ToughLift®

MATERIAL LIFTS

ML-10/ML-15/ML-20/ML-25

MAINTENANCE MANUAL
(Serial number range: From SA700100)

CE UK CA

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Contents

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Section 1 – Description & Specification

1.1 Introduction

This Maintenance Manual provides detailed scheduled maintenance information, troubleshooting, repair procedures, and exploded drawings with parts lists, to enable a qualified maintenance engineer or technician to undertake work on ToughLift® Material Lifts and accessories as follows:

Model/Accessory	Product Code
ML-10	600010
ML-15	600015
ML-20	600020
ML-25	600025
Standard Forks (standard on all models)	640000
Stabiliser Set (standard on ML-20 & ML-25)	620000
Load Platform	670000
Pipe Cradle	610043
Extension Forks	660000
Rough Terrain Wheel Kit	680000
Boom	650000

Maintenance engineers and technicians should read, understand, and adhere to all the information contained in the ToughLift® Material Lifts Instruction Handbook and in this Maintenance Manual before undertaking any maintenance work on a ToughLift® Material Lift or accessory.

Basic mechanical skills are required to perform most procedures outlined in this Maintenance Manual. However, several procedures require specialised skills, tools, lifting equipment, and a suitably equipped workshop.

Additional copies of this Maintenance Manual and the ToughLift® Material Lifts Instruction Handbook may also be obtained from the manufacturer; please see the contact details on the back cover.

The information contained in this Maintenance Manual is based on the latest product information at the time of publication. The manufacturer operates a policy of continuous product improvement and reserves the right to make product changes at any time without notice.

1.2 Characteristics & description

The ToughLift® Material Lifts include the following features as standard:

- Heavy-duty construction.
- Quick and simple setup; no tools required.
- Portable compact design for easy transport and storage.
- Anodised lightweight aluminium telescoping mast:
  - Corrosion resistant, as the anodic film is totally impermeable.
  - Abrasion resistant.
  - Anodised aluminium components are 100% recyclable.
- Unique inner lifting column locking mechanism offering the following benefits:
  - The lifting columns always raise in sequence working from the front to the back of the mast.
  - When the machines are laid horizontally for transport or maintenance and the carriage lock has not been deployed, the inner lifting columns cannot slide out of the stowed position.
- Mast safety braking system holds the carriage and lifting column(s) in position if the cable becomes loose or breaks.
- Extra wide aluminium first pulley wheel improves the laying of the cable on the winch drum.
- Heavy-duty castors with non-marking tyres.
- Braked swivel castors with foot-operated brake on the side and bolted foot operated straight-line lock to aid loading for transport or moving in a straight line on site.
- Long loading wheels/handles shaft so that the mast is horizontal when the machine is laid back for transport.
- Loading wheels with sealed bearings rotate with ease.
- Hard wearing steel and PU transport wheels with sealed bearings.
- Tube welded through the Standard Forks and Boom to prevent the drop nose pin jamming when fitting to the carriage.
- E-coated and then powder coated steel fabrications fitted with silicone rubber end caps.
- Colour coded decals use 3M high adhesive strength outdoor rated film and inks, and can be jet washed clean on a moderate pressure.
- Manufacturers plates with serial numbers riveted to the chassis of the machine and fitted to the load handling attachments to aid traceability for LOLER thorough examinations (UK only, regulations in other countries vary).
- Stainless-steel roller guards.
- Stainless-steel retaining pins.
- Robust solid pull rings on front legs and handles/loading wheels retaining pins.
- Bushed joints across the machine.
- Easy to wind dual handled manual winch with brake to hold the load in place.
- Winch handles with ergonomic grip design.
- Standard Forks can be fitted up or down in the carriage on the mast.
- All machines and load handling attachments are supplied with both EU and in the UK, UKCA Declarations of Conformity.

The following accessories are also available for use with ToughLift® Material Lifts:

- Stabiliser Set (standard on ML-20 & ML-25)
- Pipe Cradle
- Load Platform
- Extension Forks
- Rough Terrain Wheel Kit
- Boom

1.3 Intended use

The ToughLift® Material Lifts have been designed to comply with the safety requirements of the European Machinery Directive 2006/42/EC and the Supply of Machinery (Safety) Regulations 2008 (UK).

The ToughLift® Material Lifts are designed solely for the purpose of lifting materials to enable work to be undertaken at height. The ToughLift® Material Lifts are designed for indoor and outdoor use, **but not in strong or gusting winds**, and must be used on level ground which is able to support the weight of the machine, any accessory fitted, and the load being lifted.

The ToughLift® Material Lifts are designed for a multitude of tasks including building and construction, particularly fit and strip out, shop fitting, general maintenance, and facilities management. The machines are used on construction sites and in hospitals, schools, airports, shopping centres, retail outlets, transport environments, factories, and offices.

WARNING

The operator must obtain the guidance and written approval from the manufacturer in the event of any special working methods or conditions which are outside those specified in this section.

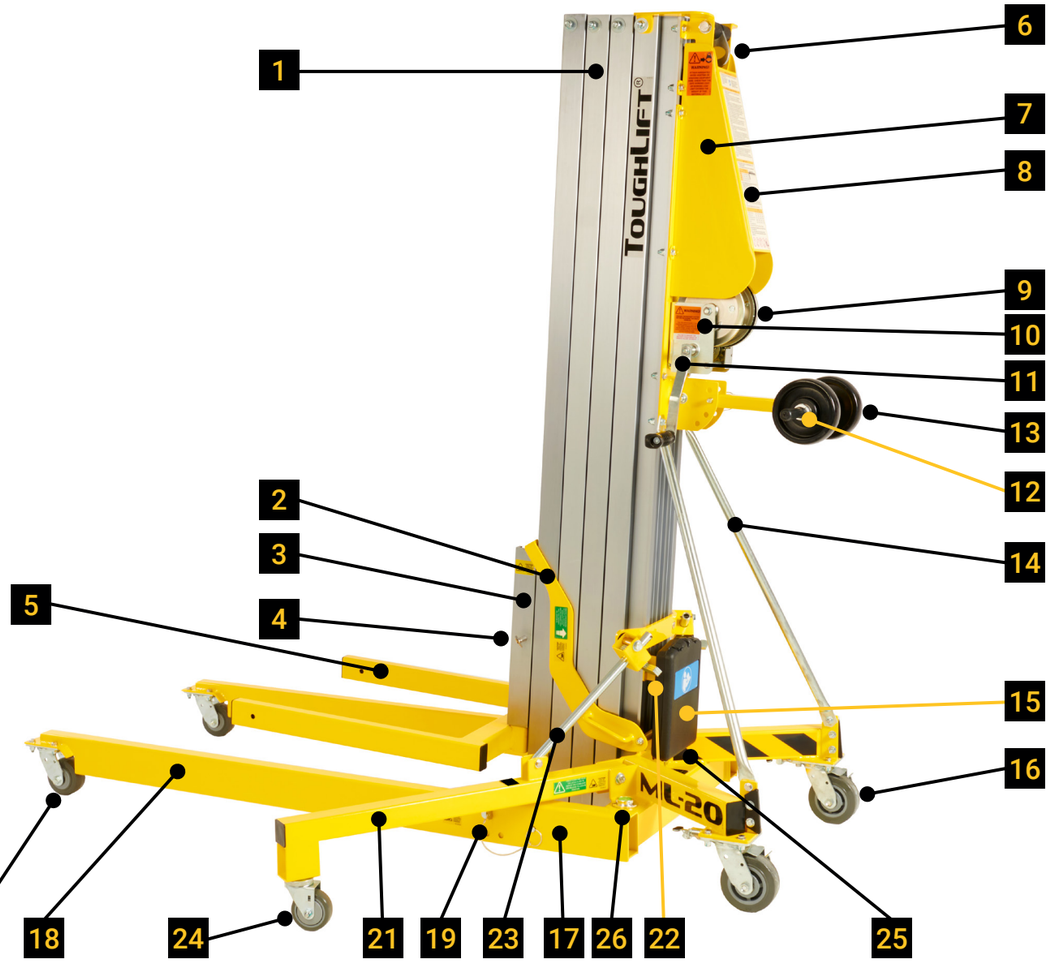
1.4 Modifications

No modifications shall be made to any ToughLift® Material Lift or accessory unless the manufacturer has given full written approval. If in doubt, please contact the manufacturer for advice:

Shenzhen Anhua Limited
A1202-1 Tianan Cyber Park
No. 441 Huang Ge Road
Longgang
Shenzhen 518116
China
✆ +44 20 7173 9777
✉ info@toughlift.co

1.5 Terminology

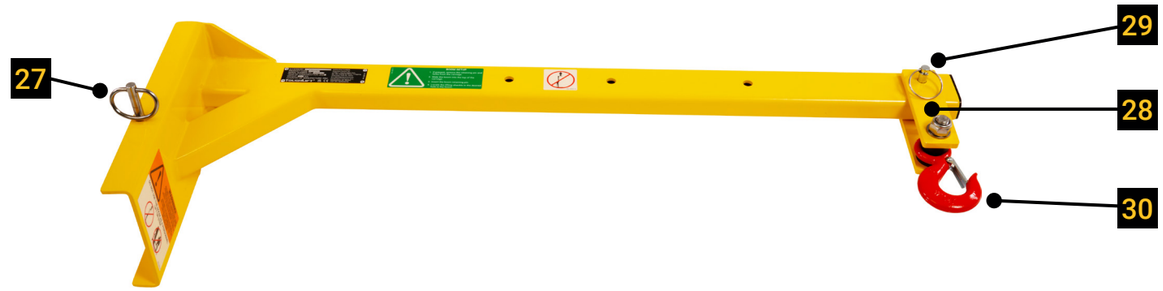
The machine below is an ML-20.



1 Mast
2 Carriage lock
3 Carriage
4 Standard Forks/Boom retaining pin
5 Standard Forks
6 Hoisting/winching anchor
7 Cable guard
8 Main operational & safety decal
9 Cable
10 Winch
11 Winch handle
12 Push & steer handle
13 Loading wheel
14 Mast brace
15 Document holder
16 Braked swivel castor
17 Chassis
18 Front leg
19 Front leg retaining pin
20 Front leg swivel castor
21 Stabiliser (standard on ML-20 and ML-25/ optional on ML-10 and ML-15)
22 Stabiliser brace latch plates
23 Stabiliser brace
24 Stabiliser swivel castor
25 Rough Terrain Wheel Kit support locator
26 Spirit level

1.5 Terminology/continued

Boom accessory.



27 Standard Forks/Boom retaining pin
28 Lifting shackle
29 Shackle retaining pin
30 Lifting hook (may be removed if required)

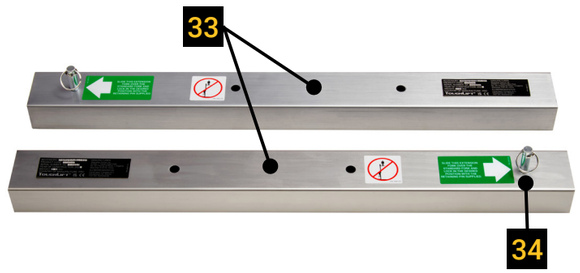
Rough Terrain Wheel Kit accessory.

31 Rough Terrain Wheel Kit

Load Platform accessory.

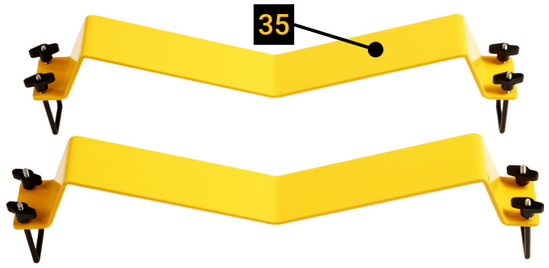
32 Load Platform

Extension Forks accessory.



33 Extension Forks
34 Extension fork retaining pin

Pipe Cradle accessory.



35 Pipe Cradle

1.6 Technical data

	MODELS			
	ML-10	**ML-15**	**ML-20**	**ML-25**
LOAD CAPACITY, WEIGHT, & OPERATING ANGLE				
Load capacity	Refer to the Load Capacity Table on the page opposite for load capacities at different load centres.			
Machine weight (1)	129kg	153kg	190kg	214kg
Maximum allowable chassis inclination	0°	0°	0°	0°
DIMENSIONS				
Working Heights				
With Standard Forks down	2.97m	4.46m	5.94m	7.42m
With Standard Forks up	3.49m	4.98m	6.46m	7.94m
With Load Platform forks down (2)	2.97m	4.46m	5.94m	7.42m
With Load Platform forks up (2)	3.49m	4.98m	6.46m	7.94m
With Boom (3)	3.28m	4.76m	6.25m	7.42m
Other Dimensions				
Width with stabilisers deployed	N/A	N/A	1.84m	1.84m
Length with front legs deployed	1.51m	1.88m	2.06m	2.06m
Stowed width	0.81m	0.81m	0.81m	0.81m
Stowed length	0.76m	0.76m	0.76m	0.81m
Stowed height	2.02m	2.02m	2.02m	2.02m
Ground clearance	52mm	52mm	52mm	52mm
AVERAGE TURNS OF WINCH PER METRE				
Carriage moving	42/m	42/m	42/m	42/m
Mast moving	19/m	19/m	19/m	19/m
NOISE EMISSIONS	<70dBA			

(1) - Excluding load handling attachments.
(2) - With Standard Forks only.
(3) - Measurement from the ground to the bottom of the lifting shackle.

1.6 Technical data/continued

Load Capacity Table

	LOAD CENTRE						
MODEL	**46cm**	**51cm**	**56cm**	**61cm**	**66cm**	**71cm**	**76cm**
ML-10	454kg	454kg	454kg	454kg	414kg	374kg	335kg
ML-15	363kg	363kg	363kg	363kg	346kg	329kg	312kg
ML-20	363kg	332kg	303kg	272kg	255kg	238kg	221kg
ML-25	295kg	264kg	235kg	204kg	193kg	181kg	170kg

	LOAD CENTRE					
MODEL	**81cm**	**86cm**	**91cm**	**97cm**	**102cm**	**107cm**
ML-10	295kg	272kg	249kg	227kg	204kg	181kg
ML-15	295kg	281kg	268kg	254kg	240kg	227kg
ML-20	204kg	195kg	186kg	177kg	168kg	159kg
ML-25	159kg	150kg	141kg	132kg	122kg	113kg

WARNING
Lifting loads which exceed those shown in the chart above could cause serious injury or death.

ACCESSORIES				
	Length	**Width**	**Depth**	**Weight**
Standard Forks (4)	69.3cm	58.4cm	6.45cm	18kg
Pipe Cradle	57.5cm (each)	6.9cm (each)	14.5cm (each)	4kg (set)
Load Platform (4)	70cm	58.5cm	8.5cm	15kg
Extension Forks (5)	76.2cm (each)	5cm (each)	7.5cm (each)	4kg (set)
Boom (4)	115.8cm	18cm	37.2cm	18kg
Rough Terrain Wheel Kit	54.8cm	73cm	24.6cm	8.3kg
Stabilisers	86.6cm (each)	5.1cm (each)	58cm (each)	6.3kg (each)

(4) - Length is measured from the front of the carriage to the end of the load handling attachment.
(5) - Adds 16.1cm, 39.9cm, or 63.1cm to the length of the Standard Forks.

WARNINGS

- **Failure to adhere to the Safety Rules below and the additional Safety Rules outlined in the ToughLift® Material Lifts Instruction Handbook will result in serious injury or death.**
- **Many of the hazards identified in the Instruction Handbook are also safety hazards when maintaining or repairing a machine or accessory.**
- **Any person working on or around a machine must be aware of all the potential safety hazards.**
- **Be aware of the safety colour coding system in Section 9 of this manual. This system is used in the Instruction Handbook, in this Maintenance Manual, and on the decals on the ToughLift® Material Lifts and accessories.**

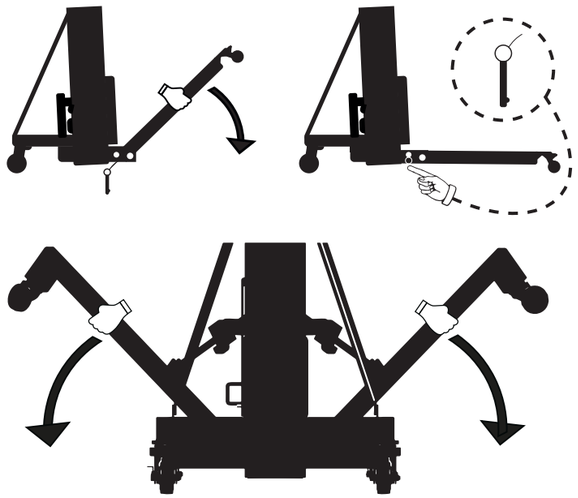
NEVER undertake maintenance of a ToughLift® Material Lift unless you are trained, qualified, and authorised to do so.

NEVER stand below a ToughLift® Material Lift on an incline when moving the machine around a worksite or workshop.

NEVER interfere with the mechanical safety devices in the mast assembly and winch.

NEVER stand on, step on, or climb on the mast, Standard Forks, Pipe Cradle, Extension Forks, Load Platform, or Boom of a ToughLift® Material Lift. **This is not a personnel lift.**

NEVER raise the mast (loaded or unloaded) unless the front legs and stabilisers (if the model being used is equipped with stabilsers) are deployed and locked in position.



NEVER raise the mast (loaded or unloaded) unless all 4 (or 6 if stabilisers are fitted) castors are in touch with the ground.

NEVER move a ToughLift® Material Lift when the carriage is loaded, whether the mast is lowered or raised (except for very minor repositioning).

NEVER stand under or allow other personnel to stand under the machine when the load is raised.

NEVER use a ToughLift® Material Lift as an electrical earth when welding structures alongside it.

ALWAYS read, understand, and adhere to the Instruction Handbook located in the document holder on the back of the fixed mast column before working on a ToughLift® Material Lift.

ALWAYS wear suitable personal protective equipment when undertaking maintenance on a ToughLift® Material Lift. It is recommended that you wear suitable eye protection, safety helmet, high visibility vest, gloves, and safety boots or shoes with steel toe caps. Always undertake a risk assessment.

ALWAYS ensure the safety of persons that may enter the area around the machine, and keep vehicles clear of the work area i.e., cordon off the area to prevent persons and vehicles entering the danger area.

ALWAYS ensure that you have prepared the necessary work area, tools, and components required for the work being undertaken on the ToughLift® Material Lift.

ALWAYS keep work surfaces clean and free of debris that could get into the components of the machine and cause damage.

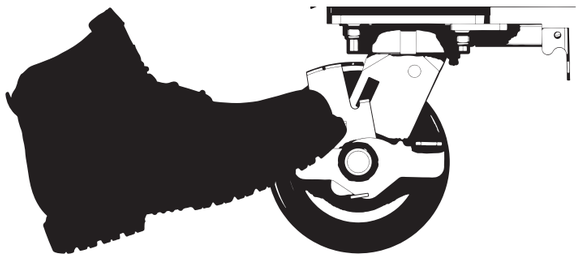
ALWAYS use proper lifting techniques to tip the machine, or to fit or remove load handling attachments to or from the carriage.

ALWAYS ensure that any forklift, overhead crane, or other lifting or supporting device has an adequate safe working load or working load limit to support and stabilise the weight to be lifted. Only use adequately rated chains or straps that are in good condition.

ALWAYS be aware of potential crushing hazards such as moving parts, and free swinging or unsecured components when lifting or placing loads.

ALWAYS check that the LOLER certification of the machine and any removable accessories is in date before working on the machine (UK only, regulations in other countries vary).

ALWAYS lock both braked swivel castors when the machine is stationary.



ALWAYS engage the carriage lock when moving the machine around a worksite or workshop, or from site to site on a delivery vehicle.

ALWAYS be aware of the following potential finger trap points when setting up the machine:

- 2 front leg joints
- 2 stabiliser leg joints (if fitted)
- Carriage lock
- Carriage

ALWAYS check that the machine is level before raising the mast by ensuring the bubble in the spirit level is within the black circle.

ALWAYS hold the front leg when the retaining pin is removed as it will drop.

ALWAYS hold the stabiliser when the lock is released as it will drop.

ALWAYS grip the winch handles until the winch brake is locked i.e., when the weight of the load will not cause the winch handles to turn.

ALWAYS engage the ratchet system before releasing the winch handles by turning the winch handle ¼ turn clockwise (away from you/raising the load) to ensure that the ratchet/brake system is engaged before winding up the mast to the desired working height.

ALWAYS ensure that fixings intended for one time use e.g., self-locking nuts, cotter pins, roll pins etc. are not reused.

Section 3 – Service Engineer Attributes

The ToughLift® Material Lifts and accessories service engineer should:

1. be physically fit and competent to carry out the work being undertaken.
2. have a responsible attitude.
3. demonstrate an ability to learn.
4. be able to communicate clearly with other personnel on site.
5. be able to identify equipment.
6. be able to demonstrate an understanding of, and apply the information contained in this Maintenance Manual.
7. be able to demonstrate that they can diagnose, rectify, and record faults.
8. be able to demonstrate an understanding and knowledge of how to carry out inspections (other than thorough examinations) and be able to make recommendations for the continued use of the equipment.
9. be able to demonstrate an understanding of and apply company procedures.
10. be able to demonstrate that they can operate the equipment safely.
11. be able to demonstrate that they can carry out functional checks.
12. be able to demonstrate knowledge of how to record all maintenance work carried out.
13. be able to demonstrate the required knowledge and expertise of the ToughLift® Material Lifts and accessories for service and maintenance purposes.
14. be undergoing a form of Continuous Professional Development.

Section 4 – Competent Person for Thorough Examination Attributes

The competent person carrying out a thorough inspection of a ToughLift® Material Lift or accessory should:

1. be physically fit.
2. have a responsible attitude.
3. demonstrate an ability to learn.
4. be able to communicate clearly with other personnel on site.
5. comply with BS EN ISO/IEC 17020.
6. be capable of detecting defects or weaknesses in the ToughLift® Material Lift and accessories for the purpose of the thorough examination.
7. have sufficient knowledge and experience to assess the importance of defects or weaknesses in the ToughLift® Material Lift and accessories, and be able to identify what actions need to be taken to rectify them. They should be able to:
   a. verify that the ToughLift® Material Lift and accessories are operating as intended in accordance with the Instruction Handbook.
   b. identify defects or weaknesses which could compromise the use of the ToughLift® Material Lift and accessories.
   c. specify the appropriate timescales within which identified defects or weaknesses need to be rectified.
   d. establish that defects identified in the previous report of thorough examination have received attention.
   e. assess that safety devices are functioning correctly.
   f. check that warning notices are correctly fixed and legible, and where necessary specify any limitations to the use of the ToughLift® Material Lift and accessories.
   g. carry out any testing required as part of the thorough examination.
   h. report on the findings of the thorough examination.

Please refer to the Appendix in this Maintenance Manual which details the information to be contained in a report of a LOLER thorough examination (UK only, regulations in other countries vary).

WARNINGS

- **Failure to adhere to the Safety Rules below and the additional Safety Rules outlined in the ToughLift® Material Lifts Instruction Handbook will result in serious injury or death.**
- **Maintenance inspections shall be completed by a person trained and qualified in the maintenance of a ToughLift® Material Lift.**
- **Scheduled maintenance inspections shall be completed Daily/Pre-Use, 3-Monthly, and Annually, as specified in the Maintenance Inspection Report.**
- **The Daily/Pre-Use Maintenance Inspection must be undertaken by the owner of the machine prior to the first use of a new ToughLift® Material Lift.**
- **The Daily/Pre-Use Maintenance Inspection must be undertaken by the owner of the machine prior to each delivery to their customer.**
- **The Daily/Pre-Use Maintenance Inspection must be undertaken if any situation has occurred which could affect the safe operation of the machine e.g., toppling, significant impact, malfunctions etc.**
- **The Daily/Pre-Use Maintenance Inspection must be undertaken following any repairs to a ToughLift® Material Lift.**
- **If a machine has been out of service for longer than 3 months, the 3-Monthly Maintenance Inspection must be completed.**
- **Failure to perform each procedure as shown and scheduled could cause death, serious injury, or substantial damage.**
- **Unless otherwise specified, perform each procedure with the machine in the following configuration:**
  - **Machine parked on a solid and level surface.**
  - **Carriage fully lowered.**
  - **Swivel castors on splayed legs locked.**
  - **Standard Forks or Boom fitted to the carriage.**
- **Immediately tag and remove from service any damaged or malfunctioning ToughLift® Material Lift.**
- **Repair any machine damage or malfunction before operating the machine.**
- **Use only ToughLift® approved replacement parts.**

Notes:

- The Lifting Operations and Lifting Equipment Regulations 1998 (LOLER) requires that lifting equipment must be THOROUGHLY EXAMINED every 12 months. However, removable accessories i.e., Standard Forks, Pipe Cradle, Extension Forks, Load Platform, or Boom, must be inspected every 6 months. Please refer to the Appendix in this Maintenance Manual which details the information to be contained in a report of a thorough examination (UK only, regulations in other countries vary).
- It is essential that only ToughLift® approved replacement parts are used when maintaining and servicing ToughLift® Material Lifts and accessories. Failure to do so could result in an unsafe machine. Please provide the following information when requesting replacement parts:
  - Name of model i.e., ML-10, ML-15, ML-20, or ML-25 or name of accessory i.e., Standard Forks, Pipe Cradle, Extension Forks, Load Platform, Boom, or Rough Terrain Wheel Kit.
  - To be found on the manufacturer's plate fixed to the chassis of the machine or fixed to the accessory:
    - Serial Number
    - Year of Construction
  - Date of purchase of machine or accessory.
  - Part number from this Maintenance Manual.
  - Description from this Maintenance Manual.
  - Quantity required.
  - Purchase order number.
  - Company invoice address.
  - Delivery address with contact name and phone number at this address.
- The ToughLift® Material Lift has been designed to operate for 10 years, providing that it is maintained in accordance with the periodical maintenance and checks outlined in this section.

Maintenance Inspection Report

Instructions

- ❑ Make copies of this report to use for each inspection undertaken.
- ❑ Select the appropriate checklist(s) for the inspection(s) to be performed.
- ❑ Tick the appropriate box after each item is inspected i.e., P = Pass / F = Fail / R = Repaired & reinspected.
- ❑ Use the step-by-step procedures in this section to learn how to perform each inspection.
- ❑ If any inspection receives an "F", remove the machine from service, repair, and reinspect it. After a completed repair and reinspection tick the R box.

Model Name i.e., ML-10, ML-15, ML-20, or ML-25	
Model Serial Number (from plate on chassis)	

Removable Part	Fitted (✓)	Serial Number
Standard Forks		
Stabiliser - Left		N/A
Stabiliser - Right		N/A
Pipe Cradle - Left		
Pipe Cradle - Right		
Extension Fork - Left		
Extension Fork - Right		
Load Platform		
Boom		
Rough Terrain Wheel Kit		N/A

WARNING

Ensure the left and right stabiliser are fitted to an ML-20 and ML-25. The ML-20 and ML-25 MUST NOT be used without stabilisers.

Inspection Frequency	Inspection Procedures	Undertaken (✓)
Daily/Pre-Use	1	
3-Monthly	1 + 2	
Annually	1 + 2 + 3	

1: Daily/Pre-Use

Item Ref.	Activity	P	F	R
a	Inspect the Instruction Handbook, decals, and plates.			
b	Pre-operation inspection.			
c	Function tests.			
Comments:				

2: 3-Monthly

Item Ref.	Activity	P	F	R
a	Inspect all welds.			
b	Clean the mast columns.			
c	Check the winch operation.			
d	Carriage lock deployment and de-deployment.			
e	Inspect and lubricate the winch.			
Comments:				

3: Annually

Item Ref.	Activity	P	F	R
a	Inspect the mast assembly for wear.			
b	Test the mast safety brake.			
c	Replace the winch friction discs.			
d	Visual inspection and testing of all wheels and castors.			
e	Lubrication of the braked swivel castors on the splayed legs and the front leg swivel castors.			
f	Inspect the yellow powder coated fabrications.			
Comments:				

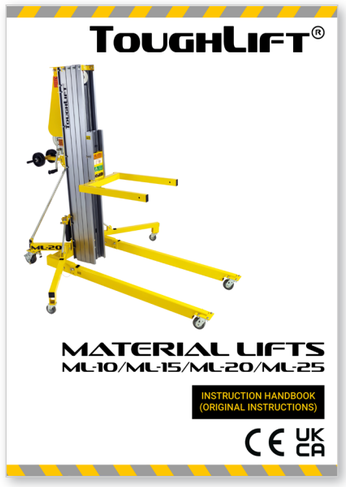
Date of Inspection:	
Machine Owned By:	
Inspector Name:	
Inspector Title:	
Inspector Company:	
Inspector Signature:	

How to Perform Each Inspection

1: Daily/Pre-Use

a. Inspect the Instruction Handbook, decals, and plates.

- ❑ The Instruction Handbook is stored in the document holder mounted on the back of the fixed mast column:
  - ♦ Check that the document holder is in position as shown in the image below.
  - ♦ Open the document holder by releasing the 2 clips on the top.
  - ♦ Check that the A5 Instruction Handbook shown in the image below is present.
  - ♦ Take the Instruction Handbook out of the document holder and check that each page is clearly legible.
  - ♦ Put the Instruction Handbook back in the document holder and close it.



- ❑ Referring to Section 9 of this Maintenance Manual ensure that all decals and manufacturer's plates are in place and legible.

Note:
Contact the manufacturer or your dealer for replacement document holder, Instruction Handbook, decals, or plates.

b. Pre-operation inspection

The Pre-Operation Inspection is a visual check performed by the operator of the ToughLift® Material Lift prior to each work shift. The inspection is designed to discover if anything is wrong with a machine before the operator performs the function tests. The inspection also identifies if any routine maintenance is required.

Note:
The operator should only inspect what they can see with the mast of the ToughLift® Material Lift lowered.

- ❑ Check the following fabrications and components for areas of damage, improperly installed or missing parts, and unauthorised modifications:
  - ♦ Mast columns.
  - ♦ Cable anchor.
  - ♦ Pulleys.
  - ♦ Cable (look for kinks, frays, and abrasions).
  - ♦ Winch and related components.
  - ♦ Chassis.
  - ♦ Front legs.
  - ♦ Stabilisers and latch plates (if fitted).
  - ♦ Carriage lock.
  - ♦ Wheels and castors (including Rough Terrain Wheel Kit, if fitted).
  - ♦ Nuts, bolts, and other fixings (in place and properly tightened).
  - ♦ Load handling attachments (as applicable): Standard Forks, Extension Forks, Load Platform, Pipe Cradle, and Boom.
- ❑ Check the entire machine for:
  - ♦ Dents or damage.
  - ♦ Corrosion or oxidation.
  - ♦ Cracks in welds or structural components.
- ❑ Ensure there is a minimum of 4 wraps of cable around the winch drum when the carriage is fully lowered.

c. Function tests

Undertaking the function tests on the following page is essential to the safe operation of a ToughLift® Material Lift. These tests are designed to identify any malfunctions before the machine is used.

If any malfunctions are identified, the machine must not be used, and must be tagged and removed from service until such time as it has been repaired by a trained, competent, and authorised maintenance engineer or technician.

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- Deploy each of the two front legs and ensure that they can be locked in position with the retaining pins attached to the machine.
- If fitted, deploy each of the two stabilisers and ensure that they are locked in position when the latch plates are released.
- Check that the machine is level by ensuring the bubble in the spirit level is within the black circle.
- Turn the winch handles 2 full turns anticlockwise (towards you) to release the pressure of the carriage against the carriage lock.
- Pull the spring-loaded carriage lock towards you, rotate clockwise, and release to latch in the fixed mast column.
- With the load handling attachment fitted to the carriage, raise the carriage by firmly grasping the winch handles and rotating them clockwise (away from you). The winch should operate smoothly, free of hesitation, or binding.
- Lower the carriage by firmly grasping the winch handles and rotating them anticlockwise (towards you). After lowering to the desired position, turn the winch handles clockwise (away from you) ¼ turn to set the brake. The winch should operate smoothly, free of hesitation, or binding.
- With the mast lowered, the swivel castor brakes applied, and on a level surface, using the handles try to push the machine to ensure that the brakes are fully functioning.

2: 3-Monthly

a. Inspect all welds

This is a visual inspection of all welds across the machine paying particular attention to the following areas:

- Winch.
- Loading wheels/push and steer handles adjustable mount bracket.
- Loading wheels/push and steer handles leg to cross bar.
- Chassis; splayed legs, front legs mount, and stabiliser mount.
- Front legs castor mounts.
- Stabilisers (if fitted): castor mount and stabiliser brace mount.
- Any load handling attachments fitted:
  - Standard Forks; all welds.
  - Boom; all welds.
- Rough Terrain Wheel Kit (if fitted); 'T' section weld.

The inspection is designed to identify any cracked or heavily corroded welds.

Section 5 – Periodical Maintenance & Checks /continued

b. Clean the mast columns

It is essential that the mast columns are kept clean to ensure that the machine operates as intended.

If the ToughLift® Material Lift is being used in very dirty conditions, the columns may need to be cleaned more often.

The recommended procedure is as follows:

- Raise the machine to full height so that all the mast columns are visible at the front and back of the mast.
- From the platform of a suitable Mobile Elevating Work Platform (MEWP), visually inspect the inner and outer channels of the columns for debris and/or other foreign material.
- Should any debris or foreign material be identified:
  - For dry debris, use a soft brush, starting at the carriage and top mast lifting column, working down to the fixed mast column.
  - For a general surface clean:
    - Use a soft cloth and either soap and water, or if the surface is greasy, a degreasing spray e.g., brake and clutch cleaner. **Note: DO NOT** get any brake and clutch cleaner on the yellow coated surfaces of the machine.
    - Start cleaning at the carriage and top mast lifting column, working down to the fixed mast column.

Note:

If, upon inspection, only the inner channels require cleaning, this cleaning can be undertaken from ground level.

WARNINGS

- **Do not place ladders or scaffolding on or against any part of the machine.**
- **Do not use ladders to undertake this procedure.**
- **Performing this procedure without the proper skills and tools could result in serious injury or death.**

c. Check the winch operation

1. Visually inspect all the winch components for damage or wear.
2. Fit either the Standard Forks or Boom to the carriage and add a load, ensuring that it is properly secured.
3. Raise the carriage and release the winch handles.
   Result: The winch should operate smoothly, free of hesitation or binding. The load should not lower when the winch handles are released.
4. Fully lower the carriage.
   Result: The winch should operate smoothly, free of hesitation or binding.

d. Carriage lock deployment and de-deployment.

It is essential that damage to the carriage lock is identified in order that the machine can be safely used and transported.

1. Fully lower the carriage.
2. Visually inspect the carriage lock for damage.
3. Pull the carriage lock towards you and rotate anticlockwise so that it locates over the carriage and release it. The carriage lock should pull and rotate smoothly.
4. Wind up the carriage until it engages with the carriage lock. Ensure the carriage lock stays in position over the carriage and prevents any movement of the carriage.

e. Inspect and lubricate the winch.

It is essential that the winch is properly maintained in order that the machine can operate safely and at optimal performance.

If the winch has excessive wear and/or does not operate smoothly, free of hesitation and binding, it is unsafe to use.

1. Carefully lubricate the following areas with Lithium EP2 Grease:
   a. The 2 pinion shaft bushes.
   b. Threads on the pinion shaft, under the pinion gear.
2. Carefully lubricate both pivot points on each ratchet pawl with SAE 30 Motor Oil.
3. Measure each friction disk for wear and replace **both** friction disks if the thickness measured is less than 1.5 mm.
4. Measure both pinion shaft bushes for wear and replace **both** if the wall thickness measurements are less than 3.1 mm.
5. Lubricate the drum pivot bolt with a thin layer of Lithium EP2 Grease. Tighten the drum bolt using a torque spanner set to 27Nm (19.9ft-lbs). **DO NOT** over tighten.

WARNING
DO NOT get any Lithium EP2 Grease or SAE 30 Motor Oil on the brake friction disks or ratchet gears.

3: Annually

a. Inspect the mast assembly for wear.

It is essential that excessive or unusual wear in the mast assembly is identified in order that the machine can operate safely.

If the mast assembly has excessive wear and/or does not operate smoothly, free of hesitation and binding, the machine must not be used.

1. Remove the load handling attachment from the carriage.
2. If the carriage lock is engaged, pull it towards you and rotate clockwise to latch in the fixed mast column.

...continued over the page

3. Inspect the inner channel, pulley wheel, pulley wheel guard, and cable of the first lifting column.
4. Wind up the carriage and first lifting column to inspect the outer channel of the first lifting column and the rollers, cable, and the inner channel of:
   a. If the model is an ML-10, the fixed mast column.
   b. If the model is an ML-15, ML-20, or ML-25, the second lifting column.

Note:
Repeat Step 4 (model dependent) until all the mast columns, rollers, and cable have been inspected.

b. Check the operation of the lifting column locking mechanism.

It is essential that the lifting column locking mechanism is properly maintained in order that the machine can operate at optimal performance.

1. Ensure that the machine has the front legs deployed and locked in position, the stabilisers (if fitted) deployed and locked in position, and the braked swivel castors locked.
2. Fit either the Standard Forks or Boom to the carriage and add a 100kg load.
3. Wind up the mast to full height ensuring that each lifting column can reach full height and that the lifting columns raise in sequence working from the front of the mast (load side) to the back. If any columns cannot reach full height or the columns do not raise in sequence, the lifting column locking mechanism on the affected or adjacent lifting column may need to be replaced.

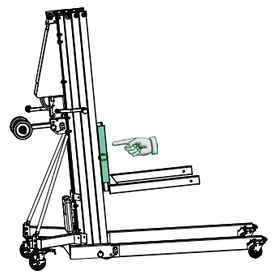
Note:
The ML-10 is not fitted with the lifting column locking mechanism as it only has one lifting column.

c. Test the mast safety brake.

It is essential that a damaged or faulty mast safety braking system be identified in order that the machine can operate safely. An unsafe working condition exists if the system is damaged or faulty and does not allow the mast to raise or lower, free of hesitation and binding.

WARNING
Beware of sharp edges. ALWAYS wear suitable protective gloves when performing this procedure.

1. Fit either the Standard Forks or Boom to the carriage, but do not add any load.
2. Using the winch normally, raise the carriage until it is at a suitable height e.g., waist height, up the first lifting column as shown in the graphic below.



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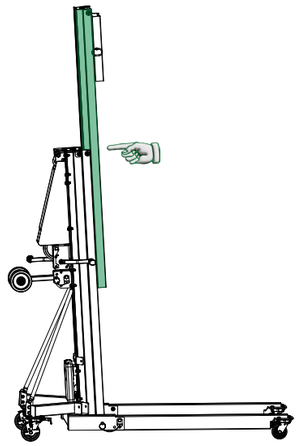
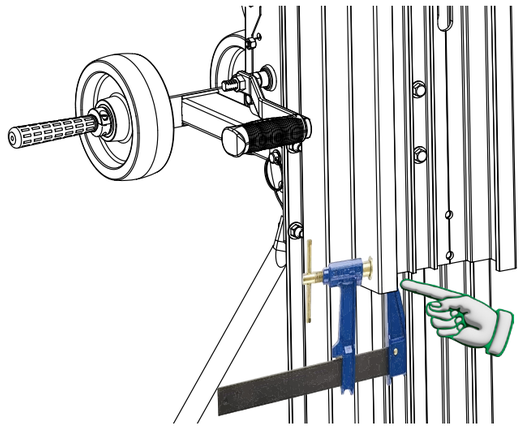
3. Grasp the bottom of the Standard Forks or Boom, lift around 13cm, and then drop.
   Result: The safety brake should engage, and the carriage should stop within 8cm from the drop height.
4. Manually lift the Standard Forks or Boom approximately 4cm to disengage the safety brake.

WARNING
NEVER stand directly under the carriage or load handling attachment.

5. Remove the Standard Forks or Boom from the carriage.
6. Operate the winch until the first lifting column is halfway up the adjacent column as shown in the graphic below.



7. Attach an F-clamp to the bottom of the first lifting column as shown in the graphic below. Grasp the long handle of the clamp and lift it approximately 13cm and then let go of the handle.
   Result: The safety brake should engage, and the first lifting column should stop within 8cm of the drop height.



WARNING
NEVER stand directly under the mast column, carriage, or load handling attachment.

8. Holding the F-clamp, lift the first lifting column approximately 4cm to disengage the safety brake.
9. For ML-15, ML-20, and ML-25 models, repeat Steps 6-8 until all mast lifting columns have been tested.

c. Replace the winch friction discs.

It is essential that the winch is properly maintained in order that the machine can operate safely and at optimal performance.

If the winch has excessive wear and/or does not operate smoothly, free of hesitation and binding, it is unsafe to use.

To replace the winch friction discs, follow the procedure below.

Note:
Refer to the exploded drawing of the winch on Page 50 as a useful guide to the terminology used in the procedure below.

1. Start with the mast vertical.
2. Apply the brakes to the swivel castors on the splayed legs.
3. Remove the cable guard from the back of the fixed mast column.
4. Lower the carriage until the lifting cable becomes loose and unwind all the cable from the winch drum.
5. Slightly loosen the locking nut on the lower cover bolt.
6. Remove the drum pivot locking nut.
7. Hold the drum and winch gear cover with your left hand while removing the drum pivot bolt with your right.
8. Lift the drum out of the winch housing and place on the floor.
9. Remove the locking nut from the right-side handle and remove the handle.
10. Remove the 2 hexagonal jam nuts from the right side of the pinion shaft. **Helpful tip:** To speed up the removal of the hexagonal jam nuts you can hold the nut with a spanner and wind the handle on the left side.
11. Remove the e-clip from the inside of the winch housing on the left side of the pinion shaft.
12. Gently lever the ratchet pawls off the ratchet gear and gripping the handle at the left of the winch, pull the pinion shaft to the left until you have created space between the right end of the pinion shaft and the right inner side of the winch housing.
13. Slide the pinion plate, right-side friction disc, ratchet gear, and left-side friction disc off the right side of the pinion shaft.
14. Unscrew the pinion gear and take off the right end of the pinion shaft.
15. Remove the pinion shaft from the winch housing.
16. Dispose of the old friction discs.
17. Clean all the parts removed from the winch.
18. Insert the pinion shaft removed in Step 15 and add the pinion gear, new left-side friction disc, ratchet gear, new right-side friction disc, and pinion plate onto the pinion shaft.

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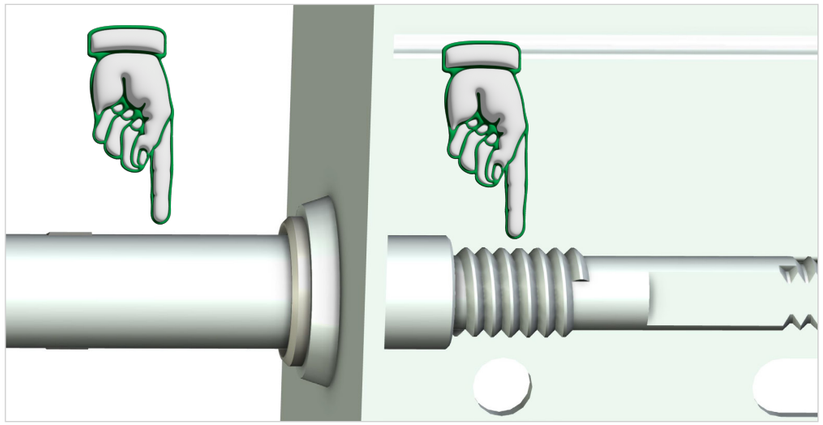
19. Apply a small amount of Lithium EP2 Grease to the pinion shaft as shown in the graphic below.



20. Screw the pinion gear back onto the threaded section of the pinion shaft.

WARNING
Ensure that you do not get any grease on the friction disc side of the pinion gear or the left-side friction disc.

21. Slide the pinion shaft all the way into the winch housing ensuring the ratchet pawls are engaging with the ratchet gear.
22. Replace the e-clip on the inside of the winch housing on the left side of the pinion shaft which was removed in Step 11.
23. Replace the 2 hexagonal jam nuts on the right side of the pinion shaft. **Helpful tip:** To speed up the fitting of these nuts you can hold the nut with a spanner and wind the handle on the left side.
24. Refit the right-side handle with the new locking nut supplied in the **Friction Disc Kit (Part Number: 630067)**. **Note:** The right-side handle should be refitted at a 180° angle to the left-side handle.
25. Add a little SAE 30 Motor Oil to both pivot points on each ratchet pawl.
26. Before replacing the winch drum, add a little Lithium EP2 Grease to the drum pivot points at each side.
27. Lower the winch drum back into the winch housing ensuring that the drum gear meshes with the pinion gear.
28. Insert the drum pivot bolt through the winch housing and winch drum.
29. Refit the winch gear cover.
30. Fit the new drum pivot locking nut supplied in the **Friction Disc Kit (Part Number: 630067)** and torque to 27Nm (19.9ft-lbs). Over tightening the drum pivot locking nut may cause damage to the frame spacer and prevent the drum from spinning freely. **Note:** Ensure that the head of the drum pivot bolt is on the drum gear side of the winch.
31. Fit the new lower cover locking nut supplied in the **Friction Disc Kit (Part Number: 630067)** and torque to 27Nm (19.9ft-lbs).

32. While holding the cable tight on the drum, rotate the drum and spool the cable onto the drum evenly. **Note:** Ensure that there are at least four wraps of cable on the winch drum and note that the cable out to the first pulley at the top of the mast must be located at the front of the winch drum i.e., the side closest to you as you stand behind the winch.
33. Check the proper operation of the winch by winding the carriage up and down the first lifting column.
34. Secure a test load to the Standard Forks or Boom and raise and lower to ensure that the machine is operating in accordance with the Instruction Handbook.
35. Replace the cable guard.

WARNING
DO NOT get any Lithium EP2 Grease or SAE 30 Motor Oil on the brake friction disks or ratchet gears.

d. Visual inspection and testing of all wheels and castors.

1. Visually inspect the following for cuts, cracks, unusual wear, or any other damage:
   a. Braked swivel castors on the splayed legs.
   b. Front leg swivel castors.
   c. Transport wheels mounted at the back of the front legs (with the front legs lifted into, and locked in the transport position).
   d. Loading wheels.
   e. If stabilisers are fitted to the machine, stabiliser swivel castors.
   f. If the Rough Terrain Wheel Kit accessory is fitted to the machine, rough terrain wheels.
2. With the machine on a level clean surface, push the machine and ensure that the:
   a. The braked swivel castors on the splayed legs roll and swivel smoothly.
   b. With the front legs lowered that the swivel castors on the front legs roll and swivel smoothly.
   c. With the front legs and stabilisers (if fitted) lifted into the transport position that the front leg transport wheels roll smoothly.
   d. With the stabilisers deployed (if fitted), that the swivel castors on the stabilisers roll and swivel smoothly.
   e. If fitted, that the rough terrain wheels on the Rough Terrain Wheel Kit roll smoothly.
3. Spin the loading wheels by hand and ensure that they roll smoothly.
4. Apply the brake to each of the braked swivel castors on the splayed legs and try to push the machine. If the castor wheel can roll, investigate the reason why and undertake the necessary repair which may require the replacement of the castor.
5. Apply the pedal operated straight-line lock to each of the braked swivel castors and ensure that the castors are firmly locked and remain in a straight line when you push the machine.

e. Lubrication of the braked swivel castors on the splayed legs and the front leg swivel castors.

Regular lubrication of the braked swivel castors on the splayed legs and the front leg swivel castors will ensure the high performance of the machine and will extend the life of these castors.

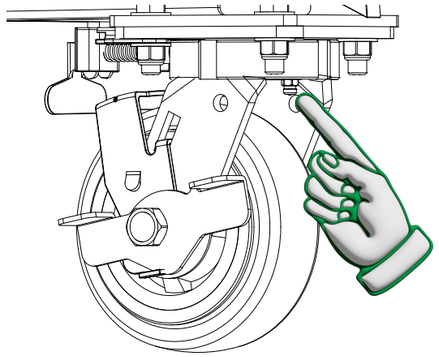
If the ToughLift® Material Lift has been operated in extremely dirty conditions it is recommended that the lubrication of the braked swivel castors on the splayed legs and the front leg swivel castors be carried out more frequently.

The castors are greased as follows:

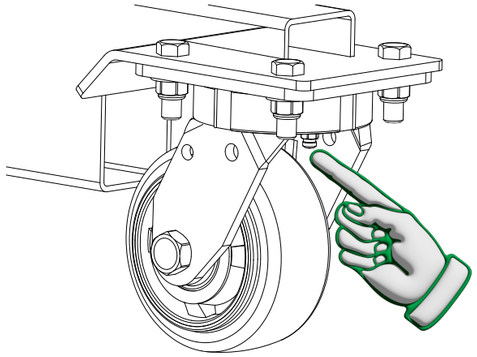
1. Fill a grease gun with Lithium EP2 Grease.
2. Attach a dual handle grease gun coupler (M6-M12), as shown in the image below, to the grease nipple.
3. Pump in the grease until you see it coming out of the bearing gap.

Note:
As shown in the graphics below there is one grease nipple on each braked swivel castor and on each front leg swivel castor to grease the swivel bearings. Each castor is fitted with sealed bearings in the axle which do not require greasing.

Braked swivel castors



Front leg swivel castors



Grease gun coupler

Helpful tip:
It is easier to grease the front leg swivel castors with the front legs lifted up into the transport position.

f. Inspect the yellow powder coated steel fabrications.

Inspecting the powder coated finish of the steel fabrications of the machine is essential to its safe operation and long service life.

An unsafe working condition exists if there is significant damage to the powder coated surfaces that are not corrected.

Re-coating or replacement of the steel fabrication will be required if blistering, rusting, or peeling are identified by visual inspection.

Issue:
The machine has been laid down without the carriage lock engaged and the carriage and first lifting column have slid out of alignment.

Solution:

1. Slowly and carefully slide each mast section back into the transport position. **Note:** You may need to release the mast safety brake in the carriage and in each lifting column. For further guidance, refer to Section 7.4 in this Maintenance Manual.
2. Undertake a visual inspection to ensure that the cable is still properly routed over each pulley wheel.
3. Lift the machine up so that the mast is vertical.
4. Using the winch, raise the mast to full height and then lower.
5. Engage the carriage lock by releasing and rotating anticlockwise.
6. Using the winch, wind up the carriage until it engages with the carriage lock.
7. You can now lay the machine back down for transport and the mast sections will be held in place.

Issue:
The winch cable has become crossed on the winch drum.

Solution:

1. Remove the cable guard, taking care to retain the fixings.
2. Unwind the whole cable until it is loose.
3. **Wearing suitable safety gloves,** hold the cable whilst slowly winding the winch clockwise, and using your hand to guide the cable to lay neatly on the winch drum.
4. When the winch starts to move the carriage, take your hand off the cable.
5. Replace the cable guard removed in Step 1.
6. You can now use the machine normally in accordance with the Instruction Handbook.

Issue:
The cable has become loose and the mast braking system has engaged locking the movement of the mast.

Solution:
Wind the winch to take up the slack in the cable and the mast brake will release. You can then use the machine normally in accordance with the Instruction Handbook.

7.1 Safety & instructions

WARNINGS

- Machine repairs shall only be undertaken by a person trained and qualified in the maintenance of a ToughLift® Material Lift and should take place in a suitably equipped workshop.
- Immediately tag and remove from service any damaged or malfunctioning ToughLift® Material Lift.
- Repair any machine damage or malfunction before operating the machine.
- Maintenance engineers and technicians must read, understand, and adhere to the safety rules and operating instructions contained in the ToughLift® Material Lifts Instruction Handbook and in this Maintenance Manual before undertaking any machine repairs.
- Ensure the workshop has a firm level floor.
- Ensure that you have prepared the necessary work area, tools, and components required for the repairs being undertaken on a machine.
- Use only ToughLift® approved replacement parts.
- Read each procedure carefully and completely **BEFORE** undertaking each repair.
- Use proper lifting techniques to tip the machine, or to fit or remove load handling attachments to or from the carriage.

Instructions

- Select the appropriate repair procedure from this section after troubleshooting the issue with the ToughLift® Material Lift.
- Perform disassembly procedures to the point where repairs can be undertaken.
- To reassemble, perform the disassembly steps in reverse order.
- The torque settings for the fixings on the machine and accessories are shown in the tables on the page opposite.

7.1 Safety & instructions /continued

TORQUE SETTINGS REFERENCE GUIDE (304 STAINLESS-STEEL IMPERIAL FIXING SIZES)				
Note: *This chart is designed to act as a guide only.*				
			Torque Setting - A2-70 - Dry	
Nominal Diameter (Inches)	**Thread Length (Inches)**	**Threads Per Inch**	**Ft-lbs**	**Nm**
3/8	1-1/2	16	20.65	28
3/8	1-1/4	16	20.65	28
3/8	1	16	20.65	28
3/8	3/4	16	20.65	28
1/2	1-3/8	13	48.68	66
1/2	1-3/16	13	48.68	66
1/2	1	13	48.68	66
1/2	5/8	13	48.68	66

TORQUE SETTINGS REFERENCE GUIDE (304 STAINLESS-STEEL METRIC FIXING SIZES)				
Note: *This chart is designed to act as a guide only.*				
			Torque Setting - Dry	
Nominal Diameter (mm)	**Thread Length (mm)**	**Class**	**Ft-lbs**	**Nm**
4	10	A2-70	1.48	2
5	12	A2-70	2.95	4
16	44	A2-70	103.26	140
18	31	A2-70	143.82	195

Note:

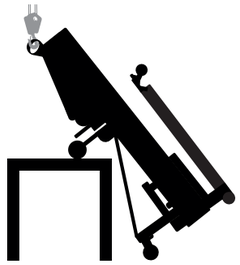
Unless alternative torque settings are specified elsewhere in this Maintenance Manual, use the torque settings specified in the table above.

7.2 How to remove the chassis

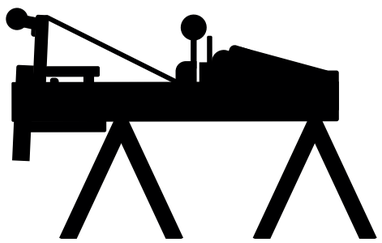
WARNINGS

- **This procedure requires 2 maintenance engineers or technicians; one to operate the hoist and the other to manually guide the machine into place.**
- **ALWAYS undertake a risk assessment.**

1. Lock the swivel castors on the splayed legs outbound of the chassis in a straight line and apply the brakes.
2. Remove the Standard Forks or Boom from the carriage.
3. Fully lower the carriage and deploy the carriage lock.
4. If fitted, remove each stabiliser by removing the bolt from the mount on the splayed leg and the bolt from the stabiliser brace mount at the rear of the fixed mast column.
5. Deploy the loading wheels into the horizontal transport position and lock in place with the retaining pin. **Note:** It is recommended to pin the loading wheels mount into the second hole from the top of the bracket on the winch mount plate.
6. Attach an adequately rated lifting hook with safety latch, strap, or chain from an adequately rated overhead crane to the hoisting and winching anchor located above the cable guard at the back of the mast.
7. Place a structure capable of supporting the machine behind the fixed mast column and carefully lower the machine onto the structure as shown below. **Note: DO NOT** completely remove the lifting hook with safety latch, strap, or chain from the hoisting and winching anchor in case the machine



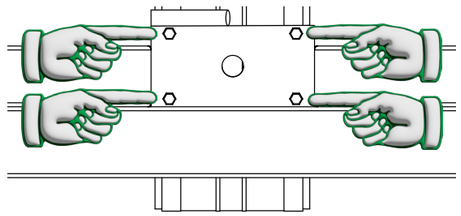
should fall.
8. Remove each of the front legs by removing the bolt and retaining pin.
9. Prepare 2 trestles or other suitable structure(s).
10. Lift the machine off the ground with the hoist and attach an additional lifting strap through and around the mast braces.
11. Lift the machine and lay it down with the front of the mast on the trestles as shown in the graphic below. **Note:** The trestles should be carrying the weight of the machine and the hoist can now be disconnected.



12. Remove the document holder by opening and unscrewing the 3 fixings.
13. Remove the bolt from each mast brace mounting on the splayed legs.
14. Remove the carriage lock threaded rod from the mounting tube on the chassis.

7.2 How to remove the chassis /continued

15. Remove the 4 bolts shown in the graphic below. **Note:** One of the maintenance engineers should support the chassis as these last fixings are removed by the other maintenance engineer.

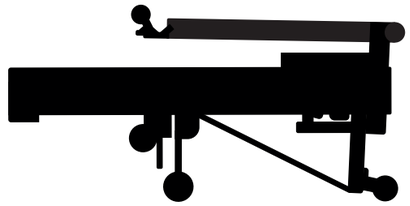


16. Remove the chassis from the machine.
17. Follow the steps above in reverse order to replace the chassis or fit a replacement. **Note:** When fitting the new chassis, ensure that the mast and the chassis are square with each other.

7.3 How to disassemble the mast

Note:
Removal of the chassis is only necessary when the fixed mast column is to be removed. Refer to **Section 7.2 How to remove the chassis**.

1. Lock the swivel castors on the splayed legs outbound of the chassis in a straight line and apply the brakes.
2. Remove the Standard Forks or Boom from the carriage.
3. Fully lower the carriage and engage the carriage lock.
4. Ensure the front legs are raised into the transport position and locked in place with the retaining pin.
5. If fitted, ensure the stabilisers are raised into the transport position.
6. If fitted, remove the Rough Terrain Wheel Kit.
7. Remove the cable guard.
8. Remove the 2 bolts from the cable anchor on the winch drum.
9. Remove all the cable from the winch drum.
10. Deploy the loading wheels into the horizontal transport position and lock in place with the retaining pin. **Note:** It is recommended to pin the loading wheels mount into the second hole from the top of the bracket on the winch mount plate.
11. Either manually, or using an overhead crane connected to the hoisting and winching anchor at the top of the fixed mast column, tip the machine backwards and lay on the floor as shown in the graphic below.



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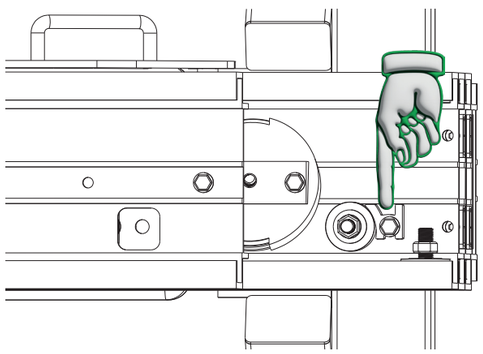
7.3 How to disassemble the mast /continued

WARNINGS

- ❑ **Use proper lifting techniques when removing the Standard Forks or Boom from the carriage and when tipping the machine backwards to the horizontal position.**
- ❑ **ALWAYS wear protective gloves when handling the mast cable.**
- ❑ **ALWAYS undertake a risk assessment.**

12. Remove the bolts from the cable anchor at the top of the first lifting column.
13. Remove all the cable from the mast by pulling on the cable anchor removed in Step 12 above.
14. Slide the carriage approximately 30cm up the first lifting column to expose the carriage down stop mounting bolt attached to the bottom end of the first lifting column. Remove the bolt and the down stop.



15. To release the carriage safety brake:
    a. Insert an Allen key through the slotted access hole in the carriage, as shown in Figure 1 below.
    b. Locate the Allen key on top of the safety brake roller, as shown in Figure 2 below.
    c. Pull the Allen key back against the safety brake roller and the safety brake is released.

Figure 1

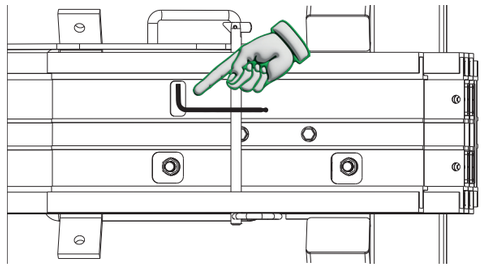
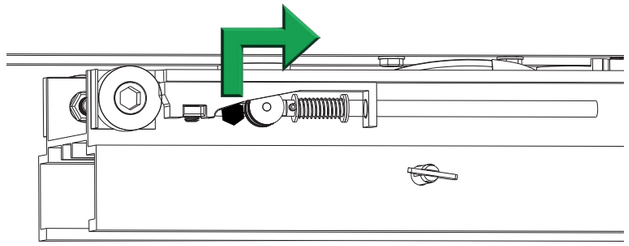


Figure 2

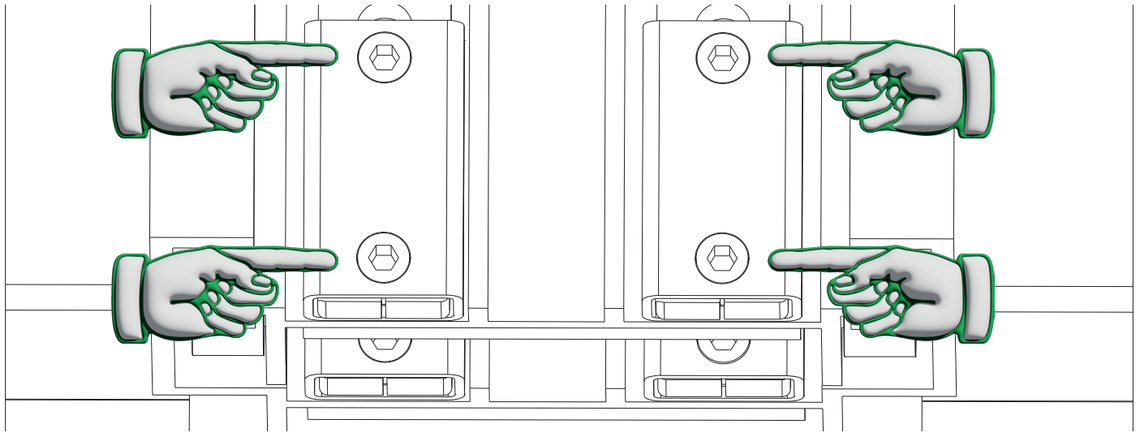


Note:
You can also release the mast safety brake using a special tool. The **Mast safety brake release tool accessory (Part Number: 630085)** is available to purchase from the manufacturer or your ToughLift® Material Lifts dealer. See Section 7.4 of this Maintenance Manual for further information.

16. Remove the carriage by sliding it out of the bottom of the mast while holding the safety brake roller in the released position with Allen key.

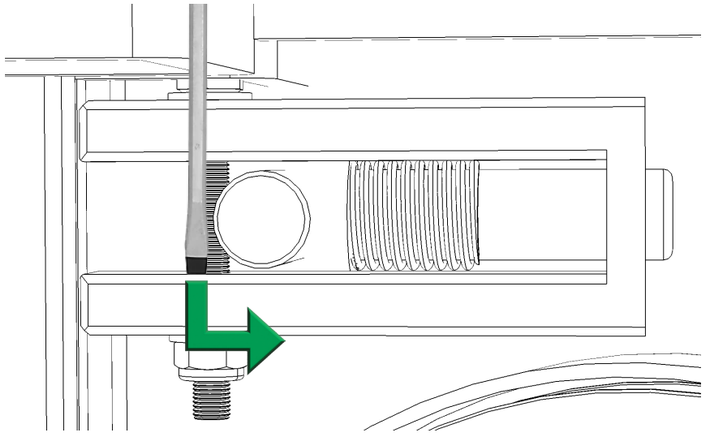
7.3 How to disassemble the mast /continued

17. Slide the first lifting column up approximately 15 cm to expose the 2 down stop shoulder bolts attached to the bottom end of the second lifting column if you are working on an ML-15, ML-20, or ML-25, or the fixed mast column if working on an ML-10. Remove the shoulder bolts and the down stops.



18. Insert an Allen key through the slotted access hole in the first lifting column and pull on the safety brake roller to release the mast safety brake.
19. Remove the first lifting column by sliding it out of the bottom of the mast while holding the safety brake roller in the released position with the Allen key.
20. For models ML-15, ML-20, and ML-25, repeat steps 17 to 19 for the remaining column(s).

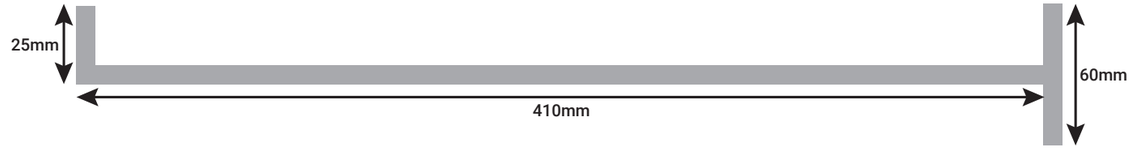
Note: The inner lifting columns of the ML-15, ML-20, and ML-25 models are fitted with a column locking mechanism. To disassemble the mast, you need to release the column lock which can be facilitated by the insertion of a large screwdriver into the top of the mast and against each column lock release rod applying a sideways force to disengage the lock as shown in the graphic below.



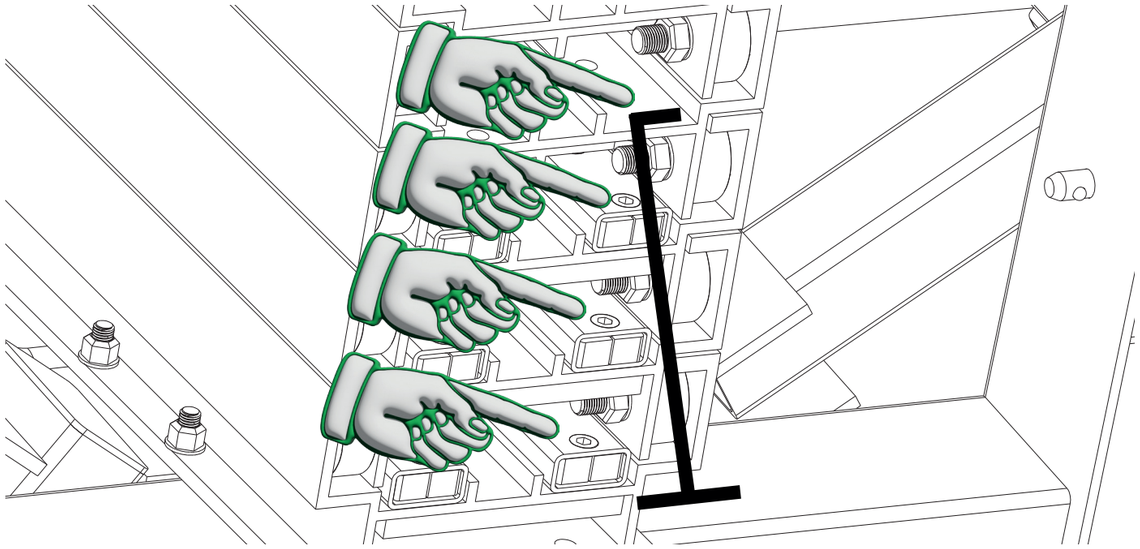
7.4 How to release the mast safety brake when servicing the mast

The mast safety braking system may engage when the machine is tilted horizontally if the carriage lock is not deployed. When the mast brake is engaged, the mast columns can extend but cannot retract. If the safety braking system engages while you are servicing the mast, use one of the following methods below to release the brake.

1. This method allows you to release each column in sequence, starting at the carriage and then removing the lifting columns one at a time. Refer to **Section 7.3 How to disassemble the mast**.
2. This method allows you to release any column in the mast assembly regardless of its position but requires a custom tool. The **Mast safety brake release tool accessory (Part Number: 630085)** is available to purchase from the manufacturer or your ToughLift® Material Lifts dealer.



Insert the tool from the bottom of the column into the safety brake access slot in the inner channel of the column as indicated in the graphic below. Reach through the far upper end of the slot and position the short end of the tool above the safety brake roller. Slide the carriage or lifting column away from the base of the mast while pulling back on the tool.

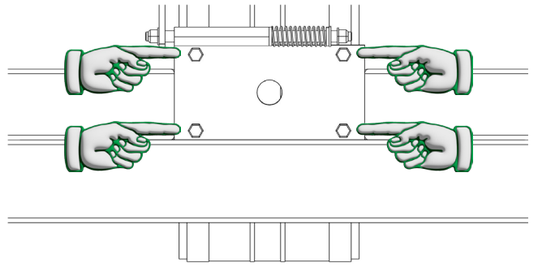


Note: The inner lifting columns of the ML-15, ML-20, and ML-25 models are fitted with a column locking mechanism. To disassemble the mast, you need to release the column lock which can be facilitated by the insertion of a large screwdriver into the top of the mast and against each column lock release rod applying a sideways force to disengage the lock.

7.5 How to assemble the mast

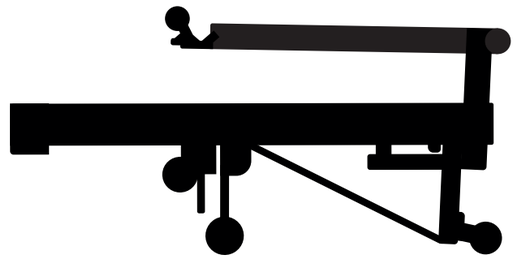
Refer to the graphic on Page 56 of this Maintenance Manual to see the routing of the cable in the mast assembly.

1. Inspect all the mast component parts for wear and damage and replace as necessary.
2. Clean the carriage, mast columns, pulley wheels, pulley wheel guards, rollers, mast safety brake assemblies, and, where fitted column locks and curved release wedges with a clean, soft cloth and either soap and water or if greasy, a degreasing spray e.g., brake and clutch cleaner.
3. If the fixed mast column is not attached to the chassis with the 4 fixing bolts, position the fixed mast column on a bench or trestles capable of supporting the weight of the machine once assembled. Ensure the fixed mast column is open side up and level. Bolt the chassis to the fixed mast column as shown in the graphic below. If the carriage lock is not fixed to the chassis, this can also be reassembled to the tube on the chassis and then the carriage lock can be latched in the fixed mast column.



Note:

If the fixed mast column is still attached to the chassis with the 4 fixing bolts you can lay the machine on the floor so that it is supported by the loading wheels and braked swivel castors locked outbound of the chassis in a straight line with brakes applied as shown in the graphic below.



4. Install all the column assembly components (removed during the disassembly in Section 7.3) except for the column down stops. Apply a small amount of Lithium EP2 Grease between the roller bolt head and the inside of the roller.
5. Slide the first of the lifting column(s) into the fixed mast column from the bottom (chassis end of the mast). Stop inserting the lifting column when the top of the up stop is level with the bottom edge of the fixed mast column.
6. Repeat Steps 4 and 5 for the remaining lifting column(s), but **DO NOT** install the carriage.

Note:

The cable is installed after all the columns have been assembled.

...continued over the page

7.5 How to assemble the mast /continued

7. Attach the swaged end of the cable (with the loop) to the cable anchor at the top of the first (front) lifting column.
8. Feed the other end of the cable through the box section (web) of the carriage into the pulley and then push the cable through the pulley until it comes out of the back of the carriage.

WARNING
ALWAYS wear suitable protective gloves when handling the cable.

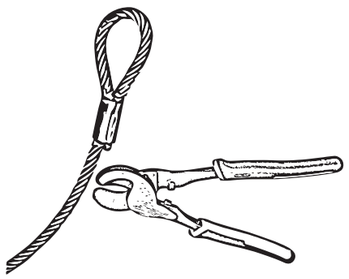
9. Insert the carriage into the bottom end of the top lifting column. Hold the carriage in place and pull the cable up to the top of the top lifting column, leaving enough slack to feed the cable through the next pulley.
10. Push the cable through the exposed portion of the pulley at the top of the column until the cable reaches the pulley at the bottom of the column.
11. Route the cable into and around the lower pulley.
12. Push the cable between the two mast sections until it comes out of the top of the column.
13. Repeat steps 10 to 12 for the remaining column(s).
14. Slide all the columns forward until you can install the column stops. **DO NOT** slide the columns forward any farther than necessary. **Note:** Ensure that you keep the cable taut at all times.
15. Refit the column down stops removed during the disassembly of the mast. **Note:** Ensure that the shoulder bolts have Loctite® removable thread sealant applied to the threads, and that all fixings have been securely tightened.
16. Using an adequately rated overhead crane connected to the hoisting and winching anchor at the top of the fixed mast column, lift the machine and guide the chassis into position on a firm level surface with the mast in the vertical position. **Note:** In the absence of a crane or hoist you could consider lifting the machine into the vertical position with 2 people. Ensure that the braked swivel castors are locked in a straight line with the brakes applied. **ALWAYS** undertake a risk assessment.
17. Attach the cable to the winch and be sure the cable is routed correctly.
18. Raise the machine to full height to release the mast safety brakes (and column locks, if fitted) to verify the proper operation of the machine.
19. Replace the cable guard removed during the disassembly of the mast.

7.6 How to replace the lifting cable using the Cable Coupler accessory

WARNING
ALWAYS wear suitable protective gloves when handling the cable.

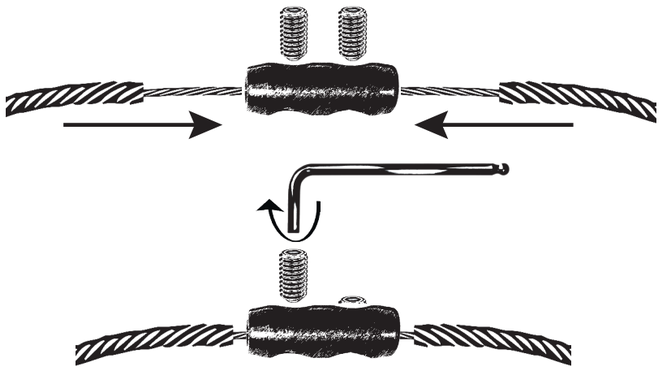
Note:
All ToughLift® Material Lift replacement cables come with one pre-swaged end with a loop that attaches to, and terminates at the top of the first lifting column (front of the mast) and one soldered end that terminates at the winch.

1. Ensure the machine is vertical.
2. Remove the Standard Forks or Boom from the carriage.
3. Fully lower the carriage and engage the carriage lock.
4. Remove the retaining bolt from the eyelet end of the cable which is fixed to the cable anchor bracket at the top of the first lifting column (front of the mast) and cut the eyelet off below the copper sleeve.



5. Unwind the outer strands of the cable and trim them off leaving an 8mm length of the core as shown in the graphic below. After cutting off the soldered part from the open end of the new cable, **NOT** on the end of the new cable with the loop, repeat the process of unwinding the outer strands of the cable and trimming them off leaving an 8mm length of the core of the new cable exposed.

6. As shown in the graphic below, insert the core of the old and new cable into each end of the **Cable Coupler accessory (Part Number: 630073)** and, using an Allen key, fully tighten the set screws.



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7.6 How to replace the lifting cable using the Cable Coupler accessory /continued

WARNING
The Cable Coupler is intended for cable replacement only. DO NOT use it as a load carrying cable splice.

7. Wrap a **single** smooth layer of high adhesive electrical tape over the joint i.e., just onto the full old and new cable at each end of the Cable Coupler, and over the Cable Coupler, as shown in the graphic below.

WARNING
DO NOT apply more than a single layer of tape, and ensure that the tape is properly overlapped and stuck down at each end of the Cable Coupler. Failure to follow this guidance will result in the cable jamming in the mast mechanism as you pull it through.

8. Remove the cable guard.
9. Remove the 2 bolts from the cable anchor on the winch drum.
10. Remove all the cable from the winch drum.
11. Pull on the old cable from the winch while feeding the new cable through the machine from the front of the mast.

    Note: If the cable gets caught as you are pulling it through the columns and pulleys, avoid pulling too hard as you may break the connection between the two cables. Try pulling the cable back and forth until the cable pulls freely.
12. When the taped joint appears at the winch, remove the tape, loosen the set screws in the Cable Coupler, and remove and dispose of the old cable.
13. Bolt the swaged end of the new cable with the loop to the cable anchor bracket at the top of the first lifting column (front of the mast).
14. Cut off the frayed end of the new cable at the winch, clean, dip the end around 10mm into a can of lead-free soldering flux paste, and then into some molten solder to fuse the end of the cable.

WARNING
ALWAYS wear suitable PPE when undertaking the fusing of the end of a cable. As a minimum you must wear heat resistant gloves and safety goggles. ALWAYS undertake a risk assessment.

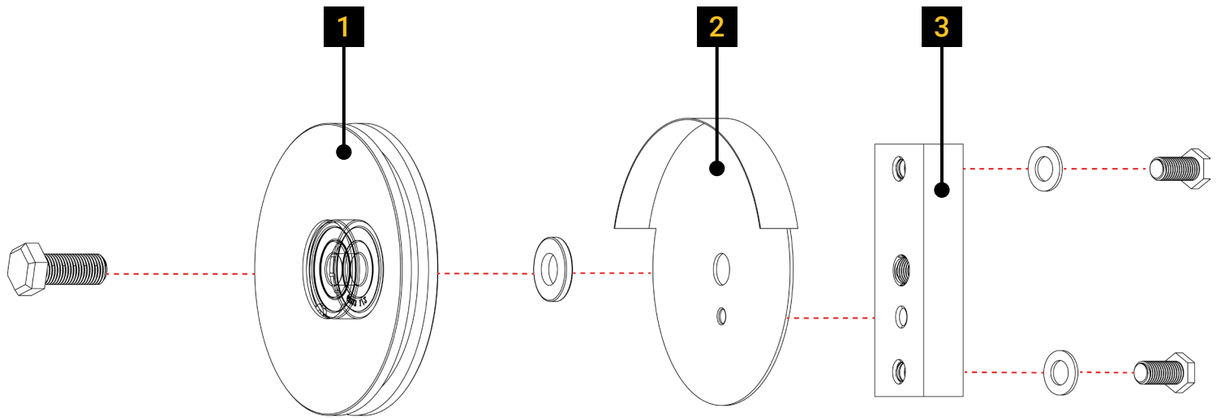
15. After cooling, bolt the cable to the winch drum using the cable anchor removed in Step 9.

    Note: Torque each nut to 5Nm (3.7ft-lbs) and ensure that there are the same number of threads protruding through the nut on each of the 2 bolts.
16. Wind the new cable evenly onto the winch drum.

    Note: Ensure that there are at least four wraps of cable on the winch drum.
17. Fully raise and lower the carriage without a load to check for proper operation. The carriage should raise and lower smoothly.
18. Fully raise and lower the carriage again with a load and check for proper operation. The carriage should raise and lower smoothly.
19. Replace the cable guard removed in Step 8.

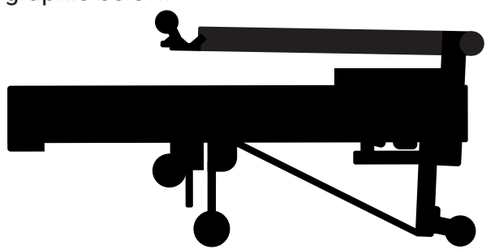
7.7 How to replace an inner lifting pulley wheel with the mast assembled

Note:
Refer to the pulley assembly exploded drawing below for the location of components and terminology used in this section.



1 Inner pulley wheel
2 Inner pulley wheel guard
3 Inner pulley mount

1. Lock the swivel castors on the splayed legs outbound of the chassis in a straight line and apply the brakes.
2. Remove the Standard Forks or Boom from the carriage.
3. Fully lower the carriage and engage the carriage lock.
4. Remove the cable guard.
5. Unwind all the cable from the winch drum.
6. Ensure the front legs are raised into the transport position and locked in place with the retaining pin.
7. If fitted, ensure the stabilisers are raised into the transport position.
8. If fitted, remove the Rough Terrain Wheel Kit.
9. Deploy the loading wheels into the horizontal transport position and lock in place with the retaining pin. **Note:** It is recommended to pin the loading wheels mount into the second hole from the top of the bracket on the winch mount plate.
10. Either manually, or using an overhead crane connected to the hoisting and winching anchor at the top of the fixed mast column, tip the machine backwards and lay on the floor as shown in the graphic below.



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7.7 How to replace an inner lifting pulley wheel with the mast assembled /continued

11. Remove either the carriage down stop mounting bolt shown in Figure 1 below if replacing the carriage pulley wheel, or if the pulley to be replaced is in one of the columns, remove the 2 column down stops (4 bolts – 2 in each) as shown in Figure 2 below from the column and slowly (so that the mast brake does not engage) slide the column down 30-40cm.

Figure 1

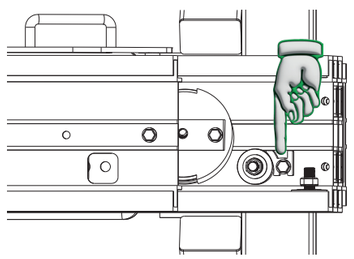
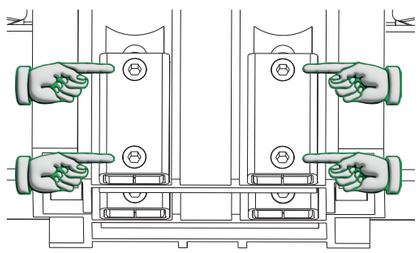


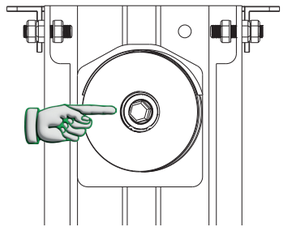
Figure 2



Notes:

- If the down stops are removed and the cable is loose you may be able to move the mast columns up or down i.e., left to right with the mast horizontal.
- The inner lifting columns of the ML-15, ML-20, and ML-25 models are fitted with a column locking mechanism. To disassemble the mast, you need to release the column lock which can be facilitated by the insertion of a large screwdriver into the top of the mast and against each column lock release rod applying a sideways force to disengage the lock as shown in the graphic on Page 35.

12. If the pulley to be replaced is in the top of the mast, this is now easily accessible on the upper side of the column at the top of the mast. If the pulley to be replaced is a pulley in the bottom of the mast, this is accessed on the underside of the column at the bottom of the mast.
13. Remove the pulley mount bolt from the centre of the pulley wheel.



14. Remove the pulley wheel. **Note:** If any damage to the pulley wheel cover or pulley mount block is identified, you will need to remove the complete pulley assembly by removing the 2 bolts which fix the pulley mount to the mast column. Take a note of the location of the spacer when disassembling the pulley assembly. If the pulley mount block must be removed apply Loctite® removable thread sealant to the 2 bolts before fitting the block back to the mast column.
15. Install the cable onto the new pulley.
16. Apply Loctite® removable thread sealant 3 threads down and below to the threaded hole for the pulley mount bolt in the pulley mount block and install the bolt through the new pulley wheel, spacer, and pulley wheel guard into the pulley mount block and tighten.
17. Check that the pulley wheel spins freely after reassembly.
18. Keeping the cable pulled tight, slide the column back up 30-40cm, and replace the carriage and/or column down stops removed in Step 11.

7.7 How to replace an inner lifting pulley wheel with the mast assembled /continued

WARNINGS

- **Failure to properly route the cable could result in damage to the machine or machine failure.**
- **DO NOT allow the cable to become twisted during the installation of the new pulley wheel.**
- **Ensure the retainer on the pulley wheel guard is located in the hole in the pulley mount block to ensure that it cannot spin with the pulley wheel.**
- **Ensure the pulley wheel cover extends over the top of an upper pulley wheel and bottom of a lower pulley wheel.**

7.8 How to disassemble the winch

WARNING

The cable may be frayed. ALWAYS wear suitable protective gloves when handling the cable.

Note:
Refer to the exploded drawing of the winch on Page 50 as a useful guide to the terminology used in the procedure below.

1. Start with the mast vertical.
2. Apply the brakes to the swivel castors on the splayed legs.
3. Remove the cable guard.
4. Lower the carriage until the lifting cable becomes loose and unwind all the cable from the winch drum.

Note:
Only if required, to release the cable connection to the winch, remove the 2 fixings from the cable anchor on the winch.

5. Slightly loosen the lower cover bolt.
6. Remove the drum pivot locking nut.
7. Hold the drum and winch gear cover with your left hand while removing the drum pivot bolt with your right hand.
8. Lift the drum out of the winch housing and place on the floor.
9. Remove the locking nut from the right-side handle and remove the handle.
10. Remove the 2 hexagonal jam nuts from the right side of the pinion shaft. **Helpful tip:** To speed up the removal of the hexagonal jam nuts you can hold the nut with a spanner and wind the handle on the left side.
11. Remove the e-clip from the inside of the winch housing on the left side of the pinion shaft.
12. Gently lever the ratchet pawls off the ratchet gear and gripping the handle at the left of the winch, pull the pinion shaft to the left until you have created space between the right end of the pinion shaft and the right inner side of the winch housing.
13. Slide the pinion plate, right-side friction disc, ratchet gear, and left-side friction disc off the right side of the pinion shaft.
14. Unscrew the pinion gear and take it off the right end of the pinion shaft.

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7.8 How to disassemble the winch /continued

15. Remove the pinion shaft from the winch housing.
16. To remove both pinion shaft bushes, use a soft metal drift equal to the outside diameter of the pinion shaft bush and tap the drift with a rubber mallet. **Note:** Place a block between the walls of the winch housing to prevent the housing from bending while removing the pinion shaft bushes. Alternatively, you can remove the winch mount plate from the fixed mast column, remove the 3 bolts connecting the winch housing to the winch mount plate, and undertake this procedure in a vice.

Note:
Keep a note of the location of all the winch components for the reassembly of the winch in Section 7.9 below.

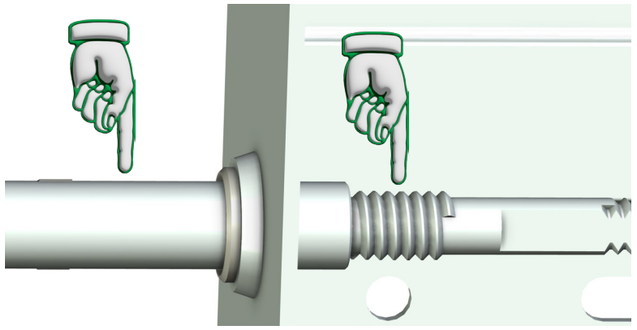
7.9 How to assemble the winch

WARNING
The cable may be frayed. ALWAYS wear suitable protective gloves when handling the cable.

Notes:

- Refer to the exploded drawing of the winch on Page 50 as a useful guide to the terminology used in the procedure below.
- Clean all the winch parts disassembled in Section 7.8 with a degreaser e.g., brake and clutch cleaner.
- It is strongly recommended that you replace the 2 friction discs. The **Friction disc kit (Part Number: 630067)** is available to purchase from the manufacturer or your ToughLift® Material Lifts dealer.

1. To refit both pinion shaft bushes, use a soft metal drift equal to the outside diameter of the pinion shaft bush and tap the drift with a rubber mallet. **Note:** Place a block between the walls of the winch housing to prevent the housing from bending while replacing the pinion shaft bushes. Alternatively, you can remove the winch mount plate from the fixed mast column, remove the 3 bolts connecting the winch housing to the winch mount plate, and undertake this procedure in a vice.
2. Insert the pinion shaft into the left side of the winch housing.
3. Add the pinion gear, new left-side friction disc, ratchet gear, new right-side friction disc, and pinion plate onto the pinion shaft.
4. Apply a small amount of Lithium EP2 Grease to the pinion shaft as shown in the graphic below.



7.9 How to assemble the winch /continued

5. Screw the pinion gear back onto the threaded section of the pinion shaft.

WARNING
Ensure that you do not get any grease on the friction disc side of the pinion gear or the left-side friction disc.

6. Slide the pinion shaft all the way into the winch housing ensuring the ratchet pawls are engaging with the ratchet gear.
7. Replace the e-clip on the inside of the winch housing on the left side of the pinion shaft.
8. Replace the 2 hexagonal jam nuts on the right side of the pinion shaft. **Helpful tip:** To speed up the fitting of these nuts you can hold the nut with a spanner and wind the handle on the left side.
9. Refit the right-side handle with the new locking nut supplied in the **Friction disc kit (Part Number: 630067)**. **Note:** The right-side handle should be refitted at a 180° angle to the left-side handle.
10. Add a little SAE 30 Motor Oil to both pivot points on each ratchet pawl.
11. Before replacing the winch drum, add a little Lithium EP2 Grease to the drum pivot points at each side.
12. Lower the winch drum back into the winch housing ensuring that the drum gear meshes with the pinion gear.
13. Insert the drum pivot bolt through the winch housing and winch drum.
14. Refit the winch gear cover.
15. Fit the new drum pivot locking nut supplied in the **Friction disc kit (Part Number: 630067)** and torque to 27Nm (19.9ft-lbs). Over tightening the drum pivot locking nut may cause damage to the frame spacer and prevent the drum from spinning freely. **Note:** Ensure that the head of the drum pivot bolt is on the drum gear side of the winch.
16. Fit the new lower cover nut supplied in the **Friction disc kit (Part Number: 630067)** and torque to 27Nm (19.9ft-lbs).

Note:
If the cable was unbolted and removed from the winch drum during disassembly:

- Route the end of the cable around the winch drum and out through the hole on the left side wall of the drum.
- Insert the end of the cable under the cable anchor clip approximately 20mm and tighten the cable anchor bolts.

WARNING
Only torque each nut to 5Nm (3.7ft-lbs) and ensure that there are the same number of threads protruding through the nut on each of the 2 bolts.

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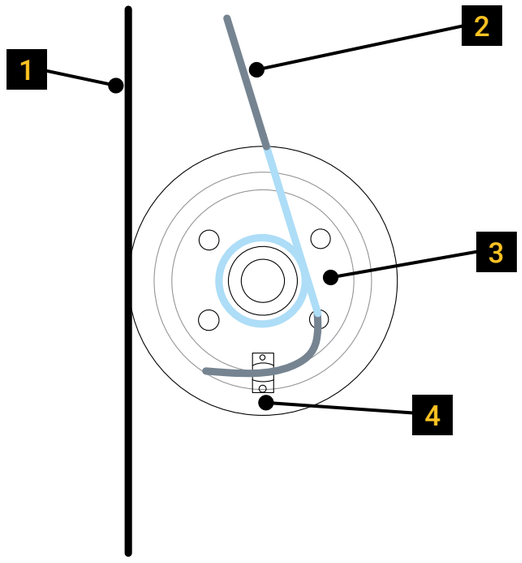
7.9 How to assemble the winch /continued



1 Winch mount plate
2 Cable
3 Winch drum
4 Cable anchor clip

17. While holding the cable tight on the drum, rotate the drum and spool the cable onto the drum evenly. **Note:** Ensure that there are at least four wraps of cable on the winch drum and note that the cable out to the first pulley at the top of the mast must be located at the front of the winch drum as shown in the graphic above.
18. Check the proper operation of the winch by winding the carriage up and down the first lifting column.
19. Secure a test load to the Standard Forks or Boom and raise and lower to ensure that the machine is operating in accordance with the Instruction Handbook.
20. Replace the cable guard.

WARNING
DO NOT get any Lithium EP2 Grease or SAE 30 Motor Oil on the friction disks or ratchet gears.

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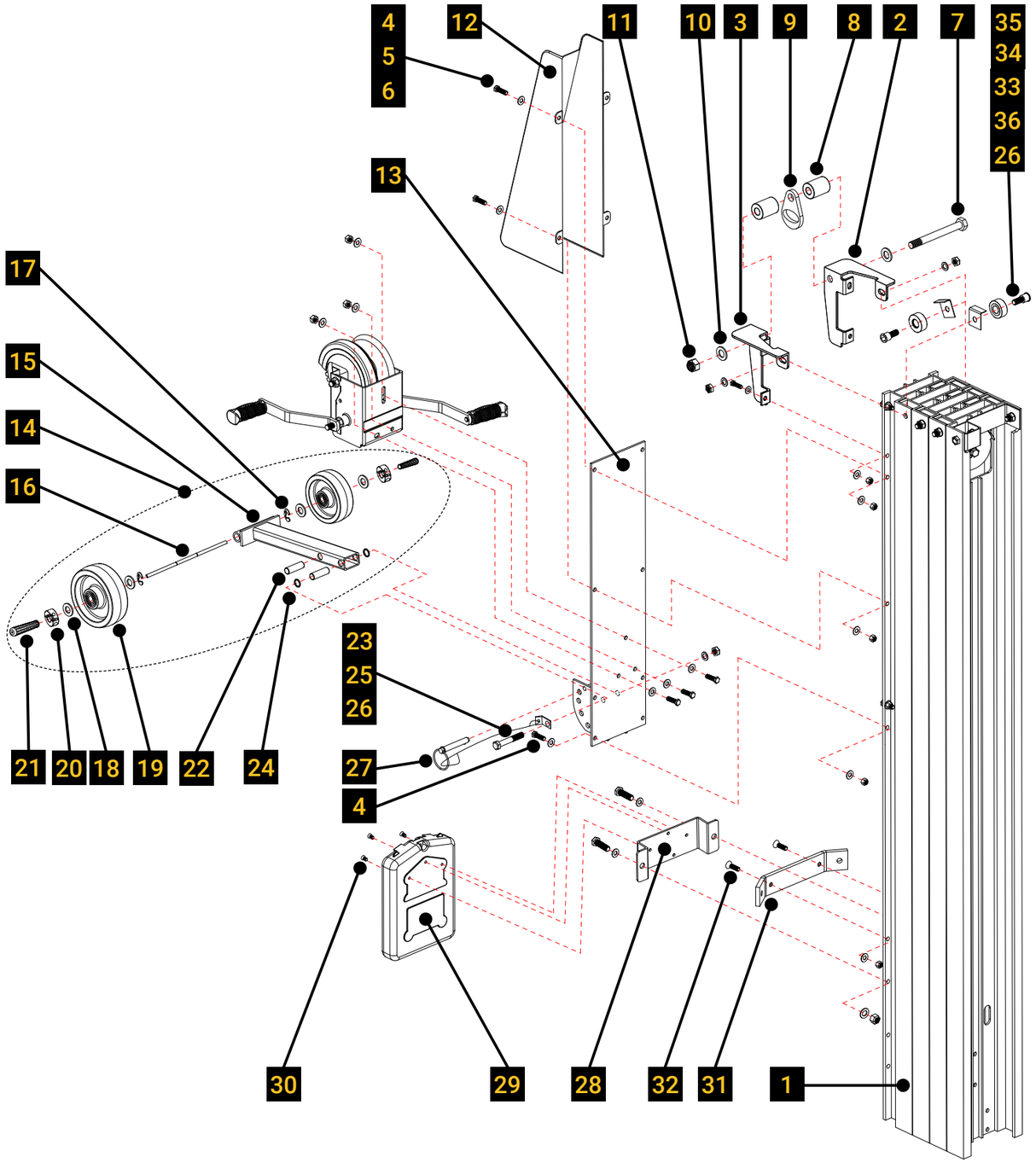
Mast - rear & top of fixed column - all models

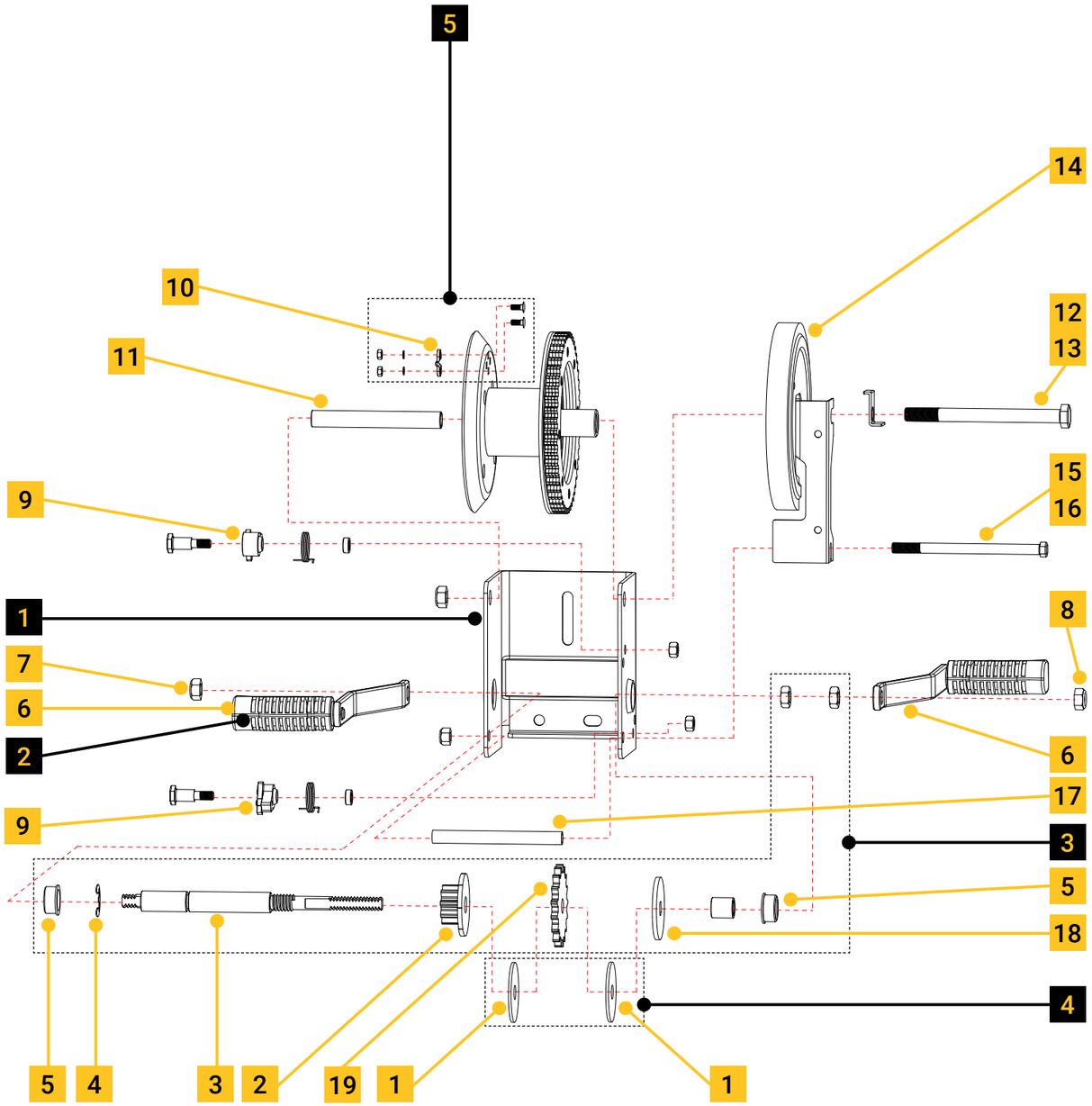


Mast - rear & top of fixed column - all models /continued

Item	Part No.	Description	Quantity
1	630001	Fixed mast column	1
2	630007	Mast stiffener - left	1
3	630008	Mast stiffener - right	1
4	630009	Bolt 3/8-16*1-1/4	6
5	630011	Washer 25/32*13/32*1/16	34
6	630010	Nyloc nut 3/8-16	19
7	630100	Bolt M16*44	1
8	630099	Hoisting & winching anchor nylon tube	2
9	630098	Hoisting & winching anchor	1
10	630102	Washer M17*2mm	2
11	630101	Nyloc nut M16	1
12	630086	Cable guard	1
13	630047	Winch mount plate	1
14	630051	Loading wheels & handles - complete assembly	1
15	630057	Loading wheels & handles mount	1
16	630052	Loading wheels & handles shaft	1
17	630104	Stainless-steel e-clip 13mm	2
18	630056	Washer M17*3mm	4
19	630058	Loading wheel	2
20	630054	Shaft collar	2
21	630053	Handle grip	2
22	630055	Self-lubricating bush	2
23	630059	Bolt 1/2-13*1-3/8	1
24	630061	Black nylon washer M13*1.5mm	2
25	630062	Washer 1-1/16*35/64*5/64	1
26	630088	Low profile Nyloc nut 1/2-13	3
27	630063	Loading wheels & handles retaining pin & lanyard	1
28	630103	Document holder mount bracket	1
29	630087	Document holder	1
30	630089	Bolt M5*12	3
31	630023	Stabiliser mount bracket	1
32	630090	Countersink bolt 3/8-16*1-1/4	2
33	630042	Roller guard	2
34	630044	Roller	2
35	630043	Roller bolt 1/2-13*1-1/8	2
36	630109	Washer 1-3/8*9/16*1/8	2

Note:
Quantities shown in the table above relate to usage on this exploded drawing only.

Winch - all models



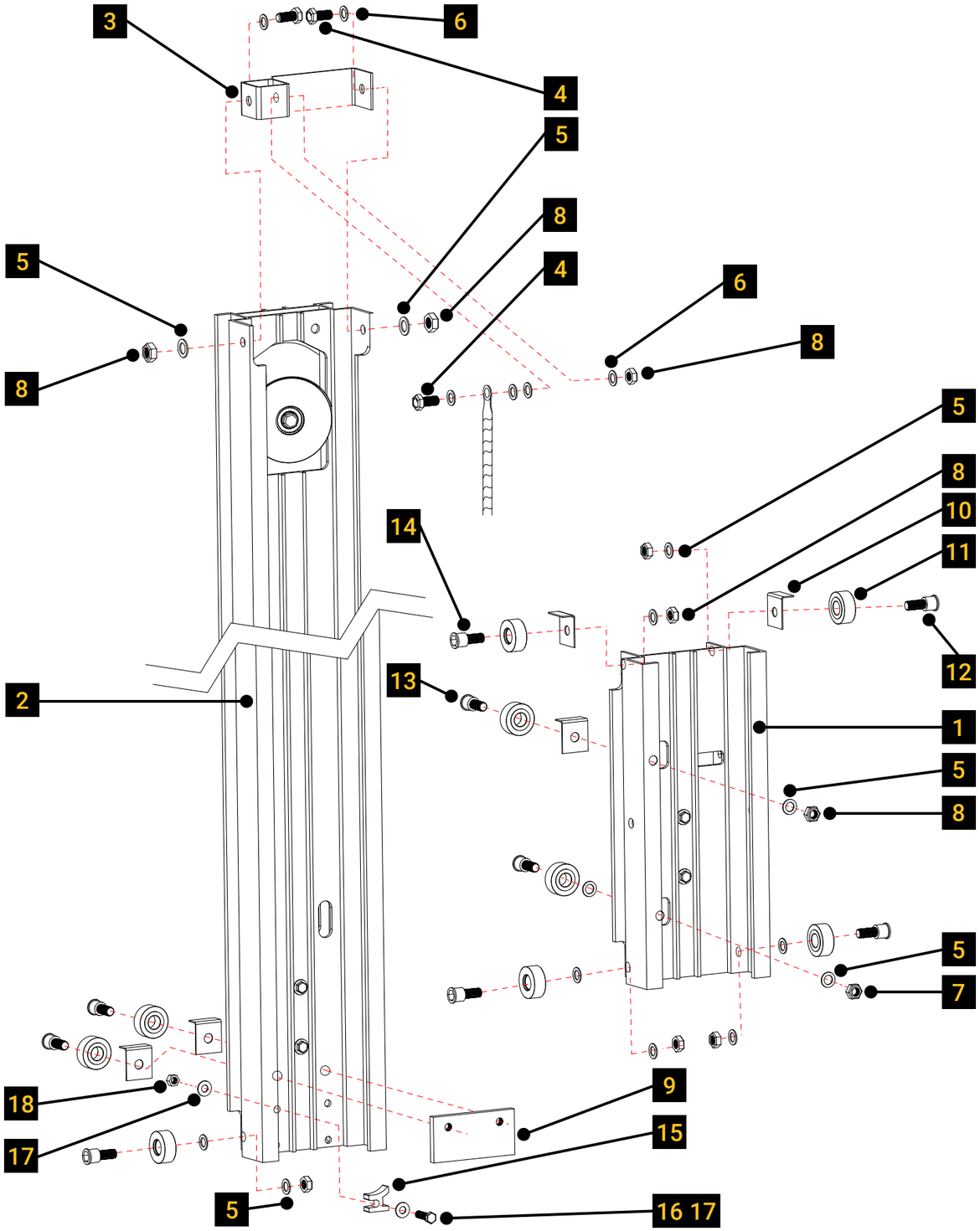
Winch - all models /continued

Item	Part No.	Description	Quantity
1	630064	Winch - complete assembly including both handles	1
2	630066	Winch handle	2
3	630065	Winch rebuild kit with fitting instructions	1
4	630067	Winch friction disc kit (2 discs, right-side handle locking nut, drum pivot locking nut, lower cover locking nut, & fitting instructions)	1
5	630068	Winch cable anchor kit	1

Note:
The following parts are not available to purchase separately (unless itemised in the table above), but are detailed here to be read in conjunction with the relevant Periodical Maintenance & Checks and Repair Procedures. These parts are numbered in yellow rather than black boxes on the exploded drawing opposite.

1 Friction disc
2 Pinion gear
3 Pinion shaft
4 E-clip
5 Pinion shaft bush
6 Winch handle
7 Handle locking nut - left
8 Handle locking nut - right
9 Ratchet pawl
10 Cable anchor clip
11 Drum spacer
12 Drum pivot bolt
13 Drum pivot locking nut
14 Winch gear cover
15 Lower cover bolt
16 Lower cover locking nut
17 Casing spacer
18 Pinion plate
19 Ratchet gear

Mast – carriage & first lifting column - all models

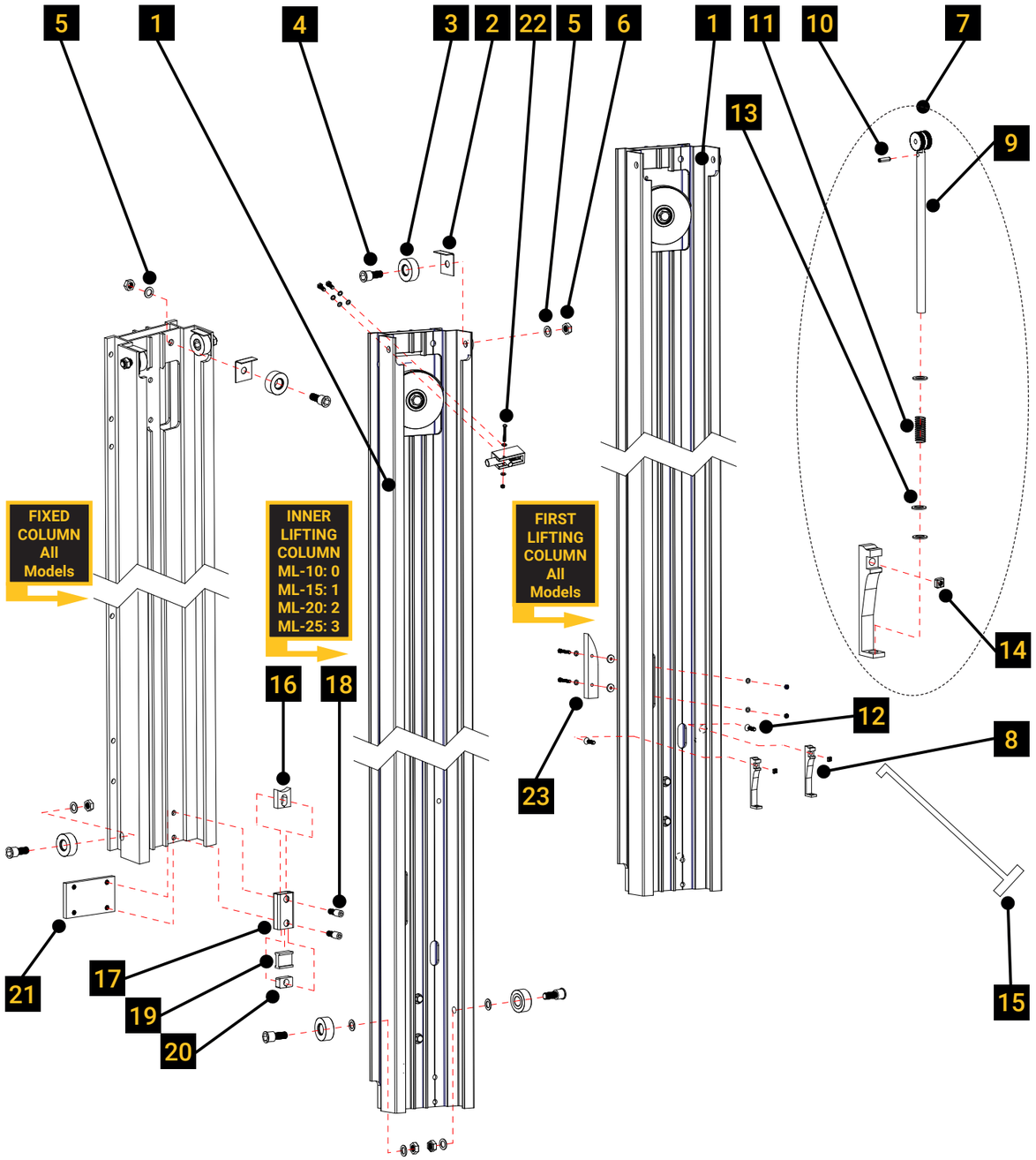


Mast – carriage & first lifting column - all models /continued

			Quantity			
Item	Part No.	Description	ML-10	ML-15	ML-20	ML-25
1	630003	Carriage	1	1	1	1
2	630114	Lifting column V2 (quantity on this drawing only)	1	1	1	1
3	630027	Cable anchor bracket	1	1	1	1
4	630106	Bolt 1/2-13*1-3/16	3	3	3	3
5	630109	Washer 1-3/8*9/16*1/8	9	9	9	9
6	630062	Washer 1-1/16*1/2*5/64	5	5	5	5
7	630060	Nyloc nut 1/2-13	6	6	6	6
8	630088	Low profile nyloc nut 1/2-13	5	5	5	5
9	630041	Mast doubler plate (quantity per machine)	1	2	3	4
10	630042	Roller guard	5	5	5	5
11	630044	Roller	10	10	10	10
12	630043	Roller bolt 1/2-13*1-1/8	8	8	8	8
13	630107	Roller bolt 1/2-13*25/32	1	1	1	1
14	630108	Roller bolt 1/2-13*45/64	1	1	1	1
15	630037	Down stop	1	1	1	1
16	630009	Bolt 3/8-16*1-1/4	1	1	1	1
17	630011	Washer 25/32*13/32*1/16	2	2	2	2
18	630010	Nyloc nut 3/8-16	1	1	1	1

Note:
Quantities shown in the table above relate to usage on this exploded drawing only.

Mast - fixed & lifting columns

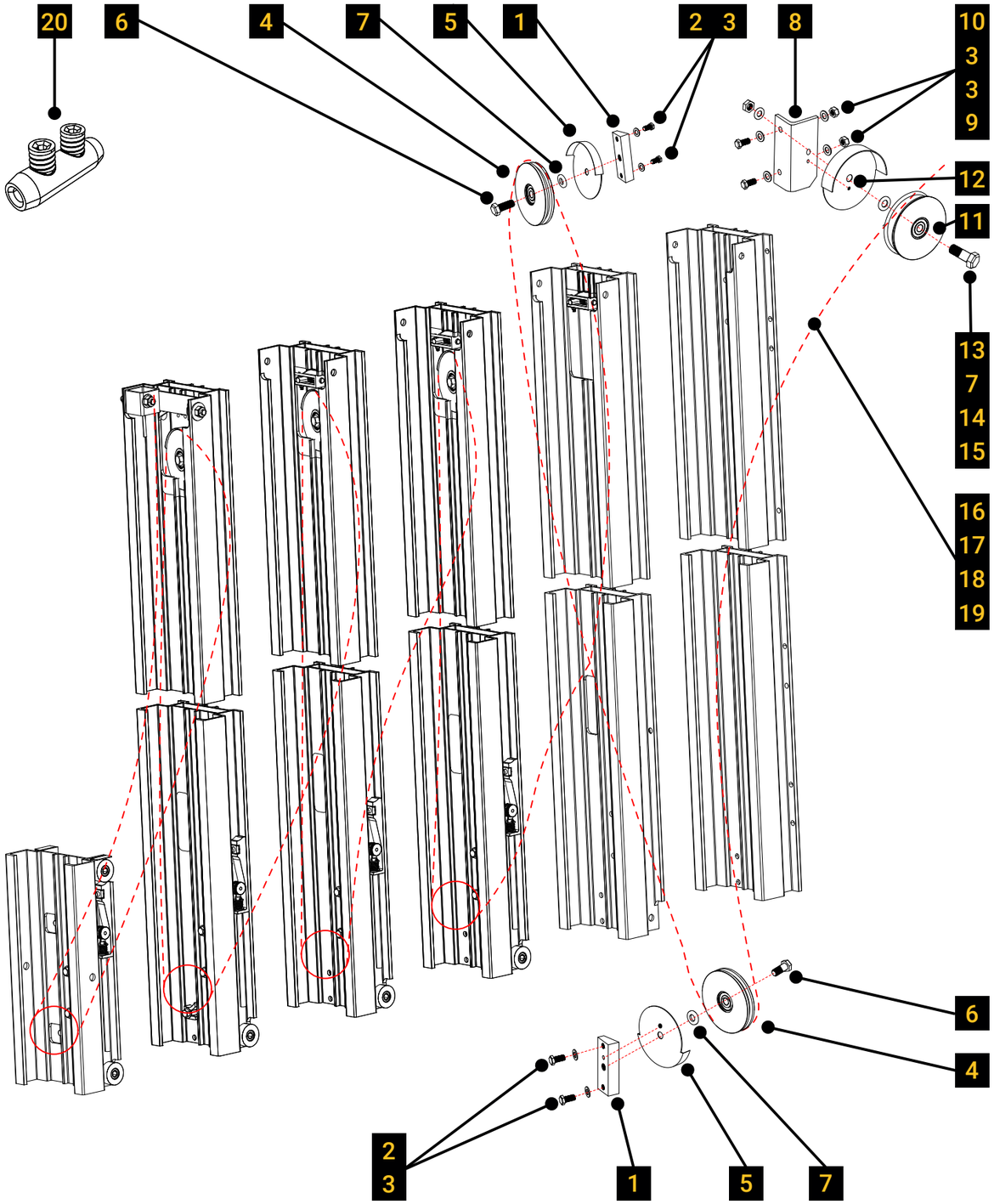


Mast - fixed & lifting columns /continued

			Quantity			
Item	Part No.	Description	ML-10	ML-15	ML-20	ML-25
1	630114	Lifting column V2 (total for each machine)	1	2	3	4
2	630042	Roller guard	3	8	13	18
3	630044	Roller	3	8	13	18
4	630043	Roller bolt 1/2-13*1-1/8	3	8	13	18
5	630109	Washer 1-3/8*9/16*1/8	3	8	13	18
6	630060	Nyloc nut 1/2-13	3	8	13	18
7	630077	Mast safety brake - complete assembly	2	3	4	5
8	630078	Up stop	3	5	7	9
9	630079	Mast brake rod and roller	2	3	4	5
10	630084	Mast brake roll pin	2	3	4	5
11	630080	Mast brake spring	2	3	4	5
12	630090	Countersink bolt 3/8-16*1-1/4	2	3	4	5
13	630083	Mast brake washer 3/4*1/2*1/16	6	9	12	15
14	630082	Mast brake square nut 3/8-16	2	3	4	5
15	630085	Mast safety brake release tool accessory	N/A	N/A	N/A	N/A
16	630032	Down stop plunger block	2	4	6	8
17	630035	Down stop tube	2	4	6	8
18	630036	Shoulder bolt	4	8	12	16
19	630033	Down stop rubber bumper	2	4	6	8
20	630034	Down stop end block	2	4	6	8
21	630031	Down stop doubler plate	1	2	3	4
22	630110	Inner column lock assembly with fixings	0	1	2	3
23	630111	Inner column lock wedge release with fixings	0	1	2	3

Note:
Quantities shown in the table above relate to usage on this exploded drawing only.

Mast – pulleys & cable



Section 8 - Exploded Drawings & Parts List /continued

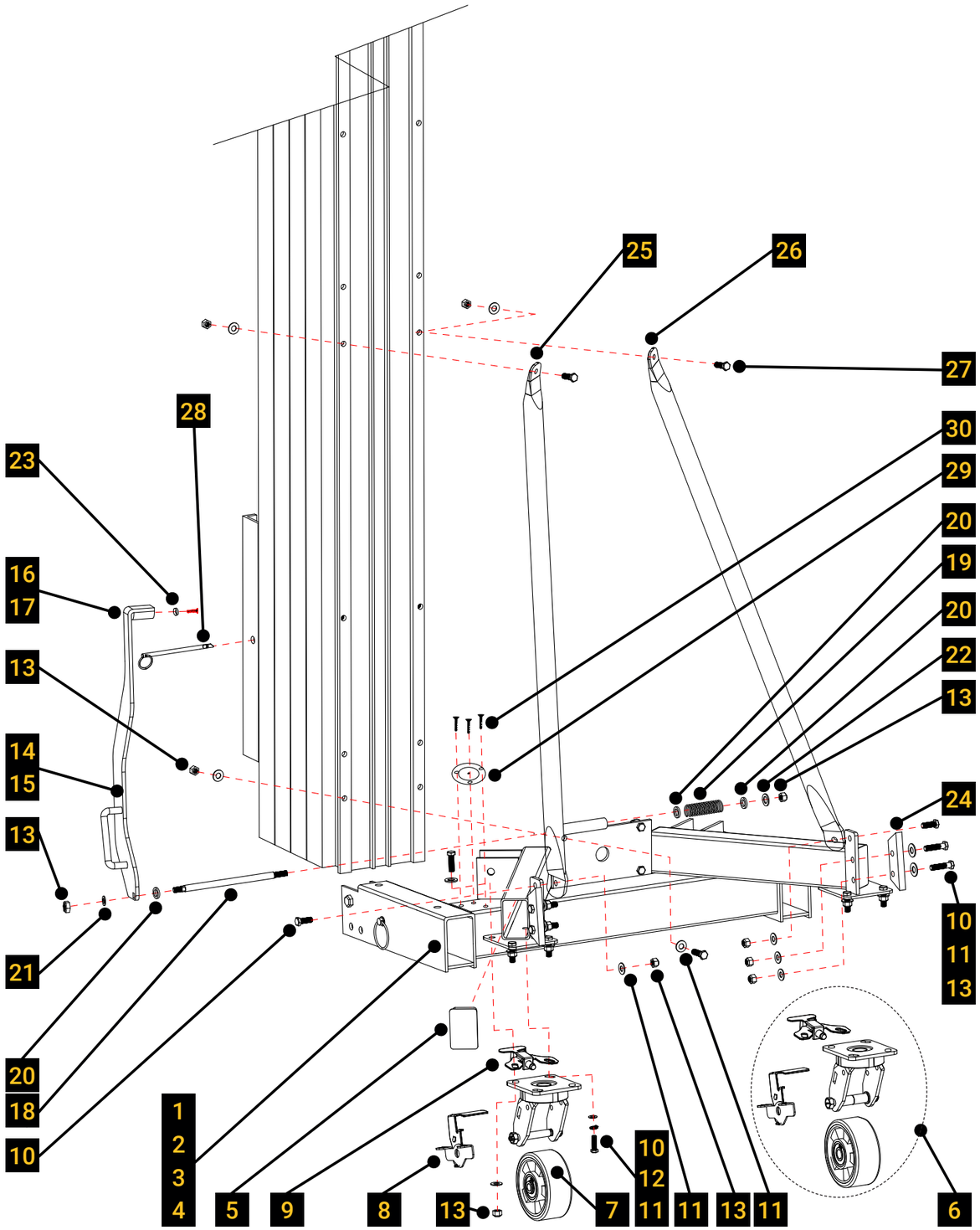
Mast – pulleys & cable /continued

			Quantity			
Item	Part No.	Description	ML-10	ML-15	ML-20	ML-25
1	630016	Inner pulley mount	3	5	7	9
2	630017	Bolt 3/8-16*3/4	6	10	14	18
3	630011	Washer 25/32*13/32*1/16	10	14	18	22
4	630012	Inner pulley wheel	3	5	7	9
5	630013	Inner pulley wheel cover	3	5	7	9
6	630014	Bolt 1/2-13*5/8	3	5	7	9
7	630046	Washer M13*4mm	3	5	7	9
8	630019	First pulley mount	1	1	1	1
9	630009	Bolt 3/8-16*1-1/4	2	2	2	2
10	630010	Nyloc nut 3/8-16	2	2	2	2
11	630093	First pulley wheel	1	1	1	1
12	630094	First pulley wheel cover	1	1	1	1
13	630095	Bolt 1/2-13*1	1	1	1	1
14	630062	Washer 1-1/16*1/2*5/64	1	1	1	1
15	630060	Nyloc nut 1/2-13	1	1	1	1
16	630069	Cable for ML-10 - 9149.6mm	1	N/A	N/A	N/A
17	630070	Cable for ML-15 - 12883.4mm	N/A	1	N/A	N/A
18	630071	Cable for ML-20 - 16998.2mm	N/A	N/A	1	N/A
19	630072	Cable for ML-25 - 20655.8mm	N/A	N/A	N/A	1
20	630073	Cable Coupler accessory	N/A	N/A	N/A	N/A

Notes:

- The exploded drawing on the left is based on the ML-25 model which has a carriage, 4 lifting columns, and 1 fixed mast column.
- Quantities shown in the table above relate to usage on this exploded drawing only.

Chassis - back

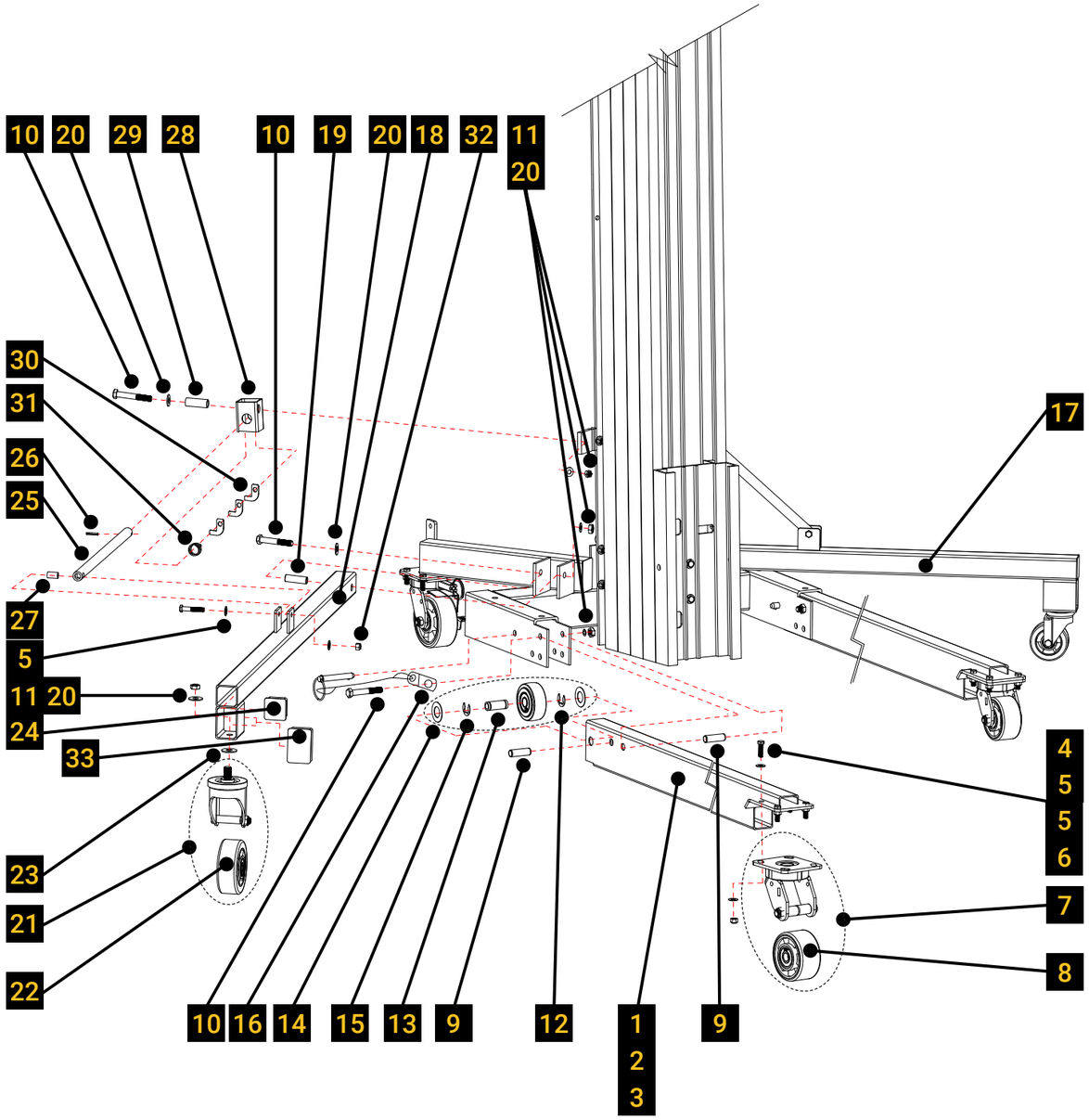


Chassis - back /continued

			Quantity			
Item	Part No.	Description	ML-10	ML-15	ML-20	ML-25
1	610001	Chassis fabrication ML-10	1	N/A	N/A	N/A
2	610040	Chassis fabrication ML-15	N/A	1	N/A	N/A
3	610041	Chassis fabrication ML-20	N/A	N/A	1	N/A
4	610042	Chassis fabrication ML-25	N/A	N/A	N/A	1
5	610031	Splayed legs & stabilisers castor mount end cap	4	4	4	4
6	610005	Braked swivel castor - complete assembly	2	2	2	2
7	610045	Braked swivel castor - wheel only	2	2	2	2
8	610006	Braked swivel castor - brake assembly only	2	2	2	2
9	610050	Braked swivel castor - straight-line lock only	2	2	2	2
10	630009	Bolt 3/8-16*1-1/4	14	14	14	14
11	630011	Washer 25/32*13/32*1/16	34	34	34	34
12	610051	Spring washer 3/8	2	2	2	2
13	630010	Nyloc nut 3/8-16	18	18	18	18
14	610024	Carriage lock - complete assembly (ML-10 & ML-15)	1	1	N/A	N/A
15	610048	Carriage lock - complete assembly (ML-20 & ML-25)	N/A	N/A	1	1
16	610025	Carriage lock - steel fabrication (ML-10 & ML-15)	1	1	N/A	N/A
17	610049	Carriage lock - steel fabrication (ML-20 & ML-25)	N/A	N/A	1	1
18	610052	Carriage lock threaded rod	1	1	1	1
19	610026	Carriage lock spring	1	1	1	1
20	610027	Carriage lock black nylon washer M12*2mm	3	3	3	3
21	610028	Washer M13*2mm	1	1	1	1
22	630011	Washer 25/32*13/32*1/16	1	1	1	1
23	610030	Black nylon pad	1	1	1	1
24	610039	Black nylon loading block	2	2	2	2
25	610011	Mast/loading brace left	1	1	1	1
26	610012	Mast/loading brace right	1	1	1	1
27	610009	Bolt 3/8-16*1	2	2	2	2
28	640002	Standard Forks & Boom retaining pin	1	1	1	1
29	610055	Spirit level	1	1	1	1
30	610056	Bolt M4*12	3	3	3	3

Note:
Quantities shown in the table above relate to usage on this exploded drawing only.

Chassis - front

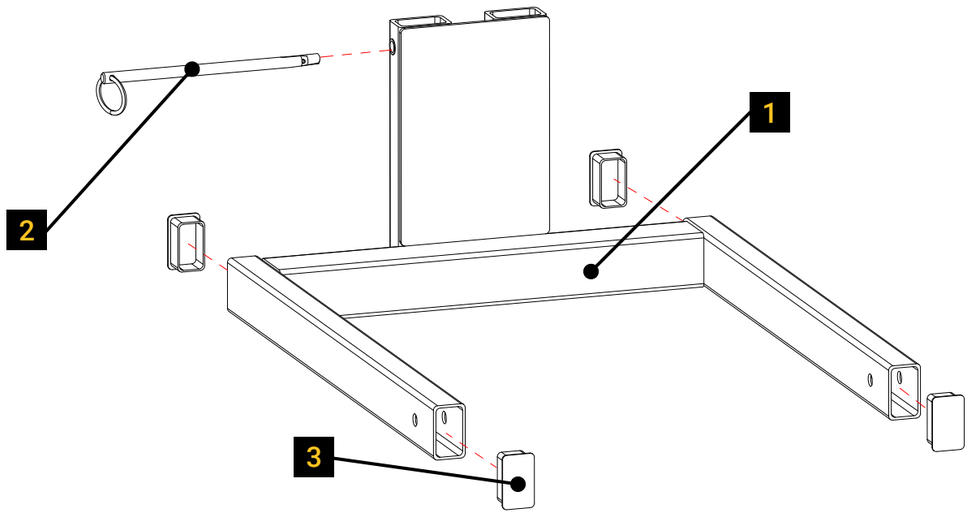


Chassis - front /continued

			Quantity			
Item	Part No.	Description	ML-10	ML-15	ML-20	ML-25
1	610013	Front leg for ML-10	2	N/A	N/A	N/A
2	610014	Front leg for ML-15	N/A	2	N/A	N/A
3	610015	Front leg for ML-20 & ML-25	N/A	N/A	2	2
4	630009	Bolt 3/8-16*1-1/4	8	8	8	8
5	630011	Washer 25/32*13/32*1/16	16	16	20	20
6	630010	Nyloc nut 3/8-16	8	8	8	8
7	610016	Front leg swivel castor - complete assembly	2	2	2	2
8	610046	Front leg swivel castor - wheel only	2	2	2	2
9	610022	Self lubricating bush	4	4	4	4
10	630059	Bolt 1/2-13*1-3/8	2	2	6	6
11	630088	Low profile nyloc nut 1/2-13	2	2	8	8
12	610035	Front leg transport wheel assembly (wheel, axle, 2 washers, & 2 e-clips)	2	2	2	2
13	610032	Front leg transport wheel axle	2	2	2	2
14	610054	Washer M23*1.1mm	4	4	4	4
15	610033	Stainless-steel e-clip 16.5mm	4	4	4	4
16	610023	Front leg retaining pin & lanyard	2	2	2	2
17	620000	Stabiliser - complete assembly (set of 2)	N/A	N/A	1	1
18	620005	Stabiliser leg	N/A	N/A	2	2
19	620021	Self-lubricating bush	N/A	N/A	2	2
20	630062	Washer 1-1/16*1/2*5/64	2	2	12	12
21	620001	Stabiliser swivel castor - complete assembly	N/A	N/A	2	2
22	610047	Stabiliser swivel castor - wheel only	N/A	N/A	2	2
23	630109	Washer 1-3/8*9/16*1/8	N/A	N/A	2	2
24	620020	Stabiliser end cap	N/A	N/A	2	2
25	620005	Stabiliser brace	N/A	N/A	2	2
26	620022	Roll pin	N/A	N/A	2	2
27	620016	Self-lubricating bush	N/A	N/A	2	2
28	620007	Stabiliser brace mount	N/A	N/A	2	2
29	620008	Self-lubricating bush	N/A	N/A	2	2
30	620015	Stabiliser latch plate	N/A	N/A	6	6
31	620009	Stabiliser latch plate spring	N/A	N/A	2	2
32	620023	Low profile nyloc nut 3/8-16	N/A	N/A	2	2
33	610031	Splayed legs & stabilisers castor mount end cap	N/A	N/A	4	4

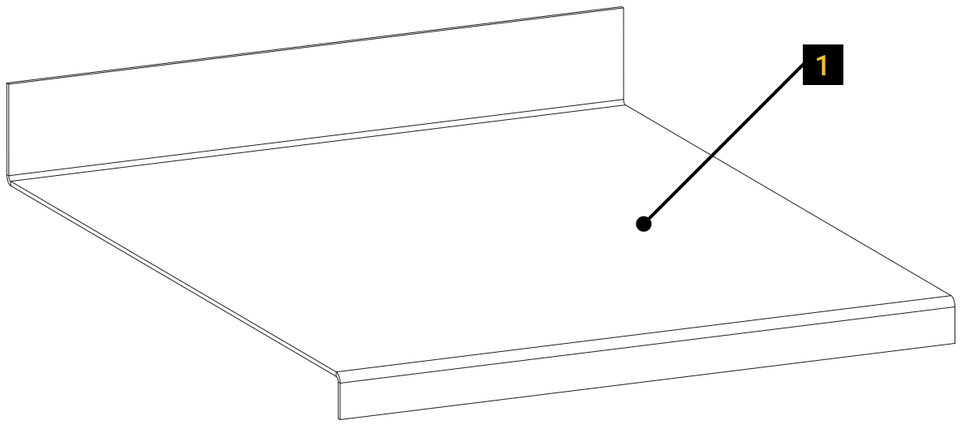
Note:
Quantities shown in the table above relate to usage on this exploded drawing only.

Standard Forks



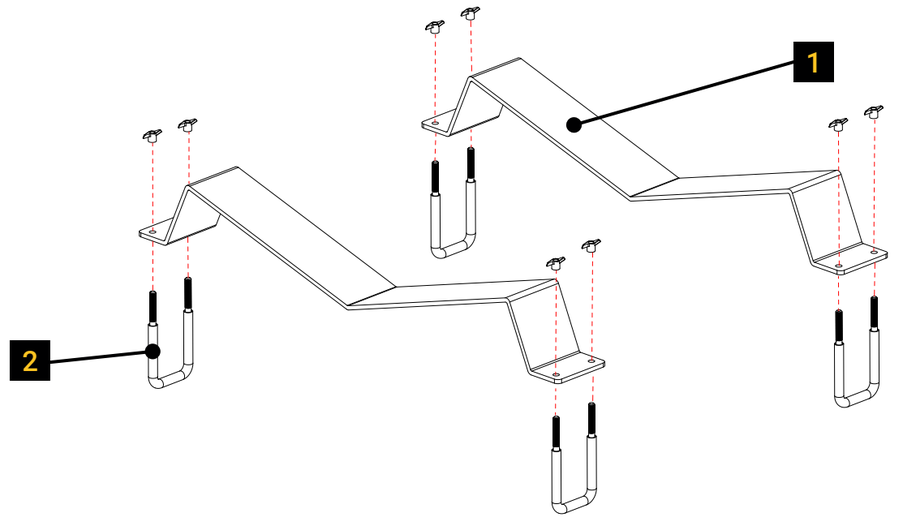
Item	Part No.	Description	Quantity
1	640000	Standard Forks - complete assembly	1
2	640002	Standard Forks & Boom retaining pin	1
3	640003	Standard Forks end cap	4

Load Platform accessory



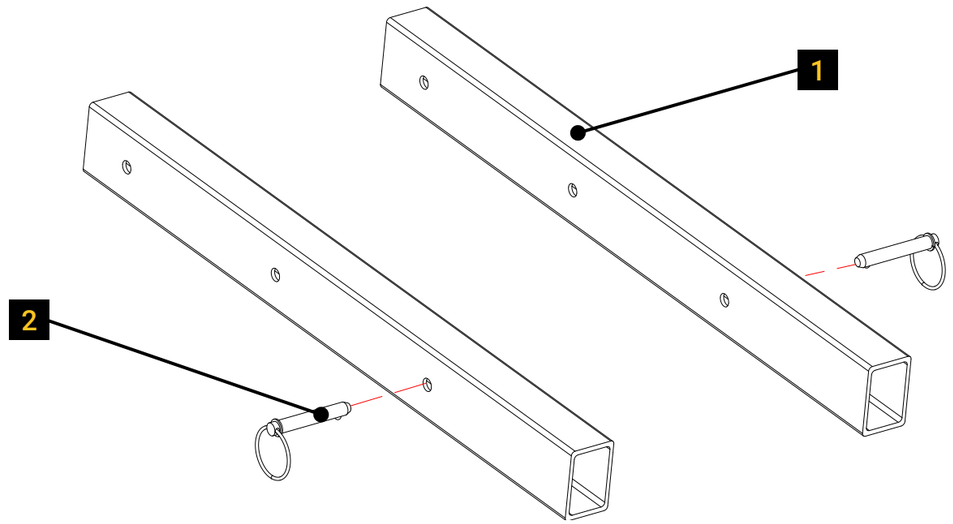
Item	Part No.	Description	Quantity
1	670000	Load Platform - complete assembly	1

Pipe Cradle accessory



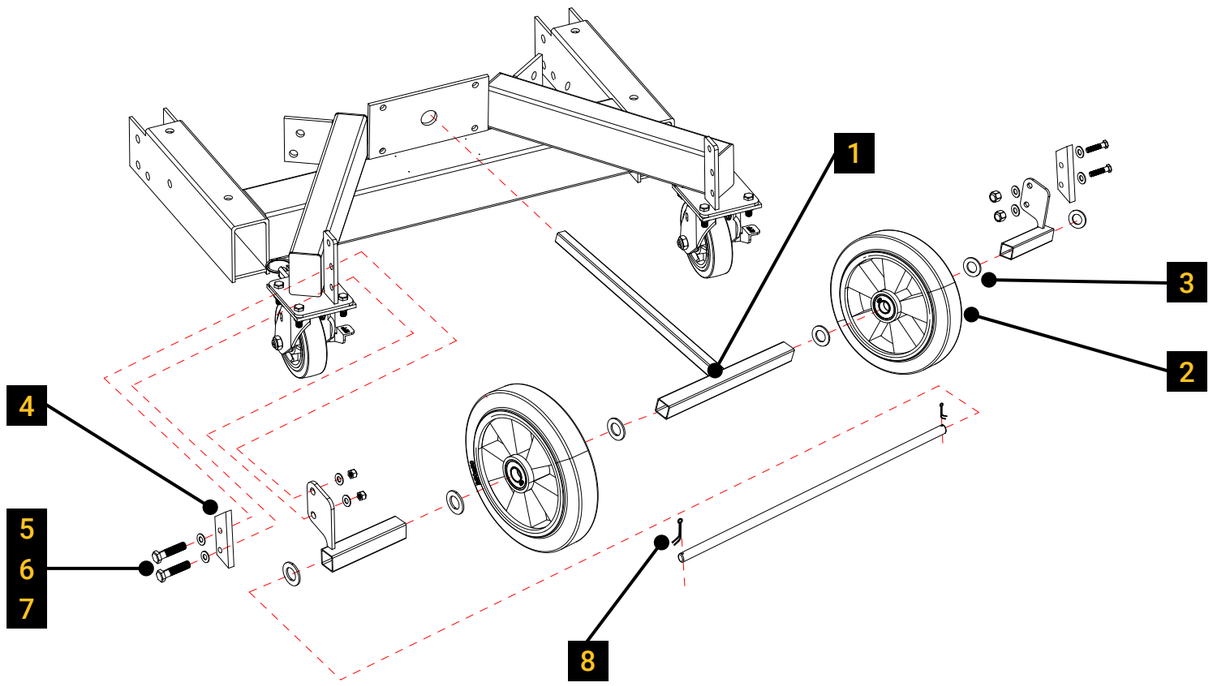
Item	Part No.	Description	Quantity
1	610043	Pipe Cradle - complete assembly	1
2	610044	U-bolt with 2 wing nuts	4

Extension Forks accessory



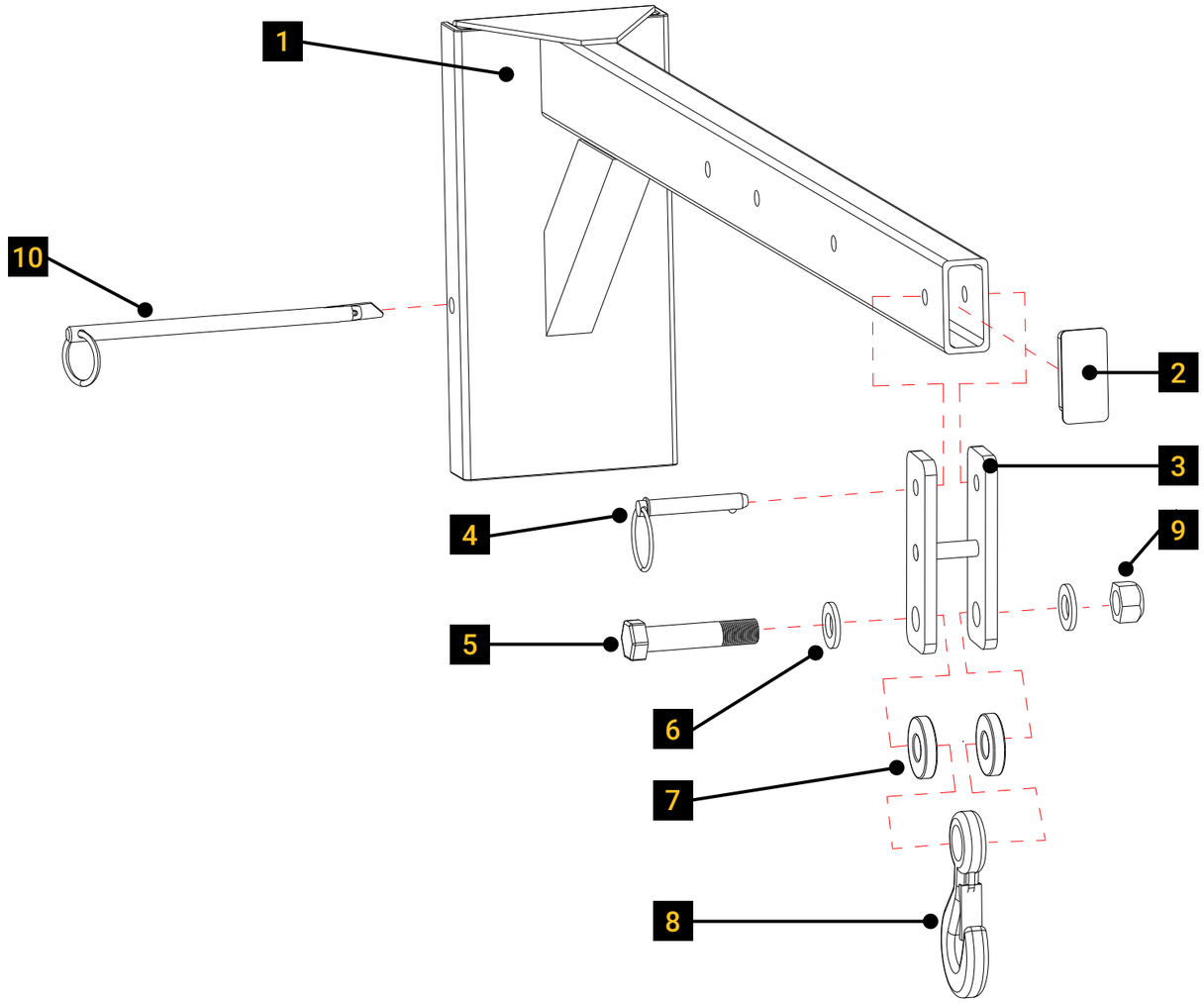
Item	Part No.	Description	Quantity
1	660000	Extension Forks - complete assembly	1
2	660002	Extension Forks retaining pin	2

Rough Terrain Wheel Kit accessory



Item	Part No.	Description	Quantity
1	680000	Rough Terrain Wheel Kit - complete assembly	1
2	680006	Rough terrain wheel	2
3	680009	Washer M19*2mm	6
4	610039	Black nylon loading block	2
5	620017	Bolt 3/8-16*1-1/2	4
6	630011	Washer 25/32*13/32*1/16	8
7	630010	Nyloc nut 3/8-16	4
8	610029	Cotter pin	2

Boom accessory



Item	Part No.	Description	Quantity
1	650000	Boom - complete assembly	1
2	650010	Boom end cap	1
3	650004	Shackle	1
4	660002	Shackle retaining pin	1
5	650007	Bolt M18*31	1
6	650009	Washer M19*3mm	2
7	650006	Black nylon spacer	2
8	650005	Lifting hook	1
9	650008	Nyloc nut M18	1
10	640002	Standard Forks & Boom retaining pin	1

When maintaining a ToughLift® Material Lift always undertake a visual inspection of all decals and manufacturer's plates to ensure that they are legible and in place.

Decals across the machine are colour coded as follows:

RED - used to indicate the presence of an imminent hazard which will result in serious injury or death.

ORANGE - used to indicate the presence of a potential hazard which could result in serious injury or death.

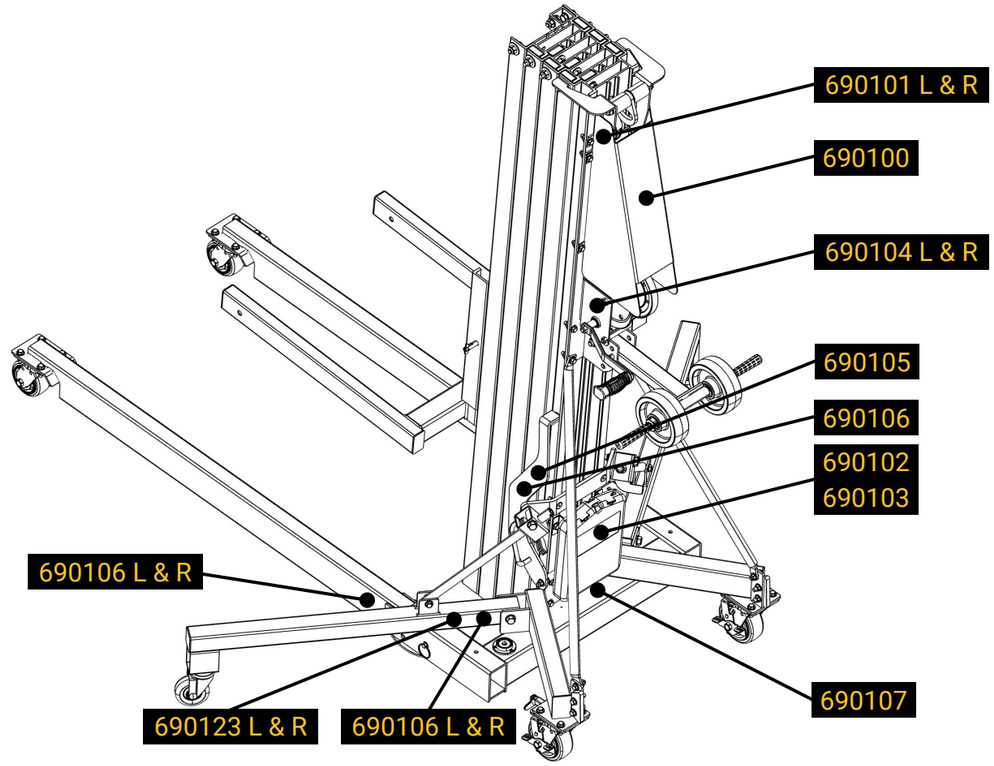
YELLOW - used to indicate the presence of a potential hazard which could result in minor or moderate injury.

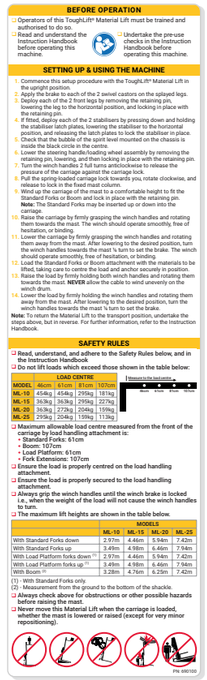
GREEN - used to indicate operational or maintenance information.

BLUE - used to indicate the location of and access to the Instruction Handbook for this machine.

Decals & manufacturer's plates for all 4 models (ML-10/ML-15/ML-20/ML-25)

		Quantity			
Part No.	**Description**	**ML-10**	**ML-15**	**ML-20**	**ML-25**
690100	Main safety decal	1	1	1	1
690101	Hoisting & winching anchor decal - left & right	2	2	2	2
690102	Instruction Handbook decal	1	1	1	1
690103	Instruction Handbook QR code decal (inside document holder)	1	1	1	1
690104	Winch warning decal - left & right	2	2	2	2
690105	Carriage lock use decal	1	1	1	1
690106	Finger trap decal	3	3	5	5
690107	Manufacturer's plate for machine	1	1	1	1
690123	Stabiliser deployment decal - left & right	N/A	N/A	2	2



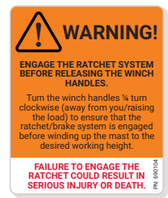


690100

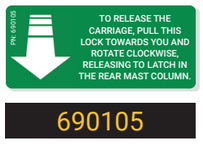
690101

690102

690103



690104



690105

690106

690107

690123

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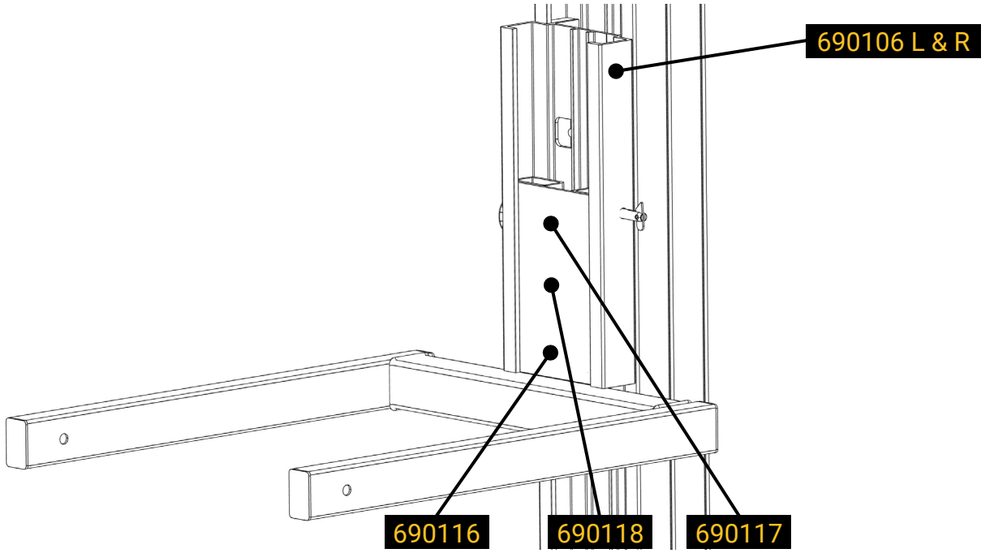
Decals & manufacturer's plates for all 4 models (ML-10/ML-15/ML-20/ML-25) /continued

Part No.	Description	Quantity
690106	Finger trap decal - left & right	2
690117	Standard Forks safety decal	1
690118	Standard Forks fitting decal	1
690116	Removable parts plate (riveted)	1



690106

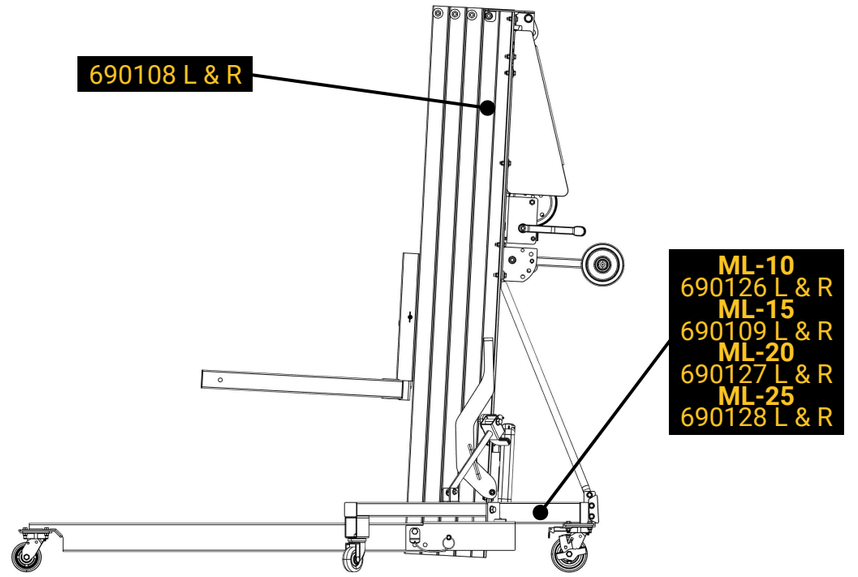
690117

690118

690116

Branding decals for all 4 models (ML-10/ML-15/ML-20/ML-25)

		Quantity			
Part No.	Description	ML-10	ML-15	ML-20	ML-25
690108	ToughLift® branding decal - left & right	2	2	2	2
690126	ML-10 model decal (ML-10 only) - left & right	2	N/A	N/A	N/A
690109	ML-15 model decal (ML-15 only) - left & right	N/A	2	N/A	N/A
690127	ML-20 model decal (ML-20 only) - left & right	N/A	N/A	2	N/A
690128	ML-25 model decal (ML-25 only) - left & right	N/A	N/A	N/A	2



690108

690126

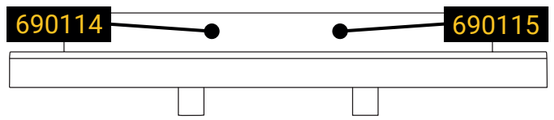
690109

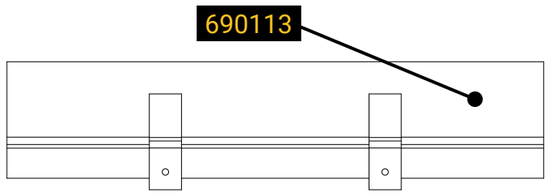
690127

690128

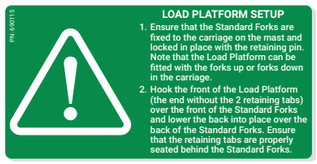
Decals & manufacturer's plate for Load Platform accessory

Part No.	Description	Quantity
690114	Load Platform safety decal	1
690115	Load Platform setup decal	1
690113	Removable parts plate (3M VHB tape)	1





690114

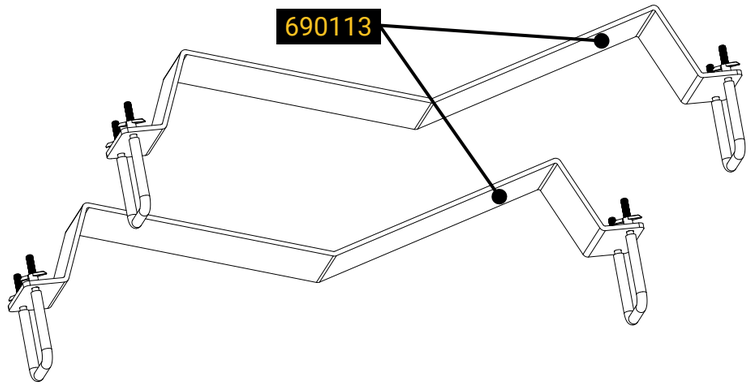


690115

690113

Manufacturer's plates for Pipe Cradle accessory

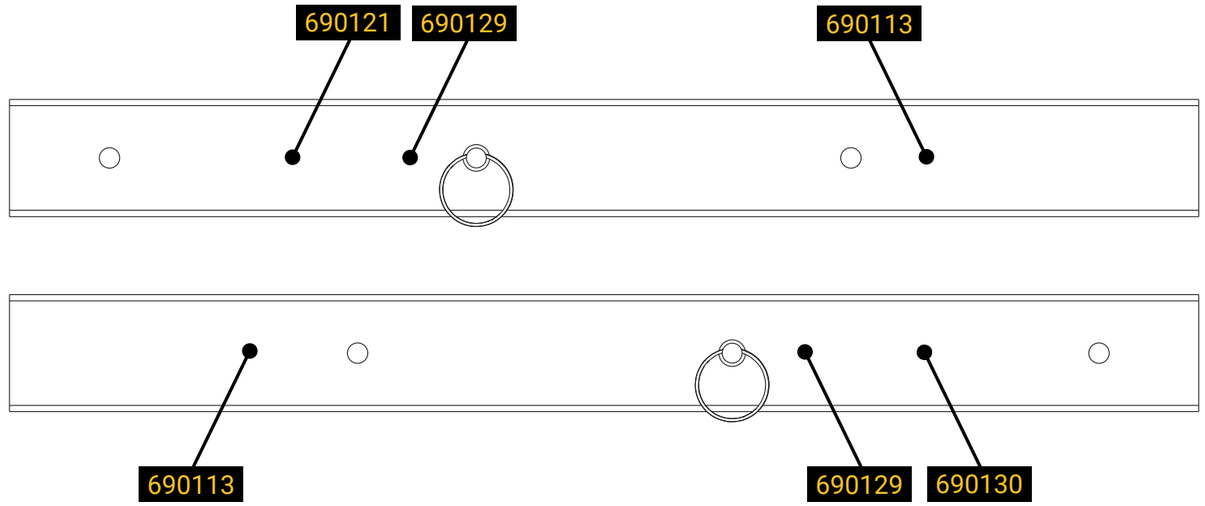
Part No.	Description	Quantity
690113	Removable parts plate (3M VHB tape) - left & right units	2

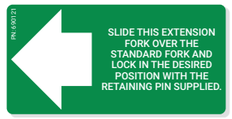


690113

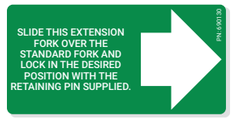
Decals & manufacturer's plates for Extension Forks accessory

Part No.	Description	Quantity
690121	Extension Forks setup decal - left fork	1
690130	Extension Forks setup decal - right fork	1
690129	Extension Forks not a personnel lift decal - left & right forks	2
690113	Removable parts plate (3M VHB tape) - left & right forks	2





690121



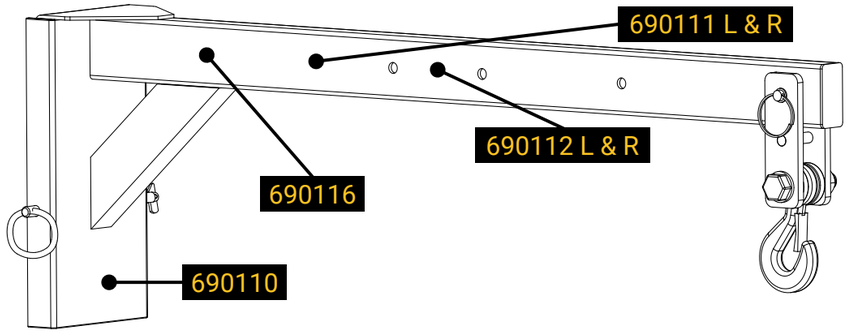
690130

690129

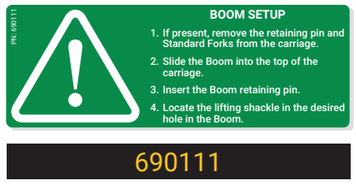
690113

Decals & manufacturer's plate for Boom accessory

Part No.	Description	Quantity
690110	Boom safety warning decal	1
690111	Boom setup decal - left & right	2
690112	Boom not a personnel lift decal - left & right	2
690116	Removable parts plate (riveted)	1



690110



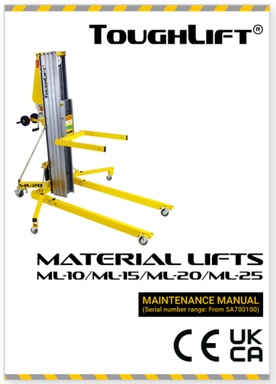
690111

690112

690116

Manuals

Part No.	Description	Quantity
690201	Instruction Handbook (Original Instructions)	1
690202	Maintenance Manual	1



ToughLift® Material Lifts should be stored inside in a secure, clean, and dry environment. When the machine is parked, both swivel castor brakes must be applied, and if the machine must be parked on a slight gradient the braked swivel castors must be chocked.

WARNING
If the machine has been in storage and out of service for any length of time, always undertake the 3-monthly checks outlined in Section 5 of this Maintenance Manual.

Section 11 - Disposal

At the end of its life, the ToughLift® Material Lift or accessory should be taken to a licensed centre for recycling.

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Appendix - Schedule 1 - Information to be contained in a report of a thorough examination

(The Lifting Operations and Lifting Equipment Regulations 1998 - Regulation 10 (1))
(UK only, regulations in other countries vary)

1. The name and address of the employer for whom the thorough examination was made.
2. The address of the premises at which the thorough examination was made.
3. Particulars sufficient to identify the lifting equipment including where known its date of manufacture.
4. The date of the last thorough examination.
5. The safe working load of the lifting equipment or (where its safe working load depends on the configuration of the lifting equipment) its safe working load for the last configuration in which it was thoroughly examined.
6. In relation to the first thorough examination of lifting equipment after installation or after assembly at a new site or in a new location:
    a. that it is such thorough examination.
    b. (if such be the case) that it has been installed correctly and would be safe to operate.
7. In relation to a thorough examination of lifting equipment other than a thorough examination to which paragraph 6 relates:
    a. whether it is a thorough examination:
        i. within an interval of 6 months under regulation 9(3)(a)(i).
        ii. within an interval of 12 months under regulation 9(3)(a)(ii).
        iii. in accordance with an examination scheme under regulation 9(3)(a)(iii) or
        iv. after the occurrence of exceptional circumstances under regulation 9(3)(a)(iv).
    b. (if such be the case) that the lifting equipment would be safe to operate.
8. In relation to every thorough examination of lifting equipment:
    a. identification of any part found to have a defect which is or could become a danger to persons, and a description of the defect.
    b. particulars of any repair, renewal, or alteration required to remedy a defect found to be a danger to persons.
    c. in the case of a defect which is not yet but could become a danger to persons:
        i. the time by which it could become such danger.
        ii. particulars of any repair, renewal, or alteration required to remedy it.
    d. the latest date by which the next thorough examination must be carried out.
    e. where the thorough examination included testing, particulars of any test.
    f. the date of the thorough examination.
9. The name, address, and qualifications of the person making the report; that they are self-employed or, if employed, the name and address of their employer.
10. The name and address of a person signing or authenticating the report on behalf of its author.
11. The date of the report.

Notes

Notes /continued

ToughLift®

For further information and support, please contact the manufacturer:
Shenzhen Anhua Ltd.
+44 20 7173 9777
info@toughlift.co
www.toughlift.co

A1202-1, Tianan Cyber Park, No. 441 Huang Ge Road, Longgang, Shenzhen 518116, China.

EU Representative: Certification Company B.V., Veluwezoom 42, Almere, 1327 AH, Netherlands.