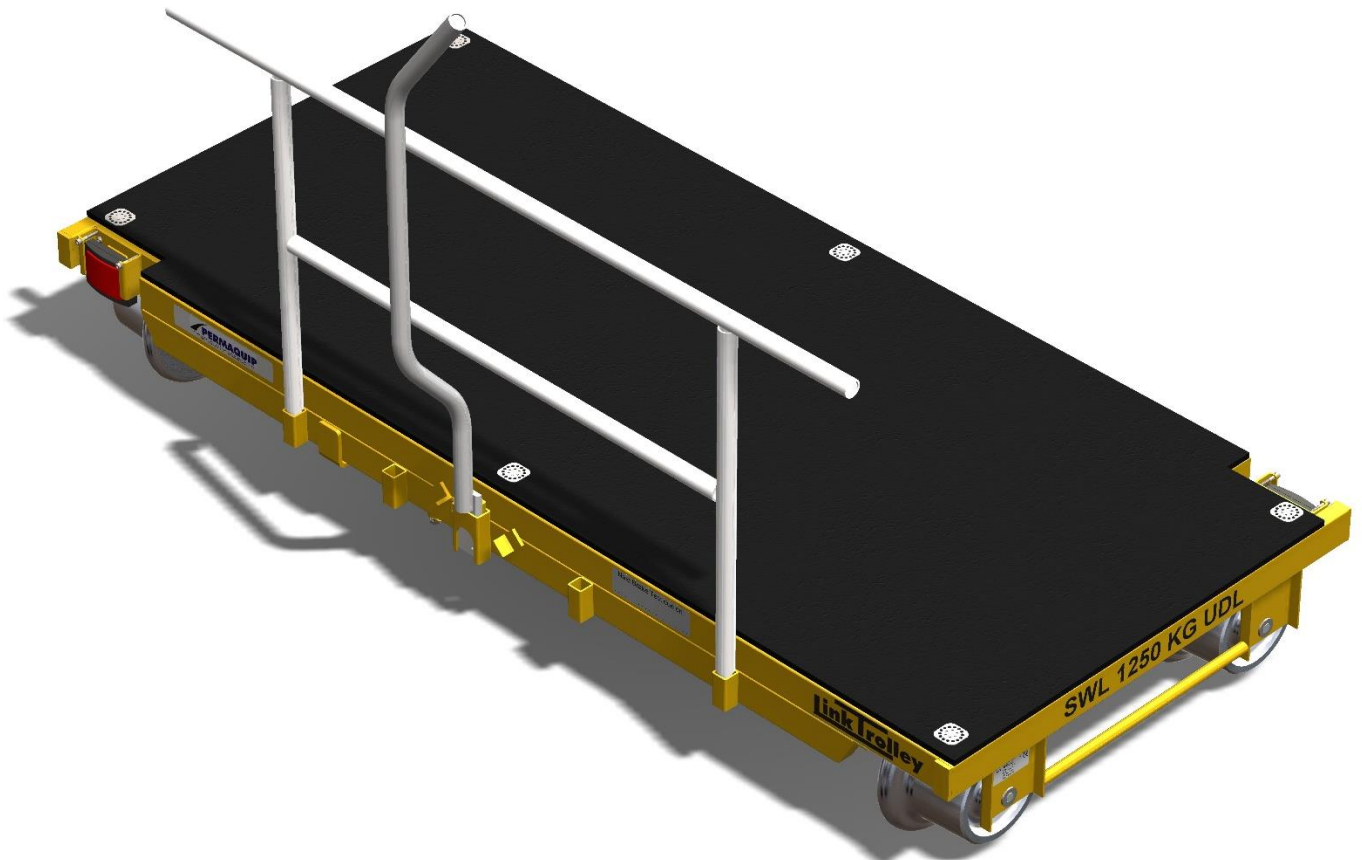


LINK TROLLEY

MAN-M-O-107_17



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CONTENTS

1.	Introduction.....	4
2.	Issue and Revision Record.....	5
3.	Safe and Correct Use	6
4.	Technical Specification	8
4.1	Physical Data for the Link Trolley	8
4.2	Load Specifications	8
4.3	Operational Limits.....	8
4.4	Physical Data for the Link Trolley Attachments	8
4.5	Scaffold Attachment Scaffolding Limits.....	9
4.6	Product Compliance.....	9
5.	Storage and Transportation.....	10
5.1	Storage	10
5.2	Transportation.....	10
6.	General Layout.....	11
7.	Operating Instructions	12
7.1	Mounting on the Track	12
7.2	Loading the Link Trolley.....	13
7.3	Fitting the Mesh Sides (Optional)	13
7.4	Using the Link Trolley	14
7.5	Removing from the Track.....	15
7.6	Using the Scaffold Attachment (optional)	15
7.7	Attachment of the Scaffold Attachment to the Link Trolley.....	15
7.8	Moving the Assembled Scaffold Link Trolley	16
7.9	Platform work on the Scaffold Link Trolley when stationary	16
7.10	Scaffold and Scaffold Attachment Removal.....	17
7.11	Fitting the Red Light.....	17
7.12	Light Mast Bracket.....	18
7.13	Using the Loading Ramps (optional)	18
8.	Maintenance.....	20
8.1	Wheels and Axles	20
8.2	Brakes	20
8.3	Link Trolley Assembly.....	21
8.4	Scaffold Attachment.....	21
8.5	Red Light	22
8.6	Light Mast Bracket.....	22
8.7	Loading Ramps.....	22
9.	Test Specification.....	23
10.	Training.....	25
11.	Ordering.....	26

Please note:

Whilst Permaquip Limited has taken every care in preparing this User Guide it is intended as a technical guideline only. Save to the extent that there are statutory rights to the contrary, Permaquip accepts no liability in relation to any use or reliance made of any information in this User Guide.

All information, illustrations and specifications in this User Guide are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

Equipment operators and installers shall be responsible for ensuring that a safe working environment and safe systems of work are in place and in certain circumstances advice and permission from the controlling authority must be sought before any operation, installation or surveying work is carried out.

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1. INTRODUCTION

The Permaquip™ Link Trolley is designed to be used as a manual propelled, stand-alone load bearing rolling platform for use on-track.

Each Link Trolley is equipped with a fail-safe braking system and is supplied with detachable Brake and Push Handles.

Up to 3 Link Trolleys can be connected together.

Any modifications or enhancements made by the user or third party which have not been approved by Permaquip are not recommended. Any modifications to the equipment will become the responsibility of the user or third party and the warranty with Permaquip will become null and void. Please see Permaquip's T and Cs on our website for further details.

Prior to using the Link Trolley, Permaquip advise all operators and personnel to familiarise themselves with the product. If required Permaquip product familiarisation training.

2. ISSUE AND REVISION RECORD

This document will be updated when necessary, by the re-issue of the complete document.

Issue	Description	Date	Revised Page No.	Revised By.
14	Movement while working removed, new PA shown.	10/03/2010	10	C.H.
15	Updated for RIS-1530-PLT issue 4 & general format update.	20/01/2014	All	M.S.
16	UDL updated for LUL.	18/12/2015	7	M.S.
17	Maintenance updated.	06/11/2017	21 & 24	M.S.
-	Formatting and Permaquip branding updated.	20/05/2021	All	M.S.
-	Permaquip address updated.	15/03/2022	All	J.F.

Authorised By:	Martin Sheppard BEng	
	Engineering Manager	

3. SAFE AND CORRECT USE

Please keep this Manual for future reference.

To ensure safe and correct use of the Link Trolley the following should be noted:



Wear eye, feet, head and hand protection when using the Link Trolley. Additional Personal Protective Equipment (PPE) should be worn according to local regulations and government guidelines.



The Link Trolley, or parts of, must be replaced if damage occurs with genuine Permaquip parts. Do not use the Link Trolley if any components are damaged.



Store the Link Trolley safely and in a secure position to prevent inadvertent damage.



Before using, always undertake a Manual Handling Risk Assessment and follow the assessment guidelines. Use the handles provided as detailed in this manual. Do not exceed walking pace, noting underfoot conditions. Do not walk on sleepers or the rail head. Reduce the walking pace on gradients.



Always ensure there is enough trained personnel present to operate the Link Trolley as detailed later in this manual. Under no circumstances should fewer staff be used.



The Link Trolley has a SWL of 1250 Kg. (Restricted to 1000kg on certain infrastructures) Under no circumstances should this be exceeded. The load must be uniformly distributed to ensure stability. Permaquip approved Load restraint straps and deck side systems should be used to assist security of the load. It is the operator's responsibility to plan the load of the Link Trolley considering all the above factors.



Loads that impair the operator's vision when moving the trolley, encroach into the operator's travel position or exceed the gauge profile should not be carried.



Only use the Scaffold Attachment with scaffolding certified to BS1139 Part 3 or equivalent.



Stopping distances will be greatly increased by icy or wet conditions; gradients; an increase in load; an increase in speed.



Before placing on track ensure the Link Trolley has been maintained and perform a COP0018 pre-use check. Failure to do so may result in injury, damage to equipment or infrastructure, consist runaway or worse.



LUL Link Trolleys and other Link Trolleys fitted with insulated wheels must not be used in locations where live AC overhead power lines are present. Do not use the Link Trolley near live DC third-rail or fourth-rail systems. Do not use the Scaffold Attachment on or near live AC overhead power lines.



The Link Trolley is designed for manual propelling only and must not be propelled using a powered vehicle.



Do not use the Link Trolley for any other purpose than as described in the introduction. Please contact Permaquip Ltd for advice on use for other applications or purposes.

- 
-  The Link Trolley is not permitted to be used outside of a possession.
 -  Do not connect more than three Link Trolleys together at any one time.
 -  Do not ride the Link Trolley or items being carried by it. Riding the Link Trolley puts yourself and others at risk.
 -  Do not hold / tie off the Brake Handles using mechanical means. Tampering with brakes puts lives at risk!
 -  Do not allow any load protrusions to face downwards such that they could foul the gap between the linked trolleys, or any load to interfere with the braking mechanism.
 -  Do not put fingers in the gap between the Link Trolleys when moving.

4. TECHNICAL SPECIFICATION

4.1 Physical Data for the Link Trolley

	Trolley Assembled (Standard)	Trolley Assembled (LUL)
Width	1670mm	1670mm
Length	800mm	800mm
Height (<i>Excluding Handles</i>)	215mm	212mm
Total Mass	50kg	57kg
Centre of Mass	Central	Central

4.2 Load Specifications

- Maximum load capacity for one Link Trolley: 1250 kg UDL¹
- Maximum total load capacity when two Link Trolleys are connected: 2000 kg UDL¹
- Maximum total load capacity when three Link Trolleys are connected: 2000 kg UDL¹

¹ Note that all loads up to and including the maximum shown should be uniformly distributed. The load must be positioned equally about the Trolley centre(s). Loads should be planned according to staffing levels and track conditions. When used on Network Rail or LUL infrastructure, the maximum SWL is 1,000 kg UDL. Please refer to CoP0018 for guidance on recommended staff depending on track gradient and load.

- Maximum load capacity of a Scaffold attachment (when fitted): 225 kg SWL
- Maximum total capacity of the Loading Ramps (when fitted): 1500 kg SWL (per pair)

4.3 Operational Limits

- Maximum gradient: 1:27
- Maximum gradient with scaffold attachment: 1:30
- Maximum cant (on track): 150 mm
- Maximum speed: 5 km/h (walking pace)

4.4 Physical Data for the Link Trolley Attachments

	Mesh Sides	Scaffold Attachment	Red Light	Light Bracket
Height	500mm	520mm	93x66x32mm	165x76x175mm
Total Mass	25kg	38kg	0.11kg	1.1kg
Mass of Heaviest Component	8kg	19kg	-	-
Centre of Mass	Central	Central	Central	Central

- Red Light Replacement Batteries



3v DC
 2 qty. Size AA (LR6, 15A, KAA, X/E91, MX/MN1500, 815, AM3, 4206/4006)
 Ø14.5 mm x 50.5 mm nominal dimensions
 1.5v DC, Alkaline
 Mercury and cadmium free

4.5 Scaffold Attachment Scaffolding Limits

- | | |
|---|---------|
| • Minimum length between scaffold legs | 1630 mm |
| • Maximum length between scaffold legs | 2496 mm |
| • Minimum width between scaffold legs | 1273 mm |
| • Maximum width between scaffold legs | 1554 mm |
| • Minimum scaffold tube internal diameter | 38 mm |
| • Maximum scaffold tube outside diameter | 70 mm |

4.6 Product Compliance

The standard Link Trolley complies with RIS-1701-PLT and BS EN13977.

5. STORAGE AND TRANSPORTATION

5.1 Storage



The Link Trolley and any associated spare parts should be stored in a dry and secure environment. Safety critical spare parts must be stored in a dry, secure and controlled environment.



The maximum number of Link trolley's that can be stacked during storage is 8.

5.2 Transportation



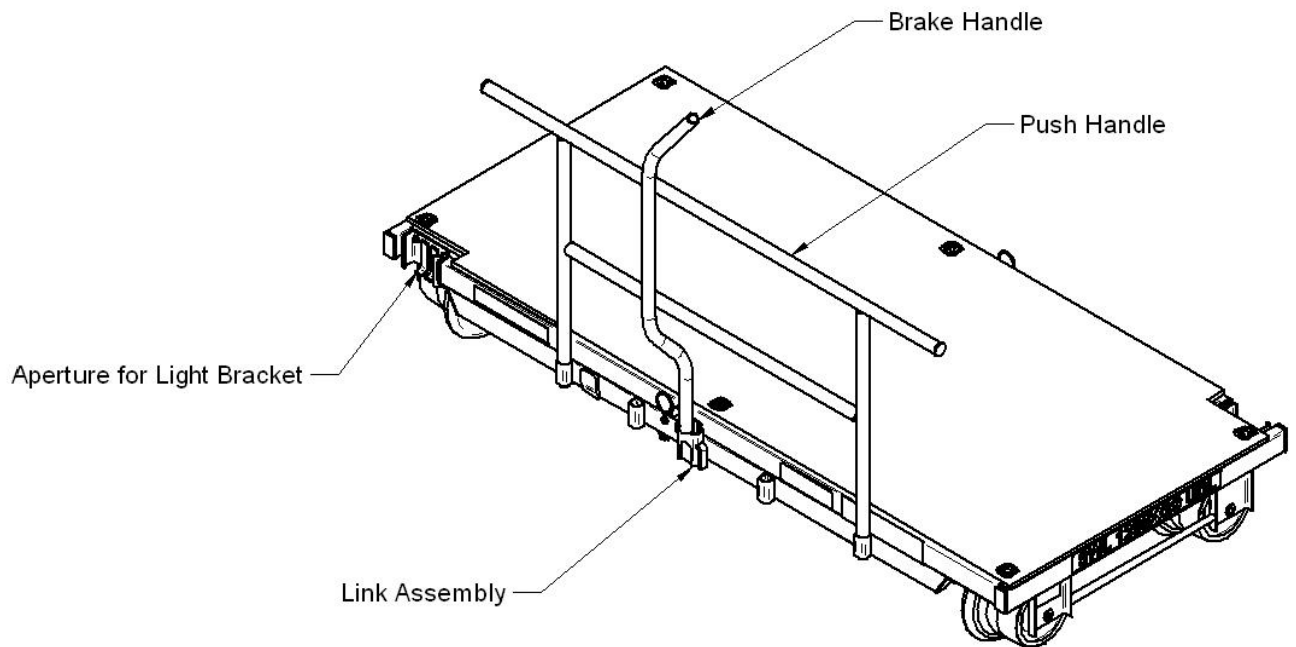
During transit, the Link Trolley should be secured and kept away from all electrified lines. Ensure that any method used to secure the Link Trolley in/on a vehicle applies the load uniformly and does not exceed the SWL. Do not use excessive force when using a ratchet type loading strap.



The maximum number of Link Trolleys that can be stacked during transit is 5, provided that this is within the vehicles operating capabilities. Note that the load must be secure and stable.

6. GENERAL LAYOUT

The following shows the main components of the Link Trolley



7. OPERATING INSTRUCTIONS

The following procedure outlines the correct method for operation.



Always push, never pull, the Link Trolley.



All work should only be performed by competent personnel.



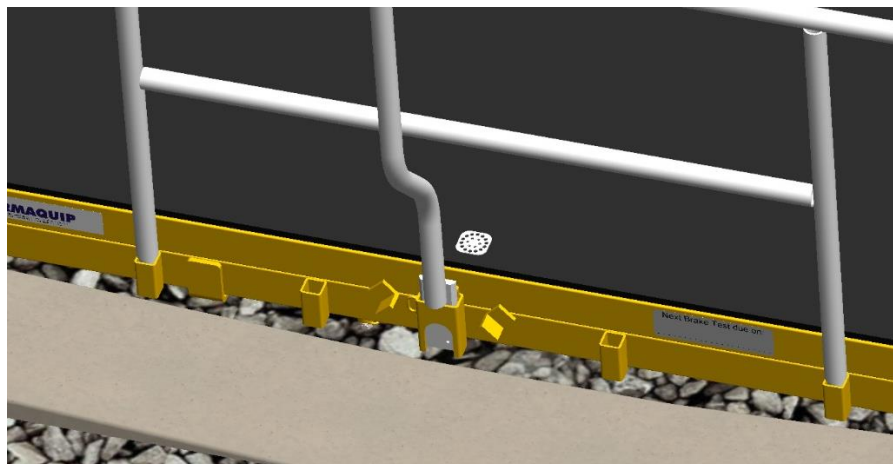
Always follow local regulations.



Observe Manual Handling Regulations.

7.1 Mounting on the Track

1. It is recommended that the Link Trolley is lifted by two persons.
2. Check that the Link trolley has a unique serial number, is identified with the SWL and the 'Next Brake Test Due' has not expired.
3. Check that the brakes are in good working order. To do this, access the braked wheels and rotate with one hand. The wheels should resist movement. If in doubt do not use until it has been checked by a competent person.
4. Place the Link Trolley, ensuring that all four wheels are in contact with the rail head.
5. Fit the Brake Handle and Push Handle onto the Link Trolley at the opposite end to the intended direction of travel, with the Link Assembly fitted onto the Brake Lever and interface plate as shown below.



6. Check the brakes are working correctly - they are fail-safe so should be on when the Link Trolley is stationary.

7. If more than one trolley is required, place the other trolley on the track as before. Remove the Link Assembly from each Link Trolley. On one of the mating Link Trolleys stow the Link Assembly as shown below. Never let them dangle in the 4ft.



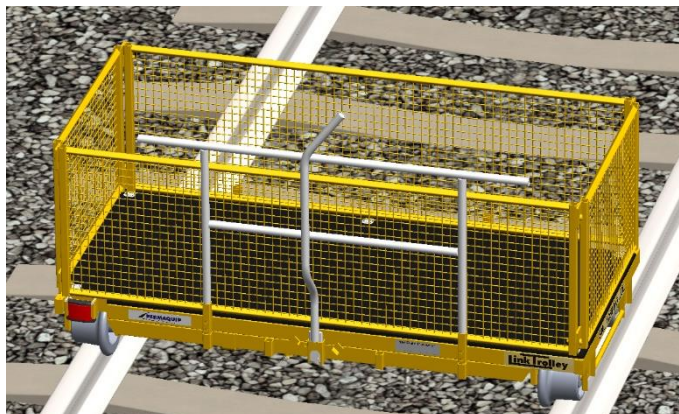
8. Move the Link Trolley's together so they are touching and connect the two together using the other Link Assembly, as shown below.



7.2 Loading the Link Trolley

1. Ensure that the SWL is not exceeded. Note that the SWL is reduced when the accessories such as Trolley Sides or Scaffold Attachments etc... are fitted.
2. Ensure that the load is stable and is uniformly distributed over the Link Trolley loading area.
3. Ensure that the load does not overhang the Link Trolley sides and infringe on the track gauge.
4. Ensure that loads do not over-hang where they may impair the operation of the brakes.
5. Ensure that load do not impair the operator's vision when moving the trolley or encroach into the operator's travel position.

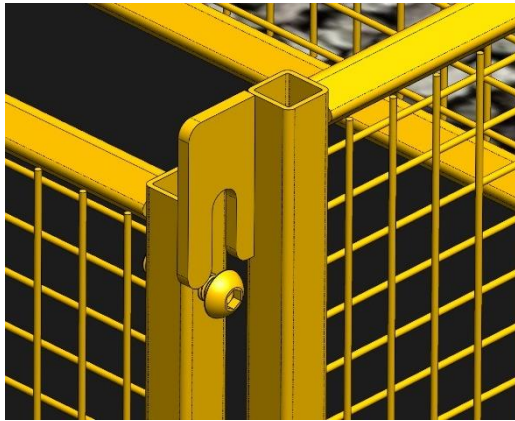
7.3 Fitting the Mesh Sides (Optional)



1. Mesh Sides (optional) are available to facilitate the loading of loose, lightweight and bulky items.
2. Locate the pins of the long Mesh Side into the Push Handle sockets of the Link Trolley as shown below.

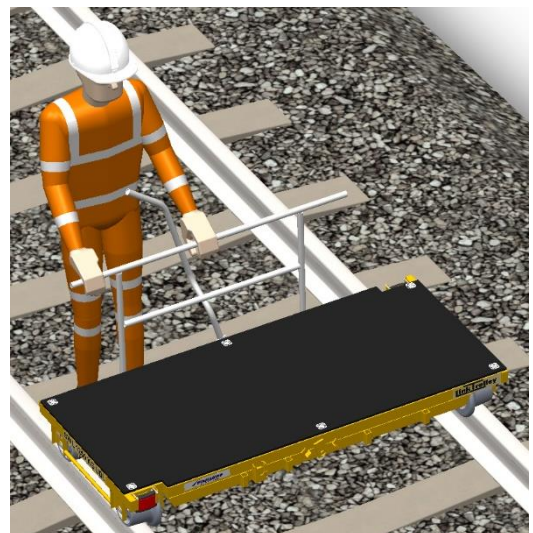
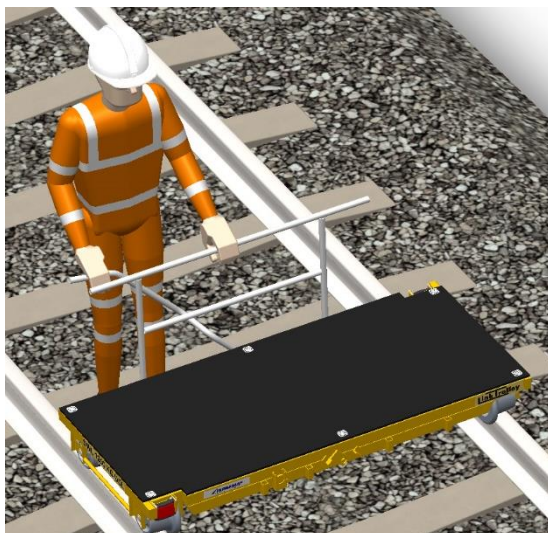


3. Slide the short Mesh Sides into the locating lugs, as shown below. Ensure that the top locking lug is engaged into the end frame of the long Mesh Sides.



7.4 Using the Link Trolley

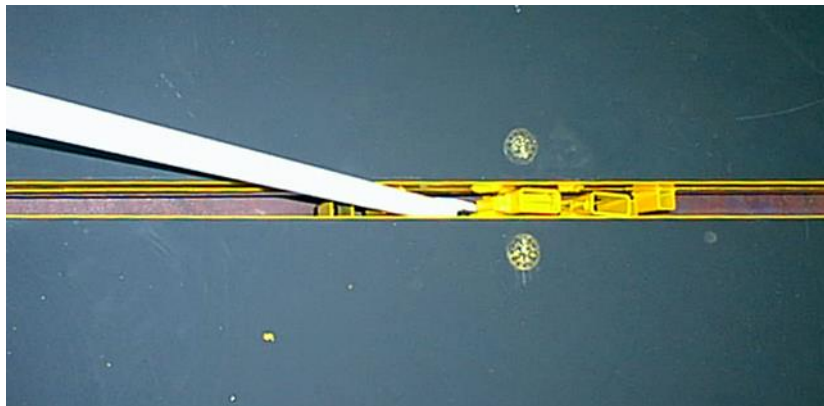
1. Move the Brake Handle sideways to release the brakes and use the Push Handle to move the Trolley.



2. Releasing the Brake Handle will then re-apply the brakes.

7.5 Removing from the Track

1. Remove the load, Mesh Sides, Scaffold Attachment Push & Brake Handles or any other ancillaries as appropriate.
2. If the Link Trolley is connected to another, use the Brake Handle to remove the Link Assembly as shown below.



3. Refit the Link Assembly onto the interface plate or storage bracket for security.
4. The Trolley can then be lifted off track. It is recommended that the Link Trolley is lifted by two persons.

7.6 Using the Scaffold Attachment (optional)



Scaffold equipment not to be used on track cants greater than 150mm and gradients greater than 1 in 30 and shall be stationary when in use with the rail hooks in place.



Follow the scaffold manufacturer's instructions for assembly and dis-assembly



Maximum SWL of 225kgs on Scaffold.



Do not exceed platform heights of 4.4m above rail height.

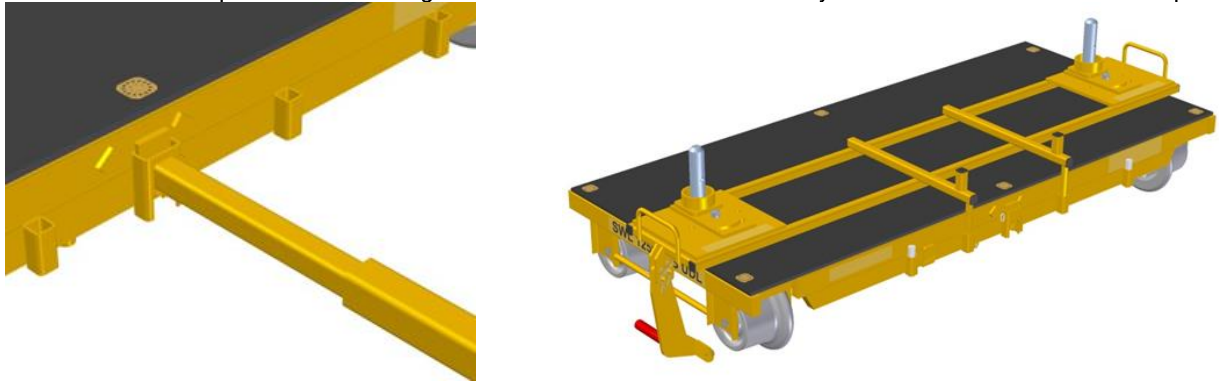


Do not use the Scaffold Attachment on or near live AC overhead power lines.

7.7 Attachment of the Scaffold Attachment to the Link Trolley

1. Visually check the frame assembly is free from distortion or damage. Do not use if the distortion is greater than 5mm or fractured welds are present.
2. Ensure all Rail Hooks, Locking Pins and R-Clips are present and are not damaged. If they are missing or damage do not use until they are replaced.

3. Fit the telescopic Brake Linkage between the two Link Trolleys onto the brake interface plates.



4. Mount the Scaffold Attachment frames onto the Link Trolleys, ensuring the two Location Dowels are fitted fully into the Push Handle sockets on the side of the Link Trolley.
5. Locate a vertical section of scaffolding into the supports. The lateral members should then be clipped into position and the longitudinal bars assembled.
6. The scaffolding can then be progressively built upwards, ensuring each level is safe and secure before elevating to the next level.

7.8 Moving the Assembled Scaffold Link Trolley

1. Ensure that all four rail hooks are in the upright position. Note that in order to raise the hooks on track with third-rail, both pins should be removed from either side and the hook lifted vertically.
2. Ensure that all Locking Pins and R-Clips are inserted prior to moving.
3. Fit the Push Handle at the rear of the Link Trolley and locate the Brake Handle.
4. Move the Brake Handle sideways to release the brakes and use the Push Handle to move the trolley.
5. Releasing the Brake handle will then re-apply the brakes.

7.9 Platform work on the Scaffold Link Trolley when stationary



Ensure that the maximum SWL of 225 kgs is not exceeded.



Do not move the Scaffold Link Trolley while persons are on the platform.

1. Ensure that all four Rail Hooks are lowered and locked into position using both of the Locking Pins for each Rail Hook, and that the R-Clips have been inserted.

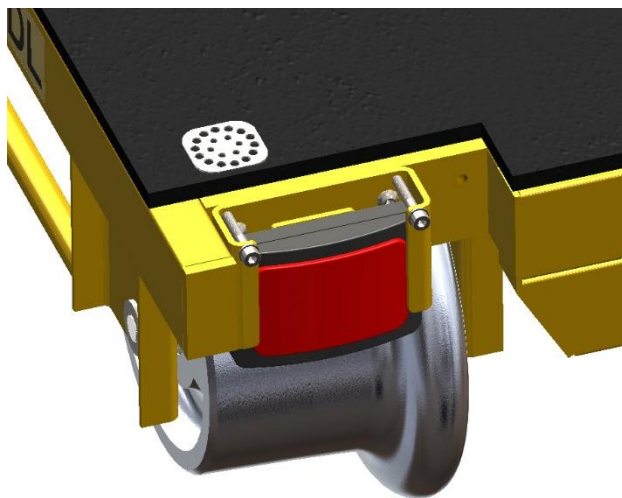
2. Adjust the Hook Adjustment Bolt under the rail head until in contact with the web of the rail. Where fishplates or saddles are present the consist might need to be moved to ensure the hooks engage correctly.
3. Ensure that the fail-safe brake is correctly applied.
4. Ensure that the scaffolding is located correctly into the Scaffold Attachments and that the Scaffold Attachments are correctly installed onto the Link Trolleys.
5. Platform operation can then proceed.

7.10 Scaffold and Scaffold Attachment Removal

1. Remove the scaffolding from the Scaffold Attachments.
2. Lift the Rail Hooks to the raised position by removing the R-Clip and lower Locking Pin, rotating the Rail Hook and locking in the raised position by re-inserting the Locking Pin and R-Clip.
3. Remove the Push and Brake Handles.
4. Lift off the Scaffold Attachment off each Link Trolleys and remove the telescopic Brake Linkage.

7.11 Fitting the Red Light

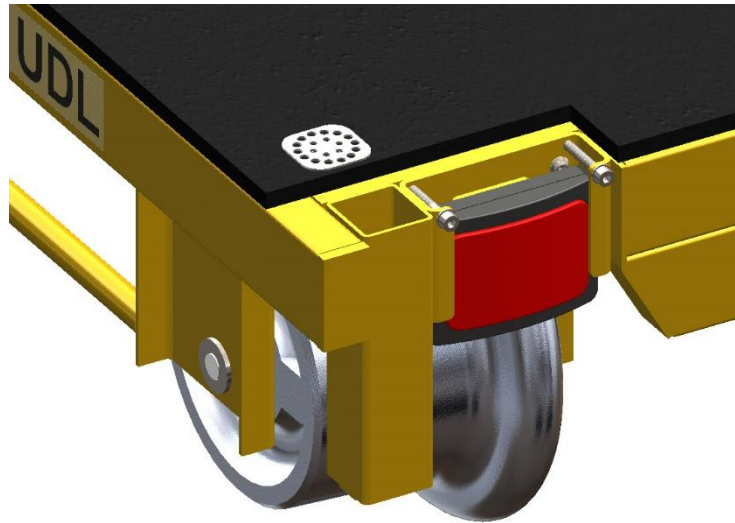
1. The Red Lights are in two positions on the Link Trolley. There are no additional fixings required as they slot into the light brackets fitted within the apertures, as shown below. The two locking screws supplied with the light bracket can be fitted to prevent unauthorised removal.



2. The Red Lights can be switched from underneath using the on and off switch positioned between the support tabs. It will need to be actuated using your fingernail or a small thin flat object. Operation has purposely been made difficult to prevent false operation.

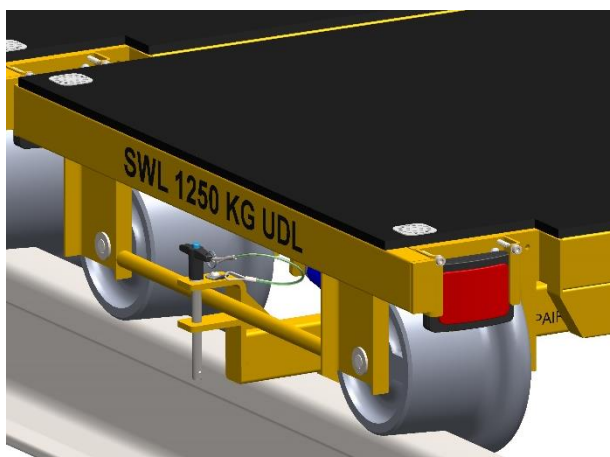
7.12 Light Mast Bracket

1. The Light Mast Bracket is designed to hold a flood light on a light mast on the Link Trolley. The light will aid the illumination of the local working environment. The Light Bracket can be mounted on each side of the Link Trolley.

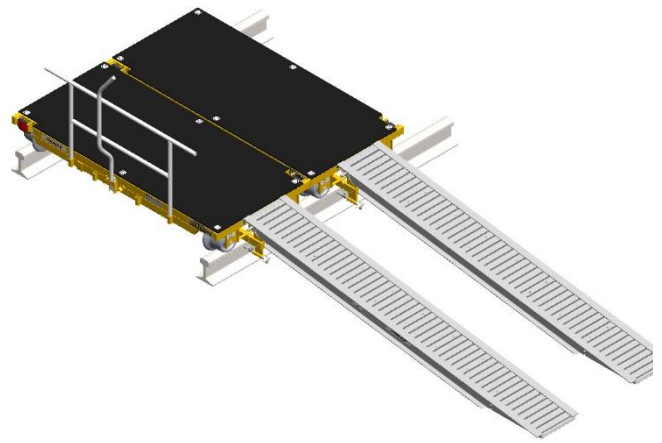
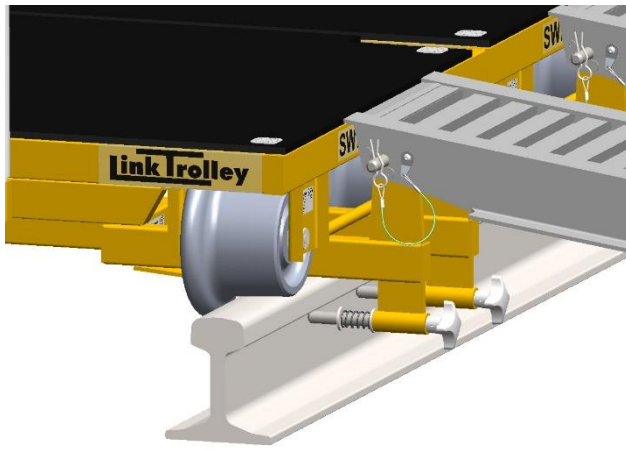


7.13 Using the Loading Ramps (optional)

1. Check that the Link Trolleys have the round Side Handles fitted. Earlier Link Trolleys without Side Handles or other manufacturer's Link Trolleys cannot be used with the Loading Ramps.
2. With two Link Trolleys connected together on the track, slide the Ramp Frame in between the Rail and underside of each trolley.
3. Ensure the front of the frame is sat on top of the rail head, hooked to the underside of the rail head with the Rail Hook and around the Side Handles on the Link Trolleys as shown below. Secure in position with the retaining pin.



4. Ensure the rear of the Ramp Frame is located on the top of the rail head with the locking pins fully extended to the flange of the rail as shown below.



5. Attach the Ramps to each Ramp Frame by locating the Hinge Pin through the holes, ensuring that the Hinge Pin is fully in. Secure in position with the retaining pin.

8. MAINTENANCE



All work should only be performed by competent personnel.



Always follow local regulations.



Observe Manual Handling Regulations.



Brake tests must be performed following any repair or replacement of the brake system or components, including brake pad replacement.

For components that require replacing please refer to the Link Trolley Spare Parts List. Please contact Permaquip Ltd for additional copies.

Note that:

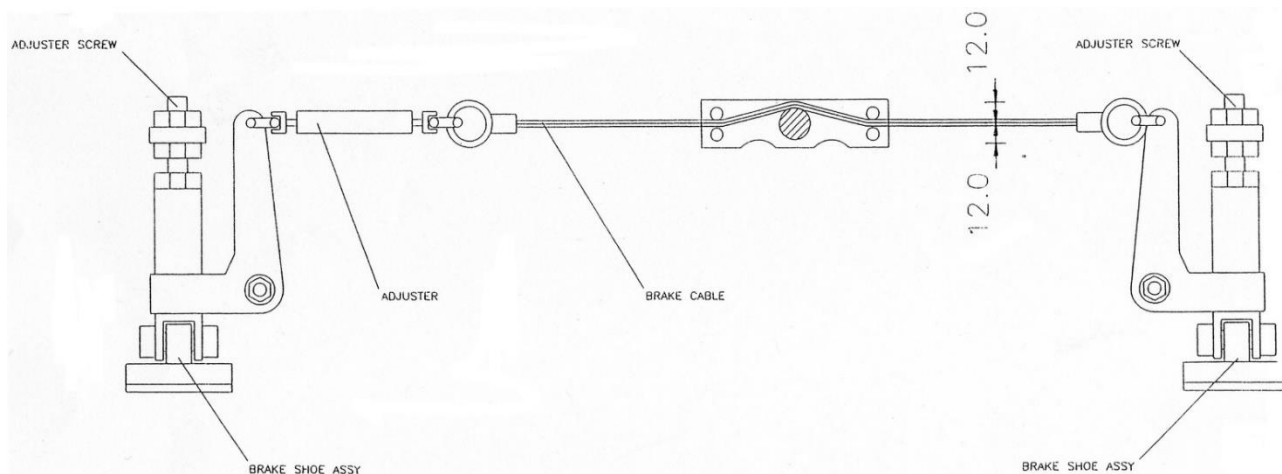
- **The Maintenance and Testing of the Brakes, Wheels and Axles are defined as Railway Safety Critical under CoP0010, Railway Safety Critical Maintenance Elements of Small Plant and Equipment.**
- **The Maintenance and Testing of the Brakes are covered under CoP0018, Rail Mounted Manually Propelled Equipment. The brakes must be maintained and tested at a periodicity of no greater than 3 months.**

8.1 Wheels and Axles

1. With the brakes released using the Brake Handle, check the wheels rotate freely.
2. Resistance to rotation or rocking of the wheel on the axle indicates either a worn axle or a cracked bearing. The wheel bearings are sealed for life and do not require lubrication. There should be no more than 2.0mm end float of the wheels.
3. Check the wheel profile for wear, cracks or damage. Replace damaged or worn wheels.
4. Check the Axle Retaining Pin is securely in place.

8.2 Brakes

1. Remove the brakes and check the brake linings. Remove any dirt or oil from the working surfaces. The recommended minimum thickness of the brake pad lining is 2.5mm.
2. Check the operation of the brakes to ensuring that the brake cable, clevis and adjusters are in good condition.
3. Lubricate all brake pivot pins, brakes cables, clevis pins and adjusters with a general-purpose lubricant.
4. Check that both brake shoes apply and release simultaneously. To adjust the brakes:
 - Slacken the brake cable.
 - Adjust each brake spring using the adjuster screw whilst the brake is applied.
 - Re-adjust the brake cable using the adjusting shackle to give 12mm of slack on the brake cable as shown in the following diagram.



5. Test the brake efficiency using the Brake Test Tool. Ensure that the wheels and brake pads are dry. The brakes should be tested at all four quadrants of each braked wheel and in both directions. The average torque at which the wheel resists movement should be equal or greater than 45 Nm. Do not exceed 55 Nm. Note that a higher torque figure may restrict the number of Link Trolleys that can be connected together, although this is not detrimental to the safe operation of individual Link Trolleys.
6. If the brake torque is not achieved, check and adjust the brakes as described previously and repeat the tests.
7. Fix a 'Next Brake Test Due' label onto the Trolley. The date specified must be within 3 months. Complete the Maintenance Brake Test Record Sheet

8.3 Link Trolley Assembly

1. Check that the Link Assemblies are free from damage.
2. Check that the frame structure is free from deformation and that all welds are in good condition.
3. Ensure that the axle mounts are straight and are in-line.
4. Mount the Link trolley onto the test track. Check the chassis is flat by ensuring that the maximum gap between one-wheel face and rail head is 2mm.
5. If the chassis is bent or twisted, place the unladen trolley on a flat test track or smooth flat level surface. Use a straight edge over the chassis frame, a maximum of 5mm bend or twist over the entire chassis is allowed assuming that the wheels are within the maximum 2mm rock tolerance.
6. For standard Link Trolleys fitted with wooden decks, check the condition of the wood. Decks that are loose, de-laminated, cracked or have holes need to be replaced.
7. For LUL Link Trolleys fitted with aluminium decks, check the condition of the aluminium. Decks that are loose, damaged or deformed need to be replaced.

8.4 Scaffold Attachment

1. Check that the frame assembly is free from distortion or damage. Renew the frame assembly if distortion is greater than 5 mm or fractured welds are present.
2. Check that the Rail Hooks, Locking Pins, Securing Wires, R-Clips and Hook Adjustment Bolts are fitted and free from damage. Replace as appropriate.
3. Replace any damaged, worn or missing Base Plates, Locking Screws and Spigots.
4. Lubricate the Base Plates with general purpose grease.

8.5 Red Light

1. To replace the batteries within the Red Light, remove the 4 off cross-headed screws from the rear of the light assembly and lift off the rear cover.
2. Replace the 2 off batteries to the correct specification, noting the polarity.
3. With the gasket in position replace the rear cover and secure using the 4 off screws.
4. Discard the old batteries according to local and national regulations.
5. Check the light operation using the slide switch on the rear cover.
6. Replace into the Link Trolley.

8.6 Light Mast Bracket

1. Check that a light mast and a red light can be installed and security screws are present.
2. Check that the Bracket is free from damage or deformation.

8.7 Loading Ramps

1. Check the Serial Numbers for the Ramp Frames and Ramps match.
2. Check that the Ramp Frames and Ramps are free from distortion or damage. Renew if distortion is greater than 5 mm or fractured welds are present.
3. Check that the Rail Hooks, Link Trolley Hooks, Locking Pins, are free from damage and that they all locate on the track and Link Trolley correctly. Replace as appropriate.
4. Check the Locking Pins are free from damage and spring return. Replace any damaged, worn or missing Locking Pins.
5. Lubricate the Locking Pins with general purpose grease.

9. TEST SPECIFICATION

The Link Trolley should be tested to the following specification after the Maintenance procedures have been completed where necessary.

Note the testing of the Brakes is defined under the Maintenance section of this User Guide. This is important as the brakes must be checked and maintained before testing.

The Link Trolley should be tested to the following specification after any structural repairs have been carried out, or when the Link Trolley has been damaged.

1. Note the Serial Number of the Link Trolley.
2. Place a straight edge between the rear face of two wheel flanges (as aligned along the rail). Check that the variation in alignment does not exceed 3mm.
3. Repeat for the other pair of wheels.
4. Mount the Link Trolley onto a test track and ensure the brakes are on.
5. Check that there is no deformation by ensuring the chassis is flat to within 2.0mm. Also check that there is no weld damage. Replace the chassis if the deformation exceeds this limit.
6. Measure the height between the track and the centre position of the Link Trolley frame on all four sides.
7. Lower a 1,562.5kg calibrated test mass onto the trolley (1.25 x 1,250kg SWL). Mark the alignment of the wheel to the rail. Roll the trolley up and down the test track once back to the marked position.
8. Remove the mass and re-measure the heights. There should be no more than 1.5mm difference between the two measurements.
9. Check that there is no deformation or weld damage. If there is reject the chassis for re-work or replace.

The standard Link Trolley should also be tested to the following specification:

1. The conductivity between the wheels and frame of the Link Trolley needs to be checked using a calibrated resistance meter.
2. Zero the meter so the display reads 0.00Ω.
3. Connect one lead to an unpainted section of the Link Trolley frame. Connect the other lead to one of the wheels. The measured resistance should be less than 0.15Ω.
4. Repeat for the other three wheels.

The LUL Link Trolley and other Link Trolleys fitted with insulated wheels should also be tested to the following specification:

1. The resistance of the insulation of the Link Trolley needs to be checked using a calibrated resistance meter.
2. Ensure the brakes are on.
3. Check that the meter display reads 1Ω or less when the two leads are connected together.
4. The resistance between the trolley frame and wheels needs to be checked. Connect one lead to an unpainted section of the Link Trolley frame. Connect the other lead to one of the wheels. The measured resistance should be at least 5 MΩ.
5. Repeat for the remaining three wheels and record the four measurements taken.
6. The resistance between the wheels needs to be checked. Connect one lead to one of the wheels. Connect the other lead to the opposite wheel that sits on the opposite rail head. The measured resistance should be at least 5 MΩ.



7. Repeat for the remaining pair of wheels and record the two measurements taken.

Permaquip Ltd offer a testing and maintenance service – please contact us for further details.

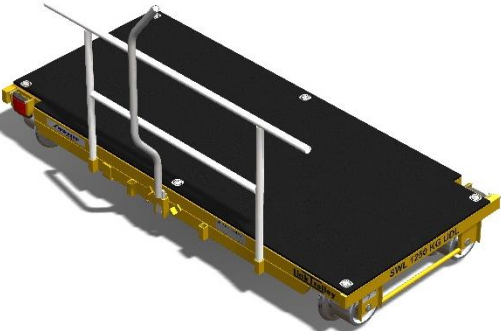
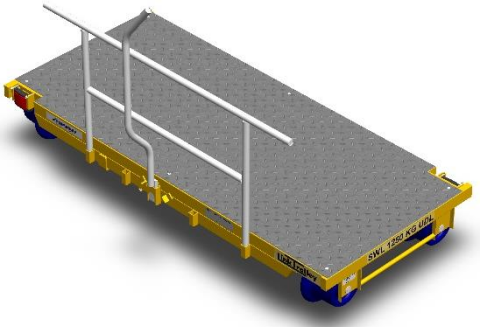
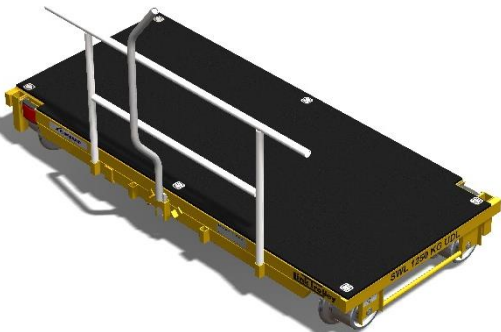
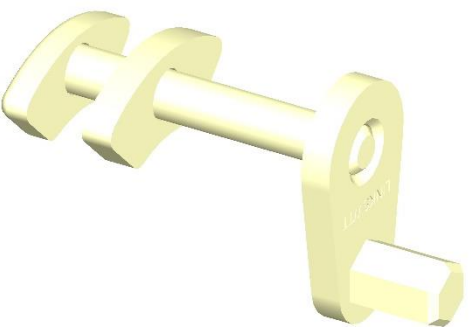
10. TRAINING

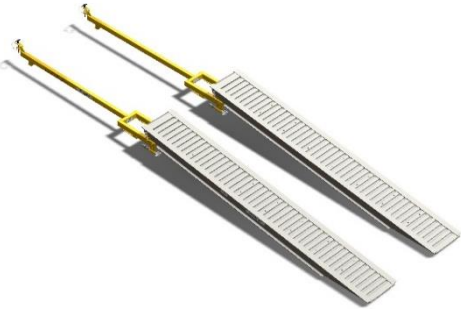
Persons that will operate, maintain and test the Link Trolley should undertake a programme of training. This programme of training should include the following aspects:

- Product familiarisation.
- Component location and function.
- Product preparation.
- Safe and Correct Use.
- Maintenance.
- Testing.
- Practical experience.

Permaquip Ltd offer a training service – please contact us for further details.

11. ORDERING

	DESCRIPTION	PADS Cat. No.	PART NO
Link Trolley Standard (wooden top non-insulated wheels)		PA05/03389	28455
Link Trolley LUL (aluminium top insulated wheels)		LUL Cert. Number PE007/1125	28800
Link Trolley c/w Light Mast Bracket (wooden top non- insulated wheels)			37979
Link Trolley Wheel Torque Tool			LINKSWTT
Red Light		068/011260	040820218

Scaffold Attachment (w/o scaffold)		68/19194	29619
LED / Light Bracket Assembly			37973
Link Trolley Mesh Sides			30643
Link Trolley Loading Ramps			34088
SafeGrip - Link - Set			SGL-01

Permaquip P1 Wheel Profile Gauge			38898
Wheel Profile Wear Gauge			34596

For spare parts please refer to the Link Trolley Spare Parts List.

Please contact Permaquip Ltd for further information and support.
Our contact details are shown on the front of this User Guide.

In order to avoid delay and to have your orders fulfilled promptly.

Please telephone, e-mail, fax or write giving the following information:

1. **Company name.**
2. **Contact details.**
3. **Invoicing and delivery details.**
4. **Purchase order number.**
5. **Method of delivery.**
6. **Part number, description and quantity for each item.**