Installation Guide" to verify that the pawl device circuitry is connected correctly and functioning as intended <u>BEFORE</u> referring to the fault finding table below.

Ref. No.	Symptom	Fault	Checks/measurements	Possible Cause	Corrective Action	Reference material
1	**Lift fails to run down OR Lift fails to run up (motor running)** This could be during normal running and/or relevelling. Nexus will display "Lift running down" or "Lift running up" and will then log a JTE fault followed by a JTT fault. There may also be relevel timeouts logged.	VD ("VMD") and/or VS ("VMP") signal(s) missing	Place a call and then see if VD or VS inputs are present, either by viewing GEV inputs in menu 1-6 of the hand held programmer OR measure voltage between COM & VMD or COM & VMP: should measure approx 20 to 24Vdc. If the fault appears to be intermittent the above checks may not show a problem. Viewing the lift events prior to the JTE fault will provide you with the floor position and direction of travel that the failure occurred. This may help to determine whether VD, VS or both signals have been missing. *Refer to 'GEV booklet' for details of menu 1-6.* *Refer to 'Nexus Reference Manual' for details of how to view details in the event log.*	PDS1 microswitch - incorrectly positioned	Adjust to correct position	Refer to 'Pawl Device Installation Guide'
				PDS1 microswitch - inconsistent operation *(due to insufficient solenoid stroke)*	Trigger arm should reach the physical end stop. If it does not, adjust the solenoid stroke and re-adjust PDS1 as per the Installation Guide.	Refer to 'Pawl Device Installation Guide'
				PDS1 microswitch - inconsistent operation *(due to mechanical binding of the trigger arm assembly etc)*	Check for full and free operation of the pawl device assembly (by manually pushing and releasing at the disc on the rear of the solenoid). If the assembly binds or is stiff in operation check the following areas: - solenoid plate pivot *(permitted to slacken nyloc nut up to a max of 1/2 turn from it's fully tightened position)* - trigger arm pivot *(permitted to slacken nyloc nut up to a max of 1/2 turn from it's fully tightened position)* - M4 nyloc solenoid support nut (check that it has not been wound too far up or down the stud)	Refer to 'Pawl Device Installation Guide' and make adjustments as described.
				PDS1 microswitch - inconsistent operation *(due to microswitch lever arm having been bent to fit)*	The microswitch lever must be straight. If the arm can be straightened satisfactorily (i.e. it was only slightly bent) then do so. Adjust PDS1 switch position - if insufficient adjustment is available it is likely that the switch/bracket/mounting plate are incorrectly assembled. See Installation Guide. If the arm was bent a considerable amount it will be necessary to replace the microswitch.	Refer to 'Pawl Device Installation Guide' Replacement part no. 908077
				PDS1 microswitch - loose electrical connection	Check the wiring connections to PDS1 (wire 3, link wire and wire 4)	Refer to wiring diagram 9333/730 and schematic 1009238 (9333/750 & 1009239 if 2 car entrances)
				PDS1 microswitch - damaged or faulty	Check for visual signs of damage (e.g. broken casing, excessive play in actuating lever, loose spade terminals etc) Replace PDS1 if external damage can be seen and/or the operation of the switch feels abnormal.	Replacement part no. 908077
				Solenoid failing to energise	Check solenoid connections (wires 1 and 2) Check voltage between COM and PDA. Should not be less than 9Vdc. If this voltage is less than 9Vdc OR the lift appears to fail to run in the down direction only, carry out modification to the GEV pcb supply (see TB96)	Refer to wiring diagram 9333/730 and schematic 1009238 (9333/750 & 1009239 if 2 car entrances) Refer to technical bulletin TB96
				PDR relay not energising	Check all connections between the PDR relay base and VMD/VMP. Check all connections between the PDR relay base and the "existing" control panel circuitry.	Refer to wiring diagram 9333/729 and schematic 1009238 (1009239 if 2 car entrances)
					If all connections are good, check the voltage between PDR and COM (should be approx 24Vdc). If the voltage is present but the PDR relay contacts are not changing over the PDR relay may be loose in its mounting base or could be faulty. Check that it is correctly inserted in the base. If faulty, replace the PDR relay.	Refer to wiring diagram 9333/729 and schematic 1009238 (1009239 if 2 car entrances) Replacement part no. 901044

1 *cont.*	CONTINUED FROM PREVIOUS PAGE			PDS2 microswitch - internal fault	Hold (or temporarily tie back) the trigger arm in its fully retracted position - i.e. such that the PDS2 switch is de-activated. Then check for continuity across the NC and COM terminals of PDS2 (corresponds to wire 4 and the 'link wire') - there should be continuity. If there is no continuity, the switch is faulty and must be replaced.	Refer to wiring diagram 9333/730 and schematic 1009238 (9333/750 & 1009239 if 2 car entrances) Replacement part no. 908077
				PDS2 microswitch - damaged or faulty	Check for visual signs of damage (e.g. broken casing, excessive play in actuating lever, loose spade terminals etc) Replace PDS2 if external damage can be seen and/or the operation of the switch feels abnormal.	Replacement part no. 908077
2	**Pawl device has operated the safety gear**	Genuine case of uncontrolled descent	If the safety gear has operated due to uncontrolled descent, the piston may have fully retracted (ropes will be slack)	Failure of VRP check valve (or failure of VMD pilot valve resulting in VRP staying open)	Replace VMD and check that pressure is maintained prior to attempting to re-instate lift.	Refer to 'VMD Replacement Procedure'
		False operation of safety gear due to lift running down with the trigger arm extended	If voltage <u>is not 0Vdc</u> when Test 1a is carried out >>>>>>>>>>>>>	SR relay may be faulty (e.g. contacts welded)	Test SR relay with a continuity meter and replace if faulty.	Replacement part no. 916016
				The manual orange "flag" on the SR relay may have been operated (it should be flush, not protruding).	Check state of manual orange flag on SR relay. If it is protruding, return it to its correct position (flush).	Refer to 'Pawl Device Installation Guide'
			If voltage <u>is 0Vdc</u> when Test 1a is carried out >>>>>>>>>>>>>>>	PDR relay may be faulty (e.g. contacts welded)	With the lift at rest with doors closed - check continuity between PDR "11" and "14" (should be no continuity). With the lift at rest with doors closed - check continuity between PDR "21" and "24" (should be no continuity). If above tests show continuity, the PDR relay is faulty and should be replaced.	Refer to wiring diagram 9333/729 and schematic 1009238 (1009239 if 2 car entrances) Replacement part no. 901044
3	**Trigger arm has struck the activation plates whilst running upwards**	Lift running up with the trigger arm extended	If voltage <u>is not 0Vdc</u> when Test 1a is carried out >>>>>>>>>>>>>	SR relay may be faulty (e.g. contacts welded)	Test SR relay with a continuity meter and replace if faulty.	Replacement part no. 916016
				The manual orange "flag" on the SR relay may have been operated (it should be flush, not protruding).	Check state of manual orange flag on SR relay. If it is protruding, return it to its correct position (flush).	Refer to 'Pawl Device Installation Guide'
			If voltage <u>is 0Vdc</u> when Test 1a is carried out >>>>>>>>>>>>>>>	PDR relay may be faulty (e.g. contacts welded)	With the lift at rest with doors closed - check continuity between PDR "11" and "14" (should be no continuity). With the lift at rest with doors closed - check continuity between PDR "21" and "24" (should be no continuity). If above tests show continuity, the PDR relay is faulty and should be replaced.	Refer to wiring diagram 9333/729 and schematic 1009238 (1009239 if 2 car entrances) Replacement part no. 901044

3 *cont.*	CONTINUED FROM PREVIOUS PAGE		If fault appears to be intermittent (i.e. the above tests all check out ok, but there are signs that the trigger arm has struck the activation plate in the past) >>>>>>>>>>>>>>>>>>>>>>>>	Door close limit switch may be too finely set. *If the switch lever is initially mechanically depressed (as it should be) the lift will begin moving with the trigger arm retracted, but if the switch subsequently releases during travel (due to acceleration or deceleration of the lift) the trigger arm will extend and the lift will carry on running resulting in the trigger arm striking the next activation plate. In other words: the pawl device is tricked in to thinking it is relevelling with the doors open despite the fact that it is outside the door zone.*	Check the door close limit switch is correctly set. This can be viewed by operating the car top door control switch. If it is operating too early or too late the door operator drive arm may not reach its mechanical end stop or may "bounce back" causing the switch to operate inconsistently or just "feathering" between actuated and non-actuated states. Adjust switch position as necessary. Note: Additional symptom - incorrect setting of this switch will sometimes result in the doors cycling backwards and forwards (until the switch is eventually fully depressed)	Refer to IGV "Installation Instruction - Type 94 Door Operator" for switch identification/adjustment.
4	**Lift will travel between floors but doors fail to open**	Trigger arm not returned to its extended position at the end of a journey	Fault due to incorrect functioning of PDS3 microswitch	PDS3 microswitch - incorrectly positioned	Adjust to correct position	Refer to 'Pawl Device Installation Guide'
				PDS3 microswitch - inconsistent operation *(due to mechanical binding of the trigger arm assembly etc)*	Check for full and free operation of the pawl device assembly (by manually pushing and releasing at the disc on the rear of the solenoid). If the assembly binds or is stiff in operation check the following areas: - solenoid plate pivot *(permitted to slacken nyloc nut up to a max of 1/2 turn from it's fully tightened position)* - trigger arm pivot *(permitted to slacken nyloc nut up to a max of 1/2 turn from it's fully tightened position)* - M4 nyloc solenoid support nut (check that it has not been wound too far up or down the stud)	Refer to 'Pawl Device Installation Guide' and make adjustments as described.
				PDS3 microswitch - inconsistent operation *(due to microswitch lever arm having been bent to fit)*	The microswitch lever must be straight. If the arm can be straightened satisfactorily (i.e. it was only slightly bent) then do so. Adjust PDS3 switch position - if insufficient adjustment is available it is possible that the switch/bracket/mounting plate are incorrectly assembled. See Installation Guide. If the arm was bent a considerable amount it will be necessary to replace the microswitch.	Refer to 'Pawl Device Installation Guide' Replacement part no. 908077
				PDS3 microswitch - loose electrical connection	Check the wiring connections to PDS3 (wire 5 and wire 6)	Refer to wiring diagram 9333/730 and schematic 1009238 (9333/750 & 1009239 if 2 car entrances)
				PDS3 microswitch - damaged or faulty	Check for visual signs of damage (e.g. broken casing, excessive play in actuating lever, loose spade terminals etc) Replace PDS3 if external damage can be seen and/or the operation of the switch feels abnormal.	Replacement part no. 908077
			Fault due to solenoid remaining energised	PDC relay faulty (i.e. contacts welded)	With lift at rest and doors closed, check continuity between PDC "5" and PDC "9" (should be no continuity). If continuity is detected the PDC relay should be replaced.	Refer to wiring diagram 9333/730 and schematic 1009238 (9333/750 & 1009239 if 2 car entrances) Replacement part no. 916016
				PDC relay has been left with the manual orange "flag" protruding (should be flush)	Reset the "flag" on the PDC relay to its flush position.	