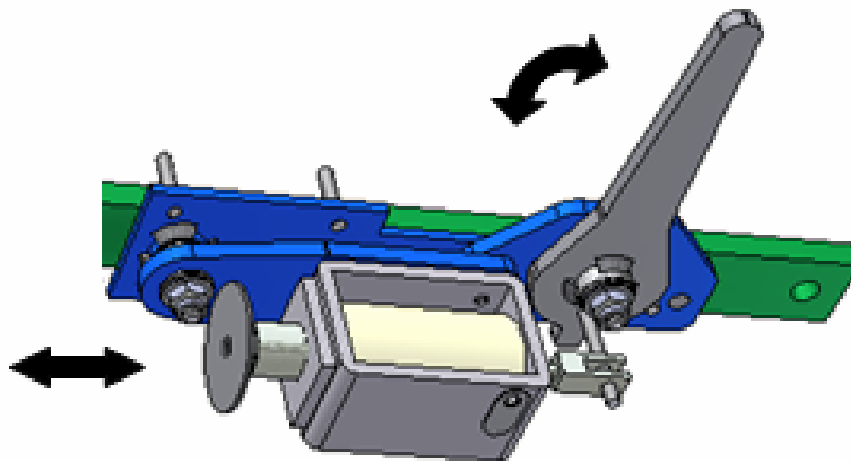


Installation Guide

*** Retrofit Version ***

Pawl Device *for prevention of unintended descent*

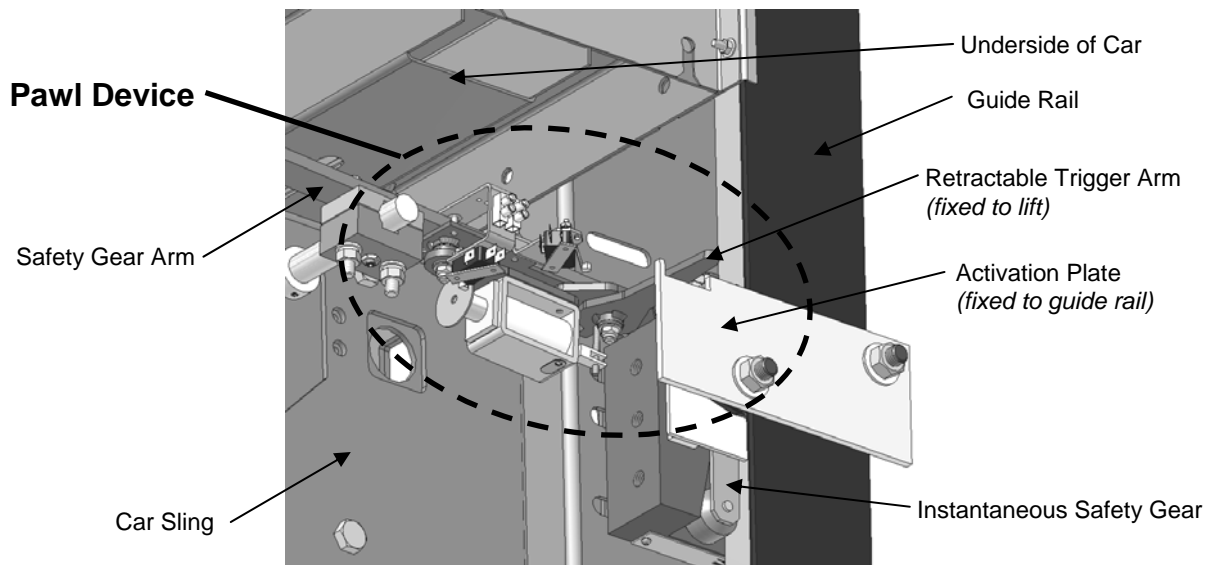


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Location:

The pawl device is installed on the safety gear arm underneath the lift car. Fixed activating plates are attached to the guide rails. See arrangement below.....



Description of Operation:

During unintended descent

This pawl device operates the instantaneous safety gear if the lift descends in an unintended manner (e.g. hydraulic failure). If the lift descends in an unintended manner (i.e. without a run signal present), the trigger arm catches on an activating plate mounted at the landing, and raises the safety gear rollers to engage the safety gear, bringing the lift to rest near to the landing.

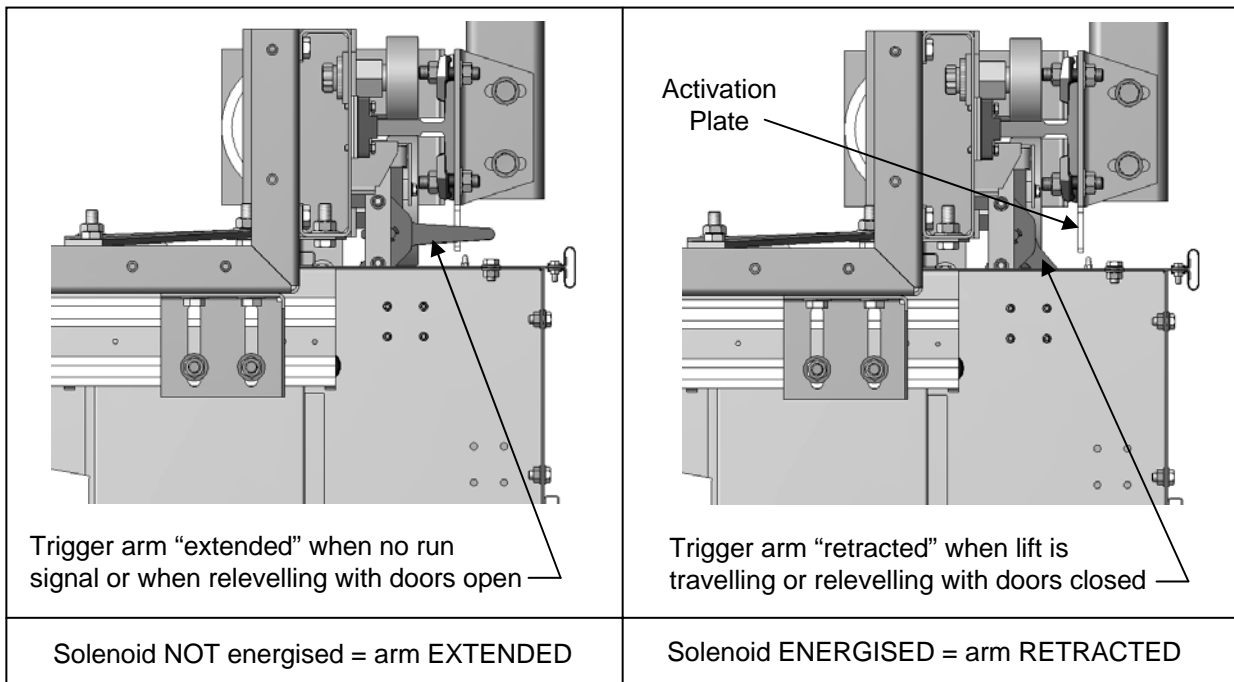
An activation plate is mounted at each landing level, except the lowest landing. At the lowest landing the lift is permitted to descend on to the car buffers.

Note: If the unintended descent was due to a failure of the check valve (VRP) or down valve (VMD) the engineer may find that the ram has continued to descend in to the cylinder causing the ropes to go slack. If this is the case, it will be necessary to ensure that the ropes do not become entangled on any items when the ram is pumped back up.

During Normal Use

The pawl device remains in its “extended” position (i.e. solenoid NOT energised, arm deployed to prevent unintended descent) at all times other than when the lift is responding to a run signal. During travel between floors the arm retracts to it’s “retracted” position (i.e. solenoid is energised) allowing the lift to pass by each activation plate. If the device does not fully retract when the run signal is received, movement of the lift is prevented. If the device fails to return to its “extended” position when arriving at floor level, all run signals are ignored (including re-levelling inputs). If the lift re-levels when the doors are closed, the arm will retract. During re-levelling operations when the doors are open the arm remains in its “extended” position, eliminating any potential shearing hazard should unintended descent occur (for example, a failure of the down valve during a down-relevel command).

Views looking down the side of the car



During Emergency Release

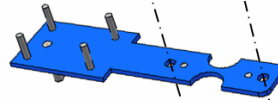
Upon pressing the electrical emergency lowering button (in the landing control panel), the pawl device is energised from the battery back-up, causing the arm to retract allowing the lift to descend past any activating plates. If the emergency release process is attempted when the safety gear has operated (for example unintended movement has occurred), the solenoid will still be energised but the lift will not descend as it is already being held by the safety gear. *Note: If the manual lowering valve is pressed (housed inside the tank) the pawl device will not be energised and so the lift will descend until the trigger arm strikes the next activation plate, causing the safety gear to engage.*

Parts List

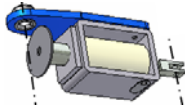
Trigger arm assembly = 1 off



Main support plate = 1 off



Solenoid assembly = 1 off



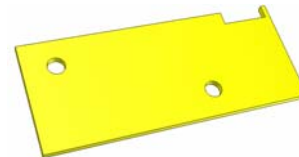
Rear switch assembly = 1 off



Front switch assembly = 1 off



Activation plate = (number of floors-1)



Electrical kit

- 950526 – common electrical kit

Please note that this kit caters for several different control panel types (architrave mounted, pit mounted or remote mounted). As such, some parts are surplus to requirements and it is normal to have some spare items left over at the end of the installation.

- Wiring Diagrams (9333/729, 9333/730 and 9333/733)
- Schematic Diagram (1009238)



NOTE: LIFTS WITH 2 CAR ENTRANCES REQUIRE AN EXTRA KIT OF PARTS.

Fixings kit

M12 guide clip, contact washer & nut (2 per activation plate)

Assorted cable ties = 2 large, 2 medium, 2 small

M6 full nut = 2 off

M6 contact washer = 2 off

M6 nyloc nut = 1 off

M6 plain washer = 1 off

M4 nyloc nut = 1 off

M4 full nut = 4 off

M4 plain washer = 4 off

M4 spring washer = 4 off

Tools required:

- 10mm, 7mm & 5.5mm spanners
- terminal screwdriver
- wire cutters
- wire strippers
- crimping tool
- indelible pen

Safe Working Procedures (Car Top and Pit):

All standard Safe Working Procedures are to be followed. Note that the installation of the pawl device on the underside of the car is best achieved using the lower section of the pit prop only. This negates the use of ladders etc, as it is possible to reach the necessary area of the sling whilst stood in the pit. The car toeguard can be easily removed, to permit safe and easy access to the pit.

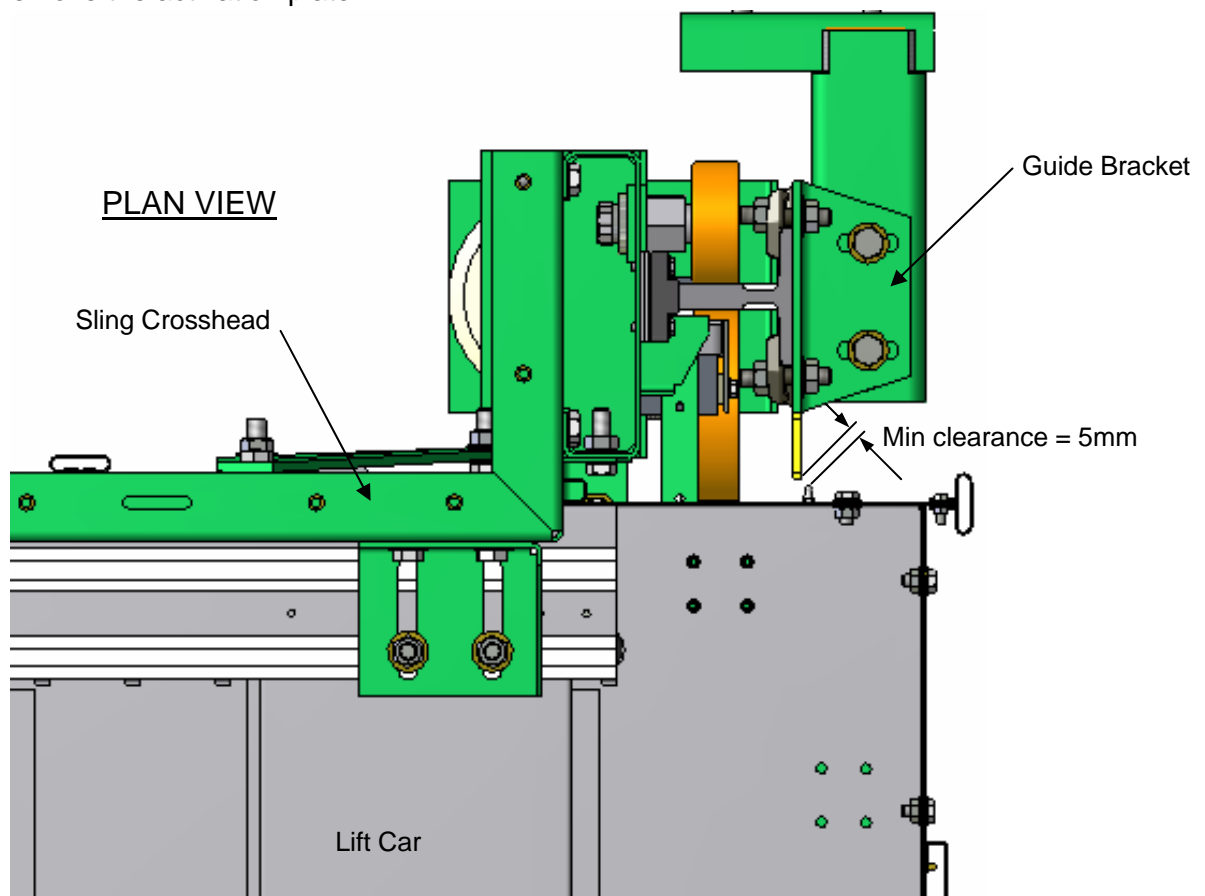
1. Pre-installation checks:

1.1 Ensure that there are enough spare trailer wires available (2 spare wires are required). Often there are spare trailers already terminated in the car top box and control panel that are not in use (for example 4C and 5C are usually wired but not in use on 2 and 3 floor lifts). Other examples that can sometimes be used are UPS and DPS. If these examples are in use (i.e. the lift is 4+ floors and has short floor switches) there are spare wires in the trailers which are usually tucked away inside the trunking. If there are not enough spare wires it will be necessary to run an additional trailing cable (for assistance contact Stannah Lifts Ltd, Andover)

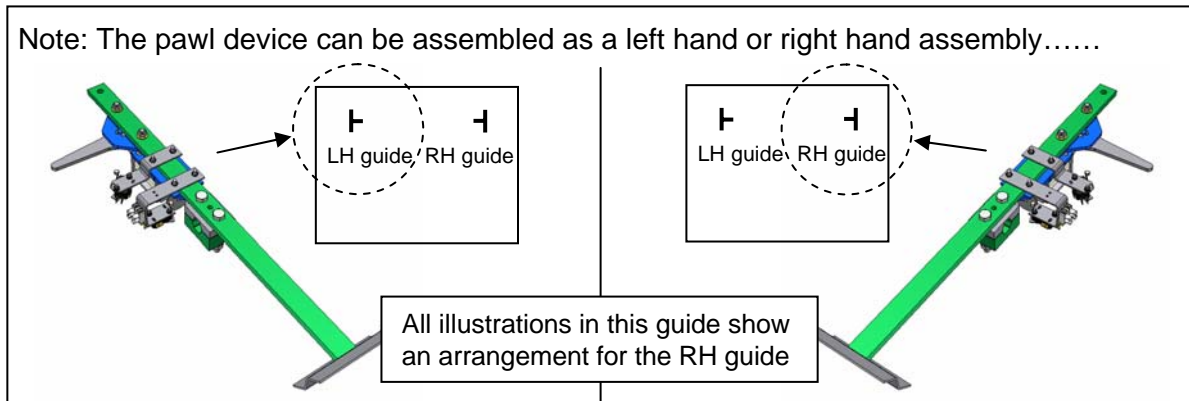
1.2 Establish which side of the car the pawl device will be fitted (it must be on the opposite side to the kite switch)

1.3 Temporarily fit one of the activation plates on to the guide and check that there is adequate running clearance between the plate and the lift car, throughout the entire height of the car (minimum running clearance = 5mm). Pay particular attention to items that project from the lift car side, for example car panel stiffeners, car skirting fixings etc.

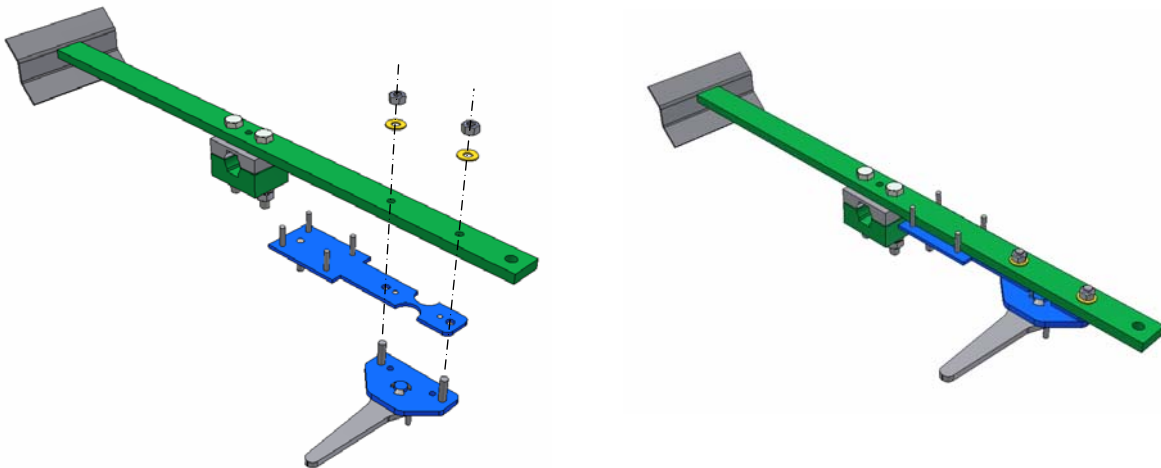
1.4 Remove the activation plate



2. Installing the pawl device on to the safety gear arm:

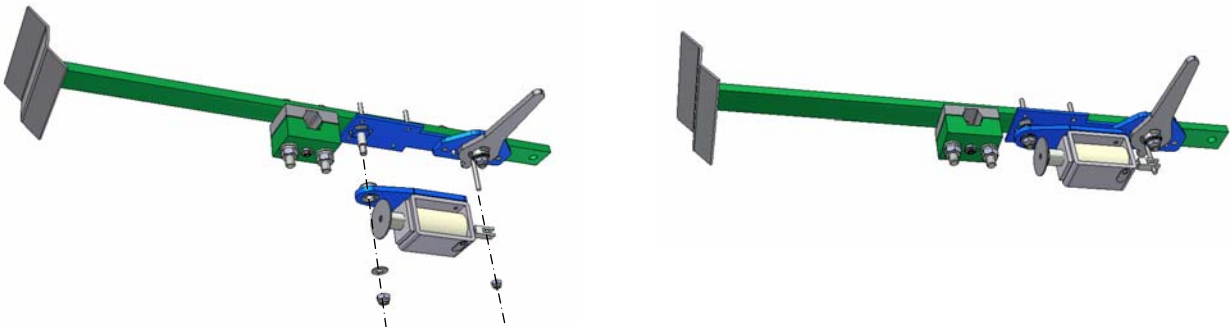


2.1 Pass the two M6 studs of the trigger arm assembly through the holes on the main support plate and then up through the two 6mm holes in the safety gear arm. Fasten to the safety gear arm using M6 contact washers and M6 full nuts. *Note: It will be necessary to raise the safety gear arm during this phase of installation (it is not necessary to undo any of the safety gear components!)*

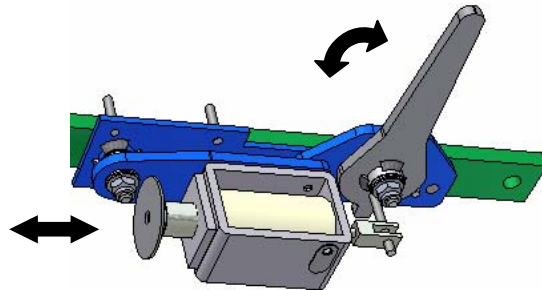


2.2 Fit the solenoid assembly on to the support plate pin, ensuring the clevis is also engaged on the 4mm stud of the trigger arm. Fasten the assembly with a plain M6 washer and nyloc nut.

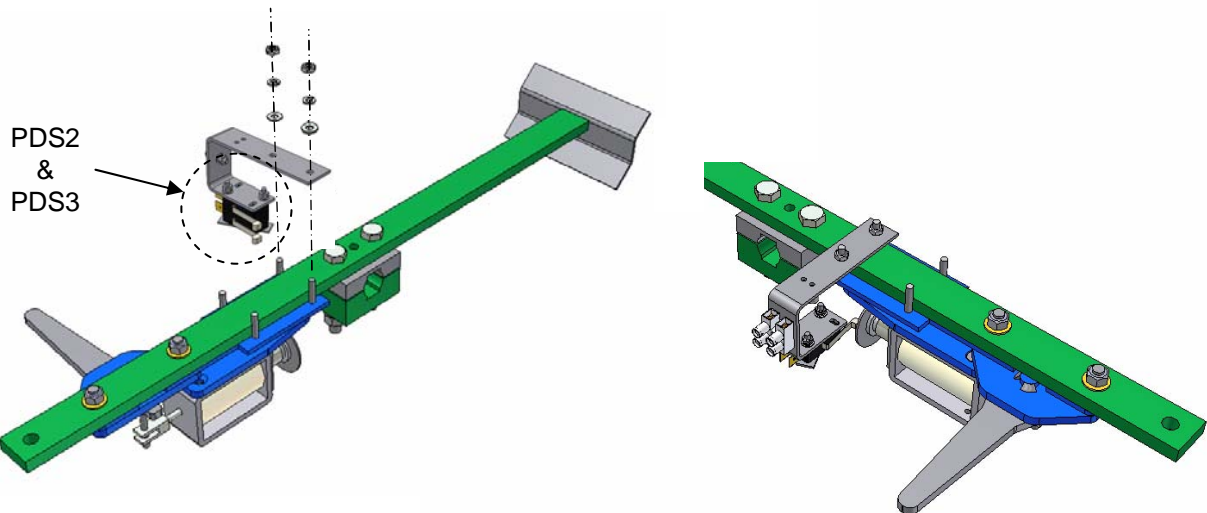
2.3 Fasten an M4 nyloc nut on the 4mm stud. This helps to just support the weight of the solenoid. **DO NOT** over tighten this nut as it may make the mechanism bind.



2.4 Check that the assembly is free in operation by manually pressing on the rear of the solenoid plunger and then releasing. The trigger arm should return to its rest position under the force of the solenoid spring.

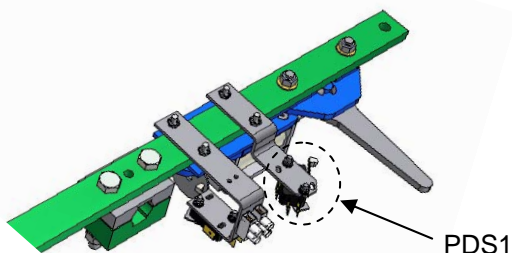


2.5 Fasten the rear switch assembly (PDS2 & PDS3) in position on the two rear studs of the support plate using M4 spring washers, flat washers and nuts. *This effectively clamps this end of the support plate to the safety gear arm.*



2.6 Similarly, fasten the front switch assembly (PDS1) with M4 fixings using the front two studs.

Note: Misalignment can sometimes occur between the trigger arm and the roller of the micro switch (due to bending of the switch bracket when “clamping” to the safety gear arm). In such cases, it is possible to align the arm and micro switch by bending the switch mounting bracket up or down slightly.



If the pawl device is to be mounted on a “**Left Hand Guide**” the switches should be re-handed as shown here:

Refer to diagram at top of section 2

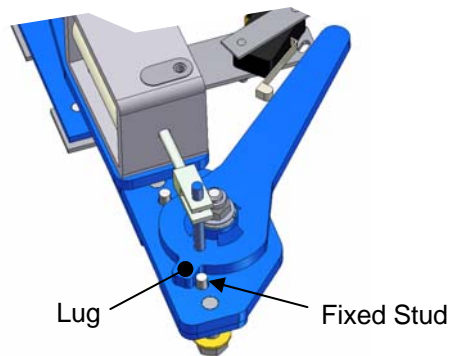
3. Adjusting the microswitches:

The micro switches are mounted on slots for adjustment. **DO NOT OVERTIGHTEN THE M3 FIXINGS AS IT CAN RESULT IN DAMAGE TO THE MICROSWITCH!!** Tightening torque is 4 to 6 kg.cm (0.39 to 0.59N.cm).

3.1 The rear switches (PDS2 & PDS3) confirm that the trigger arm has returned to its extended position. The switches should be positioned such that the electrical contacts are activated just before the trigger arm reaches its fully extended position. *Note: If the arm does not return to its fully extended position, the lift is prevented from running (PDS2) and the doors are prevented from opening (PDS3).*

3.2 The front switch (PDS1) confirms that the trigger arm has fully retracted before allowing the lift to run. The switch should be positioned such that its electrical contacts are activated just before the trigger arm reaches its fully retracted position.

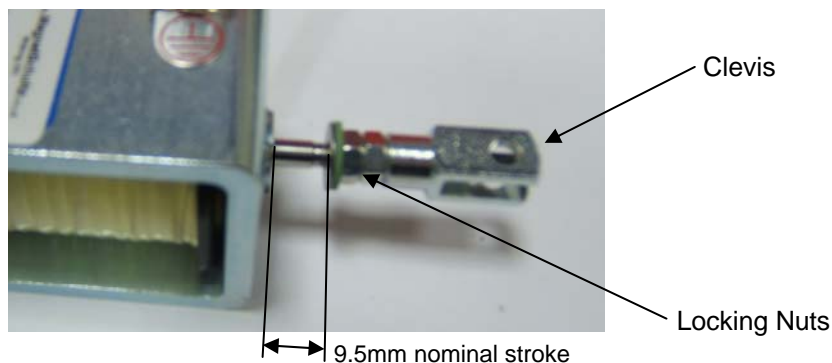
Note: the trigger arm has a “lug” which strikes a fixed stud and acts as a mechanical end stop. If the arm does not reach this end stop the solenoid stroke is insufficient and it must be adjusted to achieve the full stroke of the arm (refer to “solenoid stroke adjustment”) before adjusting the front switch.



4. Solenoid Stroke Adjustment:

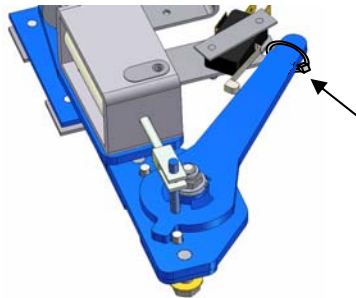
4.1 The stroke of the solenoid is factory set, so no adjustment should be necessary.

However, if the trigger arm does not reach its fully retracted position (the “lug” on the arm should strike a fixed stud) the stroke should be increased by loosening the locknuts next to the clevis and unscrewing the clevis. It is not necessary to remove the solenoid, as the adjustment can be made simply by rotating the moving part of the solenoid. When the correct stroke has been set, the locking nuts must be tightened up on to the back of the clevis. *Note: Whenever the stroke is adjusted you must check all microswitch positions and readjust if necessary.*



5. Movement of the lift prior to the electrical connections being made:

5.1 Temporarily tie the trigger arm in its fully retracted position using a small cable tie. *This is to prevent the arm catching on any fixed items in the shaft (guide brackets etc), when moving the lift prior to the electrical connections being made.*



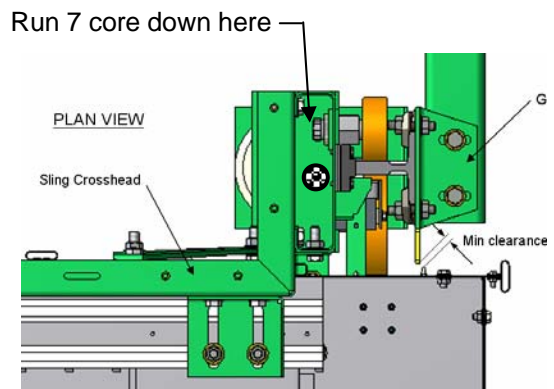
Temporarily tie the trigger arm in the retracted position (use a cable tie through the small slot in the front switch bracket)

Steps 6, 7 and 8 are slightly different on lifts with two car entrances. Refer to documentation in additional kit of parts.

6. Electrical connections (Under Car):

Refer to wiring diagram 9333/730

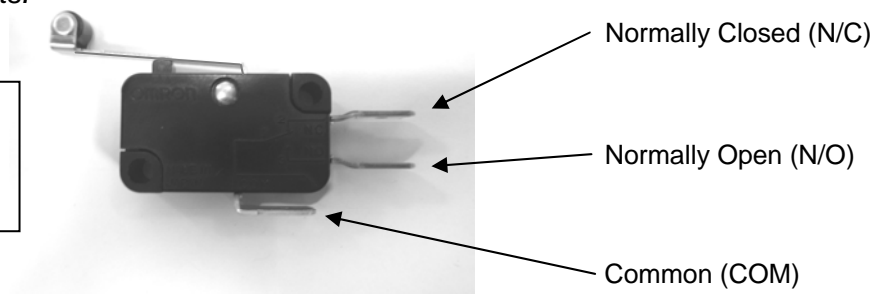
6.1 Run the 7 core cable from the car top box, down the inside of the sling upright and cable tie the lower end to the rear switch bracket of the Pawl Device using the 2 small holes provided. *Ensure that the cable cannot get caught on any items in the lift well.*



6.2 Connect wires 1 to 6 and the link wire to the pawl device. The terminal block should be fastened to the rear switch bracket with an M3 screw and nut. **Ensure that wires 1 & 2 are connected in the correct polarity for the diode (the diode is pre-soldered to the solenoid wires) - refer to wiring diagram 9333/730.**

Note: The markings on the micro switch may not always be visible at this stage of the installation. Refer to the labelled photo below to identify the Common, Normally Open or Normally Closed contacts.

Contacts which are not used should be insulated by pushing a spare spade crimp on to the contact.



7. Electrical connections (Car Top Box):

Refer to wiring diagram 9333/730

- 7.1 Fasten the 7 core cable at the top of the car (e.g. cable tie it to a spare fixing hole on the sling header) and feed the end in to the car top box trunking.
- 7.2 Install three Wago terminals on the din rail in the car top box, and label them "PDA", "PDR" and "ODR2".
- 7.3 Locate the 2 "spare" trailer wires and connect them to PDA and PDR. Make a note of the identification for reference later on (e.g. Trailer 2, wire 7 = PDA).
- 7.4 Connect wires 1 to 6 from the 7 core cable in to the car top box terminals.
- 7.5 Modify the existing door open limit switch wiring in accordance with 9333/730.

8. Electrical connections (Control Panel):

Refer to wiring diagram 9333/729 (& 9333/733 for pit mounted controller)

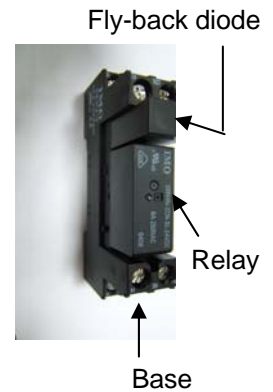
8.1 Install one of the 110V AC relays on to the din rail in the control panel and label it "SR".

8.2 Install the other 110V AC relay on to the din rail in the control panel and label it "PDC".

8.3 Install a 24V DC relay and fly-back diode on to the din rail in the control panel and label it "PDR" (see photo on right).

8.4 Install three Wago terminals on the din rail in the control panel, and label them "PD", "PDA" and "PDR".

8.5 Wire the SR, PDC and PDR relays into the existing circuitry as shown in the wiring diagram using the coloured wires provided. *Note: PDC & SR relays to have a varistor fitted (see diagram 9333/729).*



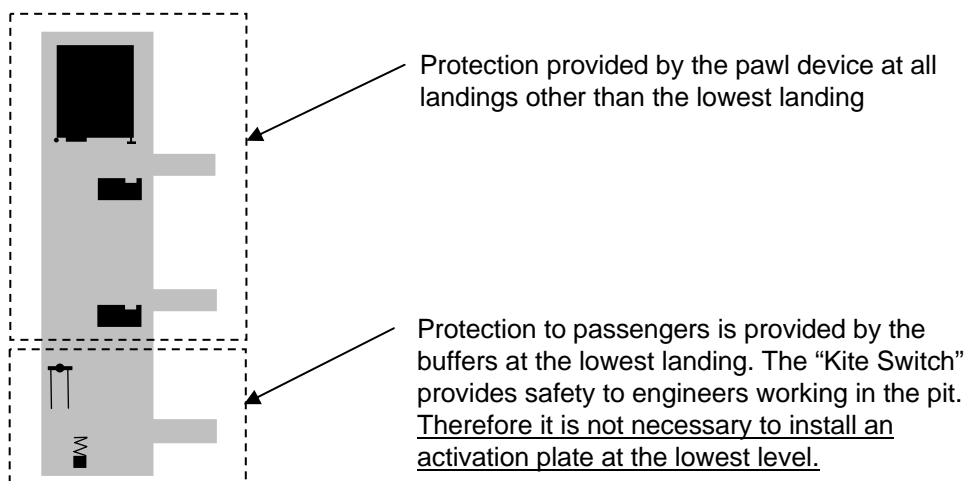
8.6 For control panels mounted outside the lift well follow step 8.6.1. For control panels mounted in the pit please follow step 8.6.2.

8.6.1 Add the additional normally open contact on to the back of the emergency lowering push and wire in accordance with wiring diagram 9333/729.

8.6.2 Install the 12V DC relay & fly-back diode on to the din rail in the control panel and label it "PLO". Wire the "PLO" relay and link wire in accordance with 9333/729. Re-label "TE6" terminals to "PLO" (in the control panel and in the landing control station). Add the additional link wire from the newly designated "PLO" terminal in the landing control station to terminal 3 on the mains isolation switch (refer to 9333/733)

9. Installing the Activation Plates:

A plate is required at every landing entrance position other than the lowest landing. A plate is not required at the lowest landing as the lift will simply descend on to the buffers if an unintended descent occurs at the bottom floor.



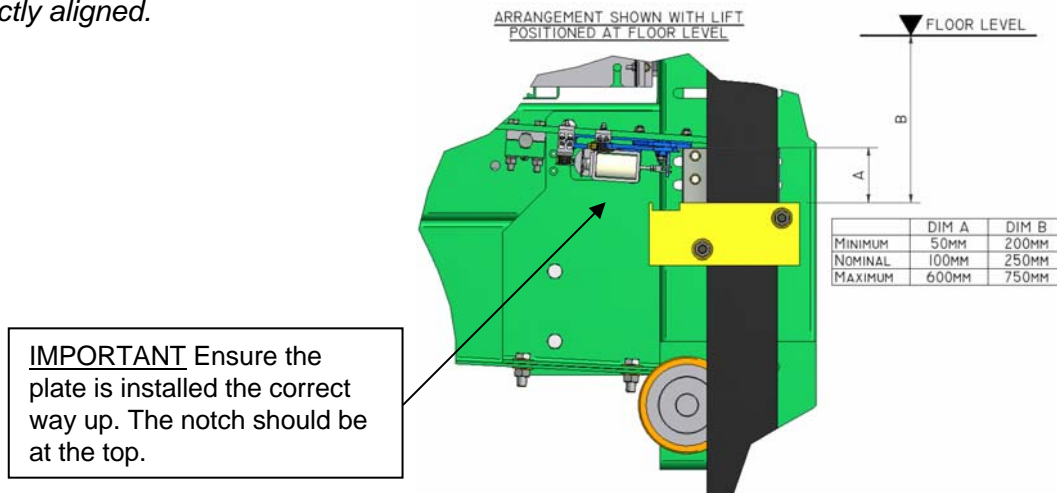
9.1 Mark the positions of the plates on the guides. The easiest way of measuring the plate positions is to work from the car top:

9.1.1 Extend a piece of string horizontally from the landing sill across to the guide rail and make a mark across the foot of the guide. Tip: a spirit level can be used to ensure the string is horizontal during marking out.

REFER TO DIAGRAM ON NEXT PAGE >>>

9.1.2 Then make another mark 250mm below the “floor level” mark (nominal dimension B in the table below). *This second mark represents the top edge of the plate and will provide 100mm clearance between the trigger arm and activation plate when the car is at floor level (nominal dimension A in the table).*

9.2 Secure an activation plate at every landing level, except the lowest landing. The top edge of the plate must be horizontal (the guide clips are positioned such that the plate will be horizontal when a downwards load is exerted on the projecting end of the plate). *Note: the plates can be positioned on to the guide with the guide clips etc already fitted loosely to the plate. The plate can then be slid up or down to the marked position and tightened once correctly aligned.*



The plates should be positioned in accordance with the nominal dimensions shown in the table. **It is preferential to position the plates somewhere between the minimum and nominal dimensions.** *Note: Sometimes the desired plate position may coincide with other items such as guide brackets or fishplates. In such circumstances, it is permissible to position the plate lower than the nominal dimension but the maximum dimensions shown in the table must not be exceeded.*

10. Testing the functioning of the pawl device mechanism:

Before carrying out the tests below it is necessary to remove the temporary cable tie from the trigger arm!

Note: If the control panel is located in the lift well it is necessary to use the test terminals provided in the landing architrave.. **DO NOT ATTEMPT TO MEASURE THE VOLTAGES FROM INSIDE THE WELL – YOU MUST UTILISE THE TEST TERMINALS OUTSIDE THE WELL.** Refer to Annex A of this booklet for connection details.

Test 1 – checking that the monitoring switches are functioning correctly

- Lift at rest in “Normal Service”, doors closed: voltage between “COM” and “PDR” terminals should be 0Vdc.
Steps (b) and (c) can be tested at the car top box by running the lift on inspection control or at the control panel running the lift with punch leads (PSM to UP or PSM to DN).
- Lift running up, doors closed: voltage between “COM” and “PDR” terminals should be approx 24Vdc.
- Lift running down, doors closed: voltage between “COM” and “PDR” terminals should be approx 24Vdc.

Test 2 – checking that the solenoid is being energised correctly

- a) Lift at rest in “Normal Service”, doors closed: voltage between “COM” and “PDA” terminals should be 0Vdc.
Steps (b) and (c) can be tested at the car top box by running the lift on inspection control or at the control panel running the lift with punch leads (PSM to UP or PSM to DN).
- b) Lift running up, doors closed: voltage between “COM” and “PDA” terminals should be 10-12Vdc.
- c) Lift running down, doors closed: voltage between “COM” and “PDA” terminals should be 10-12Vdc.

Test 3 – checking that the pawl device does not get energised when re-levelling with the car doors open

- a) Position the lift at floor level, and place the lift on Car Preference with the doors parked open.
- b) Turn off the power and press the emergency lowering button in the landing architrave to lower the lift approximately 20mm below floor position (so that the lift will need to re-level when turned back on).
- c) Have your multimeter probes ready to measure the voltage across the “COM” and “PDA” terminals, then turn the power back on.
- d) The lift should then automatically re-level (with the doors still open) – **the voltage measured across “COM” and “PDA” should be 0volts (i.e. the solenoid should not be energised when re-levelling with the doors open).**

Test 4 – checking that the doors are prevented from opening if the trigger arm does not return to it’s correct rest position

- a) Lift at rest in “Normal Service”, at floor level with doors closed. Press the landing button at the floor the lift is parked at – the doors should open.

Before performing part (b) of this test it is necessary to manually operate the orange “flag” on the “PDC” relay. This has the effect of energising the solenoid, thus simulating the trigger arm not returning to it’s normal rest position.

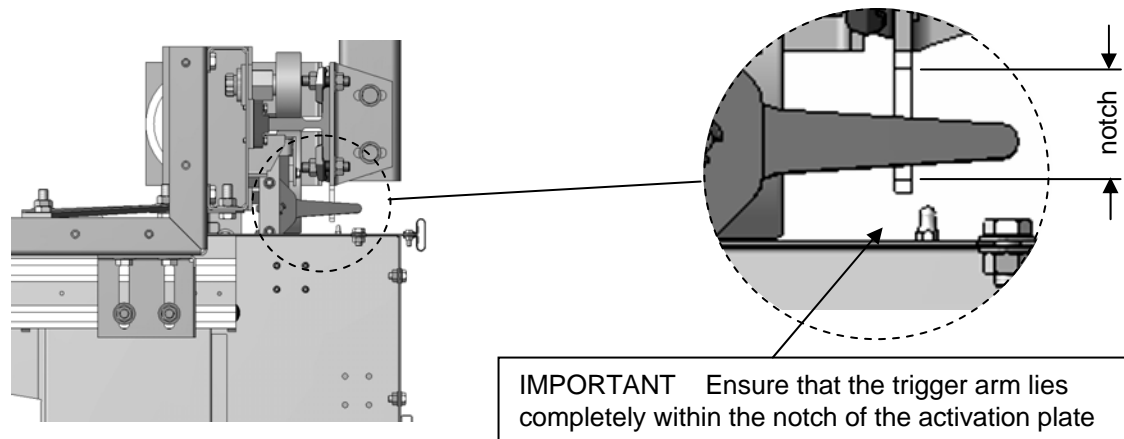
- b) After the PDC flag has been manually operated: position the lift at floor level with the doors closed on “Normal Service”. Press the landing button at the floor the lift is parked at – this time the doors should not open.

IMPORTANT – after completion of Test 4 remember to return the orange flag on the PDC relay to it’s normal “flush” position. Failure to do so will leave the solenoid energised and the doors will not open.

11. Checking the engagement between the pawl device and the activation plates:

11.1 Position the lift such that the trigger arm is approx 50mm above one of the activation plates (i.e. lift at floor level)

11.2 Look down the side of the lift car and confirm that the trigger arm is in line with the notch in the activation plate (see diagram on next page)



11.3 Confirm that every plate is positioned at the correct height by positioning the lift at floor level and viewing from the top of the car. **The pawl device trigger arm should be ABOVE the activation plate when the lift is at floor level.** *Note: it is not possible to check the uppermost plate from the car top as the lift cannot, and must not, be positioned at top floor with persons on top of the car. Confirmation of the uppermost plate must therefore be confirmed by viewing from under the car from in the pit.*

12. Checking that the pawl device operates the safety gear:

Note: It is recommended that one of the plates is temporarily moved to a lower level (to become a “test” plate), such that during the test the lift is brought to rest by the safety gear above the pit prop in a position where the safety gear can be reached and inspected. It also allows for the safety gear “kicker plate” to be pushed back up, should it fail to reset automatically. **This test is only to be performed at manual lowering speed,** using the manual lowering valve located in the hydraulic tank. **The pit prop must be in place for the duration of this test.**

12.1 Position the lift above the “test” plate (see note above).

12.2 Isolate the mains supply.

12.3 With the pit prop in position and car toeguard removed, lower the lift using the manual lowering valve on the hydraulic tank.

12.4 The trigger arm will catch on the “test” plate and as the lift continues to descend will pull the safety gear rollers in to their engaged position, thus bringing the lift to rest.

12.5 Visually check that both safety gear rollers have engaged on the guide rails.

12.6 Raise the lift back up again. Note: Initially, it will be necessary to use the hand pump to raise the lift high enough to clear the “test” plate. Once the trigger arm is clear of the “test” plate, the lift can be punched back up with punch leads.

12.7 **Re-position the “test” plate to it’s original floor level position.**

13. Documentation:

13.1 Store the 4 electrical diagrams in the document holder in the control panel.

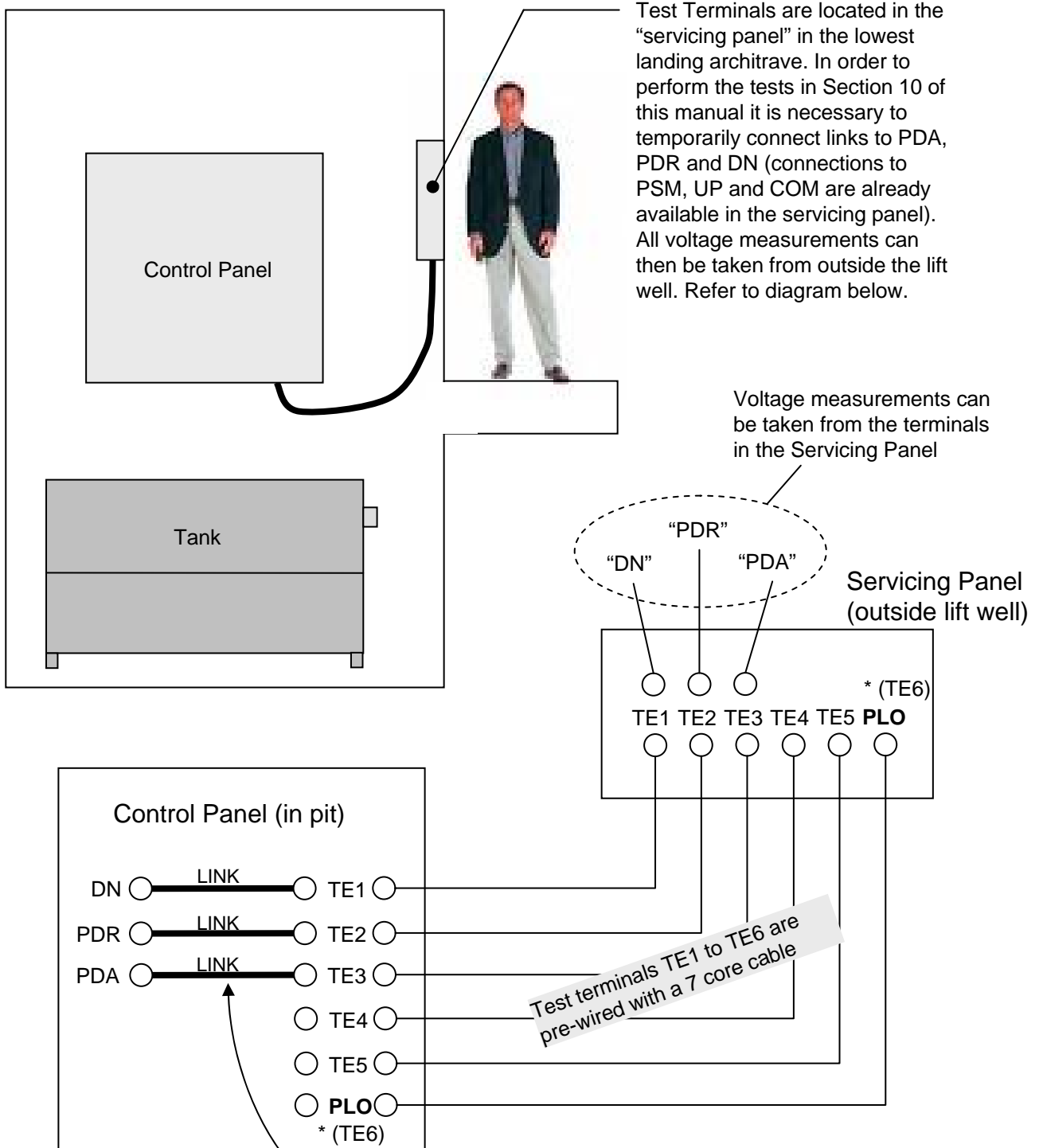
13.2 There is a label on the control panel door that lists the wiring diagrams for the contract. Please write the 4 additional wiring diagram numbers on this label.

14. Final checks:

Please check that you have:

- completed tests 1, 2, 3 and 4 (section 10)
- fitted activation plates (in accordance with step 11.3)
- performed the functional safety gear test and returned the test plate to it’s original floor level position (section 12)

Annex A: Test terminal connection for MRLi with control panel located in the lift well



* TE6 is re-designated as "PLO" (see step 8.6.2)

CONNECT THREE LINK WIRES INSIDE THE CONTROL PANEL AS SHOWN.

These should be removed after testing has been completed.

Annex B: Recommended Servicing Schedule

The requirements below are in addition to any servicing checks of the instantaneous safety gear.

Every visit:

- Check the pawl device is free in operation by manually pressing on the rear of the solenoid plunger and then releasing. The trigger arm should return to its rest position under the force of the solenoid spring. The rotating parts are mounted on self lubricating bushes and should not require lubrication. If lubrication is applied it must be done frequently, as drying lubricant could lead to stiff operation of the pawl device.

Every 4 months:

- Repeat Test 4 to confirm that the pawl device microswitch PDS3 (controls opening of doors) is functioning correctly

Every 6 months:

- Visually check activation plates are correctly positioned at each level
- Inspect trigger arm for any signs of mechanical damage

After the Pawl Device has triggered the safety gear:

- Perform safety gear checks
- Ensure the activation plate has not moved or been damaged
- Check the pawl device assembly for damage. Specifically, inspect the trigger arm for damage.

If the trigger arm is bent to a point where it no longer aligns with switch PDS1, the trigger arm must be replaced (part number 2001316).

Advisory Note:

When operating the lift as a working platform (i.e. from car top or pendant controls) care should be taken to stop the lift such that the pawl device is not in close proximity to any of the activation plates.

If the lift run button is released when the pawl device is close to an activation plate it is possible that the trigger arm will “drop out” whilst the lift is still “running on”. This can result in the pawl device triggering the safety gear (or breaking the run circuit) and the lift becoming inoperable. Persons on car top would require outside assistance from other lift engineers in order to be released.

DOCUMENT HISTORY

Issue	Name	Changes	Date
030809	-	-	03/08/11
140909	-	-	14/09/11
191009	-	-	19/10/09
250610	-	-	25/06/10
110811	R. Christopher	Document History table added. "Every visit" service item and "Advisory Note" added to Annex B.	11/08/11