



M.M.E. AIR HOISTS ULT SERIES LOW HEADROOM AIR HOISTS 2, 3, 4 & 6 TONNE

INSTRUCTION, MAINTENANCE AND PARTS MANUAL



SERIAL NO :-.....

DATE :-.....

ISSUED BY :-.....

**MANUFACTURED BY
M.M.E. MANUFACTURING CO. (PTY) LTD
CARLETONVILLE, SOUTH AFRICA**



labour

Department:
Labour
REPUBLIC OF SOUTH AFRICA
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THIS MANUAL MUST BE READ BEFORE USING OR REPAIRING THESE PRODUCTS. This manual contains important safety, installation, operation, maintenance and repair information. Make this manual available to all persons responsible for the operation, installation, maintenance and repair of these products.



Do not use this hoist for lifting, supporting, or transporting people or lifting or supporting loads over people.

Always operate, inspect and maintain this hoist in accordance with South African Bureau of Standards Specification number SANS 1638 Pneumatically powered chain hoists, SANS 1639 Reconditioned pneumatically powered chain hoists, SANS 1824 Beam trolleys (crawls) and any other safety codes or procedures relevant to the industry in which the hoist is being used. Testing of pneumatically powered chain hoists must only be carried out by the competent person contemplated in SANS 1639.

FOREWORD

MME Manufacturing Co (Pty) Ltd warrants to the user its hoists, and other products to be free from defects in material and workmanship for a period of six months from the date of purchase.

MME will repair, without cost to the user, any product found to be defective, including parts and labour charges, or at MME's option, will replace such products or refund the purchase price less a reasonable allowance for handling in exchange for the product. Repairs and replacements are warranted for the remainder of the original warranty period.

If any product proves defective within its original six months warranty period, it shall be returned to MME Manufacturing Co (Pty) Ltd with proof of purchase and the original test certificate.

This warranty does not apply to products which MME has determined to have been misused or abused, improperly maintained by the user, or where the malfunction or defect can be attributed to the use of non-genuine MME parts.

MME Manufacturing Co (Pty) Ltd makes no other warranty and its maximum liability is limited to the purchase price of the product and in no event will MME Manufacturing Co (Pty) Ltd be liable for any consequential, indirect, incidental or special damages of any nature arising from the sale or use of the product whether based on contract or otherwise.

It is MME Manufacturing Co (Pty) Ltd policy to promote safety of all persons and equipment in the workplace. All equipment manufactured is thoroughly checked, packed and inspected before dispatch. Any loss or damage which occurs during shipment while en-route must be reported to MME immediately. Should any item be delivered to you in apparent good condition, but upon opening the container, loss or damage has taken place while in transit, notify MME Manufacturing Co (Pty) Ltd immediately. Should any items be delivered back to MME Manufacturing Co (Pty) Ltd all transport costs will be for the account of the user.

These instructions are prepared by MME Manufacturing Co (Pty) Ltd for the purpose of maintenance, repair and the use of its air hoists.

No responsibility for failure of equipment due to manufacturing procedure will be assumed if these instructions are not carried out. Only original MME Manufacturing supplied spares are to be used in all repairs.

SAFETY INFORMATION

This manual will refer to existing legal requirements and engineering practices as known when this document was written. Should any such legislation or practices change or be “enlarged” upon then due consideration must be taken. Various standards have been used to assist in compiling this document and will be listed where applicable.

The use of powerful lifting equipment is subject to certain hazards that cannot be overcome by mechanical means but only by the exercise of intelligence, care and common sense. It is therefore essential that personnel involved in the use and operation of equipment must be competent, careful, physically and mentally qualified, and trained in the safe operation of the equipment and the handling of the loads. Serious hazards are overloading, dropping or slipping of the load caused by improper hitching or slinging, obstructing the free passage of the load and using equipment for a purpose for which it was not intended or designed. The above can lead to fatal consequences.

MME Manufacturing Co (Pty) Ltd fully realises the importance of proper design factors, minimum and maximum sizes and other limiting dimensions of the chain and its fastenings, sprockets and similar equipment all of which are designed with safety in mind.

The various conditions of the equipment or material can vary depending on the environment they are used in which may cause corrosion or wear and any other variables that may arise in each individual application. It is in the light of this that the hoist be maintained and repaired under the supervision of a competent person:

1. who is qualified by virtue of his knowledge, training, skills and experience to organise the work and its performance.
2. who is familiar with the legal requirements which apply to the work to be performed.
3. who has been trained to recognise any potential or actual danger to health and safety in the performance of the work.

The instructions given in this manual must be interpreted accordingly and sound judgement used in determining their application.

This manual provides important information for all personnel involved with the safe installation, operation and proper maintenance of this product. Even if you feel you are familiar with this or similar equipment, you should read and understand this manual before operating the product.

Danger, Warning, Caution and Notice

Throughout this manual there are steps and procedures which, if not followed, may result in an injury. The following signal words are used to identify the level of potential hazard.



Danger is used to indicate the presence of a hazard which *will* cause *severe* injury, death, or substantial property damage if the warning is ignored.



Warning is used to indicate the presence of a hazard which *can* cause *severe* injury, death, or substantial property damage if the warning is ignored.



Caution is used to indicate the presence of a hazard which *will* or *can* cause minor injury or property damage if the warning is ignored.



Notice is used to notify people of installation, operation, or maintenance information which is important but not hazard-related.

Safety Summary



- **Do not use this hoist or any equipment attached to it for lifting, supporting, or transporting people or lifting or supporting loads over people.**
- **MME ULT series air hoists are designed to provide a 5 to 1 factor of safety. It is the responsibility of the customer to ensure that the structure to which the hoist is attached and any load attaching devices are capable of handling the static and dynamic loads imposed on the structure by the hoist and its attachments when lifting the rated load. If in doubt, consult a registered professional structural engineer.**



- **Lifting equipment is subject to different regulations in each country. These regulations may not be specified in this manual.**
- **Whenever a conflict arises between the contents of this manual and any other applicable legislation, standard or procedure, the more stringent of the two must be applied.**

The Occupational Health and Safety Act, Mine Health and Safety Act and other recognized safety sources make a common point: Only trained personnel must operate lifting equipment. Employees who work near cranes or assist in hooking on or arranging a load should be instructed to keep out from under the load. From a safety standpoint, one factor is paramount: conduct all lifting operations in such a manner that if there were an equipment failure, no personnel would be injured. This means keep out from under a raised load and keep out of the intended path of any load.

MME Manufacturing low headroom air hoists are manufactured in accordance with the latest ISO9001 standards.

MME Manufacturing's responsibility with regards the design, manufacture, repair and supply of equipment (specifically in South Africa) is specified in:

- For mines - **The Mine Health and Safety Act, 1996 (Act No. 29 of 1996), Chapter 2 : Health and Safety at Mines, 21. Manufacturer's and supplier's duty for health and safety.**
- For general industry - **Occupational Health and Safety Act, 1993 (Act No. 85 of 1993), Section 10. General duties of manufacturers and others regarding articles and substances for use at work.**

It is the owner's and user's responsibility to determine the suitability of a product for any particular use. It is recommended that all applicable industry, trade association and legislation be checked. Read all operation instructions and warnings before operation.

Rigging: It is the responsibility of the operator to exercise caution, use common sense and be familiar with proper rigging techniques.

This manual has been produced by **MME Manufacturing** to provide agents, fitters, riggers, operators and company personnel with the information required to install, operate, maintain and repair the products described herein.

It is extremely important that fitters, riggers and operators be familiar with the servicing procedures of these products, or similar products, and are physically capable of conducting the procedures. These personnel shall have a general working knowledge that includes:

1. Proper and safe use and application of fitters common hand tools as well as special or recommended tools.
2. Safety procedures, precautions and work habits established by accepted industry standards.

MME Manufacturing cannot know of, nor provide all the procedures by which product operations or repairs may be conducted and the hazards and/or results of each method. If operation or maintenance procedures not specifically recommended by the manufacturer are conducted, it must be ensured that product safety is not endangered by the actions taken. If unsure of an operation or maintenance procedure or step, personnel should place the product in a safe condition and contact supervisors and/or the factory for technical assistance.

SAFE OPERATING PROCEDURES

The following warnings and operating instructions are recommended and are intended to avoid unsafe operating practices which might lead to personal injury or property damage.

MME Manufacturing recognizes that most companies who use hoists have a safety program in force in their plants. In the event you are aware that some conflict exists between a rule set forth in this publication and a similar rule already set by an individual company, the more stringent of the two should take precedence.

Safe Operating Instructions are provided to make an operator aware of dangerous practices to avoid and are not necessarily limited to the following list. Refer to specific sections in the manual for additional safety information.

1. Read the manufacturer's operating instructions before operating the hoist.

2. Never lift a load greater than the rated capacity of the hoist (unless for test purposes).
3. **Never apply an external load or subject any hoist to a load in excess of its rated capacity.**
4. Never use the load chain as a sling.
5. Never operate the hoist with twisted, kinked or damaged chain.
6. Be certain the load is properly seated in the saddle of the hook.
7. Do not use load chains as an earth for welding. Do not attach a welding electrode to a hoist or sling chain.
8. Do not use the up and down stops as a means of stopping a hoist. The up and down stops are emergency devices only.
9. Keep hands and clothing free from moving parts.
10. Never use the hand chain for any other purpose but for control of the hoist.
11. Never operate the hoist if the hand chain is entangled with the load chain, hooks or any other object that will prevent proper control of the hoist.
12. Keep hands free from the load chain where it enters the chain guides.
13. Do not leave a load suspended for extended periods.
14. Always stand clear of the load path.
15. Never use the hoist for lifting or lowering people, and never stand on a suspended load.
16. Never lift, move or suspend loads over people.
17. Before each shift, check the hoist for wear or damage. Check brakes, limit stops, etc.
18. Periodically, inspect the hoist thoroughly and replace worn or damaged parts.
19. Follow the lubrication instructions.
20. Do not attempt to repair load chain or hooks. Replace them when they become worn or damaged.
21. Never operate a hoist when the load chain is not centred under the hook. Do not pull the load sideways.
22. Always rig the hoist properly and carefully.
23. Do not apply shock loads to the hoist. Take up the slack chain slowly when commencing with lifting operations.
24. Keep the load chain clean and well lubricated. Do not drag the load chain or hook on the floor.
25. Be certain there are no objects in the way of a moving load.
26. Be certain the air supply is shut off before performing maintenance on the hoist.
27. Do not swing a suspended load.
28. Keep the undercarriage/cradle overhead when not in use.
29. Properly secure the hoist before leaving it unattended.
30. Only allow personnel trained in safety and operation of this product to operate the hoist.
31. Avoid collision or bumping of hoists.
32. Do not operate a hoist if you are not physically fit to do so.
33. Pay attention to the load at all times when operating a hoist.
34. Never splice a hoist chain by inserting a bolt between links or by any other means.
35. Do not force a chain or hook into place by hammering.
36. Do not allow the chain to be exposed to extremely cold weather. Do not apply loads to a cold chain.

LEGAL REQUIREMENTS

South African legal requirements pertaining to lifting equipment are detailed in the following Acts:

- For mines - **Mine Health and Safety Act (Act 29 of 1996)**
8.5 Lifting Equipment Regulations.
- For general industry - **Occupational Health and Safety Act, 1993 (Act No. 85 of 1993)**
Driven Machinery Regulations, 2015
18. Lifting machines, hand-powered lifting devices and lifting tackle

For all other countries, please consult relevant local legislation relating to the use of lifting equipment.

SPECIFICATIONS

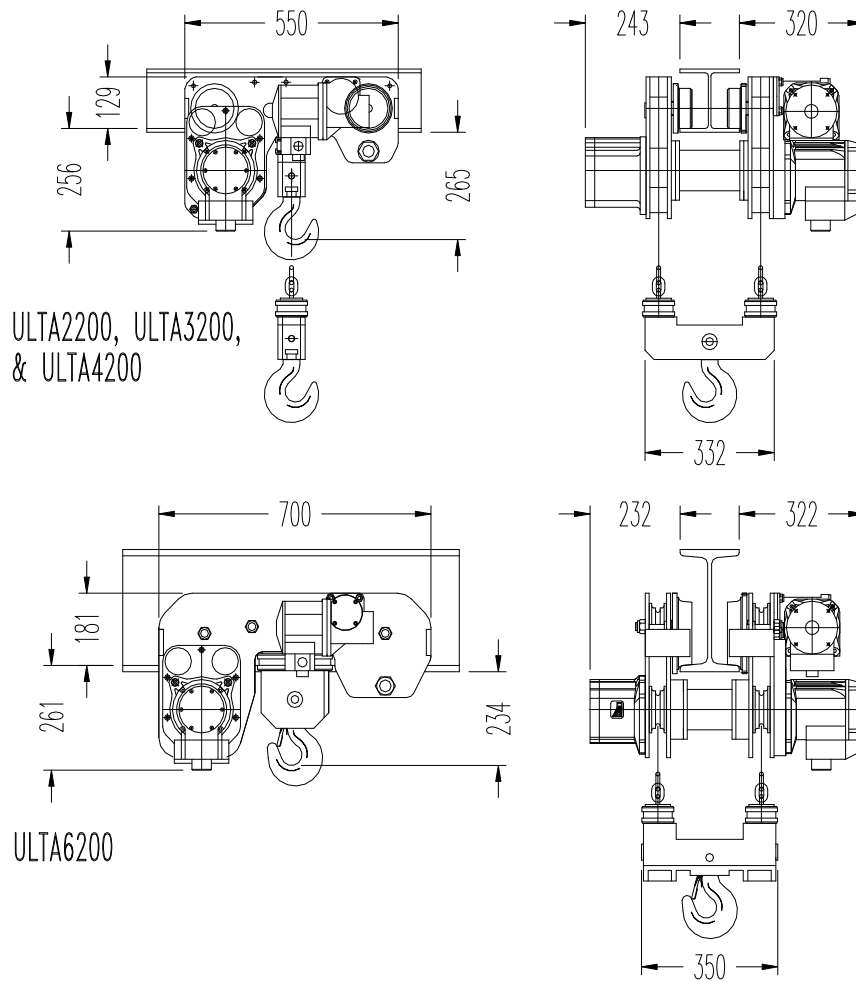


Figure 1. Overall Dimensions of ULT Series Low Headroom Air Hoists

TABLE 1. TECHNICAL SPECIFICATIONS

MODEL	ULTA2200	ULTA3200	ULTA4200	ULTA6200
Lifting Capacity (tonne)	2.0	3.0	4.0	6.0
Falls of Chain	2	2	2	4
Chain size (mm)	10 x 28	10 x 28	10 x 28	10 x 28
Total Weight (kg) *	230	235	235	265
Full Load Lifting Speed (m/min) @ 6 bar †	5.3	4.8	3.6	2.4
Full Load Lifting Speed (m/min) @ 4 bar †	3.2	3.0	2.3	1.5
Traverse Speed (m/min) @ 6 bar	28.0	28.0	28.0	27.0
Air Consumption (m ³ /min) @ 6 bar	2.6	4.0	4.0	4.0
Air Consumption (m ³ /min) @ 4 bar	1.7	2.6	2.6	2.6
Air Connection	G ¾	G1	G1	G1
Supply Hose (Inside Ø) (mm)	19	25	25	25
Sound Level (dB(A))	83	83	83	83

* Weight includes 3m lift, 2m pendent control.

* For longer lifts add 4.4kg for the ULTA2200, ULTA3200, ULTA4200 and 8.8kg for the ULTA6200.

INSTALLATION

Pre Use Check

1. Check that the hoist has been delivered free of damage. Damage may occur during shipping.
2. The hoist is supplied with a test certificate and an instruction, maintenance and parts manual. When initially receiving the hoist check that the serial number on the hoist and certificate correspond.
3. Ensure that the hoist's serial number and working load limit (rated load) are clearly marked on the hoist.
4. Check that the hoist that has been delivered is capable of performing the required task.
5. Record the hoist's serial number in a log book especially for the recording of hoist inspections.

All the hoists internal components are lubricated internally in the factory. It is however recommended that the load chain be lubricated before the hoist is put into service.

CAUTION

- **Before installing the hoist, the owner and user of the hoist should consult any safety information or regulations pertaining to the particular type of installation in which the hoist will be used.**

WARNING

- **The raising and lowering of loads is a potentially hazardous task by virtue of the fact that raised objects store large amounts of potential energy. Safety is therefore of prime importance. Read the section on "SAFETY INFORMATION" before installing the hoist.**

Mounting of the Low Headroom Air Hoist

Proper initial installation of the hoist will ensure long trouble free service and will also limit the possibility of accidents occurring.

The hoist must be attached safely to an I-section beam which is in turn attached to a secure structure of sufficient strength. The structure should be able to hold at least 5 times the hoist and its rated load. The anchorage, fittings and framework must not show any signs of distortion when the hoist is lifting its rated load. The standard unit is set up to accommodate a 152mm wide I-section beam. Different beam can be accommodated on request. The I-section beam must be horizontal and any joints in the beam must be ground smooth.

Ensure that the mechanism used to attach the I-beam to the main support structure does not hinder the hoist from traversing. Install stoppers at the ends of the beam to prevent the hoist from running off the beam.

WARNING

- **Never operate the low headroom hoist without suitable end stops installed at the ends of the traverse beam.**

After installation, allow the hoist to lift its rated load about 200mm off the ground and allow the hoist to traverse along the entire length of the beam to ensure correct operation before usage.

CAUTION

- **The hoist must be vertically above the load when lifting. This will prevent unbalanced loads damaging the hoist.**

Installation of the Chain Bag/Container

1. The chain container must be able to accommodate the full length of load chain. If the load chain will not feed into the chain container due to it being over full, a larger container must be fitted.
2. Allow the hoist to lower the bottom hook until the lower hook is at its lowest point of travel. Stop the hoist. Do not stall the hoist against the end stop buffers.
3. Attach the chain container to the hoist.
4. Now run the hoist so that the undercarriage / hook cradle is lifted. The slack side of the chain will feed into the chain container.

NOTICE

- **Ensure that the chain container is positioned such that the load chain, hook cradle or undercarriage does not come into contact with the chain container.**
- **Do not fill the chain container by hand. This may cause the chain to twist resulting in jamming of the hoist.**

Air Supply

The ULT series hoists are rated at 6 bar. This pressure must be maintained at entry to the hoist to enable the hoist to operate at rated load as specified under the section “SPECIFICATIONS”. The hoists will however operate at pressures of as low as 4 bar but performance will be affected. The air supply to the hoist must be clean, free from water and contain lubrication.

WARNING

- **The hoist must NOT be subjected to air pressures exceeding 7 bar as this may cause excessive dynamic loading of the hoist.**

Air Lines

It is recommended that the minimum inner diameter of the supply hose to the hoist be 19.0mm for the ULTA2200 models and 25.0mm for ULTA3200, ULTA4200 and ULTA6200 models. For supply hose lengths to the hoist in excess of 15m use a larger diameter hose. Before connecting the hose to the hoist, remove any dirt from the hose by blowing compressed air through the hose into atmosphere. Do not point the hose at anyone while doing this. In order to reduce pressure drops in the supply hose which affect hoist performance, the supply hose should be kept as short and straight as possible. Keep the number of hose fittings to a minimum as they cause unnecessary restrictions.

For long traverse distances MME recommends the use of MME hose support trolleys or hose support brackets to support the main air supply hose. The hose support trolleys run on the same beam as the main trolley and each hose support trolley supports one coil of the hose. The hose support brackets run on a straining wire installed parallel to the beam. Each hose support bracket supports one coil of the hose. When using the above methods to support the main air supply hose, the length of the hose should be 1.5 times the traverse length. A hose support trolley or hose support bracket should be provided for every 3 metres of hose. When installing the hose, ensure that the hose hangs according to its natural coil so as to prevent twisting or kinking.

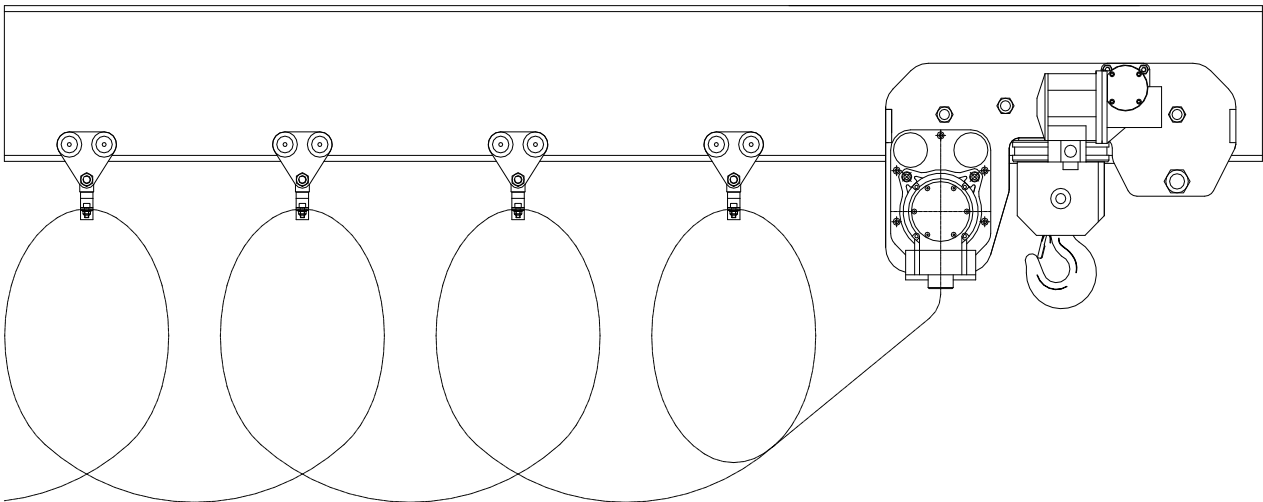


Figure 2. Recommended Trolley Air Supply Layout

NOTICE

- **Always use an air line filter-lubricator unit with a MME air hoist.**

Air Line Lubricator

The lubricator must have inlet and outlet ports at least as large as the inlet on the hoist motor. Install the air line lubricator as close to the air inlet on the hoist motor as possible. Refer to “Accessories” in the “PARTS” section for the recommended Filter-Lubricator. The use of a pressure regulator is also recommended since it allows for constant pendent control sensitivity and hoist performance.

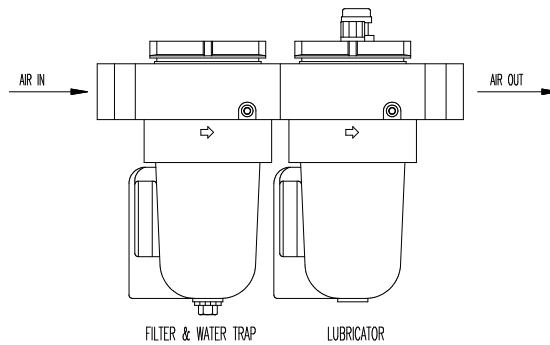


Figure 3. Filter / Lubricator Assembly

CAUTION

- **The lubricator must be installed no more than 3 m from the hoist.**

The air line lubricator must be set to deliver a minimum of 1 to 3 drops per minute when the hoist is running at full speed. The recommended lubricant is a light oil ie. SAE 10W.

CAUTION

- **Do not use automotive type detergent oil. These oils will delaminate the motor vanes and cause motor failure.**
- **Shut off air supply before filling air line lubricator.**

Air Line Filter

Dirt or grit entering the hoist motor will cause severe damage to the internal components. We recommend the installation of a 10 micron air line filter as close as possible to the hoist. The filter should be cleaned weekly to prevent excessive pressure drops due to constriction of the filter element. Filters incorporating a water trap are recommended. Moisture entering the hoist motor reduces the efficient operating life of the hoist and should be removed.

Air Line Isolation Valve

It is highly recommended to install an air line isolation valve which is readily accessible to the operator. This will enable the operator to shut off the main air supply should the control valve be jammed in the open position and be unable to be returned to its neutral position. This valve will operate as an emergency shut off valve and immediately stop the hoist.

Storing the Hoist

1. If the hoist is to be stored for a long time, spray anti corrosion spray or SAE 10W oil into the air inlet port and run the hoist and traverse motor slowly for a few seconds.
2. Plug hoist air inlet port.
3. Always store the hoist in a no load condition.
4. Wipe off all dirt and water.
5. Oil the load chain, hook pins and hook latch.

6. Store the hoist in a clean dry environment.
7. Before returning the hoist to service, follow instructions for hoists not in regular service in the “INSPECTION” section.

OPERATION

The four most important aspects of hoist operation are:

1. Follow all safety instructions when operating hoist.
2. Allow only people trained in safety and operation of this product to operate hoist.
3. Subject each hoist to a regular inspection and maintenance as outlined in this manual under the section “INSPECTION”.
4. Be aware of the hoist capacity and weight of load at all times.

Operators must be physically competent. Operators must have no health condition which might affect their ability to act, and they must have good hearing, vision and depth perception. The hoist operator must be carefully instructed in his duties and must understand the operation of the hoist, including a study of the manufacturer’s literature. The operator must thoroughly understand proper methods of hitching loads and should have a good attitude regarding safety. It is the operator’s responsibility to refuse to operate the hoist under unsafe conditions.

Initial Operating Checks

Hoists are tested for proper operation prior to leaving the factory. Before the hoist is placed into service after repair, the following initial operating checks should be performed.

1. After installation of trolley mounted hoists, check to ensure the hoist is centred below the trolley.
2. Check for air leaks in the supply hose and fittings to the pendent, and from the pendent to the control valve block.
3. When first running the hoist or trolley motors, some light oil (SAE 10W) should be injected into the inlet connection to allow good lubrication.
4. When first operating the hoist and trolley, it is recommended that the motors be driven slowly in both directions for a few minutes.
5. Operate the trolley along the entire length of the beam.
6. Test hoist and trolley performance when raising, moving and lowering test load(s). Hoist and trolley must operate smoothly and at rated specifications prior to being entered into service.
7. Check that trolley (if equipped) and hook movement is in the same direction as arrows on the pendent control.
8. Raise and lower a light load to check operation of the hoist brake.
9. Check hoist operation by raising and lowering a load equal to the rated capacity of the hoist a few centimetres off the floor.
10. Check operation of the hook travel buffers. These operate in conjunction with the load limiter.
11. Check to see that the hoist is directly over the load for vertical lifting operations.
12. Check to see that the hoist is securely connected to the overhead crane, monorail, trolley or supporting member.
13. Check to see that the load is securely attached to the hook, and that the hook safety latch is engaged.

WARNING

- **Only allow personnel trained in safety and operation of this product to operate the hoist and trolley.**
- **The hoist is not designed or suitable for lifting, lowering or moving persons. Never lift loads over people.**
- **The hook latch is intended to retain loose slings or devices under slack conditions. Hook latches are not intended to support any load.**

Hoist Controls

Pilot Pendent Control (Lever Type)

The standard low headroom hoist is operated via a four lever pilot pendent control. The two centre levers control the lifting and lowering of the hoist and the outer levers control the traversing of the hoist. The pilot pendent control allows for precise spotting and variable speed control and has arrows indicating the direction of movement of the lower hook and the trolley. The harder the pendent levers are pressed the faster the hoist or trolley will operate. When the levers are released, the control valve shuts off the air supply to the hoist thereby applying the brake and stopping the hoist. The hoist can be supplied with two independent two lever pendent controls operating the hoist and traverse motor separately. This type of control **MUST** only be used in conjunction with an air line isolation valve which is readily accessible to the operator in case of an emergency.

Pilot Pendent Control (Mining Type)

The hoist can be supplied with two independent mining type pendent controls operating the hoist and traverse motor separately. The hoist is operated by rotating the control handle. The further the handle is rotated the faster the hoist will operate. This control allows for precise spotting and variable speed. When the control lever is released, the control valve shuts off the air supply to the hoist thereby applying the brake and stopping the hoist. This type of control **MUST** only be used in conjunction with an air line isolation valve which is readily accessible to the operator in case of an emergency.

WARNING

- **Never use a Pilot Pendent Control (Lever Type or Mining Type) without an air line isolation valve.**

Direct Pendent Control

With this system, the main air supply to the hoist controlling lowering or lifting is regulated at the direct pendent handle. The further the control lever is rotated, the more air flows to the motor and the faster the hoist operates. Releasing the lever stops all air flow to the hoist and the brake will automatically be applied. Two independent controls are supplied for hoisting and traverse operations.

Toggle Control

To operate a toggle control hoist, pull on one of the hand chains attached to the control handle on the control block. The aluminium handles attached to the hand chain are marked for lifting or lowering

and traversing. The harder the chains are pulled the faster the hoist or traverse motor operates. When released, the control handle returns to its neutral position and shuts off the air supply to the hoist and traverse motor. The motor's brake is then automatically applied.

Geared Traverse

The traverse operation of the hoist can also be achieved by a geared pinion connected to a closed loop hand chain. By pulling one side of the hand chain loop, the pinion turns the geared wheel and the hoist moves horizontally.

Operation of Emergency Stop

The emergency stop valve fitted to the unit interrupts the main air supply to the control valve and not the pilot signals to the control valve. This covers the emergency condition where the control valve spool is stuck and interrupting the pilot signals to the control valve will not stop the hoist. It is activated by pressing the red button on the pendent control handle. Once the red emergency stop button has been pressed, the hoist brake will be applied automatically. The button has a detent mechanism locking it in position once pressed. The emergency stop button can be reset by pulling the reset button out



- **Keep hands and clothing free from the toggle lever. Only use the hand chain to operate the toggle lever. Do not operate the toggle lever directly by hand.**
- **Keep hands free from the load chain where it enters the chain guides.**
- **It is highly recommended to install an air line isolation valve which is readily accessible to the operator in conjunction with all control types.**

Operation of Air Hoists fitted with Load Limiters

The load limiter valve is factory set to operate at between 25% and 30% overload and is protected from tampering by a tamper resistant cover.

The load limiter functions as a differential pressure valve. At the set value, the valve activates and allows the fail safe brake to be applied thereby stopping the lifting effort. The hoist must be running for the valve to measure the pressure differential. When in the overload condition, the load can still be lowered to rectify the overload condition.

Since the load limiter valve measures a pressure differential and not the in line air pressure, the valve will still operate within the allowable 30% overload limits as prescribed in SANS 1638 at pressures of up to 7 bar.



- **Avoid shock loads on the hoist.**

- **Do not leave the hoist unattended while any loads are suspended if it is not necessary.**
- **Prevent the load from swinging due to rapid acceleration or deceleration of the traverse motor.**

INSPECTION

MME recommends two types of inspection:

- a) The frequent inspection performed by the operator.
- b) The periodic inspections performed by personnel trained in the operation and repair of this hoist.

Careful inspection on a regular basis will reveal potentially dangerous conditions while still in the early stages, allowing corrective actions to be taken before the condition becomes dangerous.

Any deficiency revealed through inspection must be reported to an appointed person. A determination must be made as to whether a deficiency constitutes a safety hazard before resuming operation of the hoist.

Records and Reports

An inspection record should be maintained for each hoist, listing all points requiring periodic inspection. A written report should be made monthly on the condition of the critical parts of each hoist. These reports should be dated, signed by each person who performed the inspection, and kept on file where they are readily available to authorized personnel.

Frequent Inspection

On hoists in continuous service, frequent inspection should be made at the beginning of each shift. In addition, visual inspections should be conducted during regular service for any damage or evidence of malfunction.

1. **OPERATION.** Check for visual signs or abnormal noises (grinding etc.) which could indicate a potential problem. Make sure all controls function properly and return to neutral when released. Check chain feed through the chain guides and undercarriage. If chain jams, wedges, jumps, is excessively noisy or “clicks”, clean and lubricate the chain. If problem persists, replace the chain. Do not operate the hoist until all problems have been corrected.
2. **HOOKS.** Check for wear or damage, increased throat width, bent shank or twisting of the hook. Replace hooks which exceed the throat opening specified in Table 2 or exceed a 10° twist (see **Figure 4**). If the hook latch snaps past the tip of the hook, the hook is sprung and must be replaced. Check hook support swivels for excessive clearance or damage. Ensure they swivel easily and smoothly.

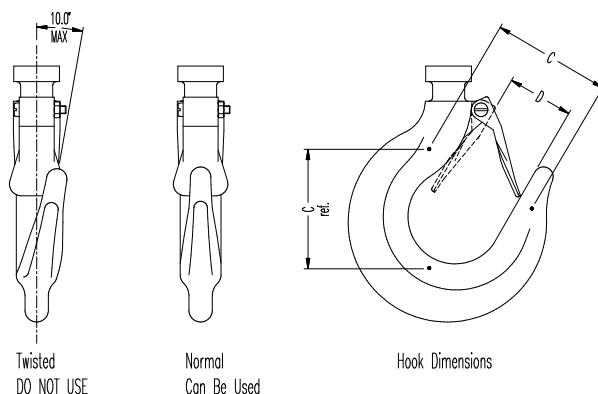


Figure 4. Hook Dimensions and Wear Limits

TABLE 2. HOOK WEAR LIMITS

MODEL	C _{ref}	C	C MAX.	D	D MAX.
ULTA2200	72.0	72.0	73.0	37.0	38.0
ULTA3200	80.0	80.0	81.0	35.0	36.0
ULTA4200	80.0	80.0	81.0	35.0	36.0
ULTA6200	80.0	80.0	81.0	35.0	36.0

3. **HOOK TRAVEL BUFFERS.** The hook travel buffers are securely attached to either end of the load chain. When functioning as hook travel limits they operate in conjunction with the load limiter which stops the air motor when pulled against the hoist. If the buffers are pulled against the hoist and the hoist stops, release the controls and listen for the sound of the load limiter valve resetting as it exhausts a small amount of air.
4. **AIR SYSTEM.** Visually inspect all connections, fittings, hoses and components for indication of air leaks. Repair any leaks found.
5. **CONTROLS.** During operation of the hoist, check the response of the hoist to the pendant is smooth and not sticky. Ensure that the control handle switches to its maximum position in both directions. The control handle must return to neutral when released. If hoist responds slowly or movement is unsatisfactory, do not operate hoist until all deficiencies have been corrected.
6. **SILENCER.** Check that the hoist performance is not restricted due to the silencer element clogging. Hoist performance with silencer fitted should be at least 80% of the hoist performance with the silencer removed. If not, clean or replace the filter element.
7. **HOOK SAFETY LATCH.** Make sure the hook safety latch is present and operating. Replace if necessary.

CAUTION

- **Do not use hoist if hook safety latch is missing or damaged.**
8. **LOAD CHAIN.** Examine each of the links for bending, cracks in weld areas or shoulders, traverse nicks and gouges, corrosion pits and chain wear, including bearing surfaces between chain links (see **Figure 5**). Replace a chain that fails any of the inspections. Check chain lubrication and lubricate if necessary. Refer to “Load Chain” in “LUBRICATION” section.

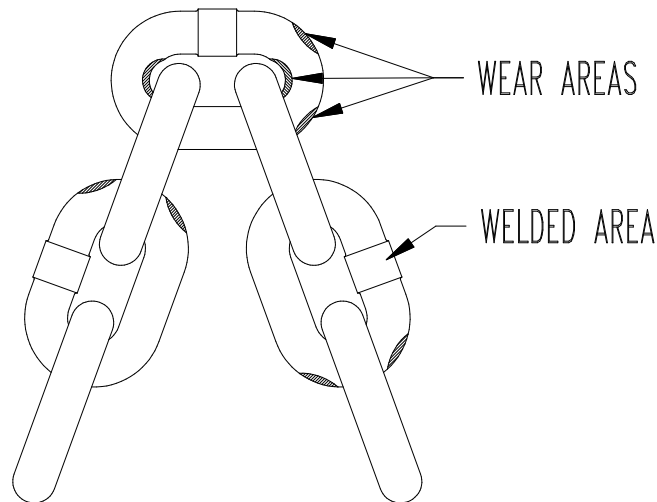


Figure 5. Chain Wear and Corrosion Areas

NOTICE

- **The full extent of load chain wear cannot be determined by visual inspection. At any indication of load chain wear inspect chain and chain wheel in accordance with instructions in “Periodic Inspection”.**
9. **LOAD CHAIN REEVING.** Ensure welds on upright links are away from the driven load sheave. Reinstall chain if necessary. Make sure chain is not twisted or kinked. Adjust as required.

Periodic Inspection

Frequency of periodic inspection depends on the severity of usage:

NORMAL	HEAVY	SEVERE
yearly	biannually	quarterly

NOTICE

- **Please note the requirements of the Occupational Health and Safety Act of South Africa (Act 85 of 1993), Driven Machinery (Regulation 18), Lifting Machines and Lifting Tackle regarding the examination, inspection and testing of lifting machines and lifting tackle.**

Disassembly may be required for HEAVY or SEVERE usage. Keep accumulative written records of periodic inspections to provide a basis for continuing evaluation. Inspect all the items in “Frequent Inspection”. Also inspect the following:

1. **FASTENERS.** Check capscrews and nuts. Replace if missing or tighten if loose.
2. **ALL COMPONENTS.** Inspect for wear, damage, distortion, deformation and cleanliness. If external evidence indicates the need, disassemble. Check gears, shafts, bearing, load sheaves, chain guides, springs and covers. Replace worn or damaged parts. Clean, lubricate and reassemble.
3. **HOOKS.** Inspect hooks carefully for cracks using magnetic particle or other suitable non-destructive testing methods. Inspect hook swivels. Tighten swivel bolts if necessary.
4. **LOAD SHEAVES.** Check for damage or excessive wear. Replace if necessary. Observe the action of the load chain feeding through the hoist. Do not operate a hoist unless the load chain feeds through the hoist and undercarriage smoothly and without audible clicking or other evidence of jamming, wedging or malfunctioning.
5. **MOTOR.** If performance is poor, disassemble the motor and check for wear or damage to bearings and other parts. The parts should be cleaned, lubricated and reassembled. Replace worn or damaged parts.
6. **BRAKE.** Raise a load equal to the rated capacity of the hoist about 200mm off the floor. Verify hoist holds the load without slipping. If slipping occurs, disassemble. Remove brake disc as described in the “MAINTENANCE” section. Check and clean the brake parts each time the hoist is disassembled. Replace the brake disc if the thickness is less than 5.00mm.
7. **SUPPORTING STRUCTURE.** Check for distortion, wear and continued ability to support the load.
8. **TROLLEY WHEELS** Check that the trolley wheels run properly on the beam and that the angle of the wheels matches the angle of the beam. Check that wheels and rail are not excessively worn and inspect the side plates for opening up due to bending. Do not operate the hoist until any problems have been identified and corrected.
9. **NAMEPLATE.** Check for presence and legibility. Replace if necessary.
10. **LOAD CHAIN END ANCHORS.** Ensure the fixed ends of the load chain are securely attached. Secure if loose, repair if damaged, replace if missing. Both free ends of the chain must have chain stoppers and buffers securely attached.

11. **LOAD CHAIN.** Measure the load chain for wear and stretching as shown below and compare to the allowable limits in Table 3. Take care to take the measurements on that part of the chain which comes into contact with the load sheave most often. If the measurements exceed the maximum values shown below, replace the chain. Always use the load chain recommended by MME for the desired application.

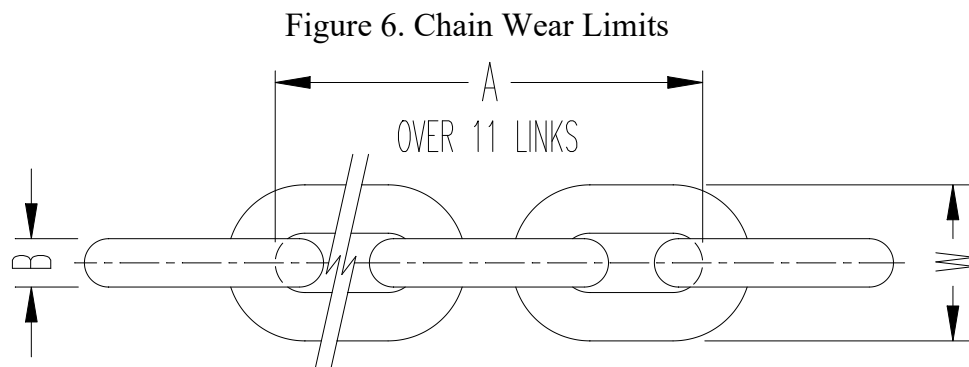


TABLE 3. CHAIN WEAR LIMITS

MODEL	A	A MAX.	B	B MIN.	W	LOAD CHAIN kg/m
ULTA2200	308.0	316.0	10.0	9.0	33.0	2.2
ULTA3200	308.0	316.0	10.0	9.0	33.0	2.2
ULTA4200	308.0	316.0	10.0	9.0	33.0	2.2
ULTA6200	308.0	316.0	10.0	9.0	33.0	2.2

12. **CHAIN BAG/CONTAINER.** Check for damage or excessive wear and that chain container is securely attached to the hoist. Secure or replace if necessary. Ensure correct positioning of the chain bag.

Hoists Not in Regular Use

1. A hoist which has been idle for a period of one month or more, but less than one year, should be given an inspection conforming with the requirements of “Frequent Inspection” prior to being placed into service.
2. A hoist which has been idle for a period of more than one year should be given an inspection conforming with the requirements of “Periodic Inspection” prior to being placed into service.
3. Standby hoists should be inspected at least biannually in accordance with the requirements of “Frequent Inspection”. In abnormal operating conditions hoists should be inspected at shorter intervals.

Testing the Load Limiter

When testing the load limiter, the ULTA2200, ULTA3200, ULTA4200 and ULTA6200 series low headroom air hoists must be subjected to a dynamic test.

The test weight must be equivalent to 130% of the working load limit. The hoist must arrest the lifting effort and hold the test weight stationary. Once the load limiter has activated it will be possible to lower the test weight.

The load limiter must not activate at or below the working load limit.

LUBRICATION

To ensure continued satisfactory operation of the hoist, all points requiring lubrication must be serviced with the correct lubricant at the proper time interval. Correct lubrication is one of the most important factors in maintaining efficient operation.

The lubrication intervals recommended in this manual are based on intermittent operation of the hoist eight hours each day, five days per week. If the hoist is operated almost continuously or more than the eight hours each day, more frequent lubrication will be required. Also, the lubricant types and change intervals are based on operation in an environment relatively free of dust, moisture, and corrosive fumes. Use only those lubricants recommended. Failure to observe this precaution may result in damage to the hoist and/or its associated components.

Whenever a MME Hoist is disassembled for overhaul or replacement of parts, lubricate as follows:

1. Coat all motor parts with a light film of SAE 10W or a good quality hydraulic oil before assembling.

CAUTION

- **Do not use automotive type detergent oil. Detergents will delaminate the motor vanes and cause motor failure.**
2. Apply a coating of grease to all gearing before assembly. Neglect of proper lubrication will lead to bearing failure. The recommended grease is as follows: FUCHS SUPER LUPLEX M2. If this specific grease is not available use an equivalent grease.

Load Chain

WARNING

- **Failure to maintain, clean and keep the load chain well lubricated will result in rapid load chain wear that can lead to chain failure resulting in severe injury, death or substantial property damage.**
1. Lubricate load chain weekly, or more frequently, depending on severity of service.
 2. In a corrosive environment, lubricate more frequently than normal.
 3. Lubricate each link of the load chain and apply new lubricant over existing layer.

4. If required, clean chain with acid free solvent to remove rust or abrasive dust build-up and re-lubricate the chain.
5. Use SAE50 to 90 EP oil for chain lubrication. As a dry lubricant Fuchs Ceplattyn 300 is highly recommended.

Hook Assemblies

1. Lubricate the hook swivel and hook latch pivot points. Hook and latch should swivel/pivot freely.
2. Use SPANJAARD COPPER SLIP COMPOUND or alternatively SAE50 to 90 EP oil for hook lubrication.

TROUBLESHOOTING

This section provides the information necessary for troubleshooting the HA22, HA32 & HA42 series hoists. The troubleshooting guide provides a general outline of problems which could be experienced with normal use of this hoist. It lists the symptom, the possible cause, and the possible remedy for the trouble being experienced.

SYMPTOM	CAUSE	REMEDY
Hoist will not operate	No air supply to hoist, or too little quantity of air or pressure.	Refer to “SPECIFICATIONS” section for correct quantity (m ³ /min) and pressure (bar).
	Throttle valve or control handle sticking.	Check control handle, throttle valve for free movement.
	Pendent malfunction.	Check pressure at pendent. Minimum operating pressure in pendent line is 4 bar.
	Hoist is overloaded.	Reduce load to within rated capacity.
	Load Limiter Valve operating prematurely.	Check valve setting
	Motor is damaged.	Repair or replace. See

	<p>Brake is not releasing.</p> <p>Silencer clogged.</p>	<p>“MAINTENANCE” section.</p> <p>Check brake release circuit, brake seals and pressure at the brake inlet. (4 bar minimum).</p> <p>Clean or replace silencer element.</p>
<p>Load continues to move when hoist is stopped. “UP” direction.</p>	<p>Throttle valve or control handle sticking.</p> <p>Pendent lever sticking.</p> <p>Control spring faulty.</p>	<p>Check control handle, throttle valve for free movement.</p> <p>Check lever and restore free movement.</p> <p>Check and refit control spring.</p>
<p>Load continues to move when hoist is stopped. “DOWN” direction</p>	<p>Throttle valve or control handle sticking.</p> <p>Brake is slipping.</p> <p>Hoist is overloaded.</p> <p>Pendent lever sticking.</p>	<p>Check control handle, throttle valve for free movement.</p> <p>Check brake springs and brake disc linings for wear. See “MAINTENANCE” section.</p> <p>Reduce load to within rated capacity.</p> <p>Check lever and restore free movement.</p>
<p>Hoist will not lift rated capacity.</p>	<p>Hoist is overloaded.</p> <p>No air supply to hoist, or too little quantity of air or pressure.</p> <p>Throttle valve travel is restricted.</p> <p>Load Limiter Valve operating prematurely.</p> <p>Exhaust restricted.</p> <p>Motor is damaged.</p> <p>Silencer clogged.</p>	<p>Reduce load to within rated capacity.</p> <p>Check pressure at control valve inlet. Refer to “SPECIFICATIONS” section for correct quantity (m³/min) and pressure (bar).</p> <p>Check control handle and throttle valve for free movement.</p> <p>Check valve setting.</p> <p>Inspect, clean and replace silencer disc.</p> <p>Check for worn motor bearings, vanes or vane springs.</p> <p>Clean or replace silencer element.</p>

<p>Hook lowers, but will not raise.</p>	<p>No air supply to hoist, or too little quantity of air.</p> <p>Hoist is overloaded.</p> <p>Load Limiter Valve operating prematurely</p> <p>Pendent malfunction.</p>	<p>Check air supply and connections, in air supply line.</p> <p>Reduce load to within rated capacity.</p> <p>Check valve setting.</p> <p>Check pressure at air inlet connection on pendent.</p>
<p>Hook can be raised but not lowered.</p>	<p>Low air pressure.</p> <p>Pendent malfunction.</p>	<p>Check pressure at control valve inlet. Raise pressure to rated capacity.</p> <p>Check pressure at air inlet connection on pendent.</p>
<p>Load chain jumps on sheave or is making a snapping sound.</p>	<p>No oil on load chain.</p> <p>Worn or rusted chain.</p> <p>Worn load sheave.</p> <p>Hoist not in-line with load.</p> <p>Incorrectly reeved load chain.</p>	<p>Lubricate load chain. See “LUBRICATION” section.</p> <p>See “INSPECTION” to determine wear limit. Replace if necessary and lubricate frequently.</p> <p>Replace worn parts.</p> <p>Align hoist with load. Do not pull sideways.</p> <p>Check load chain is correctly reeved.</p>
<p>Traverse will not operate</p>	<p>No air supply to traverse motor, or too little quantity of air or pressure.</p> <p>Spool valve or toggle sticking.</p> <p>Pendent malfunction.</p> <p>Motor is damaged.</p> <p>Lubricator is low on oil.</p>	<p>Check pressure at control valve inlet. Refer to “SPECIFICATIONS” section for correct quantity (m³/min.) and pressure (bar).</p> <p>Check toggle spring bracket, toggle and spool valve for free movement.</p> <p>Check pressure at pendent. Minimum operating pressure in pendent line is 4 bar. Check pendent hoses for leaks.</p> <p>Repair or replace. See “MAINTENANCE” section.</p> <p>Fill lubricator.</p>

	<p>Traverse gearbox is damaged.</p> <p>Obstructions on beam.</p>	<p>Repair or replace. See “MAINTENANCE” section.</p> <p>Remove obstacles from beam track.</p>
<p>Hoist continues to move horizontally when traverse motor is stopped.</p>	<p>Spool valve or toggle sticking.</p> <p>Pendent lever sticking.</p> <p>Toggle spring faulty.</p>	<p>Check toggle spring bracket, toggle and spool valve for free movement.</p> <p>Check lever and restore free movement.</p> <p>Check and refit toggle spring.</p>
<p>Traverse motor operates sluggishly.</p>	<p>Hoist is overloaded.</p> <p>No air supply to hoist, or too little quantity of air or pressure.</p> <p>Spool valve travel is restricted.</p> <p>Exhaust restricted.</p> <p>Motor is damaged.</p> <p>Poor beam condition.</p>	<p>Reduce load to within rated capacity.</p> <p>Check pressure at control valve inlet. Refer to “SPECIFICATIONS” section for correct quantity (m³/min.) and pressure (bar).</p> <p>Check control handle and toggle for free movement.</p> <p>Inspect, clean and replace silencer disc.</p> <p>Check for worn motor bearings, vanes or vane springs.</p> <p>Check condition of beam track.</p>

MAINTENANCE

WARNING

- **Never perform maintenance on the hoist while it is supporting a load.**
- **Shut off air system and depressurize air lines before performing any maintenance.**
- **Before performing maintenance, tag controls:**
DANGER - DO NOT OPERATE - EQUIPMENT BEING REPAIRED.
- **Only allow personnel trained in the operation and service of this hoist to perform maintenance.**
- **After performing any maintenance on the hoist, conduct a proof load and braking test (125% of its rated capacity) as well as a dynamic performance and load limiter test in accordance with SANS 1639, before returning the hoist to service.**

Load Chain Care

Keep the chain well lubricated as described in the “LUBRICATION” section. Never operate a hoist if the load chain does not run freely and smoothly into and out of the chain guides and load sheave, or when it makes noises indicative of jamming, wedging or other malfunctions.

Chain Replacement

Refer to “INSPECTION” section for information on load chain inspection.

Excessive chain wear cannot be detected by casual observation. Load chain is either case hardened to a depth of 0.25 to 0.30 mm or through hardened, depending on application, however excessive wear will considerably reduce the strength of the chain. Further, the chain will no longer fit the load sheave properly, greatly increasing the chance of malfunction and chain breakage.

One load sheave will outlast several chains if the chain is replaced as recommended. The use of a worn chain will cause the load sheave to wear rapidly.

If the chain is visibly damaged, examine the load sheave and chain guides and chain stripper. Install a new load sheave if the old one is visibly worn. Install new chain guides if the old one is broken or distorted.

1. Remove the chain stoppers from both ends of the chain.
2. Remove the buffers, buffer plates, anchor pins and chain anchors from the hoist side plates (ULT6200) and from the undercarriage cradle (ULT2200, ULT3200 & ULT4200).
3. Remove the undercarriage (ULT6200).
4. Run the hoist slowly until the ends of the chain passes over the load sheaves and fall free from the hoist.
5. Remove the brake housing by slacking the four brake housing screws. Remove the brake disc, brake piston and springs.
6. Reeve a piece of steel wire along the chain passage through the chain guides on either side of the hoist. Attach each wire to the last link of the chain.
7. Pull both pieces of wire so that the second link lies flat in the load sheave pocket. Also ensure that the welded section faces outwards from the load sheave (see Figure 7). Both chains must

- engage the load sheave at the same time.
8. Turn the disc brake coupler by hand until the chain has properly engaged the load sheave.
 9. Run the hoist slowly while pulling the chain with the wires until the chain is fully reeved through the hoist.
 10. Reeve the chain through the buffer plates, buffer discs and undercarriage (ULT6200).
 11. Remove the wires from the chain and attach the chain anchor and anchor pins.
 12. Attach the chain anchors to the hoist side plates (ULT6200).
 13. Attach chain stoppers, buffer plates and buffer discs to both the free ends of the chain.
 14. Ensure that no sections of the chain are twisted.

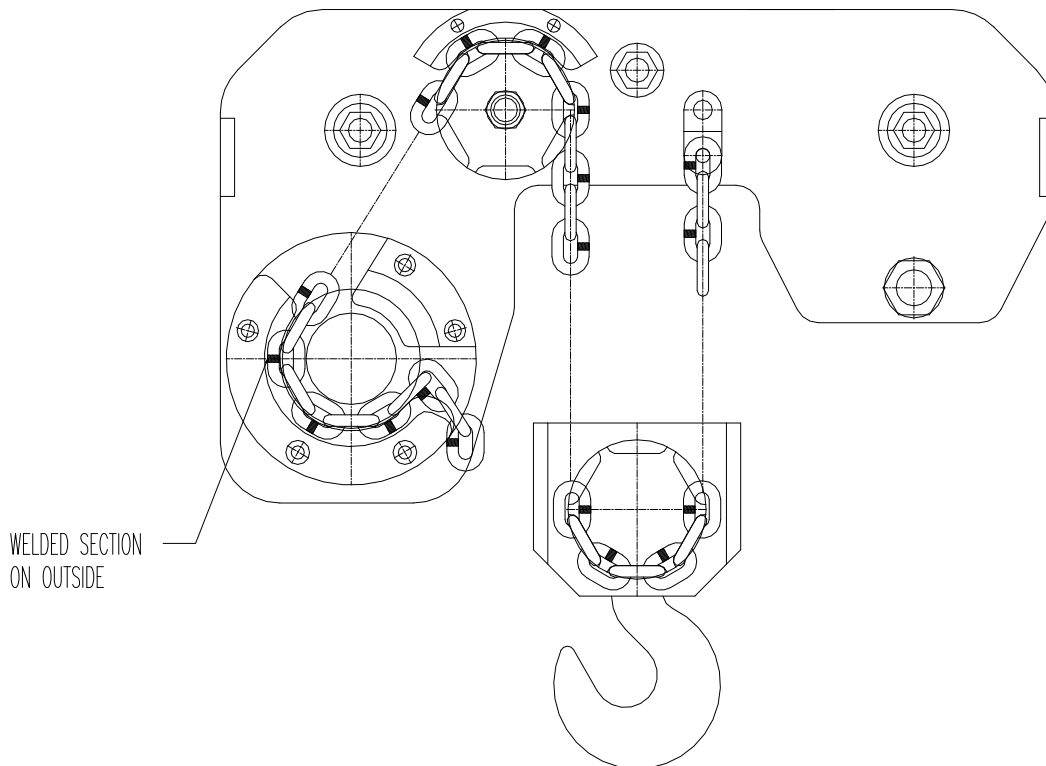


Figure 7. Installation of the Load Chain

⚠ WARNING

- **The replacement chain for all ULT series hoists must have an odd number of links.**

⚠ WARNING

- **A twisted chain can jam as it passes over the load sheave, which can result in damage to the hoist or even breakage of the chain causing severe injury, death or substantial property damage.**

Hoist Disassembly



- **Disconnect the air supply hose before performing any maintenance or repairs on this hoist.**
1. Do not disassemble the hoist any further than necessary to replace or repair damaged parts.
 2. Whenever grasping a component in a vice, always use leather covered or copper covered vice jaws to protect the surface of the component and help prevent distortion. This is particularly true of threaded members and housings.
 3. Do not remove any component which is a press fit in or on a sub-assembly unless the removal of that component is necessary to complete the repair or replacement of the component.
 4. Do not disassemble this hoist unless you have a complete set of new gaskets, o-rings and seals on hand for replacement. These are available in the Overhaul Seal and Gasket Kit.
 5. Do not attempt to wash sealed bearings. We recommend that bearings be replaced when the hoist is disassembled.

Disassembly of the Hoist Control Valve (Toggle Control).

1. Unscrew the four bolts attaching the control valve to the rotor housing. Remove the gasket.
2. Remove the control handle from the throttle valve by removing the two screws. Using a pliers unclip the spring from the throttle valve. Apply caution as the spring is under tension.
3. Remove the circlip from the rear of the control valve housing. Tap the throttle valve with a mallet towards the rear of the housing to force the throttle valve cover out. Tap the throttle valve out of the housing. Care should be taken not to burr the inner surfaces of the sleeve.
4. Examine all components for wear, replacing damaged or worn components. Replace all gaskets and o-rings before re-assembly.
5. Remove all sharp edges and burrs from components. Wipe all components with SAE 10W oil before re-assembling in the reverse order to stripping.

Disassembly of the Hoist Control Valve (Direct Pendent Control).

1. Remove the three hoses from the throttle hose connector.
2. Unscrew the four bolts attaching the throttle hose connector to the rotor housing. Remove the gasket.
3. Examine all components for wear, replacing damaged or worn components. Replace all gaskets and o-rings before re-assembly.
4. Remove all sharp edges and burrs from components. Wipe all components with SAE 10W oil before re-assembling in the reverse order to stripping.

Disassembly of the Hoist Control Valve (Pilot Pendent Control).

1. If the hoist has a pendent control, remove the three pendent control hoses.
2. Unscrew the four bolts attaching the control valve to the rotor housing. Remove the control valve from the hoist. Remove the gasket.

3. Remove both circlips securing the valve covers in position. Using a copper punch, tap the valve cover inwards to force the opposite cover out of the valve housing. Remove the spring. Now tap the sleeve towards to opposite side to force the other valve cover out. Remove the spring.
4. Remove the spool valve from the sleeve.
5. Using a soft copper punch, gently tap the control valve sleeve out of the housing. Care should be taken not to burr the inner surfaces of the sleeve.
6. Examine all components for wear, replacing damaged or worn components. Replace all gaskets, seals and o-rings before re-assembly.
7. Remove all sharp edges and burrs from components. Wipe all components with SAE 10W oil before re-assembling in the reverse order to stripping.

NOTICE

- **The spool valve and the control valve sleeve are lapped as a set. If they are worn or defective both components must be replaced.**

Disassembly of the Brake Mechanism

1. Remove the motor side carry handle by removing the two spring pins.
2. Remove the load limiter valve housing by unscrewing the four bolts. Remove the port seals.
3. Remove the brake housing cover screws, nameplate and the cover. Remove the gasket.
4. Using a M10 jacking bolt and nut, secure the brake piston in position. To do this, screw the bolt into the brake piston through the hole in the middle of the brake housing. Now fasten the nut so that the brake piston is pulled back into the brake housing. Remove the brake housing by evenly unscrewing the four brake housing screws. Remove the two port seals and the orifice. Remove the brake disc.
5. Carefully slacken the jacking nut to release the brake piston out of the brake housing. Remove the brake springs.
6. Clean and inspect all components for wear or damage. Replace excessively worn or damaged components. The brake disc must be replaced if it is less than 5.0mm thick.
7. Replace the brake piston seals and port seals.
8. Before re-assembly lightly wipe some SAE 10W oil on the surfaces where the seals work. Do not allow oil to come into contact with the brake disc or thrust plate.
9. Re-assemble in the reverse order to stripping.

Disassembly of the Load Limiter

1. The load limiter valve is a pre assembled unit that is pre set at the factory. The unit may require adjustment during service but this will not require disassembly.
2. We recommend that the load limiter not be stripped. It should instead be returned to MME Manufacturing for testing or overhaul if required.

Disassembly of the Hoist Motor

1. Remove the entire brake mechanism. Refer to “Disassembly of the Brake Mechanism”. Remove the control valve. Refer to “Disassembly of the Control Valve”. Remove the three main housing screws which hold the motor, gearbox and centre section together. Split these three main sub-assemblies.
2. Using a punch drive the brake driving pin out of the disc brake coupler. Remove the disc brake coupler.
3. Remove the rotor housing cover screws. Using a copper punch knock the rotor shaft at the brake end. This action will remove the rotor, vanes, vane lifters, rotor ring (drive end), end shield and its bearing, rotor ring (brake end) and rotor housing cover. Using a copper punch knock the rotor out of the end shield bearing. Remove the bearing from the rotor housing cover.
4. Remove the bearing retainer plate.
5. Tap the air shield lightly with a plastic hammer to remove the cylinder and air shield from the rotor housing. Remove the air shield seal and the air shield bearing from the air shield.
6. Remove the cylinder pin from the rotor housing if it has not fallen out with the air shield and cylinder.
7. Clean and inspect all components for wear and damage. Check for excessive scouring of the rotor, cylinder, air shield and end shield. If deep grooves are present replace the components and check the in line filter for correct operation. Check the faces of the vanes for excessive wear.
8. Replace both the rotor bearings and any other worn or damaged components.
9. Wipe all components with SAE 10W oil before re-assembly in the reverse order to stripping.
10. Install the cylinder pin in the motor housing before inserting the air shield and cylinder.
11. The motor must turn freely by hand when assembled.

Disassembly of the Gearbox

1. Remove the gearbox from the rest of the hoist body side plates by removing the three screws.
2. When the gearbox is removed the driveshaft will remain behind and must be removed when the hoist body is disassembled.
3. Remove the gearbox end cover by removing the five screws securing it in position.
4. Remove the locking ring and the cover plate from the end of the gearbox end cover.
5. Unscrew the three gearbox cover screws. Insert two jacking bolts in the tapped holes in the cover and evenly jack the cover out of the housing. The output load gear should come out with the cover.
6. Remove the output gear, gear housing seal and gear housing load bearing from the gear housing cover.
7. To remove the cluster gear carrier, turn the gearbox housing upside down and strike the housing firmly with a plastic mallet until the cluster gear carrier falls out.
8. Unscrew the three cluster gear shaft locking screws and gently knock the shafts out of the cluster gear carrier using a copper punch. This will remove the cluster gear carrier bearings from the carrier. Remove the six cluster gear bearings from the cluster gears using a copper punch. Remove the snap rings from the gears.
9. Remove the drive shaft bearing from the gearbox housing using a punch from the silencer element end.
10. Remove the annulus gear screws from the rear of the gearbox. Use a puller to remove the annulus gear from the gearbox housing.

11. Clean and inspect all gearbox components for wear and damage. Each gear tooth must be checked for excessive wear and cracking. Replace all damaged and excessively worn components. Replace all gearbox bearings before re-assembly.
12. All bearings must be liberally packed with grease before re-assembly. The specified lubricants are listed under the section "LUBRICATION".
13. Insert the annulus gear and secure with locating screws.
14. Replace the silencer adaptor.
15. Insert the bearing withdrawal washer and drive shaft bearing into its recess in the gearbox housing.
16. Assemble the cluster gears with their bearings and cluster gear rings (if removed). Re-assemble the cluster gear sub-assembly complete with cluster gears, cluster gear shafts, locking screws and circlips. Only insert the cluster gear carrier bearing which fits at the bottom of the gearbox.
17. Place the other cluster gear carrier bearing on the bearing insert in the load gear. Align the timing marks on the load gear with those on the cluster gears. The load gear is stamped A, B, and C on the face where the gear teeth are machined. Each cluster gear is also marked A, B, and C. Insert the cluster gear carrier assembly into the load gear ensuring that the letters on the load gear and cluster gears coincide and that the cluster gear teeth mesh properly with the load gear teeth and the drive shaft teeth.
18. Liberally apply the specified grease (Fuchs Super Luplex M2) to the gears and bearings in this sub-assembly and to the annulus gear and bearings in the gearbox housing.
19. Insert the entire sub-assembly into the gearbox housing ensuring that the annulus gear teeth mesh with the cluster gear teeth. Lightly knock the entire assembly into its home position.
20. Insert the gear housing seal in its recess in the gear housing cover.
21. Replace the gear housing cover and load bearing.
22. Insert the drive shaft.
23. Test the gearbox by turning the drive shaft by hand. It must turn smoothly and not be jerky.
24. Remove the driveshaft and reinstall it when assembling the main hoist body.
25. Replace the cover plate and locking ring.

Disassembly of the Traverse Control Valve.

1. Remove the two pendent control hoses.
2. Unscrew the four bolts attaching the control valve to the rotor housing. Remove the control valve from the hoist. This will enable the control valve to be disassembled in a more convenient area.
3. Remove both circlips securing the valve covers in position. Using a copper punch, tap the valve cover inwards to force the opposite cover out of the valve housing. Remove the spring. Now tap the sleeve towards to opposite side to force the other valve cover out. Remove the spring.
4. Remove the spool valve from the sleeve.
5. Using a soft copper punch, gently tap the control valve sleeve out of the housing. Care should be taken not to burr the inner surfaces of the sleeve.
6. Examine all components for wear, replacing damaged or worn components. Replace all gaskets, seals and o-rings before re-assembly.
7. Remove all sharp edges and burrs from components. Wipe all components with SAE 10W oil before re-assembling in the reverse order to stripping.

NOTICE

- **The spool valve and the control valve sleeve are lapped as a set. If they are worn or defective both components must be replaced.**

Disassembly of the Traverse Motor

1. Remove the control valve. Refer to “DISASSEMBLY OF THE TRAVERSE CONTROL VALVE”. Remove the four main housing screws and pull the motor off the traverse gearbox. Remove the housing gasket and o-ring.
2. Remove the rotor housing end cover.
3. Remove the rotor housing cover screws. Using a copper punch knock the rotor shaft at the end cover end. This action will remove the rotor, vanes, vane springs, rotor ring (drive end), end shield and its bearing, rotor ring (brake end) and rotor housing cover. Using a copper punch knock the rotor out of the end shield bearing. Remove the bearing and seal from the rotor housing cover.
4. Remove the bearing retainer plate.
5. Tap the air shield lightly with a plastic hammer to remove the cylinder and air shield from the rotor housing. Remove the air shield bearing from the air shield.
6. Remove the cylinder pin from the rotor housing if it has not fallen out with the air shield and cylinder.
7. Unscrew the shuttle valve plugs from the sides of the motor housing.
8. Using an allen key, remove the two inner plugs.
9. Clean and inspect all components for wear and damage. Check for excessive scouring of the rotor, cylinder, air shield and end shield. If deep grooves are present replace the components and check the in line filter for correct operation. Check the faces of the vanes for excessive wear.
10. Replace both the rotor bearings and any other worn or damaged components.
11. Wipe all components with SAE 10W oil before re-assembly in the reverse order to stripping.
12. Install the cylinder pin in the motor housing before inserting the air shield and cylinder.
13. The motor must turn freely by hand when assembled.

Disassembly of Traverse Gearbox

1. Remove the traverse motor as described in “DISASSEMBLY OF TRAVERSE MOTOR”.
2. Remove the four gearbox mounting screws and pull the gearbox off the hoist side plate. Remove the gearbox spacer.
3. Remove the drive coupling.
4. Remove the silencer element locking ring and the silence disc.
5. Remove the worm shaft cover and gasket. Using a copper punch tap the worm shaft out of the housing towards the mounting side. Remove both worm shaft bearings.
6. Remove the circlip from the output shaft.
7. Remove the output shaft cover screws.
8. Using a copper punch, tap the output shaft out towards the output shaft cover.
9. Remove the output shaft cover and bearing from the output shaft. If the output shaft bearing remains in the cover, jack the bearing out using the withdrawal washer.
10. Remove the thrust sleeve, worm gear and key from the output shaft.
11. Remove the output shaft bearing and seal from the gearbox housing.
12. Remove the oil filter plug.

13. Clean and inspect all components for wear and damage. Each gear tooth must be checked for excessive wear and cracking. Replace all damaged and excessively worn components. Renew all gearbox bearings, seals and gaskets before re-assembly.
14. Wipe all components with SAE50 or EP90 gear oil before re-assembly in the reverse order to stripping.
15. Do not fill the gearbox with oil until the motor and gearbox are bolted together with seal and gasket in place.

Disassembly of the Hoist Body

1. Remove the load chain, undercarriage and undercarriage cradle as described previously. Remove the hoist motor, hoist gearbox, traverse motor and traverse gearbox as described previously. Remove the chain guides and chain strippers.
2. Remove both width adjusting rods as well as their spacers.
3. Unscrew the drive housing capscrews so that the two halves of the body can be pulled apart.
4. Remove the coupling, drive shaft and secondary drive shaft from each side plate assembly. Remove the two driven load sheaves.
5. Remove all the bolts, nuts and shafts holding the side plate assemblies together. Remove the idler load sheaves. Separate the side plates from each other.
6. Remove the circlip from the drive pinion and tap the pinion out of the final drive housing. Remove the bearings from the housing.
7. Unscrew the wheel locknuts and remove the wheels from the wheel shafts. Remove the lock washers, wheel bearing covers, circlips, bearing seals and spacer sleeves.
8. Remove the silencer element locking rings and the silencer elements. Remove the silencer adapter.
9. Clean and inspect all components for wear and damage. Check all gear teeth for excessive wear and cracking. Check the wear on the hoist wheels, chain guides, chain strippers and load sheaves.



- **Excessive wear of the load sheave and chain guide will enable the chain to climb out of the pockets and cause shock loading on the hoist.**

10. Replace all damaged and excessively worn components.
11. Apply Fuchs Super Luplex M2 grease liberally to all bearings before re-assembly.
12. Assemble in the reverse order to stripping.

Disassembly of the Undercarriage Assembly

1. Remove the chain anchors from the hoist side plates. Remove the chain from the anchors and feed the loose ends of the chain through the undercarriage.
2. Remove the hook shaft and the hook from the undercarriage. Remove the hook swivel from the hook shank and the safety latch from the hook.
3. Remove the two load sheave pins and remove the idler load sheaves. Remove the dust covers, cradle spacer rings and bearings from the load sheaves.
4. Clean and inspect all components for wear and damage.

5. Inspect the hooks as described under the section “INSPECTION”.
6. Check for load sheave deformation or cracks.
7. Use SPANJAARD COPPER SLIP COMPOUND, SAE50 or EP90 oil for hook shank lubrication.
8. Liberally apply Fuchs Super Luplex M2 grease to new load sheave bearings.
9. Re-assemble in the reverse order to stripping.

Disassembly of the Pilot Pendent Control Handle (Lever Type)

1. Remove the three pendent hoses from the pendent control. Ensure that the main air supply to the hoist is shut off.
2. Unscrew the shaft locking screw and remove the pivot shaft and the pendent levers.
3. Unscrew the two guide locking screws.
4. Remove the two plugs at the back of the housing. Use a copper punch to lightly tap out the pistons and piston guides.
5. Remove the pendent springs from the pendent control housing.
6. Extract the piston from the piston guide and remove the stopper seal and piston guide seals.
7. Clean and inspect all components for wear and damage. If there is excessive air leakage between the piston and the piston guide, both components must be replaced.
8. Replace all seals.
9. Wipe all components with SAE 10W oil before re-assembling in the reverse order to disassembly.

Disassembly of the Pilot Pendent Control Handle (Mining Type)

1. Remove the three pendent hoses from the pendent control. Ensure that the main air supply to the hoist is shut off.
2. Remove the nut and the handle. Take care when removing the spring from the spring pins. Protective eyewear should be worn. Remove the shaft bush.
3. Unscrew the four housing screws and remove the housing cover. Remove the circlip from the cam shaft. Push the cam out of the housing cover and remove the thrust washer and seal.
4. Unscrew the two guide locking screws as well as the screws securing the guides in the recess of the handle housing.
5. Remove the two plugs at the back of the housing. Use a copper punch to lightly tap out the pistons and piston guides.
6. Remove the pendent springs from the pendent control housing.
7. Extract the piston from the piston guide and remove the stopper seal and piston guide seals.
8. Clean and inspect all components for wear and damage. If there is excessive air leakage between the piston and the piston guide, both components must be replaced.
9. Replace all seals.
10. Wipe all components with SAE 10W oil before re-assembling in the reverse order to disassembly.

Disassembly of the Direct Pendent Control Handle

1. Ensure that the main air supply to the hoist is shut off. Remove the three hoses from the direct pendent control handle. Remove the handle.
2. Remove the nut securing the handle assembly and remove the handle.

3. Using pliers carefully remove the control spring from the spring pin. Wearing eye protection is highly recommended.
4. Remove the bush over the shaft.
5. Remove the exhaust channel cover and gasket and then remove the four screws joining the throttle handle housing to the end cover. Split the two aluminium halves using a mallet.
6. Remove the housing seal, throttle plate, end plate and second housing seal.
7. Remove the circlip from the throttle pinion and extract the pinion. Remove the two pinion seals from the throttle handle housing.
8. Remove the snap ring, perforated cover, second snap ring and silencer element from the end cover.
9. Clean and inspect all components for wear and damage.
10. Replace all seals.
11. Wipe all components with SAE 10W oil before re-assembling in the reverse order to disassembly.

PARTS

Accessories

Table 17. Hoist Accessories

ACCESSORY	PART No.
Filter-Lubricator for Fixed Installations	28-145
J-type Hook Assembly (2T)	22I-23
J-type Hook Assembly (3T)	30-23
J-type Hook Assembly (4T)	42I-23
J-type Hook Assembly (6T)	30-23
Closed Eye Hook Assembly (2T)	22I-23CEM
Closed Eye Hook Assembly (3T)	32I-23CEM
Closed Eye Hook Assembly (4T)	42I-23CEM
Closed Eye Hook Assembly (6T)	60-62CE
Clevis Self Locking Hook Assembly (2T)	22I-23CSLHA
Clevis Self Locking Hook Assembly (3T)	30-23CSLHA
Clevis Self Locking Hook Assembly (4T)	42I-23CSLHA
Clevis Self Locking Hook Assembly (6T)	60-23CSLHA
Vane and Vane Lifter Kit (2T)	22I-06VS
Vane Kit (2T)	22I-06V
Vane and Vane Lifter Kit (3T, 4T, 6T)	32I-06VS
Vane Kit (3T, 4T, 6T)	32I-06V
Overhaul Seal and Gasket Kit	32I-105
Lockout Device (Toggle Control)	32I-58B
Lockout Device (Direct Pendent Control)	30-77B

