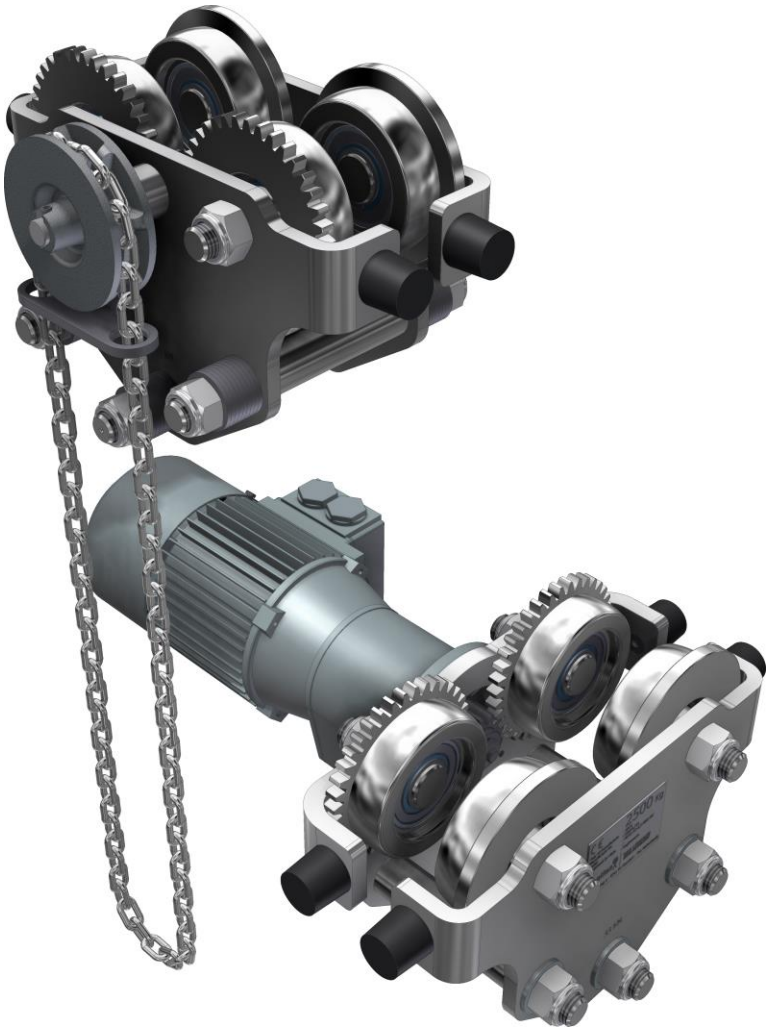
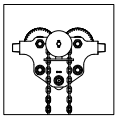
Instruction Manual

Atlas HD3C trolley series





Trolley

Original

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Introduction

This instruction manual is for an Atlas HD3C trolley manufactured by Van Leusden B.V. and contains important information for safe, proper and economic use. Observance of the manual helps to avoid dangerous situations, reduce repair costs, reduce downtimes and extend the service life of Van Leusden Atlas HD3C trolleys.

If any question arises, which is not addressed in this instruction manual, please contact your local authorised reseller or your contact person at Van Leusden B.V.

Important: Immediately upon delivery, inspect the product for any damage which might have been caused during transportation.

Do NOT install or commission a damaged product!

Immediately report damage caused during transportation to Van Leusden B.V.

After inspection, damaged items must be repaired or replaced, before installation and commissioning.

Assembly, installation, commissioning, tests and maintenance may only be executed by competent persons!

Each operator must have read the entire manual and fully understand its contents.

Atlas HD3C trolley specifications

Write down your Atlas HD3C trolley specifications on this page. The specifications can be found on the nameplate which is mounted to the Atlas HD3C trolley.

Year of manufacture :

Manufacture no. :

Model :

Table of contents

1 Definitions

The following definitions are used in this manual:

Product	Wherever the term "product" is used this means the Atlas HD3C trolley unit.
Operators	Operators are persons who use and control the product. They are well trained and conscious of the risks which may arise during operation and incorrect usage. Operators are well aware of the precautions, prevailing conditions and applicable regulations. They have proven their ability by experience and are authorised to control the product.
Experienced electricians	Experienced electricians have followed a specialist training. With their experience they have knowledge of electrical appliances, equipment, applicable electrical standards and regulations. These persons are able to detect and avoid possible risks during the work on the electrical installation.
Competent person's	Competent persons have a theoretical basis as well as a practical experience in the field of lifting equipment. They possess excellent knowledge of the product, safety regulations, directives and general accepted rules of lifting techniques, which enables them to decide whether the product can be safely used and operated. Only competent persons may execute assemblies, installations, commissioning, tests and maintenance.

2 Safety instructions

The products of Van Leusden B.V. are equipped with safety devices, such as limit switches, overload protection, brakes, etc. However, danger which arises from improper use cannot be prevented with our safety devices. Please read the safety instructions of this manual carefully to work as safe as possible. Note that some safety devices are optional and may not be included.

2.1 Symbols

This manual contains safety instructions with several different safety notices. The safety notices are classified according to the severity of the danger and the probability of its occurrence.

Danger
Gives warning of an imminent danger to health and life. Ignoring these warning notices will lead to severe injuries, possibly resulting in death

Warning
Gives warning of situations which are potentially dangerous to health and life. Ignoring these warning notices may lead to severe injuries.

Caution
Gives warning of situation which can lead to minor injuries or damage to the device or its surrounding.

Electrical voltage warning
Only experienced electricians or competent persons may open covers marked with this symbol. Contact with live parts can cause death instantaneously.

Before commissioning make sure that all electric wires are connected in accordance with the instructions, that all wires are without damages and that the whole equipment could be switched off by the main switch.

Suspended load warning
It is forbidden to stand underneath suspended loads. This entails risks to life and limb.

Injuries to hand warning
This notice indicates danger of crushing or cutting hands and fingers. The appropriate personal protective equipment should be worn for this task to avoid injury.

Attention
Important information to prevent difficulties or dangerous situations

Tip
Useful information or tip.

2.2 Safety precautions

The product can only be controlled by operators with the following qualifications:

- Complete knowledge of this manual.
- Reached the age of 18.
- Capable both physically and mentally.
- Have been instructed in operating and maintaining the product and have shown proof of their competence.
- May be expected to perform the duties assigned to them reliably and have awareness of the risks and dangers.

The following organisational measures shall be taken:

- A safe and clear working environment shall be ensured.
- The operating instructions must be stored properly and easily available for the operator.
- At regular intervals, check that work is being carried out in a safety-conscious manner.
- Observe the intervals specified for periodic maintenance and tests. File the reports in the product logbook.
- Safety regulation and accident prevention policy are implemented properly.
- Compliance with national regulations.

2.3 Purpose of use

- The product shall be used for vertical lifting and horizontal transport of loads within the limits of the technical specifications.
- The product may only be loaded up to the safe working load as specified in the technical specifications.
- Always lift and tension in a straight vertical line between load and trolley
- If the product is used for special applications beyond the technical specifications, the individual application must be assessed. In case of doubt contact Van Leusden B.V.
- The product is only to be used in combination with monorails that are properly designed and dimensioned.

2.4 Inappropriate use

- Use in areas with potentially explosive atmospheres.
- Using the standard trolley to transport people is strictly forbidden.
- Using the trolley with people walking / moving underneath the load.
- Exceeding the safe working load of the trolley and/or hoist under the specified conditions.
- Operation exceeding the allowed operating circumstances as mentioned in the technical specification (For example; reduced capacity, temperatures, etc.).
- Using a damaged trolley or trolley with defective parts.
- Pulling, dragging or towing loads.
- Lifting loads at an angle exceeding the specified limitations.
- Removing the safety latch of the hook.
- Using the hoist with slack or twisted chain or wire rope.
- Touching the moving parts, such as chain, sprockets, wheels, etc.
- Using the emergency limit switch as an operational limit switch.
- If the trolley forms a part of a machine or installation, customer is responsible that the product meets the specific regulations of the application.
- Any fundamental alterations and modifications. Fundamental alterations and modifications to the trolley must be approved by Van Leusden B.V. Van Leusden B.V. cannot accept any liability for malfunctioning or damage after these changes are made without approval.

2.5 Safe operation

- The operator is responsible for the safe operation, lifting and avoiding all possible risks involved at the working environment.
- The operator shall have complete knowledge of the manual and the operating instructions before starting to work with the product.
- The operator shall perform daily checks before operating.
- Never put yourself under a suspended load. Danger to life and limb!
- Find out where the emergency stop button is before starting operation.

- Make sure before starting with lifting, that the safe working load will not be exceeded. See chapter 3.3 "Safe Working Load".
- If overload occurs always inspect the trolley for any damage.
- Never put limbs between parts which might pinch or cut.
- Do not lift a load with loose parts, which can fall down, attached.
- Take notice of the relevant instructions when attaching loads.
- Operate from a place with clear sight and overview.
- Never stand between the load and wall or construction.
- Start lifting carefully when picking up the load.
- When lifting and setting down loads, ensure that they are in a stable position in order to avoid accidents.
- Never try to solve a malfunction while the load is suspended.
- Never use bended, distorted or broken load hooks.
- Never attempt to straighten the hook when it is distorted.
- Never apply a heat treatment to the hook.
- Locking the buttons of the control device is forbidden.
- Do not kink or crush power and control cabling.
- Never expose power and control cables to tensile stress.
- Never touch metal components that are colder than 0°C or hotter than 55°C without protective gloves.
- Do not use the emergency limit switch as an operational limit switch.
- Do not remove or bypass safety devices
- Immediately report damage and defects of the product to the responsible person. Do not use the product until the faults have been eliminated.
- Do not remove information plates from the product.
- The trolley shall be tested and inspected by a relevant authority before commissioning.

2.6 Proper load attachment / suspension

- Use only tested and approved slings to attach the load.
- Never use a hoist when the load chain or wire rope is damaged.
- Ensure a load is always suspended above the centre of gravity.
- The load must always be suspended from the base of the hook. The tip of the hook must not be subjected to load.
- Removing the safety latch from suspension and load hooks is not permitted.

2.7 Electrical equipment

Products can be supplied with different electrical control systems. The power supply is a dangerous electrical voltage. During assembly, installation, maintenance and repair, the next points shall be observed:

- Disconnect the main power of the electrical installation before opening covers marked with the "Electrical voltage warning" symbol. Only experienced electricians or competent persons may open covers marked with this symbol.
- Check wires for damage and exposed blank cores.

2.8 Installation, commissioning, maintenance and repairs.

- Only competent persons may perform installation, commissioning, maintenance and repairs.
- Only original spare parts may be used for repairs.
- We recommend having installation and commissioning carried out by personnel engaged by the manufacturer.
- Do not carry out any alterations or modifications.
- Any additional outfitting must be approved by the manufacturer.
- Dismantled guards and safety devices must be properly re-installed.
- The system shall always be tested before putting it back into operation.

2.9 Periodic inspection and tests

- A competent person must test the product and supporting structures with periodic intervals according to the regulations of the country once a year. It may be necessary to carry out tests more often if the operating conditions demand it.
- The results of the tests must be recorded and filed in the log book.

3 General information

This manual describes an Atlas HD3C trolley unit for heavy duty use in an industrial environment.

3.1 Technical specification

If deviating specification are applicable, then the technical specifications can be found in Appendix II "Technical specifications", and may contain one or more of the following items:

- Scope of supply, data & specifications
- General trolley data
- Motor data and speeds
- Power and control supply
- Switch panel and controls
- Electrical specifications
- Mechanical specifications
- Surface treatment

3.2 Factory warranty

The warranty period of the product, as specified in the technical specification, becomes invalid if:

- The instructions in this manual for installation, operation, inspection, maintenance, storage, transport etc. are not followed.
- Repairs and eliminations of faults are executed without been consulted and approved by Van Leusden B.V.
- Repairs and eliminations of faults are executed by incompetent persons.
- The product is modified or non-original spare parts are used.
- The product is improperly used.

If any question arises concerning the warranty, contact your local authorised reseller or your contact person at Van Leusden B.V.

3.3 Safe Working Load

The design is based on the safe working load specified in the technical specification of the product. It is the operator's responsibility not to go beyond what is permitted. The maximum permitted working load, indicated in kilograms or metric tons, can be found on the nameplate.

3.4 Areas of application

Atlas HD3C trolleys are designed to withstand ambient temperatures of -20°C to +50°C and humidity up to 100%, but not submerged in water. If the trolley is continuously used in a high humidity environment with temperature fluctuations, there is a chance that condensation occurs which may reduce the lifespan of the trolley. The maximum designed longitudinal slope of the traveling surface is 0.17°.

When the trolley is frequently used in an outside environment, it shall be protected against the effect of weather for example: rain, hail, snow, direct sunlight, dust, etc.

Danger! Atlas HD3C trolleys may not be used for transport of persons

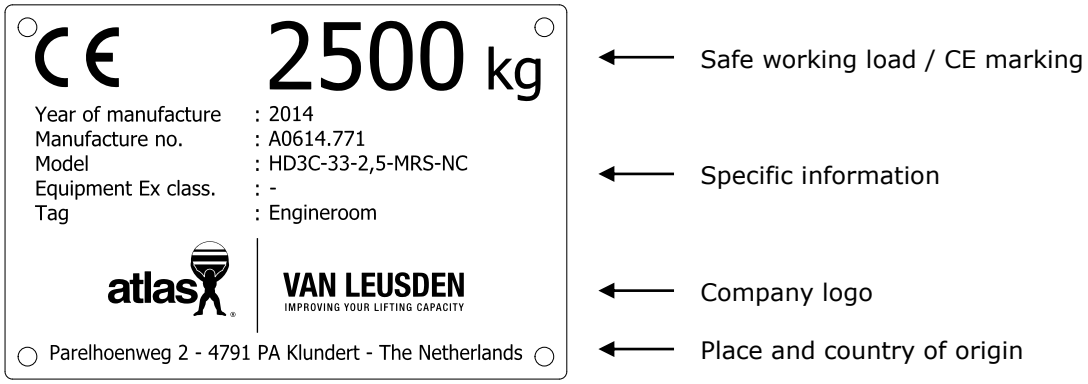
Danger! Atlas HD3C trolleys are not designed for use in potentially explosive atmospheres.

Atlas HD3C trolleys can optionally be executed for use in other circumstances. For example:

- Dusty, greasy and/or high humidity environments.
- Offshore and/or corrosive environments.
- Potentially explosive atmospheres (Ex areas).
- Food industries.
- Use in extreme high or low temperatures.
- Transport of persons

3.5 Nameplate designation

The nameplate contains product specific information and can be found fixed to the trolley. The actual nameplate mounted can differ from the example illustration below.



In the middle of the nameplate, a small list of specific information is shown for the product.

3.6 Model designation

The model description describes how the trolley is executed. The execution parameters can be converted through the table below:

HD3C-33-2,5-MRS-NC

- Non corrosive
- Headroom
  - S Standard
  - L Low
  - U Ultra Low
- Model execution
  - P Push
  - G Geared
  - W Worm geared
  - H Helical geared
  - S Swinging beam
  - C Articulated for curved beams
  - R Rack and pinion
  - F Friction wheel system
  - T Personal transportation
- Drive model
  - M Manual
  - E Electric
  - P Pneumatic
  - H Hydraulic
- Capacity in tons (1 ton = 1000 kg)
- Chassis type in Kilo Newton (kN)
- Atlas HD3C trolley

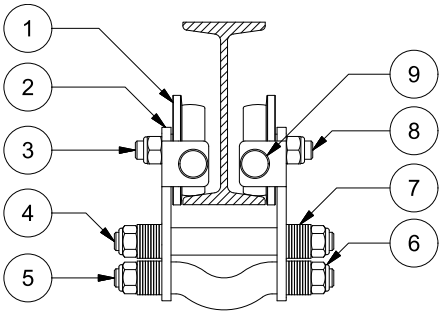
For example, the above model description describes a 2,5 tons Atlas HD3C trolley with a 33 kN chassis. The trolley is of type manual rack and pinion with standard headroom and is treated to be non-corrosive.

Tip! If the table does not match the model number, it's probably due to deviating specifications and/or a special design.

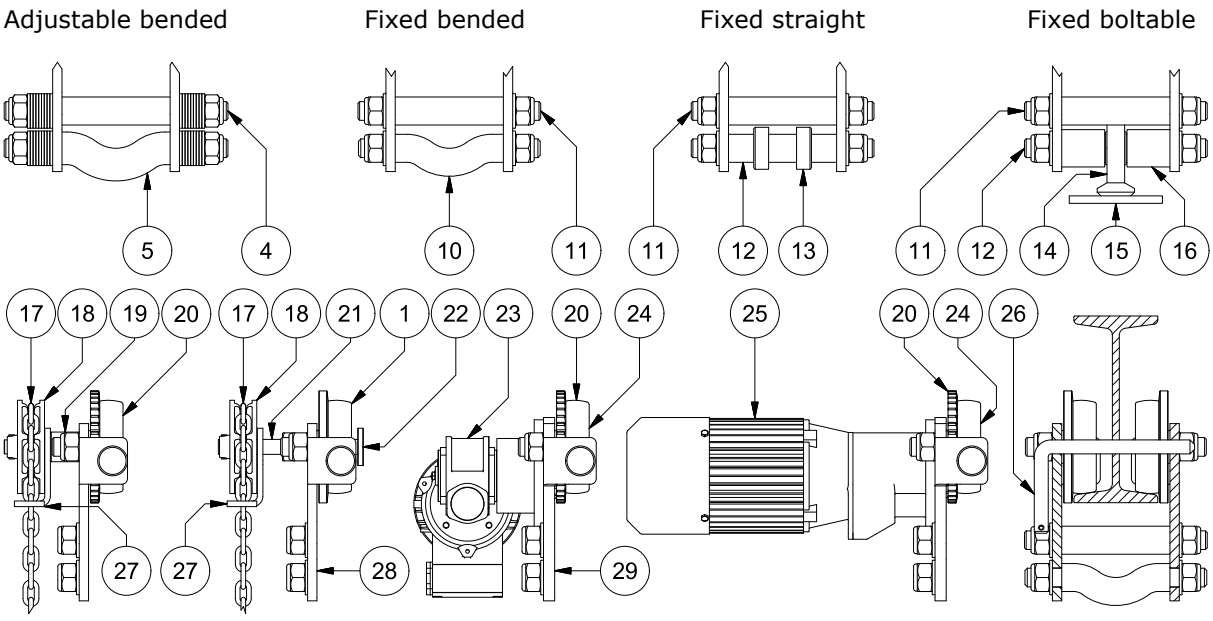
3.7 Product overview

Below illustration shows the components of an Atlas HD3C trolley unit. The default configuration can be changed with other configuration options. Most of the options shown below can be combined.

Default configuration (Adjustable, manual push):



Other configuration options:

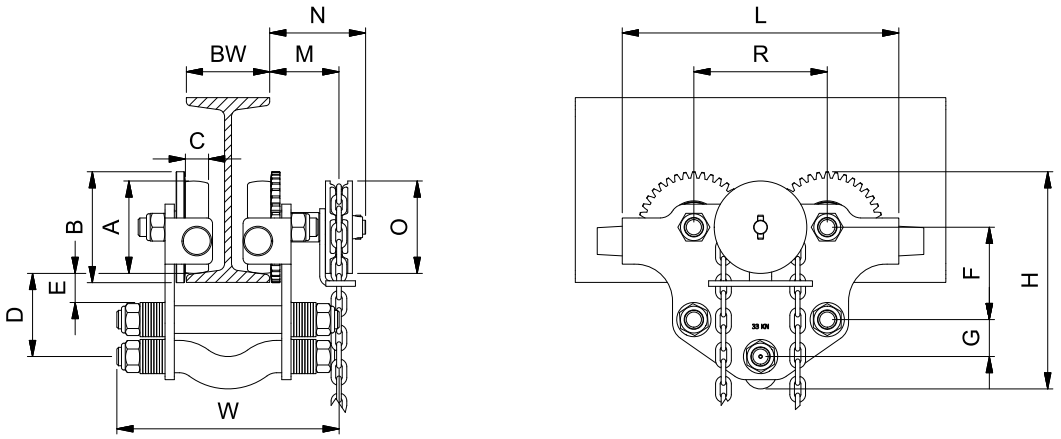


Component description

1. Single flange wheel
2. Side plate push
3. Wheel shaft
4. Adjustable support bolt
5. Adjustable bended suspension bolt
6. Hexagon lock nut
7. Adjustment washers
8. Wheel shaft circlip
9. Rubber buffer
10. Fixed size bended suspension bolt
11. Fixed size support bolt
12. Fixed size straight suspension bolt
13. Adjustment ring
14. Ball joint
15. Boltable plate
16. Distance bushing
17. Hand chain
18. Chain wheel
19. Drive shaft assembly
20. Single flange geared wheel
21. Parking device shaft assembly
22. Parking device locking disc
23. Electric motor with worm gear
24. Pinion
25. Electric motor with helical gear
26. Parking pin

3.8 Dimensions

Below illustration in combination with dimension table 1, shows the dimensions of a standard manual push and manual geared Atlas HD3C trolley unit. If applicable, dimensions of other configurations are enclosed in Appendix II "Technical specifications" or can be obtained through your contact person at Van Leusden B.V. upon request.



Capacity	Chassis	Monorail width BW	Min. radius	Dimensions													
				A	B	C	L	H	W	R	D	E	F	G	M	N	O
5.00	6 kN	55~102	1.000	45	60	15	150	125	160	75	52	15	45	30	-	-	-
		105~152							210								
1.000	11 kN	55~102	1.500	60	75	18	190	160	175	99	60	20	60	30	65	90	100
		105~152							225								
		156~203							275								
		207~254							325								
2.000	22 kN	74~127	1.600	80	100	22	255	205	215	123	75	27	80	35	65	90	100
		127~180							270								
		190~243							330								
		254~305							390								
3.200	33 kN	90~143	2.000	100	120	25	300	245	250	144	90	35	100	40	70	95	100
		149~203							310								
		203~254							360								
		251~305							410								
5.000	52 kN	106~156	2.900	125	150	30	375	305	270	174	117	40	120	60	100	130	135
		160~210							325								
		210~260							375								
		255~305							420								
6.300	64 kN	106~156	2.900	125	150	30	375	310	270	174	117	40	120	60	100	130	135
		160~210							325								
		210~260							375								
		255~305							420								
8.000	84 kN	>= 119	3.500	160	190	35	450	365	BW+150	220	145	45	145	80	105	130	270
10.000	104 kN	>= 131		160	190	35	450	370	BW+150	220	145	45	145	80	105	130	270
12.500	124 kN	>= 143		160	190	35	450	370	BW+150	220	145	45	145	80	105	130	270
16.000	164 kN	>= 155	5.500	200	240	50	550	445	BW+185	272	165	42	165	100	135	170	300
20.000	204 kN	>= 170		200	240	50	550	450	BW+185	272	165	42	165	100	135	170	300
25.000	254 kN	>= 185		200	240	50	550	455	BW+195	272	165	42	165	100	135	170	380

Dimension table 1

4 Transport and Storage

Transport
The products will be delivered as complete construction with or without custom built support frames. The products must be fixated properly for transportation.

The product or frame has suitable lifting points. Before lifting, observe the lifting points and ensure the product is attached correctly for lifting. The frame and product must always be put down correctly on a stable underground.

Storage
To keep the Atlas HD3C trolley in good condition while storing for a period longer than six months, follow the steps below.

Attention! If the Atlas HD3C trolley is going to be stored for a period shorter than six months read chapter 9 "Taking out of operation".

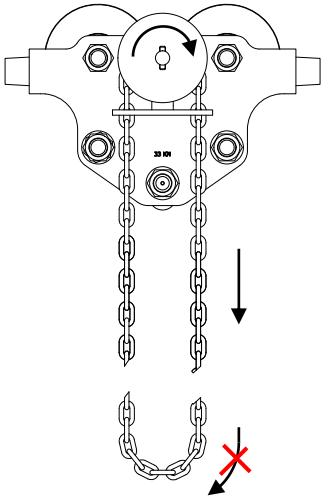
- If applicable, turn off the power supply.
- Perform routine maintenance and maintenance for storage. See chapter 8.1 "Maintenance schedule".
- The environment should be clean and dry.
- The trolley shall be kept free from excessive vibrations.
- The trolley shall be protected against excessive water, wind and salt
- The trolley shall be stored in a closed and/or sealed packing.
- Temperature not colder than -20°C or hotter than 50°C.
- Store the trolley always straight up and secure against toppling.
- Observe environmental protection laws for storage (do not allow oil etc. to leak).

Sea fastening
An Atlas HD3C trolley unit installed on a ship shall be sea fastened when necessary. Sea fastening is fixating the trolley to prevent movement which could result in a damaged trolley.

The following measures shall be taken:
- Fixate the trolley and its components by lashing or other means.
- Be sure the trolley is not able to travel on the monorail.

Parking device
Atlas HD3C trolleys executed with a parking device can be fixated on the monorail. When the right chain part is pulled down, the chain wheel of the single sided parking device rotates clockwise causing the trolley to fixate itself onto the monorail. Pulling the other chain part down will result in loosening the trolley. A parking pin can be used to fasten the trolley using a hole in the monorail.

Caution! Only pull the chain on the straight ends. Getting your hands in the bottom of the loop while pulling fast or firmly may hurt.



5 Installation

Warning! Installation may only be carried out by competent persons!

Tip! The position numbers mentioned in this chapter are according to the illustration of chapter 3.7 "Product overview".

Unpacking
Before installation, the Atlas HD3C trolley shall be unpacked from its packing.

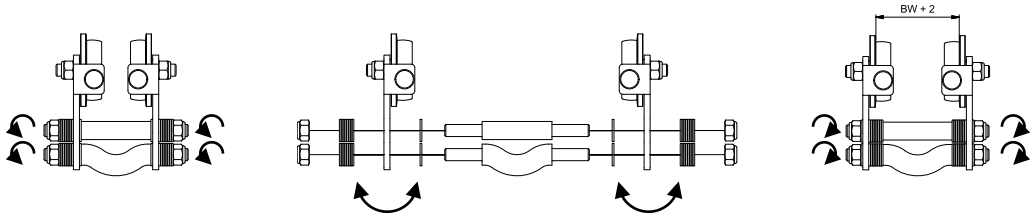
- Keep any accompanying documents near the operating site of the trolley.
- Lift the trolley carefully out of the packing and put it down on a stable underground.
- Keep in mind the weight of the trolley. The weight of the trolley can be found in the Appendix II "Technical specifications".
- Dispose or recycle the packaging materials in accordance with statutory legislation and environmental regulations.

Prior checks to Installation
Before installation of an Atlas HD3C trolley, pay attention to the following.

- Check proper installation and dimension/tolerances of the monorail.
- Check that the supporting structure is properly designed and dimensioned to hold the trolley, the safe working load and any overload which might occur.
- Remove all obstacles that makes installation of the trolley difficult.

Adjusting the trolley width
Atlas HD3C trolleys executed with an adjustable suspension set are capable of adjustment to fit a range of monorail widths. For reference, see pos. 4, 5 and 7 of chapter 3.7 "Product overview". To adjust the width of the Atlas HD3C trolley, follow below steps in sequence.

- Unscrew the support and suspension bolts (Pos. 4 and 5), on both sides of the trolley and take off the hexagon lock nuts and washers (Pos. 6 and 7).
- Slide off the side plate (Pos. 2). Be careful not to damage the threaded ends of the support and suspension bolts.
- Adjust the amount of washers on the inside and outside of the side plate. This increases or decreases the width of the trolley.
  Attention! On both sides of the support and suspension bolts shall be an equal amount of washers. If with an equal amount of washers the desired width cannot be set, then a difference of maximum 1 washer is allowed.
- Place the washers and hexagon lock nut (Pos. 6 and 7) onto the threaded ends of the support and suspension bolts and hand tighten the hexagon lock nuts.
- Measure the width between the wheel flanges. The trolley width shall be the width of the monorail (BW) + 2mm. keep increasing or decreasing the amount of washers until the correct width is reached.
- Tighten the support and suspension bolts according to chapter 8.4 "Tightening torques".
- **Attention!** After reassembly, it must be verified that the trolley is properly mounted and all bolts are tightened according to chapter 8.4 "Tightening torques". Verification shall be performed by a competent person.



Installation

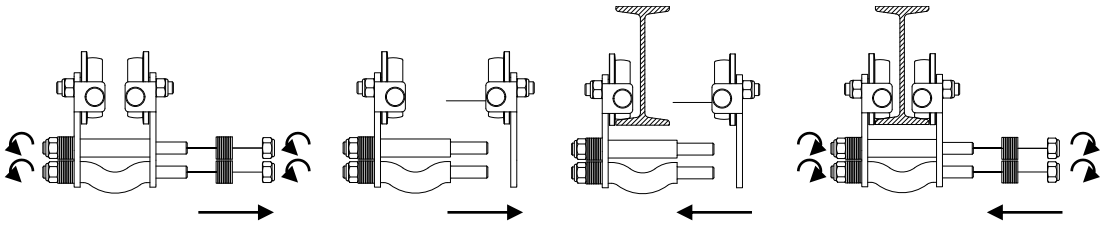
Depending on the situation, the Atlas HD3C trolley unit can be installed in two ways. Option A is recommended and preferred because of the ease of installation. If the ends of the monorail aren't accessible, due to a wall or other obstacles, follow option B instead of option A. To install the Atlas HD3C trolley unit properly, the following steps shall be taken in sequence.

Option A, Driving the trolley onto the monorail:

- Use a double sling chain of sufficient capacity when lifting the Atlas HD3C trolley unit.
- Lift the Atlas HD3C trolley unit next to the end of the monorail with the underside of the wheels just above the bottom flange of the monorail.
  Attention! Watch for the orientation of the trolley. If applicable, make sure the motor and power supply connections are oriented towards the correct side.
- Try to push the trolley onto the monorail or follow (electric execution only) the additional steps below.
  - Take off the drive motor fan cover.
  - If installed, release the drive motor brake.
  - Manually rotate the drive motor fan and drive the trolley onto the monorail.
  - Restore the trolley drive motor brake in working order.
  - Re-mount the drive motor fan cover.

Option B, Demount and lift the trolley onto the monorail:

- Use a double sling chain of sufficient capacity when lifting the Atlas HD3C trolley unit. Ensure that all parts of the trolley are supported while disassembling.
- Loosen the support and suspension bolts (Pos. 4 and 5) on one side of the trolley.
- Unscrew the support and suspension bolts on the other side of the trolley and take off the hexagon lock nut and washers (Pos. 6 and 7).
- Slide off the side plate (Pos. 2). Be careful not to damage the threaded ends of the support and suspension bolts.
- Lift the trolley half containing the support and suspension bolts onto the monorail flange.
  Attention! Watch for the orientation of the trolley. If applicable, make sure the motor and power supply connections are oriented towards the correct side.
- Slide the side plate (Pos. 2) back onto the support and suspension bolts (Pos. 4 and 5). Be careful not to damage the threaded ends of the support and suspension bolts.
- Place the washers and hexagon lock nut (Pos. 6 and 7) onto the threaded ends of the support and suspension bolts and hand tighten the hexagon lock nuts.
- Tighten the support and suspension bolts according to chapter 8.4 "Tightening torques".
  Attention! After reassembly, it must be verified that the trolley is properly mounted and all bolts are tightened according to chapter 8.4 "Tightening torques". Verification shall be performed by a competent person.



Tip! The position numbers mentioned in the following steps are to be used in combination with the below illustration instead of the illustration of chapter 3.7 "Product overview".

After performing option A or B the following actions shall be taken:

- If the trolley is executed with an electric motor (Pos. 4), follow the additional steps below.
  - Mount the power supply system (Pos. 5) along the monorail.
  - If present, mount the towing arm (Pos. 6) of the power supply system to the trolley.
  - Connect the power supply cable to the relay or terminal box of the trolley.
  - If applicable, install and connect the trolley drive limit switches (Pos. 2a and 2b).
  - Install the limit switch actuators (Pos. 1) to the monorail. The position must be such that the trolley doesn't hit the end stops (Pos. 3) after the trolley drive is switched off by the limit switch (Pos. 2a and 2b).

Caution! Make sure the trolley never drives powered into the end stops.

- Check the position of the end stops on the monorail.
- Check the lubrication of the Atlas HD3C trolley unit according to chapter 8.2 "Lubrication list".

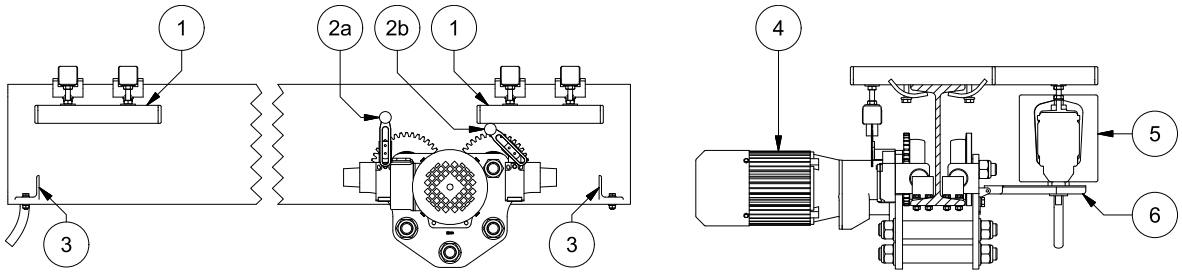


Illustration component description

1. Limit switch actuator
2a. Limit switch
2b. Limit switch in activated position
3. End stop
4. Electric motor
5. Power supply system
6. Towing arm

Attention! After installation, the Atlas HD3C trolley shall be commissioned and load tested according to chapter 6 "Commissioning".

6 Commissioning

After installation, it is important to make sure that the complete system is functioning properly by following the next tests and checks in the correct order. The tests and checks before commissioning must also be executed when the system has been stored or has been out of operation for a period longer than 3 months.

Warning! Commissioning and load tests may only be carried out by competent persons.

Attention! Below test and checks are to be performed without load.

Checks before commissioning

Before commissioning, check the following steps.

- Visual check that installation of the Atlas HD3C trolley unit is performed correctly.
- Check tightening of all bolted connections. For reference see chapter 8.4 "Tightening torques".
- Check if the end stops are properly mounted onto the monorail.
- Visually check if monorail is clean and without obstacles.
- If the trolley is executed with an electric motor, follow the additional steps below.
    - Check that all gearboxes are equipped with proper breather plugs.
    - Check the oil level of the gearboxes and bring, if needed, to a normal level.
    - If applicable, check presence of limit switches and limit switch actuators.
    - Check the position of the limit switch actuators. The position must be such that the trolley doesn't hit the end stops after the trolley drive is switched off by the limit switch. The trolley should stop before the end stop.
    - Check if all electrical wiring is properly connected.
    - Check strain relieving elements of the control and power cables for damage.
    - Check the control device housing for damage.

Checks during commissioning

During commissioning, perform, test and check the following steps.

- Always ensure that there is enough space for travelling without the risk of collision or direct activation of the limit switches.
- Check all movements. All movements must be smoothly and without any abnormal noises or vibrations.
- If the trolley is executed with an electric motor, follow the additional steps below.
    - Ensure the emergency stop is functioning correctly immediately after switching on the installation. See chapter 7.2 "Electric operation".
    - The directional movements of the system must correspond with the control device.
    - Check the braking of all movements.
    - Test the functioning of all limit switches.
- Register the results if necessary.

Load tests

The Atlas HD3C trolley should be function- and load tested according to the directives given in NEN-EN 15011 before putting into operation for the first time.

Safe Working load (S.W.L.), in metric ton	Test load
Up to 20 ton	125% S.W.L.
Exceeding 20 ton but not exceeding 50 ton	S.W.L. + 5 ton
Exceeding 50 ton	110% S.W.L.

Commissioning table 1

In addition to the above, observe the national rules and regulations of the country in which the Atlas HD3C trolley unit is used.

7 Operation

This chapter gives a short description on how to operate an Atlas HD3C trolley unit in manual push, manual geared or electric execution.

Attention! Before operating the Atlas HD3C trolley unit:
- Read chapter 2 "Safety instructions"
- See section "Before use" of chapter 8.1 "Maintenance schedule".

Personal protective equipment

Personal protective equipment shall be provided by the owner and shall be used where necessary.
- Ear and eye protection.
- Safety boots.
- Protective gloves.
- Closely fitting clothes (danger of clothing being drawn into equipment).
- Head protection.

Working environment
- The operator must always have a clear sight on the working environment.
- Movements of the load in all directions must be clearly visible.
- Clean up disturbing objects.
- The operator must not stand in the hazardous area.

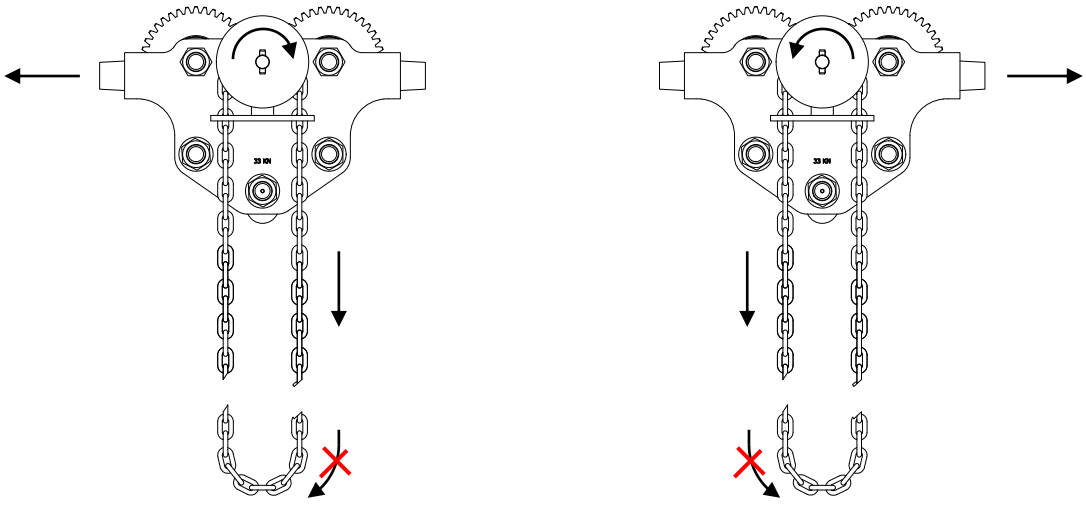
Prior to operation

Each operator must have read the entire manual and fully understand its contents. It is the responsibility of the operator to observe and follow everything that is described in this manual.

7.1 Manual push and geared operation

Manual push trolleys are not equipped with a drive mechanism and shall be pushed by hand. Manual geared trolleys are driven by a hand chain. When the right chain part is pulled down, the chain wheel rotates clockwise causing the trolley to drive backwards as shown in the illustration below. Pulling the other chain part down will result in driving the trolley forward.

Caution! Only pull the chain on the straight ends. Getting your hands in the bottom of the loop while pulling fast or firmly may hurt.



7.2 Electric operation

Electric Atlas HD3C trolleys are controlled with a control pendant. In some cases a trolley is carried out with a remote control. In this chapter a short description is given of the control pendant.

Danger! In case of an emergency situation, immediately press the red emergency stop button on top of the control device. All movements will stop immediately and all functions will become inoperative. This button must be freely accessible at all times.

Danger! After using the emergency stop, a competent person must eliminate the fault which led to an emergency situation. After all faults are eliminated and when there is no danger, the operator may restart the trolley.

When the emergency stop is used, it can be released by turning in the direction shown on top of the button. For example, the illustrated button can be released by turning clockwise.

Warning! Lethal voltage remains present in the switch panel after the emergency stop is used.

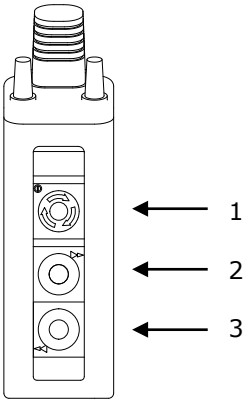
The Atlas HD3C trolley unit may only be operated by competent persons. The operating instructions and button layout of the control device must be available near the equipment and accessible for the operator of the Atlas HD3C trolley.

Layout and functioning

Button layout:

1. Emergency stop
2. Trolley drive right
3. Trolley drive left

Attention! The actual layout of the control device mounted to the trolley can differ from the shown illustration to the right.



If the control device is equipped with double speed buttons, slow and fast movement is possible. When a double speed button is pressed halfway, the slow speed is activated. Pressing the button completely activates the fast / full speed.

Attention! When travelling, wait for the movement to completely stop before travelling in reverse direction, especially when travelling at fast / full speed.

8 Maintenance

In this chapter the maintenance, lubrication and torques are given.

- **Warning!** Maintenance, inspection and damage assessment may only be executed by competent maintenance personnel.
- Malfunctions have to be reported immediately, to the owner, who has to initiate repair work, which is to be carried out by competent maintenance personnel.
- All maintenance, measurements, shortcomings, damages and repairs must be written in a logbook

- **Warning!** Repair work may only be performed when the equipment is out of service and the main power supply is turned off by the main power switch.

- **Warning!** Parts must always be replaced when damage occurs that directly or indirectly endangers the safety of the trolley.

8.1 Maintenance schedule

The following regular maintenance intervals are for reference. Regular maintenance work must be adapted to the service conditions if the product is used in higher than normal service conditions.

M = Manual push and geared
E = Electric
P = Pneumatic and Hydraulic

Maintenance table 1 shall be followed for regular maintenance.

Maintenance and checks	Daily / Before use			Monthly			3 monthly			Yearly		
	M	E	P	M	E	P	M	E	P	M	E	P
Check operation of emergency stop		x	x									
Check operation of hoisting and lowering limit switches		x	x									
Check operation of braking		x	x									
Check operation of all limit switches		x	x									
Check strain relieving elements					x	x						
Check control cables and control boxes for damage					x							
Check pinion and gears for wear				x	x	x						
Lubricate pinion and gears								x	x			
Check trolley construction for deformation										x	x	x
Check trolley wheels for wear										x	x	x
Check gearboxes for oil leakage		x	x									
Lubricate wheels, guide wheels and pillow block bearings							x	x	x			
Check all fasteners										x	x	x
Check all locking components (fixing plates, circlips, etc.)										x	x	x
Check electrical switch gear and wiring											x	
Change gearbox oil											x	x
Check power supply system								x	x			
Check hand chain for wear										x		
Check oil level of the oiler									x			
Check fittings for damage												x
Check the silencer for permeability												x
Check sealings of the control valves									x			
Clean air and oil filters									x			
Check system pressure level			x									
Drain moisture filter			x									
Check for any kind of corrosion or oxidation				x	x	x						
Visually check the overall condition of the trolley	x	x	x									

Maintenance table 1

When the trolley is going to be taken out of operation for a period longer than one month, follow maintenance table 2. Taking out of service for a period longer than six months is considered as storage for which maintenance table 3 should be used.

Maintenance when taking out of operation	Before			1 Monthly			3 Monthly			Before re-use		
	M	E	P	M	E	P	M	E	P	M	E	P
Rotate all bearings and shafts		x	x				x	x	x			
Fill all gearboxes generously with oil		x	x									
Let the motor run briefly		x	x					x	x			
Lubricate wheels, guide wheels and pillow block bearings	x	x	x									
Grease pinion and gears		x	x									
Visually check the overall condition of the trolley	x	x	x							x	x	x
Check gearboxes for oil leakage		x	x					x	x			
Check for any kind of corrosion or oxidation	x	x	x	x	x	x				x	x	x

Maintenance table 2

Maintenance before, during and after storage	Before			6 Monthly			2 Yearly			Before re-use		
	M	E	P	M	E	P	M	E	P	M	E	P
Rotate all bearings and shafts				x	x	x						
Fill all gearboxes generously with oil		x	x									
Let the motor run briefly		x	x		x	x						
Replace all gearbox breather plugs for blind plugs		x	x									
Replace all gearbox blind plugs for breather plugs											x	x
Lubricate wheels, guide wheels and pillow block bearings	x	x	x									
Grease pinion and gears		x	x									
Visually check the overall condition of the trolley	x	x	x				x	x	x	x	x	x
Check gearboxes for oil leakage		x	x		x	x						
Check for any kind of corrosion or oxidation	x	x	x	x	x	x				x	x	x

Maintenance table 3

In case of a spare part in storage, it's recommended switching the operational part with the spare part every 2 years.

8.2 Lubrication list

The following table has to be used in combination with chapter 8.3 "Lubrication codes". The given position numbers are according to the illustration drawing in chapter 3.7 "Product overview".

Component	Position number	Lubricant code
Pinions	24	9
Gearbox (Spur and helical)	25	8
Gearbox (Worm)	23	4
Gearbox (Planetary)	-	14
Bearings	-	12
Grease nipples	-	12
Wheels	1 and 20	12

Lubrication table 1

8.3 Lubrication codes

Attention! Before use of any lubrication, read the Material Safety Data Sheet (MSDS) and Technical or Product Data Sheet (TDS or PDS).

Attention! Always use Personal Protective Equipment (PPE) as described in the Material Safety Data Sheet (MSDS)

Below lubricants are used and/or recommended lubricants. To select the right lubricant, see lubrication table 1 of chapter 8.2 "Lubrication list".

Lubricant code	Oil / Grease	Lubricant	Ambient Temperature °C	ISO-Viscosity	Kinematic viscosity mm2/s @40°C	Fire point DIN ISO 2592 °C	Pour point DIN ISO 3016 °C	Penetration worked @25°C 0.1 mm	Dropping point °C
1	Oil	Shell Tellus S2 M 46	-20 +100	46	46	230	-30	-	-
2	Oil	Shell Omala S2 G 320	0 +100	320	320	250	-15	-	-
3	Oil	Shell Omala S4 GX 320	-25 +120	320	312,7	252	-42	-	-
4	Oil	Shell Omala S4 WE 220	-20 +100	220	222	278	-39	-	-
5	Oil	Shell Omala S4 WE 320	-20 +100	320	321	270	-39	-	-
6	Oil	Shell Omala S4 WE 460	-20 +100	460	460	268	-36	-	-
7	Oil	Shell Omala S4 WE 680	-20 +100	680	664	262	-39	-	-
8	Oil	Shell Omala S4 GX 220	-30 +120	220	229,4	250	-45	-	-
9	Grease	Shell Gadus S3 Wirerope T Aerosol	-30 +120	-	345	-	-	445-475	-
10	Grease	Shell Gadus S2 A320 2	-10 +60	-	320	-	-	265-295	85
11	Oil	Castrol Viscogen KL300 Spray	0 +200	-	4030	-	-12	-	-
12	Grease	Shell Gadus S3 V220C 2	-20 +140	-	220	-	-	265-295	240
13	Grease	Bel-Ray Wirerope 66700	-46 +60	-	14,2	-	-	-	-
14	Oil	Q8 Goya 150	-20 +100	150	150	-	-27	-	-
15	Oil	Castrol Viscogen KL130 Spray	-20 +200	-	249	-	-27	-	-

Lubrication table 2

8.4 Tightening torques

Tightening torques of fasteners in components such as motors gearboxes etc. should be tightened according the manufactures documentation. Other fasteners are according to below tables.

Normal bolt nut connections shall be fastened according to torque table 1. All custom threads (For example support and suspension bolts, wheel shafts, guide roller shafts, etc.) shall be fastened according to torque table 2.

All bolts are of 8.8 quality unless otherwise noted.

Torque (Nm)	8.8	10.9	12.9	A4-70	A4-80
M3	2,1	3,5	3,8	1,5	1,7
M4	4,4	7	7,6	3	3,6
M5	8	12,5	13,6	5,5	6,7
M6	13,2	20,1	21,8	8,1	11,2
M8	30	44	47	18	21
M10	49	73	93	26	34
M12	83	121	151	41	62
M14	131	188	232	68	101
M16	167	281	342	108	157
M18	275	388	467	157	224
M20	382	534	638	223	318
M22	517	719	852	310	438
M24	652	902	1.064	397	558
M27	945	1.297	1.519	589	823
M30	1.286	1.755	2.042	815	1.132
M33	1.722	2.340	2.710	-	-
M36	2.219	3.003	3.463	1.445	1.993
M39	2.852	3.845	4.415	-	-
M42	3.525	4.740	5.429	-	-

Torque table 1

Torque (Nm)	
M8	13
M10	26
M12	45
M16	110
M20	210
M24	365
M30	725
M36	1.265
M39	1.545
M42	1.890

Torque table 2

9 Taking out of operation

To keep the Atlas HD3C trolley in good condition when taking out of service for a period longer than one month follow the steps below.

Attention! If the Atlas HD3C trolley is taken out of service for a period longer than six months read chapter 9 "Taking out of operation" section storage.

- If applicable, turn off the power supply.
- Perform routine maintenance and maintenance for taking out of operation. See chapter 8.1 "Maintenance schedule".

Dismantling

When an Atlas HD3C trolley unit or its components have reached their end of service live, they shall be replaced or taken out of service. When taking an Atlas HD3C trolley unit or its components out of service they shall be dismantled according to the instructions below.

Warning! Dismantling may only be carried out by competent persons!

Attention! Before dismantling:
- Read chapter 2 "Safety instructions".
- Read chapter 7 "Operation" for use of personal protective equipment.

Tip! The position numbers mentioned below are according to the illustration of chapter 3.7 "Product overview".

Depending on the situation, the Atlas HD3C trolley unit can be dismantled in two ways. Option A is recommended and preferred because of the ease of dismantling. If the ends of the monorail aren't accessible, due to a wall or other obstacles, follow option B instead of option A.

Option A, Driving the trolley off the monorail:
- Try to push the trolley to the end monorail or follow (electric execution only) the additional steps below.
  - Take off the drive motor fan cover.
  - If installed, release the drive motor brake.
  - Manually rotate the drive motor fan and drive to the end of the monorail.
- Use a double sling chain of sufficient capacity when lifting the Atlas HD3C trolley unit.
- Lift the Atlas HD3C trolley unit off the end of the monorail.

Option B, Demount and lift the trolley off the monorail:
- Use a double sling chain of sufficient capacity when lifting the Atlas HD3C trolley unit. Ensure that all parts of the trolley are supported while disassembling.
- Loosen on one side of the trolley the support and suspension bolts (Pos. 4 and 5).
- Unscrew the support and suspension bolts on the other side of the trolley and take off the hexagon lock nut and washers (Pos. 6 and 7).
- Slide off the side plate (Pos. 2).
- Lift the trolley half containing the support and suspension bolts off the monorail

Disposal

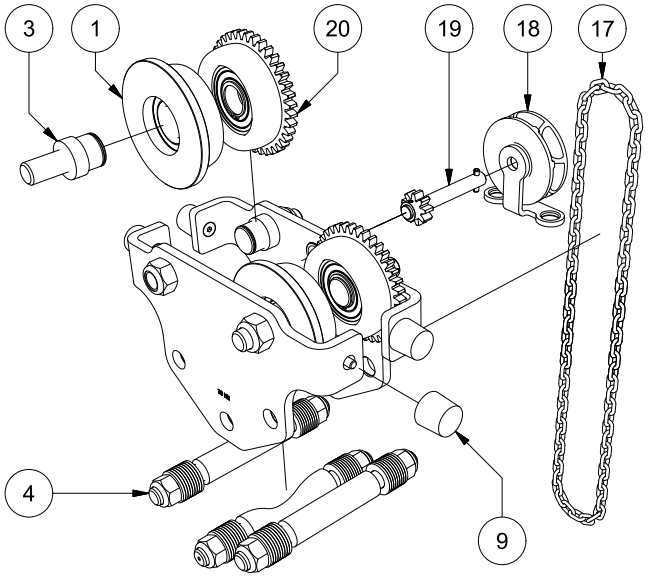
An Atlas HD3C trolley unit and its components contain a range of materials which must be disposed or recycled, in according with statutory legislation and environmental regulations.

Please note that the following materials might have been used:
- Ferrous materials (Steel, Cast iron)
- Non-ferrous materials (Bronze, Aluminium, Copper)
- Plastics (Rubber, Cabling, Component housings)
- Oils and greases

10 Spare parts

Below illustration shows the spare parts of a standard manual push and geared Atlas HD3C trolley. Spare parts for other configurations are on request. Request for spare parts can be issued at your contact person at Van Leusden B.V. using the manufacture number of the trolley.

Tip! The shown position numbers are in accordance with chapter 3.7 "Product overview".



Manual push execution 81000…

Pos.	Qty.	Consisting of	6 kN	11 kN	22 kN	33 kN	52 kN	64 kN
1	4	Single flange wheel Bearing Circlip						
3	4	Wheel shaft Hexagon lock nut Circlip						
4	1	Support bolt Suspension bolt Adjustment washer* Hexagon lock nut						
9	4	Buffer Hex head bolt						

Pos.	Qty.	Consisting of	84 kN	104 kN	124 kN	164 kN	204 kN	254 kN
1	4	Single flange wheel Bearing Circlip						
3	4	Wheel shaft Hexagon lock nut Circlip						
4	1	Support bolt Suspension bolt Adjustment washer* Hexagon lock nut						
9	4	Buffer Hex head bolt						

Spare parts table 1

*Only in combination with an adjustable suspension set.

Manual geared execution 81200...

Pos.	Qty.	Consisting of	6 kN	11 kN	22 kN	33 kN	52 kN	64 kN
1	2	Single flange push wheel Bearing Circlip	-					
3	4	Wheel shaft Hexagon lock nut Circlip	-					
4	1	Support bolt Suspension bolt Adjustment washer* Hexagon lock nut	-					
9	4	Buffer Hex head bolt	-					
17	1	Hand chain	-					
18	1	Hand chain wheel Hand chain guide	-					
19	1	Drive shaft Pinion Spring pin	-					
20	2	Single flange geared wheel Bearing Circlip	-					

Pos.	Qty.	Consisting of	84 kN	104 kN	124 kN	164 kN	204 kN	254 kN
1	2	Single flange push wheel Bearing Circlip						
3	4	Wheel shaft Hexagon lock nut Circlip						
4	1	Support bolt Suspension bolt Adjustment washer* Hexagon lock nut						
9	4	Buffer Hex head bolt						
17	1	Hand chain						
18	1	Hand chain wheel Hand chain guide						
19	1	Drive shaft Pinion Spring pin						
20	2	Single flange geared wheel Bearing Circlip						

Spare parts table 2

*Only in combination with an adjustable suspension set.

Warning! The use of non-original spare parts can lead to situations which are potentially dangerous to health and life.

Attention! The warranty will become invalid if the product is modified or non-original spare parts are used.

Appendix I. <u>Logbook</u>

The following table can be used to write down the results of installation, commissioning, maintenance, repairs, etc...

Date	Inspected by	Results

Appendix II. Technical specifications

If applicable, the technical documentation will be included as a separate document.