



648860 EN/US/AU (20/05/2019)

MHT-X 1490 129M ST3A S1
MHT 1490 129M ST4 S1
MHT-X 10130 129M ST3A S1
MHT 10130 129M ST4 S1

OPERATOR'S MANUAL
(ORIGINAL INSTRUCTIONS)



IMPORTANT

Carefully read and understand this instruction manual before using the lift truck.

It contains all information relating to operation, handling and lift truck equipment, as well as important recommendations to be followed.

This document also contains precautions for use, as well as information on the servicing and routine maintenance required to ensure the lift truck's continued safety of use and reliability.

WHENEVER YOU SEE THIS SYMBOL IT MEANS:



WARNING ! BE CAREFUL ! YOUR SAFETY OR THE SAFETY OF THE LIFT TRUCK IS AT RISK.

- This manual has been produced on the basis of the equipment list and the technical characteristics given at the time of its design.
- The level of equipment of the lift truck depends on the options chosen and the country of sale.
- According to the lift truck options and the date of sale, certain items of equipment/functions described herein may not be available.
- Descriptions and figures are non binding.
- MANITOU reserves the right to change its models and their equipment without being required to update this manual.
- The MANITOU network, consisting exclusively of qualified professionals, is at your disposal to answer all your questions.
- This manual is an integral part of the lift truck.
- It is to be kept in its storage space at all times for ease of reference.
- Hand this manual to the new owner if the lift truck is resold.

CALIFORNIA PROPOSITION 65 WARNINGS

 **WARNING**

This product can expose you to lead which is known to the State of California to cause cancer and birth defects or other reproductive harm.

For more information go to www.P65Warnings.ca.gov

 **WARNING**

Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

- Always start and operate the engine in a well-ventilated area.
- If in an enclosed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system.
- Do not idle the engine except as necessary.

For more information go to www.P65Warnings.ca.gov/diesel



SILICA DUST HAZARD

Exposure to crystalline silica (found in sand, soil and rocks) has been associated with silicosis, a debilitating and often fatal lung disease. Comply with all applicable rules and regulations for the workplace. Wear approved respiratory protection or use water spray or other means if there is no other way to control the dust.

A Silica rule "29 CFR 1929.1153" by the U.S. Occupational Safety and Health (OSHA) indicates a significant risk of chronic silicosis for workers exposed to inhaled crystalline silica over a working lifetime. Refer to the rule for more information regarding exposure limits and hazard prevention.



1st ISSUE	12/06/2015	
UPDATED	10/05/2016	
UPDATED	23/06/2016	0-1; 0-2; 0-3; 0-4; 0-5; 0-6; 0-7; 0-8; 2-11; 2-13; 2-14; 2-15; 2-16; 2-17; 2-18; 2-19; 2-20; 2-21; 2-29; 2-30; 2-48; 2-78; 2-81; 3-6; 3-7; 3-8; 3-10; 3-11; 4-5 @ 4-18; 5-1 @ 5-52.
	16/07/2018	Update Prop 65 0-2 @ 0-3

Manitou BF S.A Limited liability company with a Board of Directors.
 Head office: 430, Rue de l'Aubinière - 44150 Ancenis - FRANCE
 Share capital: 39,548,949 euros
 857 802 508 RCS Nantes.
 Tel: +33 (0)2 40 09 10 11
 www.manitou.com

This manual is for information purposes only. Any reproduction, copy, representation, recording, transfer, distribution, or other, in part or in whole, in any format is prohibited. The plans, designs, views, commentaries and instructions, even the document organization that are found in this document, are the intellectual property of MANITOU BF. Any violation of the aforementioned may lead to civil and criminal prosecution. The logos as well as the visual identity of the company are the property of MANITOU BF and may not be used without express and formal authorization. All rights are reserved.

1 - INSTRUCTIONS ET CONSIGNES DE SÉCURITÉ

2 - DESCRIPTION

3 - MAINTENANCE

4 - ACCESSOIRES ADAPTABLES EN OPTION SUR LA GAMME

5 - LOAD CHARTS FOR INTERCHANGEABLE EQUIPMENT





MHT 10130 129M ST4 S1
MHT-X 10130 129M ST3A S1

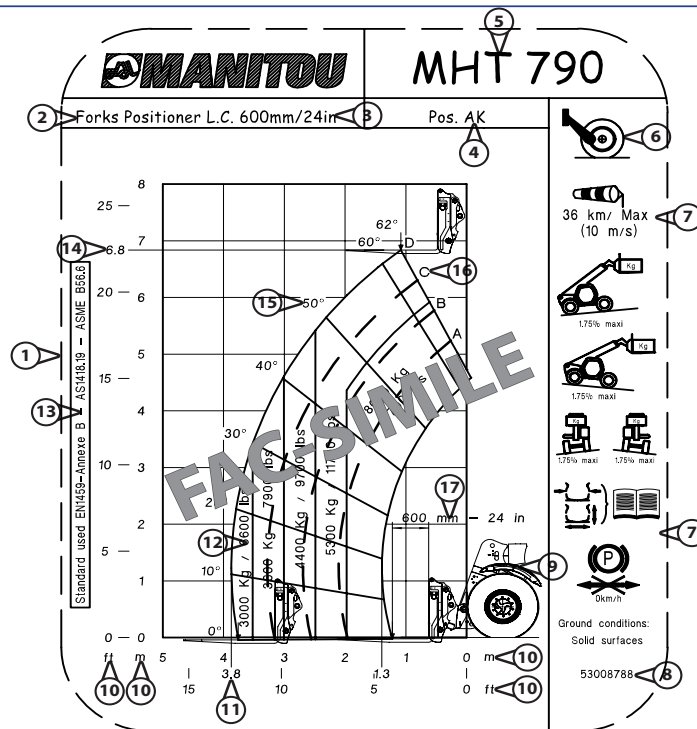


LEGEND OF SIGNS AND SYMBOLS

OVERVIEW:

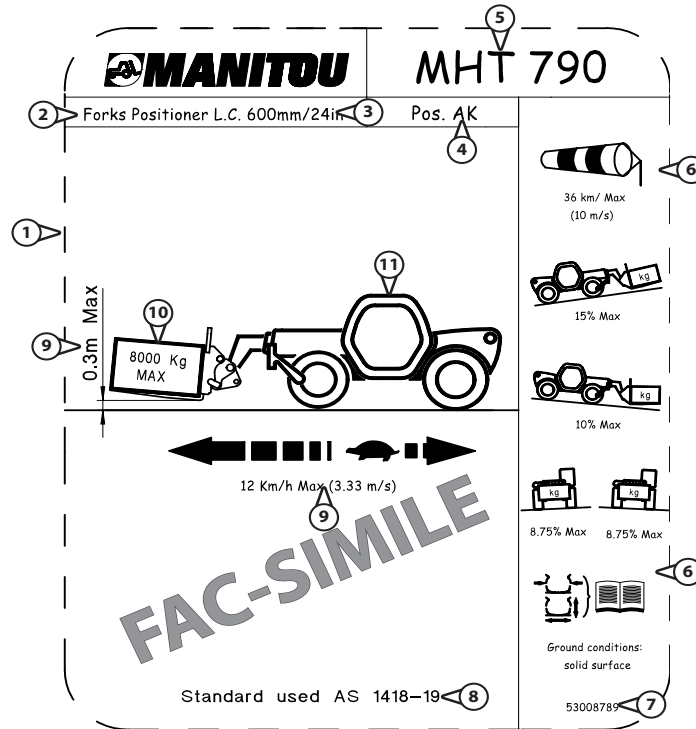
	Warning ! be careful ! your safety or the safety of the lift truck is at risk.
	See image 2-48
	For more details: see paragraph "Switches"

ATTACHMENT LOAD TABLE

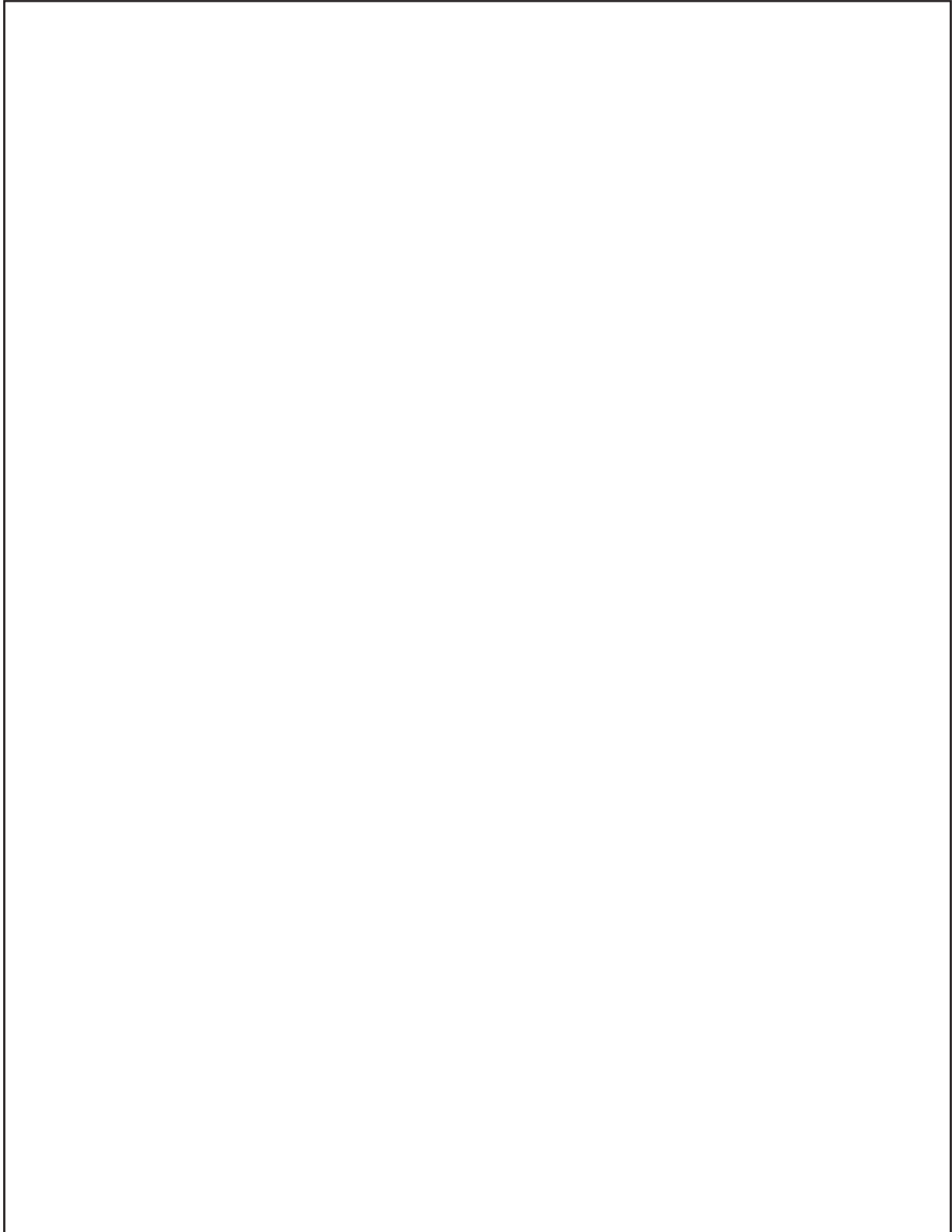


Reference	Indication (example)	Example
1	load table	
2	machine type	Forks Positioner
3	load centre	L.C.600mm/24in
4	alphanumeric code which identifies the type of attachment in use (Optional)	Pos. AK
5	machine model	MHT 790
6	machine in working configuration: on front tyres, on tyres and turret rotated, on stabilisers (Depending on the model machine)	
7	working conditions	
8	load table code	53008788
9	indicative drawing of the machine	
10	metric system [unit of length (m) and unit of weight (kg)] or imperial system [unit of length (ft) and unit of weight (lb)]	
11	maximum length extension of the telescopic boom	3.8 m
12	load capacity range of the machine	3000kg/6000lbs, 3600kg/7900lbs, 4400kg/9700lbs, 5300kg/11700lbs, 8000kg/17700lbs
13	capacity table according to standards in force in the destination country	EN1459-ANNEXE B - AS1418.19 - ASME B56.6
14	maximum lift height of the telescopic boom	6.8 m
15	angle of the boom	0°, 10°, 20°, 30°, 40°, 50°, 60°, 62°
16	length of the boom (Optional)	A, B, C, D
17	load centre	600 mm - 24in

ATTACHMENT PICK AND CARRY TABLE



Reference	Indication (example)	Example
1	load chart	Pick and Carry
2	type of attachment	Forks Positioner
3	load center	L.C.600mm/24in
4	alphanumeric code which identifies the type of attachment in use (Optional)	Pos. AK
5	machine model	MHT 790
6	working conditions	
7	load table code	53008789
8	capacity table according to standards in force in the destination country	AS 1418.19
9	metric system [unit of length (m) and unit of weight (kg)] or imperial system [unit of length (ft) and unit of weight (lb)]	
10	maximum load capacity of the attachment in use	8000 kg
11	indicative drawing of the machine	





1 - OPERATING AND SAFETY INSTRUCTIONS



TABLE DES MATIÈRES

1 - OPERATING AND SAFETY INSTRUCTIONS

INSTRUCTIONS TO THE COMPANY MANAGER	4
THE SITE	4
THE OPERATOR	4
THE LIFT TRUCK	4
A - THE TRUCK'S SUITABILITY FOR THE JOB	4
B - ADAPTATION OF THE LIFT TRUCK TO STANDARD ENVIRONMENTAL CONDITIONS	4
C - MODIFICATION OF THE LIFT TRUCK	5
D - FRENCH ROAD TRAFFIC RULES.	5
E - LIFT TRUCK CAB PROTECTION.	5
THE INSTRUCTIONS	5
THE MAINTENANCE	5
INSTRUCTIONS FOR THE OPERATOR	6
PREAMBLE	6
GENERAL INSTRUCTIONS	6
A - OPERATOR'S MANUAL	6
B - AUTHORISATION FOR USE IN FRANCE	6
C - MAINTENANCE	6
D - MODIFICATION OF THE LIFT TRUCK	6
E - LIFTING PEOPLE	7
OPERATING INSTRUCTIONS UNLADEN AND LADEN	7
A - BEFORE STARTING THE LIFT TRUCK	7
B - DRIVER'S OPERATING INSTRUCTIONS.	7
C - ENVIRONMENT	7
D - VISIBILITY	8
E - STARTING THE LIFT TRUCK.	9
F - DRIVING THE LIFT TRUCK.	9
G - STOPPING THE LIFT TRUCK	10
H - DRIVING THE LIFT TRUCK ON THE PUBLIC HIGHWAY	11
D - TRANSVERSE ATTITUDE OF THE LIFT TRUCK.	13
E - TAKING UP A LOAD ON THE GROUND.	13
F - TAKING UP AND LAYING A HIGH LOAD ON TYRES	14
G - TAKING UP AND LAYING A HIGH LOAD ON STABILIZERS.	16
H - TAKING UP AND LAYING DOWN A SUSPENDED LOAD	18
I - TRAVELLING WITH A SUSPENDED LOAD.	18
PLATFORM OPERATING INSTRUCTIONS	19
A - AUTHORISATION FOR USE.	19
B - LIFT TRUCK SUITABILITY FOR USE	19
C - PRECAUTIONS WHEN USING THE PLATFORM	19
D - USING THE PLATFORM	19
E - ENVIRONMENT	19
F - MAINTENANCE	20
INSTRUCTIONS FOR USING THE RADIO-CONTROL	21
CONFORMITY	21
RADIO LINK	21
FREQUENCIES.	21
SAFETY FUNCTIONS	21
WARNINGS	22
GENERAL OPERATING INSTRUCTIONS.	23



<i>LIFT TRUCK MAINTENANCE INSTRUCTIONS</i>	25
GENERAL INSTRUCTIONS	25
PLACING THE JIB SAFETY WEDGE	25
FITTING THE WEDGE.	25
REMOVING THE WEDGE	25
MAINTENANCE	25
MAINTENANCE LOGBOOK.	25
LUBRICANT AND FUEL LEVELS	26
HYDRAULIC	26
ELECTRICITY	26
WELDING	26
WASHING THE LIFT TRUCK	26
TRANSPORTING THE LIFT TRUCK	26
<i>IF THE LIFT TRUCK IS NOT TO BE USED FOR A LONG TIME</i>	27
INTRODUCTION	27
PREPARING THE LIFT TRUCK	27
PROTECTING THE ENGINE	27
PROTECTING THE LIFT TRUCK	27
BRINGING THE LIFT TRUCK BACK INTO SERVICE	28
<i>LIFT TRUCK DISPOSAL</i>	29
RECYCLING OF MATERIALS	29
METALS.	29
PLASTICS.	29
RUBBER.	29
GLASS.	29
ENVIRONMENTAL PROTECTION	29
WORN OR DAMAGED PARTS	29
USED OIL.	29
USED BATTERIES	29



INSTRUCTIONS TO THE COMPANY MANAGER

THE SITE

Proper management of lift truck's area of travel will reduce the risk of accidents:

- ground not unnecessarily uneven or obstructed,
- no excessive slopes,
- pedestrian traffic controlled, etc.

THE OPERATOR

- 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.



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, are strictly forbidden.

- *The foreseeable abnormal behaviour 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.*
 - *Behaviour resulting from application of the "principle of least effort" when performing a task.*
 - *For certain machines, the foreseeable behaviour of such persons 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.*

THE LIFT TRUCK

A - 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 **EN 1459** for variable range 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).

B - 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, light at the jib head, etc. (according to the lift truck model).
- The operator must take into account the operating conditions to define the lift truck's signalling and lighting equipment. Contact your dealer.
- Take into account climatic and atmospheric conditions of the site of utilisation.
 - Protection against frost (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL).
 - Adaptation of lubricants (ask your dealer for information).
 - Engine filtration (see: 3 - MAINTENANCE: FILTERS CARTRIDGES AND BELTS).



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.

- A lift truck operating in an area without fire extinguishing equipment must be equipped with an individual extinguisher. There are solutions, consult your dealer.



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

It is prohibited to use the lift truck in areas where there is a risk of fire or which are potentially explosive

(e.g. Refineries, fuel or gas depots, stores of flammable products, etc.).

For use in these areas, specific equipment is available (ask your dealer for information).

- Our trucks comply with Directive 2004/108/EC concerning electromagnetic compatibility (EMC), and with the corresponding harmonized 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 recognized 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 tires 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.



C - 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.

D - FRENCH ROAD TRAFFIC RULES

(or see current legislation in other countries)

- Only one certificate of conformity is issued. It must be kept in a safe place.
- The driving of non EC type-approved tractors 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 licence plate.
- The driving of EC type-approved tractors on the public highway is subject to the provisions of the highway code regarding agricultural tractors, defined in article R311-1 of the highway code. The lift truck must be registered.

SPECIAL INSTRUCTION APPLYING TO "EC TRACTOR" TYPE-APPROVED LIFT TRUCKS

- All EC tractor type-approved lift trucks are supplied with an "EC tractor" certificate complying with directive 2003/37/EC, to be retained by the owner, and a page of administrative details together with a CNIT number (national type approval code) for registration at the prefecture.
- The lift truck owner is responsible for carrying out the necessary procedures for obtaining the vehicle registration document within the time limit defined by the regulations.
- The operator must hold an HGV licence, unless granted an exemption.
- The lift truck must be driven on the public highway in accordance with the instructions given in the manual supplied with the lift truck (Gross weight, Gross combination weight, towing load, axle loads, maximum speeds, etc. according to type/version). The operator must be in possession of the lift truck's registration document.



When towing a trailer or agricultural equipment, the travelling speed of the lift truck is limited to 25 km/h. In this case, a "25" disc must be affixed to the rear of the convoy.

E - LIFT TRUCK CAB PROTECTION

- All lift trucks comply with the requirements of ISO 3471 (wheel loader code) regarding cab rollover protection (ROPS) and ISO 3449 (Level II) regarding the protection of the cab against falling objects (FOPS).
- "EC TRACTOR" type-approved lift trucks comply, in addition, with Directive 79/622/EC (OECD Code 4) regarding cab rollover protection (ROPS).



Structural damage or overturning, a modification, changes or a poorly executed repair can reduce the protective efficiency of the cab, cancelling its compliance.

Do not perform welding or drilling on the cab structure.

Consult your dealer to determine the limits of this structure without cancelling its compliance.

THE 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.

THE MAINTENANCE

- Maintenance or repairs other than those detailed in part: 3 - MAINTENANCE must be carried out by qualified personnel (consult your dealer) and under the necessary safety conditions to maintain the health of the operator and any third party.



Your lift truck must be inspected periodically to ensure 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)".



INSTRUCTIONS FOR THE OPERATOR

PREAMBLE



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 manoeuvres described in these 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.



In order to reduce or avoid any danger with a MANITOU-approved attachment, follow the instructions of paragraph: 4 - ADAPTABLE ATTACHMENTS IN OPTION ON THE RANGE: INTRODUCTION.

GENERAL INSTRUCTIONS

A - OPERATOR'S MANUAL

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

B - 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 authorise the driving of the lift truck by another person.

C - MAINTENANCE

- The operator must immediately advise his superior if his lift truck is not in good working order or does not comply with 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 must carry out daily maintenance (see: 3 - MAINTENANCE: A - DAILY OR EVERY 10 HOURS SERVICE).
- The operator must ensure tyres are adapted to the nature of the ground (see area of the contact surface of the tyres in the chapter: 2 - DESCRIPTION: FRONT AND REAR TYRES). There are optional solutions, consult your dealer.
 - SAND tyres.
 - LAND tyres.
 - Snow chains.



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 authorisation.

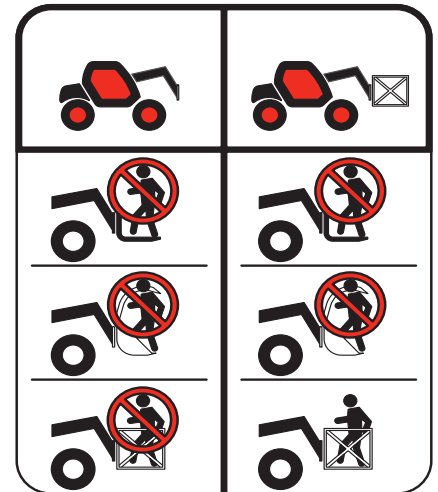
D - MODIFICATION OF THE LIFT TRUCK

- 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.



E - LIFTING PEOPLE

- The use of working equipment and load lifting attachments to lift people is:
 - either forbidden
 - or authorized exceptionally and under certain conditions (see current regulations in the country in which the lift truck is used).
- The pictogram posted at the operator station reminds you that:
 - Left-hand column
 - It is forbidden to lift people, with any kind of attachment, using a non PLATFORM-fitted lift truck.
 - Right-hand column
 - With a PLATFORM-fitted lift truck, people can only be lifted using platforms designed by MANITOU for the purpose.
- MANITOU sells equipment specifically designed for lifting people (OPTION PLATFORM lift truck, contact your dealer).



OPERATING INSTRUCTIONS UNLADEN AND LADEN

A - BEFORE STARTING THE LIFT TRUCK

- Perform the daily service (see: 3 - MAINTENANCE: A - DAILY OR EVERY 10 HOURS SERVICE).
- Make sure the lights, indicators and windscreen wipers are working properly.
- Make sure the rear view mirrors are in good condition, clean and properly adjusted.
- Make sure the horn works.

B - DRIVER'S OPERATING INSTRUCTIONS

- 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, avoid loose clothes.
- Make sure you have the appropriate protective equipment for the job to be done.
- 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 leaving the driving seat and use the handle(s) provided for this purpose. Do not jump out of the seat to get down.
- Always pay attention when using the lift truck. Do not listen to the 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.



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

- 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 forbidden to leave the cab without first putting these controls in neutral.
- It is prohibited to carry passengers either on the lift truck or in the cab.

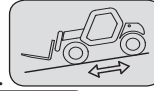
C - ENVIRONMENT

- Comply with site safety regulations.
- If you have to use the lift truck in a dark area or at night, make sure 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, follow the instructions given in the paragraph: INSTRUCTIONS FOR HANDLING A LOAD: D - TRANSVERSE ATTITUDE OF THE LIFT TRUCK.

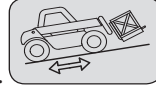


- Travelling on a longitudinal slope:
 - Drive and brake gently.

- Moving without load: Forks or attachment facing downhill.



- Moving with load: Forks or attachment facing 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.
- Never move onto a foot bridge, floor or freight lift, without being certain that they are prescribed for the weight and size of the lift truck to be loaded and without having checked that they are in sound working order.
- Be careful in the area of loading bays, trenches, scaffolding, soft ground and manholes.
- Make sure 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.



If the load or the attachment must remain above a structure for a prolonged period of time, there is the risk that it will bear on the structure as the boom descends due to cooling of the oil in the cylinders.

To eliminate this risk:

- *Regularly check the distance between the load or the attachment and the structure and readjust this if necessary.*
- *If possible use the lift truck at an oil temperature as close as possible to ambient temperature.*

- When working near aerial lines, ensure that the safety distance is sufficient between the working area of the lift truck and the aerial line.



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.

D - 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 depend 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 while travelling with no load and with the boom in the transport position.
- Special precautions must be taken if the size of the load restricts visibility towards the front:
 - moving in reverse,
 - site layout,
 - assisted by a person directing the manoeuvre (while standing outside the truck's area of travel), making sure to keep this person clearly in view at all times,
 - in any case, avoid reversing over long distances.
- Certain special accessories may require the truck to travel with the boom in the raised position. In such cases, visibility on the right hand side is restricted, and special precautions must be taken:
 - site layout,
 - assisted by a person directing the manoeuvre (while standing outside the truck's area of travel).
 - replacement of a suspended load by a load on a pallet.
- If visibility of your road is inadequate, ask someone to assist by directing the manoeuvre (while standing outside the truck's area of travel), making sure to keep this person clearly in view at all times.
- 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).



E - STARTING THE LIFT TRUCK

SAFETY INSTRUCTIONS



The lift truck must only be started up or manoeuvred when the operator is sitting in the driver's cab, with his seat belt adjusted and fastened.

- Never try to start the lift truck by pushing or towing it. Such operation may cause severe damage to the transmission. If necessary, to tow the lift truck in an emergency, the transmission must be placed in the neutral position (see: 3 - MAINTENANCE: G - OCCASIONAL MAINTENANCE).
- If using an emergency battery for start-up, use a battery with the same characteristics and respect battery polarity when connecting it. Connect at first the positive terminals before the negative terminals.



Failure to respect polarity between batteries can cause serious damage to the electrical circuit.

The electrolyte in the battery may produce an explosive gas. Avoid flames and generation of sparks close to the batteries.

Never disconnect a battery while it is charging.

INSTRUCTIONS

- Check the closing and locking of the hood(s).
- Check that the cab door is closed.
- Check that the forward/reverse selector is in neutral, and that the parking brake is applied.
- Press on the service brake pedal and maintain it down.
- Turn the ignition key to the position I to activate the electrical and pre-heating system.
- Whenever you switch on the lift truck, perform the automatic check on the longitudinal stability limiter and warning device (see: 2 - DESCRIPTION: INSTRUMENTS AND CONTROLS). Do not use the lift truck if it does not conform to the regulations.
- Check the fuel level on the indicator.
- Turn the ignition key fully, the engine should then start. Release the ignition key and let the engine run at idle.
- Do not engage the starter motor for more than 15 seconds and carry out the preheating between unsuccessful attempts.
- Make sure all the signal lights on the control instrument panel are off.
- Check all control instruments when the engine is warm and at regular intervals during use, so as to quickly detect any faults and to be able to correct them without any delay.
- If an instrument does not show the correct display, stop the engine and immediately carry out the necessary operations.

F - DRIVING THE LIFT TRUCK

SAFETY INSTRUCTIONS



The operators' attention is drawn to the risks involved in using the lift truck, in particular:

- 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 300 mm from the ground, the boom retracted 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 boom controls when the lift truck is moving.
- Never change the steering mode whilst driving.
- Do not manoeuvre the lift truck with the boom 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 on 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 bulky 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 300 mm from the ground, the boom retracted and the carriage sloping backwards.
- For lift trucks with gearboxes, use the recommended gear (see: 2 - DESCRIPTION: INSTRUMENTS AND CONTROLS).
- Select the steering mode appropriate for its use and/or working conditions (see: 2 - DESCRIPTION: INSTRUMENTS AND CONTROLS) (as model of lift truck).
- Release the hand brake.
- Shift the forward/reverse selector to the selected direction of travel and accelerate gradually until the lift truck moves off.



Starting and driving a lift truck on a slope can present a very real danger.

The lift truck being parked or stopped, scrupulously follow the following instructions for moving off:

- ***Press the service brake pedal.***
- ***Engage 1st or 2nd gear and select forward or reverse.***
- ***Check that there is nothing and no-one obstructing the lift truck's path.***
- ***Release the service brake pedal and increase the engine revs.***

The risk is increased if the lift truck is laden or towing a trailer, requiring extreme vigilance.

G - 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 meter 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.
- Engage the parking brake.
- For lift trucks with gearboxes, place the gear lever in neutral.
- Fully retract the boom.
- 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...).



H - DRIVING THE LIFT TRUCK ON THE PUBLIC HIGHWAY

(or see current legislation in other countries)

FRENCH ROAD TRAFFIC RULES

- The driving of non EC type-approved tractors 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 licence plate.
- The driving of EC type-approved tractors on the public highway is subject to the provisions of the highway code regarding agricultural tractors, defined in article R311-1 of the highway code. The lift truck must be registered.
- The lift truck must be driven on the public highway in accordance with the instructions given in the manual supplied with the lift truck (Gross weight, Gross combination weight, towing load, axle loads, maximum speeds, etc. according to type/version). The operator must be in possession of the lift truck's registration document.
- The operator must hold an HGV licence, unless granted an exemption.
- When towing a trailer or agricultural equipment, the travelling speed of the lift truck is limited to 25 km/h. In this case, a "25" disc must be affixed to the rear of the convoy. When driving with a trailer, the fact of not engaging 4th gear will ensure compliance with the towing speed limit (max. 25 km/h). On "POWERSHIFT" models, as 3rd gear is slower than on other models, it is preferable to use 5th gear and disable automatic upshifting to 6th gear (see: 2 - DESCRIPTION: INSTRUMENTS AND CONTROLS).

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.
- Select the steering mode "HIGHWAY TRAFFIC" (as model of lift truck) (see: 2 - DESCRIPTION: INSTRUMENTS AND CONTROLS).
- Fully retract the boom and set the attachment approximately 300 mm off the ground.
- Place the roll corrector in the central position, i.e. the transverse axis of the axles parallel to the chassis (as model of lift truck).
- Fully raise the stabilizers and turn the blocks inwards (according to model of lift truck).



Never coast 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 observe this instruction on a slope will lead to excessive speed which may make the lift truck uncontrollable (steering, brakes) and cause serious mechanical damage.

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 authorizes circulation with a front-mounted attachment, you must at least:
 - Protect and report any sharp and/or dangerous edges on the attachment (see: 4 - ADAPTABLE ATTACHMENTS IN OPTION ON THE RANGE: ATTACHMENT SHIELDS).
 - 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 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 (see: 2 - DESCRIPTION: CHARACTERISTICS).

IF NECESSARY, CONSULT YOUR DEALER.

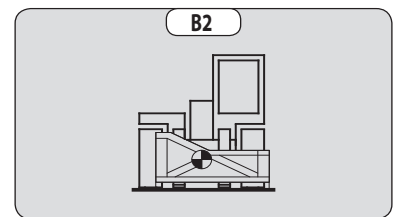
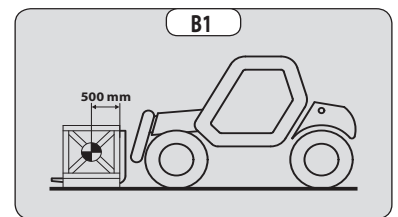
INSTRUCTIONS FOR HANDLING A LOAD

A - CHOICE OF ATTACHMENTS

- Only attachments approved by MANITOU can be used on its telehandlers.
- Make sure the attachment is appropriate for the work to be done (see: 4 - ADAPTABLE ATTACHMENTS IN OPTION ON THE RANGE).
- If the telehandler is equipped with the Single side-shift carriage OPTION (TSDL), use only the authorised attachments (see: 4 - ADAPTABLE ATTACHMENTS IN OPTION ON THE RANGE).
- Make sure the attachment is correctly installed and locked onto the telehandler carriage.
- Make sure that your telehandler attachments work properly.
- Comply with the load chart limits for the telehandler 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, as the sling risks to slip (see: INSTRUCTIONS FOR HANDLING A LOAD: H - TAKING UP AND LAYING DOWN A SUSPENDED LOAD).
- Do not handle loads that are hung directly from the forks with straps (e.g.: big-bag), as there is a risk that the straps will shear against the sharp edges. Use an attachment designed for this purpose.

B - MASS OF LOAD AND CENTRE OF GRAVITY

- Before taking up a load, you must know its mass and its centre of gravity.
- The load chart for your telehandler is valid for a load in which the longitudinal position of the centre of gravity is 500 mm from the base of the forks (fig. B1). For a higher centre of gravity, contact your dealer.
- For irregular loads, determine the transverse centre of gravity before any movement (fig. B2) and set it in the longitudinal axis of the telehandler.

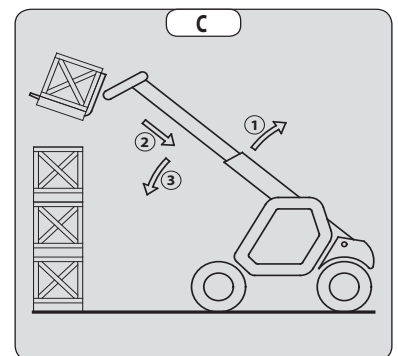


It is forbidden to move a load heavier than the effective capacity defined on the telehandler load chart.
For loads with a moving centre of gravity (e.g. liquids), take account of the variations in the centre of gravity in order to determine the load to be handled and be vigilant and take extra care to limit these variations as far as possible.

C - LONGITUDINAL STABILITY LIMITER AND WARNING DEVICE

This device gives an indication of the longitudinal stability of the telehandler, and limits hydraulic movements in order to ensure this stability, at least under the following operating conditions:

- when the telehandler is at a standstill,
- when the telehandler is on firm, stable and consolidated ground,
- when the telehandler is performing handling and placing operations.
- Move the jib very carefully when approaching the authorized load limit (see: 2 - DESCRIPTION: INSTRUMENTS AND CONTROLS).
- Always watch this device during handling operations.
- In the event that "AGGRAVATING" hydraulic movements are cut-off, only perform de-aggravating hydraulic movements in the following order (fig. C): if necessary, raise the jib (1), retract the jib as far as possible (2) and lower the jib (3) to set down the load.

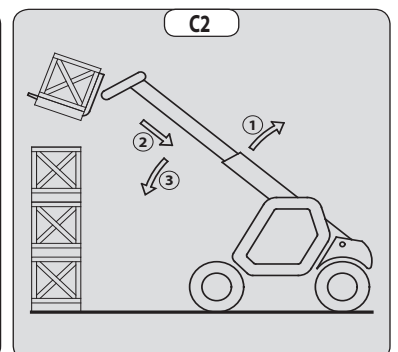
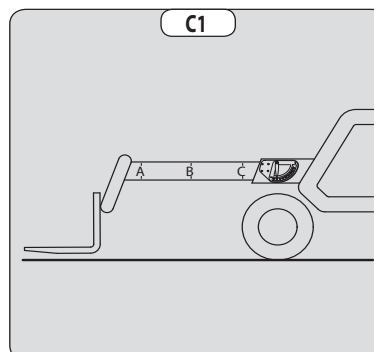


The instrument reading may be erroneous when the steering is at full lock or the rear axle is oscillated to its maximum extent.
Before lifting a load, make sure that the telehandler is not in either of these situations.

C1/C2 - LONGITUDINAL STABILITY INDICATOR

(Depending on the model of telehandler)

- Always watch this device during handling operations.
- Letters and angle indicator (fig. C1) allow to read and respect load capacities of the lifttruck according to the load chart (see: 2 - DESCRIPTION: DIMENSION AND LOADCHART).
- When the device is in limit stability, it is forbidden to perform so-called «AGGRAVATING» movements, these being:
 - A - Extending the jib.
 - B - Lowering the jib.
- Perform movements to relieve aggravation in the following order (fig. C2): if necessary, raise the jib (1), retract the jib as far as possible (2) and lower the jib (3) to release the load.



D - TRANSVERSE ATTITUDE OF THE LIFT TRUCK

Depending on the model of lift truck

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

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

1 - LIFT TRUCK WITHOUT ROLL CORRECTOR USED ON TYRES

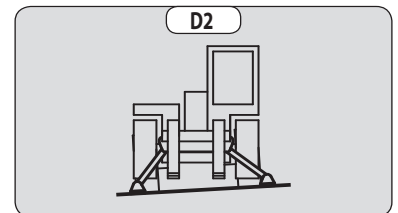
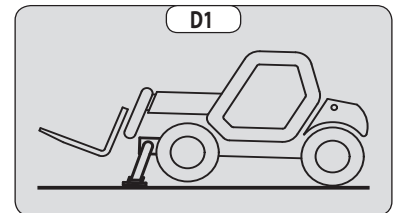
- Position the lift truck so that the bubble in the level is between the two lines (see: 2 - DESCRIPTION: INSTRUMENTS AND CONTROLS).

2 - LIFT TRUCK WITH ROLL CORRECTOR USED ON TYRES

- Correct the roll using the hydraulic control and check horizontality with the spirit level. The bubble in the level must be between the two lines (see: 2 - DESCRIPTION: INSTRUMENTS AND CONTROLS).

3 - LIFT TRUCK USED ON STABILIZERS

- Set the two stabilizers on the ground and raise the two front wheels of the lift truck (fig. D1).
- Correct the roll using the stabilizers (fig. D2) and check horizontality with the spirit level. The bubble of the level must be between the two lines (see: 2 - DESCRIPTION: INSTRUMENTS AND CONTROLS). In this position, the two front wheels must be off the ground.



E - TAKING UP A LOAD ON THE GROUND

- Approach the lift truck perpendicular to the load, with the jib retracted and the forks in a horizontal position (fig. E1).
- Adjust the fork spread and centring relative to the load to ensure stability (fig. E2) (optional solutions exist, consult your dealer).
- Never lift a load with a single fork.

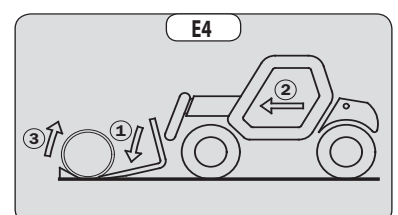
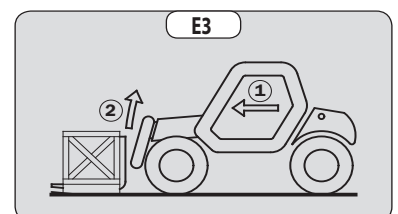
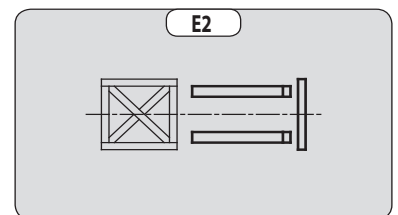
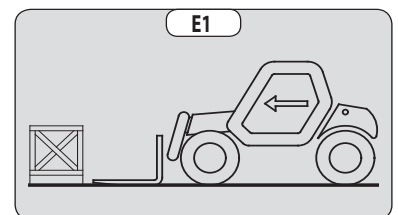


Beware of the risks of trapping or squashing limbs when manually adjusting the forks.

- Move the lift truck forward slowly (1) and insert the forks under the load as far as they will go (fig. E3). If necessary, slightly lift the jib (2) while taking up the load.
- Bring the load into the transport position.
- Tilt the load far enough backwards to ensure stability (loss of load on braking or going downhill).

FOR A NON-PALLETISED LOAD

- Tilt the carriage (1) forwards and move the lift truck slowly forwards (2), to insert the fork under the load (fig. E4) (block the load if necessary).
- Continue to move the lift truck forwards (2) tilting the carriage (3) (fig. E4) backwards to position the load on the forks and check the load's longitudinal and lateral stability.



F - TAKING UP AND LAYING A HIGH LOAD ON TYRES

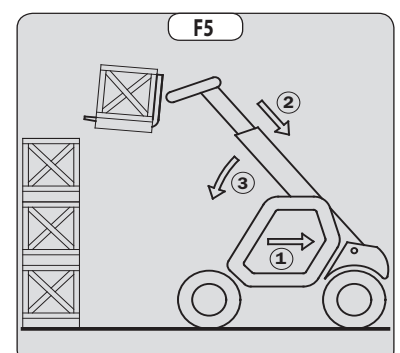
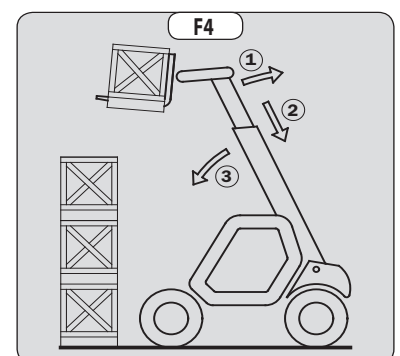
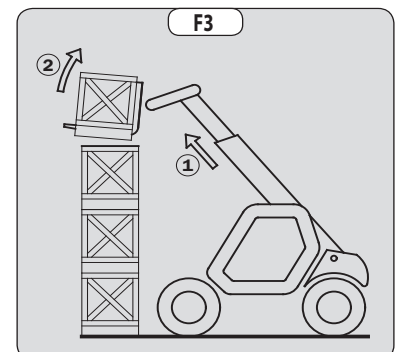
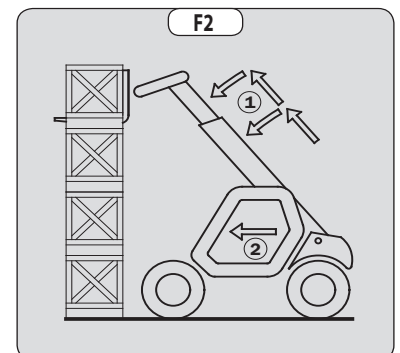
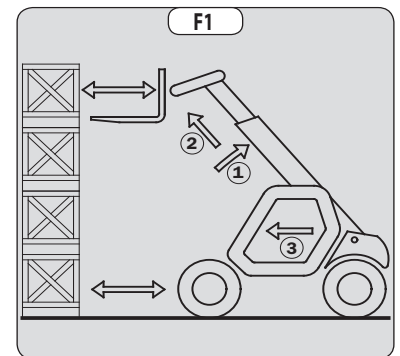


You must not raise the jib if you have not checked the transverse attitude of the lift truck (see: INSTRUCTIONS FOR HANDLING A LOAD: D - TRANSVERSE ATTITUDE OF THE LIFT TRUCK).

REMINDER: Make sure that the following operations can be performed with good visibility (see: OPERATIONS INSTRUCTIONS UNLADEN AND LADEN: D - VISIBILITY).

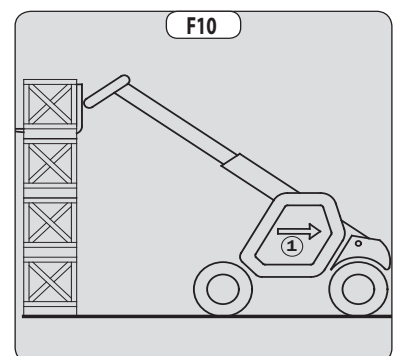
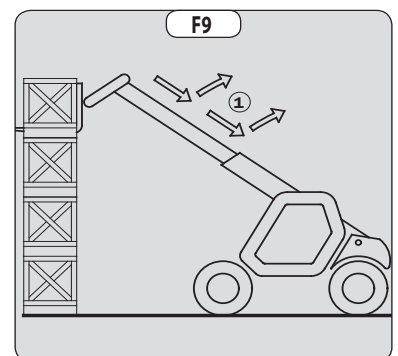
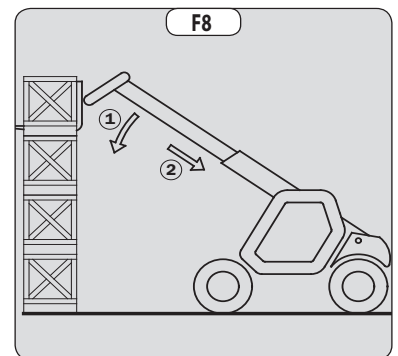
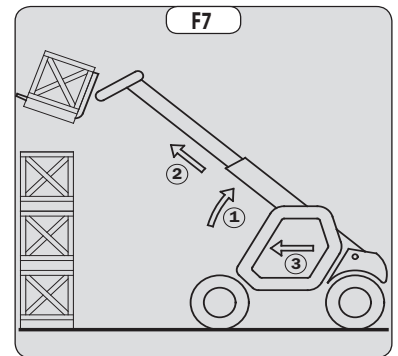
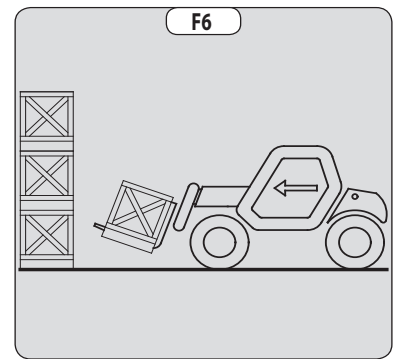
TAKING UP A HIGH LOAD ON TYRES

- Ensure that the forks will easily pass under the load.
- Lift and extend the jib (1) (2) until the forks are level with the load, moving the lift truck (3) forward if necessary (fig. F1), moving very slowly and carefully.
- Always remember to keep the distance necessary for inserting the forks under the load, between the stack and the lift truck (fig. F1) and use the shortest possible length of jib.
- Insert the forks under the load as far as they will go by alternately extending and lowering the jib (1) or, if necessary, moving the lift truck forward (2) (fig. F2). Apply the handbrake and place the forward/reverse selector in neutral.
- Slightly raise the load (1) and tilt the carriage (2) backwards to stabilize the load (fig. F3).
- Tilt the load sufficiently backwards to ensure its stability.
- Monitor the longitudinal stability limiter and warning device (see: INSTRUCTIONS FOR HANDLING A LOAD: C - LONGITUDINAL STABILITY LIMITER AND WARNING DEVICE). If it is overloaded, set the load back down in the place from which it was taken.
- If possible lower the load without shifting the lift truck. Lift the jib (1) to release the load, retract (2) and lower the jib (3) to bring the load into the transport position (fig. F4).
- If this is not possible, back up the lift truck (1), manoeuvring very gently and carefully to release the load. Retract (2) and lower the jib (3) to bring the load into the transport position (fig. F5).



LAYING A HIGH LOAD ON TYRES

- Approach the load in the transport position in front of the stack (fig. F6).
- Apply the parking brake and place the forward/reverse selector in neutral.
- Raise and extend the jib (1) (2) until the load is above the stack, while monitoring the longitudinal stability limiter and warning device (see: INSTRUCTIONS FOR HANDLING A LOAD: C - LONGITUDINAL STABILITY LIMITER AND WARNING DEVICE). If necessary, move the lift truck (3) forward (fig. F7), driving very slowly and carefully.
- Place the load in a horizontal position and lay it down on the pile by lowering and retracting the jib (1) (2) in order to position the load correctly (fig. F8).
- If possible, release the fork by alternately retracting and raising the jib (1) (fig. F9). Then set the forks into transport position.
- If this is not possible, reverse the lift truck (1) very slowly and carefully to release the forks (fig. F10). Then set them into transport position.



G - TAKING UP AND LAYING A HIGH LOAD ON STABILIZERS

Depending on the model of lift truck



You must not raise the jib if you have not checked the transverse attitude of the lift truck (see: INSTRUCTIONS FOR HANDLING A LOAD: D - TRANSVERSE ATTITUDE OF THE LIFT TRUCK).

REMINDER: Make sure that the following operations can be performed with good visibility (see: OPERATIONS INSTRUCTIONS UNLADEN AND LADEN: D - VISIBILITY).

The stabilizers are used to optimise the lift truck's lifting performances (see: 2 - DESCRIPTION: INSTRUMENTS AND CONTROLS).

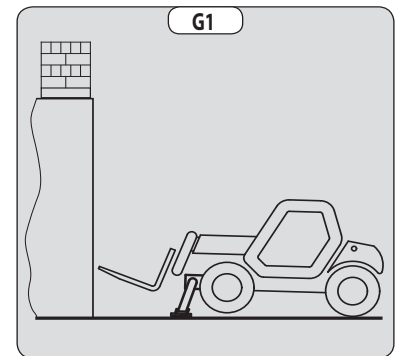
POSITION THE STABILIZERS WITH THE FORKS IN TRANSPORT POSITION (UNLADEN AND LADEN)

- Set the forks in transport position in front of the elevation.
- Stay far enough away to have room for the jib to be raised.
- Apply the parking brake and place the forward/reverse selector in neutral.
- Set the two stabilizers on the ground and lift the two front wheels of the lift truck (fig. G1), while maintaining its transverse stability.

RAISE THE STABILIZERS WITH THE FORKS IN TRANSPORT POSITION (UNLADEN AND LADEN)

- Raise both stabilizers fully and at the same time.

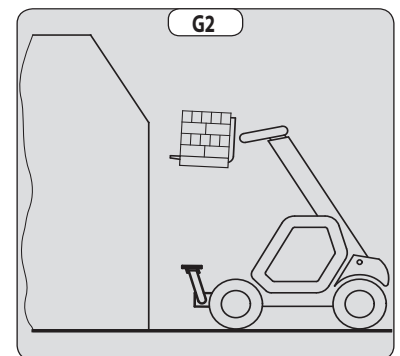
LOWERING OF STABILISERS WITH JIB UP (UNLADEN AND LADEN).



This operation must be exceptional and performed with great care.

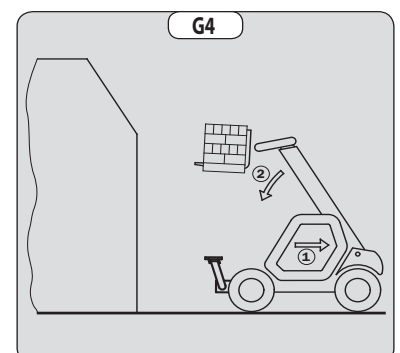
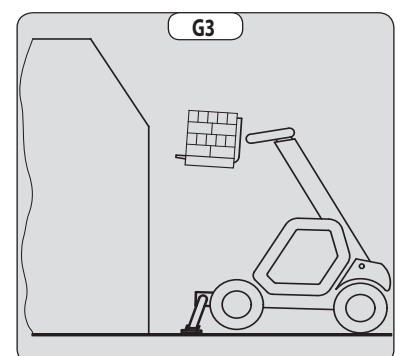
- Raise the jib and retract the telescopes completely.
- Set the lift truck in position in front of the elevation (fig. G2) moving very slowly and carefully.
- Apply the parking brake and place the forward/reverse selector in neutral.
- Move the stabilizers very slowly and gradually as soon as they are close to the ground or in contact with it.
- Lower the two stabilizers and lift the two front wheels of the lift truck (fig. G3). During this operation, transverse attitude must be permanently maintained: the bubble in the level must be kept between the two lines.

SETTING THE STABILIZERS WITH THE JIB UP (UNLADEN AND LADEN)



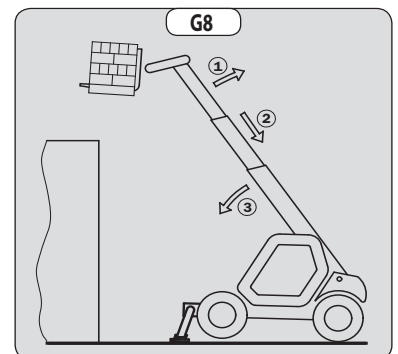
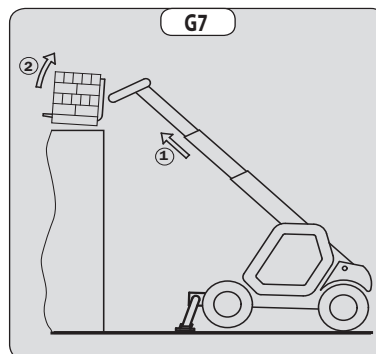
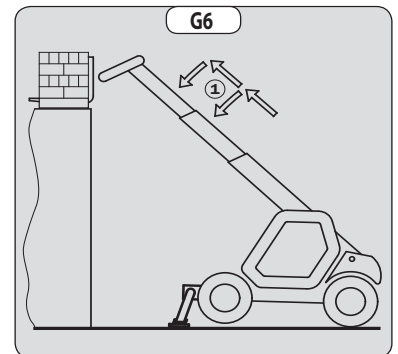
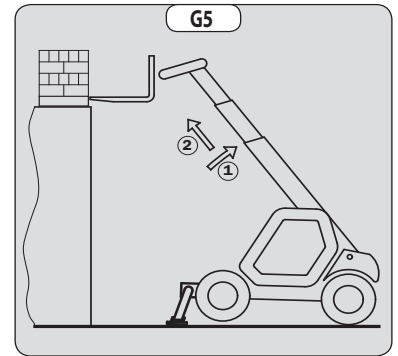
This operation must be exceptional and performed with great care.

- Keep the jib up and retract the telescopes completely (fig. G3).
- Move the stabilizers very slowly and gradually as soon as they are in contact with the ground and when they leave the ground. During this operation, the transverse attitude must be permanently maintained: the bubble in the level must be kept between the two lines.
- Raise both stabilizers completely.
- Release the parking brake and reverse the lift truck (1) very slowly and carefully, to release it and lower the forks (2) into transport position (fig. G4).



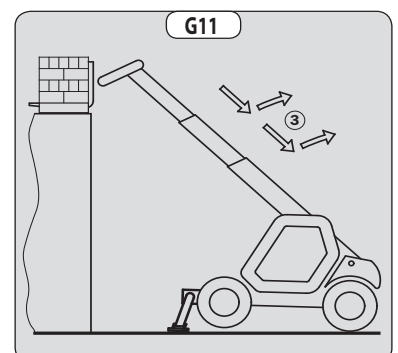
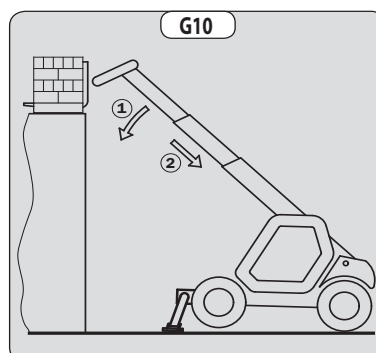
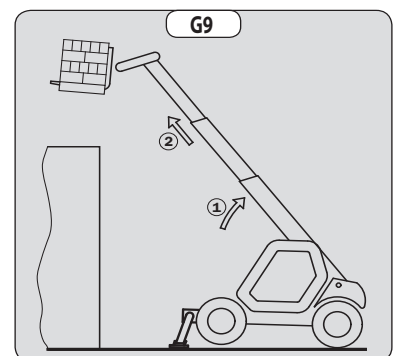
TAKING UP A HIGH LOAD ON STABILISERS

- Ensure that the forks will easily pass under the load.
- Check the position of the lift truck with respect to the load and make a test run, if necessary, without taking the load.
- Raise and extend the jib (1) (2) until the forks are at the level of the load (fig. G5).
- Insert the forks under the load as far as they will go by alternately extending and lowering the jib (1) (fig. G6).
- Lift the load slightly (1) and tilt the carriage (2) backwards to stabilise the load (fig. G7).
- Monitor the longitudinal stability limiter and warning device (see: INSTRUCTIONS FOR HANDLING A LOAD: C - LONGITUDINAL STABILITY LIMITER AND WARNING DEVICE). If it is overloaded, set the load back down in the place from which it was taken.
- If possible lower the load without moving the lift truck. Raise the jib (1) to release the load, retract (2) and lower the jib (3) to set the load into transport position (fig. G8).



LAYING A HIGH LOAD ON STABILISERS

- Raise and extend the jib (1) (2) until the load is above the elevation (fig. G9), while monitoring the longitudinal stability limiter and warning device (see: INSTRUCTIONS FOR HANDLING A LOAD: C - LONGITUDINAL STABILITY LIMITER AND WARNING DEVICE).
- Position the load horizontally and release it by lowering and retracting the jib (1) (2) to position the load correctly (fig. G10).
- Free the forks by alternating retracting and raising the jib (3) (fig. G11).
- If possible, set the jib in transport position without moving the lift truck.





H - TAKING UP AND LAYING DOWN A SUSPENDED LOAD



*Failure to follow the above instructions may lead the lift truck to loose stability and overturn.
MUST be used with a lift truck equipped with an operational hydraulic movement cut-out device.*

CONDITIONS OF USE

- The length of the sling or the chain shall be as short as possible to limit swinging of the load.
- Lift the load vertically along its axis, never by pulling sideways or lengthways.

HANDLING WITHOUT MOVING THE LIFT TRUCK

- Whether on stabilisers or on tyres, the lateral attitude must not exceed 1 % and the longitudinal attitude must not exceed 5%, the bubble of the level must be held at "0".
- Ensure that the wind speed is not higher than 10 m/s.
- Ensure that there is no one between the load and the lift truck.

I - TRAVELLING WITH A SUSPENDED LOAD

- Before moving, inspect the terrain in order to avoid excessive slopes and cross-falls, bumps and potholes, or soft ground.
- Ensure that the wind speed is not higher than 36 km/h.
- The lift truck must not travel at more than 0,4 m/s (1,5 km/h, i.e., one quarter walking speed).
- Drive and stop the lift truck gently and smoothly to minimise swinging of the load.
- Carry the load a few centimetres above the ground (max. 30 cm) the shortest possible jib length. Do not exceed the offset indicated on the load chart. If the load begins to swing excessively, do not hesitate to stop and lower the jib to set down the load.
- Before moving the lift truck, check the longitudinal stability limiter and warning device (see: 2 - DESCRIPTION: INSTRUMENTS AND CONTROLS), only the green LEDs and possible the yellow LEDs should be lit.
- During transport, the lift truck operator must be assisted by a person on the ground (standing a minimum of 3 m from the load), who will limit swinging of the load using a bar or a rope. Ensure that this person is always clearly in view.
- The lateral attitude must not exceed 5 %, the bubble in the level must be kept between the two "MAX" marks
- The longitudinal attitude must not exceed 15 %, with the load facing uphill, and 10%, with the load facing downhill.
- The jib angle must not exceed 45°.
- If the first red LED of longitudinal stability limiter and warning device (see: 2 - DESCRIPTION: INSTRUMENTS AND CONTROLS) comes on while travelling, gently bring the lift truck to a halt and stabilise the load. Retract the telescope to reduce the offset of the load.



PLATFORM OPERATING INSTRUCTIONS

For lift trucks fitted with a PLATFORM



Installation of the platform on the lift truck is only possible if the shields "operating the platform" of the lift truck and the platform are identical (see: 2 - DESCRIPTION: OPERATING THE PLATFORM).

A - AUTHORISATION FOR USE

- Operation of the platform requires further authorisation in addition to that of the lift truck.

B - LIFT TRUCK SUITABILITY FOR USE

- MANITOU has ensured that this platform is suitable for use under the normal operating conditions defined in this operator's manual, with a **STATIC** test coefficient **OF 1,25** and a **DYNAMIC** test coefficient **OF 1,1**, as specified in harmonised standard **EN 280** for "mobile elevating work platforms".
- Before commissioning, the company manager must make sure that platform is appropriate for the work to be done, and perform certain tests (in accordance with current legislation).

C - PRECAUTIONS WHEN USING THE PLATFORM

- Wear suitable clothing when using the platform, avoid loosely-fitting garments.
- Never operate the platform when hands or feet are wet or soiled with greasy substances.
- Remain alert at all times when using the platform. Do not listen to the radio or music using headphones or earphones.
- For increased comfort, adopt the correct position at the platform's operator station.
- The platform's guard rail exempts the operator from wearing a safety harness under normal operating conditions. As a result, you are responsible for deciding whether to wear a safety harness.
- 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.).
- Safety helmets must be worn.
- The operator must always be in the normal operator's position. It is prohibited to have arms or legs, or generally any part of the body, protruding from the basket.
- Ensure that any materials loaded onto the platform (pipes, cables, containers, etc.) cannot fall out. Do not pile these materials to the point where it is necessary to step over them.

D - USING THE PLATFORM

- However experienced they may be, operators must acquaint themselves with the emplacement and operation of all control instruments prior to operating the platform.
- Check before use that the platform has been correctly assembled and locked onto the lift truck.
- Check before operating the platform that the access gate has been properly locked.
- The platform should be operated in an area free of any obstructions or danger when it is lowered to the ground.
- The operator using the platform must be aided on the ground by a person with adequate training.
- You should stay within the limits set out in the platform load chart.
- The lateral stresses are limited pressure (see: 2 - DESCRIPTION: CHARACTERISTICS).
- It is strictly forbidden to hang a load from the platform or the lift truck jib without a specially designed attachment (see: INSTRUCTIONS FOR HANDLING A LOAD: H - TAKING UP AND LAYING DOWN A SUSPENDED LOAD).
- The platform cannot be used as a crane or a lift for permanently transporting people or materials, nor as jacks or supports.
- The lift truck must not be moved with one (or more) person(s) in the platform.
- It is forbidden to transport people on the platform using the hydraulic controls in the lift truck's driver's cab (except in case of rescue).
- The operator must not climb onto to off the platform when it is not on ground level (jib retracted and in the down position).
- The platform must not be fitted with attachments that increase the unit's wind load.
- Do not use ladders or improvised structures in the platform to gain extra height.
- Do not climb onto the sides of the platform to gain extra height.

E - ENVIRONMENT



It is forbidden to use the platform close to electricity cables. Maintain the specified safe distances.

RATED VOLTAGE	DISTANCE ABOVE GROUND OR FLOOR IN METRES
50 < U < 1000	2,30 M
1000 < U < 30000	2,50 M
30000 < U < 45000	2,60 M
45000 < U < 63000	2,80 M
63000 < U < 90000	3,00 M
90000 < U < 150000	3,40 M
150000 < U < 225000	4,00 M
225000 < U < 400000	5,30 M
400000 < U < 750000	7,90 M



It is strictly forbidden to use the platform when the wind speed exceeds 45 km/h.

- To visually recognise this wind speed, refer to the empirical wind evaluation scale below:

BEAUFORT scale (wind speed at a height of 10 m on a flat site)						
Force	Type of wind	Speed (knots)	Speed (km/h)	Speed (m/s)	Effects on Land	Sea conditions
0	Calm	0 - 1	0 - 1	< 0,3	- Smoke rises vertically.	- Sea is like a mirror.
1	Light air	1 - 3	1 - 5	0,3 - 1,5	- Smoke indicates direction of wind.	- Ripples with appearance of scale, no foam crests.
2	Light breeze	4 - 6	6 - 11	1,6 - 3,3	- Wind felt on face, leaves rustle.	- Short wavelets, but pronounced.
3	Gentle breeze	7 - 10	12 - 19	3,4 - 5,4	- Leaves and small twigs in constant motion.	- Very small waves, crests begin to break.
4	Moderate breeze	11 - 16	20 - 28	5,5 - 7,9	- Wind raises dust and loose pieces of paper; small branches are moved.	- Small waves, becoming longer, numerous whitecaps.
5	Fresh breeze	17 - 21	29 - 38	8 - 10,7	- Small trees in leaf begin to sway.	- Wavelets form on inland waters; moderate waves, taking longer form.
6	Strong breeze	22 - 27	39 - 49	10,8 - 13,8	- Large branches in motion, whistling heard in overhead wires, umbrella use becomes difficult.	- Larger waves forming, whitecaps everywhere, some spray.
7	Near gale	28 - 33	50 - 61	13,9 - 17,1	- Whole trees in motion, inconvenience felt when walking against the wind.	- Sea heaps up; white foam from breaking waves begins to be blown in streaks along the direction of the wind.
8	Gale	34 - 40	62 - 74	17,2 - 20,7	- Wind breaks twigs off trees; impedes progress.	- Moderately high waves of greater length; edges of crests begin to break into spindrift.
9	Strong gale	41 - 47	75 - 88	20,8 - 24,4	- Wind damages roofs (chimneys, slates, etc.).	- High waves, crests of waves begin to topple, streaks of foam; reduced visibility.
10	Storm	48 - 55	89 - 102	24,5 - 28,4	- Seldom experienced inland; trees uprooted; considerable structural damage occurs.	- Very high waves; white streaks of foam; reduced visibility.
11	Violent storm	56 - 63	103 - 117	28,5 - 32,6	- Very rare, widespread damage.	- Exceptionally high waves able to hide medium sized ships from view, reduced visibility.
12	Hurricane	64 +	118 +	32,7 +	- Devastating damage.	- Sea completely white; air filled with foam and spray, very reduced visibility.

F - MAINTENANCE



Your platform must be periodically inspected to ensure its continued compliance.

The inspection frequency is defined by the legislation applying in the country in which the platform is used.

In France, a general periodic inspection every 6 months (order of 1 March 2004).



INSTRUCTIONS FOR USING THE RADIO-CONTROL

For lift trucks with RC radio control

Conformity

Each Dynamic series radio remote control is in conformity with the (R&TTE) Directive 1999/5/EC and its essential requirements.
Each radio remote control is also in conformity with the harmonised standards given in the EC Declaration of Conformity

Radio link

The two units constantly communicate with one another through a radio link. This is an essential requirement to ensure safety for the radio remote controlled machine.
An address is stored in the S-KEY and in the address key on the connector in the receiving unit; the units use this address to code their messages. This address is unique, univocal (specific for each radio remote control) and not reproducible. Each unit can only decode the messages coming from the unit with the same address.
This prevents messages from other radio equipment from activating any system function.
The units send coded messages to one another:

- messages sent by the transmitting unit contain operational commands to be carried out by the machine
- messages sent by the receiving unit contain information useful for the automatic management of the working frequency and information about measurements collected from the machine (Data Feedback function).

Frequencies.

The radio link between the units radio remote controls is built at one of the frequencies permitted by the European standards in force when the system is put on the market.

Safety functions

Autec radio remote controls are equipped with some functions that provide high safety levels, in order to safeguard the safety of people and property.

Stop function

The stop function brings the machine to a safe state every time it is necessary to stop it due to a potentially hazardous situation. This function is either voluntarily enabled by the user (active stop), as appropriate, or it cuts in automatically and autonomously (passive stop).

Active stop

Active stop is a function enabled by the STOP pushbutton.
The transmitting unit sends to the receiving unit a command that immediately stops the machine. When the STOP pushbutton is pressed, the machine stops in shorter time than when passive stop cuts in.

Passive stop

Passive stop is a function that cuts in when a fault occurs during operation. When the radio link is incorrect or interrupted, the receiving unit autonomously stops the radio remote control.

Protection against unintended movements from the standstill position (UMFS).

This safety function protects the system "machine+radio remote control" from unintended movements, namely machine movements not activated intentionally by the user, but resulting from possible electrical and mechanical failure of the radio remote control.

Such safety function checks the neutral (rest) position of the actuators that control the machine's movements. Each time one of those actuators is operated, the transmitting unit sends both the movement command and the "SAFETY" command. Depending on the specific application, outputs related to these commands are wired in series; alternatively the SAFETY command's outputs drive the safety device provided on the machine.



WARNINGS

In addition to all instructions provided by the machine manufacturer, by the installer of the radio remote control and by the person responsible for the safety of the work area, users shall always respect the following warnings.

Before starting to work.

- The transmitting unit shall be used in a simple and comfortable way, avoiding accidental falls. The harness provided with the radio remote control serves as such.
- Stand in a position that allows the direct supervision of the remote controlled machine and its load, and stay in a place ensuring safety conditions in respect of other operations and/or activities and/or processes that are carried out in the working environment.
- Never start up or use the transmitting unit if the working conditions present the risk of losing balance or tripping.
- Always check that the mechanical operation of the STOP pushbutton is correct.
- If it is impossible or difficult to press this pushbutton, do not use the radio remote control.
- Only start up the transmitting unit when starting work: improper use may cause hazardous situations.
- Never start up or use the transmitting unit in closed spaces, with the machine not in sight, or outside the radio remote control typical working range: in such cases it is in fact still possible to build a radio link, thus causing the risk that unwanted commands be carried out by the machine.

During normal operation

- Visually and directly follow all movements of the machine and its load and remain inside the radio remote control working range.
- Pay particular attention to warnings and visual and acoustic signals, and take all measurements and steps to avoid that movements of the remote controlled machine may lead to hazardous situations for people and/or property.
- Pay attention to the entire work area. Immediately press the STOP pushbutton when a hazardous situation occurs.
- Do not touch the receiving unit's metal parts as they may reach high, potentially dangerous temperatures.
- In case of malfunction, disable the system "machine+radio remote control" until the problem has been completely solved.

After using the radio remote control.

- Switch off the transmitting unit when work is stopped or temporarily interrupted.
- Do not leave the load hanging (even when changing the battery).
- Never leave the transmitting unit unguarded when the S-KEY is inserted.
- Always store the S-KEY in a safe place each time it is removed from the transmitting unit. If this key is lost, the radio remote control cannot work, since the transmitting unit needs the address stored in the key to work with its receiving unit.

Radio remote control lifecycle.

- To ensure a safe and long-lasting operation of radio remote controls, carefully follow the instructions provided for each stage of the product lifecycle:
 - Transportation:
 - radio remote controls must always be transported and stored inside their original packing until they are installed on the machine
 - Installation:
 - The radio remote control can only be installed and tested by competent staff that masters the technical knowledge required to carry out these procedures and is qualified according to the regulation of the country where the radio remote control is mounted.
 - Only if the radio remote control is installed correctly can it be used safely.
 - Use:
 - the use of radio remote controls is strictly limited to skilled and properly trained personnel, (See chapter: 2-DESCRIPTION)
 - Radio remote control maintenance:
 - the following instructions provide information to safely carry out routine and special maintenance operations for the radio remote control
 - Routine maintenance, consists of operations needed to preserve the radio remote control normal usage conditions, thus implementing fine-tuning, checks, planned replacement actions that necessarily arise from the normal use of the radio remote controls.
 - Routine maintenance carried out as described in this manual is fundamental for using the radio remote control safely (See chapter: 3-MAINTENANCE).
 - Special maintenance, consists of repairs needed due to radio remote control failure, damage or malfunction, carried out with the aim of restoring the original usage and working conditions (See chapter: 3-MAINTENANCE).



Prior to contacting the support service technicians of the machine's manufacturer:

- read and understand all parts of this manual, and make sure that all the instructions it contains have been accomplished correctly
- follow the instructions to detect possible malfunctions and their origins.



Any fault should be repaired by authorised personnel only, contact the support service of MANITOU.

- The following radio remote control data must be reported in order to make interventions faster and more reliable:
 - 1 - radio remote control serial number (S/N) and TU ID (transmitting unit identification number)
 - 2 - purchase date (given on the certificate of guarantee)
 - 3 - description of the problem found
 - 4 - address and telephone number of the place where the device is being used (with the name of the person to contact)



All fine-tuning, checking and maintenance actions carried out on the radio remote control shall be verified and recorded by the person in charge of carrying out maintenance on the machine.



In case of failure, emergencies or damaged parts, disable the system "radioremove control+machine" until the problem has been completely solved.



Before any maintenance operation, remove the battery from the transmitting unit and disconnect power from the receiving unit.



After any maintenance operation, always make sure that commands sent by the transmitting unit only activate the corresponding expected operations.

Disposal.

When disposing of a radio remote control, give it to the waste separate collecting services in the user's country. Please pay particular attention when recycling the batteries: apply local rules. Do not throw them away with domestic trash.

General operating instructions

Starting up the radio remote control.

Starting up the radio remote control consists in building a radio link between the transmitting and the receiving unit.

For this purpose, you need to:

- power on the receiving unit respecting the voltage limits provided in the technical data (Vedere Capitolo: 2-DESCRIZIONE). The POWER LED switches on,
- insert a charged battery in the transmitting unit (Vedere Capitolo: 2-DESCRIZIONE),
- insert the S-KEY in the transmitting unit
- press the START pushbutton in the transmitting unit until the POWER LED in the receiving unit and the green LED in the transmitting unit start blinking slowly.

Command activation

With the radio remote control started, act on the joysticks, pushbuttons and switches corresponding to the command to be performed.

The user must be properly trained about the symbols on the transmitting unit panel, to be aware of the matching between actuators and movements on the machine.

Data Feedback Function.

The user receives information and/or signals concerning the controlled machine by means of the Data Feedback function. During normal radio remote control operation, pay particular attention to the indications displayed and signalled by the display or through the LEDs: they can be helpful to evaluate the machine working status.



When operating and moving the machine, remember that the radio remote control does not intervene autonomously when potential hazardous situations are displayed and signalled.

Operation with display.

If the transmitting unit has a display, it is possible to visualize signal icons, measurements collected from the machine and their description (See chapter: 2-DESCRIPTION).

Operation with LED.

If the transmitting unit has an LED array, particular machine conditions are signalled if they are on (See chapter: 2-DESCRIPTION).

Radio link interruption.

When the radio link is incorrect or interrupted for a certain period of time, the passive stop function automatically cuts in.

The green LED on the transmitting unit switches from blinking slowly to fast blinking.

The POWER LED on the receiving unit switches from blinking to steady on.

Press the START pushbutton to start the radio remote control.

Transmitting unit automatic switch off.

The transmitting unit automatically switches off when:

- the battery is flat,
- the radio remote control is not used
- for a certain time,
- the transmitting unit is powered and never switched off for eight hours non stop.

The green LED on the transmitting unit switches off.

The POWER LED on the receiving unit switches from blinking to steady on.

Press the START pushbutton to start the radio remote control.

Low battery.

The transmitting unit indicates if the battery is not sufficiently charged (the red LED blinks and an acoustic signal sounds).

The transmitting unit automatically switches off after 3.5 minutes from the beginning of the signal.

The battery shall be replaced with a charged one.

When the transmitting unit is not used.

If the transmitting unit stays on for a time equivalent to the "automatic switch off time" without any of the commands activated, it automatically switches off after this time has elapsed.

Non-stop use.

The transmitting unit indicates if it has been used for eight hours non-stop (the red LED blinks and an acoustic signal sounds).

The transmitting unit automatically switches off after 3.5 minutes from the beginning of the signal.

Switching off the transmitting unit.

The transmitting unit shall be switched off each time work is stopped: remove the S-KEY and always store it in a safe place.

Switching off the receiving unit

The receiving unit shall be switched off each time the radio remote control is not used to control the machine. Remove power from the unit to switch it off.

LIFT TRUCK MAINTENANCE INSTRUCTIONS

GENERAL INSTRUCTIONS

- Ensure the area is sufficiently ventilated before starting the lift truck.
- Wear clothes suitable for the maintenance of the lift truck, avoid wearing jewellery and loose clothes. Tie and protect your hair, if necessary.
- Stop the engine and remove the ignition key, when an intervention is necessary.
- 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.
- Make sure that the disposal of process materials and of spare parts is carried out in total safety and in a ecological way.
- Be careful of the risk of burning and splashing (exhaust, radiator, engine, etc.).

PLACING THE JIB SAFETY WEDGE

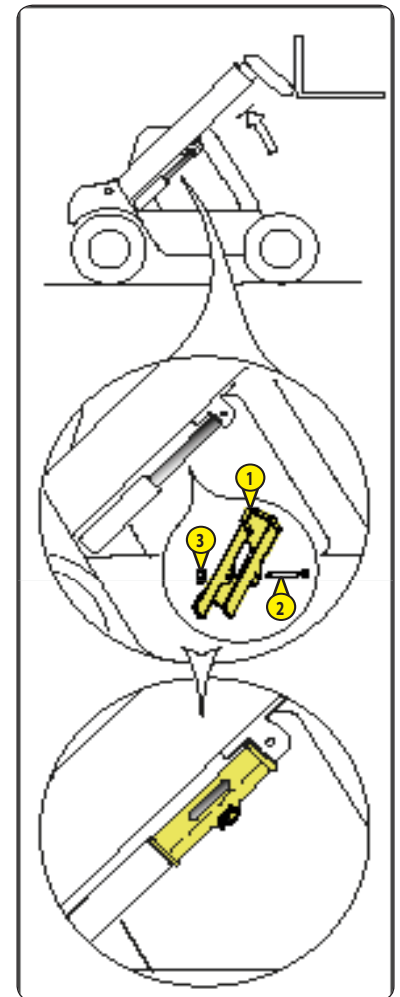
- The lift truck is equipped with a jib safety wedge (see: 2 - DESCRIPTION: INSTRUMENTS AND CONTROLS) that must be installed on the rod of the lifting cylinder when working beneath the jib.

FITTING THE WEDGE

- Fully raise the jib.
- Place the safety wedge 1 on the rod of the lifting cylinder and secure with the rod 2 and the pin 3.
- Slowly lower the jib then stop the hydraulic movements before it comes into contact with the wedge.

REMOVING THE WEDGE

- Fully raise the jib.
- Remove the pin and the rod.
- Return the safety wedge to the storage location provided on the lift truck.



Only use the wedge supplied with the lift truck.

MAINTENANCE

- Perform the periodic service (see: 3 - MAINTENANCE) to keep your lift truck in good working conditions. 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 part: 3 - MAINTENANCE and the other inspection, servicing or repair operations or modifications performed on the lift truck or its attachments shall be recorded in a maintenance logbook. The entry for each operation shall include details of the date of the works, 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 items replaced shall also be indicated.



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.

HYDRAULIC

- Any work on the load handling hydraulic circuit is forbidden except for the operations described in part: 3 - MAINTENANCE.
- Do not attempt to loosen unions, hoses or any hydraulic component with the circuit under pressure.



BALANCING VALVE: *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 pressurised units. Removing these accumulators and their pipework is a dangerous operation and must only be performed by approved personnel (consult your dealer).*

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 drop metallic items on the battery.
- Disconnect the battery before working on the electrical circuit.

WELDING

- Disconnect the battery before 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, so as to avoid high tension current passing through the alternator.
- Never carry out welding or work which gives off heat on an assembled tyre. The heat would increase the pressure which could 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.

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...).
- 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.

TRANSPORTING THE LIFT TRUCK



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

- Towing, slinging or transporting the lift truck (see: 3 - MAINTENANCE: G - OCCASIONAL MAINTENANCE).



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

INTRODUCTION

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

For these operations, we recommend the use of a MANITOU protective product, reference 603726.

Instructions for using the product are given on the packaging.



Procedures to follow if the lift truck is not to be used for a long time and for starting it up again afterwards must be performed by your dealership.

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 paintwork if necessary.
- Shut down the lift truck (see: OPERATING INSTRUCTIONS UNLADEN AND LADEN).
- Make sure the jib cylinder rods are all in retracted position.
- Release the pressure in the hydraulic circuits.

PROTECTING THE ENGINE

- Fill the tank with fuel (see: 3 - MAINTENANCE: A - DAILY OR EVERY 10 HOURS SERVICE).
- Empty and replace the cooling liquid (see: 3 - MAINTENANCE: F - EVERY 2000 HOURS SERVICE).
- Leave the engine running at idling speed for a few minutes, then switch off.
- Replace the engine oil and oil filter (see: 3 - MAINTENANCE: D - EVERY 500 HOURS SERVICE).
- Add the protective product to the engine oil.
- 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.
- Remove the injectors and spray the protective product into each cylinder for two seconds with the piston in low neutral position.
- Turn the crankshaft once slowly and refit the injectors (see engine REPAIR MANUAL).
- Remove the intake hose from the manifold or turbocharger and spray the protective product into the manifold or turbocharger.
- Cap the intake manifold or turbocharger hole with waterproof adhesive tape.
- Remove the exhaust pipe and spray the protective product into the exhaust manifold or turbocharger.
- Refit the exhaust pipe and block the outlet with waterproof adhesive tape.

NOTE: The spray time is noted on the product packaging and must be increased by 50 % for turbo engines.

- Open the filler plug, spray the protective product around the rocker arm shaft and refit the filler plug.
- Cap the fuel tank using 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.

PROTECTING THE LIFT TRUCK

- Set the lift truck on axle stands so that the tyres are not in contact with the ground and release the handbrake.
- Protect cylinder rods which will not be retracted, from corrosion.
- Wrap the tyres.

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



BRINGING THE LIFT TRUCK BACK INTO SERVICE

- Remove the waterproof adhesive tape from all the holes.
- Refit the intake hose.
- Refit and reconnect the battery.
- Remove the protection from the cylinder rods.
- Perform the daily service (see: 3 - MAINTENANCE: A - DAILY OR EVERY 10 HOURS SERVICE).
- Put the handbrake on and remove the axle stands.
- Empty and replace the fuel and replace the fuel filter (see: 3 - MAINTENANCE: D - EVERY 500 HOURS SERVICE).
- Refit and set the tension in the drive belts (see: 3 - MAINTENANCE: C - EVERY 250 HOURS SERVICE).
- 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 (see: 3 - MAINTENANCE: SERVICING SCHEDULE).



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

- Start up the lift truck, following the safety instructions and regulations (see: OPERATING INSTRUCTIONS UNLADEN AND LADEN).
- Run all the jib's hydraulic movements, concentrating on the ends of travel for each cylinder.



LIFT TRUCK DISPOSAL

MANITOU complies with the regulations deriving from Directive 2000/53/EC relating to lift truck end-of-life. This lift truck contains no substances or materials forbidden by Directive 2000/53/EC.

NOTE: Consult your dealer before disposing of your lift truck.

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 is used to simplify the recycling process.
- The majority of plastic components are made of "thermoplastic" plastics, 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.

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 organises the collection and processing of used oil products.
- 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.

NOTE: MANITOU aims to manufacture lift trucks that provide the best performance and limit polluting emissions.





2 - USE





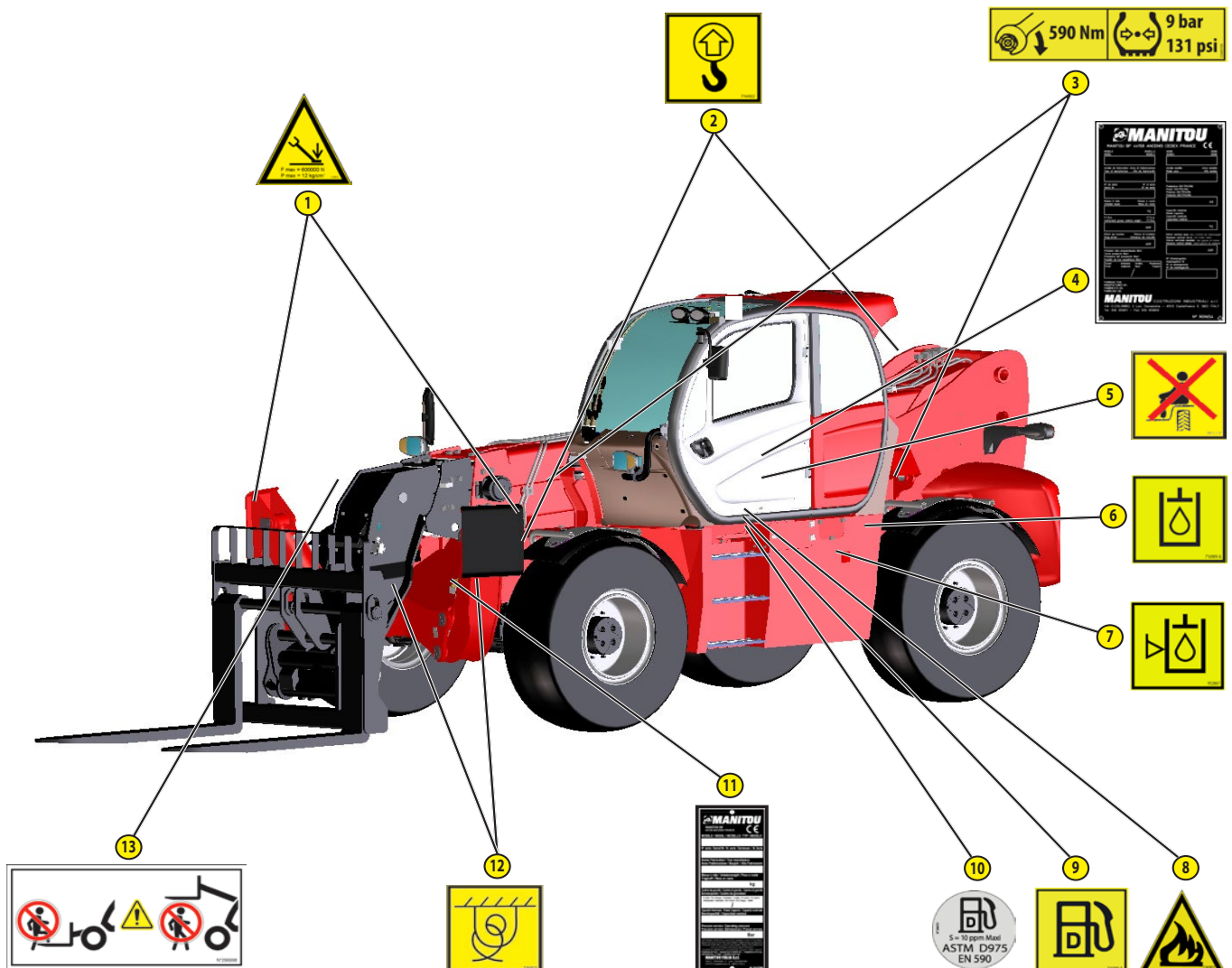
SAFETY STICKERS AND PLATES



Clean all the stickers and safety plates to keep them legible. It is essential to replace stickers and safety plates which are illegible or damaged. Check the presence of stickers and safety plates after replacing any spare parts.

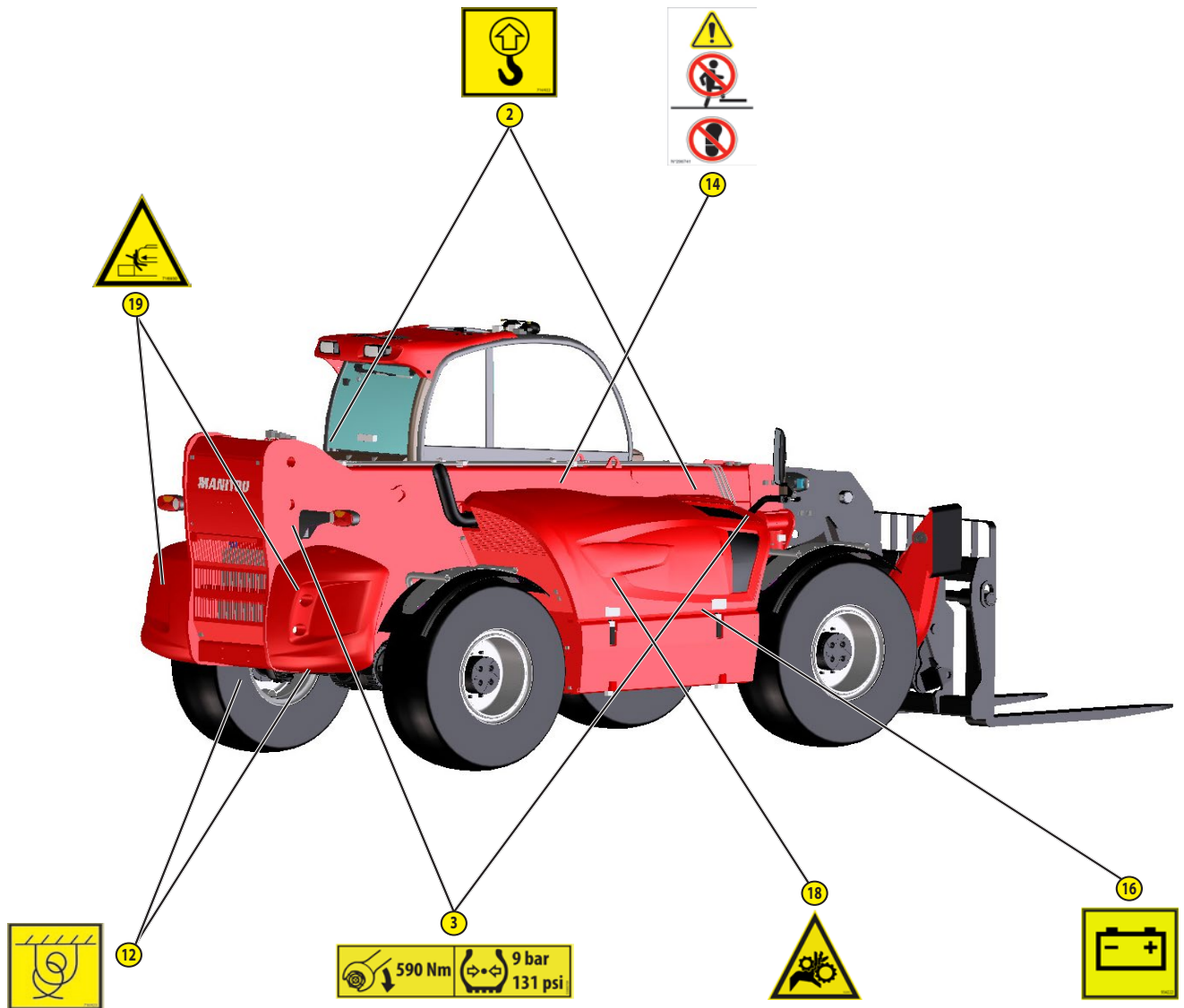
EXTERNAL STICKERS AND PLATES

Reference	Code	Description
1	934816	Attention! Pressure at the ground
2	53000709	Tightening and inflation pressure of tyres
3	716923	Harnessing point
4	(Contact your dealer)	Telehandler manufacturer's plate
5	716917	Danger of falling / crushing. Transportation of people is forbidden.
6	716909A	Hydraulic oil refill
7	932067	Hydraulic oil level
8	716907	Danger! Flammable liquids may catch fire causing personal injuries or death
9	716908A	Diesel refill
10	296751A	Diesel type
11	(Contact your dealer)	Attachment manufacturer's plate (Contact your dealer)
12	716923	Fixing point
13	296998A	MANISCOPIC Safety Instructions



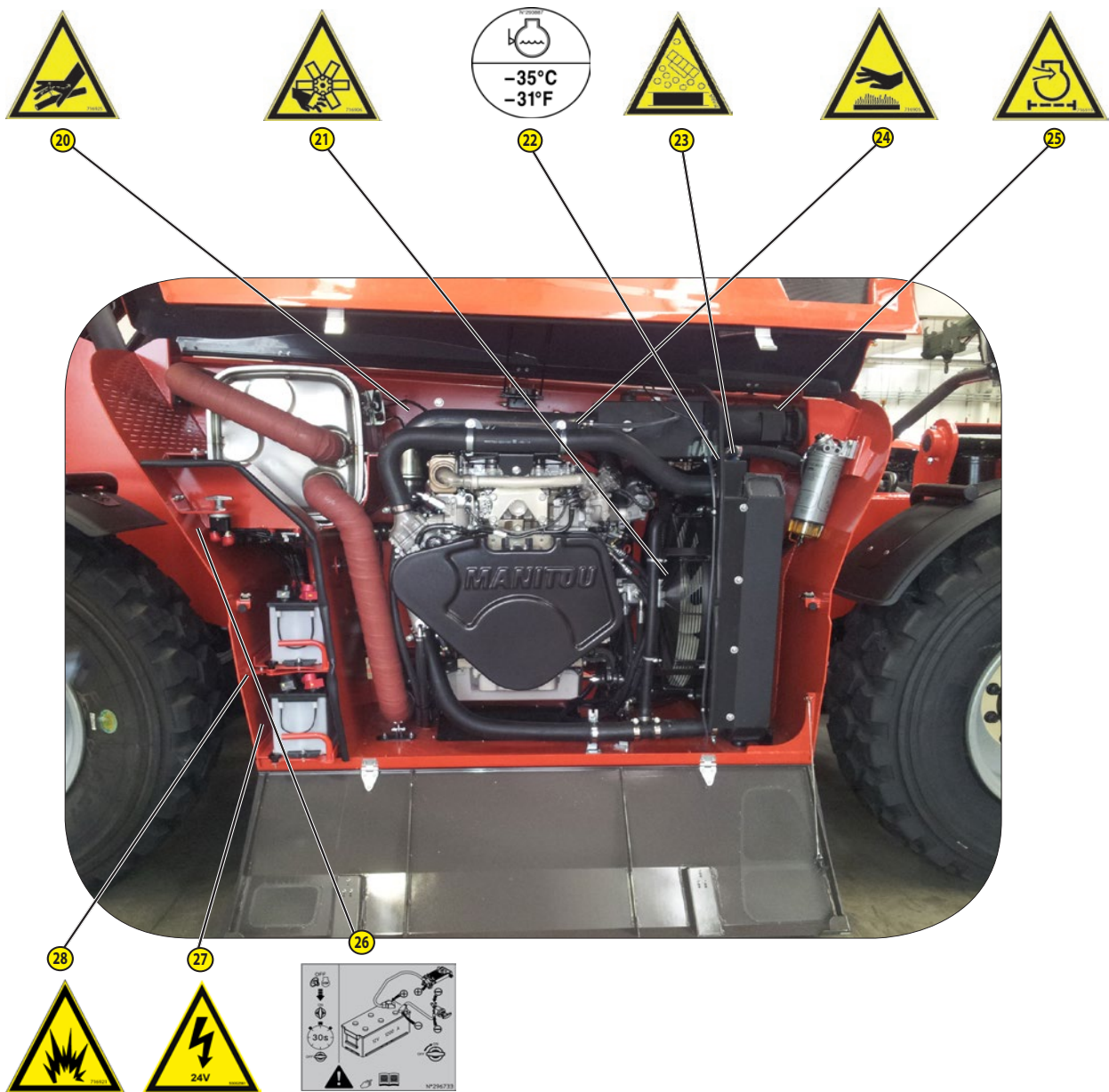


Reference	Code	Description
14	296641	Safety instruction: "Attention! Do not step on"
15	53002558	Quick-release couplings identification on the boom head
16	934222	Battery
17	934750	Control that opens the engine bonnet (access to telehandler engine)
18	932095	Warning! Access to moving parts of the telehandler due to opening of engine bonnet
19	716930	Danger! Risk of investment / crushing. During the operation of the telehandler, do not approach until it stops



PLATES AND STICKERS UNDER THE ENGINE BONNET

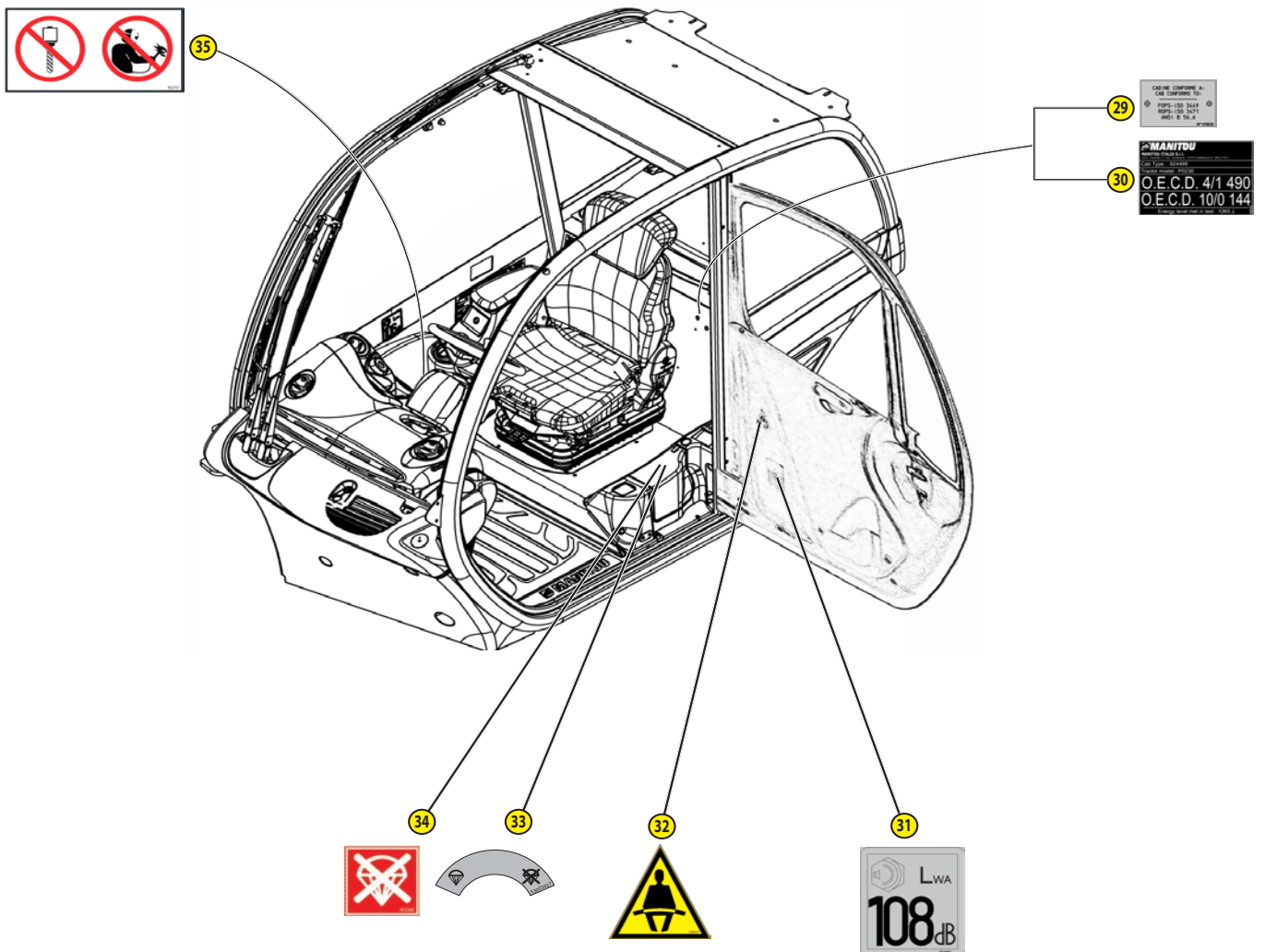
Reference	Code	Description
20	716925	Danger! Risk of injury from pressurized liquids. Before connecting the hydraulic hoses, check that the circuit is not pressurized, replace the tubes according to the wearing time provided on the user and maintenance manual
21	53000709	Fan in operation. Danger of entanglement. Do not put your hands near the fan blades
22	293887	Antifreeze fluid
23	716926	Danger! Projection hazard of pressurized antifreeze fluid
24	716917	Hot surfaces. Danger of scalding and burning! Be careful, stay away from hot surfaces (engine, exhaust manifold gas, etc.).
25	716909A	Engine intake air filter
26	296733	Battery cut-off instruction
27	909050	Risk of electric shock
28	716921	Risk of explosion. There is a danger of explosion if the battery is incorrectly replaced





PLATES AND STICKERS IN THE CAB

Reference	Code	Description
29	193032B	Cab conformity
30	930978	Cab approval (depending on model)
31	293887	Sound power
32	732107	It is mandatory to wear the safety belt when driving the telehandler
33	53003427	Control that excludes the stability system of telehandler
34	933345	Control position for the exclusion of the stability system of the telehandler
35	932117	Do not drill and weld telehandler parts





CE DECLARATION OF CONFORMITY

1) **DECLARATION "CE" DE CONFORMITE (originale)**
" EC" DECLARATION OF CONFORMITY (original)

2) La société, *The company* : **MANITOU ITALIA S.r.l.**

3) Adresse, *Address* : **Via Cristoforo Colombo 2, 41013 Cavazzona in Castelfranco Emilia -ITALIE**

4) Dossier technique, *Technical file* : **MANITOU ITALIA S.r.l. Via Cristoforo Colombo 2, 41013 Cavazzona in Castelfranco Emilia (MO) , Italie**

5) Constructeur de la machine décrite ci-après, *Manufacturer of the machine described below* :

CHARIOT TELESCOPIQUE ROTATIF MRT 2150 PRIVILEGE N° 763407
NACELLE ORH EXTENSIBLE 2,25/4M - Capacité 365 Kg p.n. 711204 (GSS POSITION B)
PFB p.n.709835 + FOURCHES FEM 4999 KG p.n.578097 (GSS POSITION A)
TREUIL 5 TON p.n.711934 (GSS POSITION J)

6) Déclare que cette machine, *Declares that this machine* :

7)- Est conforme aux directives suivantes et à leurs transpositions en droit national, *Complies with the following directives and their transpositions into national law*

2006/42/CE

8) - Pour les machines de l'annexe IV , *For annex IV machines* :

9) - Numéro de certification, *Certificate number*: **ME.0017.10 REV.05 du, of 05/07/2011**

10) - Organisme notifié, *Notified body* : **ECO s.p.a. EUROPEAN CERTIFYNG ORGANIZATION, Via Mengolina 33 48018 Faenza- Ravenna - Italia - Organismo notificato n° 0714**

2000/14/CE + 2005/88/CE

11) -Procédure appliquée, *Applied procedure* : **Annexe VI – 2000 / 14 / CE proc.I**

10) - Organisme notifié, *Notified body* : **ECO s.p.a. EUROPEAN CERTIFYNG ORGANIZATION, Via Mengolina 33 48018 Faenza- Ravenna - Italia - Organismo notificato n° 0714**

12) - Niveau de puissance acoustique, *Sound power level* :

13) Mesuré, *Measured* : **103 dB (A)**

14) Garanti, *Guaranteed* : **104 dB (A)**

2004/108/CE

15)-Normes harmonisées utilisées, *Harmonised standards used* : **EN 12895, EN 280 :2001+A2 :2009**

16)-Normes ou dispositions techniques utilisées, *Standards or technical provisions used* : /

17) - Fait à, *Done at* : **CASTELFRANCO EMILIA** 18) - Date, *Date* : **04/01/2013**

19) - Nom du signataire, *Name of signatory* : **IOTTI MARCO**

20) - Fonction, *Function* : **DIRECTEUR GENERAL**

21) - Signature, *Signature* :

MANITOU ITALIA Srl

A.Socio Unico - Sede Legale e Amm.va - Via C. Colombo, 2
Località Cavazzona - 41013 CASTELFRANCO E. (MO)
Tel. 059/959811 - Fax 059/959850
Cap. Sociale 2.000.000 I.V.
Reg. Imp. D.M. Modena e C.F. 0173970369
P.IVA IT 02591050360 - N. Mecc. MO 033322 R.E.A. 148776



IDENTIFICATION OF FORKLIFT TRUCK

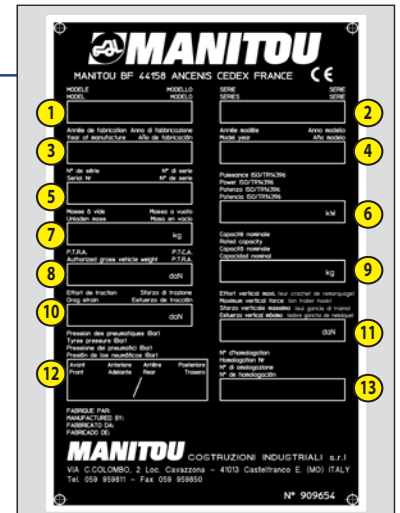
With a view to making constant improvements to our products, certain modifications may be made to our range of forklift trucks, without any obligation on our part to inform the clients.

For ordering spare parts or requesting technical information, please specify:

NOTE: To be able to easily provide us with all the reference numbers, you are advised to file the information when the forklift truck is delivered.

FORKLIFT TRUCK MANUFACTURER'S PLATE (A)

- 1 - MODEL
- 2 - SERIES
- 3 - Year of manufacture
- 4 - Model year
- 5 - Serial No.
- 6 - ISO/TR 14396 Power
- 7 - Unladen mass
- 8 - Authorised Total Circulating Weight
- 9 - Nominal capacity
- 10 - Traction force
- 11 - Maximum vertical force (on the tow hook)
- 12 - Pressure of tyres (bar)
- 13 - Approval No.



All other technical information regarding your forklift truck is listed in the chapter: 2 – DESCRIPTION: CHARACTERISTICS

ENGINE PLATE

The following data is contained on the engine data plate in the form of numbers stamped directly onto the crankcase:

Example: engine data plate

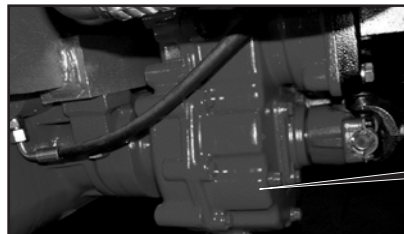
1. Manufacturer's name
2. Engine model designation
3. Type approval number
4. Engine number



1 Daimler AG
2 OM926LA.III/4/1 B4C01
4 926.959-00-XXXXXX
e1*97/68HA* 3
2004/26*0335*01

GEARBOX PLATE

1. Type and model unit - modification index
2. Serial number
3. MANITOU Reference



1
2
3
MFG. BY CLARK-HURTH COMPONENTS S.P.A.
38062 Arco (Trento)
MADE IN ITALY

FRONT AND REAR AXLE PLATE

1. Type and model unit - modification index
2. Serial number
3. MANITOU Reference



1
2
3
MFG. BY CLARK-HURTH COMPONENTS S.P.A.
38062 Arco (Trento)
MADE IN ITALY



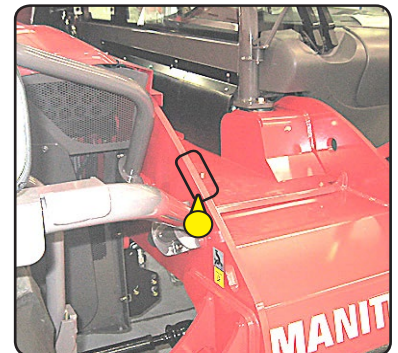
CAB

1. Type and model unit - modification index
2. Serial number



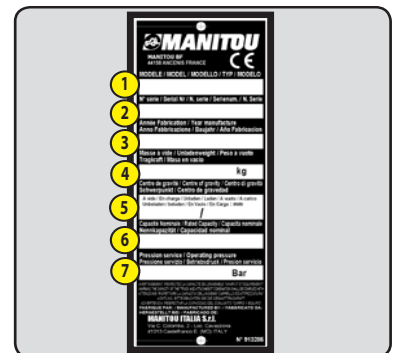
FRAME

- Serial No. of lift truck



ATTACHMENT MANUFACTURER'S PLATE (H)

1. Model
2. Serial number
3. Year manufacture
4. Unladen weight
5. Centre of gravity
6. Rated capacity
7. Operating pressure





CHARACTERISTICS

ENGINE			
Engine		MHT-X 1490 MHT-X 10130	MHT-1490 MHT 10130
Type		OM 904LA (EU Stage 3A)	OM 934LA (EU Stage 4)
Fuel		Diesel	
Number of cylinders		4	
Injection system		High pressure injection system with injection nozzles in central position	Common Rail
Firing order		1 - 3 - 4 - 2	
Displacement	litres - cm ³	4.25 - 4250	5.13 - 5130
Bore	mm - in	102 - 4.01	110 - 4.33
Stroke	mm - in	130 - 5.11	135 - 5.31
Turbocharging system		Turbocharging with charge air cooling (air/air)	
Turbocharger		TC charging with waste-gate valve	TC charging with fixed geometry and waste-gate valve
Compression ratio	rpm	18	17.6
Nominal rate	rpm	2200	2200
Idle rate	rpm	800	800
Maximum rate	rpm	2750	2500
Rated power		176 CV-129 kW @ 2200 rpm	176 CV-129 kW @ 2200 rpm
Maximum torque		675 Nm @ 1200 - 1600 rpm	750 Nm @ 1200 - 1600 rpm
Main Coupling type		SAE3	
Additional service PTO (type, max torque)			
Exhaust gas after-treatment			SCR system, exhaust muffler with catalyst, AdBlue injection with supplying and metering unit
Cooling system			
Water cooling		Cooling water/air radiator	
Hydraulic oil cooling		Cooling oil radiator	
Fan drive system		Hydraulic system with proportional regulation	
Motor type		Hydraulic	
Blower fan speed	rpm	2070	
Number of blades		14	
Diameter	mm - in	680 - 26.77	
TRANSMISSION			
Hydrostatic motor			
Motor type		A6VM115DA - Axial piston variable motor	
Max displacement	litres - cm ³	0.115 - 115	
Pressure	bar - psi	500 - 7251.88	
Gearshift		Model 357HD/497	
Nb of forward gears		2	
No. of reverse gears		2	
Reverser		On hydrostatic pump	
Brakes			
Type		Disc in oil bath on front and rear axle	
Foot brake		Action on front and rear wheels	
Hand brake		Hydraulic with negative action on front axle	
Front axle			
Type		Steering, DANA	
Brake type		6 internal, wet disk	



Limited slip system		Open differential	
Final drives		Epicyclic	
Rear axle			
Type		Steering, DANA	
Brake type		6 internal, wet disk	
Limited slip system		Open differential	
Final drives		Epicyclic	
Standard front & rear tyres		<i>MHT-X 1490</i> <i>MHT 1490</i>	<i>MHT-X 10130</i> <i>MHT 10130</i>
Dimensions		EOLUS 17.5 R 25 A2237	
Pressure	bar - psi	9 - 130.53	8 - 116.03
Optional front & rear tyres			
Dimensions		EOLUS 17.5 R 25 A2233	
Pressure	bar - psi	9 - 130.53	8 - 116.03
Optional front & rear tyres			
Dimensions		GOOD YEAR 17.5 R 25 RL-5K	
Pressure	bar - psi	9 - 130.53	8 - 116.03
ELECTRICAL CIRCUIT			
Electrical circuit			
Ground		Negative	
Battery standard		24 V - 100 A	
Voltage regulator		Built into the alternator	
HYDRAULIC CIRCUIT			
Hydrostatic pump			
Pump Type		A4VG85DA - Axial piston variable pump	
Max displacement	litres - cm ³	0.085 - 85	
Flow rate @ 2200 rpm	l/min	182	
Pressure	bar - psi	500 - 7251.88	
Hydraulic circuit main pump			
Pump Type		MVP60.84D-06S8-LSF - Axial piston variable pump	
Displacement	litres - cm ³	84 - 0.084	
Flow rate @ 2200 rpm	l/min	180	
Pressure	bar - psi	300 - 4351.13	
Hydraulic circuit secondary pump			
Pump Type		KP20.16	
Displacement	litres - cm ³	0.016 - 16	
Flow rate @ 2200 rpm	l/min	34	
Pressure	bar - psi	290 - 4206.09	
Main solenoid valves			
Lifting circuit	bar (psi)	280 (4061.05)	
	l/min	180	130
Extension circuit	bar (psi)	280 (4061.05)	
	l/min	180	130
Tilting circuit	bar (psi)	280 (4061.05)	
	l/min	180	130
Frame levelling	bar (psi)	115 (1667.93)	
	l/min	8	
Rear axle locking	bar (psi)	30 (435.11)	
	l/min	40	
Stabilizers		<i>MHT-X 1490</i> <i>MHT 1490</i>	<i>MHT-X 10130</i> <i>MHT 10130</i>
	bar (psi)	280 (4061.05)	-
	l/min	100	-



Optional circuit	bar (psi)	280 (4061.05)	
	l/min	100	
Steering circuit			
Pump Type		MVP60.84D-06S8-LSF - Axial piston variable pump	
Displacement	litres - cm ³	0.084 - 84	
Flow rate @ 2200 rpm	l/min	70	
Pressure	bar - psi	210 - 3045.79	
Type		Load sensing	
Brake circuit			
Type		Oil bathed multidisc	
Pressure	bar - psi	80 - 1160.30 (max on brakes)	
NOISE AND VIBRATION			
Acoustic pressure level in the driver's cab LpA (according to NF EN 12053)	dB(A)	79.7 (cab closed)	
Noise pressure level ensured in the LwA environment (according to directive 2000/14/EC modified by directive 2005/88/EC)	dB(A)	108 (guaranteed)	
Average weighted acceleration on driver's body (according to NF EN 13059)	m/s ²	0.786	
The average weighted acceleration trans- mitted to the driver's hand/arm system (according to ISO 5349-2)	m/s ²	< 2.5	
HYDRAULIC MOTION SPEEDS			
Unladen lifting	s	15.2	
Laden lifting	s	-	
Unladen lowering	s	13.8	
Laden lowering	s	-	
Unladen extending	s	16.1	
Laden extending	s	-	
Unladen retracting	s	10	
Laden retracting	s	-	
Reverse tilt time unladen	s	5.3	
Forward tilt time unladen	s	6.6	
SPECIFICATION AND WEIGHT			
Speed of movement of the telehandler in standard configuration on flat ground (except particular conditions)			
Driving speed			
Maximum speed:	km/h - mph	31 - 19.26	
Forward unloaded	km/h - mph	31 - 19.26	
With nominal load	km/h - mph	5 - 3.1	
Reverse unloaded	km/h - mph	31 - 19.26	
With nominal load	km/h - mph	5 - 3.1	
Lifting capacity			
		<i>MHT-X 1490</i> <i>MHT 1490</i>	<i>MHT-X 10130</i> <i>MHT 10130</i>
Standard lifting height on tyres	mm - in	13650 - 537.4	9620 - 21208.44
Standard lifting height on stabilizers	mm - in	13970 - 549.99	-
Lifting height at max capacity on tyres	mm - in	7850 - 309.05	6170 - 13602.51
Lifting height at max capacity on stabilizers	mm - in	8000 - 314.95	-
Forward reach at max capacity on tyres	mm - in	2300 - 90.55	1480 - 3262.83
Forward reach at max capacity on stabilizers	mm - in	2450 - 96.45	-
Max rated capacity with STD carriage and forks	kg - lb	9000 - 19841.58	13000 - 28660.06
Distance from centre of gravity	mm - in	600 - 23.62	



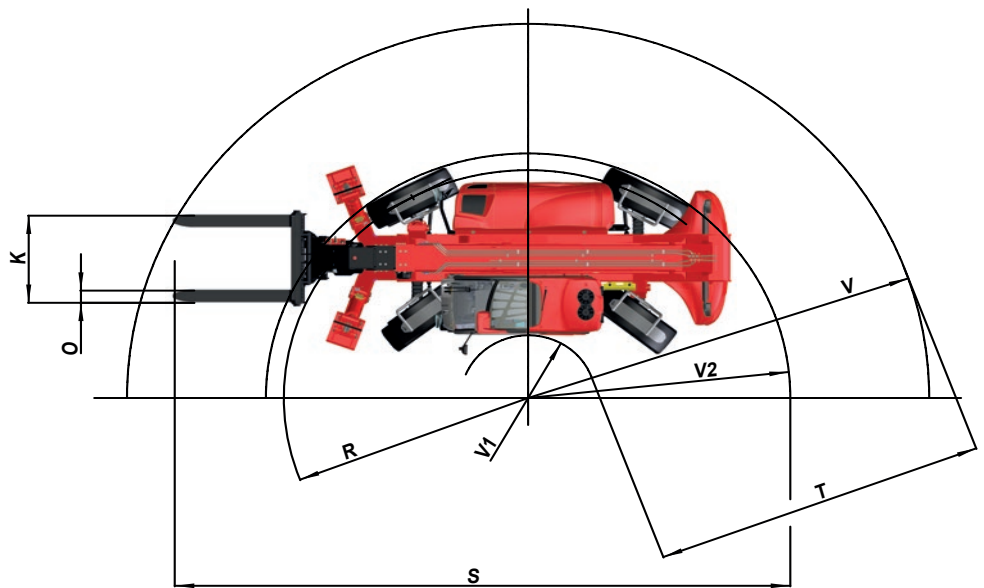
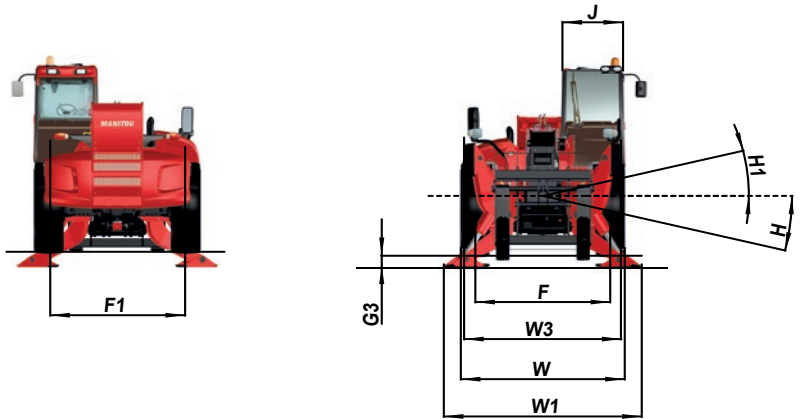
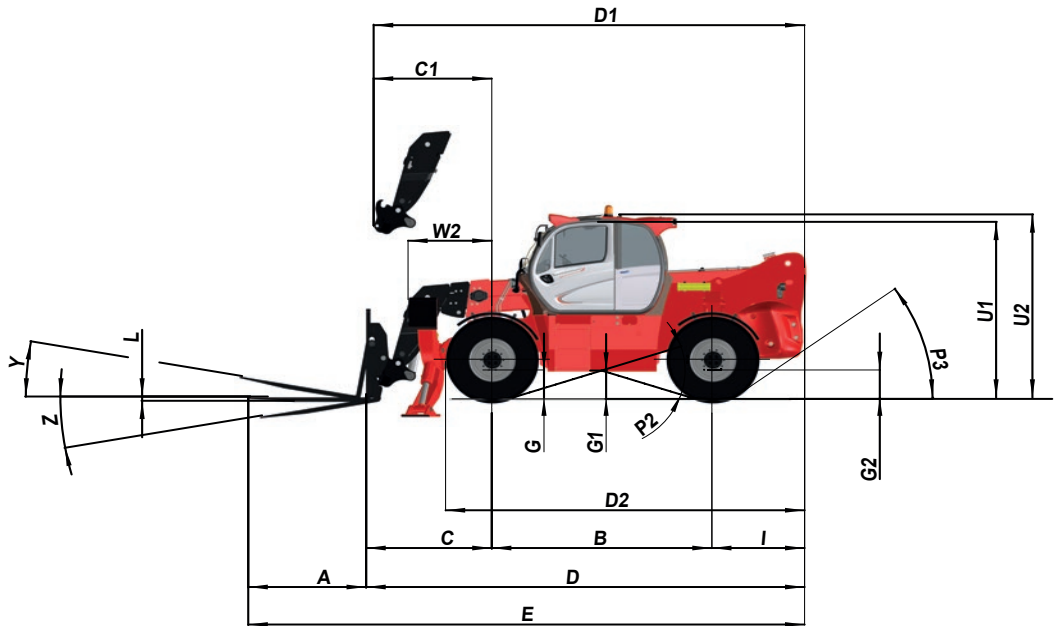
Capacity at max height with STD carriage and forks on tyres	kg - lb	4500 - 9920.79	7500 - 16534.65
Capacity at max height with STD carriage and forks on stab	kg - lb	6000 - 13227.72	-
Capacity at max reach with STD carriage and forks on tyres	kg - lb	1500 - 3306.93	3500 - 7716.17
Capacity at max reach with STD carriage and forks on stabilizers	kg - lb	3500 - 7716.17	-
Weight distribution with STD carriage and forks		MHT-X 1490 MHT 1490	MHT-X 10130 MHT 10130
Truck weight with STD carriage and forks (unloaded)	kg - lb	20800 - 45856.1	18490 - 40763.42
Front axle unloaded	kg - lb	7500 - 16534;65	6850 - 15101.65
Rear axle unloaded	kg - lb	13300 - 29321.45	11640 - 25661.78
Front axle loaded	kg - lb	24500 - 54013.19	27800 - 61288.44
Rear axle loaded	kg - lb	5300 - 11684.49	3690 - 8135.04
Max load on each stabilizer	N - kg/cm ²	135000 - 10	-
Max pressure on ground (unladen - max speed)	daN/cm ²		16
Max pressure on ground (laden - max speed 5 km/h / 3.1 mph)	daN/cm ²		29
Drawbar pull			
Tractive force (drawbar pull)	daN		10800
Breakout force with bucket (according to standard ISO 8313)			
Gradeability		MHT-X 1490 MHT 1490	MHT-X 10130 MHT 10130
Unladen	%	-	-
Loaded	%		34
FILLING			
Tank capacities		MHT-X 1490 MHT 1490	MHT-X 10130 MHT 10130
Hydraulic and transmission oil	Litres		290
Fuel	Litres		315
DEF	Litres	MHT-X 1490	MHT-X 10130
		-	63
Circuit capacities		MHT-X 1490 MHT 1490	MHT-X 10130 MHT 10130
Hydraulic and transmission oil	Litres		360
Coolant	Litres		45
Components capacities			
Engine Oil	Litres	MHT-X 1490	MHT-X 10130
		13-16	17.5-20.5
Gear box	Litres		1.8
Front axle differential oil	Litres		21
Axle final drive oil	Litres		1.8
Rear axle differential oil	Litres		20.5
Axle final drive oil	Litres		1.8



DIMENSIONS

MHT-X 1490
MHT 1490

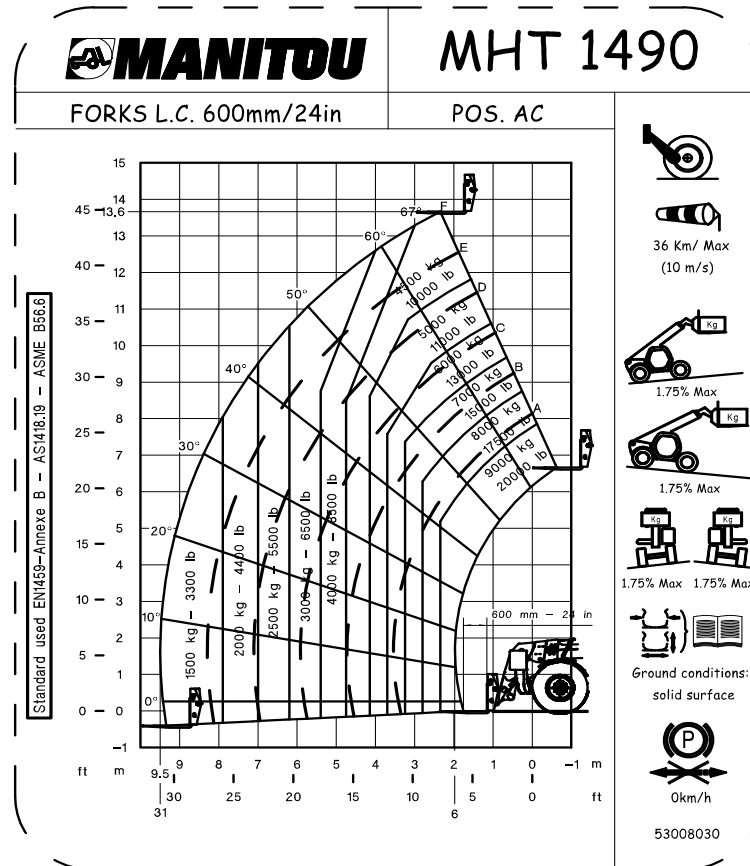
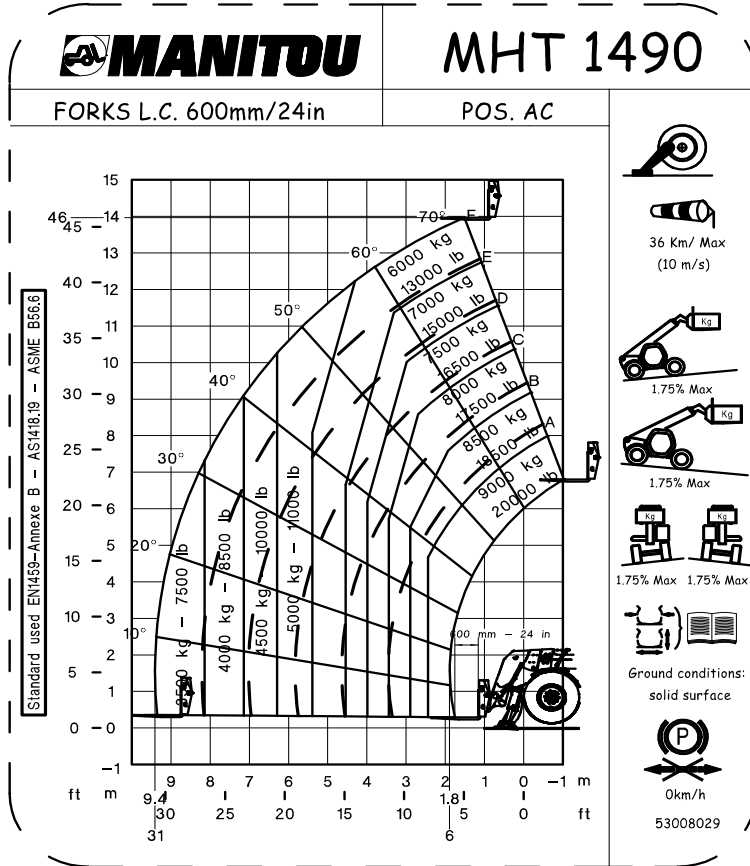
	mm	in
A	1200	47.24
B	3380	133.07
C	1870	73.62
C1	1750	68.90
D	6680	262.99
D1	6550	257.87
D2	5500	216.54
E	7880	310.24
F	2060	81.10
F1	2055	80.91
G	465	18.31
G1	420	16.54
G2	445	17.52
G3	225	8.86
H1	8.9°	
H2	10°	
I	1430	56.30
J	950	37.40
K	1415	55.71
L	60	2.36
O	200	7.87
P2	16.5°	
P3	33°	
R	5113	201.30
S	10050	395.67
T	3905	153.74
U1	2945	115.94
U2	3000	118.11
V	6455	254.13
V1	2550	100.39
V2	5345	210.43
W	2523	99.33
W1	3055	120.28
W2	1350	53.15
W3	2435	95.87
Y	30°	
Z	103°	

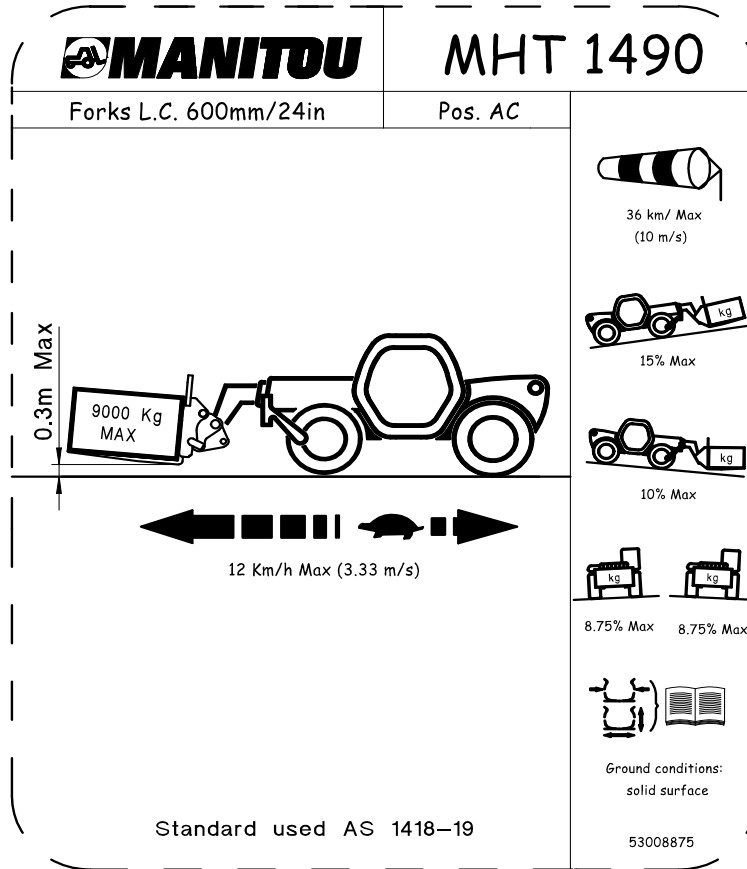




LOAD CHARTS

MHT-X 1490 with plate
MHT 1490 with plate



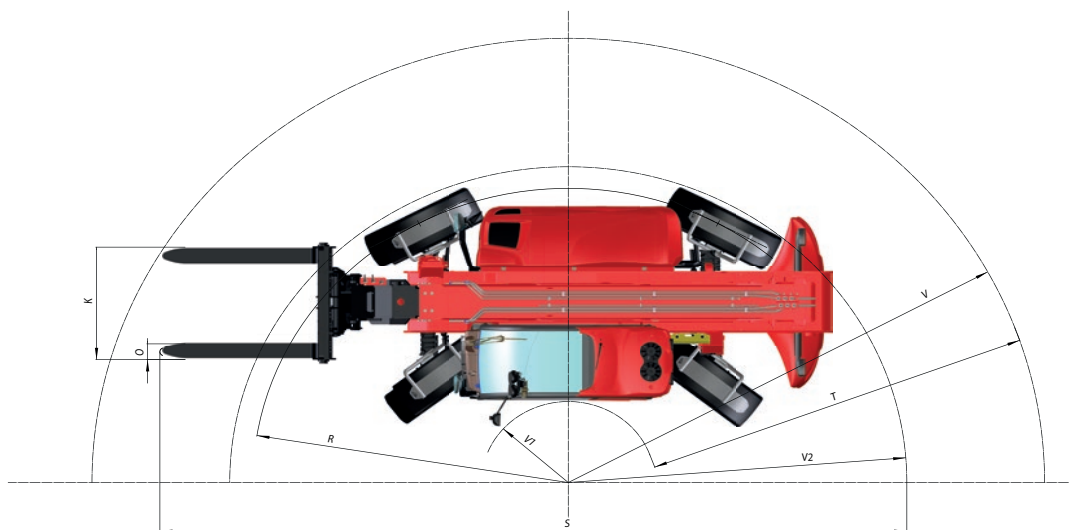
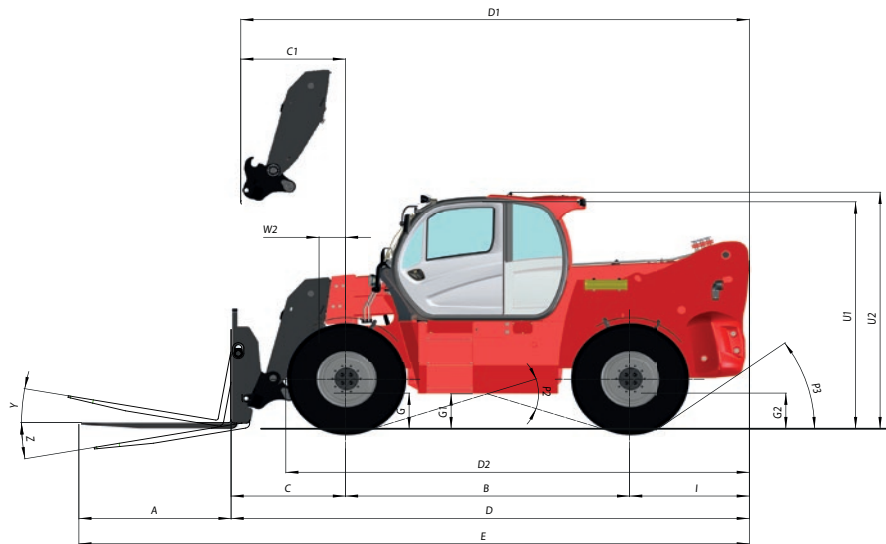




DIMENSIONS

MHT-X 10130
MHT 10130

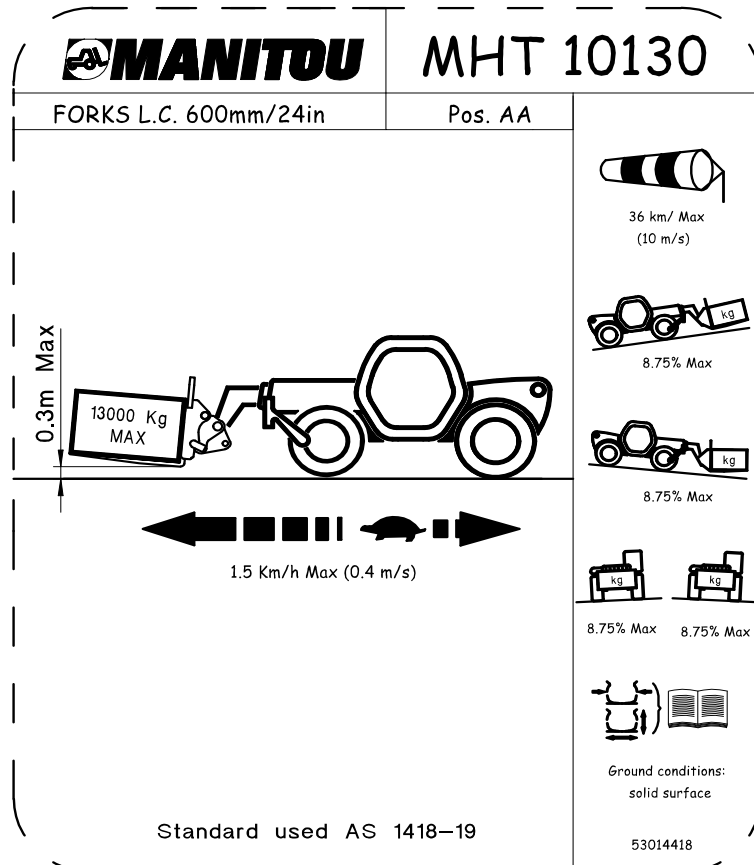
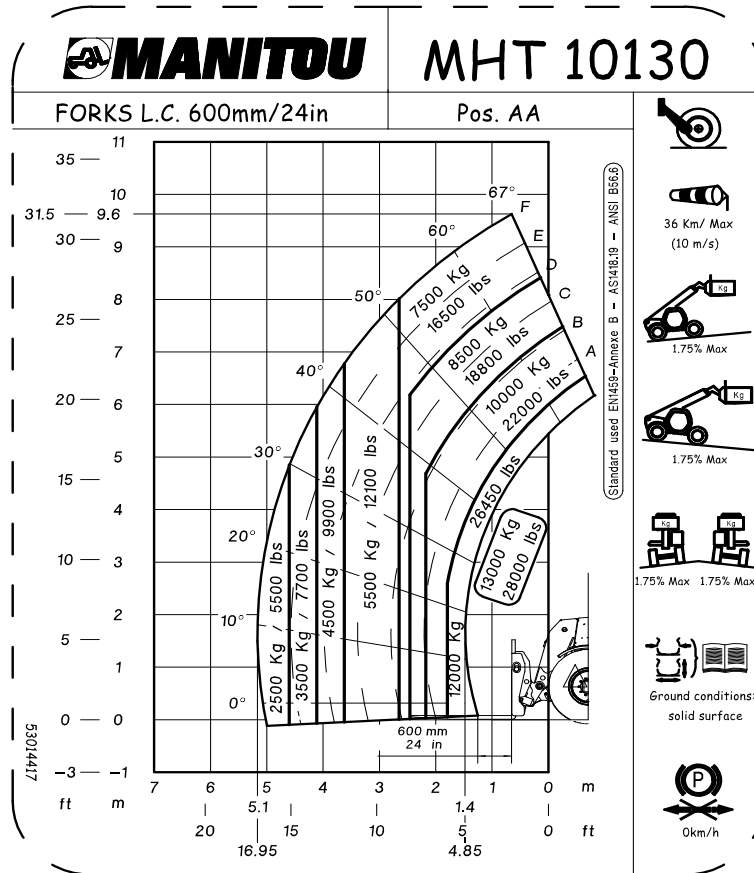
	mm	in
A	1200	47.24
B	3370	132.68
C	1365	53.74
C1	1230	48.43
D	6150	242.13
D1	6010	236.61
D2	5500	216.54
E	7950	312.99
F	2090	82.28
F1	2090	82.28
G	480	18.90
G1	440	17.32
G2	470	18.50
H1	10.3°	
H2	9.4°	
I	1415	55.71
J	928	36.54
K	1428	56.22
L	700	27.56
O	200	7.87
P2	16°	
P3	30.5°	
R	3740	147.24
S	9145	360.04
T	5120	201.57
U1	2930	115.35
U2	2990	117.72
V	6150	242.13
V1	1030	40.55
V2	4015	158.07
W	2550	100.39
W2	313	12.32
Y	22°	
Z	109°	





LOAD CHARTS

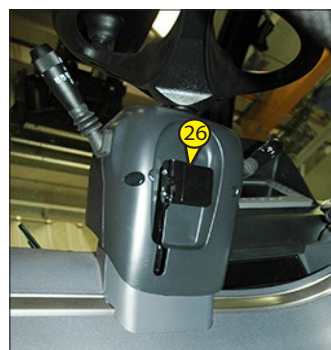
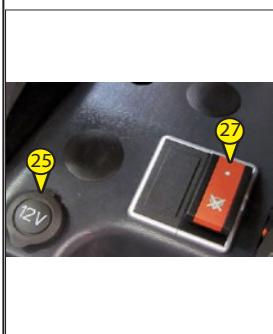
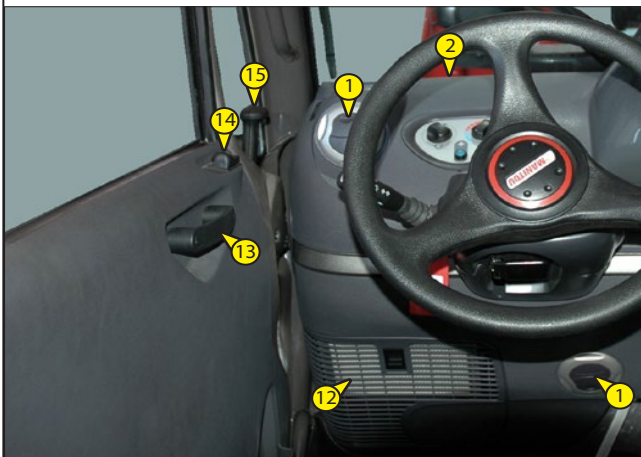
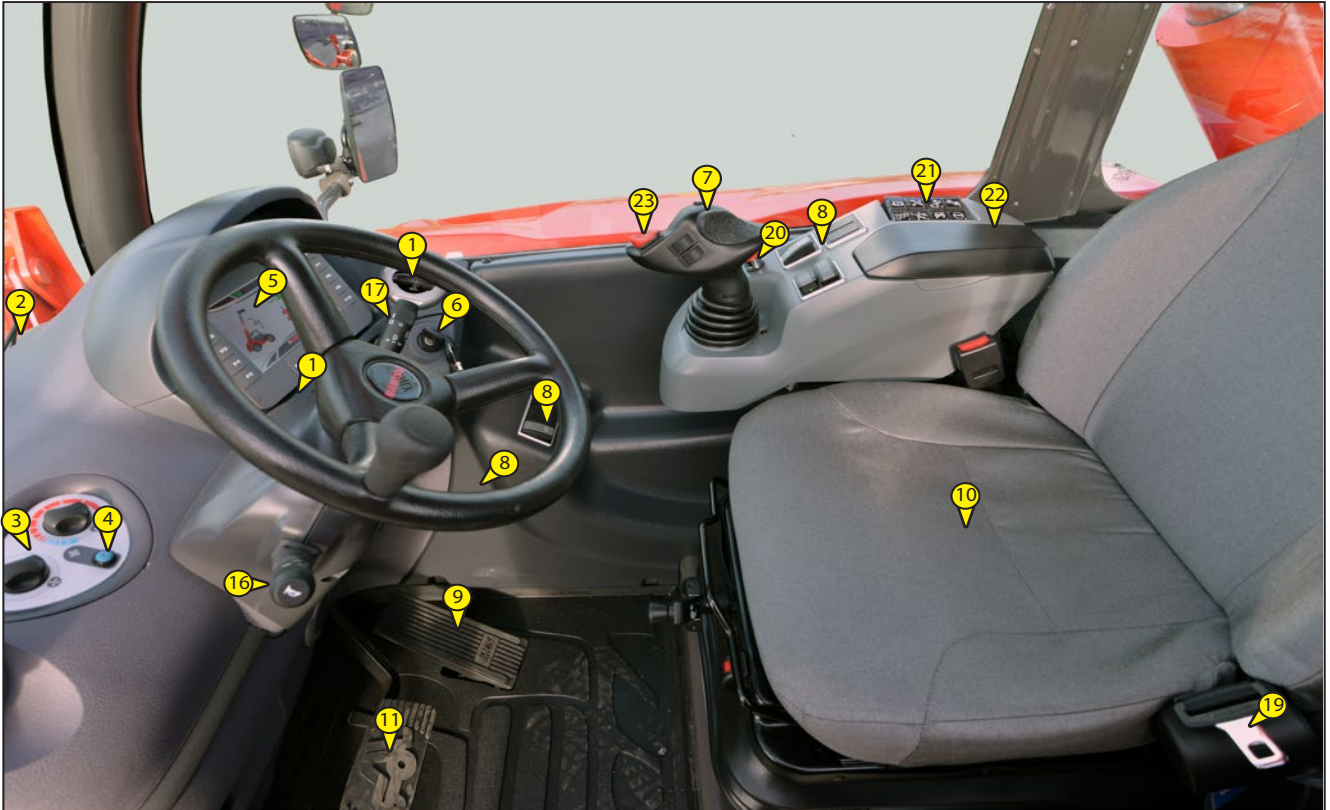
MHT-X 10130 with plate
MHT 10130 with plate





CONTROLS AND DISPLAYS

(Depending on the telehandler model)



(Second equipment)

2 - 1

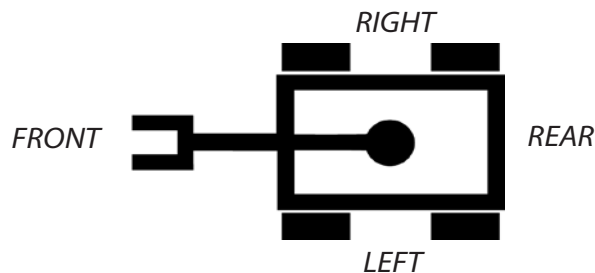


CONTROLS AND DISPLAYS

OVERVIEW (2 - 1)

1. "AIR DIFFUSERS OF HEATING"	2-66
2. "AIR DIFFUSERS FOR DEMISTING"	2-66
3. "HEATER CONTROL"	2-65
4. "AIR CONDITIONING CONTROLS (OPTION)"	2-65
5. "CONTROL PANEL AND LOAD LIMITER "HMI""	2-24
6. START-UP SWITCH	2-59
7. PROPORTIONAL ELECTRO-HYDRAULIC JOYSTICK	2-64
8. "SWITCHES"	2-42
9. "ACCELERATOR PEDAL"	2-61
10. "DRIVER'S SEAT"	2-21
11. "SERVICE BRAKE PEDAL"	2-61
12. "CAB FILTER VENTILATORS"	2-68
13. "DOOR CLOSING HANDLE"	2-66
14. "WINDOW LIFT (POWER-OPERATED) SWITCH"	2-45
15. "DOOR OPENING LEVER"	2-66
16. "LIGHTING, HORN AND INDICATOR LIGHTS LEVER"	2-62
17. "FRONT AND REAR WINDSCREEN WIPER LEVER"	2-62
18. "BUBBLE LEVEL"	2-40
19. "SEAT BELT"	2-23
20. "EMERGENCY STOP" BUTTON"	2-50
21. "KEYPAD"	2-38
22. "ARMREST AND STORAGE"	2-67
23. "FORWARD/NEUTRAL/REVERSE GEAR SELECTION"	2-63
24. "CEILING LIGHT"	2-67
25. "POWER OUTLET 12 V"	2-23
26. "STEERING WHEEL ADJUSTMENT LEVER"	2-66
27. "SELECTOR TO DISABLE THE LOAD LIMITER"	2-37

NOTE: RIGHT, LEFT, FRONT, REAR are meant for an observer seated on the driver's seat and looking forward.



1- DRIVER'S SEAT

There are three types of driver's seat:

- A - Driver's seat (standard) (🛠️ 2 - 2)
- B - Low frequency driver's pneumatic seat (option) (🛠️ 2 - 3)
- C - Driver's pneumatic seat (option) (🛠️ 2 - 3)

DRIVER'S SEAT (STANDARD)

Designed for maximum comfort, this seat can be adjusted as follows.

SEAT HEIGHT ADJUSTMENT

Sit correctly on the seat.

Turn the knob (1, 🛠️ 2 - 2) according to the desired height, clockwise to lift, anti-clockwise to lower, ensuring that the green indicator lamp (2, 🛠️ 2 - 2) remains visible.

If the indicator lamp (2, 🛠️ 2 - 2) is red, re-adjust the height.

NOTE: The seat is designed so as not to require adjustment according to the driver's weight.

LONGITUDINAL ADJUSTMENT

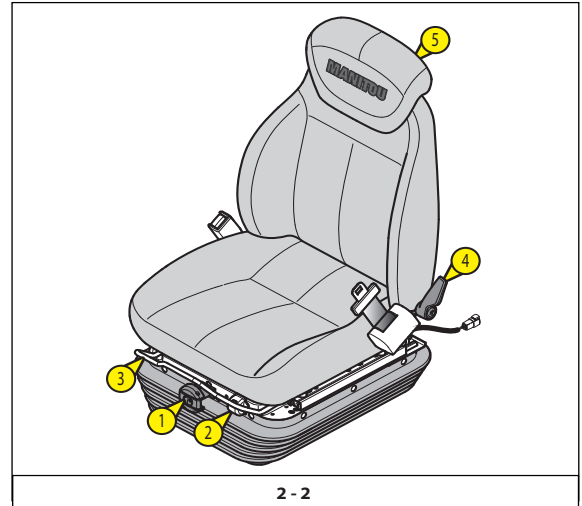
Pull the locking lever (3, 🛠️ 2 - 2) upwards.

Slide the seat to the desired position.

Release the lever and ensure it returns to the lock position.

ANGLE ADJUSTMENT OF THE BACK-REST

Support the back-rest, push the lever (4, 🛠️ 2 - 2) backward and tilt the back-rest to the desired position.



2 - 2



If you do not support the back-rest when making adjustments, it will completely swing forward.

EXTENDING THE HEAD-REST

The height of the head-rest (5, 🛠️ 2 - 2) can be adjusted by pulling it upwards (the notches will click) up to the stop.

The head-rest can be removed by applying sufficient pressure to pull it off the stop.

LOW FREQUENCY DRIVER'S PNEUMATIC SEAT (OPTION)

Designed for maximum comfort, this seat can be adjusted as follows.

SEAT HEIGHT ADJUSTMENT

Sit correctly on the seat.

Switch on lift truck ignition.

Pull or push lever (1, 2 - 3) according to the desired height, making sure that the green indicator lamp (2, 2 - 3) remains visible.

If the indicator lamp (2, 2 - 3) is red, re-adjust the height.

NOTE: The seat is designed so as not to require adjustment according to the driver's weight.

LONGITUDINAL ADJUSTMENT

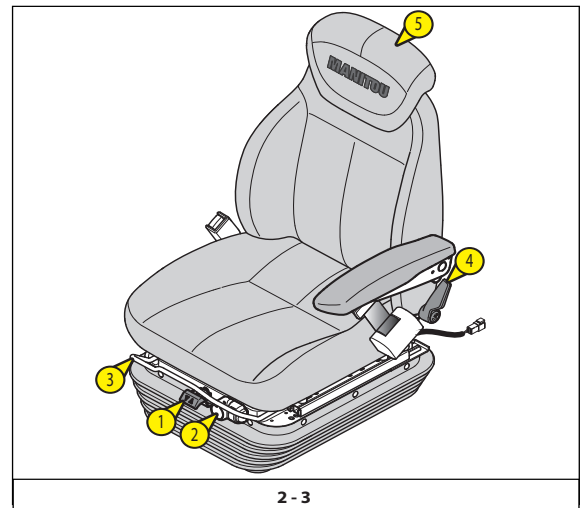
Pull the locking lever (3, 2 - 3) upwards.

Slide the seat to the desired position.

Release the lever and ensure it returns to the lock position.

ANGLE ADJUSTMENT OF THE BACK-REST

Support the back-rest, push the lever (4, 2 - 3) backward and tilt the back-rest to the desired position.



If you do not support the back-rest when making adjustments, it will completely swing forward.

EXTENDING THE HEAD-REST

The height of the head-rest (5, 2 - 3) can be adjusted by pulling it upwards (the notches will click) up to the stop.

The head-rest can be removed by applying sufficient pressure to pull it off the stop.

DRIVER'S PNEUMATIC SEAT (OPTION)

Designed for maximum comfort, this seat can be adjusted as follows.

SEAT HEIGHT ADJUSTMENT

Sit correctly on the seat.

Switch on lift truck ignition.

Pull or push lever (1, 2 - 4) according to the desired height, making sure that the green indicator lamp (2, 2 - 4) remains visible.

If the indicator lamp (2, 2 - 4) is red, re-adjust the height.

NOTE: The seat is designed so as not to require adjustment according to the driver's weight.

LONGITUDINAL ADJUSTMENT

Swing lever (3, 2 - 4) upwards.

Slide the seat to the desired position.

Release the lever and ensure it returns to the lock position.

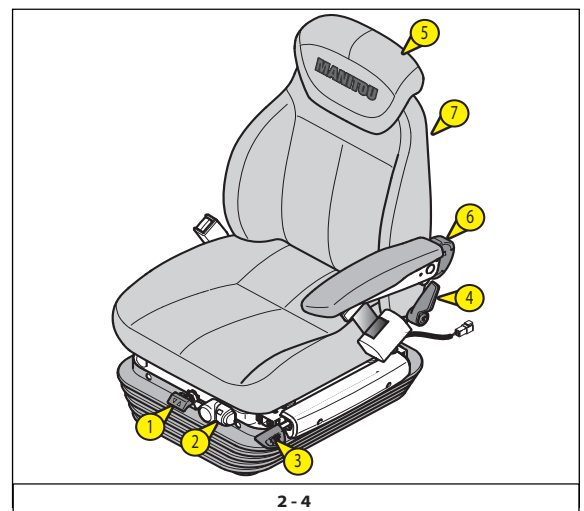
HORIZONTAL DAMPER

In certain conditions (e.g. driving with a trailer) the use of a horizontal shock absorber is recommended. The driver's seat is thus better able to absorb jerks in the direction of travel.

Swing lever (3, 2 - 4) downwards to block the horizontal damper.

ANGLE ADJUSTMENT OF THE BACK-REST

Support the back-rest, push the lever (4, 2 - 4) backward and tilt the back-rest to the desired position.



If you do not support the back-rest when making adjustments, it will completely swing forward.

EXTENDING THE HEAD-REST

The height of the head-rest (5, 2 - 4) can be adjusted by pulling it upwards (the notches will click) up to the stop.

The head-rest can be removed by applying sufficient pressure to pull it off the stop.

LUMBAR ADJUSTMENT

Turn knob (6, 2 - 4) anti-clockwise to select one of the (5, 2 - 4) lumbar support settings.

SEAT HEATING

Switch (7, 2 - 4) operates the heating of the seat cushion and the back-rest.

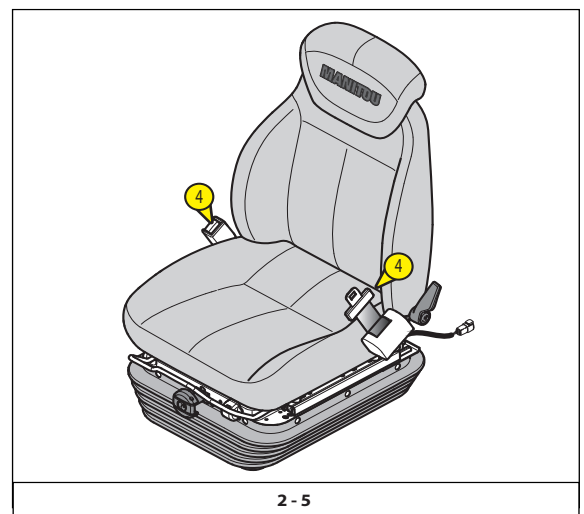
2- SEAT BELT

A 2-point belt attaches at its two endpoints (4, 2 - 5).

The seat belt is a machine safety device, designed to protect the telehandler driver against harmful movements that may occur during a collision or a sudden stop.

The seat belt function is to reduce the risk of death or serious injury in a collision. It reduces the force of secondary impacts, by keeping the driver positioned correctly and preventing the driver from being ejected from the telehandler in a crash or if the telehandler rolls over.

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



**Under no circumstances the lift truck should be used if the seat belt is defective (fixing, locking, cuts, tears, etc.).
Repair or replace the seat belt immediately.**

3- DRIVER'S PRESENCE

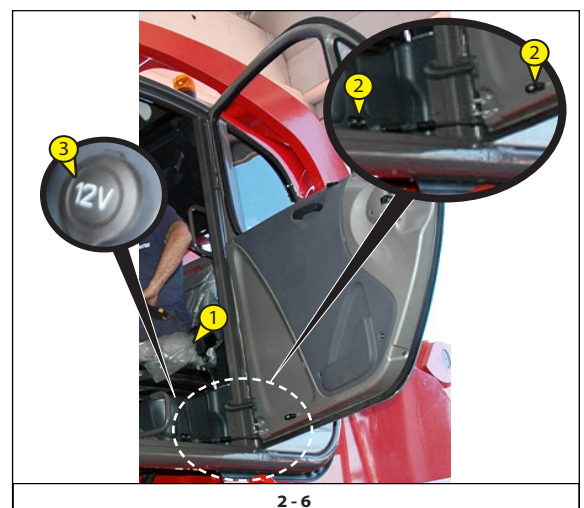
The driver's presence detector is a device that defines a specific safety device designed to monitor the presence and vigilance of the driver of telehandler.

The driver's presence is validated when the operator is correctly seated (1, 2 - 6) and the cab door is closed (2, 2 - 6).

It is only from that moment that the telehandler is operational; the operator can perform hydraulic movements and move the telehandler.

4- POWER OUTLET 12 V

(3, 2 - 6).

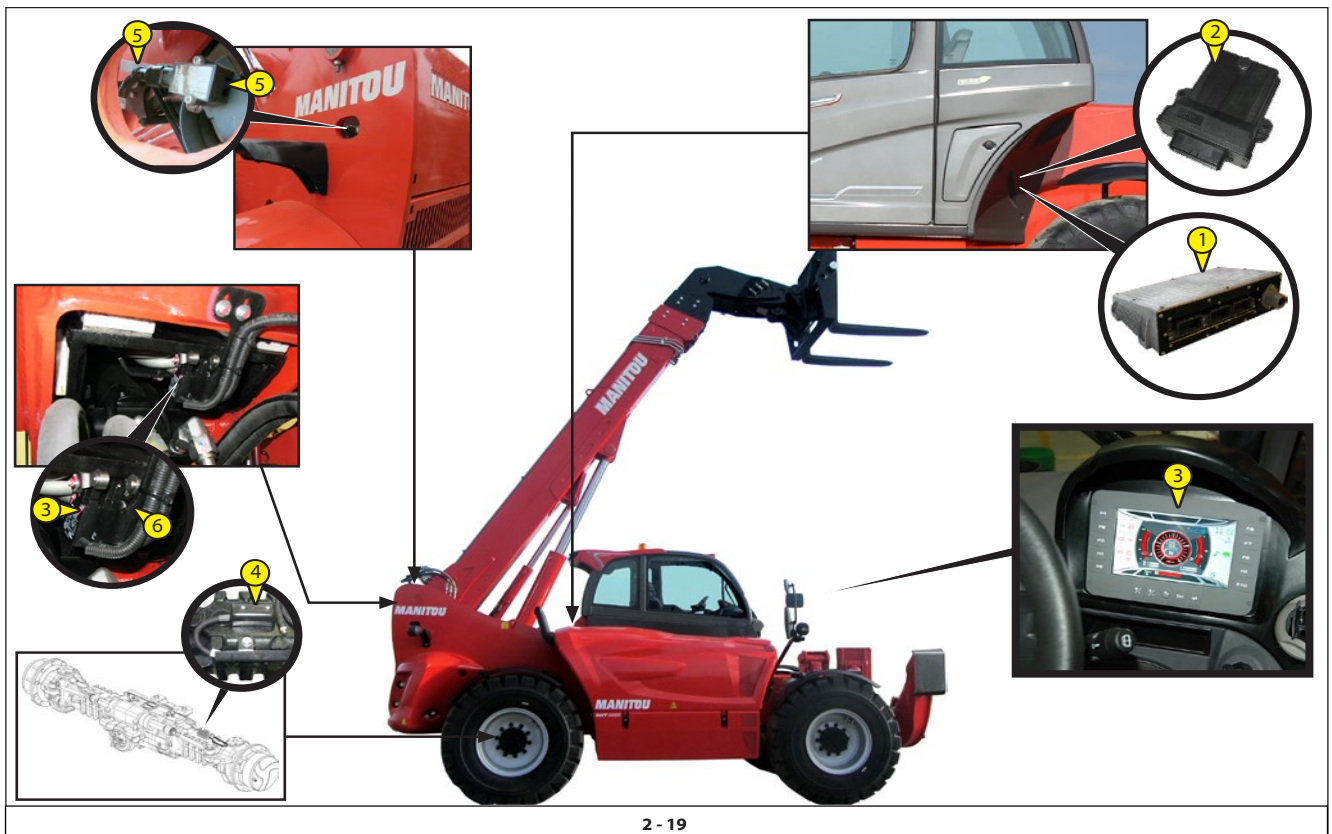


5- CONTROL PANEL AND LOAD LIMITER

The Manitou safety system performs the control functions for the telehandler and for the load moment limiter of the telehandler front.

SAFETY SYSTEM LAYOUT

- MC2M control board (1, 2 - 19)
- MIDAC control board (2, 2 - 19)
- TERA7 instrument control panel + Slave IO-CORE control board (3, 2 - 19)
- Loading cell (4, 2 - 19)
- Angle telescopic boom sensor (5, 2 - 19)
- Fully retracted telescopic boom microswitches (6, 2 - 19)





INSTRUMENT CONTROL PANEL

The control panel TERA7 (1, 2 - 19) with colour screen display shows and informs the operator of all the steps of the working of the telehandler.

Five pages are saved in memory in the panel (1, 2 - 7) and these can be selected by pressing the keys (F1, F2, F3, F4, F5 2 - 7) on the panel (1, 2 - 7). Push the keys (F1, F2, F3, F4, F5, 2 - 7) to select the pages.

Push the keys:

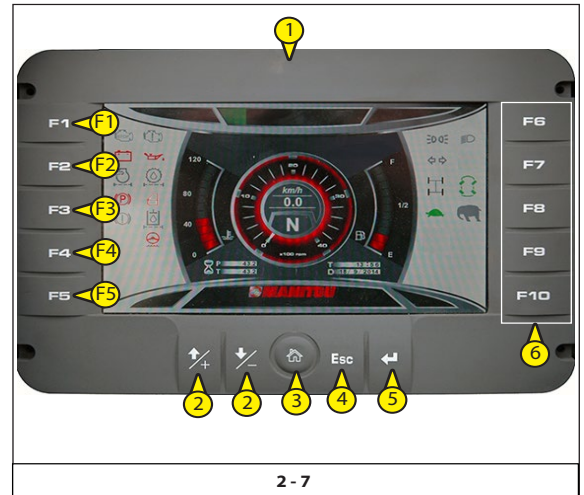
- Up/Down, Plus/Minus (2, 2 - 7)
- Home (3, 2 - 7)
- Esc (4, 2 - 7)
- Enter (5, 2 - 7)
- F3, F6, F7, F8, F9, F10 not used (6, 2 - 7).

to navigate into the pages.

Main pages saved in memory (2 - 20):

- A - Splash screen
- B - Driving page
- C - Working page
- D - Slowing page
- E - Setting page
- F - Alarm page

Pages overview:



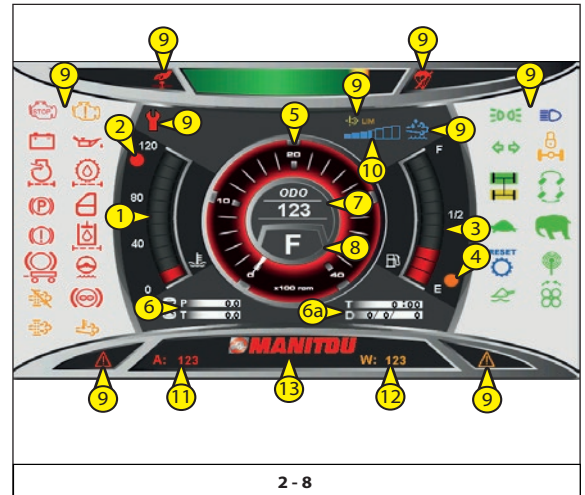
2 - 20

DRIVING PAGE

1. engine coolant temperature gauge indicator (1, 2 - 8)
2. warning light for potential engine coolant overheating (2, 2 - 8)
3. fuel level indicator (3, 2 - 8)
4. the indicator lamp light is on (4, 2 - 8) when the fuel level in the tank is lower than 10% of its capacity
5. engine rpm indicator (x100 rpm) (5, 2 - 8)
6. partial (P) and total (T) hour-counter (6, 2 - 8)
Keep the "HOME" key (6, 2 - 8) pressed to reset the partial hour-counter (P)
- 6a. time(T) and date (D) (6a, 2 - 8)
7. speed indicator (km/h or mph) (7, 2 - 8)
8. direction and gear shift indicator (8, 2 - 8):
- direction: N= neutral
F= forward
R= reverse
9. warning and indicator lamps (9, 2 - 8)

Symbol overview:

	position lights
	low beams
	blue high beams
	direction lights
	rear axle locking
	front wheel alignment
	rear wheel alignment
	front wheel steering
	concentric wheel steering
	crab steering green
	telescopic boom hydraulic movement control
	retarder (optional)
	fast gear
	slow gear
	high torque; high force
	transmission reset
	telescopic boom suspension (optional)
	remote control (optional)
	reversing radiator fan (optional)



2 - 8



	I.C. engine severe fault
	I.C. engine malfunction
	alternator excitation
	i.c. engine oil PRESSURE
	brake fluid
	engine intake air filter
	transmission oil filter
	parking brake
	telehandler door
	hydraulic oil filter
	steering emergency
	trailer brake anomaly (optional)
	DPF: quantity of soot is high
	DPF: active regeneration (↩ next paragraph)
	DPF: regeneration disabled
	Diesel exhaust fluid (DEF) level indicator (↩ next paragraph)
	Malfunction related to the emissions from the exhaust gas after-treatment system or DEF supply (↩ next paragraph)
LIM	Vehicle speed or torque operating restriction (↩ next paragraph)
	"emergency stop" red button
	safety system exclusion
	warning / alarm
	service

(For more details: ↩ next paragraph "Warning and indicator lamps" or "Switches").

10. Diesel exhaust fluid (DEF) level indicator that provides information about the quantity of diesel exhaust fluid in the tank (10, 2 - 8).
11. Machine alarm code*
(11, 2 - 8) are displayed in normal operating conditions
12. Machine warning code*
(12, 2 - 8) is displayed in normal operating conditions
13. Message area (13, 2 - 8)

*: Check the alarms or warnings types, referring to the display page "F5 - ALARM PAGE".



IMPACTS AND ACTIONS BY OPERATOR

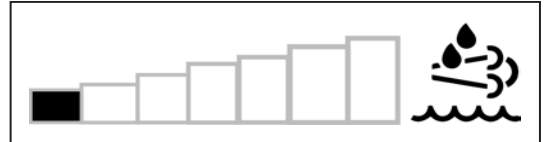
To ensure proper Tier 4 emission levels and to comply with the EPA and CARB regulations MTU has implemented an inducement strategy that will activate when emission related warnings occur. The following occurrences will trigger a warning indicator light:

- **Low DEF Additive**
- **Insufficient DEF Additive Quality**
- **Faulty Elements of the Aftertreatment**

In the case that inducement occurs again within 40 hours of engine operation, shortened inducement periods are activated.

Operators must:

- regularly check the gauge to make sure the DEF additive is at a proper level or else engine inducement may occur;
- ensure in-time refilling with DEF additive;
- avoid any contamination of DEF additive with any other fluids or debris;
- ensure refills with properly stored DEF only.



INDICATORS AND DESCRIPTIONS OF THE INDUCEMENT STRATEGY (EMISSIONS CONTROL SYSTEM OF THE EXHAUST GAS)

Overview:

OPERATING RESTRICTIONS OF THE INDUCEMENT STRATEGY				
Indicator lamp	Description	Problem	Possible causes/consequences	LEVEL: consequences/times
	Diesel Exhaust Fluid (DEF)	The indicator lamp lights up	An emissions-relevant malfunction in the exhaust gas aftertreatment system or in the DEF supply has been detected.	<p>LOW: Maximum available torque is reduced to 75% of peak torque across the speed range and for a time interval between 120 to 240 minutes.</p> <p>SEVERE: Maximum available torque will be reduced from 75 to 50% and for a time interval between 240* a 265* minutes. Engine speed will be reduced to 60% rated speed and for a time interval between 240* a 265* minutes.</p>
LIM	Torque Limiter Active (LIM):	The indicator lamp lights up	The engine torque is limited to a maximum between <100% and > 50% across the whole engine speed range.	
		The indicator lamp flashes	The engine torque is limited to a maximum of ≤ 50% across the whole engine speed range.	
	Engine Malfunction	The orange indicator lamp lights up	A failure and tampering in the engine system has been detected	<p>ULTRA SEVERE: Maximum available torque will be reduced from 50 to 20%, and simultaneously engine speed will be reduced to idle and for a time interval between 265* a 290* minutes.</p> <p>FINAL: The engine torque is limited to a maximum of 20% across the whole engine speed range and for a time interval between 290* a 300* minutes. The engine speed is limited to idling speed and for a time interval between 290* a 300* minutes..</p> <p>A maximum of 3 overrides for 30 minutes each is possible.</p>
	Stop Engine Lamp	The red indicator lamp lights up	A serious fault in the engine system has been detected Level: ULTRA SEVERE	
		The indicator lamp flashes red.	A serious fault in the engine system has been detected Level: FINAL	
	Buzzer	With each transition of inducement state the buzzer sounds for 5 seconds. In case of an override, the buzzer sounds with a frequency of: 1 bpm.		

(*): In case of reoccurring failures the time for the final inducement will be reduced from 240 to 30 minutes.



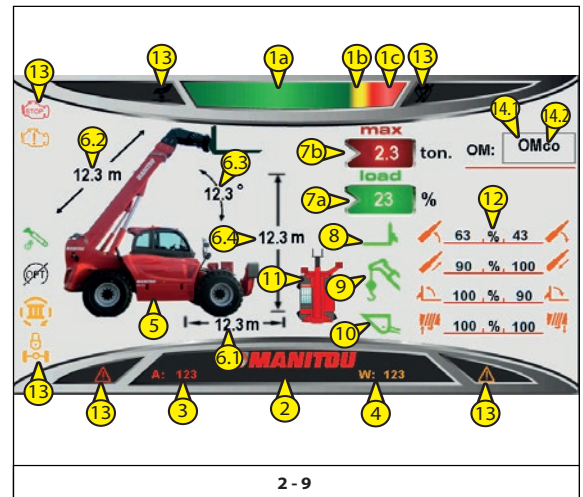
INDUCEMENT STRATEGY

Notifications					Descriptions	Operator Actions	
					Low DEF Tank Level Warning: The DEF level is now between 7.5 and 10% full.	Fill DEF tank to full. If DEF lamp is still illuminated there may be improper DEF quality. Call for service.	
		LIM			Low DEF Tank Level: DEF level is between 5 and 7.5%. Low inducement begins (75% torque).	Fill DEF tank to full. If DEF lamp is still illuminated there may be improper DEF quality. Call for service.	
		LIM			Low DEF Tank Level: DEF level is between 2.5 and 5%. Severe inducement begins (60% rated speed / 50% torque).	Park equipment and fill DEF tank. If DEF lamp is still illuminated there may be improper DEF quality. Call for service.	
		LIM			Low DEF Tank Level: DEF level is between 0 and 2.5%. Ultra severe inducement begins (idle speed / 20% torque).	Immediately park equipment in safe location and fill DEF tank. If DEF lamp is still illuminated there may be improper DEF quality. Call for service.	
		LIM			Low DEF Tank Level: DEF level is at 0%. Final inducement begins (Engine idle / 20% torque)..	Immediately park equipment in safe location and fill DEF tank. If DEF lamp is still illuminated there may be improper DEF quality. Call for service.	
					Poor DEF Quality Warning: Poor DEF quality is detected and there is one hour before inducement process takes place.	If DEF tank is above 10% full and these lights are illuminated there may be a quality issue with the DEF. Call for service.	
		LIM			Poor DEF Quality: Low inducement is taking place. Within 15 minutes torque is reduced from 100 to 75%.	If DEF tank is above 7.5% full and these lights are illuminated there may be a quality issue with the DEF. Call for service.	
		LIM			Poor DEF Quality: Severe inducement is taking place. Within 25 minutes the rated speed is reduced to 60% and torque to 50%.	If DEF tank is above 5% full and these lights are illuminated there may be a quality issue with the DEF. Call for service.	
		LIM			Poor DEF Quality: Ultra severe inducement is taking place. Within 8 minutes the rated speed is reduced to idle and torque to 20%.	If DEF tank is above 2.5% full and these lights are illuminated there may be a quality issue with the DEF. Park vehicle and call for service.	
		LIM			Poor DEF Quality: Final inducement is active. Engine speed is at idle with torque limited to 20% until problem is fixed.	If DEF tank is not empty and these lights are illuminated there may be a quality issue with the DEF. Immediately park vehicle and call for service.	
					Faulty Aftertreatment Equipment Warning: Faulty equip. has been detected and there is one hour before inducement process takes place.	Some component of the aftertreatment system is malfunctioning. Call for service.	
		LIM			Faulty Aftertreatment Equipment: Low inducement is taking place. Within 15 minutes torque is reduced from 100 to 75%.	Some component of the aftertreatment system is malfunctioning. Call for service.	
		LIM			Faulty Aftertreatment Equipment: Severe inducement is taking place. Within 25 minutes the rated speed is reduced to 60% and torque to 50%.	Some component of the aftertreatment system is malfunctioning. Call for service.	
		LIM				Faulty Aftertreatment Equipment: Ultra severe inducement is taking place. Within 8 minutes the rated speed is reduced to idle and torque to 20%.	Some component of the aftertreatment system is malfunctioning. Park vehicle and call for service.
		LIM				Faulty Aftertreatment Equipment: Final inducement is active. Engine speed is at idle and torque is limited to 20% until problem is fixed.	Some component of the aftertreatment system is malfunctioning. Immediately park vehicle and call for service.



WORKING PAGE

1. Load conditions
The coloured bar indicates the percentage of the load lifted in reference to the machine's operating condition:
 - Green reference (1a, 2 - 9): safety area.
 - Yellow reference (1b, 2 - 9): alarm area, load lifted 90% more than permitted load (external warning sound active) .
 - Yellow reference (1c, 2 - 9): alarm area, load lifted 100% more than permitted load (external warning sound active) .
2. Messages area (2, 2 - 9)
3. Machine alarm code*
(3, 2 - 9) is displayed in normal operating conditions
4. Machine warning code*
(4, 2 - 9) is displayed in normal operating conditions
5. Reading main operating data
 - Indicative drawing of the machine (5, 2 - 9)
 - Boom angle
Reading in "Degrees", with a decimal (6.4, 2 - 9)
 - Weight of load lifted "LOAD" (reading in "% or Tons" for second equipment) (7a, 2 - 9)
 - Operating radius (optional)
Measurement of the distance from the fifth wheel centre to the projection of the point of application of the load (reading in "Meters", with a decimal) (6.1, 2 - 9).
 - Boom length (optional)
Reading in "Meters", with a decimal (6.2, 2 - 9)
 - Height off the ground (optional)
Reading in "Meters", with a decimal (6.3, 2 - 9)
 - According to the type of attachment used:
 - forks (8, 2 - 9)
 - suspended load (9, 2 - 9)
 - bucket (10, 2 - 9)
6. Working configuration
 - Indicative drawing:
 - of the machine on wheels (11, 2 - 9)
 - of the machine on stabilisers (11, 2 - 9)
 - OM Code:
 - The first digit refers to the operating mode "OM":
1 = on stabilisers (14.1, 2 - 9)
2 = on wheels (14.1, 2 - 9)
 - The second digit refers to the equipment being used: PT, forks, etc.
(14.2, 2 - 9).
7. Slowing settings view (12, 2 - 9) for more details: next paragraph "Slowing page").
8. Warning and indicator lamps telehandler status (13, 2 - 9)



2 - 9

	I.C. engine severe fault
	I.C. engine malfunction
	telescopic boom hydraulic movement control
	optional exclusion
	2 nd optional working (optional)
	3 rd optional working (optional)
	rear axle locking
	"emergency stop" red button

	safety system exclusion
	warning / alarm

(For more details: next paragraph "Warning and indicator lamps").

*: Check the alarms or warnings types, referring to the display page "F5 - ALARM PAGE".

: metric unit [length unit (m) and weight unit (ton)] or imperial unit [length unit (ft) and weight unit (kLb)]

SLOWING PAGE (F3)

Is possible to save five working systems:

1. Slowing down (1, 2 - 10):
 - Maximum speed (100%) (1a, 2 - 10)
 - 1 Slowing down (1b, 2 - 10)
 - 2 Slowing down (1c, 2 - 10)
 - 3 Slowing down (1d, 2 - 10)
 - 4 Slowing down (1e, 2 - 10)

It is possible to set the maximum speed of hydraulic movement control:

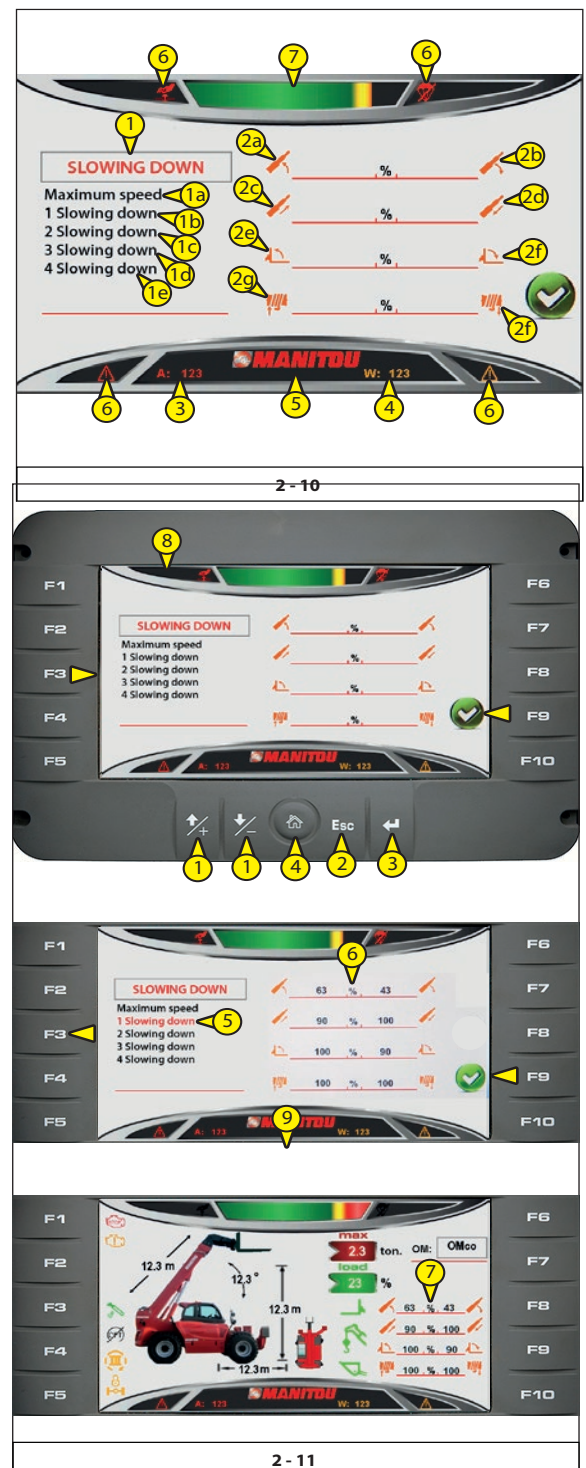
- maximum ascent speed of telescopic boom (2a, 2 - 10)
- maximum descent speed of telescopic boom (2b, 2 - 10)
- maximum extension speed of telescopic boom (2c, 2 - 10)
- maximum retraction speed of telescopic boom (2d, 2 - 10)
- maximum speed of load tilt upwards (2e, 2 - 10)
- maximum speed of load tilt downwards (2f, 2 - 10)
- maximum speed of attachment movement control: ascent, clockwise rotation, to the RH, upward tilt (depending on the attachment installed) (2g, 2 - 10)
- maximum speed of attachment movements control: descent, anticlockwise rotation, to the LH, downward tilt (depending on the attachment installed) (2h, 2 - 10)

The maximum speed of hydraulic movement control is expressed in percentage: from 0 to 100 %.

To select a working system

- Push the "F3" key to open the "Slowing page" (2 - 11)
- Push the "Scroll" key (1, 2 - 11) to select the "Slowing down" working system (8 2 - 11,)
- Push "F9" key to confirm the selection of the "Slowing down" working system (2 - 11).

Automatically will open the "Working page" (9, 2 - 11) with "Slowing down" working system selected (7, 2 - 11).



To set and save the "1 Slowing down" working system (example)

- Push the "Scroll" keys (1, 2 - 12) to select the "1 Slowing down" working system (3, 2 - 12) and setting area are shown (4, 2 - 12).
- Push the "F8" key (2 - 12) to select the hydraulic movement to be set. Near the hydraulic movement a black cursor lights up (5, 5a, 2 - 12).
- Push the "Scroll" keys (1, 2 - 12) to set the percentage (3, 2 - 11) of maximum speed of hydraulic movement control.
- Repeat these steps for each hydraulic movement to be set.
- Push "F9" key to save the settings (3, 2 - 11). The "Working page" automatically opens (9 2 - 11.), and the settings for the "1 Slowing down" working system are shown (7, 2 - 11).

To delete the "1 Slowing down" working system from memory (example)

- Push the "F3" key to open the "Slowing page" (2 - 12)
- Push the "Scroll" key (1, 2 - 12) to select the "1 Slowing down" working system (3, 2 - 12)
- Push "F8" key to access the settings (5a, 2 - 12)
- Push the key "F7" (2 - 12) to delete the settings (6, 2 - 12) for the "1 Slowing down" working system (3, 2 - 14).

2. Coloured bar indicating the load conditions (7, 2 - 10)
3. Machine alarm code* (3, 2 - 10) is displayed in normal operating conditions
4. Machine warning code* (4, 2 - 10) is displayed in normal operating conditions
5. Messages area (5, 2 - 10)
6. Warning and indicator lamps (6, 2 - 10)

Symbol overview:

	"emergency stop" red button
	safety system exclusion
	warning / alarm
	confirm or save settings
	select settings
	delete settings into Slowing down
	ascent speed of telescopic boom orange indicator
	descent speed of telescopic boom orange indicator
	extension speed of telescopic boom orange indicator
	retraction speed of telescopic boom orange indicator
	tilt speed of load upwards orange indicator
	tilt speed of load downwards orange indicator
	control speed of attachments orange indicator
	control speed of attachments orange indicator

(For more details: paragraph "Warning and indicator lamps").

*: Check the alarms or warnings types, referring to the display page "F5 - ALARM PAGE".



2 - 12

SETTING PAGE (F4)

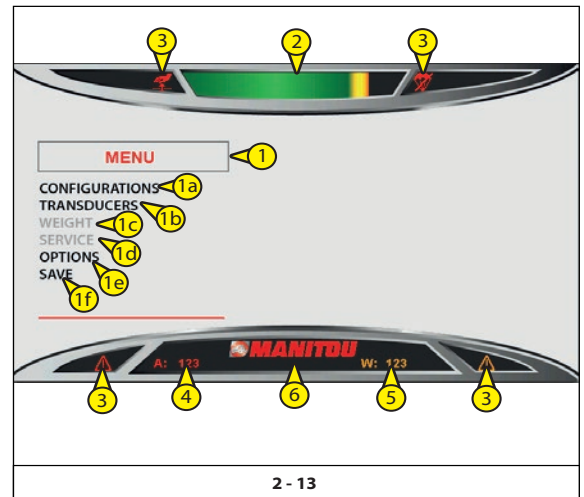
1. Menu screen (1, 2 - 13):
 - Configurations (1a, 2 - 13)
 - Transducers (1b, 2 - 13)
 - Weight (1c, 2 - 13) (only with password)
 - Service (1d, 2 - 13) (only with password)
 - Options (1e, 2 - 13)
 - Save (1f, 2 - 13)
2. Coloured bar indicating the load conditions (2, 2 - 13)
3. Machine alarm code* (4, 2 - 13) is displayed in normal operating conditions
4. Machine warning code* (5, 2 - 13) is displayed in normal operating conditions
5. Messages area (6, 2 - 13)
6. Warning and indicator lamps (3, 2 - 13)

Symbol overview:

	"emergency stop" red button
	safety system exclusion
	warning / alarm

(For more details: paragraph "warning and indicator lamps").

*: Check the alarms or warnings types, referring to the display page "F5 - ALARM PAGE".



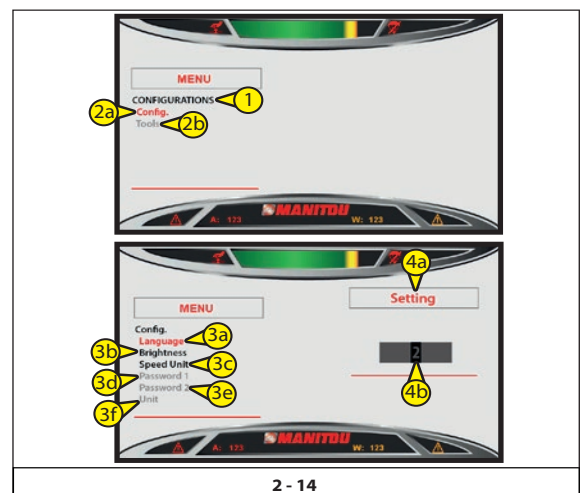
2 - 13



2 - 21

Configurations (1, 2 - 21)

- Push the "Scroll" keys (1, 2 - 21) to select "CONFIGURATIONS" (1a, 2 - 21) and to access the settings:
 - Config. (2a, 2 - 14)
 - Tools (only with password) (2b, 2 - 14)
- Push the "Enter" key (3, 2 - 14) to select "Config." and to access the functions list:
 - Language (3a, 2 - 14)
 - Brightness (3b, 2 - 14)
 - Speed Unit (3c, 2 - 14)
 - Password 1 (only with password) (3d, 2 - 14)
 - Password 2 (only with password) (3e, 2 - 14)
 - Unit (only with password) (3f, 2 - 14)
- Push the "Enter" key (3, 13) to select one function (3, 2 - 14) and to access the corresponding menu setting (4a, 2 - 14)
- Push the "Scroll" keys (1, 2 - 21) to set the number (4b, 2 - 14) of the function in the setting menu (4a, 2 - 14)
- Push the "Enter" key (3, 2 - 21) to confirm the setting
- Push the "Home" key (4, 2 - 21) to return the "Menu" screen (1, 2 - 13)



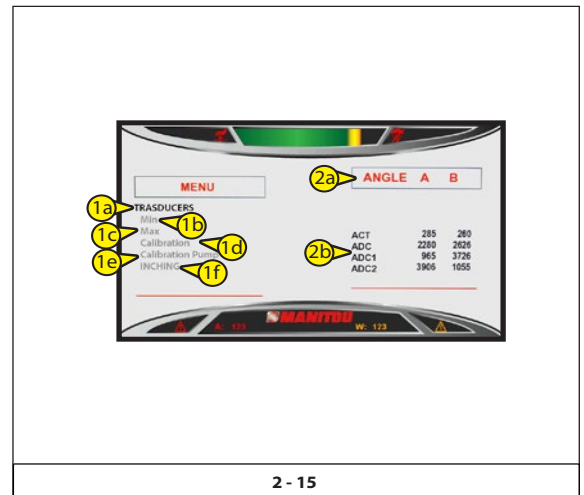
2 - 14



Transducers (1b, 2 - 13)

(These settings can be used for machine diagnostics)

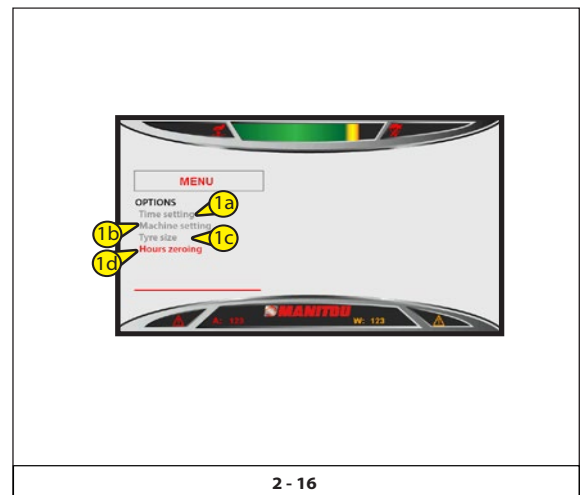
- Push the "Scroll" keys (1, 2 - 21) to select "TRANSDUCERS" (1b, 2 - 13) and to access the functions:
 - Transducers (1a, 2 - 15)
 - Min (only with password) (1b, 2 - 15)
 - Max (only with password) (1c, 2 - 15)
 - Calibration (only with password) (1d, 2 - 15)
 - Calibration pump (only with password) (1e, 2 - 15)
 - INCHING (only with password) (1f, 2 - 15)
- Transducers and sensor voltage (2a, 2b, 2 - 15)



2 - 15

Options (1c, 2 - 13)

- Push the "Scroll" keys (1, 2 - 21) to select "OPTIONS" (1c, 2 - 13) and to access the function:
 - Time setting (only with password) (1a, 2 - 16)
 - Machine settings (only with password) (1b, 2 - 16)
 - Tyre size (only with password) (1c, 2 - 16)
 - Hours zeroing (1d, 2 - 16)
- Push the "Enter" key (3, 2 - 21) to select "Hours zeroing" (1d, 2 - 16)
- Push the "Home" key (4, 2 - 21) to return the "Menu" screen (1, 2 - 13)



2 - 16

Save (1d, 2 - 13)

- Push the "Scroll" keys (1, 2 - 21) to select "SAVE" (1a, 2 - 13) and push "Enter" key (3, 2 - 21) to confirm the saving of settings.

ALARM PAGE (F5)

The indicators with the red light on the central unit or the component indicate an error or an anomaly.

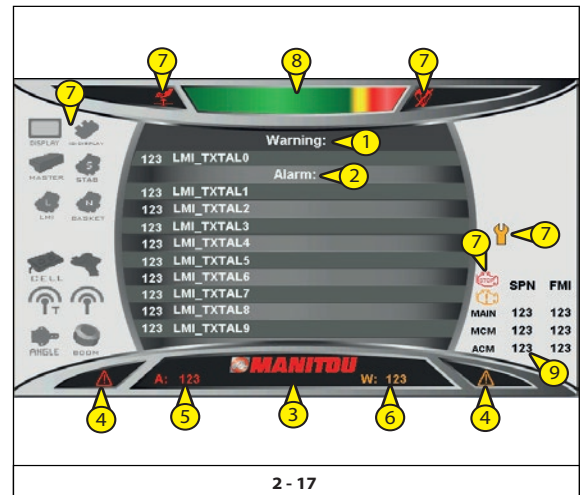
1. Warning list [⊙](1, 2 - 17)
Example: 123 [code warning] LMI_TXTAL1 [description warning]
2. Alarm list [⊙](2, 2 - 17)
Example: 123 [code alarm] LMI_TXTAL1 [description alarm]
3. Messages area (3, 2 - 17)
 - Attention, telehandler alarm (4, 2 - 17).
 - Telehandler alarms code (5, 2 - 17).
 - Telehandler warnings code (6, 2 - 17).
 - Red warning lights (7, 2 - 17)

Symbol overview:

	DISPLAY, display in cab
	IO-CORE, control unit to control the 12 V voltage
	MASTER, control unit frame
	STABILIZERS control unit
	LMI load limiter control unit (optional)
	BASKET control unit (optional)
	CEL, loading cell
	joystick
	acknowledgement of attachment (optional)
	radio remote controls
	load limiter angle sensor (optional)
	load limiter winder on BOOM (optional)
	I.C. engine malfunctions
	I.C. engine stop
	service
	"emergency stop" red button
	safety system exclusion
	warning / alarm

(For more details: paragraph "Warning and indicator lamps").

4. Coloured bar indicating the load conditions (8, 2 - 17)
5. Engine units errors codes (9, 2 - 17)



[⊙]: For more details: chapter 5 -"Machine anomalies"

6- SELECTOR TO DISABLE THE LOAD LIMITER







The load limiter can be manually deactivated only in exceptional cases and for reasons of safety.



When the load limiter is deactivated, the operator and the telehandler are exposed to risks and there is nothing to prevent overloads and/or the telehandler overturning.

KEY SELECTOR OR BUTTON SELECTOR



(Second equipment)

To disable the load limiter, the operator must turn a key selector (2,  2 - 18) or keep pressed the button selector (4,  2 - 18) in the cab.


The key (3,  2 - 18) is kept inside a safety box (4,  2 - 18) placed behind the driver's seat.

The key selector (2,  2 - 18) or button selector (4,  2 - 18) has two positions "1" and "0":

- position "1": the load limiter is activated;
- position "0": the load limiter is deactivated.

During normal use, the key selector (2,  2 - 18) or button selector (4,  2 - 18) is in position "1", so the load limiter is activated.

When the safety system is disabled, enable it automatically:

- a red warning light on the control panel display
(For more details:  paragraph "Warning and indicator lamps").
- an alarm sound,

to warn the driver and other persons who may be present outside the vehicle of a potentially dangerous situation.

When the safety system is disabled, all the telehandler movements are restricted to 15% of their maximum speed.



2 - 18

7- KEYPAD

The keypad (1, 2 - 22) is located in the cab on the armrest (10, 2 - 22).

KEY FUNCTIONS

1. Parking brake key (2, 2 - 22)
2. Hydraulic movement stop key (3, 2 - 22)
3. Speed selector (slow-fast gear) (4, 2 - 22)
4. Optional output 2nd and 3rd selector (5, 2 - 22)
5. Steering type selector (6, 2 - 22)
6. Working mode selector (7, 2 - 22)
7. Attachment control disconnect key (8, 2 - 22)
8. "Optional" key available, not used (9, 2 - 22)



PARKING BRAKE

The parking brake acts on the front and rear axle.

To engage the parking brake, press the key (2, 2 - 22). A red warning light will turn on the display (paragraph: "Instrument control panel") and a red LED switches on in the keyboard.

To disengage the parking brake, press the key (2, 2 - 22). The red warning light will switch off on the display (paragraph: "Instrument control panel")

When you start the telehandler, the parking brake is engaged and, to disengage it, press the parking brake key (2, 2 - 22). If the parking brake is disengaged manually, in some conditions, the emergency brake is activated automatically.

The emergency brake insertion conditions are:

- the operator is not present on the driver's seat,
- the gear selector is in neutral position for several seconds,
- the moving speed of the telehandler less than 3.6 km/h (2.23 mph).

The automatic emergency brake is disabled if the gear switch is engaged and the rpm are accelerated by pressing on the gas pedal.

TELESCOPIC BOOM HYDRAULIC MOVEMENT STOP KEY

While travelling on roads, it is advisable (compulsory in Italy and Germany) to stop all hydraulic movements of the telescopic boom.

Press the key (3, 2 - 22) to stop or enable the hydraulic movements.

On the display, the indicator lights indicating that the movements are stopped or are available for use (5- CONTROL PANEL AND LOAD LIMITER "HMI", 2-24).

SPEED SELECTOR (SLOW-FAST GEAR)

The machine can run at two speeds (4, 2 - 22):

- Slow (work site speed)
- Fast (for road travel)

To change the speed, follow the instructions given below:

- stop vehicle movement completely
- keep the I.C. engine running at minimum speed
- set the forward or reverse gear in idle
- push the brake pedal down
- pressing "slow-speed" will cause the "tortoise" symbol (5- CONTROL PANEL AND LOAD LIMITER "HMI", 2-24) on the display to light up and the machine will move at a slow speed
- pressing "fast-speed" will cause the "hare" symbol (5- CONTROL PANEL AND LOAD LIMITER "HMI", 2-24) on the display to light up and the machine will move at the maximum speed.



OPTIONAL OUTPUT 2nd AND 3rd SELECTOR (OPTIONAL)

The selector (↵ 5, 📖 2 - 22) is used for switching the hydraulic control, which carries out two or three hydraulic movements using the accessory.

Depending on the machine setup, select the 2nd and 3rd optional output by pressing the key (↵ 5, 📖 2 - 22).

Each time the key is pressed, the following is selected:

1. optional output direct line (LEDs off on keypad)
2. 2nd optional output (orange LED lit up on keypad)
3. 3rd optional output (red LED lit up on keypad).

On the display, the indicator light indicates the 2nd and 3rd optional output available for use (↵ 5- CONTROL PANEL AND LOAD LIMITER "HMI", 📖 2-24).

When you switch on the telehandler, the instrument control panel recalls the last output option selected.

STEERING WHEEL TYPE KEY

To select from the three different steering options press key (↵ 6, 📖 2 - 22) as follows:

- front and rear steering wheels.
- front steering wheels.
- wheels in oblique position (crab steering).

On the display, the indicator lights indicate the selected steering option (↵ 5- CONTROL PANEL AND LOAD LIMITER "HMI", 📖 2-24).

Before selecting a type of steering, check the rear and front wheel alignment (↵ 10- WARNING AND INDICATOR LAMPS, 📖 2-52).

WORKING MODES KEY

Press key (7, 📖 2 - 22) to select the working mode depending on the type of accessory installed:

- A - "HANDLING" MODE
- B - "BUCKET" MODE
- C - "SUSPENDED LOAD" MODE

A - "HANDLING" MODE

Use on forks (TFF, PFB, TDL, etc.), and adjustable accessories on forks.

- By default, the device is in "HANDLING" MODE when the telehandler is started-up, except if the "SUSPENDED LOAD" MODE has been selected before shutting-down the engine.
- Press the key (7, 📖 2 - 22), the "HANDLING" MODE is confirmed with an audible beep and the lamp on the display switches on (↵ 5- CONTROL PANEL AND LOAD LIMITER "HMI", 📖 2-24).

B - "BUCKET" MODE

Use with a bucket (CB, CBA, CBC, CBG, CBR, etc.).

- Place the telehandler in the transport position.
- Press the key (7, 📖 2 - 22) for 2 seconds, the "BUCKET" MODE is confirmed with an audible beep and the lamp on the display switches on (↵ 5- CONTROL PANEL AND LOAD LIMITER "HMI", 📖 2-24).
- The machine returns to "HANDLING" MODE by pressing the key, or in case of loss of driver presence for a few seconds, or shutting down the engine.

C - "SUSPENDED LOAD" MODE

Use with crane jib (P, PC, PT...).

- Place the telehandler in the transport position.
- Press the key (7, 📖 2 - 22) for 2 seconds, "SUSPENDED LOAD" MODE is validated with an audible beep and the lamp on the display switches on (↵ 5- CONTROL PANEL AND LOAD LIMITER "HMI", 📖 2-24).
- Return to "HANDLING" MODE by pressing the key

Movements permitted depending the working modes



Telehandler controlled from cab (operating mode: on stabilizer and on wheels)

“HANDLING” MODE

- Working condition:

Movement	Status
Lifting telescopic boom	✓
Lowering telescopic boom	✓
Extending telescopic boom	✓
Retracting telescopic boom	✓
Backward tilting accessory	✓
Forward tilting accessory	✓
Optional 1	✓
Optional 2	✓

✓: allowed
✗: not allowed

- Overturning condition:

Movement	Status
Lifting telescopic boom	✓
Lowering telescopic boom	✗
Extending telescopic boom	✗
Retracting telescopic boom	✓
Backward tilting accessory	✗
Forward tilting accessory	✗
Optional 1	✗
Optional 2	✗

✓: allowed
✗: not allowed

- The actuation of the anti-overturning system bypass key allows to rearm of movements for 10 seconds
- Opening the door does not stop the movements
- Every movement is allowed with the telescopic boom retracted and the overturning system bypassed
- When the lifted load exceeds 120%, the safety system cuts the power for the lifting of the telescopic boom (this action can be performed simultaneously with a movement of telescopic boom retraction)

“BUCKET” MODE

- Working condition:

Movement	Status
Lifting telescopic boom	✓
Lowering telescopic boom	✓
Extending telescopic boom	✓
Retracting telescopic boom	✓
Backward tilting accessory	✓
Forward tilting accessory	✓
Optional 1	✓
Optional 2	✓

✓: allowed
✗: not allowed
✗: not allowed

- Overturning condition:

Movement	Status
Lifting telescopic boom	✓
Lowering telescopic boom	✗
Extending telescopic boom	✓
Retracting telescopic boom	✓



Backward tilting accessory	✓
Forward tilting accessory	✓
Optional 1	✓
Optional 2	✓

✓: allowed
✗: not allowed

- The actuation of the anti-overturning system bypass key allows to rearm of movements for 10 seconds
- Opening the door does not stop the movements
- Every movement is allowed with the telescopic boom retracted and the over-turning system bypassed
- When the lifted load exceeds 120%, the safety system cuts the power for the lifting of the telescopic boom (this action can be performed simultaneously with a movement of telescopic boom retraction)

“SUSPENDED LOAD” MODE

- Working condition:

Movement	Status
Lifting telescopic boom	✓
Lowering telescopic boom	✓
Extending telescopic boom	✓
Retracting telescopic boom	✓
Backward tilting accessory	✗
Forward tilting accessory	✗
Optional 1	✓
Optional 2	✓

✓: allowed
✗: not allowed

- Overturning condition:

Movement	Status
Lifting telescopic boom	✓
Lowering telescopic boom	✗
Extending telescopic boom	✗
Retracting telescopic boom	✓
Backward tilting accessory	✗
Forward tilting accessory	✗
Optional 1	✗
Optional 2	✗

✓: allowed
✗: not allowed

- The actuation of the anti-overturning system bypass key allows to rearm of movements for 10 seconds
- Opening the door does not stop the movements
- Every movement is allowed with the telescopic boom retracted and the over-turning system bypassed
- When the lifted load exceeds 120%, the safety system cuts the power for the lifting of the telescopic boom (this action can be performed simultaneously with a movement of telescopic boom retraction)



2 - 23

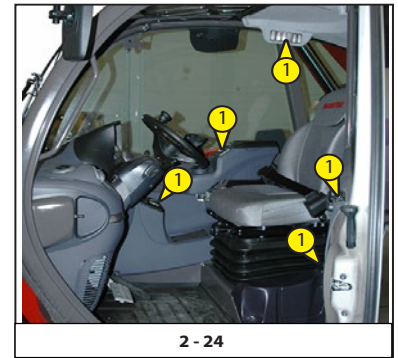
ACCESSORY CONTROL DISCONNECT KEY

Press key (8, 2 - 22) to activate or deactivate the accessory roller button (2, 2 - 23) on the joystick in the cab (1, 2 - 23).

On the control panel, the indicator lights indicates that the accessory control is disconnected or activated (⏏ paragraph: “Instrument control panel”).

8- SWITCHES

The location of the switches may vary depending on the options (1, 2 - 24).



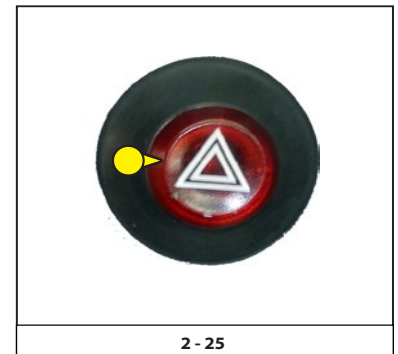
2 - 24

HAZARD WARNING LIGHTS BUTTON

This button (2 - 25) allows the L.H. and R.H. indicators to be switched on simultaneously, with the ignition off.

The red button lights up when pressed.

NOTE: except in case of emergency, it is advised to disable the hazard warning lights when the ignition is switched off to avoid a flat battery.



2 - 25

REAR FOG LIGHT SWITCH

This switch (1 2 - 26,) activates a special light located in the rear of the telehandler to aid with machine identification in foggy conditions.

On the switch, the led comes on to indicate that the function is active (2, 2 - 26).

On the control panel, the yellow indicator light indicates that the function is active (5- CONTROL PANEL AND LOAD LIMITER "HMI"; 2-24).



2 - 26

CHASSIS LEVELLING SWITCH

This switch (3, 2 - 27) controls the transverse levelling of the telehandler.

To carry out levelling operations, press the switch (1, 2 - 27) on the left to incline the telehandler to the left. Push the switch (2, 2 - 27) on the right to incline the telehandler to the right.

To make the telehandler perfectly horizontal, check the bubble level (1, 2 - 28).

The levelling operation is allow when:

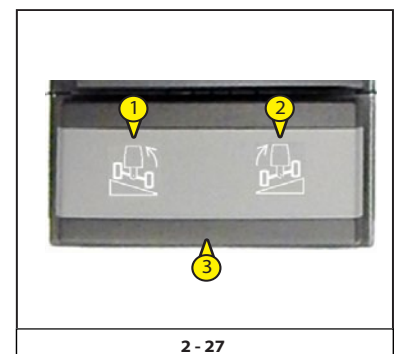
- in working configuration on wheels (F2 - WORKING PAGE, 2-28)
- if the angle of the telescopic boom is lower than 13° (F2 - WORKING PAGE, 2-28).

The telehandlers are provided with a device for levelling the chassis in relation to the ground in order to allow the levelling of the telehandler and therefore the lifting of the boom to the maximum height in complete safety and stability. This device allows to correct the level by 8° to the right and 8° to the left.

Use of the device

Checking the bubble level (1, 2 - 28) meant for the purpose, level the telehandler before lifting and extending the boom.

If the telehandler is not levelled, lower the boom and repeat the levelling operation.



2 - 27



2 - 28

STABILIZER SWITCH

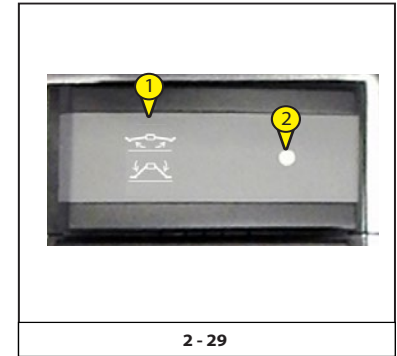
This switch (1, 2 - 29) enables the stabilizers movements (2 - 29). Keep the switch pressed (1, 2 - 29) and move the joystick (J, 2 - 29) to operate the stabilizers. On the switch, the led comes on to indicate that the function is active (2, 2 - 29).

General movement of stabilizers:

1. ascent or descent simultaneously
2. levelling

The speed of movement of stabilizers changes according to the condition of use:

Condition	Control	Percentage of speed
stabilizers on the ground	ascent or descent simultaneously	100%
stabilizers not on the ground	ascent or descent simultaneously	55%
stabilizers on the ground	levelling	60%
stabilizers not on the ground	levelling	45%

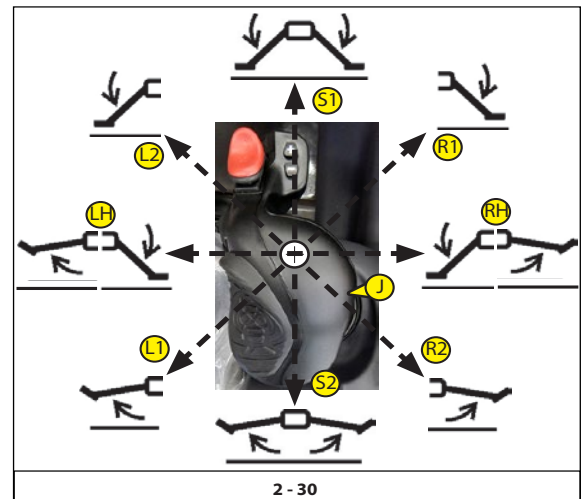


The telehandler levelling operations:

- are allowed to lift or lower the stabilizers only if the telescopic boom measure an angle less than 13°,
- are allowed to lift the stabilizers only with the telescopic boom completely retracted,
- any movement of the stabilizers is allowed with the overturning system bypassed.

Joystick movements

1. Simultaneous ascent or descent of stabilizers:
 - descent: move the joystick (S1, 2 - 30) forwards,
 - ascent: move the joystick (S2, 2 - 30) backwards,
2. Ascent or descent of a stabilizer:
 - move the joystick (J, 2 - 30) at the same time to the left and backwards or forwards (L1 or L2, 2 - 30) to lower or lift the left stabilizer,
 - move the joystick (J, 2 - 30) at the same time to the right and backwards or forwards (L1 or L2, 2 - 30) to lower or lift the right stabilizer.
3. Levelling of stabilizers:
 - move the joystick (J, 2 - 30) to the left (LH, 2 - 30): the left stabilizer lowers and the right stabilizer lifts,
 - move the joystick (J, 2 - 30) to the right (RH, 2 - 30): the right stabilizer lowers and the left stabilizer lifts.








To enable and carry out the movements, keep the manoeuvre enabling button (OK) on the joystick (1, 2 - 31) pressed.
(Depending on the telehandler model)





TRANSMISSION RESET SWITCH

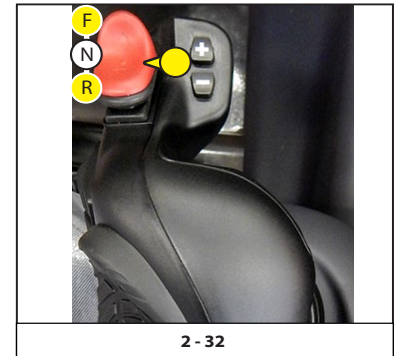
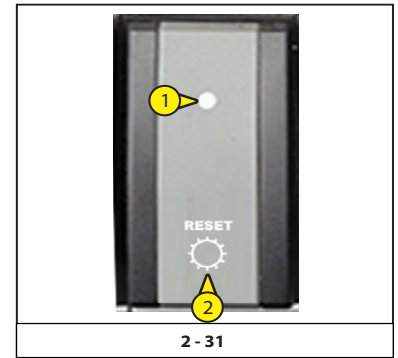
In normal operating conditions the function is off.

If the forward or reverse gear (1,  2 - 32) does not engage, follow the instructions given below:


- a blue indicator lights up on the control panel (← paragraph: "Instrument control panel")
- position the forward/backward movement selector in the neutral position (N,  2 - 32)
- release the pressure from the brake pedal
- press the switch (2,  2 - 31)
- a blue indicator turns off
- position the forward/backward movement selector in the required position (F or R,  2 - 32)
- slowly and gradually accelerate the engine until the telehandler starts moving
- release the switch (2,  2 - 31)



On the switch (2,  2 - 31) the led comes on (1,  2 - 31) to indicate that the function is active.

These indications must be followed for the proper working of the transmission.



ROTATING BEACON LIGHT SWITCH


This switch (2,  2 - 33) controls the operation of the rotating beacon light.


On the switch (2,  2 - 33) the led comes on (1,  2 - 33) to indicate that the function is active.




NOTE: except in case of emergency, it is advised to disable the rotating beacon light when the ignition is switched off to avoid a flat battery.





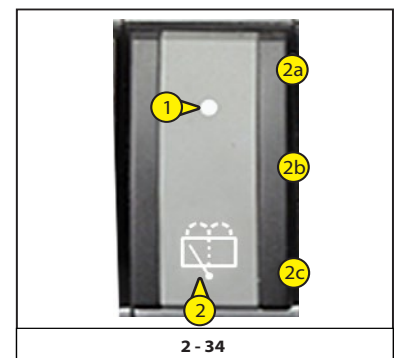
CAB ROOF WIPER AND WASHER SWITCH

This switch (2,  2 - 34) sprays a cleaning liquid on the cab roof and uses the wiper to clear the liquid from the cab roof.

The switch (2,  2 - 34) has three positions:

- deactivated (2a,  2 - 34);
- for window wiper (2b,  2 - 34);
- for window washer (2c,  2 - 34). To deactivate the window washer, just release the switch.

On the switch (2,  2 - 34,) the led comes on (1,  2 - 34) to indicate that the function is active.

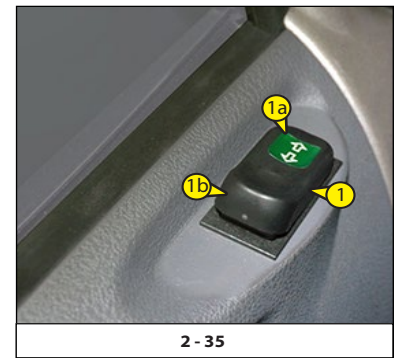




WINDOW LIFT (POWER-OPERATED) SWITCH

This switch (1, 2 - 35) activates the control that raises or lowers the cab door window using a powered mechanism.

- Opening the window.
 - Press the switch forward (1a, 2 - 35) and keep it pressed until the window has moved to the desired position.
 - Press the switch forward (1a, 2 - 35) and keep it pressed until the window will open all the way.
- Closing the window
 - Press the switch back (1b, 2 - 35) and keep it pressed until the window has moved to the desired position.
 - Press the switch back (1b, 2 - 35) and keep it pressed until the window will close all the way.

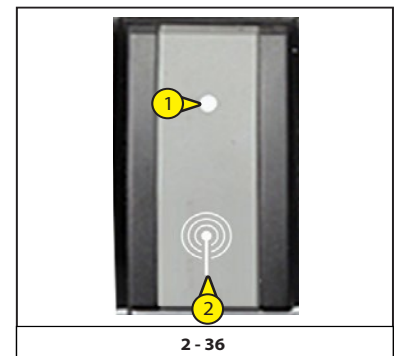


OPTIONAL FUNCTIONS SWITCHES

RADIO REMOTE CONTROL SWITCH

This switch (2, 2 - 36) activates the radio remote control. On the switch (2, 2 - 36) the led comes on (1, 2 - 36) to indicate that the function is active.

On the control panel, the green indicator light indicates the active function (paragraph: "Instrument control panel").



EMERGENCY PUMP SWITCH

This switch (1, 2 - 37) activates the emergency pump. The switch has two positions with safety block:

- press on (1a, 2 - 37) the engine safety pump is disabled,
- press on (1b, 2 - 37) the engine safety pump is enabled.

To deactivate the control, switch from pressing (1b, 2 - 37) to pressing (1a, 2 - 37), release the safety block (2, 2 - 37) and press the switch.

For more information on the control, see the "Platform User Manual".

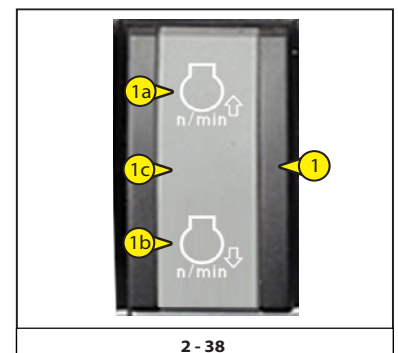


ELECTRIC ACCELERATOR SWITCH

The function of the switch (1, 2 - 38) is to electrically increase or decrease the I.C. engine rpm.

The switch has two positions:

- pressing (1a, 2 - 38) will cause the I.C. engine to accelerate gradually,
- deactivated (1c, 2 - 38),
- pressing (1b, 2 - 38) will cause the I.C. engine to decelerate gradually.



ENGINE BRAKE SWITCH

MHT 1490
MHT 10130

The engine brake decelerates the telehandler without using mechanical friction in order to avoid the overheating of the brake system. This brake is mainly used during long descents, and it allows to brake the vehicle without stressing the brakes.

Press switch (2, 2 - 39) to enable or disable the engine brake. On the control panel, an orange indicator light indicates that the function is active (paragraph: "Instrument control panel").

On the switch (2, 2 - 39), the LED switches on (1, 2 - 39) to indicate that the function is active.

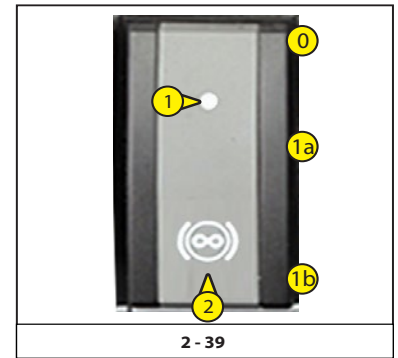
The engine brake allows two stages of deceleration (0, 1a, 1b, 2 - 39), a low and an intense one.

Operating conditions of the engine brake. The engine brake works only if:

- the engine water temperature is > 60°C
- the accelerator pedal is not pressed
- the revs of the I.C. engine are > 1100 rpm.

IMPORTANT! In order to maintain the braking power of the engine brake, the speed shall not exceed 42 km/h. If required, slow down the machine by pressing the service brake pedal.

If the speed of the machine exceeds 42 km/h, the driver will be warned by an alarm sound and by an optical signal "BRAKE" on the tachometer.



ENGINE BRAKE SWITCH

MHT-X 1490
MHT-X 10130

The engine brake decelerates the telehandler without using mechanical friction in order to avoid the overheating of the brake system. This brake is mainly used during long descents, and it allows to brake the vehicle without stressing the brakes.

Press switch (2, 2 - 40) to enable or disable the engine brake (0, 1a, 2 - 40).

On the control panel, an orange indicator light indicates that the function is active (see paragraph: "Instrument control panel").

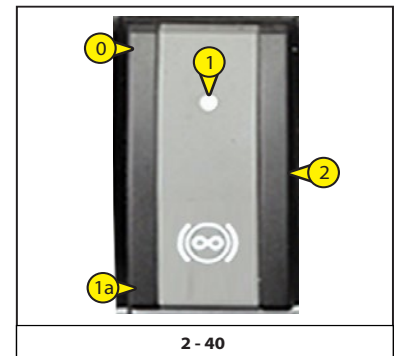
On the switch (2, 2 - 40), the LED switches on (1, 2 - 40) to indicate that the function is active.

Operating conditions of the engine brake. The engine brake works only if:

- the engine water temperature is > 60°C
- the accelerator pedal is not pressed
- the revs of the I.C. engine are > 1100 rpm.

IMPORTANT! In order to maintain the braking power of the engine brake, the speed shall not exceed 42 km/h. If required, slow down the machine by pressing the service brake pedal.

If the speed of the machine exceeds 42 km/h, the driver will be warned by an alarm sound and by an optical signal "BRAKE" on the tachometer.



FANS ROTATION INVERSION TIMED CONTROL SWITCH

The 3-position switch (2, 2 - 41) can be activated to invert the rotation of the radiator fan for a few seconds.

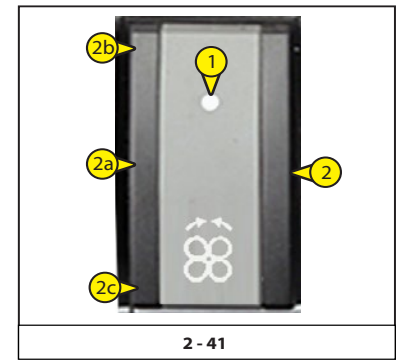
On the switch (2, 2 - 41) the led comes on (1, 2 - 41) to indicate that the function is active.

On the control panel, the green indicator light indicates the active function (paragraph: "Instrument control panel").

In this situation, the direction of fan rotation is alternated periodically.

- When the switch is pressed (2a, 2 - 41) the fan rotation inversion function is activated.
- When the switch is pressed (2b, 2 - 41) the fan rotation inversion function is deactivated.
- When the switch is in position (2c, 2 - 41) the fan rotation inversion function is forced.

When the switch is released, the fan rotation inversion timed control is reset. The switch can also be activated with the telehandler running.



IMPORTANT

When the telehandler is travelling on roads, the fan rotation inversion system must be deactivated [switch pressed in position (2c, 2 - 41)].

ATTACHMENT FAST HYDRAULIC CONNECTION SWITCH

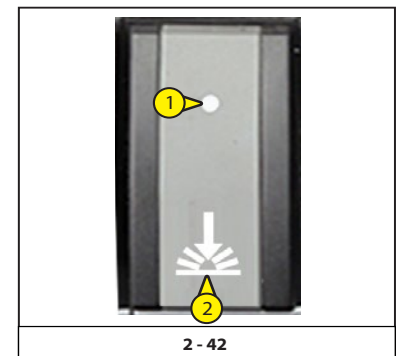
For easily connecting and disconnecting the attachment.

The switch (2, 2 - 42) has two position.

On the switch (2, 2 - 42) the led comes on (1, 2 - 42) to indicate that the function is active.

Operation:

- keep the switch (2, 2 - 42) pressed for two seconds to release the pressure from the hydraulic circuit of the attachment,
- connect or disconnect the rapid connectors of the hydraulic attachment (Chapter 4 OPTIONAL ATTACHMENTS FOR USE WITH THE RANGE: PICKING UP THE ATTACHMENTS).



BOOM SUSPENSION SWITCH

The boom is suspended to reduce the shaking of the telehandler on rough ground (e.g. when moving straw in a field).

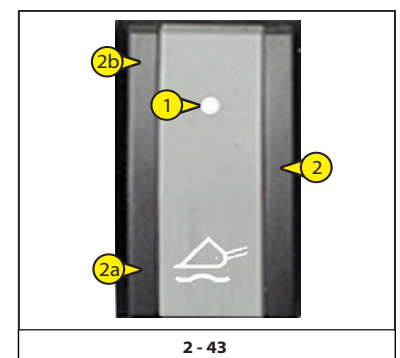
The switch (2, 2 - 43) has two position.

On the switch (2, 2 - 43) the led comes on (1, 2 - 43) to indicate that the function is active.

On the control panel, the green indicator light indicates the active function (paragraph: "Instrument control panel").

Operation:

- place the forks or the attachment on the ground and lift the front wheels just a few centimetres.
- press switch set to position (2a, 2 - 43), the visual indicator comes on indicating that the boom suspension is activated.
- press switch set to position (2b, 2 - 43), the visual indicator goes out indicating that boom suspension is deactivated.



The boom suspension is active up to a lifting height of 3 m from the axis of articulation of the carriage with respect to the ground, when the boom retracted. When you move beyond this height or make another hydraulic movement (tilting, telescoping, attachment), boom suspension is momentarily deactivated and the visual indicator of switch 1 goes out.

- When the I.C. engine is switched off, the boom suspension is automatically deactivated.

HYDRAULIC ACCESSORY BLOCK SWITCH

Precautions to be taken if the machine is provided with the “hydraulic accessory block” device.

This hydraulic device with electric control makes it possible for the operator to block/release an accessory from the driving seat.

The device activates two pins (X, Y, 2 - 44) which move horizontally on the quick-release coupling, outwards (blocking the accessory) and inwards (releasing the accessory).

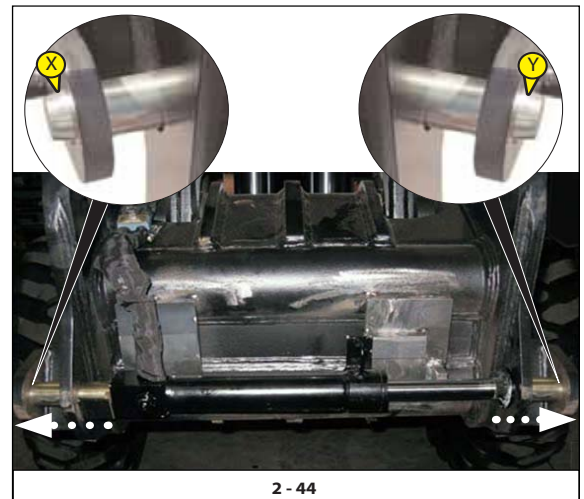
To block the accessory, the two check pins must come completely out of the quick-release coupling (X,Y, 2 - 44).

To select the “hydraulic accessory block” device, the operator must keep the optional switch 2° e 3° pressed (1, 2 - 45).

The operator can activate two pins (X,Y, 2 - 44) by pressing the optional roller button (4, 2 - 45) on the manipulator (3, 2 - 45).

By pressing the optional 2° and 3° switch again (1, 2 - 45), the operator deactivates the hydraulic block of the attachments and resets the standard controls of the optionals.

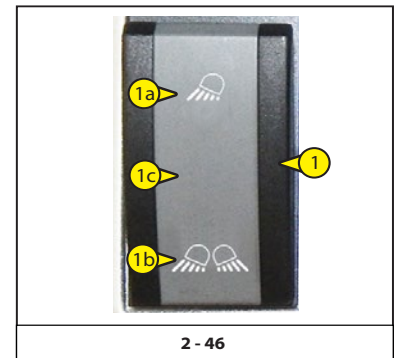
If the installed equipment is fitted with hydraulic connections, connect them to the arm quick-release fitting with the IC engine switched off (← Chapter 4 - OPTIONAL ATTACHMENTS FOR USE WITH THE RANGE: PICKING UP THE ATTACHMENTS).



CAB FRONT AND REAR WORK LIGHTS SWITCH

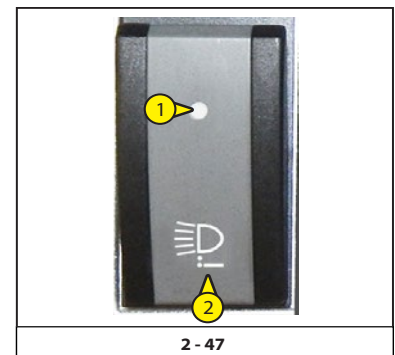
This switch (1, 2 - 46) controls the operation of the front and rear work lights. The switch (1, 2 - 46) has three positions:

- front work lights (1a, 2 - 46);
- deactivated (1c, 2 - 46);
- front and rear work lights (1b, 2 - 46).



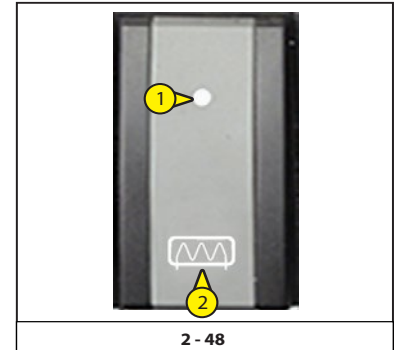
BOOM HEAD WORK LIGHTS SWITCH

This switch (2, 2 - 47) controls the operation of the boom head work lights. On the switch (2, 2 - 47), the led comes on (1, 2 - 47) to indicate that the function is active.



REAR WINDOW DEMISTING AND DEFROSTING SWITCH

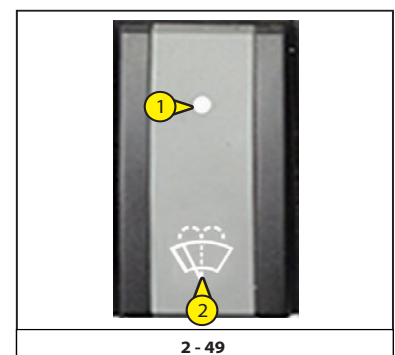
This switch (2, 2 - 48) activates the control that distributes a low electrical current to the rear window to facilitate frost, fog and mist removal. On the switch (2, 2 - 48) the led comes on (1, 2 - 48) to indicate that the function is active.



LATERAL WINDOW WASHER AND WIPER SWITCH

This switch (2, 2 - 49) activates the control which, in turn, activates the lateral wiper and dispenses washing fluid, initiating a sweeping motion and the spraying of the fluid to clear the side window.

This switch (2, 2 - 49) activates the control that distributes a low electrical current to the rear window to facilitate frost, fog and mist removal. On the switch (2, 2 - 49) the led comes on (1, 2 - 49) to indicate that the function is active.

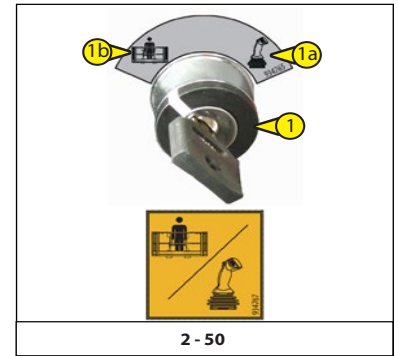




TELEHANDLER/PLATFORM SELECTOR SWITCH KEY (only with platform)

- Handling or platform operation from driver's cab controls (1, 2 - 50).
- Platform operation from control console (2, 2 - 50).

(For more details: the "Platform User Manual")



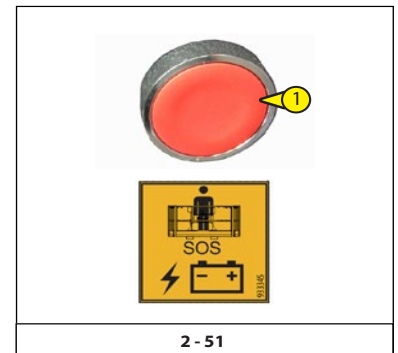
BUTTON FOR RESTORING ELECTRICAL POWER SUPPLY (only with platform)



If the "emergency stop" button is pressed from the basket, the supply of electricity from the battery is cut off and the I.C. engine switches off.

Keep button pressed (2, 2 - 51) to restore the supply of electricity to the battery and make it possible to restart the I.C. engine

(For more details: the "Platform User Manual")



9- "EMERGENCY STOP" BUTTON

In case of emergency, press the mushroom-shaped red button (1, 2 - 52) to stop the I.C. engine of the telehandler.

On the control panel, the indicator light indicates the active function (paragraph: "Instrument control panel").



Warning, hydraulic movements suddenly stop when using this button.
If possible, stop the telehandler before using the emergency stop.

Turn the button (1, 2 - 52) to disable it and to restart the telehandler.







10- WARNING AND INDICATOR LAMPS

INDICATOR LAMPS



POSITION LIGHTS

(For more details: paragraph "Lighting, horn and indicator lights lever")

	position lights are off
	position lights active green indicator light


LOW BEAMS

(For more details: paragraph "Lighting, horn and indicator lights lever")

	low beams are off
	low beams active green indicator light



HIGH BEAMS

(For more details: paragraph "Lighting, horn and indicator lights lever")

	high beams active blue indicator light
---	--



DIRECTION LIGHTS

(For more details: paragraph "Lighting, horn and indicator lights lever")

	direction lights are off
	direction lights active green indicator light


CAB DOOR

(For more details: paragraph "Driver's presence")

	telehandler door is closed
	telehandler door is not closed properly active red indicator light

FRONT WHEELS ALIGNMENT GREEN INDICATOR LIGHT

(For more details: the "Pushbutton panel" paragraph)


	front wheels alignment active green indicator light
---	---

Indicates the alignment of the front wheels in relation to the telehandler axis (◆).

When the wheels are aligned the indicator lights up.

REAR WHEELS ALIGNMENT YELLOW INDICATOR LIGHT

(For more details: the "Pushbutton panel" paragraph)

	rear wheels alignment active yellow indicator light
---	---

Indicates the alignment of the rear wheels in relation to the telehandler axis (◆).
When the wheels are aligned the indicator lights up.




◆ Front and rear wheels alignment procedure:

turn the selector for the steering type to "concentric steering", turn the wheel so that the rear wheels alignment yellow indicator does not light up; then position the selector on "front steering" and turn the wheel so that the front wheels alignment green indicator does not light up.
When the front and rear wheels are aligned, one of the three steering modes mentioned above can be selected.
The wheels coordination may be lost with use; carry out realignment of the wheels every 20 hours of service by following the procedure described above.




STEERING WHEEL TYPES

(For more details: the "Pushbutton panel" paragraph)

	front wheel steering active green indicator light
	concentric wheel steering active green indicator light
	crab steering active green indicator light


FAST GEAR

(For more details: the "Pushbutton panel" paragraph)

	gear engaged active green indicator light
---	---

SLOW GEAR

(For more details: the "Pushbutton panel" paragraph)

	gear engaged active green indicator light
---	---



TRANSMISSION RESET

(For more details: the "Pushbutton panel" paragraph)

	gear not engaged active blue indicator light
--	--



HIGH TORQUE

(For more details: paragraph "High torque selectors")

	high torque disabled
	high torque active green indicator light



REMOTE CONTROL (OPTIONAL)

(For more details: the "Switches" paragraph)



	remote control disabled
	remote control active green indicator light

STOPPING TELESCOPIC BOOM HYDRAULIC MOVEMENTS

(For more details: the "Pushbutton panel" paragraph)

	telescopic boom hydraulic movements control stopped
	telescopic boom hydraulic movements control active green indicator light

REAR AXLE LOCKING

	rear axle locking is disabled
	rear axle locking active yellow indicator light



Rear axle locking is automatic and occurs only when:

- the telehandler is stabilized and the lifting angle of the telescopic boom is more than 15°.
- the lifting angle of the telescopic boom is less than 13°.





TELESCOPIC BOOM SUSPENSION

(For more details: the "Switches" paragraph)

	telescopic boom suspension is disabled
	telescopic boom suspension active yellow indicator light


REVERSING RADIATOR FAN

(For more details: the "Switches" paragraph)

	reversing radiator fan is disabled
	reversing radiator fan active yellow indicator light


SERVICE

(For more details: see next paragraph "Warning lamps in alarm page": "Service")

	Service orange indicator light
---	--------------------------------


ATTACHMENT HYDRAULIC CONTROL DISCONNECT

(For more details: the "Pushbutton panel" paragraph)

	black indicator light indicates that the optional hydraulic movement is excluded
---	--


2ND OPTIONAL WORKING (OPTIONAL)

(For more details: the "Pushbutton panel" paragraph)



	2 nd optional working active orange indicator
---	--

3RD OPTIONAL WORKING (OPTIONAL)

(For more details: the "Pushbutton panel" paragraph)

	3 rd optional working
---	----------------------------------

EXHAUST GAS AFTER-TREATMENT

	diesel exhaust fluid (DEF) blue level indicator
	yellow indicator: emissions-relevant malfunction of the exhaust gas after-treatment system or DEF supply
LIM	yellow indicator: machine speed or torque operating restriction



WARNING LAMPS

I.C. ENGINE SEVERE FAULT

If the indicator lights up or flashes when the telescopic lift is in operation, there is a severe fault, switch off the I.C. engine immediately and contact your dealer.

	normal functioning of the I.C. engine
	I.C. engine severe failure active red warning light

I.C. ENGINE MALFUNCTIONS

If the indicator lights up or flashes when the forklift truck is in operation, there is a malfunction. The telescopic lift operates in reduced mode. Impermissible operating conditions.

	normal functioning of the I.C. engine
	I.C. engine malfunctions active orange warning light

It is important that malfunctions are rectified promptly. You can rectify certain faults yourself. Malfunctions that you cannot eliminate yourself must be rectified at a qualified specialist workshop.



The operating safety of your vehicle could be affected if maintenance work is carried out incorrectly. You could lose control of the telehandler and cause an accident. Also, the safety systems may no longer be able to protect you or others, in the way in which they were designed. Always have maintenance work carried out at a qualified specialist workshop.

I.C. ENGINE OIL LEVEL

	i.c. engine oil level (0-100 %)
	the red warning lamp lights on when the level is under 20%

ALTERNATOR EXCITATION

	normal functioning of the alternator excitation
	alternator excitation active red warning light

This indicator lights up when the electric contact on the forklift truck is activated and it must switch off once the I.C. engine starts running. If the indicator lights up while the telescopic tractor is in operation, switch the I.C. engine off immediately and check the electric circuit and the alternator belt.



I.C. ENGINE OIL PRESSURE RED INDICATOR LIGHT

	normal functioning of the i.c. engine oil pressure
	i.c. engine oil pressure active red warning light

This indicator lights up when the electric contact on the forklift truck is activated and it must switch off once the I.C. engine starts running. If the indicator lights up while the truck is in operation, switch the I.C. engine off immediately and check for the cause (check the oil level in the engine crankcase).





ENGINE AIR FILTER CLOGGING RED INDICATOR LIGHT

	normal functioning of the engine intake air filter
	blocked engine intake air filter active red warning light

This light indicates the status of the filter cartridge: if the cartridge is encrusted or damaged, the warning lights up (for replacing the cartridge, refer to the "Lubricants" Chapter).



TRANSMISSION FILTER BLOCKING

	normal functioning of the transmission oil filter
	blocked transmission oil filter active red warning light



This light indicates the status of the filter cartridge: if the cartridge is encrusted or damaged, the warning lights up (for replacing the cartridge, refer to the "Lubricants" Chapter).

PARKING BRAKE

(For more details: the "Pushbutton panel" paragraph)



	parking brake disabled
	parking brake engaged active red warning light

LOW BRAKE OIL

	normal functioning of the brake system
	red braking oil level low warning light



If the lamp switches on when the lift truck is running, stop the I.C. engine immediately and look for the cause (braking oil level, possible leak, etc.). In the event of an abnormal level drop, consult your dealer.

HYDRAULIC OIL FILTER

	normal functioning of the hydraulic oil filter
	blocked hydraulic oil filter red warning light



This light indicates the status of the filter cartridge: if the cartridge is encrusted or damaged, the warning lights up (for replacing the cartridge, refer to the "Lubricants" chapter).

STEERING SYSTEM OIL PRESSURE

	normal functioning of the steering system
	"emergency steering" red warning light

If the lamp switches on when the lift truck is running, stop the I.C. engine immediately and look for the cause (possible leak, etc.).

TRAILER BRAKE ANOMALY (OPTIONAL)

	normal functioning of the trailer brake
	trailer brake anomaly red warning light



ENGINE BRAKE (OPTIONAL)

(For more details: < the "Switches" paragraph)

	engine brake disabled
	engine brake active red warning light

"EMERGENCY STOP"

(For more details: < paragraph "Emergency stop" button)

	"emergency stop" red button not pressed
	"emergency stop" red button pressed red warning light

LOAD LIMITER DISABLED

(For more details: e paragraph "Selector to disable the load limiter")

	normal operation of the load limiter
	DANGER! Load limiter disabling red warning light

ALARM AND WARNING MACHINE

(For more details: e paragraph "Control panel and load limiter")



	ATTENTION! Machine alarm active red warning light
--	--





WARNING LAMPS IN ALARM PAGE

(For more details: e paragraph "Control panel and load limiter")



DISPLAY IN CAB

	operating normally
	red warning light on indicates an error or an anomaly

CONTROL UNIT ON HEAD BOOM TO CONTROL THE VOLTAGE 12 V



	operating normally
	red warning light on indicates an error or an anomaly

MASTER CONTROL UNIT FRAME

	operating normally
	red warning light on indicates an error or an anomaly



STABILIZERS CONTROL UNIT

(Second equipment)

	operating normally
	red warning light on indicates an error or an anomaly



LOAD LIMITER CONTROL UNIT (OPTIONAL)

(Second equipment)



	operating normally
	red warning light on indicates an error or an anomaly

BASKET CONTROL UNIT (OPTIONAL)



(Second equipment)

	operating normally
	red warning light on indicates an error or an anomaly

ACKNOWLEDGEMENT OF ATTACHMENT (OPTIONAL)



	operating normally
	red warning light on indicates an error or an anomaly

JOYSTICK

	operating normally
	red warning light on indicates an error or an anomaly





RADIO REMOTE CONTROLS (OPTIONAL) (SECOND EQUIPMENT)



	operating normally
	red warning light on indicates an error or an anomaly

WINDER ON BOOM (OPTIONAL)


(Second equipment)

	operating normally
	red warning light on indicates an error or an anomaly

I.C. ENGINE ALARM

	I.C. engine malfunctions active orange warning light
	I.C. engine severe failure active red warning light

SERVICE

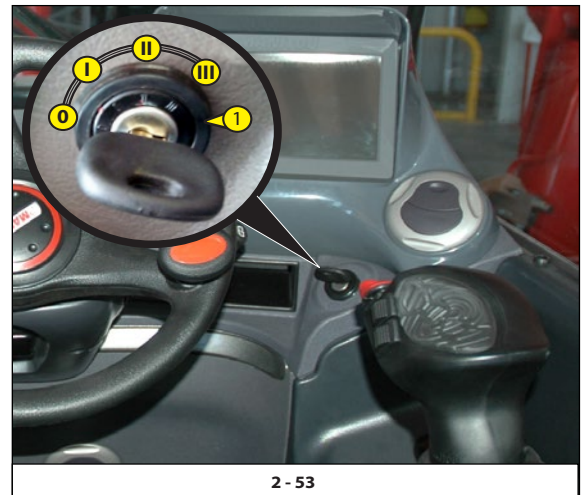
	Service orange indicator light
--	--------------------------------

To indicate that the telehandler needs servicing, maintenance. Refer to scheduled maintenance

11- START-UP SWITCH



The switch ( 2 - 53) has five positions, and its functions are:

- 0 : I.C. engine STOP;
- I : Main electric contact "+" (it also activates the preheating device, if installed)
- II : Not used
- III : I.C. engine START-UP and return to position "1" when the key is released (it also deactivates the preheat device, if installed).








12- ACCELERATOR PEDAL

Electronic pedal (1,  2 - 54) used for changing the telehandler speed by acting on the rpm of the I.C. engine.
Press on the accelerator pedal (1,  2 - 54) to move the telehandler.

13- SERVICE BRAKE PEDAL

The pedal (2,  2 - 54) acts on the front and rear wheels by a power assisted hydraulic brake system, and allows the telehandler to be slowed down and stopped.
Press on the brake pedal (2,  2 - 54) to slow or stop the telehandler forward movement.

INCHING CONTROL

The pedal (2,  2 - 54) acts on the front and rear wheels by a power assisted hydraulic brake system, allowing the telehandler to move slowly and the accurate handling of loads.
The inching control cuts off the traction of telehandler.



2 - 54



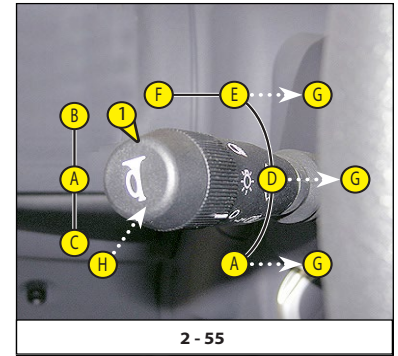
14- LIGHTING, HORN AND INDICATOR LIGHTS LEVER

The lever (1, 2 - 55) controls:

- All lights are off, the direction indicator lights do not flash (A, 2 - 55).
- The right hand direction indicator lights flash (B, 2 - 55).
- The left hand direction indicator lights flash (C, 2 - 55).
- The sidelights and the rear lights are on (D, 2 - 55).
- The dipped headlights and the rear lights are on (E, 2 - 55).
- The main beam headlights and the rear lights are on (F, 2 - 55).
- Headlight signal (G, 2 - 55).
- Pressing the switch sounds the horn (H, 2 - 55).

NOTE: positions (D - E - F - G, 2 - 55) can be used without starting the machine.

On the control panel, the indicator lights indicate the active function (10-WARNING AND INDICATOR LAMPS, 2-51).



15- FRONT AND REAR WINDSCREEN WIPER LEVER

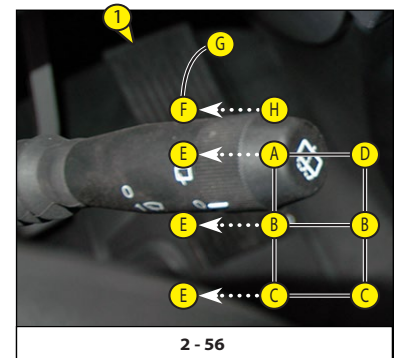
The lever (1, 2 - 56) controls:

Front windscreen wiper (1, 2 - 56):


- Front windscreen wiper stop (A, 2 - 56).
- Slow speed for front windscreen wiper (B, 2 - 56).
- Fast speed for front windscreen wiper (C, 2 - 56).
- Front windscreen wiper intermittent control (D, 2 - 56).
- Front windscreen washer, pulse-driven (E, 2 - 56).

Rear windscreen wiper (1, 2 - 56):



- Rear windscreen wiper stop (F, 2 - 56).
- Rear windscreen wiper (G, 2 - 56).
- Rear windscreen washer, pulse-driven (H, 2 - 56).



16- FORWARD/NEUTRAL/REVERSE GEAR SELECTION



This gear switch (1,  2 - 57) is located on the joystick in cab.

Authorisation to use the gear selector is given by:

- validation of driver's presence (↪ 16- FORWARD/NEUTRAL/REVERSE GEAR SELECTION,  2-62),
- parking brake not applied (↪ paragraph: "Keypad and switches,  2-32),
- stabilizers not resting on the ground (↪ paragraph: "Keypad and switches").



When operating this control, the telehandler should be travelling at slow speed and not accelerating.

FORWARD GEAR:

push the switch forward (F,  2 - 57), the gear set is displayed on the control panel (↪ Operating mode control,  2-27).

Press on the accelerator pedal to move the telehandler (↪ paragraph: "Accelerator pedal").


REVERSE GEAR:

push the switch backward (R,  2 - 57), the gear set is displayed on the control panel (↪ Operating mode control,  2-27).

Press on the accelerator pedal to move the telehandler (↪ paragraph: "Accelerator pedal").


Reversing lights and an acoustic reversing alarm indicate that the telehandler is running in reverse.



NEUTRAL POSITION:

set the switch (N,  2 - 57) to the centre position, the gear set is displayed on the control panel and the parking brake is applied (by default).




17- TRAVELLING MODE BUTTONS


These buttons (+, -, ) select the two operating mode:



- slow mode by pressing the button (-, )
- fast mode by pressing the button (+, )

When the telehandler starts, the default mode is set to fast.


The operating mode buttons (+, -, ) are located on the joystick in cab.



Slow operating mode

- The button (+, ) identifies the control that increases the torque and the force to a higher level, but decreases the travel speed.

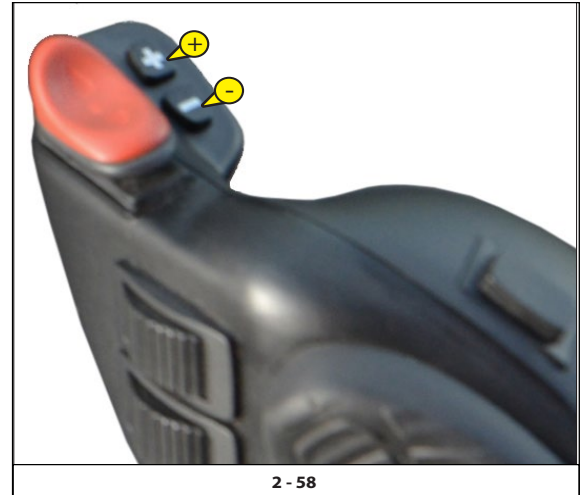
When you press the button (+, ) a green indicator lights  on the control panel.

Fast operating mode

- The button (-, ) identifies the control that decreases the torque and increase the travel speed.

- When you press the button (+, ) a indicator goes off  on the control panel.

The buttons can also be turned on with the telehandler in motion.



18- PROPORTIONAL ELECTRO-HYDRAULIC JOYSTICK

(Depending on the telehandler model)

The joystick (1, 2 - 59) is located in the cab on the armrest (2, 2 - 59).

The hydraulic control use authorisation is given by the validation of the driver's presence (18- PROPORTIONAL ELECTRO-HYDRAULIC JOYSTICK, 2-65) and by following the conditions for the hydraulic control use.

To enable and carry out the movements keep the manoeuvre enabling button (OK, 2 - 59) on joystick (1, 2 - 59) pressed (if equipped).



Do not attempt to alter the hydraulic system pressure. In the event of suspected malfunction, contact your dealer.

ANY ALTERATION MAY RENDER THE WARRANTY NULL AND VOID.

Use the hydraulic controls carefully without sudden movements, to avoid accidents caused by the shaking of the machine.

NOTE: when driving on roads, it is highly recommended that you cut-off all the hydraulic movements (Stopping telescopic boom hydraulic movements key, <?>).

GENERAL MOVEMENT OF TELESCOPIC BOOM

- Lifting control lever (A, 2 - 59).
- Tilting control lever (A, 2 - 59).
- Telescoping control button (B, 2 - 59).
- Attachment control button (C, 2 - 59).
- Hydraulic movements enable button (OK, 2 - 59) (if equipped).

Place your hand on the joystick, press the hydraulic movements enable button and execute the movement. A timer allows hydraulic movements to keep active when using the telescopic handler. If necessary, reactivate the hydraulic movements by pressing the hydraulic movements enable button.

Direction of movements

LIFTING THE LOAD

- The lever (A, 2 - 59) backwards when lifting.
- The lever (A, 2 - 59) forwards when lowering.

TILT OF CARRIAGE

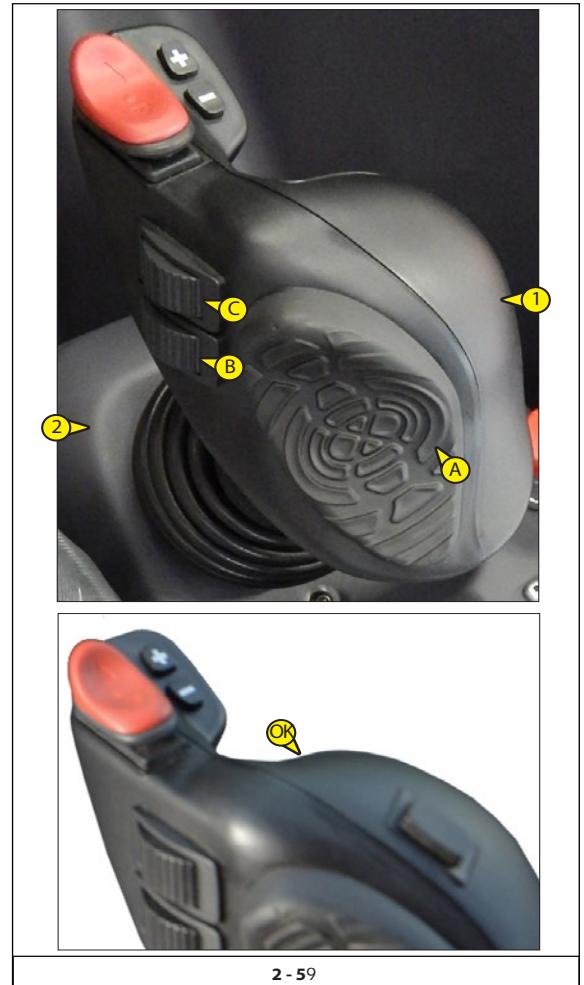
- The lever (A, 2 - 59) to the left for reverse tilt.
- The lever (A, 2 - 59) to the right for forward tilt.

TELESCOPING

- Button (B, 2 - 59) forwards for extending.
- Button (B, 2 - 59) backwards for retracting.

ATTACHMENTS

- The button (C, 2 - 59) forwards or backwards.



19- HEATER CONTROL

FAN CONTROL (1, 2 - 60)

This 3-speed control allows the air to be ventilated through the air vents.

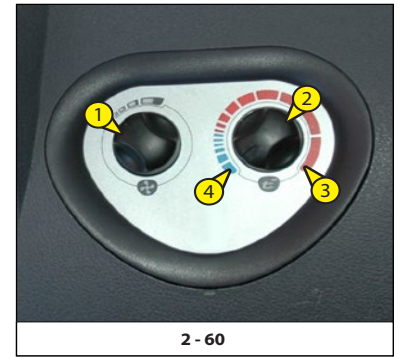
TEMPERATURE CONTROL (2, 2 - 60)

Allows the temperature inside the cab to be adjusted.

The fan pumps in the air at ambient temperature (4, 2 - 60).

The fan pumps in warm air (3, 2 - 60).

The intermediate position allows the temperature to be adjusted.



2 - 60

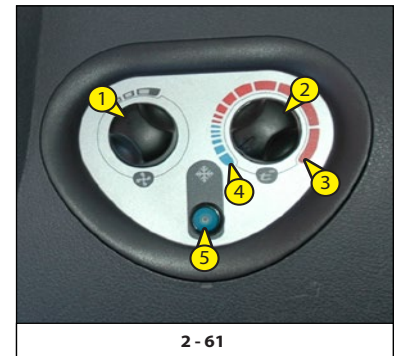
20- AIR CONDITIONING CONTROLS (OPTION)



The air conditioning only works if the telehandler has been started. When using your air conditioning unit, work with the cab closed off. In winter: In order to ensure correct operation and complete efficiency of the air conditioning unit, switch on the compressor once a week, even for a short time, to lubricate the internal seals. In cold weather: Warm the I.C. engine before switching on the compressor. This allows the coolant, which was collected in a liquid state at the lowest point of the compressor circuit, to turn into gas. This is due to the effect of the heat given off by the I.C. engine, as the compressor is liable to be damaged by the coolant in a liquid state.

If your air conditioning does not seem to be working correctly, have it examined by your dealer (see 3 - MAINTENANCE: F - EVERY 2000 HOURS OF SERVICE).

Never try to repair any faults yourself.



2 - 61

FAN CONTROL (1, 2 - 61)

This 3-speed control allows the air to be ventilated through the air vents.

TEMPERATURE CONTROL (2, 2 - 61)

Allows the temperature inside the cab to be adjusted.

- The fan pumps in cold air (4, 2 - 61).
- The fan pumps in warm air (3, 2 - 61).

The intermediate position allows the temperature to be adjusted.

AIR CONDITIONING CONTROL

This control with a pilot light allows the air conditioning unit to be switched on.

Heating mode

The controls must be adjusted in the following way:

- Control with pilot light off (5, 2 - 61).
- At the required temperature (2, 2 - 61).
- At the desired speed: 1, 2 or 3 (1, 2 - 61).

Conditioned air mode

The controls must be adjusted in the following way:

- Control with pilot light on (5, 2 - 61).
- At the required temperature (2, 2 - 61).
- At the desired speed: 1, 2 or 3 (1, 2 - 61).

Demisting mode

The controls must be adjusted in the following way:

- Control with pilot light on (5, 2 - 61).
- At the required temperature (2, 2 - 61).
- At the speed: 1, 2 or 3 (2, 2 - 61).

For optimum effectiveness, close the heating diffusers.

21- AIR DIFFUSERS FOR DEMISTING

Windscreen (1, 2 - 62).

For optimum effectiveness, close the heating diffusers. (2, 2 - 62).

22- AIR DIFFUSERS OF HEATING

The heating diffusers(2, 2 - 62) allow the distribution of the ventilated air inside the cab and on the side windows.

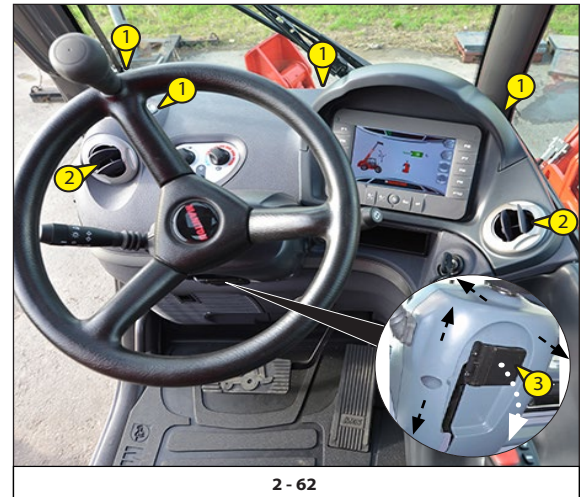
23- STEERING WHEEL ADJUSTMENT LEVER

This lever (3, 2 - 62) allows the angle and height of the steering wheel to be adjusted.

Pull the lever backwards.

Adjust the steering wheel to the desired position.

Push the lever back to lock the steering wheel in position.



2 - 62

24- COMMANDS ARMREST ADJUSTMENT CONTROL KNOBS

This control knobs (1, 2, 2 - 63) allow the longitudinal and height of the commands armrest to be adjusted.

HEIGHT ADJUSTMENT

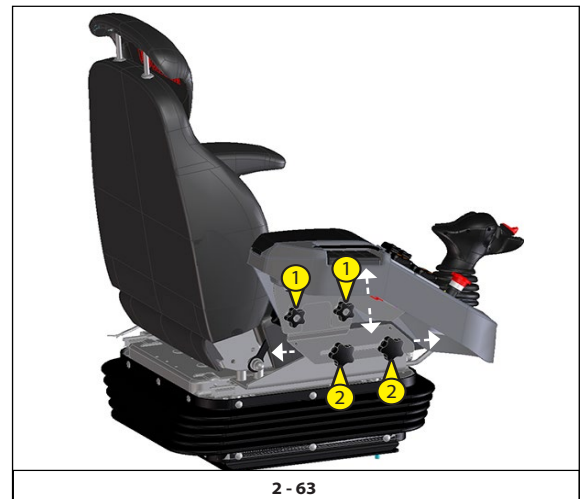
Turn the locking control knobs (1, 2 - 63) and slide the commands armrest to the desired position.

Release the control knobs and ensure it returns to the lock position.

LONGITUDINAL ADJUSTMENT

Turn the locking control knobs (2, 2 - 63) and slide the commands armrest to the desired position.

Release the control knobs (2, 2 - 63) and ensure it returns to the lock position.



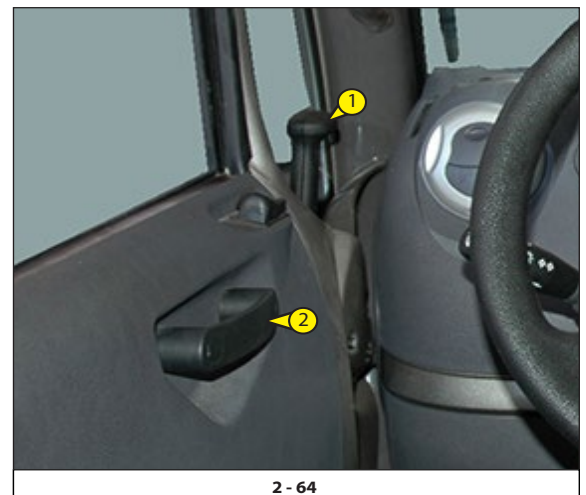
2 - 63

25- DOOR OPENING LEVER

(1, 2 - 64)

26- DOOR CLOSING HANDLE

(2, 2 - 64)



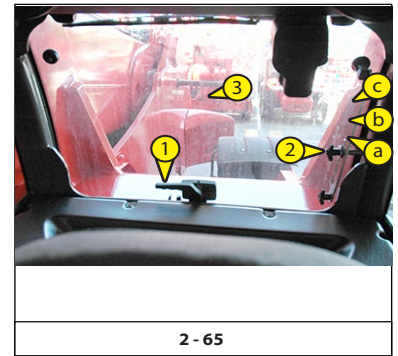
2 - 64

27- HANDLE FOR REAR WINDOW OPENING/CLOSING

The handle (1, 2 - 65) opens and closes the rear window.
 The rear window has 3-position (a, b, c, 2 - 65).
 Turn the handle (1, 2 - 65) and push it to open the window.
 Block the window in the desired position (a, b, c, 2 - 65).
 Close the window using the knob (2, 2 - 65) and ensure it returns to the lock position.

Emergency exit

Use the rear window as an emergency exit (3, 2 - 65) if it is impossible to leave the cab using the door.



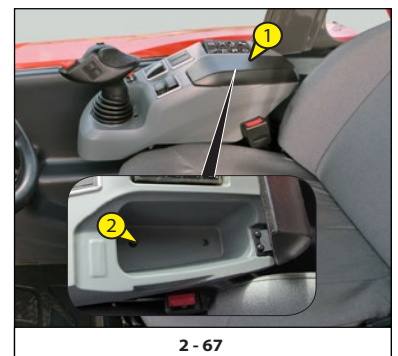
28- CEILING LIGHT

(1, 2 - 66)



29- ARMREST AND STORAGE

Lift the armrest (1, 2 - 67) to access the storage (2, 2 - 67).



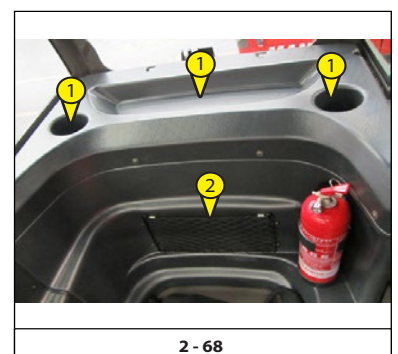
30- SIDE STORAGE SPACE

(Behind driver seat)

(1, 2 - 68)

31- DOCUMENT HOLDER NET

Make sure that the operator's manual is in the right place, i.e. in the document holder net (2, 2 - 68).



32- CAB FILTER VENTILATORS

(Standard)

Cab internal ventilation filter.

Remove the door (1, 2 - 69) that gives access to the filter ventilators (2, 2 - 69).



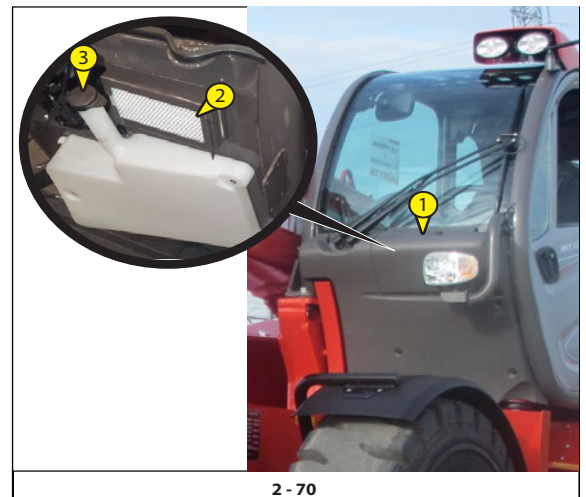
2 - 69

33- CAB FILTER FANS

(Option air conditioning)

Cab external ventilation filter.

Remove the panel (1, 2 - 70) on front cab and that gives access to the filter ventilators (2, 2 - 70).



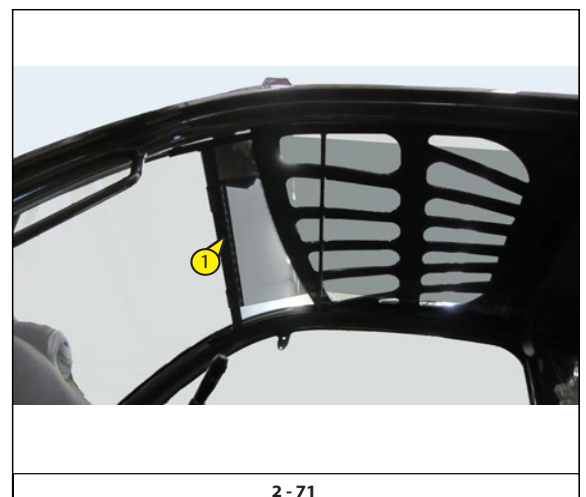
2 - 70

34- WINDSCREEN WASHER TANK

Remove the panel (1, 2 - 70) on front cab and that gives access to the wind-screen washer tank (3, 2 - 70).

35- SUN VISOR (OPTION)

(1, 2 - 71)

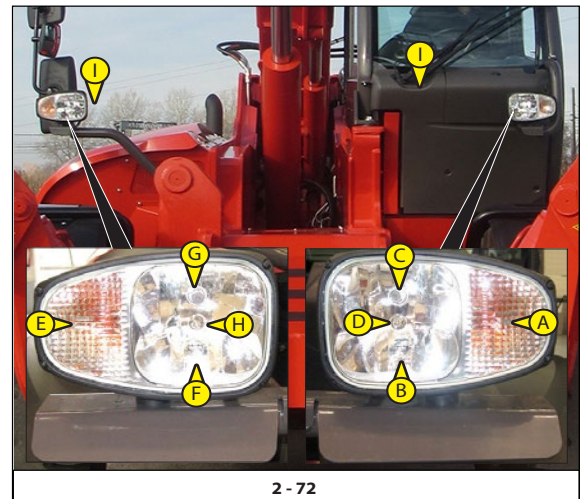


2 - 71

36- FRONT HEADLIGHTS

- Left front indicator (A, 2 - 72).
- Left front low beam (B, 2 - 72).
- Left front high beam (C, 2 - 72).
- Left front sidelight (D, 2 - 72).
- Right front indicator (E, 2 - 72).
- Right front low beam (F, 2 - 72).
- Right front high beam (G, 2 - 72).
- Right front sidelight (H, 2 - 72).

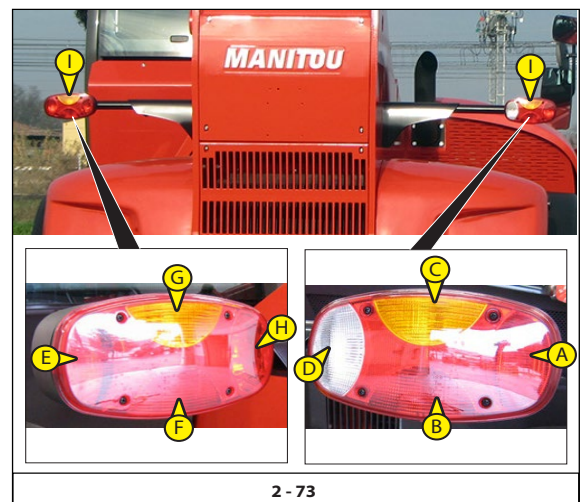
A grid protection is installed on front headlights (I, 2 - 72).



37- REAR LIGHTS

- Left rear indicator (A, 2 - 73).
- Left rear stop light (B, 2 - 73).
- Rear left headlight (C, 2 - 73).
- Rear fog light (D, 2 - 73).
- Rear reverse light (E, 2 - 73).
- Right rear headlight (F, 2 - 73).
- Right rear stoplight (G, 2 - 73).
- Right rear indicator (H, 2 - 73).

A grid protection is installed on rear lights (I, 2 - 73).



38- ROTATING BEACON LIGHT

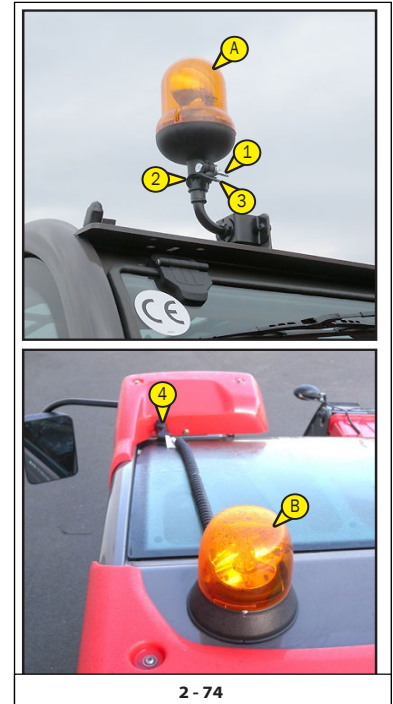
Standard

The rotating beacon light (A, 2 - 74) pivots to save space on the telehandler and can be detached to prevent theft.

- Loosen the nut (1, 2 - 74) and remove the revolving light.
- Protect mounting (2, 2 - 74) with cap (3, 2 - 74).

Optional air conditioning

The magnetic rotating beacon light (4, 2 - 74) must be clearly visible on the roof of the cab and plugged-in to socket (4, 2 - 74).



39- REAR WORK LIGHTS (OPTION)

(1, 2 - 75)



40- FRONT WORK LIGHTS (OPTION)

(1, 2 - 76)



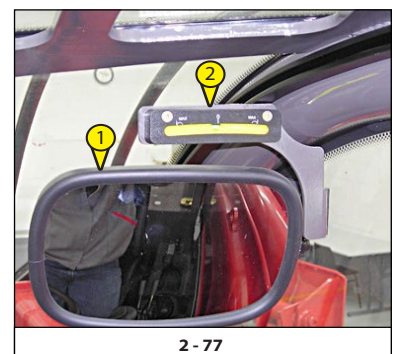
- A - Front work lights
- B - Telescope work lights

41- INSIDE REAR-VIEW MIRROR (OPTION)

(1, 2 - 77)

42- BUBBLE LEVEL INDICATOR

This indicator (2, 2 - 77) allows the operator to verify that the lift truck is in the horizontal position.

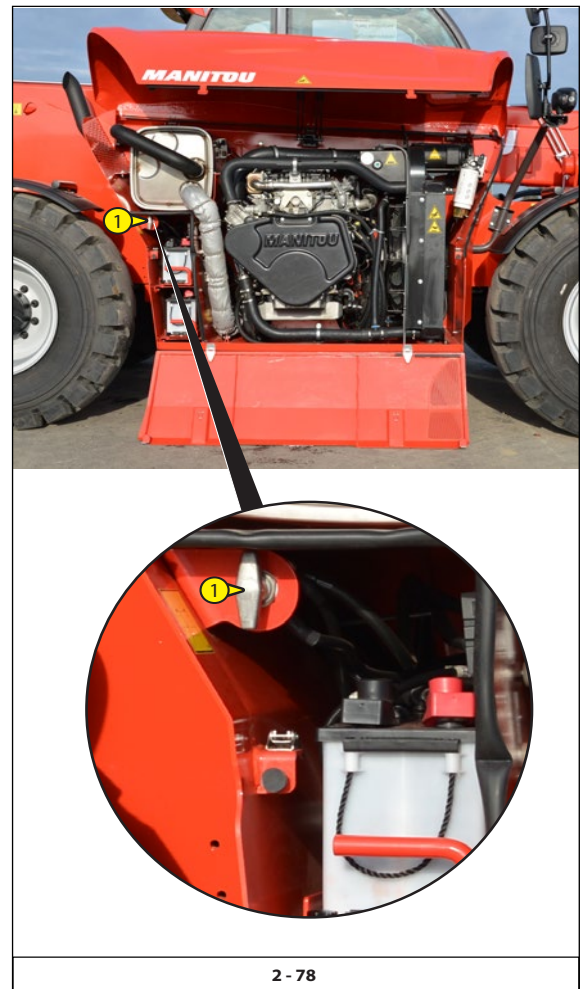


43- BATTERY CUT-OFF

It allows the quick disconnection of the battery (1, 2 - 78) for example when working on the electrical circuit or when soldering.



Operate the battery cut-off no less than 30 seconds before switching off the ignition with the ignition key.



44- BOOM SAFETY WEDGE

The forklift truck is provided with a safety wedge for the boom which must be installed under the lift cylinder rod in case of intervention on the boom (see: 1 - OPERATING AND SAFETY INSTRUCTIONS).

(1, 2 - 79)

Use only the safety wedge supplied with the forklift truck.






Operate the battery cut-off no less than 30 seconds before switching off the ignition with the ignition key.








45- PORTABLE POWDER FIRE EXTINGUISHER

Portable powder fire extinguisher (1,  2 - 80) is positioned behind the driver's seat (2,  2 - 80).

The portable powder fire extinguisher (1,  2 - 80) is suitable for use on live electric appliances.

The fire extinguisher (1,  2 - 80) fits into an extinguisher-holding support (3,  2 - 80) and is secured on the machine (4,  2 - 80).

PORTABLE POWDER FIRE EXTINGUISHER

Model	K2 B
Capacity	2 kg
Classes	13A - 89 BC

Technical features

Fire classes	13A - 89 BC
Total weight	Approx. 3.6 kg
Nominal load	2 kg.
Extinguishing agent	ABC powder
Discharge time	12.6 sec.
Tank diameter	102 mm
Total height	370 mm
Working pressure at 20°C	15 bar
Ministerial approval	DCPST / A6 / 557 / 153 According to 128 02/03/2006
Test pressure	26 bar
Bursting pressure	>55 bar
Gauge	ø 23
Working temperature	-30 +60°C



2 - 80



46- FORKLIFT TRUCK FUSES AND RELAYS

- Remove the door (1, 2 - 81) giving access to the fuses and relays (2, 2 - 81).

! Always replace a faulty fuse with an equivalent one. Never use a repaired fuse.

X410		X408		X409		X407		X406	
F6 (40A)	+30 24V/12V	F11 (5A)	F10 (7.5A)	K3	K1	K3	K1	K1	
F5 (40A)		F12 (10A)	F9 (7.5A)	F5 (10A)	F6 (7.5A)	F5 (10A)	F6 (7.5A)	K2	
F4 (20A)	+30 ECU	F13 (7.5A)	F8 (7.5A)	F7 (5A)	F8 (5A)	F7 (5A)	F8 (5A)	ECU	
F3 (20A)	+ "30"	F14 (5A)	F7 (10A)	F1 (10A)	F2 (7.5A)	F1 (5A)	F2 (10A)		
F2 (20A)		F15 (5A)	F6 (10A)	F3 (3A)	F4 (3A)	F3 (5A)	F4 (5A)		
F1 (20A)		F16 (10A)	F5 (5A)	F4 (3A)	F3 (3A)	F4 (3A)	F3 (5A)		
		F17 (3A)	F4 (5A)	F1 (10A)	F2 (7.5A)	F1 (5A)	F2 (10A)		
		F18 (10A)	F3 (7.5A)	F2 (7.5A)	F1 (5A)	F3 (5A)	F4 (5A)		
		F19 (3A)	F2 (7.5A)	F1 (5A)	F2 (7.5A)	F3 (5A)	F4 (5A)		
		F20 (3A)	F1 (5A)	F1 (5A)	F2 (7.5A)	F3 (5A)	F4 (5A)		

2 - 81

FUNCTIONS		
X 410		
F1	20 A	Fuse +30 for conditioner assy
F2	20 A	Relay fuse +30 for heating
F3	20 A	Fuse +30 for start-up panel
F4	20 A	Relay fuse +30 vp
F5	40A	Relay fuse for services
F6	40A	Supply fuse +30 for cc-cc converter
X 408		
F1	5A	Fuse for transmission sensors and axles
F2	5A	Fuse for hydraulic sensors
F3	7.5A	Fuse for rear wiper
F4	5A	Relay fuse for reversing lights
F5	5A	Relay fuse for brake and ear fog lights
F6	10A	Fuse for rotating beacon light
F7	10A	Switch fuse for rear working light
F8	7.5A	Fuse for rear window defroster
F9	7.5A	Fuse for roof and side wiper
F10	7.5A	Fuse for front window wiper-washer
F11	5A	Fuse +15 for warning
F12	10A	Fuse for pneumatic seat
F13	7.5A	Fuse for switch backlighting and light switching
F14	5A	Fuse +15 for start-up panel
F15	5A	Fuse +ve
F16	10A	Fuse +15 for mix bucket
F17	3A	Fuse +30 for display tera 7"
F18	10A	Fuse +15 for front working lights
F19	3A	Fuse front LH and rear RH position lights
F20	3A	Fuse front RH and rear LH position lights














X 409		
F1	10A	Fuse +30 for micro dome - dome light
F2	7.5A	Fuse for window lifter
F3	5A	Fuse +30 for warning
F4	3A	Fuse +30 for immobilizer - radio
F5	10A	Fuse for warning sound
F6	7.5A	Fuse for low beams
F7	5A	Fuse for high beams
F8	5A	Fuse for boom head working lights
K1		Relay for reversing lights + reversing buzzer + ev forward-reverse gear
K2		Fuse for boom head working light
K3		Relay for rear fog lights
K4		-
X 407		
F1	5A	Fuse +15 for inverter sens. + 30 for 12 V socket
F2	10A	Fuse 12 V (+15) for boom head centr.
F3	5A	Fuse +15 for brake-steering emergency kit
F4	5A	Fuse +12 V (+30) for car stereo
F5	10A	Fuse +12 V for car stereo
F6	7.5A	Fuse for remote radio control
F7	5A	Fuse for rear camera
F8	5A	Fuse for immobilizer - radio
K1		Relay for low beams
K2		Relay for high beams
K3		Relay for warning sound
K4		Relay for brake-reversing lights
X 406		
K1		Relay +15 for conditioner assy from relay
K2		Relay +15 vp for MC2M




47- FORKLIFT TRUCK FUSES AND RELAYS


- Remove the door (1, 2 - 82) giving access to the fuses and relays (2, 2 - 82).

 **Always replace a faulty fuse with an equivalent one. Never use a repaired fuse.**

X319			X318			X320		X321	
F6			F1 (20A)			K1		K1	
F5			F2 (20A)						
F3 (40A)	+30	ECU MCM2	F3 (20A)						
F6 (10A)			F4 (20A)			K2		K2	
			F5 (70A)						
F1 (5A)		F2 (5A)	F6 (20A)						
+15		+30							



2 - 82

		FUNCTIONS
X 319		
F1	5A	Fuse +15 for engine services/alternator energisation
F2	5A	Fuse +30 for alternator
F3	15A	Fuse +15 engine services/Diesel filter preheating
F3	40A	Fuse +30 for battery/Mercedes control unit
F6	20 A	Fuse +30 for battery
X 318		
F1	20 A	Fuse +30 for group 1 electro-fan relay
F2	20 A	Fuse +30 for group 2 electro-fan relay
F3	20 A	Relay fuse +30 for engine services
F4	20 A	Fuse +30 Optional
F5	70A	Fuse +30 for cab supply
F6	10A	Fuse for start-up relay
X 320		
K1		Relay for group 1 electro-fan
K2		Relay for group 2 electro-fan
X 321		
K1		Relay for starter motor
K2		Relay +15 for engine services

TOWING PIN AND HOOK

Located at the rear of the lift truck, this device is used to attach a trailer. Its capacity is limited for each lift truck by the Authorized Gross Vehicle Weight, tractive force and maximum vertical force on the coupling point.

- To use a trailer, see current regulations in your country (maximum running speed, braking, maximum weight of trailer, etc.).
- Verify the trailer's condition before using it (tyre condition and pressures, electrical connection, hydraulic hose, brake system...).



Do not tow a trailer or attachment which is not in perfect working order. Using a trailer in poor condition may affect the lift truck's steering and braking, and hence safety.



If a third party helps in coupling or uncoupling the trailer, this person must be permanently visible to the driver and wait until the lift truck has stopped, the handbrake is on and the I.C. engine is switched off before performing the operation.

NOTE: A rear-view mirror allows the lift truck to approach more closely to the trailer ring.

A - COUPLING FITTING

COUPLING AND UNCOUPLING THE TRAILER

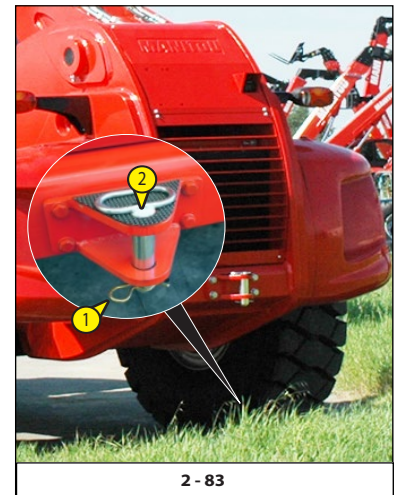
- To couple the trailer, position the lift truck as close as possible to the trailer ring.
- Put the handbrake on and switch off the I.C. engine.
- Remove the clip (1, 2 - 89), lift the trailer pin (2, 2 - 89), and place or remove the trailer ring.



Be careful not to get your fingers caught or crushed during this operation.

Do not forget to put clip 1 back in place (1, 2 - 89).

When uncoupling, make sure that the trailer is supported independently.





48- RADIO CONTROL (OPTIONAL)

Identification of the radiocontrol.

The serial number (S/N) is the only reference that must be used to identify in a unique way the radiocontrol, both for maintenance that with regards to communication to the pertinent authorities.

The serial number (S/N) and some information about the radiocontrol are present on plates both on the transmitting unit and the receiving unit.

These plates must not be:

- removed from their position (removal immediately waives the warranty)
- altered or ruined (contact MANITOU for replacement).

Plates of the transmitting unit

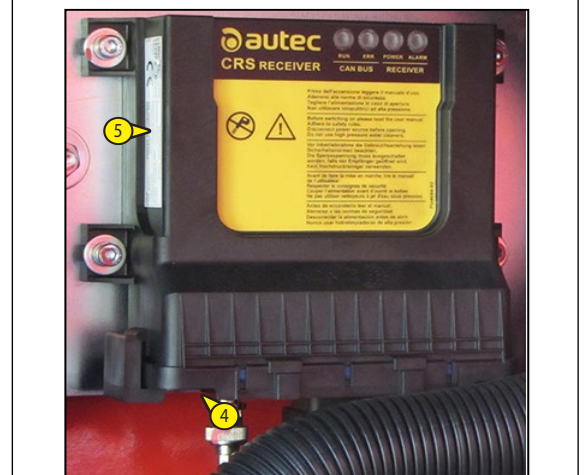
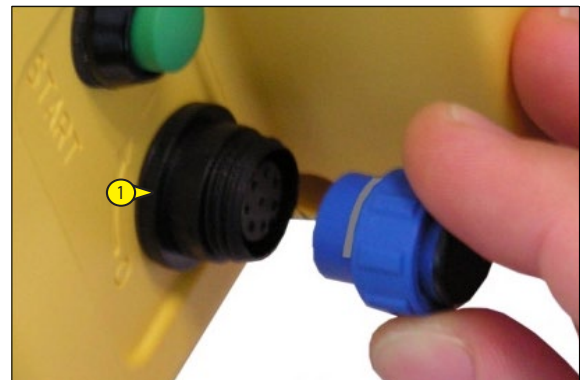
Three plates are located in the transmitting unit.

1. identification plate of the radiocontrol (1, 2 - 82).
Information contained: the serial number of the radiocontrol (S/N).
2. identification plate of the transmitting unit (2, 2 - 82).
Information contained: The manufacturing year, bar code and ID number of the transmitting unit (TU ID).
3. Technical data plate (3, 2 - 82).
Information contained: The MODEL, TYPE and main technical specification of the transmitting unit, the marking and any markings on the radiocontrol.

Plates of the receiving unit

Two plates are present in the receiving unit:

4. identification plate of the radiocontrol (4, 2 - 82).
Information contained: The serial number of the radiocontrol, a bar code (S/N) and the year of manufacture.
5. Technical data plate (5, 2 - 82).
Information contained: The MODEL, TYPE and main technical specification of the receiving unit, the marking and any markings on the radiocontrol (5, 2 - 82).



2 - 82

General description of the system

The radiocontrol system includes:

1. TRANSMITTING UNIT (PUSHBUTTON PANEL) (1, 2 - 83)
2. RECEIVING UNIT (2, 2 - 83)
3. ANTENNA (3, 2 - 83)
4. BATTERY CHARGER (4, 2 - 83)
 - Input 80-250V 7W
 - Output 9V 0.45A
 - Battery 7.2V NiMH
 - Loading time 3h
5. BATTERY (2, 2 - 83) 7.2V 750mAh Ni-MH



General operating instructions

(see also CHAPTER 1 - OPERATING AND SAFETY INSTRUCTIONS)

Operation

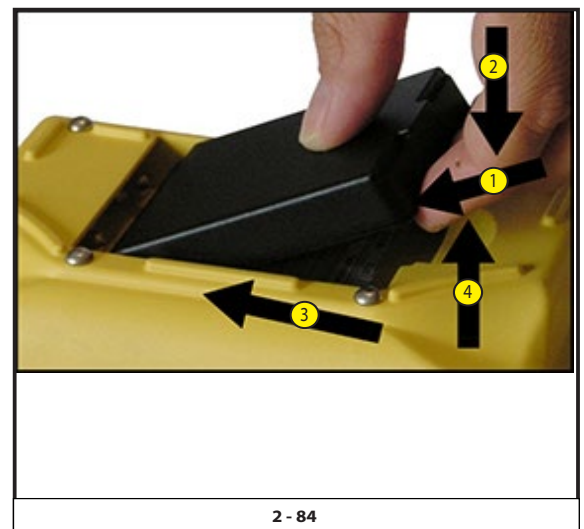
Battery (2 - 84)

The transmitting unit can be powered only with rechargeable batteries of the manufacturer.

The battery must be entered in the relevant housing of the transmitting unit, with the technical specification plat facing downward and the contacts directed toward the contacts of the transmitting unit.

To insert a battery, perform the following operations:

1. push the battery toward the contacts of the transmitting unit (1, 2 - 73)
 2. push the battery downward (2, 2 - 73)
- To pull out a battery, perform the following operations:
3. push the battery toward the contacts of the transmitting unit (3, 2 - 73)
 4. lift the battery (4, 2 - 73)













TRANSMITTING UNIT CONTROL FUNCTIONS (Radio control) (2 - 85)








1. Machine function and load status display (1,1.1, 2 - 85)
2. Joystick, selector switches, machine function buttons (2, 2 - 85)
3. Emergency stop button (3, 2 - 85)
4. Radiocontrol power on S-KEY (4, 2 - 85)
5. Engine start-up authorisation and horn (5, 2 - 85)
6. Engine start-up (6, 2 - 85)
7. Emergency electric pump button to salvage the basket (7, 2 - 85)
8. Plug for wired control (8, 2 - 85)
9. Accessory movement cards (9, 2 - 85)
10. Button to confirm acknowledgment of the attachment on the display (10, 2 - 85)

1. Machine function LED and load status display

1.1 - Page :0 (2 - 86)

- FUNCTION AND ALARM WARNING LIGHTS:

	I.C. engine stop
	I.C. engine fault
	I.C. engine energised
	DPF regeneration inhibited or DEF check(Depending on the machine model)
	Basket overload
	I.C. engine oil pressure
	Basket door
	Fuel reserve tank

	Engine water temperature boiling
	Telescopic boom chain faults
	Hydraulic oil temperature
	General alarm
	Accessory not recognised
	Stabilizers not on the ground (Depending on the machine model)
	Pivot not engaged (Depending on the machine model)
Example: FORKS	Type of installed attachment





READING MAIN OPERATING DATA (2 - 86)

- Height off the ground (H)*, (reading in "Meters", with a decimal position)
- Boom angle (A), (reading in "Degrees", with a decimal position)
- Boom length (L)*, (reading in "Meters", with a decimal position)
- Operating radius (R)*, Measurement of the distance from the fifth wheel centre to the projection of the point of application of the load (reading in "Meters", with a decimal position).
- Weight of load lifted (W), (reading in "Tons", with a decimal position).
- Maximum permitted load (M)* in the current configuration of the machine. (reading in "Tons", with a decimal position)
- Working configuration
 - The first digit refers to the operating mode:
 1. On stabilizers (Depending on the machine model)
 2. On tyres (front turret) (Depending on the telehandler model)
 3. On tyres (turned turret) (Depending on the machine model)
 4. On partially withdrawn stabilizers (Depending on the telehandler model).
 - The second digit refers to the equipment being used (PT, forks, basket, etc...).
 - Digits pertaining to the equipment being used.

- 1.a - Charging the radiocontrol battery
- 1.b - Radio signal

(*): optional

1.2 - page : 1 (2 - 86)

- 1.c - Alarm/fault
- 1.d - I.C. engine water temperature
- 1.e - Fuel level

1.3 - Display button (1.3, 2 - 86)

- Turns on the display lighting if off
- Scroll pages 0,1, in the display

1.4 - Green LED (1.4, 2 - 86)

- Off: the transmitting unit is off
- Flashes rapidly: the transmitting unit is on and the radioelectrical control is off
- Flashes slowly: the radio control is started and the radioelectrical connection is present

1.5 - Red LED (1.5, 2 - 86)

- Off: the transmitting unit works properly
- Flashing: the battery is getting low
- On for 2 seconds: the transmitting unit does not work properly
- Flashes once: when turned on, the transmitting unit detects that the STOP button is active or faulty.
- Flashes 2 times: the transmitting unit detects that a SAFETY control is active or faulty.
- Flashes 3 times: when turned on, the transmitting unit detects that the battery is flat
- Flashes 4 times: the transmitting unit detects that an alarm control is active or faulty.

1.6 - Load conditions, % and alarms (1.6, 2 - 86)

Bar indicating the percentage of lifted load compared with the maximum load that can be lifted in those operating conditions.

- Green reference: Safety area
- Yellow reference: Alarm area
Load lifted 90% more than permitted load. (external buzzer on)
- Red reference: Block area
- Load lifted 100% more than permitted load. (external buzzer on)

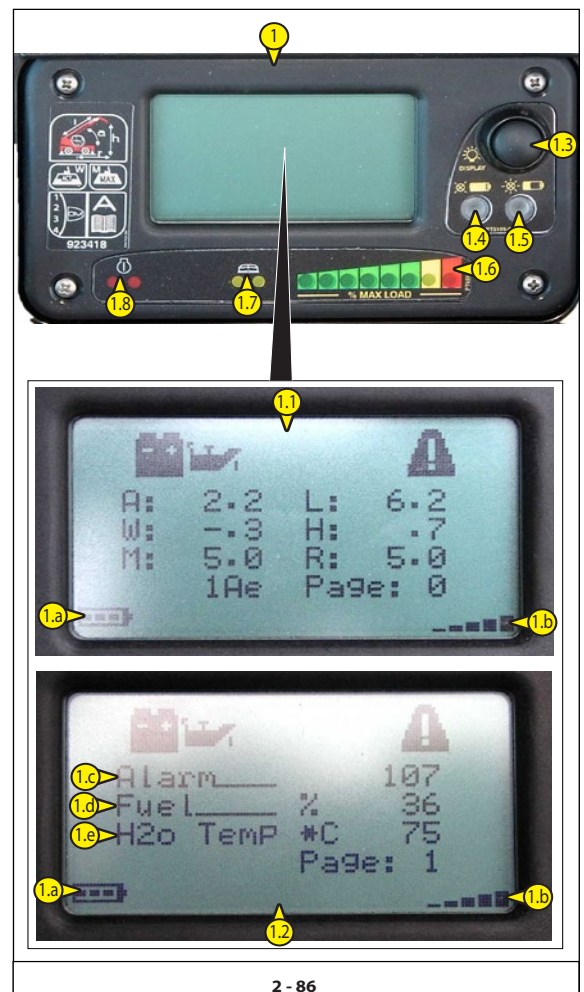
1.7 - Yellow warning light (1.7, 2 - 86)

When on, this light indicates:

- Flashing light on + buzzer indicating that the safety system is blocked.
- The light continuously on indicates that the basket is overloaded.

When the basket is overloaded, all movement controls of the platform are inhibited.

Note: when the light turn on when the basket is lifting, it means there is an overload.You must stop and lighten the basket.



2 - 86

1.8 - Red warning light(1.8, 2 - 86)

When on, this light indicates:

- Stabilizers are not properly positioned
(Depending on the machine model).
- The basket access door was not properly closed.
- The gear of the truck is engaged.

Note: only for the ORH COUVREUR BASKET: the functions of the red light (1.7, 2 - 86) are included in the yellow light (1.8, 2 - 86).

2 - Joystick, selector switches, machine function buttons (2 - 87)

2.1 - Joystick (2 - 87)

- Operate the joystick (2.1, 2 - 87) to perform the desired movements following the coloured arrows.

2.2 - Movement switch (2.2, 2 - 87)

A pair of controls that can be performed at the same time corresponds with each position (A-B-C-D-E-F)

2.3 - Engine RPM accelerator (2.3, 2 - 87)

2.4 - Hydraulic movement speed (2.4, 2 - 87)
(according to the type of accessory installed)

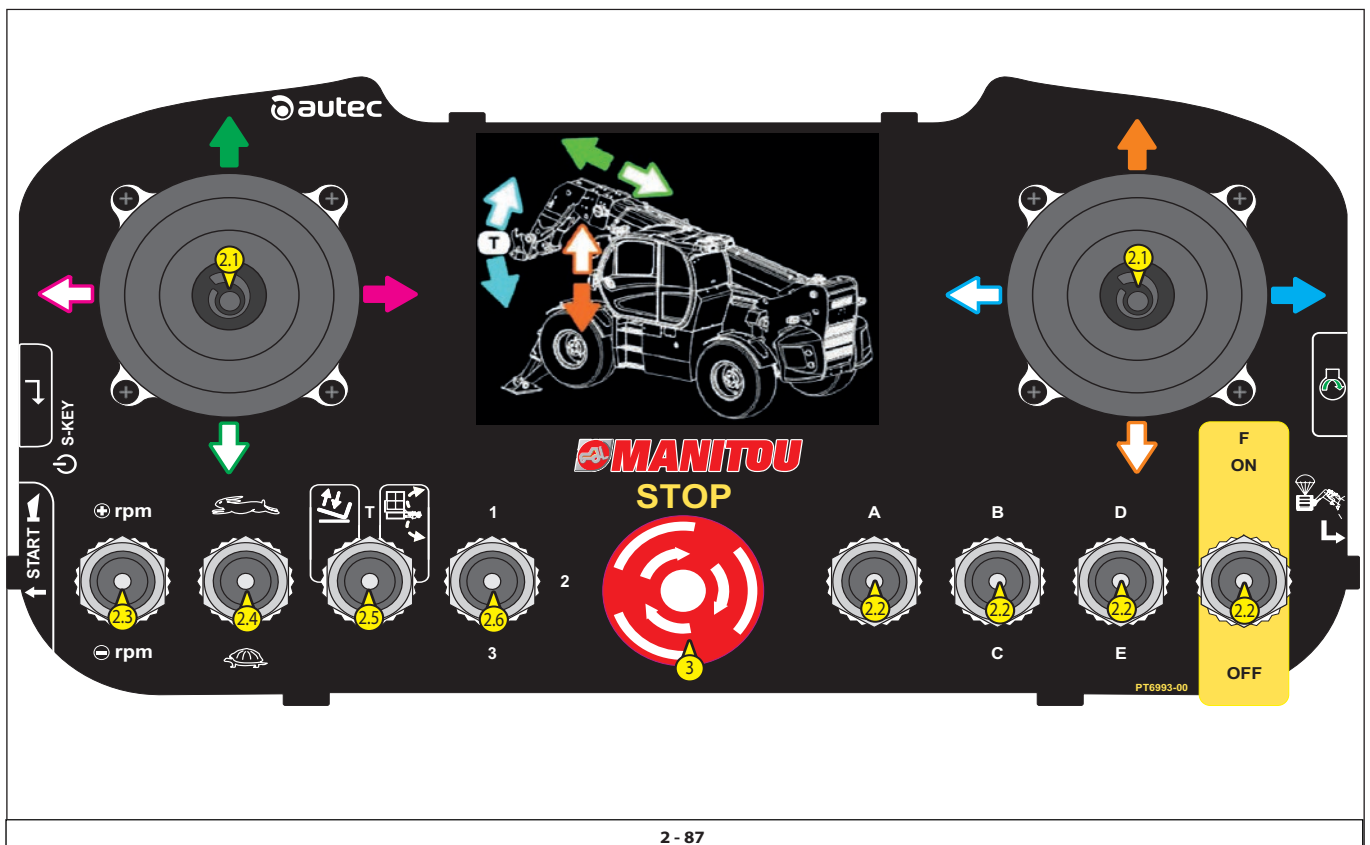
2.5 - T.S. panning movement (T) or basket levelling (O) selector switch
(2.5, 2 - 87)

2.6 - Multiple movements "1-2-3"(2.6, 2 - 87)
(according to the type of accessory installed)

3 - "Emergency stop" red button (3, 2 - 87)

Functions:

- allows accelerating the I.C. engine.
- In case of danger, this allows the basket user to bypass the movements controlled by the truck lift.
- To restore movements, turn the red button clockwise.





4 - Radiocontrol power on S-KEY (2 - 88)

Turn the key to turn on the radiocontrol (4, 2 - 88).
When the radiocontrol is not used, pull out the S-KEY for safety

5 - Engine start-up authorisation and horn (5, 2 - 88)

6 - Engine start-up (2 - 88)

Before switching on, the EMERGENCY STOP button must be raised (3, 2 - 88).
Press the button (6, 2 - 88) then press button (5, 2 - 88) to turn on the engine. (6, 2 - 88)

7 - Emergency electric pump button to salvage the load (2 - 88)

To withdraw the extensions.

- Keep button (7, 2 - 88) pressed to operate the salvage pump.
- Only perform operations that are strictly required to return to ground.

8 - Plug for wired control (8, 2 - 88)

(Only if equipped with aerial platform)

9 - Basket movement boards (9, 2 - 88)

Change the movement card according to the installed accessory.

10 - Button to confirm acknowledgment of the attachment on the display (2 - 88)

Press enter to confirm the type of accessory.



AUTOMATIC RECOGNITION OF THE ACCESSORY "E-RECO" (OPTIONAL)

The machine is equipped with an electronic accessory recognition system that identifies the type of accessory installed when it is connected (E-RECO).

This system facilitates and speeds up the accessory change operations.

- The system features 2 devices, one located on the boom (1a, 2 - 89) of the machine and one on the accessory (1b, 2 - 89).

After identifying the type of accessory and confirmation by the operator, the recognition system sets the machine to operate with the accessory attached. This is the automatic mode.

However the machine can operate with an accessory lacking an identification device; in this case the operator must identify and check the type of accessory installed. This is the manual mode.

Automatic mode

Immediately after connecting an accessory, the recognition system:

- identifies the type of accessory (2, 2 - 90),
- requires the operator to confirm (1, 2 - 90) that the recognised accessory is the actual accessory connected to the machine,
- press enter (3, 2 - 90) to confirm the type of accessory.

Manual mode

Immediately after connecting an accessory without identification device, the recognition system:

- does not recognise the connected accessory,
- The operator must select the type of installed accessory installed on the machine.

The operator must select the type of installed accessory manually, as follows:

- press ESC (1, 2 - 91) to leave the "empty" mode (2, 2 - 91) [no accessory connected]
- press the up/down arrows (3, 2 - 91) to select the accessory that was connected (4, 2 - 92), confirm the accessory, press enter (5, 2 - 92).

Note: in "empty" mode, the machine can move the arm with a fixed maximum lifting capacity of 500 kg.



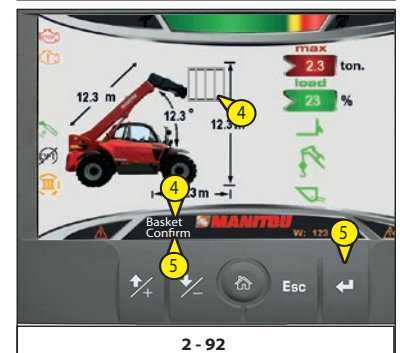
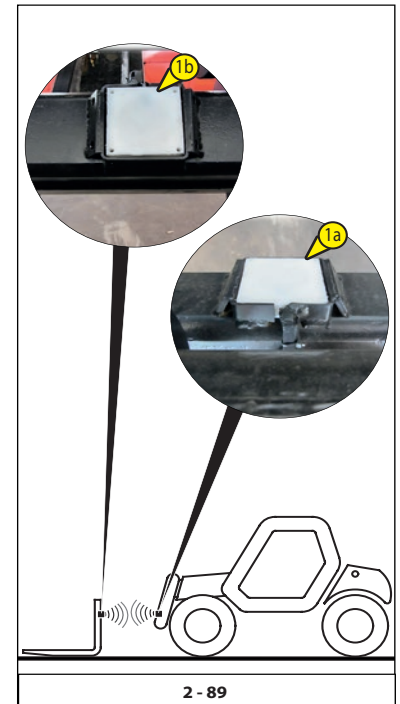
In both modes:

the operator must ensure that the connected accessory displayed on the screen is the same accessory identified by the recognition system or manually selected.

The safety of the user and of the lift truck is at stake.

Failure to observe this may cause malfunctions of the forklift and damage to property or injury to people near the machine operating area.

Follow the aforementioned procedures.





3 - MAINTENANCE





INDEX

3 - MAINTENANCE

<i>MANITOU ORIGINAL SPARE PARTS AND EQUIPMENT</i>	4
<i>FILTER ELEMENTS AND BELTS</i>	6
<i>LUBRICANTS AND FUEL</i>	8
<i>MAINTENANCE TABLE</i>	10
<i>A - DAILY OR EVERY 10 HOURS OF SERVICE</i>	12
<i>B - EVERY 50 HOURS OF SERVICE</i>	18
<i>C - EVERY 250 HOURS OF SERVICE</i>	26
<i>D - EVERY 500 HOURS SERVICE OR 6 MONTH</i>	30
<i>E - EVERY 1000 HOURS OF SERVICE OR 1 YEAR</i>	40
<i>F - EVERY 2000 HOURS SERVICE OR 2 YEARS</i>	50
<i>G - EVERY 3000 HOURS SERVICE OR 3 YEARS</i>	54
<i>H - OCCASIONAL MAINTENANCE</i>	58



MANITOU ORIGINAL SPARE PARTS AND EQUIPMENT

OUR FORKLIFT TRUCKS MUST BE SERVICED USING ORIGINAL MANITOU PARTS.

IF YOU USE PARTS WHICH ARE NOT ORIGINAL MANITOU PARTS, YOU RISK:



THE USE OF COUNTERFEIT PARTS OR COMPONENTS NOT APPROVED BY THE MANUFACTURER MEANS YOU LOSE THE RIGHT TO THE CONTRACTUAL GUARANTEE.

- Legally - being responsible in the event of an accident.
- Technically - causing operating failure or shortening the working life of the forklift truck.

BY USING ORIGINAL MANITOU PARTS FOR MAINTENANCE OPERATIONS, YOU WILL BENEFIT FROM OUR ADVANCED EXPERTISE

Through its network, MANITOU offers to the user,

- Know-how and competence.
- Guarantee of high-quality work.
- Original spare parts.
- Help with preventive maintenance.
- Efficient help with diagnostics.
- Improvements due to experience feedback.
- Operator training.
- Only the MANITOU network has a detailed knowledge of the design of the forklift truck and therefore the best technical ability to provide maintenance.



ORIGINAL SPARE PARTS ARE DISTRIBUTED EXCLUSIVELY BY MANITOU AND ITS DEALER NETWORK.
The dealer network list is available on the MANITOU website www.manitou.com.

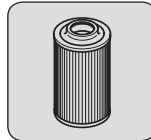


FILTER ELEMENTS AND BELTS

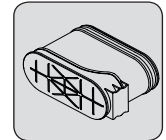
MHT 1490, MHT 10130

I.C. ENGINE

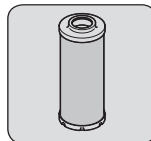
I.C. ENGINE OIL FILTER
Reference: 53006638
Replace: 500 H



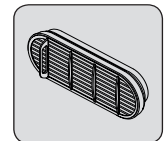
DRY AIR FILTER CARTRIDGE
Reference: 53002309
Replace: 1000 H



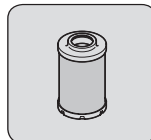
FUEL FILTER CARTRIDGE
Reference: 53006464
Replace: 500 H



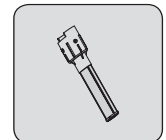
DRY AIR FILTER SAFETY CARTRIDGE
Reference: 923594
Replace: 3000 H



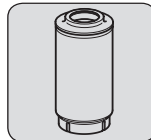
FUEL PRE-FILTER
Reference: 53006466
Replace: 500 H



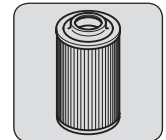
"DEF" PUMP PRE-FILTER
Reference: 53017247
Clean: 1000 H



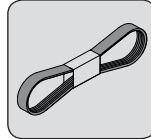
FUEL PREFILTER CARTRIDGE WITH WATER SEPARATOR
Reference: 608776
Replace: 500 H



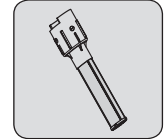
"DEF" PUMP FILTER
Reference: 53006687
Replace: 2000 H



ALTERNATOR BELT
Reference: 53006659

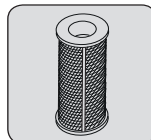


"DEF" TANK FILTER
Reference: 53002466



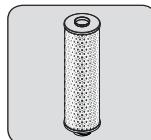
TRANSMISSION

HYDROSTATIC PUMP OIL FILTER
Reference: 737524
Replace: 500 H

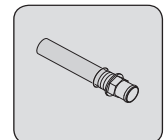


HYDRAULICS

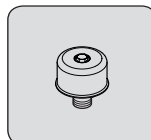
HYDRAULIC RETURN OIL FILTER CARTRIDGE
Reference: 925420
Replace: 500 H



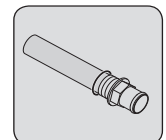
SUCTION STRAINER FOR HYDRAULIC OIL TANK
Reference: 924767
Clean: 1000 H



HYDRAULIC OIL TANK BREATHER
Reference: 781336
Replace: 1000 H

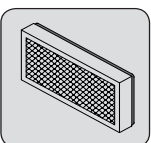


SUCTION STRAINER FOR HYDRAULIC OIL TANK
Reference: 924765
Clean: 1000 H

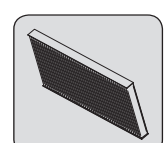


CAB

CAB EXTERNAL VENTILATION FILTER
Reference: 261971
Clean: 50 H
Replace: 250 H



CAB INTERNAL VENTILATION FILTER
Reference: 933871
Clean: 50 H
Replace: 250 H



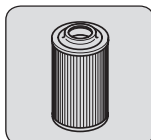


FILTER ELEMENTS AND BELTS

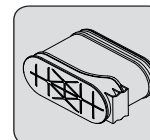
MHT -X1490, MHT-X 10130

I.C. ENGINE

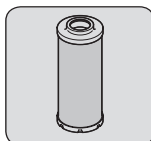
I.C. ENGINE OIL FILTER
Reference: 608773
Replace: 500 H



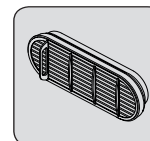
DRY AIR FILTER CARTRIDGE
Reference: 53002309
Replace: 1000 H



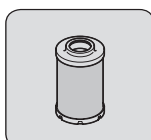
FUEL FILTER CARTRIDGE
Reference: 608774
Replace: 500 H



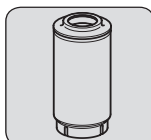
DRY AIR FILTER SAFETY CARTRIDGE
Reference: 923594
Replace: 3000 H



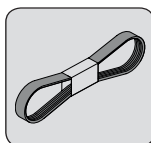
FUEL PRE-FILTER
Reference: 710887
Replace: 500 H



FUEL PREFILTER CARTRIDGE WITH WATER SEPARATOR
Reference: 608776
Replace: 500 H

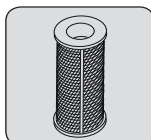


ALTERNATOR BELT
Reference: 53003392



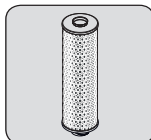
TRANSMISSION

HYDROSTATIC PUMP OIL FILTER
Reference: 737524
Replace: 500 H

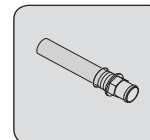


HYDRAULICS

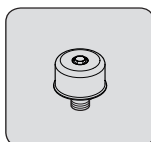
HYDRAULIC RETURN OIL FILTER CARTRIDGE
Reference: 925420
Replace: 500 H



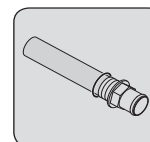
SUCTION STRAINER FOR HYDRAULIC OIL TANK
Reference: 924767
Clean: 1000 H



HYDRAULIC OIL TANK BREATHER
Reference: 781336
Replace: 1000 H

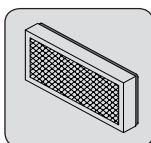


SUCTION STRAINER FOR HYDRAULIC OIL TANK
Reference: 924765
Clean: 1000 H

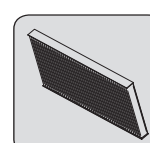


CAB

CAB EXTERNAL VENTILATION FILTER
Reference: 261971
Clean: 50 H
Replace: 250 H



CAB INTERNAL VENTILATION FILTER
Reference: 933871
Clean: 50 H
Replace: 250 H



LUBRICANTS AND FUEL



- USE THE RECOMMENDED LUBRICANTS AND FUEL:**
- Not all oils can be mixed to make up the level.
 - MANITOU oils are perfectly suitable for changing the oil.

DIAGNOSTIC ANALYSIS OF OILS

In case of an inspection or maintenance contract signed with the dealer, a diagnostic analysis may be requested for the engine, transmission and axles oils, depending on the extent of use.

(*) FEATURES OF RECOMMENDED FUEL

Use a high-quality fuel to obtain optimal performance from the I.C. engine.

MHT -X1490, MHT-X 10130

- Diesel fuel type N590 - Auto/C0/C1/C2/C3/C4
- BS2869 Class A2
- ASTM D975-91 Class 2-2DA, US DF1, US DF2, US DFA
- JIS K2204 (1992) Grades 1, 2, 3 and Special Grade 3.

Only refuel using commercially available, sulphur-free diesel fuel that complies with the following standards:

MHT 1490, MHT 10130

- EN 590 on 2010 version et seq. (max sulphur component: 0.001% by weight) (10 ppm) or
- ASTM D975 (max sulphur component: 0.0015% by weight) (15 ppm).

(◇) FEATURES OF RECOMMENDED "DEF"

MHT 1490, MHT 10130

Use only "DEF" in accordance with DIN 70070/ISO 2224.
Do not use any additives.

I.C. ENGINE				
PARTS TO LUBRICATE	CAPACITY	RECOMMENDED PRODUCTS	PACKAGING	REFERENCE
I.C. ENGINE <i>MHT -X1490, MHT-X 10130</i>	13-16 litres	Manitou PREMIUM API CI4/15W40	5 l 20 l 55 l 209 l 1000 l	895831 895832 895833 895834 895835
I.C. ENGINE <i>MHT 1490, MHT 10130</i>	17.5-20.5 litres	Oil MANITOU EVOLOGY OM CJ4 10W40	5 l 20 l 55 l 209 l 1000 l	895837 895838 895839 895840 895841
COOLING CIRCUIT	about 40 litres	Coolant (protection - 35°) [Concentrated product]	1.5 l 20 l 210 l	53017514 53017515 53017600
"DEF" TANK <i>MHT 1490, MHT 10130</i>	63 litres	"DEF" [Diesel exhaust fluid](◇)	-	-
FUEL TANK	315 litres	Diesel (*)	-	-

TRANSMISSION				
PARTS TO LUBRICATE	CAPACITY	RECOMMENDED PRODUCTS	PACKAGING	REFERENCE
GEARBOX	1.8 litres	Oil MANITOU Special immersed brakes	5 l	545976
			20 l	582391
			209 l	546222
			1000 l	720149
CARDAN SHAFT		Grease MANITOU BLUE multi-purpose	400 g	545996
			1 kg	161590
			5 kg	499235



BOOM				
PARTS TO LUBRICATE		RECOMMENDED PRODUCTS	PACKAGING	REFERENCE
BOOM PADS		Grease MANITOU BLACK multi-purpose	400G	545996
			1 kg	161590
			5 kg	499235
BOOM GREASING		Grease MANITOU BLUE multi-purpose	400G	161589
			1 kg	720683
			5 kg	554974
			20 kg	499233
			50 kg	489670

HYDRAULICS				
PARTS TO LUBRICATE	CAPACITY	RECOMMENDED PRODUCTS	PACKAGING	REFERENCE
HYDRAULIC OIL TANK	290 litres	Oil MANITOU MANITOU ISO VG 46	5 l	545500
			20 l	582297
			55 l	546108
			209 l	546109

CAB				
PARTS TO LUBRICATE	RECOMMENDED PRODUCTS	PACKAGING	REFERENCE	
WINDSCREEN WASHER TANK	Windscreen washer liquid	1 l	490402	
		5 l	486424	

FRONT AXLE				
PARTS TO LUBRICATE	CAPACITY	RECOMMENDED PRODUCTS	PACKAGING	REFERENCE
FRONT AXLE DIFFERENTIAL	21 litres	Oil MANITOU Special immersed brakes	5 l	545976
			20 l	582391
			209 l	546222
			1000 l	720149
FRONT WHEEL FINAL DRIVES	1.8 litres	Oil MANITOU SAE80W90 Mechanical transmission	2 l	499237
			5 l	720184
			20 l	546330
			55 l	546221
			209 l	546220
FRONT WHEEL FINAL DRIVE PIVOTS		Grease MANITOU BLUE multi-purpose	400 g	545996
			1 kg	161590
			5 kg	499235

REAR AXLE				
PARTS TO LUBRICATE	CAPACITY	RECOMMENDED PRODUCTS	PACKAGING	REFERENCE
REAR AXLE DIFFERENTIAL	20.5 litres	Oil MANITOU Special immersed brakes	5 l	545976
			20 l	582391
			209 l	546222
			1000 l	720149
REAR WHEEL FINAL DRIVES	1.8 litres	Oil MANITOU SAE80W90 Mechanical transmission	2 l	499237
			5 l	720184
			20 l	546330
			55 l	546221
			209 l	546220
REAR WHEEL FINAL DRIVE PIVOTS REAR AXLE OSCILLATION		Grease MANITOU BLUE multi-purpose	400 g	545996
			1 kg	161590
			5 kg	499235

FRAME				
PARTS TO LUBRICATE	RECOMMENDED PRODUCTS	PACKAGING	REFERENCE	
TILT CORRECTOR <i>MHT 1490, MHT-X 1490</i>	Grease MANITOU BLUE multi-purpose	400 g	161589	
		1 kg	720683	
		5 kg	554974	
		20 kg	499233	
		50 kg	489670	



MAINTENANCE TABLE



(1): MANDATORY 500 HOUR OR 6 MONTH SERVICE. This service must be carried out after approximately the first 500 hours of operation or within 6 months following the start-up of the machine (whichever occurs first).
(2): Every 10 hours during the first 50 hours, then a last time after 250 hours.
(3): Contact your dealer.

A = ADJUST, C = CHECK, G = GREASE, N = CLEAN, P = PURGE, R = REPLACE, V = CHANGE	PAGE	(1)	DAILY OR EVERY 10 HOURS SERVICE	EVERY 50 HOURS OF SERVICE	EVERY 250 HOURS OF SERVICE	EVERY 500 HOURS OF SERVICE OR 1 YEAR	EVERY 1000 HOURS OF SERVICE OR 2 YEARS	EVERY 2000 HOURS OF SERVICE OR 2 YEARS	EVERY 3000 HOURS OF SERVICE	EVERY 4000 HOURS OF SERVICE	OCCASIONAL
I.C. ENGINE											
- I.C. engine oil level	3-12	C	C								
- Coolant level	3-13	C	C								
- Fuel level	3-13	C	C								
- "DEF" level (MHT 1490, MHT 10130)	3-14										
- Fuel pre-filter with water separator	3-13	C		C/P							
- Dry air filter cartridge	3-40						R				
- Radiator grilles	3-18	N		N							
- Condenser grille (OPTIONAL air conditioning)	3-19	C/N		C/N							
- Wear and damage of the poly-V-belt	3-35	C/A			C/A						
- I.C. engine oil	3-33	V				V					
- I.C. engine oil filter	3-33	R				R					
- Fuel pre-filter	3-37	R				R					
- Fuel filter	3-37	R				R					
- Fuel pre-filter cartridge with water separator	3-38										
- Fuel tank	3-40						N				
- Dry air filter safety cartridge	3-54								R		
- Silicate cartridge (MHT 1490, MHT 10130)	3-56								R		
- "DEF" filter (MHT 1490, MHT 10130)	3-50							R			
- I.C. engine silentblocks	3-						C (3)				
- I.C. engine speeds	3-28						C (3)				
- Engine and engine brake valve clearance	3-45	C (3)					C (3)				
- "DEF" prefilter (MHT 1490, MHT 10130)	3-47							N			R
- Coolant	3-54								V		XXX
- Radiator								C (3)			
- Water pump and temperature sensor								C (3)			
- Alternator and starter motor								C (3)			
- Turbocharger								C (3)			
- Check that the drain system is waterproof and in good conditions						C (3)					
TRANSMISSION											
- Gearbox oil level	3-26	C	C								
- Transmission cross journals	3-19	G		G					G/C (3)		
- Hydrostatic pump oil filter	3-31					R					
- Gearbox oil	3-34/43	V					V				
- Gearbox silentblocks							C (3)				
- Gearbox controls							C (3)				
- Transmission pressures								C (3)			
- Gearbox calibration								C (3)			
TYRES											
- Tyre pressure	3-15	C		C							
- Tightening torque of wheel nuts	3-15	C		C							
- Tightening torque of the wheel nuts	3-51	C						C			
- Wheel	3-58										R
BOOM											
- Boom pads	3-15		G(2)								
- Telescopic boom external chains	3-29	N/G/C									
- Wear of telescopic boom external chains	3-43						C				
- Boom	3-20	G		G							
- Wear of boom pads							C (3)				
- Boom assembly conditions								C (3)			
- Bearings and articulation rings								C (3)			
HYDRAULICS											
- Hydraulic oil level	3-21	C		C							
- Hydraulic return oil filter cartridge	3-32	R				R					
- Hydraulic and transmission oil	3-41						V				
- Hydraulic system suction filter cartridges	3-41						N				
- Vent filter of hydraulic and transmission oil tank	3-32						R				



A = ADJUST, C = CHECK, G = GREASE, N = CLEAN, P = PURGE, R = REPLACE, V = CHANGE	PAGE	(1)	DAILY OR EVERY 10 HOURS SERVICE	EVERY 50 HOURS OF SERVICE	EVERY 250 HOURS OF SERVICE	EVERY 500 HOURS OF SERVICE OR 1 YEAR	EVERY 1000 HOURS OF SERVICE OR 2 YEARS	EVERY 2000 HOURS OF SERVICE OR 2 YEARS	EVERY 3000 HOURS OF SERVICE	EVERY 4000 HOURS OF SERVICE	OCCASIONAL
- Hydraulic motion speeds							C (3)				
- Rubber hose pipe and piping conditions							C (3)				
- Cylinder conditions (leakage, rods)							C (3)				
- Hydraulic circuit pressures								C (3)			
- Hydraulic circuit flow rate								C (3)			
- Hydraulic oil tank								N (3)			
BRAKE											
- Brake circuit								P (3)			
- Brake circuit pressure								C (3)			
- Brake								A (3)			
STEERING											
- Steering								C (3)			
- Direction ball joints									C (3)		
CAB											
Windscreen washer liquid level	3-21	C		C							
- Cab door	3-22	G		G							
- Cab ventilation filter (OPTIONAL Air conditioning)	3-22/26	R		N	R						
- Cab ventilation filter	3-34	N				N					
- Seat belt	3-42						C				
- Side rear-view mirror conditions							C (3)				
- Structure							C (3)				
- Air conditioning (OPTIONAL)								N/C (3)			
ELECTRICITY											
Batteries	3-28	C				C					
Signalling device and longitudinal stability limiter	3-16	C	C								XXX
Bundle and cable conditions							C (3)				
Lighting and signalling							C (3)				
Warning sounds							C (3)				
Front lights	3-62										A
FRONT AXLE											
- Front wheel final drive pivots	3-23	G		G					G/C (3)		
- Rear axle oscillation	3-23	G		G				G/C (3)			
- Front axle differential oil level	3-26	C			C						
- Front wheel final drive oil level	3-27	C			C						
- Front axle differential oil	3-42	V				V					
- Front wheel final drive oil	3-42	V					V				
- Wear of rear axle brake discs										C (3)	
- Front wheel final drive cross journal									C (3)		
- Front wheel final drive clearance									C (3)		
REAR AXLE											
- Front wheel final drive pivots	3-23	G		G					G/C (3)		
- Rear axle oscillation	3-23	G		G				G/C (3)			
- Front axle differential oil level	3-26	C			C						
- Front wheel final drive oil level	3-27	C			C						
- Front axle differential oil	3-42	V				V					
- Front wheel final drive oil	3-42	V					V				
- Wear of rear axle brake discs										C (3)	
- Front wheel final drive cross journal									C (3)		
- Front wheel final drive clearance									C (3)		
FRAME											
- Tilt corrector	3-23	G		G					G/C (3)		
- Stabilizers	3-24	G		G							
- Structure							C (3)				
- Bearings and articulation rings								C (3)			
ATTACHMENTS											
- Fork wear		C (3)				C (3)					
- Attachment holder T.S.							C (3)				
- Attachment condition							C (3)				
LIFT TRUCK											
- Trail the lift truck	3-58										XXX
- Sling the lift truck	3-60										XXX
- Transport the lift truck on a platform	3-61										XXX
- Radio remote control maintenance	3-62										XXX

A - DAILY OR EVERY 10 HOURS OF SERVICE

A1 - I.C. ENGINE OIL LEVEL

CHECK



Do not add too much oil. If you add too much oil, the engine or the exhaust after-treatment unit could be damaged. Drain or siphon off any excess oil.

The engine is equipped with an electronic oil level detection system. If the engine is also equipped with a dipstick, this is subsidiary to the electronic oil level measurement system. It is merely used for a general check to determine if there is oil in the engine.

Checking the oil level electronically

The current oil level in the engine is only displayed once the engine is switched off and with the ignition switched on. An accurate display of the engine oil level is therefore only possible with the engine switched off and the ignition switched on. The engine oil level is not displayed while driving or when the engine is running. On the control panel is displayed the oil level warning light 1 (A1) and the oil level measurement in "% 2 (A1).

Oil level measurement:

from 100% to 20%: maximum oil level and the black indicator lit up,
from 19% to 0%: oil level too low.

Park the vehicle/device on a level surface.

Engage the parking brake.

Switch off the engine.

Wait approximately 5 to 10 minutes. If you call up the oil level in the engine too early or while the engine is running, it is not available.

Checking the oil level with the dipstick

Park the vehicle/device on a level surface.

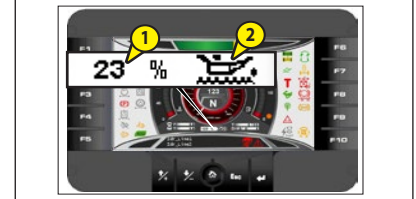
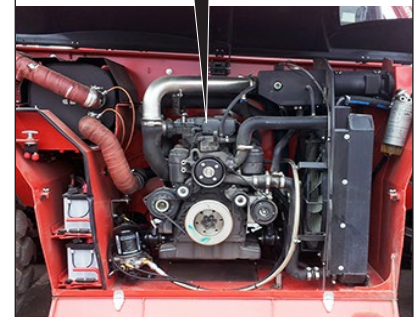
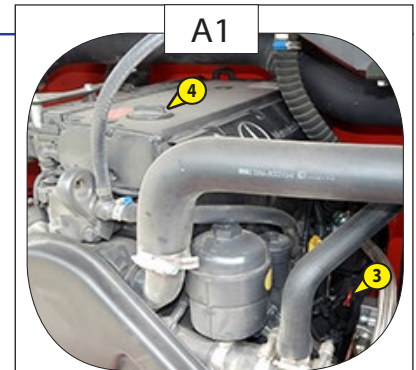
Engage the parking brake.

Switch off the engine.

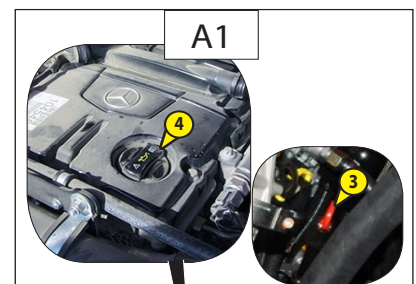
Wait approximately 5 to 10 minutes.

Check the engine oil level with dipstick 2(A1). The oil level should be between the upper and lower marks on dipstick 2 (A1).

If necessary, refill the oil (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL) through the filler port 4 (A1).



MHT-X1490, MHT-X 10130



A2 - COOLANT LEVEL

CHECK



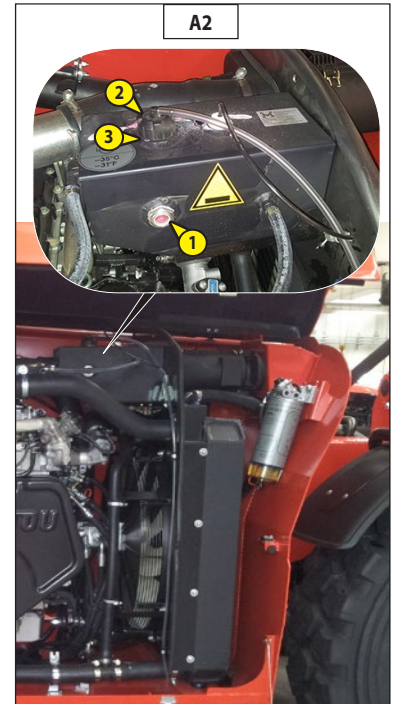
System pressurised: the boiling coolant can cause serious burns. Before opening the filler cap, stop the engine and allow the cooling circuit components to cool down.

Slacken the pressure cap slowly to discharge pressure.

Never add cold cooling liquid to a hot engine.

In an emergency, water can be used as coolant; proceed as rapidly as possible, to change the liquid in the cooling circuit (see: 3 - MAINTENANCE: F1 - COOLANT).

When maintenance or repairs are carried out on the engine cooling system, the operations must be carried out with the engine resting level on the ground. This makes it possible to check the coolant level accurately. It is thus also possible to avoid the risk of introducing an air bubble in the cooling system.



- Open the engine hood.
- Check the correct level with reference to the centre of the indicator 1 (A2).
- If necessary, add coolant (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL).
- Slowly turn the radiator cap 2 (A2) up to the safety stop.
- Allow the pressure and the steam to escape.
- Press and remove the cap by rotating it.
- Add coolant through the filler hole 3 (A2) up to the centre of the indicator 1 (A2).
- Slightly grease the filler hole to allow an easier installation and removal of the radiator cap.
- Visually check the radiator and pipes for leaks.

A3 - FUEL LEVEL

CHECK

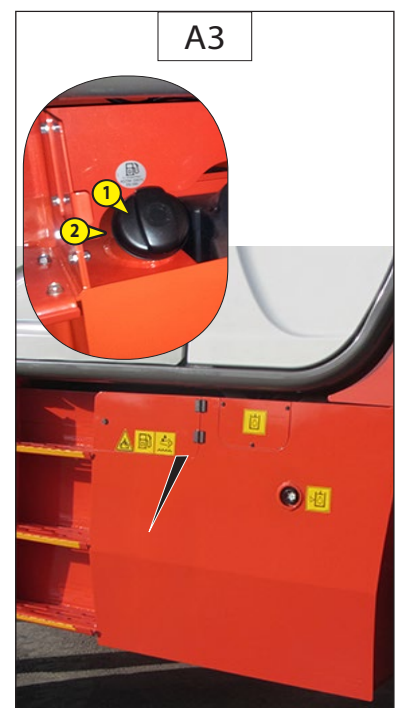
Keep the fuel tank full as far as possible to reduce condensate due to atmospheric conditions to the minimum.



Do not smoke or use a naked flame during refuelling operations or when the tank is open.

Never refuel with the engine running.

- Check the indicator on the instruments panel.
- If necessary, add fuel (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL).
- Open the door to access the tank for refuelling.
- Remove cap 1 (A3) using a contact wrench.
- Fill the tank with clean filtered fuel through filler hole 2 (A3).
- Refit the cap.
- Visually check the tank and pipes for leaks.



A4 - "DEF" LEVEL

MHT 1490, MHT 10130

CHECK



If the "DEF" tank cap is opened at high temperatures, ammonia vapours may escape.

Ammonia vapours have a pungent odour and are particularly irritating to

- the skin
- the mucous membranes
- the eyes

The presence of such vapours can result in burning eyes, nose, and oral cavities, as well as coughing and tearing. Avoid inhaling ammonia vapours.



"DEF" must not come into contact with skin, eyes or clothing.

- If the "DEF" comes into contact with your eyes or skin, rinse affected areas with clean water immediately.
- If the "DEF" is swallowed, immediately rinse your mouth out with a lot of clean water and drink plenty of water.
- Change clothing that is soiled with "DEF" immediately.
- If allergic reactions occur, consult a doctor immediately.

Keep the "DEF" out of the reach of children.



The "DEF" lines and all connected components are pressurised during operation and could be hot, even after the engine has been switched off. There is a risk of burns. When opening the pressurised system, there is a risk of scalding due to hot "DEF" spraying out.

- Wait at least 5 minutes after switching off the engine before starting to work on the exhaust gas after-treatment system.
- Open line connections and caps on system components slowly. Cover the area that you are disconnecting with a cloth.
- Wear suitable protective gloves, protective clothing and safety goggles.

If the "DEF" gets into the coolant circuit (even minute amounts), thermostats and temperature sensors will be damaged.

- Always keep the "DEF" completely separate from other service products.
- Do not use the same containers and fluid collecting pans for the "DEF" and other service products.
- Do not continue to use service products that contain traces of "DEF".

Individual components of the BlueTec® system react very sensitively to even the slightest trace of impurities in the "DEF".

- Only use containers and fluid collecting pans that are clean and suitable for the "DEF".
- Do not continue to use "DEF" which contains traces of impurities.



Fire fighting measures.

The "DEF" is not flammable. In the event of a fire, NH₃ (ammonia) may be released.

This may result in a risk of poisoning. Measures to extinguish a fire must therefore be adapted to suit the surroundings.



Environmental note.

Disposing of the "DEF":

- Even a small amount of spilled "DEF" can be an issue. The product is easily biodegradable and can be disposed of in the sewage system without issues by using a lot of water.
- Packaging that is contaminated with "DEF" residue must be treated in the same way as the "DEF".
- Packaging should be emptied as thoroughly as possible, cleaned appropriately and then recycled. Packaging should be emptied as thoroughly as possible, cleaned appropriately and then reused.
- Check the indicator on the instruments panel.
- If necessary, add "DEF" (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL).



- **Open the door to access the filler port of the "DEF" tank for refuelling.**
- **Remove cap 1 (A4) of the filler port.**
- **Fill the tank with clean filtered "DEF" through the filler port 2 (A4).**
- **Refit the cap 1 (A4).**
- **Visually check the tank and pipes for leaks.**

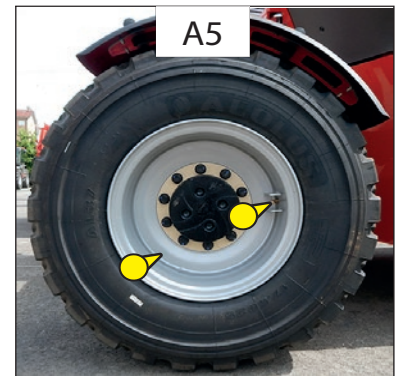
- Check the indicator on the instruments panel.
- If necessary, add "DEF" (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL).
- Open the door to access the filler port of the "DEF" tank for refuelling.
- Remove cap 1 (A4) of the filler port.
- Fill the tank with clean filtered "DEF" through the filler port 2 (A4).
- Refit the cap 1 (A4).
- Visually check the tank and pipes for leaks.

A5 - TYRE PRESSURE AND WHEEL NUT TORQUE

CHECK



Check that the air hose is correctly connected to the tyre valve before inflating and keep all persons at a distance during inflation. Respect the recommended tyre pressures given.



- Check the condition of the tyres, to detect cuts, protuberances, wear, etc.
- 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.
- Check and, if required, adjust the pressure of the tyres.
Inflation pressure, AEOLUS 17.5 R 25 A2237 (std tyres):
 - Front wheels: 9 bar - 130.53 psi
 - Rear wheels: 9 bar - 130.53 psi

A6 - BOOM PADS

CLEAN AND LUBRICATE

Operation to be carried out every 10 hours during the first 50 hours of service, then a last time after 250 hours.

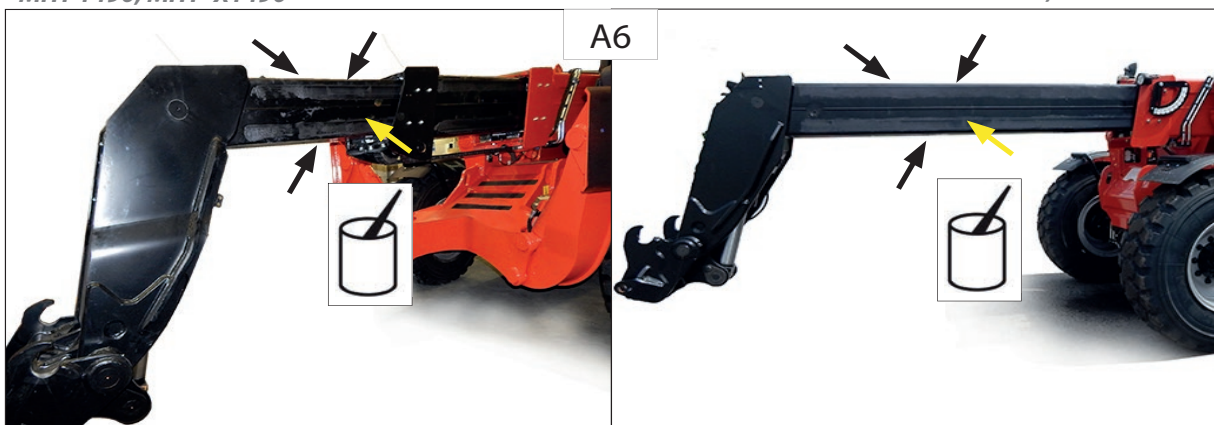
- Completely extend the boom.
- Apply grease with a brush (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL) on the 4 sides of the telehandler(s) (A6).
- Extend and retract the boom several times to evenly distribute the grease.
- Remove any excess grease.



In case of use in abrasive atmospheres (sand, dust, coal), use a protective paint (MANITOU reference: 483536). For more information, please contact your dealer.

MHT 1490, MHT-X1490

MHT 10130, MHT-X 10130



A8 - SIGNALLING DEVICE AND LONGITUDINAL STABILITY LIMITER

CHECK

only with machine equipped with safety system without load cell

Use a measuring cord and a level to check the arm angle (A) and length (L) indications.

Then lift a known weight with the fork arms closed and make sure that the load reading in the system is correct.

Lastly, extend the load (keeping it about 0.5 meters from the ground) then make sure that it reaches the limit established by the diagram and that the

machine blocks the load bearing movements when the safety system activates.





THIS PAGE IS INTENTIONALLY BLANK

B - EVERY 50 HOURS OF SERVICE

Carry out the previous operations and the following ones.

B1 - RADIATOR GRILLES

CLEAN



Adjust the cleaning frequency according to the operating environment.

Inspect these radiator elements. damaged fins, corrosion, dirt, grease, insects, leaves, oil or other debris. Clean the radiator, if necessary.

Using compressed air is the best method to remove debris.

Aim the air jets in the opposite direction to the air flow of fan 1 (B1/1-B1/2). Keep the nozzle about 6 mm (0.25") away from the radiator fins.

Move the air nozzle slowly parallel to the radiator tubes. The pressurised air will remove the debris present between the tubes.

Before blowing, remove guards 2 (B1/1-B1/2) in order to expel the air with the impurities.



The air pressure can cause personal injury.

Failure to respect the safety measures can cause personal injuries. Use a visor and protective clothing when using compressed air.

The maximum pressure at the compressed air nozzle for cleaning must be less than 21 bar (30 psi).

Pressurised water can also be used for cleaning. The maximum water pressure must be less than 2.8 bar (40 psi).

Use pressurised water to soften the mud. Clean the radiant mass on both sides.

To remove oil and grease, use a degreaser and steam.

Clean both sides of the radiator mass.

Wash the radiating body with detergent and boiling water.

Rinse thoroughly with clean water.

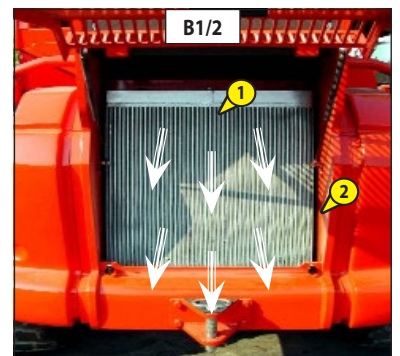
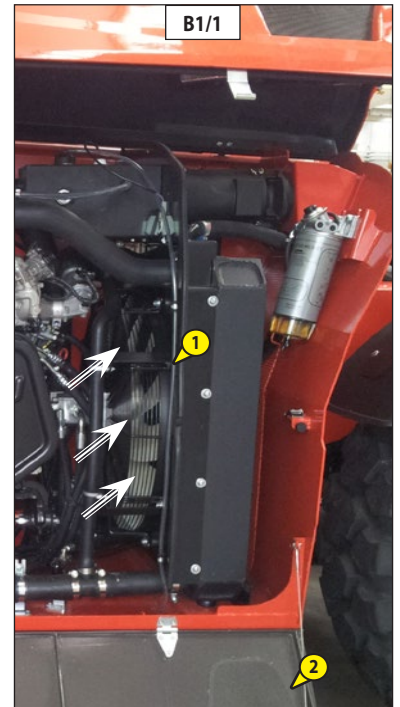
After cleaning the radiator, start up the engine.

Run the engine without load for 3-5 minutes to warm it. Bring the engine to operating speed. Running the engine at maximum speed will help remove dirt and dry the radiating body. Reduce the engine speed to minimum and then stop it. Use a light to check behind the radiating body to see if it is clean. If necessary, clean again.

Check to see if the fins are damaged. Bent fins can be straightened using a "comb".

Inspect these elements to make sure they are in good condition: welds, mounting brackets, air piping, connections, clamps and gaskets.

Carry out repairs if necessary.



B3 - CONDENSER GRILLE (OPTIONAL AIR CONDITIONING)

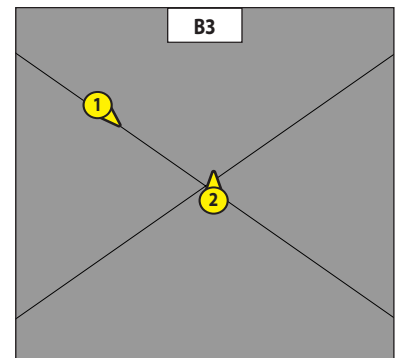
CHECK - CLEAN



In polluting environments, clean the radiator grille daily. Do not use a high pressure water or steam jet as this could damage the condenser fins.

- Remove the protection grille 1 (B3) and clean it if necessary.
- Visually check the condenser 2 for cleanliness (B3) and clean it if necessary.
- Clean the condenser using a jet of compressed air, aiming the jet in the direction of the air flow (B3).

NOTE: To optimise the cleaning, carry out this operation with the fans switched on.

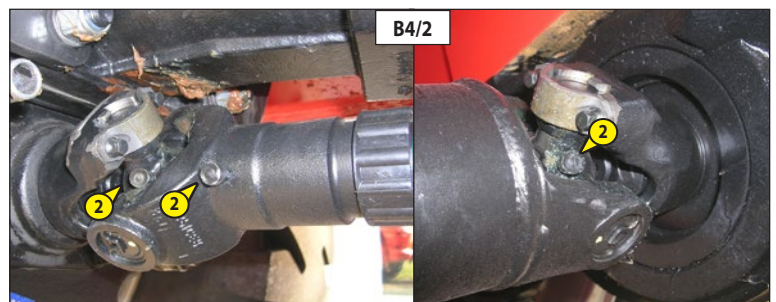
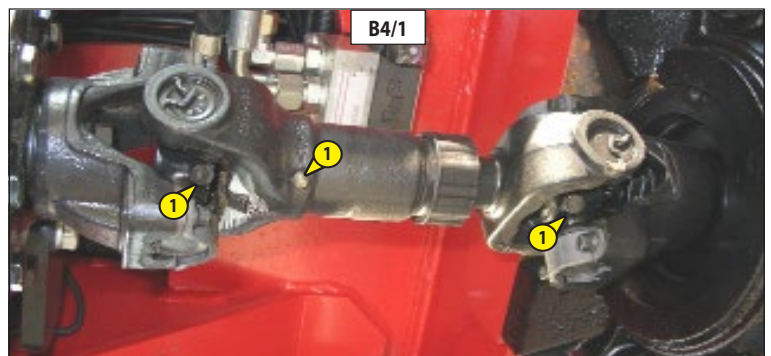


B4 - TRANSMISSION CROSS JOURNAL

LUBRICATE

Clean and lubricate the following points with grease (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL) and remove the surplus of grease.

- 1 - Grease nipples of transmission cross journal:
Transmission/Front axle
(2 grease nipples) (B4/1).
- 2 - Grease nipples of transmission cross journal:
Transmission/Rear axle
(1 grease nipple) (B4/2).



B5 - BOOM

LUBRICATE



Raise the boom and place the boom safety wedge on the rod of the lifting cylinder (see: 1 - OPERATING AND SAFETY INSTRUCTIONS: LIFT TRUCK MAINTENANCE INSTRUCTIONS).

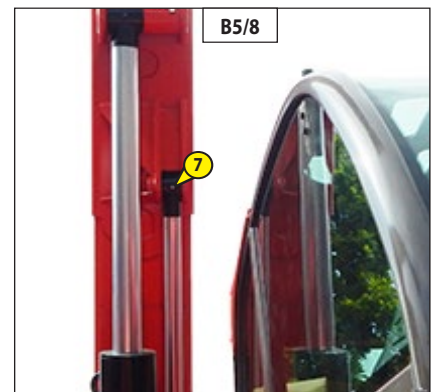
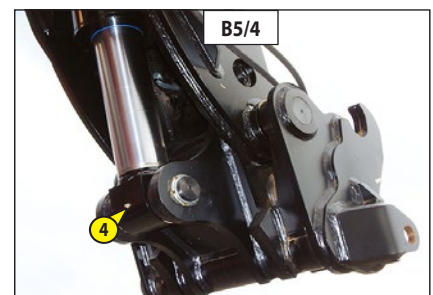
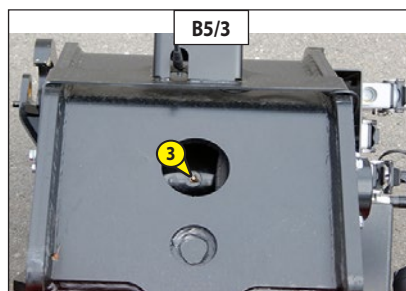
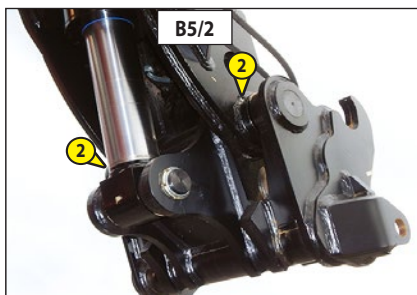
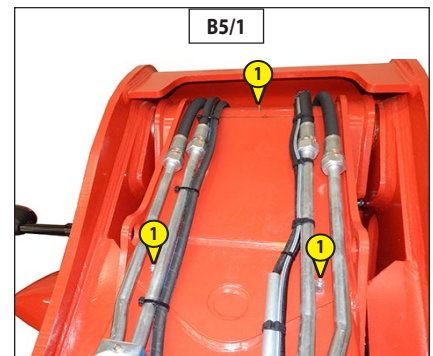
To be carried out weekly, if the lift truck has been operated for less than 50 hours during the week.



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

- Clean and lubricate the following points with grease (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL) and remove the surplus of grease.

- 1 - Lubricators of the boom (3 lubricators) (B5/1).
- 2 - Lubricators of the TS (2 lubricators) (B5/2).
- 3 - Lubricator of the tilt cylinder foot (1 lubricator) (B5/3).
- 4 - Lubricator of the tilt cylinder head (1 lubricator) (B5/4).
- 5 - Lubricator of the lifting cylinder foot (1 lubricator) (B5/5).
- 6 - Lubricator of the lifting cylinder head (1 lubricator) (B5/9).
- 7 - Lubricator of the compensation cylinder foot (1 lubricator) (B5/7).
- 8 - Lubricator of the compensation cylinder head (1 lubricator) (B5/8).



B6 - HYDRAULIC OIL LEVEL

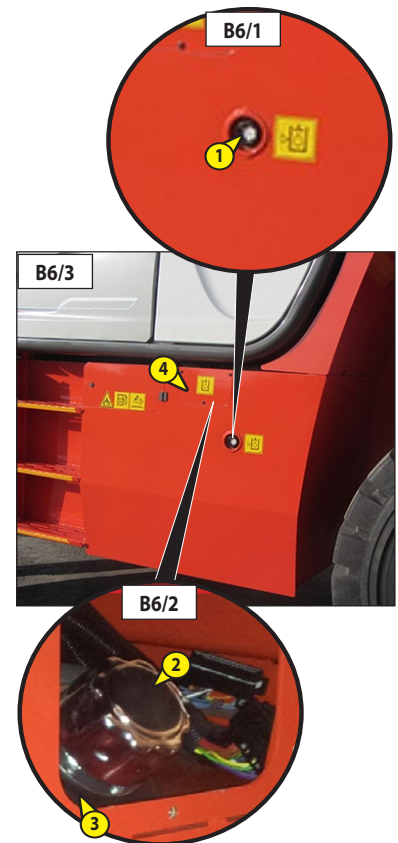
CHECK

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



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

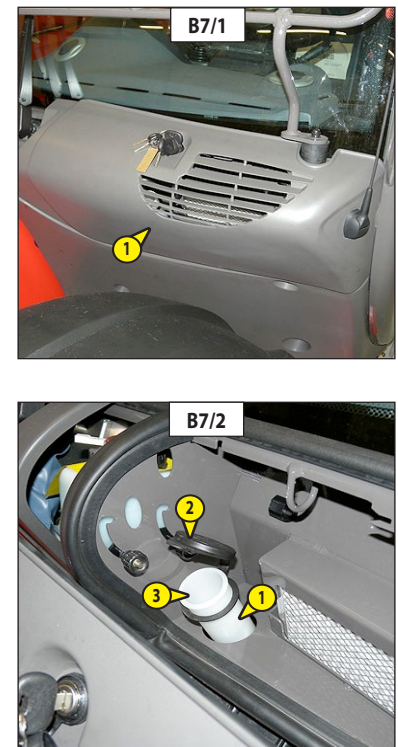
- Check the level on the low level indicator 1 (B6/1). The level is correct when it is above or on the red spot.
- If necessary, add oil (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL).
- Open the access door 4 (B7/3) for refilling the hydraulic oil using a contact wrench.
- Remove the cap 2 (B7/2).
- Refill the oil through the filler hole 3 (B6/2) up to the black spot on the level indicator 1 (B7/1).
- Refit the cap.
- Visually check the tank and pipes for leaks.



B7 - WINDSCREEN WASHER LIQUID LEVEL

CHECK

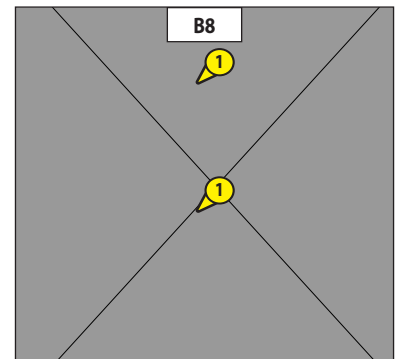
- Remove the guard 1 (B7/1) using a contact wrench.
- Check the tank level visually 1 (B7/2).
- If necessary, add windscreen washer fluid (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL).
- Remove the cap 2 (B7/2).
- Add windscreen washer liquid through filler hole 3 (B7/2).
- Refit the cap.



B8 - CAB DOOR

LUBRICATE

-Clean and lubricate the points 1 (B8) (4 lubricators) with grease (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL) and remove the surplus of grease.



B9 - CAB VENTILATION FILTERS

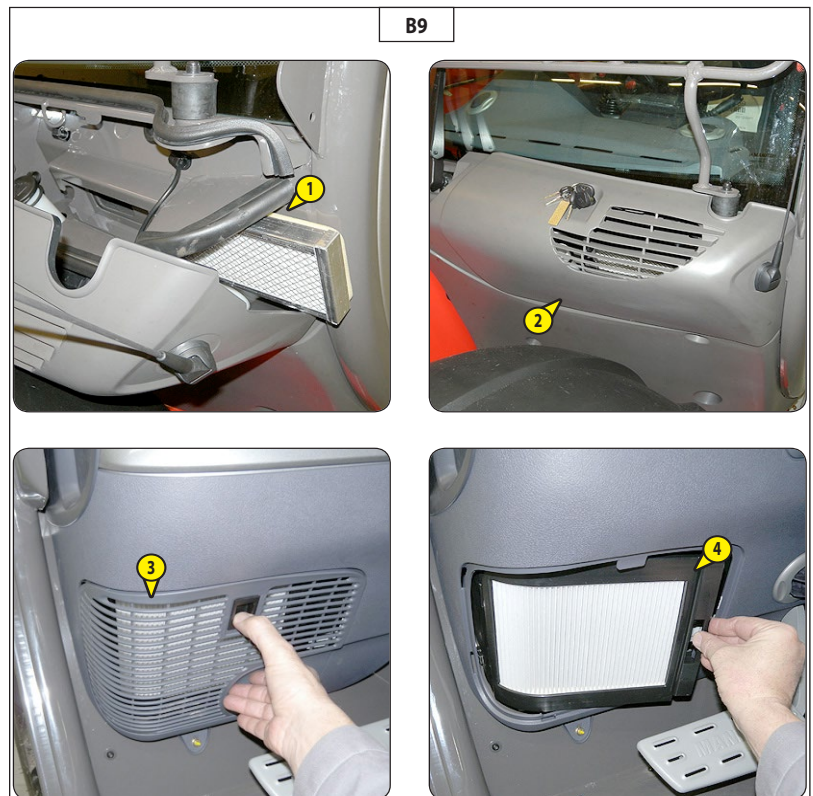
CLEAN

CAB EXTERNAL VENTILATION FILTER

- Remove the cab ventilation filter 1 (B9).
- Clean the filter with a jet of compressed air.
- Check the condition of the filter and replace it if necessary (see: 3 - MAINTENANCE: FILTER ELEMENTS AND BELTS).
- Refit the filter.
- Remove the guard 2 (B9).

CAB INTERNAL VENTILATION FILTER

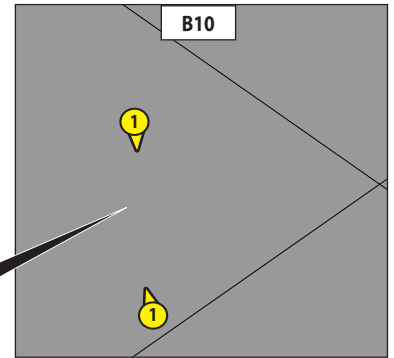
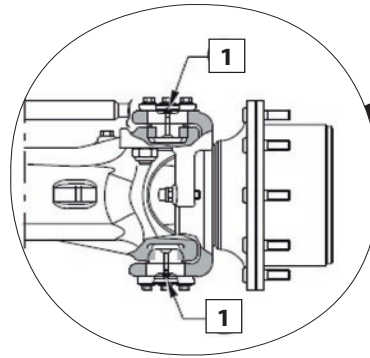
- Remove the protection grille 3 (B9).
- Remove the cab ventilation filter 4 (B9).
- Clean the filter with a jet of compressed air.
- Check the condition of the filter and replace it if necessary (see: 3 - MAINTENANCE: FILTER ELEMENTS AND BELTS).
- Refit the filter.
- Refit the protection grille 3 (B9).



B10 - FRONT AND REAR WHEEL FINAL DRIVE PIVOTS

LUBRICATE

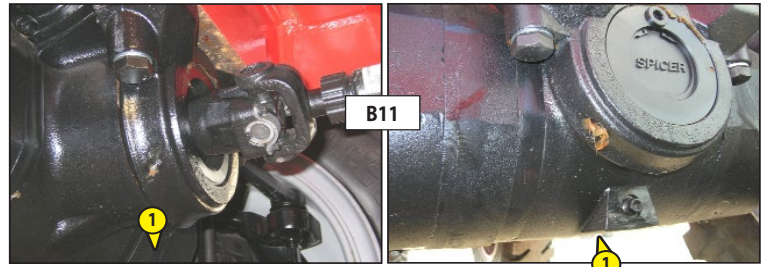
-Clean and lubricate the points 1 (B10) (8 lubricators) with grease (see:3 - MAINTENANCE: LUBRICANTS AND FUEL) and remove the surplus of grease.



B11 - FRONT AXLE OSCILLATION

LUBRICATE

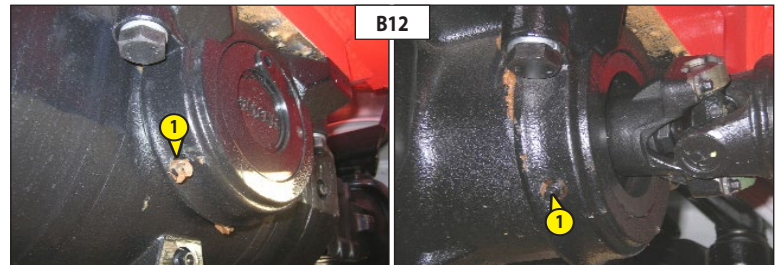
Clean and lubricate the points 1 (B11) (2 lubricators) with grease (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL) and remove the surplus of grease.



B12 - REAR AXLE OSCILLATION

LUBRICATE

-Clean and lubricate the points 1 (B12) (2 lubricators) with grease (see:3 - MAINTENANCE: LUBRICANTS AND FUEL) and remove the surplus of grease.

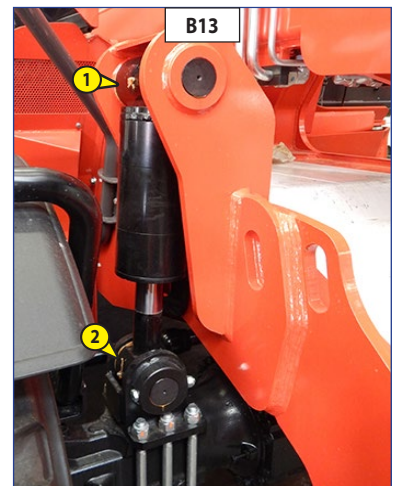


B13 - TILT CORRECTOR

LUBRICATE

- Clean and lubricate the following points with grease (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL) and remove the surplus of grease.

- 1- Lubricator of foot axis of tilt corrector cylinder (1 lubricator) 1 (B13).
- 2- Lubricator of head axis of tilt corrector cylinder (1 lubricator) 2 (B13).



B14 - STABILIZERS

LUBRICATE

- Clean and lubricate the following points with grease (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL) and remove the surplus of grease.

- 1- Lubricator of foot axis of stabilizer cylinder (1 lubricator) 1 (B14).
- 2- Lubricator of head axis of stabilizer cylinder (1 lubricator) 2 (B14).



MHT 1490, MHT -X1490

B15 - EMPTYING THE FUEL PRE-FILTER WITH WATER SEPARATOR

EMPTY



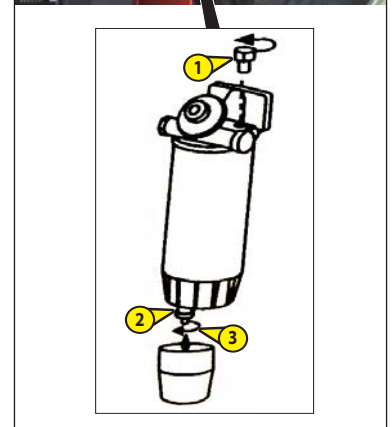
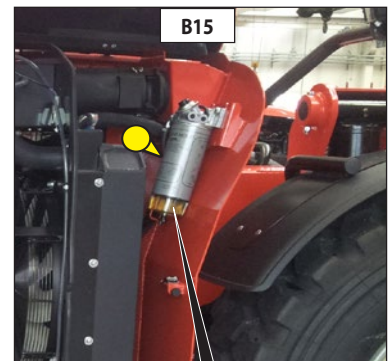
The fuel poured on the boiling surfaces and electrical components can cause fires. To avoid possible accidents, switch off the starter switch while changing the filters or water separator element. Remove spilt fuel immediately.

Make sure the engine is stationary before carrying out any maintenance or repairs on it.

The water separator is in under pressure during the normal working of the engine. Make sure the discharge valve is closed properly to prevent air from entering the supply system.

Wipe the outside of the prefilter as well as its support thoroughly to prevent dust from penetrating the system.

- Open the engine bonnet
- Place a suitable container under the condensate trap to collect the fuel that flows out. Wipe fluid that may have leaked outside.
- Make sure the outer body of the filter unit is clean and devoid of dirt.
- Install a suitable tube on outlet 3 (B15). Open discharge valve 2 (B15). Turn the discharge valve anticlockwise. It must be turned through two complete turns. Slacken the venting screw 1 (B15).
- Let the liquid flow out into the container.
- Insert the valve thread in the filter element and tighten the discharge valve only manually. Tighten the vent screw firmly.
- Remove the tube and the container.





THIS PAGE IS INTENTIONALLY BLANK

C - EVERY 250 HOURS OF SERVICE

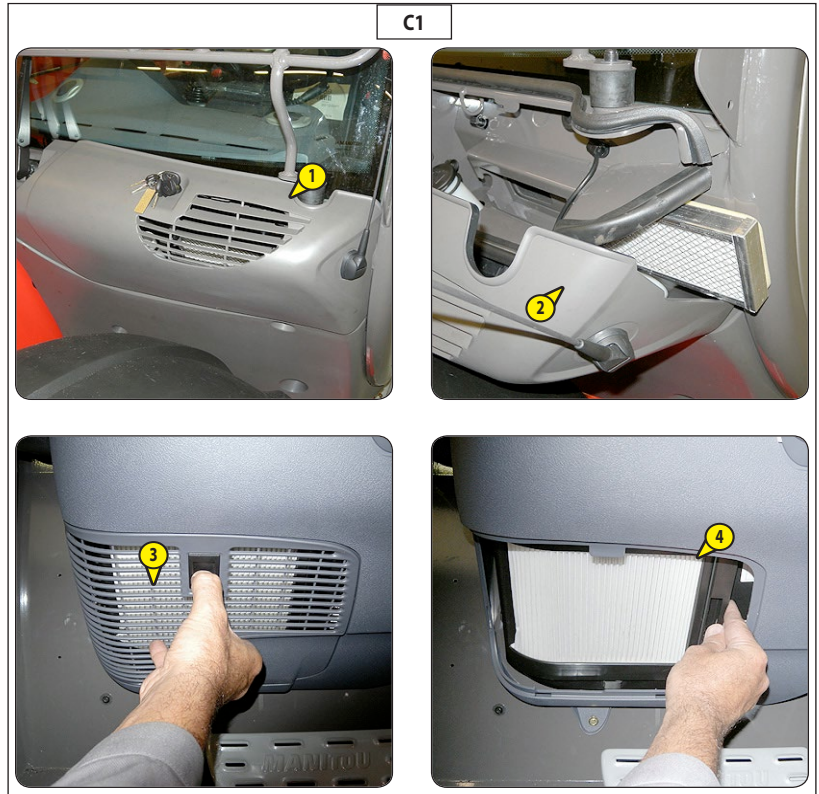
Carry out the previous operations and the following ones.

C1 - CAB VENTILATION FILTERS

REPLACE

CAB EXTERNAL VENTILATION FILTER

- Remove the guard 1 using a contact wrench.
- Remove the cab ventilation filter 2 and replace it with a new one (see: 3 - MAINTENANCE: FILTER ELEMENTS AND BELTS).
- Refit the guard.



CAB INTERNAL VENTILATION FILTER

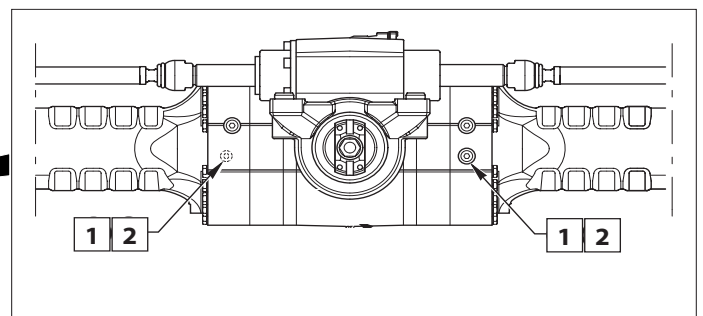
- Remove the protection grille 3.
- Remove the cab ventilation filter 4 and replace it with a new one (see: 3 - MAINTENANCE: FILTER ELEMENTS AND BELTS).
- Refit the protection grille.

C2 - REAR AND FRONT AXLE DIFFERENTIAL OIL LEVEL

CHECK

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

- Remove the level plug 1: oil must reach the hole.
- If necessary, add oil (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL) through the filler hole 2.



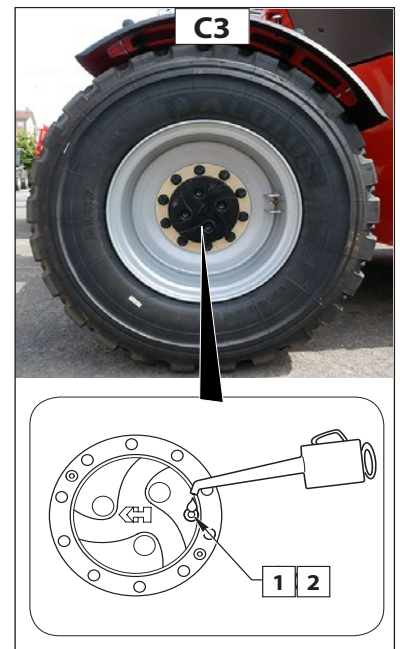
C3 - REAR AND FRONT WHEEL FINAL DRIVE OIL LEVEL

CHECK

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

- Check the oil level in each front wheel final drive.
- Place the level plug 1 horizontally.
- Remove the level plug: oil must reach the hole.
- If necessary, add oil (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL) through the same hole.
- Fit the level plug back on and tighten it (tightening torque: 34 to 49 Nm).

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

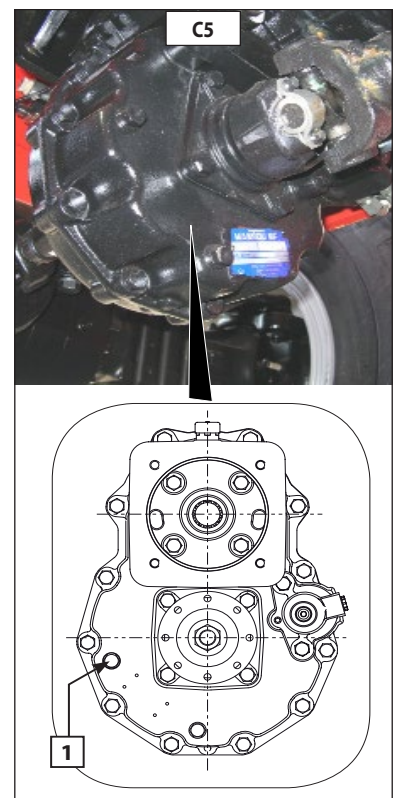


C4 - GEARBOX OIL LEVEL

CHECK

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

- Remove the level plug 1 (C4), the oil must reach the hole.
- If necessary, add oil through the same hole (see: 3 - MAINTENANCE : LUBRICANTS AND FUEL).
- Fit the drain plug 1 (C4) back on and tighten it.



C5 - BATTERIES

CHECK



Operate the battery cut-out no less than 30 seconds after having switched off the ignition with the ignition key.4 (C4). Handling and servicing a battery can be dangerous, take the following precautions:

- **Wear protective goggles.**
- **Keep the battery horizontal.**
- **Never smoke or work near a naked flame.**
- **Work in a well-ventilated area.**
- **In the event of electrolyte being spilled onto the skin or splashed in the eyes, rinse thoroughly with cold water for 15 minutes and call a doctor.**

Check the electrolyte level in the battery every 250 hours.

If necessary, add only distilled water to restore the level. Never add sulphuric acid.

If frequent topping up with distilled water becomes necessary, or if the battery is subject to getting discharged, check the regulator voltage, which must be between 13 V and 14.7 V, with the engine running at maximum speed.

Once in a while, check the connecting terminals to make sure they are not rusted.

If the vehicle is to remain unused for a long time, disconnect the battery.

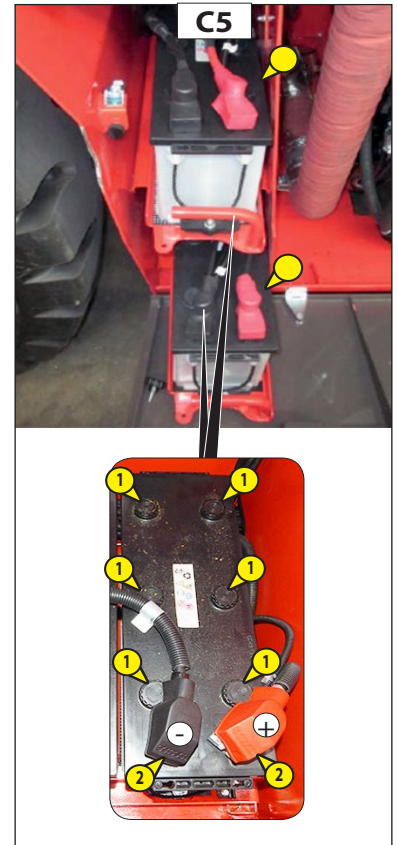
When the ambient temperature is high, the level should be checked more frequently.

Maintenance:

- Remove the guard 3 (C4).
- Check the connection terminals 2 (C4).
- Check electrolyte levels regularly 1 (C4). Add distilled or demineralised water if necessary.
- Never add sulphuric acid.
- Battery needs to be recharged if tension drops below 12.3 V (specific gravity of 1.21).
- If vehicle is not-being used for a while. disconnect the battery.

Charging the battery:

- Remove the caps 1 (fig. C4).
- Only use direct current (DC).
- Connect the positive battery charger cable (+) to the positive terminal (+) on the battery and the negative battery charger cable (-) to the negative terminal (-) on the battery.
- Charge at recommended rating i.e. 10% of battery rated capacity (Ah).
- The battery is fully charged when specific gravity has reached 1.28 (1.23 under tropical climate).
- When charge has completed. -Switch off charger then disconnect.
- Check electrolyte level.



C6 - BOOM EXTERNAL CHAINS

CLEAN - LUBRICATE - CHECK

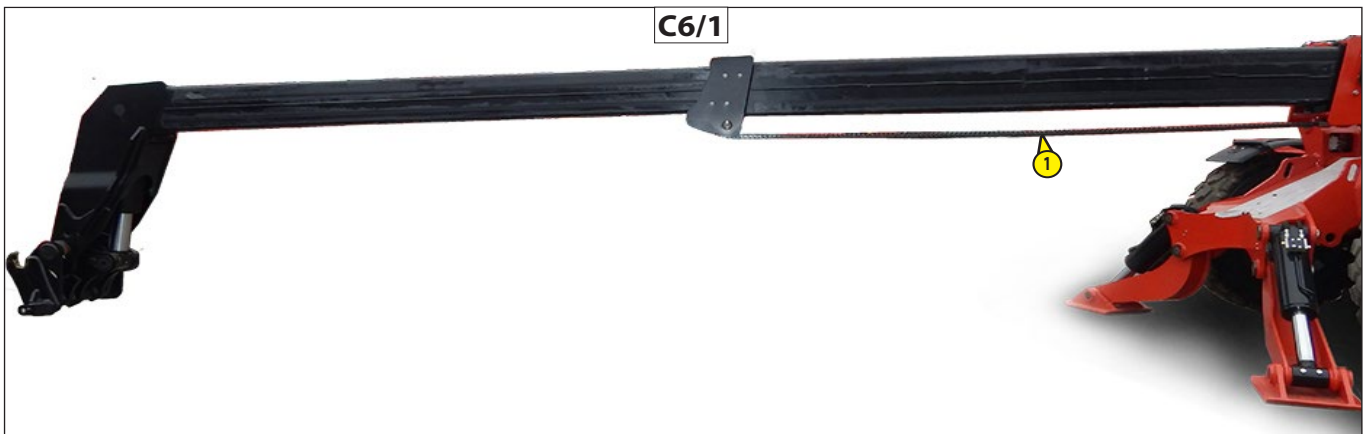
MHT 1490, MHT-X1490



These checks are important for the proper operation of the boom. In case of technical faults, consult your dealer.

CLEAN AND GREASE

- Set the lift truck on its stabilisers, with the boom horizontal.
- Fully extend the telescopic boom.
- Protect the underside of the telescopic boom.
- Wipe the external boom chains 1 (C6/1) with a clean, lint-free cloth, then examine them closely so as to detect any signs of wear.
- Vigorously brush the chains to get rid of any foreign matter. Use a hard nylon brush and clean diesel fuel.
- Rinse the chains by means of a paint brush impregnated with clean diesel fuel and dry them with a compressed air jet.
- Lightly lubricate the chains (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL) and perform a number of telescoping movements to check the behaviour of the chains.

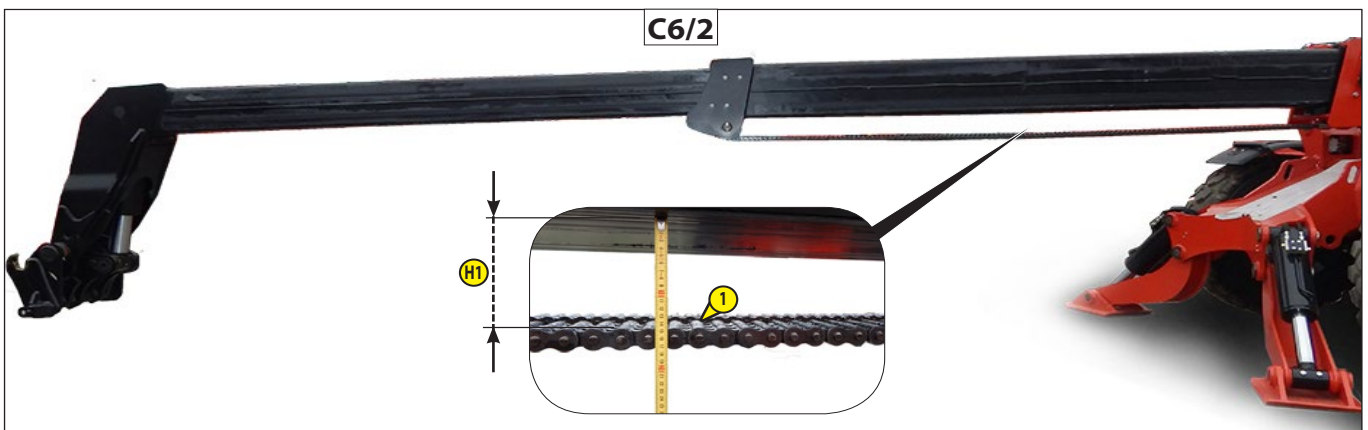


CHECK THE TENSION

- Check the tension of the boom upper chain and, if necessary, re-tighten it, using the spanner meant for the purpose:
- Position the truck on stabilizers.
- Extend the telescopic boom completely in the horizontal position (C6/2).
- Verify that the chains are still under tension.
- Measure the distance between the upper side of the chain and the lower side of the boom using a gauge or a ruler (C6/2).
- If the values are lower than those shown in the table below, adjust the chains.

Minimum measurement: $H1 \geq 137 \text{ mm}$

Maximum measurement: $H1 \leq 157 \text{ mm}$





D - EVERY 500 HOURS SERVICE OR 6 MONTH

Depending on machine model.

MACHINE INSPECT OPERATION

In order to minimize unexpected downtime or critical fault of the machine, the inspections and checks need to be carried out on a regular basis.

The interval between the inspections or checks depends on some factors:

- Operating conditions of the machine (working place environment conditions),
- Severity of the application (heavy loading and stress work cycles)
- Age of machine
- Travelling for long distance on roads.

The parts to be inspected or checked are:

- Main frame;
- Boom;
- Cab;
- Axle and axle supports;
- Engine supports;
- Stabilizers.

For each part inspects all welded joints and mounting points

If some damage parts are found, contact your dealer.

In case the machine has been involved in any accident or every 500 working hours, Manitou suggests to inspects the above parts of the machine.

More frequent inspections will be required for older machines and machines that are used in particularly severe applications.

D1 - HYDROSTATIC PUMP OIL FILTER (TRANSMISSION)

REPLACE

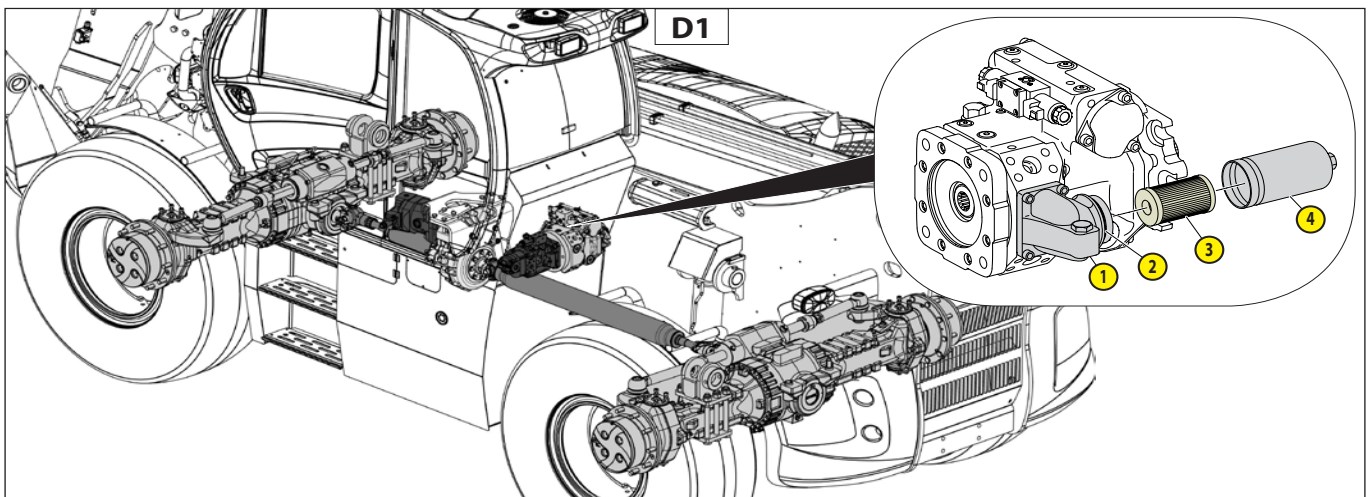


Risk of poisoning and injury! Contact with hydraulic fluid damages your health (e.g. eye injuries, skin and tissue damage, poisoning through inhalation). While working with hazardous materials (for example, hydraulic fluids), always wear safety gloves and safety glasses.

Procedure

To replace the filter cartridge and the filter case seal:

- Loosen and remove the filter housing 4 (D1) from the filter head 1 (D1).
- Remove the used filter cartridge 3 (D1) from the filter housing 4 (D1).
- Check the filter head and filter housing for damage, wear and contaminants.
- Insert the new filter cartridge 3 (D1) into the filter housing 4 (D1).
- Check the O-ring and O-ring groove for damage, wear or contaminants.
- Replace the O-ring 2 (D1) with a new one. Lightly grease the O-ring.
- Screw the filter housing 4 (D1) onto the filter head 1 (D1).
- Tighten the filter housing 4 (D1) with a torque of 45 Nm.



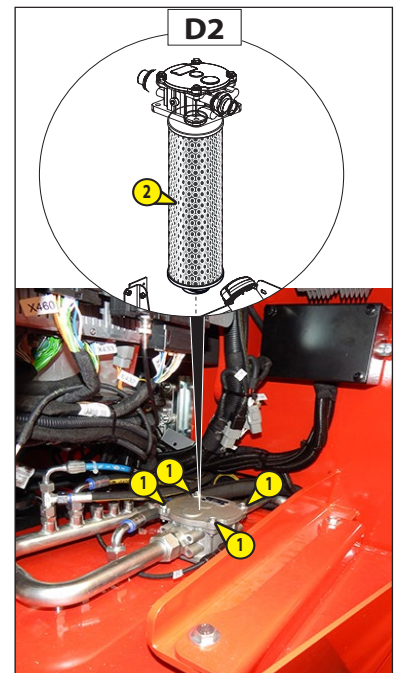
D2 -HYDRAULIC OIL FILTER CARTRIDGE (DISCHARGE)

REPLACE

Slacken the 4 screws 1 (D2) fixing the filter cover, remove the old cartridge 2 (D2) and replace it with a new one (see: FILTER ELEMENTS AND BELTS TABLE).



Before fitting the cover of filter back on, check that the cartridge has been correctly installed.



D3 -HYDRAULIC AND TRANSMISSION OIL VENT

CLEAN

Unscrew vent 1 (D3) on the oil tank and replace it with a new one (see: FILTER ELEMENTS AND BELTS TABLE). Screw on the new vent by hand.



D4 - ENGINE MAINTENANCE

D4/1 - OIL AND FILTER CHANGE

D4/2 - CHECK THE POLY-V-BELT FOR WEAR AND DAMAGE

D4/3 - FUEL PREFILTER AND FUEL FILTER: REPLACE FILTER ELEMENTS

D4/4 - FUEL PREFILTER WITH WATER SEPARATOR: REPLACE FUEL FILTER ELEMENT.

D4/1 - OIL AND FILTER CHANGE

Change the oil only with the engine at operating temperature.

Drain the engine oil

Open the engine bonnet.

Remove guard 1 (D4/1.1) under the engine compartment.

Place a suitable container under the drain screw 2 (D4/1.1) at the bottom of the oil cup.

Take drain hose 3 (D4/1.1).

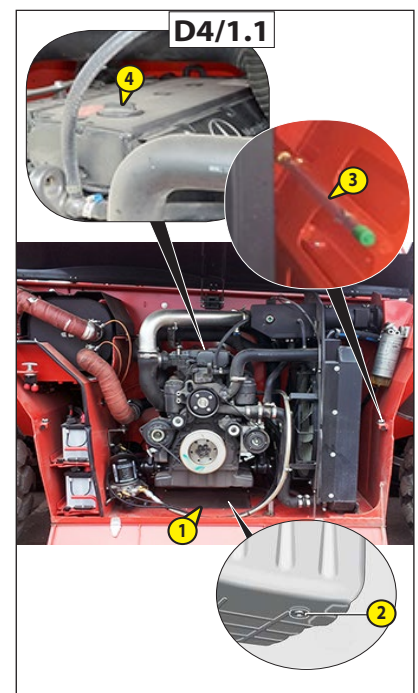
Place the end of the drain hose in the container and screw the hose fully to the drain connector 2 (D4/1.1).

Unscrew the drain screw carefully and let the oil drain out.

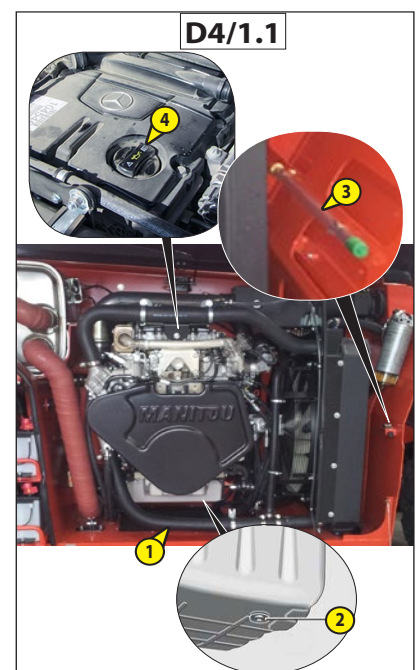
Remove level and filling plug 4 to ensure that the oil is drained properly (D4/1.1).

The engine oil and filter must be disposed off in compliance with the laws in force in the place where the engine is used.

Re-screw the drain screw back on with a new sealing ring and tighten it.
Tightening torque: M16 x 1.5 – 35 Nm



MHT -X1490, MHT-X 10130



MHT 1490, MHT 10130

Engine oil filter

Unscrew the oil filter threaded cap using a pipe wrench. Let the oil drain out of the filter casing.

Remove the threaded cap 5 (D4/1.2) together with the oil filter cartridge 7 (D4/1.2) and release the cartridge 7 (D4/1.2) by pressing on the sides on the lower edge.

Make sure foreign bodies do not penetrate the filter casing. Never wipe inside the filter housing.

Replace the sealing ring present on threaded cap 6 (D4/1.2).

Insert the new cartridge in the threaded cap and press it so that it clicks into place.

Screw the threaded cap on the oil filter casing and tighten it.

Tightening torque: 40 Nm *MHT-X 1490, MHT-X 10130*

Tightening torque: 50 Nm *MHT 1490, MHT 10130*

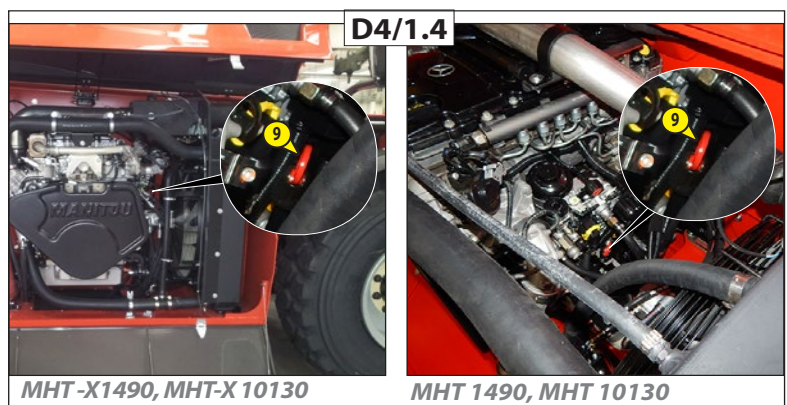
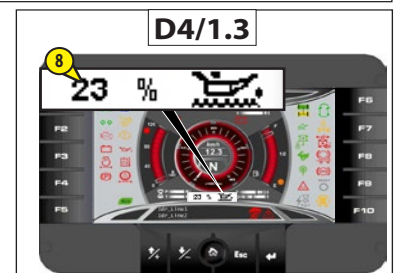
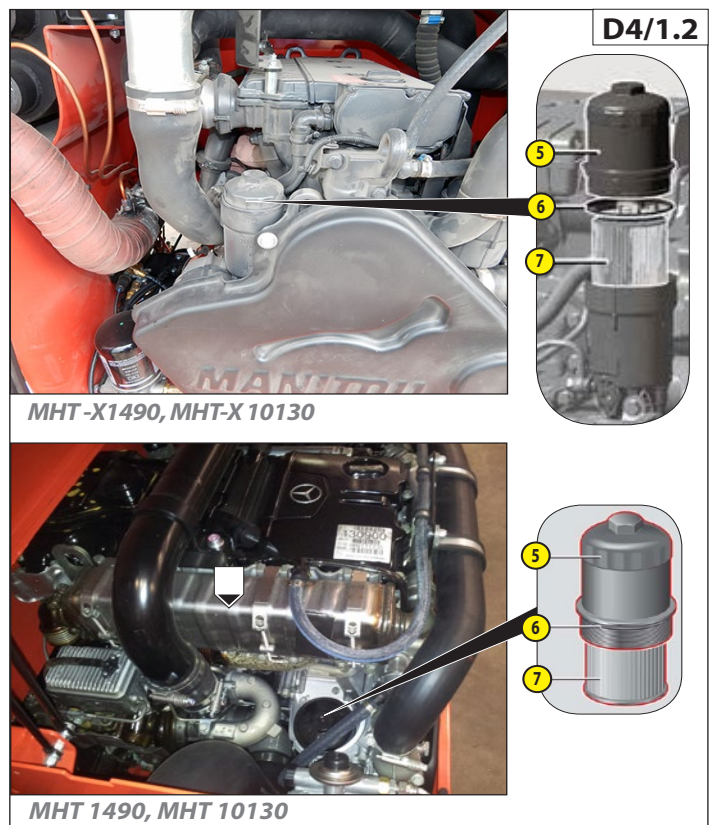
Change the engine oil

Pour fresh oil in the engine through the filler port 7 (D4/1.2).

Checking the engine oil level:

- Checking the oil level electronically 8 (D4/1.3).
- Checking the oil level with the dipstick. This is subsidiary to the electronic oil level measurement system. It is merely used for a general check to determine if there is oil in the engine. Remove the dipstick 9 (D4/1.4) to check the level. The oil level should be between the upper and lower marks on the dipstick 9 (D4/1.4).

Check the sealing of the filter and the drain screw. Switch off the engine. After about 5 minutes, check the oil level and, if necessary, top it up to the max. notch on the oil level rod.





D4/2 - CHECK THE POLY-V-BELT FOR WEAR AND DAMAGE



A faulty poly-V-belts can tear, the belt or parts of it could then be thrown off the engine, thereby causing injury to others.
- Always observe the specified maintenance intervals for poly-V-belts.
- If damage is detected, replace the poly-V belt concerned immediately.

If the poly-V-belt is torn, there is no drive to the coolant pump and the alternator. The engine may overheat as a result.
 - Check the poly-V-belt condition regularly.
 - Replace the poly-V-belt concerned immediately if there are any signs of damage.

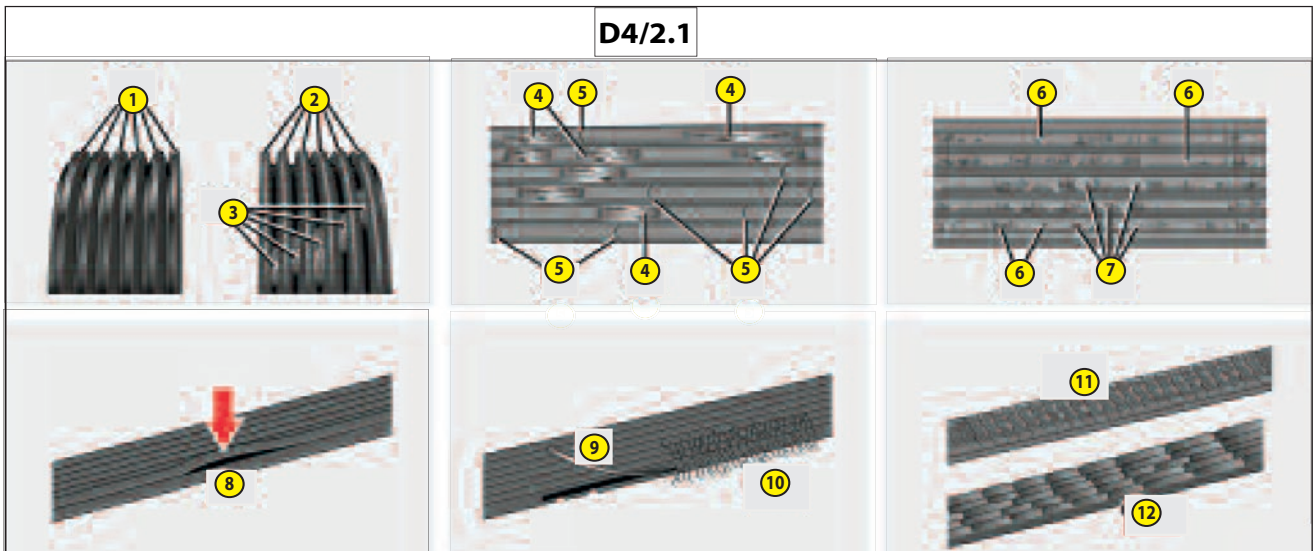
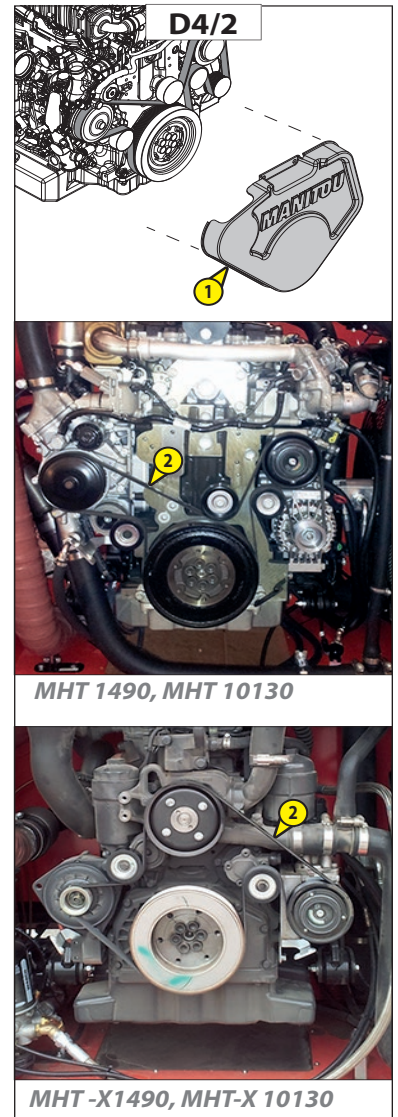
- Open the engine hood and remove crankcase 1 (D4/2).
- Fit the cranking device to the flywheel housing inspection hole.
Tightening torque: 25 Nm *MHT-X 1490, MHT-X 10130.*
Tightening torque: 30 Nm *MHT 1490, MHT 10130.*
- Make a chalk mark on the poly-V-belt.
- Check the poly-V-belt 2 (D4/2) section by section for damage (D4/2). To do this, turn the engine or poly-V-belt gradually using the cranking device until the chalk mark is reached again.
- Remove the cranking device.
- Screw the cap into the inspection hole in the flywheel housing and tighten it.
Tightening torque: 25 Nm *MHT-X 1490, MHT-X 10130.*
Tightening torque: 30 Nm *MHT 1490, MHT 10130.*

Patterns of damage



Replace the poly-V-belts if one of the following damage patterns occurs on the poly-V-belt. (D4 / 2.1)

- 1 – New belt (for comparison; ribbed fan belt)
- 2 – Wear on the sides: wedge-shaped ribbing
- 3 – Structure visible at the bottom of the ribbing
- 4 – Broken ribbing
- 5 – Transverse fissures in various ribs
- 6 – Rubber nodules at the bottom of the belt
- 7 – Dirt or rubble deposits
- 8 – Ribbing detached from the bottom of the belt
- 9 – Strands of the structure torn on the sides
- 10 – Outer strands of the structure frayed
- 11 – Transverse fissures on the dorsal side
- 12 – Transverse fissures in various ribs



Replacing the poly-V-belt

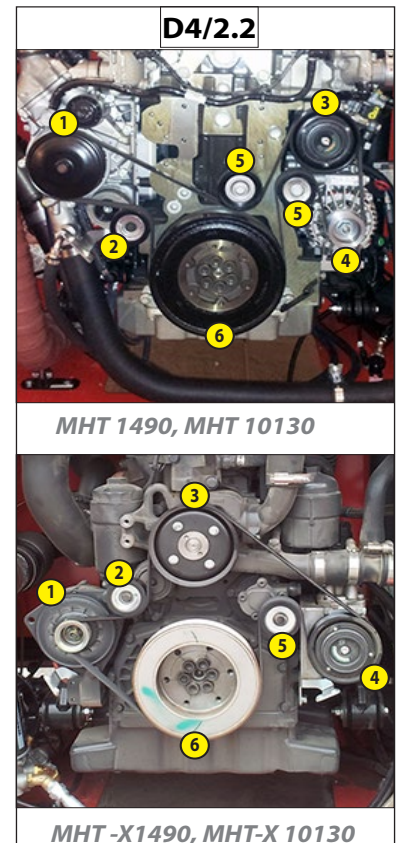


The tensioning device is spring-tensioned. When it is loosened or tightened, there is a risk of injury from crushing or entrapment in pretensioned parts.

- Always carry out work on the tensioning device with extreme care.
- Make sure that the tool is handled correctly.

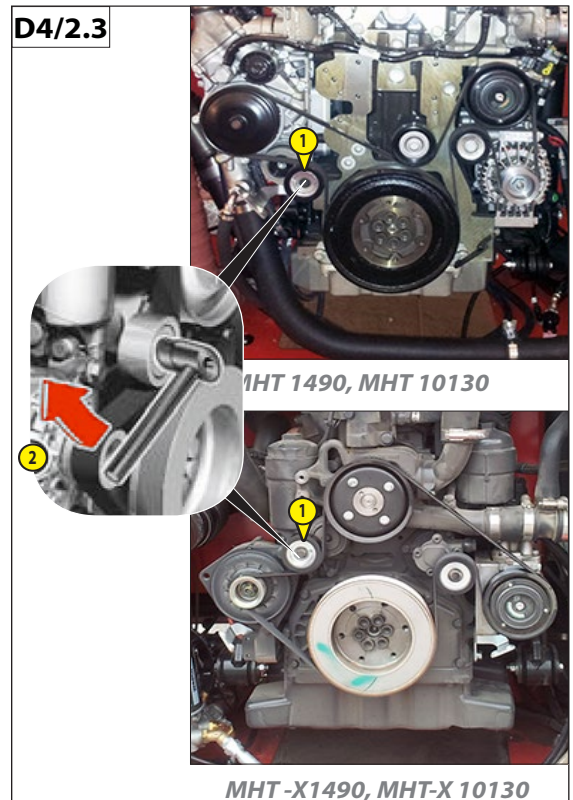
Poly-V-belt routing (engine with refrigerant compressor) (D4/2.2):

- 1 - Alternator (D4/2.2)
- 2 - Tensioning pulley (D4/2.2)
- 3 - Coolant pump (D4/2.2)
- 4 - Refrigerant compressor (D4/2.2)
- 5 - Guide pulley (D4/2.2)
- 6 - Crankshaft (D4/2.2)



- Insert the 15 mm socket, with the handle 1 (D4/2.3) and extension attached, into the tensioner 2 (D4/2.3).
- Swing the tensioning pulley up and remove the poly-V-belt.
- Swing back the tensioner.
- Check that both the tensioner and the belt pulley are in fault-free condition. Check for such defects as worn bearings in the tensioner, tensioning pulley and guide pulleys and for wear of the tooth profile on the belt pulleys.
- Replace faulty parts.
- Route the new poly-V-belt over all belt pulleys except the tensioning pulley (observe the poly-V-belt routing shown in the illustration).
- Swing the tensioning pulley up using the lever, lay the poly-V-belt over the tensioning pulley and allow the tensioning pulley to swing back.
- Remove the spanner and check for correct seating of the poly-V-belt on the belt pulleys.

D4/2.3



D4/3 - FUEL PREFILTER AND FUEL FILTER: REPLACE FILTER ELEMENTS

Clean the fuel pre-filter cartridge

Open the tank cap to discharge the overpressure inside.

Clean the outside of the fuel pre-filter, keeping the ducts, hose pipes and cables that may be present under the pre-filter covered.

Unscrew threaded cap 1 and remove it from the filter casing together with filter cartridge 2 (D4/3.1).

Clean threaded cap 1 (D4/3.1) and the filter cartridge 2 (D4/3.1). If the filter cartridge is excessively dirty or damaged, replace it.

Check the sealing ring 3 (D4/3.1) of the threaded cap and replace it if necessary.

Insert the filter cartridge in the threaded cap and screw the latter back on the filter casing. Tightening torque: 25 Nm.

Replace the fuel filter cartridge



There is an increased risk of fire when handling fuels as they are highly flammable. Avoid fire, naked flames and sparks, and refrain from smoking when handling fuels.

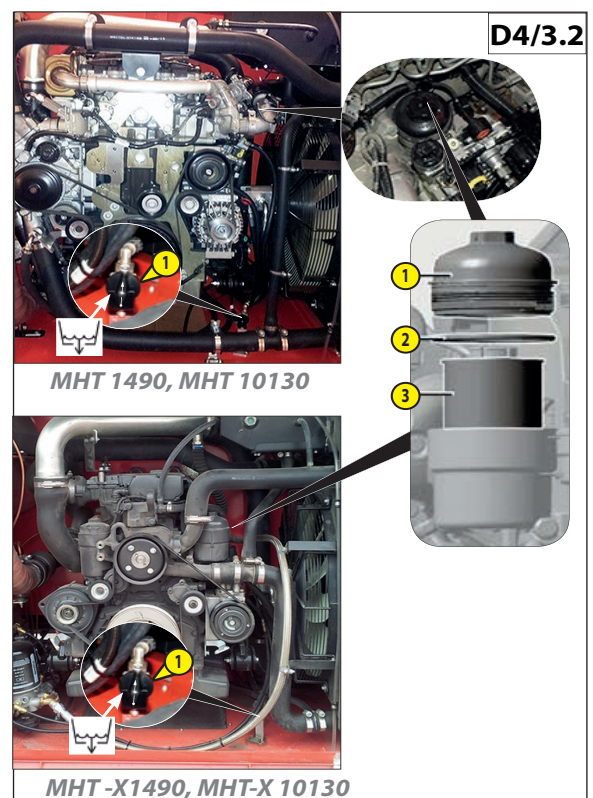
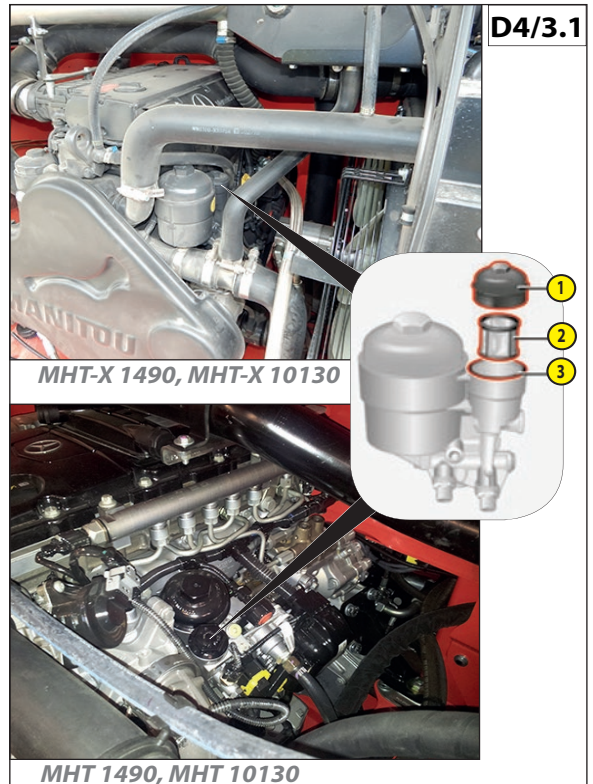
Environmental note.

Dispose of used filter elements, seals and fuel residue in accordance with relevant local regulations.

Environmental note. If the diesel level (tank) is above the height of the motor, it is necessary to perform the following when replacing the filter:

- fully close the shutoff valve on the fuel prefilter with water separator 3 (D4/3.3),
 - open the valve by turning tap 4 (D4/3.2) to drain and collect the fuel coming from the filter drain pipe into a container.
- Downward tap arrow.**
Otherwise diesel may leak.

- Clean the outside of the filter housing.
- Open the fuel filler cap to prevent excess pressure in the fuel tank.
- Unscrew fuel filter cap 1 (D4/3.2) using a socket spanner insert (SW 36).
- Pull fuel filter cap 1 (D4/3.2) with filter element 3 (D4/3.2) out of the filter housing slightly. Let the fuel drain.
- Remove the cap and filter element. Unclip the filter element by pressing the sides of the lower edge of the filter element.
 - Make sure foreign bodies do not penetrate the filter casing.
 - Never wipe inside the filter housing.
 - The ingress of water must be prevented.
- Replace sealing ring 2 (D4/3.2) with a new one (grease lightly).
- Clip new filter element 3 (D4/3.2) into housing cover 1 (D4/3.2).
- Screw on and tighten oil filter cap 1 (D4/3.2) with filter element 3 (D4/3.2) (tightening torque: 25 Nm).
- Put on the fuel filler cap and tighten it.
- Run the engine for approximately 1 minute. Bleeding of the supply system occurs automatically. If the engine stalls or does not start, bleed the fuel system manually (see paragraph D4/3.3).
- Check the fuel filter for leaks with the engine running.



Bleeding the fuel system with fuel prefilter (D4/3.3)

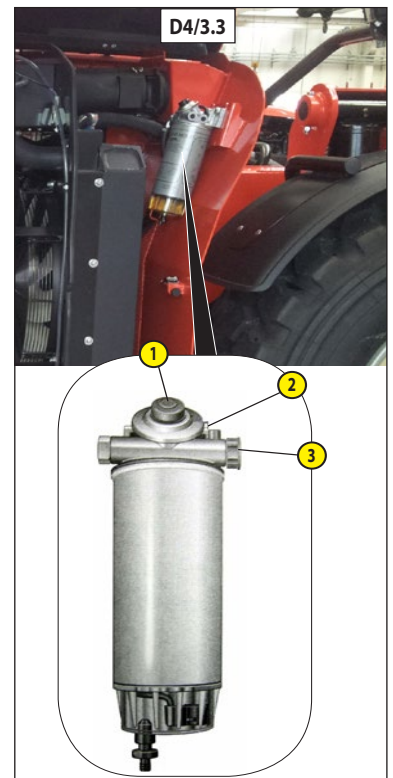
Bleeding the fuel prefilter using the manual fuel pump (D4/3.3).

The fuel prefilter must only be bled when:

- the fuel tank is empty
- the fuel filter has been replaced.
- Unscrew the fuel tank filler cap.
- Place the collector underneath the fuel prefilter.
- Open shutoff valve 3 (D4/3.3) fully.
- Open bleed nipple 2 (D4/3.3).
- Only press the manual fuel pump 1 (D4/3.3) until the fuel escaping from the bleed nipple 2 (D4/3.3) is free of bubbles. Do not continue to pump.
- Close bleed nipple 2 (D4/3.3).
- Close the fuel tank filler cap.
- Start the engine. The fuel system is bled automatically.



Do not continue to press the fuel hand pump after the engine has started. This could otherwise damage the hand pump.



D4/4 - FUEL PREFILTER WITH WATER SEPARATOR: REPLACE FUEL FILTER ELEMENT.



There is an increased risk of fire when handling fuels as they are highly flammable. Avoid fire, naked flames and sparks, and refrain from smoking when handling fuels.

Environmental note.

Dispose of used filter elements, seals and fuel residue in accordance with relevant local regulations.

Open the drain valve and bleed screw 2 (D4/4) and collect the water-fuel mixture that flows out of the filter element in a container.

Remove the heating connector.

Unscrew filter cartridge 1 (D4/4) and remove it.

Unscrew the separator container 3 (D4/4) from filter cartridge and remove it, cleaning and replacing it, if necessary.

Assembly must be done by repeating the procedure described in reverse order. Use new sealing rings during assembly.

Screw the filter element manually back all the way on the filter cup.

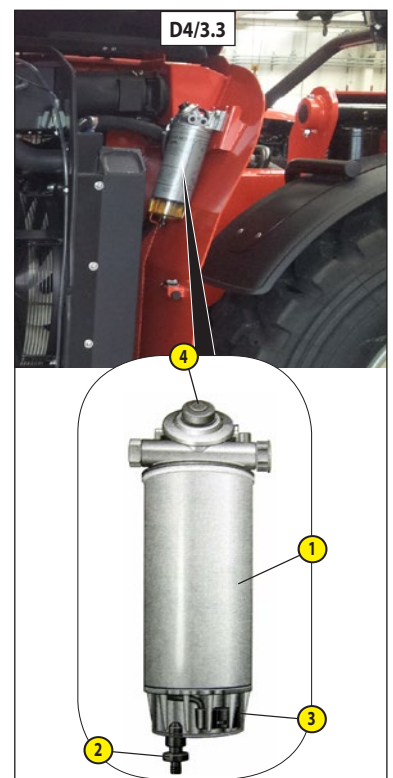
Close the drain valve and refill the pre-filter by means of fuel hand pump 4 (D4/4). Then close the bleed screw.

Start up the engine and bleed the supply system.

Run the engine for about 1 minute.

Bleeding of the supply system occurs automatically.

Check the pre-filter seal.





THIS PAGE IS INTENTIONALLY BLANK

E - EVERY 1000 HOURS OF SERVICE OR 1 YEAR

Carry out the previous operations and the following ones.

E1 – FUEL TANK

CLEAN



There is an increased risk of fire when handling fuels as they are highly flammable. Avoid fire, naked flames and sparks, and refrain from smoking when handling fuels.

Position the forklift truck on a level surface, with the I.C. engine switched off.

Unscrew the tank topping up plug 1 (E1) then place a container under the drainage plug 3 (E1) and unscrew the plug.

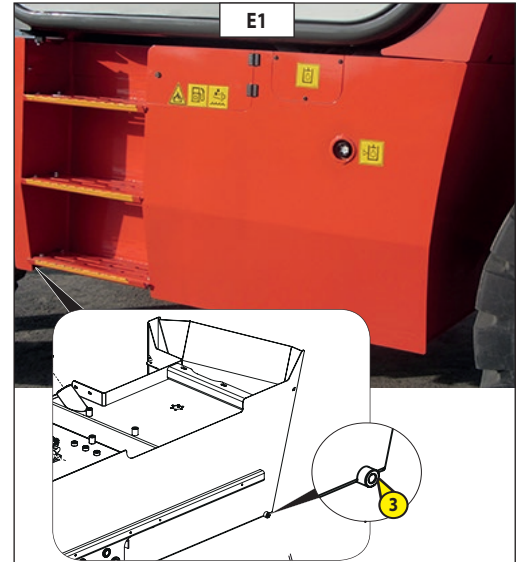
Allow the fuel to flow out and then pour 10 litres of clean fuel through the filler hole 2 (E1) to eliminate impurities, if present.

Refit and tighten the drainage plug 3 (E1).

Fill the tank with clean fuel and refit the topping up plug 1 (E1/1).



Do not fill the tank completely. As the fuel heats up, it expands. The tank may overflow.



E2 – DRY AIR FILTER CARTRIDGE

REPLACE

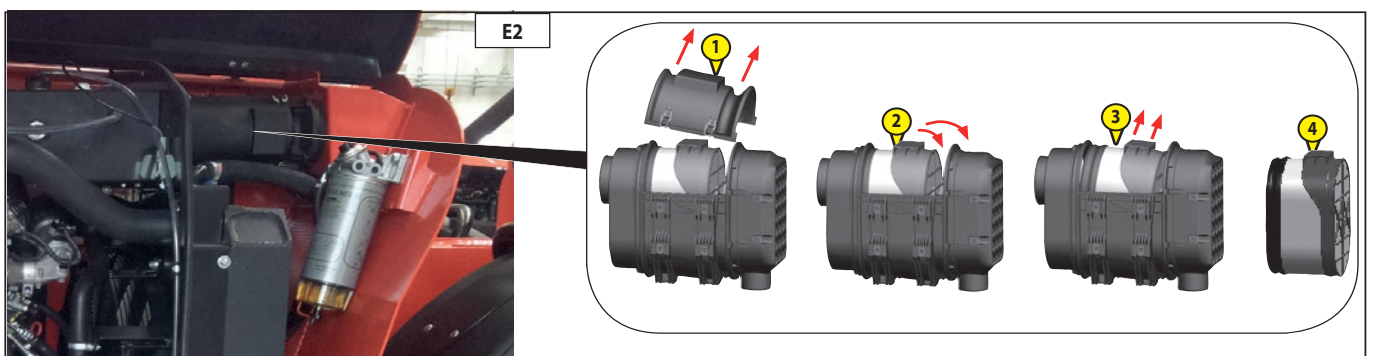
In case of use in very dusty environments, reduce the cartridge replacement frequency (up to 250 hours in very dusty environments).



Replace the cartridge in a clean environment and with the I.C. engine switched off. Never use the forklift truck without the air filter or with a damaged air filter.

If the air filter clogging indicator  lights up, replace the cartridge in the shortest possible time (maximum 1 hour).

- Open the engine bonnet.
- Free the blocks and remove the cover 1.
- Carefully rotate the cartridge 2 forwards, to reduce dust leakage as far as possible.
- Do not remove the safety cartridge.
- Carefully clean the following parts with a wet clean cloth that does not leave lint.
 - The inside of the filter and cover.
 - The inside of the filter inlet piping.
 - The seats of the gaskets in the filter and cover.
- Check the state and fixing of the connecting pipe to the I.C. engine, and the connection and the conditions of the filter clogging indicator.
- Before the assembly, check the state of the new filter cartridge (see: 3 - MAINTENANCE: FILTER ELEMENTS AND BELTS).
- Incline the cartridge forwards by about 5°, insert it in the filter and position it by pressing on the edge of the cartridge and not in the centre.
- Refit the cover and check to make sure the clips are secured correctly. It must be possible to install the cover easily; if necessary, check the correct positioning of the filter cartridge.



E3 - HYDRAULIC AND TRANSMISSION OIL

E4 - HYDRAULIC SYSTEM SUCTION FILTER CARTRIDGES

Place the lift truck on level ground with the engine stopped and telescopic boom retracted and lowered as far as possible.



Before any intervention, thoroughly clean the area surrounding the drain plug and the suction strainer on the hydraulic tank.
Use a clean container and funnel. Clean the top of the oil drum before filling.
Dispose of the drain oil in an ecological manner.

Draining the oil

- Remove the guard 1 (E1/E2).
- Place a container under drain plug 2 (E1/E2) and unscrew the plug.
- Remove filling plug 3 (E1/E2) to ensure that the oil is drained properly.

Replacing the breather

- Unscrew the breather 4 (E1/E2) and replace it with a new one (see: 3 - MAINTENANCE: FILTER ELEMENTS AND BELTS).

Cleaning the strainer

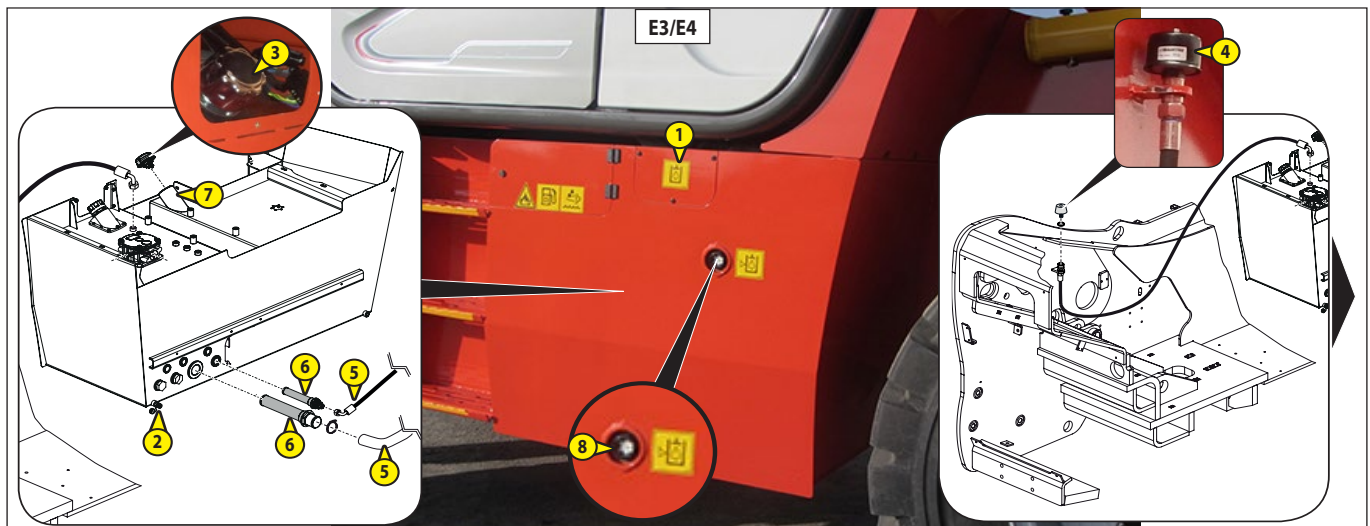
- Disconnect hose 5 (E3/E4).
- Remove and clean the suction strainer 6 (E3/E4) using a compressed air jet, check its condition and replace if necessary (see: 3 - MAINTENANCE: FILTER ELEMENTS AND BELTS).
- Refit the suction strainer making sure the seal is in the correct position.

Filling up the oil

- Refit and tighten the drainage plug 2 (E3/E4).
- Fill the hydraulic oil tank through the filler hole 7 (E3/E4) until the oil level lies mid-way between the lower and upper reference marks on the level indicator 8 (E3/E4).
- Check for leakage through the drain hole 2 (E3/E4).
- Fit and tighten the tank cover 3 (E3/E4).

Hydraulic circuit decontamination

- Leave the engine running (accelerator pedal at halfway travel) for 5 minutes without using anything on the lift truck, then for 5 more minutes while fully using the hydraulic movements (except the steering system and the service brakes).
- Accelerate the engine at full speed for 1 minute, then activate the steering system and the service brakes.
- This operation makes a pollution abatement of the circuit possible through the hydraulic return oil filter.



E5 - SEAT BELT

CHECK



**The forklift truck must not be used if the seat belt is defective (fixing, lock, seams, tears, etc.).
Repair or replace the seat belt immediately.**

SAFETY BELT WITH TWO FIXING POINTS

- Check the following points:
 - The fixing of the anchoring points on the seat.
 - The cleanliness of the belt and the locking mechanism.
 - The clicking of the locking mechanism.
 - The state of the belt (tears, fraying).

AUTOMATIC SAFETY BELT WITH TWO FIXING POINTS

- Check the afore-mentioned points and those below:
 - Correct sliding of the belt.
 - The state of the winder plates.
 - The locking of the winder mechanism by pulling the belt with one firm pull.

NOTE: After an accident, replace the safety belt.

E6 - Change front and rear axle differential oil

REPLACE

Position the forklift truck on a level surface, with the engine switched off and the differential oil still hot.

Place a container under the drainage plug (E6/1) and let the oil flow out. Remove the level and filler plug (E6/2) to ensure the oil is drained out completely.

Fit and tighten the plug (E6/1). Fill oil through the filler hole (E6/2).

The level is correct when the oil reaches the level hole (E6/2).

Check for leakage from the drainage plugs.

Fit and tighten the level and filler plug (E6/2).

Repeat the operation for the front and rear differential.

E7 - CHANGE THE FRONT AND REAR WHEELS GEAR OIL

REPLACE

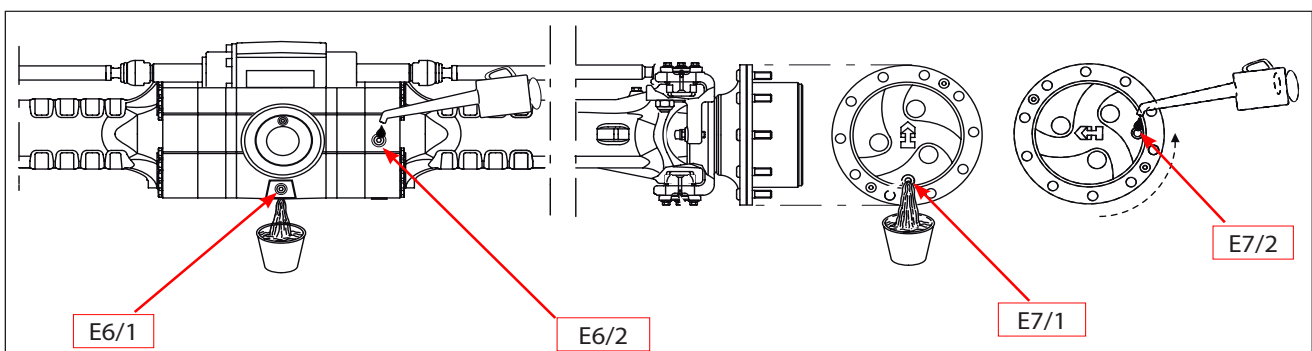
Position the forklift truck on a level surface, with the engine switched off and the gear oil still hot.

Make sure the drainage and level plug (E7/1-E7/2) faces downwards to allow the oil to drain out easily.

Place a container (E7/1) under the drainage plug and unscrew the plug. Let all the oil drain out. Bring the outlet hole to the horizontal position to check the oil level.

Fill the oil (E7/2) (see: "LUBRICANTS") through level hole (E7/2). The level is correct when the oil reaches the level hole (E7/2).

Refit the drainage plug (E7/2) and tighten it. Repeat this operation for each gear.

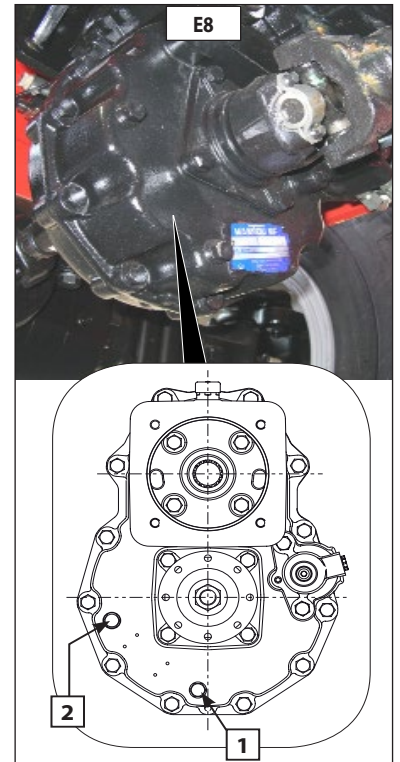




E8 - GEARBOX OIL

REPLACE

Position the truck on a horizontal surface with the engine stopped and the oil in the gear still hot.
 Place a container under the drainage plug 1 (E8). Unscrew the plug 1 and let the oil flow out.
 Remove the level and filler plug 2 (E8) to ensure the complete drainage. Refit and tighten the plug 1 (E8).
 Fill the oil (see: "LUBRICANTS") through the level and filler hole 2 (E8). The level is correct when the oil reaches the hole.
 Fit the drain and filler plug 2 (E8) back on and tighten it
 Check the drainage plug for leakage.



E9 - WEAR OF TELESCOPIC BOOM EXTERNAL CHAINS

CHECK

- Chain wear occurs at a number of locations.
 - On the articulations, which leads to elongation of the chain.
 - On the edge of link plates through contact with the pulleys.
 - On the face of the plates and the extended pins through contact with the pulley flanges.
 - On the alignment of the flats of the extended pins.

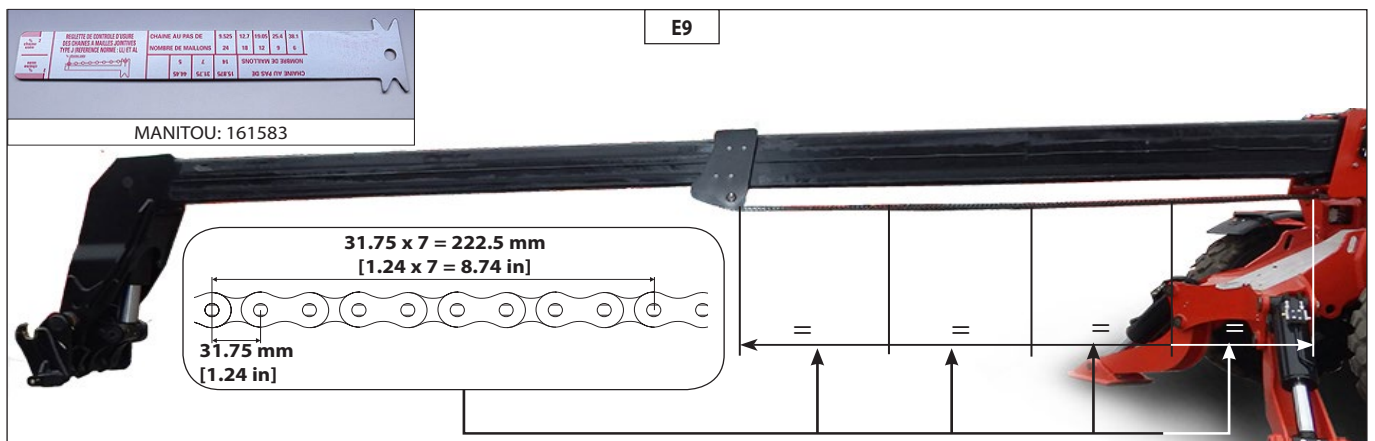
Chain elongation (E9)

We recommend that you perform this operation using the chain checking gauge (MANITOU part No.: 161583).

- Set the lift truck on its stabilisers, with the boom horizontal.
- Fully extend the telescopes and continue operating the control for a few moments to properly tension the chains.
- As the chain will likely wear unevenly over its length, divide the chain into 4 equal sections and check with the gauge at the centre of each section.



If the maximum dimension is exceeded (222,5 mm +2% = 227 mm) [8.74 in +2%= 10.4 in], replace the pair of chains (contact your dealer).



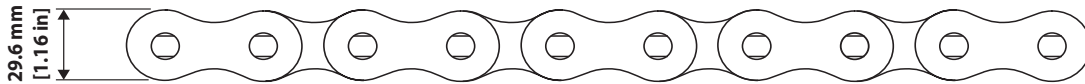


Side wear of plates

As for chain elongation, perform a check in the middle of each section using a calliper gauge.



If the minimum dimension is exceeded ($29.6 \text{ mm} - 2\% = 29 \text{ mm}$) [$1.16 \text{ in} - 2\% = 1.14 \text{ in}$], replace the pair of chains (contact your dealer).



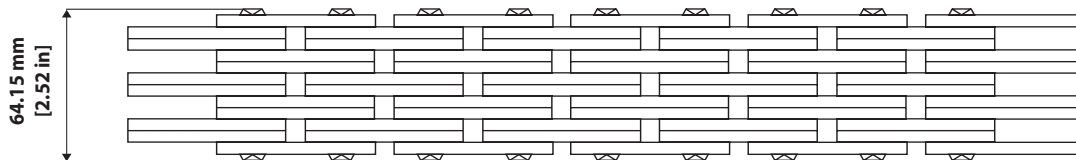
Extended pin wear

As for chain elongation, perform a check in the middle of each section using a calliper gauge.



If the minimum dimension is exceeded ($64.15 \text{ mm} - 2\% = 62.87 \text{ mm}$) [$2.52 \text{ in} - 2\% = 2 \text{ in}$], replace the pair of chains (contact your dealer).

- In addition to wear, the high pressures between the side of the plates and the pulleys may force out material, causing the articulations to seize. In this case, also replace the pair of chains.



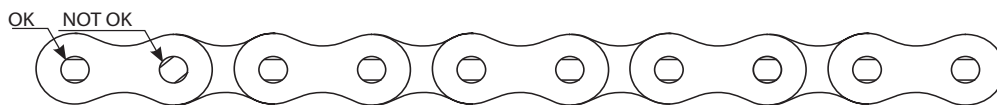
Alignment of extended pin flats

Check the chains over their entire length.

- High friction between the plates and the extended pins may cause the pins to turn in the outer plates and thus come out of their housing.



If the flats are not aligned in the longitudinal direction of the chain, replace the pair of chains (contact your dealer).



E10 - ENGINE AND ENGINE BRAKE VALVE CLEARANCE.

CHECK/ADJUST

Operation to be carried out the first time after 1000 hours of service, **periodically every 1000 hours of service.**



Adjust the valve clearance when the engine is cold (at least 30 minutes after stopping the engine, even if it was only operated for a brief period). Clean very dirty cylinder head covers before removal.

Risk of accident.

If not properly secured, a vehicle might accidentally be set in motion, knocking somebody down or trapping them or causing an accident and injuring you or others.

- Always prevent the vehicle from rolling away by applying the parking brake and, if necessary, by placing chocks under the wheels.

- Shift the transmission into neutral.

- Only turn the engine over using the rotation device provided for this purpose.

Removal/fitting of the cylinder head covers 1 (E10)

Removal

Remove engine ventilation hose 6 (E10) from the cylinder head cover.

Unscrew hexagon socket screw 3 (E10) from the cylinder head cover with sealing washers 4 (E10).

Remove cylinder head cover 2 (E10).

Installation

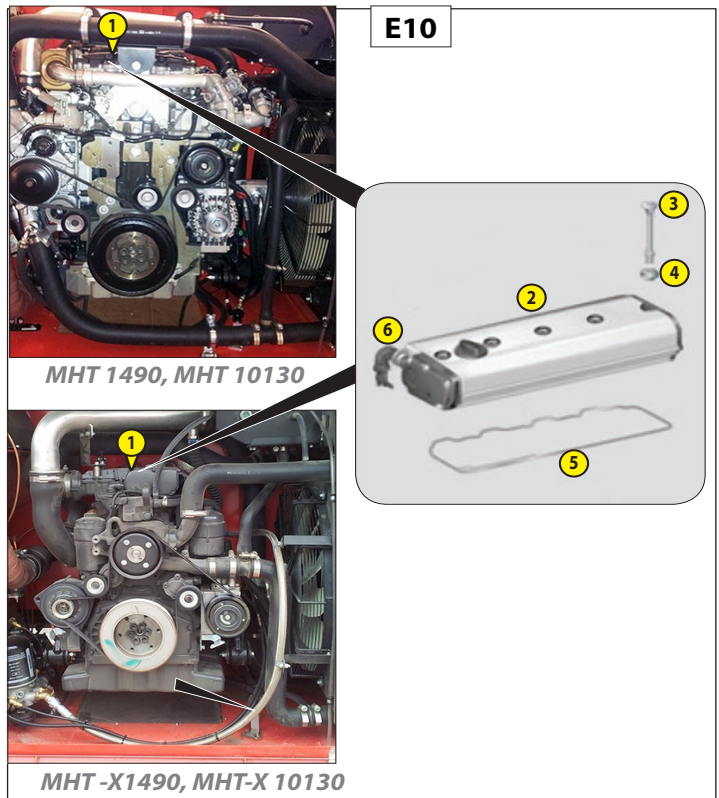
Clean the cylinder head and the cylinder head cover sealing surfaces.

Always replace the gasket between the cylinder head cover and the cylinder head.

Position the cylinder head cover.

Fit Allen bolts 3 (E10) with new sealing washers 4 (E10) and tighten.

Tightening torque: 30 Nm.



Layout of cylinders and valves ("1, 2, 3, 4" E10.1):

- = inlet valve
- = exhaust valve
- = flywheel end

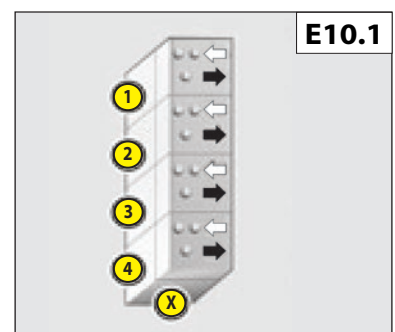
Checking and adjusting the valve clearance

Engine	Position of the drive shaft	Cylinders/valves to be adjusted			
		1	2	3	4
OM 924	Valve crossing cyl. 4	E/A	E	A	-
OM 934	Valve crossing cyl. 1	-	A	E	E/A

E – intake valve

A – exhaust valve

Adjust all valve clearances in 2 crankshaft positions.



Use the turning tool to turn the crankshaft until the 4th cylinder is at overlap TDC. (1st cylinder at ignition TDC). Then turn the 1st cylinder to overlap TDC (4th cylinder at ignition TDC).

Check and adjust the valves in accordance with the table above.

Measure the valve clearance between the rocker arm and valve stem (exhaust valve) or valve bridge (inlet valve) with a feeler gauge (arrow). It must be possible to pull the feeler gauge through with only a slight resistance.

Valve clearance:

MHT-X 1490-10130

Inlet valves	mm = 0.40 (±0.05)
Exhaust valve	mm = 0.60 (±0.05)

MHT 1490-10130

Inlet valves	mm = 0.30 (±0.05)
Exhaust valve	mm = 0.60 (±0.05)

Slacken counter nut 2 (E10.2) to adjust the valve clearance. Adjust the valve clearance by turning the adjustment screw 1 (E10.2). Tighten the counter nut again. Tightening torque: 25 Nm. Check the valve clearance again and readjust if necessary.

ENGINE BRAKE: CHECKING CONDITION AND SETTING (IF INSTALLED)

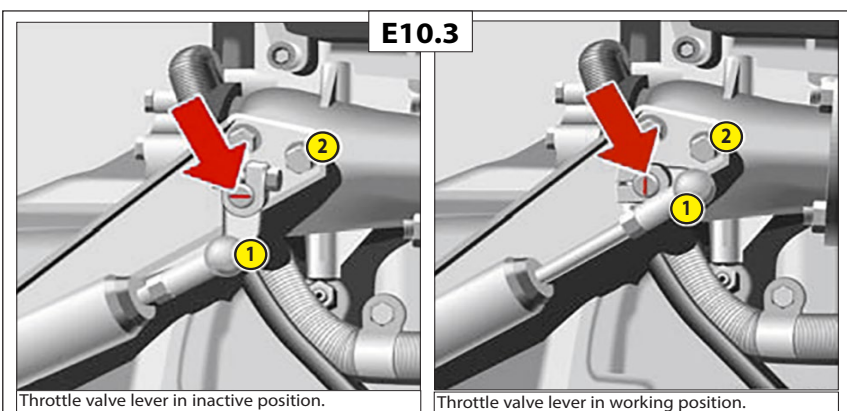
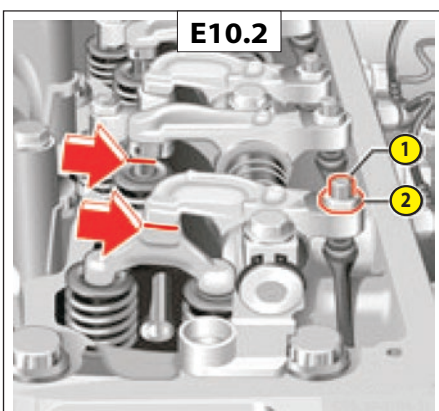
Checking condition

Remove the wire circlip from the engine cylinder ball socket. Prise off the ball socket from throttle valve lever 1 (E10.3) ball neck. Check the engine brake cylinder, ball neck and ball socket as well as the throttle valve shaft for wear. Check the throttle valve lever on the throttle valve shaft for firm seating and retighten the clamping screws if necessary. Lubricate the ball socket with the specified grease. Press the ball socket back onto the ball neck. Insert the wire circlip.

Checking adjustment

When the engine brake is applied, throttle valve lever 1 (E10.3) must make contact with retainer 2 (E10.3) when the throttle valve lever is in its active position (cylinder extended).

The throttle valve lever must also make contact with the retainer when the engine brake cylinder is in its inactive position (cylinder retracted); if this is the case the return spring pretension of the engine brake cylinder is adequate. Check the position of the throttle valve shaft: when the engine brake is inactive, the slot must be horizontal. On the other hand, in working position the slot must be in vertical position.



E11 - "DEF" PRE-FILTER

CLEAN

MHT 1490, MHT 10130



If the "DEF" tank cap is opened at high temperatures, ammonia vapours may escape. Ammonia vapours have a pungent odour and are particularly irritating to

- the skin
- the mucous membranes
- the eyes

The presence of such vapours can result in burning eyes, nose, and oral cavities, as well as coughing and tearing.

Avoid inhaling ammonia vapours.



"DEF" must not come into contact with skin, eyes or clothing.

- If the "DEF" comes into contact with your eyes or skin, rinse affected areas with clean water immediately.
- If the "DEF" is swallowed, immediately rinse your mouth out with a lot of clean water and drink plenty of water.
- Change clothing that is soiled with "DEF" immediately.
- If allergic reactions occur, consult a doctor immediately.

Keep the "DEF" out of the reach of children.



The "DEF" lines and all connected components are pressurised during operation and could be hot, even after the engine has been switched off. There is a risk of burns. When opening the pressurised system, there is a risk of scalding due to hot "DEF" spraying out.

- Wait at least 5 minutes after switching off the engine before starting to work on the exhaust gas after-treatment system.
- Open line connections and caps on system components slowly. Cover the area that you are disconnecting with a cloth.
- Wear suitable protective gloves, protective clothing and safety goggles.

If the "DEF" gets into the coolant circuit (even minute amounts), thermostats and temperature sensors will be damaged.

- Always keep the "DEF" completely separate from other service products.
- Do not use the same containers and fluid collecting pans for the "DEF" and other service products.
- Do not continue to use service products that contain traces of "DEF".

Individual components of the SCR system react very sensitively to even the slightest trace of impurities in the "DEF".

- Only use containers and fluid collecting pans that are clean and suitable for the "DEF".
- Do not continue to use "DEF" which contains traces of impurities.



Fire fighting measures The "DEF" is not flammable. In the event of a fire, NH₃ (ammonia) may be released.

This may result in a risk of poisoning. Measures to extinguish a fire must therefore be adapted to suit the surroundings.



Environmental note

Disposal of the "DEF":

- Even a small amount of spilled "DEF" can be an issue. The product is easily biodegradable and can be disposed of in the sewage system without issues by using a lot of water.
- Packaging that is contaminated with "DEF" residue must be treated in the same way as the "DEF".
- Packaging that is contaminated with "DEF" residue must be treated in the same way as the "DEF". Packaging should be emptied as thoroughly as possible, cleaned appropriately and then reused.

Cleaning the "DEF" prefilter

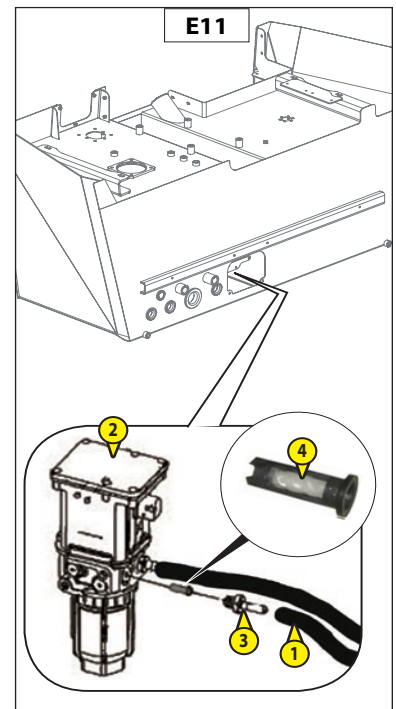
Clamp the feed 1 (E11) line on the pump/filter unit 2 (E11) using hose clamps.
 Unscrew the feed pipe fitting 3 (E11).
 Remove the "DEF" prefilter 4 (E11).

Clean the "DEF" 4 (E11) prefilter with a jet of compressed air and rinse with new "DEF" fluid.

Check its conditions and replace if significantly soiled or damaged (see: 3 - MAINTENANCE: FILTER ELEMENTS AND BELTS).

- Ensure no foreign body enters the pump-filter unit.
- The pump filter-unit must never be cleaned with cloths or similar tools.
- Do not allow fluids other than "DEF" entering the unit.

Reassemble prefilter 4 (E11) and feed pipe fitting 3 (E11), checking they are properly positioned.





THIS PAGE IS INTENTIONALLY BLANK

F - EVERY 2000 HOURS SERVICE OR 2 YEARS

Carry out the previous operations and the following ones.

F1 - "DEF" FILTER

REPLACE

MHT 1490, MHT 10130



If the "DEF" tank cap is opened at high temperatures, ammonia vapours may escape. Ammonia vapours have a pungent odour and are particularly irritating to

- the skin
- the mucous membranes
- the eyes

The presence of such vapours can result in burning eyes, nose, and oral cavities, as well as coughing and tearing. Avoid inhaling ammonia vapours.



"DEF" must not come into contact with skin, eyes or clothing.

- If the "DEF" comes into contact with your eyes or skin, rinse affected areas with clean water immediately.
- If the "DEF" is swallowed, immediately rinse your mouth out with a lot of clean water and drink plenty of water.
- Change clothing that is soiled with "DEF" immediately.
- If allergic reactions occur, consult a doctor immediately.

Keep the "DEF" out of the reach of children.



The "DEF" lines and all connected components are pressurised during operation and could be hot, even after the engine has been switched off. There is a risk of burns. When opening the pressurised system, there is a risk of scalding due to hot "DEF" spraying out.

- Wait at least 5 minutes after switching off the engine before starting to work on the exhaust gas after-treatment system.
- Open line connections and caps on system components slowly. Cover the area that you are disconnecting with a cloth.
- Wear suitable protective gloves, protective clothing and safety goggles.

If the "DEF" gets into the coolant circuit (even minute amounts), thermostats and temperature sensors will be damaged.

- Always keep the "DEF" completely separate from other service products.
- Do not use the same containers and fluid collecting pans for the "DEF" and other service products.
- Do not continue to use service products that contain traces of "DEF".

Individual components of the SCR system react very sensitively to even the slightest trace of impurities in the "DEF".

- Only use containers and fluid collecting pans that are clean and suitable for the "DEF".
- Do not continue to use "DEF" which contains traces of impurities.



Fire fighting measures

The "DEF" is not flammable. In the event of a fire, NH₃ (ammonia) may be released.

This may result in a risk of poisoning. Measures to extinguish a fire must therefore be adapted to suit the surroundings.



Environmental note

Disposal of the "DEF":

- Even a small amount of spilled "DEF" can be an issue. The product is easily biodegradable and can be disposed of in the sewage system without issues by using a lot of water.
- Packaging that is contaminated with "DEF" residue must be treated in the same way as the "DEF".
- Packaging that is contaminated with "DEF" residue must be treated in the same way as the "DEF". Packaging should be emptied as thoroughly as possible, cleaned appropriately and then reused.

Replacing the “DEF” filter

Clamp the feed 1 (F1) and return 2 (F1) lines on the pump/filter unit 3 (F1) using hose clamps.

Place a suitable receptacle under the pump/filter unit 3 (F1) to collect any “DEF” fluid that escapes.

Unscrew filter bowl 4 (F1) from the pump/filter unit 3 (F1).

Remove filter element 5 (F1).

Smear O-ring 6 (F1) on new filter element 5 (F1) thinly with silicone grease before assembly.

Insert new filter element 5 (F1) into filter bowl 4 (F1).

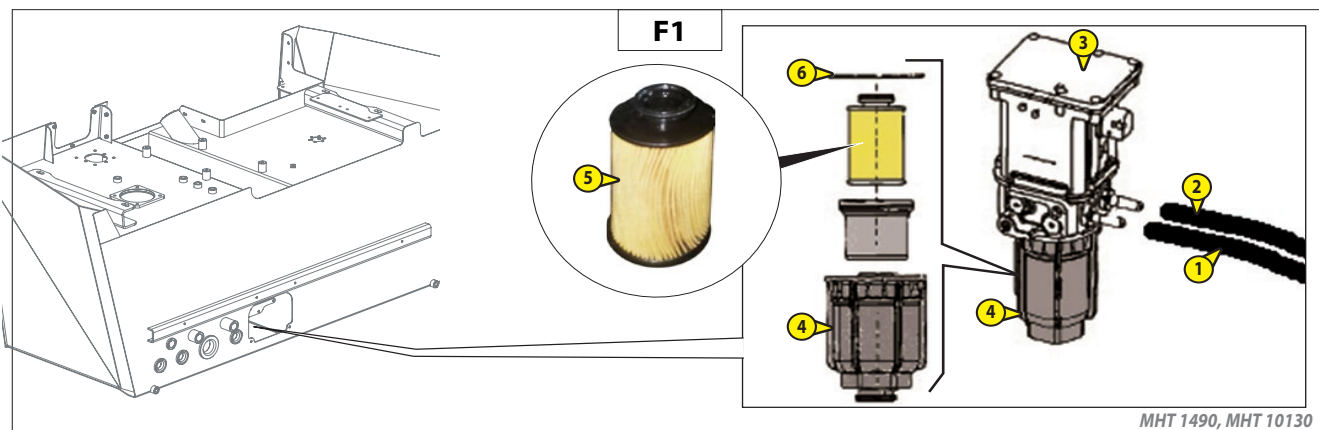
Use silicone grease as a lubricant.

Screw filter bowl 4 (F1) into pump module 3 (F1) and tighten.

Tightening torque: 32 Nm.



Only silicone grease is permissible as a lubricant. Use silicone grease very sparingly, otherwise damage to the exhaust gas after-treatment system could result. The system is self-bleeding and does not need to be bled manually.



F2 - TIGHTENING TORQUE OF THE WHEEL NUTS

CHECK

- Check the condition of the tyres, to detect cuts, protuberances, wear, etc.
- Check the tightening torque of the wheel nuts with a torque wrench.
 - Front wheels: 630 N.m ± 15%
 - Rear wheels: 630 N.m ± 15%



F3 – AIR CONDITIONING (OPTIONAL)

CLEAN - CHECK

CLEAN THE COILS OF THE CONDENSER AND EVAPORATOR (*)

CLEAN THE CONTAINER FOR THE CONDENSATE AND THE DRAINAGE VALVE (*)

RECOVERY OF THE COOLANT FOR CHANGING THE DEHYDRATOR FILTER (*)

FILLING WITH COOLANT AND CHECKING THE ADJUSTMENT OF THE THERMOSTAT AND PRESSURE SWITCHES (*)

NOTE: Do not forget to replace the sealing gasket of the cover on opening the evaporator unit.

(*): (CONTACT YOUR DEALER).



NEVER TRY TO CARRY OUT MAKESHIFT REPAIRS IN CASE OF FAULTS. TO RECHARGE A CIRCUIT, ALWAYS CONTACT THE DEALER WHO HAS THE SUITABLE SPARE PARTS, TECHNICAL KNOW-HOW AND THE NECESSARY TOOLS.



In case of inhalation, bring the victim out into the open air, supply oxygen or carry out the necessary artificial respiration and see a doctor.



In case of contact with the skin, rinse immediately with plenty of running water and remove contaminated clothing.



In case of contact with the eyes, flush eyes with plenty of water for 15 minutes and get medical attention.

- Never open the circuit, as this could cause leakage of coolant.
- The cooling circuit contains a gas which can result in danger in certain conditions. This gas, the coolant R-134a, is colourless, odourless and heavier than air.
- The compressor is equipped with a gauge to check the oil level. Never unscrew this gauge: this would discharge the circuit. Check the level only when changing the oil.



THIS PAGE IS INTENTIONALLY BLANK

G - EVERY 3000 HOURS SERVICE OR 3 YEARS

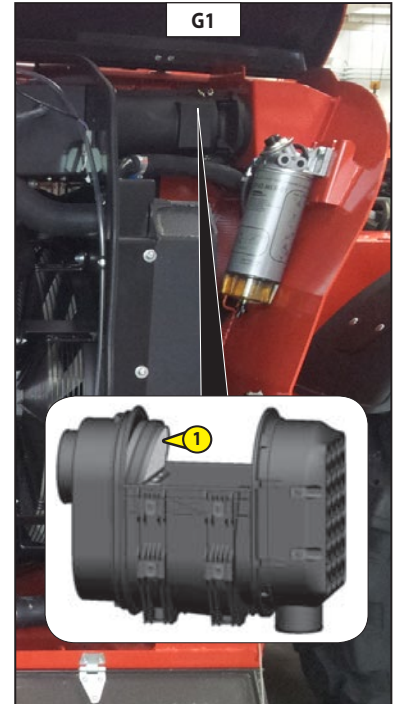
Carry out the previous operations and the following ones.

G1 - DRY AIR FILTER SAFETY CARTRIDGE

REPLACE

- To remove and refit the dry air filter, see: (3 - MAINTENANCE: "E6 – DRY AIR FILTER CARTRIDGE").
- Remove the safety cartridge "1" (fig.G1) of the dry air filter very carefully, to reduce leakage of dust to the minimum.
- Carefully clean the seat of the filter gaskets with a wet clean cloth that does not leave lint.
- Before the assembly, check the state of the new safety cartridge (see: 3 - MAINTENANCE: FILTER ELEMENTS AND BELTS).
- Insert the cartridge in the filter and position it by pressing on the edge of the filter, not in the center.

NOTE: The safety cartridge replacement frequency is purely indicative. It must be replaced with every three replacements of the dry air filter cartridge.



G2 - COOLANT AND SILICATE CARTRIDGE

REPLACE

These operations are to be carried out if necessary or every 2 years at the beginning of winter. Place the lift truck on level ground with the I.C. engine stopped and cold.



The I.C. 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.



Risk of injury

The cooling system is pressurised.

Hot coolant can escape under pressure when the cooling system is opened and scald your skin and eyes.

- Only open the cooling system at coolant temperatures below 90°C.
- Unscrew the cap slowly and release any excess pressure completely before opening the cap fully.
- Wear suitable protective gloves, protective clothing and safety goggles when handling coolant.



Risk of poisoning

There is a risk of poisoning if coolant is swallowed.

- Never swallow coolant.
- Never store coolant in containers normally used for beverages.
- Store coolant out of the reach of children.

Environmental note

Dispose of used coolant in accordance with current local regulations.

Draining coolant

Carry out operations on the cooling system only if the coolant temperature is below 50 °C.

Before proceeding with draining the coolant, cover the cables, piping, etc, present under the drain screw, and place a suitable sized container to hold the quantity of liquid to be drained.

Open the engine bonnet.

Open the cooling system cap G2/1 of the engine slowly, discharge the overpressure and then remove the cap.

Open the panel G2/2 under the drain plug G2/3.

Set a container under drain plug G2/3 on the radiator and drain plug G2/4 of the engine block and loosen them.

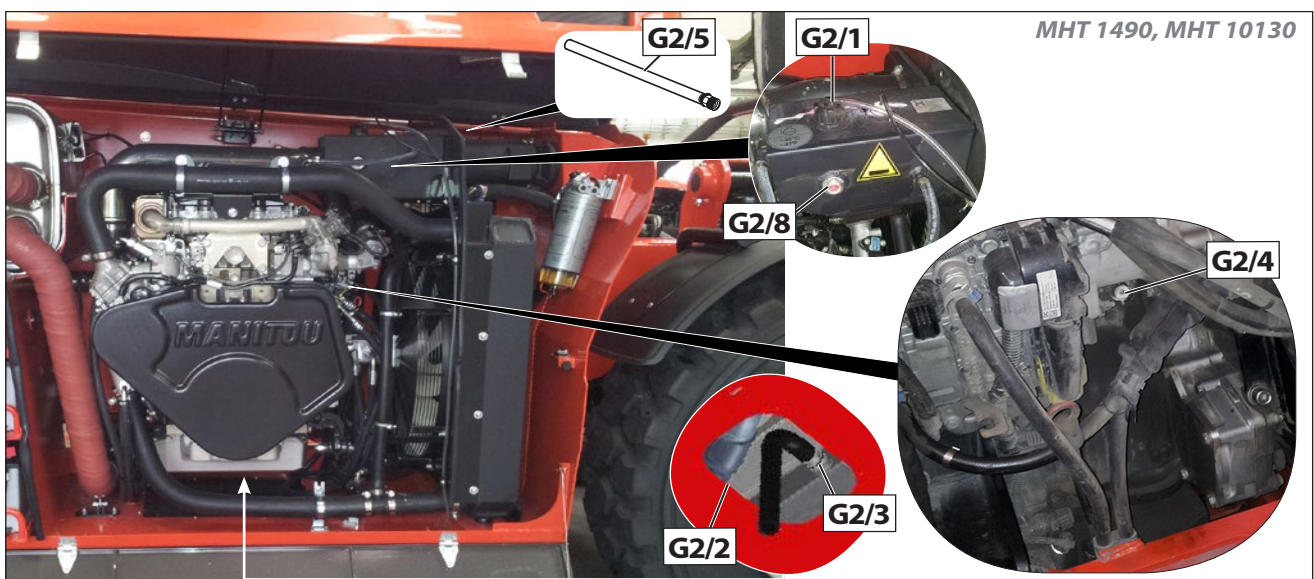
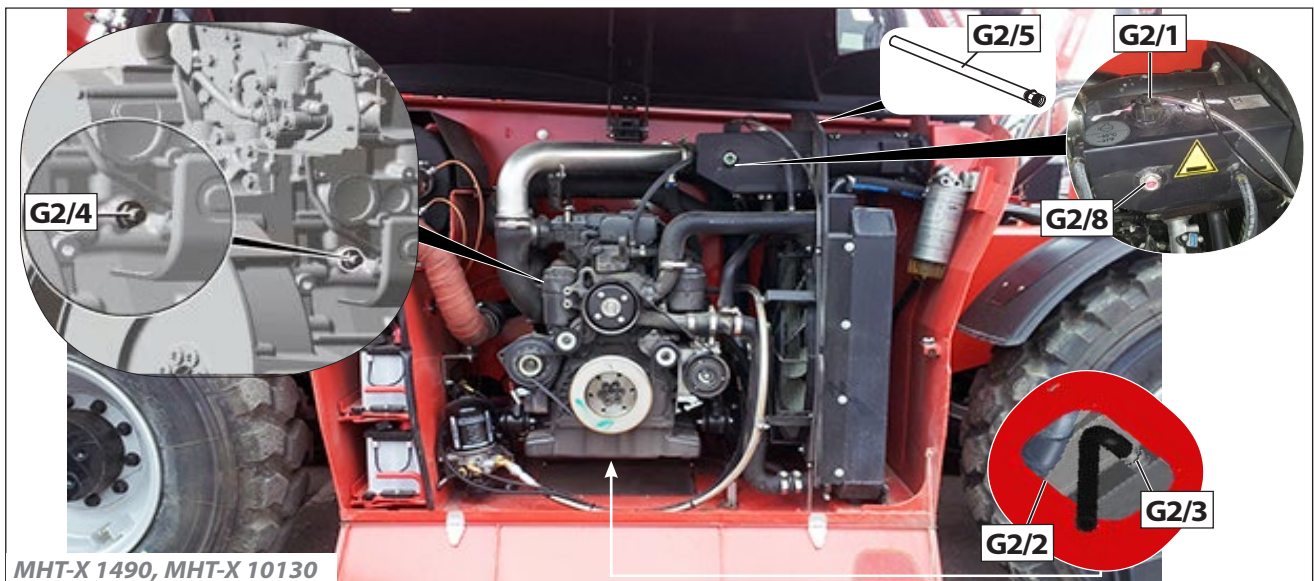
Take drain hose G2/5.

Place the end of the drain hose in the container and screw the hose fully to the drain connector G2/3.

Let the cooling circuit drain entirely while ensuring that the ports do not get clogged.

Check the condition of the hoses as well as the fastening devices and change the hoses if necessary.

Rinse the circuit with clean water and use a cleaning agent if necessary.



Replace the silicate cartridge

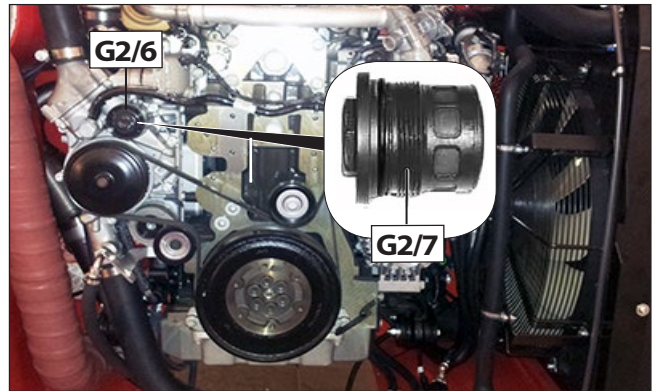
MHT 1490, MHT 10130



Clean the coolant from the sealing surface on the pump body, using a lint-free cloth.

Clean the coolant pump near the silicate cartridge G2/6.
Remove the silicate cartridge G2/7.

Assemble the new silicate cartridge (see: 3 - MAINTENANCE: FILTER ELEMENTS AND BELTS).
Screw in and tighten the silicate cartridge G2/7.
(Tightening torque: 50 Nm).



Do not grease the sealing ring of the new silicate cartridge.

Remove the silicate cartridge G2/7.

Assemble the new silicate cartridge (see: 3 - MAINTENANCE: FILTER ELEMENTS AND BELTS).

Screw in and tighten the silicate cartridge G2/7.
(Tightening torque: 50 Nm).



Do not grease the sealing ring of the new silicate cartridge.

Adding coolant

Remove, clean and refit drain hose G2/5.

Refit and tighten drain plug G2/3 and drain plug G2/4.

Slowly fill the circuit with the cooling liquid (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL) through the filler port G2/8.

Top up the cooling circuit level up to the centre of the indicator G2/10 via filler port G2/8.

Retighten the radiator filler plug G2/1.

Run the engine at idle for a few minutes.

Check for any possible leaks.

Close the panel G2/2.

Check the level and refill if necessary.

TABLE FREEZING POINT OF THE VARIOUS % VOLUMES OF ANTIFREEZE AND WATER		
Antifreeze fluid SHELL ANTIFREEZE	Water (distilled recommended)	Freezing temperature
25%	75%	-14 °C
35%	65%	-23 °C
40%	60%	-27 °C
50%	50%	-40°C Filling by manufacturer



THIS PAGE IS INTENTIONALLY BLANK

H - OCCASIONAL MAINTENANCE

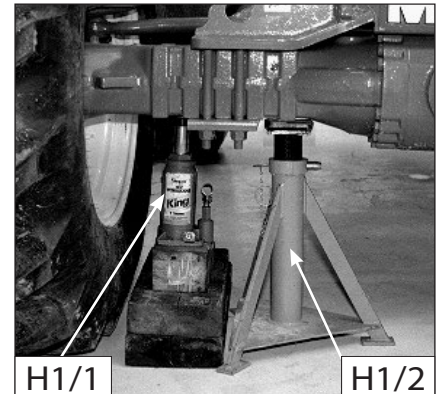
H1 - WHEEL

REPLACE



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

- Stop the lift truck, if possible on even and hard ground.
- Turn off the lift truck (See chapter : DRIVING INSTRUCTIONS in paragraph : 1 - OPERATING AND SAFETY INSTRUCTIONS).
- Operate the parking brake
- Turn on the emergency lights.
- Immobilise the lift truck in both directions on the axle opposite to the wheel to be changed.
- Unlock the nuts of the wheel to be changed.
- Place the jack under the flared axle tube, as near as possible to the wheel and adjust the jack (fig. H1/1).
- Lift the wheel until it comes off the ground and put in place the safety support under the axle (fig. H1/2).



For this operation, we advise you to use the hydraulic jack and the safety support.

- Completely unscrew the wheel nuts and remove them.
 - Free the wheel by reciprocating movements and roll it to the side.
 - Slip the new wheel on the wheel hub.
 - Refit the nuts by hand, if necessary grease them. - Remove the safety support and lower the lift truck with the jack.
 - Tighten the wheel nuts with a torque wrench.
- (See chapter: A - DAILY OR EVERY 10 HOURS SERVICE in paragraph : 3 - MAINTENANCE for tightening torque).

NOTE: As an OPTIONAL, an equipment kit for the tyres and an anti-puncture kit.

H2 - LIFT TRUCK

TOW



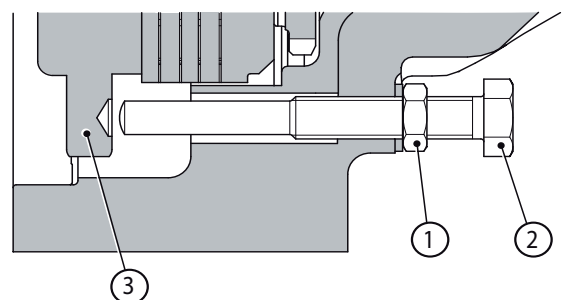
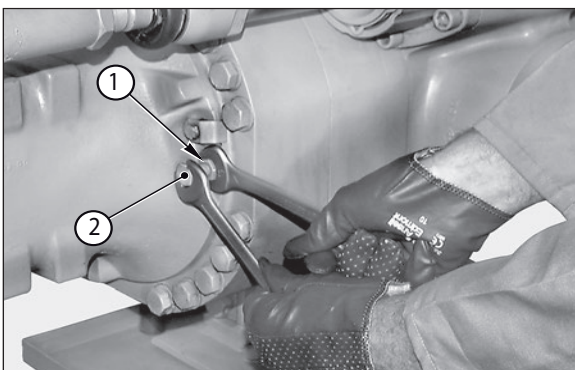
The forklift truck can be trailed at low speeds and for short distances.

Proceed as follows:

- Move the forward-reverse movement stalk switch in neutral (N).
- Deactivate the parking brake.
- Turn on the emergency lights.

Mechanical release of negative brake on front and rear axle:

- Using a spanner, alternately tighten the two screws "2" through 1/4 of a turn at a time to compress the Belleville washer
- slacken lock nuts "1" of manual mechanical release screws "2"; draw the nuts backwards by ± 8 mm.
- Tighten screw "1" so that it fits flush against disk-pusher "3".



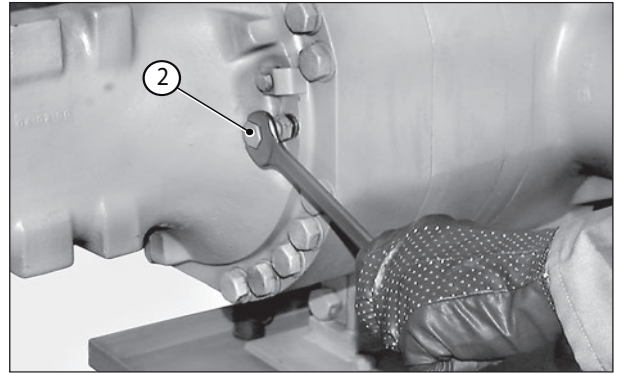


- Using a spanner, alternately tighten the two screws "2" through 1/4 of a turn at a time to compress the Belleville washer and release the braking disks.

Note: The travel necessary for release corresponds to 1 turn.

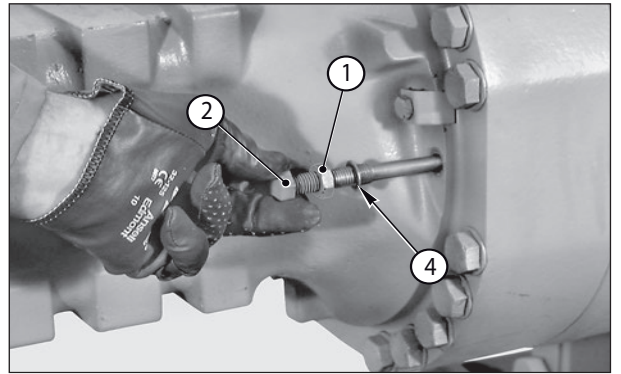


THE opposite screws must be tightened by turning them an equal number of turns.



Adjustments after every manual release

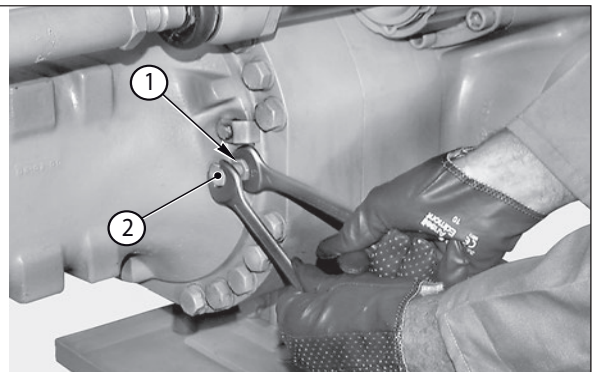
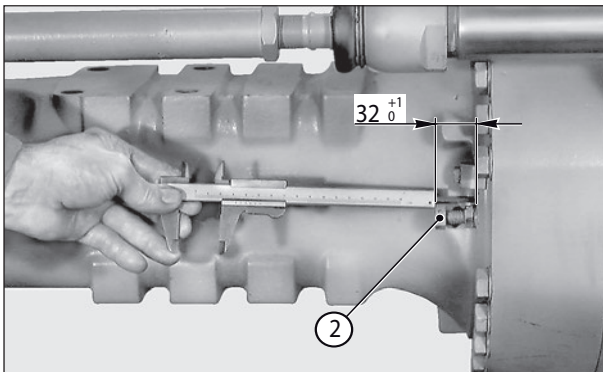
- Remove screws "2" complete with ring nuts "1" and gaskets "4".
- Replace gaskets "4", lubricate screws "2" with silicone grease and refit the complete screws "1-2-4"



- Adjust the projection of the screw heads with respect to the axle arm to a value of 34 mm.
- Block the position of screws "2" using the lock nuts "1".



Check again carefully to see if the screws project.



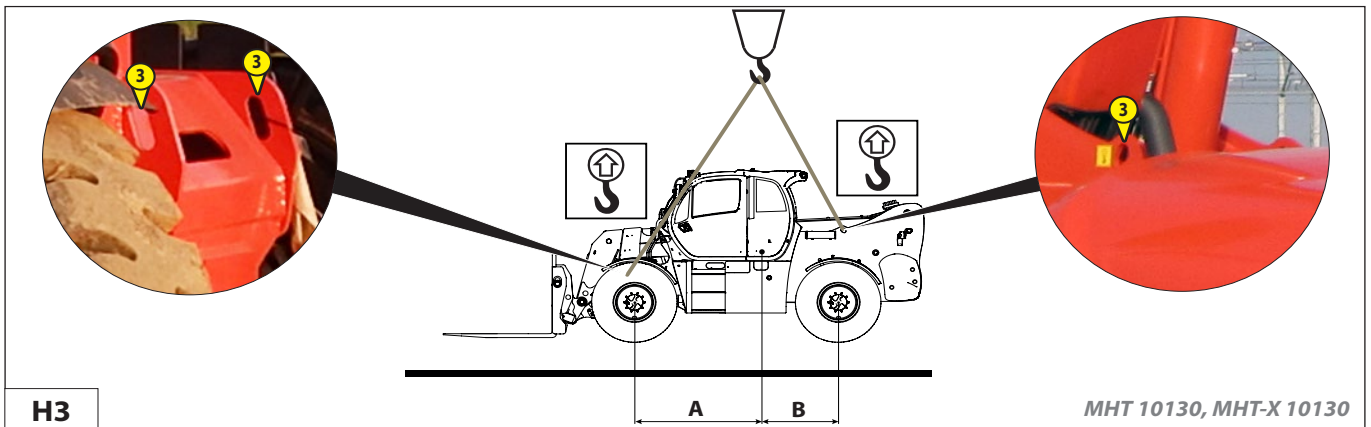
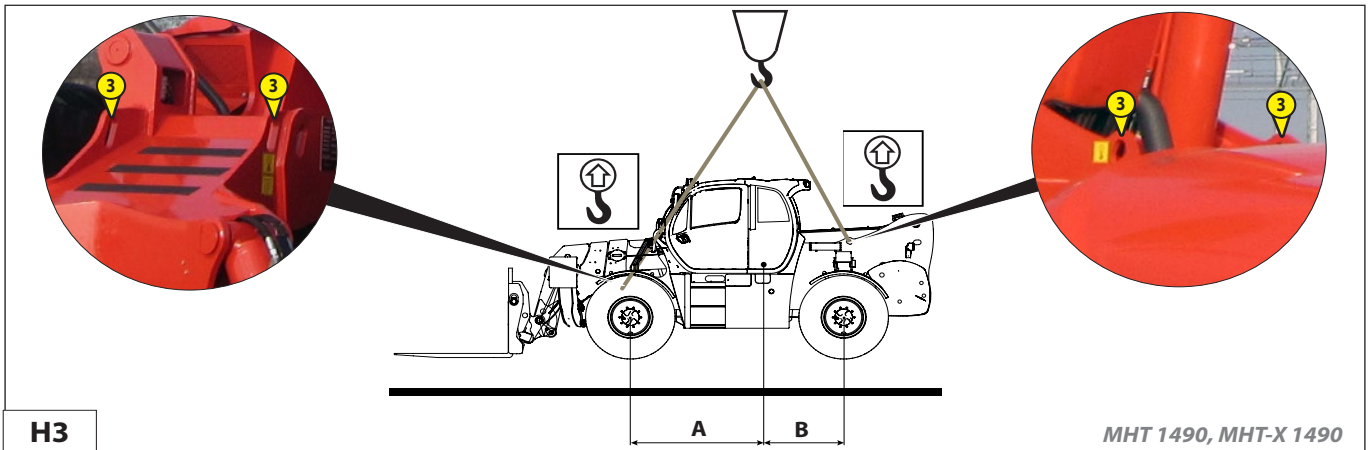
H3 - LIFT TRUCK

SLING

- Take into account the position of the lift truck gravity centre for lifting (H3):

- A = 2140 mm** **B = 1230 mm** (MHT 1490, MHT-X 1490)
- A = 2120 mm** **B = 1260 mm** (MHT 10130, MHT-X 10130)

- Place the hooks in the fastening points provided 3 (H3).
- Place the clamps 1 and 2 in the fastening points provided (H3).



H4 - LIFT TRUCK ON A PLATFORM

TRANSPORT

! Check that the safety instructions pertaining to the transport platform are properly followed before loading the forklift and check that the transport vehicle driver is informed of the size and weight of the forklift (see: 2 - DESCRIPTION: TECHNICAL FEATURES).

! Ensure that the size and load capacity of the platform are sufficient for transporting the lift truck. Check also the pressure on the contact surface allowable for the platform in connection with the lift truck.

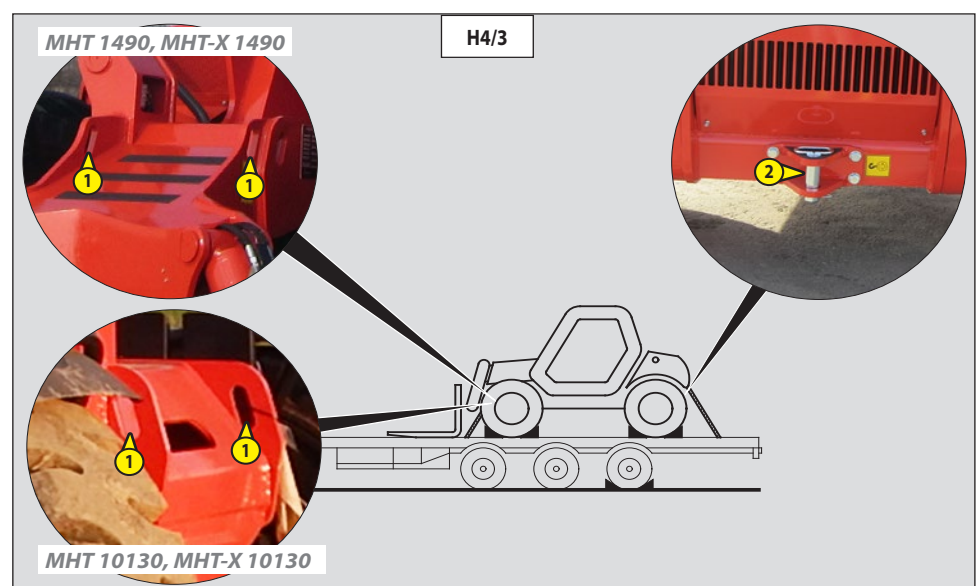
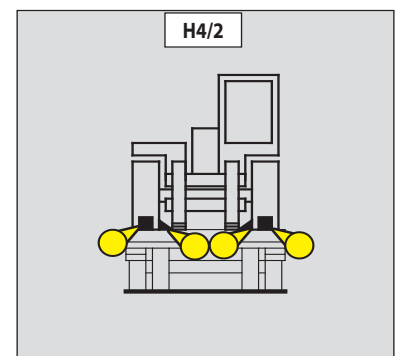
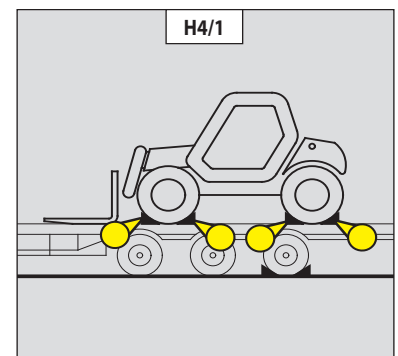
! For lift trucks equipped with a turbocharged engine, plug the drainage outlet to prevent the rotation of the turbo-shaft without lubrication when the convoy moves.

LOAD THE LIFT TRUCK

- Block the wheels of the platform.
- Fix the loading ramps so that you obtain an angle as little as possible to lift the lift truck.
- Load the lift truck parallel to the platform.
- Stop the lift truck (see: 1 - OPERATING AND SAFETY INSTRUCTIONS: DRIVING INSTRUCTIONS WITH AND WITHOUT LOAD).

SLING THE LIFT TRUCK

- Fix the chocks to the platform at the front and at the back of each tyre (H4/1).
- Fix the chocks to the platform on the inner side of each tyre (H4/2).
- Stow the lift truck on the platform with enough resisting ropes. At the front of the lift truck, on the fastening points 1 (H4/3) and on the rear of the tow hook 2 (H4/3).
- Tighten the ropes (H4/3).



H5 - FRONT LIGHTS

ADJUST

RECOMMENDATIONS FOR ADJUSTMENT

(as per standard ECE-76/756 76/761 ECE20)

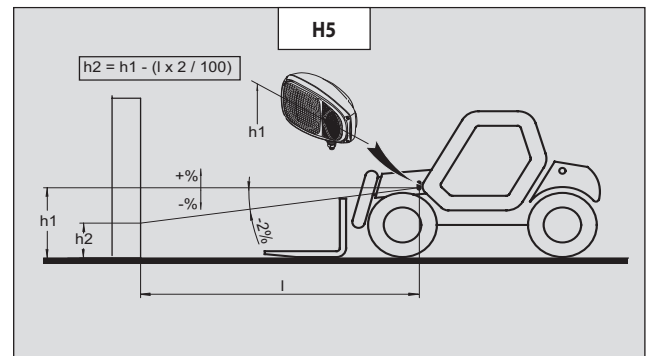
Set to - 2% of the dipped beam in relation to the horizontal line of the headlamp.

ADJUSTING PROCEDURE

- Place the lift truck unloaded and in the transport position, and perpendicular to a white wall on flat, level ground (G3).
- Check the tyre pressure (see: 2 – DESCRIPTION: TECHNICAL FEATURES).
- Put the gear selector in neutral and disengage the parking brake.

CALCULATION OF DIPPED BEAM HEIGHT (H2)

- h1 = Height of the dipped beam in relation to the ground.
- h2 = Height of the adjusted beam.
- l = Distance between the dipped beam and the white wall.



H6 - RADIO REMOTE CONTROL MAINTENANCE

Daily routine maintenance

Before starting to work:

- make sure that the battery housing and the battery contacts are always clean
- make sure that the gaskets, bellows and caps of the actuators (joysticks, selectors and pushbuttons) are intact, soft and elastic,
- make sure that the transmitting unit panel symbols can be easily recognised and replace the panel if necessary
- check that the three plates on the transmitting unit are readable and intact
- make sure that the mechanical operation of the STOP pushbutton is correct.

During normal operation:

- check the structural integrity of the transmitting unit
- make sure that materials that could endanger the transmitting unit usage and safety (such as concrete, sand, lime, dust) do not deposit on it.

After using the radio remote control:

- clean the transmitting unit: never use solvents or flammable/corrosive materials and do not use high-pressure water cleaners or steam cleaners
- store the transmitting unit in clean and dry areas.

Three-month routine maintenance

Every 3 months:

- remove dust or deposits of material from the receiving unit: never use solvents or flammable/corrosive materials to clean it, and do not use high-pressure water cleaners or steam cleaners
- check structural integrity of the receiving unit
- make sure that the wiring of the receiving unit is intact and connected
- make sure that the receiving unit panel symbols can be easily recognised and replace the panel if necessary
- check that the plates on the receiving unit are readable and intact.

Special maintenance



Any fault should be repaired by authorised personnel only (contact the support service of MANITOU).



Troubleshooting

When the radio remote control does not work:

- bring the transmitting unit close to the receiving unit to avoid radio interference and disturbances
- establish whether the problem lies with the radio remote control or with the machine. Therefore, before any inspection, try to control the machine from a control unit different from the radio remote control, if present. If the problem persists, it lies with the machine. If not, the problem may lie with the radio remote control. In such case, please refer to paragraph "Malfunction signalled by the transmitting unit".

Malfunction signalled by the transmitting unit (keypad)

Identify the radio remote control malfunction according to the light signals on the units. If the problem persists after the suggested solution has been carried out, contact the support service of MANITOU.

Signals	Possible reason	Solutions
The green LED does not switch on when the START pushbutton is pressed, even though both the battery and the S-KEY are inserted.	The battery is flat.	Replace the battery with a charged one.
The green LED blinks fast.	No radio link.	Take the transmitting unit close to the receiving unit.
The red LED switches on for 2 seconds and then the unit switches off.	The transmitting unit does not work properly.	Contact the support service of MANITOU.
The red LED blinks once during start up.	The STOP pushbutton is locked or damaged.	Unlock the STOP pushbutton. If this signal persists, contact the support service of MANITOU.
The red LED blinks twice during start up.	At least one of the actuators corresponding to commands is activated or damaged.	Take the actuators to the rest position. If this signal persists, contact the support service of MANITOU.
The red LED blinks three times during start up.	The battery is flat.	Replace the battery with a charged one.
The red LED blinks four times during start up.	At least one of the actuators corresponding to commands is activated or damaged.	Take the actuators to the rest position. If this signal persists, contact the support service of MANITOU.

Malfunction signalled by the receiving unit (keypad)

Identify the radio remote control malfunction according to the light signals on the units. If the problem persists after the suggested solution has been carried out, contact the support service of MANITOU.

Signals	Possible reason	Solutions
The POWER LED is off.	The receiving unit is switched off.	Make sure that fuse F2 is intact. Correctly plug in the connecting plug and power on the receiving unit.
The POWER LED is on.	No radio link.	Take the transmitting unit close to the receiving unit.
The ALARM LED blinks once.	Error on the STOP outputs.	Make sure that fuses F3 and F4 are intact. Correctly plug in the connecting plug. Make sure that the STOP outputs are wired correctly.
The ALARM LED blinks twice.	Error on the SAFETY outputs.	Make sure that fuses F1 and F5 are intact. Correctly plug in the connecting plug. Make sure that the SAFETY outputs are wired correctly.
The ALARM LED blinks three times.	Error on the outputs corresponding to direction commands.	Contact the support service of the machine manufacturer. Make sure that the outputs of direction commands are wired correctly.
The ALARM LED is on.	The receiving unit does not work correctly.	Contact the support service of MANITOU.
The RUN LED blinks.	The receiving unit does not send commands in the CAN network.	Contact the support service of MANITOU.
The ERR LED blinks.	CAN communication error.	Contact the support service of MANITOU.





4 - OPTIONAL ATTACHMENTS FOR USE WITH THE RANGE





INDEX

4 - OPTIONAL ATTACHMENTS FOR USE WITH THE RANGE

<i>INTRODUCTION</i>	5
<i>ATTACHMENT CONNECTIONS MANOEUVRES</i>	6
<i>ATTACHMENT CHARACTERISTICS</i>	8
<i>PROTECTION DEVICES FOR ATTACHMENTS</i>	8





INTRODUCTION

- Your lift truck must be provided with an interchangeable equipment. This interchangeable equipment is called ATTACHMENT.
- A wide range of attachments specifically designed to fit your lift truck and guaranteed by MANITOU is available.



Only attachments approved by MANITOU can be used with the lift truck.

The manufacturer will have no liability in case of modifications or adaptations of the attachments without his knowledge.

- The attachments are supplied with a load chart relating to your lift truck. The user manual and the load chart must be kept on the lift truck. The use of standard attachments is subject to the instructions contained in this manual.



The maximum loads are defined by the capacity of the lift truck taking into account the weight and the centre of gravity of the attachment.

If the capacity of the attachment is below the capacity of the lift truck, never exceed this limit.

- Some specific uses require the attachment to be adapted as it may not be included in the optional catalogue. Other solutions are available: for more information, please contact your dealer.



Due to their size, when the boom is lowered and retracted some attachments may interfere with the front tyres and damage them if the carriage is tilted downward.

IN ORDER TO AVOID THIS RISK, EXTEND THE BOOM FAR ENOUGH TO ELIMINATE ANY INTERFERENCE (THE DISTANCE WILL DEPEND ON THE TRUCK AND THE ATTACHMENT).

SUSPENDED LOAD



Suspended loads MUST be handled only with lift trucks designed for such purpose

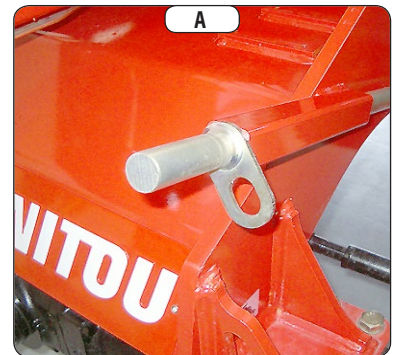
(see: 1 - OPERATING AND SAFETY OBLIGATIONS: LOAD HANDLING INSTRUCTIONS: H - TAKING UP AND LAYING A SUSPENDED LOAD).

ATTACHMENT CONNECTION MANOEUVRES

1 - ATTACHMENT WITHOUT HYDRAULIC CIRCUIT WITH MANUAL LOCK

ENGAGING THE ATTACHMENT

- Check that the attachment is in a position which simplifies the connection to the carriage. If it is badly positioned, take all the necessary precautions to move it safely.
- Check that the locking pin is engaged in the support (fig. A).
- Place the lift truck with the boom lowered in front of and parallel to the attachment and tilt the carriage forward (fig. B).
- Take the carriage under the connection pipe of the attachment, slightly raise the boom and tilt the carriage back in order to position the attachment (fig. C).
- Raise the accessory off the ground for easier engagement.



MANUAL LOCKING

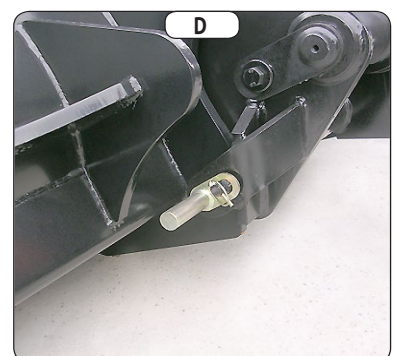
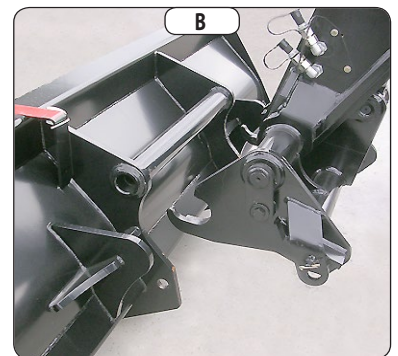
- Take the locking pin from the support (fig. A) and lock the attachment in place (fig. D). Do not forget to fit on the split pin.

MANUAL RELEASE

- Follow the MANUAL LOCKING procedure in reverse order, taking care to replace the locking pin in its support (fig. A).

LAYING THE ATTACHMENT

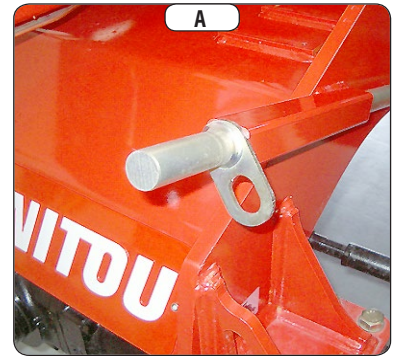
- Follow the ENGAGING THE ATTACHMENT procedure in reverse order, taking care to lay the attachment flat on the ground and in closed position.



2 - HYDRAULIC ATTACHMENT AND MANUAL LOCK

ENGAGING THE ATTACHMENT

- Check that the attachment is in a position which simplifies the connection to the carriage. If it is badly positioned, take all the necessary precautions to move it safely.
- Check that the locking pin is engaged in the support (fig. A).
- Place the lift truck with the boom lowered in front of and parallel to the attachment and tilt the carriage forward (fig. B).
- Take the carriage under the connection pipe of the attachment, slightly raise the boom and tilt the carriage back in order to position the attachment (fig. C).
- Raise the accessory off the ground for easier engagement.

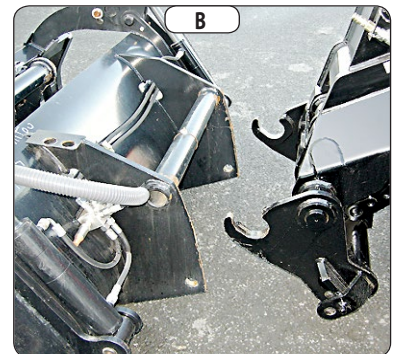


MANUAL LOCKING AND CONNECTION OF THE ATTACHMENT



Check the quick couplings for cleanliness and protect the unused orifices with the caps provided.

- Take the locking pin from the support (fig. A) and lock the attachment in place (fig. D). Do not forget to fit on the split pin.
- Discharge the pressure from the hydraulic circuit of the attachment by giving 4/5 impulses, forwards and backwards, on button 1 (fig. E) of the distributor lever.
- Connect the quick couplings, respecting the logic of the hydraulic movements of the attachment.

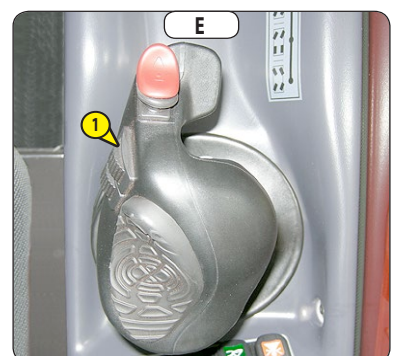
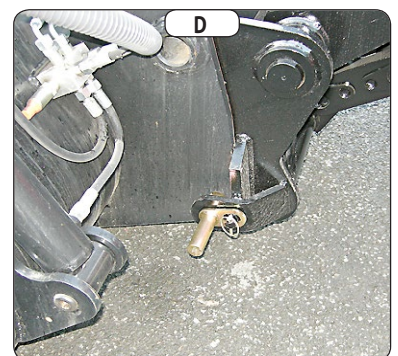
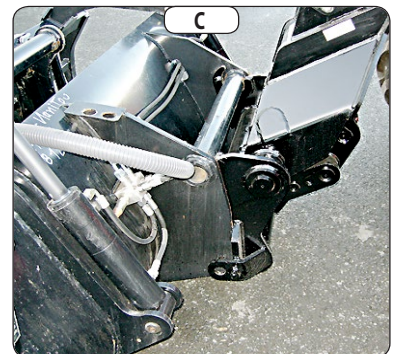


MANUAL RELEASE AND DISCONNECTION OF THE ATTACHMENT

- Follow the MANUAL LOCKING AND CONNECTION OF THE ATTACHMENT procedure in reverse order, taking care to replace the locking pin in its support (fig. A).

LAYING THE ATTACHMENT

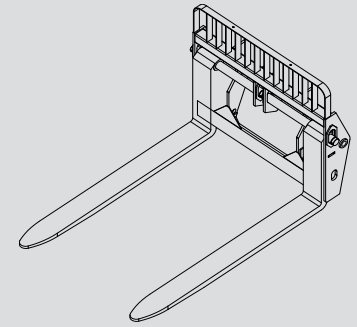
- Follow the ENGAGING THE ATTACHMENT procedure in reverse order, taking care to lay the attachment flat on the ground and in closed position.



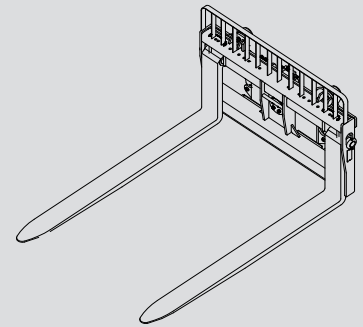
ATTACHMENT CHARACTERISTICS

FORK CARRIAGES

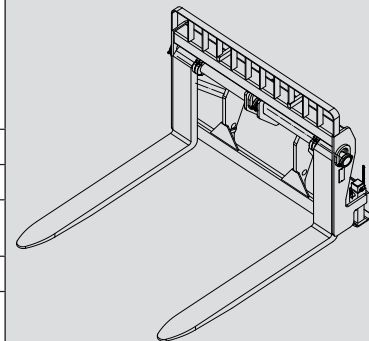
FLOATING FORKS CARRIAGE			
<i>MHT 1490 / MHT-X 1490</i>			
	TFF L1425	TFF L1425	TFF L1425
REFERENCE	939800	939345	939346
Rated capacity	9000 kg @ 600 mm 19841lb @ 23.6 in	9000 kg @ 600 mm 19841lb @ 23.6 in	9000 kg @ 600 mm 19841lb @ 23.6 in
Width	1425 mm - 56.1 in	1425 mm - 56.1 in	1425 mm - 56.1 in
Fork (Section)	200x60x1200 mm 7.8x2.3x47.2 in	200x60x1500 mm 7.8x2.3x59 in	200x60x2000 mm 7.8x2.3x78.7 in
Weight	665 kg - 1466 lb	730 kg - 1609 lb	820 kg - 1807 lb



FLOATING FORKS CARRIAGE			
<i>MHT 1490 / MHT-X 1490</i>			
	TFF CN 10		
REFERENCE	53012760		
Rated capacity	9000 kg @ 600 mm 19841lb @ 23.6 in		
Side Shift	2x200 mm - 2x7.8 in		
Width	1750 mm - 68.8 in		
Fork (Section)	200x60x2400 mm 7.8x2.3x94.4 in		
Weight	1250 kg - 2755 lb		

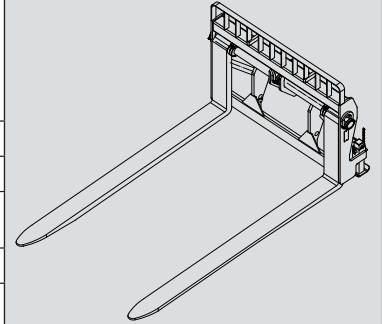


FLOATING FORKS CARRIAGE			
<i>MHT 10130 / MHT-X 10130</i>			
	TFF L1750	TFF L1750	TFF L1425
REFERENCE	53005668	939200	939201
Rated capacity	13000 kg @ 600 mm 28660 @ 23.6 in	13000 kg @ 600 mm 28660 @ 23.6 in	13000 kg @ 600 mm 28660 @ 23.6 in
Width	1750 mm - 68.8 in	1750 mm - 68.8 in	1750 mm - 68.8 in
Fork (Section)	200x70x1200 mm 7.8x2.7x47.2 in	200x70x1500 mm 7.8x2.7x59 in	200x70x1800 mm 7.8x2.7x78.7 in
Weight	974 kg - 2147 lb	1020 kg - 2248 lb	1105 kg - 2436 lb

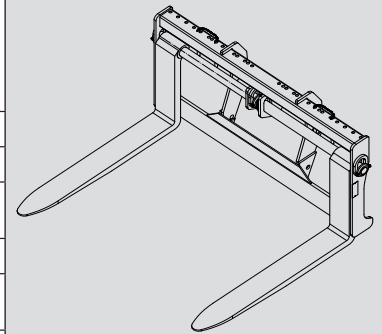




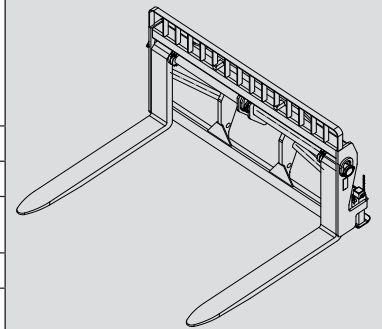
FLOATING FORKS CARRIAGE			
<i>MHT 10130 / MHT-X 10130</i>			
	TFF L1425		
REFERENCE	939202		
Rated capacity	13000 kg @ 600 mm 28660 @ 23.6 in		
Width	1425 mm - 56.1 in		
Fork (Section)	200x70x2400 mm 7.8x2.7x94.4 in		
Weight	1180 kg - 2601 lb		



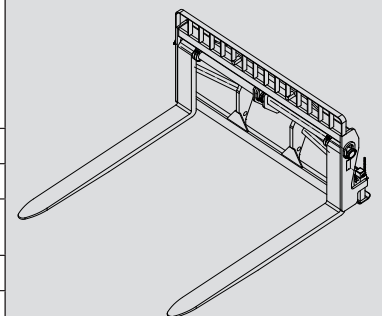
FLOATING FORKS CARRIAGE			
<i>MHT 1490 / MHT-X 1490</i>			
	TFF L2000	TFF L2000	TFF L2000
REFERENCE	939347	939348	939349
Rated capacity	9000 kg @ 600 mm 19841lb @ 23.6 in	9000 kg @ 600 mm 19841lb @ 23.6 in	9000 kg @ 600 mm 19841lb @ 23.6 in
Width	2000 mm - 78.7 in	2000 mm - 78.7 in	2000 mm - 78.7 in
Fork (Section)	200x60x1200 mm 7.8x2.3x47.2 in	200x60x1500 mm 7.8x2.3x59 in	200x60x2000 mm 7.8x2.3x78.7 in
Weight	745 kg - 1642 lb	770 kg - 1697 lb	885 kg - 1951 lb



FLOATING FORKS CARRIAGE			
<i>MHT 10130 / MHT-X 10130</i>			
	TFF L2500	TFF L2500	TFF L2500
REFERENCE	53009230	939203	939204
Rated capacity	13000 kg @ 600 mm 28660 @ 23.6 in	13000 kg @ 600 mm 28660 @ 23.6 in	13000 kg @ 600 mm 28660 @ 23.6 in
Width	2500 mm - 98.4 in	2500 mm - 98.4 in	2500 mm - 98.4 in
Fork (Section)	200x70x1200 mm 7.8x2.7x47.2 in	200x70x1500 mm 7.8x2.7x59 in	200x70x1800 mm 7.8x2.7x70.8 in
Weight	1180 kg - 2601 lb	1240 kg - 2733 lb	1300 kg - 2866 lb



FLOATING FORKS CARRIAGE			
<i>MHT 10130 / MHT-X 10130</i>			
	TFF L2500		
REFERENCE	939205		
Rated capacity	13000 kg @ 600 mm 28660 @ 23.6 in		
Width	2500 mm - 98.4 in		
Fork (Section)	200x70x2400 mm 7.8x2.7x94.4 in		
Weight	1350 kg - 2976 lb		

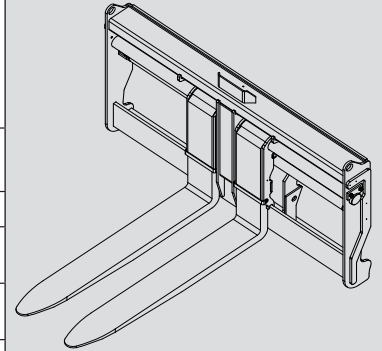




HD FORK POSITIONERS

MHT 1490 / MHT-X 1490

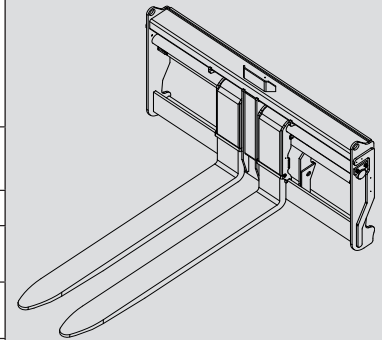
	TFF + Positioner 9t 2000mm	TFF + Positioner 9t 2000mm	
REFERENCE	939350	939351	
Rated capacity	9000 kg @ 600 mm 19841lb @ 23.6 in	9000 kg @ 600 mm 19841lb @ 23.6 in	
Width	2000 mm - 78.7 in	2000 mm - 78.7 in	
Fork (Section)	200x60x1200 mm 7.8x2.3x47.2 in	200x60x1500 mm 7.8x2.3x59 in	
Weight	840 kg - 1851 lb	880 kg - 1940 lb	



HD FORK POSITIONERS

MHT 1490 / MHT-X 1490

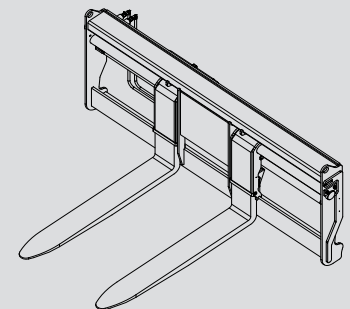
	TFF + Positioner 9t 2000mm	TFF + Positioner 9t 2000mm	
REFERENCE	939054	53009730	
Rated capacity	9000 kg @ 600 mm 19841lb @ 23.6 in	9000 kg @ 600 mm 19841lb @ 23.6 in	
Width	2000 mm - 78.7 in	2000 mm - 78.7 in	
Fork (Section)	200x60x1500 mm 7.8x2.3x59 in	200x60x2000 mm 7.8x2.3x78.7 in	
Weight	920 kg - 2028 lb	985 kg - 2171 lb	



HD FORK POSITIONERS

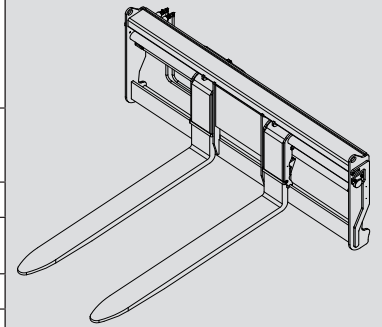
MHT 1490 / MHT-X 1490

	TFF + Positioner 9t 2500mm	TFF + Positioner 9t 2500mm	TFF + Positioner 9t 2500mm
REFERENCE	939355	939356	939216
Rated capacity	9000 kg @ 600 mm 19841lb @ 23.6 in	9000 kg @ 600 mm 19841lb @ 23.6 in	9000 kg @ 600 mm 19841lb @ 23.6 in
Width	2500 mm - 98.4 in	2500 mm - 98.4 in	2500 mm - 98.4 in
Fork (Section)	200x60x1200 mm 7.8x2.3x47.2 in	200x60x1500 mm 7.8x2.3x59 in	200x60x1800 mm 7.8x2.3x70.8 in
Weight	925 kg - 2039 lb	955 kg - 2105 lb	1000 kg - 2204 lb

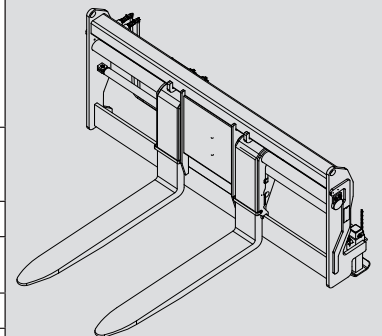




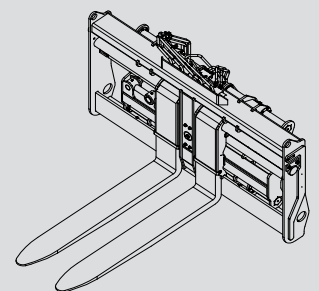
HD FORK POSITIONERS			
<i>MHT 1490 / MHT-X 1490</i>			
	TFF + Positioner 9t 2500mm		
REFERENCE	53006760		
Rated capacity	9000 kg @ 600 mm 19841lb @ 23.6 in		
Width	2500 mm - 98.4 in		
Fork (Section)	200x60x1800 mm 7.8x2.3x70.8 in		
Weight	1090 kg - 2403 lb		



HD FORK POSITIONERS			
<i>MHT 10130 / MHT-X 10130</i>			
	TFF + Positioner 13t 2500mm	TFF + Positioner 13t 2500mm	TFF + Positioner 13t 2500mm
REFERENCE	939219	939220	53008986
Rated capacity	13000 kg @ 600 mm 28660 @ 23.6 in	13000 kg @ 600 mm 28660 @ 23.6 in	13000 kg @ 600 mm 28660 @ 23.6 in
Width	2500 mm - 98.4 in	2500 mm - 98.4 in	2500 mm - 98.4 in
Fork (Section)	200x70x1500 mm 7.8x2.7x59 in	200x70x1800 mm 7.8x2.7x70.8 in	200x70x2400 mm 7.8x2.7x94.4 in
Weight	1250 kg - 2755 lb	1340 kg - 2954 lb	1420 kg - 3130 lb



HD FORK POSITIONERS			
<i>MHT 1490 / MHT-X 1490</i>			
	TFF + Positioner + Side Shift 9t 2000mm	TFF + Positioner + Side Shift 9t 2000mm	TFF + Positioner + Side Shift 9t 2000mm
REFERENCE	939552	939055	939353
Rated capacity	9000 kg @ 600 mm 19841lb @ 23.6 in	9000 kg @ 600 mm 19841lb @ 23.6 in	9000 kg @ 600 mm 19841lb @ 23.6 in
Side Shift	2x200 mm - 2x7.8 in	2x200 mm - 2x7.8 in	2x200 mm - 2x7.8 in
Width	2000 mm - 78.7 in	2000 mm - 78.7 in	2000 mm - 78.7 in
Fork (Section)	200x60x1200 mm 7.8x2.3x47.2 in	200x60x1500 mm 7.8x2.3x59 in	200x60x1800 mm 7.8x2.3x70.8 in
Weight	1090 kg	1120 kg	1176 kg

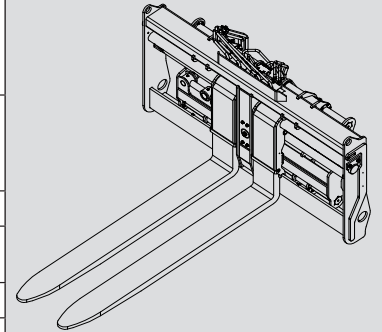




HD FORK POSITIONERS

MHT 1490 / MHT-X 1490

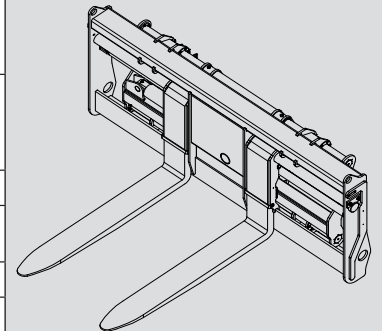
	TFF + Positioner + Side Shift 9t 2000mm		
REFERENCE	939554		
Rated capacity	9000 kg @ 600 mm 19841lb @ 23.6 in		
Side Shift	2x200 mm - 2x7.8 in		
Width	2500 mm - 98.4 in		
Fork (Section)	200x60x2000 mm 7.8x2.3x78.7 in		
Weight	1240 kg - 2733 lb		



HD FORK POSITIONERS

MHT 1490 / MHT-X 1490

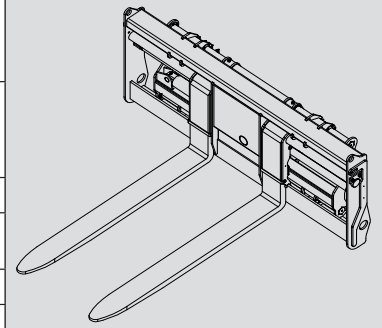
	TFF + Positioner + Side Shift 9t 2500mm	TFF + Positioner + Side Shift 9t 2500mm	TFF + Positioner + Side Shift 9t 2500mm
REFERENCE	939357	53004234	939358
Rated capacity	9000 kg @ 600 mm 19841lb @ 23.6 in	9000 kg @ 600 mm 19841lb @ 23.6 in	9000 kg @ 600 mm 19841lb @ 23.6 in
Side Shift	2x200 mm - 2x7.8 in	2x200 mm - 2x7.8 in	2x200 mm - 2x7.8 in
Width	2500 mm - 98.4 in	2500 mm - 98.4 in	2500 mm - 98.4 in
Fork (Section)	200x60x1200 mm 7.8x2.3x47.2 in	200x60x1500 mm 7.8x2.3x59 in	200x60x1800 mm 7.8x2.3x70.8 in
Weight	1230 kg - 2711 lb	1255 kg - 2766 lb	1310 kg - 2888 lb



HD FORK POSITIONERS

MHT 1490 / MHT-X 1490

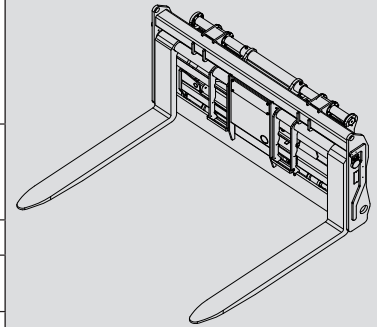
	TFF + Positioner + Side Shift 9t 2500mm		
REFERENCE	939359		
Rated capacity	9000 kg @ 600 mm 19841lb @ 23.6 in		
Side Shift	2x200 mm - 2x7.8 in		
Width	2500 mm - 98.4 in		
Fork (Section)	200x60x2000 mm 7.8x2.3x78.7 in		
Weight	1370 kg - 3020 lb		





HD FORK POSITIONERS

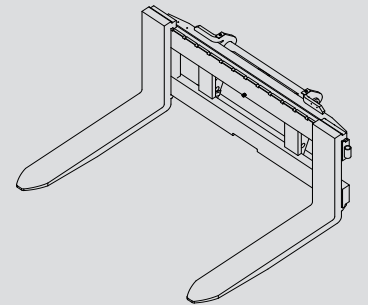
MHT 10130 / MHT-X 10130



	TFF + Positioner + Side Shift 13t 2500mm	TFF + Positioner + Side Shift 13t 2500mm	TFF + Positioner + Side Shift 13t 2500mm
REFERENCE	939221	939222	53008727
Rated capacity	13000 kg @ 600 mm 28660 @ 23.6 in	13000 kg @ 600 mm 28660 @ 23.6 in	13000 kg @ 600 mm 28660 @ 23.6 in
Side Shift	2x200 mm - 2x7.8 in	2x200 mm - 2x7.8 in	2x200 mm - 2x7.8 in
Width	2500 mm - 98.4 in	2500 mm - 98.4 in	2500 mm - 98.4 in
Fork (Section)	200x70x1500 mm 7.8x2.7x59 in	200x70x1800 mm 7.8x2.7x70.8 in	200x70x2400 mm 7.8x2.7x94.4 in
Weight	1765 kg - 3891 lb	1835 kg - 4045 lb	1935 kg - 4265 lb

TILTING FORKS CARRIAGE

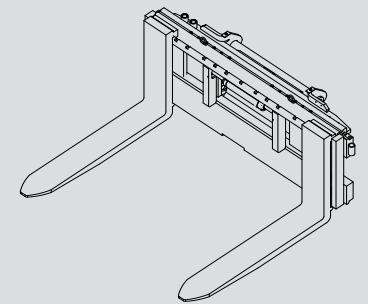
MHT 1490 / MHT-X 1490



	PFB L1750	PFB L2000	
REFERENCE	939056	939058	
Rated capacity	9000 kg @ 600 mm 19841lb @ 23.6 in	9000 kg @ 600 mm 19841lb @ 23.6 in	
Width	1750 mm - 68.8 in	2000 mm - 78.7 in	
Fork (Section)	200x60x1200 mm 7.8x2.3x47.2 in	200x60x1200 mm 7.8x2.3x47.2 in	
Weight	780 kg - 1719 lb	822 kg - 1812 lb	

TILTING FORKS CARRIAGE

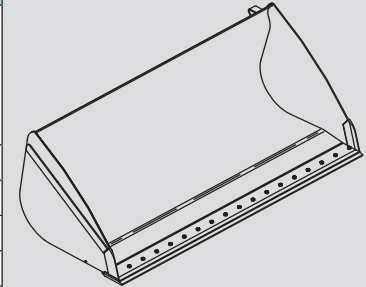
MHT 1490 / MHT-X 1490



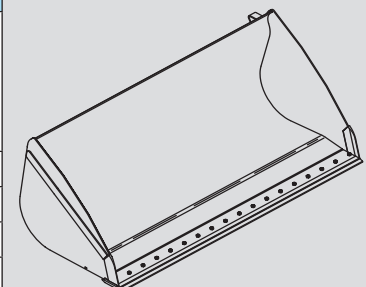
	PFB L1750 + Side Shift	PFB L2000 + Side Shift	
REFERENCE	939057	939059	
Rated capacity	9000 kg @ 600 mm 19841lb @ 23.6 in	9000 kg @ 600 mm 19841lb @ 23.6 in	
Side Shift	2x100 mm - 2x3.9 in	2x100 mm - 2x3.9 in	
Width	1750 mm - 68.8 in	2000 mm - 78.7 in	
Fork (Section)	200x70x1800 mm 7.8x2.7x70.8 in	200x70x1800 mm 7.8x2.7x70.8 in	
Weight	1090 kg - 2403 lb	1100 kg - 2425 lb	

BUCKETS

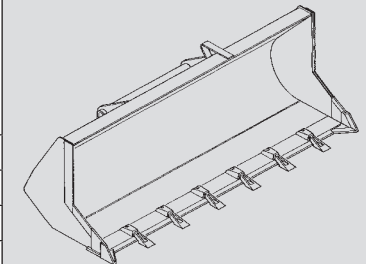
AGRICULTURAL BUCKET			
<i>MHT 1490 / MHT-X 1490</i>			
	CBA 2000 L2450		
REFERENCE	939160		
Content capacity	2000 L - 528 gal		
Width	2450 mm - 96.4 in		
Weight	678 kg - 1494 in		



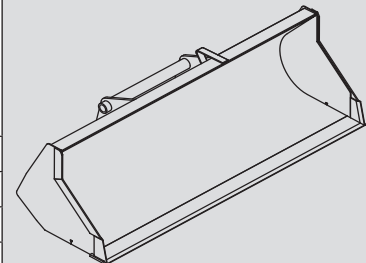
AGRICULTURAL BUCKET			
<i>MHT 10130 / MHT-X 10130</i>			
	CBA 4000 L2500		
REFERENCE	939233		
Content capacity	2500 L - 660 gal		
Width	4000 mm - 157.4 in		
Weight	1041 kg - 2295 in		



CONSTRUCTION BUCKET			
<i>MHT 1490 / MHT-X 1490</i>			
	CBC 1000 L2500	CBC 1500 L2500	
REFERENCE	939163	939164	
Content capacity	1000 L - 264.1 gal	1500 L - 396.2 gal	
Width	2500 mm - 98.4 in	2500 mm - 98.4 in	
Weight	620 kg - 1366 lb	669 kg - 1474 lb	



GENERAL PURPOSE BUCKET			
<i>MHT 1490 / MHT-X 1490</i>			
	CBR 1000 L2500	CBR 1500 L2500	
REFERENCE	939165	939166	
Rated capacity	1000 L - 264.1 gal	1500 L - 396.2 gal	
Width	2500 mm - 98.4 in	2500 mm - 98.4 in	
Weight	664 kg - 1463.8 lb	800 kg - 1763.6 lb	

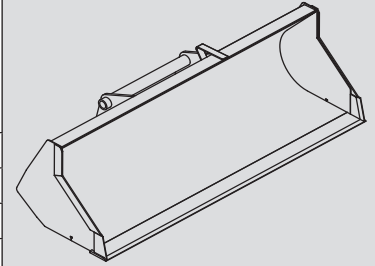




GENERAL PURPOSE BUCKET

MHT 10130 / MHT-X 10130

	CBR 2000 L2500		
REFERENCE	939232		
Rated capacity	2000 L - 528 gal		
Width	2500 mm - 98.4 in		
Weight	940 kg - 2072 lb		



WINCHES

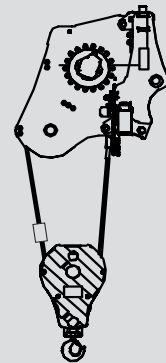
HEAVY DUTY HYDRAULIC WINCH



MUST be used with a lift truck equipped with an operational hydraulic movement cut-out device.

MHT 1490 / MHT-X 1490

	WINCH 9T		
REFERENCE	939030		
Rated capacity	9000 kg - 19841 lb		
Weight	850 kg - 1873 lb		



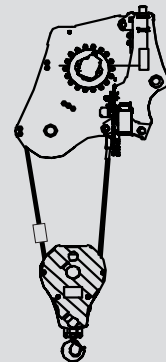
HEAVY DUTY HYDRAULIC WINCH



MUST be used with a lift truck equipped with an operational hydraulic movement cut-out device.

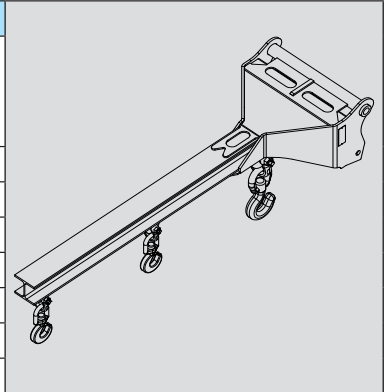
MHT 10130 / MHT-X 10130

	WINCH 13T		
REFERENCE	939234		
Rated capacity	13000 kg - 28660 lb		
Weight	1185 kg - 2612 lb		

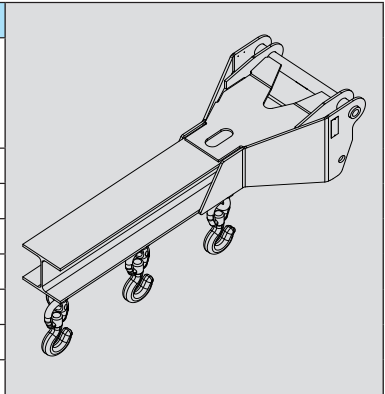


JIBS & CRANES

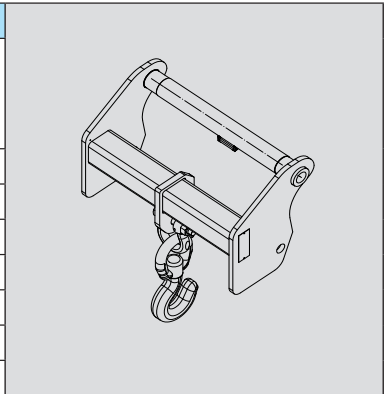
CRANE HEAVY DUTY			
<i>MHT 1490 / MHT-X 1490</i>			
	P 9 T		
REFERENCE	930830		
Rated capacity	9000 kg - 19841 lb		
Hook no. 1	9000 kg - 19841 lb		
Hook no. 2	5000 kg - 11023 lb		
Hook no. 3	2000 kg - 4409 lb		
Weight	295 kg - 650 lb		



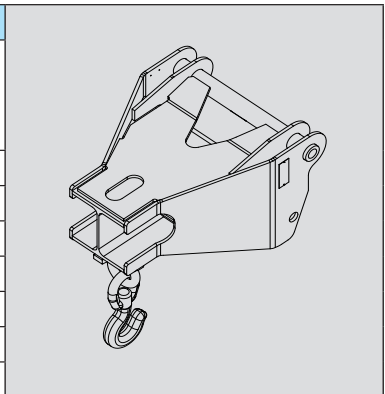
CRANE HEAVY DUTY			
<i>MHT 10130 / MHT-X 10130</i>			
	P 13 T		
REFERENCE	53009841		
Rated capacity	13000 kg - 28660 lb		
Hook no. 1	13000 kg - 28660 lb		
Hook no. 2	10000 kg - 22046 lb		
Hook no. 3	7500 kg - 16534 lb		
Weight	560 kg - 1234 lb		



FRAME MOUNTED HOOK HEAVY DUTY			
<i>MHT 1490 / MHT-X 1490</i>			
	PC 9 T		
REFERENCE	939970		
Rated capacity	9000 kg - 19841 lb		
Weight	129 kg - 284 lb		



FRAME MOUNTED HOOK HEAVY DUTY			
<i>MHT 10130 / MHT-X 10130</i>			
	PC 13 T		
REFERENCE	53008009		
Rated capacity	13000 kg - 28660 lb		
Weight	305 kg - 672 lb		

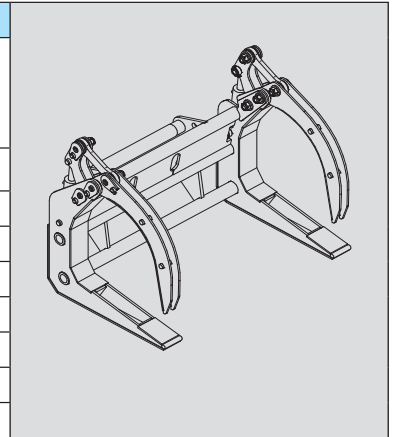


CLAMPS

GRABS FOR LOGS

MHT 10130 / MHT-X 10130

	Grabs for Logs 10 T		
REFERENCE	939235		
Rated capacity	10000 kg - 22046 lb		
Clamping range	1500 mm - 59 in		
Width	1310 mm - 51.5 in		
Weight	492 kg - 1084 lb		

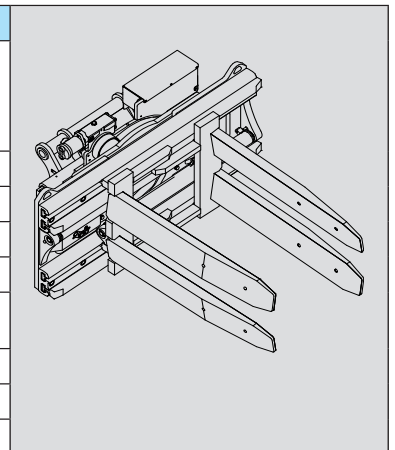


MINING ATTACHMENTS

SLIM TYRE HANDLER

MHT 1490 / MHT-X 1490

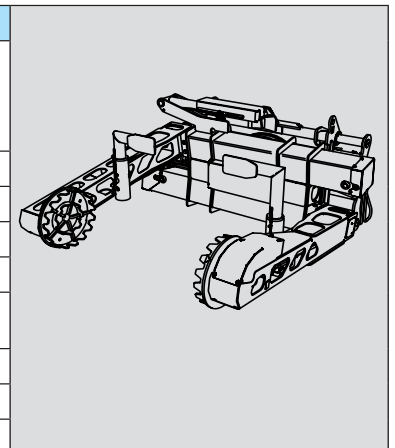
	TH 33 / 2000 S	TH 35 / 2900 S	
REFERENCE	939039	939040	
Rated capacity	2000 kg - 4409 lb	2900 kg	
Side Shift	2x100 mm - 2x3.9 in	2x100 mm - 2x3.9 in	
Clamping range	470 mm / 2100 mm 18.5 / 82.6 in	640 mm / 2650 mm 25.1 in / 104.3 lb	
Body rotation	360° continuos	360° continuos	
Weight	1160 kg - 2557 lb	1160 kg - 2557 lb	



TYRE HANDLER

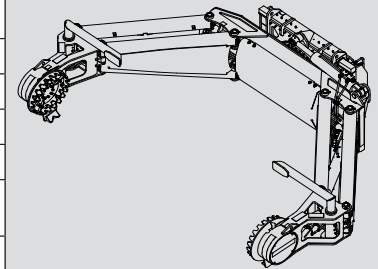
MHT 1490 / MHT-X 1490

	TH 49 / 2500		
REFERENCE	914600		
Rated capacity	1500 kg - 3306 lb		
Side Shift	2x150 mm - 2x5.9 in		
Clamping range	1100 mm / 3100 mm 43.3 in / 122 in		
Body rotation	+/- 22,5 °		
Pads Rotation	0°-120°		
Weight	1160 kg - 2557 lb		

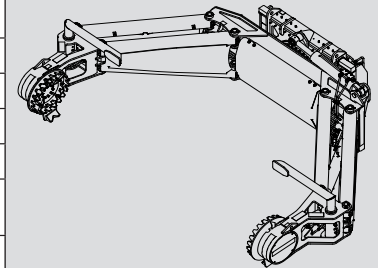




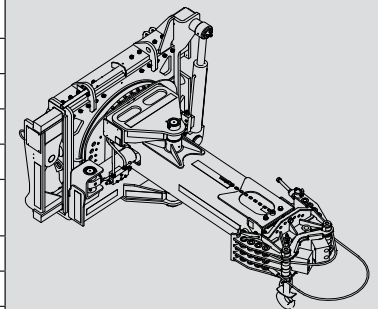
TYRE HANDLER			
<i>MHT 1490 / MHT-X 1490</i> <i>MHT 10130 / MHT-X 10130</i>			
	TH 51 / 3500		
REFERENCE	911969		
Rated capacity	3500 kg - 7716 lb		
Side Shift	2x150 mm - 2x5.9 in		
Clamping range	1130 mm / 3410 mm 44.4 in / 134.2 in		
Body rotation	+/- 22,5 °		
Pads Rotation	0°-120°		
Weight	3200 kg - 7054 lb		



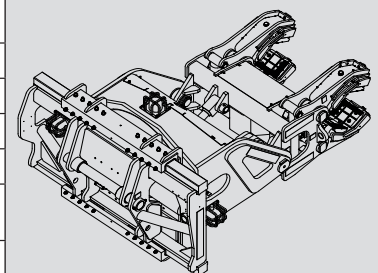
TYRE HANDLER			
<i>MHT 10130 / MHT-X 10130</i>			
	TH 57 / 6000		
REFERENCE	939237		
Rated capacity	6000 kg - 13227 lb		
Side Shift	2x300 mm - 2x11.8 in		
Clamping range	1210 mm / 3830 mm 47.6 in / 150.7 in		
Body rotation	+/- 172 °		
Pads Rotation	360° continuous		
Weight	4300 kg - 9479 lb		



CYLINDER HANDLER			
	CH 4		
REFERENCE	911968		
Rated capacity	4000 kg - 8818 lb		
Side Shift	2x150 mm - 2x5.9 in		
Clamping range	250 mm / 530 mm 9.8 in / 20.8 in		
Body rotation	+/- 22.5 °		
Head rotation	+/- 35 °		
Jib orientation	+/- 15 °		
Weight	1740 kg - 3836 lb		



CYLINDER HANDLER			
<i>MHT 10130 / MHT-X 10130</i>			
	CH 10		
REFERENCE	939239		
Rated capacity	4000 kg - 8818 lb		
Side Shift	2x300 mm - 2x11.8 in		
Clamping range	230 mm / 640 mm 9 in / 25.1 in		
Body rotation	- 140° / + 200 °		
Clamp tilting	90°		
Weight	3500 kg - 7716 lb		





5 - LOAD CHARTS FOR INTERCHANGEABLE EQUIPMENT



INTRODUCTION



The load capacity diagrams are only valid with the safety system properly activated.

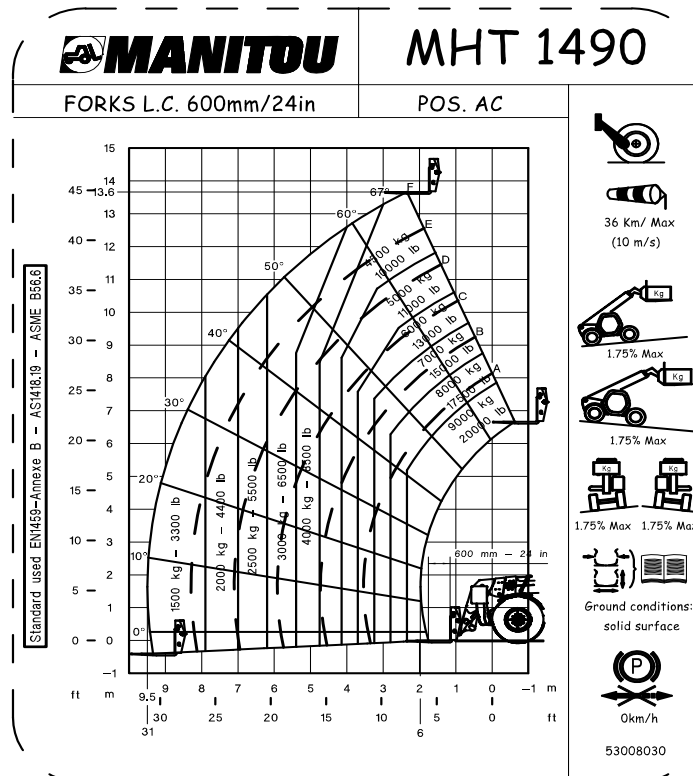
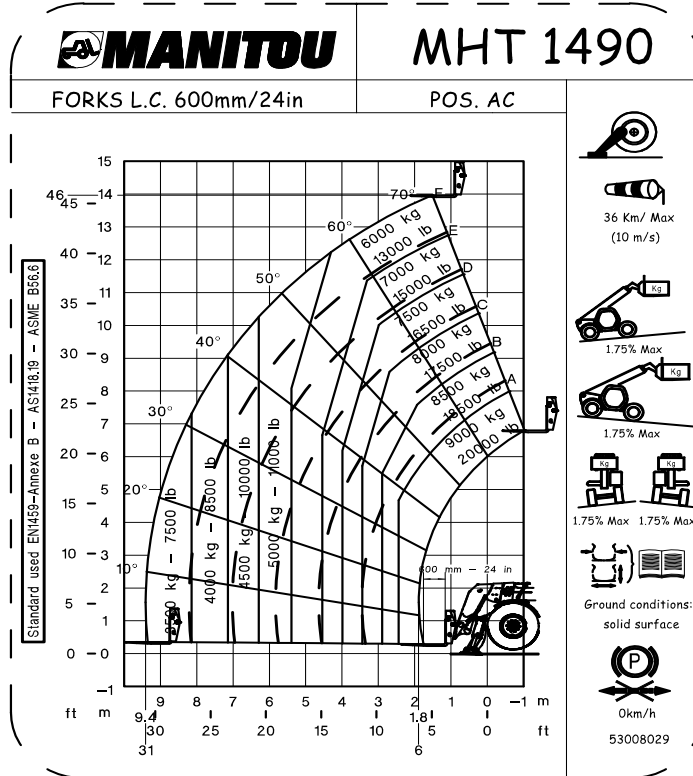


MHT-X 1490 129M ST3A S1
MHT 1490 129M ST4 S1

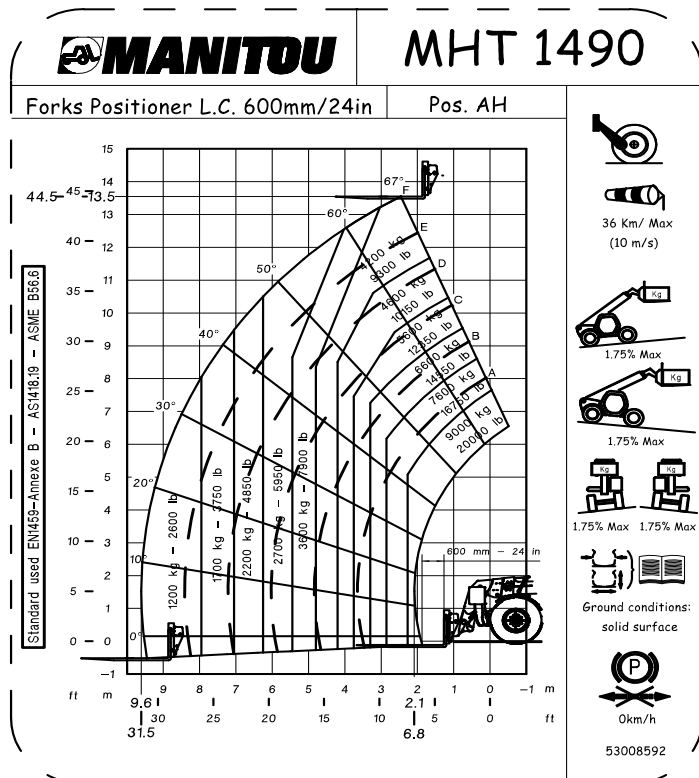
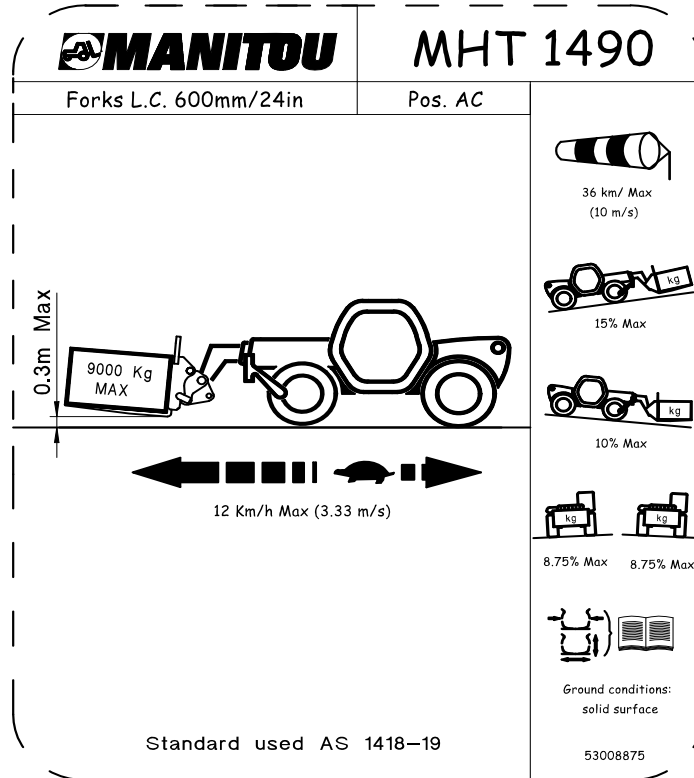




MHT-X 1490 129M ST3A S1 / MHT 1490 129M ST4 S1

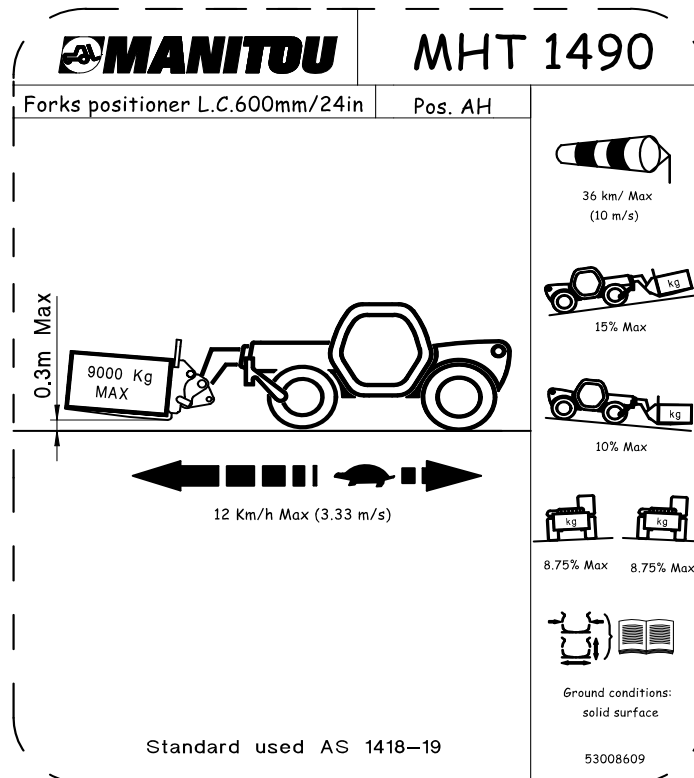
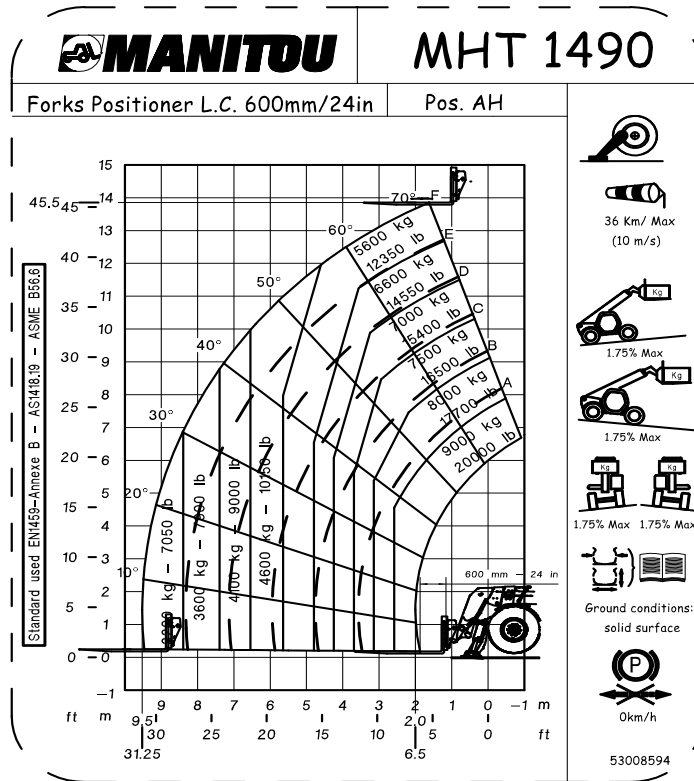


MHT-X 1490 129M ST3A S1 / MHT 1490 129M ST4 S1



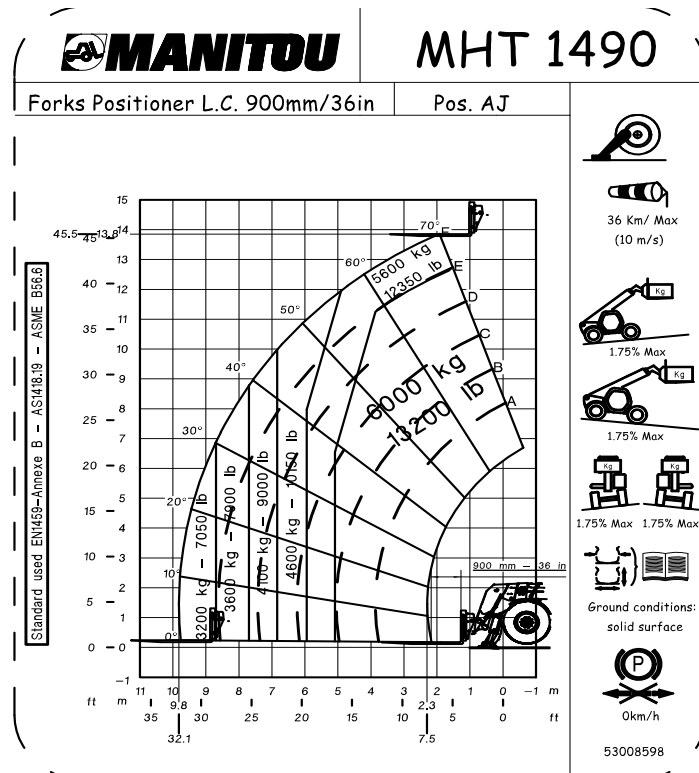
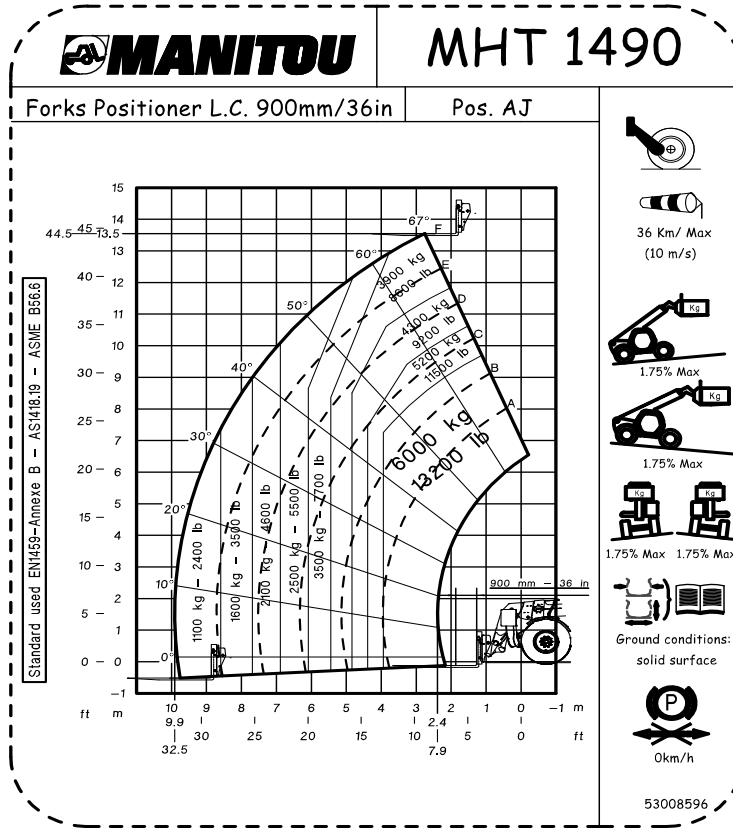


MHT-X 1490 129M ST3A S1 / MHT 1490 129M ST4 S1





MHT-X 1490 129M ST3A S1 / MHT 1490 129M ST4 S1



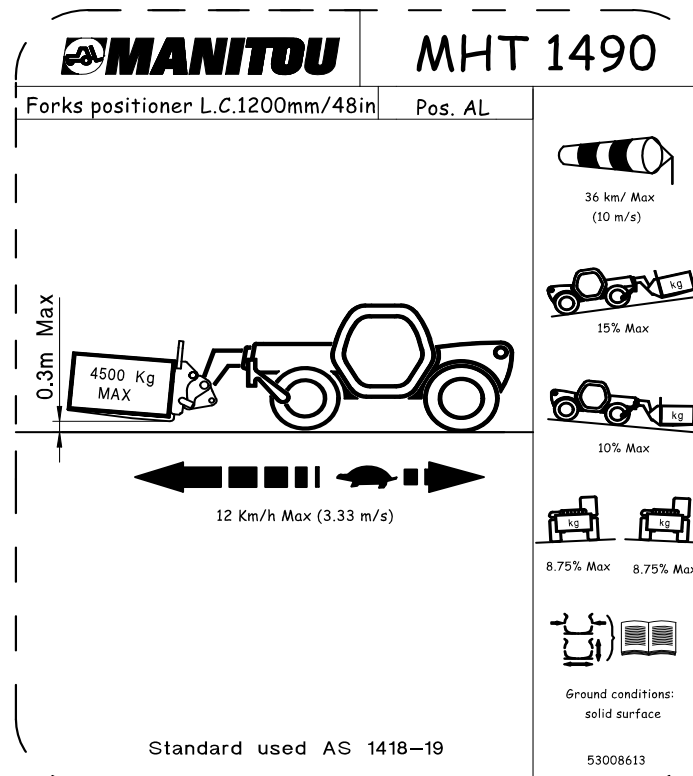
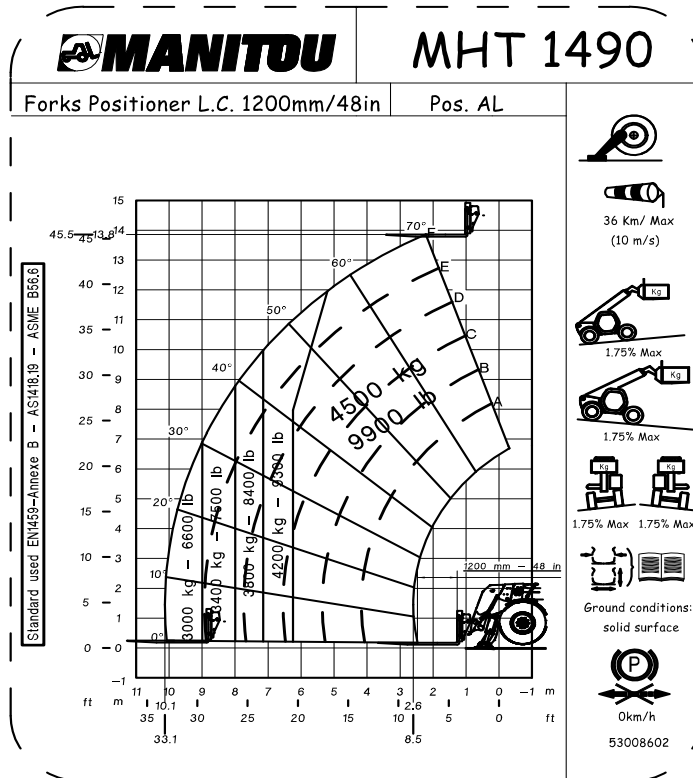


MHT-X 1490 129M ST3A S1 / MHT 1490 129M ST4 S1

MANITOU		MHT 1490
Forks positioner L.C.900mm/36in		Pos. AJ
		<p>36 km/ Max (10 m/s)</p> <p>15% Max</p> <p>10% Max</p> <p>8.75% Max 8.75% Max</p> <p>Ground conditions: solid surface</p> <p>53008611</p>
Standard used AS 1418-19		

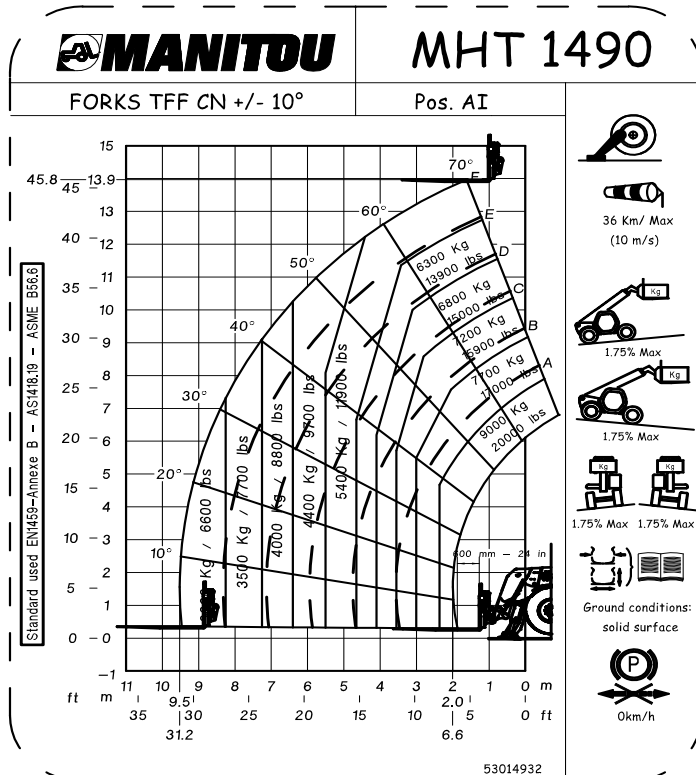
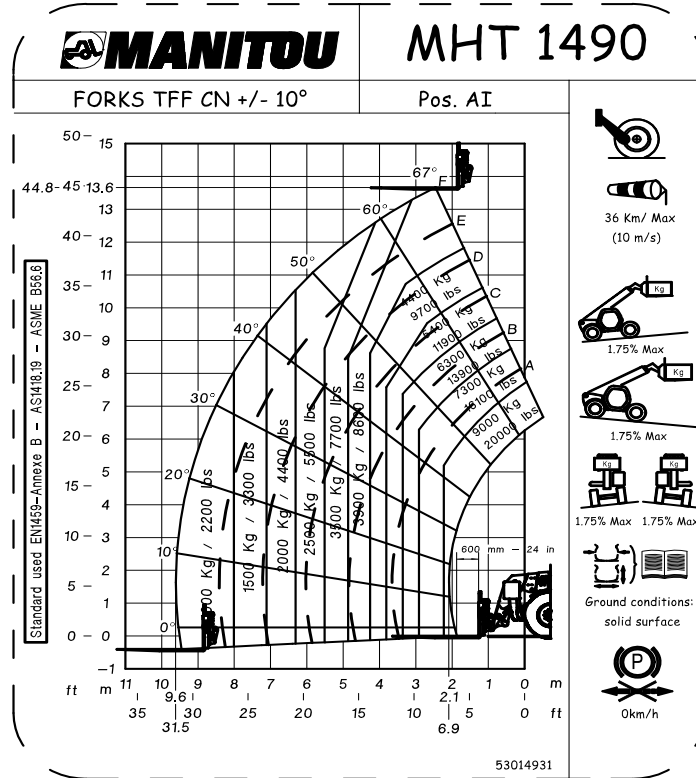
MANITOU		MHT 1490
Forks Positioner L.C. 1200mm/48in		Pos. AL
		<p>36 Km/ Max (10 m/s)</p> <p>1.75% Max</p> <p>1.75% Max</p> <p>1.75% Max 1.75% Max</p> <p>Ground conditions: solid surface</p> <p>0km/h</p> <p>53008600</p>

MHT-X 1490 129M ST3A S1 / MHT 1490 129M ST4 S1



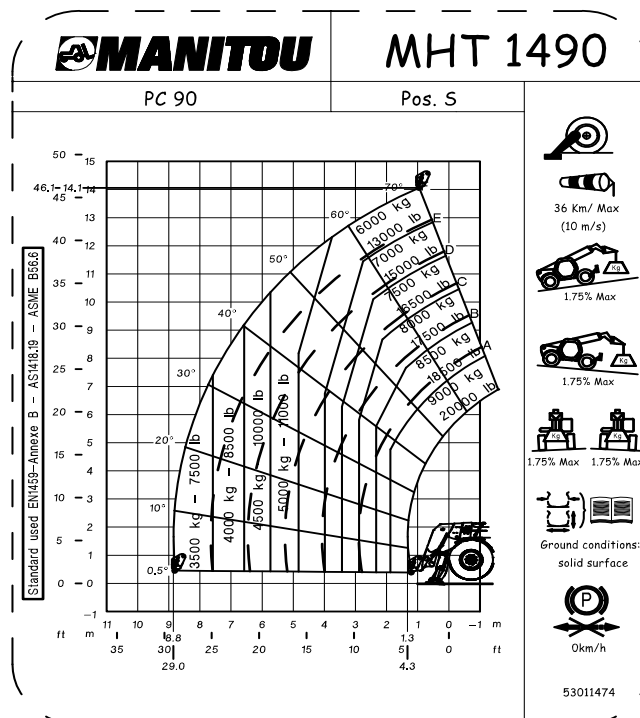
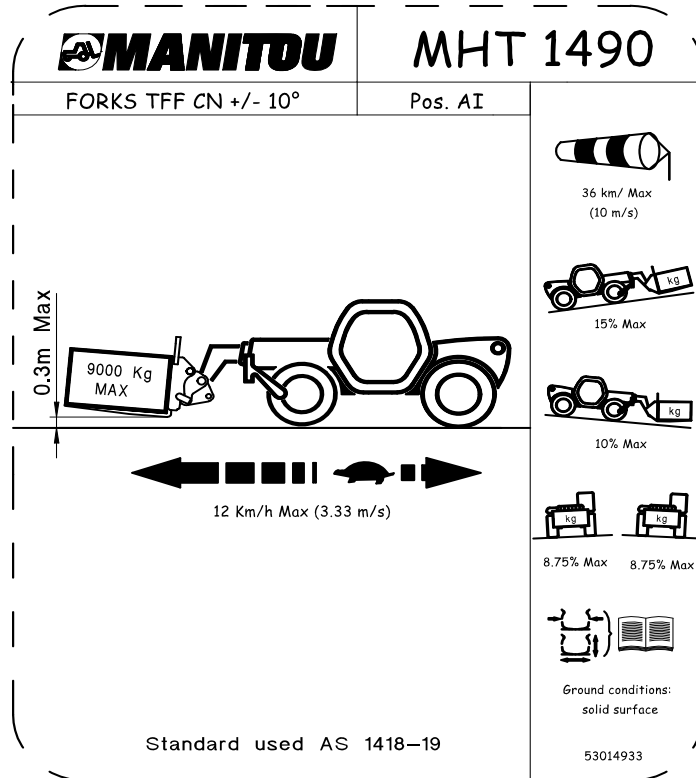


MHT-X 1490 129M ST3A S1 / MHT 1490 129M ST4 S1



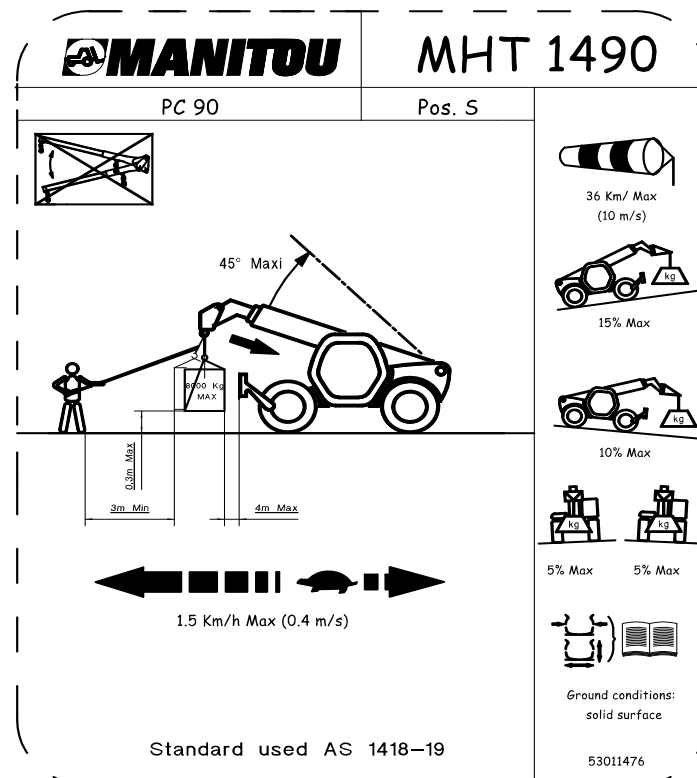
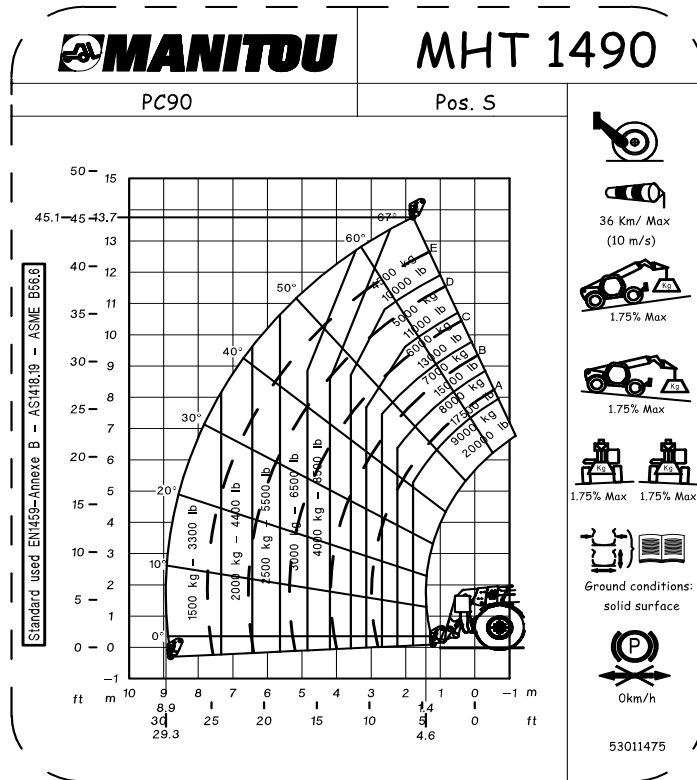


MHT-X 1490 129M ST3A S1 / MHT 1490 129M ST4 S1



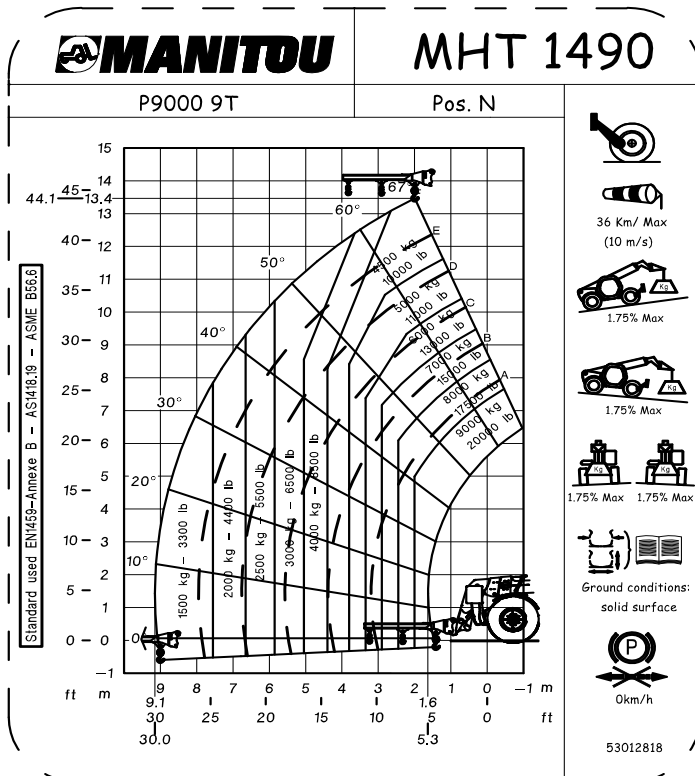
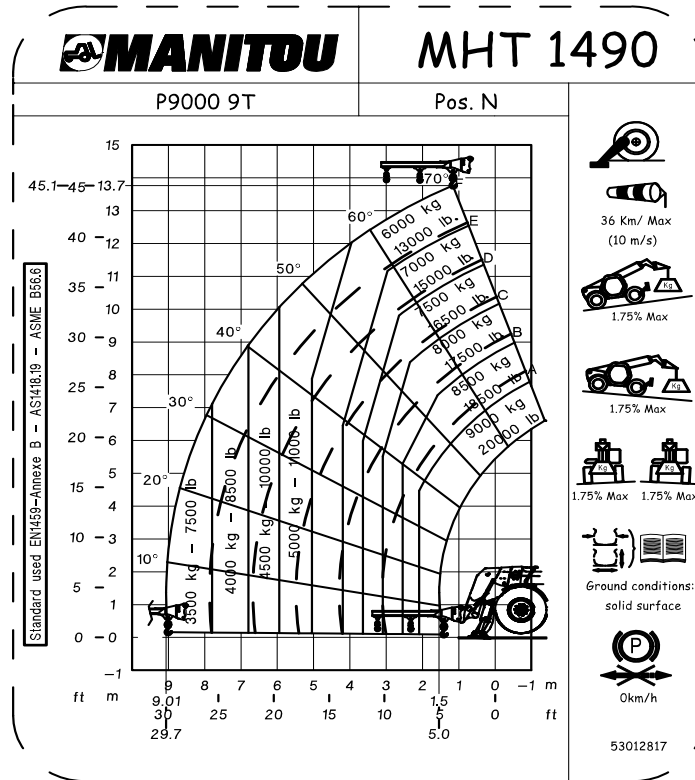


MHT-X 1490 129M ST3A S1 / MHT 1490 129M ST4 S1



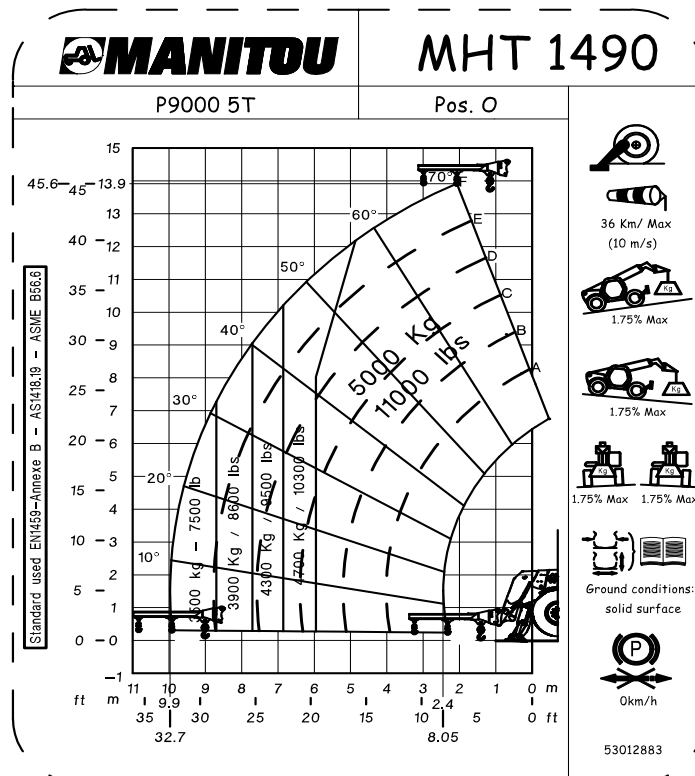
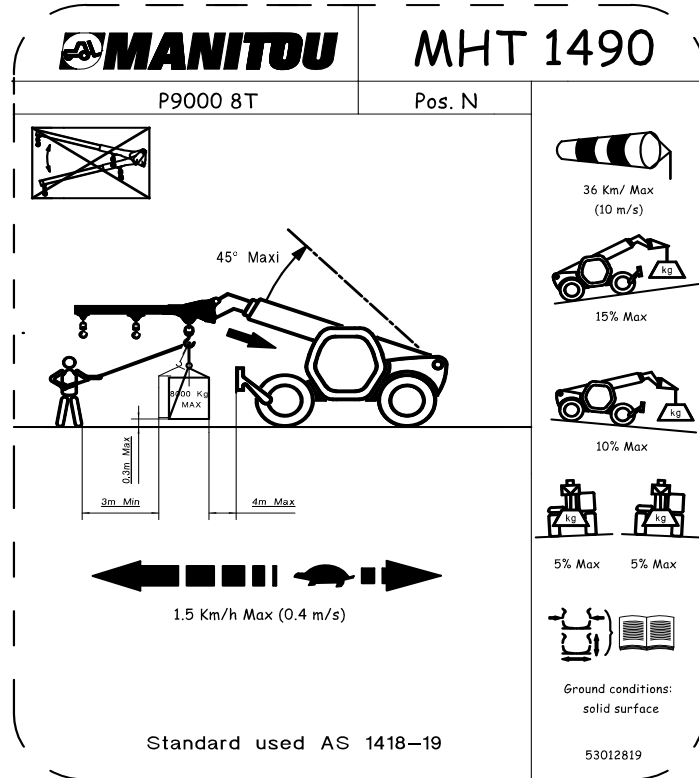


MHT-X 1490 129M ST3A S1 / MHT 1490 129M ST4 S1

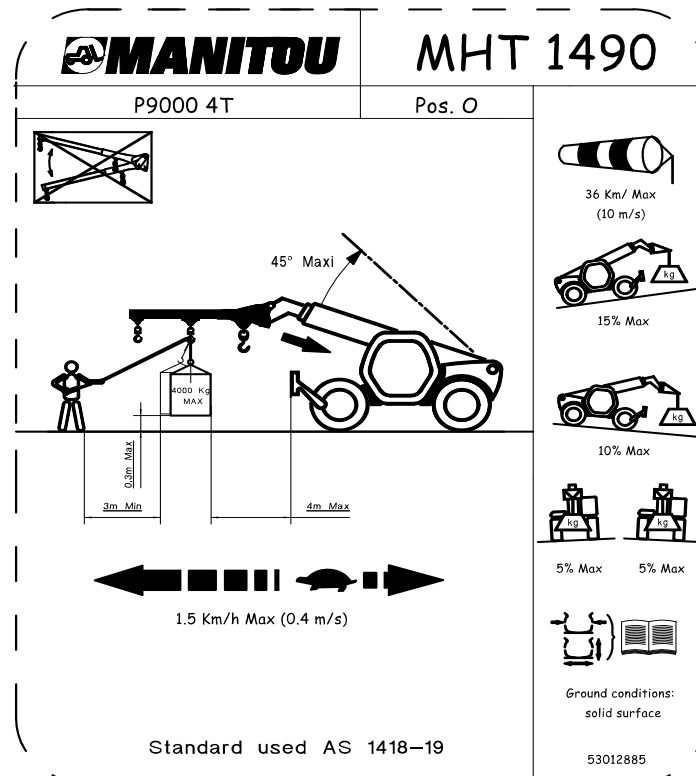
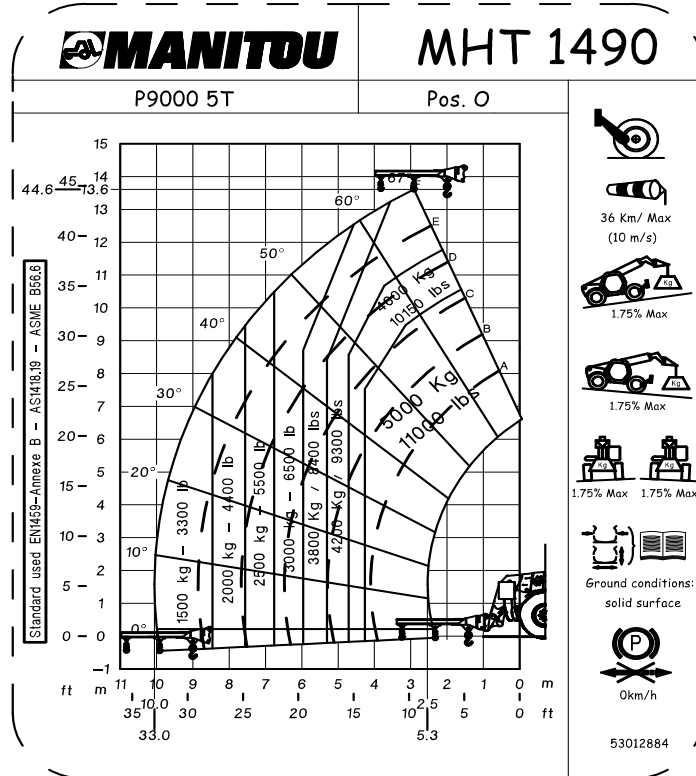




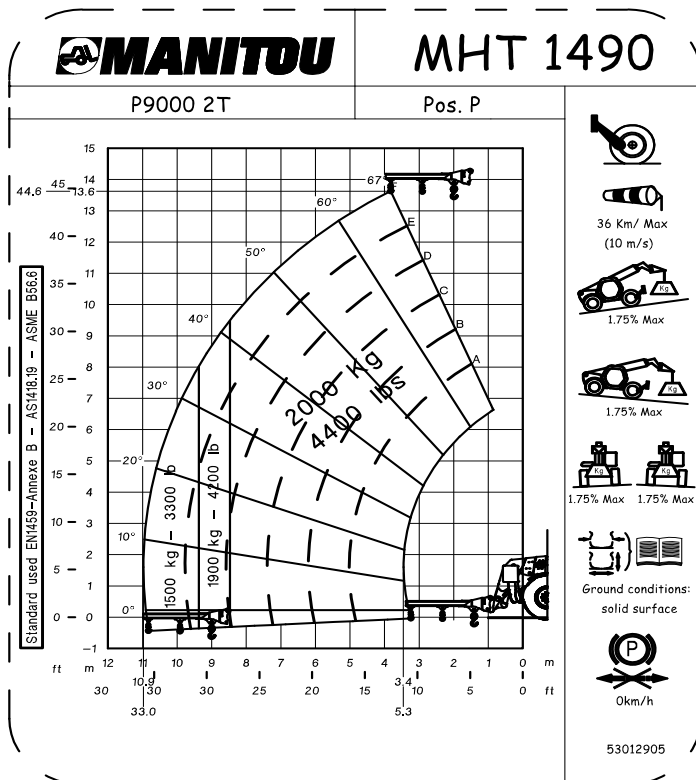
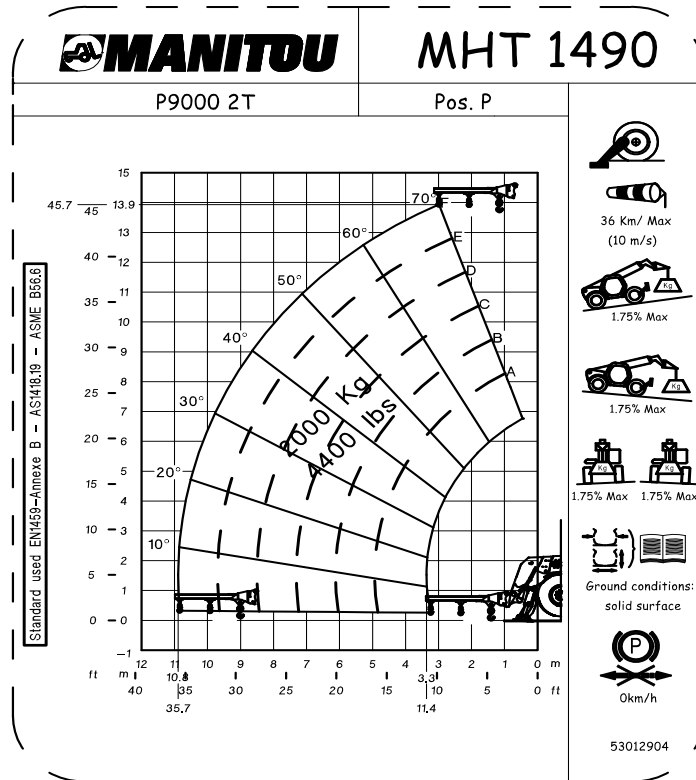
MHT-X 1490 129M ST3A S1 / MHT 1490 129M ST4 S1



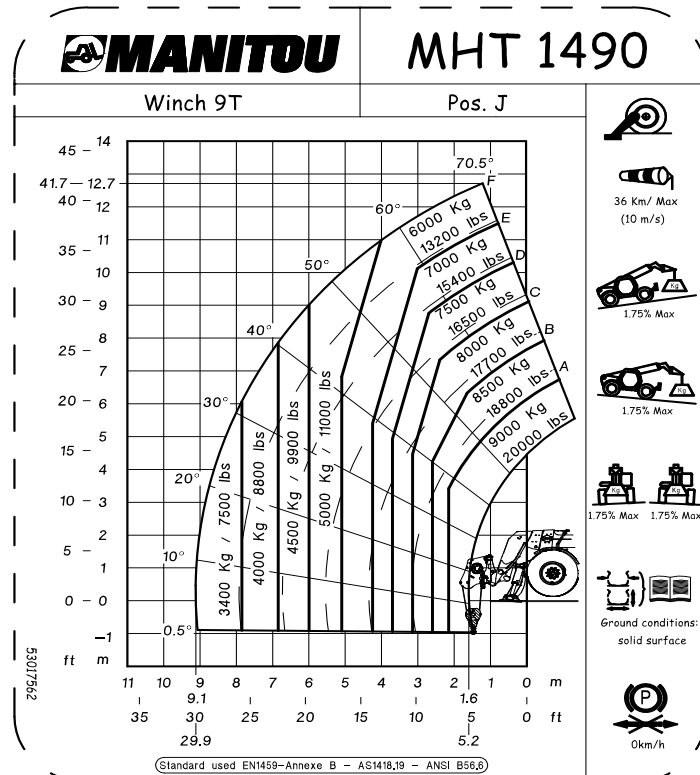
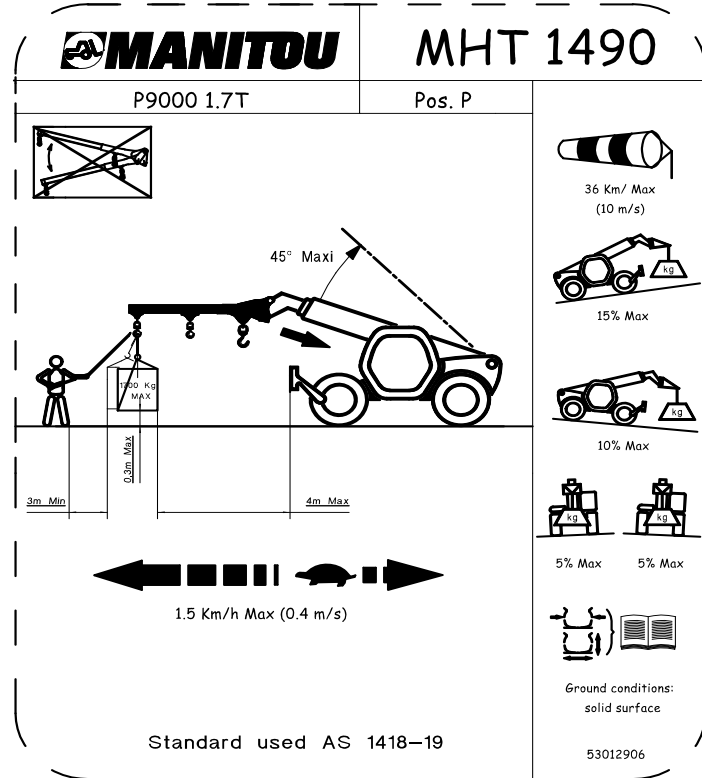
MHT-X 1490 129M ST3A S1 / MHT 1490 129M ST4 S1



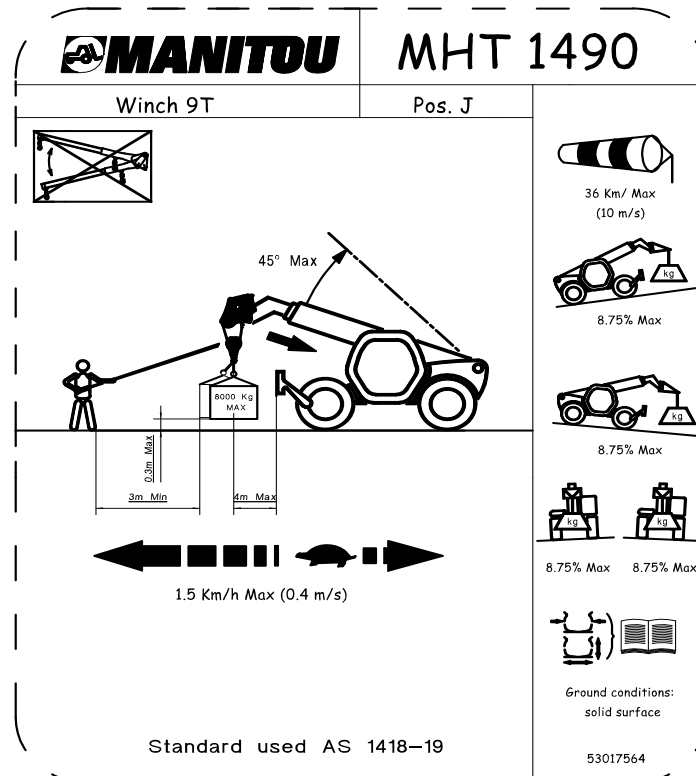
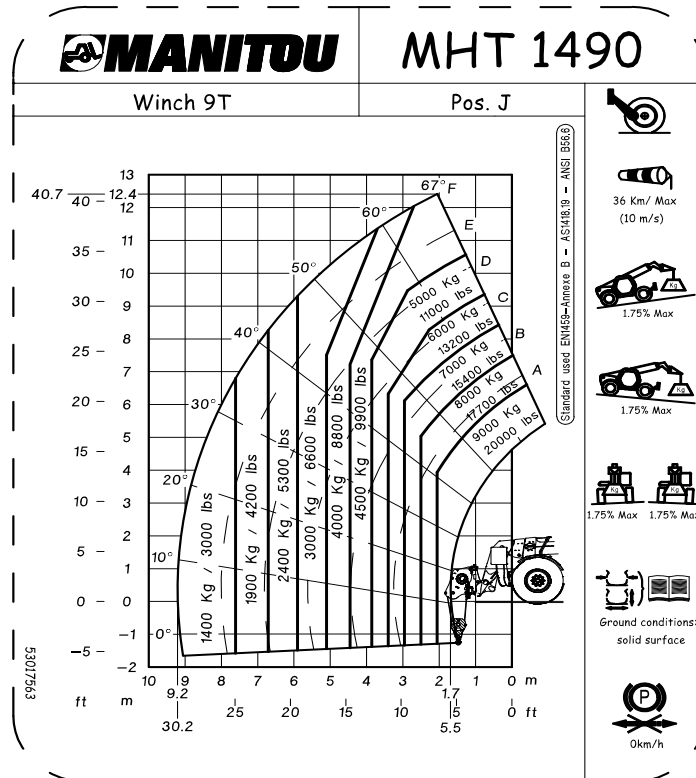
MHT-X 1490 129M ST3A S1 / MHT 1490 129M ST4 S1



MHT-X 1490 129M ST3A S1 / MHT 1490 129M ST4 S1

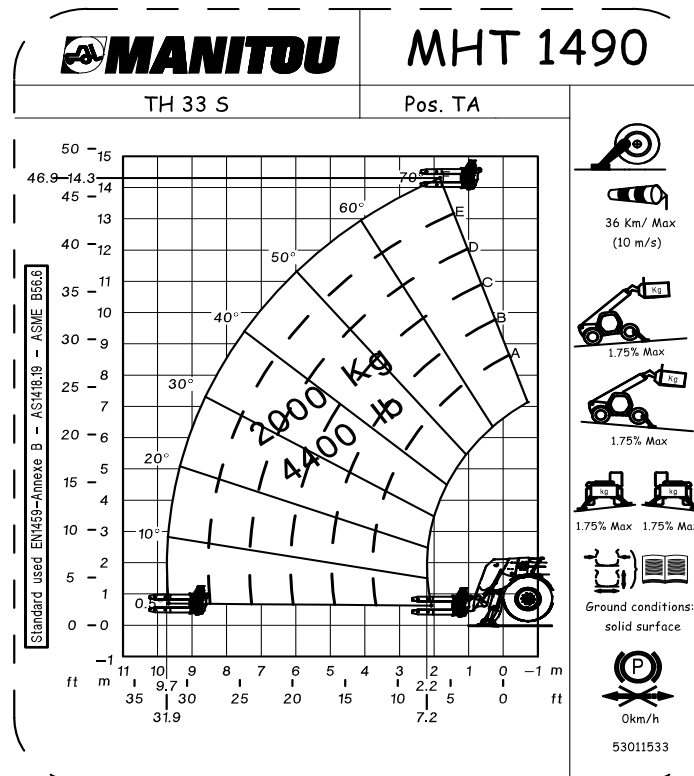
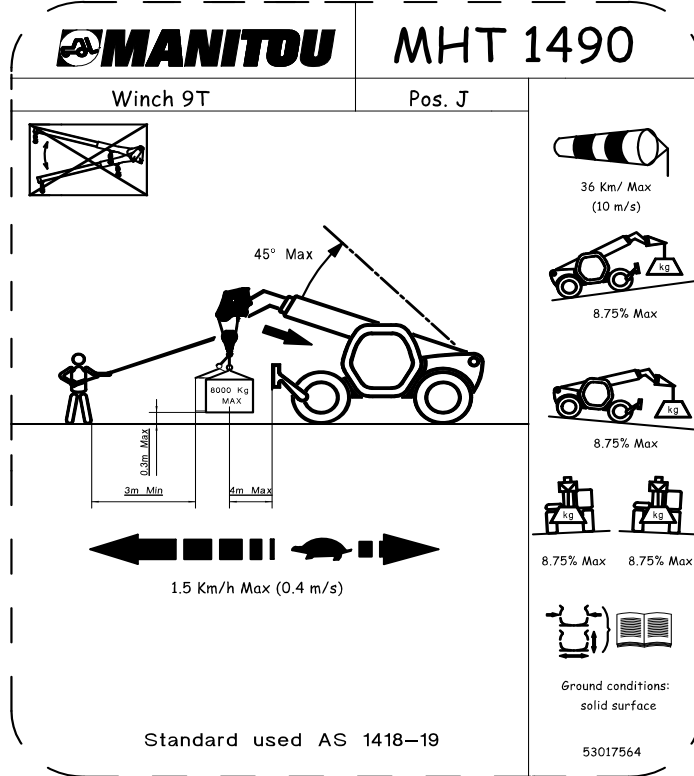


MHT-X 1490 129M ST3A S1 / MHT 1490 129M ST4 S1



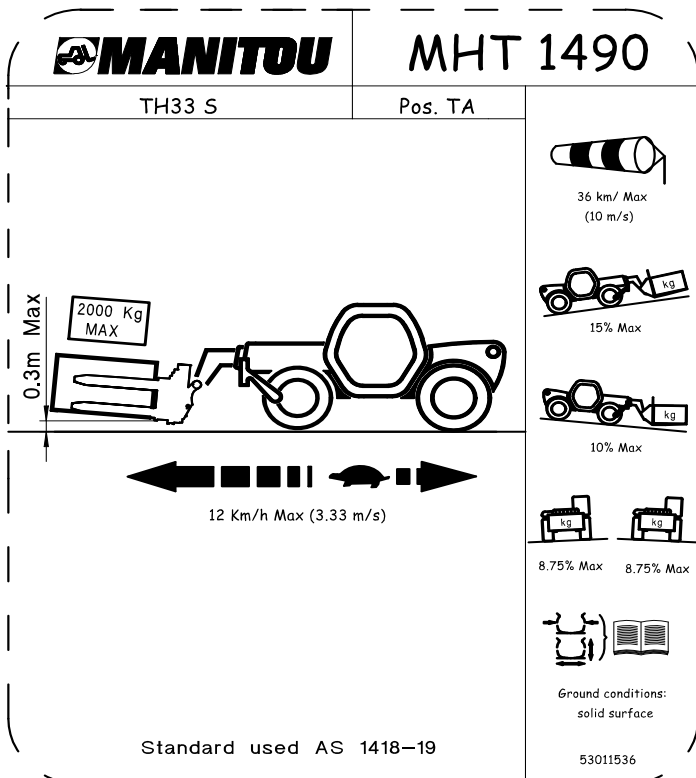
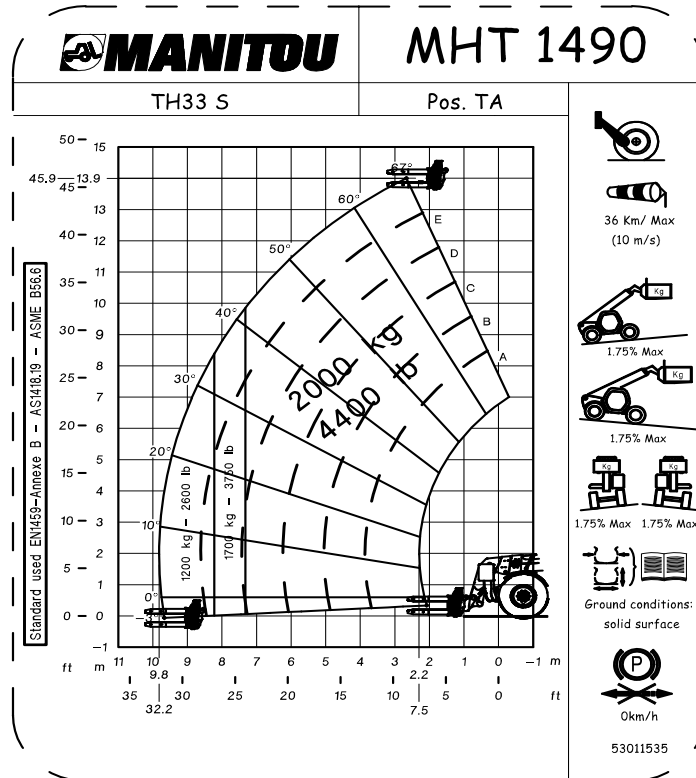


MHT-X 1490 129M ST3A S1 / MHT 1490 129M ST4 S1

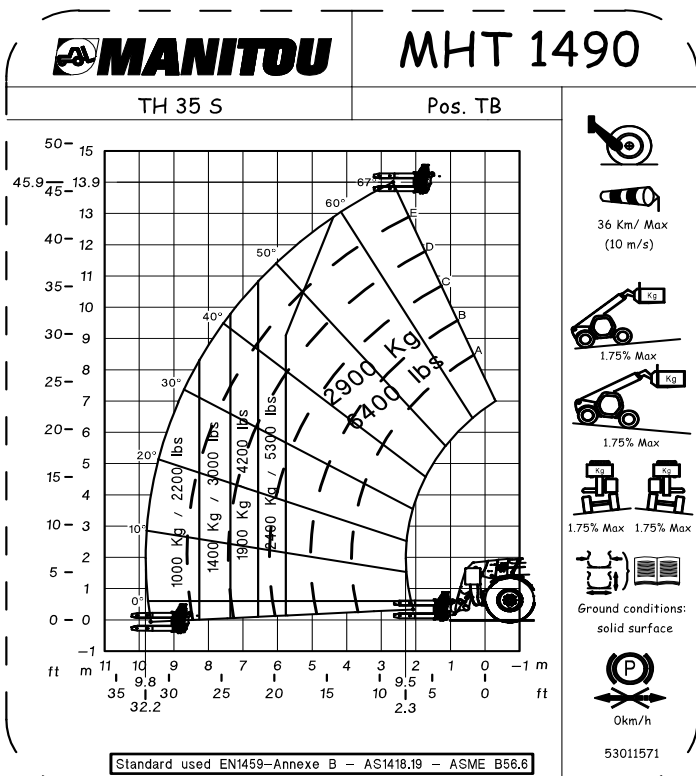
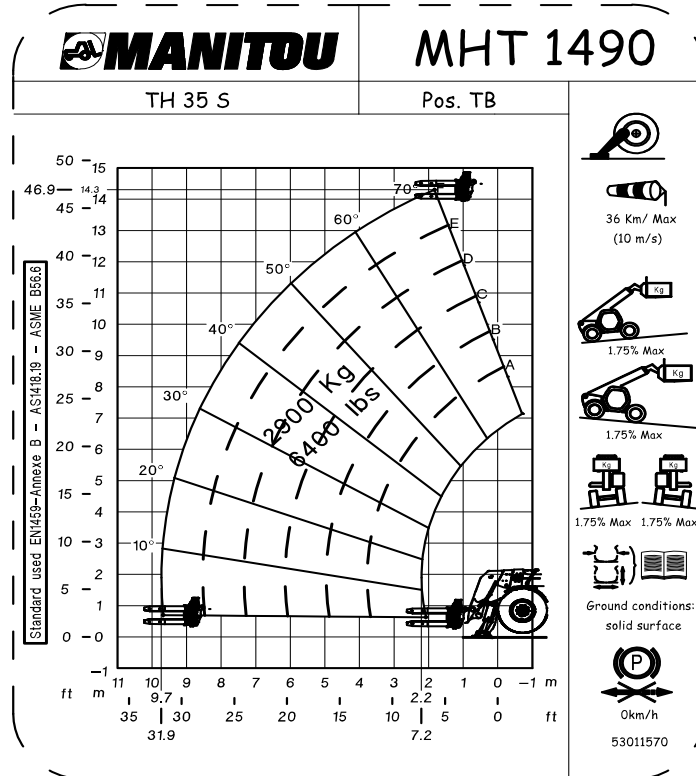




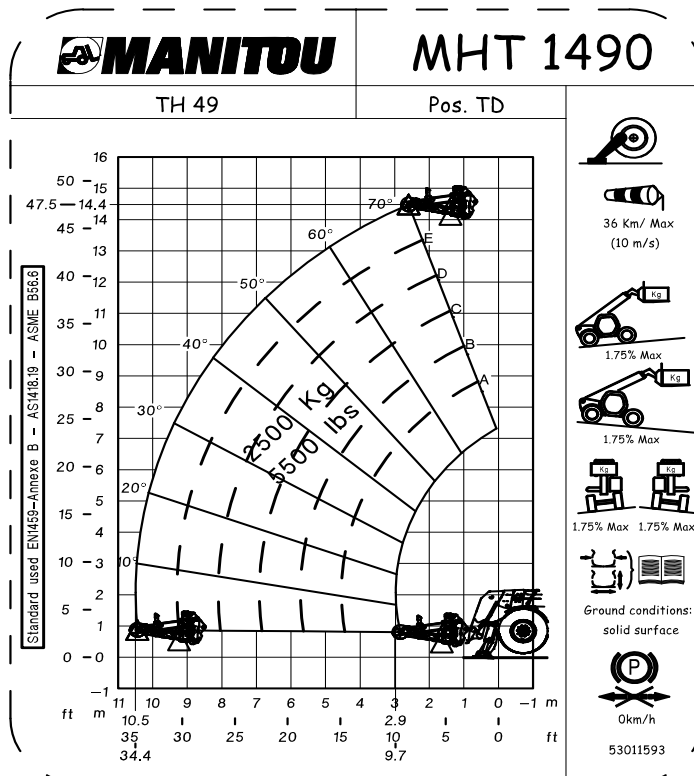
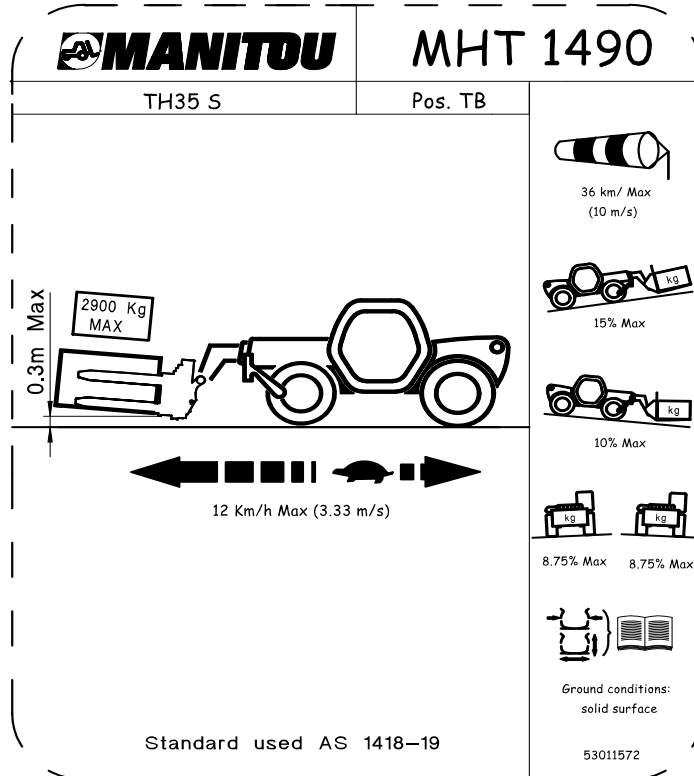
MHT-X 1490 129M ST3A S1 / MHT 1490 129M ST4 S1



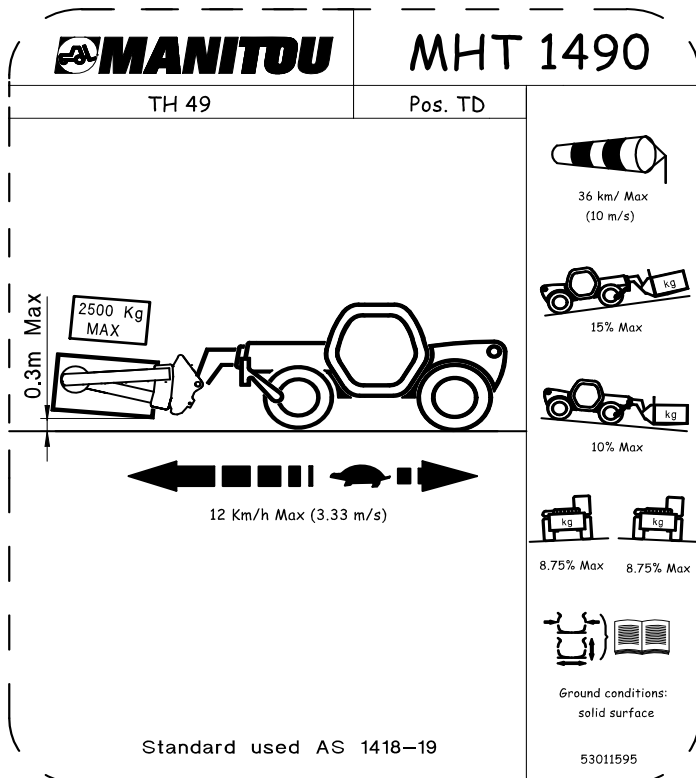
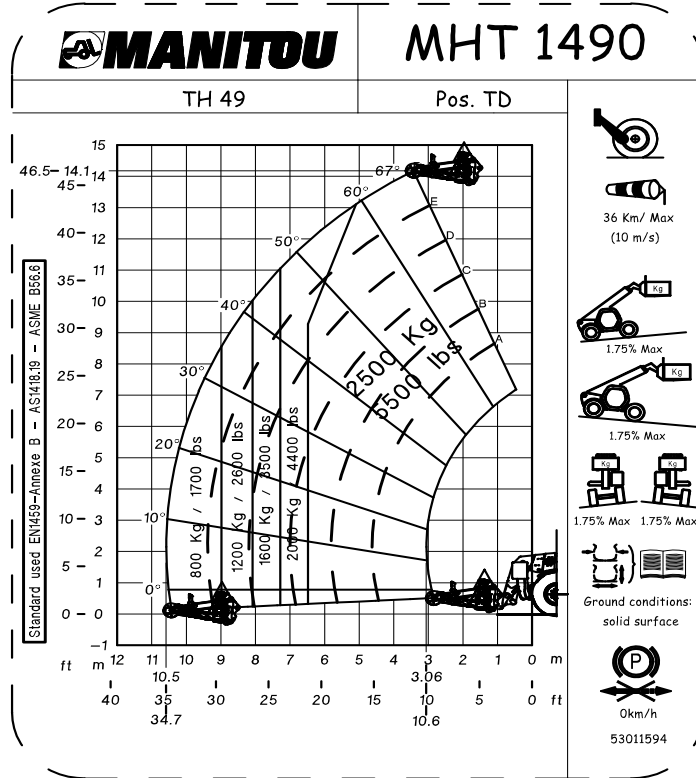
MHT-X 1490 129M ST3A S1 / MHT 1490 129M ST4 S1



MHT-X 1490 129M ST3A S1 / MHT 1490 129M ST4 S1



MHT-X 1490 129M ST3A S1 / MHT 1490 129M ST4 S1

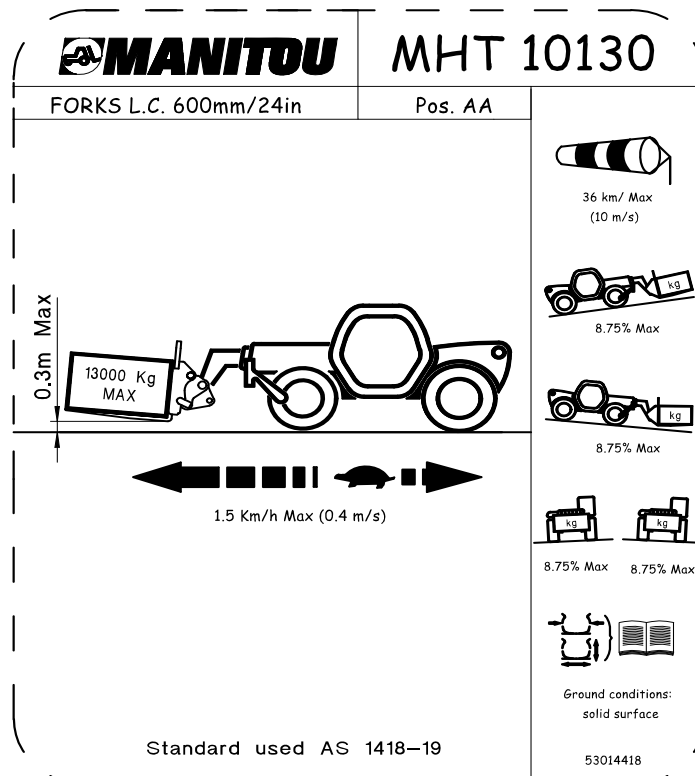
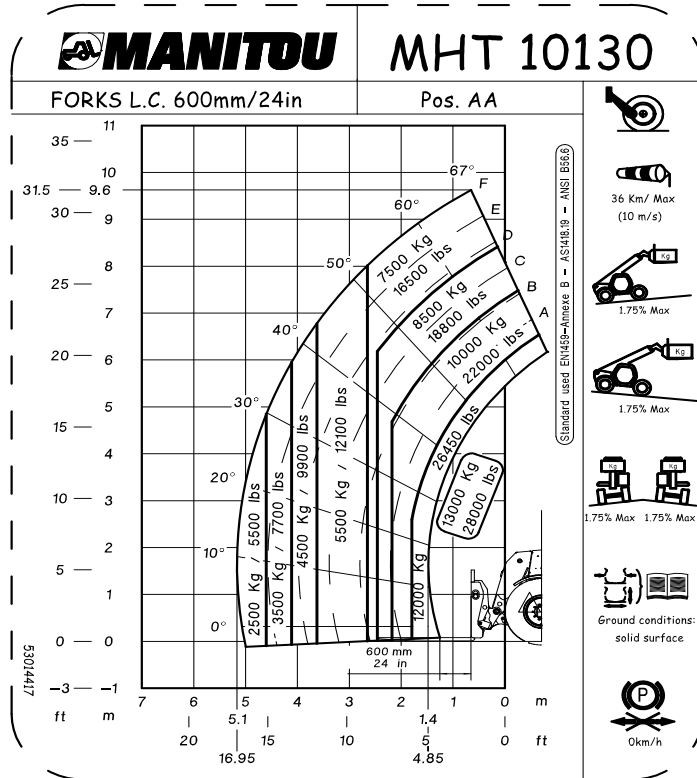




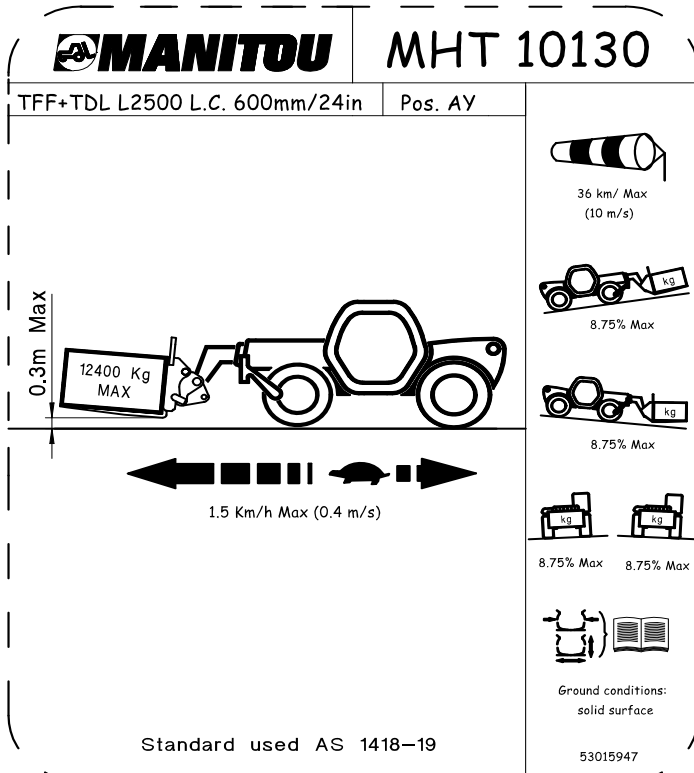
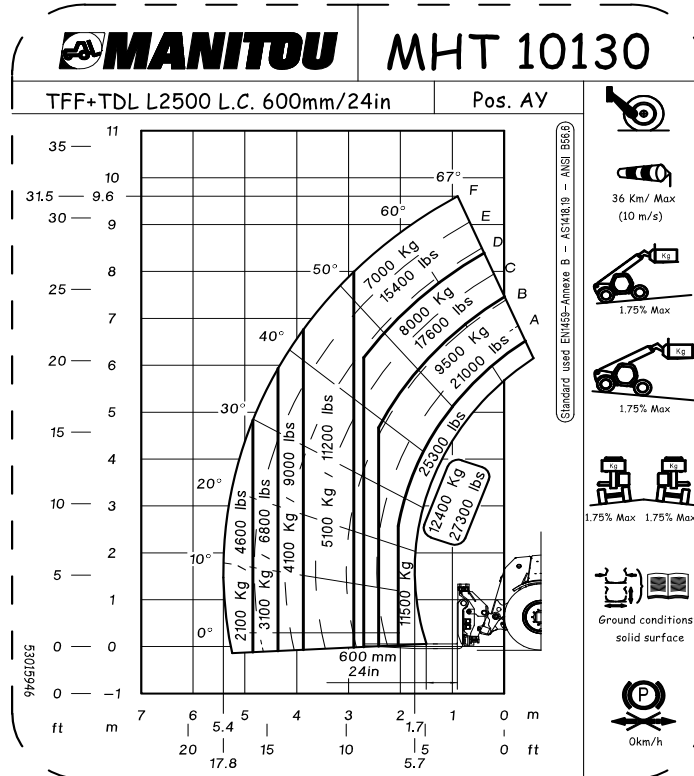
MHT-X 10130 129M ST3A S1
MHT 10130 129M ST4 S1



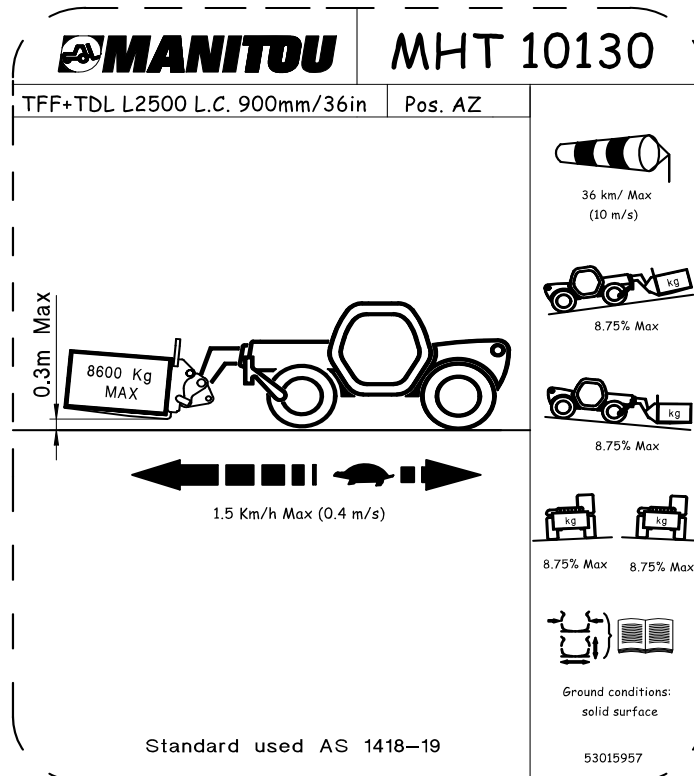
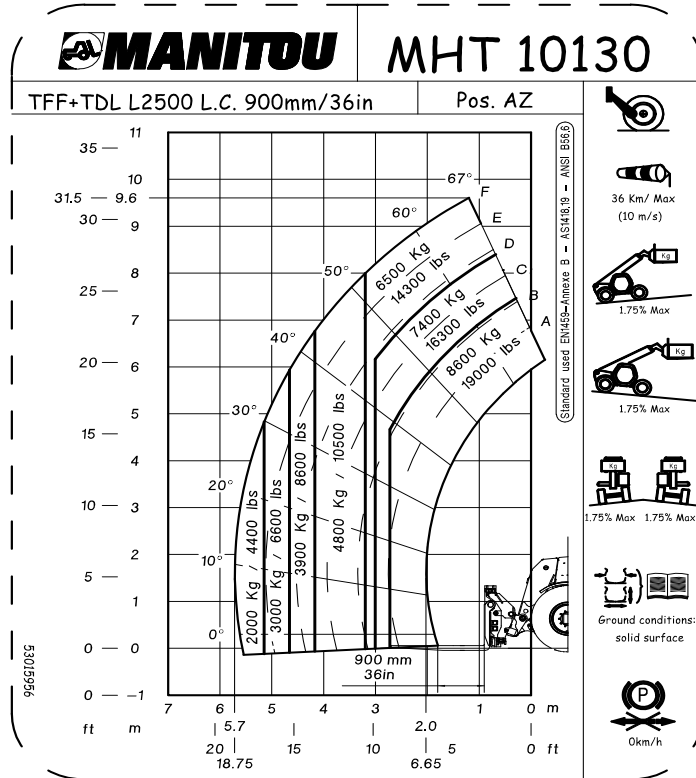
MHT-X 10130 129M ST3A S1 / MHT 10130 129M ST4 S1



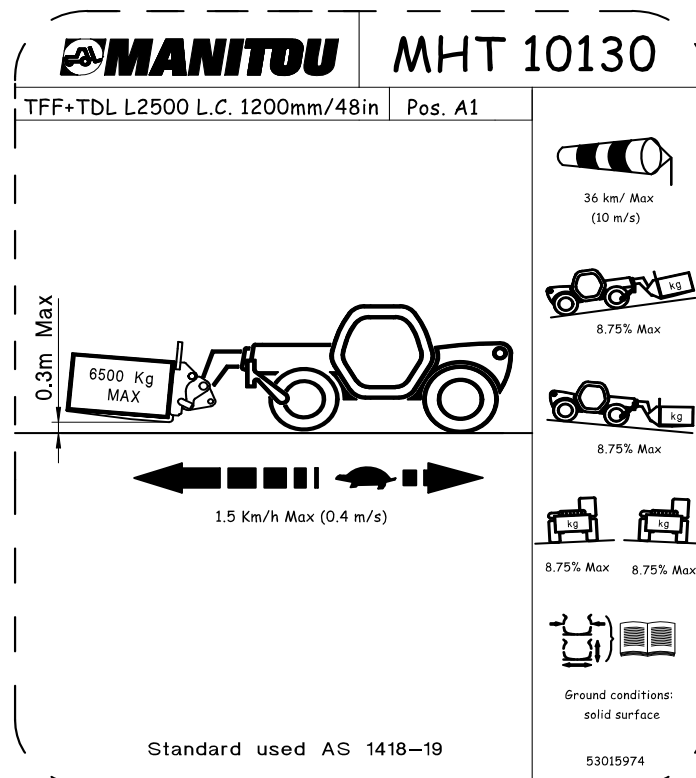
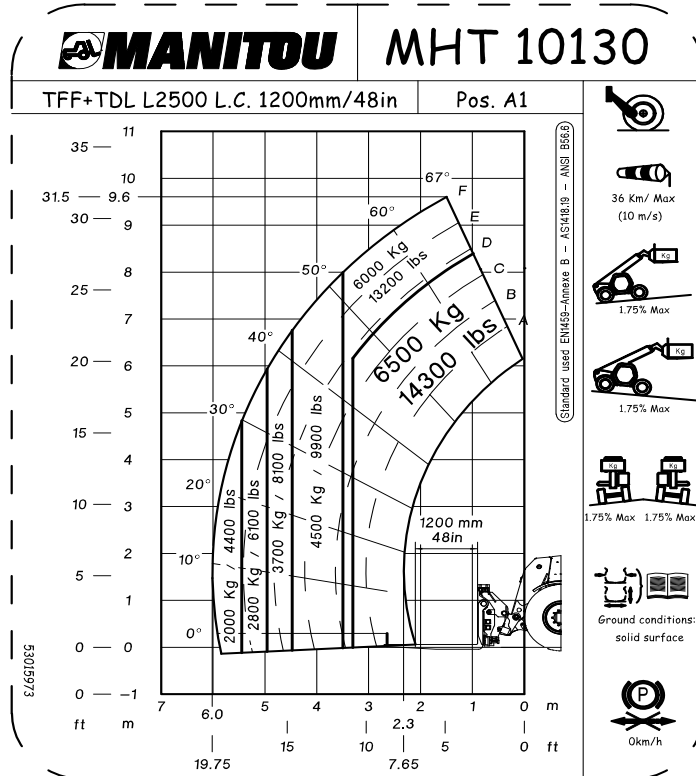
MHT-X 10130 129M ST3A S1 / MHT 10130 129M ST4 S1



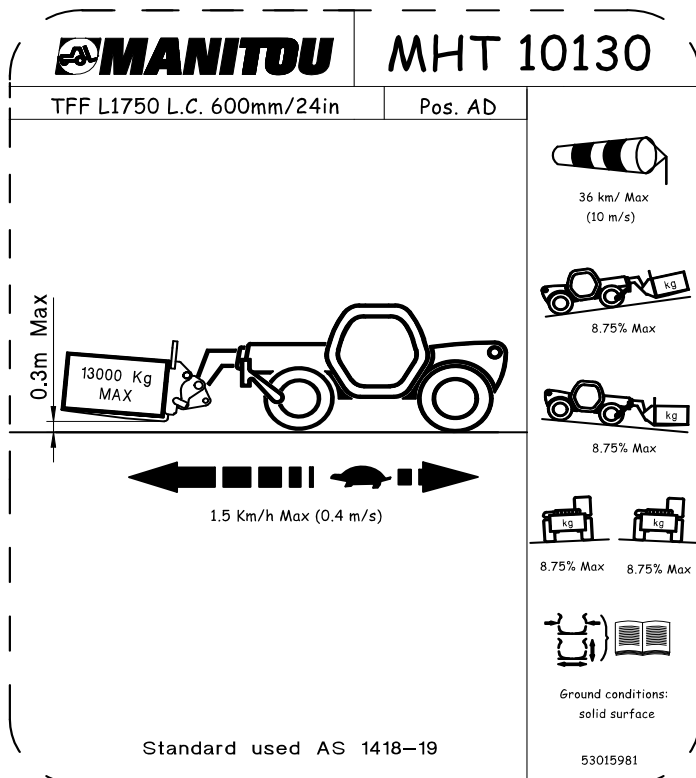
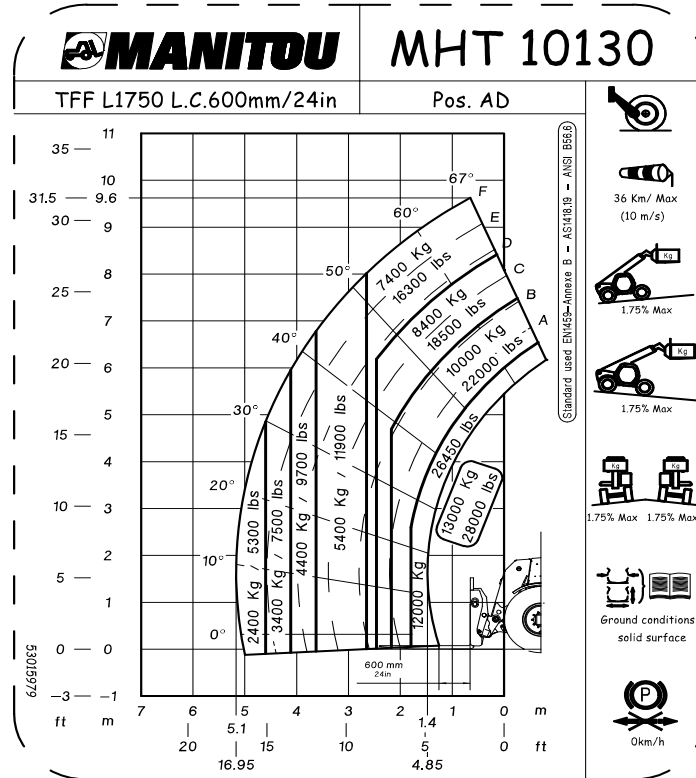
MHT-X 10130 129M ST3A S1 / MHT 10130 129M ST4 S1



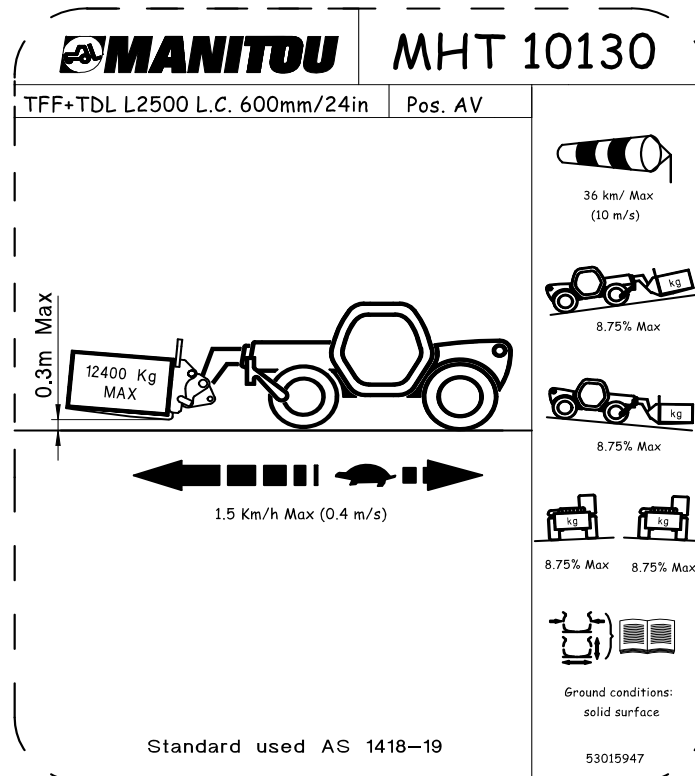
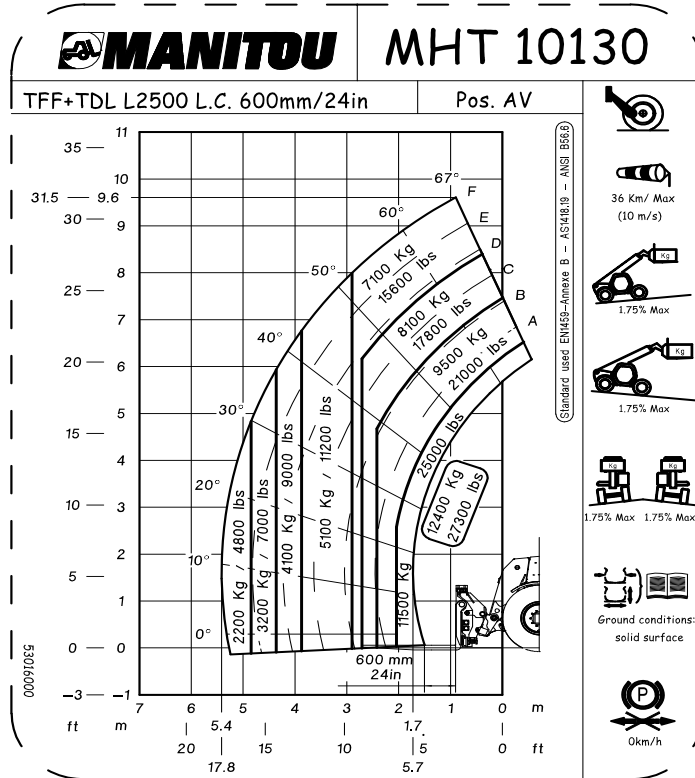
MHT-X 10130 129M ST3A S1 / MHT 10130 129M ST4 S1



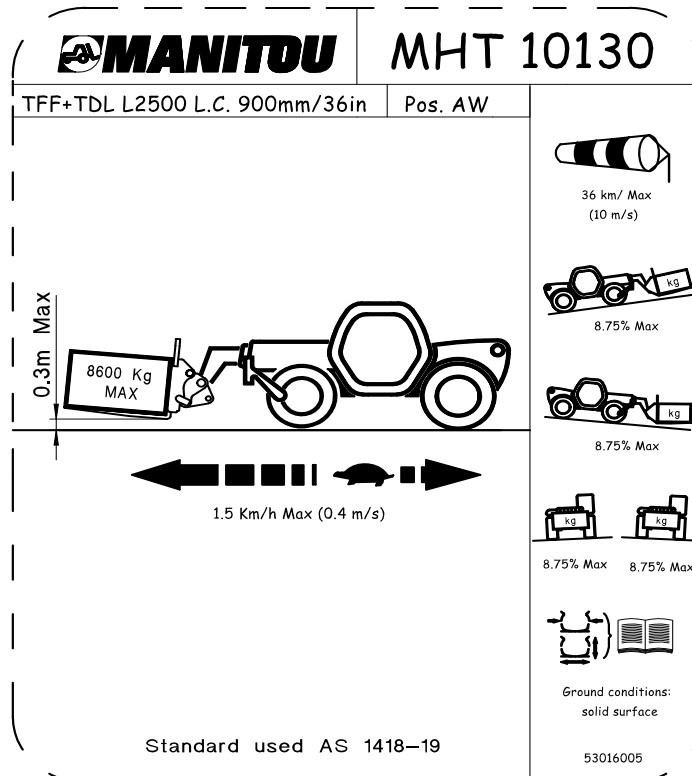
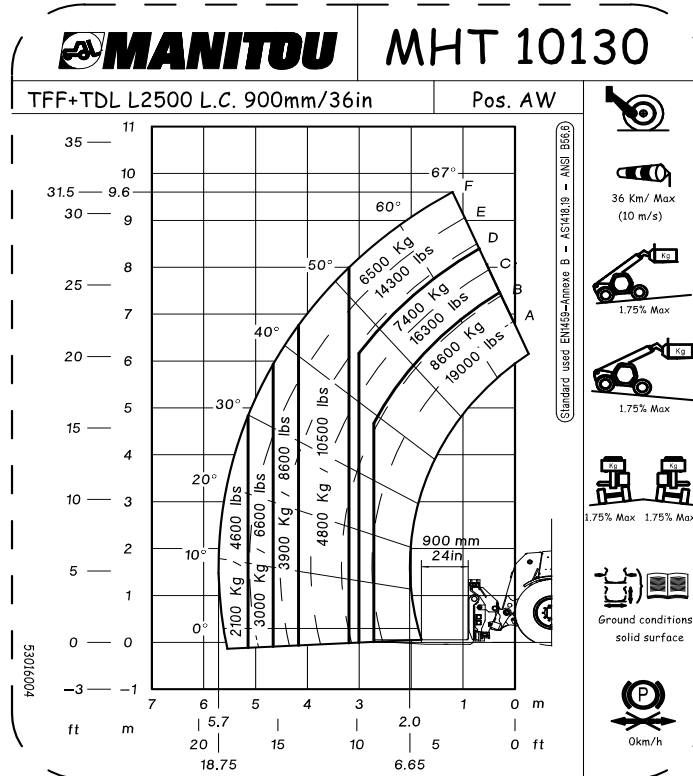
MHT-X 10130 129M ST3A S1 / MHT 10130 129M ST4 S1



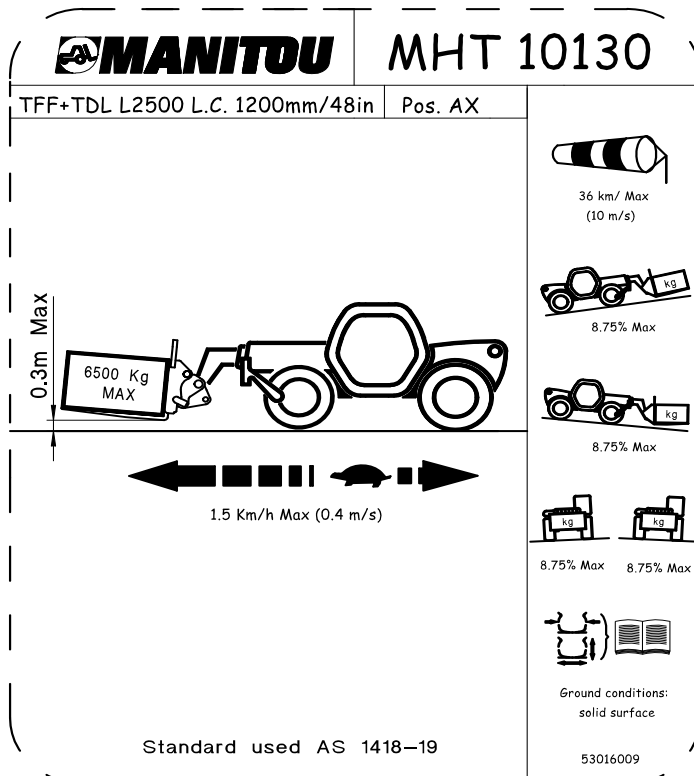
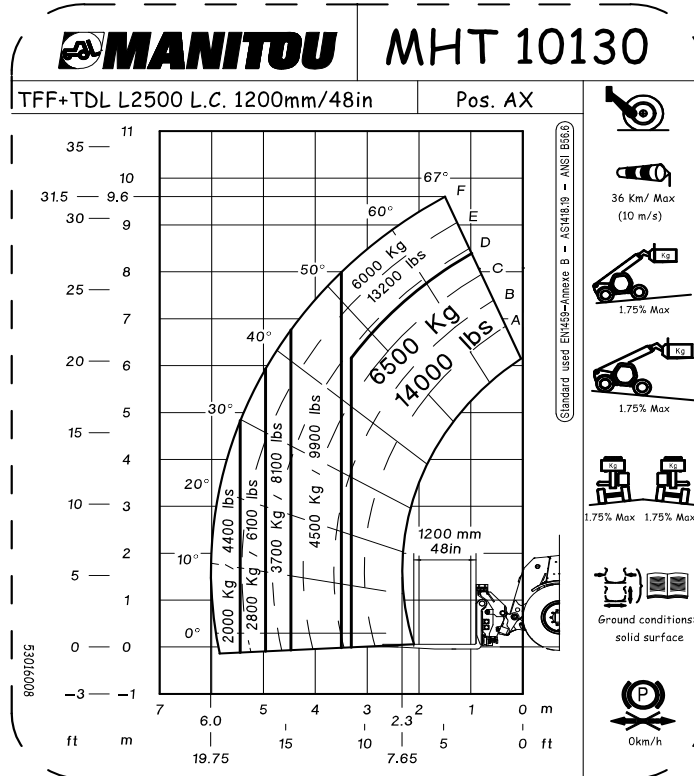
MHT-X 10130 129M ST3A S1 / MHT 10130 129M ST4 S1



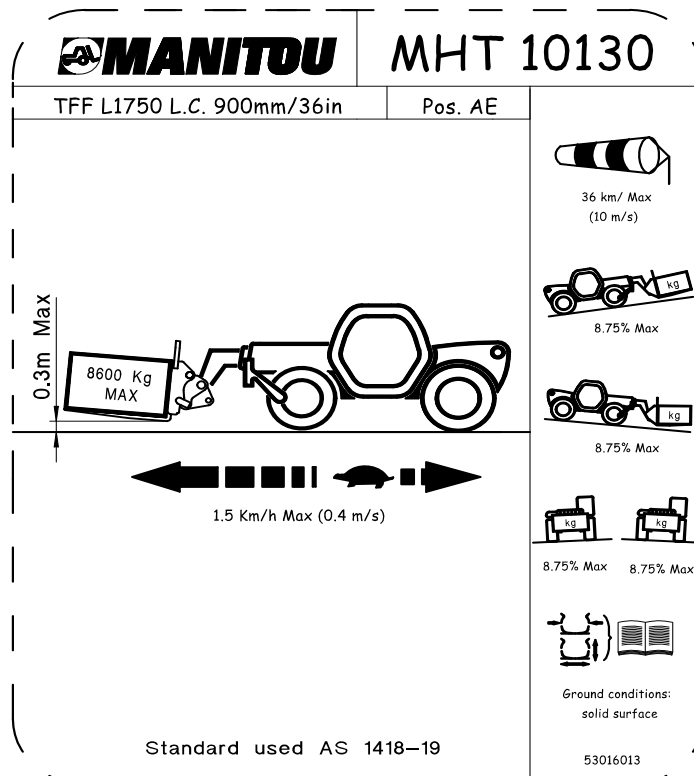
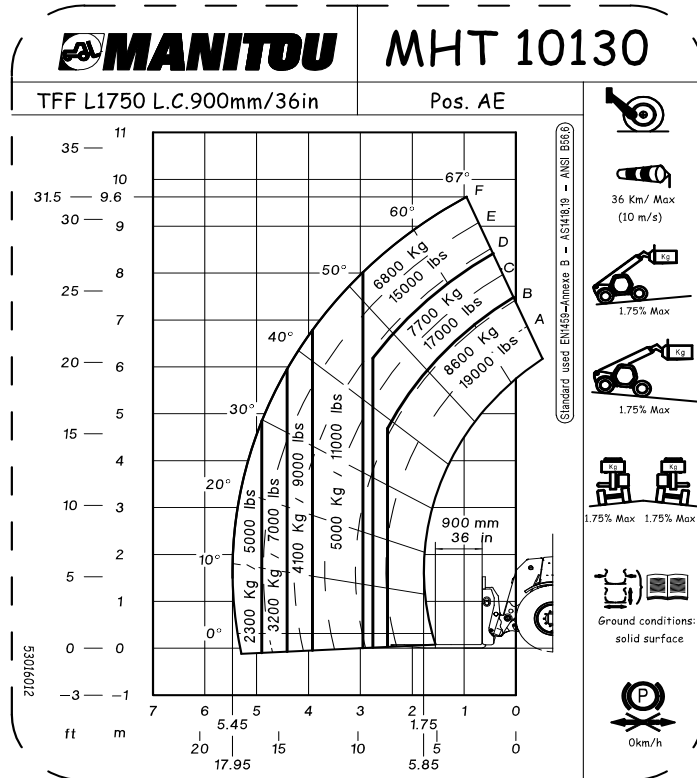
MHT-X 10130 129M ST3A S1 / MHT 10130 129M ST4 S1



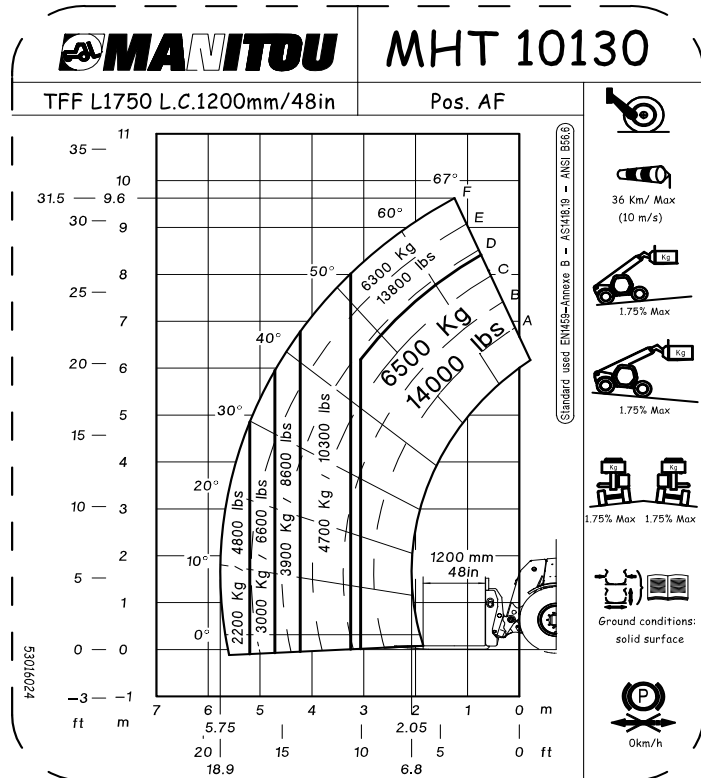
MHT-X 10130 129M ST3A S1 / MHT 10130 129M ST4 S1



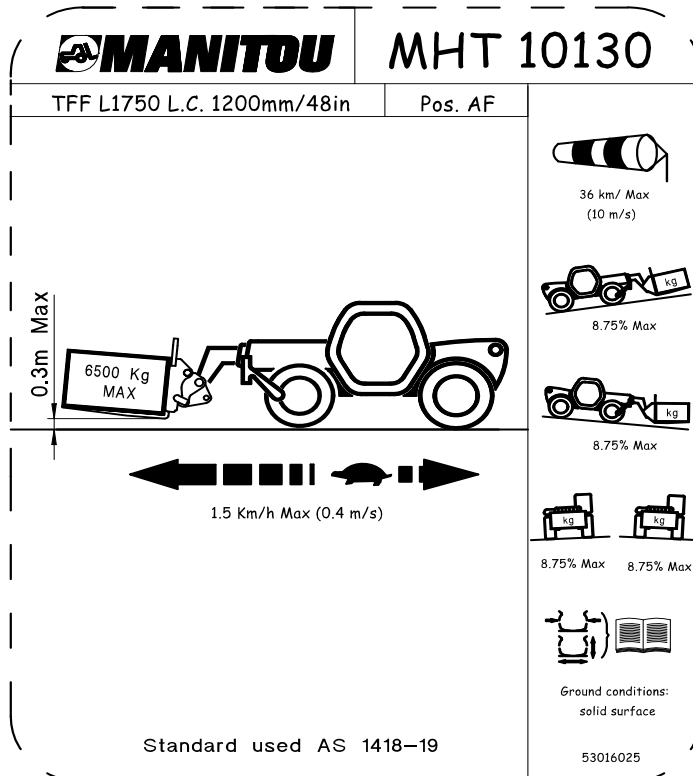
MHT-X 10130 129M ST3A S1 / MHT 10130 129M ST4 S1



MHT-X 10130 129M ST3A S1 / MHT 10130 129M ST4 S1

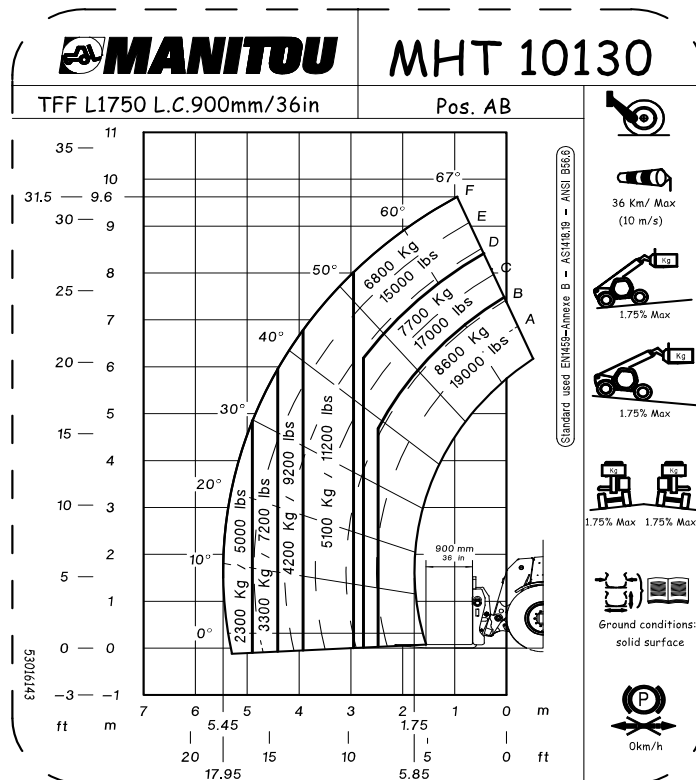
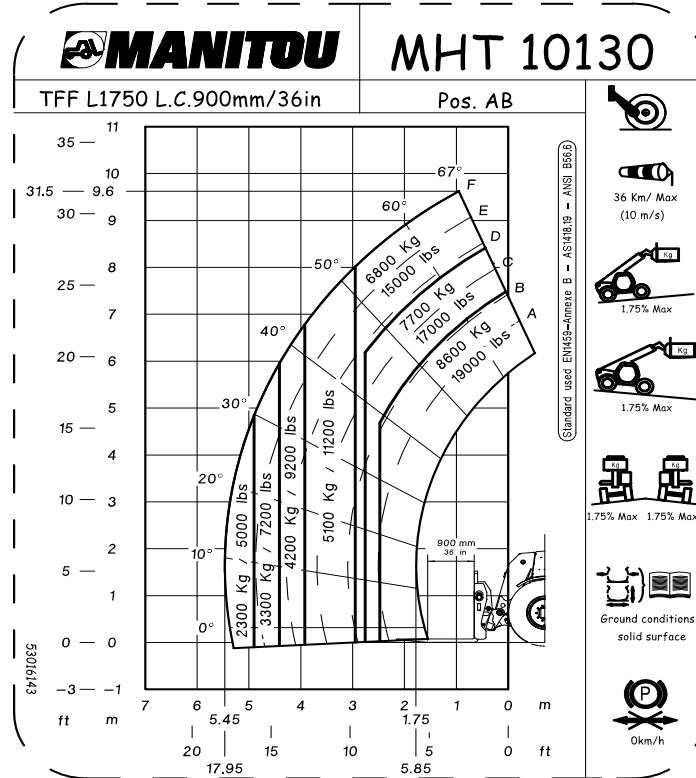


- 36 Km/ Max (10 m/s)
- 1.75% Max
- 1.75% Max
- 1.75% Max 1.75% Max
- Ground conditions: solid surface
- 0km/h

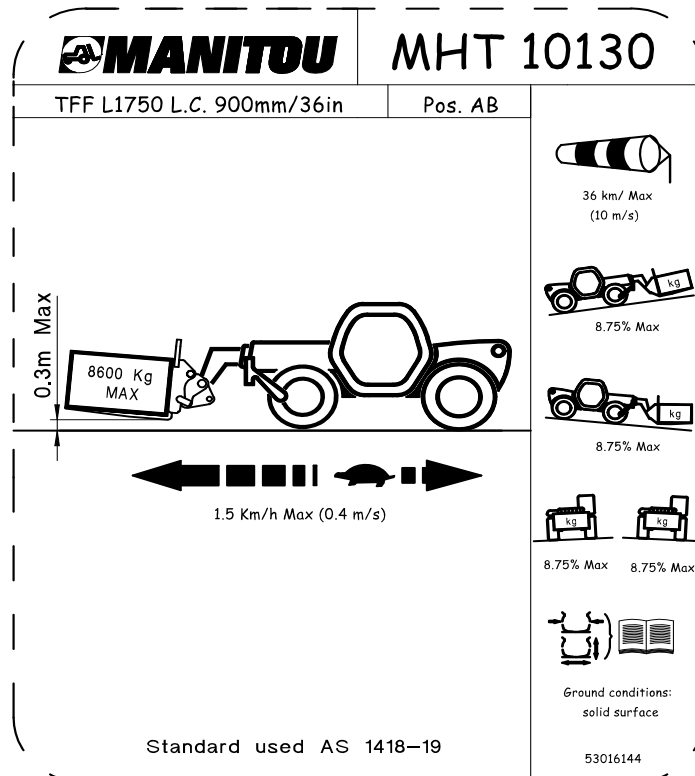
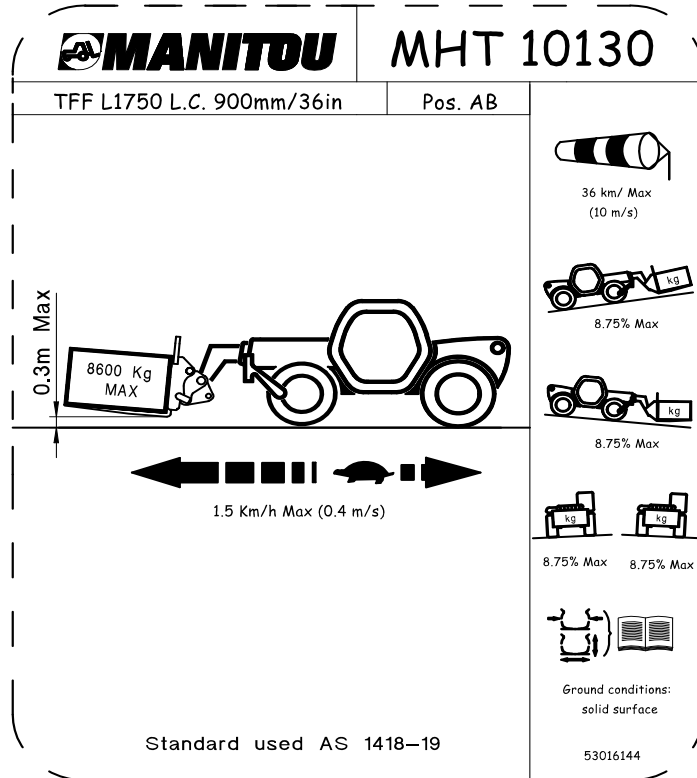


- 36 km/ Max (10 m/s)
- 8.75% Max
- 8.75% Max
- 8.75% Max 8.75% Max
- Ground conditions: solid surface

MHT-X 10130 129M ST3A S1 / MHT 10130 129M ST4 S1

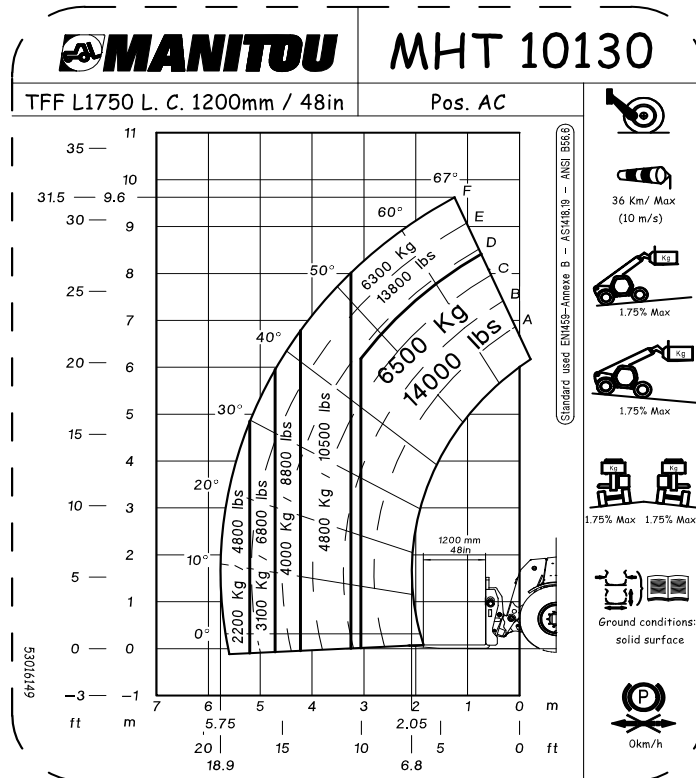
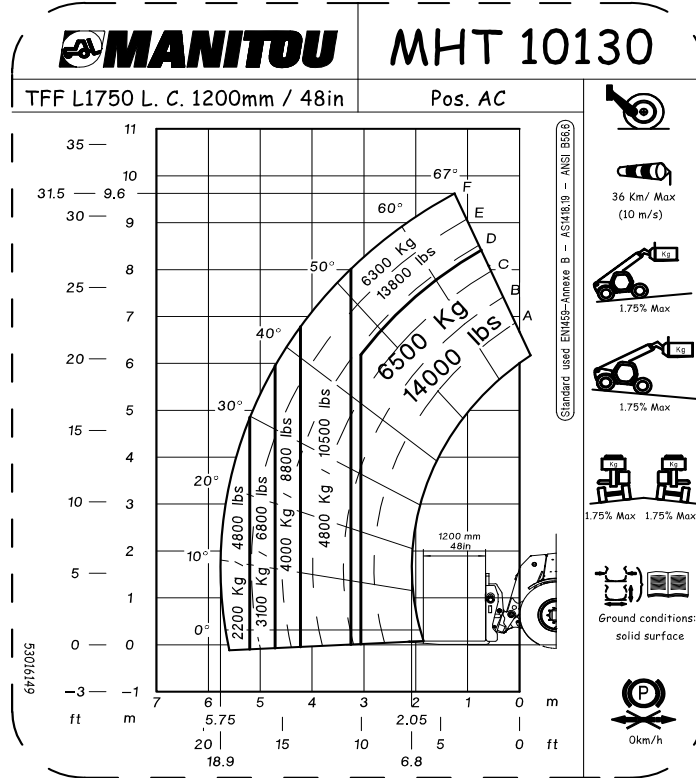


MHT-X 10130 129M ST3A S1 / MHT 10130 129M ST4 S1





MHT-X 10130 129M ST3A S1 / MHT 10130 129M ST4 S1





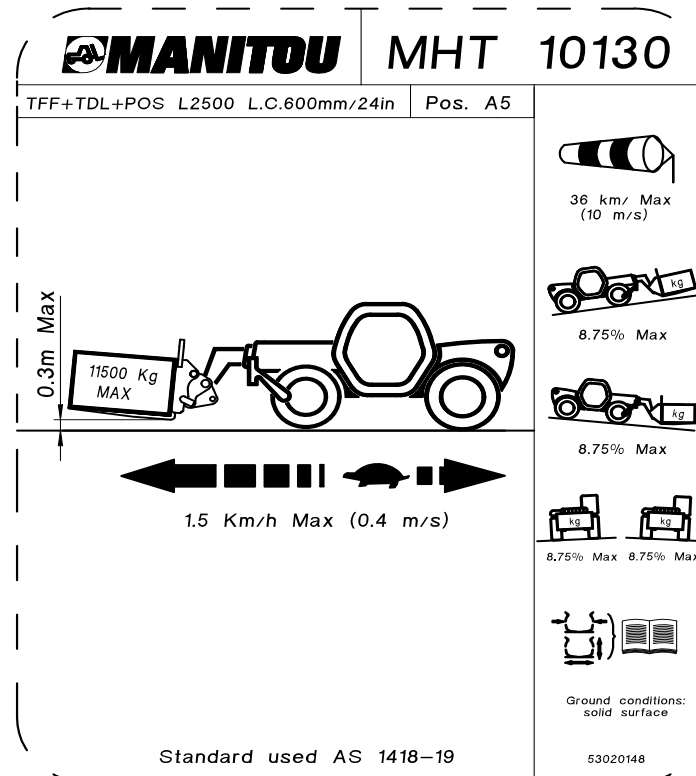
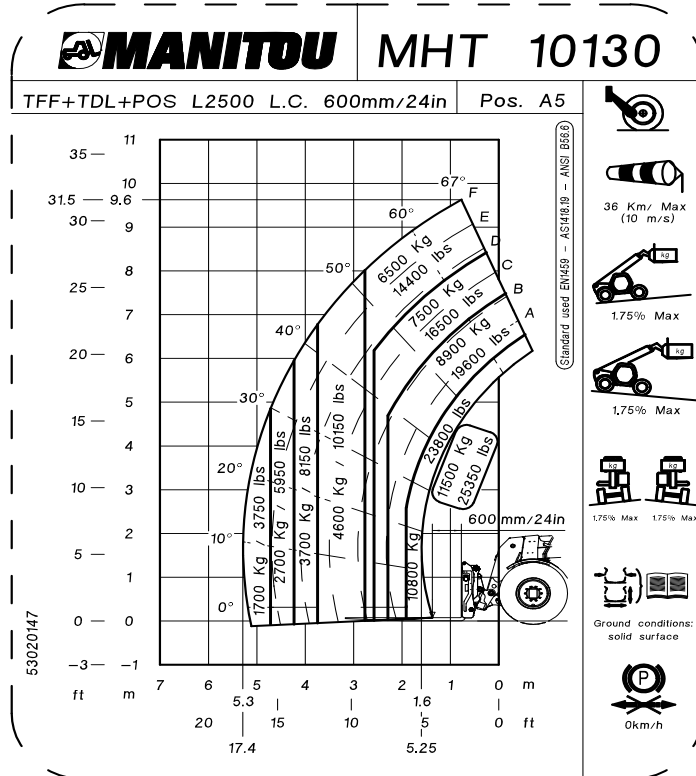
MHT-X 10130 129M ST3A S1 / MHT 10130 129M ST4 S1

MANITOU		MHT 10130
TFF L1750 L.C. 1200mm/48in		Pos. AC
		<p>36 km/ Max (10 m/s)</p>
		<p>8.75% Max</p>
		<p>8.75% Max</p>
		<p>8.75% Max 8.75% Max</p>
<p>Standard used AS 1418-19</p>		<p>Ground conditions: solid surface</p> <p>53016150</p>

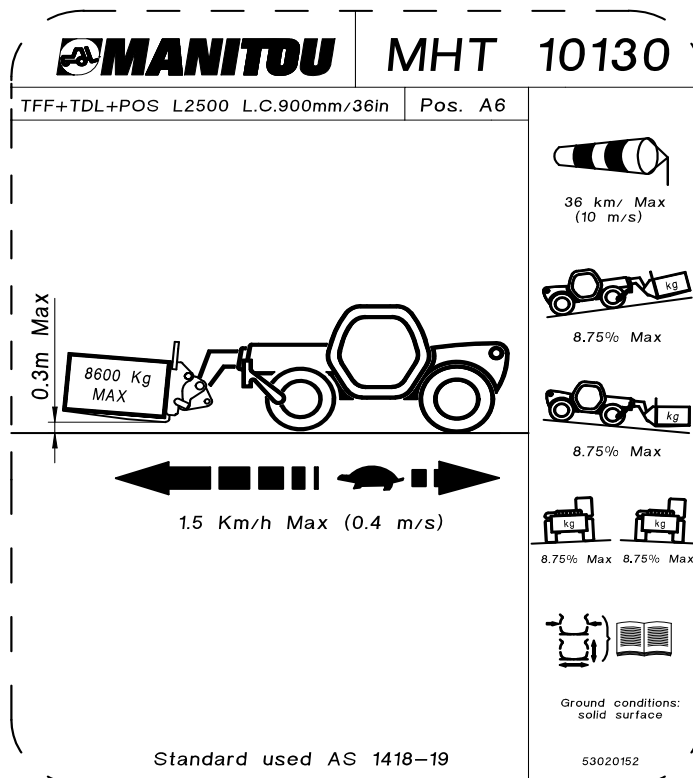
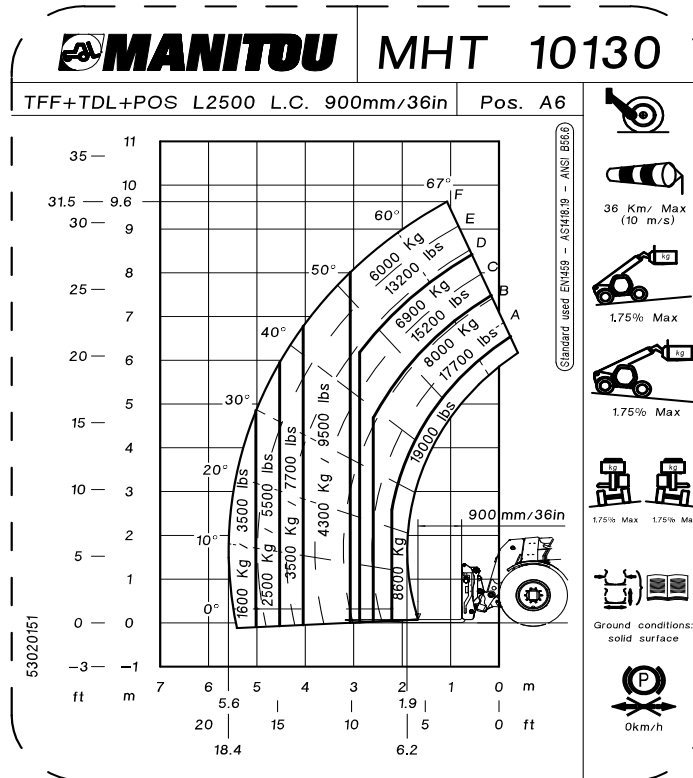
MANITOU		MHT 10130
TFF L1750 L.C. 1200mm/48in		Pos. AC
		<p>36 km/ Max (10 m/s)</p>
		<p>8.75% Max</p>
		<p>8.75% Max</p>
		<p>8.75% Max 8.75% Max</p>
<p>Standard used AS 1418-19</p>		<p>Ground conditions: solid surface</p> <p>53016150</p>



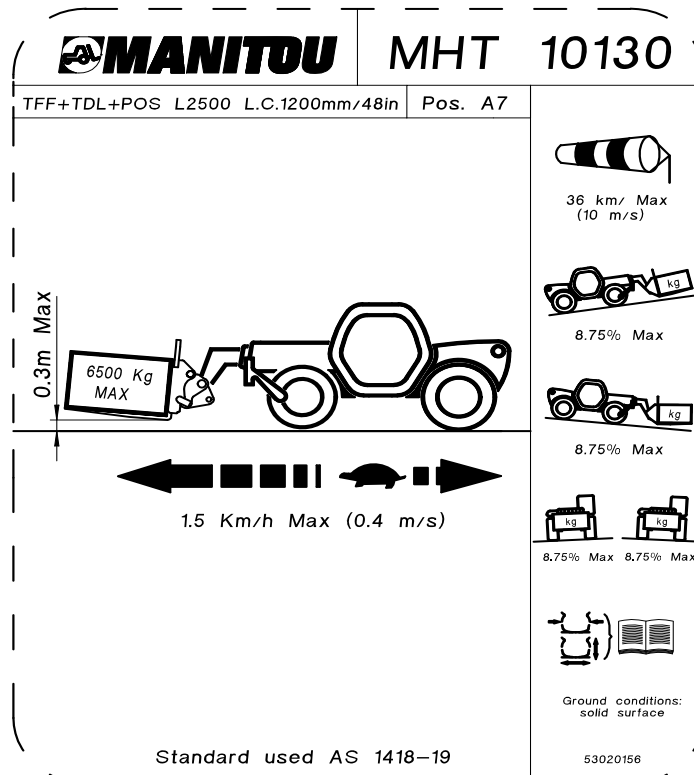
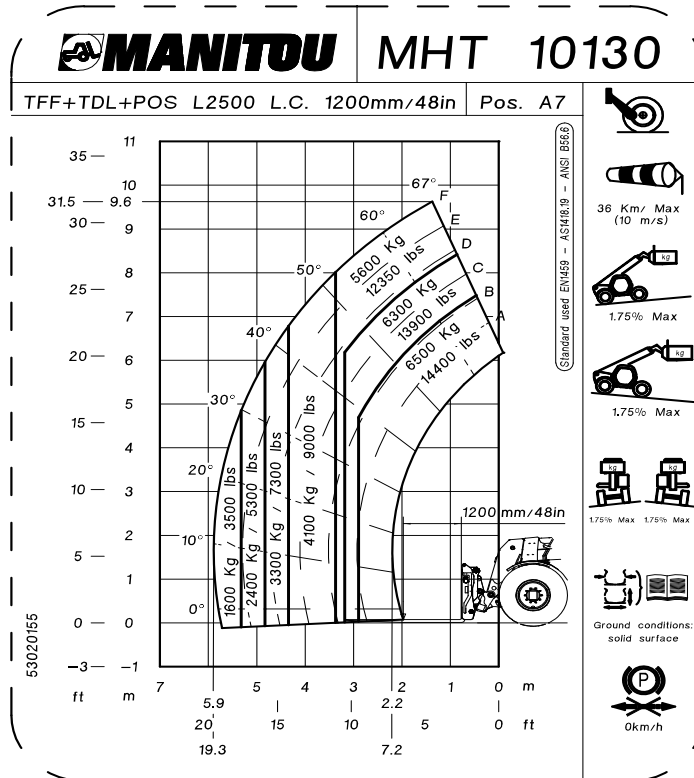
MHT-X 10130 129M ST3A S1 / MHT 10130 129M ST4 S1



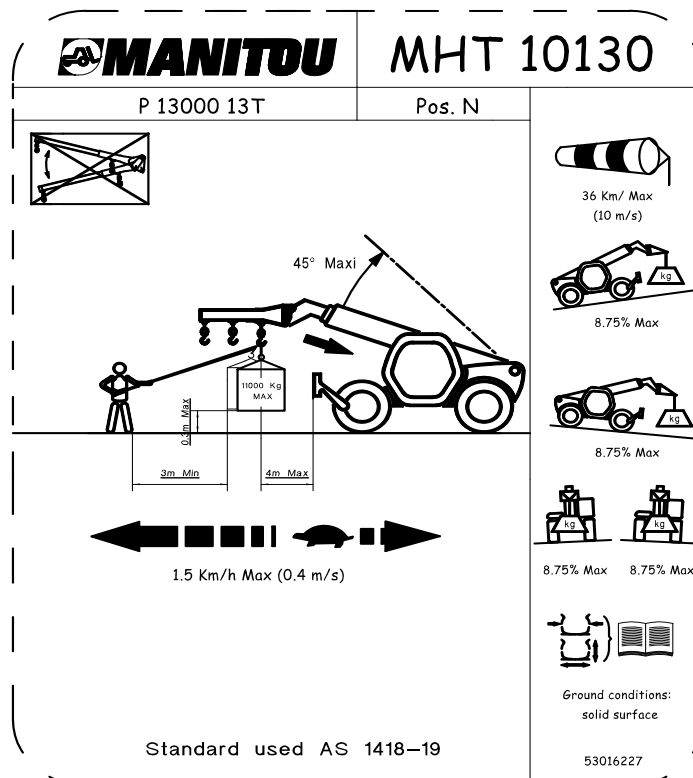
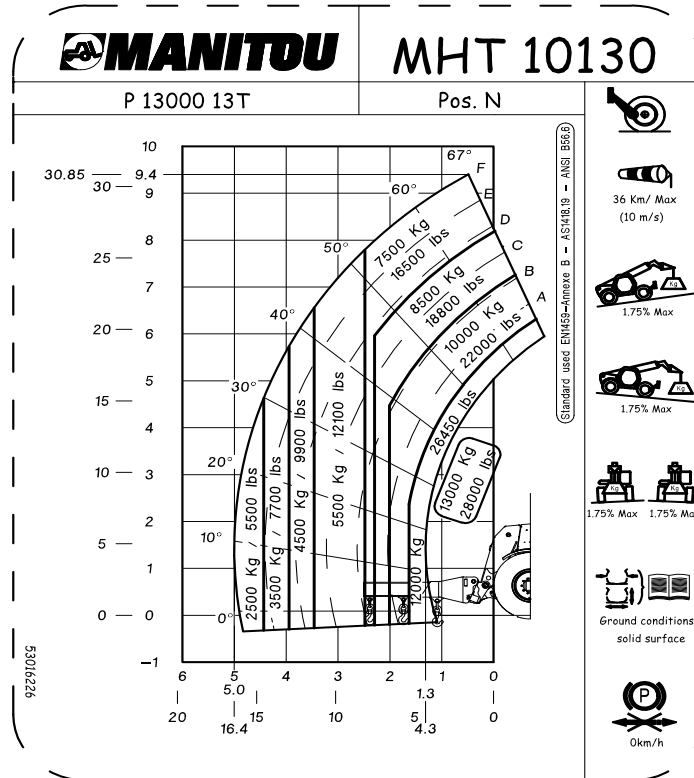
MHT-X 10130 129M ST3A S1 / MHT 10130 129M ST4 S1



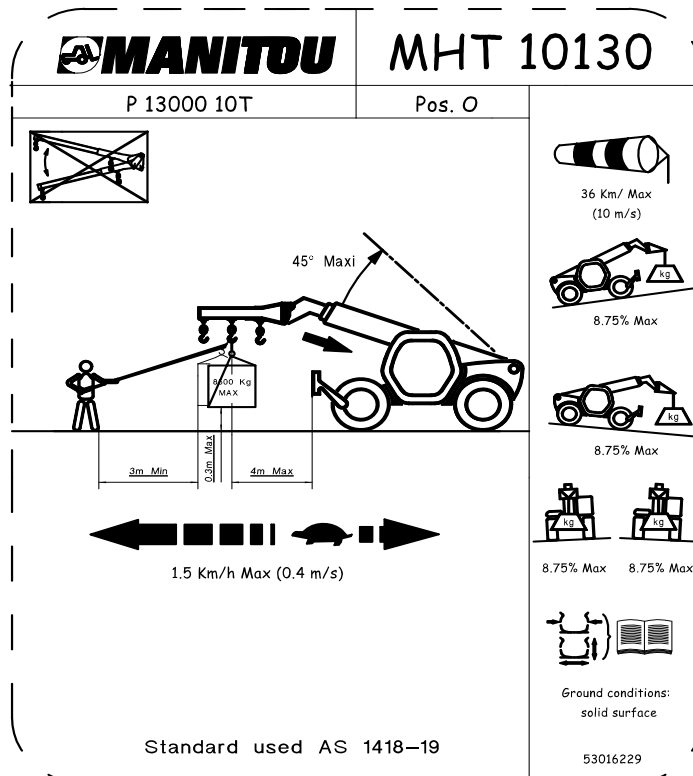
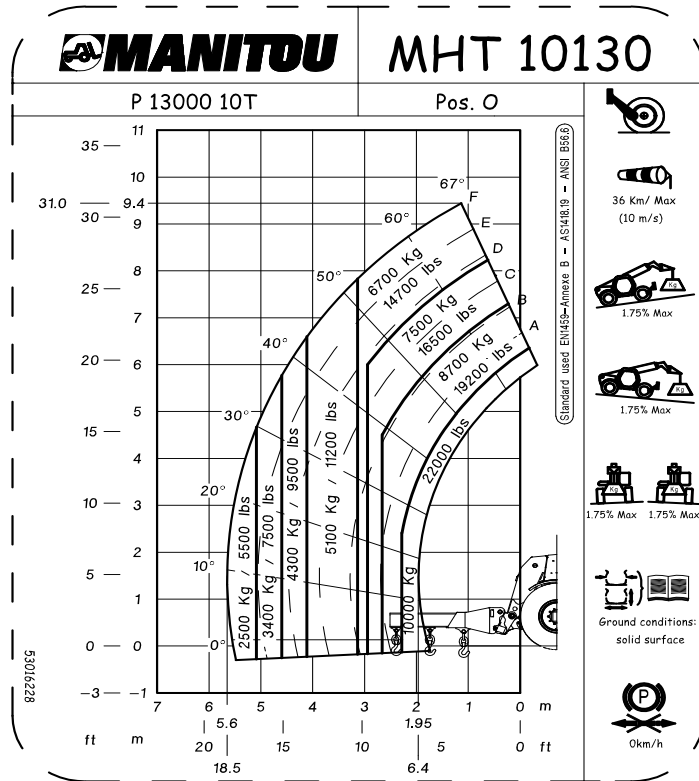
MHT-X 10130 129M ST3A S1 / MHT 10130 129M ST4 S1



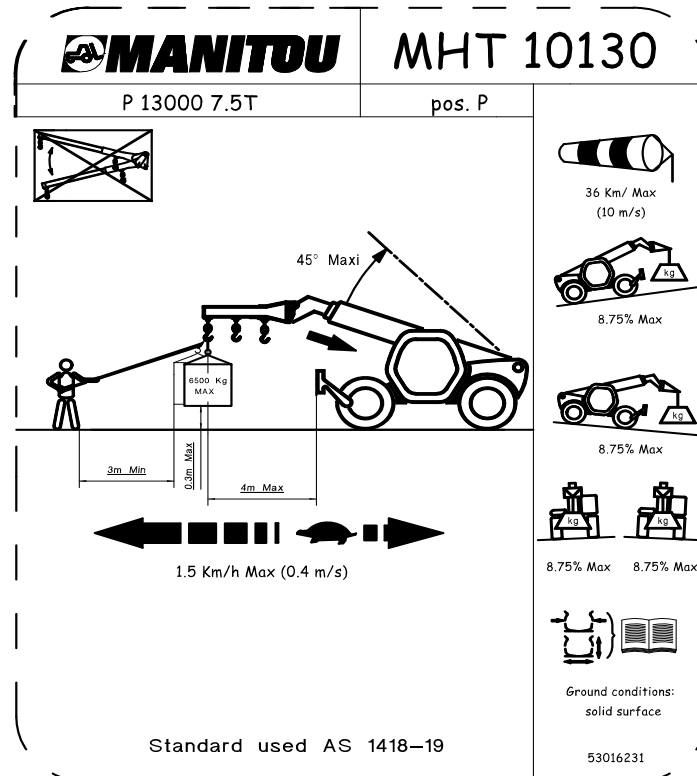
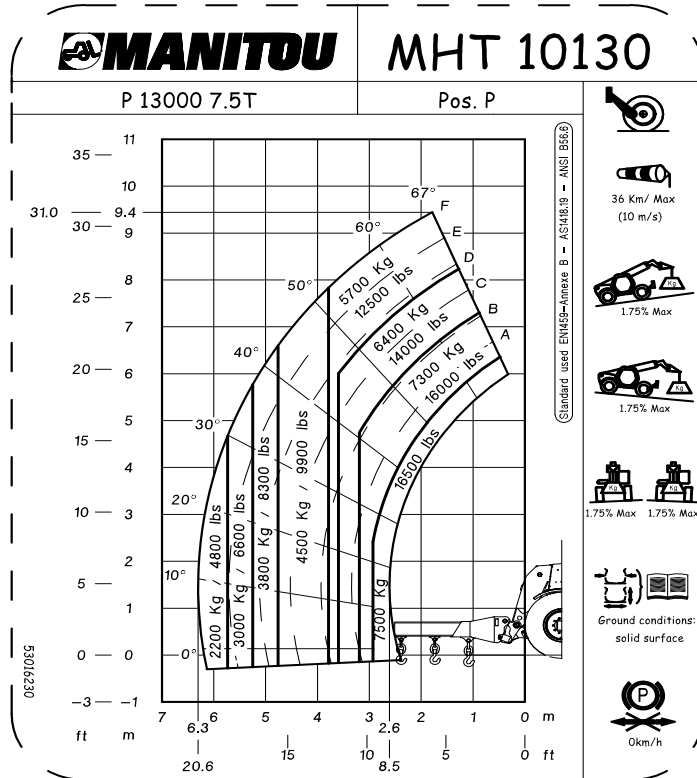
MHT-X 10130 129M ST3A S1 / MHT 10130 129M ST4 S1



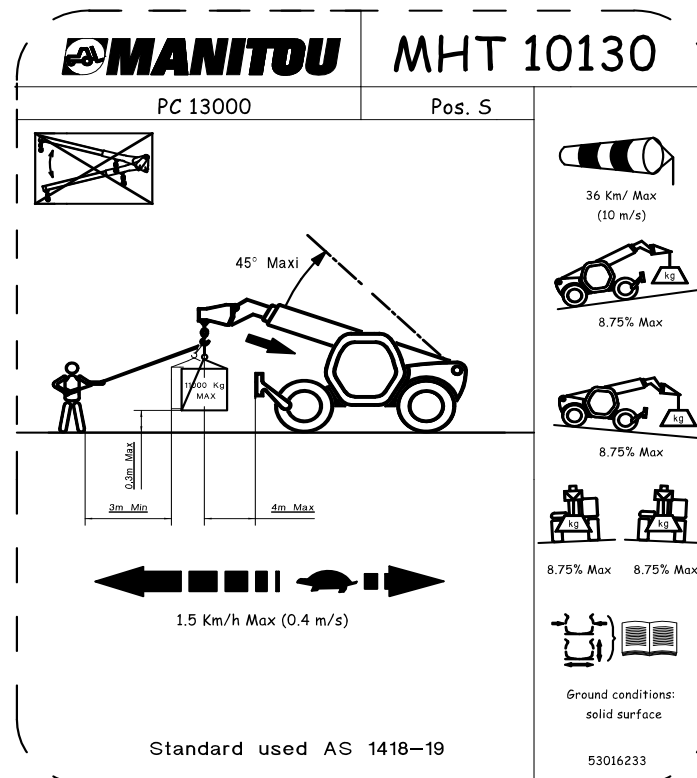
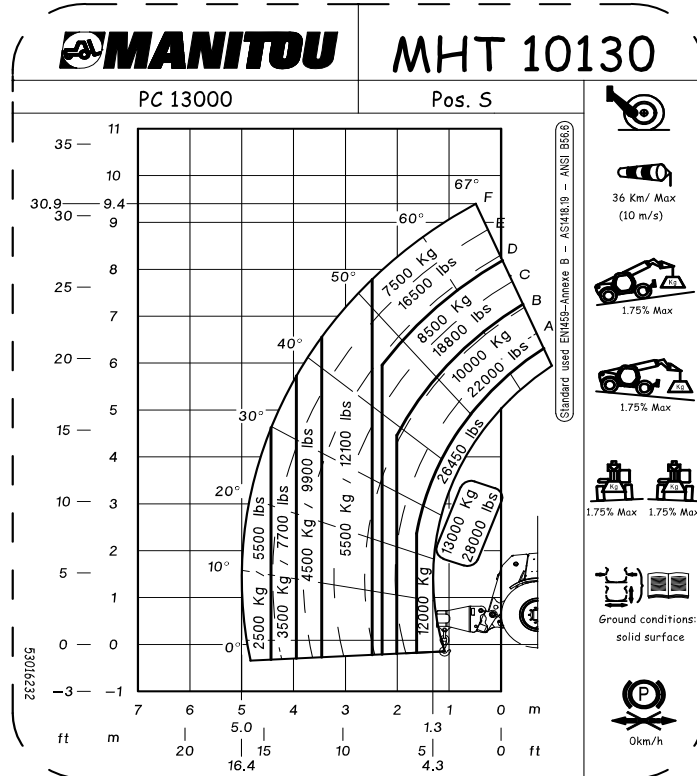
MHT-X 10130 129M ST3A S1 / MHT 10130 129M ST4 S1



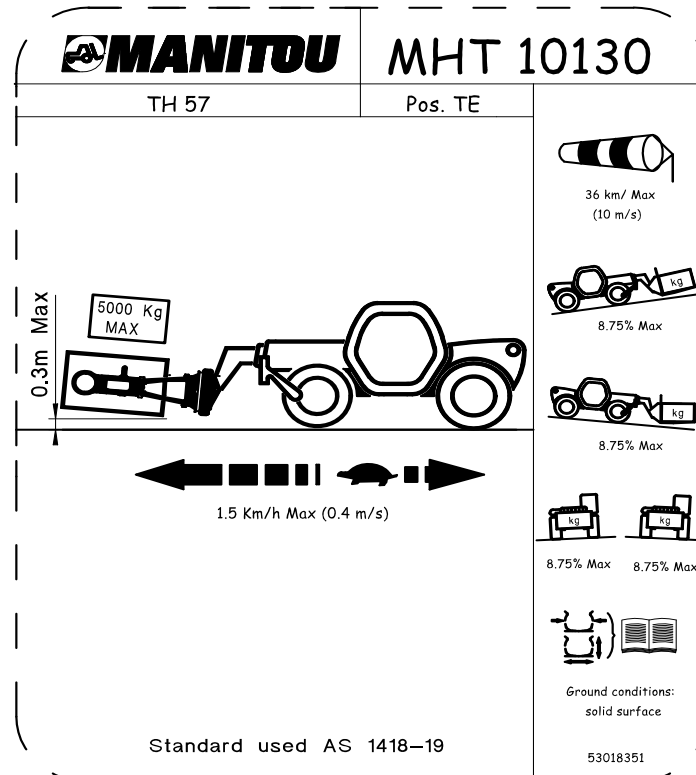
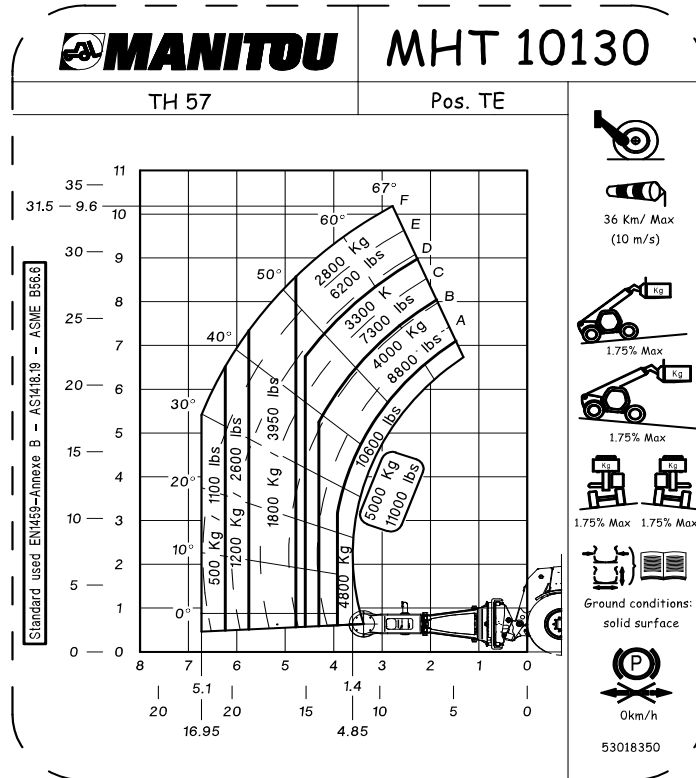
MHT-X 10130 129M ST3A S1 / MHT 10130 129M ST4 S1



MHT-X 10130 129M ST3A S1 / MHT 10130 129M ST4 S1



MHT-X 10130 129M ST3A S1 / MHT 10130 129M ST4 S1





Pagina lasciata intenzionalmente vuota (IT)
Page intentionally left blank (EN)
Page intentionnellement vierge (FR)
Esta página se deja en blanco intencionadamente (ES)
Absichtlich frei gelassene Seite (DE)
Esta página é deixada intencionalmente em branco (PT)
Deze bladzijde is opzettelijk blanco gelaten (NL)
Denne side er med vilje tom (DK)
Tämä sivu on jätetty tarkoituksellisesti tyhjäksi (FI)
Denna sida har med avsikt lämnats tom (SV)
Denne siden er blank med hensikt (NO)
Tę stronę celowo pozostawiono pustą (PL)
Tato stránka byla záměrně ponechána prázdná (CS)
Pagină lăsată în mod intenționat goală (RO)
Тази страница нарочно е оставена бяла (BG)
Эта страница намеренно оставлена пустой (RU)



Pagina lasciata intenzionalmente vuota (IT)
Page intentionally left blank (EN)
Page intentionnellement vierge (FR)
Esta página se deja en blanco intencionadamente (ES)
Absichtlich frei gelassene Seite (DE)
Esta página é deixada intencionalmente em branco (PT)
Deze bladzijde is opzettelijk blanco gelaten (NL)
Denne side er med vilje tom (DK)
Tämä sivu on jätetty tarkoituksellisesti tyhjäksi (FI)
Denna sida har med avsikt lämnats tom (SV)
Denne siden er blank med hensikt (NO)
Tę stronę celowo pozostawiono pustą (PL)
Tato stránka byla záměrně ponechána prázdná (CS)
Pagină lăsată în mod intenționat goală (RO)
Тази страница нарочно е оставена бяла (BG)
Эта страница намеренно оставлена пустой (RU)