



Use and maintenance manual

Telescopic handlers



TH 6.20 – TH 5,5.24 [-0]

Deutz stage 3A Deutz stage 5

Magni Telescopic Handlers Srl

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Manual data

TRANSLATION OF THE ORIGINAL INSTRUCTIONS

Prepared in compliance with the essential requirement for the protection of health and safety 1.7.4 of Annex I of Directive 2006/42/EC.

Version	Date	Notes
0	06/2023	First release

Vehicle model	Trade name	Engine	Emissions regulation	Rated power	Road approval
TH 6.20 D/A-0	TH 6.20	Deutz	Stage 3A	100 kW	/
TH 6.20 D/D-0	TH 6.20	Deutz	Stage 5	100 kW	/
TH 5,5.24 D/A-0	TH 5,5.24	Deutz	Stage 3A	100 kW	/
TH 5,5.24 D/D-0	TH 5,5.24	Deutz	Stage 5	100 kW	/

Manufacturer's details



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PREFACE

Important information regarding safety

Most accidents caused by the use, maintenance and repair of vehicles are due to failure to observe the most elementary rules of safety and caution. An accident can often be avoided if the potential hazards to which one is exposed are known, and the required precautions are taken. Those working on the vehicle must take the utmost care and must have suitable technical skills and equipment for carrying out the various operations correctly.

Improper use, maintenance or repair of this vehicle can lead to accidents and also death of workers.

Use the vehicle or carry out maintenance or repairs on it only after having completely read and understood all of the instructions in this use and maintenance Manual.

The precautions and warnings regarding safety are highlighted in this Manual and on the vehicle by vehicle of the informative stickers. Ignoring these warnings can result in serious accidents, or even death for the operator or other persons.

Magni Telescopic Handlers S.r.l. may not be able to foresee all the possible circumstances which can constitute a safety hazard. The warnings contained in this Manual or applied on the vehicle may not be considered as all-inclusive. In adopting procedures, equipment or methods not expressly recommended it is the operator's responsibility to make sure work is carried out in accordance with the main safety standards and in compliance with the law. Moreover, it is necessary to ensure that the vehicle is not rendered hazardous by accidental damage or emergency maintenance carried out without authorisation.

Information regarding this Manual

This Manual must be considered an integral part of the vehicle and must accompany it throughout its working life from commissioning to final disposal. It must therefore be kept safe in the spaces provided inside the vehicle, or in such a place as to prevent premature deterioration.

This Manual contains information regarding safety, instructions for correct use of the vehicle and recommendations for routine maintenance.

The information, technical specifications and instructions contained in this Manual must be considered as up to date on the date of its publication. The Manufacturer reserves the right to make modifications to the vehicles, their equipment and calibration at any time, without prior notification. These modifications can influence the maintenance and working of the vehicle.

It is necessary to have the latest and complete information before starting any operation on the vehicle. Please contact your Magni Telescopic Handlers dealer for the latest copy of this Manual.

If the vehicle is fitted with optional accessories, a use and maintenance manual for the accessories will be provided together with this Manual. The use and maintenance manual of the accessories must be considered as an integral part of the manual; therefore it must be kept safe and consulted using the same methods and with the same care.

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Symbols used

The symbols used in this Manual comply with standard UNI EN ISO 7010:2012.

Danger indications included in this manual are made easily identifiable by a "warning symbol" flanked by one or more "words of warning"; in addition, there is always a message, in written or illustrated form, underneath the symbol, illustrating the danger and techniques for avoiding it.

Parts of the text that are considerably important or specific operating procedures have been highlighted with the use of the following symbols:

NOTICE

Blue without safety alert symbol — used to indicate the presence of a potentially dangerous situation which, if not avoided, can cause damage to property.



CAUTION

Yellow with safety alert symbol — used to indicate the presence of a potentially dangerous situation which, if not avoided, can cause minor or moderate injury.



WARNING

Orange with safety alarm system — used to indicate the presence of a potentially dangerous situation which, if not avoided, can cause death or serious injury.



DANGER

Red with safety alarm system — used to indicate the presence of an imminently dangerous situation which, if not avoided, can cause death or serious injury.

Reference regulatory framework

This Manual has been drafted in compliance with the main reference standards:

- Machinery Directive 2006/42/EC;
- UNI 10653:2003 Technical documentation Quality of product technical documentation;
- UNI 10893:2000 Technical documentation of product – Instructions for use – Articulation and Exposition of the Content.

SAFETY AND WARNINGS SECTION

Symbols and safety labels

Several specific safety symbols are present on this vehicle. This section shows the exact position of the warning plates on the vehicle and the entity of the hazard. Those using the vehicle must be fully aware of the meaning of each safety symbol for rapid identification and effective prevention of risks.

Make sure all the safety symbols are present and clearly legible. Contact your dealer for missing labels, or in case of labels present but not described in this Manual. Clean illegible labels. Use a cloth, warm water and neutral soap for cleaning. Do not use solvents, petrol or abrasive chemical products for cleaning the labels. These products will irremediably damage the adhesive fixing the label to the vehicle.

Replace all missing or damaged safety labels. If a safety label is applied on a part of the vehicle that is to be replaced, make sure the spare part has a similar label. Contact your dealer for assistance in case of irreparably damaged labels, missing labels and labels present on the vehicle but not described in this Manual.

Engine compartment

This safety symbol is applied on the engine compartment near the handle.



DANGER

There are several sources of risk inside the engine compartment which can cause serious injury or even death.

Do not approach or touch any part inside the engine compartment without protective equipment and adequate technical training.

The engine has high pressure lines. Liquid leakage can penetrate the tissues causing even serious injuries.

Do not disconnect the highpressure lines. The liquid trapped inside can leak out with considerable pressure that could pierce the tissues, causing serious injury.

Do not touch the electric wiring or short circuit these. The current in the electric wiring is high voltage and can cause explosions or damage tissues if short circuited.

There are scorching hot surfaces and flammable and explosive materials inside the engine compartment. Do not allow contact between the scorching hot surfaces and flammable material.

Do not try to repair the high-pressure lines.

Carefully read the Use and Maintenance Manual before starting the engine or carrying out maintenance or repairs.

Hot surfaces



This safety symbol is present inside the engine compartment.



WARNING

The surfaces near the engine can get heated to temperatures exceeding 100 °C.

Serious burns can be caused if the skin comes in contact with these surfaces.

Do not touch the engine compartment and the parts inside it without making sure they have cooled down.

Radiator



This safety symbol is present on the upper part of the radiator, inside the engine compartment.

Do not unscrew the radiator cap when the coolant is still hot. The hot coolant is also pressurised, and unscrewing the cap will cause ejection of boiling steam jets with risk of even serious injuries.

Radiator fan



This safety symbol is present on the radiator surface near the cooling fan.

Do not touch the radiator fan with the engine running.

The fast moving fan blades can cause severe tearing or even cut the limbs.

Do not enter the operating area of the vehicle



DANGER

CRUSHING HAZARD!

Do not approach the vehicle while it is working.

The vehicle may inadvertently cause serious injury or death to persons in its working area during operation.

Do not stand under the load



This safety symbol is positioned at the top of the telescopic boom.



DANGER

If the hanging load falls to the ground it can cause serious injuries or death to persons present in the area underneath.

Never stand in the area under a hanging load.

Pressure of outriggers on the ground



This safety symbol is applied on both of the outriggers.

Always make sure the ground is capable of withstanding the load applied by the outriggers. Yielding of the ground can affect the stability of the vehicle. If the stability is affected the result can be loss of load, and in extreme cases, even tilting over of the vehicle.

Do not approach the accessory



This safety symbol is applied at the top of the telescopic boom, on the left side, near the quick-fit coupling for the accessories.

Do not approach the accessory fitted at the top of the boom during the working of the vehicle. In particular, do not climb on the accessory, and do not stand in the area under it.

Speed limit on public roads



These symbols applied on the sides and at the back of the vehicle indicate the maximum speed permitted for driving on the road, depending on the country of use.

Do not exceed the speed indicated for driving on public roads.

Ignoring this warning can be a risk for the safety of the operator, vehicle and for objects and/or persons present in the vicinity.

The operator who ignores this warning may face administrative and/or criminal penalties. The entity of these penalties depends on the road rules in force in the country in which the vehicle is used.

General danger information



Fit a **"DO NOT OPERATE"** or similar tag to the start-up switch or to the controls before carrying out maintenance or repairs on the vehicle.

The vehicle must be used only by suitably qualified trained personnel. Driving permission must be issued by the work site manager where the vehicle is to be used. The driving permit is strictly personal and must not be used by others.

Note the vehicle dimensions in order to be able to keep at a safety distance from surrounding obstacles during use.

Pay attention to the presence of high voltage lines, both overhead and underground. In case of contact between the vehicle and high voltage electricity lines, there may be intense electric shocks which can cause injuries, even fatal.



Wear the personal protective equipment necessary for the type of operations to be carried out.

Do not wear loose clothing, jewellery or metal objects which can get entangled in the controls or other parts of the vehicle.

Make sure all the guards and covers are fitted correctly on the vehicle.

Keep the vehicle in perfect working condition by carrying out the scheduled maintenance punctually and scrupulously.

Unless otherwise specified, carry out the maintenance operations with the vehicle in the maintenance position.

Dispose of the used liquids in compliance with the regulations in force in the country where the vehicle is used.

Clean the vehicle daily. Remove debris, oil, tools and other objects from the steps, passages and treading surface.



NO SMOKING OR LIGHTING UP ANY KIND OF NAKED FLAME

Do not smoke or light naked flames under any circumstances whatsoever.

Naked flames in contact with fuel, oil or solvents present on the vehicle or necessary for its maintenance can cause injuries, even fatal.

Inhalation of gases produced by a flame or contact with coolant gas can cause injury to the respiratory airways, even fatal.

Pressurised air and water

Pressurised water can cause injury to tissues, especially if accompanied by debris. Compressed air can cause injuries.

If water or compressed air is used for cleaning operations, wear suitable protective equipment, in particular for sensitive organs like the eyes.

NOTICE

The maximum air pressure for cleaning must be less than 2 bar. The maximum water pressure must be less than 3 bar.

Penetration of fluids

The pressure values in the hydraulic circuit may remain high for a long time even after the vehicle is switched off. If not discharged properly, the pressure can cause violent ejection of oil and objects.

Do not disconnect or dismantle any of the hydraulic components if the pressure has not been discharged correctly, as this can lead to serious accidents.

Refer to the maintenance section of this Manual for the methods for discharging the hydraulic pressure correctly.

Limiting the ejection of liquids

It is necessary to deal with the leakage of liquids during the operations carried out on the vehicle. Provide suitable containers for collecting the liquids before acting on any component of the vehicle containing fluids.

Dispose of the liquids used in compliance with the regulatory standards in force in the country in which the vehicle will be used.

Information regarding asbestos

Magni T.H. products and spare parts are asbestos-free. Using non-genuine spare parts can lead to risk of handling products containing asbestos.

Avoid inhaling dusts which may be produced when handling components containing asbestos fibres. Inhaling these dusts can be harmful for health. The non-original components which may contain asbestos are the friction elements of the brakes and clutches, linings and types of gaskets. The asbestos used in these components is generally immersed in resin or sealed in another manner. Normal handling is not hazardous as long as suspended dusts are not produced.

DANGER

If dusts containing asbestos are present, the following precautions must be taken:

- Do not use compressed air for cleaning;
- Avoid brushing materials containing asbestos;
- Avoid grinding materials containing asbestos;
- Use wet cleaning methods for parts containing asbestos;
- Equip the work area with appropriate air extractors;
- If there are no other methods for controlling the dusts, wear a suitable respiratory mask;
- Avoid areas where asbestos particles may be present in the air.

Prevention of cuts and crushing



Support the equipment adequately before carrying out any kind of work on it. Do not rely on hydraulic jacks for supporting the equipment: these may fall if a tube breaks or in case of involuntary activation.

Do not try to make any adjustment while the vehicle is in motion or with the engine switched on, unless otherwise specified.

Avoid tampering with the electrical system of the vehicle to try starting the engine. This may cause involuntary movements of the equipment.

Keep at a safe distance while operating the equipment using the control levers. Increase the safety distance if there is a possibility of the moving parts making rapid and sudden movements.

If it is necessary to remove the safety devices fitted on the vehicle to carry out maintenance or repairs, always refit these at the end of operations.

Keep limbs away from the moving fan blades. The fast moving blades are comparable to sharp blades, and can cause serious tears. Keep small objects away from the moving fan blades. The blades may throw off these objects at high speed, making it dangerous for the safety of persons.

Do not use frayed or bent steel cables. Always wear protective gloves while handling steel cables.

If a pin is tapped with great force, it may come out of its seat suddenly. A pin thrown off with force can cause serious injuries to persons in the vicinity. If tapping on a pin, make sure there is no one in the surrounding area.

Preventing burns



Do not touch the engine or any components directly connected to it during operation. Allow the engine to cool down before carrying out any maintenance. Before disconnecting any component of the hydraulic or pneumatic circuits, make sure all the residual pressure has been discharged from the circuit.

Coolants

When the engine is at operating temperature, the coolant is very hot and at high pressure. The radiator and all the piping connected to it are filled with hot pressurised coolant.

Contact with the hot coolant or with vapour can cause serious injuries. Allow the entire cooling system to cool down before carrying out any intervention.

Before removing the radiator cap, make sure it is not hot. Remove the radiator cap slowly to discharge the residual pressure.

The liquid in the cooling system contains HFC (hydrofluorocarbons). At ambient temperature and pressure the HFC released in the air can cause asphyxia. Do not handle HFC in the presence of naked flames. HFC at high pressure or temperature can give rise to toxic and corrosive chemical agents. Always use appropriate personal protective equipment during operations involving HFC.

Oils

Oil and components at high temperature can cause burns. Do not allow boiling hot oil to come in contact with the skin. Do not touch hot components.

Remove the hydraulic oil tank cap only after stopping the engine. Make sure the cap is cold enough to be touched with bare hands.

Batteries

The electrolyte present in the batteries is acid. Do not let the electrolyte come in contact with the tissues. Always wear protective goggles when acting on the batteries. Wash hands thoroughly after touching the batteries or electric connectors. Use of protective gloves is recommended.

Prevention of fires and explosions



All fuels, most lubricants and certain coolant mixtures are flammable.

Flammable fluids that come in contact with hot parts can cause fire, leading to considerable personal damage/injury.

Do not leave flammable material on the vehicle unless it is strictly necessary for its operation.

Store fuels and lubricants in suitable containers, marked specifically, and kept out of reach of unauthorised persons. Store greasy rags or any flammable materials in protective containers. Do not smoke in areas provided for storage of flammable material.

Do not use the vehicle in the vicinity of fire or naked flames.

Do not carry out welding operations near piping or tanks containing flammable fluids. Before carrying out these operations, drain out the piping and tanks and clean all parts thoroughly with non-flammable solvents.

Bare electric wires can cause fires or explosions. Check the electrical system daily. Repair or replace damaged wires before starting the vehicle.

Leakage of flammable liquid from the systems onboard can cause fire or explosions. Check all the piping and their supports daily. Repair or replace damaged hydraulic piping. Replace damaged fuel piping.

Take utmost care while refuelling. Do not smoke while refuelling. Do not refuel in the vicinity of sparks or naked flames. Always switch off the engine before refuelling. Do not carry out refuelling operations in closed poorly ventilated places.

The batteries can produce explosive gases. Do not smoke or use naked flames in the vicinity of the batteries.

Connecting the poles in short circuit can cause the battery to explode. Do not place metallic objects on the surface of the batteries. Do not connect the batteries differently from the method described in this Manual.

Extinguisher

It is advisable to provide the vehicle with an extinguisher. Learn to use the extinguisher and follow the Manufacturer's instructions. Carry out regular maintenance and periodic replacement of the extinguisher.

Ether

Ether is extremely flammable. If it is used for making it easier to start up the engine in cold climates or for any other purpose, adopt the following precautions.

Use ether in the open or in well-ventilated areas.

Do not smoke while using ether. Do not use ether in the presence of naked flames, sparks or electrostatic discharges.

Do not place ether cylinders in the operator's cab or in areas where workers are present. Do not expose ether cylinders for long periods to direct sunlight or temperatures exceeding 50 °C. Do not place ether cylinders near naked flames, sparks or electrostatic discharges.

Dispose of ether cylinders in accordance with the regulatory standards in force. Do not damage ether cylinders. Keep ether cylinders out of reach of unauthorised persons.

Do not spray ether in an engine if the latter is fitted with thermal devices to facilitate start-up in cold climates.

Piping

Do not bend or damage the high pressure lines. Do not install bent or damaged piping on the vehicle.

Repair or replace damaged piping promptly. Leakage can cause fire or explosions. Contact your Dealer for original spare parts and repairs.

Make sure the piping is installed correctly to prevent vibrations, rubbing or excessive heat from affecting the duration.

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Information regarding AdBlue

AdBlue is a water-soluble non-flammable, non-toxic, colourless, odourless liquid. It may be referred to as "urea" or "DEF" (Diesel Exhaust Fluid).

If AdBlue comes in contact with painted surfaces or aluminium, wash the areas concerned immediately with water.



CAUTION

Do not mix AdBlue with any additive. Mixing additives with AdBlue can cause serious faults in the plant for post-treatment of exhaust gases.

Any impurity present in AdBlue can cause malfunctioning of the engine and of the exhaust gases post treatment system. Make sure the AdBlue is free of impurities. Do not reuse the AdBlue extracted from the system.



This sign is positioned near the AdBlue tank connector.

AdBlue and high temperatures

The chemical composition of AdBlue can change if exposed to temperatures exceeding 50 °C, releasing ammonia vapours.



WARNING

Ammonia vapours are highly toxic and corrosive. Ammonia vapours have a pungent smell, and irritate:

The skin;

The airways;

The eyes.

Do not open the AdBlue tank or any part of its supply circuit while the liquid is hot.

Strictly avoid inhaling ammonia vapours or contact with the eyes and skin.

In case of contact with any part of the body, rinse immediately with water for at least 15 minutes and see a doctor immediately.

AdBlue and low temperatures

AdBlue freezes at temperatures below -11 °C. However, it is possible to use the vehicle below -11 °C.

AdBlue crystals are mainly formed in the tubes between the engine and silencer. Wash with water to remove these crystals.

Storage and disposal

To store AdBlue, use only containers made of one or more of the following materials:

- Cr-Ni steel according to standard DIN EN 10088-1 /2 /3;
- Mo-Cr-Ni steel according to standard DIN EN 10088-1 /2 /3;
- Polypropylene;
- Polyethylene.

Do not use containers made of the following materials:

- Aluminium;
- Copper;
- Copper alloys;
- Non-alloy carbon steels;
- Galvanised steels.

AdBlue can corrode these materials and cause severe damage to the exhaust gases post-treatment system.

Dispose of AdBlue in accordance with the standards in force in the country in which the vehicle is used.

NOTICE

For drive units satisfying the Stage V anti-pollution standards, in order to protect the AdBlue purification system, wait at least 5 minutes after the engine is switched off, before acting on the main electric circuit to disconnect it.

Regeneration

After a predefined period of use or use which affects operation, the filters for scrubbing fine dust emissions require regeneration.

This eventuality is automatically established by the engine diagnostics control unit which can be enabled on the Engine Data page of the multiple function panel (green button), as shown below.



This automatic function can be disabled by the user for operating requirements (e.g. instructions from the site manager, work in closed areas where this operation is strongly advised against, such as tunnels or warehouses) by pressing the green button indicated.

The green button turns red and in this mode automatic regeneration is inhibited.



NOTICE

With the automatic regeneration mode disabled, it is the sole choice of the operator who can check the engine data on the specific page and decide when to run it.

If this is not run within a certain period of time, the vehicle first indicates it with a banner on the multiple function display, so if this request is not met in a short time it goes into progressive derating, in order to preserve the engine and filters, until it stops.

Proceed as follows to run manual regeneration.



As indicated by the warning, the vehicle must be brought to the rest position with the boom retracted and lowered, in neutral gear, parking brake on and ensure that the vehicle is in an open sufficiently ventilated environment.

Press the button in the top right-hand corner to access the correct alarms page displaying the specific regeneration activation button.



Once regeneration lasting 30-40 minutes is active, all vehicle movements are inhibited.



DANGER OF BURNS

During the regeneration, temperatures to the order of 600°C are reached at the end of the exhaust pipe.

Before activating the regeneration procedures, the operator must check the area around the vehicle, if flammable material is present within a range of 5 metres, and if it is impossible to limit operators from approaching the area, the vehicle must be moved to an isolated area to avoid accidental fires or burns.

Accident prevention in case of thunderstorms with lightning

Never try to climb on or get down from the vehicle if lighting strikes in the vicinity.

The operator in the cab must stay inside until the thunderstorm and lightning is over.

If on the ground during a thunderstorm with lightning, the operator must move away from the vehicle and keep at a safe distance.

Spare parts and tooling

The Certificate of Conformity implies the Manufacturer's responsibility only for vehicles without modifications made by the user or by third parties, and only equipped with original, approved spare parts and equipment.

Use only original components for vehicle maintenance.

Using components which are not genuine can affect operation of the vehicle and its life.

Using spare parts that are not genuine can invalidate the warranty on the vehicle, and induce the Manufacturer to withdraw the certificate of conformity.

WARNING

Use of equipment or accessories not approved by the Manufacturer can cause injury or even death.

Before installing an accessory on the vehicle, check to make sure it has been approved by the Manufacturer and the relative load charts are present in the forklift truck software.

In case of doubt regarding the compatibility of an accessory with the vehicle, contact your dealer.

Make sure all the guards on the vehicle and on the accessory are fitted in place.

During maintenance of the accessories, pay special attention to the sharp and hot parts, and parts which can crush limbs.

Before using the vehicle



Operators using the vehicle must be trained and must be familiar with all its working aspects. The operator must obtain a licence or certificate if required by the regulatory standards in force. If the vehicle is used on public roads, a regular driving licence is required in accordance with the laws in force.

The operators must familiarise themselves with the work site or place in which the vehicle is to be used. The entire area must be inspected, with special attention to:

- Availability of clearance for operations on the ground as well as overhead;
- Presence of raised obstacles;
- Presence of electricity lines;
- Presence of steam or compressed air ducts;
- Stability and capacity of the ground to support the loads, with special attention to any areas with backfill.

Drive around obstacles along the path without trying to drive over these.

Keep at a safe distance of at least 10 metres between the electricity lines and the vehicle or any equipment attached to it.

Make sure the capacity of the ground to support loads is suitable for the weight of the vehicle, the equipment fitted and the load to be handled.

Check the condition of the tyres and the inflation pressure.

Before using the engine check the level of all the fluids: engine oil, transmission oil, hydraulic oil, coolant.

Before starting the engine, make sure there is no one under the vehicle, on top or within its operating area. Fasten the seat belt.

Make sure all the hoods are closed and all guards are installed correctly on the vehicle.

Always shut the cab door. Lock the windows open or closed. Clean all windows to ensure perfect visibility.

Adjust the seat so that the pedals can be pressed completely while sitting correctly. Adjust the steering column inclination to ensure a comfortable posture and easy access to all the controls.

Check the condition of the seat belt and fixing points. Replace all visibly damaged and worn parts. Replace the entire safety belt after 3 years irrespective of wear. Do not use extensions.

Make sure the lighting on board is adequate for the working conditions, and that all the lights are working correctly.

Check to make sure the horn, signalling lights and all the alarm devices work correctly.

Sound pressure and vibration levels in the cab

Sound pressure level

The sound pressure level perceived by the operator inside the cab is less than 80 dB.

This level was measured on a standard vehicle. The measuring procedure used is described in detail in the following standards:

- ISO 11201
- EN 12053

The level of acoustic power emitted (guaranteed) is indicated inside the cab for each model according to the applied engine. The measurement was carried out according to directive 2000/14/EC subsequently modified by directive 2005/88/EC.

Vibration level

Hands and arms are subjected to an average weighted acceleration level less than 5 m/s^2 .

The entire body is subjected to an average weighted acceleration level less than 1 m/s^2 .

These levels are measured on a standard vehicle. The measuring procedure used is described in detail in the following standards:

- ISO 2631-1
- ISO 5349-1
- EN 13059

Protection for the operator

Check the protection devices daily for damaged structures. It is forbidden to use the vehicle with damaged protection devices.

Improper use of the vehicle can be hazardous for the operator even if protection devices in perfect condition are used. Therefore, it is advisable to follow the operating procedures described in the following sections of this Manual.

Roll-Over Protective Structure (ROPS), Falling Objects Protective Structure (FOPS)

The ROPS/FOPS structure is specially designed, tested and certified for the vehicle. Any alteration of the structure can weaken and put the operator at risk.

The protection offered by ROPS/FOPS structures will be affected in case of structural damage.

Avoid structural repair or modification of the ROPS/FOPS structure. These operations will make the structure different from the original, and cause invalidation of the certification.

Safety devices



WARNING

Before using the vehicle, ensure that all safety devices are visible and working properly.

Should you find any anomalies in the safety devices, stop working until the fault has been repaired (Contact your dealer or Magni Telescopic Handlers After-Sales Service).

Check that the symbols and safety stickers are clearly legible.

For your own safety and that of others, do not disable or alter operation of the safety devices.



WARNING

When using equipment with electrical or hydraulic connections, these must always be connected properly to the vehicle with the respective connectors.

Failure to connect them stops the safety devices from working correctly, with a risk of damage to property and people and a risk of overturning the vehicle. The main controls for the equipment safety devices are recommended by the manufacturer with time schedules and must be indicated on the Inspection Register attached to this manual.

These checks ensure that the safety devices work correctly.

Safety devices present

Below is a list of the main safety devices on the vehicle:

- ROPS-FOPS certified cab
- Emergency light (red beacon on top of the cab)
- Emergency stop button in the cab
- Safety symbols and stickers on the vehicle
- Driver's seat microswitch (operator seated correctly)
- Dead Man's Joystick Button (manoeuvre enabling button)
- Seat belt, driver's seat
- Vehicle levelling with spirit level
- Emergency exit (door side glass and back window in cab)
- Parking brake button ((P))
- Hazard lights button (Hazard)
- Emergency hydraulic circuit
- Quick-fit coupling shear pin (manual or hydraulic)
- Work area Control System
- Load Control System (LMI)
- Fire extinguishers

A detailed description of the safety devices listed can be found in the relevant sections of this manual.

Emergency hydraulic pump

The vehicles referred to in this manual are equipped with a manually activated emergency hydraulic pump located under the rear casing of the vehicle chassis.

This pump, when used according to the specific procedure, solves the hydraulic issues relating to malfunctioning of the services pump used by the engine.

Operating test

Two operators on the ground are required for this procedure.

Set the vehicle in the parking position. Extend and lift the telescopic boom; turn off the engine.





Remove the rear casing from the vehicle chassis and take the pump actuation lever from its seat on the left side of the chassis.

Insert the lever into the seat of the pump and start moving it vertically as indicated.



With the circuit still under pressure, a second operator must use 9 mm wrenches, also from the outside, on the first spool to the right of the distributor, nut (1), in order to enable and maintain the flow of oil inside the distributor itself.

A second wrench must be used to turn the nut ② on the spool of the opposite element, the first starting from the left, for retraction-extension of the boom.

Lastly, with the arm retracted, turn the nut ③ on the third spool from the left for lowering the boom.



WARNING

In case of a fault in the emergency hydraulic circuit, avoid using the vehicle and contact your dealer.

Residual risks

Hot fluid jets and hot surfaces

After operation, the engine coolant is hot and under pressure. Contact with hot water or steam leaks can cause severe burns.

Avoid possible injuries caused by hot water jets. Do not remove the radiator cap until the engine has cooled down. To open, unscrew the cap until it stops. Before removing the cap, discharge all of the pressure.

The oil in the engine, gearboxes and hydraulic system heats up during vehicle operation. The engine, rigid and flexible hoses and other components heat up.

Wait for the components to cool down before starting maintenance or repairs.

Avoid these hazards while repairing or carrying out maintenance on the vehicle by discharging the pressure (with the hydraulic levers on the control valves) before disconnecting or repairing hoses and hydraulic parts.

Before restarting the engine make sure that all fittings are tightened correctly.

Look for any leaks with a piece of cardboard; make sure that your hands and body are protected against pressurised fluids. Protect your eyes with a face shield or safety goggles.

If an accident occurs, immediately seek medical attention. Any fluid injected under the skin must be surgically removed within a few hours to avoid infection.



PRESSURISED FLUIDS

Pressurised fluids such as fuel or hydraulic oil can penetrate the skin or eyes, causing serious injury.

DANGER OF BURNS

Pay the utmost attention to hot surfaces.



RISK OF FALLING, TRIPPING

Be extremely careful when climbing up and down the vehicle.

Being trapped in moving parts can cause damage.

Always stay at a safe distance from moving parts.

All maintenance work and/or adjustments to be performed on live parts must only be carried out by qualified and suitably trained personnel.



RISK OF SLIPPING

During operations carried out on site, the areas around the equipment can contain various kinds of debris and liquids (oil, water, etc.) that can make the ground slippery. Be extremely careful.



CRUSHING HANDS AND FEET

The presence of moving parts during operation can cause risks for ground operators. When operating the vehicle, carefully check that there are no unauthorised people within the required movement area.

Generic faults

To know the procedures to be followed in case of faults indicated by the vehicle (engine, battery, etc.), refer to the Troubleshooting Manual.

Alternatively you can contact your local dealer or Magni Telescopic Handlers After-Sales Service.

Braking system accumulators

To know the procedures to be followed to discharge the pressure from inside the braking system accumulators, refer to the Service Manual.

Alternatively, you can contact your local dealer or Magni Telescopic Handlers After-Sales Service.

Braking system accumulators



Be extremely careful when servicing accumulators under pressure.

To remove the accumulators safely, it is mainly necessary to switch off the machine and then act on the brake pedal by activating it (pumping) about 35/40 times.

Once this operation has been carried out, wearing suitable PPE (overalls, goggles, gloves) with due caution, wrap the connection fitting of the accumulator with an absorbent cloth, then start unscrewing it progressively, letting the oil slowly vent until it has come out.

When the pressure is completely discharged, remove the accumulator, and replace it.

Reasonably foreseeable misuse

During daily work, it can happen that the vehicle may be used incorrectly or the instructions in this manual may not be followed.

CAUTION

Experience has taught us that there may be some indications of reasonably foreseeable misuse of the forklift truck.

The various type of forklift truck misuse are strictly forbidden by the manufacturer.

Below is a list of reasonably foreseeable, potentially dangerous situations of misuse:

- the accidental loss of control of the vehicle by the operator;
- the behaviour resulting from a lack of concentration or carelessness by the operator, which does not stem from a desire to misuse the vehicle;
- operating the vehicle on sloping ground without following the guidelines described in the relevant section of this manual;
- the instinctive, unforeseeable reaction of an operator in the event of a malfunction, accident or breakdown while using the vehicle;
- the operator using the vehicle with the feeling that the protection devices are only a hindrance to the operations to be carried out;
- the behaviour resulting from the adoption of the "law of least effort" while carrying out a task with the vehicle;
- the behaviour resulting from external pressure on the operator to keep the vehicle in operation under all circumstances, even potentially dangerous ones;
- the predictable behaviour of certain categories of people such as: adolescents, trainees, apprentices, disabled people, etc.;
- operators tempted to use the vehicle for a bet, for competitions, etc.

DANGER



This safety symbol is applied near the mud guards and indicates that it is strictly forbidden to carry other people, besides the driver, while the vehicle is in operation.

VEHICLE DESCRIPTION SECTION

Identification

Vehicle's identification plate

The vehicle's identification plate is fixed in the cab to the right of the steering column, and shows the vehicle's mechanical data.

	- model
0 Via Masellans 22	model)
	- serial no.,
Modello	- year of manufacture,
Matricola N° Serkil number	- maximum lifting
Anno di fabbricazione Year of construction	capacity,
Capacità massima di sollevamento Max. Ilfiing capacity	 engine power,
Potenza motore Engine power	- unladen weight,
Massa a vuoto Non-loaded mass	- maximum pulling
Sforzo massimo di trazione al gancio Maximum drawbar pui at the coupling hook	force on the hook,
Sforzo massimo verticale sul gancio Maximun vertical load on the coupling hook	- maximum vertical
Manufactured in Italy by: Magni Telescopic Handlers Sri.	strain on the hook.

Serial no. stamped on chassis



The vehicle's serial number is shown in the front portion of the chassis.

Cab identification plate



The cab's identification plate is affixed on the jamb of the upper window, to the left of the driver.

Roll-Over Protective Structure (ROPS), Falling Objects Protective Structure (FOPS) label

The ROPS/FOPS certification label is applied in the upper part inside the cab.



Acoustic power emitted plate



The plate indicating the acoustic power level emitted (guaranteed), according to the Noise Directive 2000/14/EC, is affixed inside the cab at bottom right, next to the vehicle's identification plate.

The value on the plate varies according to the model and engine fitted in the vehicle.

Engine identification plate

The engine identification plate is on top of the engine inside the engine compartment.



Transmission identification plate



The transmission identification plate is affixed on the hydrostatic engine, on the right side of the vehicle. To access it, lie down under the vehicle between the two axles near the right front wheel.

Axles identification plate



The axles identification plate is affixed on the top of the differential.

Features of the vehicle

Headlights



The headlights consist of the following lights:

- Road lights ①: always On when the vehicle's electrical system is powered;
- Low beams/high beams ②: low beams always On when the engine is started up; high beams can be selected by means of the lights switch;
- Direction indicators ③: can be operated by means of the lever under the steering wheel.

Tail lights



The tail lights consist of the following lights:

- Direction indicators ①: activated with the lever under the steering wheel or the Hazard button;
- Stop lights (2): activated by pressing the brake pedal;
- Road lights ③: activated when the vehicle's electrical system is powered;
- Reversing lights ④: activated simultaneously with the reverse gear.

For ease of operation at work and to limit the protruding parts of the vehicle, both of the rear headlights can be turned upwards by removing the butterfly head screw, lifting the headlight unit towards the vehicle chassis, and then locking it with the butterfly head screw.



Butterfly head screw

Work and emergency lights



The **orange** work light **[1]** can be switched on while the vehicle is running to indicate movement.

The **red** emergency light **[2]** switches on automatically when the work overload threshold is reached.

Rear view mirrors



The vehicle has five rear view mirrors supplied as standard: three on the right side of the chassis (1), one on the left side of the cab (2) and one on the rear of the chassis (3).

Adjust the rear view mirrors before operating the vehicle to give the operator maximum visibility of the surrounding work area.

Quick-fit coupling for the equipment

The vehicle can be ordered with two types of quick-fit coupling for the equipment.

"I" coupling



The "I" coupling, with Magni Telescopic Handlers patent, is designed to be more rigid, more compact, and easy to fit, in comparison with those of competitors and is designed solely for equipment designed and constructed by Magni Telescopic Handlers with similar coupling.

"U" coupling



The **"U"** coupling ensures greater compatibility with different types of equipment: It can, in fact, be fitted with equipment designed and constructed by Magni Telescopic Handlers with similar coupling just as it can also be fitted with equipment designed and constructed by other manufacturers (e.g. Manitou Costruzioni Industriali), after checking the conformity and installation of suitable devices by Magni Telescopic Handlers.

Shear pin housing (standard)



The housing of the shear pin for the quick-fit coupling of the equipment is present in the front part of the vehicle chassis.

The shear pin must also be present on the vehicle so as to be available when required.

Always fit the shear pin in its housing when not in use.

If placed in an unsuitable part, the shear pin may get jammed between the moving parts of the vehicle, causing serious damage.

Anchoring points



The vehicle is provided with four anchoring points, in the front part of the chassis and in the rear part, all marked by a white sticker as shown above.



CAUTION

Unless otherwise indicated in this Manual, never fix lifting or anchoring devices to other parts of the vehicle.

Tow hook





CAUTION

If not used correctly, the tow hook can cause accidents or material damage.

The towing operations must always be carried out by personnel appropriately trained in compliance with the laws in force.

The vehicle is provided with a tow hook positioned in the rear part of the chassis.

Do not connect towing devices other than the tow hook as anchoring points to parts of the vehicle.

Always lock pin **1** using the split pin **2** to prevent it coming loose accidentally.

Additional work lights (optional)



The vehicle can be fitted with additional lights to light up the work area. The additional work lights are divided into three groups:

- Front work lights ①, fitted on the cab and facing the front;
- Rear work lights ②, fitted on the cab and facing the back;
- Boom work lights ③, fitted on the telescopic boom and facing the equipment.

Features of the cab

Cab door



Open the cab door lock using the key meant for the purpose.

To open the cab door from the outside, pull outer handle (1), then hold the door all the way.



To open the cab door from the outside, pull outer handle (2), then hold the door all the way.

The cab door must be kept closed when the vehicle is in operation. To allow natural ventilation inside the cab, use the rear window or side window.

Cab door window



The cab door window can be opened to allow natural ventilation.

To open the window, only from inside the cab, turn lever (1) anticlockwise to unlock it. Push the window outwards, guiding it all the way by holding handle (2). Push further to lock (3) in seat (4).



To shut the window, turn lever (5) anticlockwise to release the limit stop block. Hold the window by means of handle (2) till it is completely closed. Turn lever (1) clockwise and make sure the window is locked in the closed position.

Rear window



The rear window of the cab can be opened to allow natural ventilation. To open the window, only from inside the cab, turn handle (1) anticlockwise to unlock it. Push the window outwards.

To shut the window, pull it inwards by means of lever 1. Turn lever **1** clockwise to lock the window shut.

Emergency exit



A red hammer is present inside the cab, on the right of the door jamb; it must be used in case of an emergency to break the glass of the cab to make exit easy for the driver.

Contact your dealer to have the glass replaced.

Seat

The driver's seat is designed in accordance with law to allow a correct posture and prevent the onset of musculoskeletal disorders for the driver following prolonged working activities.

Always adjust the seat to suit your physical structure for maximum comfort.

Seat suspension



Turn the graduated grey spring suspension adjustment handle on the seat to adjust its preload until the number in yellow approximately matches the weight of the operator.

Longitudinal position of the seat



Use the lever (1) to move the entire seat structure in the longitudinal direction including the right armrest and relative joystick.

Use the lever 2 to move the seat in the longitudinal direction. With this lever the armrest and relative controls remain fixed, while only the seat and backrest move.

Tilting the seat surface



Use the grey lever (when seated) to the right of the seat to change the inclination of the seat surface to your liking.

Tilting the backrest

Use the grey lever (when seated) to the right of the seat to change the inclination of the backrest (it adjusts at the same time as that of the seat, see point above). The adjustment is correct when the operator's back forms a $95^{\circ} \pm 5^{\circ}$ angle with the legs when seated properly.

Seat belts



The seat belt is provided with an automatic winding system. The system is blocked automatically if the belt is pulled violently.



WARNING

Do not use extensions for the seat belt.

The automatic winder may not work properly, causing accidents, sometimes fatal.

If necessary, consult your dealer to have longer seat belts fitted.

Always check the fabric of the safety belt, the buckle and winder, every time before using the vehicle.

Replace the seat belt or components found to be worn or damaged.

Fasten the seat belt

Pull the seat belt out of the winder with a slow fluid movement to prevent automatic blocking.

Insert tab (1) in buckle (2) and press till the locking mechanism clicks into place. Check to make sure the tab is locked by pulling gently.

Unfasten the seat belt

Push the red button (3) on the buckle.

Hold the tab with one hand while the seat belt is rewound automatically.

Safety keys container



The container for the keys used for disconnecting the safety systems is fitted on the left jamb inside the driver's cab.

The container contains two keys:

- key for exclusion of the porthole protection safety systems, with metallic grip;
- key for exclusion of the lift platform safety systems (optional), with plastic grip.

The method for taking and using the keys is described in the "safety systems exclusion systems" section.

Air vents



The air vents positioned in front of the driver, behind the seat, and on the left upright let in air flow into the cab.

Each air vent can be opened and closed and is used to adjust the direction of the air flow.

Vehicle radio



The vehicle radio is present on the rear covering of the cab behind the operator's head. The speakers are present between the driver's seat and the rear window.

The radio is included in the standard vehicle supply. However, any other radio can be fitted with dimensions 1-DIN in accordance with standard ISO 7736.

For operation of the radio installed, refer to the Instruction Manual included in the package delivered with the vehicle.

Ceiling lights



There are two ceiling lights (1) on the cab roof on either side of the driver's seat, which can be individually operated with the switch at the front of each one.

Safety stickers

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Key:

Ref.	Sticker	Code	Description	Ref.	Sticker	Code	Description
1		91651	Load under outrigger information sticker (see manual)	18		91604	No climbing on or standing under the interchangeable equipment sticker
2	A CONTRACTOR	91696	Towing point information sticker	19		92504	No setting fire sticker
3		91695	Lifting point information sticker	20	••	93471	No open flames sticker in battery compartment
4		91657	Attachment and towing point information sticker	21		92499	Hydraulic oil filler cap sticker
5		91675	Lifting point information sticker (see manual)	22		91694	Hydraulic oil level information sticker
6		91693	Fuel filler cap information sticker	23	Ad Blue	91703	AdBlue filler cap information sticker (only for D/D [Stage V] engines)
7	CAUTION ULTRA LOW SULFUR DIESEL FUEL ONLY	43221	ULTRA LOW SULFUR DIESEL FUEL ONLY information sticker	24	AdBlue / DEF ONLY	43141	Sticker on AdBlue / DEF ONLY tank (only for D/D [Stage V] engines)
8	8.3 bar 120 psi 9300 kg	92508 [тн 6.20] - 96141 [тн 5,5.24]	Wheel pressure, nut tightening and under- wheel load information sticker (see manual)	25		93469	Multiple engine bonnet warnings sticker
9	<u>べ</u> マ	70784	Emergency exit sticker on rear window	26		91698	Air filter information sticker
10	<u> </u>	91579	Electrical voltage warning sticker	27		91592	Battery detachment information sticker
11		91687	Hot surface warning sticker	28		92515	Wear ear defenders information sticker
12		91580	High pressure fluid warning sticker	29		03439	Grease gun indication sticker
13		91582	Crushing hands warning sticker	30		62866	Automatic parking brake sticker
14		90066	Suspended load warning sticker	31		71694	Sticker indicating joystick movements for the accessories
15		92514	Coolant cap warning sticker	32		30064	Joystick movements sticker in cab
16		91689	Cooling fan warning sticker	33	NO	93474	"Do not use steam cleaner on boom pipes" hazard/information sticker
17		91645	Pressurised accumulator warning sticker (see manual)	34	20 40 25 40	-	Sticker indicating maximum speed permitted when driving on the road. Options applicable depending on the country of use.

TECHNICAL SPECIFICATIONS SECTION

Technical data

ENGINE

Model	TH 6.20 D/A-0 TH 5,5.24 D/A-0	TH 6.20 D/D-0 TH 5,5.24 D/D-0	
ENGINE SERIES	DEUTZ TCD 3.6 L4: D/A - Stage IIIA (Tier III)	DEUTZ TCD 3.6 L4: D/D - Stage V	
THERMODYNAMIC CYCLE	Diesel 4 strokes		
ARCHITECTURE	In-line 4		
VALVES	16 valves		
POWER SUPPLY	Turbocompressed with intercooler		
DISPLACEMENT	3,620 сс		
COOLING	With liquid		
MAXIMUM POWER at 2200 rpm	100 KW (134 HP)		
MAXIMUM TORQUE at 1600 rpm	500 Nm		
RATED SPEED AT MINIMUM	850 rpm		

TRANSMISSION

Model	TH 6.20 D/A-0 - TH 6.20 D/D-0 TH 5,5.24 D/A-0 - TH 5,5.24 D/D-0		
ТҮРЕ	Hydrostatic with Rexroth electronic control		
MAXIMUM PRESSURE	450 bar		
NO. OF FORWARD GEARS	2		
NO. OF REVERSE GEARS	2		
REVERSE GEAR	Electro-hydraulic		

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HYDRAULIC SYSTEM

Model	TH 6.20 D/A-0 - TH 6.20 D/D-0 TH 5,5.24 D/A-0 - TH 5,5.24 D/D-0
PUMP	with variable displacement pistons
FLOW RATE at 2200 rpm	92.4 l/min
PRESSURE	350 bar
DISPLACEMENT	42 cc

ELECTRICAL SYSTEM

Model	TH 6.20 D/A-0 - TH 6.20 D/D-0 TH 5,5.24 D/A-0 - TH 5,5.24 D/D-0
MASS	Negative
BATTERIES	2 12 V – 150 A batteries
ALTERNATOR	28V 80A
START-UP	24 V

AXLES

Model	TH 6.20 D/A-0 - TH 6.20 D/D-0 TH 5,5.24 D/A-0 - TH 5,5.24 D/D-0
FRONT AXLE	Steering and levelling
REAR AXLE	Steering and tilting
WHEEL HUB REDUCERS	Epicyclic
TYRES	18 R x22.5

BRAKES

Model	TH 6.20 D/A-0 - TH 6.20 D/D-0 TH 5,5.24 D/A-0 - TH 5,5.24 D/D-0
ТҮРЕ	Multiple disc in oil bath
SERVICE BRAKE	Pedal-operated servo-assisted, action on front and rear wheels
PARKING BRAKE	Hydraulic negative action on front axle

CLIMATIC CONDITIONS OF USE

Parameter	Values
OPERATING TEMPERATURE	from -20 °C to +45 °C (from -4 °F to +113 °F)
STORAGE TEMPERATURE	from -25 °C to +50 °C (from -13 °F to +122 °F)
HUMIDITY	from 20% to 95%
ALTITUDE	< 2500 m (< 8200 ft)

TYRES TH 6.20-0 - TH 5,5.24-0

Measurement	Characteristics	Make	Inflation pressure	Rim size
18 R 22.5 (445/65 R 22.5)	AGP23 169F	Aeolus	8.30 bar (0.83 Mpa) (120 psi)	14.00 x 22.5

PERFORMANCES

Model	TH 6.20 D/A-0 TH 6.20 D/D-0	TH 5,5.24 D/A-0 TH 5,5.24 D/D-0	
MAXIMUM SPEED	40 km/h		
STANDARD LIFTING HEIGHT (*)	19,4 m	23,7 m	
GRADEABILITY (no load)	44%		
MAXIMUM RATED CAPACITY (**)	6.000 Kg	5.500 Kg	
MASS IN RUNNING ORDER (without accessory)	14.200 Kg	16.300 Kg	
MASS DISTRIBUTION ON FRONT AXLE	5.600 Kg	6.800 Kg	
MASS DISTRIBUTION ON REAR AXLE	8.600 Kg	9.500 Kg	
MAXIMUM GROUND LOAD ON OUTRIGGERS	17.000 Kg	17.000 Kg	
MAXIMUM GROUND PRESSURE ON OUTRIGGERS	15,3 Kg / cm²	15,3 Kg / cm²	
MAXIMUM GROUND LOAD ON TYRES (***)	9.300 Kg	9.700 Kg	
MAXIMUM GROUND PRESSURE ON TYRES (***)	6,5 Kg / cm ²	6,9 Kg / cm ²	

(*) With interchangeable fork carriage equipment

(**) To find out the actual load capacity according to the conditions of use of the vehicle, refer to the specific use and maintenance manual of the connected equipment

(***) data referring to tyres supplied as standard by the manufacturer and with vehicle at maximum load

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Dimensions





MODEL	TH 6.20 D/A-0 - TH 6.20 D/D-0	TH 5,5.24 D/A-0 - TH 5,5.24 D/D-0
А	1950 mm (76,77")	2430 mm (95,66")
В	2903 mm (114,29")	2903 mm (114,29")
С	420 mm (16,54")	420 mm (16,54")
D	1566 mm (61,65")	1566 mm (61,65")
E	6420 mm (252,76")	6895 mm (271,46")
F	2700 mm (106,30")	2700 mm (106,30")
G	2490 mm (98,03")	2490 mm (98,03")
Н	3250 mm (127,95")	3770 mm (148,43")
I	R 3880 mm (R 152,76")	R 3880 mm (R 152,76")
Visibility data

TH 6.20-0 model – Report on Visibility with load (according to EN 15830)







Direct Visibility Zone

Indirect Visibility Zone (with CCTV system in accordance with ISO 16001)

Obscured Visibility Zone







TH 6.20-0 model – Report on Visibility with hanging load (according to EN 15830)



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Direct Visibility Zone

Indirect Visibility Zone (with CCTV system in accordance with ISO 16001)

Obscured Visibility Zone





Model TH 5,5.24-0 – Report on Visibility with load (according to EN 15830)





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Direct Visibility Zone

Indirect Visibility Zone (with CCTV system in accordance with ISO 16001)

Obscured Visibility Zone









Model TH 5,5.24-0 – Report on Visibility with hanging load (according to EN 15830)



Direct Visibility Zone

Indirect Visibility Zone (with CCTV system in accordance with ISO 16001)

Obscured Visibility Zone





OPERATION

Controls

Steering column

The steering column is designed to offer various adjustment possibilities, its position can be adjusted in inclination and depth. The correct position of the steering wheel depends on individual preferences:

- It must be possible to reach the steering wheel without detaching the shoulders or back from the back rest;
- The arms must be bent at right angles when gripping the steering wheel;
- The joysticks must not obstruct rotation of the steering wheel while driving, in any manner whatsoever;
- The position of the steering wheel must not obstruct the movements of the joysticks, in any manner whatsoever.



To adjust the inclination of the lower part of the steering column, while correctly seated in the driver's seat, press the pedal shown in the photo and pull the steering wheel towards you; once you have found the correct position, release the pedal.

To adjust the inclination of the upper part of the column and the telescopic depth of the steering wheel, use the levers on the right-hand side, below the ignition key. Lift the upper lever (1) upwards to adjust the inclination of the upper part of the column, turn the lower lever (2) outwards to adjust the telescopic depth of the steering wheel; when the correct configurations have been found, reposition the levers.



On the right-hand side, under the two steering column adjustment levers, there are two CAN connectors for control of the diagnostics of the entire vehicle and one LAN connector for transferring data to the vehicle / software updates.

Ignition switch



The ignition switch is located on the steering column, to the right. The switch has three active positions:

- 0: engine stop;
- I: main electric contact closure;
- III: starter motor contact.

Switch positions **P** and **II** are deactivated.

Lights/horn/windscreen wiper selector



The lever on the left of the steering wheel controls the direction indicators, work lights switch and windscreen wipers.

Direction indicators

To activate the direction indicators:

- right side: push the lever forwards towards the windshield,
- left side: pull the lever backwards towards the seat.

The direction indicators are deactivated when the lever is in the central position.

Lights switch

To activate the lights, rotate the specific ring:

- **O**: turned off,
- ^{ED 0E}: road lights on,
- ^{≣D}: low beams on.

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To activate the high beams $\equiv \mathbb{D}$:

- push the lever down for continuous activation,
- push slightly towards the steering wheel to flash the high beams. The lever will return immediately to the neutral position when released.

Horn

To use the horn, press the button on the tip of the lever.

Do not use the horn in densely populated spaces or where expressly banned by means of signs.

NOTICE

The horn emits a short warning if connected with a radio control (optional).

Windscreen Wipers/Washers

The vehicle has three windscreen wipers. The wiper on the rear window is activated separately, while those on the upper window and windshield can only be activated simultaneously.

Controls:

- O: all windscreen wipers deactivated;
- I: activates intermittent movement of the front and upper windscreen wipers;
- II: activates continuous movement of the front and upper windscreen wipers;
- J: activates the rear windscreen wiper.



To activate the washer liquid supply on all the nozzles, press the bottom part of the green button on the left of the steering column under the steering wheel.

Parking brake



The switch for engaging/disengaging the parking brake is under the steering wheel in the centre of the steering column. Press the upper part of the switch to put the parking brake on. Check to make sure the indicator light in the main page of the multiple function display lights up.



To disengage the parking brake, it is mandatory to first be sitting properly on the seat, then start the engine, checking that the reverse gear is in "Neutral"; now slide tab (1) of the central switch upwards while pressing on the lower part of it at the same time (dual action consent).

At a speed below 5 km/h, if the driver gets up from the seat, the vehicle stops automatically, and the parking brake is engaged.

Hazard lights



The switch for activation of the hazard lights is on the right-hand side of the steering column, under the steering wheel.

Pressing the lower part of it will switch on the emergency light and the four direction indicators simultaneously.

Deactivate the hazard lights by pressing the upper part of the same switch.

Pedals



Press the accelerator pedal (1) to increase the engine speed.

Release the accelerator pedal to decrease the engine speed.

Press the brake pedal (2) down all the way to stop the vehicle.

Steering modes



Use the steering wheel to guide the movement of the vehicle. A knob is provided to drive with one hand, keeping the other free for other controls.

Do not use the knob for driving on public roads. In these situations, keep both hands on the steering wheel to have better control of the vehicle.

There are three steering modes:



Two-wheel steering: on front axle

Four-wheel steering with concurrent axis

Four-wheel steering with parallel axis

To change the steering modes:

- Stop the vehicle;
- Display the main page of the multiple function display;
- Align the wheels of both axles until the green indicators light up;
- Press the button concerned for the required steering mode.

Joystick

The vehicle has a joystick on the armrest on the right of the driver's seat. The joystick controls the main hydraulic movements of the vehicle.



To impart commands using the joystick, keep the confirmation button shown above pressed.

Not pressing the confirmation button prevents accidental movements of the vehicle following involuntary activation of the joystick.

Commands given with the joystick are inhibited if the operator is not seated correctly on the driver's seat.

The anomalies described above are shown by means of intermittent visual signals on the control panel next to the driver's seat.



Transmission selector



The forward/reverse gear selector is at the top of the joystick and is identified by a red three-position toggle switch:

- in the centre the transmission is in NEUTRAL,
- when pushed forwards the forward movement is activated,
- when pushed backwards reverse gear is activated;

During start-up of the engine, the gear selector must be in the central NEUTRAL position.



CAUTION

The gear must be engaged (forwards or reverse) by pressing the enable button on the joystick. Otherwise the incorrect procedure will be displayed on the touchscreen panel.

Apply reverse gear only with the vehicle stopped. Otherwise the incorrect procedure will be displayed on the touchscreen panel.

Drive speed

The two-speed hydrostatic transmission works according to two modes:

- "tortoise", low speed ratio;
- "hare", high speed ratio.

The selection button for these modes is on the *main page*:



To activate one function or the other, press it and wait for the graphics to change.

In "tortoise" mode, the transmission allows the vehicle to move at low speed. Use this mode for precision movements and to move the load.

In "hare" mode the transmission uses both speeds and makes it possible to reach maximum speed. Use this mode for travelling on roads or for rapid movements in the work area.

You can switch between the two modes only under the following conditions:

- vehicle stopped;
- brake pedal pressed;
- gear selector in NEUTRAL position.

If necessary, it is possible to change forcibly from one mode to the other by pressing the "reset" button.

Joystick movements





The vehicle's movements using the Joystick in the cab are described below:

- A1: move the joystick forward to lower the telescopic boom;
- **A2**: move the joystick backward to raise the telescopic boom;
- **B1**: move the joystick to the right to rotate the equipment downward;
- **B2**: move the joystick to the left to rotate the equipment upward;
- C1: rotate the roller forward to extend the telescopic boom;
- **C2**: rotate the roller backward to retract the telescopic boom.

Traversing control



To activate front axle traversing, press the yellow button on the head of the joystick and simultaneously direct the right or left joystick to give the same directional movement to the telescopic boom.



CAUTION

Always keep the manoeuvre enabling button pressed to give the command.

Boom head hydraulic control



The roller on the outside right of the joystick activates the hydraulic connections on the boom head, at the same time as selecting the **ABC** button on the dashboard that determines which output is active. This button and its function are described further on in the manual.

Depending on the equipment fitted, this mode manages its movements. For example, if there is a winch, it controls the ascent and descent of the rope; if there is an aerial platform with rotating attachment, it controls the direction of rotation.

NOTICE

If there is only one double outfeed at the boom head, alternatively you can rotate the side roller while keeping the yellow button pressed to give the required command to the accessory.

NOTICE

If the roller present on the joystick is activated without the help of the enable button and with the engine switched on, pressure in the hydraulic circuit sent to the accessory is discharged.

Use this procedure before disconnecting the quick-fit couplings of the hydraulic circuit of the equipment at the head of the boom.

Control dashboard

USB socket (dialogue function)



A USB socket is present under the graphic panel with a unique dialogue function with the software installed on the vehicle to help quickly update it.

Emergency stop button



The emergency stop button is located on the pushbutton panel to the right of the driver's seat.

Press the emergency stop button to stop the engine and interrupt all vehicle movements.

The emergency stop button must be reset after use. If the button is not reset the vehicle cannot be restarted.

To reset the emergency stop button turn it clockwise.

Levelling on wheels

Levelling on wheels can be done by means of the switch shown below;

levelling on wheels can be done only with the following conditions:

- inclination of the telescopic boom in relation to the horizontal axis less than or equal to 30°.



- To level the vehicle manually press the switch on the control panel to the right of the driver's seat. Pressing the switch on the right portion will cause the vehicle chassis to incline to the right. Pressing the switch on the left portion will cause the vehicle chassis to incline to the left.



- The outcome of the levelling can be checked by means of electronic level gauge: if the vehicle is levelled correctly, the green indicator will be in the centre of the level.

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Control of the outriggers

The outriggers can be controlled in two ways:

- with the button on the dashboard;
- with the controls on the multiple function display and joypad.

Control with the button on the dashboard



The switch controls the movements for lifting and lowering of the outriggers.

Press on the icons present on the switches to:

lift the outriggers

lower the outriggers

Depending on the equipment and vehicle version, it is possible to control lifting and lowering of the two front outriggers simultaneously or independently.

In case of vehicle version with simultaneous lifting / lowering of the outriggers, the pushbutton panel has button **A** that controls both as described above.



In case of vehicle version with independent lifting / lowering of the outriggers, the pushbutton panel has button **B**, that controls the movements of the left outrigger, and button **C**, that controls the movements of the right outrigger.

Control by means of the multiple function display



To control the outriggers by means of the multiple function display, press the button at the top centre of the joypad (1) to display the outriggers page.

The controls on the page are blocked by default for safety reasons. To activate these, press unlock button 2.

After activating the control, use the joypad joystick to impart the movements:

- **X1**: move the joystick to the right to lower the outriggers;
- X2: move the joystick to the left to lift the outriggers.

After stabilising the vehicle, always check the levelling by means of electronic level 4. The indicator must be in the centre of the measuring range.

The vehicle can be automatically levelled on outriggers. For automatic levelling of the vehicle on outriggers, press button (5).

Exclusion of the safety systems



DANGER

Exclusion of the safety systems accompanied by inappropriate movements can cause the vehicle to tilt over, with risk of accidents and death.

Do not try to exclude the safety systems to increase the loading capacity of the vehicle.

Take the key with the metal grip from the safety keys cabinet after breaking the glass using the hammer provided.

Insert the key in (1), Pressing the key and turning it clockwise while holding it in position will automatically activate the acoustic alarm and steady red warning light on the top of the cab to warn of the potentially hazardous situation for those working in the area near the forklift truck.

Perform all the necessary movements to solve the emergency and restore the vehicle to safety conditions.

Remove the key and put it back in its container. Replace the glass that was broken earlier.

Exclusion of safety systems for lifting platforms

Take the key with the plastic grip from the safety keys cabinet after breaking the glass using the hammer provided.

Insert the key in (2). Press and turn the key clockwise, holding it in position. Use the same hand to press and hold down button (3).

Perform all the necessary movements to solve the emergency and restore the vehicle to safety conditions.

Remove the key and put it back in its container. Replace the glass that was broken earlier.

Double USB socket (accessory function)

The rear part of the right dashboard has a dual USB socket that has accessory functions for the vehicle operator (mobile device charging: tablets, smartphones, etc.).



Multiple function display



WARNING

Using the multiple function display while driving the vehicle can cause serious accidents.

It is advisable to limit the use of the display while driving to the minimum possible extent to allow prompt identification and avoid obstacles along the vehicle route.

This Chapter contains information regarding the methods of use of the display and an overview of the information provided for the operator.

For functions connected to the buttons present in the various pages, consult the operating techniques described in the successive chapters.

The touch-screen display is situated inside the driver's cab, on the right side, in front of the right joystick.

The information and controls provided for the operator by the multiple function display are divided into a number of pages. The pages are, in turn, divided into four groups:

- Control and command pages;
- On-board diagnostics pages;
- Password pages;
- Alarms page.

The pages concerning operation of the vehicle are (in the order of appearance):

- Accessory confirmation page;
- Main page;
- Outriggers page;
- Load control page;
- Controls page;
- Limits page.

Browsing through the pages



Each page is divided into a number of sections. The current section is highlighted on the display in electric blue, as shown above.

Each section may contain one or more buttons. Each button when pressed will take on a number of configurations, differentiated by the colour:

	Button not pressed and not selected
	Button not pressed and selected
	Button pressed and not selected
\bigcirc	Button pressed and selected
	Button not active

A button is not active when it belongs to a sector different from the current one or cannot be selected for the forklift truck model being used.

During the working of the vehicle the page most relevant to the current action is selected automatically. In particular:

- When the forward or reverse gear is engaged, the display automatically shows the main page;
- When the outriggers are activated by means of the switches, the outriggers page is automatically displayed;
- When hydraulic movements of the telescopic boom are performed, the display automatically shows the load control page.

In case of two simultaneous actions, like the movement of the forklift truck on wheels and the movement of the boom, the load control page is given priority.

It is possible to browse through the pages of the display manually. To do so, use the four arrows present at the corners of the screen:



Moving between the control/command pages and the on-board diagnostics pages

Access to the alarms page
Moving to the next page

Return to the previous page

There are two ways for browsing manually among the pages and pressing the buttons present in these.

Browsing using the touch screen

Pressing on any button on the screen will activate or deactivate the connected function.

Browsing using the controller



To the right of the driver's seat there is a joypad consisting of a controller and display controls buttons. These allow the operator to interact with the display without using the touch screen. The following commands can be given using the joypad:

- Press one of the five buttons;
- Move the controller forwards or backwards;
- Move the controller to the right or to the left;
- Rotate the controller around its axis;
- Press the controller downwards.

Move the controller forwards or backwards to move between the sections of a page. The selected sector of the page is shown in blue.

Rotate the joystick clockwise or anticlockwise to select the buttons in the current section of the page.

Press the joystick down to press the button selected on the display.

The five buttons arranged around the joystick correspond to the following functions:

90 9 <i>9</i>	Displays the main page
	Displays the outriggers page
	Displays the load control page
<u></u>	Displays the hydraulic movements limits and speeds page (if activated by the software)
* *	Displays the controls page

Adjusting the control panel intensity

To adjust the intensity of the control panel backlighting press the controller button showing the outriggers for 3 seconds until the display shows the icon indicating the luminosity percentage.



Keeping the button pressed, turn the controller knob clockwise to increase the panel luminosity or anticlockwise to reduce it.



Release the controller button after obtaining the required luminosity.

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Accessory confirmation page



This page is displayed every time the sensor at the head of the telescopic boom detects a new equipment. This page cannot be selected manually.

Below the **Magni**, logo, the name of the equipment identified by the control system is shown in the centre of the screen. A graphic representation for rapid identification is also provided.

Identification of the accessory fitted or absence of the accessory can be confirmed in this screen page by pressing on the GREEN icon.

In the case of missing or incorrect identification of the accessory, press the RED button for lack of confirmation; it is however possible to use the vehicle, but the functions and load capacity will be limited for safety reasons; **contact Magni TH Assistance Service**.

The number of hours before the next scheduled maintenance is shown at the bottom of the page.

Main page



The main page groups together the main information of the vehicle in the driving on wheels configuration.

For all the models the display shows, at the top: the daily time and working hours of the forklift truck, the speed selection button and the reset button.

Drive speed

The two-speed hydrostatic transmission works according to two modes:

- "Tortoise" mode;
- "Hare" mode.

The buttons for selection of these modes are present at the top of the main page:



- Tortoise \rightarrow hare button
- Hare \rightarrow tortoise button
- 💮 Reset button

The hare and tortoise buttons occupy the same position on the display. The current operating mode is highlighted by the symbol on the button. In "tortoise" mode, the transmission allows the vehicle to move at low speed. Use this mode for precision movements and to move the load.

In "hare" mode the transmission uses both speeds and makes it possible to reach maximum speed. Use this mode for travelling on roads or for rapid movements in the work area.

To switch from "hare" mode to "tortoise" mode, press the hare \rightarrow tortoise button. To switch from "tortoise" mode to "hare" mode, press the tortoise \rightarrow hare button.

You can switch between the two modes only under the following conditions:

- vehicle stopped;
- brake pedal pressed;
- gear selector in NEUTRAL position.

If necessary, it is possible to change forcibly from one mode to the other by pressing the "reset" button.

Graduated indicators

Depending on the type of drive unit used, the digital indicators show the engine oil pressure, the engine rpm, the coolant temperature for Stage IIIA as shown in the image below,



the AdBlue liquid level, the engine rpm and coolant temperature for Stage V as shown in the image below.



Indicator lights

	Fuel tank in reserve
1	Diesel engine oil pressure alarm
Ŀ	Diesel engine temperature alarm
	Hydraulic motor oil filter clogging alarm
	Water/fuel separator filter clogging alarm
SCR	SCR Alarm
	Hydraulic oil temperature alarm
	Hydraulic oil tank filter clogging alarm
	Batteries flat alarm
2	Diesel engine suction filter clogging alarm
AdBlue	AdBlue tank in reserve (on models with urea tank)
	Generic diesel engine alarm
	Serious diesel engine alarm
	Generic transmission alarm
	Generic hydraulic system alarm
	Parking brake on
	Service brake system alarm
	Generic electrical system alarm
	Telescopic boom shock absorber activated
	AdBlue level alarm for Stage V drive unit
	AdBlue level alarm for Stage V drive unit
	Front wheels alignment
	Rear wheels alignment
	Rear axle block applied

Front axle traversing indicator



In the centre of the MAIN, LOAD, OUTRIGGERS and LIMITS pages is the indicator for centring front axle traversing: when the axle is exactly centred, the green light in the middle at the top is on; otherwise it is off and grey.

Before making any movement on wheels, always make sure that the front axle is exactly aligned with the longitudinal axis of the forklift truck.

Vehicle levelling indicator



Vehicle levelling means the inclination of the chassis with respect to an ideal perfectly horizontal flat surface. Vehicle levelling is not the inclination of the chassis in relation to the ground.

A circular green marker in the centre of the page provides graphic indication of the vehicle levelling. In case of imbalance, the marker moves in the direction of the vehicle's centre of gravity. In the example in the figure, the marker is in the centre, so the vehicle is perfectly level. When the vehicle leaves this range by 3° the marker changes to flashing yellow.

Outriggers page

The outriggers page contains information regarding the configuration of the outriggers, and certain buttons to control the working.

1 button for self-levelling on outriggers,

(2) hydraulic operating pressure measured per outrigger,

- (3) position of the outrigger,
- (4) movement enabling button,
- (5) graphic indication of outriggers' movement,
- **(6)** radio control activation button.



Load control page



The load control page contains information regarding the configuration of the telescopic boom and equipment fitted.

Configuration of boom



The section at the top of the load control page contains information regarding the boom configuration. The data shown in the image above and organised from left to right, top to bottom, are:

- Telescopic boom extension length;
- Height off the ground of the accessory's centre of gravity;
- Layout for rapid interpretation of information;
- Telescopic boom angle in relation to the horizontal;
- Distance of the boom head from the front wheel;
- Maximum permitted load for current configuration of the boom;
- Actual load.

Interactive load chart

The interactive load chart is seen at the centre of the display. In the top left-hand corner a schematic drawing of the equipment detected is displayed for rapid identification.

The vehicle control system automatically selects the appropriate load chart on the basis of the three parameters measured:

- Type of equipment fitted at the top of the boom, detected automatically by means of the transponder;
- Resting on the ground and percentage extension of the outriggers;

The position of the load on the chart is identified by the following icon:



Load position identification icon

The icon moves on the chart in relation to the position of the boom.

Load percentage

On the right-hand side of the page a graduated indicator displays the ratio, expressed in percentage, of the load acting on the equipment and the maximum permitted load.

The load percentage indicator is present on all the control and command pages on the right side of the screen.



The load percentage indicator in combination with the load chart provides complete clear information regarding the operating conditions of the vehicle.

Limits page



The "limits page" is used to set limitations on vehicle movements should it be necessary to operate more safely; the limitations concern:



The maximum lifting height of the telescopic boom



The hydraulic oil flow rate at boom head -**OPTIONAL** use



The swinging speed



The telescopic boom lifting speed



The telescopic boom lowering speed



The telescopic boom extension speed



The telescopic boom retraction speed

Working height limitation (Electronic roof)



To set the working height limitation (e.g. indoor work), follow this procedure:

- position the telescopic boom with attached equipment and load at the maximum height for safe operation,
- press and hold the button (1) until the value (2) is the same as indicated by the graphics (3) (actual boom height measured by the software), whereupon the control system is set to the desired value.
- To enable/disable the height limitation function, press the button (4).









function enabled

To set a new maximum height, reposition the boom at the desired height and repeat the above steps.

Adjustment of the speed of the hydraulic movements



To adjust the speeds of the hydraulic movements ①, use the buttons at the bottom of the limits page. Up to 4 configurations/users can be stored with the numeric keypad displayed to the right of the adjustment buttons.

NOTICE

The numbers above and below the buttons (1) identifying the adjustment action indicate the movement speed as a percentage (%):

- **100**: full movement speed as set by the factory,
- **0**: no movement speed = vehicle locked,

so setting decreasing values slows down the movement.

Hydraulic movement speed limitation activation procedure



First of all, one of the four program buttons (1, 2, 3, 4) must be selected: the selection is highlighted by the colour of the chosen number changing from black (off) to blue (selected).

If the vehicle is brand new, all six parameters are set at **0**.

Select the movements one by one and set the desired value:

• Press the icon of the function to be set, e.g. (2), with confirmation of selection identified by the colour changing to blue.



 Press the percentage number ③ next to the selected icon to display the numeric keypad, then type in the desired movement speed and press ENTER,



• Deselect the function to which the value was given (the button must return to grey); the set value remains visible, then move on to the next one.



Once **all** six parameters have been set, make them operational by selecting the on button (4):



NOTICE

To switch off all limitations, press the button 2.

Controls page



The controls page contains information and controls regarding the cab conditioning system and control buttons for the work lights, boom suspension and radio control.

Air conditioning



The controls for the cab air conditioning system are at the top of the controls page.

Press button ① to activate or deactivate the air conditioning.

To adjust the temperature of the air coming out of the air vents use the + and - buttons under the air temperature indicator (3).

To adjust the air flow from the vents use the + and - buttons under the air flow rate indicator (4).

In case of contamination of the outside air, recirculation of the internal air can be activated. To activate or deactivate internal air recirculation press button (2).

The indicators do not express the temperature or flow rate values but only reference numeric values.

Work lights



Button (1) activates the orange beacon that indicates that the vehicle is in motion.

Buttons (2), (3) and (4) activate the lights at the top of the boom, those on the front of the cab and those at the rear of the cab, respectively.

Four-wheel drive release



Pressing this button disconnects the drive to the rear axle wheels.

Telescopic boom suspension (optional)



This button is present if the optional concerned is present on the forklift truck being used.

The telescopic boom suspension is designed for operating the vehicle on uneven ground with loads raised.

To use this function the following conditions must be respected:

- vehicle on wheels;
- telescopic boom height from the ground less than 3 metres.

To activate/deactivate the telescopic boom suspension, press the button on the controls page shown above. Wait for the relevant indicator to light up or be switched off in the main page of the display to confirm the required selection.



The boom suspension only works in the presence of the aforementioned conditions: if said requirements are not satisfied during a movement, the function is automatically disabled; if, with the forklift truck moving, the parameters required fall within the envisaged limits, the boom suspension is automatically reactivated.

When the forklift truck stops, the function is deactivated; to reactivate it repeat the procedure described above.

Checking the engine rpm



The button indicated is used to activate or deactivate the engine speed electronic control function: if selected, as soon as a hydraulic movement is imparted to a forklift truck component, the engine automatically increases the speed to provide force to the services pump and consequently facilitate the movement imparted.

Activation of radio control



To operate the forklift truck externally using radio control the receiver connection present on the vehicle must be activated by pressing the button shown above.

To use the radio control (OPTIONAL) refer to the relevant Use and Maintenance Manual.

24V socket (OPTIONAL)



Press this button to activate the power socket (optional) present at the top of the boom for supplying current to the accessories that may be fitted.

Auxiliary continuous function



This selection (1) makes it possible to activate, for a certain accessory, the continuous movement of one of its element such as a mixer bucket, adjusting the operating speed by means of the buttons concerned, (2) and (3).

Value 4 is the flow % as regards the maximum flow rate.

Cooling fan inversion function



This selection makes it possible to invert the direction of fan rotation, for forklift trucks equipped with horizontally installed cooling element.

This function makes it possible to blow air outside the engine compartment to clean the aeration surfaces by removing accidental deposits of material potentially harmful for the equipment.

The inversion sequence involves two minutes of air suction and one minute of expulsion at cyclic intervals of 20 seconds of slowing down of the fan speed in order to protect its mechanism.

Radio controls (Optional)



General information

The vehicles can be equipped with a radio control for controlling at a distance; for the specific information, refer to the relevant manual.

Before starting the engine

Visual inspection

To ensure the maximum useful operating life of the vehicle, proceed with a thorough visual inspection before every start-up.

Look around and under the vehicle, checking to make sure there are no loose or missing bolts, leakage of oil, fuel and other liquids, broken or worn parts.

Check the state of the equipment and hydraulic components.

Check the state and wear of the tyres. If necessary, adjust the inflation pressure.

Check the levels of the oil, coolant and fluid.

Check the AdBlue® tank level (if present).

Remove all accumulated dirt and debris. Carry out all the repairs necessary before starting up the vehicle.

Climbing on to or climbing down from the vehicle



Always use steps (1) and handles (2) to climb on to or down from the vehicle.

Before climbing on to or climbing down from the cab, clean all steps and handles thoroughly. Damaged steps or handles must be repaired immediately.

Do not climb on or down from the vehicle with your back to it.

Always use three gripping points when climbing up or down: two hands gripping the handles and one foot on a step, or two feet on the steps and one hand gripping the handle.

Do not climb on or down when the vehicle is in motion.

Do not climb on or down from the vehicle carrying tools or other objects. Load the tools required before climbing on the vehicle. Unload the tools from the vehicle using a rope to lower these to the ground.

Do not use any of the vehicle's control devices (joystick or handwheel) as a grip for climbing up or down.

Driver's seat

Adjust the seat before every work phase and every time the operator changes.

For instructions regarding the adjustment of the driver's seat, consult the relevant section of this Manual.

Always check the nuts, bolts and screws used for fixing the seat and seat belt. Replace damaged and worn parts.

The driver's seat is provided with a special sensor to detect presence of the driver: if the driver is not seated correctly in the seat in the cab, all the controls activated will be inhibited.

This is displayed by an intermitted visual signal on the control panel next to the seat.



Starting the engine



RISK OF INTOXICATION

The exhaust from the engine always contains chemical elements that may be asphyxiating or toxic.

Start the engine in open, well-ventilated areas. If the vehicle is in a closed space, direct the exhaust gases outside by means of suitable devices.

Start-up in normal conditions

- Check to make sure the reverse gear is in neutral.
- Turn the ignition key to position I to close the electric contact.
- Wait for about 10 seconds to allow the vehicle to run the diagnostic and preheating cycles.
- Turn the ignition key to position III and hold it in this position until the engine starts up. Do not hold the key in position III for more than 5 seconds.
- Let the engine run at minimum speed for a few minutes to bring the lubricants to the right temperature. The duration of this phase depends on the outside temperature.

Start-up in extreme climates

The start-up in normal conditions procedure makes it possible to start the engine with ambient temperatures above -18 °C.

To start the engine at ambient temperatures less than -18 °C use one or more supplementary devices to help the start-up. These devices may be:

- A coolant heater;
- A fuel heater;
- A heater for the engine oil and hydraulic oil;
- Batteries with greater capacity.

Before using the vehicle at temperatures less than -23 °C consult your dealer instructions and technical assistance.

Start-up using jumper cables



BATTERIES

The batteries generate flammable gases which can explode causing injuries to persons.

Avoid sparks near the batteries. Make sure the jumper cable ends do not come in contact with one another or with the vehicle.

Do not smoke in the vicinity of the batteries.

The electrolyte contained in the batteries is an acid and can cause burns if it comes in contact with the skin and eyes.

Always wear safety goggles and acid-resistant gloves when starting up a vehicle using jumper cables.

Incorrect connection of jumper cables can cause explosions with risk of causing injuries.

Never connect the opposite poles of the batteries to one another.

Create the jumper only using an energy source having the same voltage as the stopped vehicle.

This vehicle has a 24 V system. If the batteries are unable to start up the vehicle, they may have to be replaced.

- Apply the parking brake on the vehicle to be started up. Bring the transmission to neutral. Lower the equipment to the ground;
- Turn the vehicle ignition switch to position **0**;
- Bring the vehicle used as source of power supply to such a distance as to allow connection with jumper cables. Make sure the vehicles do not touch;
- Set the gear in neutral and apply the vehicle parking brake used as power supply source;
- Stop the vehicle engine used as source. If an emergency starter is used, cut off the power supply;
- Make sure the electrolyte level of both batteries is correct. Make sure the caps of both batteries are fitted and tightened correctly. Make sure the batteries of the vehicle to be started are not frozen;
- The positive terminals (+) of the jumper cable are red. Connect one positive terminal of the jumper cable to the positive terminal of the flat battery from which the cable connected to the starter motor branches out. Do not place the positive terminal in contact with any part of the vehicle other than the positive pole of the battery;

- Connect the other end of the positive jumper cable to the positive terminal of the battery of the power source;
- The negative terminals (-) of the jumper cable are black. Connect one negative terminal of the jumper cable to the negative terminal of the electric power source;
- Connect the other end of the negative jumper cable to the chassis of the vehicle stopped. Do not connect the jumper cable to the battery poles. Make sure the jumper cables do not touch the following elements: fuel piping, hydraulic pipes, electrical/electronic components and mobile parts;
- Start up the engine of the vehicle used as source, or switch on the emergency starter;
- Wait for the source to charge the vehicle batteries for at least three minutes;
- Try to start up the engine of the faulty vehicle.
 For the start-up procedure refer to the "Start-up in normal conditions [start-up in normal conditions]" chapter;
- Immediately after start-up, disconnect the jumper cables, repeating the operations described above in reverse order;
- Analyse the causes of the fault and carry out the necessary repairs.

After start-up

Let the engine run at minimum speed. During the first 30 seconds of operation do not connect any charge to the engine.

Check all the indicators and lights. All the indicators and lights must indicate normal operating conditions.

Check on the multiple function display to see that the diagnostics button in the top right-hand corner is not flashing.

If the diagnostics button flashes, immediately stop the engine, press the button to access the diagnostics page and find the causes of the fault signals.

Let the engine run at minimum speed for at least 5 minutes to heat up the oil. In case of particularly cold climates more than 5 minutes of heating may be necessary.

Use this period of time to heat the hydraulic oil, operating the joysticks to raise and lower the telescopic boom.

Releasing the parking brake

To release the vehicle's parking brake, follow the criteria given below:

- sit correctly in the seat inside the cab,
- with the engine running, check to make sure the gear lever is in the NEUTRAL position,
- press button (P) positioned on the steering column under the handwheel for 3 seconds and check to ensure the indicator lights on the panel switches off.

After following the procedure, select the reverse gear and move the vehicle in the required direction.

Driving the vehicle

Move the vehicle with the accessory in transport position, i.e. with the boom completely retracted and the load approx. 300 mm above the ground.

NOTICE

The speed of the forklift truck with load must never exceed 10 km/h.

Drive carefully, adjusting the speed according to the stability of the vehicle and the ground conditions. Slow down on bends. Avoid sudden action on the vehicle controls. Never operate the vehicle with the load in a position other than that for transport. Avoid grounds where there is risk of inclining or overturning the vehicle. Use the rear view mirrors frequently.

Never leave the vehicle unmanned with the engine running.

Do not bring the vehicle to rest on any structure unless you are sure it can stand the weight and dimensions of the vehicle without risk for safety.

Operating techniques



ELECTRICITY

If the vehicle is very close to electricity lines, current may flow through it causing injuries or even death.

Keep the vehicle at a distance of at least 10 m from the electricity lines. Always check for the presence of overhead electricity lines before operating the boom.



DANGER

Lack of vehicle stability can cause serious or fatal injuries. To ensure vehicle stability, the following conditions must be met.

Inflate the tyres to the correct pressure.

Always level the vehicle on wheels.

Do not try to by-pass the safety systems unless strictly necessary for the safety of the vehicle and the operators.

Do not tamper with the accessory identification systems.

Do not operate the vehicle with the boom in a position other than for transport.

Fitting the equipment



WARNING

If fitted incorrectly, an attachment can suddenly detach from the vehicle during operation. This can cause injury or even death.

Do not operate the vehicle without the shear pin fitted in the quick-fit coupling.

Position the attachment on a stable level surface. Make sure there is sufficient space for operation. Check the attachment to make sure it is clean and intact before fitting it.



Bring the vehicle perpendicular to the equipment with the boom completely retracted and lowered. Retract the slewing jack to make hooking easier.

Stop the vehicle with the quick-fit coupling about a metre away from the equipment. Move the reverse gear lever to the neutral position and apply the parking brake.



Extend the telescopic boom slowly, checking the alignment, then raise it to fit the accessory. Raise the equipment by a few centimetres off the ground to ensure the elements fit in perfectly.



Rotate the quick-fit coupling until it is aligned perfectly with the accessory.



Take the shear pin 1 from its housing and insert it in all the way, taking care to align the hole.

Complete the procedure by inserting the split pin (2) in the hole to prevent the shear pin from coming loose accidentally.

M

NOTICE

Hydraulic shear pin

If the vehicle supply includes a hydraulic shear pin, an option valid for **"I"** and **"U"** couplings, keep the spring button with the relevant screen print on the dashboard to the right of the driver's seat pressed



and simultaneously turn the right side roller forwards until the locking pin comes completely out of the quick-fit coupling.

The multiple function display shows the name of the equipment identified by the automatic identification system. Two buttons are displayed under the name:

Attachment confirmation

No attachment confirmation

Press the confirmation button if the equipment identified corresponds to that actually fitted on the vehicle.

Press the no confirmation button if the equipment identified does not correspond to that fitted on the vehicle. The vehicle can however be used, but the functionality and load capacity are limited for safety reasons.

If no accessory is fitted on the forklift truck, confirm the absence by means of the green validation button.

Disassembling the equipment

Position the vehicle on a stable level surface. Make sure there is sufficient space for operation. Move the reverse gear lever to the neutral position and apply the parking brake.

Remove the locking pin and remove the shear pin. Fit the shear pin in its housing on the vehicle chassis.

Lower the telescopic boom and rest the equipment gently on the ground. Rotate the quick-fit coupling downwards to make it easy to detach the equipment.

Lower the telescopic boom to separate the forklift truck from the accessory. Retract the boom completely to separate the quick-fit coupling from the equipment. Clean the equipment thoroughly. Grease all the pins and movable parts to protect them from corrosion and wear. Remove excess grease to prevent accumulation of dirt.

Always keep the equipment protected from atmospheric agents. Rest the equipment on a support raised off the ground and protect it with a waterproof cover if necessary.

List of compatible accessories

- Winch
- Bucket (e.g. for concrete)
- Jib
- Lattice boom with winch
- Hook
- Waste buckets
- Platform
- Clamp (with different applications)
- Fork carriage
- Branch cutter

These accessories are approved for use on the telescopic handler models mentioned in this manual. Do not use accessories that are not approved by the manufacturer.

Contact your Magni dealer for more information on approved accessories.

Handling of loads

During load handling operations always display the load control page to keep the percentage indicator and load chart under control.

If the load status indicator is in alarm, make only the unloading movements in the following order:

- Retract the telescopic boom as far as possible;
- Lift the telescopic boom if necessary;
- Lower the boom to deposit the load.

Never try to extend the telescopic boom when the load indicator shows an alarm signal.

Before picking up the load always check to make sure the vehicle is levelled using an electronic level gauge.

Centre of gravity of the load



Never try to lift loads heavier than the rated capacity of the vehicle.

Before lifting a load, it is necessary to know its weight and the relative centre of gravity position.

The longitudinal position of the centre of gravity varies according to the type of accessory attached to the vehicle.

Refer to the technical specifications in the accessory's user manual to know the centre of gravity of the model used.



In case of irregular loads, determine the centre of gravity in the transverse direction to the vehicle before making any movement.

For loads with mobile centre of gravity, such as tanks containing liquids, it is necessary to take into account the load oscillations and take utmost caution in handling to avoid excessive shifting of the centre of gravity.

Picking up a load from the ground



During manual adjustment of the forks there is a crushing hazard for the limbs. This can lead to serious injuries.

Take the utmost care while making manual adjustments.

Position the vehicle at right angles to the chosen load.

Manually adjust the width of the forks so that these can be inserted in the openings in the pallet at the base of the load. If there is no pallet, assess the width of the blades to give the load maximum stability.



Incline the quick-fit coupling ① so that the forks are not in the horizontal position. Approach the load ② slowly with the boom lowered and insert the forks under it.

Apply the parking brake and set the reverse gear lever in the neutral position.



Lift the load slightly (3) and incline the quick-fit coupling upwards (4) to make the load stable. Take care to avoid modifying the load balance negatively (tipping forward).

Taking a load from a height with the vehicle on tyres

Put the vehicle perpendicular to the designated load. Make sure the forks pass under the load and are properly adjusted to the load.



Bring the vehicle near the load (1) slowly with the forks in the horizontal position. Move carefully to insert the forks under the load.

The forks must enter the pockets of the pallet all the way with precision. Take care to avoid knocking against the load.

Apply the parking brake and set the reverse gear lever in the neutral position.



Lift the load ② slightly and incline the quick-fit coupling upwards ③ to make the load stable, taking care to avoid modifying the balance negatively.



If possible, lower the load without moving the forklift truck. Lift the boom to move the load away (4), retract the telescopic boom (5) and lower it to bring the load to the transport position (6).



If the load cannot be lowered without shifting the vehicle, move gently in reverse \bigcirc and with utmost care to move the load away. Retract the telescopic boom 8 and lower it 9 to bring the load to the transport position.

Bring the load to the transport position



Every time reference is made to the "transport position" in this Manual, it means the configuration of the vehicle is as described below:

- Outriggers lifted;
- Telescopic boom completely retracted;
- Quick-fit coupling rotated slightly upwards;
- Telescopic boom lowered in such a way as to keep the load approx. 300 mm off the ground.

For specific cases, the transport configuration is indicated in the "Pick & Carry" chart in the relevant section of the Interchangeable Equipment's Use and Maintenance Manual.

Placing a load at a height with the vehicle on tyres



After picking up the load, lift (1) and extend (2) the telescopic boom to position the load above the area in which it is to be deposited. Move the telescopic handler close to the area where it is to be deposited (3).

Apply the parking brake and set the reverse gear lever in the neutral position.

OPERATION





Rotate the quick-fit coupling downwards (4) to position the load horizontally. Lower (5) and retract (6) the boom with slow movements to release the load in its place.

Release the parking brake and set the reverse gear lever in reverse. Release the forks lowering the telescopic boom slightly and moving slowly in reverse (7).

Picking up a load without a pallet



Position the vehicle at right angles to the load. Approach the load with the telescopic boom completely lowered and retracted. Apply the parking brake and set the reverse gear lever in neutral. Incline the quick-fit coupling downwards ①. Extend the telescopic boom slowly ② and at the same time rotate the quick-fit coupling upwards to insert the forks under the load ③.

If the operation is found to be difficult, insert a chock behind the load, to prevent it from shifting while the forks are being inserted.

Picking up and placing a hanging load



DANGER FROM HANGING LOAD

Failure to follow the instructions below may result in loss of stability with consequent overturning of the forklift truck.

General conditions of use

The length of the harness or chain should be as short as possible so as to minimise swinging of the load.

Take care to lift the load vertically on its axis, never sideways or longitudinally.

Handling the load with the forklift truck stationary

Make sure that the wind speed does not exceed 10 m/s.

Check that there is no one in the area between the load and the forklift truck during operations.

Moving the forklift truck with a hanging load

Before starting to move, it is advisable to inspect the ground in order to avoid slopes, excessive inclinations, dips, holes and ground that is too soft.

Make sure that the wind speed does not exceed 35 km/h.

The maximum travel speed of the forklift truck must not exceed 1.4 km/h.

Move and stop the forklift truck as smoothly and softly as possible to minimise load swinging.

Carry the load a few centimetres off the ground (max. 300 mm) with minimal extension of the boom. Do not exceed the load indicated on the charts. If the load starts swinging too much, immediately stop and lower the boom to the ground.

When moving, get help from a second person on the ground who, standing at least 3 m from the load, with the help of a holding bar or rope, tries to stop the load swinging. Make sure that you always have a good view of this person.

The lateral stability can have a maximum deviation of 5% (Rev. A 5°).

The longitudinal stability can have a maximum deviation of 15% (Rev. A 14°), with upstream load, and 10% (Rev. A 10°), with downstream load.

The boom angle must not exceed 45°.

Moving the centre of gravity

Before picking up a load, it is necessary to know its mass and centre of gravity.

The position of the centre of gravity is indicated on the dimensional drawings and on the load charts in the Use and Maintenance Manuals of the individual accessories.

During operation, the forklift truck is subjected to a number of stresses that can affect its stability and therefore its safety.

The objective of greater operational safety is achieved by complying with the balancing principle, which entails operating without compromising the longitudinal and transverse balance of the forklift truck, in order to prevent the causes that may cause it to overturn.

For loads with a movable centre of gravity (e.g. liquids), possible variations in the centre of gravity must be taken into account to determine the load volume to be handled.



WARNING

It is forbidden to handle a load exceeding the actual capacity specified on the corresponding load chart in the Use and Maintenance Manual of the individual accessory used.

Operate with the utmost caution and care to limit such variations as much as possible.

Visibility

When driving the vehicle, it is mandatory to remain particularly vigilant especially in its immediate vicinity due to the possible presence of people, animals, obstacles, etc.

Here are a few useful recommendations to have, and maintain, good visibility around the vehicle:

- Make sure you always have a good view from the cab (clean windows, sufficient lighting, rear view mirror adjusted, etc.).
- Always try to have a good view of the route, with direct vision and indirect vision (using the panoramic rear view mirrors) to check for the possible presence of people, animals, holes, obstacles, changes in slope, etc.

- Visibility, on the right side, may be reduced when raising the boom, so make sure you have a good view of the route before raising the boom and proceeding with operations.
- If visibility while driving forward is not sufficient enough to guarantee safety due to the size of the load, it is advisable to drive in reverse. Remember that this manoeuvre is exceptional and can only be carried out over short distances.
- The forklift truck's signalling systems and lights must be suitable for its conditions of use. The vehicle's standard lighting might not be enough for use in environments that are poorly lit or at night.

Traversing over sloping ground



WARNING

Working with the vehicle on sloping ground can cause overturning or slipping. Move forward and brake gently taking the necessary precautions.

Always move in a straight line to climb up or down a slope.

Moving crosswise or horizontally along the slope is extremely dangerous.

<u>Always</u> use the parking brake when placing or lifting a load on a slope.

When travelling on sloping routes, whether uphill or downhill, turn the lifting accessory downstream for empty movements and upstream for movements with a load.

It is strictly forbidden to move with the load facing downstream on a downhill slope, because it would seriously compromise the stability of the load and the forklift truck.

If you must go down the slope with a load, do so in reverse gear with the load positioned upstream.

If you must go up the slope with a load, do so in forward gear with the load positioned upstream.

Climatic conditions of use

It is recommended to always take into account the climatic and atmospheric conditions of the place of vehicle use.

The vehicle is designed for use in different temperature, humidity and altitude conditions. However, it is still advisable to observe the values below:

Parameter	Values
Operating temperature	from -20 °C to +45 °C (from -4 °F to +113 °F)
Storage temperature	from 25 °C to +50 °C (from -13 °F to +122 °F)
Humidity	from 20% to 95%
Altitude	< 2500 m (< 8200 ft)

For use in extreme cold conditions, it is necessary to install a few additional devices to help with start-up (e.g. coolant, fuel, engine oil and/or hydraulic oil heater, higher capacity batteries, etc.)

Contact your dealer or the After-Sales Service for recommendations and technical assistance or consult the "Start-up in extreme climates" and "Setup for countries with cold climate (optional)" sections in this manual.

Adverse climatic conditions

Always take into account the climatic and atmospheric conditions of the place of use.

Using the vehicle in snow



WARNING

Be careful to use the vehicle and proceed with great caution in the event of snow falling and/or snow on the ground as it hides obstacles, buries objects, it can cover holes / excavations / ditches, etc.

It is strictly forbidden to operate if the amount of snow is such that the obstacles and dangers along the route cannot be clearly distinguished.

In case of snow be very careful not to move away from the roadside; anything buried along the edge of the road could cause the vehicle to overturn or damage some components. Surfaces covered with snow or ice are extremely dangerous, operate with great caution and reduce the vehicle speed as much as possible.

In case of snow operate with great caution, if the vehicle sinks into the snow there is a risk that it may overturn or remain buried and/or trapped.

Be very careful when moving on icy ground; as the temperature increases, the base becomes loose and slippery.

Using the vehicle in wind

The variation in wind speed can lead to many problems such as loss of vehicle stability, swinging load, reduced visibility due to rising earth, dust, leaves, etc.

Unfavourable factors for vehicle use are:

- Location of the site: the aerodynamic effect of buildings, trees and other structures can lead to an increase in wind speed.
- The height of the extended boom: the higher it extends vertically, the more the wind speed is perceived.
- The load area: the more area the load occupies, the more it is affected by the wind force.

Near gale

Magni telescopic handlers can be used up to a wind speed of 36 km/h equal to 10 m/s (5 on the Beaufort scale) measured on the ground.

Wind-Chill effect

At a temperature of 10 °C, a wind speed of 32 km/h (8.9 m/s) makes the exposed parts of the body feel a temperature of 0 °C.

The higher you climb, the more the wind speed increases and the more the feeling of a drop in temperature increases.

WARNING

In the presence of strong wind (5 on the Beaufort scale) never lift loads with a surface area of more than 1 m².

Parking the vehicle

Parking position

The parking position is a vehicle configuration suitable for parking and carrying out routine maintenance. Always leave the vehicle in the parking position when it is not working, unless expressly indicated in this Use and Maintenance Manual.



A vehicle in the parking position has the following configuration:

- Reverse gear in neutral;
- Parking brake on;
- All wheels aligned;
- Outriggers completely raised;
- Telescopic boom completely retracted and lowered with equipment resting on the ground;
- Engine switched off and ignition key deactivated.

Stopping the vehicle

Park the vehicle on level ground as far as possible. If the vehicle is to be parked on a slope, block all four wheels with wedges.

Do not park the vehicle with a load hanging from the equipment.

Use the service brake pedal to stop the vehicle. After stopping move the reverse gear lever to neutral and apply the parking brake. Release the service brake pedal and make sure the vehicle cannot move.

If the vehicle is to remain parked for a long period, protect it from atmospheric agents.

Before stopping the engine let it run at minimum for a few minutes. Immediately stopping the engine after it has been working under load can cause overheating and premature wear of some of the components.

Leaving the vehicle

Remove the ignition key from the switch.

Before leaving the cab, shut all windows and make sure they are locked properly.

Get down from the vehicle and lock the cab door shut.

Open the engine compartment and check for debris. Remove any debris or paper if present to prevent risk of fire.

Turn the battery disconnect switch to switch off the main circuit. This will prevent a short circuit and damage to the batteries and will preserve the charge from abnormal power draws.

NOTICE

For engines meeting Stage V anti-pollution standards, wait at least 5 minutes after the engine is switched off before disconnecting the main electrical circuit. This will help protect the AdBlue purification plant.

Lock the engine compartment with a key. Lock the compartment at the back of the cab and on the lefthand side of the vehicle with a key. Lock the fuel tank cap with a key.

Before leaving the vehicle, check all the locks. Install a waterproof covering to protect the vehicle from atmospheric agents if it is to remain unused for a long period.

Transport information

Shipping the vehicle

Make sure the total weight of the vehicle and transport vehicle comply with the standards and regulations in force in the countries along the route.

Ensure that the road chosen has vertical and horizontal margins suitable for the transport vehicle with the vehicle loaded on it.

Before loading the vehicle, remove all slippery material from the transport vehicle, railway carriage or loading ramp.

Before loading the vehicle, always block the wheels of the transport vehicle or railway carriage with chocks.

The boom must be completely stowed and lowered, until the quick-fit coupling or equipment come to rest on the transport vehicle.

The dimensions and weights for shipping a standard vehicle are shown in this Use and Maintenance Manual in the technical specifications.

Driving the vehicle on the road

The vehicle must conform to the road travel codes of the country in which it is to be used.

Consult your dealer for additional information on the matter.

Observe the general rules on the matter of road travel in force in the country in which the vehicle is to be used.

While driving on roads, only use the mode with two steering wheels.

Travel with the telescopic boom completely retracted and lowered as far as possible.

Make sure that the quick-fit coupling is high enough from the ground.



CAUTION

Driving on the road with accessory mounted on the boom head is allowed only if expressly indicated in the technical attachment of the road approval.

Lifting and anchoring the vehicle



WARNING

If the vehicle slips during transport, it can cause injury or even death.

The vehicle may slip if inadequate procedures or equipment are used for transport.

Use suitable procedures and equipment for transport.

Lifting





Use equipment approved for the weight of the vehicle to be lifted together with the equipment.

The configuration of the lifting devices must be such as to avoid damage to the vehicle.

Wind the lifting belts in positions (1) and insert the lifting hooks in points (2) as shown above.

Fix the lifting devices at the designated points marked with the following sticker.



Anchoring



Install anchoring devices approved for the weight of the vehicle with equipment. Fix the anchoring devices at the four designated points marked with the following symbol.



Block the front and rear wheels of the vehicle with chocks. Insert the wedges from both sides of each tyre.

Apply the parking brake and set the reverse gear in neutral.

Make sure the boom is completely retracted. Make sure the boom is lowered and the equipment rests on the surface of the transport vehicle.

Stop the engine and remove the ignition key from the switch. Get out of the vehicle and close all windows, doors and compartments.

If in doubt, contact your dealer for information and assistance.

Towing the vehicle



WARNING

Towing the vehicle using an incorrect procedure can cause serious accidents.

Before disengaging the negative brake manually, block the vehicle to prevent its movement.

Follow the instructions given below to tow the vehicle correctly.

Towing a faulty vehicle must be done only for short distances and at speeds not exceeding 10 km/h. If the vehicle is to be transported for longer distances and at higher speeds, use a suitable transport vehicle.

Before towing the vehicle, retract and lower the telescopic boom completely and remove the load.

Do not use chains for towing the vehicle. Use steel cables with rings at the ends, or a special rigid tow bar. Make sure the cable is in good condition. Make sure the cable has a nominal carrying capacity 1.5 times the weight of the vehicle to be towed.

Position the reverse gear lever in the neutral position. Apply the parking brake. Switch on the hazard lights. Block the wheels of the vehicle with wedges.

Connect one end of the cable to the two front eyelets on the towing vehicle. Connect the other end of the cable to the two front eyelets of the vehicle to be towed.



Go under the vehicle near the front axle. Unscrew lock nut 1 of power screw 2. Tighten the power screw completely. Tighten it further through another turn to

deactivate the negative control brake. Repeat the operation for both screws on the same axle.

Have an operator climb on the vehicle to be towed to control the braking and steering. An observer must stand in a safe position to check the outcome of the operations. The observer must not stand on the vehicle to be towed.

Disengage the parking brake and remove the wedges. Tighten the tow cable slowly. Avoid sudden movements to avoid overload on the cable. Keep the angle between the vehicle and the towing cable minimum; it must not exceed 30° in any case whatsoever.

Because of the impossibility of listing all the precautions and towing procedures for all the situations, it is advisable to consult your Dealer for assistance.

Manual positioning of the reverse gear in neutral

The reverse gear must be positioned manually in case of malfunctioning of its lever because of a hydraulic failure.



Move under the vehicle near the front axle from the right side. Identify the hydrostatic transmission and hydraulic actuator of the reverse gear.

Disconnect unions (1) and (2) from the actuator and plug the ends of the tubes with suitably sized screw caps.

Using a tool as lever, shift rod ③ of the actuator to the intermediate position. There is a "click" when the actuator moves from one position to another.

Complete the operation by detaching the cardan shaft from the transmission shaft by unscrewing the screws.
MAINTENANCE

General information

Tightening torques

CAUTION

Unsuitable bolts or those of incorrect size can cause damage, faults and injuries.

Take care to avoid mixing metric nuts and bolts with nuts and bolts in inches.

The tightening torques shown in the following tables are meant as general reference. Exceptions are indicated on a case by case basis.

Before fitting any component, make sure it is as good as new. Bolts and threads must not be worn or damaged. The threads must not have burrs or be chipped.

The components must not be rusty or corroded. Clean the components with a non-corrosive detergent. Do not grease the threads of the bolts unless otherwise specified.

Metric nuts and bolts

Diameter	Tightening torque
M6	12 ± 3 Nm
M8	28 ± 7 Nm
M10	55 ± 10 Nm
M12	100 ± 20 Nm
M14	160 ± 30 Nm
M16	240 ± 40 Nm
M20	460 ± 60 Nm
M24	800 ± 100 Nm
M30	1600 ± 200 Nm
M36	2700 ± 300 Nm

Nuts and bolts in inches

Diameter	Tightening torque
1/4	12 ± 3 Nm
5/16	25 ± 6 Nm
3/8	47 ± 9 Nm
7/16	70 ± 15 Nm
1/2	105 ± 20 Nm
9/16	160 ± 30 Nm
5/8	215 ± 40 Nm
3/4	370 ± 50 Nm
7/8	620 ± 80 Nm
1	900 ± 100 Nm
1 1/8	1300 ± 150 Nm
1 1/4	1800 ± 200 Nm
1 3/8	2400 ± 300 Nm
1 1/2	3100 ± 350 Nm

Pipe clamps

For first assembly on a new pipe:

Width	Tightening torque
7.9 mm	0.9 ± 0.2 Nm
13.5 mm	4.5 ± 0.5 Nm
15.9 mm	7.5 ± 0.5 Nm

For a second assembly:

Width	Tightening torque
7.9 mm	0.7 ± 0.2 Nm
13.5 mm	3.0 ± 0.5 Nm
15.9 mm	4.5 ± 0.5 Nm

Washing



CAUTION

When cleaning the vehicle, avoid the direct use of high pressure water jets on all visible main electrical and hydraulic elements. (E.g. under the cab, on the telescopic boom head, inside the rear cab compartment, on the back of the vehicle, on the valve transducers and on all microswitches in general, etc.).



Tyres

NOTICE

Only use tyres approved by Magni Telescopic Handlers.





CAUTION

Use a quick-fit coupling and keep behind the tread when inflating the tyres.

Appropriate equipment and training are necessary to avoid excessive inflation.

Inadequate procedures can cause a tyre to burst or breakage of a rim.

Before inflating a tyre, install it on the vehicle or on a device to hold it steady.

Standard inflation pressures

The inflation pressures given below are those for cold inflation and standard shipment of Magni vehicles and may vary depending on the conditions of use. For more information, contact the tyres supplier.

Do not fill tyres with foam. Tyres filled with foam can damage certain components of the vehicle. Using tyres filled with foam can invalidate the warranty.

Sealing liquid can be inserted into the tyres, if the maximum weight of the vehicle is not exceeded. If the maximum weight of the vehicle is exceeded the warranty and the certification of certain components and structures may be cancelled.

Tyres inflated in the workshop (approx. 18 °C to 21 °C) will be deflated if the vehicle works at temperatures below zero. Adjust the tyre pressure in case of environmental temperatures less than 0 °C.



CAUTION

Periodically check that the inflation value is correct, also according to sensitive climatic variations and/or working environments, as given in this manual, on the sticker applied near each wheel under the mudguard or, if it is missing, contact Magni Telescopic Handlers Support Service.

Inflation with air

Adjust the tyre inflation apparatus regulator to not more than 0.5 bar more than the inflation pressure.

In case of doubt regarding the inflation pressure for fitted tyres, contact your dealer.

Inflation with nitrogen



WARNING

Special equipment and training are necessary for inflating tyres with nitrogen. Nonconforming procedures can lead to bursting of a tyre or breakage of a rim, with serious consequences, sometimes even mortal.

The pressure inside a filled nitrogen cylinder is about 150 bar. If not used correctly, the inflation equipment can explode causing serious injuries or even death.

It is advisable to use dry nitrogen for inflating tyres and adjusting pressures. Nitrogen is an inert gas and reduces risk of explosion.

Nitrogen reduces rusting of the wheel, deterioration, and rusting of the rims.

Adjust the tyre inflation regulator to no more than 1.4 bar more than the inflation pressure. Use the same inflation pressure as that with air.

Fusebox

Fusebox in chassis compartment



Relay/Fuse reference	Colour	Description
К1	black	Hazard lights
К2	black	Parking brake solenoid valve
КЗ	green	Low beams control
К4	green	Road lights control
К5	green	Right rear road light
Кб	green	Stop lights
К7	green	Reversing lights
К8	green	Left front high beam
К9	green	Right front high beam
К10	green	Left front road light

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	Relay/Fuse reference	Colour	Description
	K11	black	Parking brake feedback
	К12	black	Engine Override - setup
	К13	black	Cab air recirculation Opening/Closing
	К14	black	Cab air recirculation Opening/Closing
	F1	nut brown	Left front road light relay positive
	F2	blue	Front windscreen wiper motor positive
	F3	brown	Right high beam relay positive
	F4	blue	Boom head work lights positive
	F5	brown	Left high beam relay positive
	F6	nut brown	Reversing light relay positive
	F7	brown	Stop lights relay positive
	F8	brown	Right front road light relay positive
	F9	-	NOT PRESENT
	F10	-	NOT PRESENT
	F11	-	NOT PRESENT
	F12	-	NOT PRESENT
	F13	-	NOT PRESENT
	F14	blue	Setup positive
	F15	brown	Positive from battery temp.display
	F16	-	NOT PRESENT
	F17	brown	DC/DC converter positive for EGR DEUTZ
	F18	nut brown	Axle alignment proximity sensor positive
	F19	blue	Positive under Bosch Rexroth control unit power supply key
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X100	Relay size	Colour	Description
R1	24V micro with diode	black	Front windscreen wiper intermittence function relay
R2	<i>R2</i> 24V micro with diode		Windscreen wiper intermittence/continuity exchange relay
R3	24V micro with diode	black	Front windscreen wiper 1° speed relay
R4	24V micro with diode	black	Upper windscreen wiper 1° speed relay
R5	24V micro with diode	black	Rear windscreen wiper 1° speed relay
R6	5 24V micro with diode		NOT PRESENT
X101	Relay size	Colour	Description
R1	24V micro with diode	black	Tap opening
R2	24V micro with diode	black	Tap closing
R3	24V micro with diode	black	Boom head work lights
R4	24V micro with diode	black	Vehicle radio power supply
R5	24V micro with diode	black	Right front low beam

X101	Relay size	Colour	Description
R6	24V micro with diode	black	Left front low beam
X102	Relay size	Colour	Description
R1	24V maxi with diode	grey	Start-up 50 signal
R2	24V maxi with diode	grey	Hydraulic oil radiator fans
X103	Fuse	Colour	Description
F1	ATO 25A	nut brown	+15 turret control unit
F2	ATO 25A	nut brown	+15 forklift truck control unit
F3	ATO 25A	nut brown	Fuel filter
F4	ATO 15A	blue	+15 vehicle radio
F5	ATO 15A	blue	+30 vehicle radio
F6	ATO 10A	red	+30 cigarette lighter
F7	MAXI 30A	green	+30 engine
F8	MAXI 40A	orange	+30 engine control unit
F9	<i>F9</i> MAXI 40A		Oil radiator fans



X105	Fuse	Colour	Description
F1	ATO 20A	yellow	+30 DC/DC converter
F2	ATO 10A	red	+30 forklift truck control unit LD
F3	ATO 15A	blue	+15 services - radio control
F4	ATO 10A	red	+15 services - Grahyll
F5	ATO 10A	red	+15 services – ACM2.1
F6	ATO 15A	blue	+30 load control unit



X106	Fuse	Colour	Description
F1	ATO 15A	blue	+15 right joystick
F2	ATO 15A	blue	+15 services – boom head funct.
F3	ATO 15A	blue	+15 services - forklift truck control unit
F4	ATO 15A	blue	+15 sect lights stalk switch
F5	ATO 15A	blue	+15 pneumatic seat
F6	ATO 15A	blue	NOT PRESENT

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A FU1.5B
FU1.3B
FU1.4B1
A FU1.4B
A FU1.3B1
FU1.4B2
FU1.2B1
A FU1.2B
FU1.6B
FU1.7C
A FU1.2C1
FU1.4C1
FU1.4C
FU1.5C
FU1.6C

Pos.	Fuse	Pin Out	Colour	Function
P3	FU1.2D	J2.1	brown	+15 - turret control unit key
P3	FU1.2D1	J2.2	brown	+15 outrigger pressure switches
P3	FU1.3D	J2.3	red	+15 load control unit - output
P3	FU1.3D1	J2.4	brown	+15 services - forklift truck control unit LQ
P3	FU1.4D	J2.5	red	+15 forklift truck control unit – CPU2 power
P3	FU1.4D1	J2.6	red	+15 forklift truck control unit – CPU1 power
P3	FU1.4D2	J2.7	blue	NOT CONNECTED
P3	FU1.5D	J2.8	nut brown	NOT CONNECTED
P3	FU1.5D1	J2.9	brown	+15 services – pos.sens. Bucher
P3	FU1.6D	J2.10	nut brown	NOT CONNECTED
P3	FU1.6D1	J2.11	blue	NOT CONNECTED
P3	FU1.7D	J2.12	brown	+15 key – boom sens.
P2	FU1.2C	J1.10	red	+15 sec trinari

Pos.	Fuse	Pin Out	Colour	Function
P1	FU1.5B1	J1.9	red	+15 setups
P2	FU1.3C	J1.12	red	+15 intermittence
J2.14	FU1.8D	J2.13	brown	+30 batt – hazard lights and ceiling light
J2.14	FU1.7D1	J2.18	red	+30 batt - turret control unit LD
P1	FU1.5B	J1.8	brown	+15 switch functions
P1	FU1.3B	J1.3	nut brown	+15 Right low beam
P1	FU1.4B1	J1.6	nut brown	+15 Left low beam
P1	FU1.4B	J1.5	brown	+15 sec. – sensors
P1	FU1.3B1	J1.4	brown	+15 upper windscreen wiper
P1	FU1.4B2	J1.7	nut brown	+15 sec. – Parking brake relay
P1	FU1.2B1	J1.2	nut brown	+15 gear stalk switch
Ρ1	FU1.2B	J1.1	brown	+15 rear windscreen wiper
Ρ1	FU1.6B	J1.22	nut brown	+15 Sec Alternator
J1.19	FU1.8C	J1.21	blue	NOT CONNECTED
J1.19	FU1.7C	J1.20	blue	NOT CONNECTED
P2	FU1.2C1	J1.11	brown	NOT CONNECTED
J2.15	FU1.4C 1	J1.14	blue	NOT CONNECTED
J2.15	FU1.4C	J1.13	nut brown	+15 OBD key
J1.17	FU1.6C	J1.18	blue	NOT CONNECTED
J1.16	FU1.5C	J1.15	nut brown	Operator panel posit.
P2	No fuse	J2.16		NOT CONNECTED
P1	No fuse	J2.17		NOT CONNECTED

Liquids, lubricants and spare parts

Compartment	Туре	Strength	°C (min/max)	Litres
Ca alian ainmit	List of liquids recommended	50%/50%*	-41	22
Cooling circuit	"DQC CA-14"	35%/65%*	-22	23
Fuel tank	Diesel			150
AdBlue tank (only for Stage V engines)	AdBlue	ISO 22241-1		10
	List of oils recommended by	SAE 5W30	-27/+30	9
Engine sump	"DQC III LA"/"DCQ IV LA"	SAE 10W40	-20/+40	
Front axle gear	Oil	SAE 85W90	-27/+77	2.8
Front/rear axles differentials	Oil	SAE 85W90	-27/+77	11
Wheel reduction gears	Oil	SAE 85W90	-27/+77	1.6
Hydraulic oil tank	Oil	ISO 46	-15/+130	140
Greasing points	Grease	NGLI 2	-30/+120	as requ.
Boom sliding	Grease	PTFE NLGI 2	-20/+150	as requ.

List of liquids and lubricants recommended for routine maintenance

* The percentages correspond, in the order, to the composition of the antifreeze+distilled water mixture:

- 50%/50% means a mixture in equal parts;

- 35%/65% corresponds to a mixture of 35% antifreeze and 65% distilled water.

List of spare parts for routine maintenance

Position	Description	Quantity	Code
Engine transmission belt	Belt	1	34631
Air conditioning compressor transmission belt	Belt	1	24230
Air conditioning filter	Filter cartridge	1	09371
Cab air filter	Filter cartridge	1	15291
Engine air filter	Primary filter cartridge	1	31461
Engine air filter	Safety filter cartridge	1	31459
Fuel filter	Filter cartridge	1	24309
Fuel pre-filter	Filter cartridge	1	24293
AdBlue pump filter (only for Stage V engines)	Filter cartridge	1	33204
Transmission hydraulic oil filter (delivery/suction)	Filter cartridge	1	23094
Engine oil filter	Filter cartridge	1	24289
Hydraulic oil tank bleed		1	31480

Maintenance Schedule

Read and understand all the warnings and instructions before starting any maintenance.

Before carrying out any maintenance, make sure all the scheduled actions have been carried out as planned.

As required

Telescopic boom chain - adjustment Transmission belt - replacement AdBlue filter Fuel tank - refuelling Windscreen washer liquid tank - filling **Every 10 hours of operation or daily** Engine oil - check

Coolant - check Telescopic boom sliding blocks – check Liquid leaks – check Emergency hydraulic pump - operation test Wheels - check the tyre pressure

Every 50 hours of operation or every 2 weeks

Transmission shaft – lubrication of universal joints Axles – lubrication of oscillation bushes Axles – lubrication of levelling cylinders pins Hydraulic oil - check Telescopic boom sliding blocks – lubrication Telescopic boom pins – lubrication Fuel prefilter – discharge water Wheels – check tightness of nuts Outriggers – lubrication of pins

Every 250 hours of operation or every 3 months

Telescopic boom chains – checking and lubrication Transmission belt - check Differentials oil - check Two-speed reduction gear oil – check Wheel reduction gear oil – check Steering elements – lubrication

Every 500 hours of operation or every 6 months

Hydraulic oil filter – replacement (suction) Hydraulic oil filter – replacement (drainage) Engine oil and filter – replacement Fuel prefilter – replacement Engine radiator – cleaning Engine pipes - inspection Transmission shaft – check tightness of screws/nuts

Every 1000 hours of operation or every year

Telescopic boom chains – check for wear Fuel filter – replacement AdBlue filter – replacement Air filter – replacement of primary cartridge Valve play - check and adjust Differentials oil - change Two-speed reduction gear oil – change Wheel reduction gears oil – change Telescopic boom sliding blocks – adjust the play Fuel tank – clean

Every 1500 hours of operation

Fuel filter – clean mesh element Fuel prefilter – replacement

Every 2000 hours of operation or every 2 years

Hydraulic oil - change Air filter – replacement of safety cartridge Coolant - change

Maintenance

Transmission shaft

Lubrication of universal joints



Set the vehicle in the parking position. Make sure no one approaches the work area.

Lubricate the universal joints by injecting grease into the grease nipples 1. Repeat for all the transmission shaft joints. Remove the excess grease.

Checking tightness of cardan shaft screws/bolts



Set the vehicle in the parking position. Make sure no one approaches the work area.

Check that the screws/bolts securing the cardan shaft (1) to the transmission and rear axle are tightened properly.

Axles

Lubrication of oscillation bushes



Set the vehicle in the parking position. Make sure no one approaches the work area.

Stand near the front axle oscillation bushes. Inject grease in the grease nipples 1 present on both sides of the axle (front and rear).

Repeat the lubrication for the rear axle.

Lubrication of levelling cylinders pins



Set the vehicle in the parking position. Make sure no one approaches the work area.

Access the levelling cylinders present behind the wheels of the vehicle. Lubricate pins (2) and (3) by injecting grease in the grease nipples provided for the purpose.

Telescopic boom chains

Checking and lubrication



Position the vehicle on outriggers. Centre the front axle of the forklift truck (traversing) and extend the telescopic boom completely in the horizontal position.

Clean the chains and inspect carefully for signs of wear. Brush thoroughly to remove impurities. For maximum efficiency use a hard nylon brush and clean fuel.

Blow on the chains with compressed air. Lubricate with a brush soaked in oil. Wipe excess oil using a clean cloth.

Lubricate the pins of the rotation pulleys by injecting grease in the grease nipples provided for the purpose.

Repeat the operations for all the outer chains and for all the pulleys of each extension of the telescopic boom.

Adjustment



The services of an operator and an inspector are required to check the chains to see if they require adjustment.

Extend the telescopic boom in the horizontal position. Provide a rapid pulse to retract the boom and observe the oscillation of the chains. If, during oscillation, distance H is less than 4 cm, the chain must be adjusted.



To adjust the chain, first loosen lock nut (1), then turn screw (2) clockwise to increase the chain tension, or anticlockwise to decrease it.

Measure the distance between the chain axis and the surface of the boom. The reference values are:

- first extension: min. 85 mm, max. 100 mm;
- second extension: min. 65 mm, max. 80 mm;
- third extension: min. 70 mm, max. 80 mm.

CAUTION

Take special care to avoid tightening the chains excessively. Breakage of a chain following incorrect adjustment without the dealer's assistance can lead to serious damage.

Checking for wear



To check the chains for wear, the main structural dimensions of the chains of each extension must be known. Take measurements of a new chain or contact your dealer for this information.

Position the vehicle on outriggers. Centre the front axle of the forklift truck (traversing) and extend the telescopic boom completely in the horizontal position.

Measure the lengthening of the chain due to wear. Take the measurements on sections with 15-18 links. Use the heads of the pins as reference. If the lengthening of any of the sections is found to be $\geq 2\%$, the chain must be replaced.

Check the wear on the plates profile (H1 or H2) and compare with a new chain (H). If the chain is found to be $[(H-H1)/H]x100 \ge 2\%$ or $[(H-H2)/H]x100 \ge 3.5\%$ at any point, it must be replaced.

Check the wear on the edge of the plates and on the heads of the pins. If in any point the chain is found to be $(R1/R)x100 \ge 25\%$ or $/S1/S)x100 \ge 20\%$, it must be replaced. Since this is a case of abnormal wear, before making the replacement, check for the causes of wear and implement corrective measures.

Repeat the measurements for all the chains. For each chain, take a number of measurements on a number of sections to check non-uniform wear. Always take the most worn area as reference.

For replacement of one or more chains, contact your dealer for assistance.

Retiming the boom



CAUTION

Before operating, check the phase displacement of the telescopic boom extensions: if a certain phase displacement is ascertained, solve the problem by acting immediately on the extensions closure command until the boom is retracted completely.

A misalignment greater than 50 mm involves risk of breakage of the hydraulic pipes inside the boom

Transmission belt



CAUTION

Work on the transmission belt only with the engine stopped! After repairs, make sure all the protection devices have been refitted and that no tool has been forgotten on the engine.

Checking the belt tension



To check the tension of the belts, lower the arm of indicator 1 in the tester.

Place the guide ③ between two pulleys on the V-belt ②. At this point, the stop must be on the side.

Press button ④ in the right corner with respect to Vbelt ② uniformly until the spring clicks audibly.

Lift the tester gently, without modifying the position of the indicator arm (1).

Read the value measured on the intersection point (arrow), scale **5** and indicator arm (1).

Correct the tension if necessary and repeat the measurement.

The belt tension tester can be ordered through the Customer Service.

Replacement





To replace the transmission belt:

- unscrew the screw and lock nut,
- move the generator above the adjuster wrench in direction (**B**) until the belt slackens,
- remove the belts and fit the new ones,
- reposition the generator above the adjuster wrench in direction (**A**) until the belt tension is correct,
- check the belt tension:
 - pre-tensioning 650 ± 50 Nm
 - correct tension 400 ± 50 Nm
- tighten the screw and lock nut.
- Tightening torque: screw ① 30 Nm
 - screw (2) 42 Nm
 - screw (3) 30 Nm

Engine Oil



WARNING

Do not operate with the engine running!

Do not smoke or use naked flames!

Danger of burns!

During operations on the lubricant oil system, ensure utmost cleanliness. Thoroughly clean the area around the components involved from time to time.

Dry the damp parts with air jets. For handling lubricant oils follow the safety directives and specific local standards.

Dispose of the leaked lubricant oil and the filter elements. Do not let the used lubricant oil spread in the ground. Run a test cycle after every intervention.

At the same time, ensure sealing and pressure of the lubricant oil and then check its level.



An insufficient and/or excessive lubricant oil level can damage the engine. Check the oil level only with the engine horizontal and stopped. Check the lubricant oil level only while it is warm, 5 minutes after the engine is switched off. Do not remove the oil level rod with the engine running. Danger of burns.

Checking the engine oil level

Remove the rod and wipe it clean with a cloth, do not leave fibres.

Insert the oil rod up to the stop then remove it and read the lubricant oil level.

The level must always between the MIN and MAX notches. Top up to the MAX notch if necessary.

Changing the engine oil

Heat the engine until the oil temperature reaches $> 80\ ^\circ\text{C}.$

Park the vehicle on a horizontal surface and stop the engine.

Place a container under the drain screw, unscrew the latter and drain out the lubricant oil.

After draining, reposition the screw with a new sealing ring and tighten by applying a 55 Nm torque.

Fill lubricant oil, warm the engine to a temperature > 80 °C and check the lubricant oil level.

Top up, if necessary.

Replacing the lubrication oil cartridge



Loosen the filter using the tool and unscrew it.

Collect the lubricant oil that flows out.

Wipe the surface of the filter-holder with a clean cloth that does not leave lint.

Oil the original DEUTZ filter cartridge seal slightly.

Manually screw the new filter tightening it by applying a 10-12 Nm torque.

Fuel prefilter



FLAMMABLE MATERIAL

Fuel is flammable and can cause severe burns and death.

Do not smoke or use naked flames while working on the fuel line.

Clean the engine parts and engine compartment to remove all traces of fuel to prevent risk of fire.



pump fuel supply - 2 bleed screw - 3 electric connection for the water level sensor - 4 drainage cap - 5 filter cartridge - 6 fuel tank inlet

Emptying the water container

Stop the engine.

Place a suitable container.

Electrical connection.

Disconnect the cables.

Loosen the drainage screw.

Drain the liquid until the pure diesel fuel starts flowing out.

Fit the drainage cap by applying a tightening torque of 1.6±0.3 Nm.

Connect the cables.

Replacing the fuel filter cartridge

Stop the engine.

Block the fuel intake to the engine (if the tank is positioned at the top).

Place a suitable container.

Electrical connection.

Disconnect the cables.

Unscrew the drainage cap and drain out the liquid.

Remove the filter element.

Wipe the surface of the new filter cartridge and the opposite side of the filter head to remove dirt.

Slightly dampen the surfaces of the filter cartridge with fuel and re-screw the filter head clockwise (17-18 Nm).

Fit the drainage cap by applying a tightening torque of 1.6 ± 0.3 Nm.

Connect the cables.

Open the fuel cock and bleed the system (see "Bleeding the fuel system").

Fuel filter



Replacement

Loosen the filter using the tool and unscrew it.

Collect the fuel that flows out.

Wipe the surface of the filter-holder with a clean cloth that does not leave lint.

Oil the original DEUTZ filter cartridge seal slightly.

Manually screw the new filter tight.

Tighten the clamps of the anti-twisting safety (optional).

Bleed the fuel supply system.

Bleed the fuel supply system

The fuel supply system is bled by means of the fuel delivery electric pump.

To make sure fault messages are not generated, try not to start up during the bleeding process.

This process is carried out as described below:

Switched on.

The fuel delivery electronic pump is activated for 20 seconds to bleed the fuel supply system and generate the necessary fuel pressure.

Wait for the fuel delivery electric pump to be deactivated from the control unit.

Switched off.

Repeat the process at least twice until the fuel supply system bleeding is complete.

AdBlue filter



RISK OF INTOXICATION

The ammonia in AdBlue is highly toxic and corrosive, and in contact with tissues can cause serious burns or even death.

Wear protective clothing and goggles to avoid contact with the tissues.

In case of contact with tissues, rinse thoroughly with plenty of water and get medical care.

Before working on the AdBlue fuel system, read the safety information given in the section "information regarding AdBlue".

Replacement



(1) cover - (2) compensator - (3) filter cartridge.

Proceed with replacement of the filter cartridge of the AdBlue supply pump by following the indications given:

- switch the engine off,
- disconnect the electric terminals,
- place a suitably sized container under the pump and filter to hold the liquid flowing out,
- remove the cover using a 27 mm hex head wrench,
- remove the compensator and filter element completely,
- replace the filter element and refit it together with the compensator,
- fit the cover by applying a 22±2.5 Nm tightening torque,
- reconnect the electrical system,
- start up the engine.

NOTICE

For drive units satisfying the Stage V anti-pollution standards, in order to protect the AdBlue purification system, wait at least 5 minutes after the engine is switched off, before acting on the main electric circuit to disconnect it.

Coolant



DANGER OF BURNS

The coolant is pressurised and at high temperature with the engine switched on. When the cap is removed, the liquid may flow out violently and cause serious burns.

Make sure the engine is cold before working on the cooling system.

Checking



Set the vehicle in the parking position.

Check the level in the expansion tank placed above the radiator. The level is correct when it is half-way on the inspection window.

Open the tank, check the coolant additive concentration ratio using the instrument concerned (e.g. hydrometer, refractometer).

If necessary, top up with a suitable mixture depending on the use.

Refit the cap and make sure it is tightened properly. Run the engine to bring it to the required temperature. Switch off the engine and check for leaks in the circuit.

Bleeding the cooling system



Set the vehicle in the parking position.

Remove the radiator cap carefully to release the residual pressure.

Place a suitably sized container under the drainage cap to collect the coolant flowing out.

Remove screw ① and drain out the coolant. If the screw is not accessible, drain through the engine oil radiator (coolant duct).

Refit the screw by applying mastic.

Refit the radiator cap.

Differentials oil



Checking

Set the vehicle in the parking position. Make sure no one approaches the work area.

Remove filler cap (1). The oil must flow out through the opening.

If necessary, remove filler cap (2). Add oil to the correct level. Close level cap (1), and then filler cap (2). Clean the axle surfaces.

Repeat the operations for the front and rear differential.

Replacement

Place suitably sized containers under the axle. Remove the three drainage caps of the differential (3). Wait for the oil to drain out completely. To speed up the operation, remove filler cap (2).

Refit caps (3) and tighten adequately. Remove filler cap (1).

Pour fresh oil of the correct type through hole 2. Fill in stages and check the flow of oil through level hole 1.

When the correct level is reached, refit level cap (1) and filler cap (3).

Repeat the operations for the front and rear differential.

Hydraulic oil

Checking

The hydraulic oil tank is on the left side of the vehicle. Check the hydraulic oil level through the inspection window present on the tank.



The oil level is correct if it is halfway on the window, as shown by the dashes in the figure.

To top up the oil level, open the cap at the top of the tank.

Pour oil of suitable strength up to the correct level.

Refit the cap and tighten it manually.

Replacement



Open the engine compartment bonnet and place a funnel, connected to a fluid recovery tray on the floor, under the threaded drainage cap 1, indicated above. To speed up the operation, also unscrew the filler cap.

Refit drainage cap **1** and fill the tank with fresh fluid. Close the filler cap.

Start the engine. Check to make sure there is space to extend the telescopic boom completely. Raise and lower the boom a number of times. Extend and retract the boom a number of times. With the boom in the transport position, drive the vehicle carefully forwards. Steer the vehicle to the right and left.

Park the vehicle and check the oil level. Add oil if necessary.

Hydraulic oil filter

NOTICE

The vehicles use a single filter for hydraulic oil: the filter placed inside the engine compartment has the combined function for oil at the suction as well as return.



Park the vehicle on a flat surface: clean the filter housing and surrounding areas to prevent dirt from entering the circuit. Unscrew the cap.

Replacement of the filter cartridge does not necessary involve drainage of the tank: the filter housing has a special closure system. When it is being removed, the fluid present inside the filter normally flows out.

Remove the filter cartridge and dispose of according to the regulatory standards in force. Insert a new filter cartridge of the same type.

Refit the filter cover. Start up the engine and check for leaks.

Check for a drop in the oil level through the window present on the tank: if required, top up with the quantity necessary to reach the correct level.

Two or three-speed reduction gear oil



Checking

Set the vehicle in the parking position. Make sure no one approaches the work area.

Remove the cap ①. Check the oil level: the level is correct if it reaches the base of the hole. Add oil if necessary.

Reposition and tighten cap (1).

Replacement

Place a suitably sized container under the two-speed reduction gear.

Remove the cap (1). Remove the magnetic drainage cap (2). Wait for the oil to drain out completely.

Clean magnetic cap (7) to remove iron filings, then refit and tighten it.

Fill the reduction gear with oil through hole (1) up to the prescribed level. Reposition and tighten cap (2).

Wheel reduction gears oil



Checking

Set the vehicle in the parking position. Turn the reduction gear cap in the horizontal position (2).

Remove the cap. The oil level is correct when the oil flows out through the filler hole.

If necessary, top up with oil (photo) (2) to the correct level.

Refit the cap. Repeat this operation for each wheel.

Replacement

Place a suitably sized container under the reduction gear. Turn the reduction gear cap in position (1).

Remove the cap and wait for the oil to drain out completely.

Turn the reduction gear cap in position ②. Fill oil through the hole to the correct level.

Refit the cap. Repeat this operation for each wheel.

Steering elements

Lubrication



Lubricate the wheels rotation pins 1 by injecting grease in the grease nipples provided for the purpose. Remove the excess grease.

Lubricate the ball joint (2) injecting grease in the grease nipples provided for the purpose. Remove the excess grease.

Repeat the operations for each wheel.

Engine air filter

The efficiency and life of the engine depend greatly on the quality of air taken in. A dirty or damaged air filter can seriously affect the correct working of the engine and increase the possibility of a failure.

Replace the air filters strictly according to the schedule indicated in this Manual. Do not try to wash dirty filters.

If the vehicle is expected to be used in environments with a lot of dust or high concentrations of contaminating or polluting agents in the air, halve the time interval between one filter replacement and the next.

Replacing the primary cartridge

To access the filter box, open the engine compartment and locate the air filter cartridge, which is on the right as shown in the image.



Unclip the catches and remove the front filter cover.



Grip the filter housing and remove it from its seat.



Wipe thoroughly inside the filter housing with a damp cloth. Avoid the use of aggressive solvents or products as these can damage the safety filter or the filter housing.

Install a new filter element. Make sure the filter element is inserted properly in its seat. If installation is difficult, grease the rubber gasket slightly with silicone grease.

Replacement of safety cartridge

Carry out the primary filter removal procedure described earlier.



Hold the filter element with two fingers in the holes and pull to separate it from its seat.

Wipe thoroughly inside the filter housing with a damp cloth. Avoid the use of aggressive solvents or chemicals as they can damage safety of the filter housing.

Install a new filter element. Lightly grease the outer gasket of the new filter element with silicone grease.

Cab air filter

Replacement



Open the compartment in the rear part of the cab to access the filter housing.

Unscrew the four screws (1) and remove the filter holder frame.

Remove the air filter and replace it with a new one of the same type.

For reassembly repeat the above operations in reverse order. Check the correct direction of assembly before fitting the holder frame.

Telescopic boom sliding blocks

Checking

Set the vehicle in the parking position. Extend the telescopic boom completely.

Check to make sure the boom movement is smooth. Ensure that there are no abnormal vibrations, unusual noises, and no part of the boom gets heated due to friction during the movement.

Check for the presence of a sufficient layer of grease on the sliding surfaces and on the sliding blocks.

Lubrication

Position the vehicle on a flat surface in a large enough area. Remove any equipment from the quick-fit coupling and move the telescopic boom into the horizontal position. Extend the telescopic boom completely.



Clean all the sliding surfaces ① thoroughly.

Using a brush, apply a thin layer of grease on the sliding surfaces (1) on all four sides of the boom. Repeat the operation for each stage of the extension.

Retract and extend the telescopic boom a number of times to distribute the grease uniformly.

Remove excess grease to prevent accumulation of dirt.

Adjusting the play

Position the vehicle on a flat surface in a large enough area. Remove any equipment from the quick-fit coupling and move the telescopic boom into the horizontal position. Retract the telescopic boom almost completely.

Move to the front of the boom and identify the sliding blocks as shown below.



Loosen all the lock nuts 2 of the upper and side sliding blocks at the top of the boom. Screw all the grub screws 3 all the way without tightening them, then unscrew them all by half a turn.

Repeat the adjustment operation for the lower and side sliding blocks at the bottom of the boom.

Tighten each lock nut holding the relative screw firm. Tightening torque: **100 Nm**.

Try to adjust the sliding blocks in such a way that all the screws 3 protrude to the same extent.

Always try to adjust the sliding blocks symmetrically, to facilitate boom extension centring.

After completing the operations try to extend and retract the boom to check the boom movement is smooth.

If the movement of the boom is not smooth, repeat the adjustments, unscrewing the screws (3) by one complete turn instead of by half a turn.

Contact your dealer for any clarification or for assistance if the sliding blocks are worn and need to be replaced.

Telescopic boom pins



WARNING

One of the two safety precautions for operators involved in the operations described below must be taken before carrying out maintenance inside the telescopic boom compartment, or in any case below it.



1) Raise the telescopic arm up to the desired height for the maintenance operations to be performed and hook it to a load-bearing structure (e.g. bridge crane) using the hooks anchored to the eyelets present on the same, making sure that it has sufficient capacity to support its weight, as illustrated above.



2) Correctly position and secure the mechanical block on the lifting jack to prevent its accidental descent in the event of hydraulic failure during maintenance operations, as shown above.

Lubricate the pins of the movable parts of the telescopic boom at regular intervals. Lack of lubrication can cause seizure of the pins in their seats.



Set the vehicle in the parking position, unless otherwise specified.

Identify the grease nipples 1 and inject grease into these until it flows out from the edges of the pins.

Wipe excess grease to prevent accumulation of dirt.

Lubrication of boom pin



Lubricate pin (2) injecting grease in both grease nipples present on the boom.

Lubrication of lift cylinder pins



Lubricate pins (3) and (4) of the lift cylinder. To make access to the grease nipples easier, lift the telescopic boom completely.

Lubrication of compensation cylinder pins



Lubricate pins (5) and (6) of the compensation cylinder. To make access to the grease nipples easier, lift the telescopic boom completely.

Lubrication of quick-fit coupling pin



Lubricate the pin of quick-fit coupling T through the grease nipples.

Lubrication of slewing cylinder pins



Lubricate pins (8) and (9) of the slewing cylinder by means of the grease nipples provided on the cylinder.

Engine radiator

Cleaning



To remove dust and debris from the radiator mass (1), compressed air, pressurised water or steam can be used. However, it is preferable to use compressed air.

NOTICE

When using pressurised water, keep the high pressure jet cleaning nozzles at a distance of at least 50 cm from the radiator mass. Bringing the nozzle too close to the radiator mass can lead to risk of damaging the radiator.

Wheels

Checking the tyre pressure

Set the vehicle in the parking position.

Clean the area around the valve stem. Remove the protective cap from the valve stem.

Measure the pressure of each tyre using a pressure gauge. If the pressure is different from that prescribed, make the necessary adjustments.

Refit the protective cap.

Checking the tightness of the nuts

Set the vehicle in the parking position.

Check the tightening torque of the new wheels. Check the tightening torque of the repaired wheels.

Tighten the wheel nuts in the cross-wise sequence applying the correct tightening torques.

The checking must be done every 10 hours of service, until the torque remains constant. It is then possible to return to normal checking intervals.

The tightening torque of the wheel nuts is 630 Nm. The tightening torque is shown on the plate affixed to the chassis near the axles.

Replacing the wheels

NOTICE

Only use tyres approved by Magni Telescopic Handlers.

Park the vehicle on a flat surface, apply the parking brake and turn the engine off.

CAUTION

Make sure that the surface of the work area is compact and of sufficient consistency to withstand the load placed on it.

If working in an area with loose soil, place plates under the handlers and winch supports to prevent them from sinking.

Position the jack under the axle of the vehicle as shown below.



NOTICE

If the vehicle model is equipped with its own stabilisers, these can be used as lifting aids.

Raise the vehicle, put the winch support - previously adjusted for height - in place under the axle, and then lower the machine onto the winch support.



WARNING

Movement or falling of the vehicle placed on winch supports can result in serious injury or even death.

With the vehicle raised, remove the nuts and replace the affected wheel.



WARNING

Pay the utmost attention to movement of the wheel after unfastening the nuts: accidental falling of the wheel can cause serious injuries to the person carrying out this maintenance.

To facilitate handling and replacement, we recommend the use of a forklift truck (or one equipped with a tyre clamp) to support the weight of the wheel and prevent it from accidentally falling off the axle.

Refasten the nuts removed earlier and tighten them in a criss-cross pattern using the tightening torque indicated in this manual and marked on the vehicle near the axles.

When done, lift the machine off the winch support, remove it and lower the vehicle to the ground.

Fuel tank

Refuelling



Set the vehicle in the parking position. Switch the engine off.

Unlock the tank cap using wrench (1). Unscrew the tank cap by turning it anticlockwise.

Refuel using suitable fuel. Screw the fuel cap in and lock using wrench (1).

Cleaning



Unscrew the filler cap. Place a suitably sized container under the fuel tank near drainage cap (2).

Unscrew drainage cap (2) and drain out the tank completely.

Pour 10 litres of clean fuel into the tank to rinse out impurities that may be present at the bottom.

Close and tighten drainage cap (2). Fill the tank with clean fuel. Check to make sure there are no leaks.

Windscreen washer liquid tank

Filling



Open the compartment in the rear part of the cab to access the windscreen washing liquid tank housing.

Unscrew the cap (1) by turning it anticlockwise. Fill the tank with windscreen washer liquid, leaving about 1 cm between the liquid level and the edge.

Refit cap (1) and tighten it by hand.

Outriggers



Set the vehicle in the parking position. Lower the outriggers completely to the ground for easier access to the areas to be lubricated.

Lubricate all the rotation pins of the outriggers, including the pins of the hydraulic cylinders. Lubricate by injecting grease in the grease nipples present on each pin. Wipe excess grease to prevent accumulation of dirt.

Operate the hydraulic movement of the outriggers a number of times to distribute the grease uniformly. Make sure the outrigger foot oscillates freely. Increase the lubrication frequency of the base support pin if necessary.

TROUBLESHOOTING

Engine – does not switch on or switching on is difficult (no fumes at exhaust)

Cause	Solution
No fuel in tank.	Refuel.
Ignition switch defective.	Check the opening and closing of the electric connection.
Fuel filter clogged.	Bleed the water separator or replace the filter.
Fuel priming pump defective.	Check to make sure the pump provides the flow rate suitable for the high pressure pump. Check the electrical connections.
Air in the fuel	Check the absence of air returning to the circuit
Fuel dirty or non-conforming	SWITCH THE ENGINE OFF. Replace the fuel filters. Run the engine with correct fuel.
Suction or discharge system obstructed	Visually inspect the suction and discharge and remove any obstructions present. Replace the air filter if necessary
Fuel return line blocked	Check to make sure the line is clear and connected to the upper part of the tank
Fault in one or more injectors	Check the electrical connections.
ECU or sensors fault	Check the electrical connections.

Engine – Does not rotate when started up or moves slowly

Cause	Solution
Electric circuit elements loose or worn	Clean and carry out the necessary maintenance
Battery flat	Check the voltage using a multimeter. Check the working of the alternator.
Solenoid or starter motor fault	Replace the starter motor
Starter motor working but the engine does not rotate	Remove the starter motor and check the state of the gears and spring

Engine – Starts up but switches off immediately

Cause	Solution
No fuel in tank.	Refuel.
Starter motor charged	Check the presence of external loads due to faulty auxiliaries.

Cause	Solution
Suction or discharge system obstructed	Visually inspect the suction and discharge and remove any obstructions present. Replace the air filter if necessary
Fuel priming pump defective.	Check to make sure the pump provides the flow rate suitable for the high pressure pump. Check the electrical connections.
Fuel frozen	Use fuels suitable for low temperatures
Air in the fuel	Check the absence of air returning to the circuit
Fuel dirty or non-conforming	SWITCH THE ENGINE OFF. Replace the fuel filters. Run the engine with correct fuel.
Fuel supply obstructed	Check for blockage along the line. Check the state of the filters and replace if necessary.
Fuel return line blocked	Check to make sure the line is clear and connected to the upper part of the tank
ECU or sensors fault	Check the electrical connections.

Engine – irregular operation

Cause	Solution
Engine cold, or coolant temperature sensor fault	Check the sensor electrical connection. Check the working of the sensor.
Leakage in fuel circuit	Replace the defective connections. DO NOT try to carry out repairs.
Air in the fuel	Check the absence of air returning to the circuit
Fuel priming pump defective.	Check to make sure the pump provides the flow rate suitable for the high pressure pump. Check the electrical connections.
Fuel supply obstructed	Check for blockage along the line. Check the state of the filters and replace if necessary.
Fuel dirty or non-conforming	SWITCH THE ENGINE OFF. Replace the fuel filters. Run the engine with correct fuel.
Incorrect adjustment of valve play	Correct the adjustment
Compression not good in one or more cylinders	Check the compression ratio
ECU or sensors fault	Check the electrical connections.

Engine – excessive noise

Cause	Solution
Slipping of transmission belt, tension insufficient or excessive	Check the belt tensioner and inspect the belt. Make sure the pulley rotation is not hindered
Coolant temperature sensor fault	Check the sensor electrical connection. Check the working of the sensor.
Fuel dirty or non-conforming	SWITCH THE ENGINE OFF. Replace the fuel filters. Run the engine with correct fuel.
Incorrect adjustment of valve play	Correct the adjustment. Make sure the rod and equaliser mechanism is not damaged or worn
Noise coming from engine block	Contact your dealer immediately

Engine – reduced power

Cause	Solution
No fuel in tank.	Refuel.
Oil level not correct	Check the level
Engine overload	Check the presence of overloads due to faulty auxiliary parts
Fuel dirty or non-conforming	SWITCH THE ENGINE OFF. Replace the fuel filters. Run the engine with correct fuel.
Fault in turbocompressor	Contact your dealer
Leakage in fuel circuit	Replace the defective connections. DO NOT try to carry out repairs.
Fuel supply obstructed	Check for blockage along the line. Check the state of the filters and replace if necessary.
Air in the fuel	Check the absence of air returning to the circuit
Fuel priming pump defective.	Check to make sure the pump provides the flow rate suitable for the high pressure pump. Check the electrical connections.
Suction or discharge system obstructed	Visually inspect the suction and discharge and remove any obstructions present. Replace the air filter if necessary
Fault in one or more injectors	Check the electrical connections.
Leaks in manifolds or in turbocompressor	Check and correct leaks in the manifolds
Too many sealing washers installed under the injectors	Remove the excess sealing washers
Incorrect adjustment of valve play	Correct the adjustment
Compression not good in one or more cylinders	Check the compression ratio

Engine – Does not reach the maximum rpm

Cause	Solution
Speedometer defective	Check the engine speed using a manual speedometer. Correct if necessary
Engine overload	Check the presence of overloads due to faulty auxiliary parts
Fuel dirty or non-conforming	SWITCH THE ENGINE OFF. Replace the fuel filters. Run the engine with correct fuel.
Wastegate valve actuator diaphragm cracked	Repair or replace the turbocompressor
Leakage in fuel circuit	Replace the defective connections. DO NOT try to carry out repairs.
Fuel supply obstructed	Check for blockage along the line. Check the state of the filters and replace if necessary.
Fuel priming pump defective.	Check to make sure the pump provides the flow rate suitable for the high pressure pump. Check the electrical connections.
Fault in one or more injectors	Check the electrical connections
Fuel high pressure pump fault	Contact your dealer

Engine – Excessive vibrations

Cause	Solution
Oil level excessive	Check the level
Fan damaged or auxiliaries fault	Replace the defective components
Fan hub damaged	Check and replace the hub
Engine supports loose or damaged	Tighten the loose supports and replace those that are damaged
Incorrect adjustment of valve play	Correct the adjustment
Compression not good in one or more cylinders	Check the compression ratio
Alternator bearing worn	Check/replace the alternator

Engine – black fumes at the exhaust

Cause	Solution
Suction or discharge system obstructed	Visually inspect the suction and discharge and remove any obstructions present. Replace the air filter if necessary
Leaks between the turbocompressor and suction manifold	Inspect and repair the leaks
Intercooler defective	Check the radiator mass
Leaks from discharge manifolds or from turbocompressor	Repair the leaks from the gaskets. Check for cracks in the connections
Wastegate valve fault	Replace the valve
Turbocompressor fault	Replace
Fault in one or more injectors	Check the electrical connections
Compression not good in one or more cylinders, fumes with load mainly at average and low speeds	Contact your dealer

Engine - white fumes at the exhaust

Cause	Solution
Fuel dirty or non-conforming	SWITCH THE ENGINE OFF. Replace the fuel filters. Run the engine with correct fuel.
Oil level not correct	Check the level
Diesel and hydraulic oil in engine casing	If the oil is contaminated, check the gaskets at the power take-offs. Drain oil, clean and refill with fresh oil
Leaks from seals in the valve seats – evident after long periods at minimum speed followed by sudden acceleration	Contact your dealer
Fault in one or more injectors	Check the electrical connections
Piston belts not sealed – blue fumes at all speeds	Contact your dealer

Restrictions to the working due to malfunctioning of the UREA/AdBlue system

The engines meeting Stage V standards are provided with special control software for limiting their working until they are switched off for precautionary purposes if there are problems in the UREA/AdBlue purification systems. Specifically, the problems can be summarised as follows:

- low level of urea in tank,
- poor quality of urea liquid,
- tampering with the urea system,
- system errors.

Depending on the extent of the anomaly, in order to protect the thermal unit, the software controls a power reduction at two levels:

- level 1: torque reduction,
- level 2: torque and engine rpm reduction.

A separate safety button is provided for temporary deactivation of the power reduction caused by the system.

This function can only be activated for a limited period to allow the operator to park the vehicle in a safe place.

In compliance with EU legislation, the function is available for engines with level 1 and 2 power reduction, while in compliance with EPA legislation, it is only available for level 1 power reduction.

AdBlue[®] filling level

Beginning of warning signals starting from AdBlue filling level less than 15%.

AdBlue [®] filling level SCR indicator light AdBlue [®]	Engine indicator light	Power reduction		
		EU	EPA	
<15%	Permanent light	Off	None	None
<10%	Flashing light (0.5 Hz)	Off	None	None
<5%	Flashing light (0.5 Hz)	Permanent acoustic signal light	None	None
<5% ≥ 10 min	Flashing light (1 Hz)	Permanent acoustic signal light	Level 1	None
<5% ≥ 15 min	Flashing light (2 Hz)	Flashing acoustic signal light	Level 1	None
<5% ≥ 20 min	Flashing light (2 Hz)	Flashing acoustic signal light	Level 2	Level 2

Efficiency of catalyst/AdBlue® quality

If the efficiency of the catalyst is too low (yield percentage), even if the level has already been topped up, warning messages are sent to the SCR function or optional CAN display. The warning signals are also transmitted if an unsuitable reducing agent is used.

Efficiency of catalyst / AdBlue [®] quality	SCR indicator light	Engine indicator light	Power reduction	
			EU	EPA
Excessively low	Permanent acoustic signal light	Permanent light	Level 1 after the pre- alarm period	None
Too low not solved	Permanent acoustic signal light	Flashing light	Level 2 after the pre- alarm period	Level 2 after the pre- alarm period

Manipulation

If the system detects the presence of a component that has been manipulated or if an unsuitable reduction agent has been used, the power is reduced. The power reduction takes place gradually and depends on the engine power.

Manipulation	SCR indicator light	Engine indicator light	Power reduction	
			EU	EPA
Recognised	Permanent acoustic signal light	Permanent light	Level 1 after the pre- alarm period	None
Not solved	Permanent acoustic signal light	Flashing light	Level 2 after the pre- alarm period	Level 2 after the pre- alarm period

System errors

System errors may concern problems involving the individual SCR components, including an implausible NOx level or temperature sensor value. If the AdBlue[®] injection cycle is affected by a system error, the power is reduced.

System errors	SCR indicator light	Engine indicator light	Power reduction
Recognised	Permanent acoustic signal light	Flashing light	None
Recognised ≥ 10 min	Permanent acoustic signal light	Flashing light	Level 2

In power limitation condition, the forklift truck driver can display the errors page on the control panel by pressing

the alarm button 4, and activate the OVERRIDE function 3 times by means of the button concerned: this allows the engine to run at full speed for 30 minutes bypassing the errors detected.

Once the errors detected have been rectified, the engine returns to operation at its full capacity but without the errors being cancelled from the memory of the control unit.

Fuel – excessive consumption

Cause	Solution
Additional loads on the engine	Check/repair the auxiliaries and equipment of the forklift truck
Fuel leaks	Check for leaks near the tank, fuel line, filters and priming pump. DO NOT try to repair the defective piping
Control unit defective	Contact your dealer
Fault in one or more injectors	Check the electrical connections
Incorrect adjustment of valve play	Correct the adjustment

Fuel/oil – leaks from the drainage

Cause	Solution
Turbocompressor lubrication line obstructed	Check and clean the piping
Leaks from discharge manifolds or from turbocompressor	Repair the leaks from the gaskets. Check for cracks in the connections
Leaks from the valve guides	Contact your dealer
Control unit defective	Contact your dealer
Fault in one or more injectors	Check the electrical connections

Lubricant – excessive consumption

Cause	Solution
Oil leaks	Check the engine for leaks
Lubricant specifications unsuitable	Make sure a suitable lubricant is used. Check contamination by fuel
Leaks in cooling system	Check for the presence of lubricating oil in the coolant
Leaks from turbocompressor in the suction or discharge system	Check for leaks
Leaks from the valve guides	Contact your dealer
Cylinders worn or damaged	Contact your dealer
Lubricant - contamination

Cause	Solution
Oily deposit in lubricant	Change the oil and filters. If operating in particularly heavy duty conditions, increase the maintenance frequency. Make sure a suitable lubricant is used
fuel in lubricant oil, engine temperature very low	Avoid leaving the engine running at low speed for too long

Lubricant - pressure excessively low

Cause	Solution
Oil level not correct	Check the level
Lubricant specifications unsuitable	Make sure a suitable lubricant is used. Check contamination by fuel
Pressure gauge fault	Check the correct working
Oil filter clogged	Change the oil and filters. If operating in particularly heavy duty conditions, increase the maintenance frequency. Make sure a suitable lubricant is used
The oil priming pump pressure limiter valve is blocked in the open position	Contact your dealer
The oil pump pressure limiter valve is blocked in the open position	Contact your dealer
Oil pump worn	Contact your dealer

Lubricant – excessive pressure

Cause	Solution
Lubricant specifications unsuitable	Make sure a suitable lubricant is used. Check contamination by fuel
Pressure gauge fault	Check the correct working
The oil pump pressure limiter valve is blocked in the closed position	Contact your dealer

Coolant - leaks

Cause	Solution
Coolant level not correct	Check the level
Liquid leaks from radiator	Check the radiator, hoses and piping for leaks

Cause	Solution
Liquid leaks from engine	Check the engine for leaks from gaskets, pipes or unions. Make sure all the clamps are tightened properly and in good condition
Leaks from the head gasket	Contact your dealer
Engine head cracked or shows porosity	Contact your dealer
Leaks from lubricant passages in the base	Contact your dealer

Coolant - overheating

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Cause	Solution
Coolant level not correct (low)	Check the level
Radiator grille obstructed	Clean the radiator grille
Air flow to radiator insufficient or obstructed	Check/repair the fan
Belt tension insufficient	Check the tension
Radiator tube crushed, obstructed or cracked	Check/replace the defective tube
Oil level not correct (high)	Check the level
Radiator cap defective	Replace the radiator cap
Excessive concentration of antifreeze	Drain part of the circuit and fill with distilled water
Temperature sensor defective	Check the accuracy of the sensor
Thermostat faulty or missing	Check/replace the thermostat
Coolant pump faulty	Check/replace the pump
Passage of liquid through the radiator, head or engine block obstructed	Wash the plant with distilled water and fill with fresh coolant

Coolant – not at required temperature

Cause	Solution
Temperature sensor defective	Check the accuracy of the sensor
Thermostat defective (blocked open)	Check/replace the thermostat
Liquid not circulating near the temperature sensor	Check/clean the liquid passages

Recovery of the aerial platform in the event of a failure

Should any hydraulic faults to the engine power (engine, service pump) or electro-hydraulic faults (battery, control unit power line problems) occur while using the vehicle, resulting in the aerial platform shutting down at height, proceed as follows to bring it back down to the ground.

CAUTION

The following procedures are to be carried out only and exclusively in the event of technical faults: they do not in any way affect safety operation lockouts such as overload warnings, absence of shear pin, etc.

WARNING

In the event of unexamined problems or problems of a greater extent than those given below, contact your local dealer or the Magni Telescopic Handlers Assistance Service.

DANGER

The following procedures MUST only be carried out by operators trained on how to use the vehicle correctly and the potential risks involved.

In order to safely recover the aerial platform, always proceed with alternating boom retraction and boom descent movements so as to stay within the working area shown in the load chart.

In dangerous conditions, first contact the local emergency services.

Procedures to be followed with TH series fixed vehicles

This type of model can be fitted with or without an electrically activated emergency pump.

Malfunctions that may occur during work operations:

- engine/service pump failure in models fitted with an electric emergency pump;
- electrical system failure in models fitted with a manual emergency pump;
- 3) total shutdown of the vehicle.

Models with electric emergency pump

In models fitted with an electric emergency pump, the operator on the platform at height must press (and hold) the electric emergency pump activation button on the radio control (illustrated in the previous sections) and simultaneously select the movements required to bring the platform back down to the ground.



In the event the operator at height is unable to carry out these instructions, a second operator can intervene from the cab by pressing the red emergency pump activation button with dedicated graphics, which is located on the dashboard to the right of the driver's seat.



Once the electric emergency pump has been switched on, the equipment movement process is similar to that described in the previous sections **together with the radio control signal bypass procedure**.

WARNING

ONLY USE THE EMERGENCY PUMP IF THE HYDRAULIC SYSTEM MALFUNCTIONS.

UNNECESSARY PROLONGED USE OF THE ELECTRIC EMERGENCY PUMP WILL CAUSE THE VEHICLE'S BATTERY CHARGE LEVEL TO BE USED UP RAPIDLY.

Models with manual emergency pump

On models fitted with a manual emergency pump, in the event of an electrical system in alarm, the aerial platform can **only** be recovered by two operators on the ground who must intervene directly on the hydraulic distributor located at the rear of the vehicle.

In the event the entire vehicle has shut down (no engine power), the hydraulic circuit must be activated manually: after taking the rear cover off the vehicle and pulling out the actuation lever located inside the chassis, the first operator must insert it in its seat, as illustrated below, and start pumping in order to pressurise the circuit.



With the circuit still under pressure, a second operator must use 9 mm wrenches, also from the outside, on the first spool to the right of the distributor, nut (1), in order to enable and maintain the flow of oil inside the distributor itself.

A second wrench must be used to turn the nut ② on the spool of the opposite element, the first starting from the left, for retraction-extension of the boom.

Lastly, with the arm retracted, turn the nut ③ on the third spool from the left for lowering the boom.

REFERENCE INFORMATION

Leaving the vehicle unused for long periods

If the vehicle is to be left unused for more than 30 days, carry out certain operations to keep it in good condition and maintain a high level of service.

Leaving the vehicle unused for less than 12 months

Park the vehicle in a well-ventilated area, free of humidity and protected from atmospheric agents. Make sure the environmental temperature in the area does not fall below -10 °C.

Clean the vehicle thoroughly. Remove all traces of rust or corrosion. Touch up the paint layer in the areas concerned.

Change the engine oil and the filter if the oil is more than 12 months old or after 300 hours of service after the last change.

Charge the batteries. Check the level of electrolyte before and after charging. Disconnect the negative pole after the charging.

Check the coolant level and top up if necessary.

Check the pressure in the AdBlue circuit pressure accumulator.

Drain water from the fuel prefilter with water/fuel separator.

Close the drainage pipe and the air intake in the filter casing with rags soaked in oil.

Loosen the belt tensioner device in the transmission belt. Do not dismantle the transmission belt completely.

Leaving the vehicle unused for less than 36 months

If the vehicle is to be left unused for more than 12 months and less than 36 months, certain protective measures must be adopted in addition to those required for leaving the vehicle unused for less than 12 months.

Fill the fuel tank completely. Run the engine for 15 – 30 minutes at not more than 900 rpm.

Disconnect the suction manifolds from the top of the engine. Press the start button present on each engine briefly and at the same time pour about 15 cc of oil in each cylinder.

Pour about 5cc of oil in the volumetric compressor on the suction side.

Refit all the components and tighten the fixing screws applying the correct tightening torque.

Reusing the vehicle

Clean the fuel tank. Refuel.

Replace the fuel prefilter and filter.

Check the coolant level. If topping up is necessary, take a sample of the liquid and check the composition. Add distilled water or pure liquid to adjust the composition.

Check the battery charge. Charge if necessary. Check the level of electrolyte before and after charging. Again connect the negative pole to the batteries. Check the electrical system to make sure it is working correctly.

Check the condition of the transmission belt. Replace if necessary. Restore the working of the belt tensioner device.

Start up the engine and let it run for 15 - 30 minutes at not more than 900 rpm. Keep the oil pressure, water temperature and oil temperature indicators under observation.

Check the oil level in the axles, in the wheel reduction gears and in the gearbox.

Dismantling and disposal of the vehicle

When the vehicle is out of service, the reference standards will have changed. The procedures for dismantling and scrapping the vehicle vary according to the regulatory standards in force in the country in which it is used.

For information regarding dismantling and scrapping the vehicle, contact your dealer for updates regarding the directives in force.

Approved equipment



CAUTION

Using equipment that is not approved for use on the vehicle can cause accidents or even death.

Before installing equipment on the vehicle, make sure it has been approved by Magni Telescopic Handlers S.r.l., and that the corresponding load charts are present in the vehicle management software.

The code of the equipment manufactured by Magni Telescopic Handlers S.r.l. is stamped on its identification plate. To establish whether equipment is approved, contact the dealer or the Customer Service directly.

Some equipment produced by companies other than Magni Telescopic Handlers S.r.l. can be adapted for fitting on the vehicles described in this Manual. Contact your dealer to know if your equipment can be adapted for assembly on your vehicle.

If the equipment is suitable and before proceeding, the equipment and the vehicle must be sent to the dealer for the required modifications and tests. At the end of the procedure a certificate of conformity will be issued.

NOTICE

It is forbidden to use equipment not accompanied by the certificate of conformity. It is also forbidden to use any equipment on your vehicle if the specific certificate of conformity does not confirm the compatibility.