MANITOU

HANDLING YOUR WORLD

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(EUROPEAN UNION)

OPERATORS MANUAL
(NOTICE ORIGINALE)

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00. EXPLANATION OF SYMBOLS

⚠ DANGER

Indicates an imminent hazardous situation which, if not avoided will result in death or serious injury.

⚠ WARNING

Indicates a potentially hazardous situation which, if not avoided, may result in death or serious injury.

⚠ CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor injury or damage to property. It is also used to warn users of unsafe practices.

NOTICE

Indicates a practice not related to a physical injury which, if not avoided, may damage the machine.

Indicates a message to draw attention to important information regarding environmental protection.

Indicates special tools for performing a task.

Indicates the value of tightening torque to be applied.

Indicates the weight of an item.

e.g. it helps to anticipate an action linked to a person's health or the choice of lifting equipment.

1. SAFETY

1.1. REDUCE RISKS

Figure 1: Reduce risks program

1.2. INSTRUCTIONS TO THE COMPANY MANAGER

1.2.1 THE SITE

Proper management of the lift truck's area of travel will reduce the risk of accidents, so follow the precautions:

- Make sure that the ground is not unnecessarily uneven or obstructed.
- Make sure that there are no excessive slopes.
- Make sure that the pedestrian traffic is controlled, etc.

1.2.2 THE OPERATOR

Only qualified, authorized personnel can use the lift truck. This authorization is given in writing by the competent manager in the establishment for the use of lift trucks and must be carried permanently by the operator.

⚠ WARNING

Experience has shown that there are a number of inappropriate ways in which the lift truck might be used. Such foreseeable misuse, of which the main examples are listed below, is strictly not permitted

The foreseeable abnormal behavior resulting from ordinary negligence, but which does not result from any wish to put the machinery to any improper use.

The reflex reactions of a person in the event of a malfunction, incident, fault, etc,. during operation of the lift truck.

Behavior resulting from application of the "principle of least effort" when performing a task.

For certain machines, the foreseeable behavior of persons such as apprentices, teenagers, handicapped persons, trainees tempted to drive a lift truck, operators tempted to operate a truck for the purposes of a bet, a competition or for their own personal experience.

The person in charge of the equipment must take these criteria into account when assessing the suitability of a person to drive.

1.2.3 THE LIFT TRUCK

THE TRUCK'S SUITABILITY FOR THE JOB

- MANITOU has ensured that this lift truck is suitable for use under the standard operating conditions defined in this operator's manual, with a **STATIC TEST COEFFICIENT OF 1.33** and a **DYNAMIC TEST COEFFICIENT OF 1**, as specified in harmonised standard **ISO 3691-1** for mast trucks.
- Before commissioning, the company manager must make sure that the lift truck is appropriate for the work to be done, and perform certain tests (in accordance with current legislation).

ADAPTATION OF THE LIFT TRUCK TO STANDARD ENVIRONMENTAL CONDITIONS

- In addition to series equipment mounted on your lift truck, many options are available, such as: road lighting, stop lights, revolving light, reverse lights, reverse buzzer alarm, front light, rear light, etc.
- The operator must take into account the operating conditions to specify the lift truck's signalling and lighting equipment. Contact your dealer.
- Take into account climatic and atmospheric conditions of the site of use.
  - Protection against frost
  - Adaptation of lubricants (ask your dealer for information).
  - Engine filtration .

NOTICE

For operation under average climatic conditions, i.e.: between -15 °C and 35 °C, correct levels of lubricants in all the circuits are checked in production .

For operation under more severe climatic conditions, before starting up, it is necessary to drain all the circuits, then ensure correct levels of lubricants using lubricants properly suited to the relevant ambient temperatures.

The same applies to the cooling liquid.

- Preventing fire risks associated with use in dusty and flammable conditions (e.g. straw, flour, sawdust, organic waste, etc.).
- A lift truck operating in an area without fire extinguishing equipment must be equipped with an individual extinguisher. There are solutions, consult your dealer.

⚠ WARNING

Your lift truck is designed for outdoor use under normal atmospheric conditions and indoor use in suitably aerated and ventilated premises.

It is forbidden to use the lift truck in areas where there is a risk of fire or potential explosion (e.g. Refineries, fuel or gas depots, stores of flammable products, etc.).

Special equipment is available for use in such areas (ask your dealer for information).

- Our trucks comply with Directive 2004/108/EC concerning electromagnetic compatibility (EMC), and with the corresponding harmonised standard EN 12895. Their proper operation is no longer guaranteed if they are used within areas in which the electromagnetic fields exceed the limit specified by that standard (10 V/m).
- Directive 2002/44/EC requires company managers to not expose their employees to excessive vibration doses. There is no recognised code of measurement for comparing the machines of different manufacturers. The actual doses received cannot therefore be measured under actual operating conditions at the user's premises.
- The following are some tips for minimizing these vibration doses:
  - Select the most suitable lift truck and attachment for the intended use.
  - Adapt the seat adjustment to the operator's weight (according to lift truck model) and maintain it in good condition, as well as the cab suspension. Inflate the tyres in accordance with recommendations.
  - Ensure that the operators adapt their operating speed to suit the conditions on site.
  - As far as possible, arrange the site in such a way as to provide a flat running surface and remove obstacles and harmful potholes.

MODIFICATION OF THE LIFT TRUCK

- For your own safety and that of others, you must not change the structure and settings of the various components used in your lift truck by yourself (hydraulic pressure, limiter calibration, engine speed, addition of extra equipment, addition of counterweights, unapproved attachments, alarm systems, etc. In this event, the manufacturer cannot be held liable.

FRENCH ROAD TRAFFIC RULES

- Only one certificate of conformity is issued. It must be kept in a safe place.
- The driving of non-approved lift trucks on the public highway is subject to the provisions of the highway code relating to special machines, defined in article R311-1 of the highway code, in category B of the Equipment Order of 20 November 1969 that determines the procedures applicable to special machines. The lift truck must be fitted with a license plate.

1.2.4 INSTRUCTIONS

- The operator's manual must always be in good condition and kept in the place provided on the lift truck and in the language used by the operator.
- The operator's manual and any plates or stickers which are no longer legible or are damaged must be replaced immediately.
- When handling bulky loads, which restrict your vision, operate the machine in reverse or have a guide.

1.2.5 MAINTENANCE

- Maintenance or repairs other than those detailed in section - MAINTENANCE must be carried out by qualified personnel (consult your dealer) and in the necessary safety conditions to preserve the health of the operator and any third party.

NOTICE

Your lift truck must be inspected periodically to make sure that it remains in compliance.

The frequency of this inspection is defined by current legislation in the country in which the lift truck is used.

- Example for France: "The manager in charge of the establishment using a lift truck must open and maintain a maintenance log for each machine (order of 2 March 2004) and undergo a general periodic inspection every 6 months (order of 1 March 2004)".

1.3. INSTRUCTIONS FOR THE OPERATOR

1.3.1 FOREWORD

⚠ WARNING

The risk of accident while using, servicing or repairing your lift truck can be restricted if you follow the safety instructions and safety measures detailed in these instructions.

Failure to respect the safety and operating instructions, or the instructions for repairing or servicing your lift truck may lead to serious, even fatal accident.

- Only the operations and maneuvers described in this operator's manual must be performed. The manufacturer cannot predict all possible risky situations. Consequently, the safety instructions given in the operator's manual and on the lift truck itself are not exhaustive.
- At any time, as an operator, you must envisage, within reason, the possible risk to yourself, to others or to the lift truck itself when you use it.

⚠ WARNING

In order to reduce or prevent any danger with a MANITOU-approved attachment, follow the instructions in the section - ADAPTABLE ATTACHMENTS AS OPTIONS ON THE RANGE: INTRODUCTION.

1.3.2 GENERAL INSTRUCTIONS

OPERATOR'S MANUAL

- Read the operator's manual carefully.
- The operator's manual must always be in good condition and kept in the place provided on the lift truck.
- You must report any plates and stickers which are no longer legible, or which are damaged.

AUTHORISATION FOR USE IN FRANCE

(or see current legislation in other countries)

- Only qualified, authorized personnel can use the lift truck. This authorization is given in writing by the appropriate person in the establishment with respect to the use of lift trucks and must be carried permanently by the operator.
- The operator is not competent to authorize the driving of the lift truck by another person.

MAINTENANCE

- The operator must immediately advise his superior if his lift truck is not in good working order or does not obey the safety notice.
- The operator is prohibited from carrying out any repairs or adjustments himself, unless he has been trained for this purpose. He must keep the lift truck properly cleaned if this is among his responsibilities.
- The operator is responsible for carrying out daily maintenance
- The operator is responsible for deciding and adjusting the frequency of cleaning necessary to prevent the risk of fire ensuing from the build-up of flammable material(s). The operator must pay special attention to all the areas of the lift truck where these risk materials are likely to accumulate.

TYRES

⚠ DANGER

Do not use the lift truck if the tyres are incorrectly inflated, damaged or excessively worn, because this could put your own safety or that of others at risk, or cause damage to the lift truck itself.

The fitting of foam inflated tyres is prohibited and is not guaranteed by the manufacturer, excepting prior authorization.

- The operator must ensure tyres are adapted to the nature of the ground. There are optional solutions, consult your dealer.
  - SAND tyres.
  - Farm Tyres.
  - Snow chains.
- The lift truck's four tyres must be of the same brand and of the same usage category (normal, snow or special), have the same structure (radial or diagonal) and have the same degree of tread wear.
- In the event of tyre replacement, use tyres authorized by MANITOU that are of the same type and dimensions. Using different tyres voids the lift truck's type approval and you may be liable.
- If you are replacing just one of the lift truck's tyres (e.g. because it is damaged), we recommend choosing a tyre with the same degree of wear as the remaining tyres so as not to damage the transmission's kinematic chain.

MODIFICATION OF THE LIFT TRUCK

For your safety and that of others, you must not change the structure and settings of the various components used in your lift truck (hydraulic pressure, calibrating limiters, engine speed, addition of extra equipment,

addition of counterweight, unapproved attachments, alarm systems, etc.) yourself. In this event, the manufacturer cannot be held responsible.

Lifting People

It is forbidden to lift or carry people.

1.3.3 OPERATING INSTRUCTIONS UNLADEN AND LADEN

BEFORE STARTING THE LIFT TRUCK

- Perform the daily maintenance operations.
- Make sure that the driver's cab is clean, particularly the floor and floor mat. Do a check that no movable object may prevent the operation of the lift truck.
- Make sure that the forward-reverse lever is in neutral.
- Make sure that the lights, indicators and windscreen wipers are working properly.
- Make sure that the rear view mirrors are in good condition, clean and properly adjusted.
- Make sure that the horn works.

DRIVER'S OPERATING INSTRUCTIONS AVAILABLE IN THE DRIVER'S CAB

⚠ DANGER

Under no circumstances must the seat be adjusted while the lift truck is moving.

- Whatever his experience, the operator is advised to familiarize himself with the position and operation of all the controls and instruments before operating the lift truck.
- Wear clothes suited for driving the lift truck and avoid loose clothes.
- Make sure that you have the appropriate protective equipment for the task to be performed.
- Prolonged exposure to high noise levels may cause hearing problems. It is recommended to wear ear muffs to protect against excessive noise.
- Always face the lift truck when getting into and out of the driver's cab.
  - Use the handle(s) provided for this purpose.
  - Use the step(s).
  - Do not jump out of the lift truck.
- Always pay attention when using the lift truck. Do not listen to radio or music using headphones or earphones.
- Never operate the lift truck when hands or feet are wet or soiled with greasy substances.
- For increased comfort, adjust the seat to your requirements and adopt the correct position in the driver's cab.
- The operator must always be in his normal position in the driver's cab. It is prohibited to have arms or legs, or generally any part of the body, protruding from the driver's cab of the lift truck.
- The safety belt must be worn and adjusted to the operator's size.
- The control units must never in any event be used for any other than their intended purposes (e.g. climbing onto or down from the lift truck, portmanteau, etc.).
- If the control components are fitted with a forced operation (lever lock) device, it is not permitted to leave the cab without first putting these controls in neutral.
- Do not carry passengers either on the lift truck or in the driver's cab.

ENVIRONMENT

- Comply the site safety regulations.
- Examine the work area.
- If you have to use the lift truck in a dark area or at night, make sure that it is equipped with working lights.
- During handling operations, make sure that no one is in the way of the lift truck and its load.
- Do not allow anybody to come near the working area of the lift truck or pass beneath an elevated load.
- When using the lift truck on a transverse slope, before lifting the boom obey the instructions given in the section - INSTRUCTIONS FOR HANDLING A LOAD: D - TRANSVERSE ATTITUDE OF THE LIFT TRUCK
- Travelling on a longitudinal slope, do the steps that follow::
  - Drive and brake gently.
  - Moving without load: forks or attachment must face downhill.
  - Moving with load: Forks or attachment must face uphill.
- Take into account the lift truck's dimensions and its load before trying to negotiate a narrow or low passageway.
- Never move onto a loading platform without having first checked:
  - That it is suitably positioned and made fast.

- That the unit to which it is connected (wagon, lorry, etc.) will not shift.
- That this platform is prescribed for the total weight of the lift truck to be loaded.
- That this platform is prescribed for the size of the lift truck.

- Be careful in the area of loading bays, trenches, scaffolding, soft ground and manholes.
- Make sure that the ground is stable and firm under the wheels and/or stabilizers before lifting or removing the load. If necessary, add sufficient wedging under the stabilizers.
- Make sure that the scaffolding, loading platform, pilings or ground is capable of bearing the load.
- Never stack loads on uneven ground, they may tip over.
- When working near aerial lines, make sure there is sufficient safety distance between the working area of the lift truck and the aerial line.

⚠ DANGER

You must consult your local electrical agency. You could be electrocuted or seriously injured if you operate or park the lift truck too close to power cables.

In the event of high winds, do not carry out handling work that jeopardises the stability of the lift truck and its load, particularly if the load catches the wind badly.

- Prevent fire risks associated with the use in dusty and flammable conditions (e.g. straw, flour, sawdust, organic waste, etc.).

Visibility

- The safety of people within the lift truck's working area, as well as that of the lift truck itself and the operator are dependent on good operator visibility of the lift truck's immediate vicinity in all situations and at all times.
- This lift truck has been designed to allow good operator visibility (direct or indirect by means of rear-view mirrors) of the immediate vicinity of the lift truck during running operations, unladen and boom in the transport position.
- Special precautions must be taken if the size of the load restricts visibility toward the front. These include:
  - moving in reverse.
  - site layout,
  - assisted by a person directing the maneuver (while standing outside the truck's area of travel), making sure to keep this person clearly in view always,
  - in any case, do not reverse over long distances.
- If visibility of your road is inadequate, ask someone to assist by directing the maneuver (while standing outside the truck's area of travel), making sure to keep this person clearly in view always.
- Keep all components affecting visibility in a clean, properly adjusted state and in good working order (e.g. windscreens, windows, windscreen wipers, windscreen washers, driving and work lights, rear-view mirrors)..

Starting the lift truck

SAFETY INSTRUCTIONS

⚠ WARNING

Risk of losing control.

Risk of losing lateral and frontal stability of the lift truck. The operator must remain in control of the lift truck.

In the event of the lift truck overturning, do not try to leave the cabin during the incident. YOUR BEST PROTECTION IS TO STAY FASTENED IN THE CABIN.

- Observe the company’s traffic regulations or, by default, the public highway code.
- Do not carry out operations which exceed the capacities of your lift truck or attachments.
- Always drive the lift truck with the forks or attachment to the transport position, i.e. at 300mm from the ground and the carriage sloping backwards.
- Only carry loads which are balanced and properly anchored to avoid any risk of a load falling off.
- Ensure that pallets, cases, etc. are in good order and suitable for the load to be lifted.
- Familiarise yourself with the lift truck on the terrain where it will be used.
- Ensure that the service brakes are working properly.
- The loaded lift truck must not travel at speeds in excess of 12 km/h.
- Drive smoothly at an appropriate speed for the operating conditions (land configuration, load on the lift truck).
- Do not use the hydraulic mast controls when the lift truck is moving.
- Do not manoeuvre the lift truck with the mast in the raised position unless under exceptional circumstances and then with extreme caution, at

very low speed and using gentle braking. Ensure that visibility is adequate.

- Take bends slowly.
- In all circumstances make sure you are in control of your speed.
- On damp, slippery or uneven terrain, drive slowly.
- Brake gently, never abruptly.
- Only use the lift truck's forward/reverse selector from a stationary position and never do so abruptly.
- Do not drive with your foot on the brake pedal.
- Always remember that hydrostatic type steering is extremely sensitive to movement of the steering wheel, so turn it gently and not jerkily.
- Never leave the engine running when the lift truck is unattended.
- Do not leave the cab when the lift truck has a raised load.
- Look where you are going and always make sure you have good visibility along the route.
- Use the rear-view mirrors frequently.
- Drive round obstacles.
- Never drive on the edge of a ditch or steep slope.
- It is dangerous to use two lift trucks simultaneously to handle heavy or voluminous loads, since this operation requires particular precautions to be taken. It must only be used exceptionally and after risk analysis.
- The ignition switch has an emergency stop mechanism in case of an operating anomaly occurring in the case of lift trucks not fitted with a punch-operated cut-out.

INSTRUCTIONS

- Always drive the lift truck with the forks or attachment to the transport position, i.e. at 300mm from the ground and the carriage sloping backwards.
- For lift trucks with gearboxes, use the selected gear.
- Release the hand brake.
- Shift the forward/reverse selector to the selected direction of travel and accelerate gradually until the lift truck moves off.

Stopping the lift truck

SAFETY INSTRUCTIONS

- Never leave the ignition key in the lift truck during the operator's absence.
- When the lift truck is stationary, or if the operator has to leave his cab (even for a moment), place the forks or attachment on the ground, apply the parking brake and place the forward/reverse selector in neutral.
- Make sure that the lift truck is not stopped in any position that will interfere with the traffic flow and at less than one metre from the track of a railway.
- In the event of prolonged parking on a site, protect the lift truck from bad weather, particularly from frost (check the level of antifreeze), close and lock all the lift truck accesses (doors, windows, cowls, etc.).

INSTRUCTIONS

- Park the lift truck on flat ground or on an incline lower than 15%.
- Set the forward/reverse selector to neutral.
- Apply the parking brake.
- For lift trucks with gearboxes, place the gear lever in neutral.
- Lower the forks or attachment to rest on the ground.
- When using an attachment with a grab or jaws, or a bucket with hydraulic opening, close the attachment fully.
- Before stopping the lift truck after a long working period, leave the engine idling for a few moments, to allow the coolant liquid and oil to lower the temperature of the engine and transmission. Do not forget this precaution, in the event of frequent stops or warm stalling of the engine, or else the temperature of certain parts will rise significantly due to the stopping of the cooling system, with the risk of badly damaging such parts.
- Stop the engine with the ignition switch.
- Remove the ignition key.
- Lock all the accesses to the lift truck (doors, windows, cowls)
- For lift trucks operating on gas carburisation, shut the LPG bottle. For a long-lasting stop, let the engine stop naturally by shutting the LPG bottle before switching off the ignition, so as to eliminate all the fuel in the feed tube.

DRIVING THE LIFT TRUCK ON THE PUBLIC HIGHWAY (FRENCH ROAD TRAFFIC RULES)

⚠ DANGER

Never move in neutral (forward/reverse selector or gear lever in neutral or transmission cut-off button pressed) to preserve the lift truck engine brake.

Failure to follow this instruction on a slope will lead to excessive speed which may make the lift truck uncontrollable (steering, brakes) and may cause serious mechanical damage.

The driving of non-approved lift trucks on the public highway is subject to the provisions of the highway code relating to special machines, defined in article R311-1 of the highway code, in category B of the Equipment Order of 20 November 1969 that determines the procedures applicable to special machines. The lift truck must be fitted with a license plate.

SAFETY INSTRUCTIONS

- Operators driving on the public highway must comply with current highway code legislation.
- The lift truck must comply with current road legislation. If necessary, there are optional solutions. Contact your dealer.

INSTRUCTIONS

- Make sure the revolving light is in place, switch it on and verify its operation.
- Make sure the lights, indicators and windscreen wipers are working properly.
- Switch off the working headlights if the lift truck is fitted with them.
- Place the attachment 300 mm from the ground.

DRIVING THE LIFT TRUCK WITH A FRONT-MOUNTED ATTACHMENT

- You must comply with current regulations in your country, covering the possibility of driving on the public highway with a front-mounted attachment on your lift truck.
- If road legislation in your country authorises circulation with a front-mounted attachment, you must at least:
  - Protect and report any sharp and/or dangerous edges on the attachment.
  - The attachment must not be loaded.
  - Make sure that the attachment does not mask the lighting range of the forward lights.
  - Make sure that current legislation in your country does not require other obligations.

OPERATING THE LIFT TRUCK WITH A TRAILER (For lift trucks equipped with a towing system)

- For using a trailer, observe the regulations in force in your country (maximum travel speed, braking, maximum weight of trailer, etc.).
- Do not forget to connect the trailer’s electrical equipment to that of the lift truck.
- The trailer's braking system must comply with current legislation.
- If pulling a trailer with assisted braking, the tractor lift truck must be equipped with a trailer braking mechanism. In this case, do not forget to connect the trailer braking equipment to the lift truck.
- The vertical force on the towing hook must not exceed the maximum authorised by the manufacturer (consult the manufacturer’s plate on your lift truck).
- The authorised gross vehicle weight must not exceed the maximum weight authorised by the manufacturer (consult the manufacturer’s plate on your lift truck).

IF NECESSARY, CONSULT YOUR DEALER.

1.4. LIFT TRUCK MAINTENANCE INSTRUCTIONS

1.4.1 GENERAL INSTRUCTIONS

- Ensure that the area is sufficiently ventilated before starting the lift truck.
- Wear clothes suitable for the maintenance of the lift truck. Do not wear jewelry and loose clothes. Tie back and protect your hair, if necessary.
- Before carrying out any work on the lift truck:
  - Switch off the engine.
  - Apply the parking brake
  - Remove the ignition key.
- Read the operator's manual carefully.
- Carry out all repairs immediately, even if the repairs concerned are minor.
- Repair all leaks immediately, even if the leak concerned is minor.
- Ensure that process materials and of spare parts are disposed in all safely and in an ecological manner.
- Be careful of the risk of burns and splashing (exhaust, radiator, engine, etc.).

1.4.2 MAINTENANCE

Perform the periodic service to keep your lift truck in good working condition. Failure to perform the periodic service may cancel the contractual guarantee.

MAINTENANCE LOGBOOK

The maintenance operations carried out in accordance with the recommendations given in section - MAINTENANCE and the other inspection, servicing or repair operations or modifications performed on the lift truck or its attachments are recorded in a maintenance logbook. The entry for each operation must include the date of the work, the names of the individuals or companies having performed them, the type of operation and its frequency, if applicable. The part

numbers of any lift truck components that are replaced are indicated.

1.4.3 LUBRICANT AND FUEL LEVELS

- Use the recommended lubricants (never use contaminated lubricants).
- Do not fill the fuel tank when the engine is running.
- Only fill up the fuel tank in areas specified for this purpose.
- Do not fill the fuel tank to the maximum level.
- Do not smoke or approach the lift truck with a flame when the fuel tank is open or is being filled.

1.4.4 HYDRAULICS

- Any work on the load handling hydraulic circuit is not permitted except for the operations described in 4 - MAINTENANCE.
- Do not attempt to loosen connections, hoses or a hydraulic component with the circuit under pressure.

⚠ DANGER

It is dangerous to change the setting and remove the balancing valves or safety valves which may be fitted to your lift truck cylinders.

The HYDRAULIC ACCUMULATORS that may be fitted on your lift truck are pressurized units. Removing these accumulators and their pipework is a dangerous operation and must only be performed by approved personnel (consult your dealer).

These operations must only be performed by approved personnel (consult your dealer).

1.4.5 ELECTRICITY

- Do not short-circuit the starter relay to start the engine. If the forward/reverse selector is not in neutral and the parking brake is not applied, the lift truck may suddenly start to move.
- Do not put metal items on the battery.
- Disconnect the battery before working on the electrical circuit.

1.4.6 WELDING

- Disconnect the battery before carrying out any welding operations on the lift truck.
- When carrying out electric welding work on the lift truck, connect the negative cable from the equipment directly to the part being welded to avoid high tension current passing through the alternator.
- Never carry out welding or any work which gives off heat on an assembled tyre. The heat will increase the pressure which can cause the tyre to explode.
- If the lift truck is equipped with an electronic control unit, disconnect this before starting to weld to avoid the risk of causing irreparable damage to electronic components.

1.4.7 WASHING THE LIFT TRUCK

- Clean the lift truck or at least the area concerned before any intervention.
- Remember to close and lock all accesses to the lift truck (doors, windows, cowls, etc.).
- During washing, avoid the articulations and electrical components and connections.
- If necessary, protect against penetration of water, steam or cleaning agents, components susceptible of being damaged, particularly electrical components and connections and the injection pump.
- Clean the lift truck of any fuel, oil or grease trace.

1.4.8 TRANSPORTING THE LIFT TRUCK

⚠ WARNING

Transporting the lift truck involves real risks for the operator and others involved.

Towing, winching, slinging or transporting the lift truck, see Maintenance, Occasional operation.

1.5. IF THE LIFT TRUCK IS NOT TO BE USED FOR A LONG TIME

1.5.1 INTRODUCTION

The following recommendations are intended to prevent the lift truck from being damaged when it is withdrawn from service for an extended period.

NOTICE

Procedures to follow if the lift truck is not to be used for a long time, and for starting it up again afterward must be performed by your dealership. This period of long-term stoppage must not exceed 12 months.

1.5.2 PREPARING THE LIFT TRUCK

- Clean the lift truck thoroughly.
- Check and repair any fuel, oil, water or air leaks.
- Replace or repair any worn or damaged parts.
- Wash the painted surfaces of the lift truck in clear and cold water and wipe them.
- Touch up the paint work if necessary.
- Stop the lift truck.
- Make sure the mast cylinder rods are all in the retracted position.
- Release the pressure in the hydraulic circuits.

1.5.3 PROTECTING THE ENGINE

- Contact your dealer to obtain the procedure for protecting the inside of the engine (use of protection product).
- Fill the tank with fuel .
- Drain and replace the coolant .
- Leave the engine running at idling speed for a few minutes, then switch off.
- Replace the engine oil and oil filter .
- Run the engine for a short time so that the oil and cooling liquid circulate inside.
- Disconnect the battery and store it in a safe place away from the cold after charging it to a maximum
- Block the outlet with waterproof adhesive tape.
- Remove the drive belts and store them in a safe place
- Disconnect the engine cut-off solenoid on the injection pump and carefully insulate the connection.

1.5.4 PROTECTING THE LIFT TRUCK

- Set the lift truck on axle stands so that the tyres are off the ground.
- Release the parking brake (depending on the model of lift truck).
- Protect cylinder rods which will not be retracted, from corrosion.
- Wrap the tyres.

If the lift truck is to be stored outdoors, cover it with a waterproof tarpaulin.

1.5.5 BRINGING THE LIFT TRUCK BACK INTO SERVICE

⚠ WARNING

Ensure the area is sufficiently ventilated before starting the lift truck.

- Remove the waterproof adhesive tape from all the holes.
- Refit and reconnect the battery.
- Remove the protection from the cylinder rods.
- Perform the daily maintenance operations .
- Put the handbrake on and remove the axle stands.
- Drain and clean the fuel tank .
- Fill the fuel tank with clean diesel filtered through the filler port.
- Replace the fuel filter .
- Replace the fuel pre-filter (depending on the model of lift truck)
- Drain and rinse the DEF tank (depending on the model of lift truck)
- Top up, slowly fill the tank with new "DEF" (Diesel Exhaust Fluid) up to the bottom of the filler neck (depending on the model of lift truck)
- Refit the drive belts and adjust the tension .
- Turn the engine over with the starter, to allow the oil pressure to rise.
- Reconnect the engine cut-off solenoid.
- Lubricate the lift truck completely .
- Start up the lift truck, following the safety instructions and regulations.
- Carry out all the boom hydraulic movements, concentrating on the ends of travel for each cylinder.

1.6. LIFT TRUCK DISPOSAL

1.6.1 RECYCLING OF MATERIALS

Metals

- Metals are 100 % recoverable and recyclable.

Plastics

- Plastic parts are identified with a marking in accordance with current regulations.

- A limited range of materials are used to simplify the recycling process.
- Most of the plastic components are made up of "thermoplastic" that are easily recycled by melting, granulating or grinding.

Rubber

- Tyres and seals can be ground for use in cement manufacture or to obtain reusable granules.

Glass

- Glass items can be removed and collected for processing by glaziers.

1.6.2 ENVIRONMENTAL PROTECTION

By entrusting the maintenance of your lift truck to the MANITOU network, the risk of pollution is limited and the contribution to environmental protection contribution is made.

Worn or Damaged Parts

- Do not dump them in the countryside.
- MANITOU and its network have signed-up to a scheme of environmental protection through recycling.

Used Oil

- The MANITOU network organizes the collection and processing of used oil.
- By handing over your waste oil to MANITOU, the risk of pollution is limited.

Used Batteries

- Do not throw away batteries, as they contain metals that are harmful for the environment.
- Return them to the MANITOU network or any other approved collection point.

MANITOU seeks to manufacture lift trucks providing the best performance and limiting polluting emissions.

1.7. DECALS

1.7.1 DECALS LOCATION — MI 20→35 D K ST5 S1

Figure 2: Decals location

Table 1. List of decals

Marker	Reference	Description	Option
1	828045	Slinging point	
2	828054	Crushing hazard	
3	828046	Slinging warning	
4	828044	Safety instructions for mast trucks	
5	952462	Acoustic plate 107 dB	
6	53201972	Diesel ULSD	
7	896744	Safety instructions	
8	53203002	Parked DPF regeneration	
9	53203006	DPF inside	
10	828062	Tie-down point	
11	52759172	Warning risk of misuse (for UK only)	
12	-	Not used	
13	-	Not used	
14	-	Not used	
15	-	Not used	

2. SPECIFICATIONS & DESCRIPTION

2.1. “EC” DECLARATION OF CONFORMITY — MI 20→35 D K ST5 S1

This document is a specimen of the “EC” declaration of conformity mirroring the content of the original declaration provided with the machine.

This specimen and the original document may contain data fields which does not apply to the machine. These fields are left blank if not relevant.

See the original certificates for all relevant values for your machine.

1) **DÉCLARATION «CE» DE CONFORMITÉ (originale)**

«EC» DECLARATION OF CONFORMITY (original)

2) Constructeur, *Manufacturer :* **MANITOU BF**
3) Adresse, *Address :* **430, RUE DE L'AUBINIÈRE - B.P 10249**
44158 - ANCENIS - CEDEX - FRANCE
4) Titulaire du dossier technique, *Holder of the technical file :* **MANITOU BF**
3) Adresse, *Address :* **430, RUE DE L'AUBINIÈRE - B.P 10249**
44158 - ANCENIS - CEDEX - FRANCE
5) Le constructeur déclare que la machine décrite ci-après, *The manufacturer declares that the machine described below :*
MI 20 D K ST5 S1
MI 25 D K ST5 S1
MI 30 D K ST5 S1
MI 35 D K ST5 S1

6) Est conforme aux directives suivantes et à leurs transpositions en droit national (si applicables), *Complies with the following directives and their transpositions into national law (if applicable) :*

2006/42/CE

7) Pour les machines annexe IV, *For annex IV machines :*
8) Numéro d'attestation, *Certificate number :*
9) Organisme notifié, *Notified body :*

2000/14/CE + 2005/88/CE

10) Procédure appliquée, *Applied procedure :*
9) Organisme notifié, *Notified body :*

11) Niveau de puissance acoustique, *Sound power level :*
12) Mesuré, *Measured :* dB (A)
13) Garanti, *Guaranteed :* dB (A)

2014/30/UE

14) Normes harmonisées utilisées, *Harmonised standards used :*

15) Normes ou dispositions techniques utilisées, *Standards or technical provisions used :*

16) Fait à, *Done at :* *17)* Date, *Date :*
18) Nom du signataire, *Name of signatory :*
19) Fonction, *Function :*
20) Société, *Company :*
21) Signature, *Signature :*

Figure 3: “EC” declaration of conformity — MI 20→35 D K ST5 S1 (specimen) page 1/2

Figure 4: “EC” declaration of conformity — MI 20→35 D K ST5 S1 (specimen) page 2/2

2.2. “UKCA” DECLARATION OF CONFORMITY — MI 20→35 D K ST5 S1

This document is a specimen of the “UKCA” declaration of conformity mirroring the content of the original declaration provided with the machine.

This specimen and the original document may contain data fields which does not apply to the machine. These fields are left blank if not relevant.

See the original certificates for all relevant values for your machine.

UKCA DECLARATION OF CONFORMITY

Manufacturer: **MANITOU BF**
Address: **430, RUE DE L'AUBINIÈRE - BP 10249**
44158 ANCENIS CEDEX - FRANCE
Authorized representative: **MANITOU UK**
Ebblake Industrial Estate - Dorset BH 31 6BB
Verwood - United Kingdom

The manufacturer declares that the below described machinery:

MI 20 D K ST5 S1
MI 25 D K ST5 S1
MI 30 D K ST5 S1
MI 35 D K ST5 S1

Complies with the following legislation:

The supply of Machinery (Safety) Regulations 2008, as amended

The machine is designed for the lifting of persons:

Applied procedure: Non applicable
Certificate number: Non applicable
Dated:
Approved body: Non applicable

Noise Emission in the Environment by Equipment for use Outdoors Regulations 2001, as amended

Applied procedure:
Approved body:

Sound power level:
Measured: dB (A)
Guaranteed: dB (A)

Electromagnetic Compatibility Regulations 2016, as amended

The following designated standards have been addressed:
EN 12895

The following standards or technical guidance have been addressed:
-

At: Date:
Name of signatory:
Position:
Company:
Signature:

Figure 5: "UKCA" declaration of conformity — MI 20→35 D K ST5 S1 (specimen)

2.3. MACHINE MANUFACTURER PLATE

"Designation" Designation	
"Series" Series	
"Power" Power	
"Year of manufacture" Year of manufacture	
"Model year" Model year	
"Max vertical force (on trailer hook)" Max vertical force (on trailer hook)	
"Serial number / Product identification number" Serial number / Product identification number	
"Authorized grass vehicle weight" Authorized grass vehicle weight	
"Unladen mass" Unladen weight	

“Rated capacity” Rated capacity	
“Drag strain” Pulling force	

2.4. ATTACHMENT MANUFACTURER PLATE

"Modele" Model	
"N° série" Serial number	
"Année fabrication" Year of manufacture	
"Masse à vide" Unladen weight	
"Centre de gravité Centre of gravity	
"Capacité Nominale" Rated capacity	
"Pression service" Working pressure	

2.5. MACHINE SPECIFICATIONS

2.5.1 TECHNICAL DATASHEET MI 20 D K ST5 S1

The specifications given are not binding on the manufacturer and can be modified without prior notification.

Specifications

Table 2. Specifications

	Description		Unit	Value
1.1	Manufacturer		-	MANITOU
1.2	Type of model		-	MI 20 D K ST5 S1
1.3	Drive : battery, diesel, gasoline, LPG, mains		-	Diesel
1.4	Driving position : manual, walking alongside, standing, seated		-	Seated
1.5	Nominal load / Load on forks (basic capacity)	Q	kg (lb)	2000 (4410)
1.6	Load center of gravity	c	mm (ft-in)	500 (17.7)
1.7	Distance from the load-bearing surface to centre of front axle	x	mm (ft-in)	465 (1-6.3)
1.8	Wheelbase	y	mm (ft-in)	1600 (5-3)

Weights

Table 3. Weights

	Designation	Unit	Value
2.1	Weight of truck in working order	kg (lb)	3725 (8213)
2.2	Front axle load on loaded truck	kg (lb)	5005 (11034)
2.2.1	Rear axle load on loaded truck	kg (lb)	720 (1588)
2.3	Front axle load on unloaded truck	kg (lb)	1765 (3892)
2.3.1	Rear axle load on unloaded truck	kg (lb)	1960 (4321)

Tires

Table 4. Tires

	Designation		Unit	Value
3.1	Tire equipment : bandage (V), superelastic (SE), pneumatic (L)		-	SE
3.2	Size of front wheels		ft or mm	7.00-12 12PR
3.3	Size of rear wheels		ft or mm	6.00-9 10PR
3.4	Number of front wheels (x = drive wheels)		-	2x
3.4.1	Number of rear wheels (x = drive wheels)		-	2
3.5	Front wheel gauge (middle of wheels)	b10	mm (ft-in)	965 (3-2)
3.6	Rear wheel gauge (middle of wheels)	b11	mm (ft-in)	973 (3-2.3)

Dimensions

Table 5. Dimensions

	Designation		Unit	Value
4.1	Tilt of mast forward	α	°	6
4.1.1	Tilt of mast backward	β	°	12
4.2	Height mast lowered	h1	mm (ft-in)	2185 (7-2)
4.3	Normal free lift	h2	mm (ft-in)	140 (5.5)
4.4	Height of lift	h3	mm (ft-in)	3300 (1-1)
4.5	Height mast extended	h4	mm (ft-in)	4345 (14-3.1)
4.6	Height of standard overhead guard or cab or cab with air conditioning	h6	mm (ft-in)	2115 (6-11.3)
4.7	Seat height	h7	mm (ft-in)	1190 (3-10.9)
4.8	Height of towing bar	h10	mm (ft-in)	355 (1-2)
4.9	Overall length	l1	mm (ft-in)	3615 (11-10.3)
4.10	Length to face of forks	l2	mm (ft-in)	2465 (8-1)
4.11	Total width (overall) – Single tires / Dual tires	b1	mm (ft-in)	1155/1595 (3-9.5/ 5-2.8)
4.12	Thickness of fork arms	s	mm (ft-in)	40 (1.6)
4.12.1	Width of fork arms	e	mm (ft-in)	122 (4.8)
4.12.2	Fork arms length	l	mm (ft-in)	1150 (3-9.3)
4.13	Fork carriage to DIN 15173 A/B		-	FEM2A
4.14	Fork carriage width	b3	mm (ft-in)	1038 (3-4.9)
4.15	Ground clearance of mast	m1	mm (ft-in)	115 (4.5)
4.16	Ground clearance at centre of wheelbase	m2	mm (ft-in)	175 (6.9)
4.17	Width of aisle for pallet 1000x1200 crossways	Ast	mm (ft-in)	3865 (12-8.2)
4.18	Width of aisle for pallet 800x1200 lengthways	Ast	mm (ft-in)	4065 (13-4)
4.19	Turning radius (position down/up)	Wa	mm (ft-in)	2200 (7-2.6)
4.20	Inner turning radius	b13	mm (ft-in)	145 (5.7)

Performances

Table 6. Performances

	Designation	Unit	Value
5.1	Travelling speed laden	km/h (mph)	18 (11.2)
5.1.1	Travelling speed unladen 2WD / 4WD	km/h (mph)	18.5 (11.5)
5.2	Lifting speed laden	m/s (ft/min)	0.6 (118.1)
5.2.1	Lifting speed unladen	m/s (ft/min)	0.65 (128)
5.3	Lowering speed laden	m/s (ft/min)	0.48 (94.5)
5.3.1	Lowering speed unladen	m/s (ft/min)	0.55 (108.3)
5.4	Nominal towing power laden	N (lbf)	18000 (4047)
5.4.1	Nominal towing power unladen	N (lbf)	12300 (2765)
5.5	Gradeability laden	%	>20
5.5.1	Gradeability unladen	%	>20
5.6	Acceleration time laden	s	-
5.7	Service brake		Hydraulic

Motors

Table 7. Motors

	Designation	Unit	Value
6.1	Engine manufacture / type		Kubota V2607-CR-E5B
6.2	Engine power acc. To ISO 1585	KW (HP)	37.4 (50.8)
6.3	Rated speed	tr/min (rpm)	2400
6.4	No. Of cylinders / displacement	cm3 (cu in)	4/2615 (160)
6.5	Fuel consumption acc. To VDI cycle	L/h (gph)	4.55 (1.2)

Miscellaneous

Table 8. Miscellaneous

	Designation	Unit	Value
7.1	Hydraulic pressure for attachments	Bar (Psi)	160 (2321)
7.2	Oil volume for attachments	L/min (gpm)	25 (6.6)
7.3	Sound level at driver's ear according to DIN 12053 (overhead guard / cab)	dB (A)	84
7.4	Towing coupling design / DIN type	-	-
7.5	Average weighted acceleration on driver's body (according to standard NF EN 13059)	m/s²	0.78

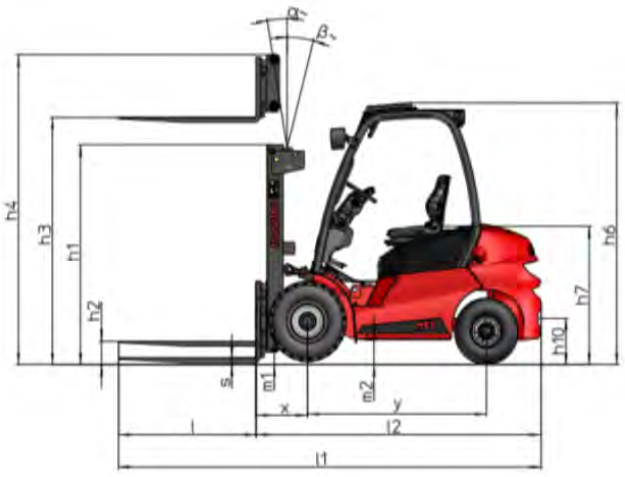


Figure 6: Dimensions diagram - Side view

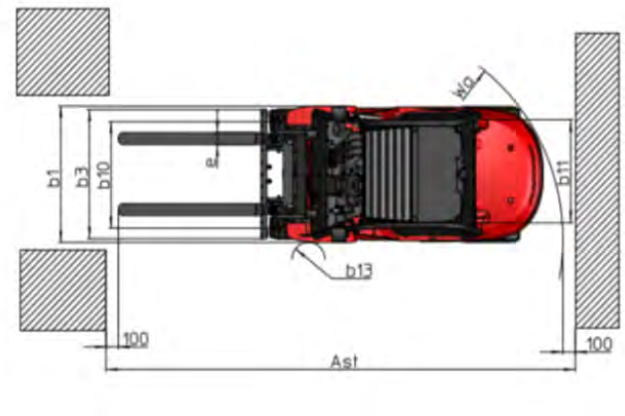


Figure 7: Dimensions diagram - Top view

2.5.2 TECHNICAL DATASHEET MI 25 D K ST5 S1

The specifications given are not binding on the manufacturer and can be modified without prior notification.

Specifications

Table 9. Specifications

	Description		Unit	Value
1.1	Manufacturer		-	MANITOU
1.2	Type of model		-	MI 25 D K ST5 S1
1.3	Drive : battery, diesel, gasoline, LPG, mains		-	Diesel
1.4	Driving position : manual, walking alongside, standing, seated		-	Seated
1.5	Nominal load / Load on forks (basic capacity)	Q	kg (lb)	2500 (5512)
1.6	Load center of gravity	c	mm (ft-in)	500 (1-7.7)
1.7	Distance from the load-bearing surface to centre of front axle	x	mm (ft-in)	465 (1-6.3)
1.8	Wheelbase	y	mm (ft-in)	1600 (5-3)

Weights

Table 10. Weights

	Designation	Unit	Value
2.1	Weight of truck in working order	kg (lb)	4000 (8819)
2.2	Front axle load on loaded truck	kg (lb)	5735 (12644)
2.2.1	Rear axle load on loaded truck	kg (lb)	765 (1687)
2.3	Front axle load on unloaded truck	kg (lb)	1710 (3770)
2.3.1	Rear axle load on unloaded truck	kg (lb)	2290 (5049)

Tires

Table 11. Tires

	Designation		Unit	Value
3.1	Tire equipment : bandage (V), superelastic (SE), pneumatic (L)		-	SE
3.2	Size of front wheels		ft or mm	7.00-12 12PR
3.3	Size of rear wheels		ft or mm	6.00-9 10PR
3.4	Number of front wheels (x = drive wheels)		-	2x
3.4.1	Number of rear wheels (x = drive wheels)		-	2
3.5	Front wheel gauge (middle of wheels)	b10	mm (ft-in)	965 (3-2)
3.6	Rear wheel gauge (middle of wheels)	b11	mm (ft-in)	973 (3-2.3)

Dimensions

Table 12. Dimensions

	Designation		Unit	Value
4.1	Tilt of mast forward	α	°	6
4.1.1	Tilt of mast backward	β	°	12
4.2	Height mast lowered	h1	mm (ft-in)	2185 (7-2)
4.3	Normal free lift	h2	mm (ft-in)	140 (5.5)
4.4	Height of lift	h3	mm (ft-in)	3300 (1-1)
4.5	Height mast extended	h4	mm (ft-in)	4345 (14-3.1)
4.6	Height of standard overhead guard or cab or cab with air conditioning	h6	mm (ft-in)	2115 (6-11.3)
4.7	Seat height	h7	mm (ft-in)	1190 (3-10.9)
4.8	Height of towing bar	h10	mm (ft-in)	360 (1-2.2)
4.9	Overall length	l1	mm (ft-in)	3685 (12-1.1)
4.10	Length to face of forks	l2	mm (ft-in)	2535 (8-3.8)
4.11	Total width (overall) – Single tires / Dual tires	b1	mm (ft-in)	1155/1595 (3-9.5/ 5-2.8)
4.12	Thickness of fork arms	s	mm (ft-in)	40 (1.6)
4.12.1	Width of fork arms	e	mm (ft-in)	122 (4.8)
4.12.2	Fork arms length	l	mm (ft-in)	1150 (3-9.3)
4.13	Fork carriage to DIN 15173 A/B		-	FEM2A
4.14	Fork carriage width	b3	mm (ft-in)	1038 (3-4.9)
4.15	Ground clearance of mast	m1	mm (ft-in)	115 (4.5)

	Designation		Unit	Value
4.16	Ground clearance at centre of wheelbase	m2	mm (ft-in)	175 (6.9)
4.17	Width of aisle for pallet 1000x1200 crossways	Ast	mm (ft-in)	3930 (12-10.7)
4.18	Width of aisle for pallet 800x1200 lengthways	Ast	mm (ft-in)	4130 (13-6.6)
4.19	Turning radius (position down/up)	Wa	mm (ft-in)	2265 (7-5.2)
4.20	Inner turning radius	b13	mm (ft-in)	145 (5.7)

Performances

Table 13. Performances

	Designation	Unit	Value
5.1	Travelling speed laden	km/h (mph)	18 (11.2)
5.1.1	Travelling speed unladen 2WD / 4WD	km/h (mph)	18.5 (11.5)
5.2	Lifting speed laden	m/s (ft/min)	0.6 (118.1)
5.2.1	Lifting speed unladen	m/s (ft/min)	0.65 (128)
5.3	Lowering speed laden	m/s (ft/min)	0.5 (98.4)
5.3.1	Lowering speed unladen	m/s (ft/min)	0.55 (108.3)
5.4	Nominal towing power laden	N (lbf)	19400 (4361)
5.4.1	Nominal towing power unladen	N (lbf)	12400 (2788)
5.5	Gradeability laden	%	>20
5.5.1	Gradeability unladen	%	>20
5.6	Acceleration time laden	s	-
5.7	Service brake		Hydraulic

Motors

Table 14. Motors

	Designation	Unit	Value
6.1	Engine manufacture / type		Kubota V2607-CR-E5B
6.2	Engine power acc. To ISO 1585	KW (HP)	37.4 (50.8)
6.3	Rated speed	tr/min (rpm)	2400
6.4	No. Of cylinders / displacement	cm3 (cu in)	4/2615 (160)
6.5	Fuel consumption acc. To VDI cycle	L/h (gph)	4.55 (1.2)

Miscellaneous

Table 15. Miscellaneous

	Designation	Unit	Value
7.1	Hydraulic pressure for attachments	Bar (Psi)	160 (2321)
7.2	Oil volume for attachments	L/min (gpm)	25 (6.6)
7.3	Sound level at driver's ear according to DIN 12053 (overhead guard / cab)	dB (A)	84

	Designation	Unit	Value
7.4	Towing coupling design / DIN type	-	-
7.5	Average weighted acceleration on driver's body (according to standard NF EN 13059)	m/s²	0.78

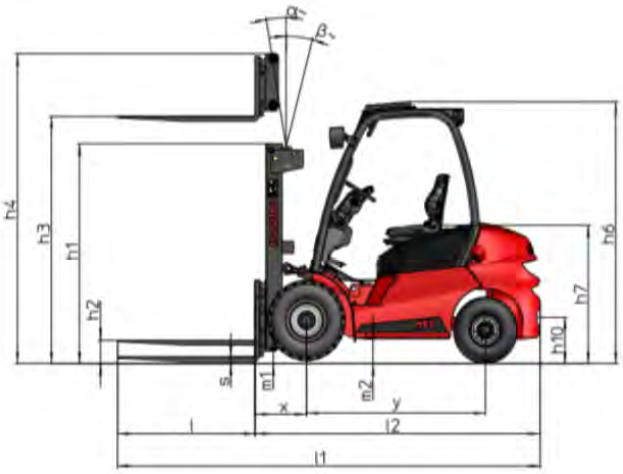


Figure 8: Dimensions diagram - Side view

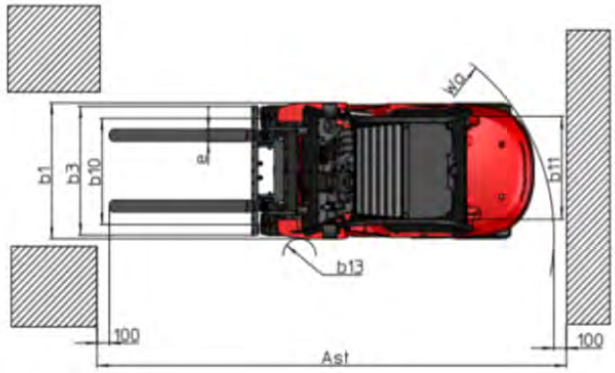


Figure 9: Dimensions diagram - Top view

2.5.3 TECHNICAL DATASHEET MI 30 D K ST5 S1

The specifications given are not binding on the manufacturer and can be modified without prior notification.

Specifications

Table 16. Specifications

	Description	Unit	Value
1.1	Manufacturer	-	MANITOU
1.2	Type of model	-	MI 30 D K ST5 S1
1.3	Drive : battery, diesel, gasoline, LPG, mains	-	Diesel

	Description		Unit	Value
1.4	Driving position : manual, walking alongside, standing, seated		-	Seated
1.5	Nominal load / Load on forks (basic capacity)	Q	kg (lb)	3000 (6615)
1.6	Load center of gravity	c	mm (ft-in)	500 (1-7.7)
1.7	Distance from the load-bearing surface to centre of front axle	x	mm (ft-in)	480 (1-6.9)
1.8	Wheelbase	y	mm (ft-in)	1700 (5-6.9)

Weights

Table 17. Weights

	Designation	Unit	Value
2.1	Weight of truck in working order	kg (lb)	4610 (10164)
2.2	Front axle load on loaded truck	kg (lb)	6650 (14661)
2.2.1	Rear axle load on loaded truck	kg (lb)	960 (2117)
2.3	Front axle load on unloaded truck	kg (lb)	1860 (4101)
2.3.1	Rear axle load on unloaded truck	kg (lb)	2750 (6063)

Tires

Table 18. Tires

	Designation		Unit	Value
3.1	Tire equipment : bandage (V), superelastic (SE), pneumatic (L)		-	SE
3.2	Size of front wheels		ft or mm	28-9-15 12PR
3.3	Size of rear wheels		ft or mm	6.50-9 10PR
3.4	Number of front wheels (x = drive wheels)		-	2x
3.4.1	Number of rear wheels (x = drive wheels)		-	2
3.5	Front wheel gauge (middle of wheels)	b10	mm (ft-in)	965 (3-3.6)
3.6	Rear wheel gauge (middle of wheels)	b11	mm (ft-in)	975 (3-2.4)

Dimensions

Table 19. Dimensions

	Designation		Unit	Value
4.1	Tilt of mast forward	α	°	6
4.1.1	Tilt of mast backward	β	°	12
4.2	Height mast lowered	h1	mm (ft-in)	2200 (7-2.6)
4.3	Normal free lift	h2	mm (ft-in)	145 (5.7)
4.4	Height of lift	h3	mm (ft-in)	3300 (1-1)
4.5	Height mast extended	h4	mm (ft-in)	4445 (14-7)
4.6	Height of standard overhead guard or cab or cab with air conditioning	h6	mm (ft-in)	2130 (6-11.9)
4.7	Seat height	h7	mm (ft-in)	1215 (3-11.8)
4.8	Height of towing bar	h10	mm (ft-in)	355 (1-2)
4.9	Overall length	l1	mm (ft-in)	3865 (12-8.2)

	Designation		Unit	Value
4.10.	Length to face of forks	l2	mm (ft-in)	2715 (8-10.9)
4.11	Total width (overall) – Single tires / Dual tires	b1	mm (ft-in)	1225/1725 (4-0.2/ 5-7.9)
4.12	Thickness of fork arms	s	mm (ft-in)	45 (1.8)
4.12.1	Width of fork arms	e	mm (ft-in)	122 (4.8)
4.12.2	Fork arms length	l	mm (ft-in)	1150 (3-9.3)
4.13	Fork carriage to DIN 15173 A/B		-	FEM3A
4.14	Fork carriage width	b3	mm (ft-in)	1100 (3-7.3)
4.15	Ground clearance of mast	m1	mm (ft-in)	130 (5.1)
4.16	Ground clearance at centre of wheelbase	m2	mm (ft-in)	200 (7.9)
4.17	Width of aisle for pallet 1000x1200 crossways	Ast	mm (ft-in)	4140 (13-7)
4.18	Width of aisle for pallet 800x1200 lengthways	Ast	mm (ft-in)	4130 (13-6.6)
4.19	Turning radius (position down/up)	Wa	mm (ft-in)	2460 (8-0.9)
4.20.	Inner turning radius	b13	mm (ft-in)	160 (6.3)

Performances

Table 20. Performances

	Designation	Unit	Value
5.1	Travelling speed laden	km/h (mph)	18 (11.2)
5.1.1	Travelling speed unladen 2WD / 4WD	km/h (mph)	18.5 (11.5)
5.2	Lifting speed laden	m/s (ft/min)	0.49 (96.5)
5.2.1	Lifting speed unladen	m/s (ft/min)	0.52 (102.4)
5.3	Lowering speed laden	m/s (ft/min)	0.43 (84.7)
5.3.1	Lowering speed unladen	m/s (ft/min)	0.48 (94.5)
5.4	Nominal towing power laden	N (lbf)	19500 (4384)
5.4.1	Nominal towing power unladen	N (lbf)	13800 (3103)
5.5	Gradeability laden	%	>20
5.5.1	Gradeability unladen	%	>20
5.6	Acceleration time laden	s	-
5.7	Service brake		Hydraulic

Motors

Table 21. Motors

	Designation	Unit	Value
6.1	Engine manufacture / type		Kubota V2607-CR-E5B
6.2	Engine power acc. To ISO 1585	KW (HP)	37.4 (50.8)
6.3	Rated speed	tr/min (rpm)	2400
6.4	No. Of cylinders / displacement	cm3 (cu in)	4/2615 (160)
6.5	Fuel consumption acc. To VDI cycle	L/h (gph)	4.55 (1.2)

Miscellaneous

Table 22. Miscellaneous

	Designation	Unit	Value
7.1	Hydraulic pressure for attachments	Bar (Psi)	160 (2321)
7.2	Oil volume for attachments	L/min (gpm)	25 (6.6)
7.3	Sound level at driver's ear according to DIN 12053 (overhead guard / cab)	dB (A)	84
7.4	Towing coupling design / DIN type	-	-
7.5	Average weighted acceleration on driver's body (according to standard NF EN 13059)	m/s²	0.5

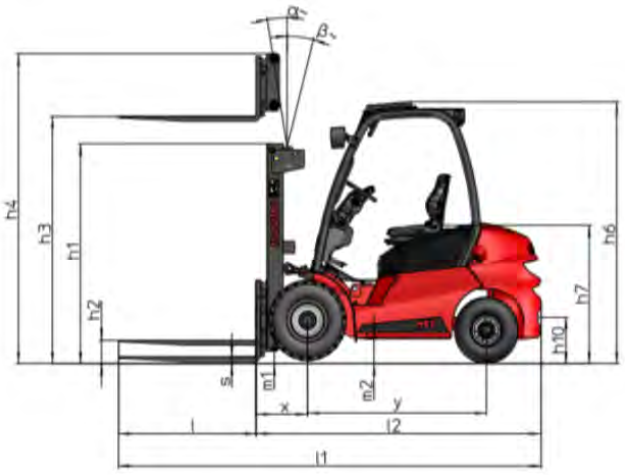


Figure 10: Dimensions diagram - Side view

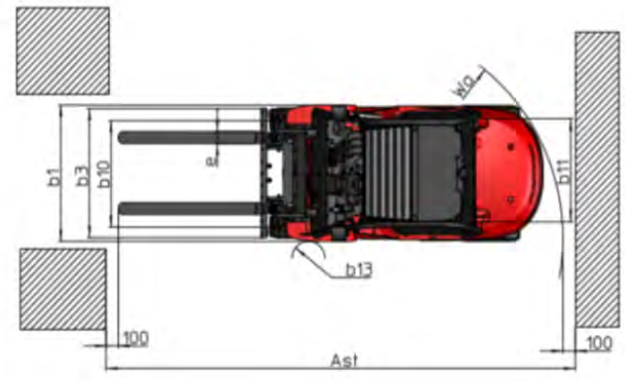


Figure 11: Dimensions diagram - Top view

2.5.4 TECHNICAL DATASHEET MI 35 D K ST5 S1

The specifications given are not binding on the manufacturer and can be modified without prior notification.

Specifications

Table 23. Specifications

	Description		Unit	Value
1.1	Manufacturer		-	MANITOU
1.2	Type of model		-	MI 35 D K ST5 S1
1.3	Drive : battery, diesel, gasoline, LPG, mains		-	Diesel
1.4	Driving position : manual, walking alongside, standing, seated		-	Seated
1.5	Nominal load / Load on forks (basic capacity)	Q	kg (lb)	3500 (7718)
1.6	Load center of gravity	c	mm (ft-in)	500 (1-7.7)
1.7	Distance from the load-bearing surface to centre of front axle	x	mm (ft-in)	485 (1-7.1)
1.8	Wheelbase	y	mm (ft-in)	1700 (5-6.9)

Weights

Table 24. Weights

	Designation	Unit	Value
2.1	Weight of truck in working order	kg (lb)	4860 (10715)
2.2	Front axle load on loaded truck	kg (lb)	7350 (16204)
2.2.1	Rear axle load on loaded truck	kg (lb)	1000 (2205)
2.3	Front axle load on unloaded truck	kg (lb)	1825 (4024)
2.3.1	Rear axle load on unloaded truck	kg (lb)	3035 (6691)

Tires

Table 25. Tires

	Designation		Unit	Value
3.1	Tire equipment : bandage (V), superelastic (SE), pneumatic (L)		-	SE
3.2	Size of front wheels		ft or mm	28-9-15 12PR
3.3	Size of rear wheels		ft or mm	6.50-9 10PR
3.4	Number of front wheels (x = drive wheels)		-	2x
3.4.1	Number of rear wheels (x = drive wheels)		-	2
3.5	Front wheel gauge (middle of wheels)	b10	mm (ft-in)	1005 (3-3.6)
3.6	Rear wheel gauge (middle of wheels)	b11	mm (ft-in)	975 (3-2.4)

Dimensions

Table 26. Dimensions

	Designation		Unit	Value
4.1	Tilt of mast forward	α	°	6
4.1.1	Tilt of mast backward	β	°	12
4.2	Height mast lowered	h1	mm (ft-in)	2315 (7-7.1)
4.3	Normal free lift	h2	mm (ft-in)	145 (5.7)
4.4	Height of lift	h3	mm (ft-in)	3300 (1-1)

	Designation		Unit	Value
4.5	Height mast extended	h4	mm (ft-in)	4445 (14-7)
4.6	Height of standard overhead guard or cab or cab with air conditioning	h6	mm (ft-in)	2130 (6-11.9)
4.7	Seat height	h7	mm (ft-in)	1215 (3-11.8)
4.8	Height of towing bar	h10	mm (ft-in)	360 (1-2.2)
4.9	Overall length	l1	mm (ft-in)	3935 (12-10.9)
4.10.	Length to face of forks	l2	mm (ft-in)	2785 (9-1.6)
4.11	Total width (overall) – Single tires / Dual tires	b1	mm (ft-in)	1225/1725 (4-0.2/ 5-7.9)
4.12	Thickness of fork arms	s	mm (ft-in)	50 (2)
4.12.1	Width of fork arms	e	mm (ft-in)	122 (4.8)
4.12.2	Fork arms length	l	mm (ft-in)	1150 (3-9.3)
4.13	Fork carriage to DIN 15173 A/B		-	FEM3A
4.14	Fork carriage width	b3	mm (ft-in)	1100 (3-7.3)
4.15	Ground clearance of mast	m1	mm (ft-in)	130 (5.1)
4.16	Ground clearance at centre of wheelbase	m2	mm (ft-in)	200 (7.9)
4.17	Width of aisle for pallet 1000x1200 crossways	Ast	mm (ft-in)	4195 (13-9.2)
4.18	Width of aisle for pallet 800x1200 lengthways	Ast	mm (ft-in)	4395 (14-5)
4.19	Turning radius (position down/up)	Wa	mm (ft-in)	2510 (8-2.8)
4.20.	Inner turning radius	b13	mm (ft-in)	160 (6.3)

Performances

Table 27. Performances

	Designation	Unit	Value
5.1	Travelling speed laden	km/h (mph)	18 (11.2)
5.1.1	Travelling speed unladen 2WD / 4WD	km/h (mph)	18.5 (11.5)
5.2	Lifting speed laden	m/s (ft/min)	0.42 (82.7)
5.2.1	Lifting speed unladen	m/s (ft/min)	0.45 (88.6)
5.3	Lowering speed laden	m/s (ft/min)	0.4 (78.7)
5.3.1	Lowering speed unladen	m/s (ft/min)	0.35 68.9)
5.4	Nominal towing power laden	N (lbf)	20000 (4496)
5.4.1	Nominal towing power unladen	N (lbf)	15200 (3417)
5.5	Gradeability laden	%	>18
5.5.1	Gradeability unladen	%	>20
5.6	Acceleration time laden	s	-
5.7	Service brake		Hydraulic

Motors

Table 28. Motors

	Designation	Unit	Value
6.1	Engine manufacture / type		Kubota V2607-CR-E5B
6.2	Engine power acc. To ISO 1585	KW (HP)	37.4 (50.8)
6.3	Rated speed	tr/min (rpm)	2400
6.4	No. Of cylinders / displacement	cm3 (cu in)	4/2615 (160)
6.5	Fuel consumption acc. To VDI cycle	L/h (gph)	4.55 (1.2)

Miscellaneous

Table 29. Miscellaneous

	Designation	Unit	Value
7.1	Hydraulic pressure for attachments	Bar (Psi)	160 (2321)
7.2	Oil volume for attachments	L/min (gpm)	25 (6.6)
7.3	Sound level at driver's ear according to DIN 12053 (overhead guard / cab)	dB (A)	84
7.4	Towing coupling design / DIN type	-	-
7.5	Average weighted acceleration on driver's body (according to standard NF EN 13059)	m/s²	0.5

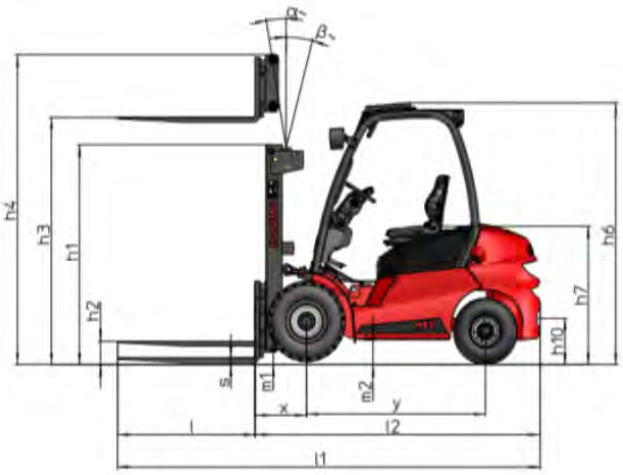


Figure 12: Dimensions diagram - Side view

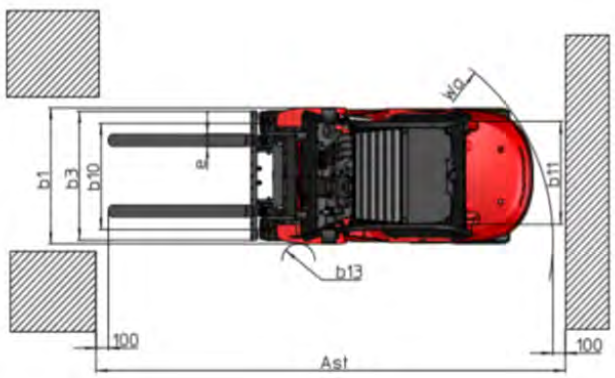


Figure 13: Dimensions diagram - Top view

2.5.5 MAST TECHNICAL DATASHEET MI 20/25 D K ST5 S1

Mast specifications MI 20/25 D K ST5 S1

Table 30. Mast specifications MI 20/25 D K ST5 S1

	Mast fork height mm (in-ft)	***Free lift H2***	***Height - mast lowered H1***	***Height - mast extended with backrest H4***	***Height mast extented without backrest H4***	***Tilt range - AV - FWD***	***Tilt range - AV - FWD***
2 Stage wide-view	3300 std (10-9.9)	140 (5.5)	2185 (7-2)	4345 (14-3.1)	3960 (12-11.9)	6°	12°
	3700 (12-1.7)	140 (5.5)	2435 (7-11.9)	4745 (15-6.8)	4360 (14-3.7)	6°	12°
	4000 (13-1.5)	140 (5.5)	2635 (8-7.7)	5045 (16-6.6)	4660 (15-3.5)	6°	12°
2 Stage full-free-lift	3300 (10-9.9)	1480 (4-10.3)	2160 (7-1)	4345 (14-3.1)	3980 (13-0.7)	6°	12°
	3700 (12-1.7)	1680 (5-6.1)	2360 (7-8.9)	4745 (15-6.8)	4330 (14-2.5)	6°	12°
	4000 (13-1.5)	1880 (6-2)	2560 (8-4.8)	5045 (16-6.6)	4680 (15-4.3)	6°	12°
3 Stage full-free-lift	4300 (14-1.3)	1400 (4-7.1)	2100 (6-10.7)	5345 (17-6.4)	5000 (16-4.9)	6°	6°
	4500 (14-9.2)	1470 (4-9.9)	2150 (7-0.6)	5595 (18-4.3)	5230 (17-1.9)	6°	6°
	4700 (15-5)	1520 (4-11.8)	2200 (7-2.6)	5745 (18-10.2)	5380 (17-7.8)	6°	6°
	4800 (15-9)	1570 (5-1.8)	2250 (7-4.6)	5845 (19-2.1)	5480 (17-11.7)	6°	6°

	Mast fork height mm (in-ft)	Free lift H2	Height - mast lowered H1	Height - mast extended with backrest H4	Height mast extented without backrest H4	Tilt range - AV - FWD	Tilt range - AV - FWD
	5000 (16-4.9)	1620 (5-3.8)	2300 (7-6.6)	6045 (19-10)	5680 (18-7.6)	6°	6°
	5500 (18-0.5)	1820 (5-11.7)	2500 (8-2.4)	6545 (21-5.7)	6180 (20-3.3)	3°	6°
	6000 (19-8.2)	2070 (6-9.5)	2750 (9-0.3)	7095 (23-3.3)	6730 (22-1)	3°	6°
	6500 (21-3.9)	2200 (7-2.6)	2900 (9-6.2)	7545 (24-9)	7200 (23-7.5)	3°	6°

Capacity with forks MI 20/25 D K ST5 S1

Table 31. Capacity with forks MI 20/25 D K ST5 S1

	Mast fork height mm (in-ft)	Height at max capacity mm (in-ft)		Load capacity at 500 mm (20 in) kg (lb)	
		2 T (3306 lb)	2.5 T (5513 lb)	2 T (3306 lb)	2.5 T (5513 lb)
2 Stage wide-view	3300 (10-9.9) std	3300 (10-9.9)	3300 (10-9.9)	2000 (6-6.7)	2500 (8-2.4)
	3700 (12-1.7)	3700 (12-1.7)	3700 (12-1.7)	2000 (6-6.7)	2500 (8-2.4)
	4000 (13-1.5)	4000 (13-1.5)	4000 (13-1.5)	2000 (6-6.7)	2500 (8-2.4)
2 Stage full-free-lift	3300 (10-9.9)	3300 (10-9.9)	3300 (10-9.9)	2000 (6-6.7)	2500 (8-2.4)
	3700 (12-1.7)	3700 (12-1.7)	3700 (12-1.7)	2000 (6-6.7)	2500 (8-2.4)
	4000 (13-1.5)	4000 (13-1.5)	4000 (13-1.5)	2000 (6-6.7)	2500 (8-2.4)
3 Stage full-free-lift	4300 (14-1.3)	1950kg (4300lb) - 4000 (13-1.5)	4000 (13-1.5)	1850 (6-0.8)	2400 (7-10.5)
	4500 (14-9.2)	1900kg (4189lb) - 4000 (13-1.5)	4000 (13-1.5)	1800 (5-10.9)	2350 (7-8.5)
	4700 (15-5)	1900kg (4189lb) - 4000 (13-1.5)	4000 (13-1.5)	1750 (5-8.9)	2200 (7-2.6)
	4800 (15-9)	1900kg (4189lb) - 4000 (13-1.5)	4000 (13-1.5)	1750 (5-8.9)	2200 (7-2.6)
	5000 (16-4.9)	1850kg (4079lb) - 4000 (13-1.5)	4000 (13-1.5)	1700 (5-6.9)	1950 (6-4.8)
	5500 (18-0.5)	1800kg (3969lb) - 4000 (13-1.5)	4000 (13-1.5)	1300 (4-3.2)	1650 (5-5)
	6000 (19-8.2)	1800kg (3969lb) - 4000 (13-1.5)	4000 (13-1.5)	900 2-11.4)	1050 (3-5.3)
	6500 (21-3.9)	-	-	-	-

Capacity with integrated TDL MI 20/25 D K ST5 S1

Table 32. Capacity with integrated TDL MI 20/25 D K ST5 S1

	Mast fork height mm (in-ft)	Height at max capacity mm (in-ft)		Load capacity at 500 mm (20 in) kg (lb)	
		2 T (3306 lb)	2.5 T (5513 lb)	2 T (3306 lb)	2.5 T (5513 lb)
2 Stage wide-view	3300 (10-9.9) std	3300 (10-9.9)	3300 (10-9.9)	2000 (6-6.7)	2500 (8-2.4)
	3700 (12-1.7)	3700 (12-1.7)	3700 (12-1.7)	2000 (6-6.7)	2500 (8-2.4)
	4000 (13-1.5)	4000 (13-1.5)	4000 (13-1.5)	2000 (6-6.7)	2500 (8-2.4)
2 Stage full-free-lift	3300 (10-9.9)	3300 (10-9.9)	3300 (10-9.9)	2000 (6-6.7)	2500 (8-2.4)
	3700 (12-1.7)	3700 (12-1.7)	3700 (12-1.7)	2000 (6-6.7)	2500 (8-2.4)
	4000 (13-1.5)	4000 (13-1.5)	4000 (13-1.5)	2000 (6-6.7)	2500 (8-2.4)
3 Stage full-free-lift	4300 (14-1.3)	1950kg (4300lb) - 4000 (13-1.5)	4000 (13-1.5)	1750 (5-8.9)	2350 (7-8.5)
	4500 (14-9.2)	1900kg (4189lb) - 4000 (13-1.5)	4000 (13-1.5)	1700 (5-6.9)	2300 (7-6.6)
	4700 (15-5)	1900kg (4189lb) - 4000 (13-1.5)	4000 (13-1.5)	1650 (5-5)	2150 (7-0.6)
	4800 (15-9)	1900kg (4189lb) - 4000 (13-1.5)	4000 (13-1.5)	1650 (5-5)	2150 (7-0.6)
	5000 (16-4.9)	1850kg (4079lb) - 4000 (13-1.5)	4000 (13-1.5)	1600 (5-3)	1900 (6-2.8)
	5500 (18-0.5)	1800kg (3969lb) - 4000 (13-1.5)	4000 (13-1.5)	1200 (3-11.2)	1600 (5-3)
	6000 (19-8.2)	1800kg (3969lb) - 4000 (13-1.5)	4000 (13-1.5)	800 (2-7.5)	1000 (3-3.4)
	6500 (21-3.9)	-	-	-	-

Capacity with PDF + DL MI 20/25 D K ST5 S1

Table 33. Capacity with PDF + DL MI 20/25 D K ST5 S1

	Mast fork height mm (in-ft)	Height at max capacity mm (in-ft)		Load capacity at 500 mm (20 in) kg (lb)	
		2 T (3306 lb)	2.5 T (5513 lb)	2 T (3306 lb)	2.5 T (5513 lb)
2 Stage wide-view	3300 (10-9.9) std	3300 (10-9.9)	3300 (10-9.9)	1900 (6-2.8)	2500 (8-2.4)
	3700 (12-1.7)	3700 (12-1.7)	3700 (12-1.7)	1900 (6-2.8)	2500 (8-2.4)
	4000 (13-1.5)	4000 (13-1.5)	4000 (13-1.5)	1900 (6-2.8)	2450 (8-0.5)
2 Stage full-free-lift	3300 (10-9.9)	3300 (10-9.9)	3300 (10-9.9)	1900 (6-2.8)	2500 (8-2.4)
	3700 (12-1.7)	3700 (12-1.7)	3700 (12-1.7)	1900 (6-2.8)	2500 (8-2.4)
	4000 (13-1.5)	4000 (13-1.5)	4000 (13-1.5)	1900 (6-2.8)	2450 (8-0.5)
3 Stage full-free-lift	4300 (14-1.3)	-	-	-	-
	4500 (14-9.2)	1850kg (4079lb) - 4000 (13-1.5)	2400kg - 4000 (13-1.5)	1700 (5-6.9)	2250 (7-4.6)
	4700 (15-5)	1850kg (4079lb) - 4000 (13-1.5)	2400kg - 4000 (13-1.5)	1650 (5-5)	2100 (6-10.7)
	4800 (15-9)	1850kg (4079lb) - 4000 (13-1.5)	2400kg - 4000 (13-1.5)	1650 (5-5)	2100 (6-10.7))

	Mast fork height mm (in-ft)	Height at max capacity mm (in-ft)		Load capacity at 500 mm (20 in) kg (lb)	
		2 T (3306 lb)	2.5 T (5513 lb)	2 T (3306 lb)	2.5 T (5513 lb)
	5000 (16-4.9)	1800kg (3969lb) - 4000 (13-1.5)	2400kg - 4000 (13-1.5)	1600 (5-3)	1850 (6-0.8)
	5500 (18-0.5)	1750kg (3858lb) - 4000 (13-1.5)	2400kg - 4000 (13-1.5)	1200 (3-11.2)	1550 (5-1)
	6000 (19-8.2)	1750kg (3858lb)- 4000 (13-1.5)	2400kg - 4000 (13-1.5)	800 (2-7.5)	950 (3-1.4)
	6500 (21-3.9)	-	-	-	-

2.5.6 MAST TECHNICAL DATASHEET MI 30/35 D K ST5 S1

Mast specifications MI 30/35 D K ST5 S1

Table 34. Mast specifications MI 30/35 D K ST5 S1

	Mast fork height mm (in-ft)	Free lift H2		Height - mast lowered H1		Height - mast extended with backrest H4		Height mast extented without backrest H4		Tilt range - AV - FWD	Tilt range - AV - FWD
		3T (6615 lb)	3.5T (7717 lb)	3T (6615 lb)	3.5T (7717 lb)	3T (6615 lb)	3.5T (7717 lb)	3T (6615 lb)	3.5T (7717 lb)		
2 Stage wide-view	3300 std (10-9.9)	145 (5.7)	145 (5.7)	2200 (7-2.6)	2315 (7-7.1)	4445 (14-7)	4445 (14-7)	4035 (13-2.9)	4115 (13-6)	6°	12°
	3700 (12-1.7)	145 (5.7)	145 (5.7)	2450 (8-0.5)	2565 (8-5)	4845 (15-10.7)	4845 (15-10.7)	4435 (14-6.6)	4515 (14-9.8)	6°	12°
	4000 (13-1.5)	145 (5.7)	145 (5.7)	2650 (8-8.3)	2715 (8-10.9)	5145 (16-10.6)	5145 (16-10.6)	4735 (15-6.4)	4815 (15-9.6)	6°	12°
2 Stage full-free-lift	3300 (10-9.9)	1475 (4-10.1)	1500 (4-11.1)	2230 (7-3.8)	2330 (7-7.7)	4445 (14-7)	4445 (14-7)	4055 (13-3.6)	4130 (13-6.6)	6°	12°
	3700 (12-1.7)	1675 (5-5.9)	1700 (5-6.9)	2430 (7-11.7)	2530 (8-3.6)	4845 (15-10.7)	4845 (15-10.7)	4455 (14-7.4)	4530 (14-10.3)	6°	12°
	4000 (13-1.5)	1825 (5-11.9)	1850 (6-0.8)	2580 (8-5.6)	2680 (8-9.5)	5145 (16-10.6)	5145 (16-10.6)	4755 (15-7.2)	4830 (15-10.2)	6°	12°
3 Stage full-free-lift	4300 (14-1.3)	1360 (4-5.5)	1385 (4-6.5)	2115 (6-11.3)	2215 (7-3.2)	5445 (17-10.4)	5445 (17-10.4)	5050 (16-6.8)	5130 (16-10)	6°	6°
	4500 (14-9.2)	1410 (4-7.5)	1435 (4-8.5)	2165 (7-1.2)	2265 (7-5.2)	5695 (18-8.2)	5695 (18-8.2)	5305 (17-4.9)	5380 (17-7.8)	6°	6°
	4700 (15-5)	1460 (4-9.5)	1485 (4-10.5)	2215 (7-3.2)	2315 (7-7.1)	5895 (19-4.1)	5895 (19-4.1)	5455	5530 (18-1.7)	6°	6°

	Mast fork height mm (in-ft)	Free lift H2		Height - mast lowered H1		Height - mast extended with backrest H4		Height mast extented without backrest H4		Tilt range - AV - FWD	Tilt range - AV - FWD
		3T (6615 lb)	3.5T (7717 lb)	3T (6615 lb)	3.5T (7717 lb)	3T (6615 lb)	3.5T (7717 lb)	3T (6615 lb)	3.5T (7717 lb)		
								(17-10.8)			
	4800 (15-9)	1510 (4-11.4)	1535 (5-0.4)	2265 (7-5.2)	2365 (7-9.1)	5945 (19-6.1)	5945 (19-6.1)	5555 (18-2.7)	5630 (18-5.7)	6°	6°
	5000 (16-4.9)	1560 (5-1.4)	1585 (5-2.4)	2315 (7-7.1)	2415 (7-11.1)	6145 (20-1.9)	6145 (20-1.9)	5755 (18-10.6)	5830 (19-1.5)	6°	6°
	5500 (18-0.5)	1760 (5-9.3)	1735 (5-8.3)	2515 (8-3)	2565 (8-5)	6645 (21-9.6)	6645 (21-9.6)	6255 (20-6.3)	6330 (20-9.2)	3°	6°
	6000 (19-8.2)	2010 (6-7.1)	1985 (6-6.1)	2765 (9-0.9)	2815 (9-2.8)	7195 (23-7.3)	7195 (23-7.3)	6805 (22-3.9)	6880 (22-6.9)	3°	6°
	6500 (21-3.9)	2160 (7-1)	2135 (7-0.1)	2915 (9-6.8)	2965 (9-8.7)	7645 (25-1)	7645 (25-1)	7255 (23-9.6)	7330 (24-06)	3°	6°

Capacity with forks MI 30/35 D K ST5 S1

Table 35. Capacity with forks MI 30/35 D K ST5 S1

	Mast fork height mm (in-ft)	Height at max capacity mm (in-ft)		Load capacity at 500 mm (20 in) kg (lb)	
		3T (6615 lb)	3.5T (7717 lb)	3T (6615 lb)	3.5T (7717 lb)
2 Stage wide-view	3300 (10-9.9) std	3300 (10-9.9)	3300 (10-9.9)	3000 (9-10.1)	3500 (11-5.8)
	3700 (12-1.7)	3700 (12-1.7)	3700 (12-1.7)	3000 (9-10.1)	3500 (11-5.8)
	4000 (13-1.5)	4000 (13-1.5)	4000 (13-1.5)	3000 (9-10.1)	3500 (11-5.8)
2 Stage full-free-lift	3300 (10-9.9)	3300 (10-9.9)	3300 (10-9.9)	3000 (9-10.1)	3500 (11-5.8)
	3700 (12-1.7)	3700 (12-1.7)	3700 (12-1.7)	3000 (9-10.1)	3500 (11-5.8)
	4000 (13-1.5)	4000 (13-1.5)	4000 (13-1.5)	3000 (9-10.1)	3500 (11-5.8)
3 Stage full-free-lift	4300 (14-1.3)	4000 (13-1.5)	4000 (13-1.5)	2950 (9-8.1)	3450 (11-3.8)
	4500 (14-9.2)	4000 (13-1.5)	4000 (13-1.5)	2900 (9-6.2)	3400 (11-1.9)
	4700 (15-5)	4000 (13-1.5)	4000 (13-1.5)	2800 (9-2.2)	3300 (10-9.9)
	4800 (15-9)	4000 (13-1.5)	4000 (13-1.5)	2800 (9-2.2)	3300 (10-9.9)
	5000 (16-4.9)	4000 (13-1.5)	4000 (13-1.5)	2500 (8-2.4)	3000 (9-10.1)
	5500 (18-0.5)	4000 (13-1.5)	4000 (13-1.5)	1850 (6-0.8)	2200 (7-2.6)
	6000 (19-8.2)	4000 (13-1.5)	4000 (13-1.5)	1400 (4-7.1)	1600 (5-3)
	6500 (21-3.9)	-	-	-	-

Capacity with side-shift TDS MI 30/35 D K ST5 S1

Table 36. Capacity with side-shift TDS MI 30/35 D K ST5 S1

	Mast fork height mm (in-ft)	Height at max capacity mm (in-ft)		Load capacity at 500 mm (20 in) kg (lb)	
		3T (6615 lb)	3.5T (7717 lb)	3T (6615 lb)	3.5T (7717 lb)
2 Stage wide-view	3300 (10-9.9) std	3300 (10-9.9)	3300 (10-9.9)	3000 (9-10.1)	3500 (11-5.8)
	3700 (12-1.7)	3700 (12-1.7)	3700 (12-1.7)	3000 (9-10.1)	3500 (11-5.8)
	4000 (13-1.5)	4000 (13-1.5)	4000 (13-1.5)	3000 (9-10.1)	3500 (11-5.8)
2 Stage full-free-lift	3300 (10-9.9)	3300 (10-9.9)	3300 (10-9.9)	3000 (9-10.1)	3500 (11-5.8)
	3700 (12-1.7)	3700 (12-1.7)	3700 (12-1.7)	3000 (9-10.1)	3500 (11-5.8)
	4000 (13-1.5)	4000 (13-1.5)	4000 (13-1.5)	3000 (9-10.1)	3500 (11-5.8)
3 Stage full-free-lift	4300 (14-1.3)	4000 (13-1.5)	4000 (13-1.5)	2850 (9-4.2)	3450 (11-3.8)
	4500 (14-9.2)	4000 (13-1.5)	4000 (13-1.5)	2800 (9-2.2)	3300 (10-9.9)
	4700 (15-5)	4000 (13-1.5)	4000 (13-1.5)	2700 (8-10.3)	3200 (10-6)
	4800 (15-9)	4000 (13-1.5)	3400kg (7496) - 4000 (13-1.5)	2700 (8-10.3)	3200 (10-6)
	5000 (16-4.9)	2900kg (6394lb) - 4000 (13-1.5)	3300kg (7276lb) - 4000 (13-1.5)	2400 (7-10.5)	2900 (9-6.2)
	5500 (18-0.5)	2900kg (6394lb) - 4000 (13-1.5)	3250kg (7165lb)- 4000 (13-1.5)	1750 (5-8.9)	2100 (6-10.7)
	6000 (19-8.2)	2800kg (6173lb) - 4000 (13-1.5)	3250kg (7165lb) - 4000 (13-1.5)	1300 (4-3.2)	1500 (4-11.1)
	6500 (21-3.9)	-	-	-	-

Capacity with PDF + DL MI 30/35 D K ST5 S1

Table 37. Capacity with PDF + DL MI 30/35 D K ST5 S1

	Mast fork height mm (in-ft)	Height at max capacity mm (in-ft)		Load capacity at 500 mm (20 in) kg (lb)	
		3T (6615 lb)	3.5T (7717 lb)	3T (6615 lb)	3.5T (7717 lb)
2 Stage wide-view	3300 (10-9.9) std	3300 (10-9.9)	3300 (10-9.9)	2900 (9-6.2)	3400 (11-1.9)
	3700 (12-1.7)	3700 (12-1.7)	3700 (12-1.7)	2900 (9-6.2)	3400 (11-1.9)
	4000 (13-1.5)	4000 (13-1.5)	4000 (13-1.5)	2900 (9-6.2)	3400 (11-1.9)
2 Stage full free-lift	3300 (10-9.9)	3300 (10-9.9)	3300 (10-9.9)	2900 (9-6.2)	3400 (11-1.9)
	3700 (12-1.7)	3700 (12-1.7)	3700 (12-1.7)	2900 (9-6.2)	3400 (11-1.9)
	4000 (13-1.5)	4000 (13-1.5)	4000 (13-1.5)	2900 (9-6.2)	3400 (11-1.9)
3 Stage full-free-lift	4300 (14-1.3)	-	-	-	-
	4500 (14-9.2)	4000 (13-1.5)	4000 (13-1.5)	2700 (8-10.3)	3200 (10-6)
	4700 (15-5)	4000 (13-1.5)	3400kg (7496) - 4000 (13-1.5)	2600 (8-6.4)	3100 (10-2)
	4800 (15-9)	2900kg (6394lb) - 4000 (13-1.5)	3300kg (7276lb) - 4000 (13-1.5)	2600 (8-6.4)	3100 (10-2)
	5000 (16-4.9)	2800kg (6173lb) - 4000 (13-1.5)	3250kg (7165lb)- 4000 (13-1.5)	2300 (7-6.6)	2800 (9-2.2)
	5500 (18-0.5)	2700kg (5953lb) - 4000 (13-1.5)	3250kg (7165lb)- 4000 (13-1.5)	1650 (5-5)	2000 (6-6.7)

	Mast fork height mm (in-ft)	Height at max capacity mm (in-ft)		Load capacity at 500 mm (20 in) kg (lb)	
		3T (6615 lb)	3.5T (7717 lb)	3T (6615 lb)	3.5T (7717 lb)
	6000 (19-8.2)	2700kg (5953lb) - 4000 (13-1.5)	3150kg (6945lb)- 4000 (13-1.5)	1200 (3-11.2	1400 (4-7.1)
	6500 (21-3.9)	-	-	-	-

2.5.7 TIRES – MI 20/25 D K ST5 S1

Table 38. Front tires

		Pressure bar (psi)	Load per tire kg (lb)			
			MI 20 D K ST5 S1		MI 25 D K ST5 S1	
			Unladen	Laden	Unladen	Laden
ADVANCE	PPS 7.00-12/5.00	-	900 (1984)	2500 (5512)	850 (1874)	2850 (6283)
	PPS JUM 7.00-12/ 5.00	-				
CHENG SHIN	7.00-12-12PR	8.6 (125)				
	JUM 7.00-12-12PR	8.6 (125)				
CONTINENTAL	PPS 7.00-12/5.00 SC20 M+S	-				
	7.00-12 16PR	10 (145)				
	PPS NM 7.00-12/ 5.00	-				

Table 39. Rear tires

		Pressure bar (psi)	Load per tire kg (lb)			
			MI 20 D K ST5 S1		MI 25 D K ST5 S1	
			Unladen	Laden	Unladen	Laden
ADVANCE	PPS 6.00-9/4.00	-	1000 (2205)	350 (772)	1150 (2535)	400 (882)
CHENG SHIN	6.00-9-10PR	8.6 (125)				
CONTINENTAL	PPS 6.00-9/4.00 SC20 M+S	-				
	6.00-9 12PR	7 (102)				
	PPS NM 6.00-9/4.00	-				

2.5.8 TIRES – MI 30/35 D K ST5 S1

Table 40. Front tires

		Pressure bar (psi)	Load per tire kg (lb)			
			MI 30 D K ST5 S1		MI 35 D K ST5 S1	
			Unladen	Laden	Unladen	Laden
ADVANCE	PPS 28x9-15/7.00	-	950 (2094)	3300 (7275)	900 (1984)	3700 (8157)
	PPS JUM 28x9-15/ 7.00	-				
CHENG SHIN	28x9-15-12PR	8.3 (120)				
	JUM 28x9-15-12PR	8.3 (120)				
CONTINENTAL	PPS 28x9-15/7.00	-				

		Pressure bar (psi)	Load per tire kg (lb)			
			MI 30 D K ST5 S1		***MI 35 D K ST5 S1***	
			Unladen	***Laden***	***Unladen***	***Laden***
	28x9-15 14PR	10 (145)				
	PPS NM 28x9-15/ 7.00	-				

Table 41. Rear tires

		Pressure bar (psi)	Load per tire kg (lb)			
			MI 30 D K ST5 S1		***MI 35 D K ST5 S1***	
			Unladen	***Laden***	***Unladen***	***Laden***
ADVANCE	PPS 6.50-10/5.00	-	1350 (2976)	500 (1102)	1500 (3307)	500 (1102)
CHENG SHIN	6.50-10-10PR	7.9 (115)				
CONTINENTAL	PPS 6.50-10/5.00 SC20 M+S	-				
	6.50-10 14PR	10 (145)				
	PPS NM 6.50-10/ 5.00	-				

2.5.9 GROUND CONTACT PRESSURE - MI 20→35 D K ST5 S1

Table 42. ADVANCE tires

	Pressure bar (psi)	Load kg (lb)	Ground contact pressure Kg/cm² (lb/in²)		Ground contact area cm² (in²)	
			Hard ground	***Soft ground***	***Hard ground***	***Soft ground***
PPS 7.00-12/5.00	-	850 (1873)				
		900 (1984)				
		2500 (5510)				
		2850 (6281)				
PPS JUM 7.00-12/5.00	-	850 (1873)				
		900 (1984)				
		2500 (5510)				
		2850 (6281)				
PPS 6.00-9/4.00	-	350 (771)				
		400 (882)				
		1000 (2204)				
		1150 (2535)				
PPS 28x9-15/7.00	-	900 (1984)				
		950 (2094)				
		3300 (7273)				
		3700 (8155)				
PPS JUM 28x9-15/7.00	-	900 (1984)				
		950 (2094)				
		3300 (7273)				
		3700 (8155)				

	Pressure bar (psi)	Load kg (lb)	Ground contact pressure Kg/cm² (lb/in²)		Ground contact area cm² (in²)	
			Hard ground	***Soft ground***	***Hard ground***	***Soft ground***
PPS 6.50-10/5.00	-	500 (1102)				
		1350 (2975)				
		1500 (3306)				

Table 43. CHENG SHIN tires

	Pressure bar (psi)	Load Kg (lb)	Ground contact pressure Kg/cm² (lb/in²)		Ground contact area cm² (in²)	
			Hard ground	***Soft ground***	***Hard ground***	***Soft ground***
7.00-12-12PR	8.6 (125)	850 (1873)				
		900 (1984)				
		2500 (5510)				
		2850 (6281)				
JUM 7.00-12-12PR	8.6 (125)	850 (1873)				
		900 (1984)				
		2500 (5510)				
		2850 (6281)				
6.00-9-10PR	8.6 (125)	350 (771)				
		400 (882)				
		1000 (2204)				
		1150 (2535)				
28x9-15-12PR	8.3 (120)	900 (1984)				
		950 (2094)				
		3300 (7273)				
		3700 (8155)				
JUM 28x9-15-12PR	8.3 (120)	900 (1984)				
		950 (2094)				
		3300 (7273)				
		3700 (8155)				
6.50-10-10PR	7.9 (115)	500 (1102)				
		1350 (2975)				
		1500 (3306)				

Table 44. CONTINENTAL tires

	Pressure bar (psi)	Load Kg (lb)	Ground contact pressure Kg/cm² (lb/in²)		Ground contact area cm² (in²)	
			Hard ground	***Soft ground***	***Hard ground***	***Soft ground***
PPS 7.00-12/5.00 SC20 M+S	-	850 (1873)				
		900 (1984)				
		2500 (5510)				
		2850 (6281)				
7.00-12 16PR	10 (145)	850 (1873)				
		900 (1984)				

	Pressure bar (psi)	Load Kg (lb)	Ground contact pressure Kg/cm² (lb/in²)		Ground contact area cm² (in²)	
			Hard ground	***Soft ground***	***Hard ground***	***Soft ground***
		2500 (5510)				
		2850 (6281)				
PPS NM 7.00-12/5.00	-	850 (1873)				
		900 (1984)				
		2500 (5510)				
		2850 (6281)				
PPS 6.00-9/4.00 SC20 M+S	-	350 (771)				
		400 (882)				
		1000 (2204)				
		1150 (2535)				
6.00-9 12PR	7	350 (771)				
		400 (882)				
		1000 (2204)				
		1150 (2535)				
PPS NM 6.00-9/4.00	-	350 (771)				
		400 (882)				
		1000 (2204)				
		1150 (2535)				
PPS 28x9-15/7.00	-	900 (1984)				
		950 (2094)				
		3300 (7273)				
		3700 (8155)				
28x9-15 14PR	10 (145)	900 (1984)				
		950 (2094)				
		3300 (7273)				
		3700 (8155)				
PPS NM 28x9-15/7.00	-	900 (1984)				
		950 (2094)				
		3300 (7273)				
		3700 (8155)				
PPS 6.50-10/5.00 SC20 M+S	-	500 (1102)				
		1350 (2975)				
		1500 (3306)				
6.50-10 14PR	10 (145)	500 (1102)				
		1350 (2975)				
		1500 (3306)				
PPS NM 6.50-10/5.00	-	500 (1102)				
		1350 (2975)				
		1500 (3306)				

2.5.10 LOAD CHART

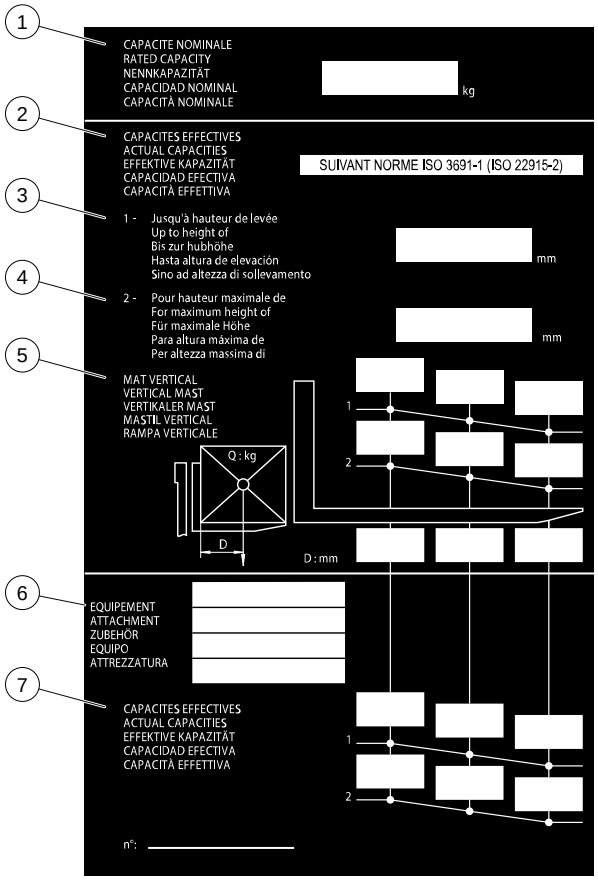


Figure 14: Load chart informations

Marker	Description
1	Rated capacity
2	Actual capacities According to standard ISO 3691-1 (ISO 22915-2)
3	Up to lift height
4	For maximum height of
5	Vertical mast
6	Equipment
7	Actual capacities

2.6. MACHINE COMPONENTS

2.6.1 COMPONENTS LOCATION — MI 20→35 D K ST5 S1

Figure 15: Components location — MI 20→35 D K ST5 S1

Table 45. List of components — MI 20→35 D K ST5 S1

Marker	Description	Option
1	Mast	
2	Overhead guard	
3	Driver's cab	●
4	Fork carriage	
5	Driving seat access handle	

Marker	Description	Option
6	Leftside step	
7	Front headlights	
8	Front windscreen wiper	•
9	Exhaust pipe	
10	Rear lights	
11	Rear working light	
12	Rotating beacon light	
13	Rear windscreen wiper	•
14	Rightside step	

2.6.2 DRIVER'S CAB COMPONENTS LOCATION — MI 20→35 D K ST5 S1

Figure 16: Driver's cab components location — MI 20→35 D K ST5 S1

Table 46. List of driver's cab components — MI 20→35 D K ST5 S1

Marker	Description	Option
1	Steering wheel	
2	Horn	
3	Lighting and indicator switch	
4	Lifting hydraulic control lever	
5	Tilting hydraulic control lever	
6	Fork carriage side-shift hydraulic control or Attachment hydraulic control	
7	Forward/Neutral/Reverse gear selector	
8	Ignition switch	
9	Cup holder	
9	Windscreen washer fluid tank	●
10	Display	
11	Switches	
12	Parking brake lever	
13	Steering wheel adjustment lever	
14	Transmission cut-off pedal	
15	Service brake	
16	Accelerator pedal	
17	Heating control components	●
18	Mini-lever armrest	●
19	Driver’s seat	
20	Rear windscreen wiper switch	●
21	Horn	
22	Driving seat access handle	
23	Internal rear-view mirror	

2.7. DISPLAY & CONTROLS

2.7.1 MACHINE SWITCHES

Table 47. List of machine switches

Pictogram	Description	Option
	Rotating beacon	
	Working tail light	
	Front windscreen wiper	●
	Front windscreen washer	●
	Rear windscreen wiper	●

2.7.2 MINI-LEVERS CONTROLS

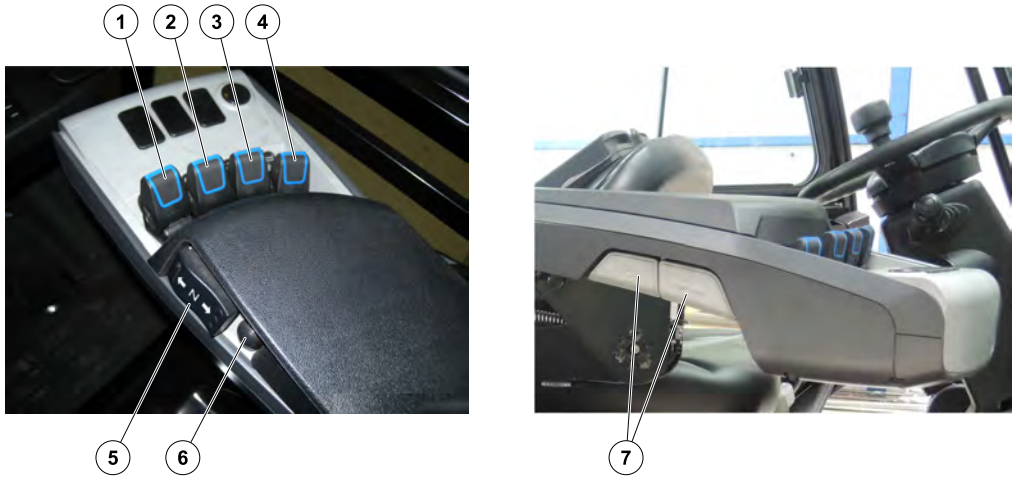


Figure 17: Mini-levers controls

Table 48. List of mini-levers controls

Marker	Description	Option
1	Fork lifting hydraulic	●
2	Mast tilting hydraulic	●
3	Fork carriage side-shift hydraulic	●
4	Hydraulic attachment	●
5	Forward/Neutral/Reverse gear selector	●
6	Horn	●
7	Armrest adjustment	●

2.7.3 DISPLAY SCREEN

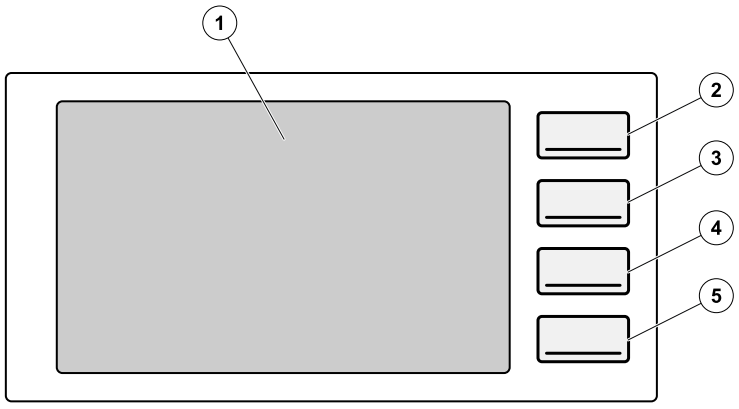


Figure 18: Display screen's components location

Table 49. List of display screen's components

Marker	Description
1	Display screen
2	Access to engine fault information display page
3	Access to language switch (Chinese/English)
4	Access to engine information display page
5	Access to setting page /Return to main page

2.7.4 WORK PAGE – MI 20→35 D K ST5 S1

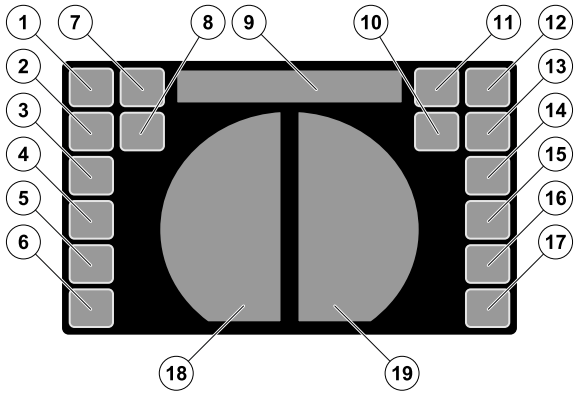


Figure 19: Indicator lamps location

Table 50. List of Indicator lamps – MI 20→35 D K ST5 S1

Marker	Pictogram	Description
1		Battery charge warning
2		Engine oil pressure
3		Water in fuel pre-filter
4	N	Neutral position
5		Transmission oil temperature
6		Seat belt
7		Engine preheating
8	(P)	Parking brake
9		Hour meter

Marker	Pictogram	Description
10		Service brake
11		Engine fault
12		Air filter
13		Operator Presence System
14		Exhaust regeneration information • **Flashing** : Passive exhaust regeneration will begin shortly. • **Steady** : Passive exhaust regeneration in progress. • **Flashing & engine fault lamp ON** : Parked regeneration required.
15		Exhaust regeneration warning
16		Exhaust regeneration limited and impossible
17		Exhaust regeneration status
18		Engine water temperature
19		Fuel level

3. MACHINE OPERATION

3.1. INSTALLATION AT THE DRIVER'S CAB

3.1.1 GETTING ON/OFF THE MACHINE

⚠ CAUTION

Risk of injury

Do not jump out of the lift truck.

NOTICE

Risk of machine damage

Do not use the steering wheel as point of support.

Always face the lift truck when getting into and out of the driver’s cab.

Always enter the driver's cab on the left side of the machine.

Make sure that you always have 3 points of support when getting in and out of the driver’s cab.

- Use the driving seat access handle.
- Use the step.
- Use either the engine cover, the driver’s seat or the overhead guard as third point of support.

3.1.2 ADJUSTING THE SEAT

⚠ CAUTION

Risk of injury and crushing the hand

Support the back-rest when adjusting the seat.

Be careful when adjusting the seat.

The driver is sitting on the driver’s seat.

Weight adjustment

1. Pull the weight adjustment lever fully out.

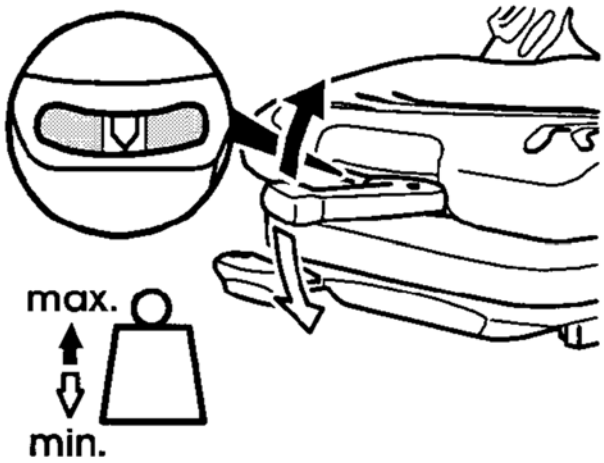


Figure 20: Driver’s seat weight adjustment

2. Move the weight adjustment lever up to increase the weight or down to reduce it.

   There are ten possible positions between the min. and max. weights.

   Before each run, return the lever to the central position.

   The max. or min. position is indicated by a freely traveling lever.

   The driver's weight is correctly adjusted when the arrow is in the center of indicator.

3. After completing weight adjustment, fully lower the lever.

Longitudinal adjustment

- Adjust the locking lever until you reach the position required.

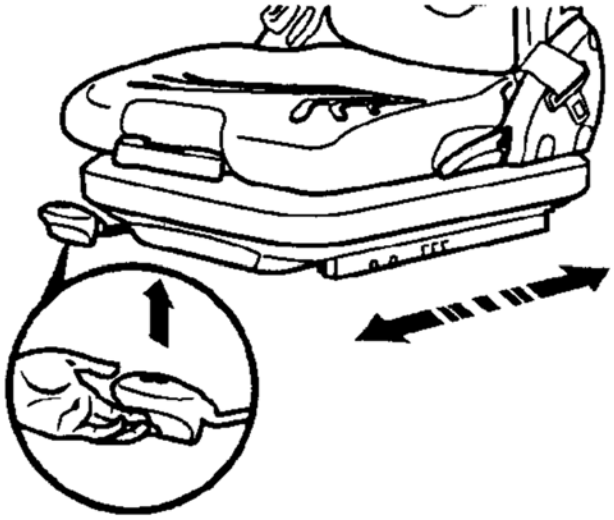


Figure 21: Driver's seat longitudinal adjustment

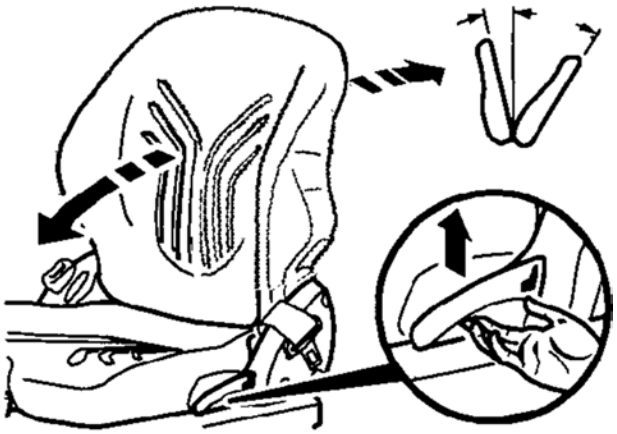


Figure 23: Driver's seat angle adjustment of the back-rest

Lumbar adjustment

- Turn knob to 1 to adjust the height and depth of the lumbar support of the upper part of the back-rest.
- Turn knob to 2 to adjust the height and depth of the lumbar support of the lower part of the back-rest.

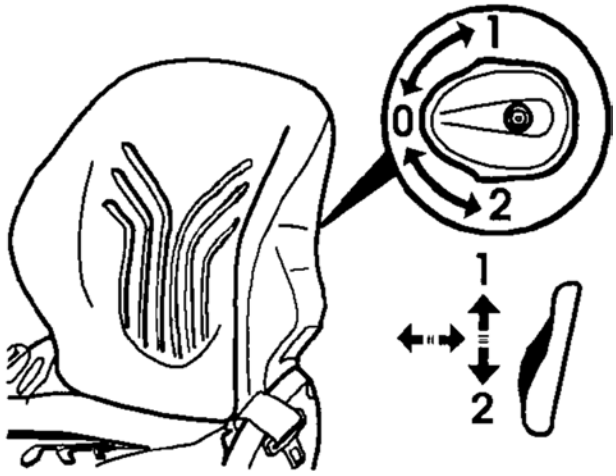


Figure 22: Driver's seat lumbar adjustment

Angle adjustment of the back-rest

1. Support the back-rest.
2. Pull the lever and adjust the back-rest to find the desired position.

3.1.3 ADJUSTING THE STEERING WHEEL

1. Pull out the steering wheel tilting knob to adjust the position of the steering wheel.
2. Push back in the steering wheel tilting knob to lock the steering wheel in the desired position.

3.1.4 ADJUSTING THE ARMREST

The armrest is adjustable in height and length.

- Press the button (1) to adjust in height.
- Press the button (2) to adjust in length.

Figure 24: Buttons to adjust the armrest

3.1.5 FASTENING THE SEAT BELT

⚠ DANGER

In no event should the lift truck be used if the seat belt is defective (fixing, locking, cuts, tears, etc.).

Repair or replace the seat belt immediately.

1. Sit correctly on the seat.
2. Check that seat belt is not twisted.
3. Place the seat belt at hip level.
4. Attach the seat belt and check that it locks.
5. Adjust the seat belt to your body shape without squeezing your hip and without over-slack.

3.2. OPERATING THE MACHINE

3.2.1 OPERATING THE MACHINE WITH THE OPERATOR PRESENCE SYSTEM

If the parking brake is released without operator on the seat, a sound alarm will be heard.

If the operator leaves the seat over 2 seconds in the process of handling, a sound alarm will be heard and the handling operation will automatically stop.

Lift truck from 2023–04–15:
If the operator has not fastened the seatbelt when the parking brake is released or in the process of handling, a sound alarm will be heard.
If the operator unfastens the seatbelt and leaves the seat in the process of handling, a sound alarm will be heard and the handling operation will automatically stop.

- Moving the machine forwards or backwards:
  1. Sit down correctly in the driver's seat and fasten the seatbelt
  2. Release the parking brake
  3. Engage forward or reverse movement
- Stopping the machine:
  1. Set the forward/reverse selector to neutral
  2. Apply the parking brake
  3. Unfasten the seatbelt and get off the machine

3.2.2 POWERING UP THE MACHINE

The forward/reverse selector is in neutral position (lamp is lit), the ignition switch is in position (1) and the machine is stationary.

1. Turn the ignition switch to the preheating position (2) for a few seconds until the lamp goes out.

Figure 25: Ignition switch positions

2. Turn the ignition switch to the position (3) to start the engine.

The machine is powered up and the ignition switch is in position (2).

3.2.3 POWERING DOWN THE MACHINE

The forward/reverse selector is in neutral position (lamp is lit), the ignition switch is in position (2) and the machine is stationary.

1. Turn the ignition switch to position (1).

Figure 26: Ignition switch positions

The machine is powered down.

3.2.4 OPERATING THE HORN

- Press in the center of the steering wheel.

- Press the red button on the driving seat access handle.

In both cases, the horn will sound.

3.2.5 OPERATING THE HORN ON THE MINI-LEVERS

- Press on the button on the side of the mini-lever armrest.

The horn will sound.

3.2.6 OPERATING THE ROTATING BEACON

- Press on the rotating beacon switch to turn the light on and off.

3.2.7 OPERATING THE HEATER

- Press on the heater switch to turn the heating on and off.

You may choose between two fan speeds.

3.2.8 DRIVING THE MACHINE

3.2.8.1 Operating the gear selector

NOTICE

Risk of transmission damage

Do not accelerate while changing gears.

Change gears at speeds below 2km/h.

The gear selector will not work unless the OPS system prerequisites are met.

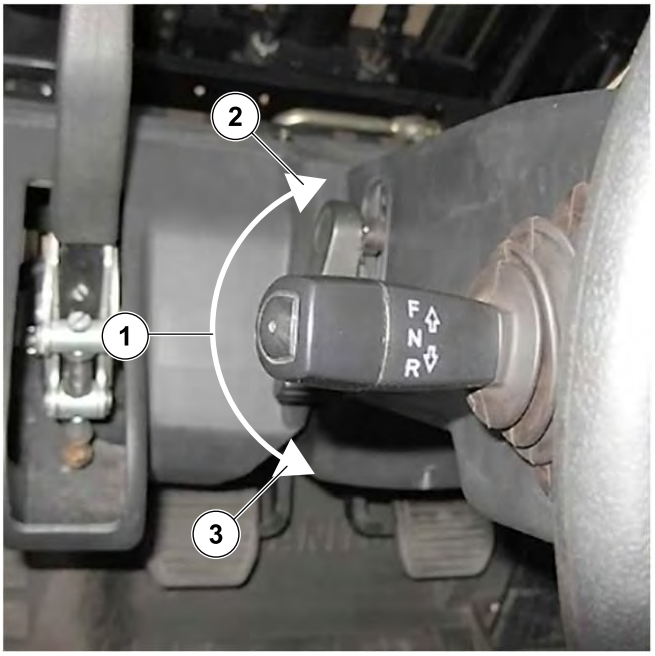


Figure 27: Gear selector

- Neutral position
  1. Stop the machine.
  2. Move the lever to position (1).
- Forward drive position
  1. Stop the machine.
  2. Move the lever to position (2).
- Reverse drive position
  1. Stop the machine.
  2. Move the lever to position (3).

     The reversing lights are on and the audible reverse warning is on.

3.2.1 *Operating the machine with the operator presence system*, page 58

3.2.8.2 Operating the gear selector on the mini-levers

NOTICE

Risk of transmission damage

Do not accelerate while changing gears.

Change gears at speeds below 2km/h.

The gear selector will not work unless the OPS system prerequisites are met.

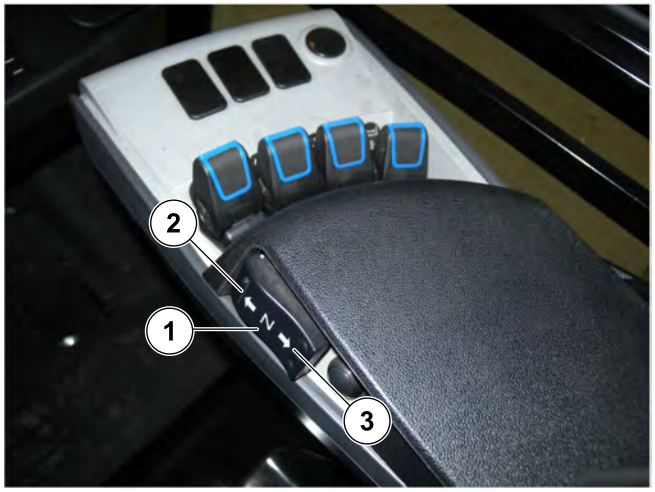


Figure 28: Gear selector on the mini-levers

- Neutral position
  1. Stop the machine.
  2. Move the switch to position (1).
- Forward drive position
  1. Stop the machine.
  2. Move the switch to position (2).
- Reverse drive position
  1. Stop the machine.
  2. Move the switch to position (3).

     The reversing lights are on and the audible reverse warning is on.

3.2.1 *Operating the machine with the operator presence system*, page 58

3.2.8.3 Driving the machine

1. Get on the machine
2. Adjust the seat
3. Adjust the steering wheel
4. Fasten the seat belt
5. Release the parking brake
6. Power up the machine
7. Operate the gear selector to move forwards or backwards

3.2.8.4 Operating the lights and indicators

Positions (2) and (3) can be used without switching on the ignition

- Put the Switch in position (1) and the lever in central position

Figure 29: Lights and indicators

- The lights and indicators are off
- Put the switch in position (2)
- The sidelights and the rear lights are on
- Put the switch in position (3)
- The headlights and the rear lights are on
- Push the lever (4) upwards
- The left hand indicator lights flash
- Push the lever (4) downwards
- The right hand indicator lights flash

3.2.8.5 Operating the windscreen wipers

- Press on the desired windscreen wiper switch

The location of the switches may vary depending on the options

The desired windscreen wipers are working

3.2.9 HANDLING A LOAD

3.2.9.1 Instructions for Handling a Load

Choice of Attachments

- Only attachments approved by MANITOU can be used on its lift trucks.
- Make sure the attachment is appropriate for the work to be done.
- Make sure the attachment is correctly installed and locked onto the lift truck carriage.
- Make sure that your lift truck attachments work properly.

- Comply with the load chart limits for the lift truck for the attachment used.
- Do not exceed the rated capacity of the attachment.
- Never lift a load in a sling without the attachment provided for the purpose. There are optional solutions; contact your

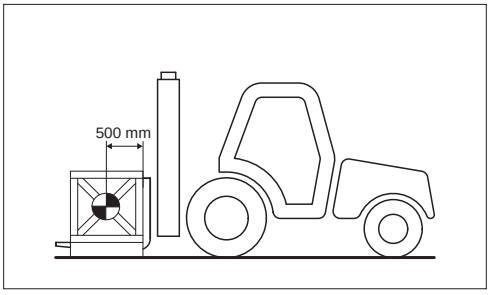
Weight of Load and Centre of Gravity

⚠ WARNING

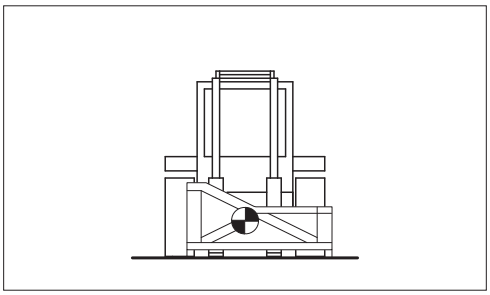
It is forbidden to move a load heavier than the effective capacity defined on the lift truck load chart.

For loads with a moving centre of gravity (e.g. liquids), take account of the variations in the centre of gravity in order to determine the load to be handled and be extra vigilant and careful to limit these variations as far as possible.

- Before taking up a load, you must know its mass and its centre of gravity.
- The load chart for your lift truck is valid for a load in which the longitudinal position of the centre of gravity is 500 mm or 600 mm from the base of the forks (according to the model of lift truck) . For a higher centre of gravity, contact your dealer



- For irregular loads, determine the transverse centre of gravity before any movement and set it in the longitudinal axis of the lift truck.



Transverse Attitude of the Lift Truck

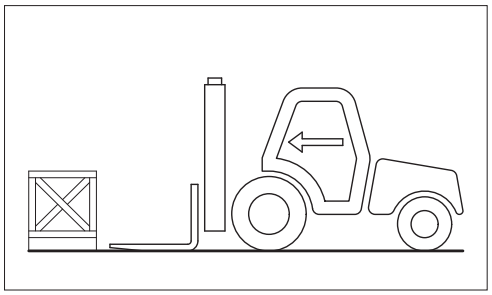
The transverse attitude is the transverse slope of the chassis with respect to the horizontal.

Raising the mast reduces the lift truck's lateral stability. The transverse attitude must be set with the mast in down position as follows:

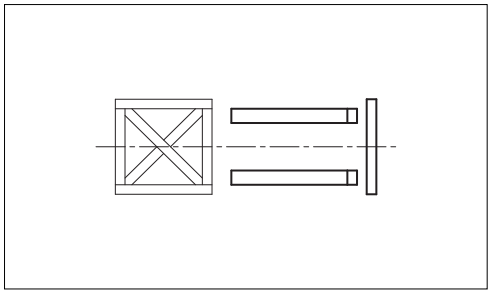
- Position the lift truck so that the bubble in the level is between the two lines.

Picking up a load on the ground

1. Approach the lift truck perpendicular to the load, with the forks in a horizontal position.



2. Approach the lift truck perpendicular to the load, with the forks in a horizontal position.

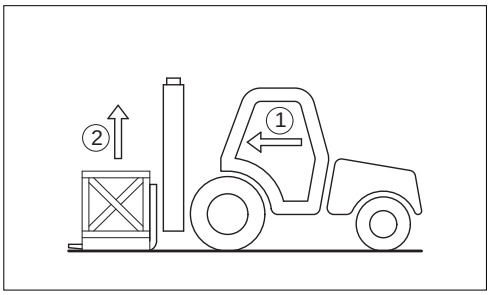


3. Adjust the fork spread and centring in connection with the load (optional solutions exist, consult your dealer).
4. Never lift a load with a single fork.

⚠ WARNING

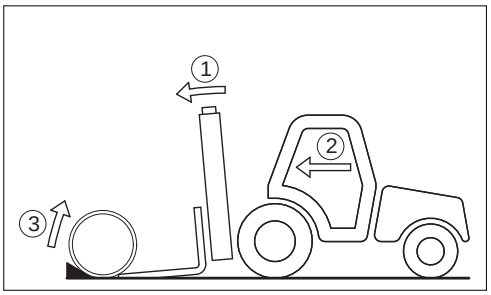
Beware of the risks of trapping or crushing limbs when manually adjusting the forks.

5. Move the lift truck forward slowly (1) and bring the forks to stop in front of the load, if necessary, slightly lift the mast (2) while taking up the load.
6. Bring the load into the transport position.
7. Tilt the load far enough backwards to ensure stability (loss of load on braking or going downhill).



FOR A NON-PALLETISED LOAD

1. Tilt the carriage (1) forwards and move the lift truck slowly forwards (2), to insert the fork under the load (block the load if necessary).
2. Continue to move the lift truck forwards (2) tilting the carriage (3) backwards to position the load on the forks and check the load's longitudinal and lateral stability.



Picking up and laying down a high load on tires

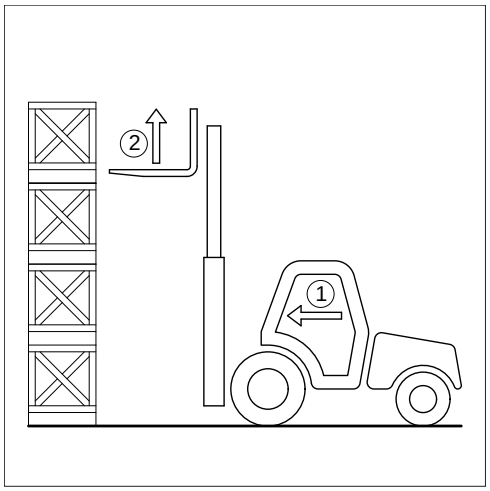
⚠ DANGER

You must not raise the boom if you have not checked the transverse attitude of the lift truck.

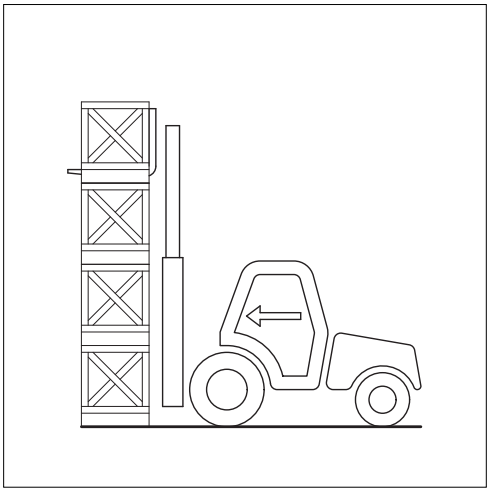
Remember: Make sure that the following operations can be performed with good visibility.

PICKING UP A HIGH LOAD ON TIRES

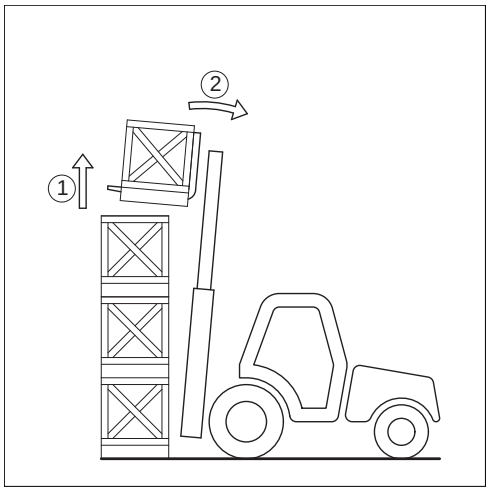
1. Ensure that the forks will easily pass under the load.
2. Keeping the mast vertical (1), advance the lift truck and raise the forks to level with the load (2) .



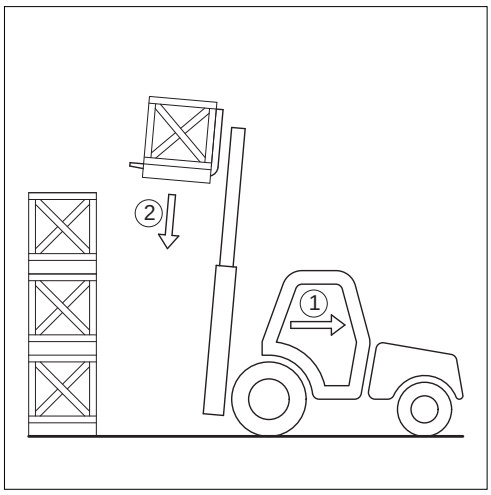
3. Manoeuvre carefully and gently to bring the forks to the stop in front of the load. Set the handbrake and place the forward/reverse selector to neutral.



4. Slightly raise the load (1) and tilt the carriage (2) backwards to stabilise the load.

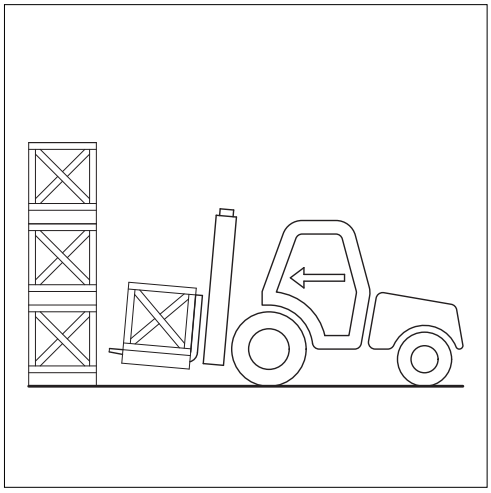


5. Tilt the load sufficiently backwards to ensure its stability.
6. Reverse the lift truck (1) very carefully and gently to free the load. Lower the mast (2) to bring the load into transport position.

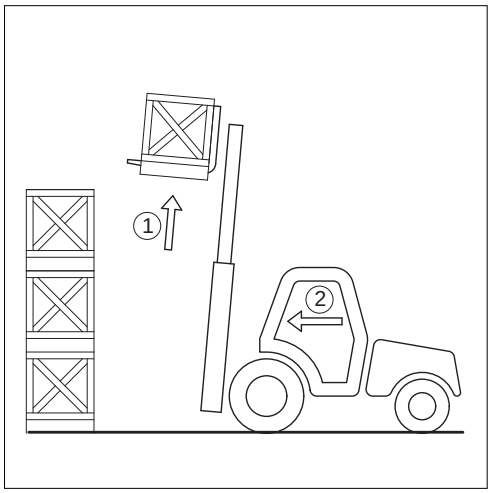


LAYING A HIGH LOAD ON TYRES

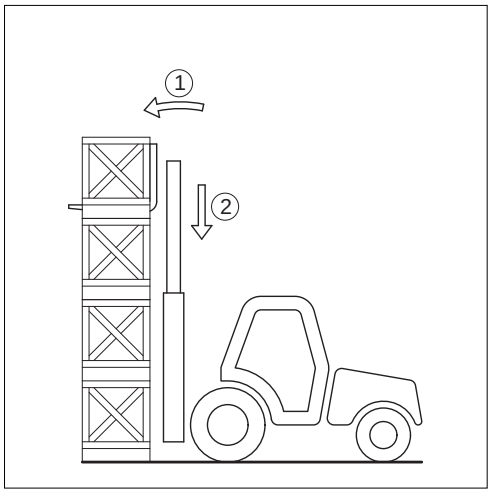
1. Approach the load in the transport position in front of the pile.



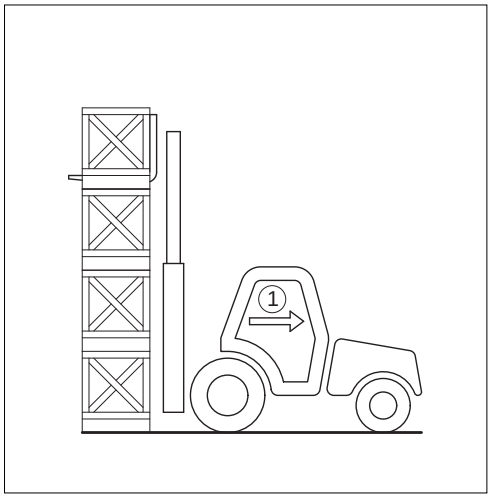
2. Raise the mast (1) until the load is higher than the pile and move the lift truck forward (2) very carefully and gently, until the load is over the pile. Put the handbrake on and set the forward/reverse selector to neutral.



3. Place the load in a horizontal position by tilting the mast forwards (1) and lay it down on the pile (2) while checking the correct positioning of the load .



4. Reverse the lift truck (1) very slowly and carefully to release the forks. Then set them into transport position.



3.2.9.2 Using the hydraulic controls

⚠ WARNING

Machine shaking

Risk of accident

Use the hydraulic controls without jerking

The gear selector will not work unless the OPS system prerequisites are met.

The driver is sat on the seat

Lifting the load

- Move the lever (1) backwards to lift the load

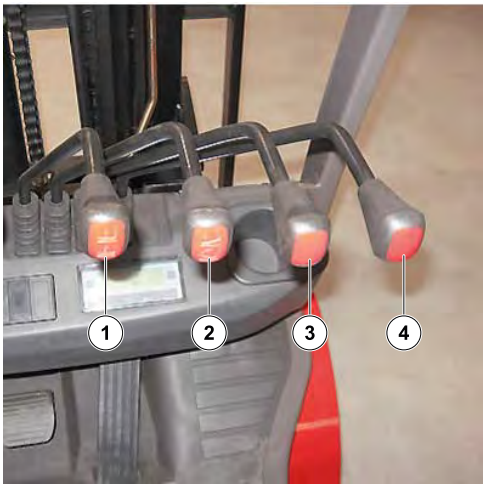


Figure 30: Hydraulic controls

- Move the lever (1) forwards to lower the load

Tilting the mast

- Move the lever (2) backwards to tilt the mast backwards
- Move the lever (2) forwards to tilt the mast forwards

Carriage side-shift

- Move the lever (3) backwards to move sideways to the right
- Move the lever (3) forwards to move sideways to the left

Attachment

- Move the lever (3) forwards or backwards

Additional accessory

- Move the lever (4) forwards or backwards

◁ 3.2.1 *Operating the machine with the operator presence system*, page 58

3.2.9.3 Using the hydraulic controls on the mini-levers

⚠ WARNING

Machine shaking

Risk of accident

Use the hydraulic controls without jerking

The gear selector will not work unless the OPS system prerequisites are met.

The driver is sat on the seat

Lifting the load

- Move the mini-lever (1) backwards to lift the load

Figure 31: Mini-lever hydraulic controls

- Move the mini-lever (1) forwards to lower the load

Tilting the mast

- Move the mini-lever (2) backwards to tilt the mast backwards
- Move the mini-lever (2) forwards to tilt the mast forwards

Carriage side-shift

- Move the mini-lever (3) backwards to move sideways to the right

- Move the mini-lever (3) forwards to move sideways to the left

Attachment

- Move the mini-lever (3) forwards or backwards

Additional accessory

- Move the mini-lever (4) forwards or backwards

3.2.1 *Operating the machine with the operator presence system*, page 58

3.2.9.4 Adjusting the fork spacing

The machine must be unloaded

1. Pull up the adjusting knob and turn it 180 degrees to unlock the fork

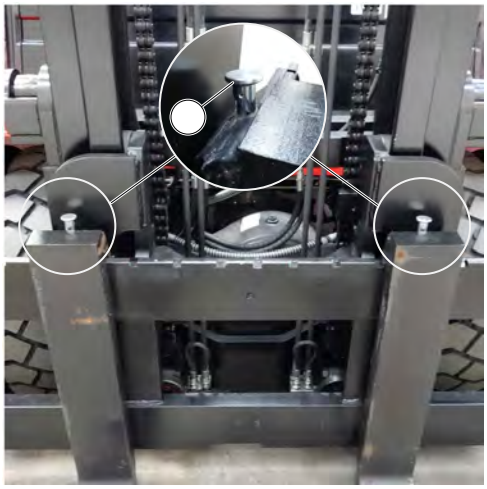


Figure 32: Fork spacing adjustment

2. Slide the forks to the left or the right to adjust them
3. Turn the adjusting knob 180 degrees and push it down to lock the fork

3.3. MANAGEMENT OF THE POLLUTION CONTROL SYSTEM

3.3.1 DEACTIVATING THE EXHAUST REGENERATION

NOTICE

Risk of engine damage

Only inhibit the exhaust regeneration in impossible regeneration situations (for example : indoor use).

Only reactivate the exhaust regeneration when the conditions are appropriate.

Inhibiting the exhaust regeneration for too long will lead to an increased clogging of the DPF.

1. Enter the **"Setting page"** on the display screen
2. Enter the **"Emissions"** setting page
3. Press on **"Inhibit"** button to turn off the exhaust regeneration function

3.3.2 REACTIVATING THE EXHAUST REGENERATION

1. Enter the **"Setting page"** on the display screen
2. Enter the **"Emissions"** setting page
3. Press on **"Cancel inhibit"** button to turn back on the exhaust regeneration function

3.3.3 STARTING THE PARKED REGENERATION

⚠ DANGER

Risk of suffocation

Park the machine in a safe and adequately ventilated place

NOTICE

Risk of engine damage

Do not stop the exhaust regeneration unless it's absolutely necessary

Do not use any machine functions while the exhaust regeneration is in progress

The parked regeneration and engine default indicator lamp are lit on the work page

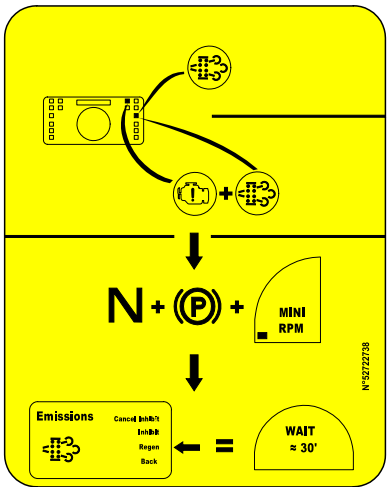


Figure 33: Parked DPF regeneration decal

The fuel is at sufficient level

1. Put the gear selector in neutral position
2. Apply the parking brake
3. Rest the forks on the ground
4. Put the engine in idling speed
5. Enter the **"Setting page"** on the display screen
6. Enter the **"Emissions"** setting page
7. Launch the **"DPF parking regeneration"**

Stay close to the machine during the exhaust regeneration

The duration of the regeneration procedure is approximately 30 minutes

When finished, the remaining hours before next regeneration will appear on the screen

3.4. PARKING AND STORING THE MACHINE

3.4.1 PARKING THE MACHINE

1. Move the machine to an approved parking location.
2. Set the wheels straight.

Block the wheels if the parking location is on a slope.

3. Put the gear selector to neutral.
4. Set the parking brake on.
5. Lower the forks to the ground.
6. Turn off the engine and remove the key.

3.4.2 STORING THE MACHINE FOR A SHORT DURATION

1. Wait for the machine to cool down.
2. Check the general state of the machine.

Report any damage to the machine.

3. Check the lubricants levels. Top-up the lubricants levels if necessary.

3.5. TRANSPORT AND LIFTING OF THE MACHINE

3.5.1 LOADING/UNLOADING THE MACHINE

⚠ WARNING

Ensure that the safety instructions connected to the platform are respected before the loading of the machine and that the driver of the means of transport is informed about the dimensions and the weight of the machine.

⚠ WARNING

Ensure that the platform is of sufficient size and load capacity for transporting the machine. Check also the allowable ground contact pressure of the platform relative to the machine.

- Loading the machine
  1. Block the wheels of the platform.
  2. Attach the loading ramps to the platform in such a way as to give the shallowest possible ramp angle for the machine.
  3. Load the machine parallel to the platform.
  4. Stop the machine.
- Unloading the machine
  1. Block the wheels of the platform.
  2. Attach the loading ramps to the platform in such a way as to give the shallowest possible ramp angle for the machine.
  3. Power up the machine.
  4. Unload the machine parallel to the platform.

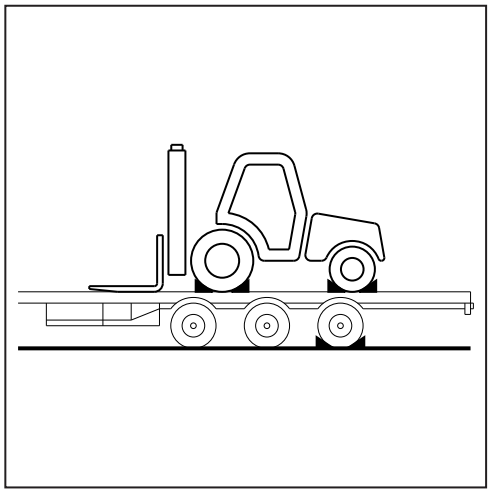
3.5.2 TYING DOWN THE MACHINE

⚠ WARNING

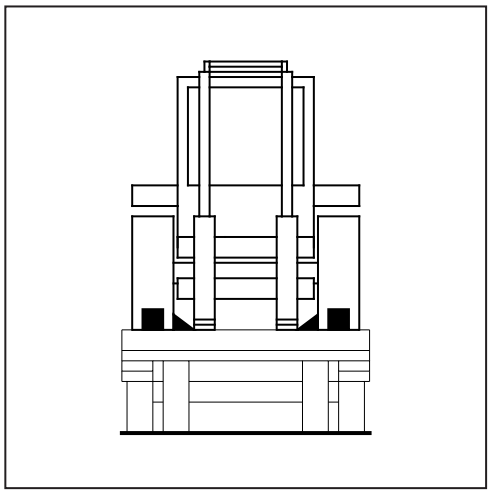
Risk of machine falling during transport

Stow the machine onto the semi-trailer with sufficiently strong ropes.

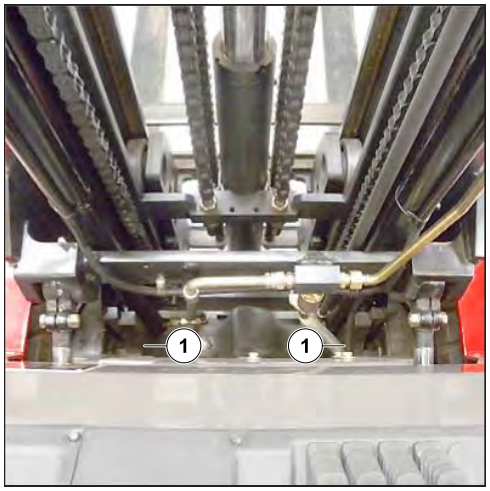
1. Fix the chocks to the platform at the front and at the back of each tyre.



2. Also fix the chocks to the platform on the inside of each tyre.



3. Stow the machine onto the semi-trailer with sufficiently strong ropes to the front by passing above the articulation fittings (1) of the mast and to the back onto the towing pin (2).



4. Tighten the ropes.

4. MAINTENANCE

4.1. MAINTENANCE COMPONENTS LOCATION - MI 20→35 D K ST5 S1

Figure 34: Maintenance components location - MI 20→35 D K ST5 S1

Table 51. Maintenance components location - MI 20→35 D K ST5 S1

Marker	Description
1	Floor mat
2	Floor engine cover
3	Engine cover key and button
4	Engine cover
5	Fuel tank cap
6	Windscreen washer fluid tank
7	Brake fluid tank access panel
8	Cyclonic air pre-filter

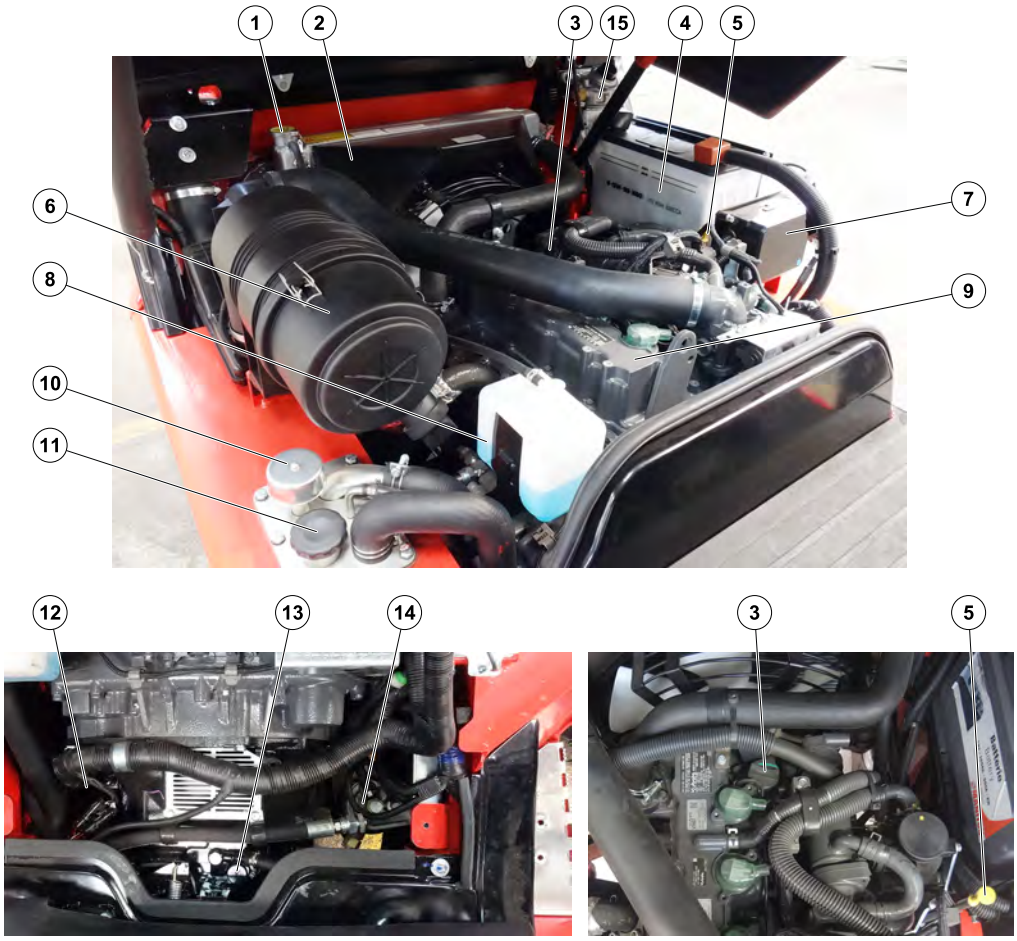


Figure 35: Maintenance components location under the engine cover - MI 20→35 D K ST5 S1

Table 52. Maintenance components location under the engine cover - MI 20→35 D K ST5 S1

Marker	Description
1	Radiator cap
2	Radiator
3	Engine cap
4	Battery
5	Engine oil gauge
6	Dry air filter
7	Fuse and relay box
8	Cooling liquid tank
9	Engine
10	Breather
11	Hydraulic fluid tank filler cap
12	Transmission oil gauge
13	Transmission oil filler plug
14	Fuel filter
15	Fuel pre-filter

4.2. OPENING THE ENGINE COVER

On the cab version, open the side doors, the side half-doors and the rear sliding window before lifting the engine cover.

If the machine is equipped with mini-levers, retract the armrest.

- Lifting the engine cover

  1. Turn counterclockwise the key (1).

Figure 36: Key in engine cover lock

  2. Push the button on the lock.
  3. Keep the button pushed in and gently lift the engine cover until the gas strut safety catch (2) locks in place.

Figure 37: Gas strut safety catch

- Lowering the engine cover

  1. Release the safety catch (2) and gently lower the engine cover.
  2. Check that the engine cover is properly closed.

4.3. ORIGINAL MANITOU SPARE PARTS AND EQUIPMENT

4.3.1 ORIGINAL MANITOU SPARE PARTS AND EQUIPMENT

Our lift trucks must be serviced using original Manitou parts.

4.3.2 BY ALLOWING THE USE OF NON-ORIGINAL MANITOU PARTS, YOU RISK

The use of counterfeit parts or components not approved by the Manufacturer, means you lose the benefit of the contractual guarantee

- Legally - to be held responsible in the event of an accident.
- Technically - to cause operating malfunctions or shorten the life of the lift truck.

4.3.3 BY USING ORIGINAL MANITOU PARTS FOR MAINTENANCE OPERATIONS, YOU BENEFIT FROM OUR KNOW-HOW

Through its network, MANITOU provides the user with the following,

- Know-how and competence.
- The guarantee of high-quality work.
- Original replacement parts.
- Help with preventive maintenance.
- Efficient help with diagnosis.
- Improvements due to experience feedback.
- Operator training.
- Only the MANITOU network has detailed knowledge of the design of the lift truck and therefore the best technical ability to provide maintenance.

Original replacement parts are distributed exclusively by Manitou and its dealer network. The dealer network list is available on the Manitou web site: www.manitou.com

4.4. FORKLIFT TRUCK MAINTENANCE

4.4.1 DAILY AND WEEKLY MAINTENANCE

The operator is authorised to carry out this maintenance

These maintenance operations lets the operator to maintain the lift truck in a clean and safe condition.

4.4.2 MANDATORY FIRST 500 HOURS OR 6 MONTHS SERVICE

This service must be carried out after the first 500 hours of service or within the 6 months following putting the machine into service (whichever occurs first).

4.4.3 PERIODIC SERVICE

The periodic maintenance must be carried out by a professional approved by the Manitou network.

Maintenance Schedule

This schedule lets the operator to keep up with the periodic maintenance of the lift truck by notifying the total number of hours of operation and the date of the service performed by the professional approved by the MANITOU network.

4.4.4 OCCASIONAL MAINTENANCE AND OPERATION

These maintenance tasks and operations are to be performed as required for the safety and upkeep of the lift truck.

4.5. MAINTENANCE LOGBOOK

- ❶ List of maintenance procedures to be carried out every 500 hours or 6 months.
- ❷ List of maintenance procedures to be carried out every 1,000 hours of service or every year.
- ❸ List of maintenance procedures to be carried out every 2,000 hours of service or every 2 years.
- ❹ List of maintenance procedures to be carried out every 4,000 hours of service or every 4 years.

SCHEDULE	10 hours or daily	50 hours or weekly	First 6 months	First 500 hours	500 hours or 6 months	1,000 hours or 1 year
PERIODIC MAINTENANCE	See: Daily maintenance or every 10 hours of service.	See: Weekly maintenance or every 50 hours of service.	Mandatory service	Mandatory service + ❶	❶	❶+❷
MACHINE COUNTER						
DATE OF SERVICING						
OBSERVATION						

SCHEDULE	1,500 hours or 1.5 years	2,000 hours or 2 years	2,500 hours or 2.5 years	3,000 hours or 3 years	3,500 hours or 3.5 years	4,000 hours or 4 years
PERIODIC MAINTENANCE	❶	❶+❷+❸	❶	❶+❷	❶	❶+❷+❸+❹
MACHINE COUNTER						
DATE OF SERVICING						
OBSERVATION						

SCHEDULE	4,500 hours or 4.5 years	5,000 hours or 5 years	5,500 hours or 5.5 years	6,000 hours or 6 years	6,500 hours or 6.5 years	7,000 hours or 7 years
PERIODIC MAINTENANCE	❶	❶+❷	❶	❶+❷+❸	❶	❶+❷
MACHINE COUNTER						
DATE OF SERVICING						
OBSERVATION						

4.6. SERVICING PROGRAM

4.6.1 DAILY AND WEEKLY MAINTENANCE

These maintenance operations enable the operator to maintain the lift truck in a clean and safe condition.

The operator is authorised to carry out this maintenance.

10 hours of service or daily maintenance

Table 53. 10 hours of service or daily maintenance

Operation	Description	Note
Check	Lift truck environment	
Check	Engine oil level	
Check	Fuel level	
Check	Cooling liquid level	
Check	Fuel prefilter	

50 hours of service or weekly maintenance

Carry out the daily maintenance procedures as well.

Table 54. 50 hours of service or weekly maintenance

Operation	Description	Note
Check	Transmission oil level	
Check	Differential oil level	
Clean	Radiator core	
Clean	Dry air filter cartridge	
Check	Wheel nut torque	
Adjust	Tension and alignment of the mast lifting chains	
Grease	Mast	
Check	Windscreen washer liquid level	
Grease	Cab door	
Grease	Swivel pins	See : Grease rear axle
Grease	Steering connecting rod	See : Grease rear axle
Grease	Rear axle oscillation	See : Grease rear axle

4.6.2 FIRST MANDATORY SERVICING

This service must be carried out at the first 500 hours of service or within 6 months of the initial start-up of the machine (whichever occurs first).

Mandatory servicing

Table 55. Mandatory servicing

Operation	Description	Note
Check	Engine oil level	
Check	Cooling liquid level	
Check	Fuel level	
Check	Hydraulic oil level	
Check	Brake fluid level	
Check	Transmission oil level	
Check	Differential oil level	
Clean	Radiator core	
Check	Wheel nut torque	
Adjust	Tension and alignment of the mast lifting chains	
Grease	Mast	
Check	Windscreen washer liquid level	
Grease	Cab door	
Grease	Swivel pins	See : Grease rear axle
Grease	Steering connecting rod	See : Grease rear axle
Grease	Rear axle oscillation	See : Grease rear axle
Replace	Dry air filter cartridge	First time at 50 hours then every 500 hours
Replace	Engine oil	First time at 50 hours then every 500 hours
Adjust	Alternator/fan/crankshaft belt tension	
Grease	Mast lifting chains	
Check	Speeds of hydraulic movements	Consult your dealer
Check	Condition of hoses and flexible pipes	Consult your dealer

Operation	Description	Note
Check	Condition of cylinders (leakage, rods)	Consult your dealer
Check	Fork wear	Consult your dealer
Check	Condition of attachments	Consult your dealer
Replace	Differential oil	

4.6.3 PERIODIC SERVICING

The periodic maintenance must be carried out by a professional approved by the Manitou network.

500 hours of service or 1 year

Carry out the daily and weekly maintenance.

Table 56. 500 hours of service or 1 year

Operation	Description	Note
Replace	Dry air filter cartridge	First time at 50 hours then every 500 hours
Replace	Engine oil	First time at 50 hours then every 500 hours
Drain	Fuel water trap	
Adjust	Alternator/fan/crankshaft belt tension	
Grease	Mast lifting chains	
Check	Attachment carriage	Consult your dealer
Check	Speeds of hydraulic movements	Consult your dealer
Check	Condition of hoses and flexible pipes	Consult your dealer
Check	Condition of cylinders (leakage, rods)	Consult your dealer
Check	Fork wear	Consult your dealer
Check	Condition of attachments	Consult your dealer

1000 hours of service or 2 years

Carry out the 500 hours service.

Table 57. 1000 hours of service or 2 years

Operation	Description	Note
Replace	Fuel filter	
Replace	Fuel pre-filter	
Replace	Safety dry air cartridge	Only for MI 20/25/30/25
Check	Valve clearance	Consult your dealer
Check	Engine silent blocks	Consult your dealer
Check	Engine speeds	Consult your dealer
Replace	Transmission oil	
Replace	Hydraulic oil return filter	See: Replace hydraulic oil
Replace	Hydraulic oil	
Grease	Brake pedal axle	
Adjust	Brakes	Consult your dealer
Replace	Brake fluid	Consult your dealer
Check	Seat belt	Consult your dealer
Check	Condition of the rear view mirrors	Consult your dealer
Check	Condition of wiring harnesses and cables	Consult your dealer

Operation	Description	Note
Check	Lights and signals	Consult your dealer
Check	Warning indicators	Consult your dealer
Check	Condition of the rear view mirrors	Consult your dealer
Check	Cab structure	Consult your dealer
Check	Frame structure	Consult your dealer

2000 hours of service or 4 years

Carry out the 500 and 1000 hours service.

Table 58. 2000 hours of service or 4 years

Operation	Description	Note
Replace	Vacuum valve filter	Consult your dealer
Replace	Cooling fluid	
Clean	Fuel tank	
Check	Injection pump	Consult your dealer
Check	Injectors	Consult your dealer
Check	Radiator	Consult your dealer
Check	Water pump and thermostat	Consult your dealer
Check	Alternator and starter motor	Consult your dealer
Replace	Differential oil	
Check	Wheel nut tightening torque	Consult your dealer
Check	Mast lifting chains	Consult your dealer
Check	Condition of the mast unit	Consult your dealer
Check	Chain rollers	Consult your dealer
Check	Mast guide rollers	Consult your dealer
Check	Mast bearing rollers	Consult your dealer
Check	Thickness of the mast wearing plates	Consult your dealer
Check	Hydraulic circuit pressures	Consult your dealer
Check	Hydraulic circuit outputs	Consult your dealer
Clean	Hydraulic tank	Consult your dealer
Check	Rear axle oscillation	Consult your dealer
Check	Steering	Consult your dealer
Check	Bearings and articulation rings	Consult your dealer

4000 hours of service or 4 years

Carry out the 500, 1000 and 2000 hours service.

Table 59. 4000 hours of service or 4 years

Operation	Description	Note
Check	Brake wear	Consult your dealer
Check	Swivel pins	Consult your dealer
Check	Rear axle	Consult your dealer

4.7. 10 HOURS OF SERVICE OR DAILY MAINTENANCE

4.7.1 CHECK ENGINE OIL LEVEL

Place the lift truck on level ground with the engine stopped, and let the oil settle in the sump.

1. Raise the engine cover.
2. Remove the dipstick (2).

3. Wipe the dipstick and check the correct level between the MINI and MAXI marks.
4. If necessary, add oil by the filler port (1).
5. Visually check that there is no leakage or seepage of oil in the engine.

4.7.2 CHECK COOLING LIQUID LEVEL

⚠ DANGER

To avoid any risk of spraying or scalding, wait until the engine has cooled down before removing the cooling system filler plug. If the cooling fluid is very hot, add only hot cooling fluid (80°C). In an emergency, you can use water as a coolant. In such a case, the cooling system fluid should be changed as soon as possible.

Place the lift truck on level ground with the engine stopped, and allow the engine to cool.

1. Raise the engine cover.
2. The fluid must be at the MAX level on the expansion tank (1).

3. If necessary, add cooling fluidthrough the filler port (2).
4. Check visually that there is no leakage in the radiator and pipes.

When the expansion tank is empty, check the level in the radiator before filling the expansion tank.

5. Slowly turn the cap of the radiator (3) up to the safety stop.

6. Allow the pressure and the steam to escape.
7. Press down and turn the cap so as to release it.
8. Add cooling fluid through the filler port.
9. Lubricate slightly the filler neck in order to facilitate the setting and the removal of the radiator cap.

4.7.3 CHECK FUEL LEVEL

⚠ DANGER

Never smoke or approach with a flame during filling operations or when the tank is open. Never refill while engine is running.

NOTICE

The fuel tank is degassed via the filler plug. When changing it, always use an original part, with degassing hole.

The fuel level is shown by a fuel gauge.

As far as possible, keep the fuel tank well filled in order to minimize condensation due to the atmospheric conditions.

1. Remove cap (1).

2. Fill the fuel tank with clean diesel filtered through the filling port.
3. Put back the cap (1).
4. Check visually that there is no leakage in the tank and pipes.

4.7.4 CHECK HYDRAULIC FLUID LEVEL

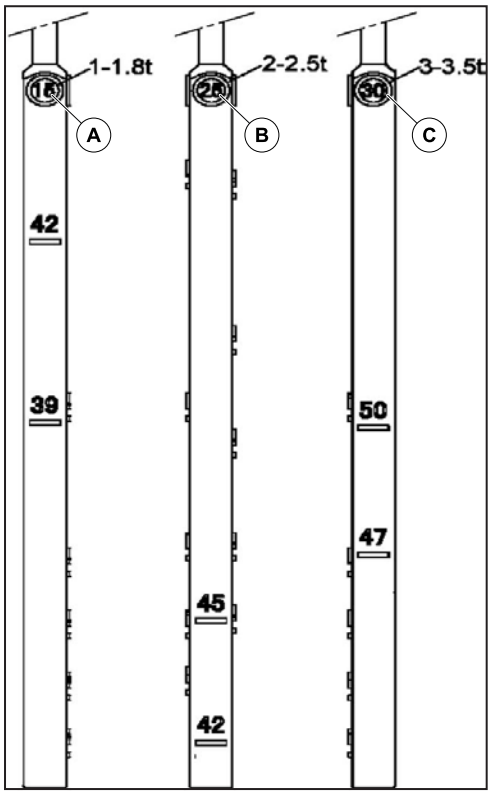
⚠ WARNING

Consult your dealer in case of abnormal operation of the hydraulic controls.

Place the lift truck on level ground with the engine stopped, the mast tilted backward and lowered as far as possible.

1. Raise the engine cover.
2. Remove cap (1).

3. Refer to the dipstick (2).



A	MI 15 / MI 18
B	MI 20 / MI 25
C	MI 30 / MI 35

4. The level is correct when it is between the MIN and MAX markings on the dipstick.
5. Top up if necessary.

6. Add fluid through filler port (3).

Use a clean funnel and clean the underside of the oil drum before filling.

7. Put back the cap (1).
8. Visually check that there is no leakage in the tank and pipes.

Always maintain the fluid level at maximum as cooling depends on the fluid flowing through the reservoir.

9. Check the operation of the hydraulic controls.

4.7.5 CHECK BRAKE FLUID LEVEL

⚠ WARNING

If the brake fluid level is abnormally low, consult your dealer.

⚠ DANGER

Consult your dealer in case of abnormal operation of the brakes.

Place the lift truck on level ground.

1. Lift up the braking fluid reservoir access panel (1).

2. Visually check the level.
3. The level is correct when it is at the MAX level on the tank.
4. If necessary, add fluid through filler port (2).

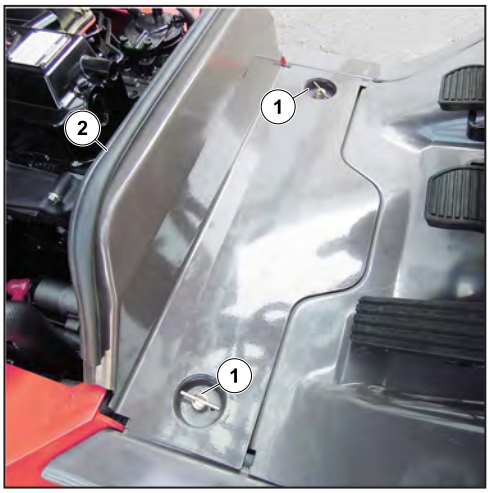
5. Visually check that there is no leakage in the tank and pipes.
6. Check the operation of the service brakes.
7. Check the proper operation of the parking brake.

4.8. 50 HOURS OF SERVICE OR WEEKLY MAINTENANCE

4.8.1 CHECK TRANSMISSION OIL LEVEL

Place the lift truck on level ground with the engine stopped.

1. Raise the engine cover.
2. Remove the floor mat.
3. Undo screws (1) to remove the floor (2).



4. Remove dipstick (3).

5. Wipe the dipstick and check the correct level between the MINI and MAXI marks.
6. If necessary, add oil through the filler port (4).

7. Visually check that there is no leakage or seepage of oil from the transmission.

4.8.2 CHECK DIFFERENTIAL OIL LEVEL

Place the lift truck on level ground with the engine stopped.

1. Remove level plug (1). The oil should be flush with the edge of the hole.

2. If necessary, add oil through the same hole.
3. Replace and tighten the level plug (1).

4.8.3 CLEAN RADIATOR CORE

NOTICE

In a polluting atmosphere, clean the radiator core every day. Do not use a water jet or high-pressure steam as this could damage the radiator fins.

1. Raise the engine cover

In order to prevent the radiator becoming clogged, clean it with a compressed air jet directed from inside to outside. This is the only effective way of removing the impurities.

4.8.4 CLEAN DRY AIR FILTER CARTRIDGE

NOTICE

The cartridge must not be cleaned more than seven times, after which the cartridge must be changed. Never operate the lift truck with the air filter removed or damaged.

NOTICE

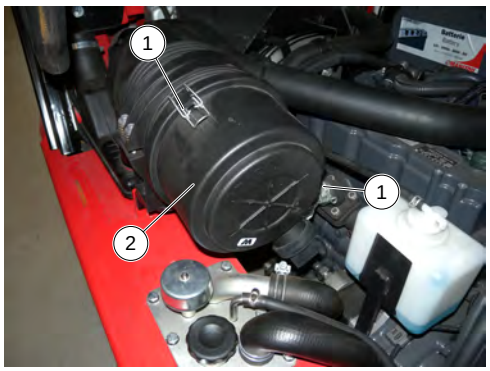
Respect the safety distance of 30mm between the air jet and the cartridge to avoid tearing or making a hole in the cartridge. The cartridge must not be blown anywhere near the air filter box. Never clean the cartridge by tapping it against a hard surface. Your eyes must be protected during this intervention.

NOTICE

Do not clean the dry air filter cartridge by washing it in liquid. Do not clean by any means the safety cartridge located inside the filter cartridge, change it for a new one if it is dirty or damaged.

In case of use in a heavily dust laden atmosphere, the cartridge inspection and cleaning frequency must be reduced.

1. Raise the engine cover.
2. Release the bolts (1) and remove cover (2).



3. Clean the filter cartridge using a compressed air jet (max. pressure 3 bar (43.5 psi) directed from the top to the bottom and from the inside towards the outside at a minimum distance of 30 mm (1.18 in) from the cartridge wall.
4. Cleaning is completed when there is no more dust on the cartridge.
5. Clean the cartridge seal surfaces with a damp, clean lint-free cloth and grease with a silicone lubricant (MANITOU reference: 479292).
6. Check visually the outer condition of the air filter and its mounts. Verify the condition of the hoses and their mounts also.

4.8.5 CHECK WHEEL NUT TORQUES

1. Check the condition of the tyres, to detect cuts, protuberances, wear, etc.
2. Check the torque load of the wheel nuts. Non compliance with this instruction can cause damage and rupture to the wheel bolts and distortion to the wheels.

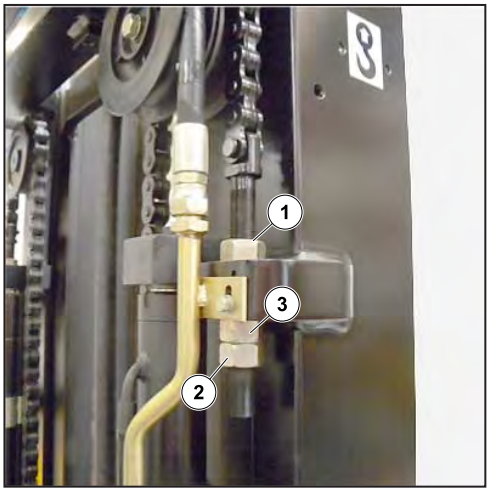
4.8.6 CHECK-ADJUST TENSION AND ALIGNMENT OF MAST LIFTING CHAINS

⚠ WARNING

These checks are important for the good working operation of the mast. In case of technical faults, consult your dealer.

Place the lift truck on level ground with the mast in a vertical position and the forks raised approximately 200 mm (7.87 in).

1. Visually check the state of the mast and the forks.
2. Check the alignment of the mast lifting chains between the carriage's chain fasteners and the chain rollers.
3. Manually verify the chain tension, if necessary adjust as following while ensuring that the carriage is perpendicular to the mast.
4. Loosen the nut (1).



5. Loosen the lock nut (2) of the chain tension adjuster.
6. Adjust the tension by tightening or loosening the nut 3 while checking the alignment of the lifting chains.
7. Then block the lock nut (2) and the nut (3).
8. Retighten the nut (1).

4.8.7 GREASE MAST

NOTICE

In the event of prolonged use in an extremely dusty or oxidising atmosphere, reduce this interval to 10 working hours or every day.

To be carried out weekly, if the lift truck has been operated for less than 50 hours during the week.

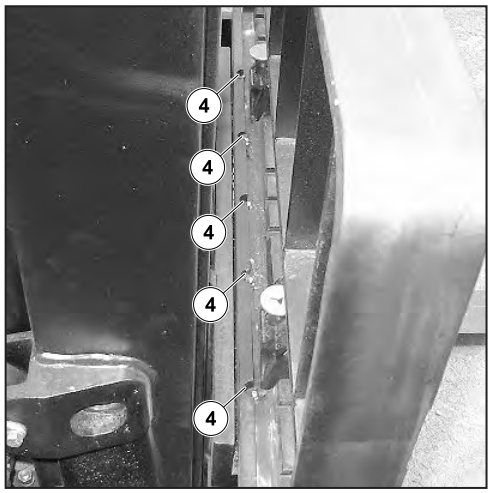
1. Clean and lubricate the following points with grease and remove the surplus of grease.

1.1. Lubricators of the hinge axles at the foot of the mast (2 lubricators).

1.2. Lubricators of the tilt cylinder head axles (4 lubricators).

1.3. Lubricators of the tilt cylinder foot axles (2 lubricators).

1.4. Lubricators of the side-shift carriage (5 lubricators).



4.8.8 CHECK WINDSCREEN WASHER LIQUID LEVEL (OPTION)

1. Remove the storage tray (1).

2. Visually check the level.

3. If necessary add windscreen washer liquid through filler port (2).

4.8.9 GREASE CAB DOOR (OPTION)

1. Clean and lubricate the points (1) (4 lubricators) with grease and remove the surplus of grease.

4.8.10 GREASE REAR AXLE

1. Clean and lubricate the following points with grease and remove the surplus of grease.

1.1. Swivel pin lubricators (6 lubricators).

1.2.Steering rod lubricators (4 lubricators).

1.3.Rear axle oscillation pin lubricators (2 lubricators).

4.9. 500 HOURS OF SERVICE OR 6 MONTHS

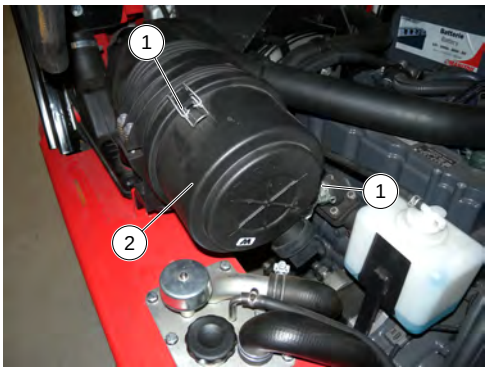
4.9.1 REPLACE DRY AIR FILTER CARTRIDGE

⚠ WARNING

Change the cartridge in a clean location, with the engine stopped. Never operate the lift truck with the air filter removed or damaged.

Pre-filtration cartridges are available for use in a heavily dust laden atmospheres. The cartridge checking and cleaning interval must also be reduced (to 250 hours in a heavily laden dust atmosphere and with pre-filtration).

1. Raise the engine cover.
2. Release the bolts (1) and remove cover (2).



3. Gently remove the cartridge (3), taking care to avoid spilling the dust.

4. Leave the safety cartridge in place.
5. The following parts must be cleaned with a damp, clean lint-free cloth.
   5.1.The inside of the filter and cover.
   5.2.The inside of the filter inlet hose.
   5.3.The gasket surfaces in the filter and in the cover.
6. Check pipes and connections between the air filter and the engine.
7. Before mounting check the state of the new cartridge.
8. Introduce the cartridge into the filter axis and push it in, pressing the edges and not the middle.
9. Refit the cover (2).

4.9.2 REPLACE ENGINE OIL

Place the lift truck on level ground, let the engine run at idle for a few minutes, then stop the engine.

1. Draining the oil

1.1. Raise the engine cover.

1.2. Place a container under drain plug (1) and unscrew the plug.

1.3. Remove filler cap (2) in order to ensure that the oil is drained properly.

Dispose of the drain oil in an ecological manner.

2. Replacement of the filter

2.1. Remove engine oil filter (3); discard the filter and the filter seal.

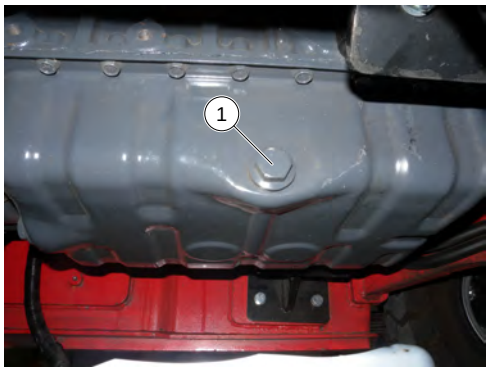
2.2. Clean the filter bracket with a clean, lint-free cloth.

2.3. Lightly grease the new oil filter seal and fit the new oil filter on the filter bracket.

Tighten the oil filter by hand pressure only and lock the filter in place by a quarter turn.

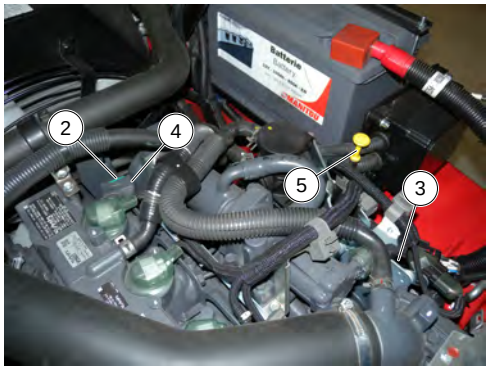
3. Filling up the oil

3.1. Refit and tighten drain plug (1).



3.2. Fill up with oil by filler port (4).

For this operation, we recommend you use a funnel fitted with a hose.



3.3. Wait a few minutes to allow the oil to flow into the sump.

3.4. Start the engine and let it run for a few minutes.

3.5. Check for possible leaks at the drain plug and the oil filter.

3.6. Stop the engine, wait a few minutes and check the level between the MAX and MIN marks on dipstick (5).

3.7. Top up the level if necessary.

4.9.3 DRAIN FUEL WATER TRAP

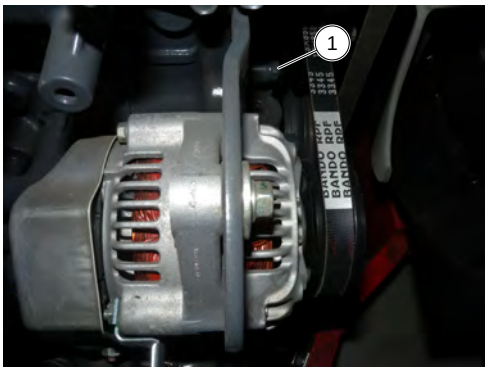
The water trap serves to stop the water contained in the fuel, it is incorporated within the fuel filter.

1. Raise the engine cover.
2. Place a container under the fuel filter.
3. Undo the valve located under the filter by two or three turns and operate the hand pump (2).
4. Retighten the valve.

4.9.4 ADJUST ALTERNATOR/FAN/ CRANKSHAFT BELT TENSION

1. Raise the engine cover.
2. Check the belt for signs of wear and cracks and change if necessary.
3. Under a pressure of 98 N (22 lbf) applied by the thumb, the tension should be between 10 & 12 mm (0.4 & 0.5 in).
4. Adjust if necessary.

5. Undo screws (1) by two to three thread turns.



6. Swivel the alternator assembly so as to obtain the belt tension required.
7. Re-tighten the screws (1).

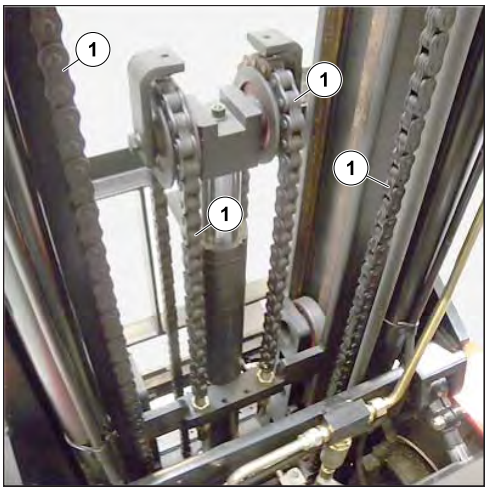
If the alternator belt has to be changed, check the tension again after the first 20 hours of operation.

4.9.5 GREASE MAST LIFTING CHAINS

⚠ WARNING

In case of technical faults, consult your dealer.

1. Wipe the mast lifting chains (1) with a clean, lint-free cloth, then examine them closely so as to detect any signs of wear.



2. Vigorously brush the chains to get rid of any foreign matter, with a hard nylon brush and clean diesel fuel.
3. Rinse the chains by means of a paint brush impregnated with clean diesel fuel and dry them with a compressed air jet.
4. Moderately lubricate the chains.

4.10. 1000 HOURS OF SERVICE OR 1 YEAR

4.10.1 REPLACE FUEL FILTER

1. Raise the engine cover.
2. Carefully clean the outside of the filter and its holder, to prevent dust from getting into the system.
3. Remove and empty the fuel filter (1).

4. Discard the fuel filter cartridge and its seals.
5. Clean the inside of the filter head using a brush immersed in clean diesel oil.
6. Refit the assembly with a new cartridge and new seals.

4.10.2 REPLACE FUEL PREFILTER

1. Carefully clean the outside of the filter and its holder, to prevent dust from getting into the system.
2. Remove and empty the fuel filter (1).

3. Unscrew the fuel water trap.

4. Discard the fuel filter cartridge and its seals.
5. Clean the inside of the filter head using a brush immersed in clean diesel oil.
6. Refit the assembly with a new cartridge and new seals.
7. Pressurize the circuit by means of the hand pump (2).
8. If necessary, bleed the fuel system.

4.10.3 REPLACE SAFETY DRY AIR CARTRIDGE

1. Remove the dry air filter cartridge.
2. Gently remove the dry air filter safety cartridge (1), taking care to avoid spilling the dust.

3. Clean the gasket surface on the filter with a damp, clean lint-free cloth.
4. Check the condition of the new safety cartridge before fitting.
5. Introduce the cartridge into the filter axis and push it in, pressing the edges and not the middle.

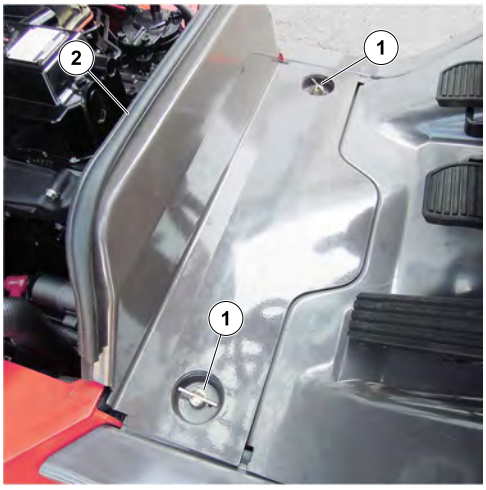
The safety cartridge replacement frequency is given for information only. It must be changed every second time the dry air filter cartridge is changed.

4.9.1 *Replace dry air filter cartridge*, page 83

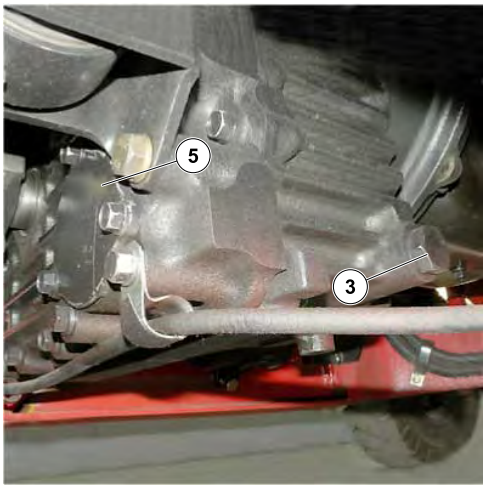
4.10.4 REPLACE TRANSMISSION OIL

Place the lift truck on level ground with the engine stopped.

1. Raise the engine cover.
2. Remove the floor mat.
3. Undo the screws (1) to remove the floor (2).



4. Draining the oil
   4.1. Place a container under drain plug (3) and unscrew the plug.

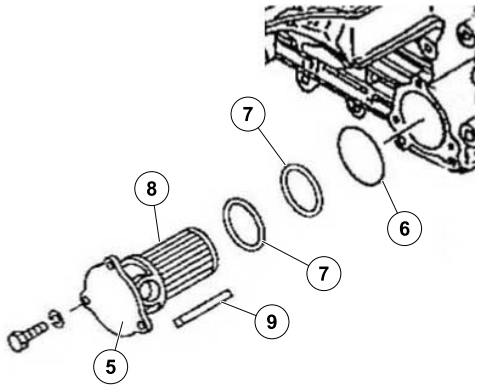


4.2. Remove filler plug (4) in order to ensure that the oil is drained properly.

Dispose of the drain oil in an ecological manner.

5. Cleaning the metal oil filter

5.1. Remove the plate (5) and set aside the O-ring joint (6) and the thrust washers (7).



5.2. Allow the rest of the oil to drain away.

5.3. Clean the metal filter (8) with a compressed air jet.

5.4. Clean the magnetic part (9).

5.5. Reassemble the unit.

6. Filling up the oil

6.1. Refit and tighten drain plug (3).

6.2. Fill up with oil through filler port (10).

For this operation, we recommend you use a funnel fitted with a hose.

6.3. Wait a few minutes to allow the oil to flow into the sump.

6.4. Start the engine and let it run for a few minutes.

6.5. Check for any possible leaks from the oil filter drain plug.

6.6. Stop the engine, wait a few minutes and check the level between the MAX and MIN marks on dipstick (11).

6.7. Top up the level if necessary.

4.10.5 REPLACE HYDRAULIC OIL

NOTICE

Before any intervention, thoroughly clean the area surrounding the drain plugs and the plate on the hydraulic tank.

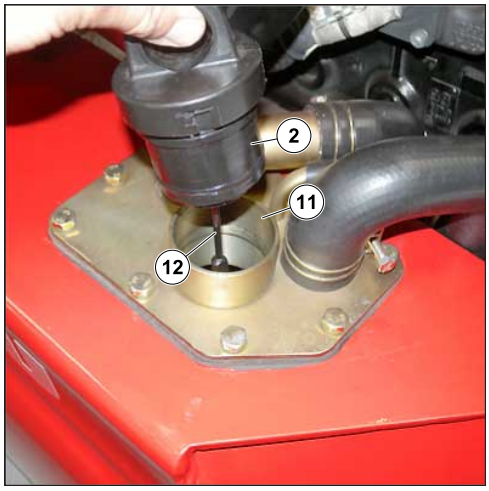
Place the lift truck on level ground with the engine stopped, and the mast lowered as far as possible.

1. Draining the oil

1.1.Place a container under drain plug (1) and unscrew the plug.

1.2.Remove filler plug (2) in order to ensure that the oil is drained properly.

Dispose of the drain oil in an ecological manner.



2. Cleaning of filter plug

2.1.Remove the filler plug cover (3) by twisting through a quarter turn.

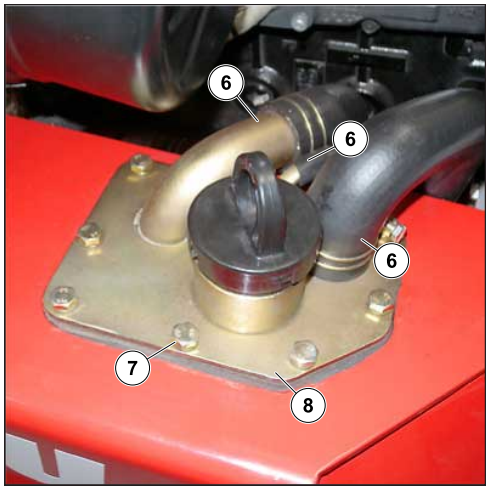
2.2.Remove and clean the filter (4) .

2.3.Clean the filter holder (5) .

2.4.Put the filter and the cover back in place on the holder.

3. Cleaning the strainer

3.1.Disconnect the hoses (6).



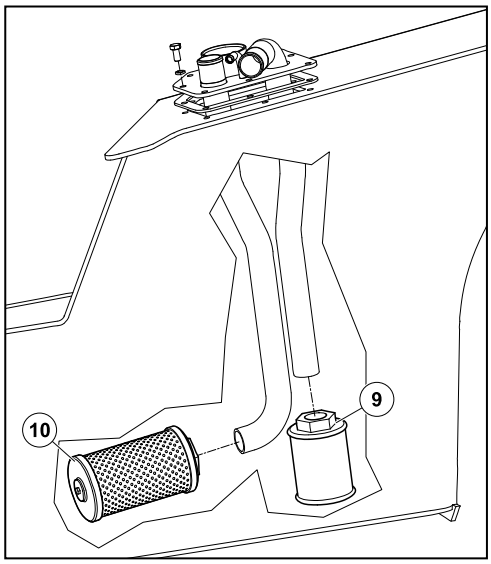
3.2.Undo the screws (7) and remove the holder (8).

3.3.Unscrew suction strainer (9) , clean it using a compressed air jet, check its condition and replace it, if necessary.

3.4.Refit the suction strainer.

4. Replacement of the oil filter

4.1. Unscrew the hydraulic return oil filter (10) and replace with a new one.



4.2. Refit the access panel (8).

4.3. Re-connect the hoses (6).

5. Filling up the oil

5.1. Clean and refit drain plug (1) (tightening torque 29 to 39 N.m (21.39 to 28.76 ft-lb).

5.2. Fill up with oil through filler port (11).

Use a clean container and funnel and clean the underside of the oil drum before filling.

5.3. Check the oil level on the dipstick (12).

5.4. Check for any possible leaks at the drain plug.

6. Hydraulic circuit decontamination

6.1. Let the engine run (accelerator pedal at halfway travel) for 5 minutes without using anything on the lift truck, then for 5 more minutes while using completely the hydraulic movements (except the steering system).

6.2. Accelerate the engine at full speed for 1 minute, then activate the steering system.

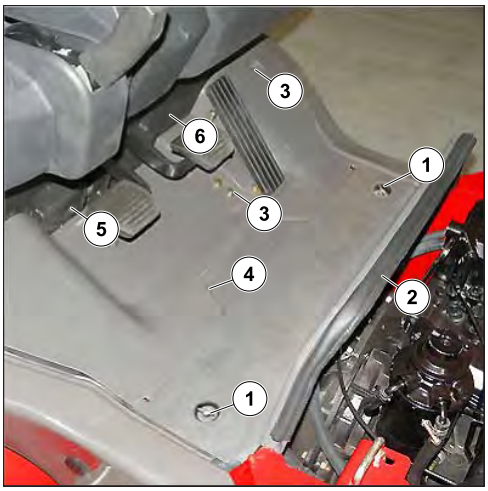
6.3. This operation makes a pollution abatement of the circuit possible through the hydraulic return oil filter.

4.10.6 GREASE BRAKE PEDAL AXLES

⚠ WARNING

In the event of prolonged use in an extremely dusty or oxidizing atmosphere, reduce this interval to 500 hours of service or every year. In case of technical faults, consult your dealer.

1. Raise the engine cover.
2. Remove the floor mat.
3. Undo the screws (1) to remove the floor (2) .



4. Unscrew screws (3) to remove the floor (4) .
5. Unscrew screws (5) to remove the casing (6) .
6. Clean, then lubricate the lubricator (7) located at the end of the brake pedal axle and remove any excess grease.

4.10.7 CHECK SEAT BELT

⚠ DANGER

If the seat belt is defective (fixing, locking, cuts, tears, etc.), the lift truck must not be used. Repair or replace the seat belt immediately.

1. Check fixing of the anchoring points on the seat.
2. Check cleanness of the strap and the locking mechanism.
3. Check triggering of the locking mechanism.
4. Check condition of the strap (cuts, curled edges).
5. Check the correct winding of the belt. (Reeled seat belt with two anchoring points)
6. Check condition of the reel guards. (Reeled seat belt with two anchoring points)
7. Check roller locking mechanism when the strap is given a sharp tug. (Reeled seat belt with two anchoring points)

After an accident, replace the seat belt.

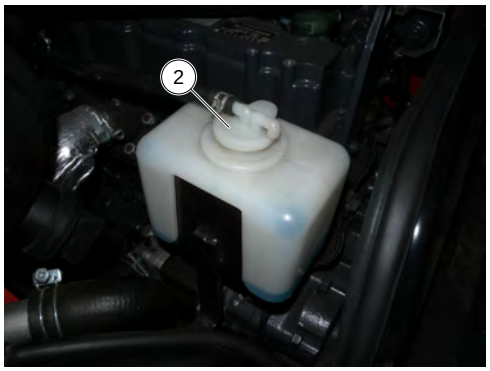
4.11. 2000 HOURS OF SERVICE OR 2 YEARS

4.11.1 REPLACE COOLING FLUID

These operations are to be carried out if necessary or every two years at the beginning of winter. Place the lift truck on level ground with the engine stopped and cold.

1. Draining the liquid
   1.1. Raise the engine cover.
   1.2. Open radiator drain valve (1).

   1.3. Undo engine block drain plug.
   1.4. Remove expansion tank filling plug (2) and empty the tank.



   1.5. Remove radiator filler cap (3).

   1.6. Let the cooling circuit drain entirely while ensuring that the ports do not get clogged.
   1.7. Check the condition of the hoses as well as the fastening devices and change the hoses if necessary.
   1.8. Rinse the circuit with clean water and use a cleaning agent if necessary.
2. Filling the liquid
   2.1. Close radiator drain valve (1).
   2.2. Retighten engine block drain plug.
   2.3. Slowly fill the circuit with the cooling fluid through the filler port .
   2.4. Fill the expansion tank to the maximum level through the filler port.
   2.5. Run the engine at idle for a few minutes.
   2.6. Check for any possible leaks.
   2.7. Check the level and refill if necessary.
   2.8. Refit expansion tank filler plug (3).

2.9.Refit expansion tank filler plug (2).

The engine does not contain any corrosion resistor and must be filled during the whole year with a mixture containing 25% of ethylene glycol-based antifreeze.

4.11.2 CLEAN FUEL TANK

⚠ DANGER

While carrying out these operations, do not smoke or work near a flame.

⚠ DANGER

Never try to carry out a weld or any other operation by yourself, this could provoke an explosion or a fire.

Place the lift truck on level ground with the engine stopped.

1. Inspect the parts susceptible to leaks in the fuel circuit and in the tank.
2. In the event of a leak, contact your dealer.
3. Place a container under drain plug (1) and unscrew the plug.

4. Remove filling plug (2) in order to ensure that the fuel is drained properly.

5. Rinse out with ten litres of clean diesel through the filler port.
6. Refit and tighten the drain plug (tightening torque 29 to 39N.m).
7. Fill the fuel tank with clean diesel filtered through the filling port.
8. Refit the filler plug.
9. If necessary, bleed the fuel system.

4.11.3 DRAIN DIFFERENTIAL OIL

Place the lift truck on level ground with the engine stopped and the oil still warm.

Dispose of the drain oil in an ecological manner.

1. Place a container under drain plug (1) and unscrew the plug.

2. Remove level and filling plug (2) in order to ensure that the oil is drained properly.

3. Refit and tighten drain plug (1).
4. Fill up with oil through filling port (2).
5. The level is correct when the oil level is flush with the edge of the hole.
6. Check for any possible leaks at the drain plug.
7. Refit and tighten level and filling plug (2).

4.11.4 CHECK WHEEL NUTS TIGHTENING

1. Check the tightening torque of the wheel nuts with a torque wrench.

Table 60. Wheel nut tightening torques

Front wheels:	157-176 N. m (115.8-129.8 ft-lb)	MI 15 D/ MI 18 D
	441-588 N. m (325.28-433.7 ft-lb)	MI 20 D / MI 25 D / MI 30 D / MI 35 D
Rear wheels:	157-176 N. m (115.8-129.8 ft-lb)	

4.12. OCASSIONAL MAINTENANCE

4.12.1 REPLACE WHEEL

⚠ DANGER

In the event of a wheel being changed on the public highway, make sure of the following points:

1. Stop the lift truck, if possible on even and hard ground.
2. Shut-down the lift truck.
3. Switch on the hazard warning lights (option).
4. Immobilize the lift truck in both directions on the axle opposite to the wheel to be changed.
5. Loosen the nuts of the wheel to be changed until they can be easily removed.
6. Replace rear wheel

For this operation, we advise you to use the hydraulic jack (MANITOU Part number 505507).

6.1. Place the jack under the counterweight. It must be situated in the middle and under the flat part of the counterweight.

6.2. Lift the wheel until it lifts off the ground and fit security wedges under the rear axle.

6.3. Completely unscrew the wheel nuts and remove them.

6.4. Free the wheel by reciprocating movements and roll it to the side.

6.5. Slip the new wheel on the wheel hub.

6.6. Refit the nuts by hand, if necessary grease them.

6.7. Remove the security wedges and lower the lift truck with the jack.

6.8. Tighten the wheel nuts with a torque wrench.

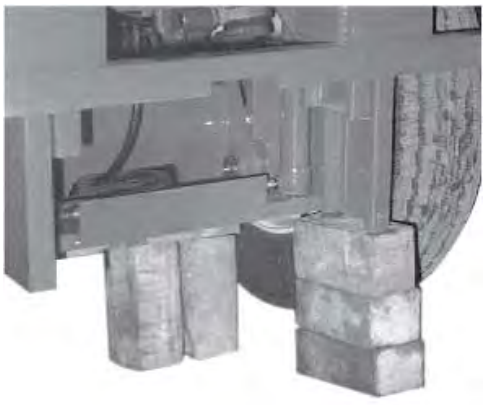
7. Replace front wheel

7.1. Lift the carriage and tilt the mast backwards.

7.2. Put wedges under the foot of the mast on the side of the wheel to be changed.

7.3. Tilt the mast forwards to lift the wheel.

7.4. Place wedges under the chassis as near as possible to the wheel.



7.5. Completely unscrew the wheel nuts and remove them.

7.6. Free the wheel by reciprocating movements and roll it to the side.

7.7. Slip the new wheel on the wheel hub.

7.8. Refit the nuts by hand, if necessary grease them.

7.9. Remove the wedges under the axle and lower the lift truck.

7.10. Tighten the wheel nuts with a torque wrench.

4.13. OCCASIONAL OPERATION

4.13.1 WINCHING/TOWING THE MACHINE

NOTICE

Risk of excessive machine wear

While towing, steering and hydraulic assistance are disabled.

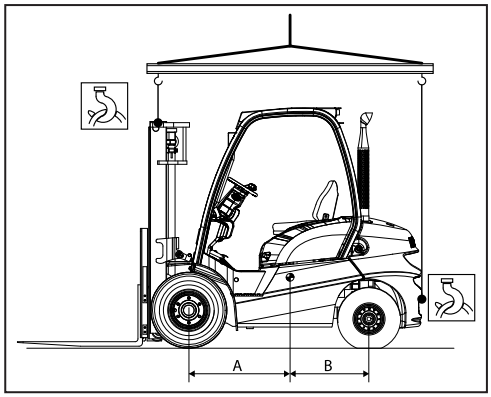
Do not tow the machine at more than 25 km/h.

Operate the steering wheel and pedal slowly avoiding sudden or jerky movements.

1. Place the gear selector in neutral position.
2. Release the parking brake.
3. Switch on the hazard warning lights.
4. Since there will be no steering or braking hydraulic assistance, operate the steering wheel and pedal slowly avoiding sudden or jerky movements.

4.13.2 LIFTING THE MACHINE - MI 20→35 D K ST5 S1

1. Take into account the position of the machine center of gravity when lifting.



Machine	A mm (in)	B mm (in)
MI 20 D K ST5 S1	-	-
MI 25 D K ST5 S1	-	-

Machine	A mm (in)	B mm (in)
MI 30 D K ST5 S1	-	-
MI 35 D K ST5 S1	-	-

2. Place the hooks in the fastening points provided and around the uprights of the guard.

5. REFERENCES & ATTACHMENTS

5.1. REFERENCES

5.1.1 LUBRICANTS & FUEL - MI 20→35 D K ST5 S1

Recommended lubricants and fluids

NOTICE

Use the recommanded lubricants and fuel:

For topping up, oils may not be miscible.

For oil changes, MANITOU oils are perfectly appropriate.

Diagnostic analysis of oils

If a service or maintenance contract has been set up with the dealer, a diagnostic analysis of engine, transmission and axle oils may be requested depending on the rate of use.

Recommended fuel specification:

Use a high-quality fuel to obtain optimal performance of the engine.

- Type of diesel fuel EN590
- Type of diesel fuel ASTM D975.

Machine oils and lubricants

Table 61. Engine

Description	*Capacity*	*Recommendation*	*Temperature range*
Engine	10,2 Litres (10.78 quarts)	MANITOU EVOLOGY 10W40 API CJ4	
Cooling circuit	11 Litres (11.62 quarts)	Cooling fluid (protection - 25°)	-25 °C / +55 °C (-13 °F / 131 °F)
		Cooling fluid (protection - 35°)	-35 °C / +55 °C (-31 °F / 131 °F)
Fuel tank	60 litres (15.9 gallons)	Diesel fuel (*)	-20 °C / +55 °C (-4 °F / 131 °F)

Table 62. Mast

Description	Recommendation	Temperature range
Mast lifting chains	MANITOU Lubricant Chain special (aerosol)	-20 °C / +55 °C (-4 °F / 131 °F)
Greasing of the mast	MANITOU Grease BLACK multi-purpose	-20 °C / +55 °C (-4 °F / 131 °F)

Table 63. Hydraulics

Description	Capacity	Recommendation	Temperature range
Hydraulic oil tank	40 Litres (10.6 gallons) 50 Litres (13.2 gallons)	MANITOU Oil Hydraulic ISO VG 32	-25 °C / +20 °C (-13 °F / 68 °F)

Table 64. Transmission

Description	Capacity	Recommendation	Temperature range
Transmission	4 Litres (4.23 quarts)	MANITOU Oil DEXRON-III Automatic transmission	-25 °C / +50 °C (-13 °F / 122 °F)
Differential	6,5 Litres (6.87 quarts)	MANITOU Oil SAE80W90 Mechanical transmission	

Table 65. Brake

Description	Capacity	Recommendation	Temperature range
Brake system	1,5 Litres (4.59 quarts)	Brake fluid DOT3	

Table 66. Rear axle

Description	Recommendation	Temperature range
Swivel pins	MANITOU Grease BLUE multi-purpose	-25 °C / +55 °C (-13 °F / 131 °F)
Steering connecting rod		
Rear axle oscillation		
Rear wheel bearings		

Table 67. Cab

Description	Recommendation	Temperature range
Cab door	MANITOU Grease BLUE multi-purpose	-25 °C / +55 °C (-13 °F / 131 °F)
Windscreen washer tank	Windscreen washer liquid	-45 °C / +55 °C (-49 °F / 131 °F)

5.1.2 FILTER ELEMENTS & BELTS — MI 20→35 D K ST5 S1

Table 68. Periodicities of filters and belts

Description	❶ 500H	❷ 1000H	❸ 2000H
Engine oil filter		●	
Complete fuel filter			●
Complete oil filter		●	
Air filter cartridge		●	
Air filter cartridge	●		
Breather filter		●	
Complete hydraulic oil return filter			●
Strainer		●	
Alternator belt		●	

5.1.3 FUSES & RELAYS - MI 20→35 D K ST5 S1

To access fuses and relays,4.2. Opening the engine cover, page 70.

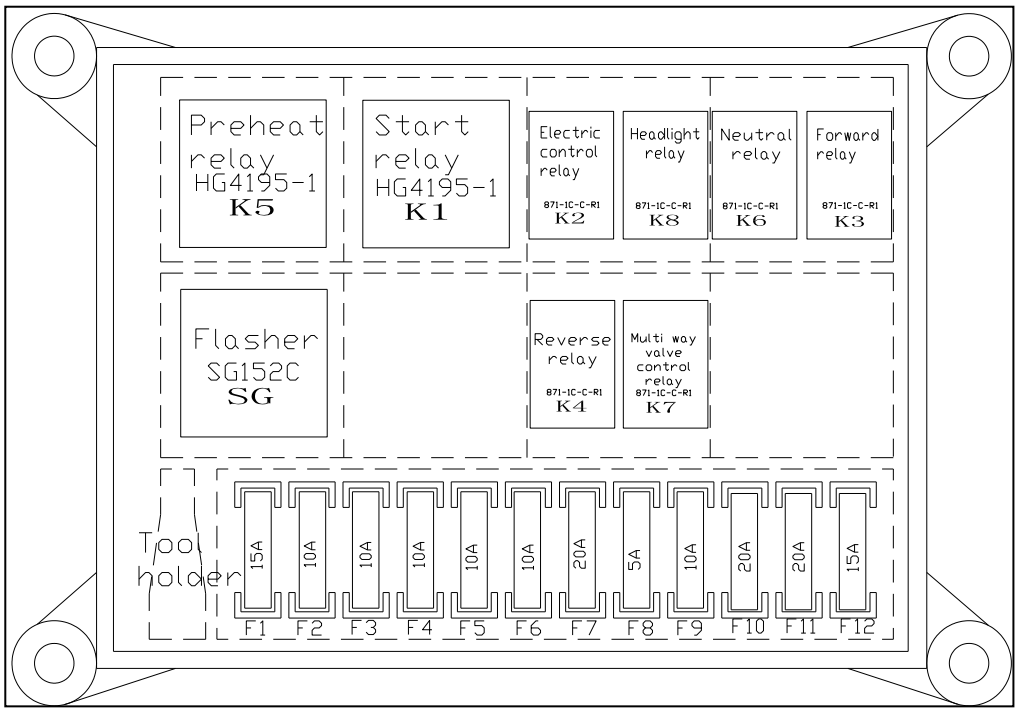


Figure 38: Fuses and relays placement (Lift truck before 2023–04–15)

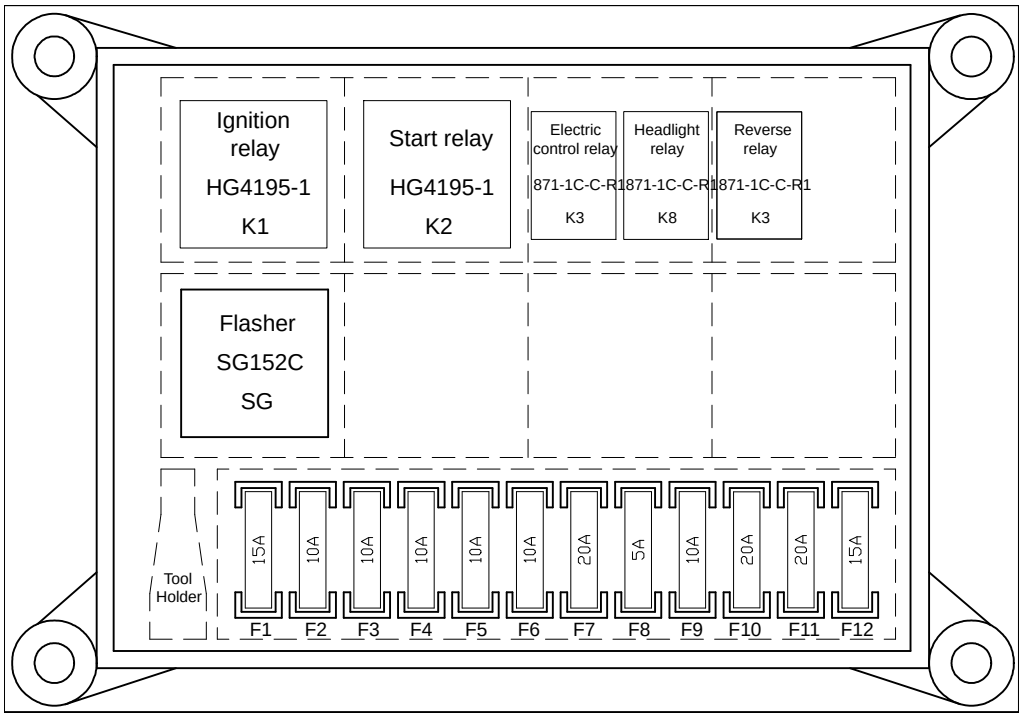


Figure 39: Fuses and relays placement (Lift truck after 2023–04–15)

Table 69. List of fuses - MI 20→35 D K ST5 S1

Fuse	Rating	Description
F1	15 A	Light switch (power supply)
F2	10 A	Horn power supply
F3	10 A	Brake light switch power supply
F4	10 A	OPS power supply
F5	10 A	Power supply of instrument and indicator light
F6	10 A	ECU starting power
F7	20 A	Control terminal of electric control relay
F8	5 A	ECU power R2
F9	10 A	Cab power 2
F10	20 A	Cab power 1
F11	20 A	Cab power 3
F12	15 A	OPS power B+
Y1	50 A	Electric control
Y2	50 A	Preheat

◁ 4.2. *Opening the engine cover*, page 70

◁ 4.1. *Maintenance components location - MI 20→35 D K ST5 S1*, page 68

5.2. OPTIONAL ADAPTABLE ATTACHMENTS FOR THE RANGE

5.2.1 USAGE AND INSTALLATION OF ATTACHMENT AND SAFETY RULES

Manitou will choose attachment that is in accordance with International standard ISO2328 (Forklift pothook fork and install size of carriage), such as clamp, rotator, paper roll clamp, carrying ram, side-shifter etc.

5.2.2 USE OF ATTACHMENT

1. Know well the content of nameplate on attachment, and read the instruction manual before use. (Especially the manual from professional attachment company) Before operating the attachment, people must be trained and obtain the qualification.
2. One must understand the basic capability and operating methods of attachment, especially the admitted load, lift height, size of cargo and adapted range of attachment.
3. Operate the multi-functional attachment, such as with side-shifter, clamp or rotator. It is not permitted to do two actions at one time. Operate one action and then do another one.
4. Forklift with attachment is not permitted to travel with the cargo at a high position. If the size of cargo

is too big, prohibit the truck to move on. When transporting the cargo, make sure that the distance of bottom of cargo is 300 mm off the ground and mast tilts backward.

5. The weight of cargo cannot exceed the limited value of combination load capacity of forklift and attachment. Partial load is not permitted at high position. It is a short time work for attachment with side-shifter. Partial load is around 100 mm (Above 5 ton, including 5 ton), the side-shifter shift level is about 150mm.
6. In the range of the projection forth 2 m of the lower of attachment and cargo, besides driver's position with overhead guard protection, it is not permitted to stand to avoid accidents.
7. Do not apply hard brake to the forklift with attachment during traveling. It is required to move slowly if with loads.
8. Protect attachment being impacted by outside force. Attachment is not permitted to be used in incorrect situation and work over the normal working scope.
9. When the attachment occurs to fail, prohibit the use without checking.

Do the following checks and maintenance frequently:

1. Do a check if the clearance between carriage beam and down attachment hook meets requirement of attachment manual.
2. Do a check if the upper hook is right in the flute of fork carriage.
3. Use the auto general lithium grease per 500 hours to bearing surface.
4. Do a check if the fastening pieces become flexible.
5. Do a check if each connector of hydraulic return line loosens or the tube damages. Never use before repairing the damage.
6. Do a check if the drive or turning component of attachment frays or blocks. Change the damaged part in time.
7. Under loading condition, do a check if each working element, working pressure and working condition of attachment is normal. If not, do a check of the hydraulic return line, and find out the leaked part. Change the sealing article or the whole return line.

5.2.3 ATTACHMENT ASSEMBLY

Warning

1. Without technology licensing of our company, any refit at safety and capability to attachment is strictly not permitted.
2. Actual rating load capacity must be the least of rated load capacity, the load capacity of attachment, colligate load capacity of truck. Generally, the colligate load capacity of truck is the least. Attachment load capacity is just a count value of attachment pressure.
3. Assembly must be reasonable, reliable and safe to avoid the attachment gliding around the carriage when using.
4. After hanging attachment, embed the rise catch block to the gap of top beam. Let the offset of centerline of attachment and carriage be less than 50 mm. Otherwise, it may affect the forklift lateral stability.
5. To this attachment with rotating function, such as paper roll clamp, bale clamp, multi-purpose clamp, drum clamp, it is necessary to weld chock block in the joint of carriage beam and attachment to prevent moving from side to side in the operation.
6. Assemble the attachment with below catch orientation. It is necessary to adjust the clearance between the below catch and beam of carriage.

5.3. ATTACHMENT SPECIFICATIONS

5.3.1 INTRODUCTION

Your lift truck must be used with interchangeable equipment. These items are called: ATTACHMENTS. A wide range of attachments, specially designed and perfectly suitable for your lift truck is available and guaranteed by MANITOU.

NOTICE

Only attachments approved by MANITOU are to be used on our lift trucks The manufacturer's liability will be denied in case of modification or of attachment adaptation carried out without his knowing it.

The attachments are delivered with a load chart concerning your lift truck. The operator's manual and the load chart should be kept in the places provided in the lift truck. For standard attachments, their use is governed by the instructions contained on this notice.

⚠ WARNING

Maximum loads are defined by the capacity of a lift truck taking account of the attachment's mass and centre of gravity. In the event of the attachment having less capacity than the lift truck, never exceed this limit. All attachments with a suspended load (winch, crane jib, crane jib with winch, hook, etc.) MUST be used with a lift truck equipped with a hydraulic movement cut-out device. In this case, the movement cut-out must be switched on and the transverse attitude perfectly horizontal.

Some particular uses require the adaptation of the attachment which is not provided in the price-listed options. Optional solutions exist, consult your dealer.

5.3.2 TECHNICAL SPECIFICATIONS OF ATTACHMENTS

- *: Double Mast With All-Round Vision (DVT)
- **: Double Mast With Total Free-Acting Lift (DLL)
- ***: Triple Mast With Free-Acting Lift (TLL)

Standardized side-shift carriage for MI 20/ 25 D K ST5 S1

Table 70. Standardized side-shift carriage for MI 20/25 D K ST5 S1

	*HC 20/25 **	*HC 20/25 ***	*HC 20/25 ****	
Part Number	-	-	-	
Rated capacity	2500 kg (5510 lb)	2500 kg (5510 lb)	2500 kg (5510 lb)	
Side-shift	2 x 100 mm (3.9 in)	2 x 100 mm (3.9 in)	2 x 100 mm (3.9 in)	
Width	988 mm (3-2.9 ft-in)	988 mm (3-2.9 ft-in)	988 mm (3-2.9 ft-in)	
Weight	44 kg (97 lb)	44 kg (97 lb)	44 kg (97 lb)	

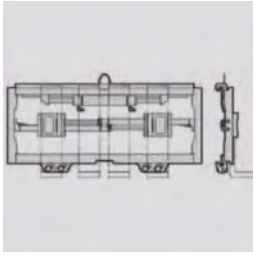
Standardized side-shift carriage for MI 30/ 35 D K ST5 S1

Table 71. Standardized side-shift carriage for MI 30/35 D K ST5 S1

	*HC 30/35 **	*HC 30/35 ***	*HC 30/35 ****	
Part Number	-	-	-	
Rated capacity	3500 kg (7714 lb)	3500 kg (7714 lb)	3500 kg (7714 lb)	
Side-shift	2 x 100 mm (3.9 in)	2 x 100 mm (3.9 in)	2 x 100 mm (3.9 in)	
Width	1050 mm (3-5.3 ft-in)	1050 mm (3-5.3 ft-in)	1050 mm (3-5.3 ft-in)	
Weight	68 kg (149.9 lb)	68 kg (149.9 lb)	68 kg (149.9 lb)	

Fork positioner with side-shift for MI 20/25 D K ST5 S1

Table 72. Fork positioner with side-shift for MI 20/25 D K ST5 S1

	*55K-FPS-A253 **	*55K-FPS-A253 ***	*55K-FPS-A253 ****	
Part Number	916212	916213	916214	
Rated capacity	2500 kg (5510 lb)	2500 kg (5510 lb)	2500 kg (5510 lb)	
Side-shift	2 x 100 mm (3.9 in)	2 x 100 mm (3.9 in)	2 x 100 mm (3.9 in)	
Spacing	50 - 912 mm (2 in - 2-11.9 ft-in)	50 - 912 mm (2 in - 2-11.9 ft-in)	50 - 912 mm (2 in - 2-11.9 ft-in)	
Width	1040 mm (3-4.9 ft-in)	1040 mm (3-4.9 ft-in)	1040 mm (3-4.9 ft-in)	
Weight	66 kg (145.5 lb)	66 kg (145.5 lb)	66 kg (145.5 lb)	

Fork positioner with side-shift for MI 30/35 D K ST5 S1

Table 73. Fork positioner with side-shift for MI 30/35 D K ST5 S1

	65K-FPS-B198 *	***65K-FPS-B198 *****	***65K-FPS-B198 ******	
Part Number	916215	916216	916217	
Rated capacity	3500 kg (7714 lb)	3500 kg (7714 lb)	3500 kg (7714 lb)	
Side-shift	2 x 100 mm (3.9 in)	2 x 100 mm (3.9 in)	2 x 100 mm (3.9 in)	
Spacing	50 - 975 mm (2 in - 3-2.4 ft-in)	50 - 975 mm (2 in - 3-2.4 ft-in)	50 - 975 mm (2 in - 3-2.4 ft-in)	
Width	1038 mm (3-4.9 ft-in)	1038 mm (3-4.9 ft-in)	1038 mm (3-4.9 ft-in)	
Weight	82 kg (180.7 lb)	82 kg (180.7 lb)	82 kg (180.7 lb)	

Standardized fork for MI 20/25 D K ST5 S1

Table 74. Standardized fork for MI 20/25 D K ST5 S1

Part Number	***916183***	
Section	122x40x1150 mm (4.8x1.6x45.28 in)	
Weight	58 kg (127.8 lb)	

Standardized fork for MI 30 D K ST5 S1

Table 75. Standardized fork for MI 30 D K ST5 S1

Part Number	***916184***	
Section	125x45x1150 mm (4.9x1.8x45.28 in)	
Weight	71 kg (156.5 lb)	

Standardized fork for MI 35 D K ST5 S1

Table 76. Standardized fork for MI 35 D K ST5 S1

Part Number	916185	
Section	125x45x1150 mm (4.9x1.8x45.28 in)	
Weight	80 kg (176.3 lb)	

Load back rest for MI 20→35 D K ST5 S1

Table 77. Load back rest for MI 20→35 D K ST5 S1

Part Number	916197	916198	916199	
Width	1000 mm (3-3.4 ft-in)	1038 mm (3-4.9 ft-in)	1100 mm (3-3.7 ft-in)	
Weight	-	-	-	

Fork protector for MI 20→35 D K ST5 S1

Table 78. Fork protector for MI 20→35 D K ST5 S1

Part Number	227801	
		

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