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USER AND MAINTENANCE MANUAL

VARIABLE REACH TRUCK

TRANSLATION OF THE ORIGINAL INSTRUCTIONS

INDEX

CONTENTS

VALIDITY OF THE MANUAL

This manual is valid for the following MERLO machine models:

DEUTZ 74 kW (100CV) ENGINE

• P37.12PLUS – P38.12PLUS – P38.13PLUS – P38.14PLUS – P40.9PLUS – P40.17PLUS – P60.10 – P72.10

KUBOTA 55.4 Kw (75CV) ENGINE

• P38.12 – P38.13 – P38.14 – P40.17

KUBOTA 74 Kw (100CV) ENGINE

• P38.13EE – P40.17EE – P60.10EE – P72.10EE

Pay attention to these sub-divisions when consulting the Operator's Manual.

GENERAL NOTES

This machine has been designed and manufactured according to MERLO specifications. In order to avoid accidents and ensure the best performances over time, the machine must not be modified or altered in any way and all safety rules, as well as the general operation instructions described in chapter "SAFETY PREVENTION MEASURES" of this instruction manual must be respected.
Any change made to either the machine or its attachments by subjects other than Merlo S.p.A. shall forfeit the manufacturer's liability and suspend warranty. Any civil or criminal consequences shall fall on the subject who has made the change.
All information, images and specifications contained in this manual are based on the updated product at the time of publication.
MERLO S.p.a. reserves the right to make all the necessary changes deemed necessary without prior notice.
Entrust the machine only to qualified and skilled staff whose characteristics are compliant with existing legal requirements. The non observance of that indicated in this document may cause personal or material damage.
The handling of both the machine and loads must be carried out in an operating range free of people.

INTENDED USE OF THE MACHINE

This machine is designed and manufactured for agricultural and industrial applications. Any use in other sectors is to be considered not compliant with its intended use.
Compliance and strict adherence to the Manufacturer's specifications for use, storage and maintenance are also fundamental for the intended use of this machine.
This machine must only be used by qualified, skilled and authorized personnel. Operators must be familiar both with the various components of this machine and with the safety procedures to be followed if the need arises.
Any arbitrary changes made to this machine without prior written authorization from the Manufacturer exempt Merlo S.p.A. from any civil and/or criminal liability.

OPERATOR MANUAL

Before using your MERLO machine, it is necessary to carefully read the OPERATION AND MAINTENANCE MANUAL to fully understand all the operation, maintenance and safety information it contains.

The operator's manual is an integral part of the machine, it shall be written in a language spoken or at least understood by the operator and be held in the document holding pocket behind the driver's seat, so that it can be consulted at any time. Should the manual be damaged or made illegible in any of its parts, please order a new copy from the Merlo Technical Assistance service, by providing the identification code written in the bottom left-hand corner of the front page.
The stickers and leaflets found on the machine must always be present and accessible to the driver. Should these be unreadable, damaged or missing, it is necessary to order them again from the Merlo Technical Assistance Service indicating the superimposed code or referring to chapter "ADHESIVE CONTROL LABELS" of the machine operator manual.

If the machine is fitted with special applications supplied under specific customer request, which are not included in the official list of accessories, the related instructions can be found in the last page of this manual.
Any device and/or label found on the machine and not described by the present manual are related to applications installed under specific customer request; in this case the specific operating instructions shall be supplied separately.

SYMBOLS USED IN THE MANUAL

The operator manual contains some graphic symbols which help the user understand the importance of instructions and highlight any specific precautions to be taken or general notes:

WARNING!
This symbol indicates important messages aimed at ensuring driver and vehicle safety. In such cases it is necessary to carefully read the text following the symbol and strictly follow the instructions given.

NOTE!
This symbol indicates a closer description of an instruction and aims at highlighting a part of the text.

HEXAGONAL WRENCH
This symbol is used to identify the dimension of the wrench to be used for some operations described in the manual.
The type of wrench is indicated only if different from the standard one.

OPERATOR MANUAL SYMBOL
This symbol is shown on some machine plates and warns the operator that the explanations contained in the Operator manual shall be carefully read before using the control.

WORK ENVIRONMENT

The machines manufactured by Merlo S.p.a., are designed to be used within the following environmental temperature ranges:

- minimum temperature: - 20°C
- maximum temperature: + 40°C

Always take the atmospheric and climatic conditions of the workplace into account.
Special applications may be provided on request for particularly cold or hot environments.
A single fire extinguisher should be fitted on the machine when the workplace does not have external fire extinguishing equipment and the risk of fires exists.
The machine is supplied with a leaflet stating the maximum permissible wind under normal operating conditions. Before using the machine read the table showing the Beaufort scale to estimate wind strengths, so that you can check whether there are the right conditions to ensure safety when working at a certain height. Please note that the maximum permissible value is 12.5 m/s (level 6 on the "Beaufort scale").

CONFIGURATION FOR UNDERGROUND OPERATIONS

Merlo machines are fitted for outdoor use.
When using them in closed, underground environments or in places where a risk of explosion exists, special equipment can be fitted on the machine. These shall be defined when ordering the machine and its attachments.

FIRST COMMISSIONING OR RECOMMISSIONING AFTER A LONG SHUTDOWN

Before operating the machine for the first time, or after a long shutdown, the following operations should be carried out:

- check that the machine is not damaged
- check that the mechanical parts of the machine are in prime condition and not rusted
- check both the engine coolant level and the coolant level for the service hydraulic system
- check the tire wear level
- check that the lights and the electrical equipment work correctly
- check for any oil leaks from the fittings or the pipes of the hydraulic system
- check both the battery electrolyte level and the battery charge
- check that all protection devices are in their correct positions
- thoroughly grease all the mobile parts of the machine

MACHINE GARAGING

If the machine needs to be shut down for a prolonged period of time, it should be garaged in a place where it is not exposed to atmospheric agents, and should be protected to avoid any damage. Before being garaged, the machine should be cleaned down and all its mechanical parts properly lubricated to prevent rusting.
Check that the temperature of the garaging location is between 0°C and 50°C. For temperatures below 0°C and not more than -29°C, the density of the antifreeze fluid in the cooling circuit of the engine must be checked. The main operations to be carried out before garaging the machine for a prolonged period of time are listed below. Please follow these instructions:

- clean down the whole machine.
- perform a general visual inspection of the machine, so that you can identify any structural damage and/or deep abrasions on painted surfaces.
- perform a general visual inspection of the machine, so that you can check whether all safety plates and stickers are in place and in prime condition. Replace the damaged or illegible plates and/or stickers with new ones, to be ordered from the Merlo Technical Assistance Service.
- lubricate and grease all mechanical parts, as well as all the pins exposed to the air.
- garage the machine in a sheltered place, and park it on a flat, compact surface.
- engage the parking brake
- take the engine start key out of the dashboard, lock the cab door and store the key in a safe place.

TYRES

Only use tyres approved by Merlo S.p.a.
If tyres are deteriorated or show excessive wear, they must be replaced with new tyres with the same characteristics. Fit tyres suited to the operating surface conditions - several types of tyres exist (for agricultural or industrial use, sandy terrains etc.). If needed, or in case of abnormal wear, contact your dealer. Do not fit polyurethane-filled or fluid-filled tyres if not explicitly authorised by Merlo S.p.a.

WARNING! The list of tyres that are authorized and installed on your machine are shown in the paragraph PERFORMANCE AND FEATURES of chapter TECHNICAL INFORMATION. In the event a type of tire needs to be replaced with another model in the list of those authorized, contact the Merlo Technical Assistance Service, since tire replacement may also require the replacement of the safety devices electronic management unit and load tables.

ORIGINAL MERLO SPARES

Maintenance operations on Merlo machines should be carried out only with original and approved spare parts. In this way, the customer is legally covered and has the following advantages:

- guaranteed quality of spare parts
- guaranteed training of the technical staff
- support in preventive maintenance operations
- support in diagnosis operations

If NON original Merlo spare parts are used, the customer runs the following risks:

- from a technical point of view, this may damage or cause general operation problems to the machine
- from a legal point of view, the customer may be deemed directly liable in case of accidents
- from an economic point of view, any claims for repairs carried out in the warranty period (materials and labour) may be rejected.

In this case Merlo S.p.A holds itself free from any liability, and the warranty terms on the machine shall no longer be applicable. Finally, only Merlo S.p.A has all the technical and engineering know-how which ensures maximum expertise in the maintenance if its machines.

MACHINE SCRAPPING

When the machine is scrapped, it shall be disposed of in proper dumps, in compliance with current legislation. Before scrapping the machine, separate plastic or rubber parts, as well as electric or electronic parts, from other components. Recover used oil and dispose of it in proper collection centres.
Parts which are solely made of plastic, aluminium or steel can be recycled if they are collected in proper collection centres.

WARNING! Used oil shall be properly recovered, and not released into the environment. Current legislation classifies it as a hazardous substance, therefore it shall be disposed of in proper collection centres.

WARRANTY

To benefit from the Manufacturer's warranty, the operator shall take all the precautions described in the Operator's Manual, with particular reference to the following:

- comply with the operating limits defined by the Manufacturer
- never make any changes to the machine without prior written authorization from the Manufacturer
- always carry out all the maintenance operations prescribed by the Manufacturer
- always use Merlo original spare parts
- make sure that the personnel operating the vehicle have the necessary skills and are properly trained.

The Manufacturer's warranty shall not apply if the conditions above are not met, or are only partially met.
If spare parts which are not approved by the Manufacturer are used, any warranty shall be made void and the Manufacturer shall be exempt from any liability for malfunctions or accidents.
The removal or modification of safety guards exonerates the Manufacturer from any liability for damage caused to property and/or persons.

ORDINARY MAINTENANCE OPERATIONS

In order to ensure that the machine is used in maximum safety, reliability and efficiency conditions, it is key to regularly carry out all ordinary maintenance operations following closely the instructions provided by the present operator manual.
Do not use the machine unless all maintenance operations and any necessary repair work have been executed.
Should the operator notice that the machine does not operate as it should or it does not meet all safety requirements, the anomaly shall be immediately communicated to the person in charge.
Before carrying out any work on the machine, the engine must be stopped, the travel direction selector must be brought to its central position and the gear selector must be in neutral gear.
Maintenance operations must be carried out by qualified and skilled staff. For any work on parts which fall outside the scope of ordinary maintenance operations - as defined by the present operator manual - contact the Merlo Technical Support Service.
It is strictly forbidden and highly dangerous to modify any machine component by changing its original structure. it is further forbidden to change the hydraulic and electric setup or modify the safety systems. Otherwise, Merlo S.p.A shall be relieved from any civil or criminal liability.

INFORMATION FOR DRIVING THE MACHINE ON PUBLIC ROADS

For all information on how to drive the machine on public roads, always refer to the applicable laws of the country where the machine is used.

SAFETY AND ACCIDENT PREVENTION MEASURES

WARNING!

To prevent any conditions of risk, avoid accidents and injuries, minimize failures and improve the functionality and the durability of your machine, always operate your machine correctly, obey the rules described in the following sections of this paragraph, and take all the necessary precautions while working.

Merlo S.p.A. declines liability for any damage, accident or injury if the code of conduct described in the following sections of this paragraph is not applied:

• SAFE USE CONDITIONS OF THE MACHINE

- the machine is not intended for use in sectors other than the one it was designed for; any use other than the one specified by the manufacturer shall be considered improper.
- the machine shall be used by only one operator, sitting in the driver's cab.
- the machine should only be used by qualified, competent and authorized personnel. The operator shall read and understand all the instructions provided in this operator's manual, be sufficiently trained on the correct use of the machine, and hold a driving licence. Should the operator have any doubts on either the use of the machine or the interpretation of the manual, they shall contact the Manufacturer.
- to drive the machine from one spot to another, the operator shall sit correctly in the driver's seat; if this is not the case, the system will automatically lock the hydrostatic transmission.
- never operate the machine if you feel tired or sick, or if you are under the effect of alcohol, prescription drugs or illicit drugs.
- if you need to work either under poor visibility conditions or at night, always switch on the work headlights available on your machine. As an alternative, you can install a proper external lighting system in the area you are working in.
- any arbitrary changes made to your machine shall exempt Merlo S.p.A. from any liability for any damages or injuries to the operator, third parties or property.
- inspect your machine very carefully every time before use.
- if you stop your machine on sloping ground, place wheel chocks (if present) under its wheels.
- avoid operating the machine on a muddy, sandy or soft ground.
- never use the controls or the pipes on the machine as hand holds; these components are mobile and cannot offer a stable grip.
- check tire inflation pressure at regular intervals, and make sure that it corresponds to the pressure value shown on the rim, which has been determined based on the kind of soil the machine is supposed to be operated on.
- never use your machine to transport people or animals.
- never use your machine to lift people or animals.
- always refer to the load chart of your machine, which defines the maximum load capacity depending on the extension of the telescopic boom.
- never leave your machine unattended while the engine is still running or when loads are hanging from the telescopic boom.
- before getting off the machine and before carrying out any maintenance operations, apply the parking brake, switch off the engine and take the engine start key out of the dashboard.
- always fasten your seat belt while driving your machine from one spot to another on a site.

• PERSONAL PROTECTION SYSTEMS

- the personnel shall use both safety devices and personal protective equipment during machine operation, servicing and maintenance. Machine operators shall avoid wearing jewellery or loose clothes that may get caught in machine parts or gears.
- if you usually work in particularly dusty or dry environments, you are advised to inspect the filters of the cab ventilation system periodically and to wear respiratory protection devices, such as dust masks or masks equipped with filters.
- some personal protective equipment are shown here by way of example only. Such devices should be used by telehandler operators while working on and servicing their machines, as described in this chapter and in chapter "ROUTINE MAINTENANCE":

  - Head protection helmet (fig. 1)
  - Safety shoes (fig. 2)
  - Safety gloves (fig. 3)
  - Safety overalls (fig. 4)
  - Safety goggles (fig. 5)
  - Safety face mask (fig. 6)
  - Respiratory mask (fig. 7)
  - Earmuffs (fig. 8)

- such devices shall be made available by either the employer or the foreman, based on their risk assessment.

• MACHINE OPERATING AREA

- Before operating the machine, always check the workplace with extreme care, so as to prevent dangerous situations. Check the lie of the land and the soil condition, so as to equip your machine with the necessary equipment for safe operation.
- The operator shall make sure that no people or animals stand in or pass through the machine working area while the machine is in operation.
- Avoid any accidental contact between the telescopic boom and high-voltage overhead lines; keep a minimum distance of at least 5m.

• SAFETY PLATES AND STICKERS

- safety plates and stickers applied on your machine provide important information; obeying the rules written on them is essential to your safety.
- make sure that the safety stickers and plates on your machine are in prime condition. Periodically clean all stickers and plates with a cloth dampened with a mild soap and water solution. Should stickers and plates be damaged or illegible, replace them with new original ones, to be ordered from Merlo Technical Support Service, and to be placed in the position shown in the Operator's Manual.

• SAFETY DEVICES

- before operating your machine, make sure that all safety devices are in good condition and placed in their correct positions; should guards and safety devices be faulty or damaged, stop working and file a replacement/repair claim.
- it is prohibited to either remove or tamper with safety devices.

• CLEANING YOUR MACHINE

- during machine operation the operator shall have enough visibility of the working areas which are considered dangerous; therefore, rear-view mirrors shall always be kept clean and in good condition.
- remove any foreign matter (rubble, tools, various objects) from your machine, since they may damage it or injure the operator.
- periodically inspect the wear level of hydraulic hoses; if they are worn, replace them.

FIRE PREVENTION MEASURES

Follow the instructions below:

- make sure that a fire extinguisher having a proper capacity is always available on board, and refill it periodically.
- inform machine operators about the measures to be taken in case of fire.
- note that all fuels and most lubricants and hydraulic fluids are flammable.
- never smoke or set anything aflame while refilling fluids, and never pour fuel.
- always switch off the engine before refuelling.
- never refuel in poorly ventilated rooms.
- before starting the engine make sure that there are no leaks or residual traces of fuel, lubricant, or other fluids which may cause small fires.
- short-circuits may cause fires. Periodically check the condition of the battery terminals, of cables and of the electrical equipment.
- never store flammable substances in places which are not suitable for that purpose; never prick or burn pressurized receptacles or spray cans; never let materials soaked in flammable substances accumulate.
- be careful where you store rags or materials soaked in flammable substances.
- to minimize the risk of spontaneous ignition, periodically clean the machine with proper devices (either a high-pressure water jet cleaner or compressed air).
- use appropriate fire extinguishers: carbon dioxide extinguishers, foam extinguishers, chemical fire extinguishers.
- avoid using water jets; only use this method to cool down surfaces exposed to fire.
- never use petrol, solvents or other flammable or toxic fluids to clean mechanical parts; use commercial, non-flammable, non-toxic solvents instead.
- never perform welding operations near tanks, pipes, cans, cables, or flammable materials in general.
- if a weld needs to be made, protect flammable parts with proper shields.
- before making a weld always disconnect both battery terminals.

"CE" COMPLIANCE

Your machine complies with the safety requirements of the European directives (2006/42/CE) (2004/108/CE) for the protection and safety of people from potential hazards deriving from machine operation.
To ensure the operator's safety, the cab is built in compliance with the following standards:

- ISO 3449 FALLING-OBJECT PROTECTIVE STRUCTURES (FOPS)
- ISO 3471 TIP-OVER PROTECTION STRUCTURES (ROPS)

As it complies with the above mentioned requirements of the Safety directive, your machine is labelled with the "CE" marking.

• MACHINE-PRODUCED VIBRATIONS

Your machine has been designed and built in compliance with international ergonomic standards.
The vibrations sent by the machine to the upper limbs of the operator's body are irrelevant, as the machine operation does not require a lengthy contact of upper limbs with vibrating parts. In any case, the value of such vibrations does not exceed 2.5 m/sec² Vibrations sent from the machine to the operator's body are less than 0.5 m/sec² (RMS).

• ELECTROMAGNETIC INTERFERENCE

This machine complies with Directive 2004/108/CE on electromagnetic interference which may arise between some electronic device on the vehicle and further external devices.
Make sure that all extra electric devices fitted on the machine comply with the said standard and that they do not produce any interference with the vehicle's on-board devices.
Also, make sure they are all labelled with the specific "CE" marking.

• NOISE

AIRBORNE NOISE

This machine complies with Directive 2000/14/CE (Legislative Decree n.262 dated 04 October 2002) concerning "acoustic emissions in to the environment by machinery and attachments intended for operation outdoors".
The sound power level of your machine is determined on the basis of measurements carried out on an identical machine in accordance with measurement methods of airborne noise generated by "fork lift trucks with cantilever loading and combustion engines", whose validity applies at the time of publication of this manual.

The following table shows the sound power level (Lwa) measured:

TYPE OF MEASUREMENT	SOUND POWER LEVEL
Guaranteed sound power level (Lwa)	106 dB(A)

During equipment operation, higher noise levels may be measured due to particular working conditions, the surrounding environment and additional noise sources.

NOTE!

The guaranteed sound power level (Lwa) is also shown on a sticker applied on the inside of the cab window.

NOISE INSIDE THE CAB

Noise inside the cab heard by the operator is detected on the basis of the UNI 12053 standard detailing "sound pressure level at the operator's position".
The sound pressure level of your machine is determined on the basis of on measurements performed on an identical machine in accordance with the measurement methods described in the above-mentioned standards, whose validity applies at the time of publication of this manual.

The following table shows the sound pressure level measured inside the cab (LpAZ):

TYPE OF MEASUREMENT	SOUND PRESSURE LEVEL
Sound power level (LpAZ)	77 dB

The value of uncertainty KpA is 2 dB.
The operating cycle used during measurement is as follows:

- LIFTING (a=0,18)
- MINIMUM (b=0,58)
- TRACTION (c=0,24)

References a, b, c are coefficients proportional to usage time.

During equipment operation, higher noise levels may be measured due to particular working conditions, the surrounding environment and additional noise sources.

• CE CERTIFICATE OF CONFORMITY

MERLO

COMPANY WITH QUALITY SYSTEM CERTIFIED BY DNV = ISO 9001 =

MERLO SPA Industria Metalmeccanica con unico socio

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Capitale Sociale 15.000.000,00 euro

S. Defendente,

Ns. rif.

Vs. rif.

Oggetto:

MOD CE/C/I//v6

DICHIARAZIONE DI CONFORMITA' CE

Merlo S.p.A. Industria Metalmeccanica
12010 S. Defendente di Cervasca, Cuneo, ITALIA

Si dichiara che il prodotto di seguito indicato:
CARRELLO ELEVATORE CON CARICO A SBALZO
(CARRELLO A BRACCIO TELESCOPICO CON FORCHE)
Tipo:
N° di telaio:

a cui questo certificato si riferisce, è conforme ai requisiti essenziali di sicurezza delle Direttive europee 2006/42/CE e 2004/108/CE e s.m.i. .

Si dichiara inoltre che la macchina, oggetto della presente dichiarazione, è conforme alla direttiva 2000/14/CE (d.lgs. n.262 del 04 settembre 2002), "Emissione acustica ambientale delle macchine ed attrezzature destinate a funzionamento all'aperto". Procedura applicata per la valutazione di conformità: assicurazione di qualità completa: allegato VIII. Organismo notificato:
EUROFINS – MODULO UNO S.p.A (Via Cuorgnè 21 - 10156 Torino - Italia, N. 0477).
- Livello di potenza sonora emessa da una macchina rappresentativa del tipo: dB (A)
- Livello di potenza sonora garantito: dB (A)
- Potenza del motore: kW (secondo la 97/68/CE)

Il fascicolo tecnico è costituito dalla MERLO PROJECT s.r.l., via Nazionale n. 9/a – 12010 S. Defendente di Cervasca – CN – Italia.

Data emissione del certificato:
Luogo emissione del certificato: San Defendente di Cervasca – Cuneo (Italia)

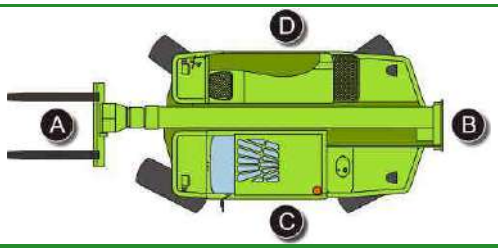
Il presente certificato si riferisce ai modelli prodotti dalla MERLO S.p.A. con l'attrezzatura standard, in particolare la conformità non può essere estesa alle macchine equipaggiate con pneumatici non conformi a quelli previsti dalla MERLO S.p.A.

END OF SECTION

CONTENTS

NOMENCLATURE MACHINE EXTERIOR

Please, pay attention to the identification of the machine sides, because they will be re quoted in the manual.

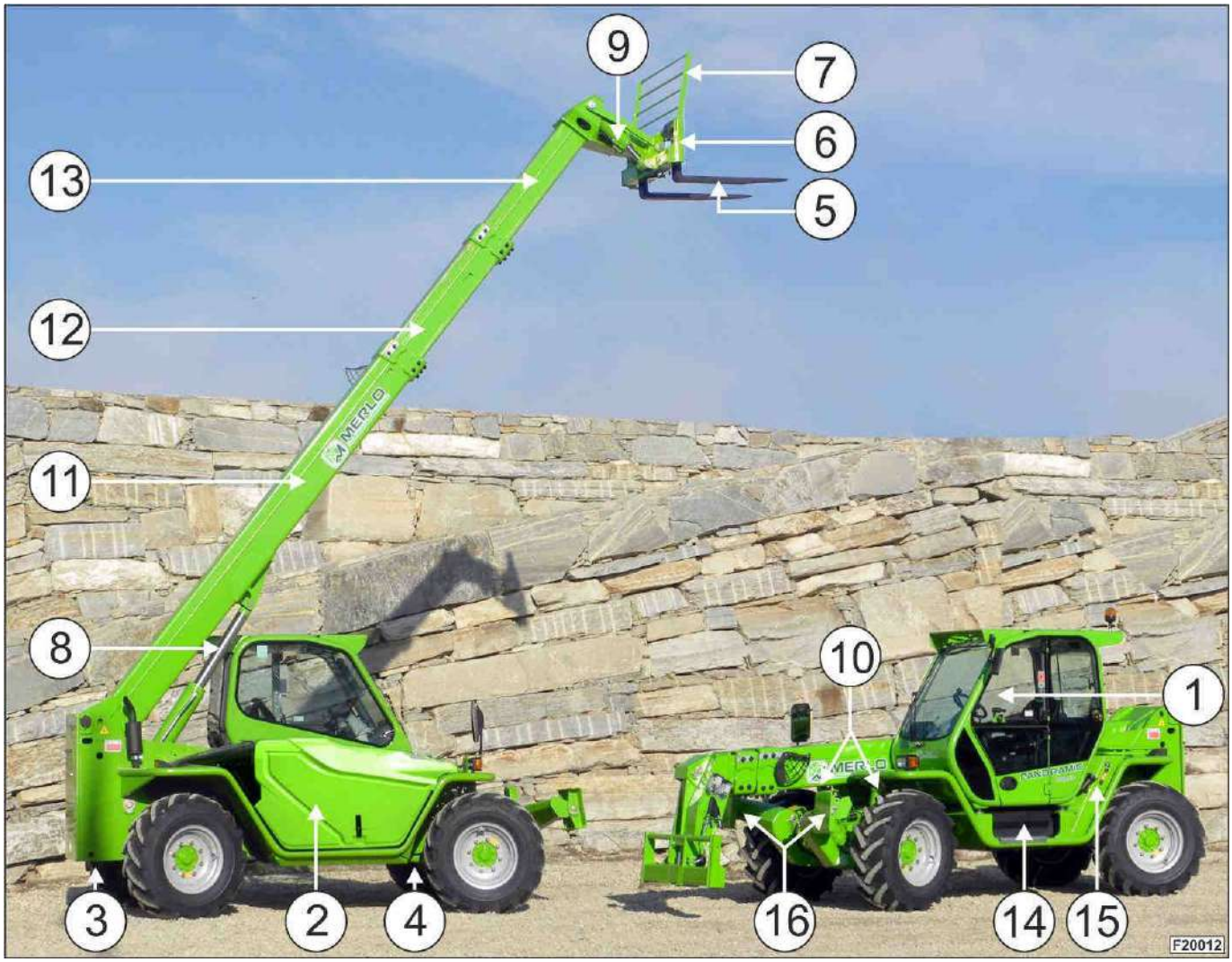


REF.	DESCRIPTION
A	Front side
B	Rear side
C	Left-hand side
D	Right-hand side

P37.12 PLUS - P40.9 PLUS

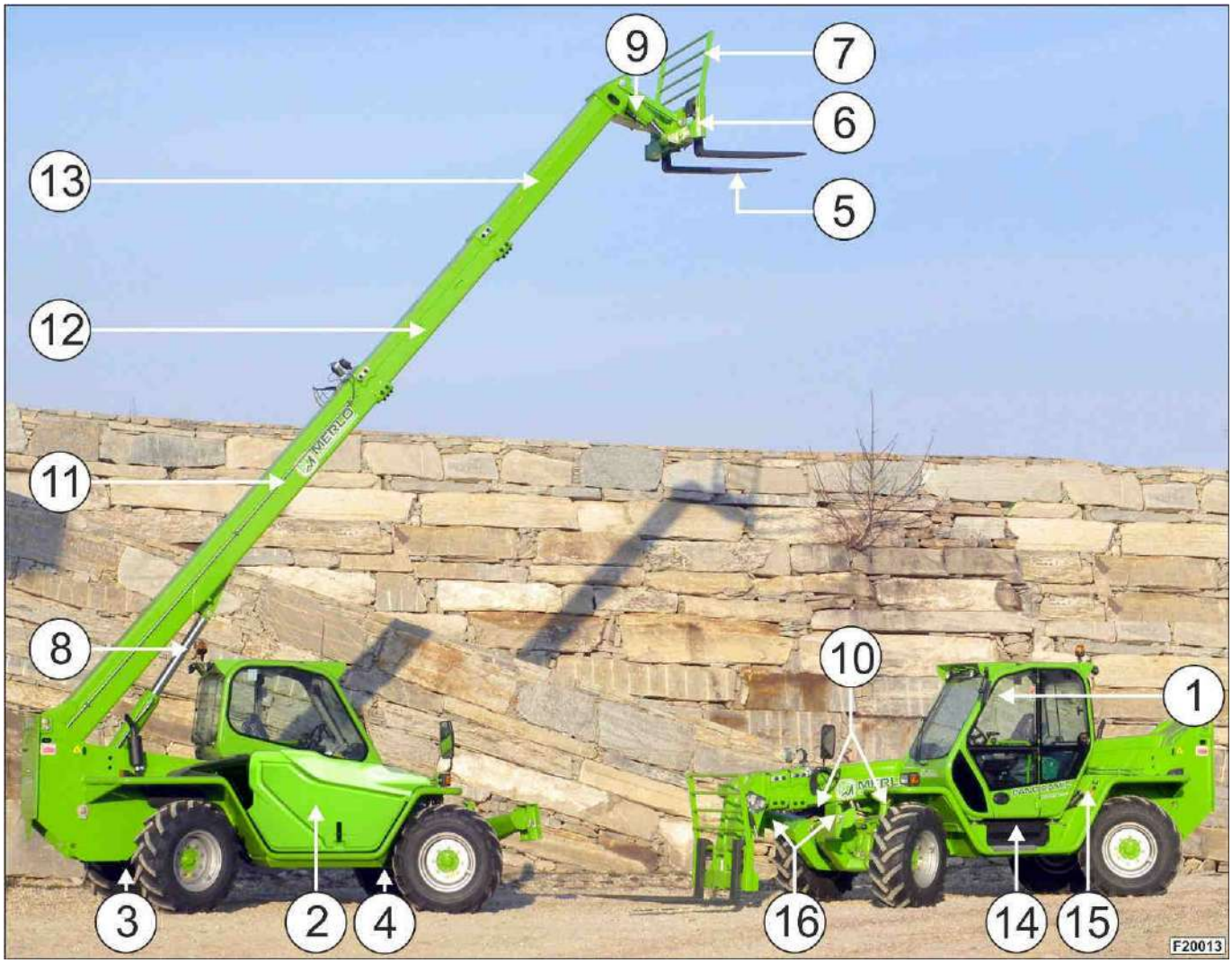
REF.	DESCRIPTION	REF.	DESCRIPTION
1	Operator cab	9	Fork tilt jack
2	Engine compartment and battery compartment	10	Crossways tilt correction jacks
3	Front axle - brake callipers - wheel reducers	11	First boom
4	Rear axle - brake callipers - parking brake calliper - wheel reducers	12	Second boom
5	Forks	13	Third boom ((only P37.12 PLUS)
6	Attachment carriage	14	Fuel tank
7	Protection on carriage	15	Hydraulic oil tank
8	Telescopic boom lifting jacks		

P38.12 PLUS - P38.13 PLUS – P38.12 – P38.13 – P38.13EE



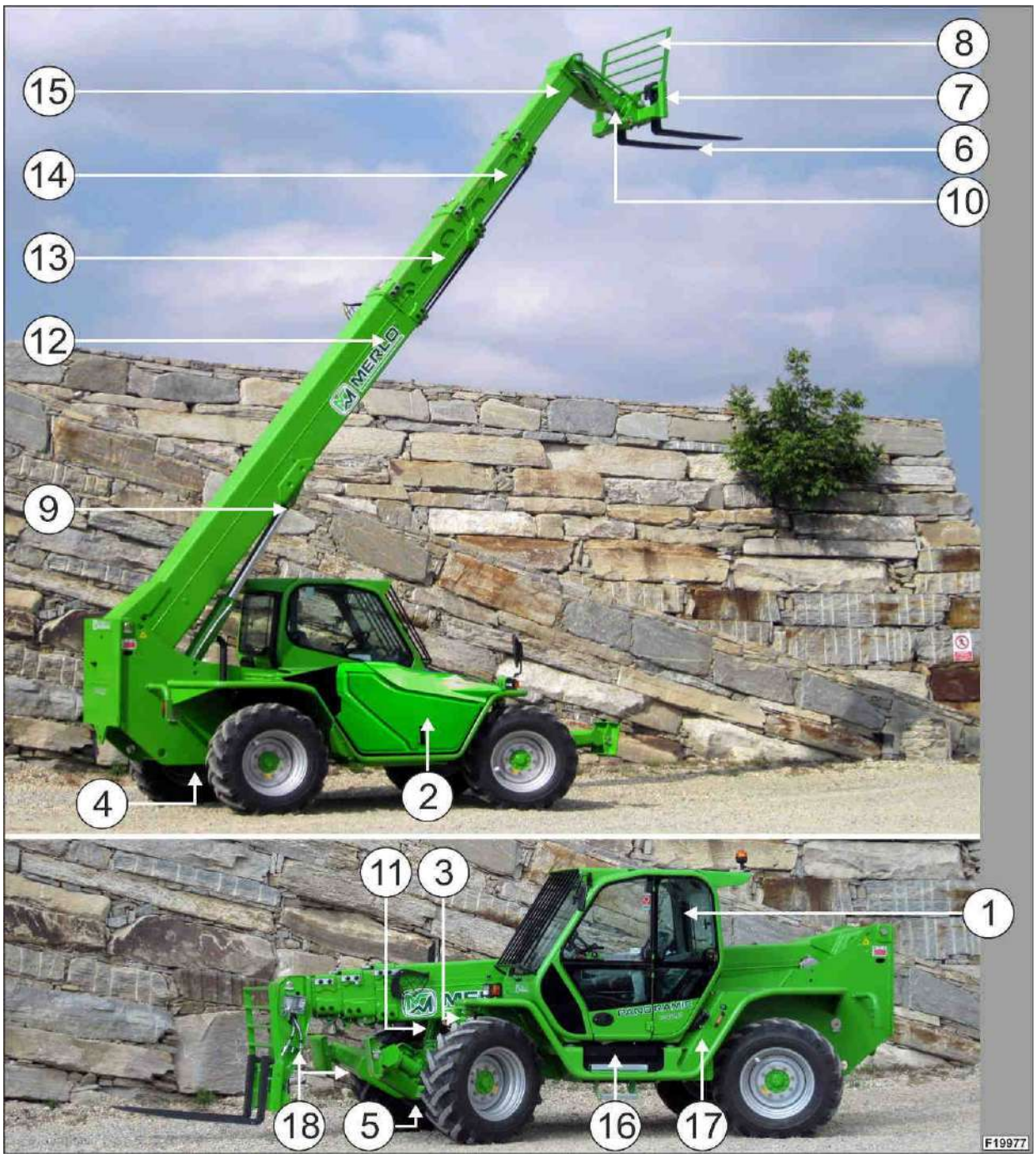
REF.	DESCRIPTION	REF.	DESCRIPTION
1	Operator cab	9	Fork tilt jack
2	Engine compartment and battery compartment	10	Crossways angle correction jacks
3	Front axle - brake callipers - wheel reducers	11	First boom
4	Rear axle - brake callipers - parking brake calliper - wheel reducers	12	Second boom
5	Forks	13	Third boom
6	Attachment carriage	14	Fuel tank
7	Protection on carriage	15	Hydraulic oil tank
8	Telescopic boom lifting jacks	16	Stabilisers

P38.14 PLUS – P38.14



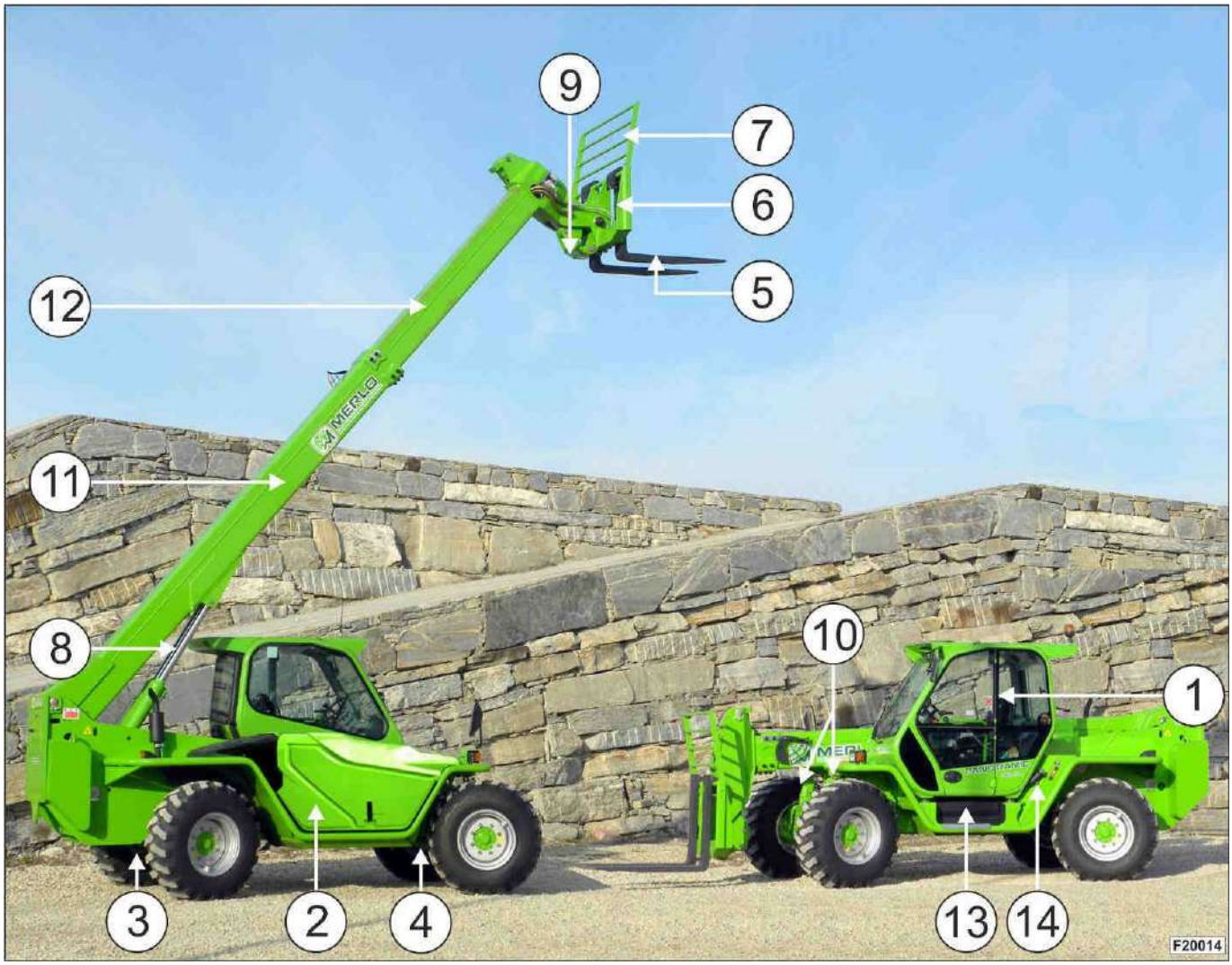
REF.	DESCRIPTION	REF.	DESCRIPTION
1	Operator cab	9	Fork tilt jack
2	Engine compartment and battery compartment	10	Crossways angle correction jacks
3	Front axle - brake callipers - wheel reducers	11	First boom
4	Rear axle - brake callipers - parking brake calliper - wheel reducers	12	Second boom
5	Forks	13	Third boom
6	Attachment carriage	14	Fuel tank
7	Protection on carriage	15	Hydraulic oil tank
8	Telescopic boom lifting jacks	16	Stabilisers

P40.17 PLUS – P40.17 – P40.17EE



REF.	DESCRIPTION	REF.	DESCRIPTION
1	Operator cab	10	Telescopic boom lifting jack
2	Engine and battery compartment	11	Fork tilt jack
3	Electronic control unit compartment	12	Crossways angle correction jacks
4	Rear axle - brake callipers - wheel reducers	13	First boom
5	Front axle - brake callipers - parking brake calliper - wheel reducers	14	Second boom
6	Forks	15	Third boom
7	Attachment carriage	16	Fourth boom
8	Protection on carriage	17	Fuel tank
9	Telescopic boom lifting jack	18	Hydraulic oil tank

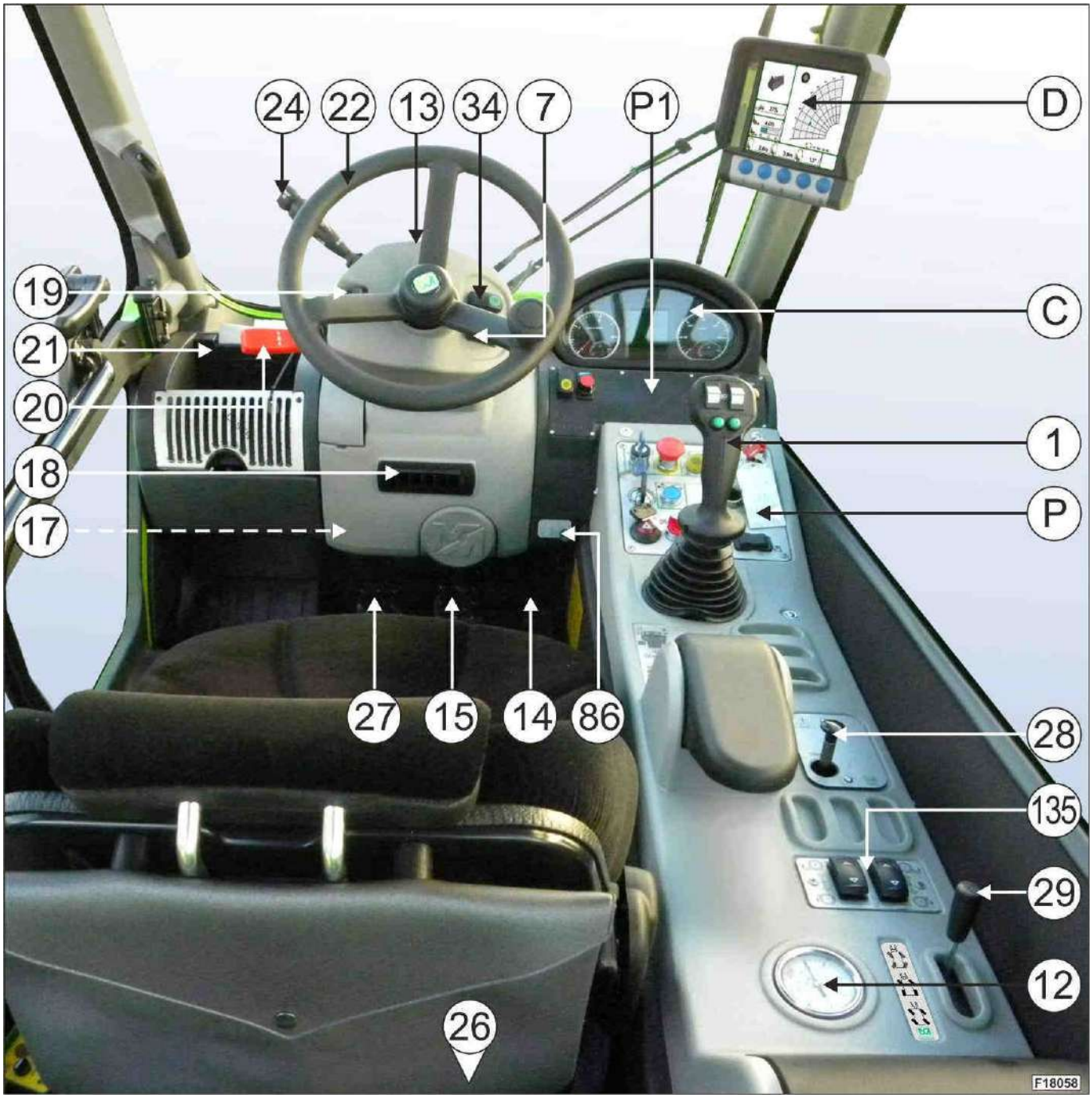
P60.10 - P72.10 – P60.10EE – P72.10EE



REF.	DESCRIPTION	REF.	DESCRIPTION
1	Operator cab	8	Telescopic boom lifting jacks
2	Engine compartment and battery compartment	9	Fork tilt jack
3	Front axle - brake callipers - wheel reducers	10	Crossways angle correction jacks
4	Rear axle - brake callipers - parking brake calliper - wheel reducers	11	First boom
5	Forks	12	Second boom
6	Attachment carriage	13	Fuel tank
7	Protection on carriage	14	Hydraulic oil tank

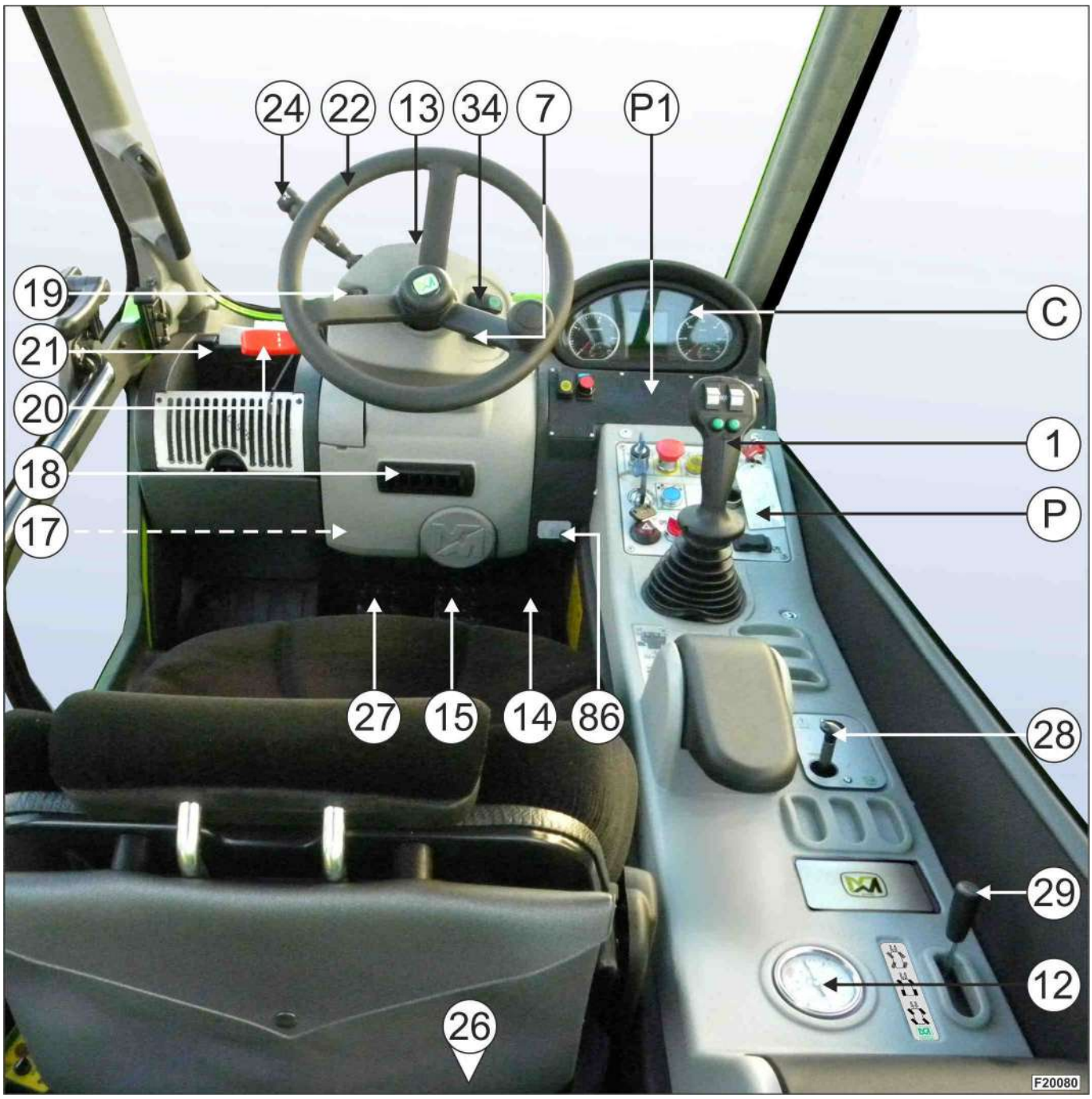
CAB INTERIOR KEY WORD

(only for models P37.12PLUS – P38.12PLUS – P38.13PLUS – P38.14PLUS – P40.9PLUS – P40.17PLUS – P60.10 – P72.10)



REF.	DESCRIPTION
1	Telescopic boom control joystick
7	Rear windscreen-wiper switch
12	Pressure gauge for hydraulic system oil or hydrostatic transmission system
13	Spirit level
14	Accelerator pedal
15	Brake pedal
17	Steering wheel trim lock lever
18	Air vent
19	Gear control
20	Drive direction selector
21	Load chart and safety instruction holder
22	Steering wheel
24	Parking lights switch/ low beam lights / Direction indicators / head lights / Horn
26	Lever for the selection of the air suction from inside/outside the cab
27	Driving speed adjustment pedal
28	Small emergency pump for releasing parking brake
29	Steering mode selection lever
34	Front windscreen wiper and screen-washer switch
86	Hand accelerator
135	Stabiliser command switches (only for models P38.12 PLUS – P38.13 PLUS – P38.14 PLUS – P40.17 PLUS)
C	Instrument panel
D	Attachments dynamic control display
P – P1	Control panels

(only for models P60.10EE – P72.10EE)

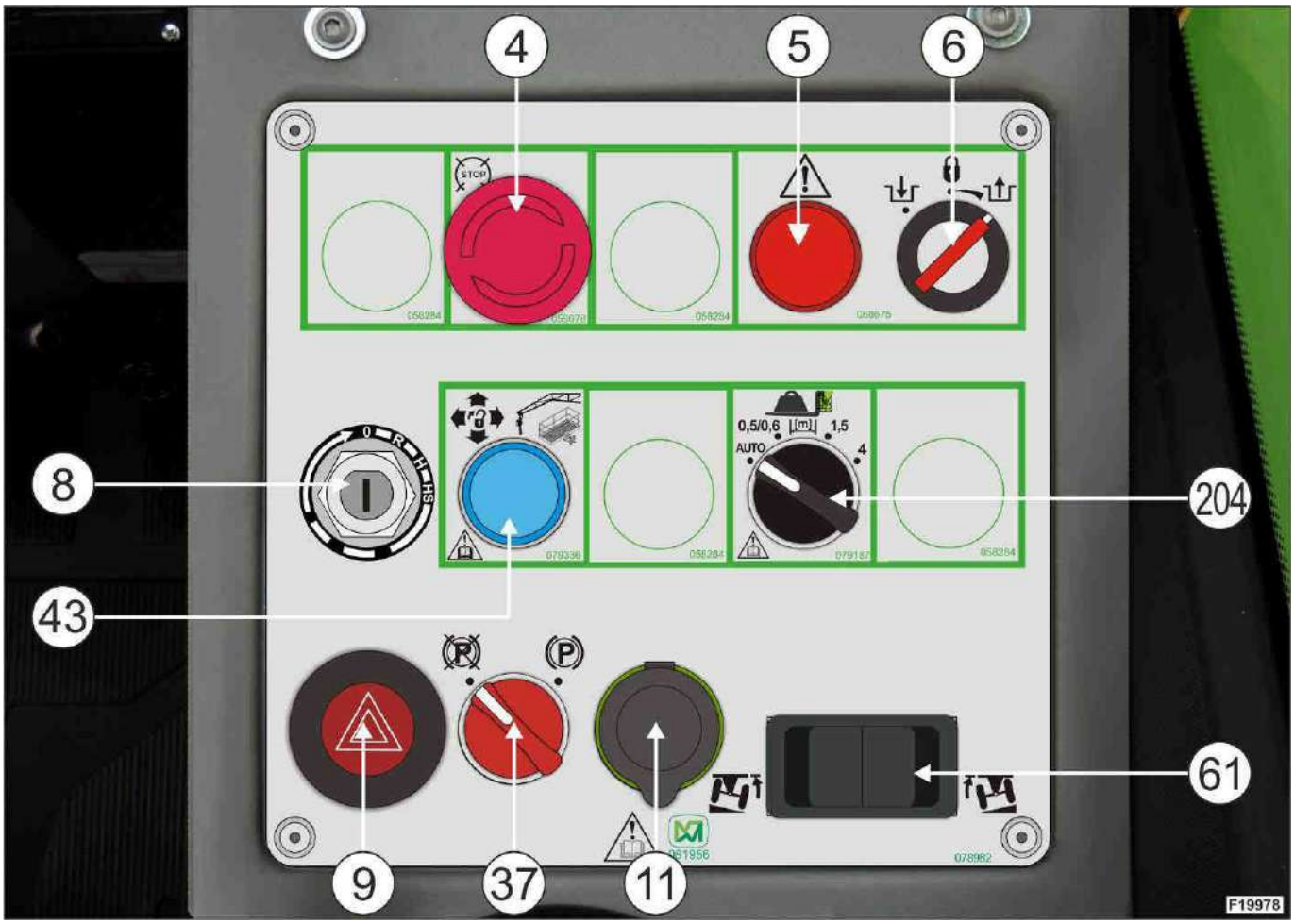


REF.	DESCRIPTION
1	Telescopic boom control joystick
7	Rear windscreen-wiper switch
12	Pressure gauge for hydraulic system oil or hydrostatic transmission system
13	Spirit level
14	Accelerator pedal
15	Brake pedal
17	Steering wheel trim lock lever
18	Air vent
19	Gear control
20	Drive direction selector
21	Load chart and safety instruction holder
22	Steering wheel
24	Parking lights switch/ low beam lights / Direction indicators / head lights / Horn
26	Lever for the selection of the air suction from inside/outside the cab
27	Driving speed adjustment pedal
28	Small emergency pump for releasing parking brake
29	Steering mode selection lever
34	Front windscreen wiper and screen-washer switch
86	Hand accelerator
C	Instrument panel
P – P1	Control panels

(only for models P38.12 – P38.13 – P38.14 – P40.17 – P38.13EE – P40.17EE)

REF.	DESCRIPTION
1	Telescopic boom movements command lever
2	Telescopic boom and chassis movements command lever
7	Rear windscreen-wiper switch
12	Pressure gauge for hydraulic system oil or hydrostatic transmission system
13	Spirit level
14	Accelerator pedal
15	Brake pedal
17	Steering wheel trim lock lever
18	Air vent
19	Gear control
20	Drive direction selector
21	Load chart and safety instruction holder
22	Steering wheel
24	Parking lights switch/ low beam lights / Direction indicators / head lights / Horn
26	Lever for the selection of the air suction from inside/outside the cab
27	Driving speed adjustment pedal
28	Small emergency pump for releasing parking brake
29	Steering mode selection lever
34	Front windscreen wiper and screen-washer switch
86	Hand accelerator
135	Stabiliser command switches
C	Instrument panel
P – P1	Control panels

(P) CONTROL PANEL KEY WORDS



REF.	DESCRIPTION
4	Emergency stop push-button
5	Anti-overturn disabling red warning lamp
6	Operating mode selector switch
8	Starter key
9	Emergency lights
11	Portable lamp socket
37	Parking brake selector
43	Lifting equipment load limiting device
61	Side-tilt corrector control
204	The selector type of equipment installed on the machine (only for models P37.12PLUS – P38.12PLUS – P38.13PLUS – P38.14PLUS – P40.9PLUS – P40.17PLUS – P60.10 – P72.10)

DESCRIPTION OF THE COMMAND PANEL (P1)

REF.	DESCRIPTION
33	Roof flashing light switch
35	Heating cock
36	Fan switch for cab heating
226	Adjustment buttons for instrument panel settings (C)

INSTRUMENT PANEL (C) DESCRIPTION

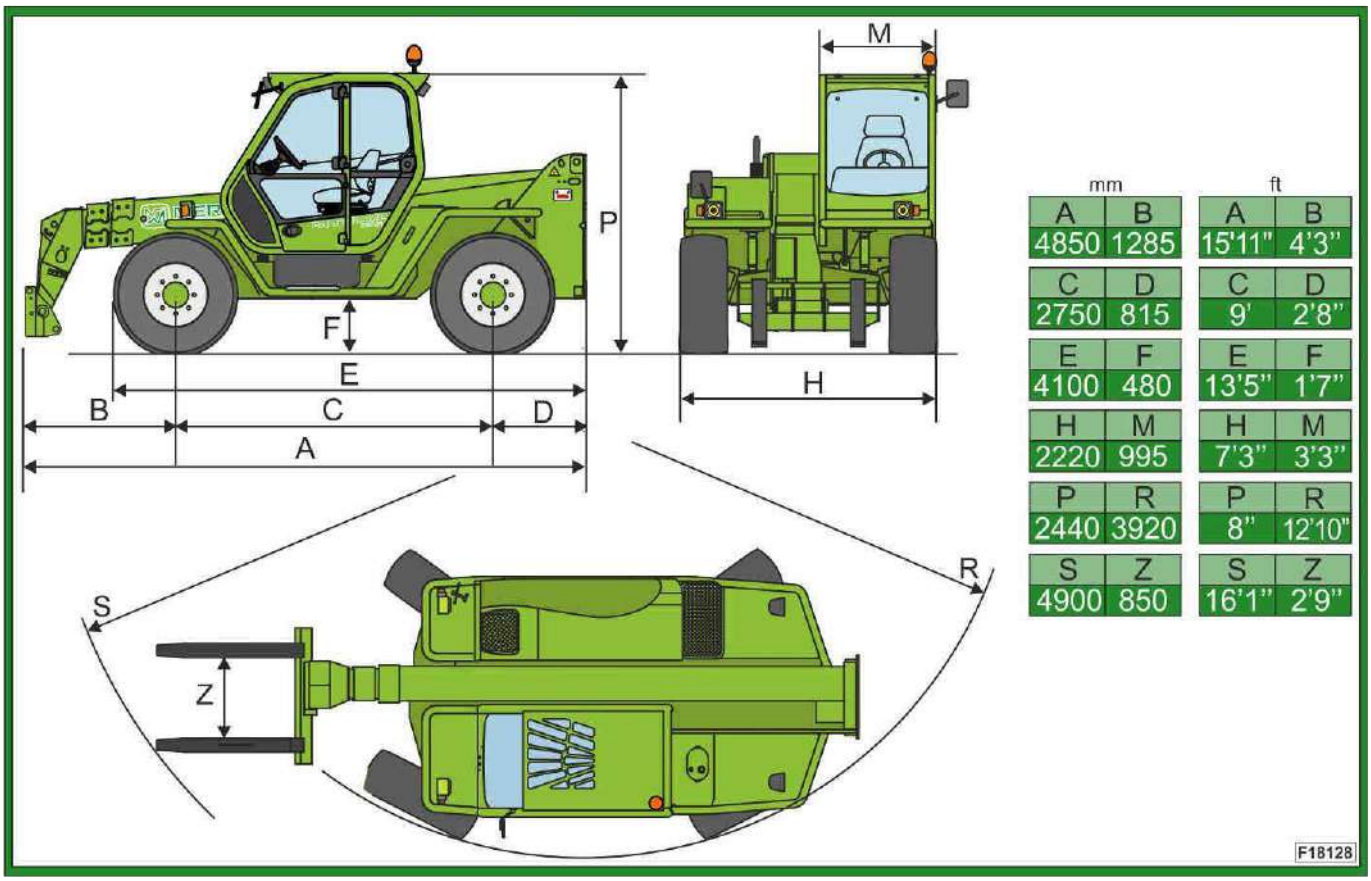
REF.	DESCRIPTION
58	Coolant thermometer
59	Fuel level indicator
60	Speedometer
61	Tachometer
62	Hour counter / clock LCD display
S	Control lights

NOMENCLATURE FOR DYNAMIC LOAD CONTROL DISPLAY (D)

(only for models P37.12PLUS – P38.12PLUS – P38.13PLUS – P38.14PLUS – P40.9PLUS – P40.17PLUS – P60.10 – P72.10)

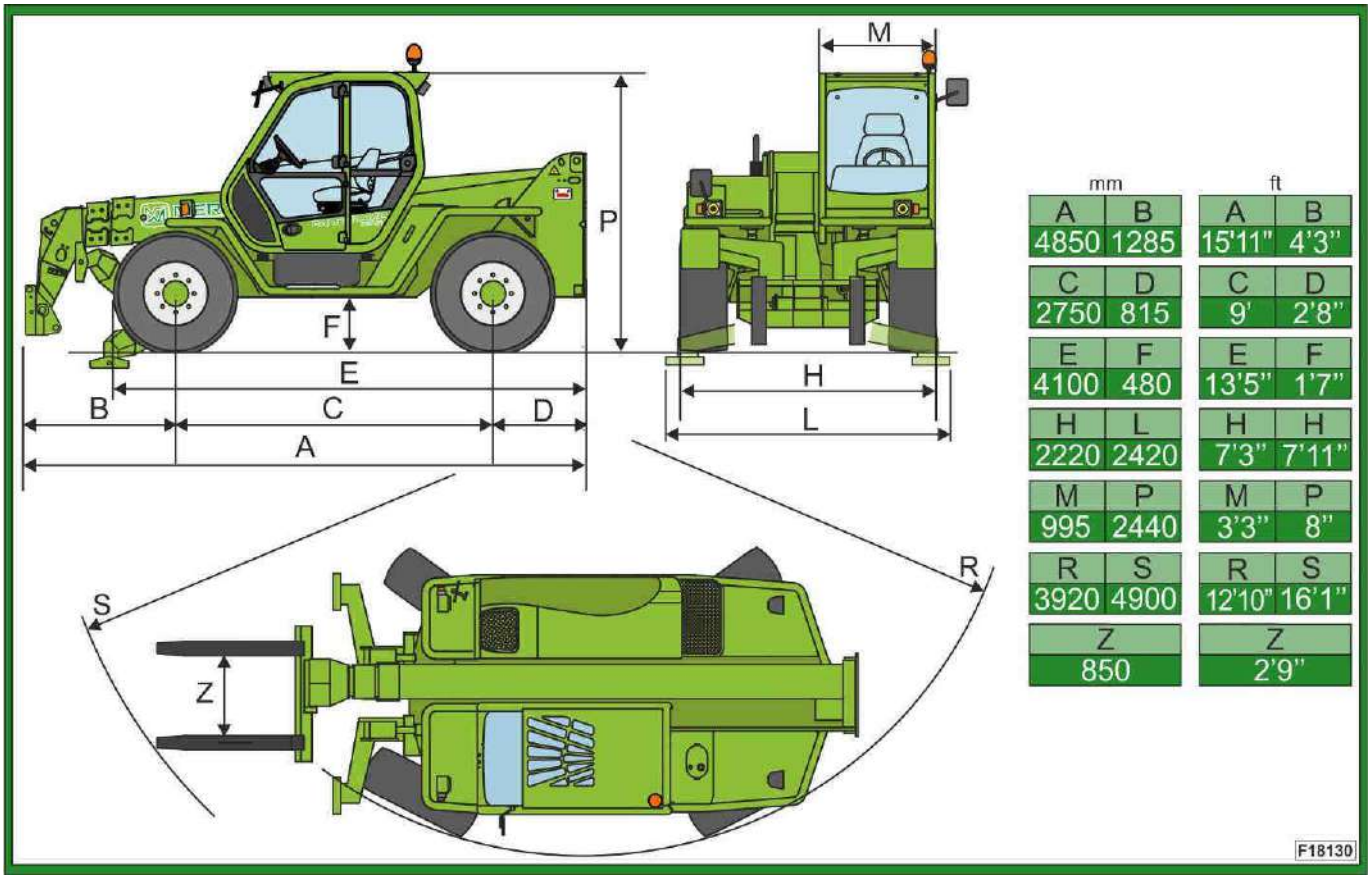
REF.	DESCRIPTION
210	Light bar indicating percentage machine stability
S1	Machine operating function display
P1 – P2 – P3 P4 – P5	Section / setup buttons

DIMENSIONS - P37.12 PLUS



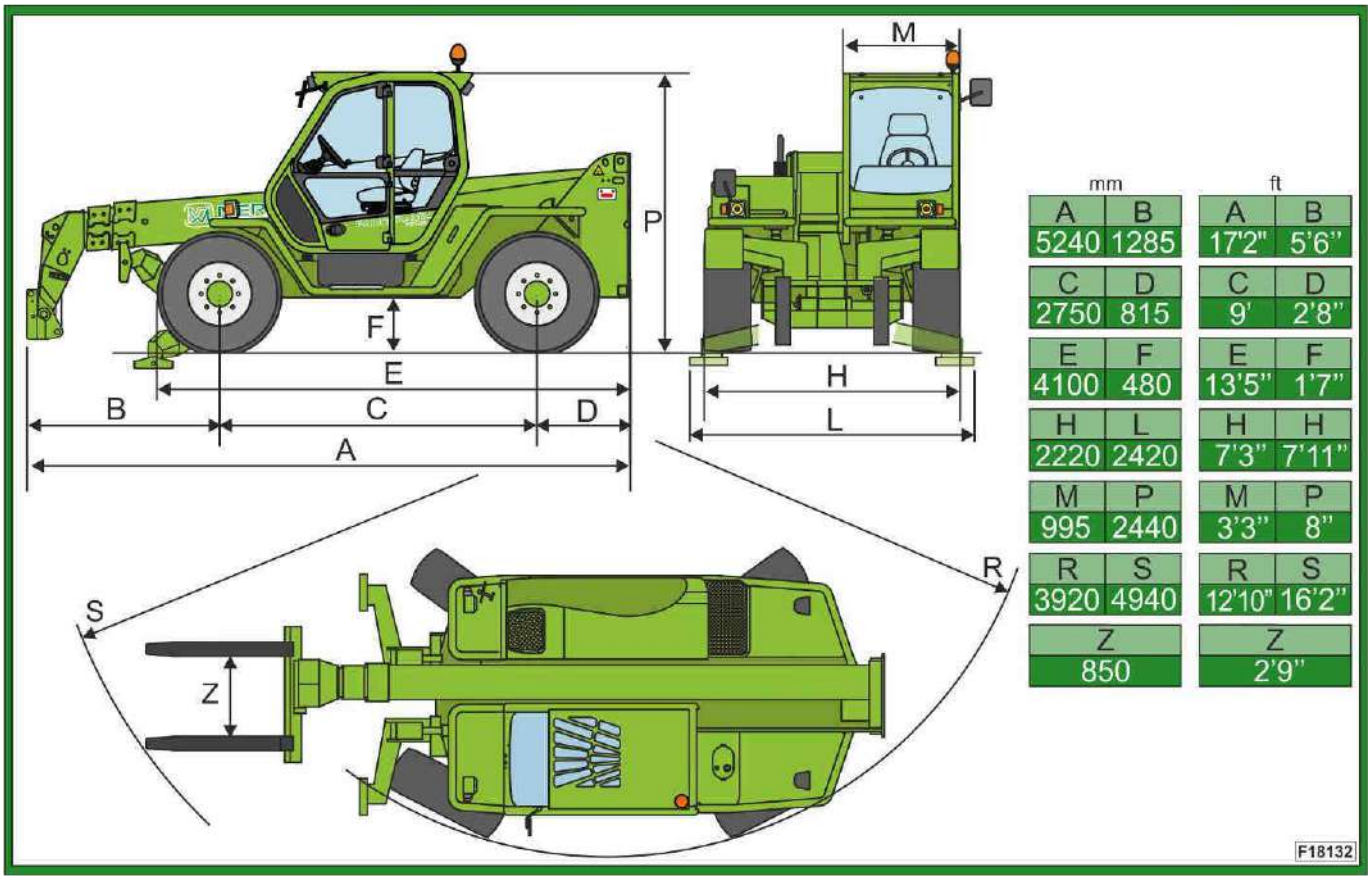
mm		ft	
A	B	A	B
4850	1285	15'11"	4'3"
C	D	C	D
2750	815	9'	2'8"
E	F	E	F
4100	480	13'5"	1'7"
H	M	H	M
2220	995	7'3"	3'3"
P	R	P	R
2440	3920	8"	12'10"
S	Z	S	Z
4900	850	16'1"	2'9"

DIMENSIONS - P38.12 PLUS – P38.12



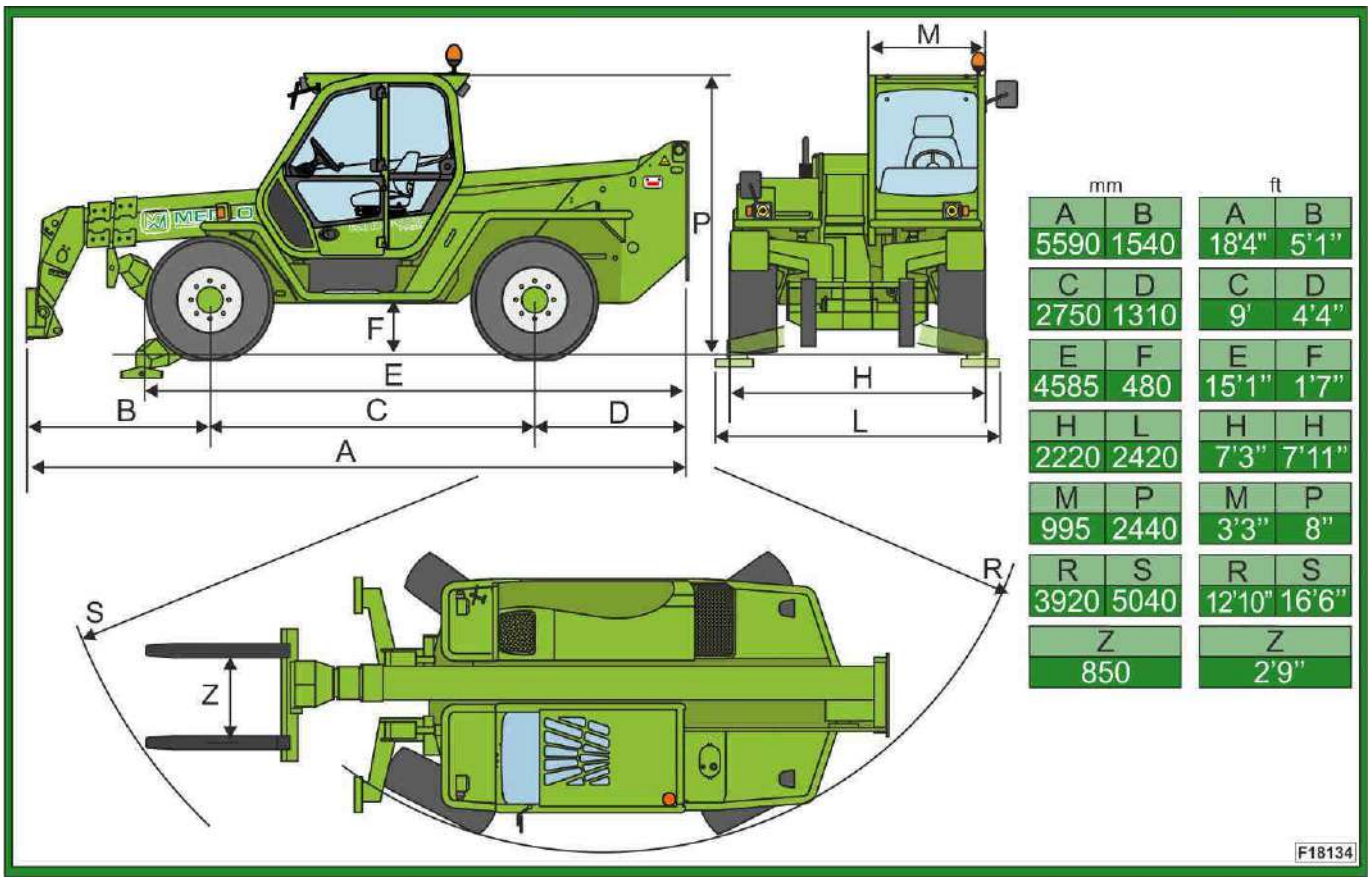
mm		ft	
A	B	A	B
4850	1285	15'11"	4'3"
C	D	C	D
2750	815	9'	2'8"
E	F	E	F
4100	480	13'5"	1'7"
H	L	H	H
2220	2420	7'3"	7'11"
M	P	M	P
995	2440	3'3"	8"
R	S	R	S
3920	4900	12'10"	16'1"
Z		Z	
850		2'9"	

DIMENSIONS - P38.13 PLUS – P38.13 – P38.13EE



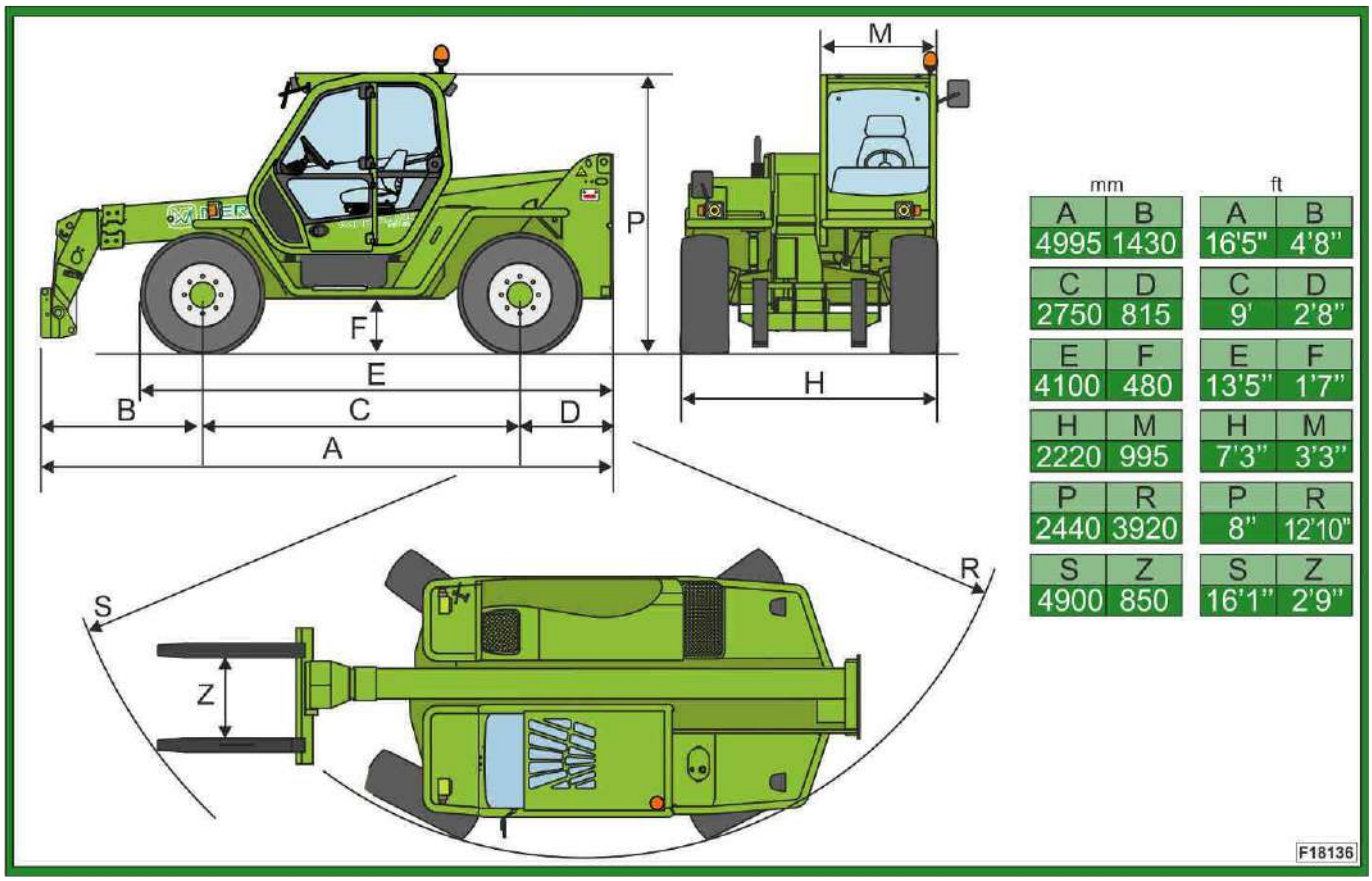
mm				ft			
A	B			A	B		
5240	1285			17'2"	5'6"		
C	D			C	D		
2750	815			9'	2'8"		
E	F			E	F		
4100	480			13'5"	1'7"		
H	L			H	H		
2220	2420			7'3"	7'11"		
M	P			M	P		
995	2440			3'3"	8"		
R	S			R	S		
3920	4940			12'10"	16'2"		
Z				Z			
850				2'9"			

DIMENSIONS - P38.14 PLUS – P38.14



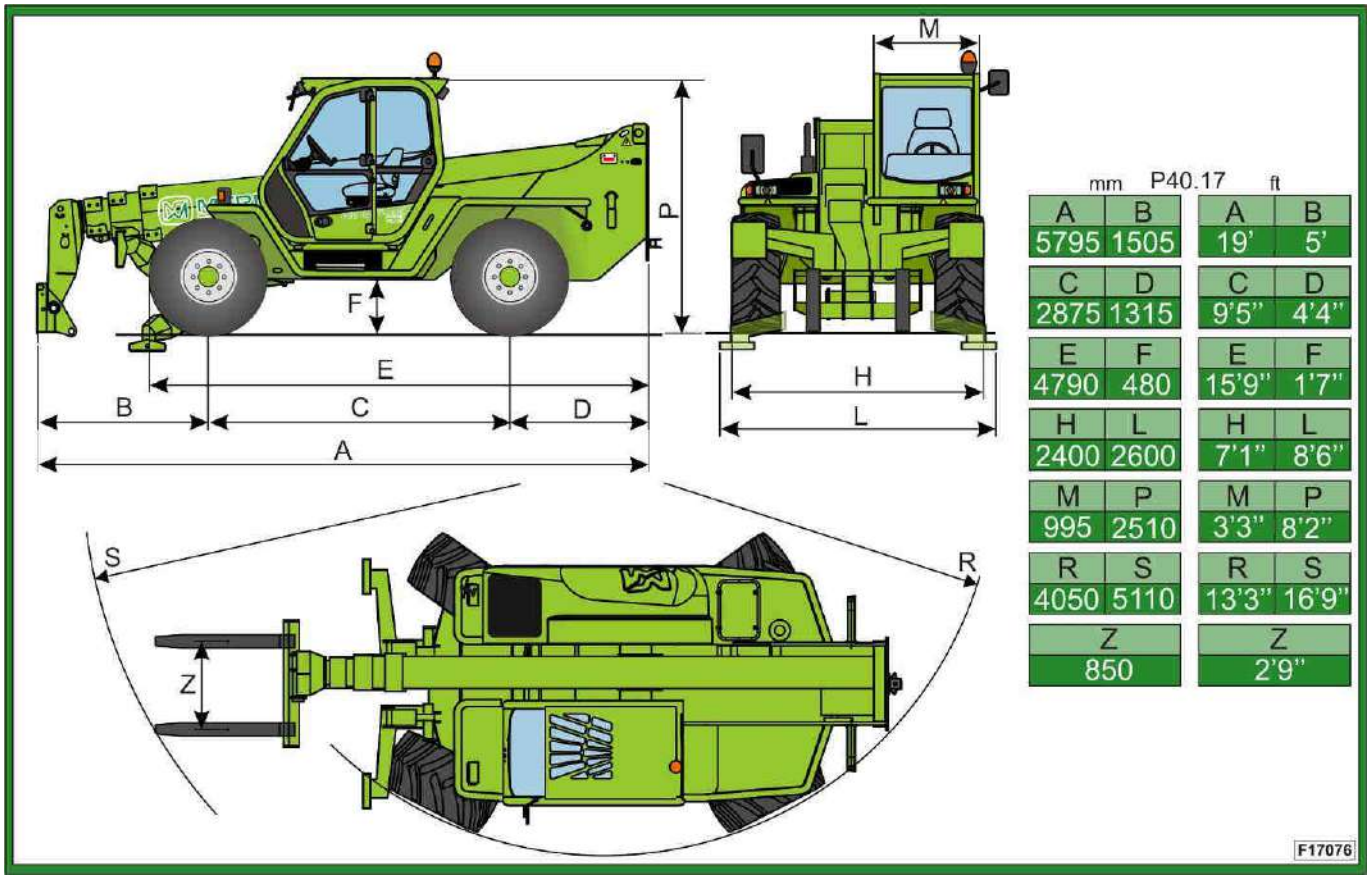
mm				ft			
A	B			A	B		
5590	1540			18'4"	5'1"		
C	D			C	D		
2750	1310			9'	4'4"		
E	F			E	F		
4585	480			15'1"	1'7"		
H	L			H	H		
2220	2420			7'3"	7'11"		
M	P			M	P		
995	2440			3'3"	8"		
R	S			R	S		
3920	5040			12'10"	16'6"		
Z				Z			
850				2'9"			

DIMENSIONS - P40.9 PLUS



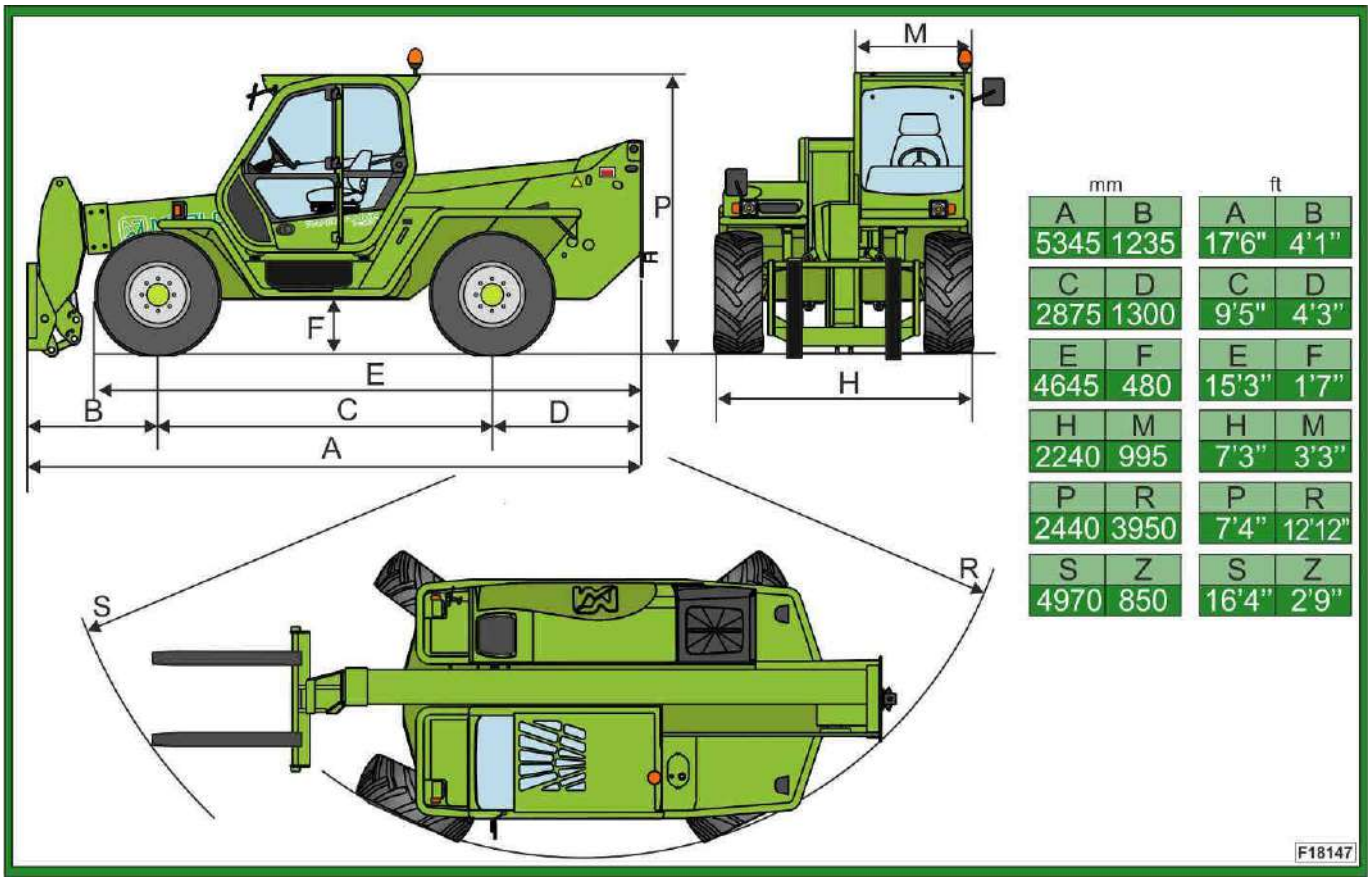
mm		ft	
A	B	A	B
4995	1430	16'5"	4'8"
C	D	C	D
2750	815	9'	2'8"
E	F	E	F
4100	480	13'5"	1'7"
H	M	H	M
2220	995	7'3"	3'3"
P	R	P	R
2440	3920	8"	12'10"
S	Z	S	Z
4900	850	16'1"	2'9"

DIMENSIONS – P40.17 PLUS – P40.17 – P40.17EE



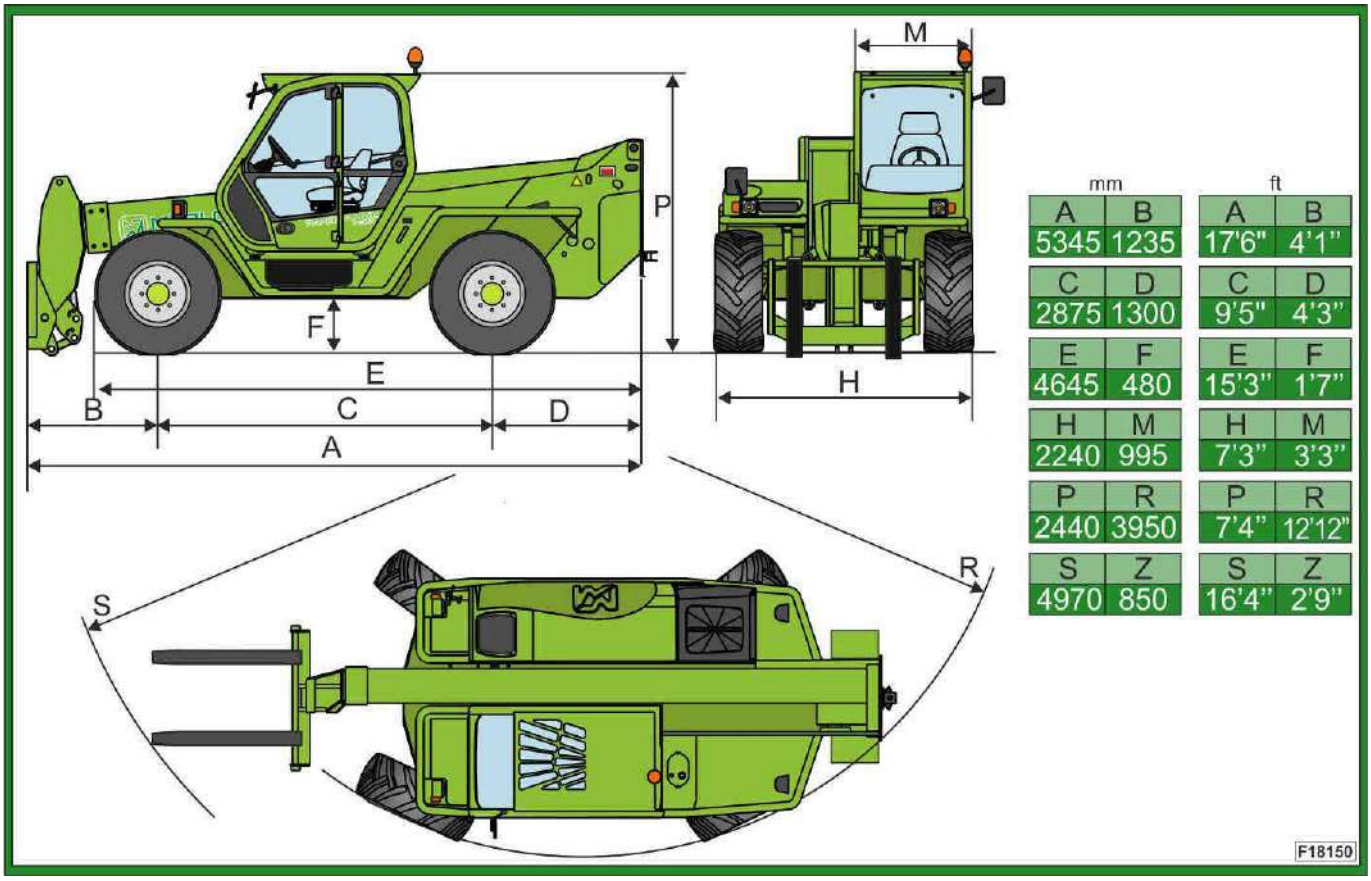
mm	P40.17	ft	
A	B	A	B
5795	1505	19'	5'
C	D	C	D
2875	1315	9'5"	4'4"
E	F	E	F
4790	480	15'9"	1'7"
H	L	H	L
2400	2600	7'1"	8'6"
M	P	M	P
995	2510	3'3"	8'2"
R	S	R	S
4050	5110	13'3"	16'9"
Z		Z	
850		2'9"	

DIMENSIONS - P60.10 – P60.10EE



mm		ft	
A	B	A	B
5345	1235	17'6"	4'1"
C	D	C	D
2875	1300	9'5"	4'3"
E	F	E	F
4645	480	15'3"	1'7"
H	M	H	M
2240	995	7'3"	3'3"
P	R	P	R
2440	3950	7'4"	12'12"
S	Z	S	Z
4970	850	16'4"	2'9"

DIMENSIONS - P72.10 – P72.10EE



mm		ft	
A	B	A	B
5345	1235	17'6"	4'1"
C	D	C	D
2875	1300	9'5"	4'3"
E	F	E	F
4645	480	15'3"	1'7"
H	M	H	M
2240	995	7'3"	3'3"
P	R	P	R
2440	3950	7'4"	12'12"
S	Z	S	Z
4970	850	16'4"	2'9"

PERFORMANCE AND FEATURES

The present tables contain data indicating the machine's standard configuration.
MERLO S.p.a. reserves the right to make changes to its range of machines without prior notice, even with regards the data declared.

WEIGHT (kg)

MEASUREMENT CONDITIONS

- Machine in standard configuration, without accessories or options
- Machine equipped with standard tyres
- Standard forks installed on the carriage
- Operator NOT in the cab
- Diesel fuel tank empty

P37.12 PLUS	8400 (kg)	P38.13 PLUS P38.13 P38.13EE	8650 (kg)	P40.9 PLUS	7900 (kg)
P38.12 PLUS P38.12	8550 (kg)	P38.14 PLUS P38.14	9050 (kg)	P40.17 PLUS P40.17 P40.17EE	10350 (kg)
P60.10 P60.10EE	9800 (kg)	P72.10 P72.10EE	10650 (kg)		

PERFORMANCE

Machine	Maximum capacity (kg)	Lift height (mm)	Maximum reach (mm)	Speed (Km/h) 1st gear - 2nd gear
P37.12 PLUS	3700	11560	7650	14 - 40
P38.12 PLUS	3800	11560	7650	14 - 40
P38.13 PLUS	3800	12560	8650	14 - 40
P38.14 PLUS	3800	13630	9125	14 - 40
P40.9 PLUS	4000	9070	5200	14 - 40
P40.17 PLUS	4000	16700	12500	16 - 40
P60.10	6000	9550	5500	14 - 40
P72.10	7200	9550	5500	14 - 40
P38.12	3800	11560	7650	9 - 33
P38.13	3800	12560	8650	9 - 33
P38.14	3800	13630	9125	9 - 33
P40.17	4000	16700	12500	9 - 33
P38.13EE	3800	12560	8650	11 - 40
P40.17EE	4000	16700	12500	11 - 40
P60.10EE	6000	9550	5500	11 - 40
P72.10EE	7200	9550	5500	11 - 40

CAB

Compliance with ISO 3449 (FOPS) and ISO 3471 (ROPS) standards

STEERING

Four-wheel steering with automatic resynchronization

3 steering modes : normal, all wheel, crab

TRANSMISSION
Hydrostatic with electronic control

ENGINE P37.12PLUS – P38.12PLUS – P38.13PLUS – P38.14PLUS – P40.9PLUS – P40.17PLUS – P60.10 – P72.10
DEUTZ TCD 3.6 Turbo – Intercooler – water cooled
Power: 74 kW – (100CV) at 2600 rpm
Reduced emissions IIIB Stage / Tier IV Interim

ENGINE P38.12 – P38.13 – P38.14 – P40.17
KUBOTA V3307-DI-T Turbo Intercooler with direct injection - water cooled
Power: 55.4 kW – (75CV) at 2600 rpm
Reduced emissions EURO3 phase IIIA/Tier 3

ENGINE P38.13EE – P40.17EE – P60.10EE – P72.10EE
KUBOTA V3800-DI-T Turbo Diesel– water cooled
Power: 74 kW (100CV) at 2600 rpm
Reduced emissions EURO3 phase IIIA/Tier 3

HYDRAULIC SYSTEM
Hydraulic system with Load-Sensing pump

ELECTRICAL SYSTEM
12 V
100 Ah battery

SYSTEM CAPACITIES (litres or dm^3)
Hydraulic system: 105 litres 140 litres (P40.17 PLUS – P40.17 – P40.17EE)
diesel: 150
Hydrostatic oil: 12
Engine oil: 8
Coolant: 12

TYRES

To find out about tyres available for your machine, refer to the information in the DIAGRAMS FILE at the end of the manual.

Observe also to the inflation pressures indicated for each type of tyre.

LOAD CHART

WARNING! Always observe the load chart.

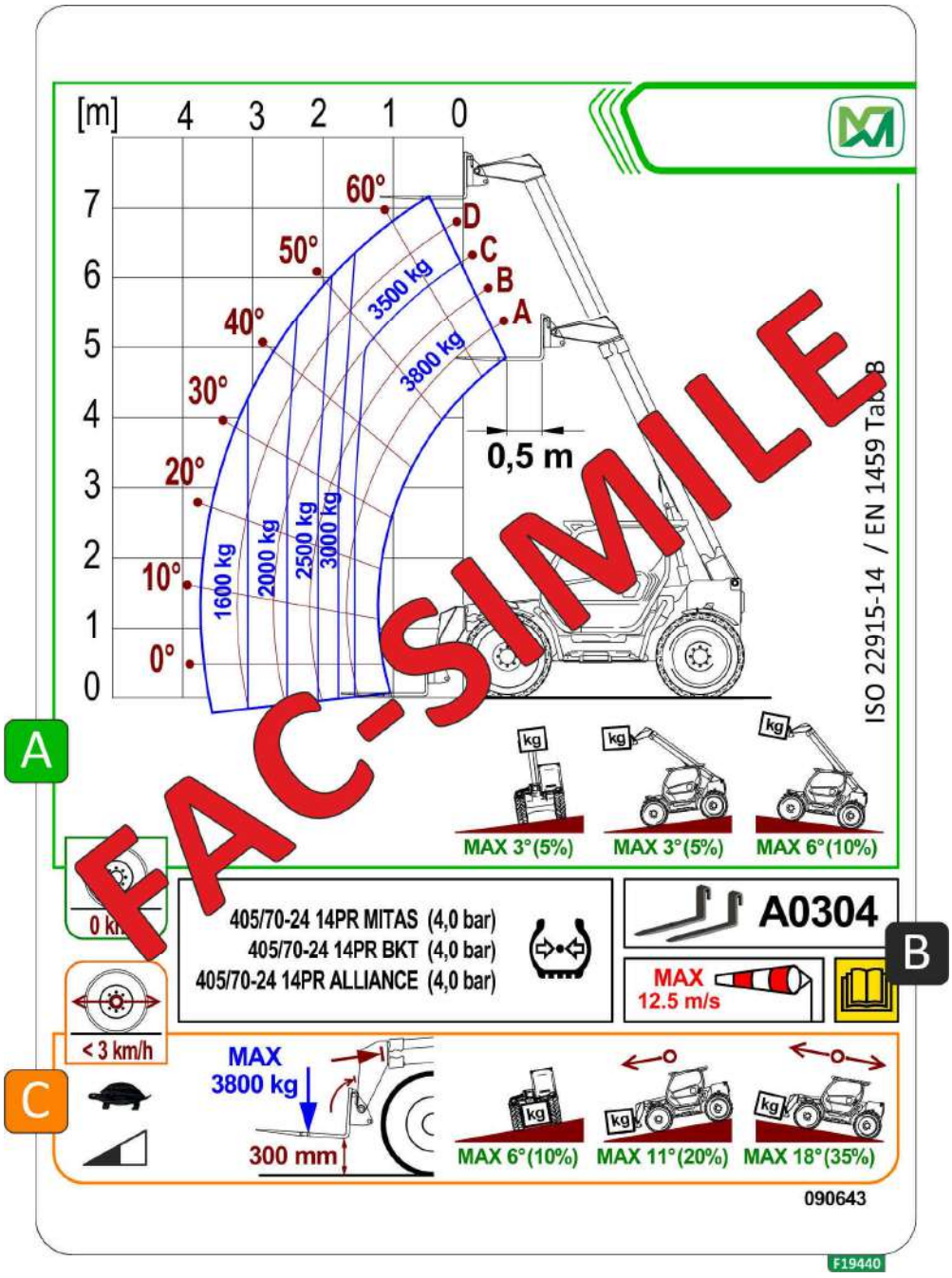
This paragraph provides instructions to consult the load charts correctly.

To see all attachments, the installation of which in combination with the machine has been approved by Merlo, refer to the file of diagrams shown at the back of this manual.

DO NOT use any attachment if the corresponding load chart (diagrams file inside the cab and at the back of this manual) valid for the machine/attachment combination is not present.

The centre of gravity of the load being transported is calculated at 500 mm from the fork heel.

• MACHINE WITHOUT STABILISERS

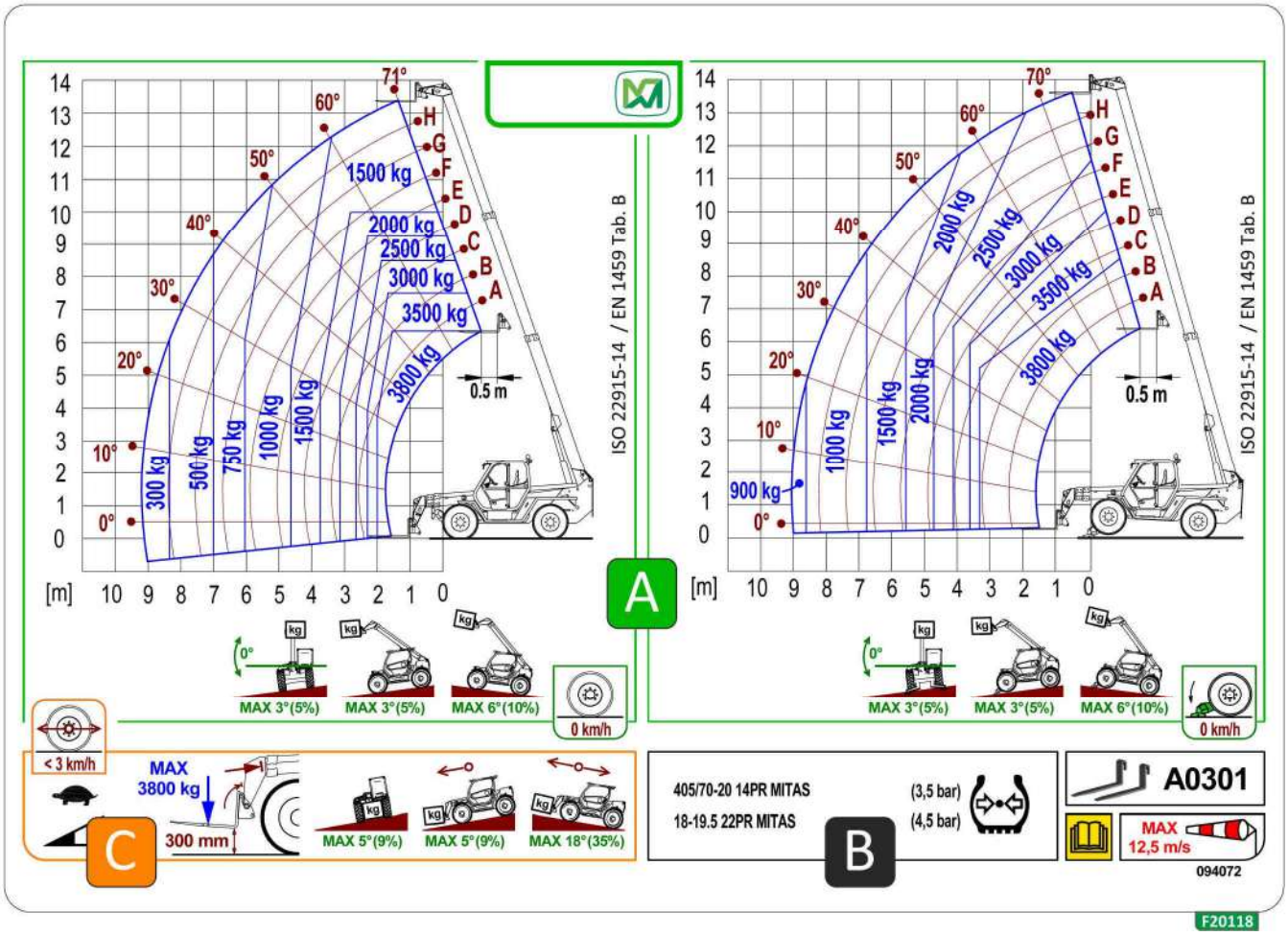


LIFTING A LOAD A

USE CONDITIONS B

TRANSPORTING A LOAD C

• **MACHINE WITH STABILISERS**

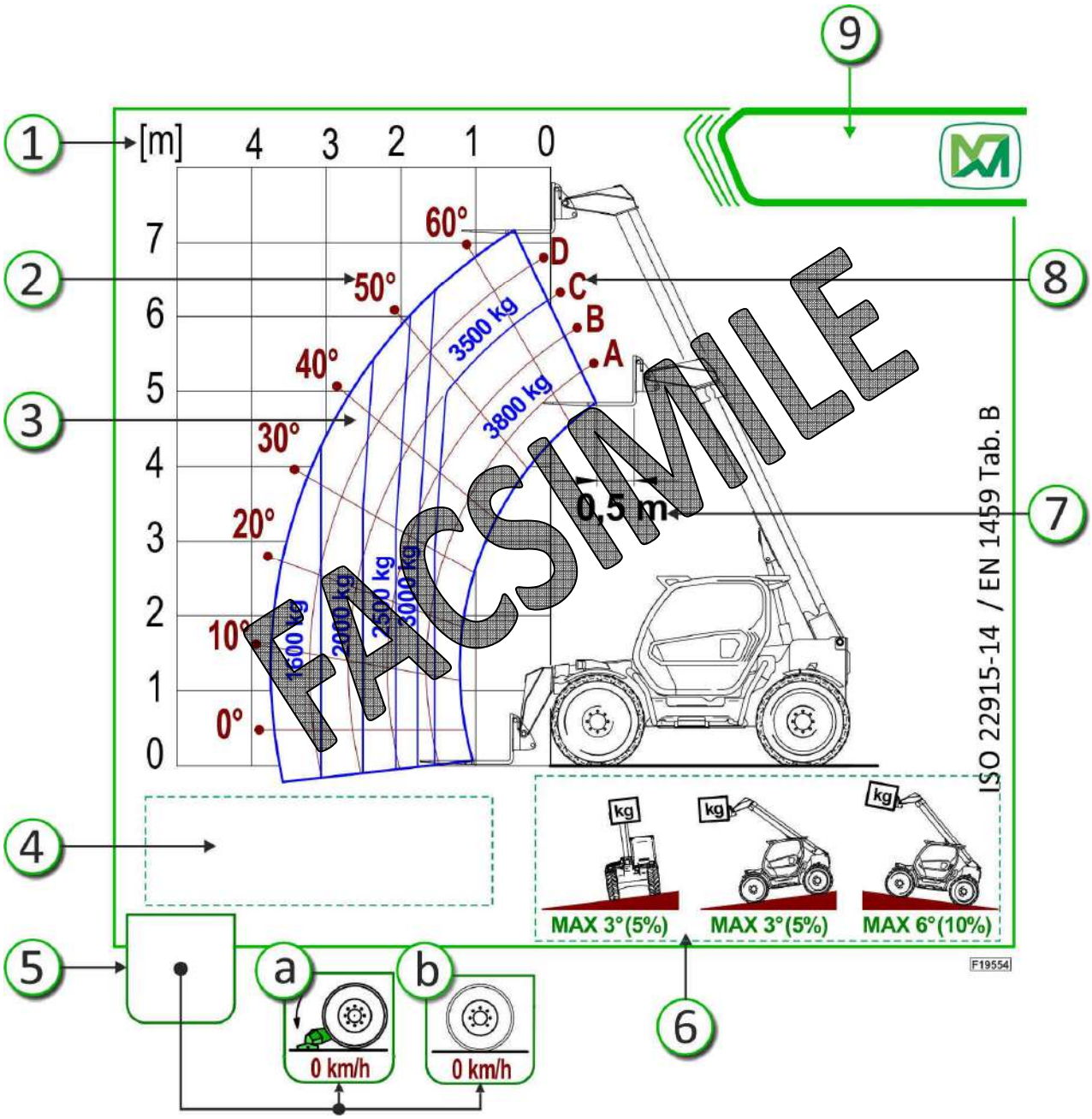


LIFTING A LOAD A

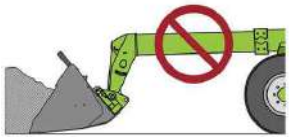
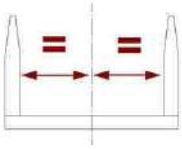
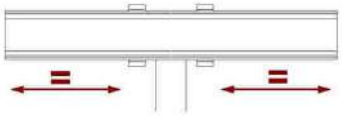
USE CONDITIONS B

TRANSPORTING A LOAD C

A LIFTING A LOAD



1. Metric grid
2. Lifting angle of the telescopic boom
3. Working area (in reference to section B)
4. Additional information

 Use on rough and unprepared terrain is prohibited	 Filling the bucket with the boom extended is prohibited	 The transportation of people in the handler is prohibited
 Keep the forks symmetrically centred	 Keep the load symmetrically centred	 Secure the oscillating load

5. Indications of machine at a standstill
   a. on stabilisers
   b. on tyres

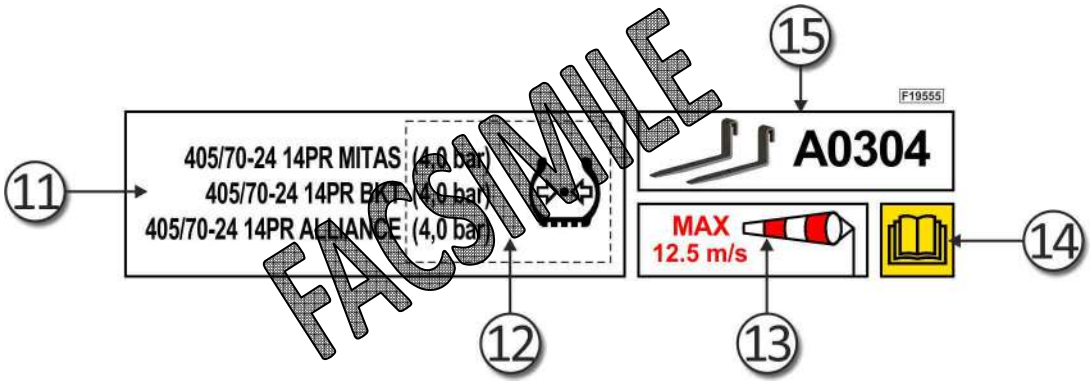
WARNING! The load charts for the machine on tyres refers to a machine that is standing still, with its wheels aligned to the chassis and positioned on a sufficiently even and solid ground.

6. Maximum gradients that can be exceeded in static lifting conditions of a load
7. Distance of the load's centre of gravity from the heel of the forks
8. Extension indication of the telescopic boom
9. Working area valid for the machine model indicated

B USE CONDITIONS

WARNING!

Check all the points listed in section B of the diagram in use before using the machine.



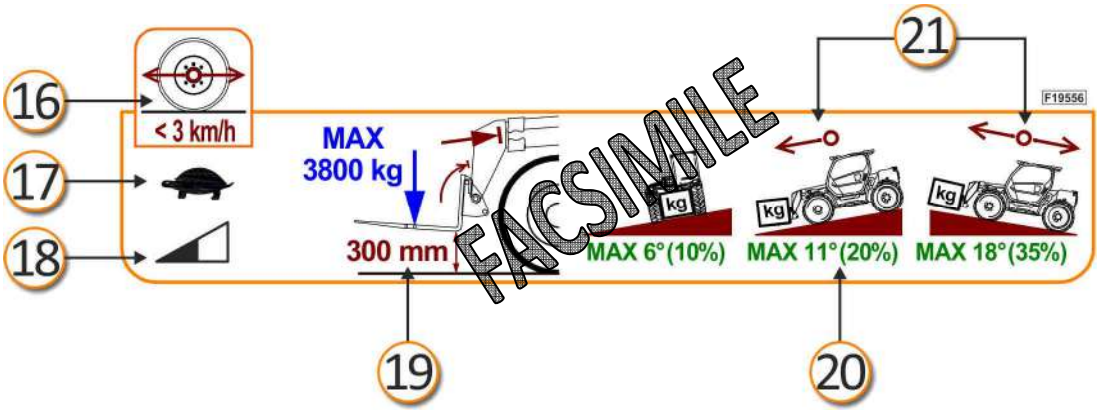
11. Authorised tyres

WARNING! The list of tyres that are authorized and installed on your machine are shown in the paragraph PERFORMANCE AND FEATURES of chapter TECHNICAL SPECIFICATIONS.

In the event a type of tire needs to be replaced with another model in the list of those authorized, contact the Merlo Technical Assistance Service, since tire replacement may also require the replacement of the safety devices electronic management unit and load tables.

12. Inflation pressure
13. Maximum wind speed
14. Indication to always refer to the information in the Operator's Manual
15. Reference sales code of the attachment used

C TRANSPORTING A LOAD

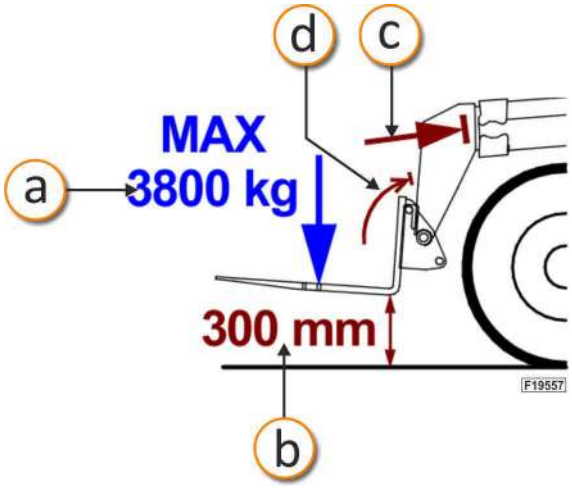


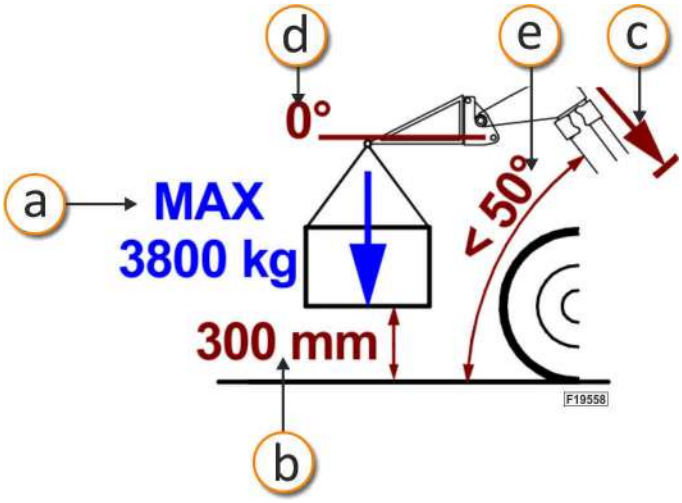
16. Indication of the machine moving at a speed less than 3 km/h
17. Load transportation in slow gear
18. Load transportation with partial throttle

WARNING!

Sudden acceleration can cause instability of the machine.

19. Position of load transportation



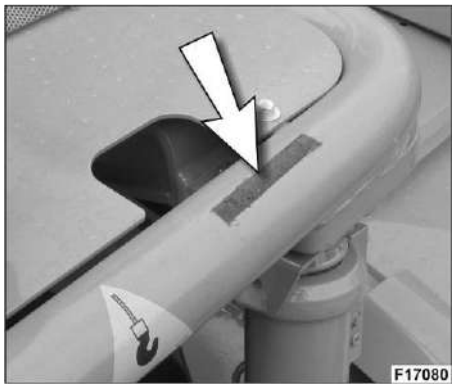


a. Maximum transportable capacity
b. Load transport height from the ground
c. Telescopic boom completely retracted
d. Carriage rotation: - carriage rotated completely backwards (example on the left)
   - carriage perpendicular to the ground (example on the right)
e. Maximum transportation angle of a suspended load

20. Maximum gradients that can be exceeded when transporting a load
21. Direction of travel of the machine

SERIAL NUMBER OF THE MACHINE

CHASSIS NUMBER



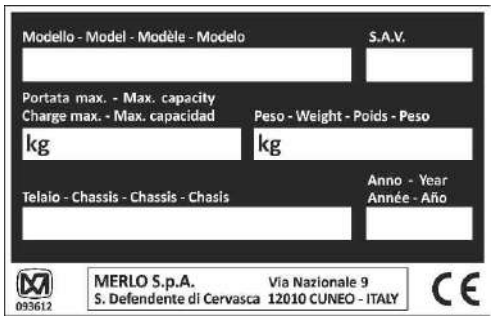
The chassis number of your machine is printed on the front right side of the chassis, and coated with a layer of black paint. When requesting assistance or spare parts, please provide Merlo Technical Support Service with both the chassis number and the Sav number of your machine.
This code is made up of 17 characters, divided into 3 sectors, and shows the manufacturing data of your machine.
An example of a chassis number stamped on a chassis is given below:

• chassis identification code: ZF1A28L01C1190883

ZF1: code that identifies MERLO S.p.A.
A28L01: specific model code
C1190883: code that identifies the manufacturing decade (C= 2010-2019), the manufacturing year (1=2011), the manufacturing progressive number (1908), and the engine code (83)

IDENTIFICATION AND TYPE APPROVAL PLATES

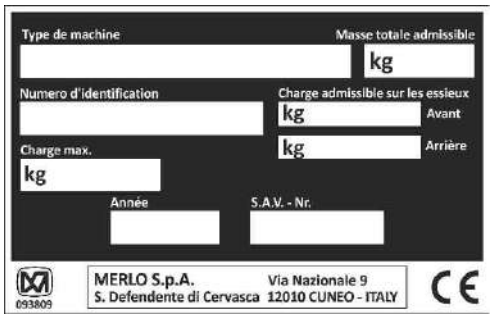
• MACHINE IDENTIFICATION PLATE



The machine identification plate is placed in the rear left part of the cab and provides the operator with the following data:

- Model
- SAV number
- Maximum capacity
- Weight
- Chassis number
- Manufacturing year

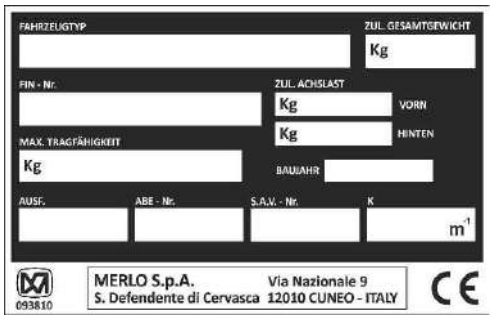
• MACHINE IDENTIFICATION PLATE (SWISS MARKET)



The machine identification plate is placed in the rear left part of the cab and provides the operator with the following data:

- Model
- Total permissible mass
- Chassis number
- Maximum permissible load per axle (front and rear)
- Maximum load
- Manufacturing year
- SAV number

• MACHINE IDENTIFICATION PLATE (GERMAN MARKET)



The machine's identification plate is applied in the engine compartment and provides the operator with the following information:

- German homologation certificate (ABE)
- Total weight of the machine
- Chassis number
- Weight on front and rear axle
- Capacity of the machine
- Manufacturing year
- ABE version
- ABE homologation number
- SAV number of the machine
- Total unladen mass of the machine

• ENGINE IDENTIFICATION PLATE

The engine identification plate is applied in the upper part of the engine, and provides you with engine data and specifications.

Should you need information, support, or original spare parts, please provide the engine Manufacturer with the data shown on the engine identification plate.

DEUTZ 74kW

KUBOTA 55kW

KUBOTA 75kW

• TYPE APPROVAL PLATE FOR DRIVING ON PUBLIC ROADS

The machine type approval plate for driving on public roads is located in the front part of the cab and provides the operator with the following data:

A- Type of machine
B - Modification
C - Manufacturing year
D - Identification no.
E - Type approval no.
F - Maximum permissible load
G - Maximum load on front axle
H - Maximum load on rear axle
I - Towable weight with assisted braking (hydraulic)
L - Towable weight with assisted braking (pneumatic)
M - Towable weight with overrun braking

• TYPE APPROVAL PLATE DNT01A

The type approval plate for the DNT01A cab is applied inside the cab itself and indicates:

- ISO 3449 standards - Falling Object Protective Structures (FOPS)
- ISO 3471 standards - (ROPS)

TIGHTENING TORQUES FOR ISO METRIC THREADS

The tightening torque "Ma" of either a screw or a nut is the moment of a force required to put the screw under a certain initial tension. The tightening torque value is used to adjust the dynamometric wrench, as well as to prevent the screw from breaking due to fatigue. The following table shows the tightening torques "Ma" related to the external diameters of screws having metric threads. These are just indicative values, because the exact values depend on both the friction and the machining conditions of the screw supporting surfaces.

NOTE!

This table refers to a slowly applied tightening and with dynamometric cables.

SIZE OF BOLT		TYPE OF BOLT					
		8.8		10.9		12.9	
		Nm	Kgm	Nm	Kgm	Nm	Kgm
COARSE PITCH	M3 x 0.5	1.8	0.18	2.6	0.27	3	0.31
	M4 x 0.7	3.1	0.32	4.5	0.46	5.3	0.54
	M5 x 0.8	6.1	0.62	8.9	0.91	10.4	1.06
	M6 x 1	10.4	1.06	15.3	1.56	17.9	1.82
	M7 x 1	17.2	1.75	25	2.55	30	3.06
	M8 x 1.25	25	2.55	37	3.77	44	4.49
	M10 x 1.5	50	5.10	73	7.44	86	8.77
	M12 x 1.75	86	8.77	127	12.95	148	15.09
	M14 x 2	137	13.97	201	20.49	235	23.96
	M16 x 2	214	21.81	314	32.01	368	37.51
	M18 x 2.5	306	31.19	435	44.34	509	51.89
	M20 x 2.5	432	44.04	615	62.69	719	73.29
	M22 x 2.5	592	60.35	843	85.93	987	100.61
	M24 x 3	744	75.84	1060	108.05	1240	126.4
	M27 x 3	1100	112.13	1570	160.04	1840	187.56
	M30 x 3.5	1500	152.91	2130	217.13	2500	254.84
PICHT FINE	M8 x 1	27	2.75	40	4.08	47	4.79
	M10 x 1.25	53	5.4	78	7.95	91	9.28
	M12 x 1.25	95	9.68	139	14.17	163	16.62
	M14 x 1.5	150	15.29	220	22.43	257	26.2
	M16 x 1.5	229	23.34	336	34.25	393	40.06
	M18 x 1.5	345	35.17	491	50.05	575	58.61
	M20 x 1.5	482	49.13	687	70.03	804	81.96
	M22 x 1.5	654	66.67	932	95.01	1090	111.11
	M24 x 2	814	82.98	1160	118.25	1360	138.63
	M27 x 2	1200	122.32	1700	173.29	1990	202.85
	M30 x 2	1670	170.23	2370	241.59	2780	283.38

Nm = Newton-meter / lbft = pound - foot kgm = kilogram - meter

END OF SECTION

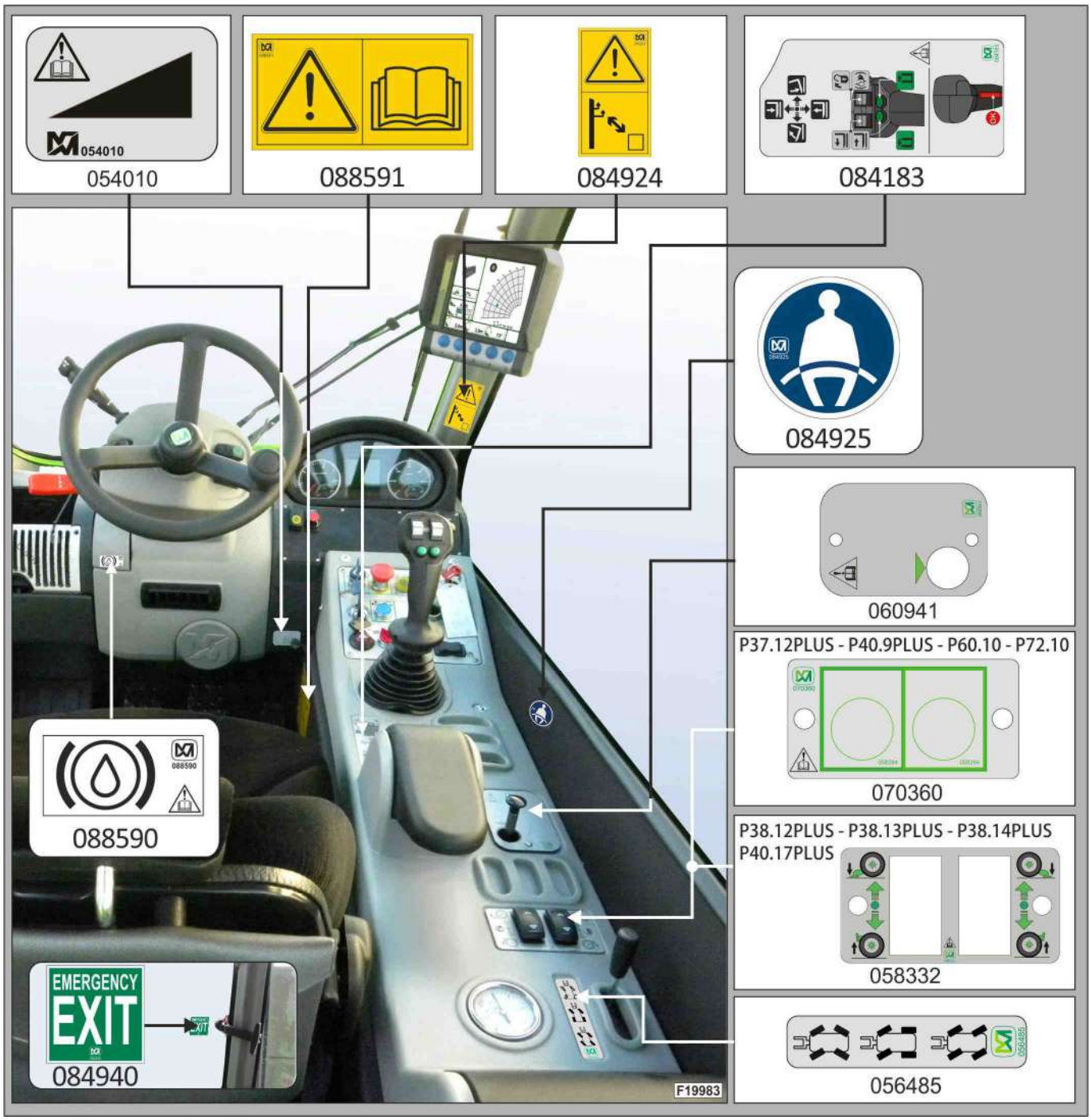
CONTENTS

GENERAL REMARKS

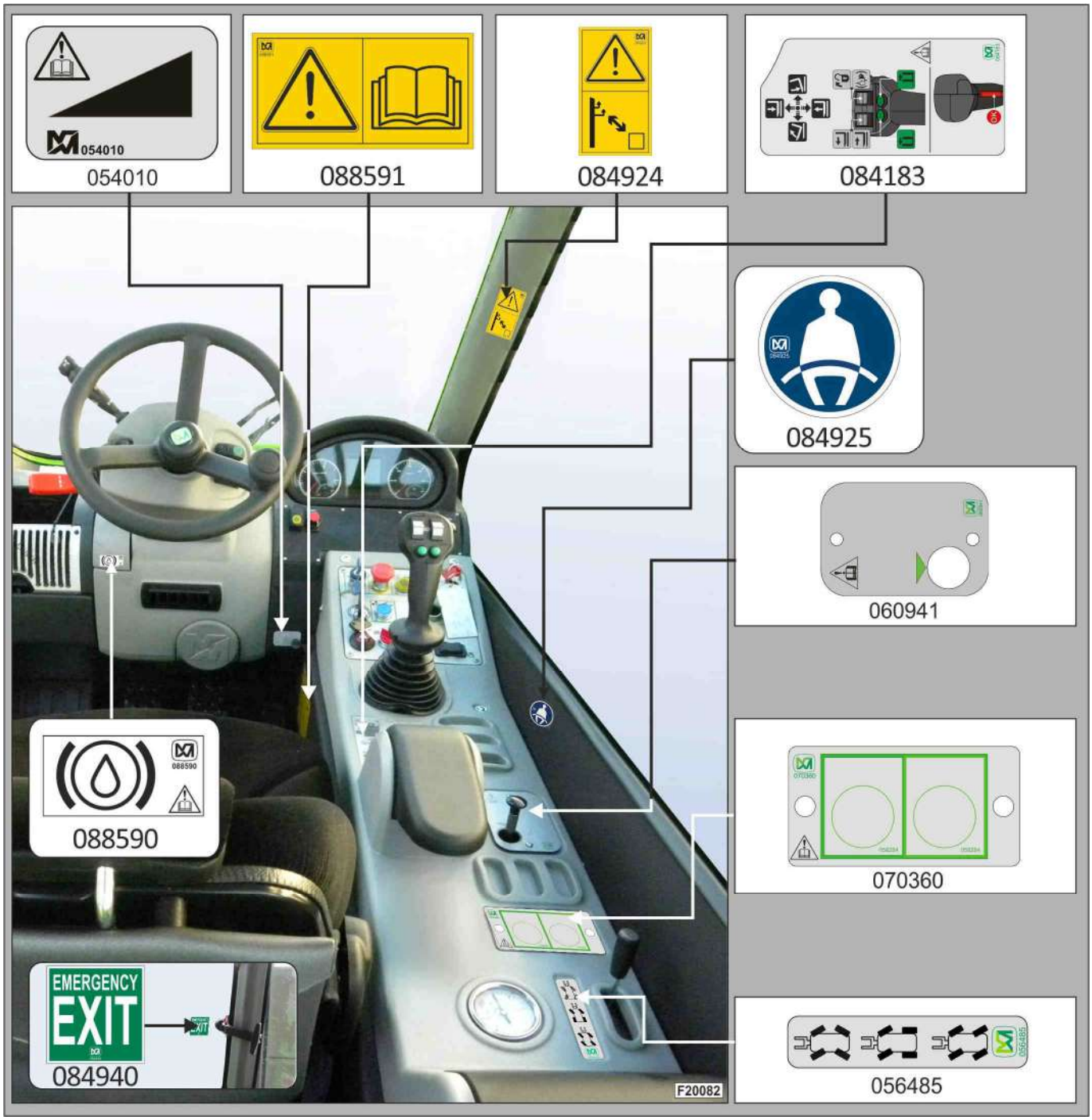
All the stickers and the leaflets described in this chapter shall always be available on your machine; for this reason, make sure that they are undamaged, and clean them periodically with a cloth dampened with a mild soap and water solution.
Should they be damaged or illegible, replace them with new original ones, to be ordered from Merlo Technical Support Service, and to be placed in the positions shown in the Operator's Manual.
Most of the symbols used are based on the International ISO 3287 and ISO 6405 standards. In any case, to avoid any misinterpretation, do not use the controls before having looked up the pertaining information contained in section "CONTROLS AND INSTRUMENTS".

INSIDE CAB STICKERS

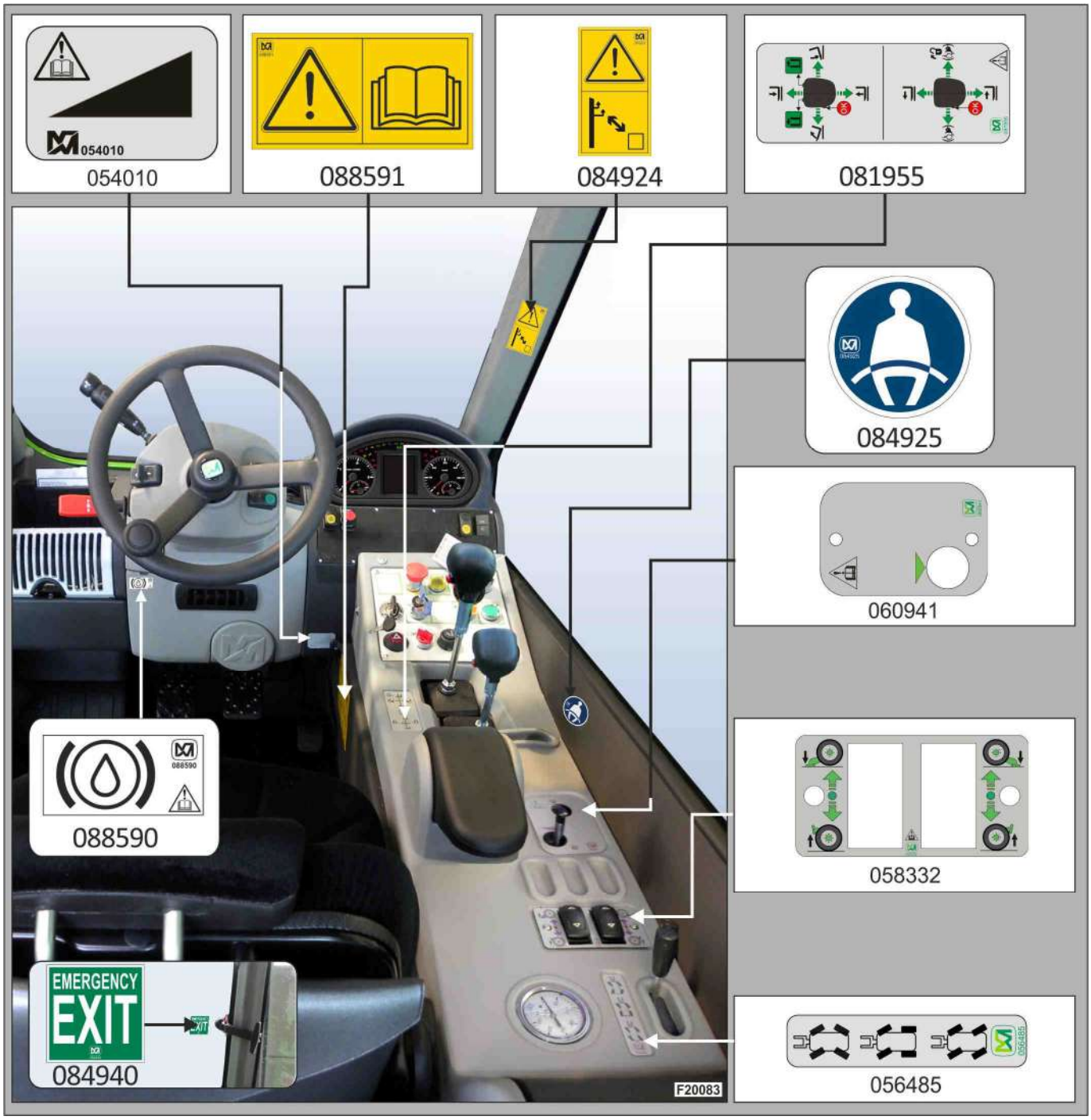
(only for models P37.12PLUS – P38.12PLUS – P38.13PLUS – P38.14PLUS – P40.9PLUS – P40.17PLUS – P60.10 – P72.10)



(only for models P60.10EE – P72.10EE)

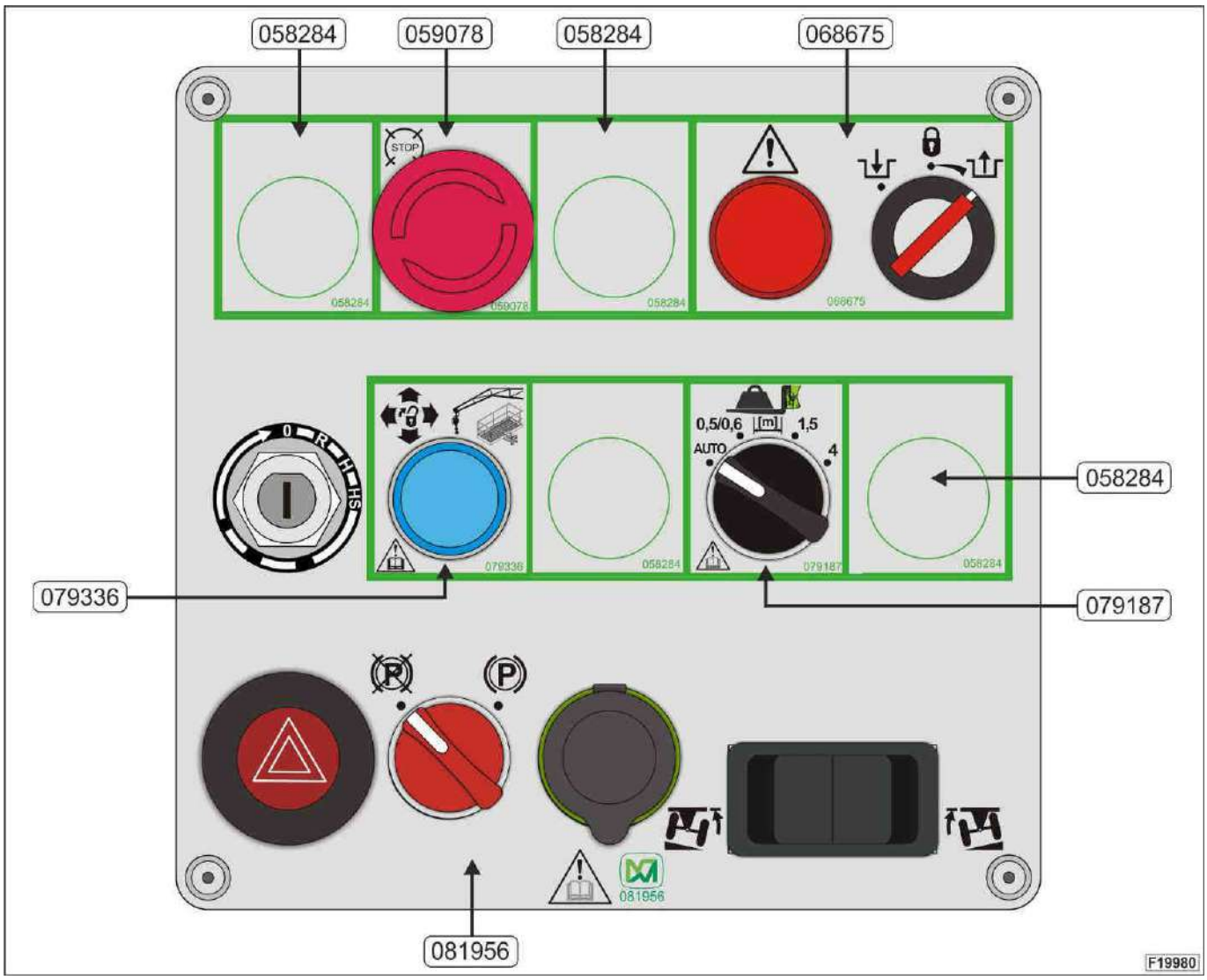


(only for models P38.13 – P38.13 – P38.14 – P40.17 – P38.13EE – P40.17EE)

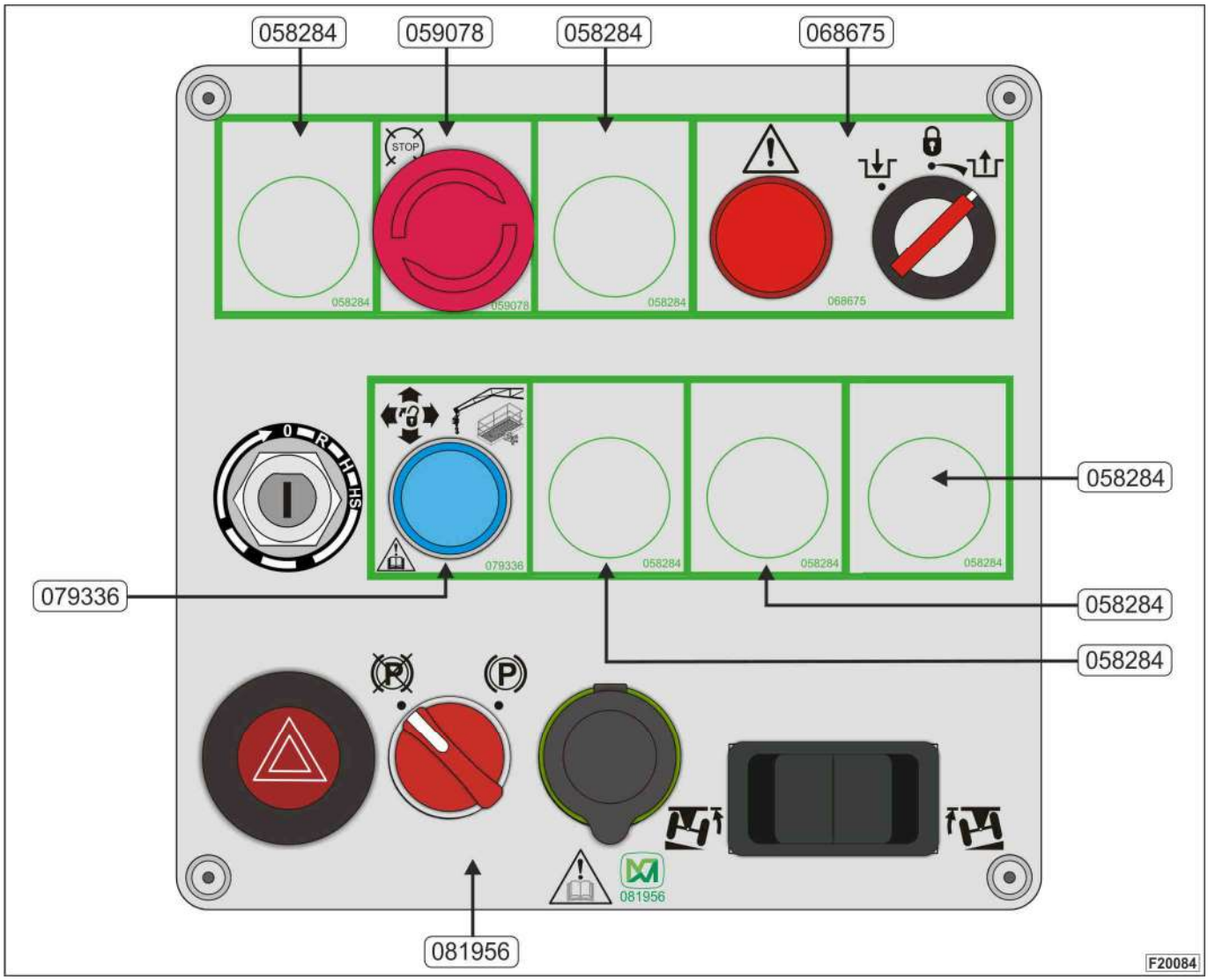


• CONTROL PANEL STICKERS (P)

(only for models P37.12PLUS – P38.12PLUS – P38.13PLUS – P38.14PLUS – P40.9PLUS – P40.17PLUS – P60.10 – P72.10)

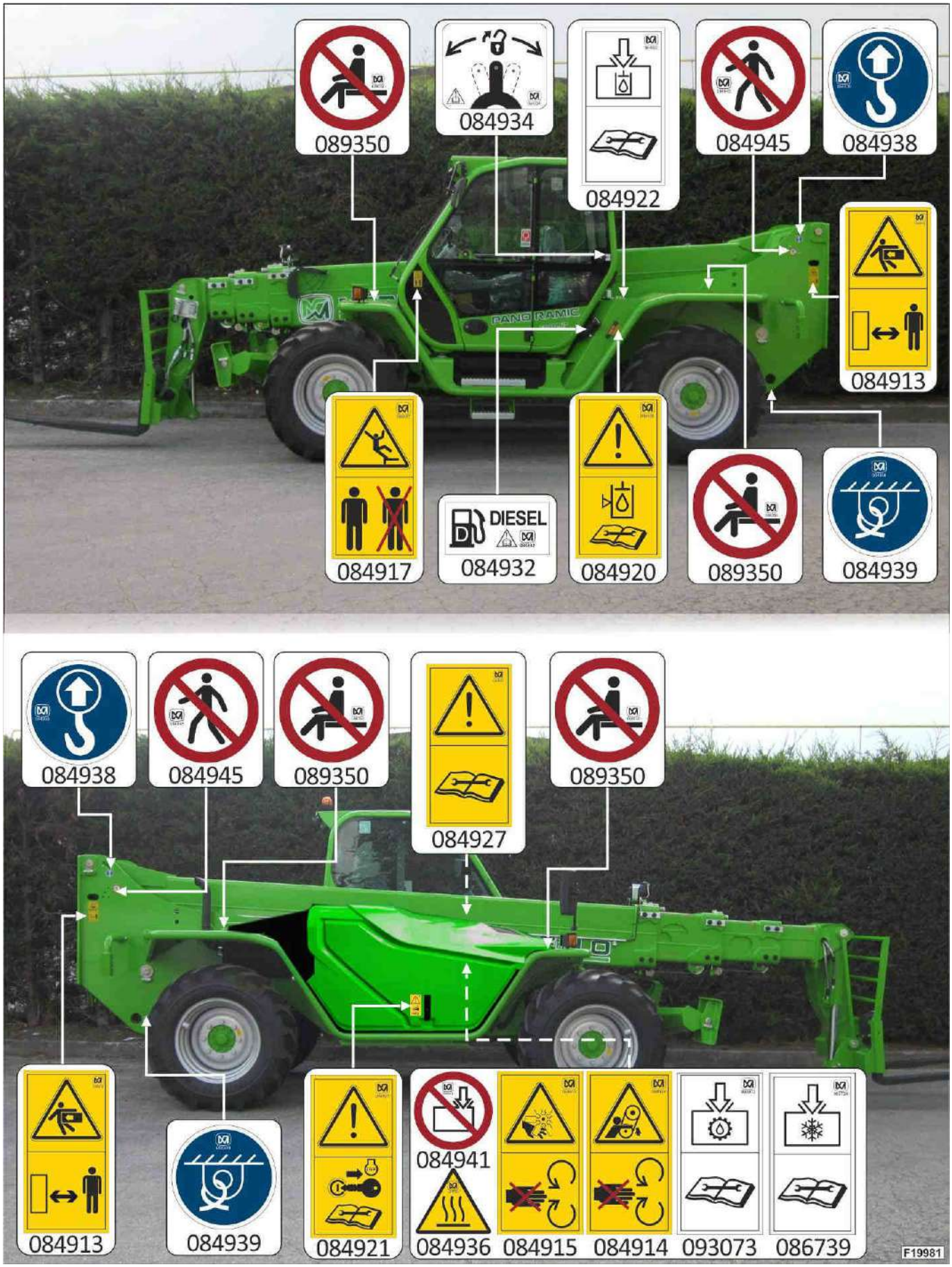


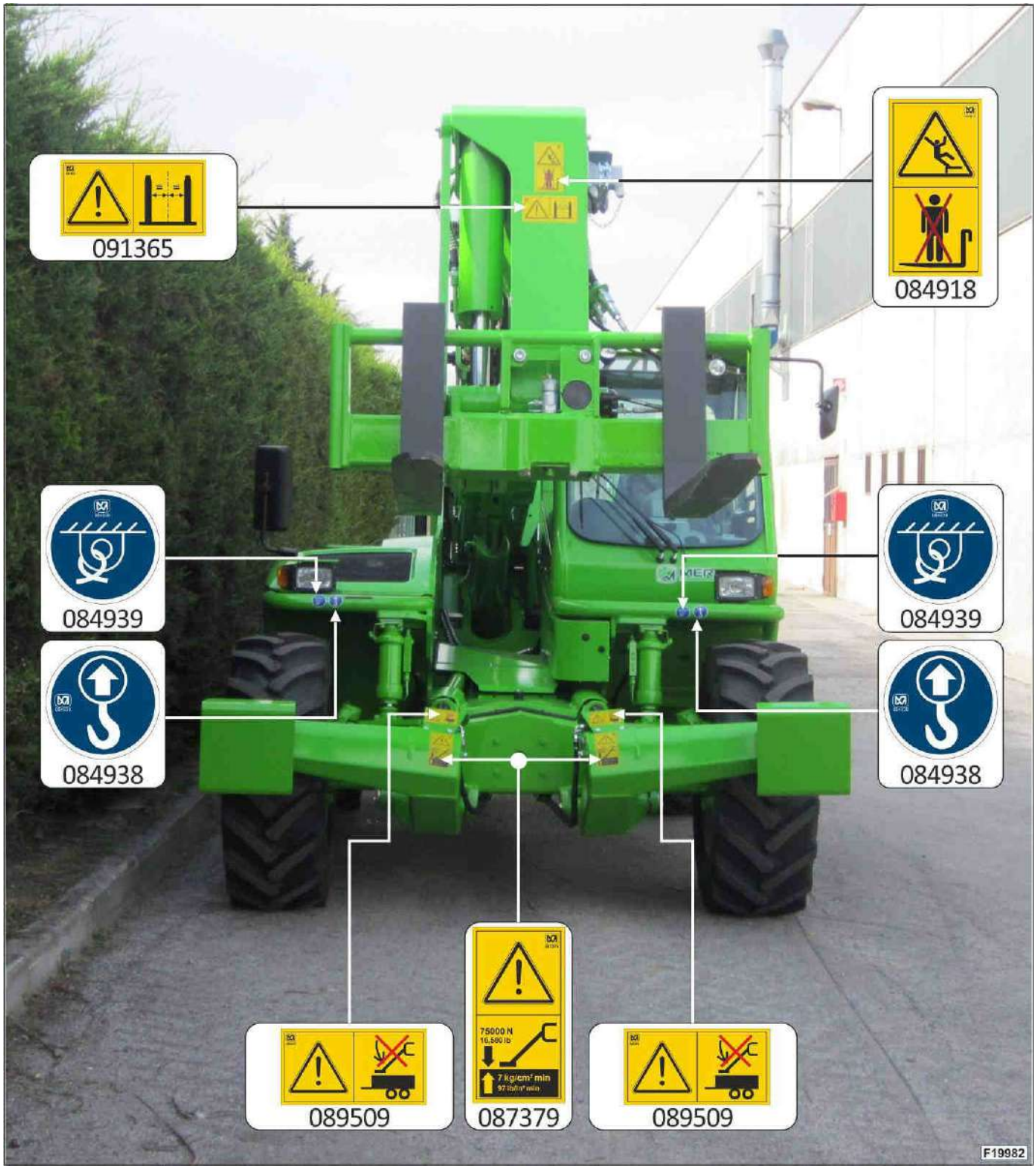
(only for models P38.12 – P38.13 – P38.14 – P40.17 – P38.13EE – P40.17EE – P60.10EE – P72.10EE)



OUTSIDE CAB STICKERS

• P40.17 PLUS – P40.17 – P40.17EE




091365
084918
084939
084939
084938
084938
089509
75000 N
16.580 lb
7 kg/cm² min
087379
089509
F19982

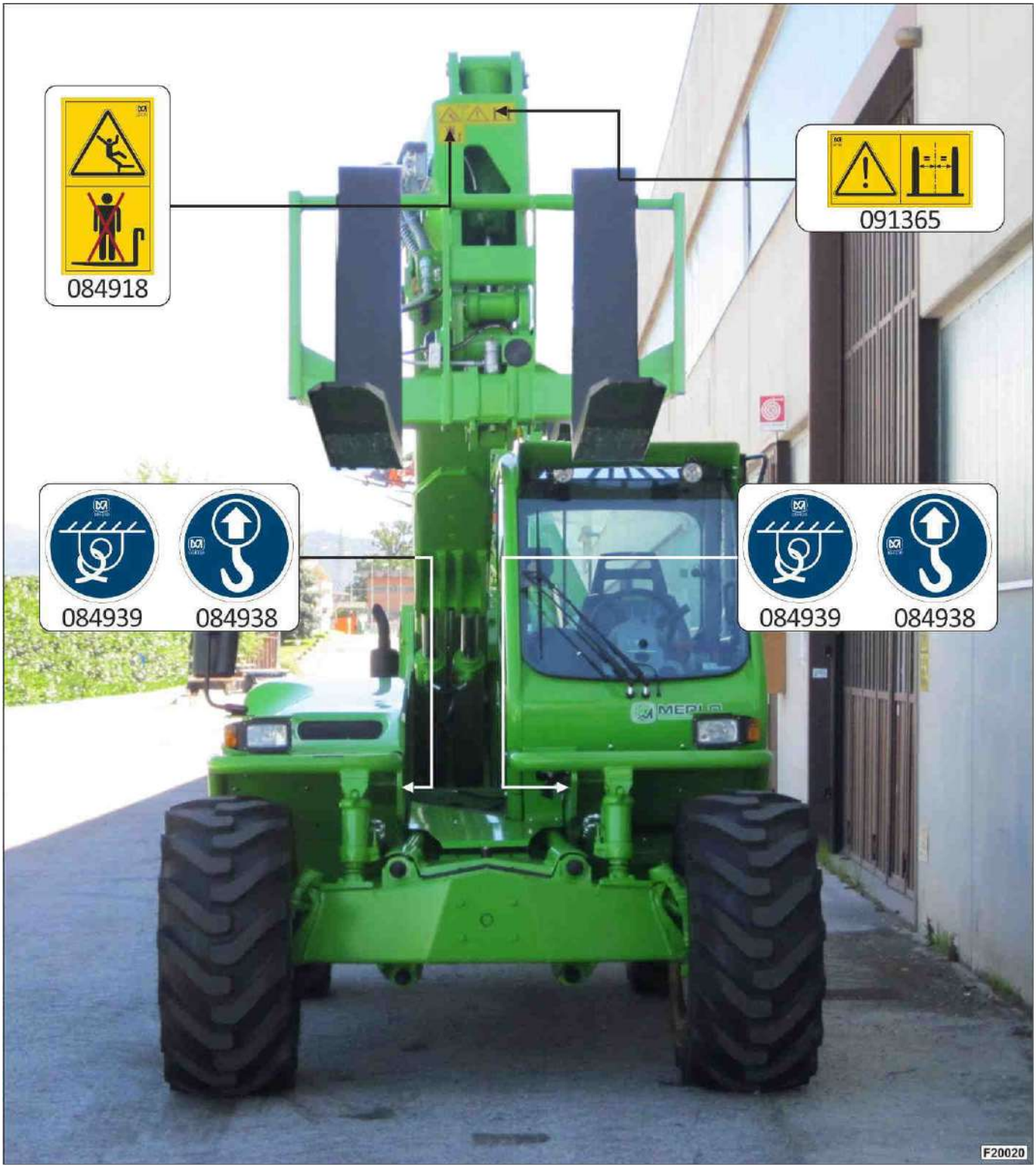
• P38.12 PLUS – P38.13 PLUS – P38.12 – P38.13 – P38.13EE – P38.14 – P38.14PLUS


091365
084918
084939
084938
084939
084938
089509
087378
089509
F20017

• P37.12 PLUS – P40.9 PLUS


091365
084918
084939
084938
084939
084938
F20018

• P60.10 – P72.10 – P60.10EE – P72.10EE



END OF SECTION

CONTENTS

GENERAL OVERVIEW OF THE CAB

• OPENING THE DOOR

To open the driving cab door, release the lock by rotating the key "X" (supplied) clockwise, then act on handle "A" as indicated in the figure (1).

• ACCESSING THE CAB

In order to access the cab correctly, please follow these instructions:

- open the cab door
- look towards the machine and grasp handles "A" and "B", located on the two sides of the cab (fig.2)
- use the steps to access the cab

ATTENTION! Use the fitted supports only when accessing the cab (handles "A" and "B", non-slip steps). Do not grasp any control (steering wheel, switches, instrument panel) to access the driver's cab. Always keep the steps and handles to access the cab clean and in perfect operating condition.

• CLOSING THE DOOR

Before using the machine, close the cab door by grasping the handrail "D" and pulling firmly inwards (fig.3).

ATTENTION! The lower part of the driver's cab must always be closed, both during transfers with the machine and when working.

• OPENING THE CAB DOOR FROM THE INSIDE

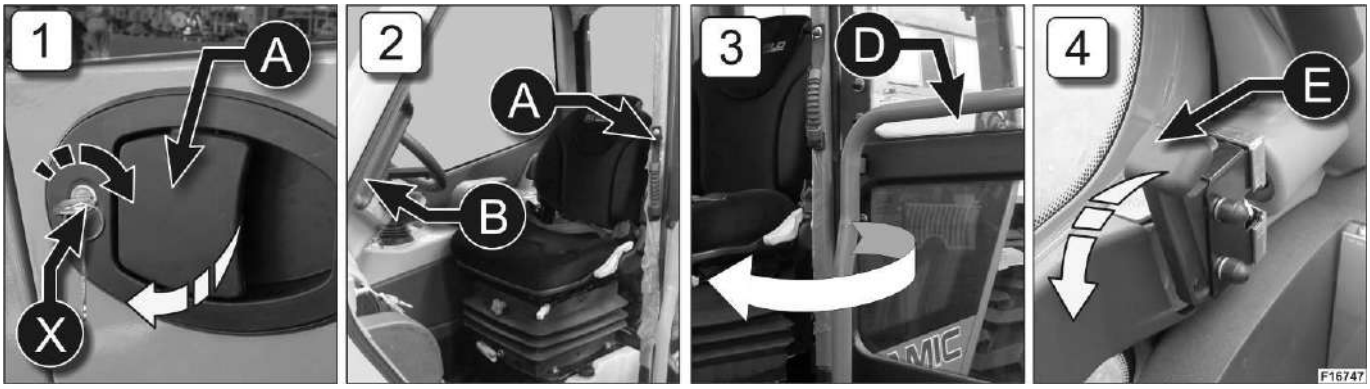
To open the cab door from the inside, simply pull lever "E" (fig.4) in the direction shown by the arrow.

• DESCENDING FROM THE DRIVER'S CAB

Use the appropriate supports (handles "A" and "B") to exit the cab.
Always perform these operations facing the machine.

• CLOSING THE CAB DOOR

Always close the door after descending from the driver's cab. In the event of a prolonged stoppage or at the end of each working day, it is recommended to close the cab door and lock it with the provided key, so as to prevent any unauthorised tampering. To close the cab door, rotate the key "X" (supplied) anticlockwise.



• FIRE EXTINGUISHER INSTALLATION IN THE CAB

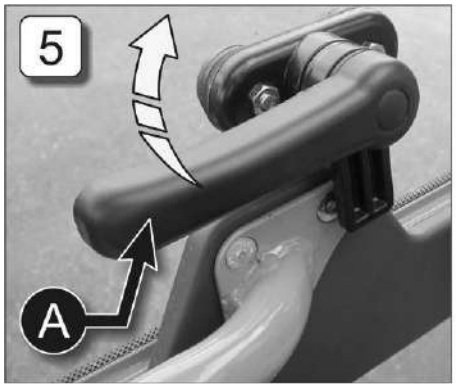
WARNING!

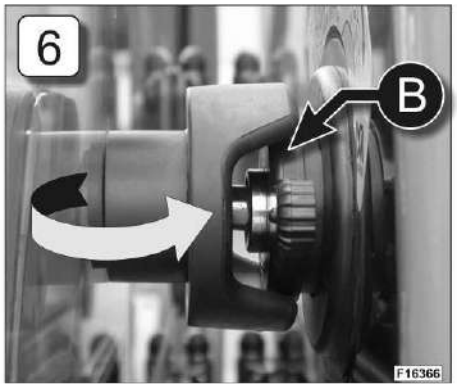
The person in charge (owner, responsible of the building site, etc.) must check whether it is necessary to mount a fire extinguisher inside the cabin.

• OPENING THE UPPER PART OF THE DOOR

To open the upper part of the door, proceed as follows:

- rotate handle "A" upwards (direction indicated by the arrow) (fig.5)
- completely open the upper part of the door and hook it to the appropriate external device "B" (fig.6)



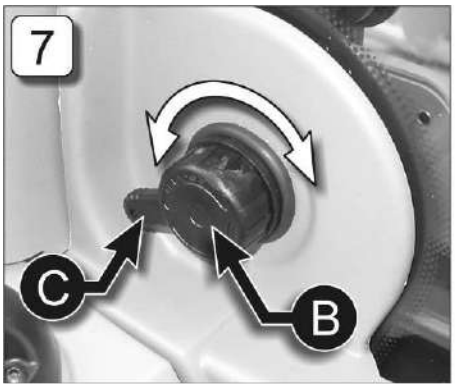


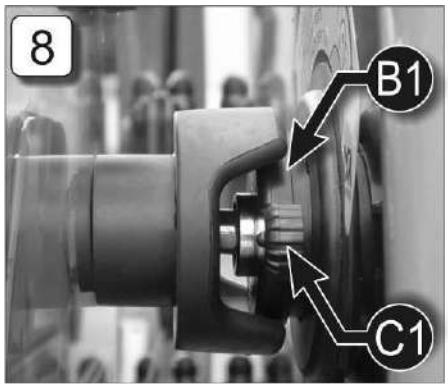
WARNING! Please remember that the lower part of the door must be closed both during transfers with the machine and when working.

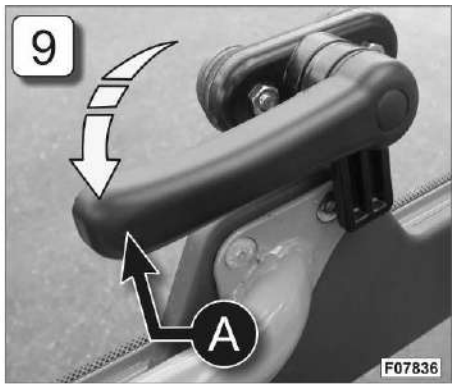
• CLOSING THE UPPER PART OF THE DOOR

To close the upper part of the door, proceed as follows:

- from the inside of the cab, release stop "B" by acting on its tongue "C" (fig.7)
- from the outside of the cab, release stop "B1" by acting on its tongue "C1" (fig.8)
- completely close the upper part of the door and lock it into position by rotating handle "A" downwards (in the direction shown by the arrow) (fig.9)







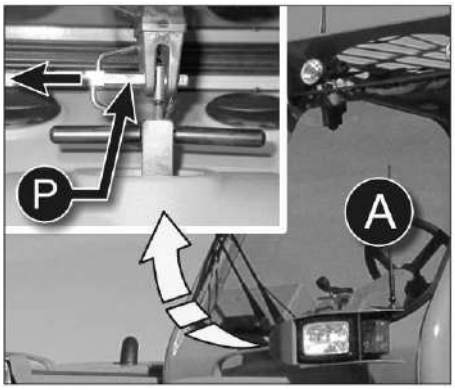
WARNING! Before starting operating with the machine, the operator must ensure that the upper part of the door cannot accidentally open.

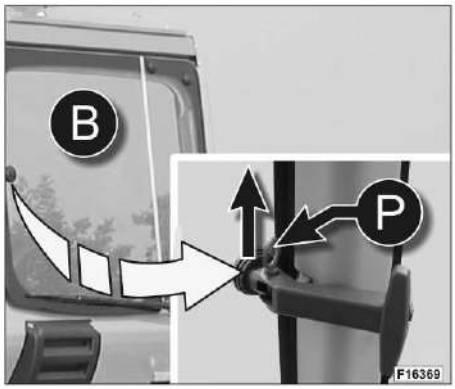
• LEAVING THE CAB IN THE EVENT OF AN EMERGENCY

If it is not possible to leave the vehicle using the cab door, it is necessary to use the emergency exit:

FRONT WINDOW (A)

- Remove the fixing pivot "P" by pulling in the direction indicated
- Fling the front window "A" open and exit the cab with the utmost care.



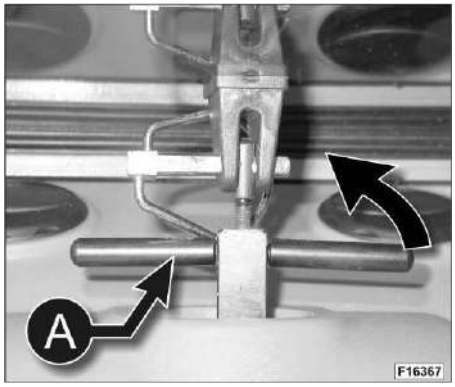


REAR WINDOW (B)

- Remove the fixing pivot "P" by pulling in the direction indicated
- Fling the rear window "B" open and exit the cab with the utmost care.

• WINDSCREEN OPENING

- turn the lever "A" through 45°
- open the windscreen slightly
- move the lever "A" in the horizontal position
- push the windscreen forward up to the automatic stop position.

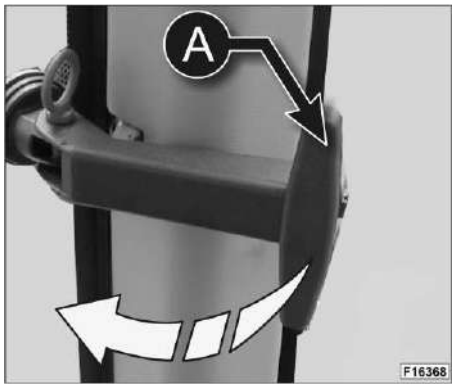


• WINDSCREEN CLOSING

- turn the lever "A" through 45°
- close the windscreen slightly
- move the lever "A" in the horizontal position
- close the windscreen by pulling it backwards up the rest position.

• REAR WINDOW OPENING

Rotate the lever (A) to the left, then open the window pushing it forward to the desired position.



• REAR WINDOW CLOSING

Rotate the lever (A) to the right to the automatic stop position.

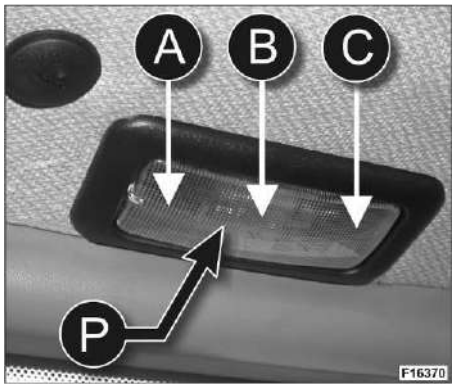
• CAB LIGHT

The cab courtesy light "P" is located in the right upper part of the roof lining.

The light has 3 positions:

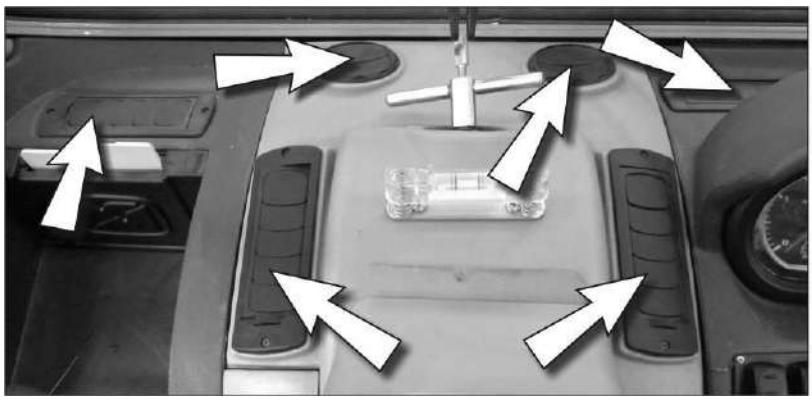
a) left position: light off
b) central position: light off
c) right position: courtesy light on

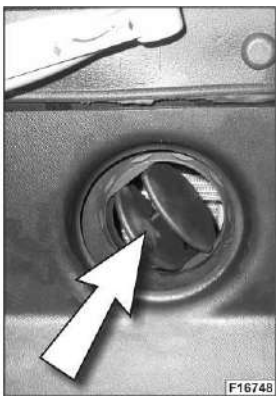
The cab courtesy light can be switched on even when the instrument panel is switched off.



CAB VENTILATION

The cab ventilation is granted by the outlets present on the dashboard and under the seat.
Press to lift fins, then adjust the outlet in the desired position.





STANDARD SEAT

The instructions for the proper use of the driver's seat, described in this paragraph, refer to the standard model mounted on your machine. If your machine is equipped with a seat different from the standard one, please refer to the relevant instructions in the "OPTIONAL EXTRAS" chapter.

SEAT SHIFT (1)
Lift lever "M", slide the seat forwards or backwards to obtain the required position and release the lever.

HEIGHT ADJUSTMENT (2)
Sit on the seat and use knob "I" to adjust to the required height; turn the knob to direction "+" to raise the seat or in direction "-" to lower it.

SUSPENSION ADJUSTMENT (3)
To adjust the seat suspension use handle "A" located at the front side of the seat frame. Sit on the seat and turn the handle until just the right degree of suspension is achieved for one's weight. (direction "R" to tighten the suspension, direction "S" to slacken the suspension)

BACK ADJUSTMENT (4)
Sit with your back firmly against the seat back.
Lift lever "L" upwards to position the back to the required angle.

DOCUMENT HOLDER POCKET (5)
Located behind the seat for holding the machine documentation and small objects.

ATTENTION! It is forbidden and it is extremely dangerous to adjust the driver's seat while the vehicle is moving. Position the driver's seat so that the driver can easily reach the vehicle controls. Always keep the "INSTRUCTION HANDBOOK FOR OPERATING AND MAINTENANCE" in the document holder pocket (5).

SAFETY BELT

Seat correctly in the driving seat and check that the safety belt is not kinked. Fasten correctly the safety belt as shown in the picture.

ADJUSTMENT **LOCKING** **RELEASE**

ATTENTION! Before operating the machine always fasten the seat belt and close the lower part of the door whether machine is stationary or moving.

Adjust the safety belt so that it lays on your hips and not on your stomach.

INSTRUMENT PANEL (C) DESCRIPTION

The instrument panel on your machine shows the following information:

- ANALOGUE TACHOMETER (61)

The analogue tachometer is used to:

- check the engine usage speed
- adjust the engine speed when using the manual lever (86) (see the relevant paragraph)
- allow specialised personnel to perform maintenance operations

- ANALOGUE TACHOMETER (60)

The analogue tachometer is used to check the drive speed on roads.

WARNING!

Always respect current regulations when driving on public roads in the country where your machine is used.

- INDICATOR SHOWING THE TEMPERATURE OF THE ENGINE COOLANT (58)

When using the machine, check the temperature of the engine coolant at regular intervals. If the temperature reaches the upper limit (indicated by a red line and the yellow indicator light ON), you must switch off the engine immediately and wait for it to cool down.

Check the level of the motor coolant too, as explained in the "ROUTINE MAINTENANCE" chapter.

- FUEL LEVEL INDICATOR (59)

This instrument indicates the level of fuel in the tank. When topping up the level, only use the fuel indicated in Standard EN590. For further information, refer to "FUEL AND LUBRICANTS".

- INDICATOR LIGHTS ON THE INSTRUMENT PANEL

The instrument panel contains indicator lights of various colours, that inform the operator:

- when a command is switched ON (green or blue light ON)
- when a device requiring special usage attention has been activated (yellow light ON)
- when an alarm has been activated (red light ON and buzzer sounding continuously)

REF.	DESCRIPTION
44	**Battery recharging** The alternator cannot recharge the battery correctly while the engine is running
45	**Engine oil pressure** Insufficient oil pressure in the engine. This indicator light switches on when the engine is running at more than 1000 rpm and the engine oil pressure is low. In these conditions, stop the engine immediately and top up the oil level. Start the engine again and make sure the indicator light switches off. If the problem persists, contact Merlo Technical Assistance service.
46	**Brake oil level** Insufficient brake oil. Stop the machine and check the reason for the fault. Top up the level with specific oil.
47	**Clogged engine air filter** The engine's air intake filter is clogged. Clean the filter or if necessary replace it
48	**Hydrostatic transmission oil level** Insufficient level of oil in the hydrostatic transmission. Stop the machine and check the reason for the fault. Top up the level with specific oil.
49	**Hydrostatic transmission oil temperature** High temperature of the hydrostatic transmission oil. Stop the machine and check the reason for the fault.
50	**Low-beam lights** Low-beam headlights ON. Comply with the current regulations in the country of use.
51	**High-beam lights** High-beam headlights ON. Comply with the current regulations in the country of use.
52	**Direction indicators** Direction indicators for turning lights, switched on with intermittent signal
53	**Indicator light for glowplug pre-heating** Pre-heating of the glowplugs for cold engine start-up
54	**Front anti-tip-over check** Activation of the front anti-tip-over check, with resulting deactivation of the commands
55	**Crab steering** Crab steering engaged; pay special attention during movements
56	**Chassis side-shift** Shift system not in central position
57	**Parking brake** Activation of the parking brake with the direction selector in neutral position. If the fault signal persists even after you have disengaged the brake, this means the system pressure has fallen below the minimum value (about 18 bar).
87	**Engine fault** Contact Merlo Technical Assistance Service to define the cause of the problem
88	**Differential locking** The differential lock is engaged (available upon request).
93	**Engine coolant temperature** Engine coolant temperature too high. Turn off the engine and wait for it to cool down. Check the coolant level in the expansion small tank.
96	**Tail lights** Tail lights on. Comply with the current regulations in the country of use.
103	**Rear power take-off** (not active on this model)
108	**Fuel reserve indicator light** Low fuel level in the tank. Top it up
132	**Coolant level** The level of the engine coolant is low. Stop the machine and top up the level in the engine cooling system, using the coolant indicated in the engine manual. Once topped up, check the system for any leaks
133	**Water in the diesel oil** Drain the water from the diesel pre-filter as indicated in the chapter “ORDINARY MAINTENANCE” in the section “EVERY 50 HOURS”.
205	**Fault with the direction indicators for agricultural trailers** (available as an option)
206	**Breaking of the extension cable of the telescopic boom** (only for models P40.9 PLUS – P60.10 – P72.10 – P60.10EE – P72.10EE)
207	**Merlo Service signal** (not active on this model)
208	**Malfunctioning of the steering hydraulic system** Lowering of the pressure in the machine's steering system, with subsequent difficulty in steering wheel manoeuvres. If this indicator light comes on while you are driving on a public road, stop immediately and contact the Merlo Technical Assistance Service.

- LCD DISPLAY (62)

When the engine is off, the display (62) is disabled. To set some functions of the LCD display it is necessary to use the (OK) and (C) keys on the control panel (P1). The LCD display provides the operator with the following information:

• gear selected (Ref.1)

The gear currently engaged is displayed in the middle of the LCD display (62). Gear selection is carried out using the gear selector switch (19) beside the steering wheel. For further information see the section "GEAR SELECTOR" in this chapter.

• date and time (Ref.2)

The current time and date is displayed in the top part of the LCD display. To manually set this data, follow the instructions below:

- press the button (C) for about 3 seconds; the time indicator will start to flash. Release the button (C) and then press the button (OK) to adjust the time and date. By briefly pressing the button (OK) the data decreases, while keeping it pressed the data quickly increases until the button is released. To switch to adjusting other information (minutes, day, month, year) press the button (C) and carry out the same adjustment operations.

• partial and total hour counter (Ref.3)

The lower part of the LCD display (62) shows the information of the partial hour counter / total hour counter (separated by a central indicator light in the shape of an hourglass) or the information of the trip odometer /total kilometres odometer (separated by an indicator light showing the lettering "km"). To switch from one adjustment to another just press the button (C).
The partial hour counter shows the number of hours the machine has been used since the last reset. The maximum value that can be displayed is 999.99 hours and then it starts again from 0.0. To reset the partial hour counter press the (OK) button for 3 seconds.

The total hour counter shows the total machine usage hours (the hour counter starts working when the engine is switched on). The maximum value that can be displayed is 999999 hours, after which it will restart from 0.

• partial and total kilometre odometer (Ref.4)

The lower part of the LCD display (62) shows the information of the trip odometer / total kilometres odometer (separated by an indicator light showing the lettering "km") or the information of the partial hour counter / total hour counter (separated by an indicator light in the shape of an hourglass). To switch from one adjustment to another just press the button (C).
The trip odometer indicates the number of kilometres travelled with the machine since the last reset. The maximum value that can be displayed is 999.99 hours and then it will restart from 0.0. To reset the trip odometer press the button (OK) for 3 seconds.

The total kilometres odometer indicates the total kilometres travelled with the machine (the odometer starts to operate after the engine is started). The maximum value that can be displayed is 999999 hours, after which it will restart from 0.

• direction of the gear selected (Ref.5)

The system represents, in a graphic format, the direction of the gear selected (forwards or backwards) and displays it in the display (62) in the following way:

A) forward gear selected
B) reverse gear selected

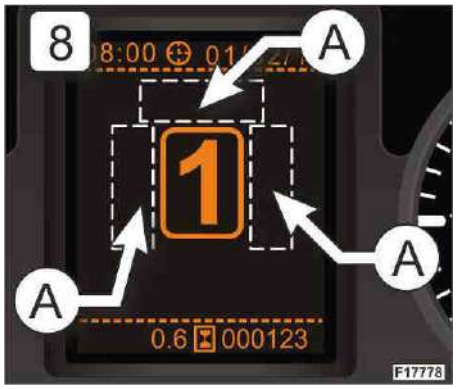
The selection of the gear direction takes place using the specific control lever (20). For further information see the section DIRECTION SELECTOR in this chapter.

• indication of operating faults

Any faults with the machine are signalled to the operator by the lighting up of the relative indicator lights in the specific fields (A) of the LCD display (62).

Some faults also light up, at the same time, the corresponding indicator light at the top of the instrument panel. In this case, follow the instructions in the table of the section "INDICATOR LIGHTS ON THE INSTRUMENT PANEL".

The following table shows all the possible faults that can be signalled:



INDICATOR LIGHT	FAULT DESCRIPTION	IGNITION MODE	AUDIBLE ALARM
	Engine fault Function corresponding to warning light (87)	Steady	No
CAN	**Communication error between control unit and engine** (not active on this model)	Steady	No
	Engine coolant level Function corresponding to warning light (132)	Flashing	Intermittent
	Engine coolant temperature Function corresponding to warning light (93)	Steady	No
	Intercooler system air temperature (not active on this model)	Steady	No
	Hydrostatic transmission oil temperature Function corresponding to warning light (49)	Steady	No
	Hydrostatic transmission oil level Function corresponding to warning light (48)	Steady	No
	Brake oil level Function corresponding to warning light (46)	Steady	No
P	**Parking brake alarm** With the engine running and the parking brake applied, the forward/reverse drive is selected.	Flashing	Intermittent
	Front overturn prevention system control Function corresponding to warning light (54)	Steady	No
	Break in ropes Function corresponding to warning light (206)	Steady	No
	Centring rear axle wheels (on request) The wheels of the rear axle are not centred with the axis of the machine. In this condition, do not drive on public roads. (for additional information, refer to the section “OPTIONAL ATTACHMENTS AND ACCESSORIES”.	Flashing	Intermittent
	Starting the engine or drive direction command inhibited Starting the engine or drive direction command (forward / reverse) are inhibited because no operator is sitting on the seat. Sit correctly to restore operating conditions.	Steady	Intermittent

• display of info messages

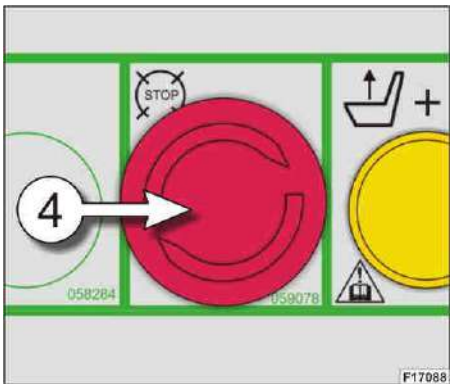
In the event the operator is carrying out an unauthorised manoeuvre, the system indicates this by displaying one or more info message icons in the middle of the display (62) (see photo on the side). When the info message icons appear, the buzzer goes off at the same time, and emits a continuous tone.

The following table shows the info message icons available for your machine, the ways the icons come on and the operations to carry out to resolve the problem.

FAULT DESCRIPTION	ICONS DISPLAYED	PROBLEM SOLVING
It is impossible to start the engine using the direction selector in the forwards or reverse position.	Steady / Flashing	Set the direction selector in the central position (neutral) and then start the diesel engine.
Request for scheduled maintenance.	Steady / Flashing	Request for scheduled machine maintenance. Refer to the information provided in the Operator Manual
It is impossible to move the machine with the parking brake engaged.	Steady / Flashing	Deactivate the parking brake and then place the direction selector in the forwards or reverse position in order to move the machine.
It is impossible to change gear if the direction selector is in the forwards or reverse position. It is impossible to select the driving direction (forwards or reverse) if the operator is not sitting correctly on the driving seat Forward or reverse driving direction selected with the engine OFF and the starter key in position “R” (instrumental panel comes on)	Flashing	To change gear, firstly place the direction selector in the central position (neutral) and then engage the required gear To drive the machine, the operator must sit correctly in the driver's seat (indicator light 90 OFF); Shift the drive direction selector to the central position (neutral).
Emergency button pressed.	Flashing	Release the emergency button by rotating it in the direction of the arrow
Electrical plug of the attachment not connected to the socket on the machine's boom Incorrect position of the 3-position blue command source selector (available together with a platform or radio remote control)	Steady / Steady	Connect the plug from the attachment correctly to the electrical outlet on the telescopic boom of the machine Select the appropriate command source for the attachments installed
Electrical plug of the attachment not connected to the socket on the machine's boom Incorrect position of the 2-position key command source selector (available together with a platform or radio remote control)	Steady / Steady	Connect the plug from the attachment correctly to the electrical outlet on the telescopic boom of the machine Select the appropriate command source for the tool installed
Radio control signal insufficient (available with purchase of a remote control unit)	Steady	Radio field interference or too distant from machine
Control joystick fault (available with purchase of single-lever joystick)	Flashing	Contact Merlo Technical Assistance Service
Machine lock following activation of satellite anti-theft device (available with purchase of optional SATELLITE ANTI-THEFT DEVICE)	Flashing / Steady	Switch off the satellite anti-theft device

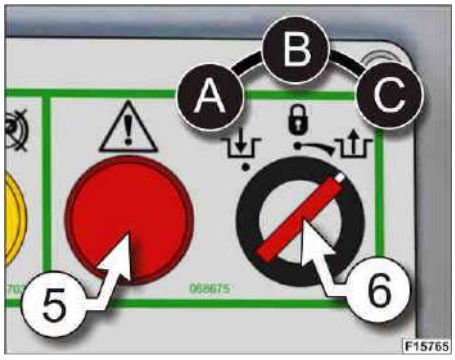
NOTE! To switch off an info-message icon, it is also possible to press the (OK) button on the control panel (P1); in this case, the window is disabled but the problem persists.

CONTROL PANEL (P) DESCRIPTION



• EMERGENCY PUSH BUTTON (4)

These can be used to stop the diesel engine with subsequent disconnection of the controls.
Before starting the engine again, the button has to be reset rotating it in direction of the arrow.



• OPERATING MODE SELECTOR SWITCH (6)

When your machine is delivered to you, the key (6) can be found in the document pocket behind the seat. When using the key, observe the following instructions scrupulously:

A) Movement engagement.

Material or personnel hoisting use. The machine can be used as a lifting equipment (e.g. using forks, fly jib...) and the key must be removed from its location.

B) Running on the road.

Isolation of all hydraulic controls except steering. This prevents accidental control operation whilst driving the machine on the road.

When this operating mode is selected, the system switches off the display (D) in the cab.

C) Emergency movements (command with spring return to position B)

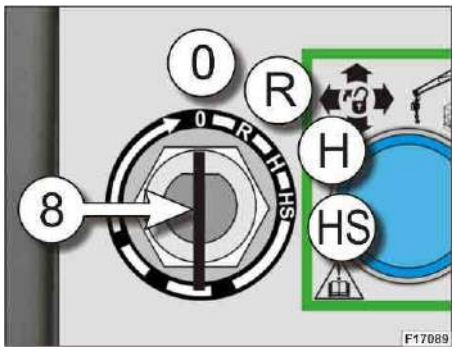
Position "C" of the selector (6) allows you to make all the movements to bring the machine back into acceptable driving conditions in the event of a fault on one of the safety devices.

When emergency movements are being performed, the red indicator light (5) on the "P" command panel flashes while the buzzer is deactivated.

The safety bypass function can be activated in any machine configuration or operating condition

ATTENTION! The correct and safe use of the key described in this paragraph is ultimately the responsibility of the person in charge of the operation (owner, foreman, etc.). Never leave the key inserted, to avoid any improper use during normal operation. The key can only be taken out when the selector (6) is in position "A".

• IGNITION KEY (8)



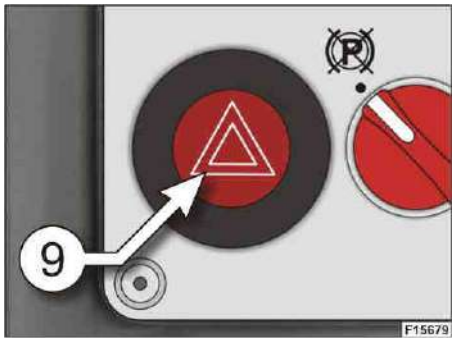
0 = engine off
R = dash board lights on
H = spark plug heating

For models with DEUTZ ENGINE, the management of the glow plugs is automatically managed by the electronic control unit

For models with KUBOTA ENGINE, the management of the glow plugs is controlled manually by the operator with the key (8) in position "H" for about 15 seconds.

HS = engine start

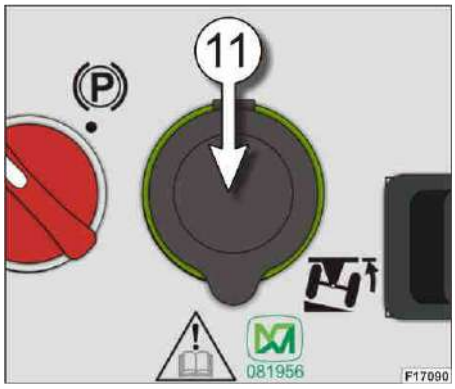
• EMERGENCY LIGHTS (9)



HAZARD WARNING LIGHT SWITCH

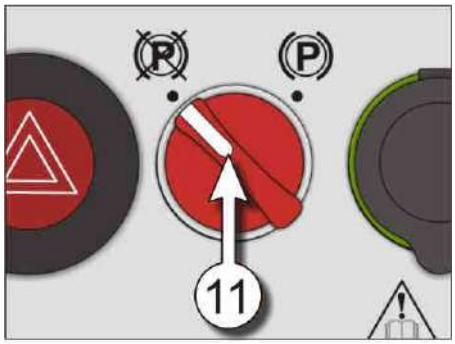
Push the switch to operate the 4 emergency lights (it can be used also with the ignition key in position 0).

• SOCKET FOR PORTABLE LIGHT (11)



The indicated socket (11) can be used to feed a portable light equipped with a normal electric cigarette lighter connection. Use a 12 V and max. 40 W lamp.

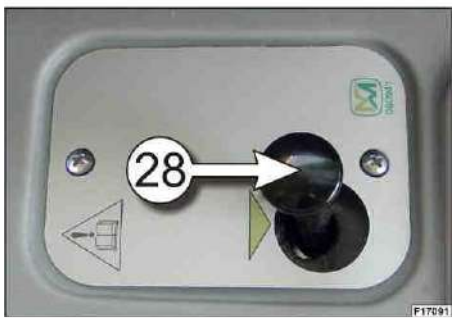
• PARKING BRAKE (37)



With engine running:

- Turn the (37) selector switch towards right to engage parking brake (the selector switch lights)
- Turn the (37) selector switch towards left to release parking brake (the selector switch stops lightening)

Whenever the engine stops, the parking brake remains engaged independently from the selected condition.
The emergency pump (28) must be used only to release the parking brake before towing the vehicle.



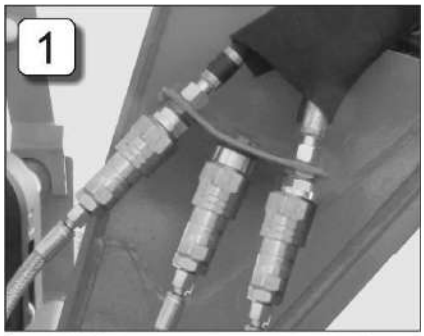
WARNING!

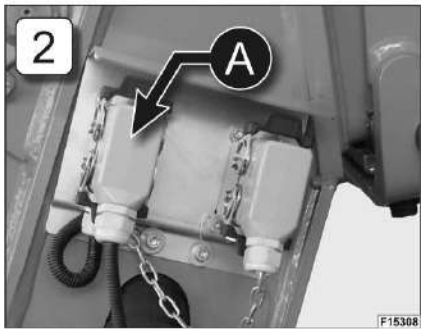
The machine is fitted with a system which activates the intermittent sound alarm when, while the parking brake (37) is applied, the drive direction selector (20) is activated.

LOAD LIMITER FOR LIFTING ATTACHMENTS (43)

(valid for models P37.12PLUS - P38.12PLUS - P38.13PLUS - P38.14PLUS - P40.9PLUS - P40.17PLUS - P60.10 - P72.10)

Lifting attachments (fitted with a hook) having a lower maximum capacity than the capacity of the machine are fitted with a load limiting system designed to protect the attachment when performing lifts/hoists with the machine boom.





Below are listed several types of attachments fitted with a load limiter:

- fly jib with hook, fly jib with winch (max. capacity 600kg or 1500kg)
- winch on LIFT BOX platform
- lifting boom, telescopic lifting boom
- etc, etc…

• PREPARING THE MACHINE FOR USE WITH THE LOAD LIMITER

- hook up the attachment to the machine platform
- connect any hydraulic hoses (Fig.1)
- connect the electrical connection from the attachment to socket "A" on the head of the boom (Fig.2) (see paragraph "QUICK-COUPLING ATTACHMENTS" in the "ATTACHMENTS" Section)

The machine is ready for operation.

• ACTIVATING THE LOAD LIMITER

The load limiting device is set off when the load lifted exceeds the maximum load capacity of the attachment. In this case, the system blocks all machine controls and activates the following indicators:

- indicator light in button (43) on the control panel (Fig. 3)
- green-yellow-red indicators on the graphic LED bar (210) (Fig. 4)
- red indicator (219) of the dynamic load chart (Fig. 4)

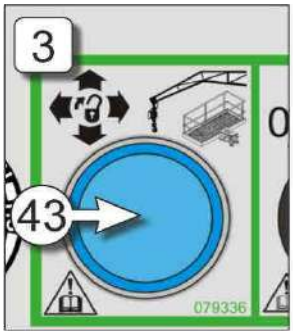
In this case, the operator must perform the movements that do not worsen the overload on the attachment, as they are required to restore safe working conditions (indicator light 43) OFF and green indicators (210-219).. To do so, proceed as follows:

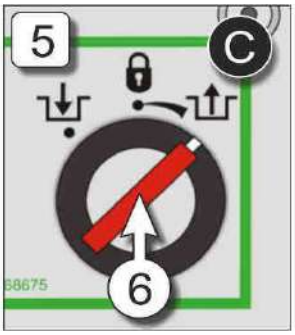
- press and hold down the button (43)
- use the joystick (1) in the cab to perform movements that do not worsen the overload on the attachment, until safe working conditions are restored

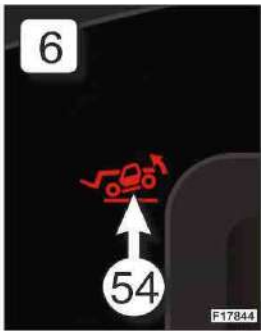
If, during these manoeuvres, the operator performs a movement that worsens the overload on the attachment, the system blocks machine controls again, indicators (210 and 219) are red and after 5 seconds the indicator light in button (43) also comes ON again. To reset controls and restore the machine to safe working conditions, repeat the operations described above. The system envisages a maximum of 3 attempts to reset safe operating conditions. If, after the third attempt, an overload situation affecting the attachment occurs again, the system will block the machine controls and activate:

- Indicator light (54) on instrument panel (C) (Fig.5)
- green-yellow-red indicators on the graphic LED bar (210) (Fig. 4)
- red indicator (219) of the dynamic load chart (Fig. 4)

In this condition, turn the operating mode selector switch key (6) to position "C" (emergency movements), then slowly and carefully make the necessary movements to make the load transportable (for further information, refer to the "WORKING MODE SELECTOR" and "FRONT OVERTURN PREVENTION CONTROL" paragraphs in the "CONTROLS AND INSTRUMENTS"). (Fig.6)





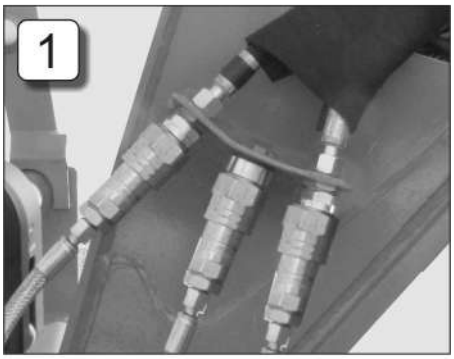


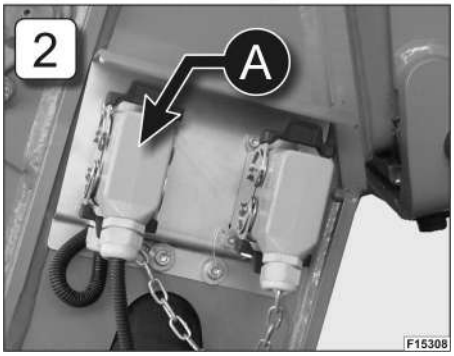
LOAD LIMITER FOR LIFTING ATTACHMENTS (43)

(valid for models P38.12 – P38.13 – P38.14 – P40.17 – P38.13EE – P40.17EE – P60.10EE – P72.10EE)

Lifting attachments (fitted with a hook) having a lower maximum capacity than the capacity of the machine are fitted with a load limiting system designed to protect the attachment when performing lifts/hoists with the machine boom.
Below are listed several types of attachments fitted with a load limiter:

- fly jib with hook, fly jib with winch (max. capacity 600kg or 1500kg)
- winch on LIFT BOX platform
- lifting boom, telescopic lifting boom
- etc, etc…





• PREPARING THE MACHINE FOR USE WITH THE LOAD LIMITER

- hook up the attachment to the machine platform
- connect any hydraulic hoses (Fig.1)
- connect the electrical connection from the attachment to socket "A" on the head of the boom (Fig.2) (see paragraph "QUICK-COUPLING ATTACHMENTS" in the "ATTACHMENTS" Section)

The machine is ready for operation.

• ACTIVATING THE LOAD LIMITER

The load limiting device is set off when the load lifted exceeds the maximum load capacity of the attachment. In this case, the system blocks all machine controls and activates the following indicators:

- indicator light in button (43) on the control panel (Fig. 3)
- the acoustic alarm in the cab

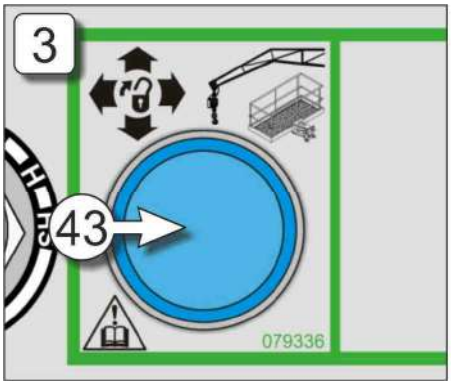
In this case, the operator must perform the movements not aggravating the overload of the attachment needed to restore the safe operating conditions, in the following manner:

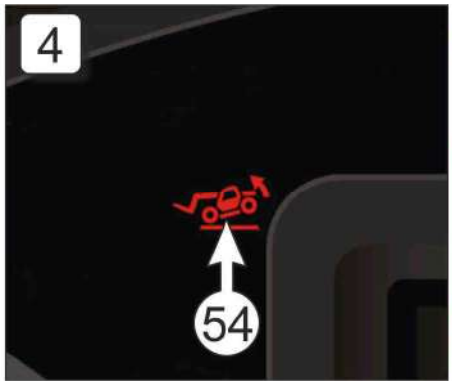
- press and hold down the button (43)
- use the joystick (1) in the cab to perform movements that do not worsen the overload on the attachment, until safe working conditions are restored

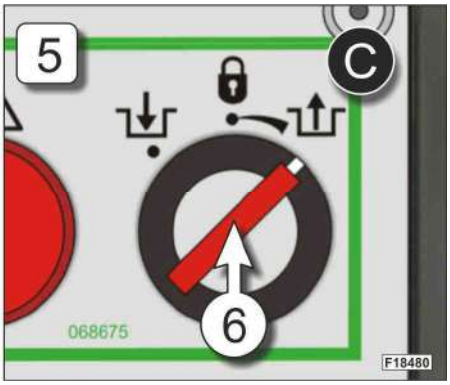
In the event that, during these manoeuvres, the operator performs a movement aggravating the overload of the attachment, the system blocks the controls of the machine again and the lamp inside the button (43) lights again after 5 seconds. To reset controls and restore the machine to safe working conditions, repeat the operations described above.
The system envisages a maximum of 3 attempts to reset safe operating conditions. If, after the third attempt, an overload situation affecting the attachment occurs again, the system will block the machine controls and activate:

- Indicator light (54) on instrument panel (C) (Fig.4)
- the acoustic alarm in the cab

In this condition, turn the operating mode selector switch key (6) to position "C" (emergency movements), then slowly and carefully make the necessary movements to make the load transportable (for further information, refer to the "WORKING MODE SELECTOR" and "FRONT OVERTURN PREVENTION CONTROL" paragraphs in the "CONTROLS AND INSTRUMENTS"). (Fig.5)



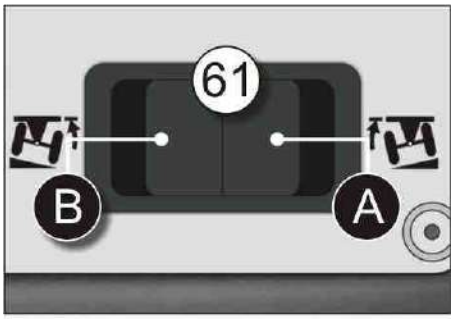


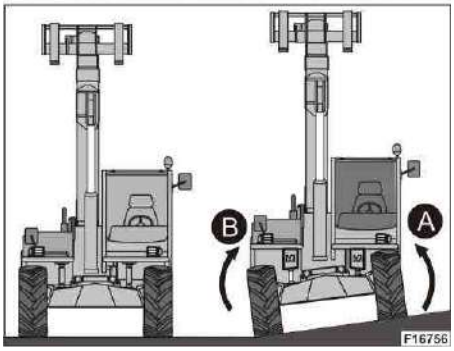


• CROSSWAYS TILT CORRECTOR COMMAND (61)

ROCKER SWITCH (61)

A = clockwise chassis levelling
B = anticlockwise chassis levelling





WARNING!

Make sure that machine is correctly levelled before attempting any lifting operations.

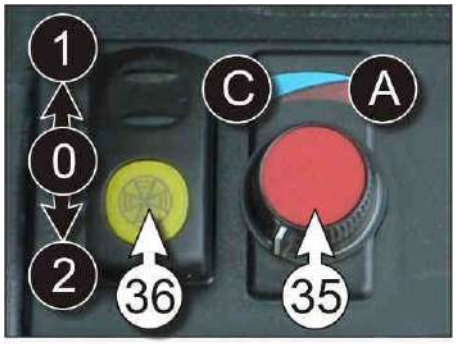
Load handling on uneven surfaces is permitted by using frame levelling device to level the machine chassis to the proper position. Check correct levelling using the spirit level in the cab.

If the machine boom is raised beyond the safety limit, operating the crossways tilt corrector is prevented by a specific device.

DESCRIPTION OF THE COMMAND PANEL (P1)

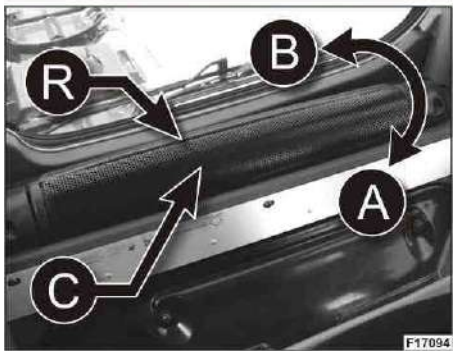
• HEATING (35)

COCK (REF. 35)
A = maximum temperature
C = minimum temperature



CAB FAN SWITCH (REF. 36)

0 fan OFF
1 fan activated at first speed
2 fan activated at second speed



WARNING! Do not leave any objects behind the seat as they could obstruct the ventilation system air inlet.

SELECTION OF THE AIR SUCTION FROM INSIDE/OUTSIDE THE CAB

To select the air suction mode, use the relevant reference control "R" located behind the seat, as follows:

- lever in position "A" (air intake grill "C" not visible): air suction from the outside of the cab
- lever in position "B" (air intake grill "C" visible): air suction from the inside of the cab (recirculation)

• FLASHLIGHT ON ROOF (33)

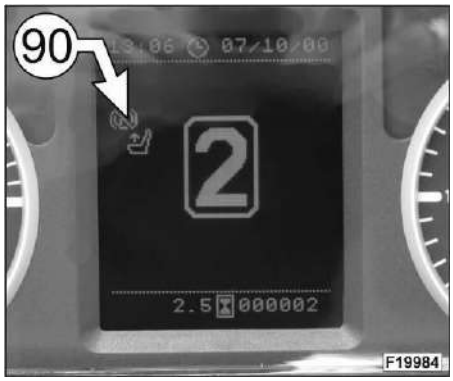
Press the switch (33) to activate the rotary flashlight on the cab roof.

For the use of the flashlight, respect the regulations for road use given in "COMMAND STICKERS - LEAFLETS IN THE CAB".

HYDROSTATIC TRANSMISSION LOCK (90)

If the operator decides to leave the driving can with the engine ON and the parking brake not engaged, the machine automatically set a safe mode by locking the hydrostatic transmission.

In order to resume using the hydrostatic transmission for machine forward / reverse manoeuvres, the operator must sit correctly on the seat in the cab.
If the operator decides to leave the driving can with the engine ON and the direction selector (20) in position "F" or "R", the hydrostatic transmission is reset by placing the selector switch (20) in neutral position "N" and then in the position for the required direction.
If the operator forgets to engage the parking brake before leaving the machine, a flashing yellow signal (90) warns this non-conforming use situation.



NOTE! Correct and safe use of the machine requires the following steps before leaving the driving cab:

• place the gear selector (19) in the neutral position "N"

- place the direction selector (20) in neutral position "N"

• engage the parking brake (37)

- switch off the machine's diesel engine

- leave the driving cab and close the cab door

The automatic lock of the hydrostatic transmission described in this paragraph must be considered as an exceptional case and not a routine procedure.

DYNAMIC LOAD CONTROL SYSTEM (M-CDC)

(only for models P37.12PLUS – P38.12PLUS – P38.13PLUS – P38.14PLUS – P40.9PLUS – P40.17PLUS – P60.10 – P72.10)

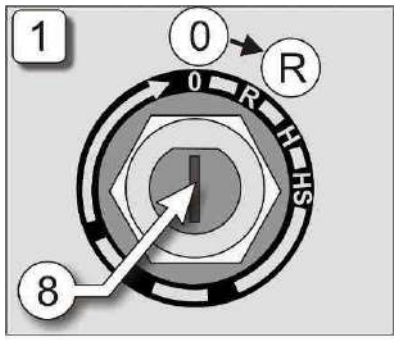
• INTRODUCTION

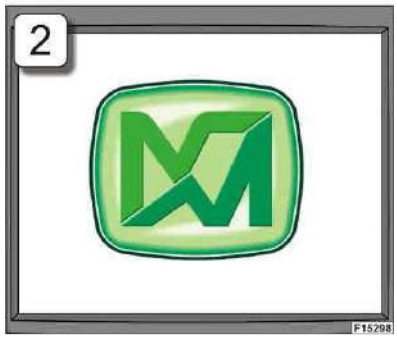
The dynamic load control system constantly checks the longitudinal stability of your machine in relation to the load lifted on the carriage, the position of the telescopic boom and the attachments installed in order always to ensure maximum machine operating safety for the operator.

The following paragraphs provide all the instructions for correct operation of the dynamic load control system installed on your machine. Inasmuch, pay very close attention to this information before using the machine.

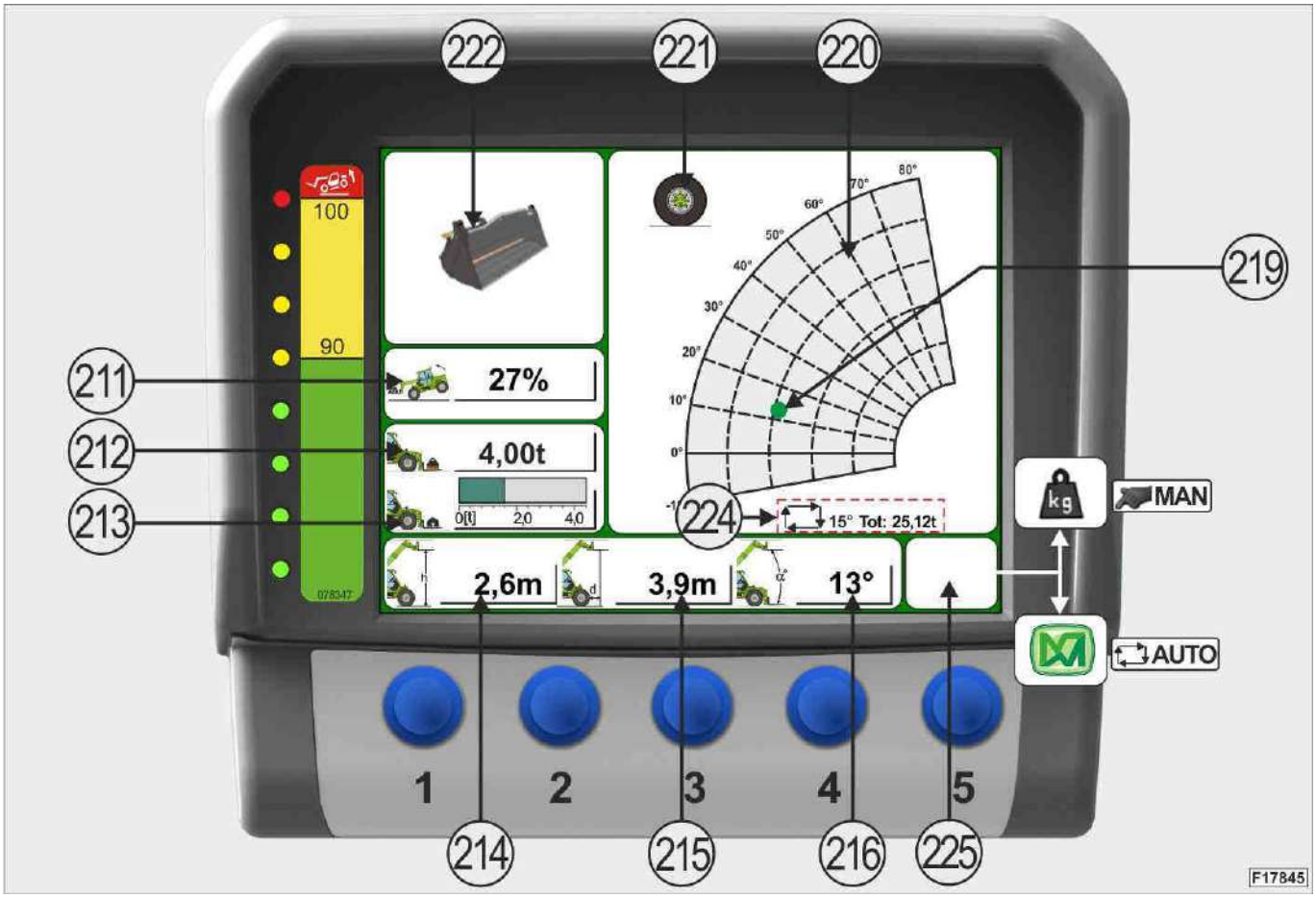
• DISPLAY NOMENCLATURE (D)

When the instrument panel is switched on (starter key (8) in position "R") (FIg.1), the system displays a screen for 3 seconds with the MERLO logo (Fig.2) and then automatically opens the main screen.



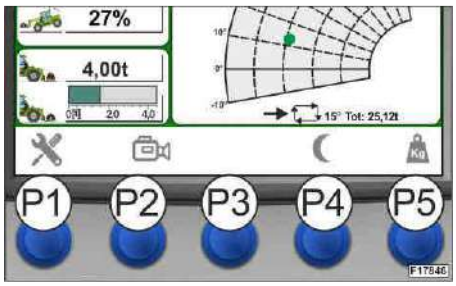


The main screen displays the following information:



REF.	DESCRIPTION
211	Percentage longitudinal stability limit
212	Maximum liftable load, in the point where the telescopic boom is located, in relation to the attachment
213	Graphics bar indicating the load effectively lifted in relation to the attachment mounted
214	Height of load from ground (in metres)
215	Distance of load from external limit of tyres (or stabilisers, if present) (in metres)
216	Telescopic boom lifting angle (in degrees)
219	Colour indicator (green – yellow – red) of the position of the lifted load on the carriage
220	Machine load chart in relation to the attachment mounted (auto-identification) or the position of selector switch (204) (manual identification)
221	Indication when operating the machine on tyres
222	Image of attachment mounted and auto-identified by the system
224	Weighing information: operating mode, lifting angle set, total weight
225	In MAN WEIGHING mode: Manual weighing – In AUTO WEIGHING mode: No command

• ACTIVATING THE COMMAND SELECTION GRAPHIC BAR



The display (D) of the load control system is equipped with a disappearing graphics bar which shows the functions of command buttons P1 - P2 - P3 - P4 - P5. Activation of this graphic bar is regulated by weighing mode selection:

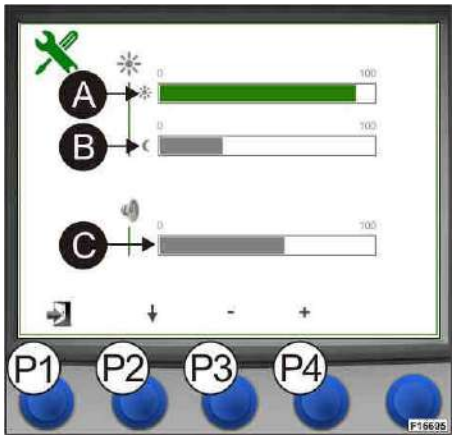
1) In "AUTO WEIGHING" mode (see paragraph WEIGHING SCREEN), on pressing one of the 5 selection buttons (P1 - P2 - P3 - P4 - P5), the system activates the graphic bar in the lower part of the display (D) which shows the functions which can be performed. At this stage, the operator has 5 seconds of time to press the button for the function intended to be performed. If no selection button is pressed within 5 seconds, the system de-activates the graphic bar.

2) In "MAN WEIGHING" mode (see paragraph WEIGHING SCREEN), on pressing one of the 4 selection buttons (P1 - P2 - P3 - P4), the system activates the graphic bar in the lower part of the display (D) which shows the functions which can be performed. At this stage, the operator has 5 seconds of time to press the button for the function intended to be performed. If no selection button is pressed within 5 seconds, the system de-activates the graphic bar.
Pressing button P5 does not activate the graphic bar but weights the lifted load (see paragraph MANUAL WEIGHING (E)

The functions offered by the selection buttons are:

(P1): press button (P1) to activate the display set-up menu (D) where day/night brightness and speaker volume can be adjusted.
(P2): press button (P2) to activate the telecamera installed on the machine (optional on request). Every time button (P2) is pressed, the system cycles through all telecameras that may be mounted on the machine (check whether your machine is fitted with optional telecameras)
(P3): this button has no machine function
(P4): press button (P4) to activate display (D) day/night brightness modes
(P5): press button (P5) to activate the weighing screen (for additional information, refer to the instructions in paragraph "WEIGHING SCREEN").

• DISPLAY SET-UP (BUTTON P1)



To adjust the brightness of the display (D) (in day and night modes) and speaker volume, perform the following operations:

- activate the menu graphic bar
- press button (P1); the brightness and volume adjustment screen opens
- press button (P2) to select the graphic bar for the setting to be modified (in sequence: day brightness (A), night brightness (B) , volume (C)
- press buttons (P3) and (P4) to set the required brightness and volume values la adjustment from min. 0 to max. 100)

To leave the display set-up screen (D), press button (P1).

• TELECAMERA SELECTION (BUTTON P2)

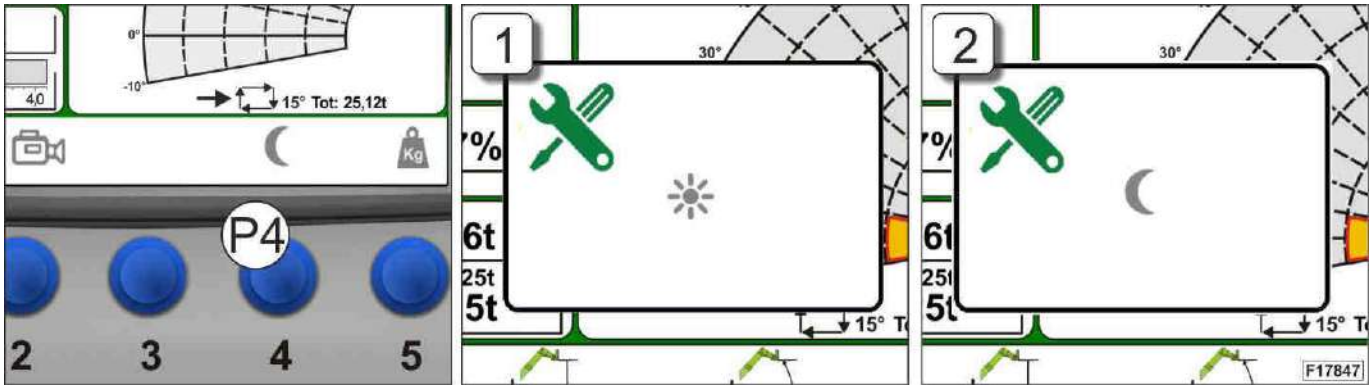
To see images from the telecameras installed on the machine on the display screen (D) (optional on request), perform the following operations:

- activate the menu graphic bar
- press button (P2); the system activates display on CHANNEL 1. Press button (P2) again to go to CHANNEL 2.
- press button (P1) to return to the main screen

• DISPLAY DAY/NIGHT BRIGHTNESS MODE SELECTION (BUTTON P4)

To set day or night display (D) brightness mode, perform the following operations:

- activate the menu graphic bar
- press button (P4) to switch between day and night brightness mode for the display (D). The system signals the operator that the setting has been made by showing window "1" (day mode) or "2" (night mode) in the middle of the display (D).



• WEIGHING SCREEN (BUTTON P5)

From the main screen, activate the menu's graphic bar and then press button (P5) to access the weighing screen. This screen indicates the following information:

REF.	DESCRIPTION
A	Net weight lifted by the attachment mounted on the carriage (in tonnes)
B	Table summarising the last 20 weighing operations stored indicating total lifted weight
C	Cancel all stored weighing operations. The total weight is reset.
D	Attachment tare
E	Manual weighing
F	Selecting the weighing mode: automatic or manual
G	Modifying the weights stored in table “B”
P1	Weighing screen exit button and return to main screen
P2	Weighing menu scroll button
P3	Confirm button for menu item selected
P4	Automatic weighing angle decrease button
P5	Automatic weighing angle increase button

1) INDICATIONS FOR WEIGHING A LOAD

To perform the most precise weighing operations possible, proceed as follows:

1) the machine must be placed on firm, level ground
2) the machine must be at a standstill with the wheels aligned with the chassis
3) the telescopic boom must be completely withdrawn and in a horizontal position
4) the carriage must be in a vertical position
5) the MANUAL WEIGHING mode is recommended

Under these conditions, the indicative load readout tolerance is about ±5% of maximum rated load.
The weight of the lifted load is merely indicative for the operator and has no fiscal and/or certified weighing value.

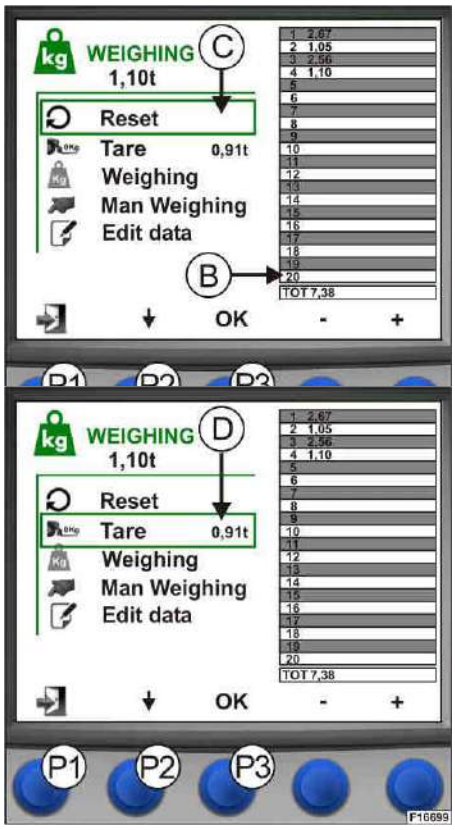
The various functions of the weighing system are described below in this paragraph.

2) RESET (C)

The reset command is used to cancel all weighing operations stored in table "B". When all partial weights are cancelled, the total weight is also cancelled.

The reset command is performed from the weighing screen using the button (P2), selecting "RESET" and then confirming by pressing the button (P3).
The total weighing value is also given in the main screen in field (224). The RESET command also resets the value of field (224).

Press button (P1) to return to the main screen



3) TARE (D)

This command is used to calculate the tare of the weighing system. In this way, it will then be possible to display in field (A) only the weight of the load lifted, net of the weight of the attachment.

The tare command is performed from the weighing screen using the button (P2), selecting "TARE" and then confirming by pressing the button (P3). At this stage, the weight detected (in tonnes) is indicated next to the wording TARE.

Press button (P1) to return to the main screen

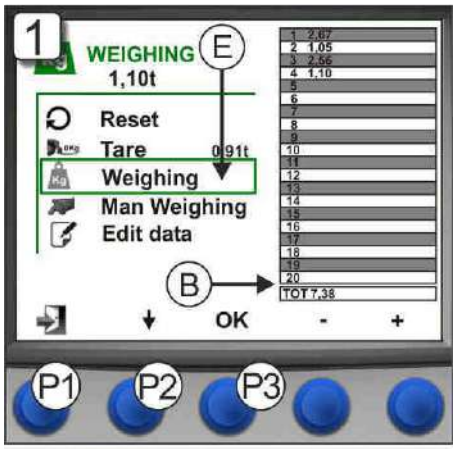
4) MANUAL WEIGHING (E)

Use this command to weigh the load lifted by the attachment manually. The data measured by the system is displayed in Table "B" starting from box n. 1 through to box n. 20. When there are more than 20 weighing operations, all values scroll upwards and more recent figures will always be displayed at the bottom of the table. The total shown at the bottom of Table "B" is always the sum of all weighing operations, including those that are off-screen.

The manual weighing command is performed from the weighing screen using the button (P2), selecting "WEIGHING" and then confirming by pressing the button (P3). Audible confirmation is given that the weight has been read and the system stores the result in Table "B".
To obtain the sum of all weighing operations performed, refer to the figure next to the wording "TOT" at the bottom of the table; this total increases up to a maximum of 9999,99 t. (Fig.1)

Press button (P1) to return to the main screen

It is also possible to perform a manual weighing operation even from the main screen by pressing the OK button (P5); audible confirmation is given that the weight has been read and the system stores the result. The main screen also has the total for weighing operations performed and the value is given underneath the load graph in field (224). Manual readout of weight from the main screen can only be performed if "MAN WEIGHING" was previously selected in the weighing screen. (Fig.2)



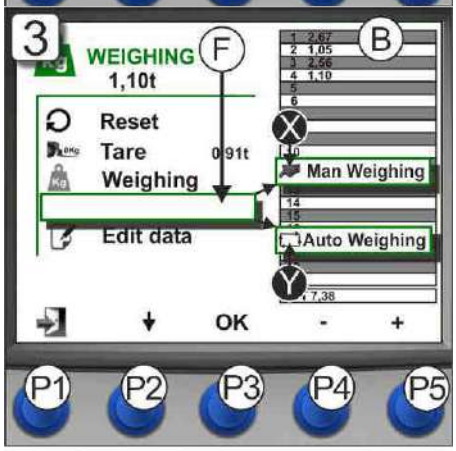
5) WEIGHING MODE (F)

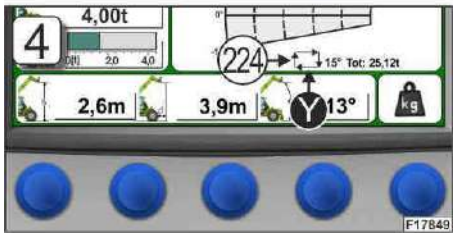
This command is used to set the weighing readout mode:

1) MANUAL
2) AUTOMATIC

If manual weighing is set, the symbol "X" and the item "MAN WEIGHING" appears; if automatic mode is set, the symbol "Y" and the item "AUTO WEIGHING" appears. To perform manual weighing, refer to the instructions provided in the previous item (MANUAL WEIGHING "E").while for automatic weighing refer to the following instructions.

Move around the weighing screen using button (P2) and select the item "AUTO WEIGHING"; then press button (P3) to confirm. It is now possible to set a lifting angle for the telescopic boom beyond which the system automatically performs a weighing operation. This angle must be set using buttons (P4, decrease) and (P5, increase) and must be between 0° and 70°. Having set these functions, press button (P1) and return to the MAIN MENU since automatic weighing does not work in the WEIGHING MENU. (Fig.3)



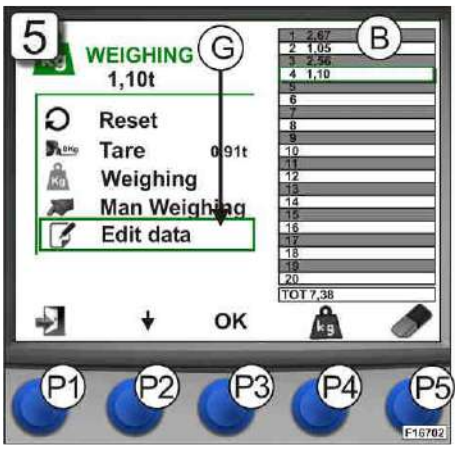


In order to confirm that the system has been set correctly in automatic mode, the main screen displays in field (224) the symbol "Y" and the value (in degrees) of the angle chosen.
In this condition, every time the telescopic boom is lifted beyond this angle, the system automatically weighs the load (with audible signal) and stores the value in Table "B". The sum of weighing operations is always given in the main screen, under the load chart next to the wording "TOT". (Fig.4)

To perform a new automatic weighing operation, lower the telescopic boom by 5° less than the value of the angle set beforehand; if this is not the case, when the telescopic boom is lifted again, the system will not perform an automatic weighing operation.

6) MODIFYING WEIGHTS (G)

If one or more weights stored in Table "B" have to be modified or cancelled, this can be done using the modification function on the WEIGHING SCREEN. To do this, move around the weighing screen using button (P2) and select the item "EDIT DATA"; then press button (P3) to confirm. At this stage, the manual weighing and eraser symbols respectively under buttons (P4) and (P5).
To select the weighing to be modified, press button (P2) until the desired weighing operation is highlighted (flashing) and then press button (P4) to repeat a manual weighing or button (P5) to cancel the weighing. (Fig.5). Press the button (P3) to confirm the selection.
Press button (P1) to return to the main screen



• SELECTOR SWITCH FOR TYPE OF ATTACHMENT MOUNTED ON THE CARRIAGE

The machine is fitted with a selector switch (204) with 4 stable positions allowing the operator to set (manually or automatically) the type of attachment mounted on the carriage in order to define the appropriate capacity chart for the machine + attachment set-up.

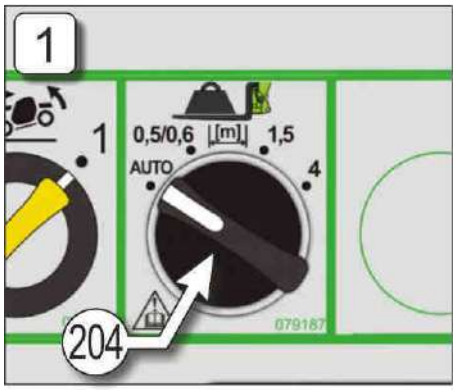
The 4 positions of the selector switch (204) for the type of attachment installed on the carriage are (Fig.1):

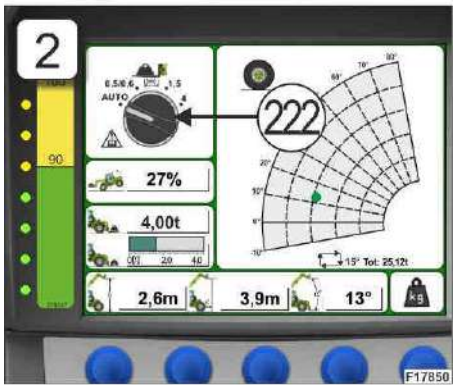
a) AUTO: auto-identification of the attachment installed
b) 0.5/0.6: attachments with a centre of gravity of the lifted load at 0.5 / 0.6 metres from the carriage
c) 1.5: attachments with a centre of gravity of the lifted load at 1.5 metres from the carriage
d) 4: attachments with a centre of gravity of the lifted load at 4 metres from the carriage

A graphic depiction of the selector switch (204) is also provided on the display (D) in the cab in field (222) (Fig.2) and is displayed when:

- there is no attachment mounted on the carriage.
- the attachment mounted on the carriage is not identified.
- there is a fault or problem with the auto-identification system for an attachment mounted on the carriage

When an attachment is installed and identified on the carriage and the system is functioning correctly, the graphic depiction of the selector switch (204) in field (220) shows the symbol of the attachment installed (see below in this paragraph)





For a better understanding of the functional modes of the selector switch (204), refer to the following instructions:

• AUTO-IDENTIFICATION OF AN ATTACHMENT (selector switch (204) positioned on AUTO)

When an attachment fitted with an auto-identification sensor is installed on the carriage, the selector switch (204) must be placed in the "AUTO" position; in this case, the system automatically calculates the work chart for the machine + attachment combination to define the correct index of stability, maximum capacity and the safe working area. At this stage, field (222) displays the graphic icon of the attachment detected (in this instance a loader) (Fig.3).

When, on the other hand, the carriage has an attachment with an auto-identification sensor but the selector (204) is not turned to the "AUTO" position, the following are activated:

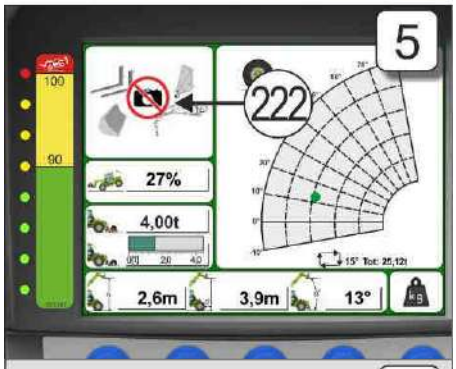
- the red indicator of the led graphic bar (210)
- the red indicator (219) of the load position on the dynamic diagram
- the indicator light (54) on the instrument panel (C)
- the buzzer in the cab

In this case, the system immediately locks the machine's controls and centre of the display (D) displays the window "X" with the instruction to turn the selector (204) to the "AUTO" position (Fig. 4);

WARNING!

The equipment self-identification system is deactivated if the operating mode selector switch (6) is on "B" position (moving on a road). In this case turn the selector (6) to position "A" (movements enabled).

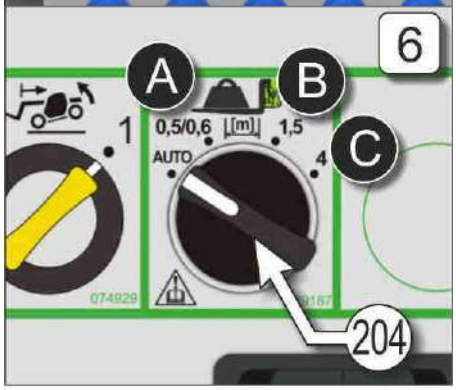
If the auto-identification system works correctly but there is no graphic depiction of the attachment installed on the carriage, the machine signals this status with the symbol in field (222) of the display (D) in the cab (Fig.5).



For a better understanding of the attachment auto-identification and manual selection system, a table is provided with all the icons used in field (222) of display (D) and their description.

• MANUAL ATTACHMENT SELECTION (selector switch (204) positioned on 0.5/0.6 or 1.5 or 4)

When an attachment is mounted on the machine's carriage that is not fitted with an auto-identification sensor or when the system has an operating problem or fault, the type of equipment must be defined manually using the selector switch (204) as follows (FIg.6):

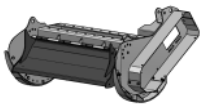
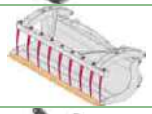


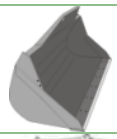
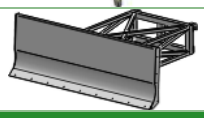
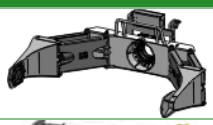
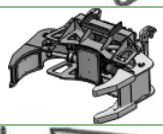
- place the selector switch (204) in position "A" (0.5/0.6) when fitting an attachment with a centre of gravity at 0.5 - 0.6 metres in front of the carriage
- place the selector switch (204) in position "B" (1.5) when fitting an attachment with a centre of gravity within 1.5 metres in front of the carriage
- place the selector switch (204) in position "C" (4) when fitting an attachment with a centre of gravity within 4 metres in front of the carriage

In this way, the machine is set up to receive the selected attachment in relation to its type, defining the work chart and calculating the correct index of stability, maximum capacity and the safe working area. Field (222) shows the icon of the position of the selector switch (204) (Fig.7)

If the selector switch (204) is set to AUTO and an attachment is mounted on the machine's carriage that is not fitted with an auto-identification sensor or when the system has an operating problem or fault, the system automatically activates the work chart in position "C" (load centre of gravity at 4 metres from the locator on the carriage).

SYMBOL SHOWN IN FIELD (222)	DESCRIPTION

	The attachment installed on your machine was correctly identified by the system, but the corresponding image is not available in the database. Make sure that selector (204) is turned to the AUTO position
	The attachment installed on your machine is either not equipped with a self-identification sensor, or it was not automatically identified by the system due to a system failure or malfunctioning. Manual selection of the type of attachment installed with selector (204) was necessary. When selector switch (204) is in the AUTO position, mode “C” of the load chart is active, referring to attachments whose centre of gravity is 4 metres ahead of the carriage.
	The attachment installed on your machine is either not equipped with a self-identification sensor, or it was not automatically identified by the system due to a system failure or malfunctioning. Manual selection of the type of attachment installed with selector (204) was necessary. When selector switch (204) is in the 0.5/0.6 position, mode “A” of the load chart is active, referring to attachments whose centre of gravity is between 0.5 and 0.6 metres ahead of the carriage.
	The attachment installed on your machine is either not equipped with a self-identification sensor, or it was not automatically identified by the system due to a system failure or malfunctioning. Manual selection of the type of attachment installed with selector (204) was necessary. When selector switch (204) is in the 1.5 position, mode “B” of the load chart is active, referring to attachments whose centre of gravity is no more than 1.5 metres ahead of the carriage.
	The attachment installed on your machine is either not equipped with a self-identification sensor, or it was not automatically identified by the system due to a system failure or malfunctioning. Manual selection of the type of attachment installed with selector (204) was necessary. When selector switch (204) is in position 4, mode “C” of the load chart is active, referring to attachments whose centre of gravity is no more than 4 metres ahead of the carriage.
Attachments whose centre of load gravity is 0.5/0.6 metres from the machine carriage (position “A” of selector 204)	
	The TRAVELLING LIFT ON CARRIAGE - SIDE-SWINGING CARRIAGE / CARRIAGE WITH FLOATING FORKS - FEM CARRIAGE / EXTRA-LARGE FORK CARRIAGE attachment, installed on the machine, was correctly identified by the system.
	The BRICK HANDLER attachment installed on the machine was correctly identified by the system.
	The CHOPPER attachment installed on the machine was correctly identified by the system.
	The HAY BALE HANDLER WITH GRABS / 2/3 FOLDING-SPIKE FORK FOR HAY BALES / HAY BALE FORK WITH SLIDING PROTECTION attachment, installed on the machine, was correctly identified by the system.
	The MANURE FORK WITH GRABS attachment installed on the machine was correctly identified by the system.
	The CARRIAGE-MOUNTED HOOK attachment installed on the machine was correctly identified by the system.
	The 4 IN 1 BUCKET attachment installed on the machine was correctly identified by the system.
	The MULTI-PURPOSE LOADER WITH CLAW attachment installed on the machine was correctly identified by the system.
	The DOUBLE LOG GRABS attachment installed on the machine was correctly identified by the system.

	The BULK LOADER / REHANDLING BUCKET / DIGGING BUCKET attachment, installed on the machine, was correctly identified by the system.
	The CARRIAGE-MOUNTED WINCH attachment installed on the machine was correctly identified by the system.
	The PUSHING BLADE attachment installed on the machine was correctly identified by the system.
Attachments whose centre of load gravity is 1.5 metres from the machine carriage (position “B” of selector switch 204)	
	The WHEEL JOYSTICK attachment installed on the machine was correctly identified by the system.
	The MIXING BUCKET attachment installed on the machine was correctly identified by the system.
	The ROUND-BALE HANDLER attachment installed on the machine was correctly identified by the system.
	The FRONT CLAMPS attachment installed on the machine was correctly identified by the system.
	The LOWERED LIFTING BOOM / TELESCOPIC LIFTING BOOM attachment, installed on the machine, was correctly identified by the system.
	The FLY JIB / FLY JIB WITH WINCH attachment, installed on the machine, was correctly identified by the system.
Attachments whose centre of load gravity is 4 metres from the machine carriage (position “C” of selector 204)	
	The MINI TOWER JIB attachment installed on the machine was correctly identified by the system.
	The TUNNEL RIB HANDLER attachment installed on the machine was correctly identified by the system.
Attachments that cannot be used with the dynamic load control system in the event of malfunctioning, faults or absence of the self-recognition sensor.	
	The SLEWING HOIST attachment installed on the machine was correctly identified by the system.
	The COUNTER-CARRIAGE MOUNTED HOIST attachment installed on the machine was correctly identified by the system.
	The FIXED PLATFORM / TRILATERAL PLATFORM / TRILATERAL EXTENSIBLE PLATFORM attachment, installed on the machine, was correctly identified by the system.
	The PANEL HANDLING PLATFORM attachment installed on the machine was correctly identified by the system.
	The SPACE 11 attachment installed on the machine was correctly identified by the system.

• FRONT ANTI-TIP-OVER CONTROL

The front anti-tip-over control device steps in when the machine is close to its longitudinal stability limit, and locks all aggravating movements.
During handling operations, the system automatically detects and processes the position of the lifted load and the machine's stability percentage. These values are shown on the display D) in the cab in 3 different ways:

- icon of the lifting position (indicator (219) green - yellow - red)
- led icon of the machine's stability condition indicator (210) (green - yellow - red)
- percentage icon (211) of the longitudinal stability limit

The number displayed at point (211) refers to 3 stability conditions:

• 0%-90% (Fig.1)

- machine stable and no movement block
- indicator (219) is green
- graphic bar (210) has green LEDs on

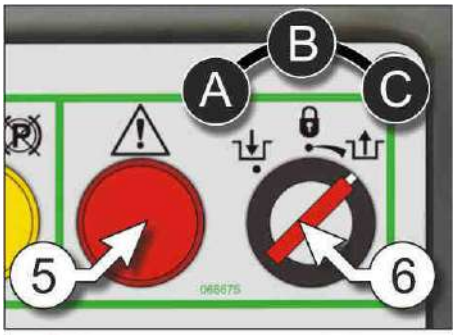
• 90%-100% (Fig.2)

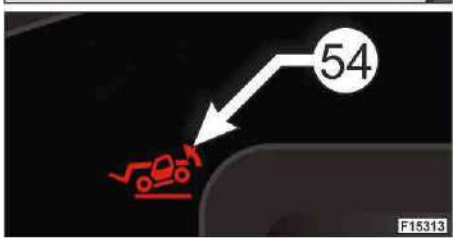
- close to the longitudinal stability limit and no movement block
- indicator (219) on load chart is yellow
- graphic bar (210) has yellow LEDs on
- buzzer sounds intermittently in cabin. The sound becomes more frequent as it reaches 100% (red zone)

• over 100% (Fig.3)

- longitudinal stability limit reached with consequent block of movements that may worsen the condition
- instrument panel warning light (54) comes ON
- indicator (219) on load chart is red
- graphic bar (210) has red LED on
- buzzer in the cab sounds continuously

To restore safe machine operating conditions (indicator (219) and led graphic bar (210) - green), the telescopic boom must be retracted.
If either it's not possible to retract the telescopic boom or this manoeuvre is not sufficient to restore safe operating conditions for your machine, turn operating mode selector (6) to the "C" position and hold it in that position. Then proceed slowly and very cautiously with non-aggravating manoeuvres until safe operating conditions are restored (both warning light 54 and audible alarm in the cab are off; indicator light (219) and graphic bar (210) - green).





WARNING!

Before working with the machine, test the warning and overload systems. With the boom just above the ground, pick up a load and extend the boom to the point of overbalance. In the event of malfunction do not use the machine until the fault has been repaired.

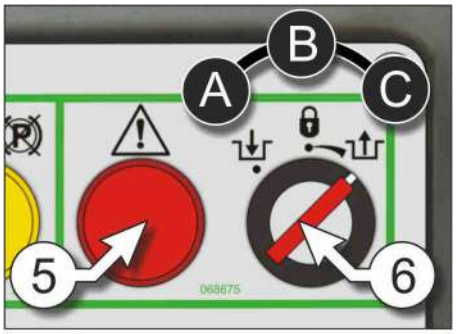
FRONT ANTI-TIP-OVER CONTROL

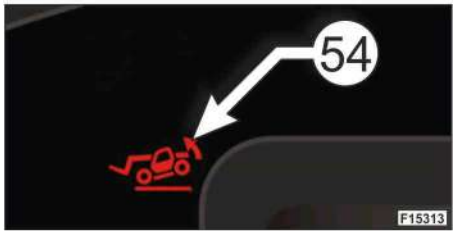
(only for models P38.12 – P38.13 – P38.14 – P40.17 – P38.13EE – P40.17EE – P60.10EE – P72.10EE)

The front anti-tip-over control device steps in when the machine is close to its longitudinal stability limit, and locks all aggravating movements.

To restore the safe operating condition of the machine, the retraction manoeuvre of the boom must be performed until the safety conditions are restored (indicator light 54 on the instrument panel off and buzzer off)

If either it's not possible to retract the telescopic boom or this manoeuvre is not sufficient to restore safe operating conditions for your machine, turn operating mode selector (6) to the "C" position and hold it in that position. Then proceed slowly and very cautiously with non-aggravating manoeuvres until safe operating conditions are restored (both warning light 54 and audible alarm in the cab are off)



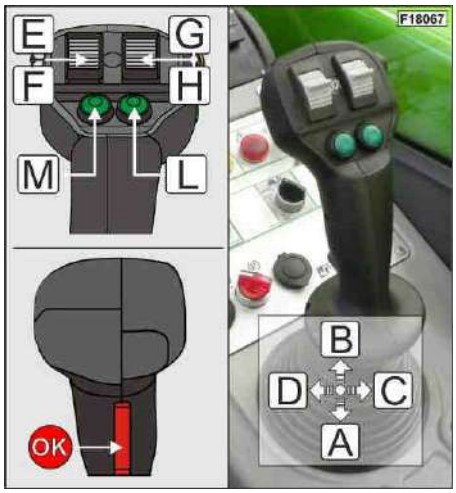


WARNING! Before working with the machine, test the warning and overload systems. With the boom just above the ground, pick up a load and extend the boom to the point of overbalance. In the event of malfunction do not use the machine until the fault has been repaired.

JOYSTICK (1)

(only for models P37.12PLUS – P38.12PLUS – P38.13PLUS – P38.14PLUS – P40.9PLUS – P40.17PLUS – P60.10 – P72.10 – P60.10EE – P72.10EE)

These machines are fitted with an electro-mechanical single-lever joystick for performing 5 hydraulic functions:



- Position A: lift telescopic boom
- Position B: lower telescopic boom

- Position C: rotate carriage downwards
- Position D: rotate carriage upwards

- Position E: extend telescopic boom
- Position F: retract telescopic boom

- Position G: release attachments installed on carriage
- Position H: • command for attachments installed on carriage

- Button L: shift machine to right
- Button M: shift machine to left

The movement speed required is proportional to the angle given to the joystick (the larger the angle of the joystick the higher the movement speed), the rotation of the control thumb-wheels (the larger the rotation of the thumb-wheels the higher the movement speed) and diesel engine rpm (the higher the diesel engine rpm the higher the movement speed).
Depending on load conditions, it is possible to combine machine movements.
Movements stop automatically when the joystick, control thumb-wheel or button are released.

To enable the operation of the joystick it is necessary to press and keep pressed the red button (U) located on the rear.

To move the machine, press and hold down the dedicated button. The movement execution speed is set with a proportional ramp and reaches maximum speed within about 4 seconds of pressing the control. To make small movements, press the control switches briefly.

WARNING! Before operating the machine, please mark off the area where the machine needs to be operated, in order to keep both people and vehicles away from it.

Should you need to operate the machine near overhead lines, the person in charge of safety shall require the minimum safety distance from such lines to the manager of said lines, as well as from the authorities in charge of safety and health in the workplace; in this way all necessary precautions shall be taken and potential accidents shall be prevented.

For further information please refer to paragraph "INSTRUCTIONS FOR A CORRECT USE OF THE MACHINE NEAR OVERHEAD LINES" in chapter "OPERATING INSTRUCTIONS".

MAIN DISTRIBUTOR LEVER (1-2)

(only for models P38.12 – P38.13 – P38.14 – P40.17 – P38.13EE – P40.17EE)

These machines are equipped with two control levers with which it is possible to perform the following movements:

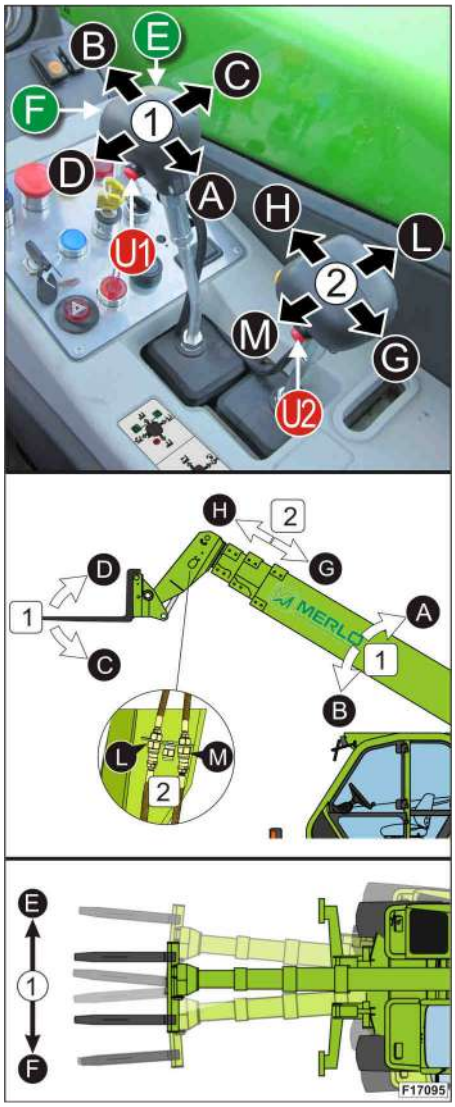
1) LIFTING/LOWER OF THE TELESCOPIC BOOM
2) UPWARD/DOWNWARD ROTATION OF THE FORKS
3) EXTENSION/RETRACTION OF THE TELESCOPIC BOOM
4) LEFT/RIGHT SIDE SHIFT
5) COMMAND FOR ATTACHMENTS INSTALLED ON THE CARRIAGE

The speed of the movement to be made is proportional to:

- the inclination given to the control lever (the greater the movement of the lever, the greater the speed of the movement)
- the rpm of the diesel engine (the higher the rpm of the engine, the greater the speed of movement).

The movement stops automatically when the lever used is released. Depending on load conditions, it is possible to combine movements.

This machine is equipped with a side-shift that works directly on the base chassis.
When the chassis of the machine is not in a central position, the system will signal it with the lighting of the indicator light (56) on the instrument panel (C) (see Chapter NOMENCLATURE).
Before driving on a public road, the chassis of the machine must be positioned centrally (indicator light 56 off).



• CONTROL LEVERS ENABLING BUTTONS (U1) AND (U2)

U1 = Press and hold the button (U1) to enable the controls of the lever (1)
U2 = Press and hold the button (U2) to enable the controls of the lever (2)

• LEVER (1) IN POSITION:

A = boom lifting
B = boom descent

C = tilting of forks downward
D = tilting of forks upward

E = right side-shift
F = left side-shift

• LEVER (2) IN POSITION:

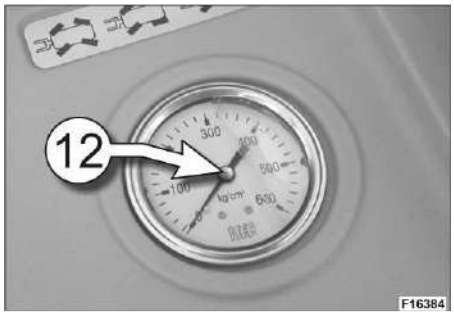
G = retraction of the telescopic boom
H = extension of the telescopic boom
L = attachments release/attachments command
M = attachments command

To move the machine, press and hold down the dedicated button. The movement execution speed is set with a proportional ramp and reaches maximum speed within about 4 seconds of pressing the control. To make small movements, press the control switches briefly.

WARNING! Before operating the machine, please mark off the area where the machine needs to be operated, in order to keep both people and vehicles away from it.

Should you need to operate the machine near overhead lines, the person in charge of safety shall require the minimum safety distance from such lines to the manager of said lines, as well as from the authorities in charge of safety and health in the workplace; in this way all necessary precautions shall be taken and potential accidents shall be prevented. For further information please refer to paragraph "INSTRUCTIONS FOR A CORRECT USE OF THE MACHINE NEAR OVERHEAD LINES" in chapter "OPERATING INSTRUCTIONS".

HYDRAULIC OR HYDROSTATIC SYSTEM PRESSURE GAUGE (12)

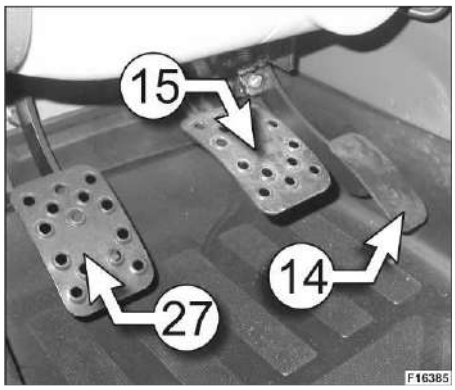


WARNING!! During normal operating conditions of the machine, the instrument must be left disconnected.

In case of loss of pressure in the hydraulic system, please refer to the instructions in the paragraph "HYDRAULIC SYSTEM OIL PRESSURE" in the chapter "SECURITY PERIODICAL INSPECTIONS".

In case of anomalies in the hydrostatic transmission system, please refer directly to the Merlo Service Centre for further information.

PEDALS (14-15-27)



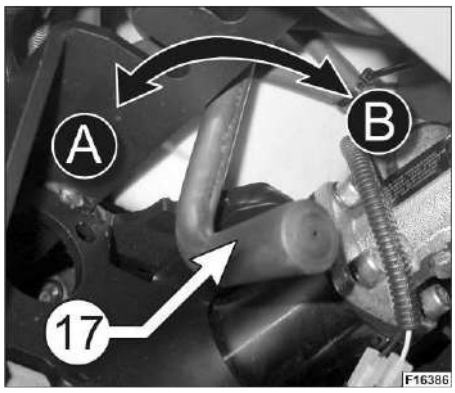
ACCELERATOR PEDAL (14) operate the pedal to increase or decrease the diesel engine rpm.

SERVICE BRAKE PEDAL (15) the disc brakes on both vehicle axles are activated by means of this pedal. Service brakes are seldom used thanks to the braking efficiency of the hydrostatic transmission. We suggest using the services brakes from time to time to keep them efficient and to the avoid pads sticking.

INCHING PEDAL (27) depress the pedal to slow the vehicle down independently of the diesel engine rpm and in any working condition, it can be used continuously without causing damage or wear to the transmission. It is particularly useful to approach a load or when using the machine as a loader.
When going down slopes, it is advisable to use the pedal (27), in order to reduce vehicle speed without relying only on the braking system. The following should also be kept in mind:

- Select suitable gear according to the slope and the transported load.
- In extreme conditions, it is advisable to put the load in front of the machine in order to ensure stability.

LEVER FOR THE ADJUSTMENT OF THE STEERING WHEEL (17)

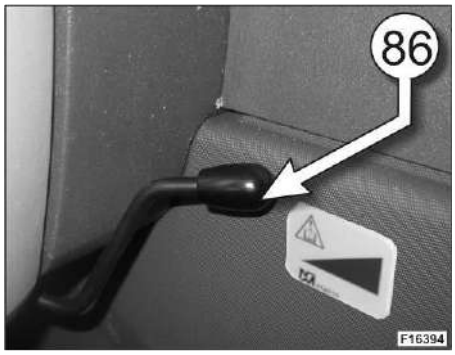


Turn the steering wheel locking lever (17) to position B. Pull the steering wheel to the required position and lock by returning the locking lever to position A.

ATTENTION!

Never adjust the steering wheel angle whilst the machine is in motion.

HAND ACCELERATOR (86)



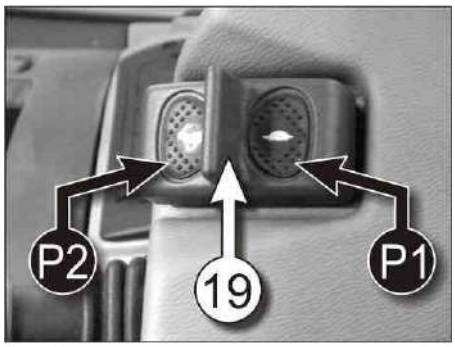
Lever (86) allows manual diesel engine rpm adjustment.

It is always possible to use the pedal to reach maximum revs; on releasing the pedal, the engine returns to the preset rpm value.

WARNING!!

It is forbidden to use this command while driving on road.

GEARBOX (19)

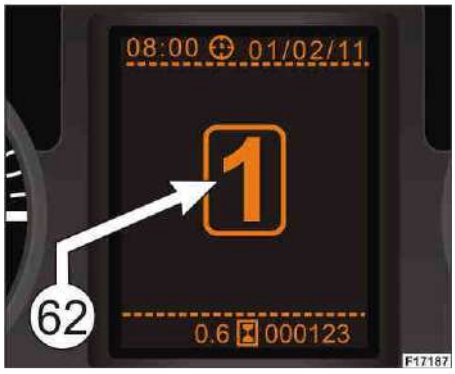


The machine gearbox has two forward gears and two reverse gears which can be selected through selector switch (19), located on the steering column.

Press button (P1) to downshift
Press button (P2) to upshift
Press and hold button (P1) for more than 5 seconds to select the neutral gear.

The gears available are (in order):

• neutral (idle)
• 1st gear
• 2nd gear



The machine speed changes to:

- 0 Km/h up to 14 Km/h (16 Km/h for P40.17 PLUS) in first gear
- 0km/h - 40km/h in second gear

For the proper use of the gear-shift (19), follow the instructions below:

- start the machine engine; the system will automatically engage the fast gear (P2)
- if necessary, engage the required gear
- bring the direction selector (20) to position "F" (forwards) or "R" (backwards), depending on the movement you need to make
- accelerate smoothly without brusque steering movements

To change gear, follow these instructions:

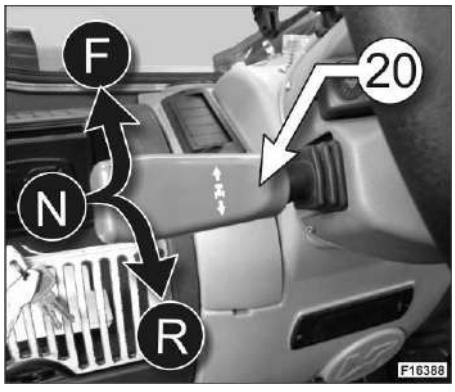
- stop the machine with the diesel engine running
- press button (P1) or (P2) to engage the required gear

The gear used will be shown on the LCD display (62).

WARNING!! Gears can only be changed with machine at a standstill.

When reverse gear is selected, the reverse alarm system will be activated automatically and an intermittent audible warning signal will sound. When the machine is moving, the drive direction can only be reversed if the 1st gear is engaged. When the machine is moving, never reverse the drive direction if the 2nd gear is engaged.

DIRECTION SELECTOR (20)



In order to select the machine direction of travel, use lever (20) located by the steering column as described below:

pull the lever (20) towards you, then move it:

- towards "F" to select the machine forward gear
- towards "R" to select the machine reverse gear

Moving lever (20) into "N" position engages the neutral gear. No movement is generated when operating the accelerator pedal in this condition.
The driving direction can only be inverted when the machine is moving in first gear.

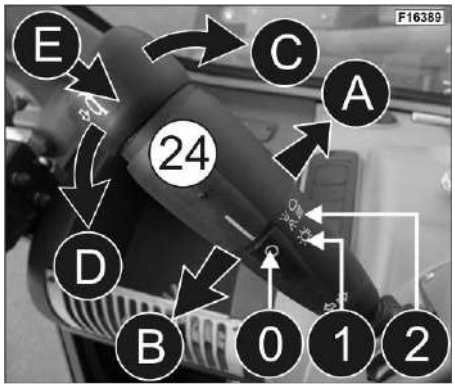
WARNING!

Do not invert the driving direction with the machine in 2nd gear.

With the direction selector (20) in position "F" or "R" it is impossible to start up the engine. In this case it is necessary to move the machine direction of travel selector (20) into position "N" and then start the diesel engine.

When reverse drive is selected, the reverse alarm system will be activated automatically and an intermittent audible warning signal will sound.

LIGHTS AND HORN ON/OFF LEVER (24)



Lever (24), located beside the steering wheel, allows you to switch the lights on your machine on/off, and to operate the horn. To carry out these operations, the ignition key (8) needs to be in position "R".
Should the ignition key (8) be in position "0", the operation of lever (24) is disabled.

SWITCHING OFF THE LIGHTS (Fig.M)

To switch off all the lights on your machine, turn the switch of control lever (24) to position "0"

TAIL LIGHTS (Fig.N)

To switch on the tail lights, turn the switch of control lever (24) to position "1"

LOW-BEAM HEADLIGHTS (Fig.P)

To switch on the low-beam lights, turn the switch of control lever (24) to position "2"

TURN INDICATORS (Fig.R)

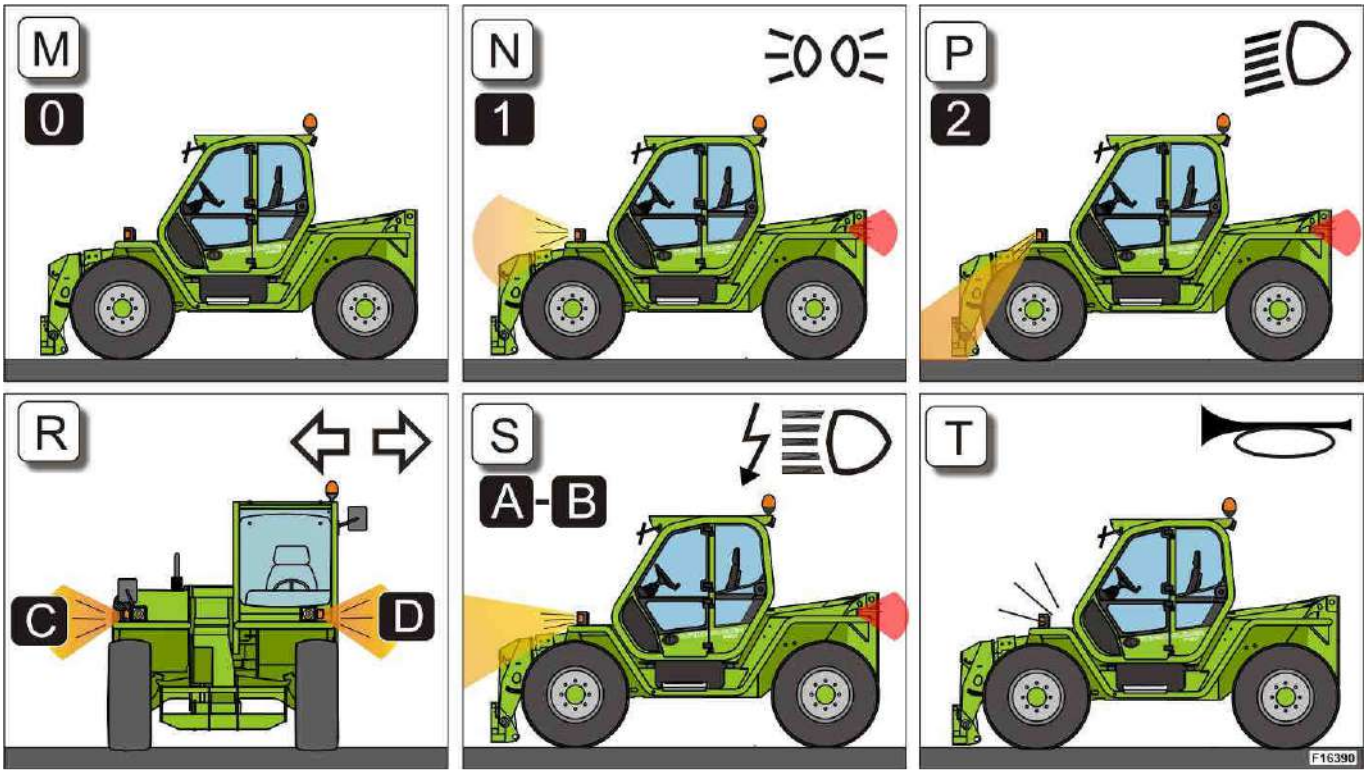
To switch on the right turn indicators, shift lever (24) to position "C"
To switch on the left turn indicators, shift lever (24) to position "D"

HIGH-BEAM HEADLIGHTS (Fig.S)

To switch on the high-beam lights, shift lever (24) to position "A"
To flash the high-beam lights, shift lever (24) to position "B"

HORN (Fig.T)

To operate the horn, press button "B" placed at one end of lever (24)



• SELECTING STEERING MODE (29)

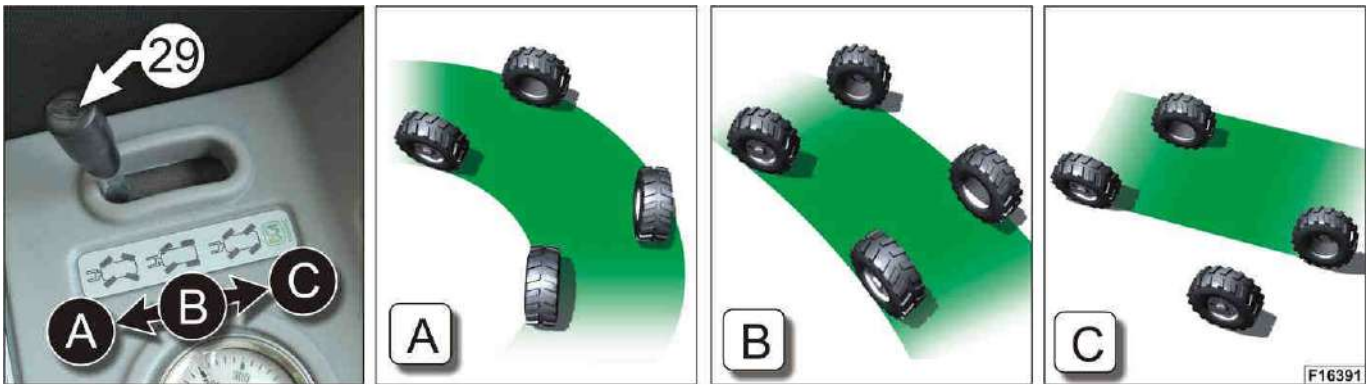
The machine relies on a system which allows the operator to choose among 3 steering modes:

A) Four wheel coordinated steering
Use this mode to obtain a narrower steering angle.

B) Front axle steering mode
Use this mode when travelling on public roads.

C) Crab steering
Use this mode to move the machine laterally without losing the longitudinal alignment.

The selection of a different steering mode must be made when the machine is standing still and all wheels are aligned with the chassis. The correction of a possible misalignment between the front and the rear wheel can be achieved by bringing the steering wheel to its end stop for a few seconds on one side, then repeat on the other side.



WARNING! Such correction can only be carried out when in "four-wheel" or "crab" mode, even if the misalignment occurred while using the front axle steering mode.

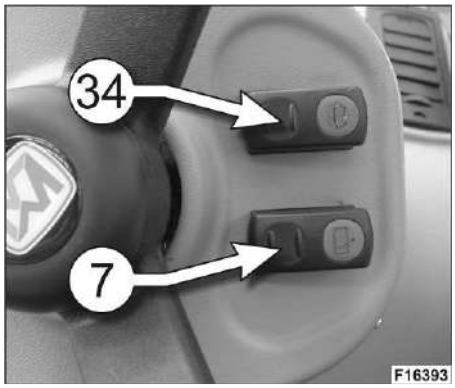
WINDSCREEN WIPERS AND WINDSCREEN WASHER (34), (7)

FRONT WINDSCREEN WIPER & WASHER SWITCH (34)

Two-positions switch: the first tripping operates the front windscreen wiper, the second operates the front and the rear windscreen washer.

REAR WINDSCREEN WIPER (7)

Press button (7) to engage the rear windscreen wiper.

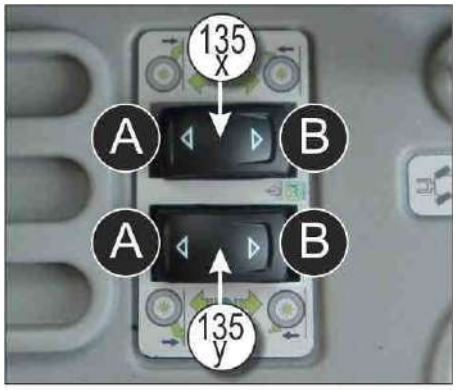


STABILISER COMMAND SWITCHES (135)

(only for P38.12 PLUS – P38.13 PLUS – P38.14 PLUS – P40.17 PLUS – P38.12 – P38.13 – P38.14 – P40.17 – P38.13EE – P40.17EE)

The machine is equipped with a stabilising system consisting of 2 ground supports.

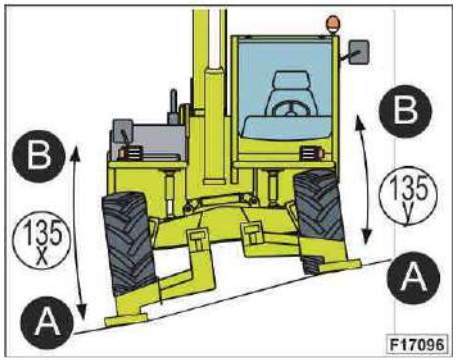
The maximum load transmitted to the ground by each stabiliser is indicated on each stabiliser itself by a specific sticker. Additional load distributing systems are required if the ground is not solid.



The general operating conditions of this device are the following:

- carry out the machine stabilising operations on a sufficiently firm and compact ground
- stabilise the machine at a standstill and with all 4 tyres resting correctly on the ground
- place the gear selector (19) and drive direction (20) to neutral "N"
- lower the telescopic boom within the safety limit;

The machine can be considered to be stabilised when the front tyres are raised off the ground. The dynamic load control display (D) in the cab must show the symbol with the machine on stabilisers in field (221).



WARNING! Always work with the utmost care, especially when handling loads. If this is the case, please make sure that the load falls within the limits of the corresponding load chart, so as to prevent the machine stability control system to step in with a consequent block of all controls.

It is possible to lift loads on an uneven ground by correctly stabilising the machine in order to return it to the initial operating conditions. Before proceeding to any lifting operation, check that the machine is correctly levelled using the spirit-level (13) located in the cab.

If during operation with lowered stabilisers the machine needs to be supported on the wheels, it is necessary to check that the weight of the load to be lifted falls within the limits for operations on wheels, as outlined in the machine's load chart; such manoeuvres are otherwise prevented by the stability control system. Before performing this operation, it is in any case advisable to lower and retract the telescopic boom completely.

To move stabilisers up or down, press and hold down the dedicated button. The movement execution speed is set with a proportional ramp and reaches maximum speed within about 3 seconds of pressing the control. To make small stabiliser movements, press the control switches briefly.

SWITCH REF. 135-X

A = right stabiliser descent
B = right stabiliser lifting

SWITCH REF. 135-Y

A = left stabiliser descent
B = left stabiliser lifting

IMPORTANT!
If the machine boom is raised beyond the safety limit, operating the stabilisers is prevented by a specific device.

END OF SECTION

CONTENTS

INTRODUCTION

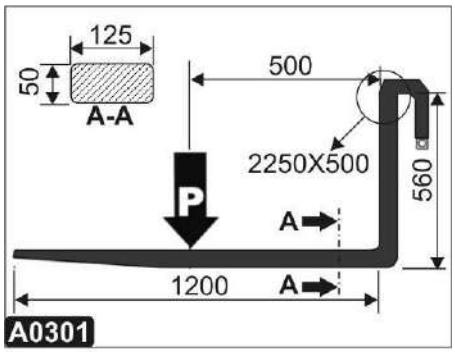
This chapter provides the instructions for using your machine as a variable reach fork lift truck. Please follow the instructions below very carefully, so as to ensure efficiency and utmost safety while working.

GENERAL INFORMATION

- when manoeuvring the loads never exceed the limits set in the load chart
- do not use counter-weights to alter the limits of the load chart
- never leave your machine unattended while the engine is running or when loads are hanging
- lifting people on the machine is absolutely forbidden if no platform, homologated and approved by Merlo S.p.A., is installed
- carrying a second operator on-board the machine is absolutely prohibited.

STANDARD FORKS ASSEMBLY

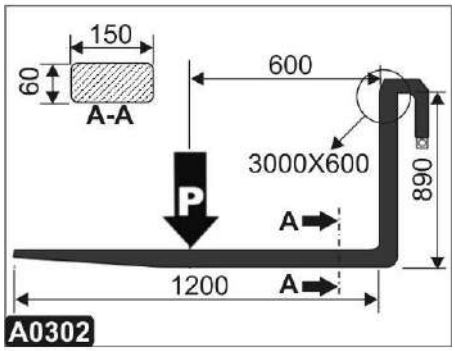
Standard forks are part of the standard equipment of your machine.



• TECHNICAL DATA OF STANDARD FORKS

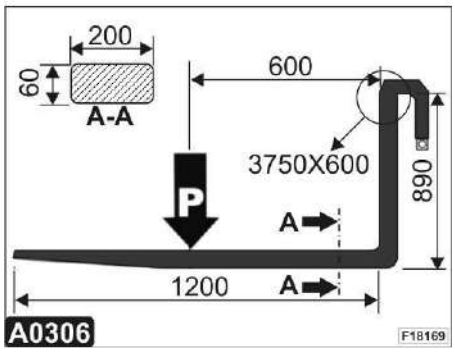
For machines (P38.12 PLUS – P38.13 PLUS – P38.14 PLUS – P40.9 PLUS – P37.12 PLUS – P40.17 PLUS – P38.12 – P38.13 – P38.14 – P40.17 – P38.13EE P40.17EE) the following forks are supplied as standard:

- Fork type: A0301- Standard fork
- Weight of a single fork: 85 kg
- Rated load capacity: 2250 kg
- Centre of gravity of the load ("P") from the fork heel: 500 mm



Machines (P60.10 – P60.10EE) are fitted as standard with the following forks:

- Fork type: A0302- Standard fork
- Weight of a single fork: 143 kg
- Rated load capacity: 3000 kg
- Centre of gravity of the load ("P") from the fork heel: 600 mm

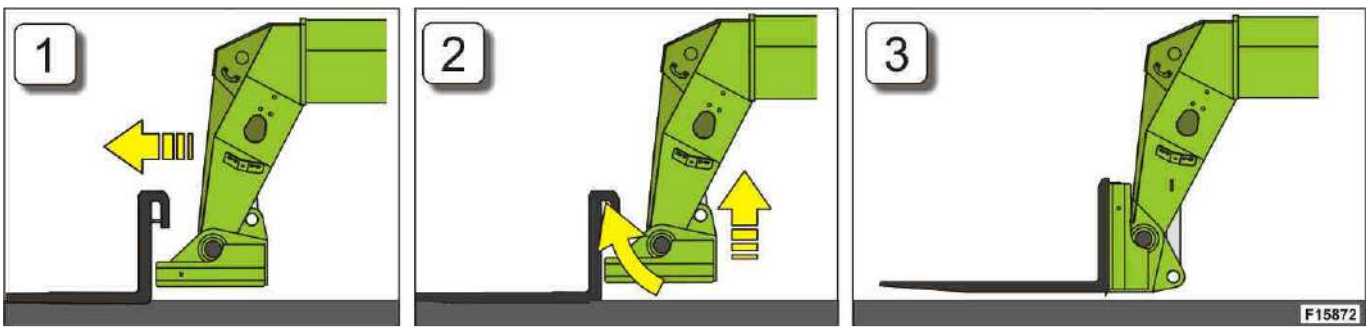


Machines (P72.10 – P72.10EE) are fitted as standard with the following forks:

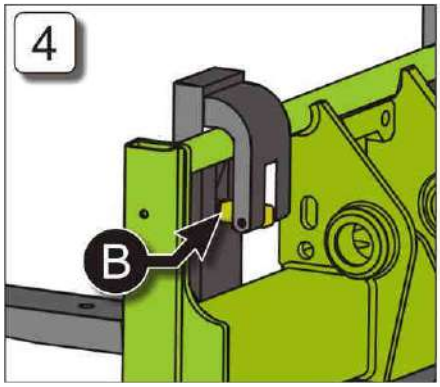
- Fork type: A0306- Standard fork
- Weight of a single fork: 190 kg
- Rated load capacity: 3750 kg
- Centre of gravity of the load ("P") from the fork heel: 600 mm

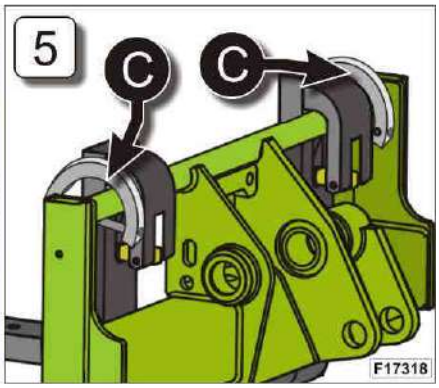
• INSTRUCTIONS FOR STANDARD FORKS ASSEMBLY

- place the forks on a compact and even surface
- shift the drive direction selector to the neutral position ("N") and apply the parking brake
- rotate the carriage downwards, so as to bring it parallel to the ground
- extend the telescopic boom, so as to move closer to the fork couplings (Fig.1)
- raise the telescopic boom, while at the same time rotating the carriage upwards, until the forks are correctly coupled. During this operation, the carriage automatically lifts safety pin "B" of the forks (Fig. 2 and 3).



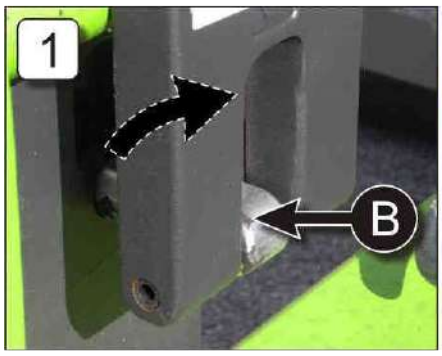
- check that safety pin "B" engages correctly, and goes back to a horizontal position once the forks are coupled; this prevents the forks from accidentally uncoupling. Do not use the forks if the pin "B" is not returned to safe position. (Fig.4)
- insert locking brackets "C" so as to prevent the forks from sliding sideways (Fig. 5).

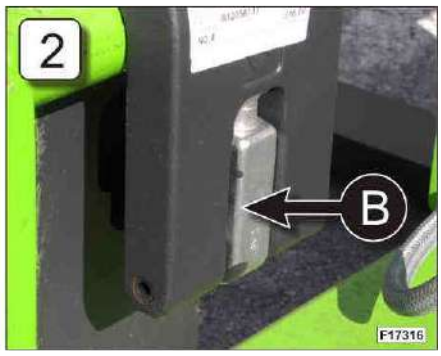




STANDARD FORKS DISASSEMBLY

Proceed as follows to disassemble the standard forks from the carriage correctly and safely:





- these operations should be carried out by a single operator
- always use the personal protection systems shown in the paragraph "SAFETY AND ACCIDENT PREVENTION MEASURES" of chapter "INTRODUCTION"
- lower the forks to the ground, and check that they are correctly resting on a flat, compact surface
- descend from the driver's cab
- lift pin 'B' from its safety position (Fig. 1) to a released position (Fig. 2), and check that it is kept in a lifted position
- climb into the cab again and carry out the fork removal operations with extreme caution. Perform the operations described in paragraph 'STANDARD FORK ASSEMBLY' in reversed order.

RULES FOR LOAD TRANSPORT

- always handle loads slowly and with caution
- if you are not transporting any loads, you are allowed to drive your machine from one spot to another with the boom raised to a maximum height of 2 metres from the ground
- if you are transporting a load, the boom must be in a transport position (see also paragraph "BOOM POSITION FOR ROAD TRAVEL"), and the forks must be lifted to about 0.5 metres from the ground
- while driving your machine from one spot to another, avoid sharp acceleration and braking
- while driving your machine from one spot to another, always keep a low speed, and take all possible safety measures to prevent the load being transported from shifting on or falling from your machine

MACHINE OPERATING AREA

- check soil condition and make sure that the working area is well lit
- make sure that nobody is standing in the machine operating area
- make sure that there are no overhead lines in the machine operating area
- make sure that the machine operating area is always sufficiently lit; should the standard lighting system your machine is equipped with not be sufficient for the workplace, please contact either Merlo S.p.A. or your local dealer for additional solutions which may suit your needs.
- make sure that all the windows and the rear-view mirrors of your machine are always perfectly clean; clean them at regular intervals, so as to ensure good visibility over the machine operating area.

ATTACHMENTS AND ACCESSORIES

- only use accessories approved by Merlo S.p.A.
- check that the accessories of your machine are undamaged and work correctly
- check that the stability control system of your machine works correctly
- check that the accessories are correctly mounted on the tool carrier carriage
- always follow the load chart of the accessory being used
- never lift any load with only one fork
- never use ropes, chains or slings hitched to the forks, to the carriage or to the telescopic boom to lift any load. Always use the attachments designed for this purpose, which are type-approved and guaranteed by Merlo S.p.A.

HOW TO HANDLE A LOAD

This paragraph describes all the operations required to correctly handle a load with standard forks.

• CENTRE OF GRAVITY OF A LOAD

Before lifting a load, its weight and centre of gravity need to be established. Note that the centre of gravity of a load on the forks is calculated at 500 mm (600 mm for models P60.10 - P60.10EE - P72.10 - P72.10EE) from the heel of the forks (Fig.1)

If irregular loads are manoeuvred, the centre of gravity needs to be calculated transversely before each manoeuvre (Fig.2).

WARNING! Manoeuvring a load that exceeds the maximum indicated in the machine's load chart is forbidden.

• MANOEUVRING A LOAD AT GROUND LEVEL

- make sure the ground where the load is to be placed is flat and firm
- position the machine near the load to be lifted with the telescopic boom completely retracted and the forks in a horizontal position (Fig.4)
- turn the gearbox selector switch (19) and gear direction switch (20) to position "N"
- level the machine perfectly using the crossways tilt corrector;
- regulate the width and centring of the forks in relation to the load to be lifted (Fig.5)
- extend the boom, bring the forks under the load and lift it a few centimetres (Fig.6)
- rotate the carriage a few degrees upwards and completely retract the telescopic boom (Fig.7)

• MANOEUVRING A CIRCULAR-SHAPED LOAD

For handling circular shaped loads (barrels, cans etc.) installation of the appropriate attachment, provided and type-approved by Merlo S.p.a., on the machine carriage is necessary. In order to ascertain the attachment best suited to the type of circular load to be handled, contact the nearest dealer.

• MANOEUVRING A HIGH LOAD

WARNING!

Before collecting a high load or before placing a load high up, correct levelling of the machine needs to be carried out checking, with particular attention, that the air bubble is in the central zone of the level. Never pick up or lay down any loads from above if your machine is not levelled correctly.

Never exceed the limits set in the load chart.

- check that the place where the load is to be positioned is flat and strong enough to support the load
- check that the place where the load is to be positioned is within the operating area of the machine and respects the load chart
- check that the surrounding ground is flat and resistant in order to support the machine and the load to be handled
- move as near as possible to the area where the load is to be deposited
- prior to start any movement, set both speed range and direction selectors in their neutral position "N".

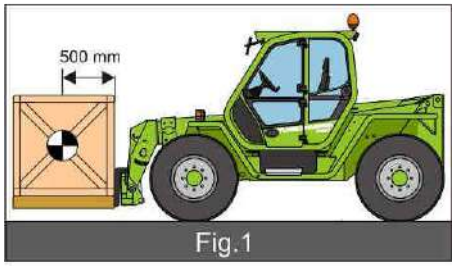


Fig.1

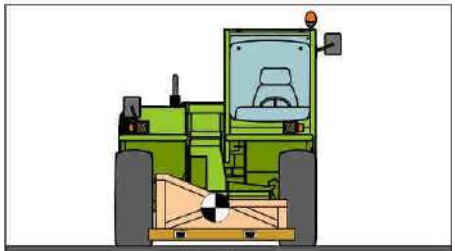


Fig.2

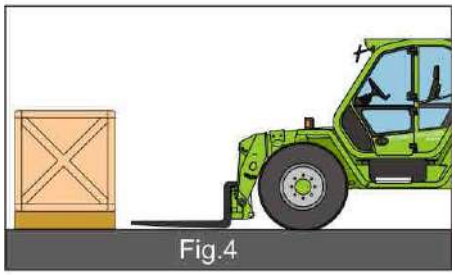


Fig.4

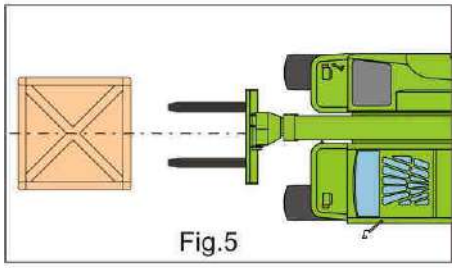


Fig.5

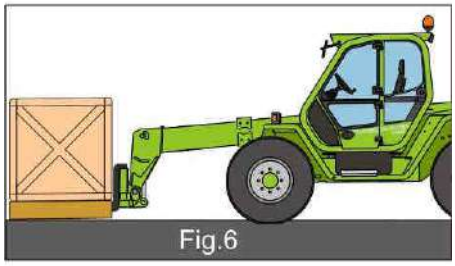


Fig.6

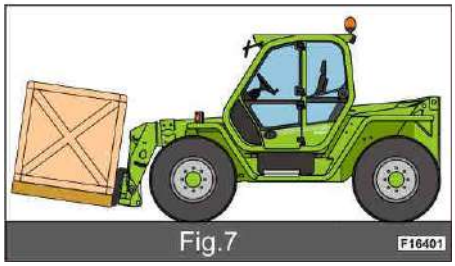


Fig.7 F16401

If stabilisers are to be used (if the machine is equipped with front stabilisers),. follow these instructions:

- correctly stabilise the machine as described in the relevant paragraph of this manual remember that to stabilise the machine the telescopic boom must not pass beyond the upper edge of the cab. if this is not the case, it will be impossible to stabilise the machine (Fig. X)
- check that the machine is perfectly levelled using the spirit level in the cab

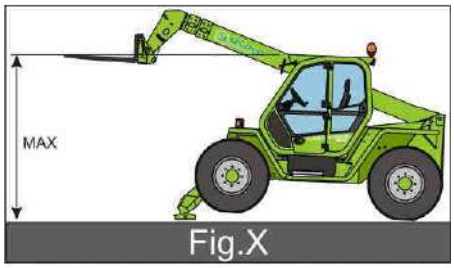


Fig.X

If intending to operate on tyres follow these instructions:

- level the machine using the crossways tilt corrector; remember that to level the machine the telescopic boom must not pass beyond the upper edge of the cab. if this is not the case, it will be impossible to use the crossways tilt corrector (TILTING) (Fig.Y)
- prior to start any movement, set both speed range and direction selectors in their neutral position "N".

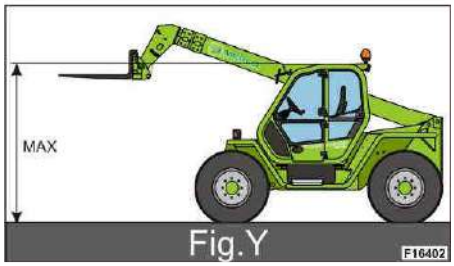


Fig.Y

WARNING! Manoeuvring loads suspended on cables, chains, slings or other is prohibited if the machine is not equipped with the Merlo attachment specific to such use (hook on forks, hook on carriage, crane boom, fly jib etc...)

When using compatible and type-approved Merlo attachments, always refer to the relevant load chart present in the holder provided in the cab.

If operations with the platform must be carried out near overhead electricity cables, the person in charge must ask whoever manages the cables and the area's health and safety authorities for the minimum safety distance from the cables, so that all necessary precautions for avoiding accident risks can be taken.

- bring the forks into a horizontal position and approach the load with care, lifting and extending the telescopic boom the minimum possible or, if necessary, slowly advancing the machine (Fig.8)
- position the forks under the load taking care that they insert easily (Fig.9)
- shift the gear selector switch (19) and direction switch (20) into position "N"
- lift the load a few centimetres and tilt the carriage upwards (Fig.10)
- if possible, slowly and carefully reverse the machine then lower and retract the telescopic boom to bring the load into the transportation position (Fig.11)
- in the transport position, move the machine into the area where the load is to be placed
- lift and extend the telescopic boom until the load is above the stack; if necessary advance the machine with care. (Fig.12)
- shift the gear selector switch (19) and direction switch (20) into position "N"
- bring the forks into a horizontal position and correctly place the load on top of the stack, lowering and retracting the telescopic boom (Fig.13). Reverse the machine in order to retract the forks

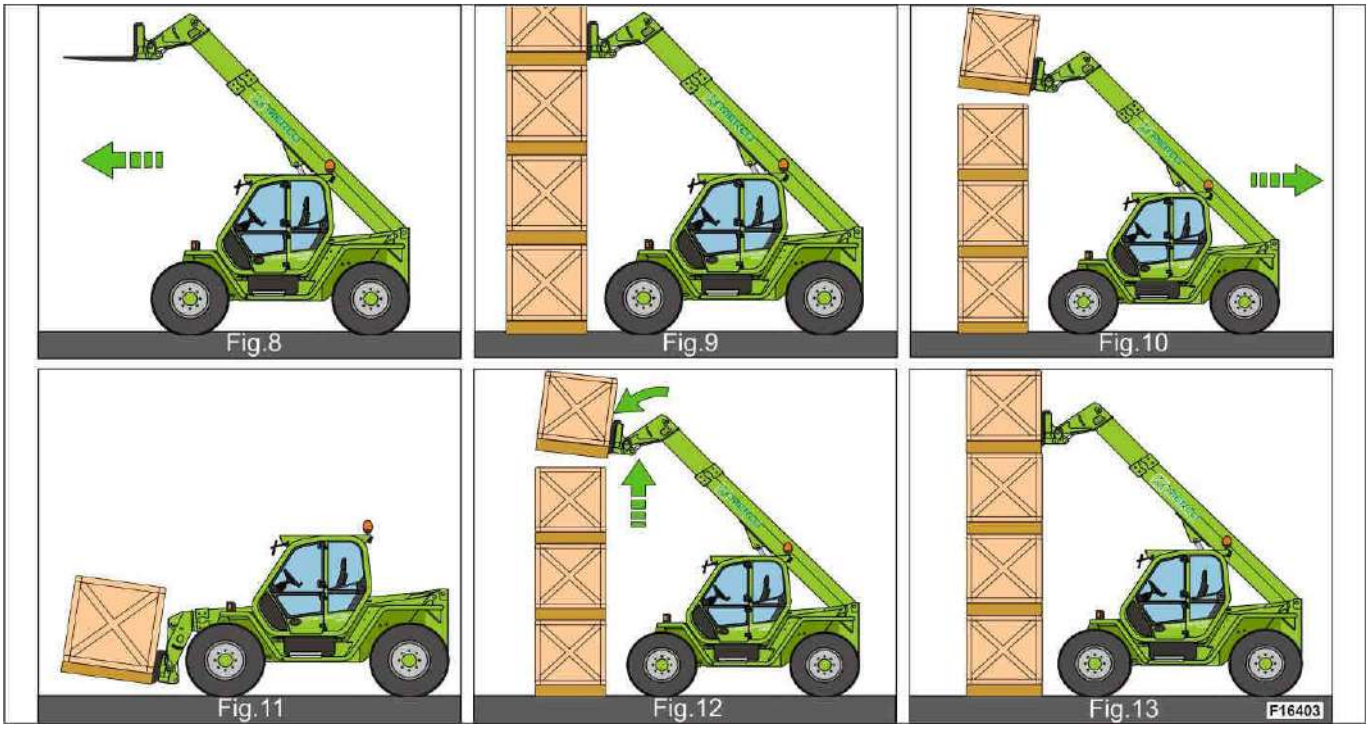


Fig.8 Fig.9 Fig.10
Fig.11 Fig.12 Fig.13

INSTRUCTIONS FOR STARTING YOUR MACHINE

WARNING!

Before starting to drive your MERLO machine all the information and safety instructions in this paragraph need to have been read and understood.

It is particularly important to have a good knowledge of the positioning and functioning of all controls.

• GENERAL CONDITIONS

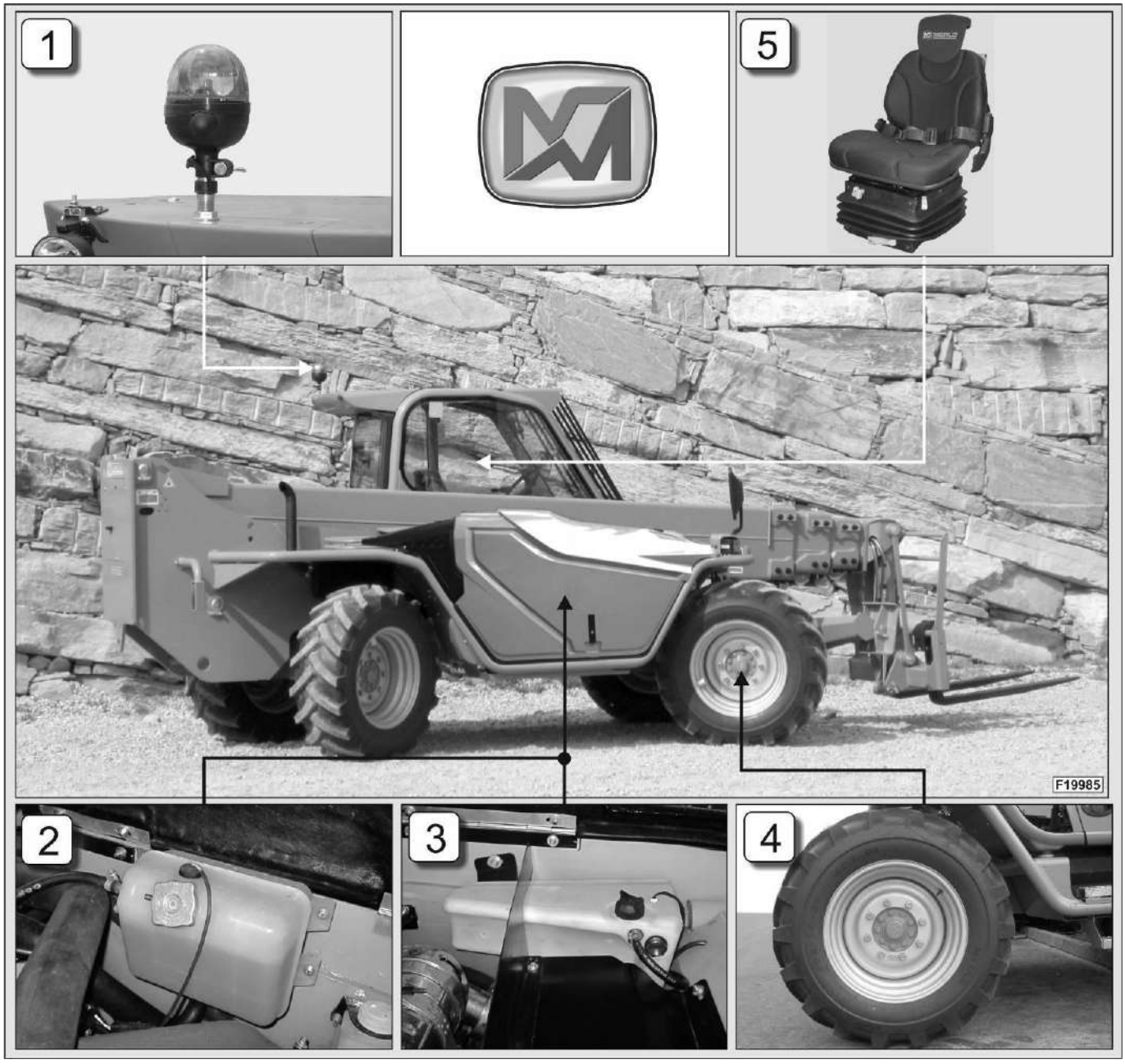
- always wear clothing suitable for driving a lift truck
- always remember to close the engine bonnet and other compartments
- adjust the seat to your own requirements in order to ensure safe and comfortable driving
- never drive with dirty, damp or oily hands or shoes
- always close the lower part of the cab door
- always fasten your seat belt and adjust it as described in the relative paragraph of chapter "CAB"
- before every journey check the correct functioning of the parking brake and the horn
- for driving on public roads it is necessary to select the steering on the front axle of the machine, bring the operating mode selector switch (6) to the central position and turn on the rotating signal lamp on top of the cab
- never transport passengers in the cab and on no other part of the vehicle
- always respect the rules in force in the country where you are driving
- never extend parts of your body out of the cab window; always maintain a correct driving position
- manoeuvring the machine without a load must be done with the telescopic boom at a maximum of 2 metres above the ground
- manoeuvring the machine with a load on the forks must be done with the telescopic boom at a maximum of 0.5 metres above the ground
- always look ahead of the machine and use the wing mirrors and rear view mirror constantly to see the road
- always drive with extreme care and in particular control your speed on wet, uneven or slippery ground
- avoid sudden braking
- the forward/reverse gear change must always be done with the vehicle stationary
- do not leave the vehicle unattended with the engine running
- at night, light the working area using all the machine's headlights including the work lights (if present)
- be sure to have understood all of the machine's controls before starting to drive
- at the beginning of each working day, carry out all the checks described in the following paragraphs

• GENERAL CHECKS BEFORE STARTING THE ENGINE

NOTE! A P40.17PLUS was taken to list the parts to be checked. The same instructions apply to all models included in this manual.

Carry out the following checks every day (before using the vehicle):

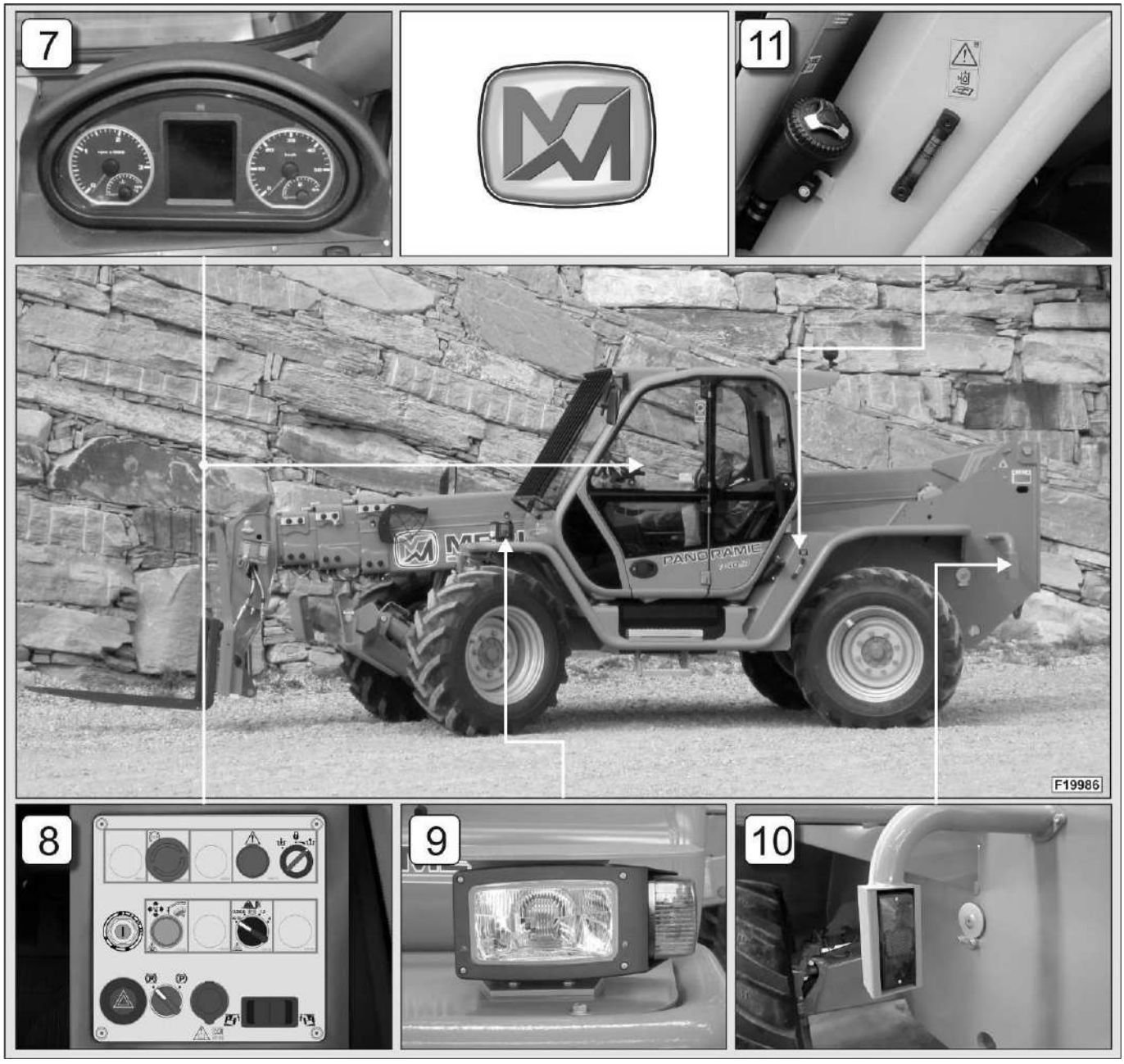
- keep all machine parts in due order and clean
- inspect the exterior of the machine to check that no screws or bolts are loose or missing and that there are no leakages of hydraulic oil
- roof rotating flashing beacon (figure 1)
- water level in the radiator (figure 2)
- hydrostatic transmission oil level (figure 3)
- tyre pressure and condition (figure 4)
- presence, function and good condition of the safety belt (figure 5)
- adjust the seat to ensure that all the driver controls can be conveniently reached
- adjust the rear view mirrors to ensure good visibility from the driver's seat
- check the correct opening and closing of the upper and lower part of the driver's cab door



• CHECKS WITH THE IGNITION KEY (8) IN POSITION "R"

Turn the ignition key (8) to position "R" and carry out the following checks:

- warning light panel (figure 7)
- correct operation of all control switches (figure 8)
- front lights and direction indicators (figure 9)
- rear lights and direction indicators (figure 10)
- hazard warning lights
- hydraulic oil level (figure 11)
- buzzer (horn)
- reverse gear warning beeper



• CONTROL PANEL ACTIVATION

To switch on the machine control panel turn the ignition key (8) to "R".

At this point all the lights and indicators on the instrument panel come on for a short time (GENERAL CHECK function) and then only these indicators remain on:

44 - battery charger indicator light
45 - engine oil pressure indicator light
55 - crab steering indicator light (only if selected)
57 - parking brake indicator light
58 - Coolant thermometer
59 - Fuel level indicator
62 - LCD display
208 - steering plant pressure indicator light

WARNING! Switch off the engine immediately should the light indicators fail to function as described. If the crab steering warning light (55) is lit, use the appropriate lever to reset normal conditions.

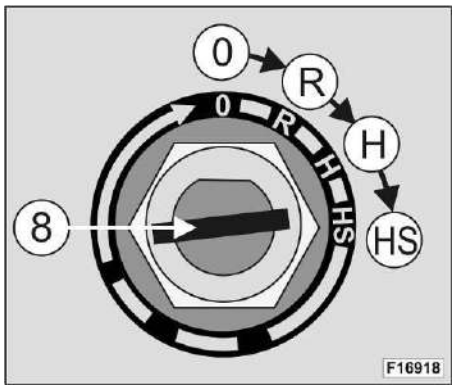
• ENGINE START-UP

Before starting the engine, check that:

- the parking brake (37) is engaged
- the drive direction selector (20) is in neutral position "N".

Then turn the ignition key (8) as follows:

- turn the ignition key (8) to position "R" to turn on the instrument panel
- turn the ignition key (8) to position "HS" to start the diesel engine; when the engine is running, release the key (8), which automatically turns to position "R" again.



For models with KUBOTA engine

At temperatures below -5°C, the thermo-starter must be used to start up the engine:

- set the key to pos. "R"
- set the key to pos. "H" the indicator light (53) comes ON; hold the position for about 15 seconds.
- return the key to position "HS" and start the engine

IMPORTANT! Should the engine fail to start after 20 seconds, release the ignition key (8). Wait 2 minutes before trying to start the engine again, so as to let the starter cool down.

Once the engine has started, check that:

- all the indicator lights on the instrument panel switch off except for the parking brake light (57)
- the engine rpm indicator (61) and the hour counter / odometer (62) start operating

Before driving your machine, check that:

- both the acoustic alarm and the indicator lights on both the instrument panel and the control panel are off
- the controls of the hydraulic system are in working order
- both the service brake and the parking brake are perfectly efficient (for further information please refer to chapter "PERIODIC SAFETY CHECKS")
- the fuel tank is sufficiently full

• MACHINE START

NOTE! Depending on ground conditions, the machine could start moving before the operator is ready. The procedure described below grants the operator full control of the machine.

With the engine running, follow the procedure below:

- check that the wheels are aligned with the chassis
- select the required steering mode
- press the service brake pedal and keep pressed fully down (15)
- disengage the parking brake
- select the desired gear with the gear selector (19)
- select the direction of movement using the direction selector (20)
- gradually press the accelerator pedal (14) and release the service brake (15) at the same time

WARNING!

The machine is fitted with a system which activates the intermittent sound alarm when, while the parking brake (37) is applied, the drive direction selector (20) is activated.

• STOPPING THE ENGINE AND PARKING THE MACHINE

When parking the machine after a days' work, carry out the following operations:

- Shift the drive direction selector to the position “N”
- Select the neutral gear (N).
- Apply the parking brake.
- Fully retract the telescopic boom.
- Lower the forks to the ground.
- Let the engine idle for 2 minutes before stopping it.
- Turn the ignition key (8) to position "0"; the engine automatically stops
- Remove the ignition key (8) from the instrument panel.
- Shift the control lever of the boom extension cylinder forwards and backwards to release any air contained in the cylinder.
- If the machine is equipped with a safety chock, use it to block the wheels.
- Lock the cab door.

• CONTROL CHECK

The system signals a fault by means of a buzzer and the lighting up of the relative indicator light.
The indicator lights that are part of this CONTROL CHECK are:

• 44 - battery charger indicator light
• 45 - engine oil pressure indicator light
• 46 - brake oil level indicator light
• 47 - clogged engine air filter indicator light
• 48 - hydrostatic transmission oil tank level indicator light
• 49 - hydrostatic transmission oil temperature indicator light
• 57 - parking brake activation indicator light
• 93 - engine coolant temperature indicator light
• 132 - engine coolant level indicator light
• 133 - water in the diesel fuel indicator light
• 206 - cable failure indicator light
• 207 - MERLO SERVICE indicator light
• 208 - steering system low pressure indicator light

For all the information on the general CHECK CONTROL indicator lights see the instructions in the table "INDICATOR LIGHTS ON THE INSTRUMENT PANEL" in the section "DESCRIPTION OF THE INSTRUMENT PANEL (C) in the chapter "CONTROLS AND INSTRUMENTATION".
In any case the operator must immediately stop the engine and remove the cause of the anomaly (for the maintenance operations refer to the relative chapter).

INSTRUCTIONS FOR DRIVING YOUR MACHINE ON THE ROAD

WARNING! Observe the laws in force.

The circulation of the machine on public roads is permitted only with the attachments foreseen and indicated in the road traffic documents.

Lock the working tools with the special mechanical stops and install any prescribed protective devices.

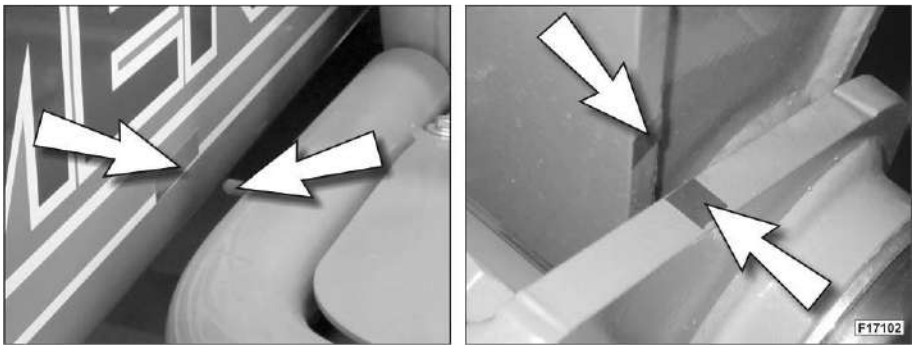
The transport of loads on public roads is strictly forbidden.

You are reminded that the circulation of the machine on public roads with forks mounted is forbidden.

Before driving the machine on the road:

- make sure that the tyres are inflated to the correct pressure (as shown on the sticker applied on the rim), and that they are in perfect condition for use
- make sure that all visual and acoustic alarms are in perfect condition, clean and in working order
- make sure that all the windows and the rear-view mirrors of your machine are clean, and that the latter are correctly adjusted
- make sure that the beacon on the roof is correctly installed and in working order
- make sure that the fuel tank is sufficiently full
- align the wheels with the chassis and select front-axle steering
- completely lift the stabilisers (only P39.10)
- fully retract the telescopic boom, then lower it until the red stripe applied on the cab window (to the operator's right) is aligned with the red stripe applied on the telescopic boom
- make sure that the attachment carriage is perpendicular to the ground: the carriage is in the correct position if the red stripe on the carriage is aligned with the one on the boom head (see corresponding paragraph)
- turn operating mode selector switch key (6) to position "B" (the controls of the hydraulic system are disabled)
- switch on the rotary signal lamp, and make sure it works in daylight also
- switch on the low-beam headlights (if this is prescribed by the local highway code)
- close the cab door

• BOOM POSITIONING FOR ROAD CIRCULATION



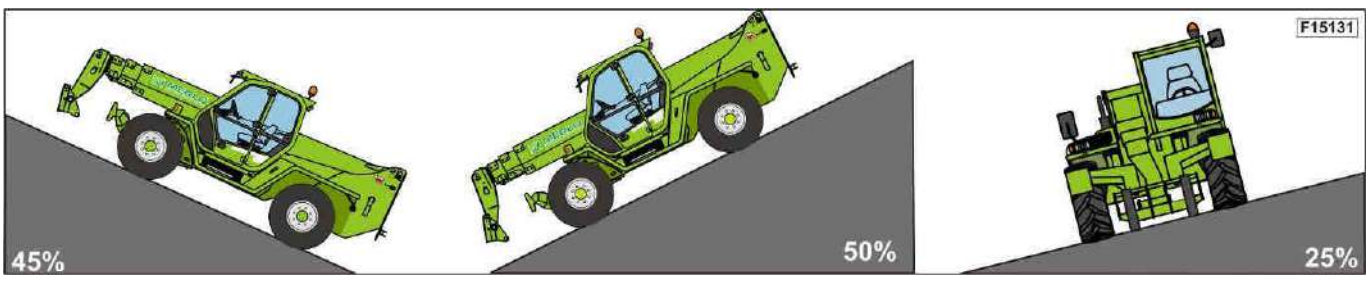
Before driving your machine on the road, fully retract the telescopic boom, then lower it until the red stripe applied on the cab window is aligned with the red stripe applied on the telescopic boom.
Check also that the carriage is perpendicular to the ground: the correct position is given by the alignment between the two red lines (B) on the carriage and on the boom head.

• MAXIMUM INCLINES WITH UNLOADED VEHICLE

The following indications refer to the maximum inclines that the machine can tackle with no load on the forks. Before driving an unloaded vehicle, it is necessary to position the telescopic boom in the position described in paragraph (BOOM POSITIONING FOR ON-ROAD CIRCULATION).
The maximum inclines for your unloaded machine are:

- longitudinal: 45% with forks upstream
- longitudinal: 50% with forks downstream
- transverse: 25% (in both cases)

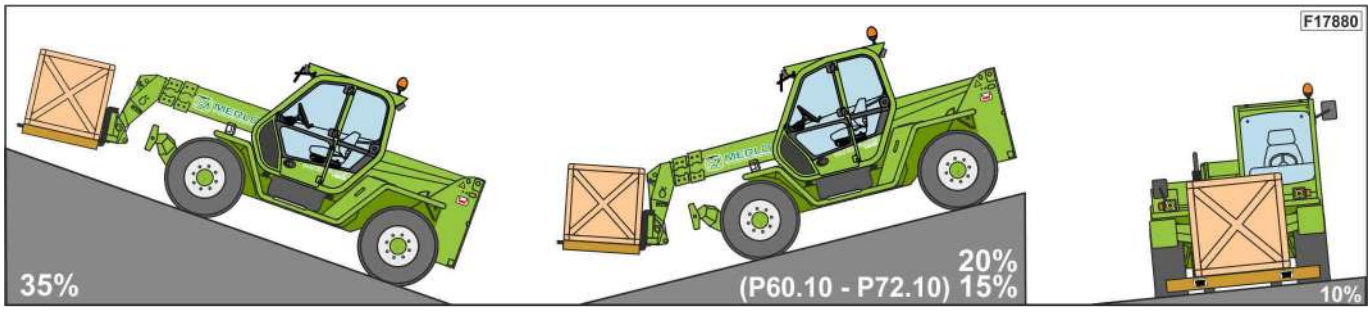
WARNING! The drawing below is by way of example only in order to explain better the concepts previously expressed concerning the incline limits that can be achieved.



• MAXIMUM INCLINE WITH LOAD ON FORKS

- Ensure that the proper steering mode has been selected.
- Retract the boom fully.
- Raise the boom, rotate the carriage backwards (not to the stop) so that the load is approximately 50 cm from the ground
- Carry the load using the slow gear.
- The transport of loads on public roads is strictly forbidden.
- The maximum in line limits that can be achieved are:
  35% with the load to the front, 20% (15% for the models P60.10 - P60.10EE - P72.10 - P72.10EE) with the load to the rear, 10% in the transverse direction of the machine.

WARNING!!! The drawing below is by way of example only in order to explain better the concepts previously expressed concerning the incline limits that can be achieved.



• TOWING OF THE MACHINE

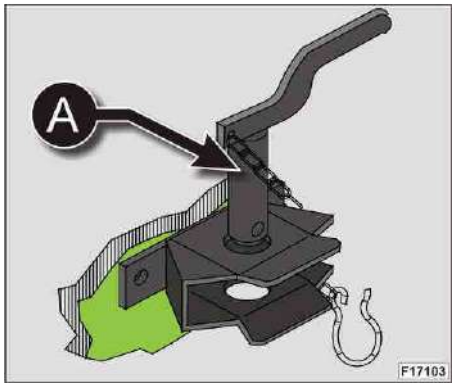
Tow the machine only when no other options are available. If possible, appropriate rescue vehicles should be used. Keep in mind that the towing force must be at least 1500 kg.

GENERAL STANDARDS FOR TOWING THE MACHINE

- towing of the vehicle must be carried out using the special points prepared for this purpose
- never use cables, belts or chains to tow the machine or to have it towed, since they can break
- never use cables, belts or chains to tow the machine or to have it towed if the braking system of the machine does not work
- always use a solid and suitably sized bar to tow the machine
- when towing the machine, an operator must always be sitting in the vehicle being towed
- never stand near vehicles while they are being towed
- the machine can be towed for short distances by vehicles of adequate size and weight and being compliant with the national law as it stands

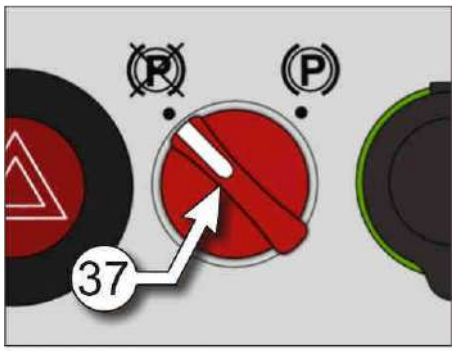
PREPARING THE MACHINE FOR TOWING

- Hook up the machine from the rear side using the specific towing hook (A) or the holes available for fitting one.
- Turn the steering wheel until rear wheels are parallel with the side of the machine.
- Select the front axle steering mode.
- If the battery is completely flat connect an external one, as outlined in chapter "TROUBLE-SHOOTING", paragraph "STARTING THE ENGINE IN CASE OF FLAT BATTERY".
- Place the gear and forward/reverse selector in the neutral position.



Release the parking brake following these instructions:

- Turn the ignition key to position R.
- Turn selector (37) to the left.
- Act on the emergency pump (28) in order to open the brake calliper (the selector 37 stop lightening).
- If it is not possible to disable the hand brake, go on as described in the chapter "FAILURE - CAUSES - REMEDIES" of this manual at the paragraph " MALFUNCTIONING OF THE EMERGENCY PUMP".



WARNING!

Do not tow the machine over 24 Km/h (15 MPH).

• SECURING AND LIFTING OF THE MACHINE

To anchor and lift the machine, ONLY use the points indicated by the specific sticker as described below:

A) Machine lifting points

B) Machine anchorage points

- Disassemble the vehicle attachments
- Assemble suitable clevis in each of the points indicated
- Lower and retract the vehicle boom completely
- Connect the cables to the previously assembled clevis.

The total weight of the machine is written on the identification plate on the outside the cab.

Keep in mind that each clevis and related cable must have a min. lift capacity greater than 2/3 of the vehicle's total weight.

The attachments must be lifted or anchored separately from the vehicle and following the instructions of the pertaining chapter in this manual or attachments.

WARNING! Check that cables, hooks and lifting devices are in good condition and that their lift capacity is sufficient for the weight to be handled.

• TRANSPORTATION OF THE MACHINE

- Load and unload the machine on a firm and level surface.
- Ensure that the brakes of the truck and trailer are engaged.
- Use a ramp or loading platform. The ramp must be strong, shallow angle and correct height.
- Drive the machine onto the ramp.
- Park the machine in the centre of the trailer bed.
- Place chock blocks in front and behind the wheels of the machine.
- Place the gear and forward/reverse selector in the neutral position.
- Engage the parking brake.
- Lower the boom until the forks lay on the trailer.
- Stop the engine, and remove the key.
- Lock the cab door.
- Fasten the machine to the trailer with chains or cables

WARNING ! Do not use just the parking brake but secure the machine to the trailer by external means also.

INSTRUCTIONS FOR THE CORRECT USE OF THE MACHINE IN THE VICINITY OF ELECTRICITY POWER SUPPLY LINES

Before setting to work, check that there are no overhead utility lines in that area.
Should there be overhead utility lines, keep at a safe distance from them (at least 5 metres, as provided for by applicable laws). However, you are advised to inquire the minimum safety distance from such lines from the operator of the said lines, as well as from the authorities in charge of safety and health in the workplace.
Please note that the higher the voltage, the greater the safety distance should be.

USE OF THE MACHINE DEPENDING ON WIND STRENGTHS

Before using the machine, check whether wind strengths allow its safe operation at altitude.
Read the following table - showing the Beaufort scale - to estimate wind strengths.

WARNING!!

The maximum permissible wind strength for the operation of the access platform is 12.5 mps

This table is also available as a leaflet, to be found in its holder in the cab.

INSTRUCTIONS FOR USING THE TABLE CORRECTLY

- working conditions are good up to class 4 (green symbol)
- class 6 indicates that the machine is operating under hazardous conditions. The yellow-red symbol indicates to work with extreme caution, especially if working at a significant height
- from class 7 onwards (Beaufort scale has 12 classes) the machine should not be used

WARNING!!

Never install or use on the machine, on its parts and attachments subject to the action of the wind, components or materials (such as panels, sheets or the like) which might have a "sail effect" and decrease machine stability on windy days.

END OF SECTION

CONTENTS

INTRODUCTION

In this chapter you will find all the ordinary maintenance operations to be executed both during the running in period and periodically.
Moreover, you can find all information concerning type of fuel, greases and oils to be used on your machine in order to assure the highest reliability, efficiency and duration.

SAFETY INFORMATION AND GENERAL RULES

In order to ensure that the machine is used in maximum safety, reliability and efficiency conditions, it is key to regularly carry out all ordinary maintenance operations following closely the instructions provided by the present operator manual.
Do not use the machine unless all maintenance operations and any necessary repair work have been executed.
Should the operator notice that the machine does not operate as it should or it does not meet all safety requirements, the anomaly shall be immediately communicated to the person in charge.
Before carrying out any work on the machine, the engine must be stopped, the direction selector must be brought to its central position and the gear selector must be in neutral gear.
It is strictly forbidden and highly dangerous to modify any machine component by changing its original structure. it is further forbidden to change the hydraulic and electric setup or modify the safety systems. Otherwise, Merlo S.p.a shall be waived of any liability and guarantee claim.

WARNING!! Maintenance must be performed by skilled and competent personnel. For any work on parts which fall outside the scope of ordinary maintenance operations - as defined by the present operator manual - contact the Merlo Technical Support Service.

ENVIRONMENTAL INFORMATION

WARNING! Always comply with the environmental laws of the country where the machine is used.

It is strictly forbidden to unload or discharge oils, filters or any other source of environmental pollution. Pay particular attention to the safe disposal of such materials which are dangerous for people and the environment – in such cases, contact the responsible organisations.

All appropriate personal protection devices must be worn when handling lubricants (gloves, masks, overalls, etc.).

In order to avoid personal burns or fires, do not work on heated fluids or components.

INFORMATION ON ORIGINAL MERLO SPARE PARTS

WARNING! Maintenance operations on Merlo machines must be carried out using original and approved spare parts only. If non original spare parts are used, Merlo shall be waived of any liability and all machine guarantee terms shall be deemed void.

MAINTENANCE INFORMATION

In the event of machine failure, the operator shall switch off the diesel engine as soon as possible, remove the ignition key, exit the machine and check the extent of the problem. Please note that maintenance operations shall be carried out by skilled and trained personnel with the machine idle.
It is also necessary that all maintenance operations are carried out indoors by a properly equipped workshop.

Before starting any maintenance operation, please make sure that the following conditions are met:

- never carry out maintenance operations you are not familiar with. Always follow the instructions provided in the Operator's Manual and, if necessary, contact the Merlo Technical Assistance service
- place the machine on flat and compact ground, having a maximum slope of 3%.
- lower and fully retract the telescopic boom of your machine
- remove any loads or attachments fitted on the machine and place them on the ground.
- shift both the gearbox selector switch and the operating mode selector switch to the neutral position.
- switch off the diesel engine and take the ignition key out of the instrument panel.
- with the engine off, operate the control levers to relieve any residual pressure from the oil circuit.
- place wedges under both front and rear wheels of the machine to prevent accidental movements.
- always use personal protective equipment
- take all the necessary accident prevention measures for the kind of operation to be carried out.
- replace engine oil only when its temperature drops below 60°C.
- carry out all maintenance operations at least 4 hours after switching off the engine, so that any contact with hot machine parts can be avoided.
- when using compressed air for cleaning and blowing operations, make sure that the maximum pressure is 2 bar. Always wear protection goggles when using compressed air.

- use either a ladder or an access platform - compliant with the law in force - if you need to carry out maintenance operations on the machine at a height exceeding 1.50 m from the ground.
- if you need to carry out maintenance operations underneath the machine, use either a pit or an auto lift with appropriate characteristics. For the total weight of the machine please refer to the identification plate applied on the outside of the cab.
- if you need to raise the telescopic boom to carry out maintenance operations, equip the working area with external supports which can support the telescopic boom and prevent it from being lowered accidentally. For this purpose connect a sling to a suitable hoisting device having a minimum load capacity of 2,000 kg.
- if you need to lift the machine from the ground to carry out maintenance operations, use a suitable lifting device which complies with safety regulations; the coupling points on the machine are shown by a yellow triangular sticker.
- deflate the tire completely before carrying out any maintenance operations on the tyre or rim.
- while inflating tyres, never stand in front of the tire side-wall but to one side.
- never make welds on the rim if the tyre is still mounted, since this may lead to either an explosion or a fire.
- avoid any prolonged and repeated skin contact with fuels, lubricants or other fluids, since this may cause skin problems or other syndromes.
- never swallow fuels, lubricants or other fluids.
- when cleaning or replacing filters, make sure there is adequate ventilation in order to prevent toxic fumes from accumulating.
- never perform welding operations in enclosed rooms which are not properly ventilated.
- never perform welding operations on painted surfaces. Remove the paint with suitable products first, then wash the surfaces and let them dry.
- be careful when removing caps from tanks, radiators, or cylinders: turn them cautiously to relieve any residual pressure.
- stay out of the way during draining operations, and always wear protection goggles. Slowly unscrew the draining screw by a few turns to let either the condensate or the fluid come out.
- relieve pressure from circuits before carrying out maintenance operations.
- never try to identify leaks of pressurized fluids with your bare hands.

FUEL AND LUBRICANTS

Please follow these descriptions in order to know the type of fuel, oils and greases to be used on your machine.

• DIESEL FUEL

NOTE! The fuel used to fill the machine tank must comply with EN590 regulations.

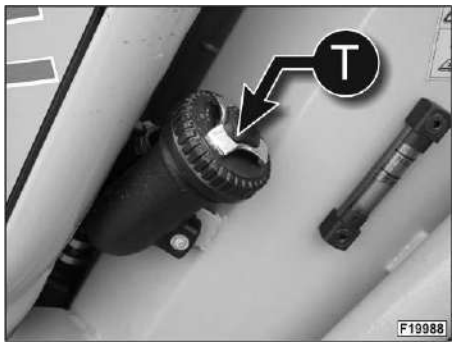
For further details consult the manual of the relative engine.

- FUEL STORAGE

Carefully observe the following rules to correctly store the fuel:

- Store the diesel fuel in clean containers, away from direct sunlight and in a protected area.
- Before refuelling the machine, eliminate any dirt, water or sediment in the deposit tanks, as these may obstruct filters, the injection pump or injectors. This is particularly necessary if diesel is stored for a long period of time.
- During cold weather, do not use antifreeze to remove water from the diesel, but rely solely on special additives for diesel engines
- Do not rely only on the pre-filter found on the machine to completely eliminate water from the diesel fuel.

- FUEL TANK FILLING



Refuel with diesel at the end of each working day.

For correct refuelling, follow these instructions:

- Carefully clean the area of the fuel cap.
- Remove the fuel cap "T" by releasing its lock with the key provided.
- Add the fuel in the tank paying attention not to refill it to the limit; in fact, some free space must be kept for fuel expansion
- Immediately clean any fuel spills.
- Screw the fuel cap "T" and lock it with the provided key so as to prevent any tampering.

Fuel tank capacity = 150 lt.
Fuel reserve = 40 lt

WARNING! Handle the fuel with great care. Stop the engine before refuelling with diesel. Do not smoke while filling up the tank or while working on the fuel system. Do not refuel or pour fuel in closed or nor sufficiently aired environments.

In cold weather, use diesel with antifreeze additives only.

• ANTI FREEZE

Refer to the relative engine workshop manual.

• OILS CHART FOR USE OF THE MACHINE IN NORMAL TEMPERATURES (0°C, + 40°C)

WARNING! The oil to be used for the replacement or top up can be chosen between the products indicated by the manufacturer or between others available on the market; in any case they must have the characteristics indicated in the table.

Although it is not possible to mix different oil brands, it is possible to top up the oil using a different brand to that inside the system, providing that it complies with the specifications indicated and that the quantity required does not exceed 10% of the total capacity of the system.

Different brand oil cannot be mixed.

Oil transportation and trade must be subject to European and local laws in force. Customers are kindly requested to provide for their own supply following the above mentioned regulations. For control and replacement operations, refer to the information in the instruction manual.

The oils chart is also enclosed, as a booklet, in container (21) inside the cab (please see Chapter "STICKERS WITH CONTROL DESCRIPTIONS - LEAFLETS IN THE CAB").

ENGINE OIL		
		SPECIFICATIONS
ENGINE	SAE 10W-40	ACEA E3/E5/E7
COOLANT	COLOUR: RED -35%- TEMPERATURE: UP TO -25°C	ASTM D4985 VW TL 774D MB325.3

HYDRAULIC CIRCUIT OIL					
	ESSO	MOBIL	SHELL	Q8 OILS	SPECIFICATIONS
HYDRAULIC SYSTEM **SERVICE SYSTEM** **HYDROSTATIC TRANSMISSION**	HYDRO HVI 46 UNIVIS N46	DTE 15 M	TELLUS T 46	Q8 HANDEL-46	Viscosity at 40°C = 46cst Iso 3448 = 46

BRAKING CIRCUIT OIL					
	ESSO	MOBIL	SHELL	Q8 OILS	SPECIFICATIONS
BRAKING CIRCUIT	BRAKE FLUID SUPER	MOBIL BRAKE FLUID	BRAKE FLUID DOT 4	———	In conformity FM VSS 116 DOT 4

MECHANICAL GROUPS OIL					
	ESSO	MOBIL	SHELL	Q8 OILS	SPECIFICATIONS
GEAR BOX **DIFFERENTIALS** **REDUCTION HUB** **CHAIN TRANSFER UNIT**	ESSO GEAR OIL GX 80W/90	MOBILUBE HD 80W-90	SPIRAX HD	Q8 T 55 80W-90	SAE 80W-90 MIL-L-2105C

• OILS CHART FOR USE OF THE MACHINE IN ARCTIC TEMPERATURES (-15°C, + 30°C)

For different brands of oil, ensure that they have characteristics equal to the above ESSO products. Should you wish to change the product brand, the system must be flushed clean of the original product. If using oil that is not compliant, any warranty on all components of the hydraulic system will be immediately revoked.

ENGINE OIL	
ENGINE	Refer to the relative engine handbook.
COOLANT	COLOUR: RED -50%- TEMPERATURE: UP TO -38°C

HYDRAULIC CIRCUIT OIL		
HYDRAULIC SYSTEM	ESSO UNIVIS N32	Hydraulic oil with viscosity at 40°C = 34.9 c St
HYDROSTATIC TRANSMISSION		High viscosity index ISO 3448 = 32

BRAKING CIRCUIT OIL					
	ESSO	MOBIL	SHELL	Q8 OILS	SPECIFICATIONS
BRAKING CIRCUIT OIL	BRAKE FLUID SUPER	MOBIL BRAKE FLUID	BRAKE FLUID DOT 4	_____	In conformity FM VSS 116 DOT 4

MECHANICAL GROUPS OIL					
	ESSO	MOBIL	SHELL	Q8 OILS	SPECIFICATIONS
GEAR BOX	ESSO GEAR OIL GX 80W/90	MOBILUBE HD 80W-90	SPIRAX HD	Q8 T 55 80W-90	SAE 80W-90 MIL-L-2105C
DIFFERENTIALS					
REDUCTION HUB					
CHAIN TRANSFER UNIT					

• GREASES CHART FOR USE OF THE MACHINE IN NORMAL TEMPERATURES (0°C, + 40°C)

APPLICATIONS	PRODUCT	NOTES
Pivot pins, Greased joints, Boom sliding pads (Internal) Plunger for quick uncoupling of attachments	**SPECIAL GREASE ROLOIL TIV SPECIAL-MERLO**	
Boom sliding pads (external)	**SPECIAL GREASE ROLOIL ULTRAGREASE SPECIAL-MERLO**	
Parking brake calliper piston seals	**PBR Rubber grease (Repco brake group)**	Vegetal

IMPORTANT! "ROLOIL SPECIAL-MERLO" greases have been designed and manufactured especially for Merlo machines. Therefore, to ensure maximum reliability and efficiency of your machine, use these products only, which can be ordered from Merlo Technical Assistance Service.

• GREASES CHART FOR USE OF THE MACHINE IN ARCTIC TEMPERATURES (-15°C, + 30°C)

APPLICATIONS	PRODUCT	NOTES
Pivot pins and universal joints	**ESSO type CAZAR K2**	Calcium, Penetration A.S.T.M.: 280 mm/10

For different brands of grease ensure they have properties equal to and are compatible with the above products.

IMPORTANT! Your machine can operate at top efficiently only if clean lubricants are used. Before mounting the pivot pins in the joints that mount plastic bushings, a film of "ESSO CAZAR K2" grease must be applied to the latter to avoid oxidation.

SCHEDULED MAINTENANCE DURING THE MACHINE'S RUNNING-IN PERIOD

• INTRODUCTION

The instructions indicated below only relate to the maintenance operations during the machine's running-in period and complement all other maintenance operations described in chapter "ORDINARY MAINTENANCE".
Machine maintenance operations must be carried out by skilled and qualified members of staff in an adequately ventilated environment. The machine must be located on a flat level ground and the diesel engine must be off.

During the machine's first 100 hours of running-in, carefully carry out the following operations:

- Regularly check the coolant level.
- Regularly check the oil level in the hydrostatic transmission and eliminate any leaks.
- Regularly check the engine air intake filter and make sure it is always in good conditions and free from any clogging.
- Regularly check that there is no oil spillage or leakage from the hydraulic oil system or the brake circuit; if necessary, eliminate the fault.
- Regularly check the electrolyte level in the battery and the proper connection of the "+" and "-" terminals.
- Grease the indicated points (see also the table below).
- Check the correct tightening of components at the indicated torque (see also the table below).
- regularly check warning lights and indicators (light and sound) during operation.
- Accurately warm up the machine systems by executing a few idle movements
- after engine start, slowly warm up the engine, without revving .
- avoid running the engine at maximum power.
- avoid stressing the brakes.
- check the tension of auxiliary control belts.
- Pay attention to any fault or defect.

WARNING! For information on the times and interventions to carry out on diesel engines always refer to the provided engine manual. Before carrying out any operation during the running-in period, carefully read the related instruction in chapter "ORDINARY MAINTENANCE".

To determine the running-in and scheduled maintenance intervals, refer to the counter on the instrument panel.

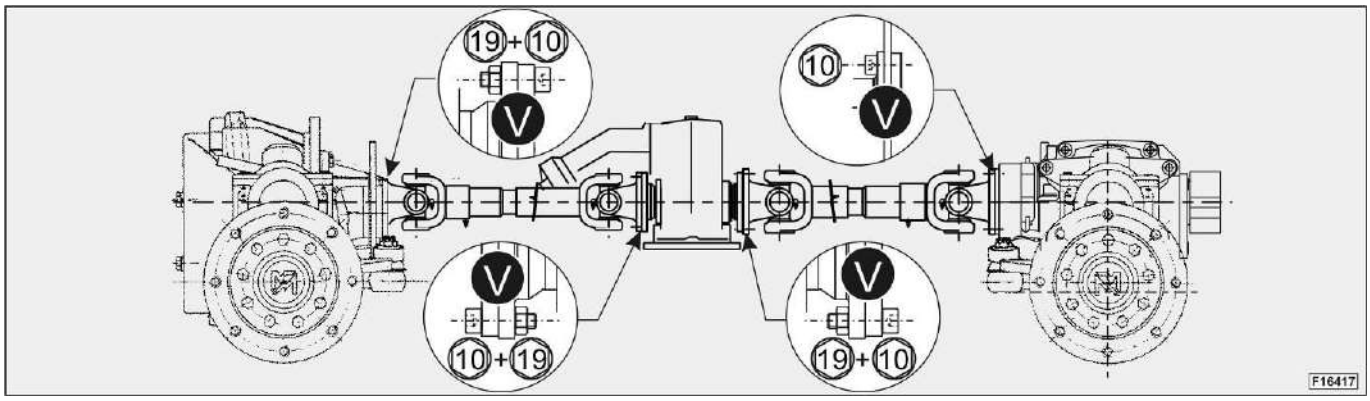
• MAINTENANCE SCHEDULE FOR THE RUNNING-IN PERIOD

PERIOD (HOURS)	COMPONENT	OPERATION
After the first 10 hours	Nuts and bolts of the transmission components Wheel columns	Tighten to torque Tighten to torque
After the first 50 hours	Nuts and bolts of the steering components Nuts and bolts fastening the axles to the chassis	Tighten to torque Tighten to torque
After the first 100 hours (servicing coupon)	Cardan joints Hydrostatic transmission oil filter Hydraulic oil return filter	Grease Replace Replace

• SCHEDULED MAINTENANCE AFTER THE FIRST 10 HOURS

NUTS AND BOLTS OF THE DRIVE COMPONENTS

Tighten the screws "V" of the universal joint coupling flanges to a torque of 11.7 kgm (115 Nm) (8 screws for each of the two universal joints).

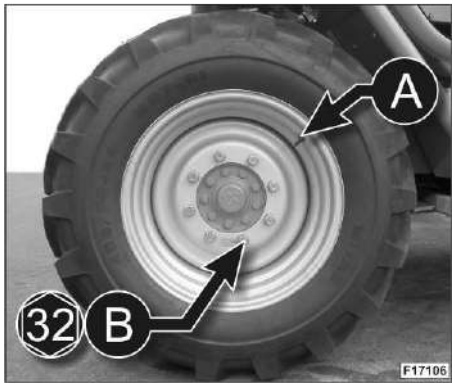


TYRES AND WHEEL COLUMNS

Check the tyre pressure with a pressure gauge and, if needed, inflate them through valve "A".

The correct tyre inflation pressure is indicated on the sticker on the inside of the wheel rim.

Check the correct tightening of the wheel columns "B" . If needed, tighten the columns to a torque of 550 Nm.



• SCHEDULED MAINTENANCE AFTER THE FIRST 50 HOURS

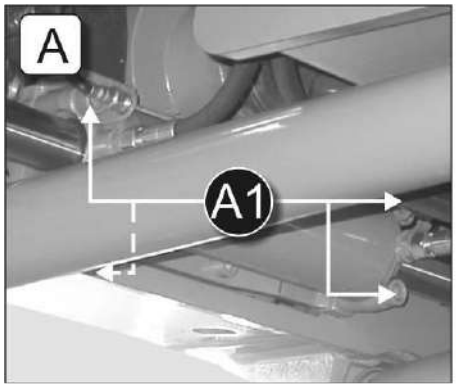
NUTS AND BOLTS OF THE STEERING COMPONENTS

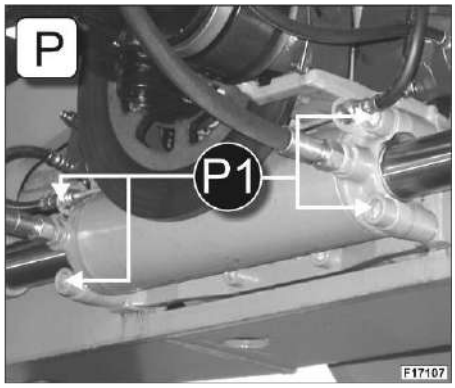
FRONT BRIDGE (A)

Torque (30 kgm) the fastening screws "A1" of the jack to the axle (4 screws).

REAR AXLE (P)

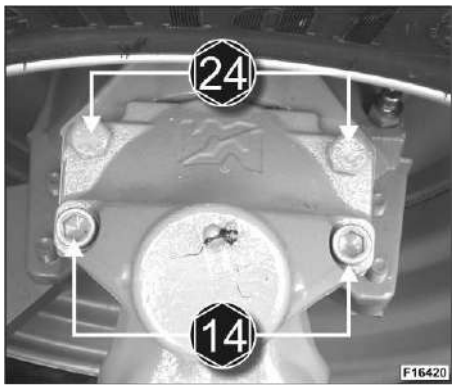
Torque the fastening screws "P1" of the jack to the axle (4 screws).





REDUCTION HUB

Torque (32 Kgm) (Nm) the screws fastening the upper joint pin (4 screws for each of the four reduction hubs).



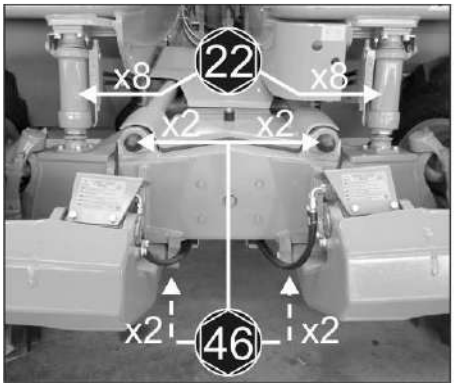
NUTS AND BOLTS FASTENING THE AXLES THE FRAME

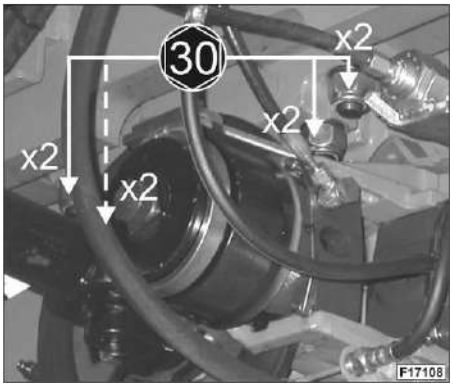
FRONT BRIDGE (A)

Torque (13,5 Kgm) the crossways tilt corrector securing screws of the jacks (8 screws for each of the two jacks) Torque (70 Kgm) the horizontal long-life tie-rods clamping nuts (2 nuts for each of the four tie-rods)

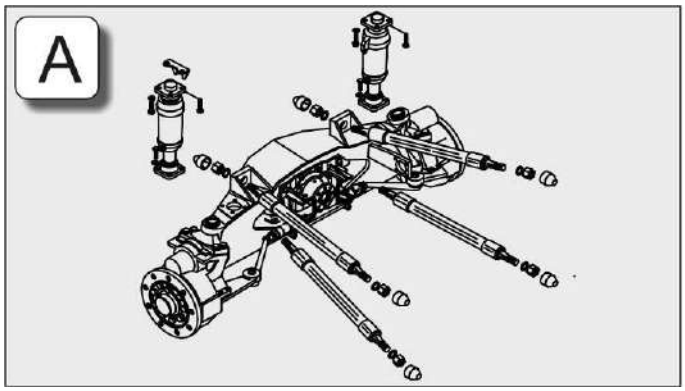
REAR AXLE (P)

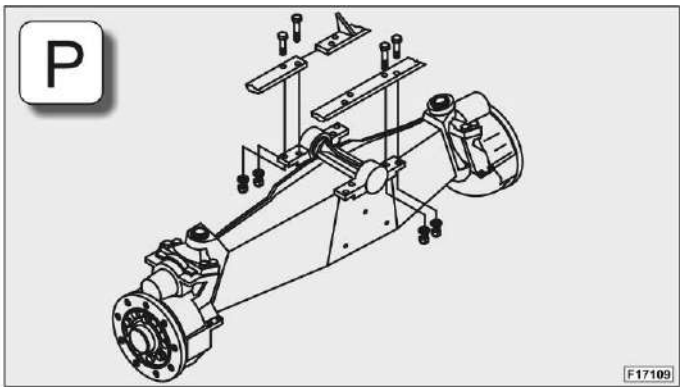
Tighten the 8 fixing screws "V2" of the rear axle to the chassis, with a torque of 45Kgm.





To better understand the position of the "V2" screws which fasten the front (A) and rear (P) axles to the frame, refer to the drawing below:

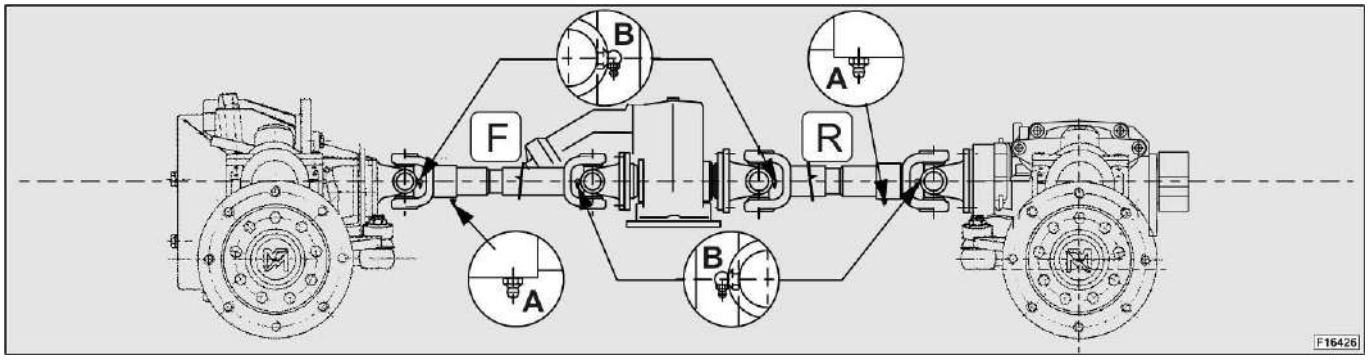




• SCHEDULED MAINTENANCE AFTER THE FIRST 100 HOURS

CARDAN JOINTS

Grease the front (F) and rear (R) universal joints at the indicated points:
A – grooved profiles
B - crossings



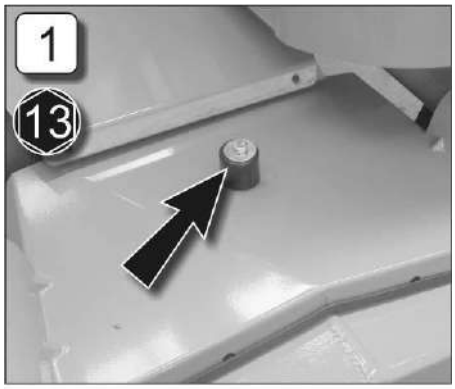
HYDROSTATIC TRANSMISSION OIL FILTER

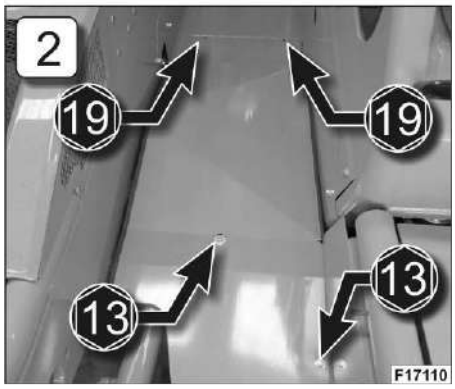
For information on the hydrostatic transmission oil filter replacement, refer to the specific paragraph "EVERY 500 HOURS".

HYDRAULIC OIL RETURN FILTER

For information on the hydraulic oil filter replacement, refer to the specific paragraph "EVERY 500 HOURS".

COVERS





Before carrying out some ordinary maintenance operations on your machine, you are required to either remove or open the following covers:

- COVER 1

COVER 1 is located in the front-central part of the machine chassis and contains certain components of the front differential, front universal joint, braking system and Long-life tie-rods. To remove COVER 1, unscrew the screw with an appropriate wrench

- COVER 2

COVER 2 is located between the engine and the cab and houses the universal joints, gearbox and hydrostatic engine . To remove COVER 2, unscrew the 3 screws shown in the picture with an appropriate wrench

- COVER 3

COVER 3 is located next to the cab and contains the hoses and fittings of the hydraulic system. To remove COVER 3, unscrew the 5 screws shown in the picture with an appropriate wrench

- COVER 4

COVER 4 is located in the rear part of the machine and contains components of the telescopic boom (slide pads, lock valve for the extension jack, etc.). To remove COVER 4, unscrew the 3 screws shown in the picture with an appropriate wrench

- COVER 5

COVER 5 (engine bonnet) houses the machine's diesel engine and all related components (filters, small tanks, radiator, battery, inlet pipes, pumps, etc). Proceed as follows to open COVER 5:

- release the lock using the key "S" provided
• pull lever "L" towards yourself
• lift the bonnet completely until it automatically stays open

The bonnet is held open by a gas strut placed inside the engine compartment.

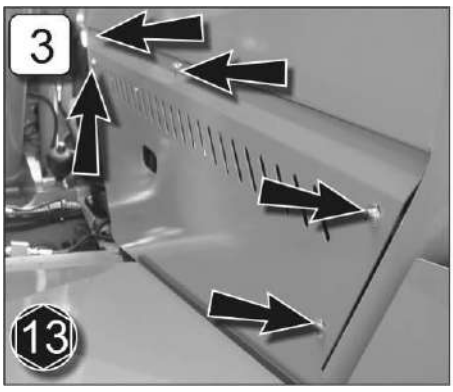
Proceed as follows to close COVER 5:

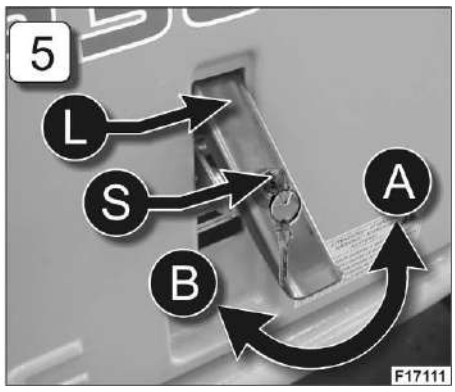
• lower the bonnet completely
• push lever "L" towards the machine
• use key "S" supplied to lock the engine bonnet

WARNING!!

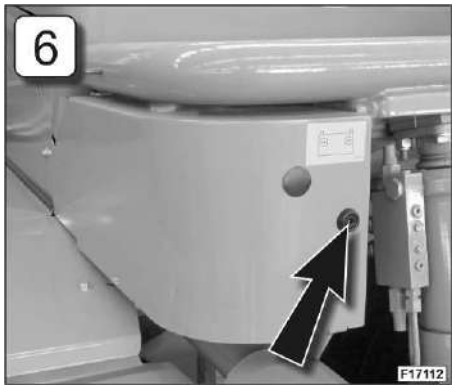
NEVER open the bonnet while the engine is running.

To avoid the engine bonnet opening and to prevent moving or hot parts from accidentally coming into contact with non-authorised personnel, the security keylock on the engine bonnet must be locked. Keep the "S" key together with the engine ignition key (8).





- COVER 6



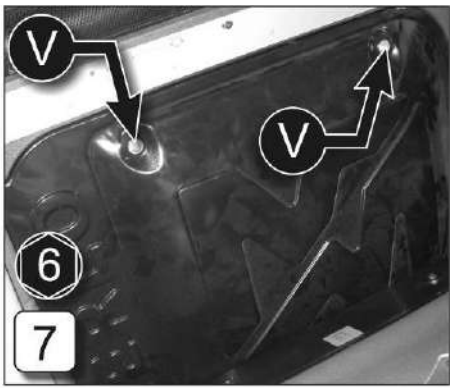
COVER 6 is located in front of the cab and houses the machine electronic control unit. Proceed as follows to remove COVER 6:

- open the lock using the specific key provided
- slide protective cover in the direction shown by the arrow

To re-close the cover, proceed as follows:

- fit the cover in its seat
- push the cover fully into place
- close the lock using the special key provided

- COVER 7



The electrical box containing the fuses, the relays and the electronic boards of the machine can be found under COVER 7, which is located behind the driver's seat.

Proceed as follows to open COVER 7:

• unscrew fixing screws "V"
• remove COVER 7

Proceed as follows to close COVER 7:

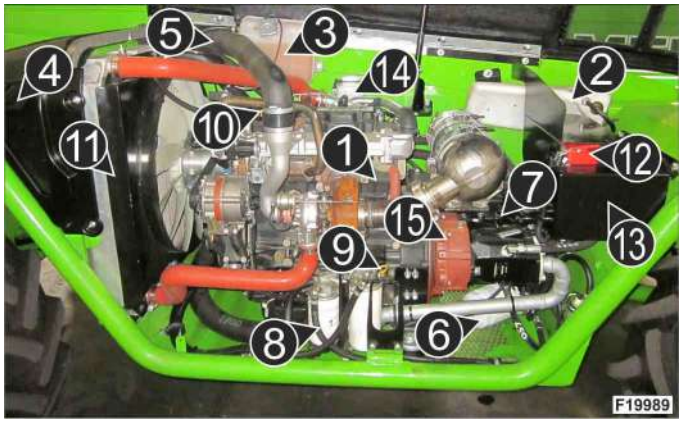
• rest COVER 7 on the two lower supports of the electrical box
• tighten fixing screws "V"

ENGINE COMPARTMENT - NOMENCLATURE

Pay particular attention to the position of the engine compartment components mentioned in this paragraph, because they will be mentioned again and described in the MAINTENANCE paragraphs.

• (P37.12PLUS – P38.12PLUS – P38.13PLUS – P38.14PLUS – P40.17PLUS – P40.9PLUS – P60.10 – P72.10)

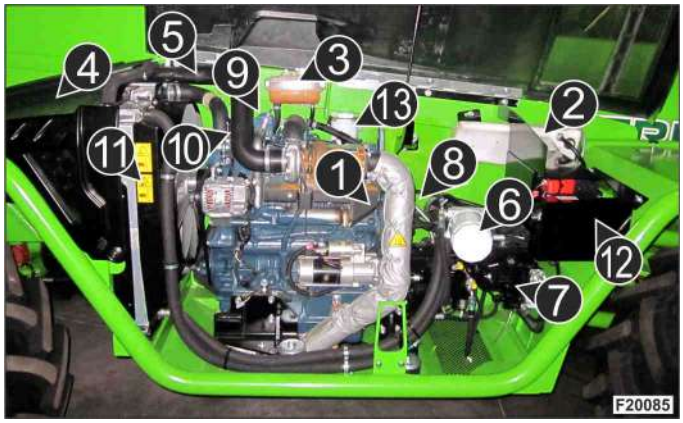
DEUTZ 74 kW (100CV)



1) Diesel engine
2) Hydrostatic transmission oil level small tank
3) Engine coolant level small tank
4) Engine air intake filter
5) Engine air intake pipe
6) Hydrostatic transmission oil filter
7) Hydrostatic pump
8) Diesel oil filter
9) Engine oil dipstick
10) Engine oil filler cap
11) Radiator
12) Battery
13) Fuses and relays
14) Gear box oil bleeding small tank
15) Chain transfer unit

• (P38.13EE – P40.17EE – P60.10EE – P72.10EE)

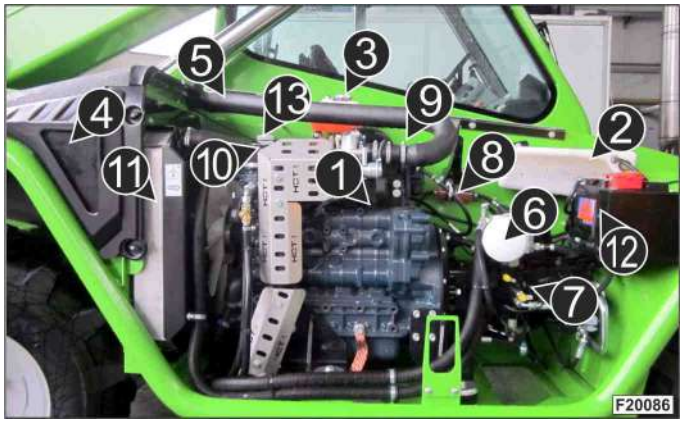
KUBOTA 74 kW (100CV)



1) Diesel engine
2) Hydrostatic transmission oil level small tank
3) Engine coolant level small tank
4) Engine air intake filter
5) Engine air intake pipe
6) Hydrostatic transmission oil filter
7) Hydrostatic pump
8) Diesel oil filter
9) Engine oil dipstick
10) Engine oil filler cap
11) Radiator
12) Battery
13) Gear box oil bleeding small tank

• (P38.12 – P38.13 – P38.14 – P40.17)

KUBOTA 55,4 kW (75CV)



1) Diesel engine
2) Hydrostatic transmission oil level small tank
3) Engine coolant level small tank
4) Engine air intake filter
5) Engine air intake pipe
6) Hydrostatic transmission oil filter
7) Hydrostatic pump
8) Diesel oil filter
9) Engine oil dipstick
10) Engine oil filler cap
11) Radiator
12) Battery
13) Gear box oil bleeding small tank

MERLO PERIODIC MAINTENANCE SCHEDULE

This paragraph contains the periodic maintenance schedule which has to be applied to the machine by strictly following the predetermined time intervals. If the machine is used in particularly heavy duty conditions, maintenance shall be carried out at shorter intervals.

Machine maintenance is scheduled as follows:

- hourly bands (every 10 hours, 50 hours, 500 hours, 1000 hours, 1500 hours)
- regular intervals (daily, weekly, every 6 months, every 12 months, every 18 months)

Hourly bands and regular intervals are linked in the following way:

1) EVERY 10 HOURS OR DAILY
2) EVERY 50 HOURS OR WEEKLY
3) EVERY 500 HOURS OR 6 MONTHS
4) EVERY 1000 HOURS OR 12 MONTHS
5) EVERY 1500 HOURS OR 18 MONTHS

The operator must perform ordinary machine maintenance in relation to which of the 2 situations (hourly or interval) occurs first.

All maintenance operations must be performed in a cyclic manner. At each maintenance interval, also carry out the operations described in the previous intervals. For instance, every 1,000 hours, also carry out the maintenance operations foreseen at 500, 50 and 10 hour intervals. The 5 scheduled maintenance bands, indicated in the table below, will be described in further detail in the following paragraphs.

WARNING!

• Maintenance of your machine must be performed by skilled and competent personnel.

• To perform maintenance operations correctly, place the machine on flat, firm ground.

• Before performing the maintenance task, make sure that the diesel engine is OFF and that the battery cut-off switch (if fitted) is in the OFF position

• For more information about the oils and greases to be used in machine maintenance procedures, refer to the paragraph "FUELS AND LUBRICANTS" in this section and the OIL TABLE in the section "COMMAND STICKERS - BROCHURES IN CA". Lubricators which are not listed in the maintenance table shall be periodically greased according EVERY 1000 HOURS OR 12 MONTHS in relation to machine use conditions.

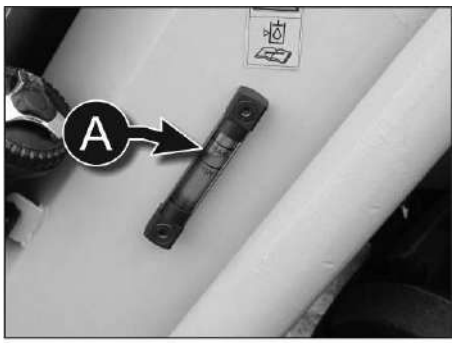
• Always use original spare parts approved by Merlo S.p.a.

For information on maintenance times and interventions to carry out on diesel engines always refer to the engine manual supplied as standard with the machine.

It is recommended to note the maintenance work date in order to carry out operations on a regular basis.

PERIODIC MAINTENANCE SCHEDULE		
COMPONENT	*** EVERY 10 HOURS**	**OPERATION**
Hydraulic oil	Check level and top up	
Hydrostatic transmission oil	Check level and top up	
Engine cooling system	Check level and top up	
Tyres and wheel bolts	Inspect	
Safety belts	Inspect	
COMPONENT	*** EVERY 50 HOURS**	**OPERATION**
Boom sliding pads (Internal)	Grease	
Reduction hub articulation	Grease	
Brakes pads	Check wear	
Tires and stud bolts	Check pressure and stud bolts tightening	
Air ventilation filter	Clean	
Diesel pre-filter (only for DEUTZ engines)	Drain water	
Engine air intake hoses	Check connections	
Battery	Check electrolyte level and terminals	
Engine air filter	Clean	
Brake fluid	Check level	
Sliding pads of the telescopic boom (outer pads)	Check	
Plunger for quick uncoupling of attachments	Grease	
COMPONENT	**EVERY 500 HOURS**	**OPERATION**
Hydraulic oil tank bleeder filter	Replace the filter	
Reduction hub oil	Check level	
Differential oil	Check level	
Gear box oil	Check level	
Cap screws and bolts	Check tighten	
Universal joints	Grease	
Fuel tank	Drain water and sediments	
Hydrostatic transmission oil filter	Replace	
Hydraulic oil filter on return line	Replace	
Engine air filter	Replace the filter	
Sliding pads of the telescopic boom (inner pads)	Check	
Pipeline guide pipe (only for models P40.9PLUS – P60.10 – P60.10EE – P72.10 – P72.10EE)	Check	
Diesel pre-filter (only for KUBOTA engines)	Check	
Chain transfer unit oil (only for DEUTZ engines)	Check level	
COMPONENT	**EVERY 1000 HOURS**	**OPERATION**
Articulated joints	Check the play and grease	
Boom sliding pads (External)	Grease	
Anti-dust filter	Replace	
Hydraulic pipes/hoses	Inspect	
COMPONENT	**EVERY 1500 HOURS**	**OPERATION**
Hydrostatic transmission oil	Replace	
Hydraulic oil	Replace	
Gear box oil	Replace	
Differential oil	Replace	
Reduction hub oil	Replace	
Brake fluid	Replace	

EVERY 10 HOURS OR DAILY



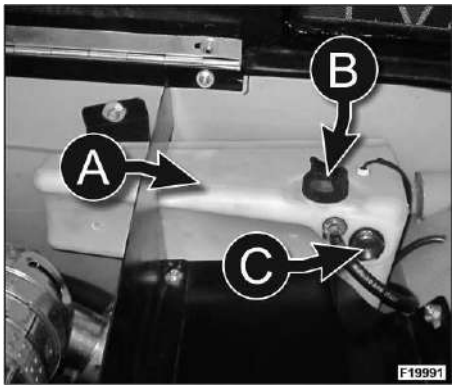
• HYDRAULIC OIL

To check the hydraulic oil level it is necessary to:

- place the machine on a perfectly even ground
- lower and retract the telescopic boom completely
- switch off the Diesel engine
- use indicator "A" to check that the hydraulic oil level is between the minimum (MIN) and the maximum (MAX) level.
- if necessary, remove the filler cap (B) and top up (also see paragraph FUELS AND LUBRICANTS).

NOTE! To ensure the machine's optimum performance, regularly check the oil level in the hydraulic system, and top up the oil if necessary.

• HYDROSTATIC TRANSMISSION OIL



Check the level of the hydrostatic transmission oil present in tank "A".

WARNING!! Do not remove cap "B" unless the engine is cold. Release all pressure before fully removing the cap.

The hydrostatic oil level must be visible in the indicator glass "C", located near the drain plug.

If the level is low, add specific oil (also see paragraph FUELS AND LUBRICANTS). Re-tighten cap "B" and check for any leak in the system.

• COOLING SYSTEM

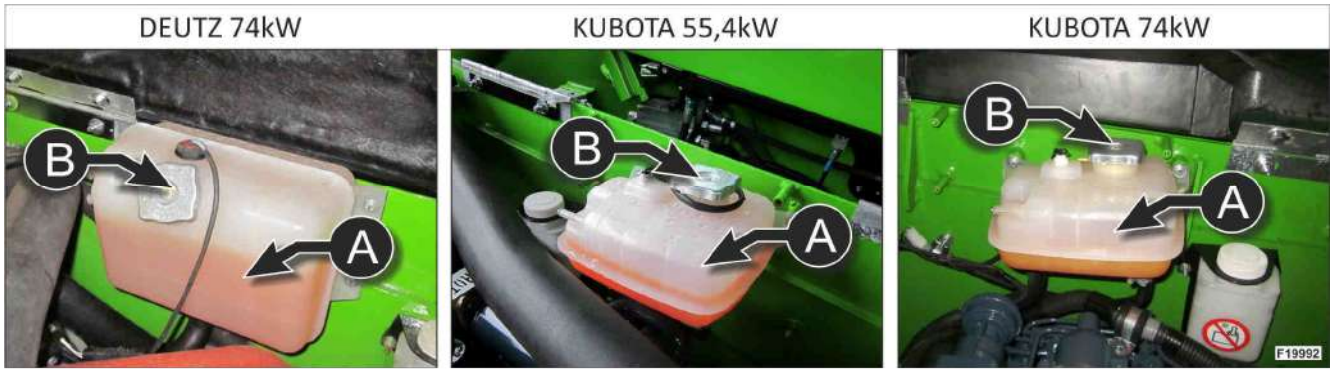
Check the engine coolant level.

CAUTION !!! Do not remove cap "B" unless the engine is cold. Release all pressure before fully removing the cap. For further information, refer to the attached engine manual.

The coolant level in the expansion tank "A" must be between the "MIN" and "MAX" marks indicated on the tank.

If the engine coolant level is low, top up with a coolant available on the market.

Tighten the filler cap and check the cooling system for loose connections and leaks.



• TYRES AND STUDS BOLTS

Check that the wheel studs are tightened and the tyres are properly inflated. Inspect tires for damages or excessive wear daily.

• SAFETY BELTS

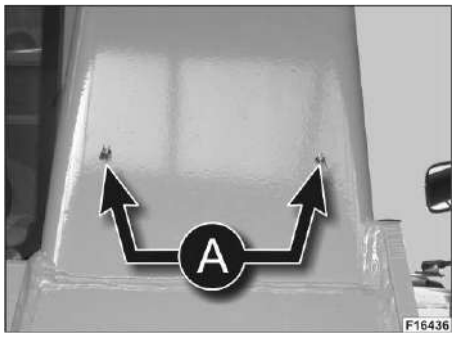
Check the presence, function and the good condition of safety belt.

WARNING!

Do not use the machine on site if the safety belt is not in efficient working condition.

EVERY 50 HOURS OR WEEKLY

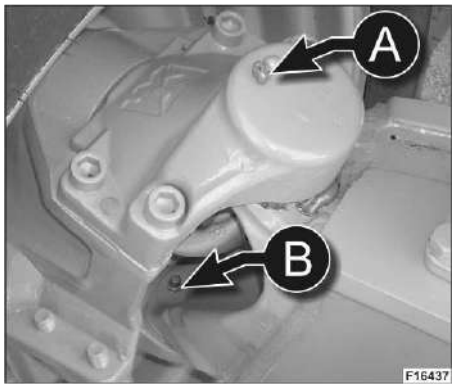
• SLIDING PADS OF THE TELESCOPIC BOOM (INNER PADS)



The internal sliding pads must be greased to guarantee optimal performance of the telescopic boom. To carry out this operation correctly, proceed as follows:

- Fully retract the telescopic boom
- apply the specific product for the boom sliding pads (internal) with the lubricators "A" (see paragraph "FUELS AND LUBRICANTS")
- extend and retract the boom a few times so as to evenly distribute the grease inside the pads.

• ARTICULATED JOINT OF THE WHEEL REDUCTION HUBS



To ensure optimum performance of the wheel reduction hubs, grease them as follows:

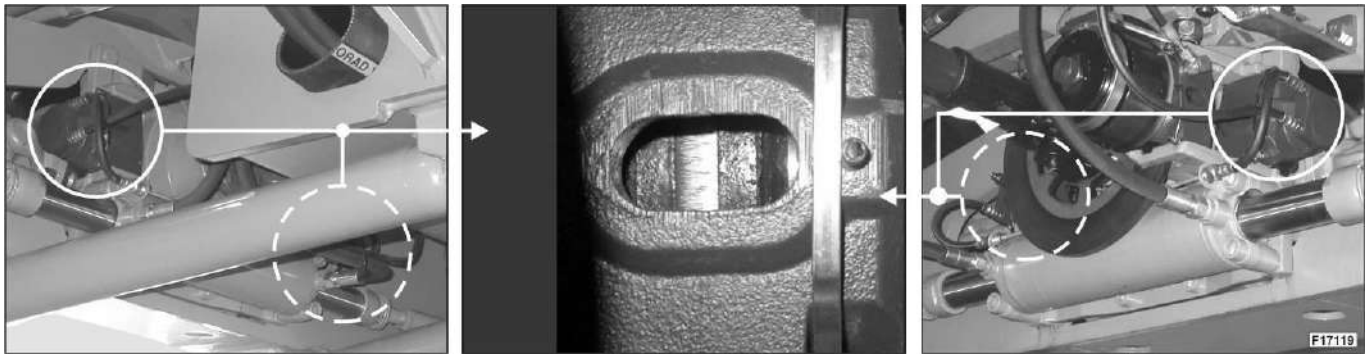
- stop the machine
- apply some specific grease onto the couplings of the wheel reduction hubs through greasing points "A" and "B" until grease comes out (see section "FUELS AND LUBRICANTS")
- repeat this operation on all the couplings of the wheel reduction hubs
- perform a few steering cycles to spread grease uniformly inside the wheel reduction hubs

NOTE ! To facilitate the greasing of the wheel reduction hubs, it is possible to steer the front wheels in such a way as to get a better view of the greasers "A" and "B"

• BRAKE PADS

Check the wear of break pads as follows:

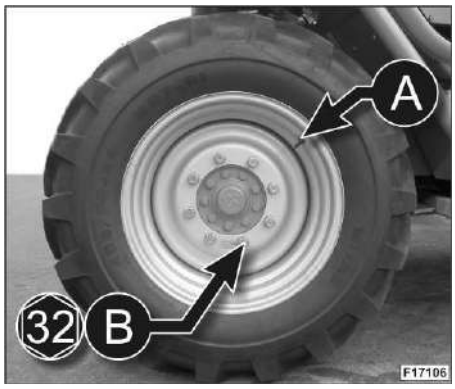
- stop the diesel engine
- lie under the machine until you reach the area where brake callipers are located
- Check pads "A" on both sides of the bridge
- Repeat the operation for the other bridge



If the thickness of the friction material is less than 2 mm, replace the pads.

WARNING! The maintenance and replacement of brake pads must be carried out by skilled and competent personnel. Contact Merlo Technical Assistance Service.

• TYRES AND WHEEL STUDS

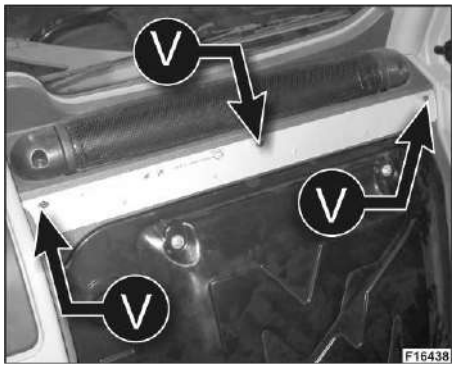


Check the tyre pressures with an accurate pressure gauge,"A" = inflating valve.
Check the tightening (550 Nm) of the wheel locking stud bolts (B).

WARNING!

The tyres which can be used on the machine are those indicated in the Merlo List and/or in the machine registration document (if provided).

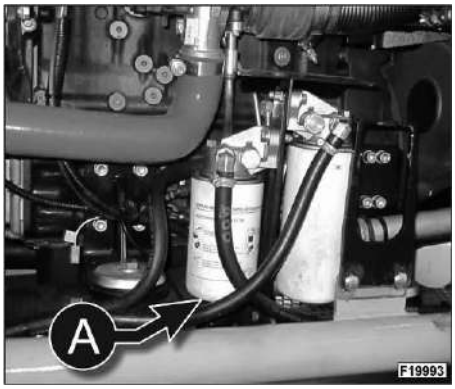
• CAB VENTILATION SYSTEM FILTER



To check its cartridge, follow the instructions below:

- Unscrew fastening screws "V"
- Extract the cab ventilation filter
- Clean the filter using a jet of compressed air
- Check the filter wear condition and, if needed, replace it with a new filter with the same features

• DIESEL PRE-FILTER



(only for models with DEUTZ 74 kW engine)

Drain the water :

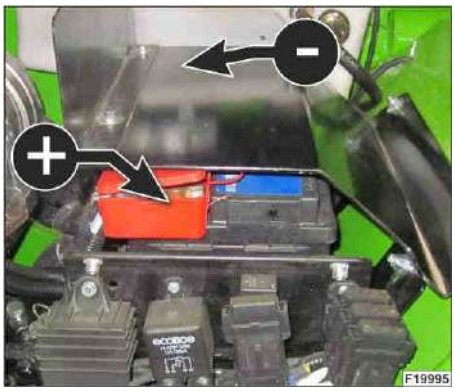
- Loosen the drain screw (A)
- Leave the liquid to drain for a few seconds.
- Tighten the screw (A)

After discharging the water from the diesel pre-filter it is not necessary to bleed the supply system

• ENGINE AIR INTAKE HOSES

Tighten the connecting clamps and check the status of the rubber pipes.

• BATTERY

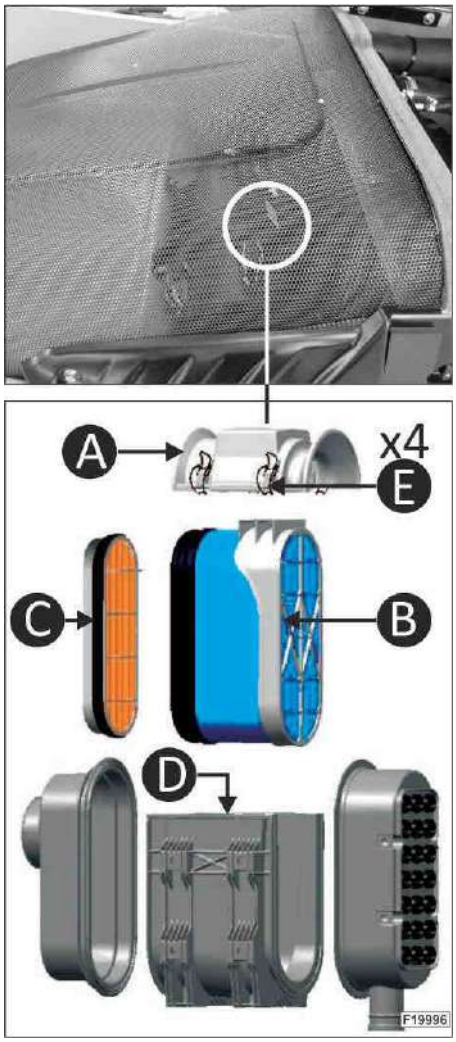


WARNING! Before working on the battery, carefully read the instructions in chapter "ELECTRICAL SYSTEM". Keep the battery and its compartment clean and the terminals covered with Vaseline grease to avoid corrosion.

Disconnect negative (-) terminal cable before you charge the battery or work on the electrical system.

Check the electrolyte level and terminals. Wipe battery with damp cloth. Clean the terminals with a stiff brush. If necessary, wash battery with baking soda solution: 0.1 kg. added to 1 lt. of water.

• ENGINE AIR FILTER



A) cover
B) filter cartridge
C) safety cartridge
D) filter body
E) open / close devices

Check the integrity of the cartridge:

- if the clog warning lamp (47) lights
- if the engine smokes excessively
- if the motor looses power

OPERATING INSTRUCTIONS

- remove the filter cover by using the release devices "E"
- pull out the filter cartridge "B" from its seat

The filter cartridge "B" can be cleaned by following the instructions here below:

- direct a jet of compressed air not over 5 bars from the inner side to the outer side of the cartridge;
- tap the cartridge against your palm (makeshift solution), taking care not to damage it;
- clean the cartridge by washing it in a special solution (this operation is allowed but not recommended)

WARNING! It is strictly forbidden to use petrol or warm fluids to clean the filter cartridge.

If it is not possible to clean the filter cartridge using one of the 3 methods indicated, it will have to be replaced with another one having the same features.

- check that the filter cartridge is not damaged and that there are no tears or small holes. If not, it will have to be replaced with another one having the same features.
- clean the inside of the filter body (D) and the cover (A).
- insert the filter cartridge "B"
- close the cover "A" using the specific clamping devices "E"

WARNING! It is strictly forbidden to use petrol or warm fluids to clean the filter cartridge.

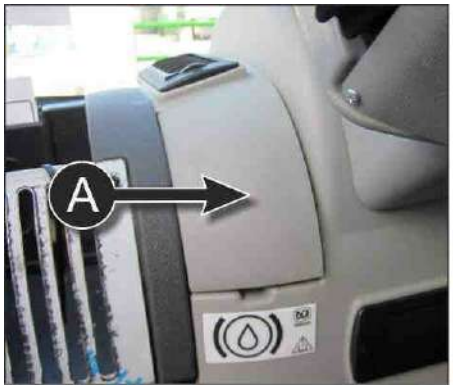
The special pre-filtering devices must be installed if the machine is used in particularly dusty environments.

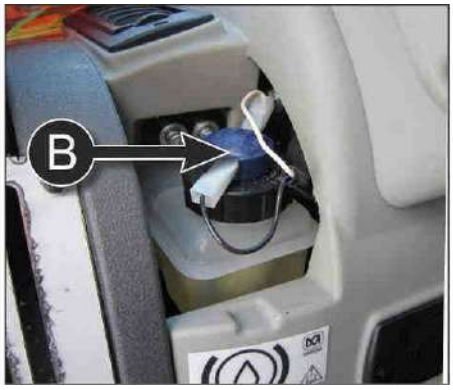
• BRAKE FLUID

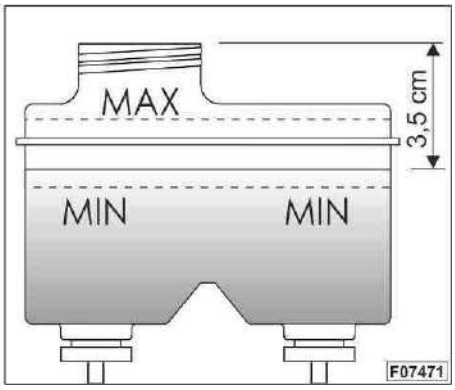
To check the brake oil level, proceed as follows:

- place the machine on a perfectly even ground
- switch off the Diesel engine
- remove cover "A".
- remove the cap "B" from the control tank

The oil level must be about 3.5 cm from the upper brim of the tank. a slight decrease in the level is due to the normal wear of brake pads.
This level must never be less than the minimum "MIN"; if necessary, top up to the indicated level without going over the maximum level ("MAX"). For the type of brake oil to use, refer to paragraph "OIL TABLE" in chapter "STICKERS WITH CONTROL DESCRIPTIONS - LEAFLETS IN THE CAB".





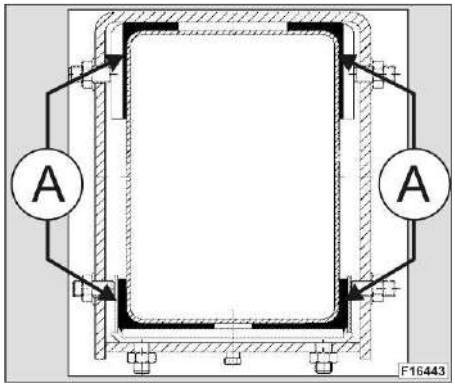


WARNING!

Significant lowering of fluid level is due to system leakages. Seek the help of skilled personnel to check the system. Be careful when filling up the appropriate small tank with brake fluid, as it is particularly toxic and could ruin painted or plastic surfaces.

• SLIDING PADS OF THE TELESCOPIC BOOM (OUTER PADS)

Perform the following checks on all the outer sliding pads of each boom:



1 - visual inspection of outer sliding pads to check for wear
2 - visual inspection of outer sliding pads to check for wear uniformity
3 - visual inspection of the boom surface to check for any indentations due to the sliding of outer sliding pads
4 - visual inspection of outer sliding pads to check for any burrs or large shavings (plastic powder is accepted)

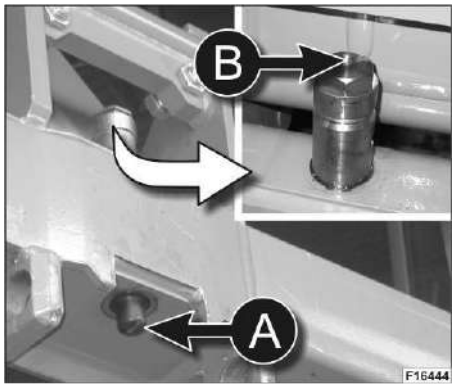
Should either condition "1" or "2" occur, please contact Merlo Technical Assistance Service.
Should either condition "3" or "4" occur, please proceed as follows:

- remove grease from the telescopic boom surface
- adjust the telescopic boom as described in the paragraph "GENERAL MAINTENANCE"
- apply a layer of specific Merlo grease on the telescopic boom, as described in paragraph "OUTER SLIDING PADS OF THE TELESCOPIC BOOM"

Should the problem persist, please contact Merlo Technical Assistance Service for repair.

NOTE! While extending and retracting the telescopic boom, some paint might be removed from the areas where the outer pads of the telescopic boom slide. This is to be considered absolutely normal, and it does not interfere with the correct operation of the telescopic boom.

• GREASING THE QUICK UNCOUPLING PLUNGER OF THE ATTACHMENTS



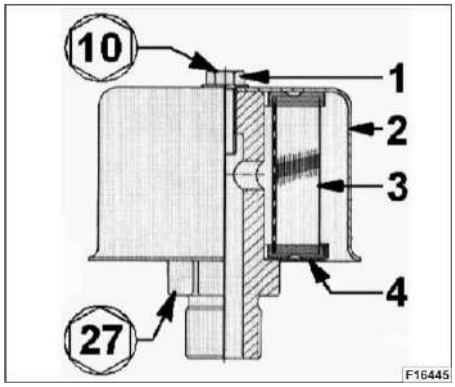
Periodically grease the quick uncoupling plunger of the attachments to ease sliding and prevents rust from forming inside the cylinder chamber.

To perform this operation correctly, please follow the instructions below:

- lower the telescopic boom
- stop the machine
- apply 30 ml of specific grease (see paragraph "FUELS AND LUBRICANTS") with lubricator "B"
- start the engine, and perform a few plunger lifting cycles (plunger "A"). During the first cycle, plunger "A" may move slowly, since the grease applied needs to flow from the plunger to the spring. This delay is more significant at low temperatures.
  Excess grease inside the chamber is expelled from the side of plunger "A" during the first cycle.

EVERY 500 HOURS OR EVERY 6 MONTHS

• HYDRAULIC SUMP BLEED FILTER

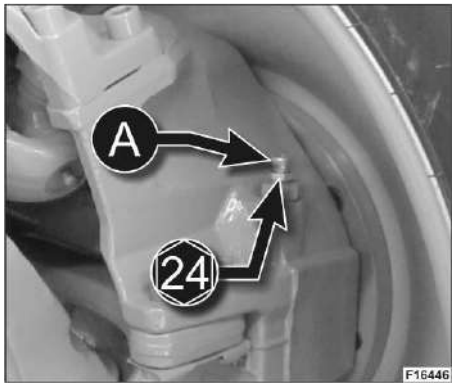


Replacement of the filter cartridge:

- Unscrew the fastening screw (1)
- Remove the cap (2)
- Remove the cartridge (3) and replace it with a new one having the same characteristics
- Reinstall the cap (2).
- Tighten the fastening screw (1)
- Check that the lower washer is in the correct position (4).

Start the machine and check for any leak in the hydraulic system.

• REDUCTION HUB OIL



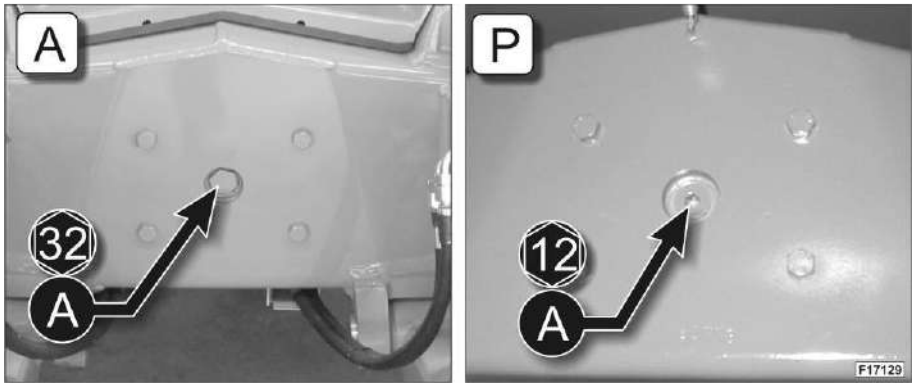
Carry out the following operations to correctly check the oil of the wheel reduction hubs:

- work on one reduction hub at a time
- remove the cap "A"
- check that the oil level is about 93mm from the edge of the cap "A"
- if necessary, top up with specific oil (see the "OIL TABLE" in chapter "STICKERS WITH CONTROL DESCRIPTIONS - LEAFLETS IN THE CAB")
- put back the cap "A"

• FRONT AND REAR DIFFERENTIAL OIL

Carry out the following operations to check the oil of the front and rear differentials:

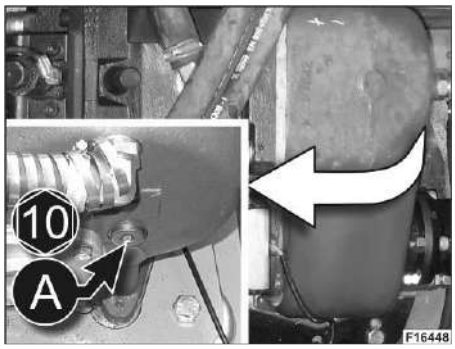
- remove the cap "A" on the front bridge "A" as well as on the rear bridge "P"
- check that the differential oil reaches the edge of the hole.
- if necessary, top up with specific oil (see the "OIL TABLE" in chapter "STICKERS WITH CONTROL DESCRIPTIONS - LEAFLETS IN THE CAB")
- reinstall and tighten cap "A".



• GEAR BOX OIL

To check the gearbox oil level, first remove protection housing "1" (see paragraph "COVERS"). Then carry out the following operations:

- Remove cap "A"
- Check that the gearbox oil reaches the edge of the hole
- If necessary, top up with the specific oil (see "OIL TABLE" in chapter "STICKERS WITH CONTROL DESCRIPTIONS - LEAFLETS IN THE CAB")
- Reinstall and tighten cap "A".
- Refit the protection cover "1".



• UNIVERSAL JOINTS

Grease the points indicate every 200 hours when used under heavy duty conditions.

FRONT AXLE

Universal joints between gear box and differentials :

F Front universal joint
R Rear universal joint

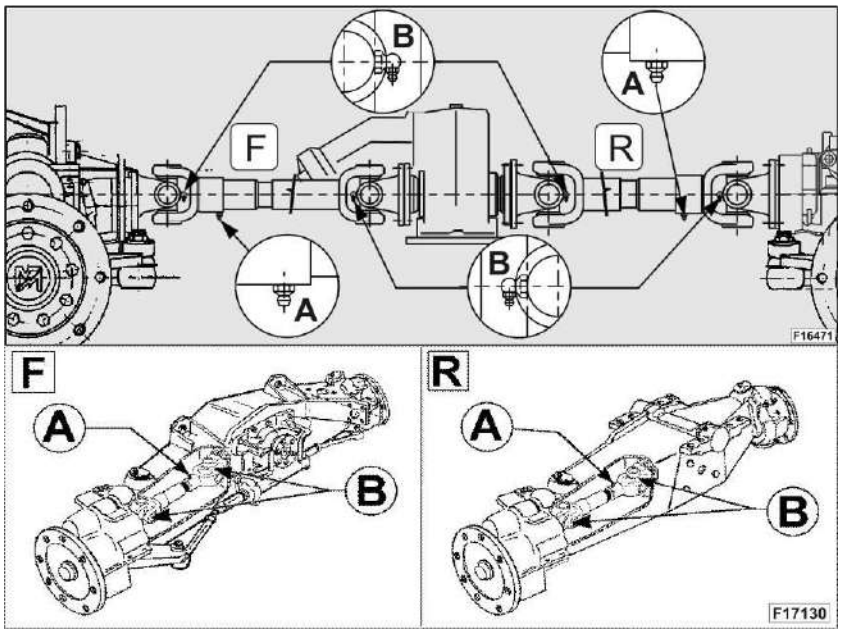
Grease points shown in the picture:

A universal joint splines
B universal joint carrier

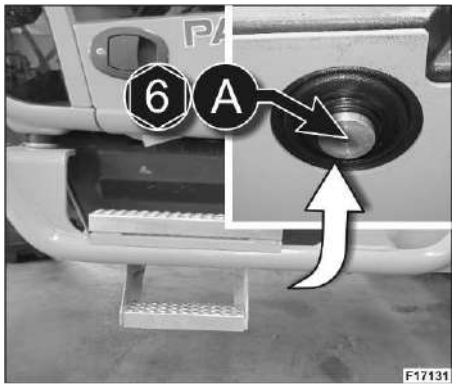
REAR AXLE

Universal joints inside axles:

A universal joint splines
B universal joint carrier



• FUEL TANK



Carry out the following operations to discharge any water or sediment from the fuel tank:

- Place an appropriately sized container underneath discharge cap "A"
- loosen discharge cap "A" using an appropriate hexagonal wrench.
- discharge the water and sediments contained in the tank.
- Tighten discharge cap "A".

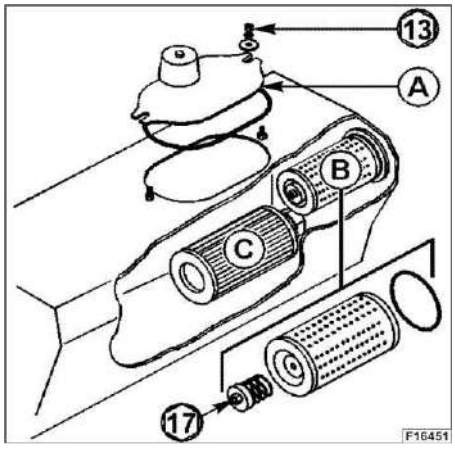
Tighten to torque (15 Nm).

• HYDROSTATIC TRANSMISSION OIL FILTER

Replace the hydrostatic transmission filter:

- place an appropriately sized container underneath filter "A"
- loosen filter "A"; use an appropriate chain or belt extractor to carry out this operation
- collect the oil that flows out
- remove filter "A"
- fill the new filter with specific oil through the appropriate external holes (see paragraph "FUELS AND LUBRICANTS")
- top up the oil in the tank and wait for the air to exit.

• HYDRAULIC OIL RETURN FILTER

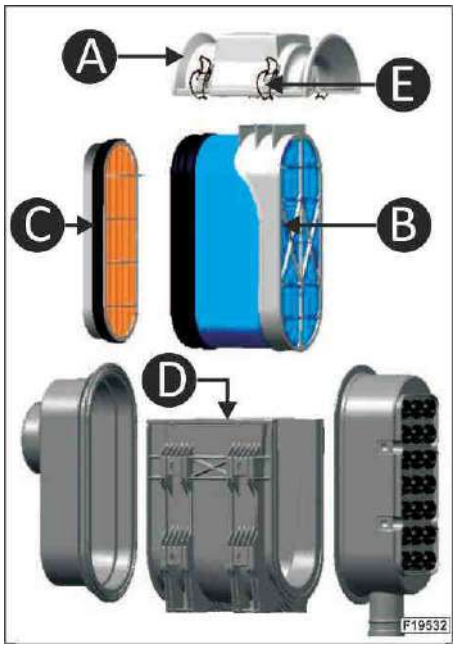


Filter replacement:

- remove the cover (A) and the filter (B) with the related seals;
- replace the filter (B) and reinstall all above items, taking care not to damage the seals.

The hydraulic oil intake filter (C) does not require maintenance.

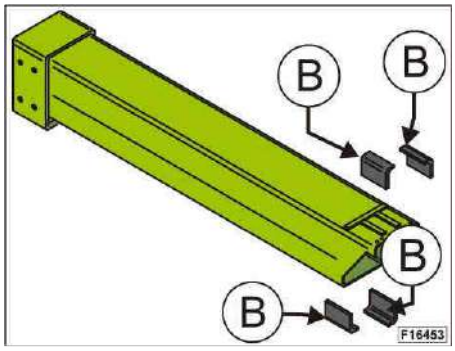
• ENGINE AIR FILTER



A) cover
B) locking device
C) filter cartridge
D) safety cartridge
E) filter body

- remove the filter cover by using the release devices (E)
- pull out the filter cartridge (B) from its seat
- pull out the safety cartridge (C) from its seat
- fit a new safety cartridge (C) in its seat
- fit a new filter cartridge (B) in its seat
- clean the inside of the filter body (D) and the cover (A).
- close the cover (A) using the specific clamping devices (E)

• SLIDING PADS OF THE TELESCOPIC BOOM (INNER PADS)



A visual inspection of the inner sliding pads "B" is necessary to ensure maximum reliability, performance and durability of the telescopic boom.

To inspect the inner sliding pads of the telescopic boom, remove rear case "4" first (see also paragraph "COVERS").

Perform the following checks on the inner sliding pads of the telescopic boom:

1 - visual inspection of inner sliding pads to check for wear
2 - visual inspection of inner sliding pads to check for wear uniformity
3 - visual inspection of inner sliding pads to check for any breaks
4 - visual inspection of inner sliding pads to check for any burrs or large shavings (plastic powder is accepted).

Should any of the above conditions occur, please contact Merlo Technical Assistance Service.

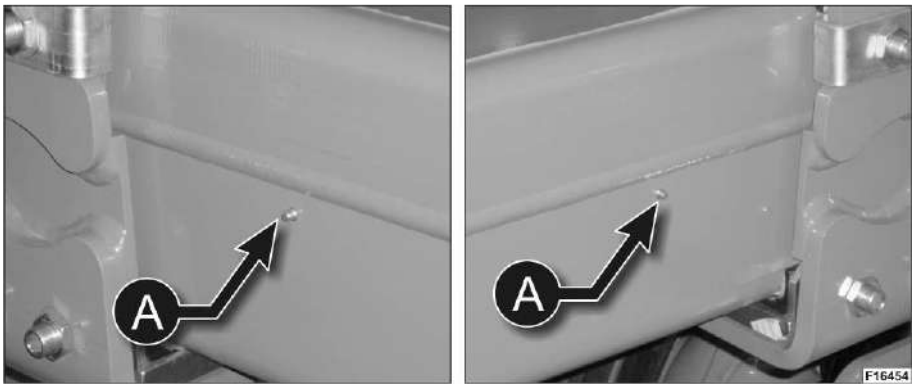
• SCREWS AND BOLTS

Check tightness. See torque chart in this manual (section MACHINE TECHNICAL INFORMATION). The nuts and bolts control instructions of some machine parts are indicated in the paragraph RUNNING-IN PERIOD.

• PIPELINE GUIDE PIPE

(only for models P40.9 PLUS – P60.10 – P72.10 – P60.10EE – P72.10EE)

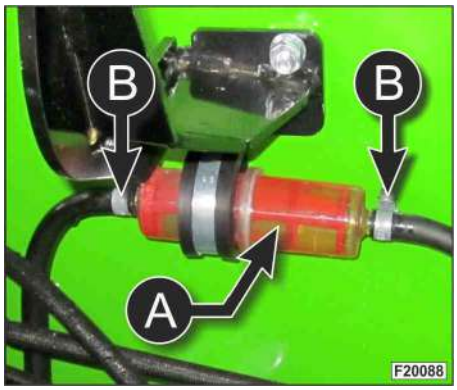
Completely extend the boom and grease (about 200 cc) in the points shown (A).



• DIESEL OIL FILTER

(only for models with KUBOTA engine)

Check the clogging of the diesel oil filter "A" in the following way:



- stop the machine engine.
- inspect the diesel oil filter "A"

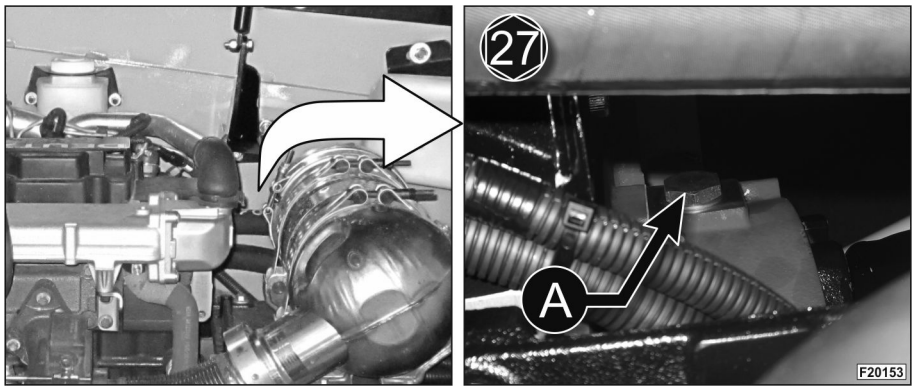
If the diesel filter is excessively dirty, clean it as follows:

- remove the retaining clamps "B" and disconnect the diesel oil filter from pipelines
- directing a jet of compressed air in the opposite direction to the flow of fuel to remove any sediments present in the filter
- inspect the inside of the filter and verify that the mesh is in good condition and free from obstructions; otherwise replace it with a part from the Merlo Technical Assistance service
- replacing the filter, connecting the pipelines and securing the retainer clamps "B"

WARNING! The diesel oil filter has an arrow on the plastic casing which indicates the flow direction of the fuel; replacing the filter on the engine, paying particular care that it is in the correct direction. Otherwise it will lose its protective efficacy.

• CHAIN TRANSFER UNIT OIL

Check the oil level inside the chain transfer unit:



- the chain transfer unit is located inside the engine compartment;
- remove the cap "A"
- check that oil reaches the lower edge of the hole
- if necessary, top up with specific oil (see paragraph "FUELS & LUBRICANTS")
- put back the cap "A"

EVERY 1000 HOURS OR EVERY 12 MONTHS

• ARTICULATED JOINTS

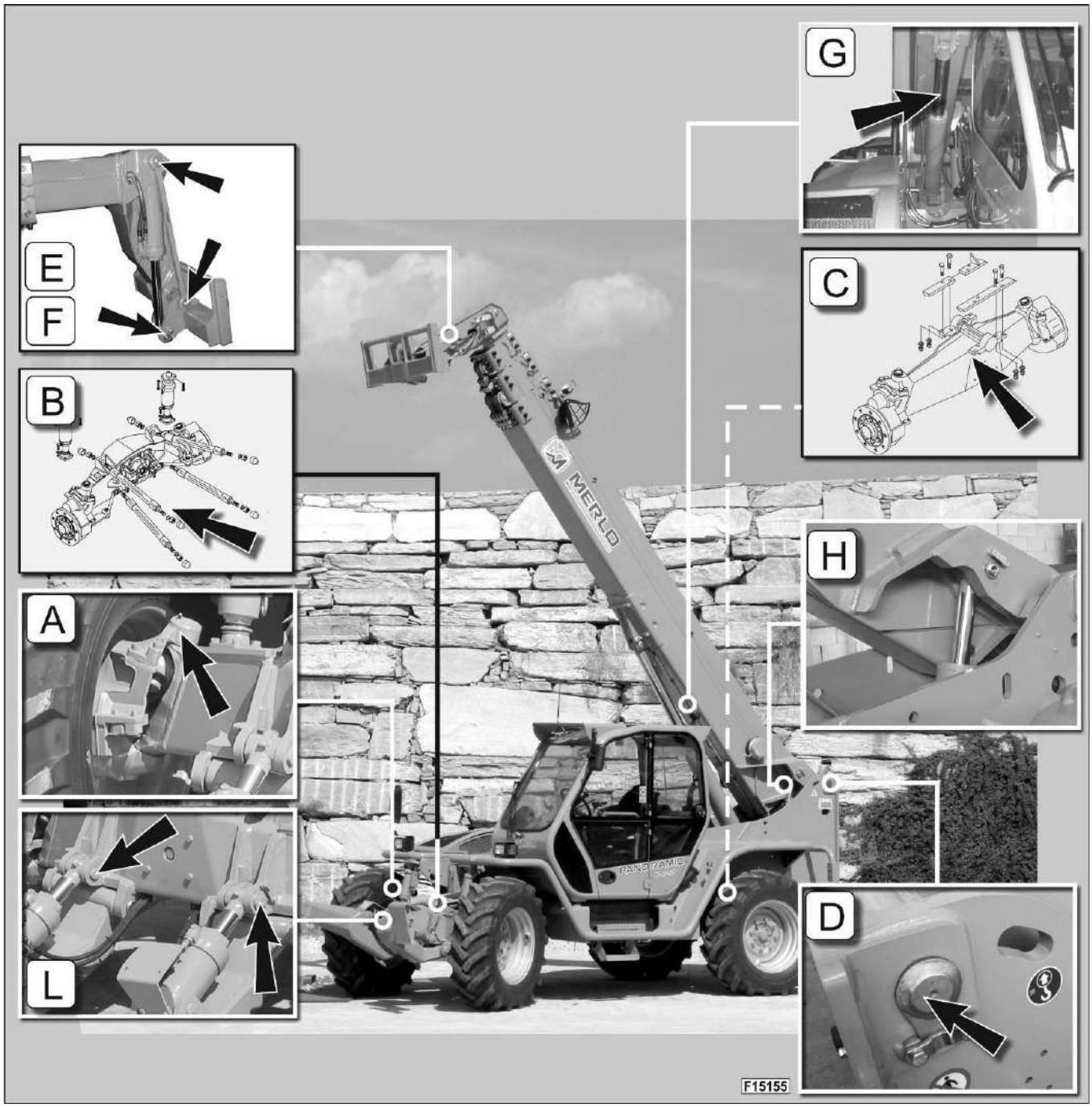
Check the play on the articulated joints of the indicated components. If the play is more than 1 mm, replace the related bushings.
Lubricate the articulated joints of the indicated components that are equipped with greaser.

A) Wheel reduction hubs - B) Front axle - C) Rear axle - D) Boom - E) Carriage - F) Fork jack
G) Lifting jack - H) Offset jack - L) Stabilisers (if fitted to the machine)

NOTE! A P40.17PLUS has been selected to explain this maintenance operation. The instructions are also valid for all other machines included in this Operator's Manual.

WARNING!

To use the machine in particularly harsh conditions (dusty, muddy environments, etc) or for continuous and prolonged daily use, the indicated components must be greased EVERY 50 HOURS or WEEKLY.



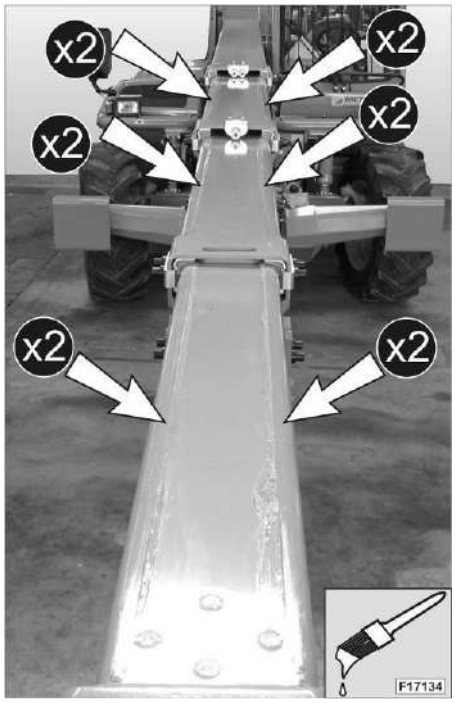
• BOOM SLIDING PADS (EXTERNAL)

- Fully extend the telescopic boom
- Carefully clean the boom sliding surface, removing the residual grease
- Using a cotton wad, evenly spread a thin layer of grease (see paragraph "FUELS AND LUBRICANTS") over the entire boom sliding surface
- Carry out a few boom extension and retraction cycles so as to evenly distribute the product.

WARNING!

Only the recommended product can be used; a different product could cause serious damages to the sliding surface of the boom. More frequent greasing is required when using the machine in particularly demanding conditions.

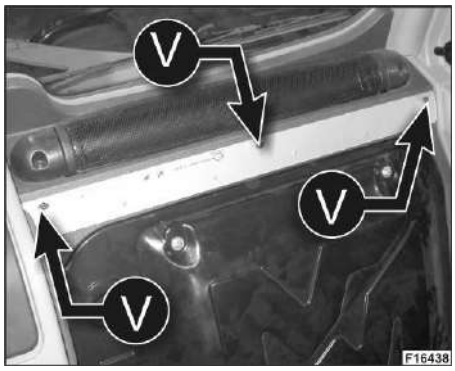
By way of example only, the boom of a P40.17 PLUS machine (3 extensions) is shown. Perform the same operations for the telescopic boom on your machine (1 or 2 extensions depending on the model).



• AIR VENTILATION FILTER

Replace the filter of the cab ventilation system as follows:

- Unscrew fastening screws "V"
- Extract the cab ventilation filter
- Replace the filter with a new one with the same features
- refit the filter, tightening the fastening screws "V"



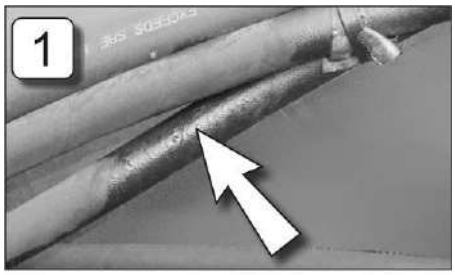
• HYDRAULIC HOSES

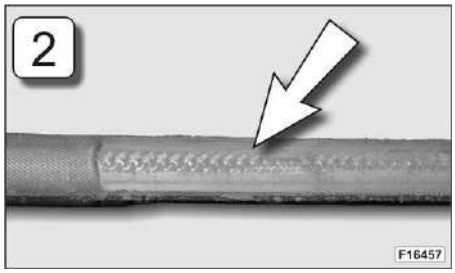
Perform the following checks on the hydraulic hoses:

1) visual check for any oil leaks
2) visual check for any marks on the hydraulic hoses which might be indicative of future oil leaks (photo 1)
3) visual check for any mechanical scraping or grazing on the external protection of the hydraulic hoses (photo 2)

Should any of the conditions above occur, replace the defective hose as soon as possible, so as to prevent the problem from getting worse.

NOTE! Photos 1 and 2 show some examples of problems which might occur on hydraulic hoses.





EVERY 1500 HOURS OR EVERY 18 MONTHS

• HYDROSTATIC TRANSMISSION SYSTEM

Replace the oil from the hydrostatic transmission system

1) Radiator
2) Tank
3) Hydrostatic pump
4) Hydrostatic motor
5) Hydrostatic transmission filter
6) Hand pump

The total capacity of the system is 12 litres

WARNING! Use only hydrostatic oil shown in paragraph FUEL AND LUBRICANTS ..

OIL REPLACEMENT

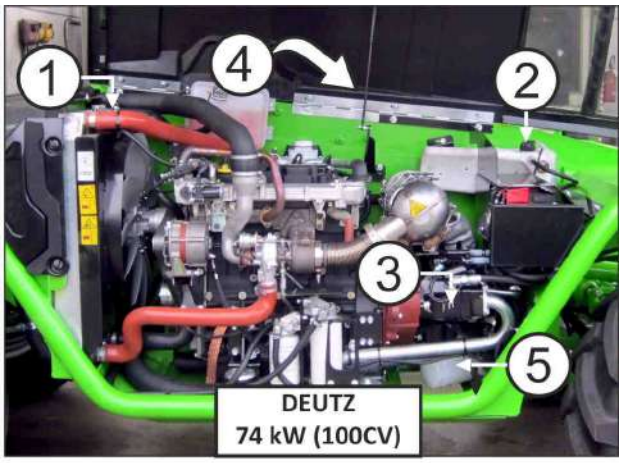
WARNING! Oil change in the hydrostatic transmission must be performed by skilled and qualified personnel.

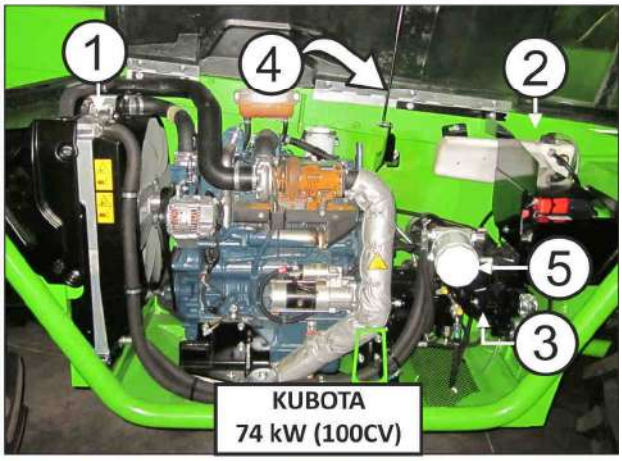
- unscrew the caps of the radiator (1) and hydrostatic oil tank (2)
- remove the filter (5) and drain the oil into a container; to perform this operation, proceed in the manner described in the Filter Replacement Paragraph “EVERY 500 HOURS”
- disconnect pipe "F" located beneath the hydrostatic motor (4), then drain the oil from the system into a container.
- once the oil has been completely drained, reconnect piping "F" in its correct position
- install a new filter (5) for the hydrostatic transmission
- The system must be filed with specific hydraulic oil, filtered at 10-micron and supplied at a pressure of about 2.5 bar.
- For this purpose use a hand pump "M" as shown in the photo (6). Pour the oil into the hydrostatic pump through pressure inlet (fitting M16x2) until the tank is filled

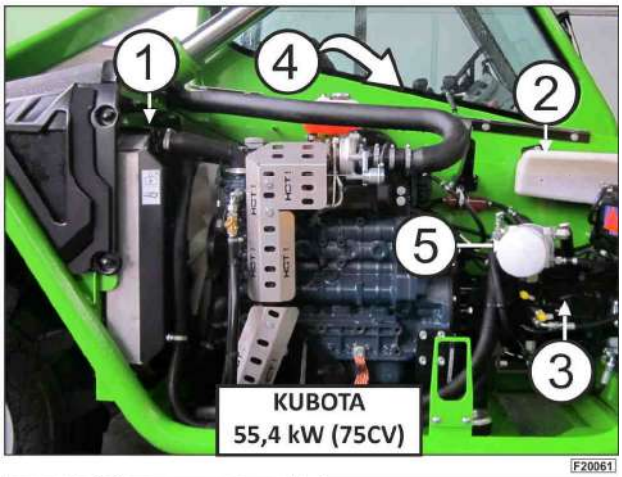
- close radiator cap (1)
- close cap (2) of the tank
- Remove the hand pump from the pressure connection and close the cap

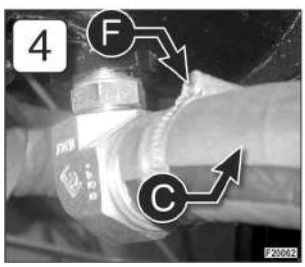
The system must be bled after filling; follow the instructions below:

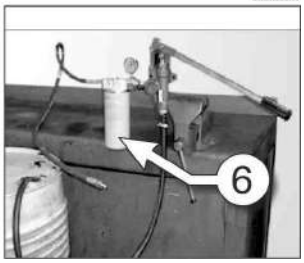
- closing the bonnet, get in the cab and start the engine
- leave the engine running for about 2 minutes
- switch off the engine
- wait 2 minutes to allow the air to bleed completely from the system.
- open the bonnet and check that the oil level in the tank is between the MIN and MAX marks. If not top up the level with the specific oil (see paragraph FUEL AND LUBRICANTS in this chapter).











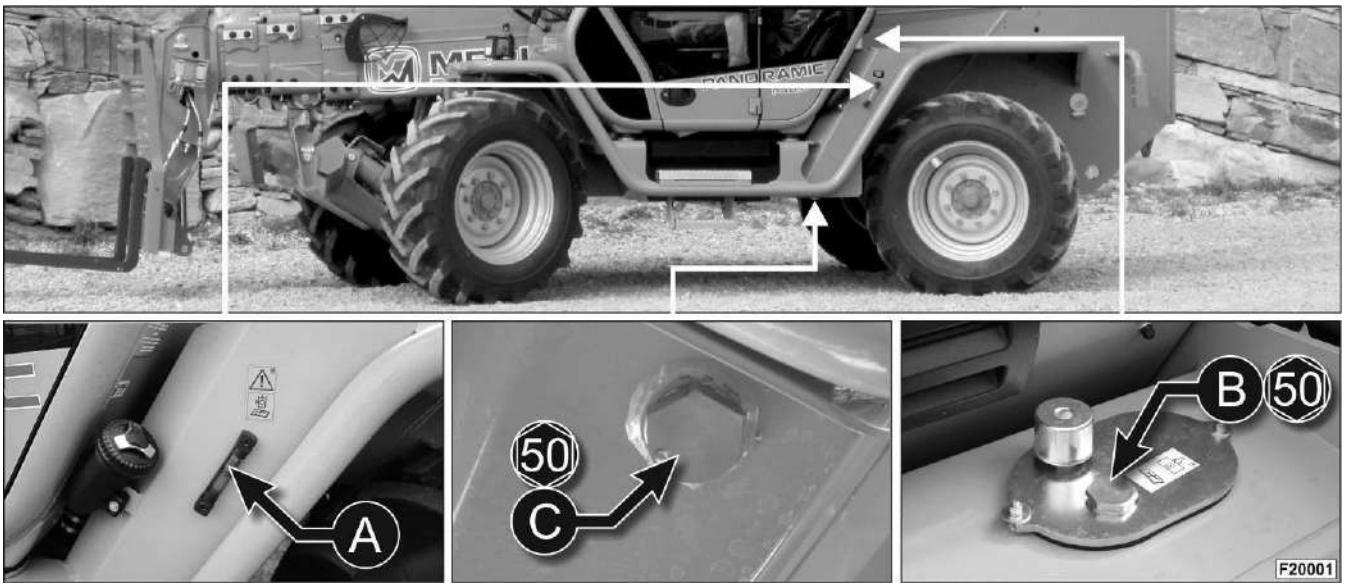
Repeat this procedure until, having left the engine running for about 2 minutes, the oil level is within the MIN and MAX marks on the tank.

• HYDRAULIC OIL

To correctly change the hydraulic oil, do as follows:

- Fully retract and lower the telescopic boom
- Stop the machine diesel engine
- Remove filling cap "B"
- Extract and clean the magnets
- Remove discharge cap "C" and empty the hydraulic oil into an appropriate container
- Close the discharge cap "C"
- Pour some new hydraulic oil through the filler cap "B"; use only the hydraulic oil indicated in the "OIL TABLE" in chapter "STICKERS WITH CONTROL DESCRIPTIONS - LEAFLETS IN THE CAB"
- Check that the level of the hydraulic oil poured into the system is about 5 mm from the upper edge of the indicator glass "A". Close the filling cap "B".

The total capacity of the system is 105 litres (140 litres for P40.17 – P40.17PLUS – P40.17EE)



• GEAR BOX OIL

To correctly change the gearbox oil, do as follows:

- Stop the machine diesel engine
- open covering housing "2" as described in paragraph "COVERS" in section "ORDINARY MAINTENANCE"
- remove the filler cap "A"
- Remove discharge cap "B" and collect the gearbox oil in an appropriate container
- close the discharge cap "B"
- Pour some new gearbox oil through filler cap "A" until it starts flowing out; use only the gearbox oil indicated in the "OIL TABLE" in chapter "STICKERS WITH CONTROL DESCRIPTIONS - LEAFLETS IN THE CAB"
- Close the filler cap "A".

SYSTEM CAPACITY

The total capacity of the system is 3 litres.

• BRAKE FLUID

The replacement of brake fluid and bleeding of the system must be performed by qualified personnel.
The overall capacity of the system is 300 ml

• FRONT AND REAR DIFFERENTIALS OIL

To correctly change the differential oil, do as follows:

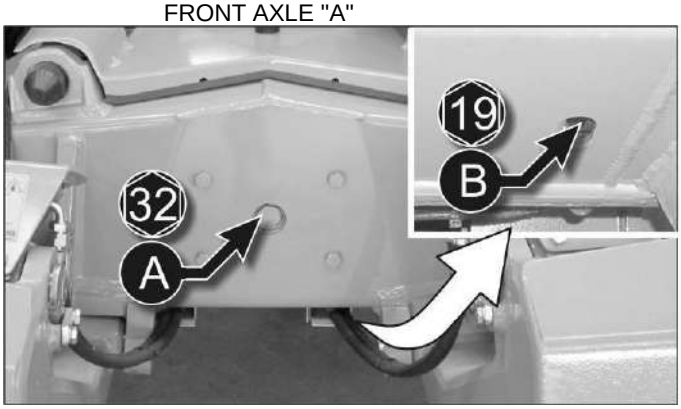
- Stop the machine diesel engine
- work on one differential at a time
- remove the filler cap "A"
- remove the discharge cap "B" and collect the differential oil in an appropriate container
- close the discharge cap "B"
- pour some new differential oil through the filler cap "A" until it starts flowing out; use only the differential oil indicated in the "OIL TABLE" in chapter "STICKERS WITH CONTROL DESCRIPTIONS - LEAFLETS IN THE CAB" Close the filler cap "A".

Repeat the same operations for the other differential of the machine as well.

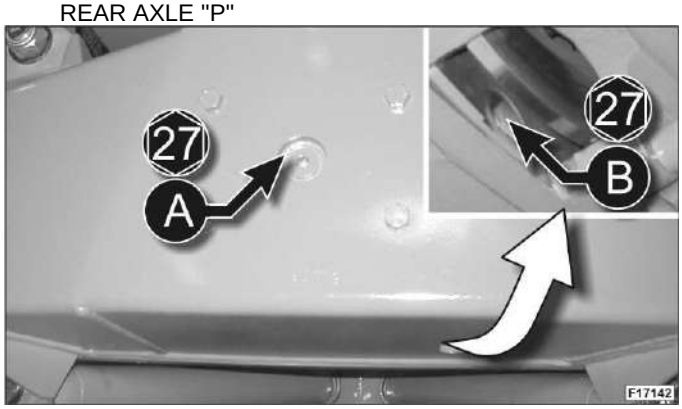
SYSTEM CAPACITY

The total capacity of the system is 5,3 litres

FRONT AXLE "A"



REAR AXLE "P"



• REDUCTION HUB OIL

NOMENCLATURE

A filler cap
B discharge cap
C bleeder cap

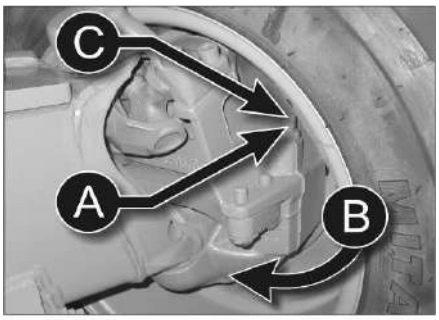
To correctly change the wheel reduction oil, do as follows:

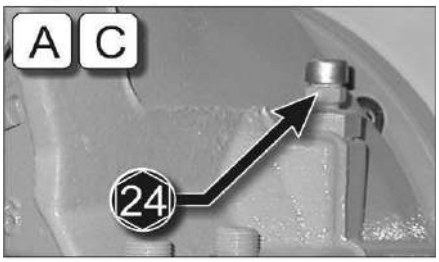
- position the machine on a flat and solid surface
- work on one reduction hub at a time
- remove the filler cap "A"
- remove the discharge cap "B" and drain the oil into a container
- put back the discharge cap "B"
- put in the new oil for the wheel reduction hubs through the filler cap "A" until it comes out (use only wheel reduction oil that is compatible with that shown in the "OIL TABLE" in the chapter "STICKERS WITH CONTROL DESCRIPTIONS - LEAFLETS IN THE CAB")
- put back the filler cap "A"

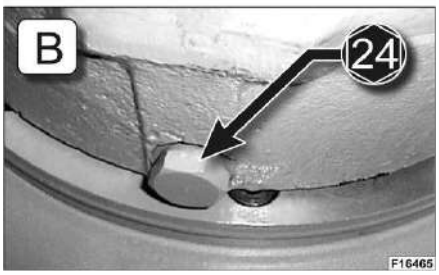
Repeat the same operations for the other reduction hubs as well.

SYSTEM CAPACITY

The total capacity of the system is 1.3 litres.







GENERAL MAINTENANCE

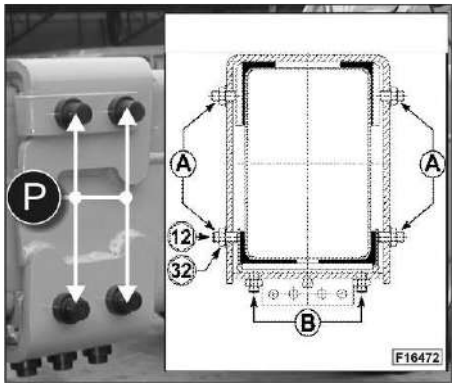
• INTRODUCTION

This chapter describes all the general maintenance operations to be performed on the machine based on its actual operating conditions, without following any particular schedule.

WARNING! Carefully read the instructions in chapter ORDINARY MAINTENANCE before carrying out the following operations.

• ADJUSTMENT OF THE BOOM PADS AND/OR CARRIAGE PARALLEL INCLINATION
(only for P37.12 PLUS – P38.12 PLUS – P38.13 PLUS – P38.14 PLUS – P40.17 PLUS – P38.12 – P38.13 – P38.14 – P40.17 – P38.13EE – P40.17EE)

Should clearance between boom sections and sliding pads result excessive and/or carriage is not parallel to the ground it is necessary to extend the boom by approx. 30 cm. and proceed as follows:



- remove the protective casing "P"

<u>To adjust horizontal clearance:</u>

- loosen the side lock nuts (A)
- tighten dowels (A) fully, in the same way on both sides to centre the boom
- loosen the dowels by 1/2 a turn to give the necessary clearance and tighten the lock nuts.

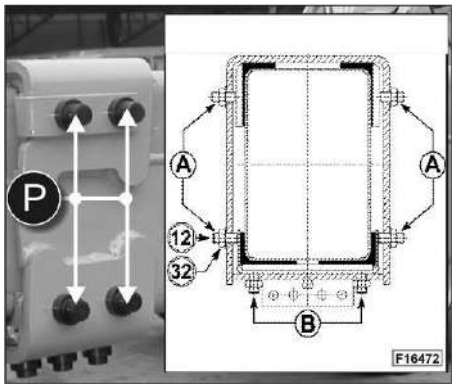
<u>To adjust vertical clearance:</u>

- loosen the lower lock nuts (B)
- tighten the lower dowels (B) fully then loosen them by 1 turn to give the necessary clearance and tighten the lock nuts.

To make best use of the pads it is advisable and cost-effective to swap their position above - below..

• SLIDING SHOE ADJUSTMENT OF THE TELESCOPIC BOOM
(ONLY FOR P40.9 PLUS – P60.10 – P72.10 – P60.10EE – P72.10EE)

If play between the boom sections becomes excessive or the carriage is not correctly parallel to the ground, the sliding shoes of the boom need to be adjusted as follows:



- position the machine on a flat, perfectly level surface
- engage the parking brake
- correctly level the machine (if fitted with TILTING or SUSPENSIONS)
- remove the protective mufflers "P" from the lock nuts
- loosen the side sliding shoes and the lower M12 screws

- connect an overhead crane "C" to the head of the telescopic boom (as shown in the photo) in such a way as to lift the second boom bringing it into contact with the first boom. It is also possible to rest the carriage on the ground on a perfectly flat plate, small-sized and positioned centrally with respect to the boom, and then to lower the telescopic boom in such a way as to raise the second boom bringing it into contact with the first. In both cases never force the manoeuvre bringing about contact between the booms so as not to damage the structure of the telescopic boom.

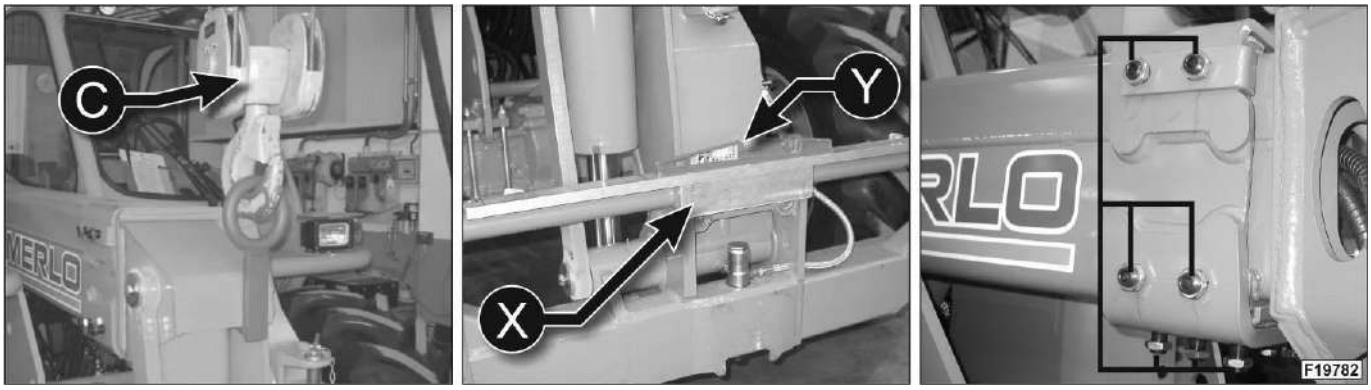
- lay a 1 metre gauge rod "X" on the carriage in a symmetrical manner

- place a spirit level "Y" in the middle of the rod "X"

- loosen all the lower dowels and then tighten them starting with the ones in the middle of each slide and continuing in a criss-cross manner. Loosen by 1 turn all the lower dowels and tighten the counter nuts.

- loosen all the side dowels (on both sides of the boom) and then tighten proceeding in a criss-cross manner. Loosen by 1/2 turn all the side dowels and tighten the counter nuts.

- remove the bridge crane or, in the event a ground blockage was used, lift the machine's telescopic boom.



- on the spirit level "Y" check that the carriage is level.

- if the carriage is not level, you need to adjust the lower runner that you intend to lower.
  To do this you have to unscrew the two M12 screws of the lower runners and then loosen the dowels of the upper runner on the same side of the boom that has to be lowered.

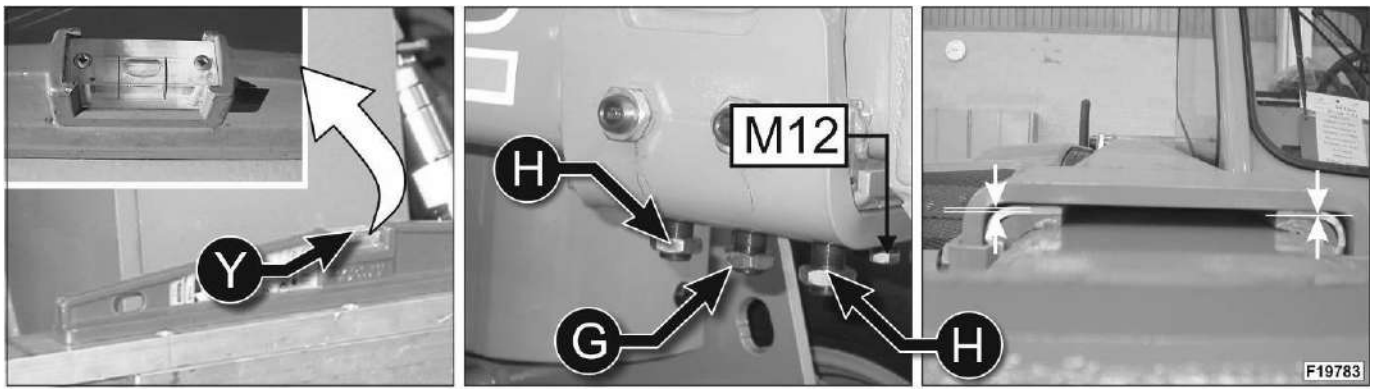
- unscrew the outer lower dowels “H” of the slide that should lower and use the middle dowel "G" until the spirit level shows that the carriage is perfectly level.

- tighten all the dowels in question working in a criss-cross manner, and then loosen the side dowels by half a turn and the upper dowels by 1 turn

- tighten all the counter nuts

- fully extend the telescopic boom, making sure that the inclination percentage of the boom never exceeds the value of ±0.3%.

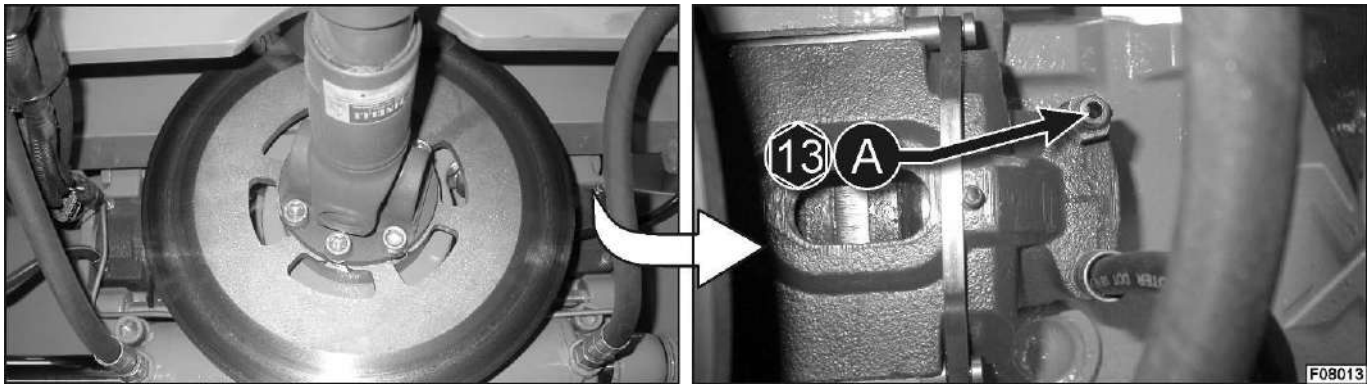
After adjusting the running pads of the boom there might be non-symmetrical play between the runners themselves and the top of the boom, as shown in the photo.



• BRAKE SYSTEM BLEED

Bleeding consists in eliminating the air inside the system. This operation must be performed each time hydraulic parts of the system are disassembled.
Carry out the operations needed to bleed the brake system on both axles and just on the callipers that have the special screw "A"

- fully depress the brake pedal.
- loosen the bleeder screw (A).
- close the bleeder screw (A).
- pump the brake pedal repeatedly.
- repeat from the first point until the fluid exits the bleeder screw without air.



• CLEANING OF THE MACHINE AND ATTACHMENTS

WARNING! All the described operations have to be carried out with the engine off (it is advisable to remove the ignition key from the instrument panel).

To clean correctly follow these instructions:

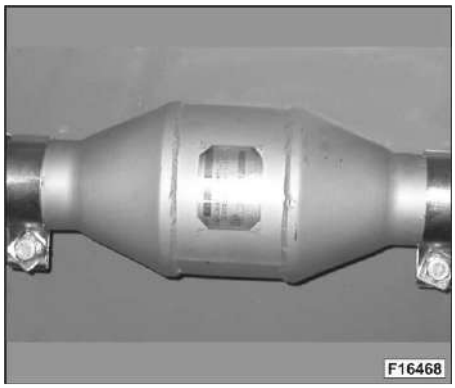
- wear suitable personal protective equipment (gloves, masks, glasses, overalls, etc.)
- do not use flammable liquids and acids or products which could chemically attack the vehicle parts
- do not clean moving or overheated parts.
- the same products used for cleaning cars can be used to clean the inside of the cab. Pay particular attention to remove the build-up of dust, grease or other from the machine's controls.
- to clean the outside of the vehicle and the engine, it is advisable to use a pressure washer, keeping in mind the following:
  - make sure that all filler caps (of the radiator, of the oil tank for both the hydraulic system and the hydrostatic transmission, of the fuel tank) are tightened correctly, and check that the handle of the battery cut-out switch is in the "ON" position (for further information please refer to chapter "ELECTRICAL EQUIPMENT")
  - do not use water pressure and temperature higher than 100 bar and 80° C respectively
  - keep the washing nozzle at not less than 20 cm from the surface being cleaned
  - do not insist with the jet on one point only but wash with wide movements.
  - take care not to turn the jet directly on identification plates in order not to damage them
- After washing, carefully dry the glass screens and the rear-view mirror.

• CATALYTIC DEPURATOR (on request)

If the exhaust is excessively smoky, eliminate the cause by taking the required action on the engine.

If this problem has lasted for a long time, the catalytic depurator must be disassembled from the machine and cleaned inside simply by immersing it in warm soapy water.
It must then be rinsed carefully and left to dry. DO NOT USE detergents or solvents.

In any case, such cleaning must be performed at intervals of no less than 200 hours.



• ENGINE COOLING SYSTEM

For coolant replacement operations. Contact an Authorised Workshop.

• ENGINE OIL

Periodically check the engine oil as follows:

- position the machine on a level surface and turn off the diesel engine
- wait a few minutes to allow the engine to cool and drain the engine oil inside the sump
- check the oil lever by extracting the dipstick "A"; the level must be above the "minimum" mark

WARNING! Do not start the diesel engine if the oil level is below the "minimum" mark.

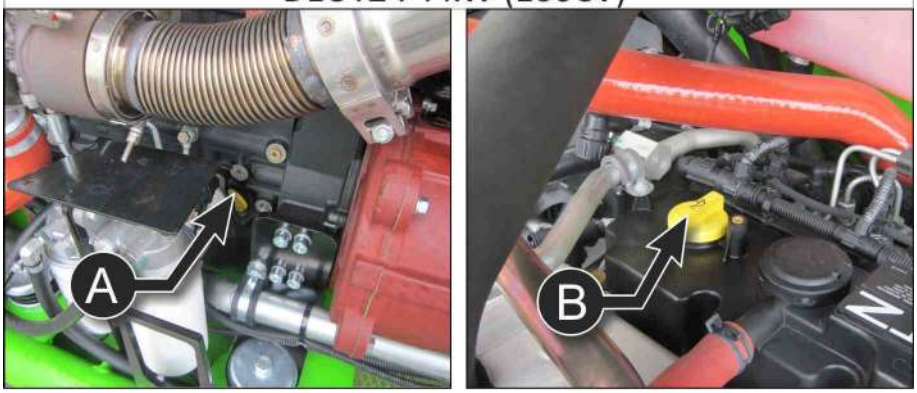
Do not fill the engine oil tank above the "maximum" level.

To obtain more precise information, it is advisable to check the oil level before starting the work day and in any case when the engine is cold.

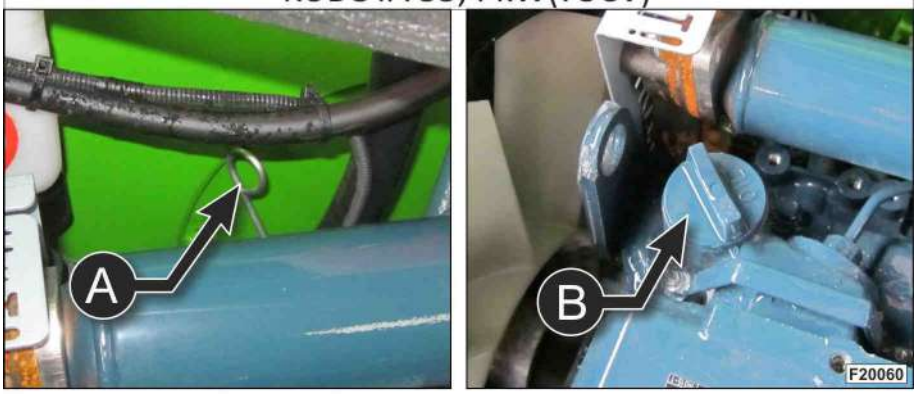
For all other information concerning the use and maintenance of the diesel engine, refer to the related manual.

If necessary, unscrew the filler cap (B) and top up with engine oil indicated in paragraph “FUEL AND LUBRICANTS”

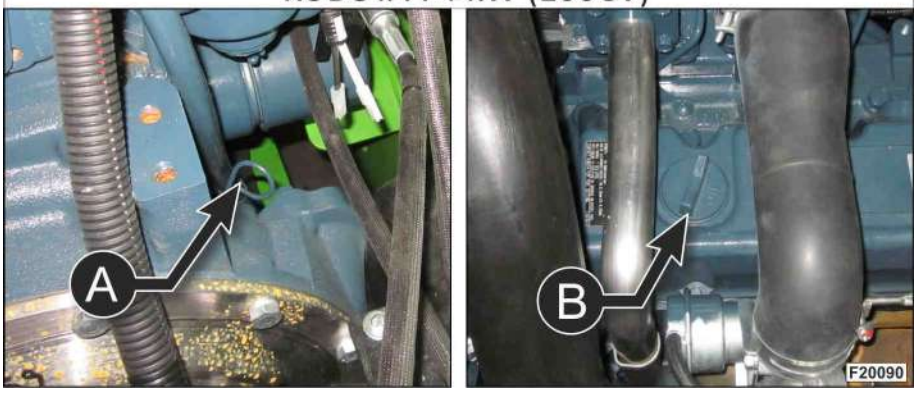
DEUTZ 74 kW (100CV)



KUBOTA 55,4 kW(75CV)

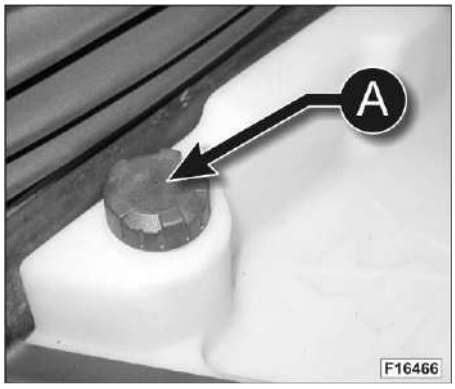


KUBOTA 74 kW (100CV)



• WINDSCREEN WASHER LIQUID TANK

Fill tank "A" situated inside the cab with the specific liquid available on the market.

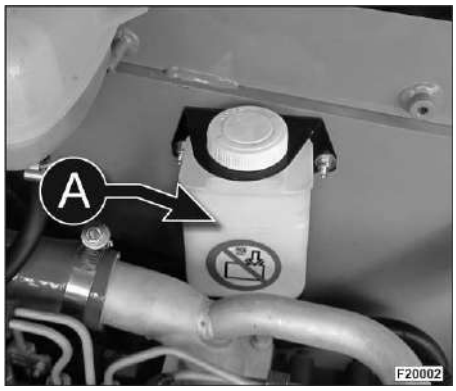


• GEAR BOX OIL BLEEDING TANK

The gearbox oil breather small tank is located inside the engine compartment and is maintenance-free.

WARNING!

Never add oil or any other liquid into the small tank (A).



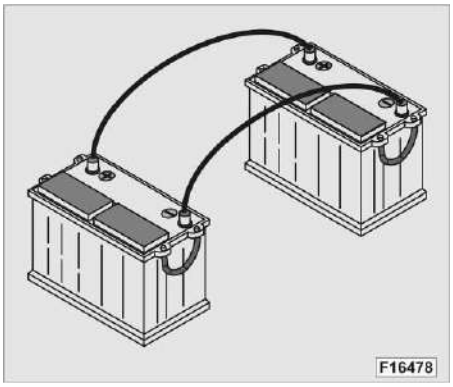
TROUBLE SHOOTING

Should your machine not work correctly, please refer to the following table, so as to identify and eliminate the cause of the problem. The operator is allowed to carry out just some operations, while the most complex ones shall be carried out by Merlo Technical Assistance service.

FAILURE	*CAUSE*	*REMEDY*
HYDRAULIC SYSTEM	- Oil level is too low/too high	Restore the correct oil level
	- Oil type is not suitable	Change the oil type
	- Oil is dirty or contains water	Change the oil
	- Oil is cold at start	Let the oil warm up
	- Leak in the system	Eliminate the leak
	- Presence of air in the oil	Eliminate air
	- Hoses throttling	Eliminate constriction
	- Return filter is dirty/ clogged	Replace the filter
	Should you notice any other failures in the hydraulic system (pump, valves, cylinders, etc.), please contact Merlo Technical Assistance service.	
ELECTRICAL SYSTEM	- Battery is flat	Charge it
	- Electrolyte level is low	Fill it up
	- Connections are slack/ rusted	Restore normal conditions
	- Fuses are blown	Search for failure cause – Replace fuses
	- Alternator belt is slack	Adjust belt tension
	Should you notice any other failures in the electrical equipment, please contact Merlo Technical Assistance service.	
BRAKING SYSTEM	- Excessive brake pad wear	Replace brake pads. Please contact Merlo Technical Assistance service
	- Low brake fluid level	Check the system for any leak, then fill it up
	- Air in the system	Purge air from the system
ENGINE	Please refer to the troubleshooting section in the Engine Manual. For any operations other than routine maintenance to be carried out on certain parts (injection pump, injectors, valves, etc.), please contact Merlo Technical Assistance service.	
HYDROSTATIC TRANSMISSION	For these operations please contact Merlo Technical Assistance service.	

• STARTING THE ENGINE WITH FLAT BATTERY

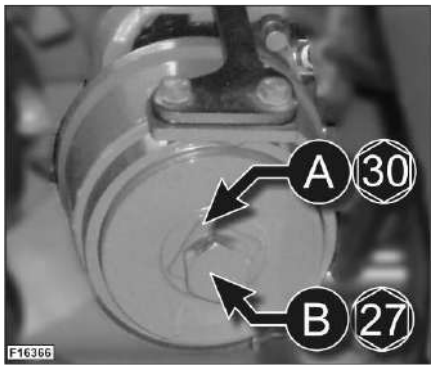
WARNING! Before working on the battery, carefully read the instructions found in paragraph "BATTERY" and in chapter "ELECTRICAL SYSTEM". Check polarity before connecting the cables. Avoid any contact between the two cables.



If the battery is flat, the engine can be started as follows:

1) Take an emergency battery having the same characteristics and two cables.
2) Connect the cable to the (+) and (-) of the battery inside the machine and, then, to the correspondent (+) and (-) of the emergency battery.
3) Start the engine and disconnect the cables.

• MALFUNCTIONING OF THE EMERGENCY PUMP TO DISENGAGE THE PARKING BRAKE

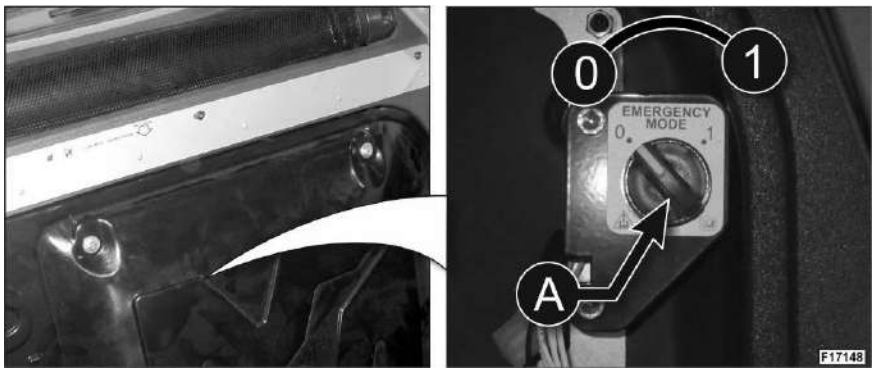


If it is not possible to release the parking brake using the emergency pump, act as follows (see paragraph "TOWING OF THE MACHINE" in the section "OPERATING INSTRUCTIONS"):

- chock the wheels to lock the machine in place
- hold the brake calliper chamber (A) still
- fully loosen the adjusting screw (B)

Before restarting the vehicle tighten the adjusting screw and make sure the system is working correctly.

• "EMERGENCY" FUNCTION



(only for models with DEUTZ engine)

Using the "EMERGENCY" function, in the event of an electronic fault with the hydrostatic transmission (for example the machine does not move either forwards or backwards), it is possible to reset the movements at about 40% of the maximum speed.

Rotating the ignition key "8" to "R" the luminous selector "A" flashes; when the engine starts it switches off.

Activating the system:

- Luminous selector (A) on "0" = emergency function disengaged (the selector is off)
- Indicator light selector (A) on "1" = emergency function engaged (the selector is ON).

WARNING!

Never remove the cover of the box, this should only and exclusively be carried out by personnel from the technical assistance service of MERLO S.p.A.

END OF SECTION

CONTENTS

PERIODIC INSPECTION RECORD SHEET

The following card must be reproduced (i.e. photocopied) and used to record the inspections to be carried out following the periods as reported in the table. If the box between the line and the column is not highlighted, inspection is not necessary. The operations hereafter listed must be carried out following the deadlines in working hours or in months, whichever come first. Inspections of the machine and following recording on the card must be carried out by the person in charge of the operations (e.g. Owner, site manager, etc.). The duly filled in cards must be kept by the machine user and must be at disposal for possible checking by the authorized inspection organism.

P37.12 PLUS

TYPE OF MACHINE	CHASSIS NUMBER	NAME OF CONTROLLER

FUNCTION TO BE CHECKED	PERIOD IN HOURS / MONTHS					
	Every 250 hours or 2 months		Every 500 hours or 6 months		Every 1000 hours or 1 year	
	Control Date	Restoration Date	Control Date	Restoration Date	Control Date	Restoration Date
Functioning of the anti-overturn system acoustic alarm	.../.../...	.../.../...	.../.../...	.../.../...	.../.../...	.../.../...
Functioning of the anti-overturn system visual alarm	.../.../...	.../.../...	.../.../...	.../.../...	.../.../...	.../.../...
Functioning of the anti-overturn system movement locking	.../.../...	.../.../...	.../.../...	.../.../...	.../.../...	.../.../...
Functioning of the locking system of the levelling and shifting command distributor with raised boom	.../.../...	.../.../...	.../.../...	.../.../...	.../.../...	.../.../...
Make sure that the operating and maintenance instruction manual is in the cab	.../.../...	.../.../...	.../.../...	.../.../...	.../.../...	.../.../...
Check spirit level calibration	.../.../...	.../.../...	.../.../...	.../.../...	.../.../...	.../.../...
Check the maximum pressure in the oleodynamic system			.../.../...	.../.../...	.../.../...	.../.../...
Check the jack locking valves			.../.../...	.../.../...	.../.../...	.../.../...
Check the parking brake			.../.../...	.../.../...	.../.../...	.../.../...
Check of the three steering operating modes			.../.../...	.../.../...	.../.../...	.../.../...
Check the power steering unit calibration pressure			.../.../...	.../.../...	.../.../...	.../.../...
Check the boom extension and retraction chains			.../.../...	.../.../...	.../.../...	.../.../...
Check, inside the cab and on the machine, for the presence and condition of the instruction plates					.../.../...	.../.../...

Signature:	Machine total working hours:

WARNING! Before beginning any of the checking operations (described below) which require machine movement, make sure there are no people or objects in its radius of operation. Furthermore, for operations which require a load to be lifted, ensure that the machine is on a compact surface and is fully level.

Should any anomalies be identified during these checks, do not use the machine before they have been resolved.

(P38.12 - P38.12 PLUS - P38.13 - P38.13 PLUS - P38.14 - P38.14 PLUS – P38.13EE)

TYPE OF MACHINE	CHASSIS NUMBER	NAME OF CONTROLLER

FUNCTION TO BE CHECKED	PERIOD IN HOURS / MONTHS					
	Every 250 hours or 2 months		Every 500 hours or 6 months		Every 1000 hours or 1 year	
	Control Date	Restoration Date	Control Date	Restoration Date	Control Date	Restoration Date
Functioning of the anti-overturn system acoustic alarm	.../.../...	.../.../...	.../.../...	.../.../...	.../.../...	.../.../...
Functioning of the anti-overturn system visual alarm	.../.../...	.../.../...	.../.../...	.../.../...	.../.../...	.../.../...
Functioning of the anti-overturn system movement locking	.../.../...	.../.../...	.../.../...	.../.../...	.../.../...	.../.../...
Check the stabiliser and levelling control distributor locking system with the boom raised	.../.../...	.../.../...	.../.../...	.../.../...	.../.../...	.../.../...
Make sure that the operating and maintenance instruction manual is in the cab	.../.../...	.../.../...	.../.../...	.../.../...	.../.../...	.../.../...
Check spirit level calibration	.../.../...	.../.../...	.../.../...	.../.../...	.../.../...	.../.../...
Check the maximum pressure in the oleodynamic system			.../.../...	.../.../...	.../.../...	.../.../...
Check the jack locking valves			.../.../...	.../.../...	.../.../...	.../.../...
Check the parking brake			.../.../...	.../.../...	.../.../...	.../.../...
Check of the three steering operating modes			.../.../...	.../.../...	.../.../...	.../.../...
Check the power steering unit calibration pressure			.../.../...	.../.../...	.../.../...	.../.../...
Check the boom extension and retraction chains			.../.../...	.../.../...	.../.../...	.../.../...
Check, inside the cab and on the machine, for the presence and condition of the instruction plates					.../.../...	.../.../...
Signature:			**Machine total working hours:**			

WARNING!

Before beginning any of the checking operations (described below) which require machine movement, make sure there are no people or objects in its radius of operation. Furthermore, for operations which require a load to be lifted, ensure that the machine is on a compact surface and is fully level.

Should any anomalies be identified during these checks, do not use the machine before they have been resolved.

(P40.9 PLUS - P60.10 - P72.10 – P60.10EE – P72.10EE)

TYPE OF MACHINE	CHASSIS NUMBER	NAME OF CONTROLLER

FUNCTION TO BE CHECKED	PERIOD IN HOURS / MONTHS					
	Every 250 hours or 2 months		Every 500 hours or 6 months		Every 1000 hours or 1 year	
	Control Date	Restoration Date	Control Date	Restoration Date	Control Date	Restoration Date
Functioning of the anti-overturn system acoustic alarm	.../.../...	.../.../...	.../.../...	.../.../...	.../.../...	.../.../...
Functioning of the anti-overturn system visual alarm	.../.../...	.../.../...	.../.../...	.../.../...	.../.../...	.../.../...
Functioning of the anti-overturn system movement locking	.../.../...	.../.../...	.../.../...	.../.../...	.../.../...	.../.../...
Functioning of the locking system of the levelling and shifting command distributor with raised boom	.../.../...	.../.../...	.../.../...	.../.../...	.../.../...	.../.../...
Make sure that the operating and maintenance instruction manual is in the cab	.../.../...	.../.../...	.../.../...	.../.../...	.../.../...	.../.../...
Check spirit level calibration	.../.../...	.../.../...	.../.../...	.../.../...	.../.../...	.../.../...
Check the maximum pressure in the oleodynamic system			.../.../...	.../.../...	.../.../...	.../.../...
Check the jack locking valves			.../.../...	.../.../...	.../.../...	.../.../...
Check the parking brake			.../.../...	.../.../...	.../.../...	.../.../...
Check of the three steering operating modes			.../.../...	.../.../...	.../.../...	.../.../...
Check the power steering unit calibration pressure			.../.../...	.../.../...	.../.../...	.../.../...
Check, inside the cab and on the machine, for the presence and condition of the instruction plates					.../.../...	.../.../...
Signature:			**Machine total working hours:**			

WARNING!

Before beginning any of the checking operations (described below) which require machine movement, make sure there are no people or objects in its radius of operation. Furthermore, for operations which require a load to be lifted, ensure that the machine is on a compact surface and is fully level.

Should any anomalies be identified during these checks, do not use the machine before they have been resolved.

(P40.17 – P40.17PLUS – P40.17EE)

TYPE OF MACHINE	CHASSIS NUMBER	NAME OF CONTROLLER

FUNCTION TO BE CHECKED	PERIOD IN HOURS / MONTHS					
	Every 250 hours or 2 months		Every 500 hours or 6 months		Every 1000 hours or 1 year	
	Control Date	Restoration Date	Control Date	Restoration Date	Control Date	Restoration Date
Functioning of the anti-overturn system acoustic alarm	.../.../...	.../.../...	.../.../...	.../.../...	.../.../...	.../.../...
Functioning of the anti-overturn system visual alarm	.../.../...	.../.../...	.../.../...	.../.../...	.../.../...	.../.../...
Functioning of the anti-overturn system movement locking	.../.../...	.../.../...	.../.../...	.../.../...	.../.../...	.../.../...
Check the stabiliser and levelling control distributor locking system with the boom raised	.../.../...	.../.../...	.../.../...	.../.../...	.../.../...	.../.../...
Make sure that the operating and maintenance instruction manual is in the cab	.../.../...	.../.../...	.../.../...	.../.../...	.../.../...	.../.../...
Check spirit level calibration	.../.../...	.../.../...	.../.../...	.../.../...	.../.../...	.../.../...
Check the maximum pressure in the oleodynamic system			.../.../...	.../.../...	.../.../...	.../.../...
Check the jack locking valves			.../.../...	.../.../...	.../.../...	.../.../...
Check the parking brake			.../.../...	.../.../...	.../.../...	.../.../...
Check of the three steering operating modes			.../.../...	.../.../...	.../.../...	.../.../...
Check the power steering unit calibration pressure			.../.../...	.../.../...	.../.../...	.../.../...
Control of the attachment points and the adjustment of the boom extension chains			.../.../...	.../.../...	.../.../...	.../.../...
Check, inside the cab and on the machine, for the presence and condition of the instruction plates					.../.../...	.../.../...
Signature:			**Machine total working hours:**			

WARNING!

Before beginning any of the checking operations (described below) which require machine movement, make sure there are no people or objects in its radius of operation. Furthermore, for operations which require a load to be lifted, ensure that the machine is on a compact surface and is fully level.

Should any anomalies be identified during these checks, do not use the machine before they have been resolved.

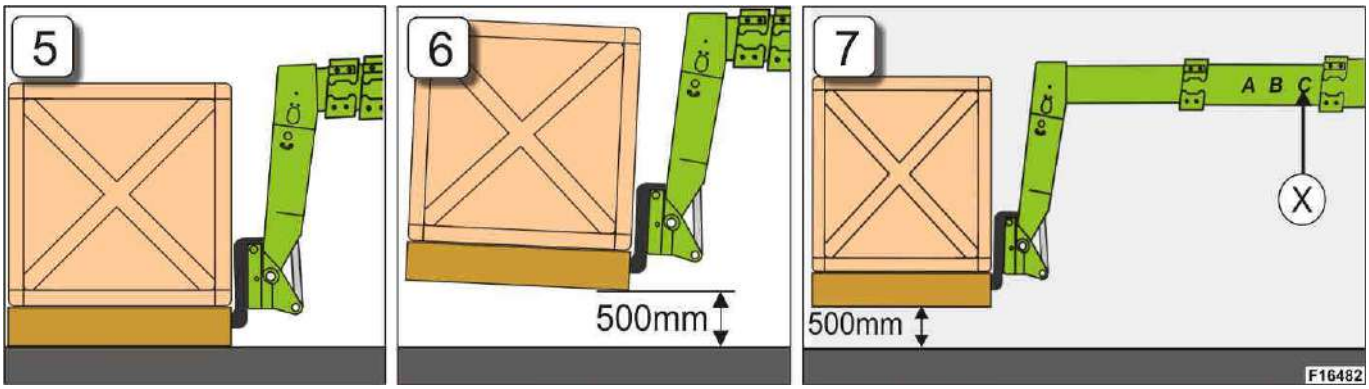
SOUND-VISUAL ALARMS AND MOVEMENT BLOCKING OF THE ANTI-OVERTURN SYSTEM

Your machine is fitted with two micro-switches (one on the right rear axle shaft and one on the left rear axle shaft) which control the anti-overturn system. Inasmuch, carry out the safety check on both rear axle shafts, proceeding as follows:

WARNING! When carrying out the following operations, it will necessary to leave the driver's cab. Always switch off the engine before leaving the driver's seat.

It is recommended to use a load with a weight of about 2/3 of the maximum load for the test.

1) Operate on solid, level ground
2) Fit the forks on the machine
3) Choose a load whose weight is known with a good approximation (± 10%)
4) Pick up the load with the forks (Fig.5)
5) Make sure that the machine is level and centred in reference to the longitudinal axis; also check that the wheels are aligned to the chassis frame
6) Lift the load to about 500 mm above ground (Fig.6)
7) Ascend with the right tyre on a step having a minimum height of 10 cm
8) Tilt the machine crossways and clockwise (see "CROSSWAYS TILT CONTROL LEVER" in section "COMMANDS AND INSTRUMENTS") in order to bring the right hand rear semi-axle to the end of its travel
9) Extract the boom until the point where the anti-overturn system intervenes (sound and visual alarm, block of movements)
10) Check the length of the boom in reference to the "X" letter which is the closest to the fixed part of the boom
11) On the basis of the load used for the test, check if the "X" letter where the system has intervened matches the letter foreseen by the machine's load chart found in the cabin. The tolerance for system intervention is ± 400 mm in relation to what is indicated in the diagram (Fig. 7)



12) Completely retract the telescopic boom
13) Place the load on the ground
14) Drive off the step under the rear right wheel
15) Reset the crossways tilt corrector in the central position
16) Ascend with the left tyre on a step having a minimum height of 10 cm
17) Tilt the machine crossways and anticlockwise (see "CROSSWAYS TILT CONTROL LEVER" in section "COMMANDS AND INSTRUMENTS") in order to bring the left hand rear semi-axle to the end of its travel
18) Carry out the test operations indicated in points (9) to (15)

The test is successfully passed only if - when carrying put the above mentioned operations - the anti-overturn system works correctly on both sides of the rear axle. If even one of the two anti-overturn control systems does not work correctly, do not use the machine and contact the Technical Assistance Service of Merlo S.p.A.

STEERING OPERATING MODES

Make sure the steering system is working correctly in the three modes envisaged:

- four-wheel coordinated steering
- steering on the front axle
- crab steering

PLATES AND INSTRUCTIONS

Make sure all the plates are present on the machine, and the various instruction pages are actually in the removable container in the cab. They must all be in good condition.
The main ones are shown in the relative chapters of this manual. If they are illegible or have been lost, you must request replacements (giving the serial number on the specific part as a reference).

STABILISERS COMMAND LOCK

- Raise the boom until its lower part (without load) coincides with the upper corner of the cab.
- Operate the stabiliser command. The control must be locked.
- Lower the boom and repeat the commands, making sure they can be activated in this condition.

CROSSWAYS LEVELLING "TILTING" COMMANDS LOCK

- Raise the boom until its lower part (without load) coincides with the upper corner of the cab.
- Activate the TILTING command. The control must be locked.
- Lower the boom and repeat the commands, making sure they can be activated in this condition.

USE AND MAINTENANCE INSTRUCTIONS MANUAL

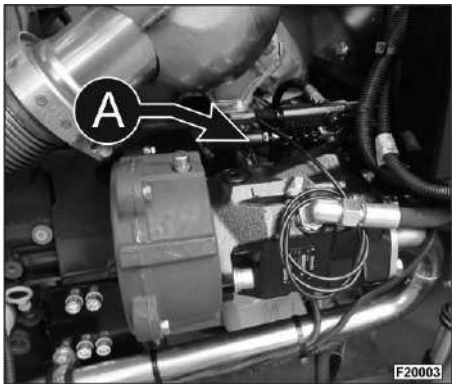
Make sure the manual is effectively in the cab and in good condition. In case of loss or damage, request a duplicate indicating, if possible, the reference code at the bottom of the cover, otherwise use the SAV number of the machine.

POWER STEERING UNIT CALIBRATION PRESSURE

- Stop the engine and remove the ignition key.
- Connect the pressure gauge cable to the pressure connection on the pump (as for the HYDRAULIC OIL SYSTEM PRESSURE check).
- Start the engine
- Hold the transmission in neutral position
- Accelerate to approx. 1800 rpm
- Turn the steering wheel on full lock to any side of the machine and continuing to exert a slight force and read the pressure gauge in the cab
- System pressure should be over 180 bar (180 kg/cm²)

HYDRAULIC SYSTEM OIL PRESSURE

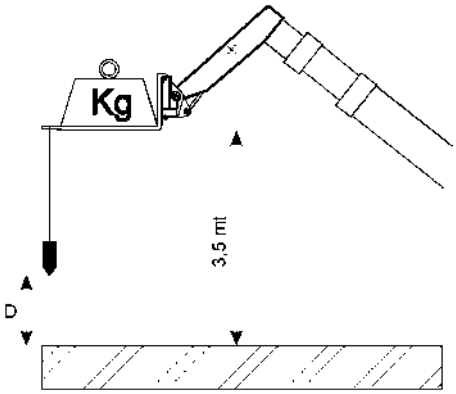
- Stop the engine and remove the ignition key.
- Connect the small cable in the engine bay to the pressure socket "A"
- Start the engine
- Fully retract the telescopic boom.
- Accelerate to 2,400 rpm, while keeping boom retraction activated.
- Check on the gauge in the cab that the pressure is between 205 and 215 Bar.



WARNING! If the gauge indicates a pressure value different from that expected, please ask for assistance from qualified Merlo Service personnel.

When the checking of the pressure is ended, disconnect the small hose from the pump and rearrange it in the engine compartment.

JACK LOCKING VALVES



- Start the engine Pick up a load, using the forks, weighing at least 2/3 of the machine's maximum capacity.
- Hook a plumb line (about 3 metres long) near the end of the forks
- Stabilise the machine (if the machine is equipped with stabilisers)
- Raise the boom to a height of about 3.5 metres
- Extend the boom by about 0.5 metres
- Stop the engine and operate the distribution levers as to lower the boom and to rotate the forks downward.
- Release the levers
- Measure the distance "D" between the end of the plumb line and the ground
- Lock the cab and wait approx. 30'.
- Repeat the measurement.

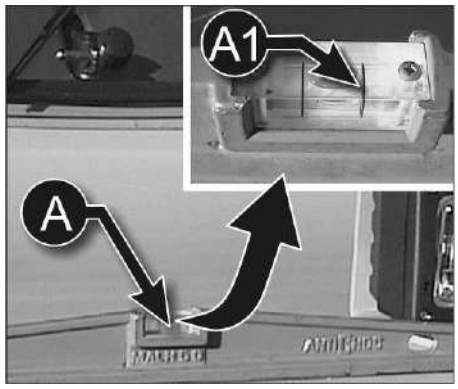
The difference between the two measurements must not be over 25 mm, in case the difference is over 25 mm contact the MERLO service centre.

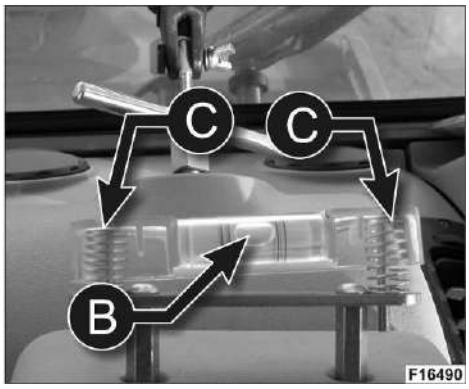
PARKING BRAKE

- Start the engine and engage 2nd gear.
- Check that the gear is engaged by driving the machine for a short distance.
- Engage the parking brake.
- Whilst keeping one foot on the brake, engage the forward drive and accelerate to a speed to approx 1600 rpm.
- Slowly release the brake pedal.
- If the machine does not move, accelerate again to maximum rpm. The machine must remain at a standstill.

SPIRIT LEVEL CALIBRATION

Check the correct calibration of the spirit level on the machine dashboard.





- position spirit level "A" of a minimum length of no less than 400 mm (as shown).
- level the machine using the relative devices mounted on the machine (stabilizers, tilting or suspension type). If the machine is not fitted with any of these devices, move the machine to an area of flat ground in order to find a point at which the spirit level in the level gauge "A" is perfectly centred.
- Turn screw "C" until the air bubble is perfectly central in the machine's spirit level "B".

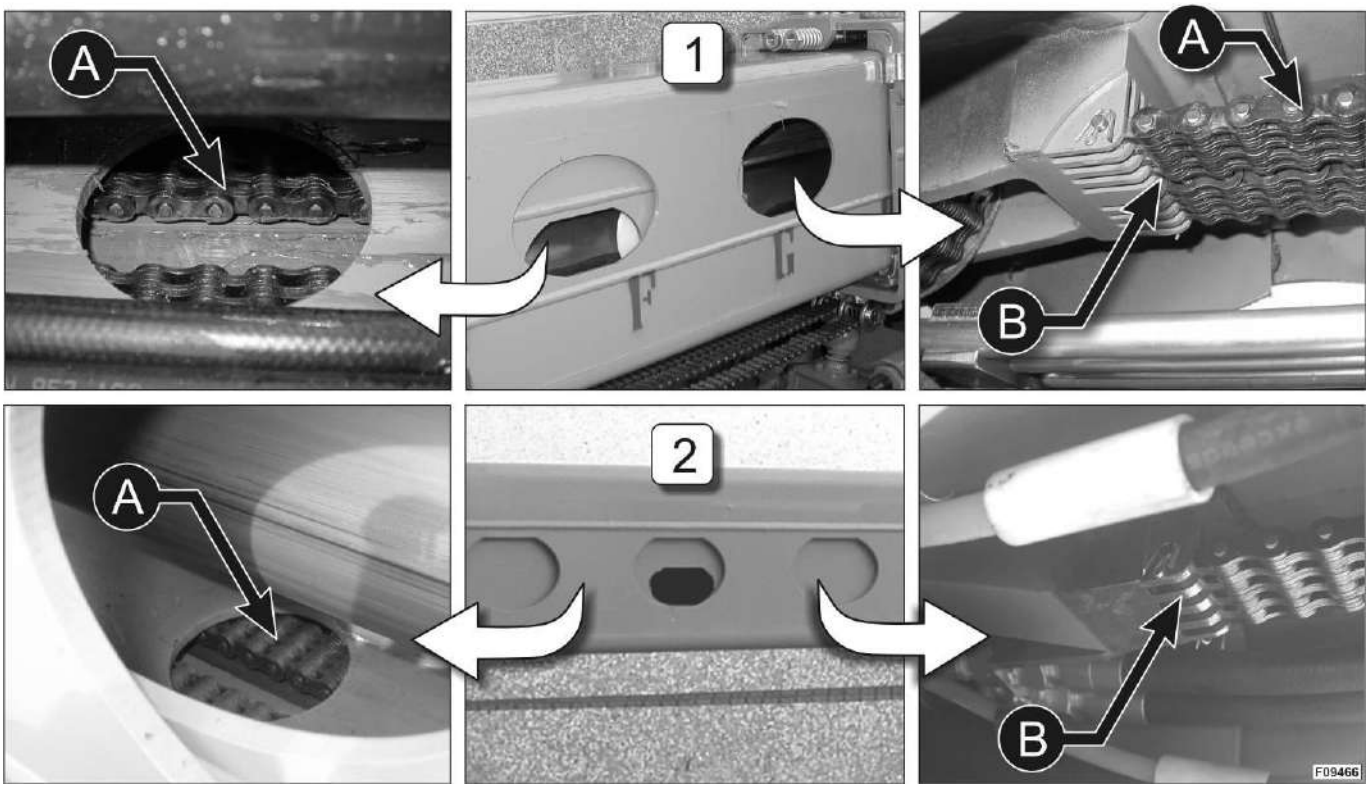
CONTROL OF THE CHAINS FOR THE EXTENSION AND RETRACTION OF THE BOOM

(only for models P40.17 – P40.17PLUS – P40.17EE)

INSPECTION OF CHAINS

a) chains inside the boom

To check the integrity and the state of wear of chains "A", as well as their correct fitting on combs "B", extend the telescopic boom completely and perform the inspection through the slots on the second and third boom (fig.1), third and fourth boom (fig.2).

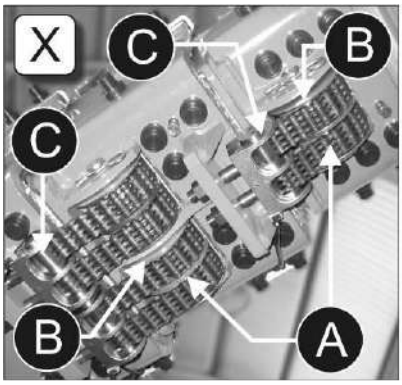


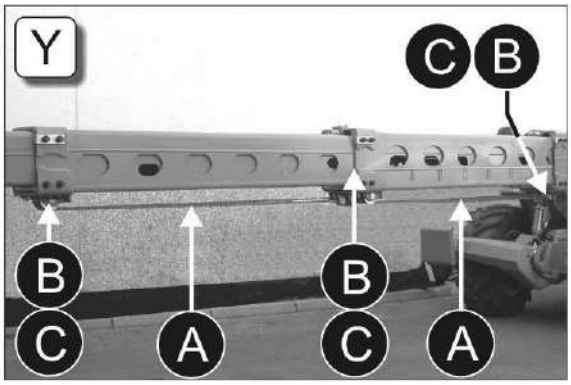
b) chains outside the boom

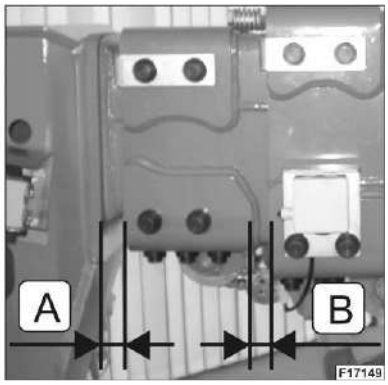
To check the integrity and the wear level of chains "A", of pulleys "B" and their correct fitting on combs "C", the telescopic boom of the machine must be placed parallel to the ground and the inspection carried out:

X – with the boom retracted
Y – with the boom extended

c) Completely retract the telescopic boom and check that the measurements indicated (A and B) are about 30 mm; If this is not the case, the chains must be adjusted.



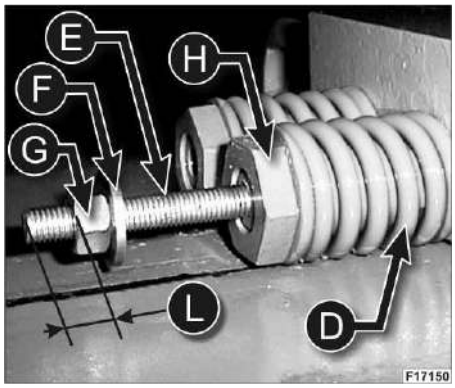




CHAIN ADJUSTMENT

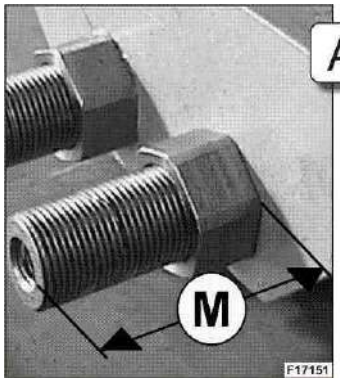
Before adjusting the chains, the springs (D) have to be disassembled proceeding as follows:

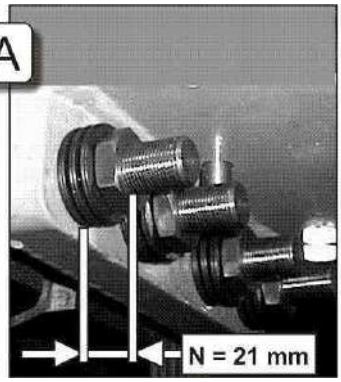
- Take the threaded bar (E), the washer (F) and the nut (G) from the pocket behind the seat. Fully screw the threaded bar (E) into the hole on the pin.
- Insert the washer (F) and screw the nut (G) onto the threaded bar up to about L=10 mm as shown in the photo.
- Carefully unscrew the retainer nut (H) of the spring so that it is completely released; then remove the threaded bar (E), the nut (H) and the spring (D).
- Repeat the same operation also for the other pin

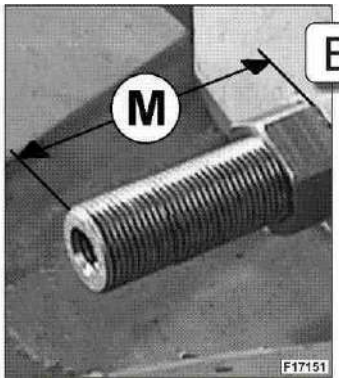


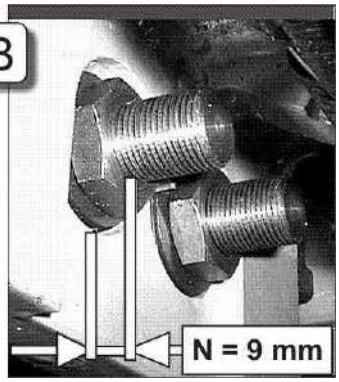
Proceed to adjust the chains as follows:

- The distance between the second and third boom (position A) is adjusted by using the adjusting screws "A", that between the third and fourth boom (position B) is adjusted using the adjustments screws "B".
- To reduce the distance between the booms the corresponding lower adjustments screws need to be loosened, then the top ones tightened to obtain a distance of 30 mm (adjust the position "A" using the adjustment screw on the cab side, then the other adjustment screw needs to be tightened until the same length as the uncovered threading is obtained; In any event, make sure that the position (M) is no more than 50 mm).
  Tighten the corresponding lower cab side adjustment screw until the spring pack is at the position (N) indicated in the photo; fully extend the booms, then bring them in by about 50 cm and tighten the remaining adjustment screws so as to bring the other chains parallel to the first.
- To increase the distance between the boom the corresponding upper adjustment screws need to be loosened, then the lower ones need to be tightened until the booms are brought to a distance of about 35 mm; retract the booms to the correct distance by carrying out the operations reported in the previous point.



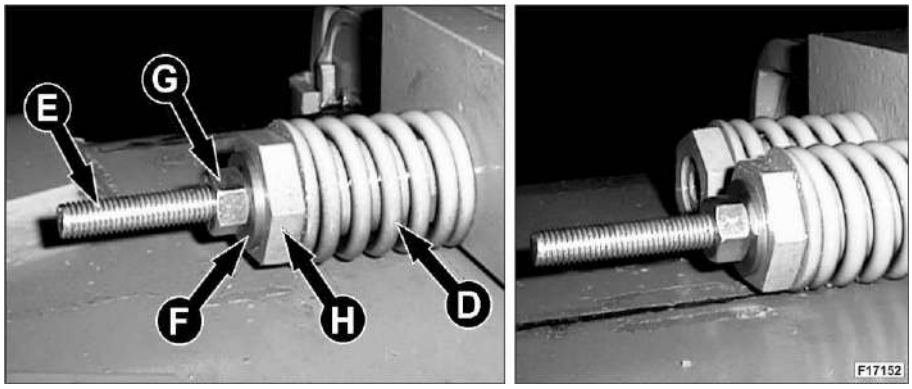




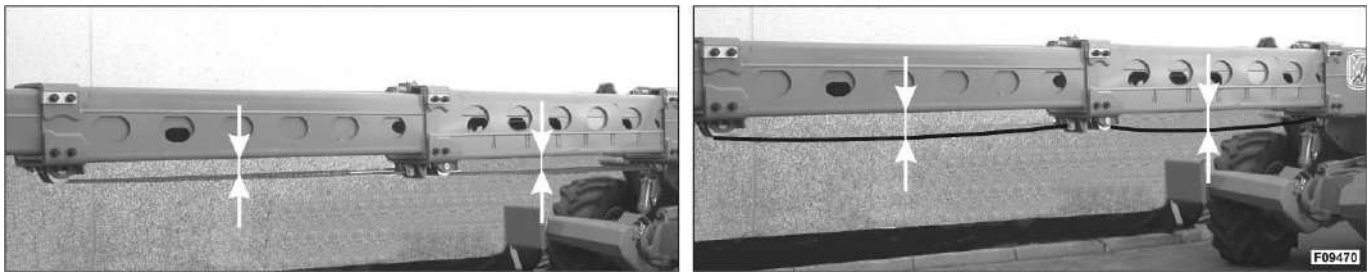


Re-assemble the springs on the pins, proceeding as follows:

- Insert the spring (D) then screw in the threaded bar (E).
- Insert on the threaded bar, in the following order: the retainer nut (H) of the spring, the washer (F) and the nut (G).
- Screw on the nut (G) until the retainer nut (H) is brought into contact with the pin; screw on the retainer nut (H) of the spring until it is closed on the adjustment nut.
- Then remove the threaded bar (E), the nut (H) and the spring (D) and put them back in the pouch.



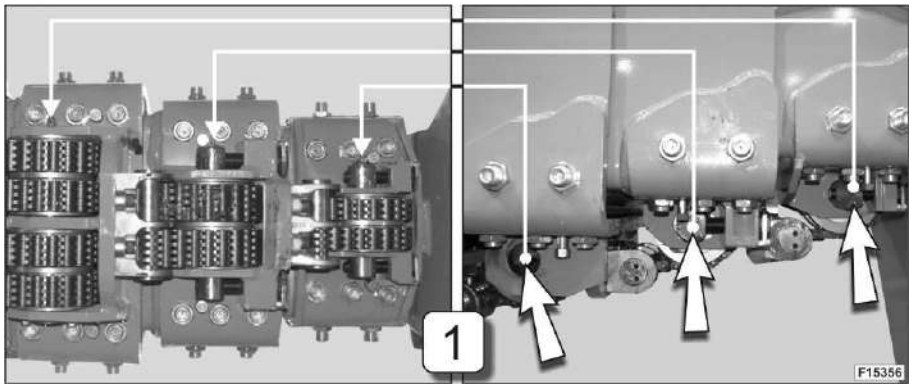
Extend the telescopic boom completely, and place it parallel to the ground; measure the distance between the chains and the lower surface of the second and third boom sections (make the measurement in mid-length of the chain).
Then retract the boom by about 50 cm and check that the distance measured previously has increased by about 5 cm; if not, see point (b) of the section "INSPECTION OF THE CHAINS".



LUBRICATION OF CHAIN RETURN PINS

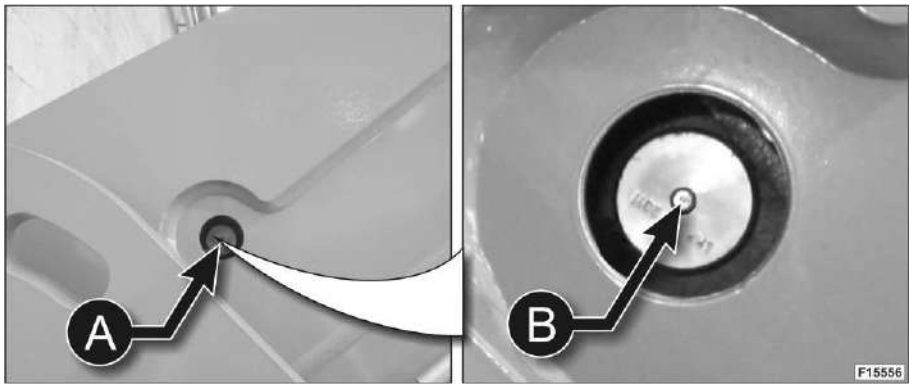
While checking the telescopic boom chains you are required to grease the chain return pins.

Grease the chain return pins shown in the photo (1) until grease comes out.



GREASING THE SUPPORT PIN OF THE CHAIN RETURN PULLEY OF THE INTERNAL BOOM CHAINS

- stand at the rear right of the machine
- raise the telescopic boom until the greasing hole "A" can be seen
- grease, until grease comes out, the support pin of the internal boom "B" chain return pulley

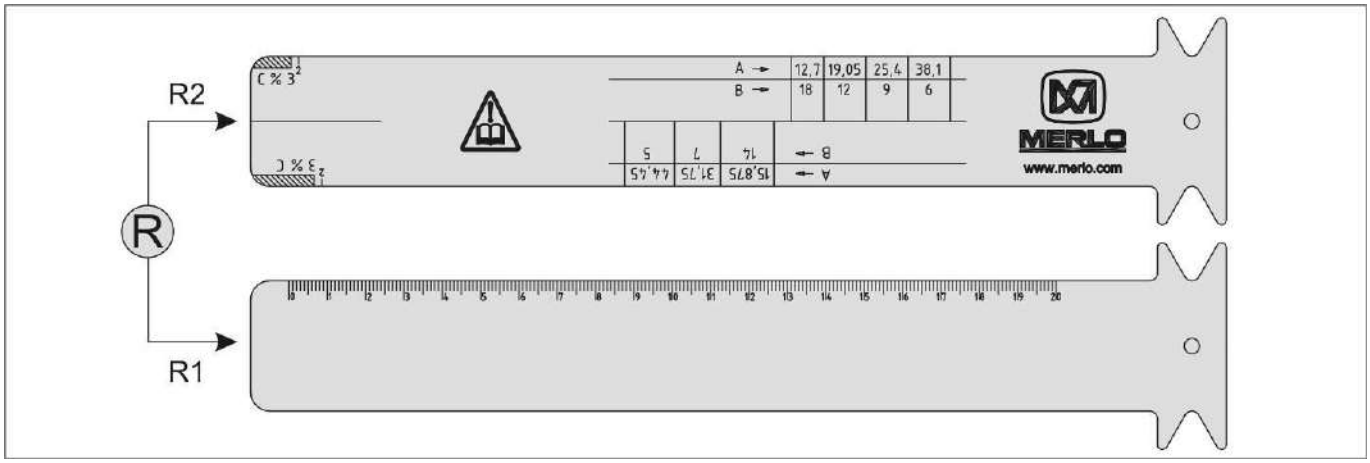


INSPECTION OF THE TELESCOPIC BOOM CHAIN STRETCHING WITH SLIDE RULE "R"

It is advisable to perform the following operations every 1,000 operating hours.
This check shall not replace the compulsory inspections of the chain status in compliance with national provisions and regulations.

Perform the following operations to check chain stretching:

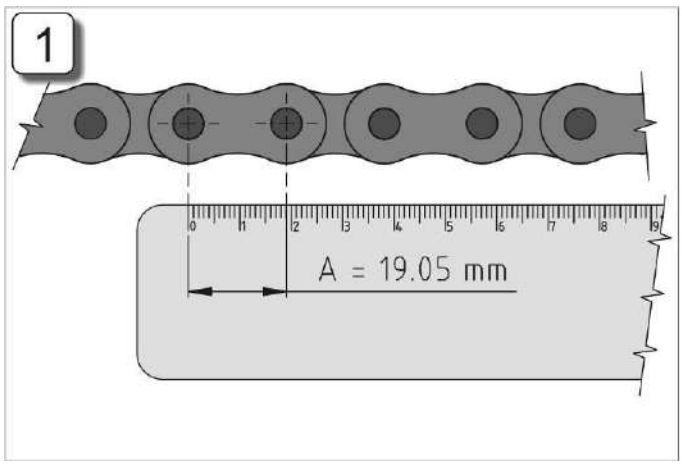
- extend the machine boom completely and rest the carriage on the ground.
- stop the machine engine.
- take slide rule "R" from the pocket behind the driver's seat.

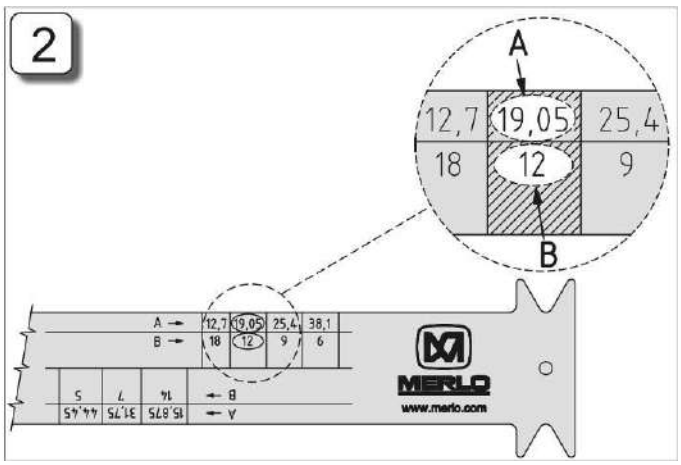


Perform the inspection as described in the example below.

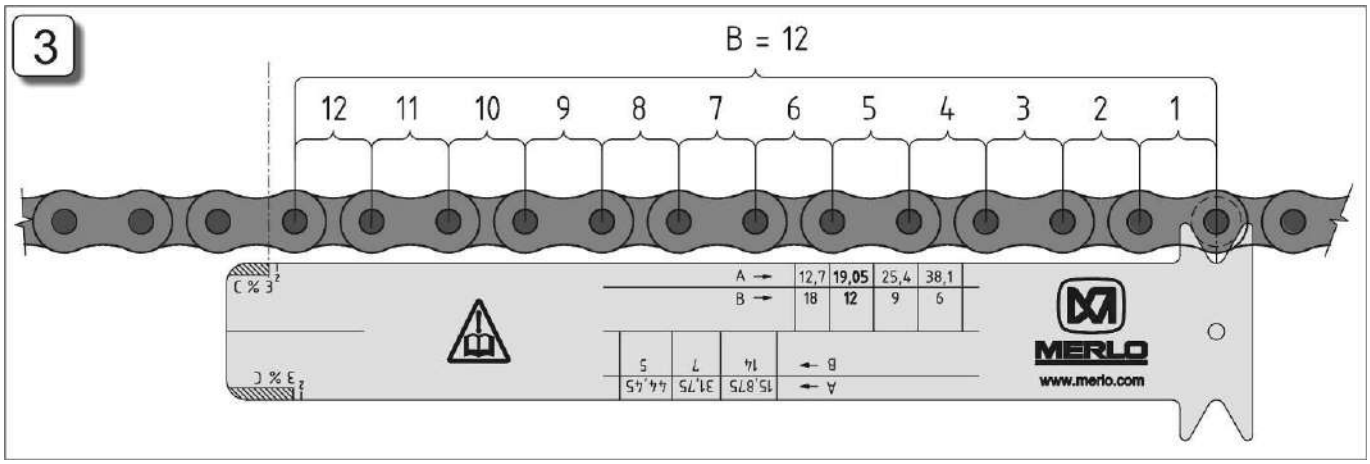
• EXAMPLE

- by using slide rule "R", on the ruler side (R1), measure the pitch of chain link "A" in a point of the chain taken at random. In this example A=19. (Fig. 1)
- by referring to the table shown on the rule face (R2), trace the real pitch "A" of the chain being inspected. In this example the value closest to the measured one is A=19.05.
  The lower line "B" indicates the number of chain links to be inspected; in this example the number of chain links to be inspected is B=12 (Fig. 2).

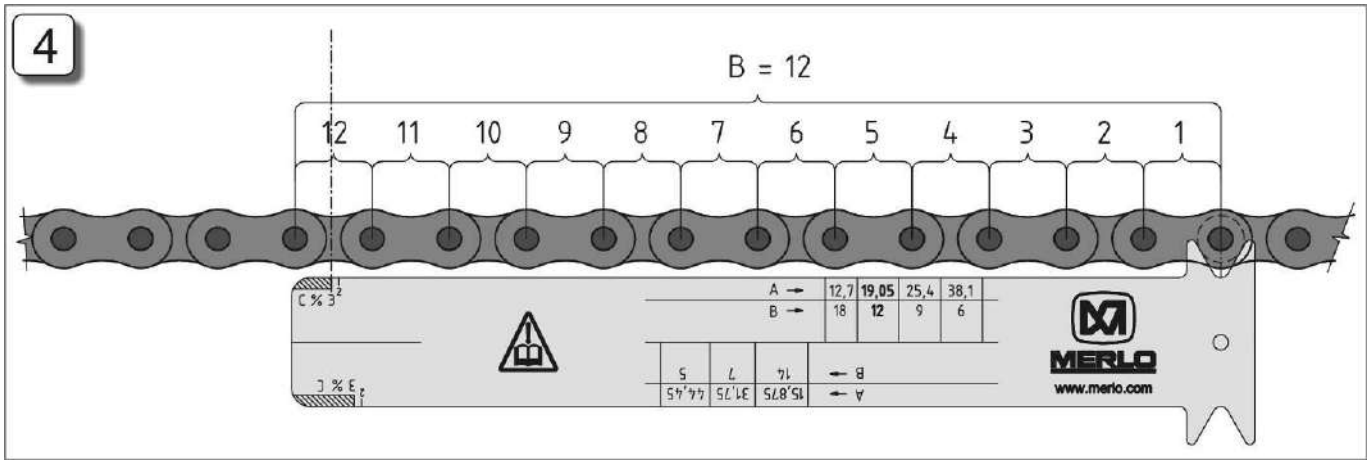




- place rule "R" into contact with the chain, so that the v-shaped notch can be inserted into a chain link pin; perform this operation with side "R2" of the rule facing the operator (fig. 3)
- starting from the v-shaped notch, count the number "B" of chain links to be inspected; since in this case B=12, count 12 chain links.
- check that the 12th chain link does not reach or go beyond the dashed end part of rule "R" on which "C % 3" is written; this limit represents the maximum permissible extension of the chain due to wear. In this example the chain does not reach the maximum limit ("C % 3"), therefore it passes the inspection successfully and does not need to be replaced.



- if the 12th chain link either reaches or goes beyond the maximum limit shown by the dashed area "3 % C", this means that excessive stretching occurred and that the chain needs to be replaced. (fig. 4)



WARNING!

Perform this inspection in several points of the chain, especially next to the snub pulleys.

Should clear signs of malfunction be found on the chain, replace it even though it has not yet reached its limit extension (equal to 3%).

END OF SECTION

CONTENTS

ATTACHMENTS

This section of the handbook is about one range of MERLO attachments which can be assembled on the vehicles described in this handbook. These attachments can be coupled and released using the locking hydraulic system control from the cab.
The procedures to perform the operations previously mentioned are described in the manual. Refer to the relevant paragraph for the assembly and disassembly of the forks.
Carefully read the given information before handling, assembling, using or removing any attachment.
The attachments which need more instructions about their use will be described one by one in a leaflet attached to this manual.
The attachment is designed and built following Merlo specifications. In order to avoid accidents and to ensure good performance, the attachment must not be changed from that approved by Merlo S.p.A. and it must not be used for any purpose other than that for which it is intended by design.

WARNING! Do not handle, assemble, use or remove any attachment not described in this manual (or in the leaflet attached) until pertaining instructions have been received, read and understood. The attachments can be assembled and used only on vehicles for which they have been requested.

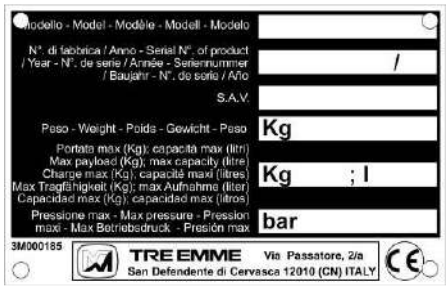
MERLO S.p.A. is not responsible for the use of attachments not produced by them or whose assembly on the standard vehicle has not been explicitly approved.

ATTACHMENT IDENTIFICATION PLATE

All attachments manufactured by Merlo are equipped with an identification plate. This plate provides the operator with various identification data regarding the attachment:

1) Attachment model
2) Manufacturing number
3) Attachment weight
4) Maximum load capacity
5) Maximum operating pressure

Should you need to order any spare parts, please provide the Manufacturer with the data marked with numbers "1" and "2" above.



ATTACHMENT MAINTENANCE

In order to use the attachment safely and efficiently, you must service it regularly, strictly following the instructions of this manual (or in the attached leaflet). Do not use the attachment until the servicing and the necessary repairs have been made.

DAILY OR EVERY 10 HOURS:

- Inspect the attachment in order to check that it is clean and there is no damaged or missing parts.
- Check the correct fastening of the hinge pins and related locks.
- Check there are no oil leaks from the attachment.

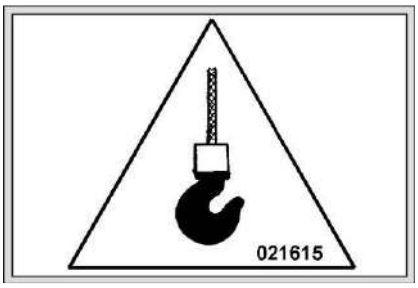
WARNING! Maintenance must be performed by skilled and competent personnel. For operations on parts which are not part of the normal maintenance, contact the MERLO assistance service.

ATTACHMENT HANDLING

To lift the attachment, use the hitching points shown by the reference plate (see figure). Pay particular attention to any notes and remarks regarding handling. The total weight of the attachment is shown on its identification plate.

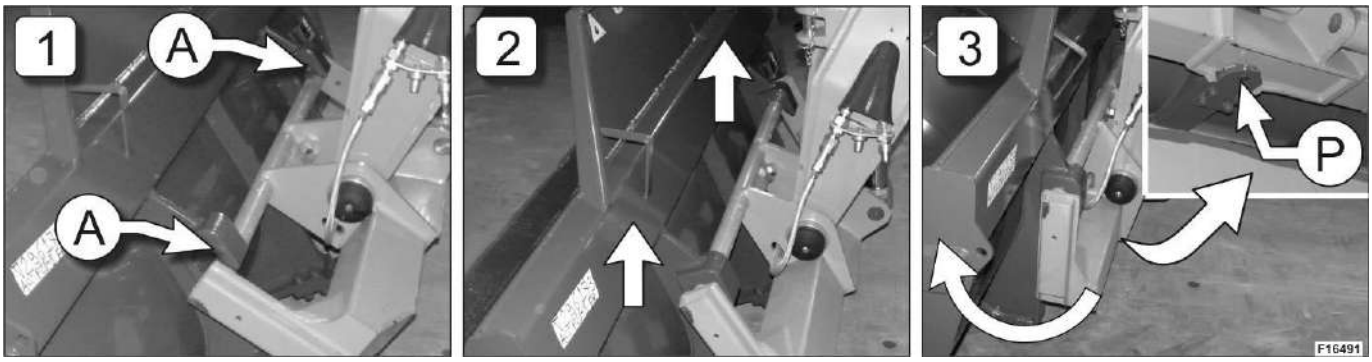
WARNING! Keep people away from the surrounding area when handling the attachment.

Check that cables, hooks and lifting devices are in good condition and that their lift capacity is sufficient for the weight to be handled.



ASSEMBLY OF ATTACHMENTS WITH QUICK-COUPLING

- a standard loader has been chosen to illustrate the operations required for the installation of a quick-coupling attachment; the following operations apply to any attachment manufactured by Merlo that is equipped with the same coupling system.
- read and make sure to understand all the instructions regarding the attachment you purchased, which are provided either in the following paragraphs or in the attached manual. Pay particular attention to safety warnings and to any notes on how to install and handle the attachment.
- make sure that the equipment is resting on a compact flat surface, and that it cannot accidentally topple over
- drive your machine close to the couplings of attachment "A", with the carriage rotated downwards (Fig. 1).
- slightly raise the telescopic boom (Fig. 2).
- activate the control to lift the quick-coupling piston "P" (see paragraph "MAIN DISTRIBUTOR LEVER", in the chapter "CONTROLS AND INSTRUMENTS"), while at the same time rotating the carriage upwards, so as to hitch the attachment (Fig. 3)
- release button on the control joystick
- raise the telescopic boom by about 1.5 metres, and check that quick coupling cylinder "P" is correctly engaged in its locking position on the carriage.



WARNING! Keep people away from the surrounding area when installing equipment. Consult the data plates inside the driver's cab so that the machine's load limits in relation to the various positions of the boom are not exceeded.

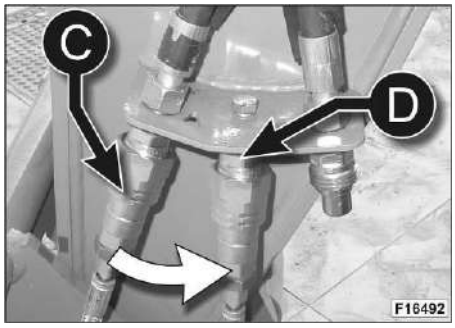
Before starting the assembly of the attachments with quick coupling, make sure that the machine's carriage does not have any attachment fitted.

Never position yourself underneath the attachment to check the correct insertion of the locking pin.

Do not use the attachment if the locking pin is not correctly inserted.

Lower the telescopic boom and repeat the procedure.

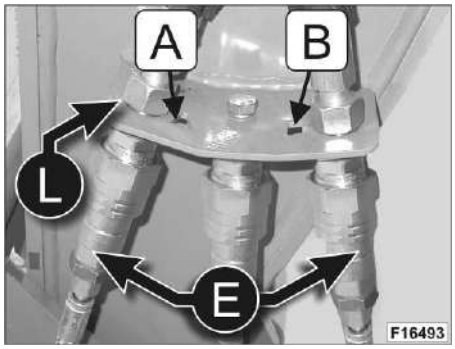
- stop the diesel engine
- unscrew the ring nut from quick coupling [A], and disconnect hose "C" that feeds the quick coupling cylinder "P"
- connect hose "C" to coupling "D"; this prevents the attachment from accidentally uncoupling from the carriage if the quick-coupling cylinder "P" is unintentionally operated.



HYDRAULIC CONNECTION OF QUICK-COUPLING ATTACHMENTS

Should the attachment installed on the carriage feature hydraulically controlled functions, connect hoses "E", from the attachments, to the quick couplings marked with letters [A] and [B], on metal sheet "L".

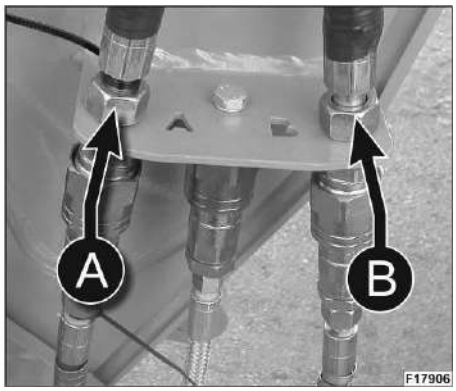
The connection diagram, also shown on the joystick sticker in the cab, foresees that the quick coupling marked with the letter [A] must be used for the oil delivery to the attachment, while the quick coupling marked with the letter [B] must be used for the oil return. (see also paragraph "CONTROL JOYSTICK" chapter "CONTROLS AND INSTRUMENTS").



CONTROL OF HYDRAULICALLY FUNCTIONING ATTACHMENTS

Consult the control plate of the attachment in order to ascertain its maximum operating pressure.
To control the hydraulic attachment, use the right joystick thumb-wheel (1) as follows:

- rotate the right roller to position "3" to send oil to the hydraulic conduit "A" on the head of the boom. (opening claws, valves, hatches, etc.)
- rotate the right roller to position "4" to send oil to the hydraulic conduit "B" on the head of the boom. (closing claws, valves, hatches, etc.)

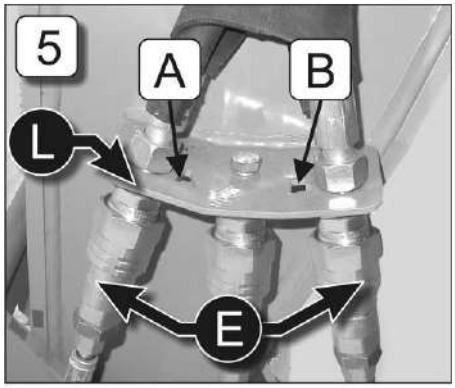


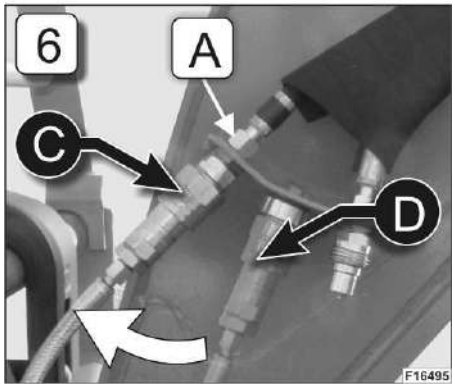
Other types of manoeuvre will be described in the instructions relevant to the attachments.

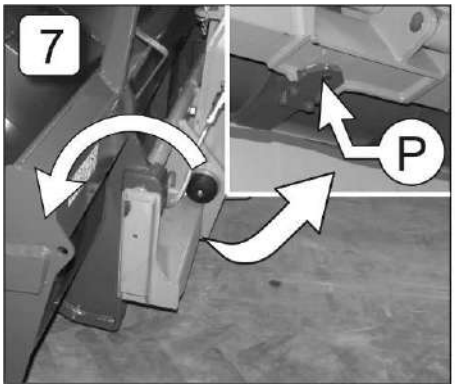
DISMANTLING OF ATTACHMENTS WITH QUICK COUPLING

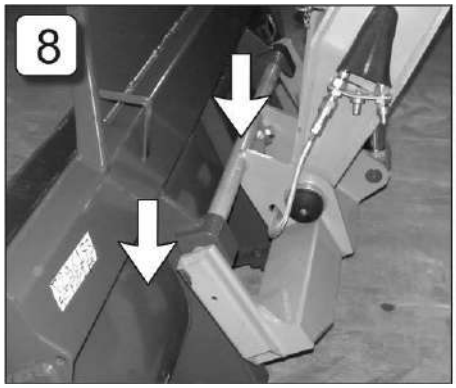
To remove a quick-coupling attachment from the carriage, please refer to the following instructions:

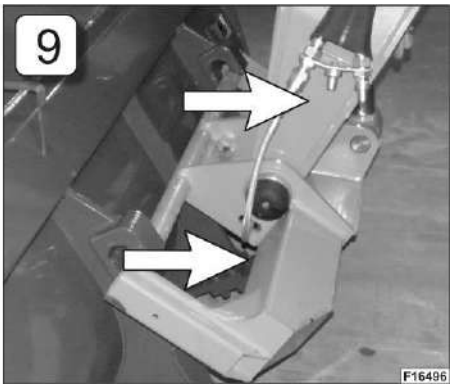
- a standard loader has been chosen to illustrate the operations required for the disassembly of a quick-coupling attachment; the following operations apply to any attachment manufactured by Merlo that is equipped with the same coupling system.
- read and make sure to understand all the instructions regarding the attachment you purchased, which are provided either in the following paragraphs or in the attached manual. Pay particular attention to safety warnings and to any notes on how to install and handle the attachment.
- make sure that the attachment rests on compact, flat ground.
- engage the parking brake, shift both the gearbox selector (19) and the drive direction selector (20) to position "N".
- if you need to remove attachments that feature hydraulic functions, disconnect hoses "E" from quick couplings [A] and [B] placed on metal sheet "L" (Fig. 5).
- disconnect hose "C" that feeds quick coupling cylinder "P" from the coupling "D" and connect it to the quick coupling [A]. (Fig.6)
- lower the machine's telescopic boom so that the equipment is resting on the ground
- activate the control to lift the quick-coupling piston "P" (see paragraph "MAIN DISTRIBUTOR LEVER", in the chapter "CONTROLS AND INSTRUMENTS"), while at the same time rotating the carriage downwards, so as to uncouple the attachment (Fig. 7)
- release button on the control joystick
- if necessary, slightly lower the telescopic boom, so as to release the attachment (Fig. 8)
- retract the telescopic boom, and cautiously back up (Fig. 9)











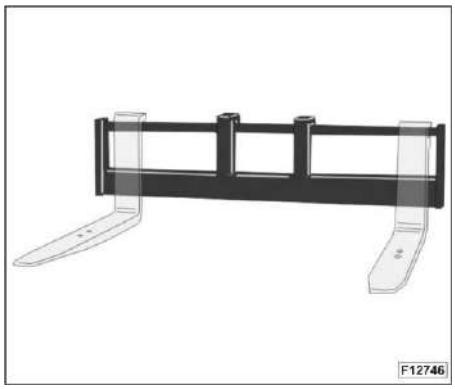
WARNING! Keep people away from the surrounding area when uninstalling equipment. Consult the data plates inside the driver's cab so that the machine's load limits in relation to the various positions of the boom are not exceeded.

Never force the attachment on to the ground to carry out uncoupling.

ATTACHMENTS COMPATIBLE WITH VEHICLES MANUFACTURED BY MERLO S.p.A.

The attachments described in this paragraph are those available at the time the manual was published. For increased safety, before using any type of attachment, always check all of the relevant data given in the type-approval charts applied to the attachment.

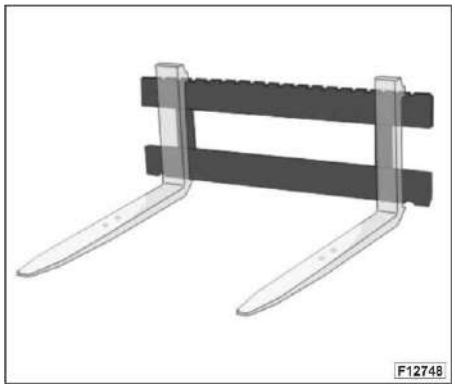
• EXTRA LARGE FORK CARRIAGE



To install this attachment on the carriage, carry out the same operations described in paragraph "INSTALLATION OF QUICK-COUPLING ATTACHMENTS" in this chapter.
Install this attachment on the carriage if you need a larger distance between the forks.
The installation of this attachment on the carriage implies the following reduction of the load capacity shown in the load chart:

- Liftable load (W) with an extra large fork carriage = machine load chart "D" - attachment weight "P" shown on the attachment identification plate.

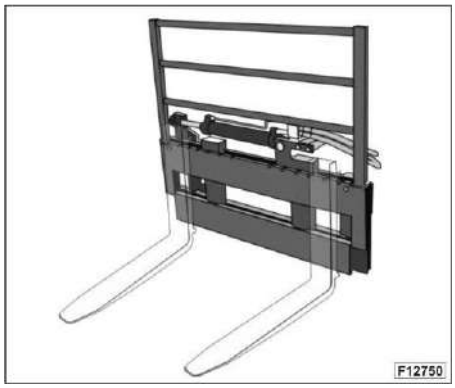
• FEM III FORK CARRIAGE



To install this attachment on the carriage, carry out the same operations described in paragraph "INSTALLATION OF QUICK-COUPLING ATTACHMENTS" in this chapter.
Install this attachment on the carriage if you need to use FEM III FORKS.
The installation of this attachment on the carriage implies the following reduction of the load capacity shown in the load chart:

- Liftable load (W) with FEM III fork carriage = machine load chart "D" - attachment weight "P" shown on the attachment identification plate.

• TRAVELLING LIFT FITTED ON A STANDARD CARRIAGE



To install this attachment on the carriage, carry out the same operations described in paragraph "INSTALLATION OF QUICK-COUPLING ATTACHMENTS" in this chapter.
The attachment is comprised of a fixed part, coupled to the standard carriage, and a mobile part, which shifts the load lifted on the FEM III FORKS transversely with respect to the telescopic boom of your machine.
The installation of this attachment on the carriage implies the following reduction of the load capacity shown in the load chart:

- Liftable load (W) with a travelling lift fitted on the standard carriage = machine load chart "D" - attachment weight "P" shown on the attachment identification plate.

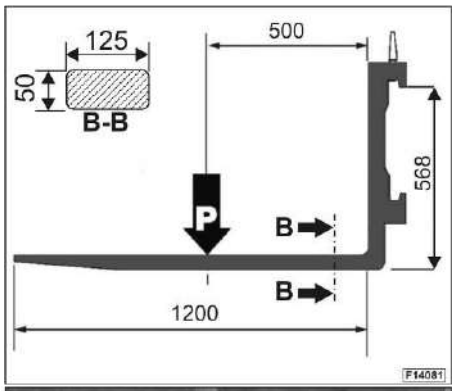
• CARRIAGE WITH FLOATING FORKS

To install this attachment on the carriage, carry out the same operations described in paragraph "INSTALLATION OF QUICK-COUPLING ATTACHMENTS" in this chapter.
Install this attachment on the carriage if the digging angle with the carriage in a folded position is required to be 5° wider than the standard one offered by your machine.
The installation of this attachment on the carriage implies the following reduction of the load capacity shown in the load chart:

- Liftable load (W) with floating forks fitted on the carriage = machine load chart "D" - attachment weight "P" shown on the attachment identification plate.

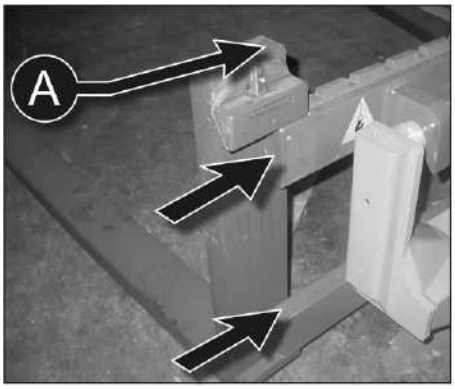
• FORK FOR CARRIAGE ATTACHMENT FEM III (ONLY FOR P37.12 PLUS - P38.12 PLUS - P38.13 PLUS - P38.14 PLUS - P40.9 PLUS – P40.17 PLUS – P38.12 – P38.13 – P38.14 – P40.17 – P38.13EE – P40.17EE)

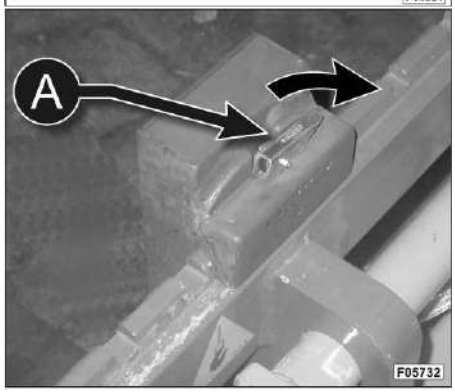
- Weight of a single fork: 83 kg
- Rated load capacity: 2150 kg
- Centre of gravity of the load ("P") from the fork heel: 500 mm



Assembly of forks on the FEM carriage is carried out as follows:

- assemble the carriage FEM as described in the paragraph ASSEMBLY OF ATTACHMENTS WITH QUICK COUPLING in this chapter
- position the machine with the carriage near the FEM forks
- lift the safety pin "A"
- insert the forks from the two extremities following the direction of the arrow
- arrange the forks in the desired position
- lower the safety pin "A" inserting it correctly in one of the slots provided on the carriage





WARNING!

Always check to ensure that the forks are correctly secured on the carriage so as to prevent any lateral sliding and possible escape.

Fitting this attachment demands a reduction in the useful loads in the diagram equal to the weight of the FEM carriage.

• FORK FOR CARRIAGE ATTACHMENT FEM IV (ONLY FOR P60.10 - P72.10 – P60.10EE – P72.10EE)

- Weight of a single fork: 131 kg
- Rated load capacity: 3000 kg
- Centre of gravity of the load ("P") from the fork heel: 600 mm

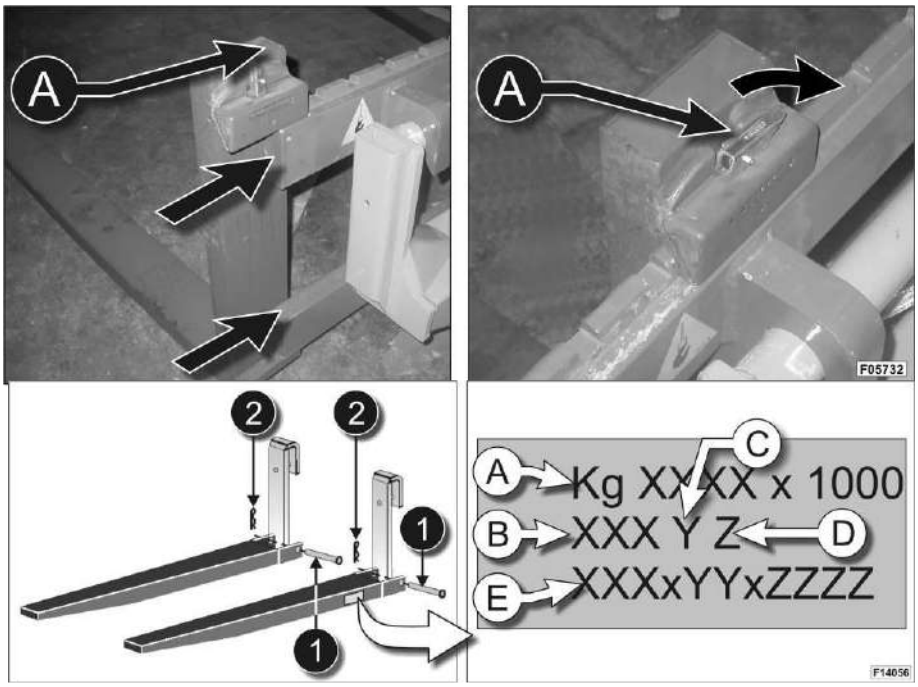
Assembly of forks on the FEM carriage is carried out as follows:

- assemble the carriage FEM as described in the paragraph ASSEMBLY OF ATTACHMENTS WITH QUICK COUPLING in this chapter
- position the machine with the carriage near the FEM forks
- lift the safety pin "A"
- insert the forks from the two extremities following the direction of the arrow
- arrange the forks in the desired position
- lower the safety pin "A" inserting it correctly in one of the slots provided on the carriage

WARNING!

Always check to ensure that the forks are correctly secured on the carriage so as to prevent any lateral sliding and possible escape.

Fitting this attachment demands a reduction in the useful loads in the diagram equal to the weight of the FEM carriage.



• FORK EXTENSION

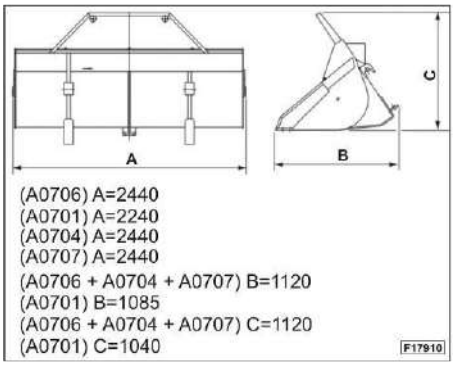
The standard fork is inserted into the extension and secured by means of pin "1" behind the heel of the fork (2). Each fork extension bears a plate with the following details:

A = Maximum applicable load at 1000 mm (1200 mm for P60.10 - P72.10) from the heel of the forks
B = Progressive manufacturing number of each month
C = Month of manufacture (starting from January of each year with the letter "A")
D = Last figure of the year of manufacture
E = Permitted fork dimensions (width, thickness, minimum length)

(P37.12 PLUS - P38.12 PLUS - P38.13 PLUS - P38.14 PLUS - P40.9 PLUS – P40.17 PLUS – P38.12 – P38.13 – P38.14 – P40.17 – P38.13EE – P40.17EE)
• Weight: 50 kg; • Rated load capacity: 1125 kg; • Centre of gravity of the load ("P") from the fork heel: 1000 mm

(P60.10 - P72.10 – P60.10EE – P72.10EE)
• Weight: 60 kg; • Rated load capacity: 1500 kg; • Centre of gravity of the load ("P") from the fork heel: 1200 mm
Always check to ensure that the pin has been correctly fitted to prevent the risk of the tools accidentally becoming unhitched. Check that the load has been correctly applied.

• DIGGING BUCKET



Assemble the attachment on the carriage as described in the paragraph INSTALLATION OF QUICK-COUPLING ATTACHMENTS in this chapter and use it with the auxiliary controls in the cab as described in the paragraph CONTROL OF HYDRAULICALLY FUNCTIONING ATTACHMENTS.

• (P37.12 PLUS - P38.12 PLUS - P38.13 PLUS - P38.14 PLUS - P40.9 PLUS – P40.17 PLUS – P38.12 – P38.13 – P38.14 – P40.17 – P38.13EE – P40.17EE)

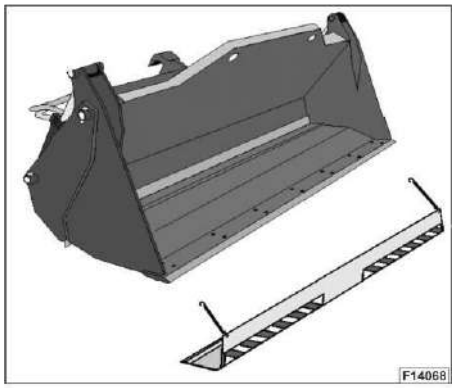
- Weight: (A706) = 420 kg : (A701) = 400 kg
- Max capacity: (A706) = 1000 l : (A701) = 900 l

• (P60.10 - P72.10 – P60.10EE – P72.10EE)

- Weight: (A704) = 525 kg : (A707) = 420 kg
- Max capacity: (A704) = 1200 l : (A707) = 1000 l

TRANSPORT: Circulation on public roads with the bucket connected is only allowed if the appropriate protection, included with the attachment, is applied.

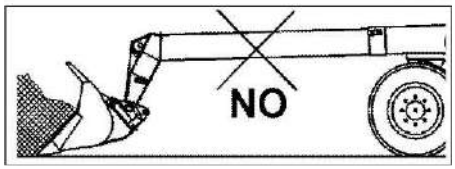
• 4X1 BUCKET (800 l) - (1000 l) - (1250 l)



Assemble the attachment on the carriage as described in the paragraph INSTALLATION OF QUICK-COUPLING ATTACHMENTS in this chapter and use it with the auxiliary controls in the cab as described in the paragraph CONTROL OF HYDRAULICALLY FUNCTIONING ATTACHMENTS.

- Weight: (A0800) = 680 kg; (A0820) = 710 kg; (A0870) = 750 kg
- Max capacity: (A0800) = 800 l; (A0820) = 1000 l; (A0870) = 1250 l

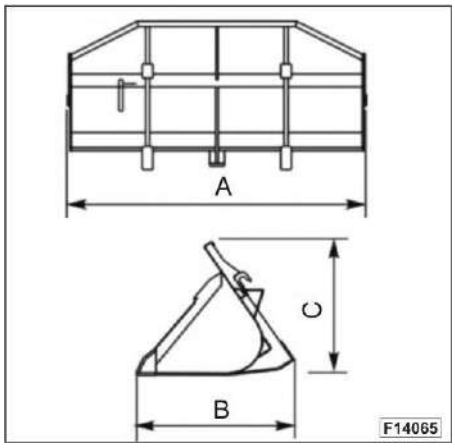
TRANSPORT: Circulation on public roads with the bucket connected is only allowed if the appropriate protection, included with the attachment, is applied.



WARNING! (BUCKET, 4 X 1 BUCKET): the excavation or loading of loose material using the machine with extended boom, may cause serious damage to the boom itself; MERLO S.p.A. strongly recommends not to perform such operation and will not be held responsible for any damage arising from this use.

• RE-HANDLING BUCKET

Assemble the attachment on the carriage as described in the paragraph INSTALLATION OF QUICK-COUPLING ATTACHMENTS in this chapter and use it with the auxiliary controls in the cab as described in the paragraph CONTROL OF HYDRAULICALLY FUNCTIONING ATTACHMENTS.



(A0710)
- Weight: 400 kg • Max specific weight of the material: 1800 (Kg/m3) • Max capacity: 1250 l
- A = 2240 ; B= 1180 ; C = 1050

(A0712)
- Weight: 415 kg • Max specific weight of the material: 1800 (Kg/m3) • Max capacity: 1350 l
- A = 2400 ; B= 1510 ; C = 1065

(A0717) *
- Weight: 410 kg • Max specific weight of the material: 1800 (Kg/m3) • Max capacity: 1800 l
- A = 2500 ; B= 1190 ; C = 1050

(A0720)
- Weight: 495 kg • Max specific weight of the material: 900 (Kg/m3) • Max capacity: 2000 l
- A = 2400 ; B= 1515 ; C = 1065

(A0780)
- Weight: 610 kg • Max specific weight of the material: 900 (Kg/m3) • Max capacity: 2500 l
- A = 2400 ; B= 1680 ; C = 1170

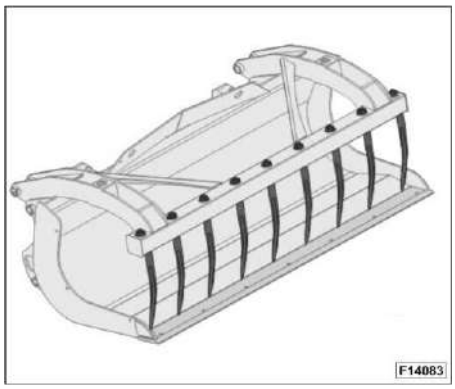
(A0781) *
- Weight: 610 kg • Max specific weight of the material: 900 (Kg/m3) • Max capacity: 2500 l
- A = 2500 ; B= 1780 ; C = 1220

* (only for P60.10 - P72.10 – P60.10EE – P72.10EE)

TRANSPORT: Circulation on public roads with the bucket connected is only allowed if the appropriate protection, included with the attachment, is applied.

• MULTIPURPOSE BUCKET WITH GRAB

Assemble the attachment on the carriage as described in the paragraph INSTALLATION OF QUICK-COUPLING ATTACHMENTS in this chapter and use it with the auxiliary controls in the cab as described in the paragraph CONTROL OF HYDRAULICALLY FUNCTIONING ATTACHMENTS.



(A0838) Weight: 620 kg; Max capacity: 1200 l
(A0840) Weight: 590 kg; Max capacity: 1000 l
(A0841) Weight: 550 kg; Max capacity: 900 l
(A0846) * Weight: 800 kg; Max capacity: 2350 l

* (only for P60.10 - P72.10 – P60.10EE – P72.10EE)

TRANSPORT: Circulation on public roads with the bucket connected is only allowed if the appropriate protection, included with the attachment, is applied.

• LIFTING HOOK ON FORKS

- Weight: 70 kg
- The working load of the attachment corresponds to that of the machine's load chart.

The hook needs to be inserted in the standard fork and fixed to it with the relevant pins (1) and the relevant staples (2).
When this attachment is purchased, standard supply includes the summary booklet in the cab (inside the load chart folder - 21).

WARNING! Always check the correct fitting of the pins in order to avoid the accidental release of the attachment.

• CARRIAGE-MOUNTED HOOK

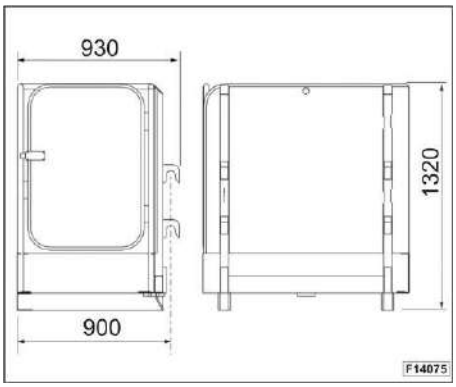
Assemble the attachment on the carriage as described in the paragraph ASSEMBLY OF ATTACHMENTS WITH QUICK COUPLING in this chapter.

- Weight: 75 kg
- The working load of the attachment corresponds to that of the machine's load chart.

When this attachment is purchased, standard supply includes the summary booklet in the cab (inside the load chart folder - 21).

• MATERIAL BASKET

Assemble the attachment on the carriage as described in the paragraph ASSEMBLY OF ATTACHMENTS WITH QUICK COUPLING in this chapter and use it with the auxiliary controls in the cab.

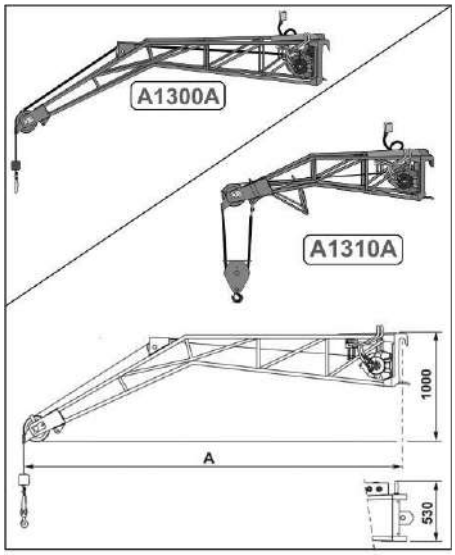


- Weight: 200 kg
- Load of attachment: 1000kg

WARNING! To be used for carrying materials only. It is forbidden to use the attachment to lift people. Always check that the door is correctly closed to avoid the accidental spillage of material from the attachment.

• FLY-JIB WITH WINCH

Light weight trestle structure, highly rigid under load. A shape bent forward permits to reach an operating height as high as that of the machine combined with the jib height, keeping the hook clear of the machine. High-resistance anti-spin rope complete with pulley and rope guide at the jib end (A1300). The winch is equipped with block valves and descent control valves as well as hook ascent and descent limiting devices.
Block with safety hook slewing over 360°.



• (P37.12 PLUS - P38.12 PLUS - P38.13 PLUS - P38.14 PLUS - P40.9 PLUS – P40.17 PLUS – P38.12 – P38.13 – P38.14 – P40.17 – P38.13EE – P40.17EE)

(A1300A)
A = 3520 mm; Weight: 215 kg; Attachment capacity: 600kg

(A1310A)
A = 1900 mm; Weight: 240 kg; Attachment capacity: 1500 kg

(A1215)
A = 1500 mm; Weight: 200 kg; Attachment capacity: 2000 kg
For attachment assembly, operating and maintenance instructions, refer to the relevant manual.

• (P60.10 - P72.10 – P60.10EE – P72.10EE)

(A1320B)
A = 4010 mm; Weight: 265 kg; Attachment capacity: 900 kg
For attachment assembly, operating and maintenance instructions, refer to the relevant manual.

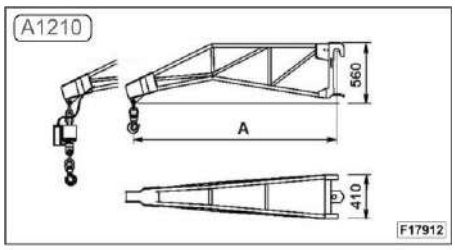
WARNING! For machines equipped with stabilisers, the use of this attachment is foreseen with the machine properly stabilized.

This attachment has a rated load capacity lower than the maximum load capacity of your machine. Therefore, before installing the attachment, please check that your machine is equipped with a load limiter.

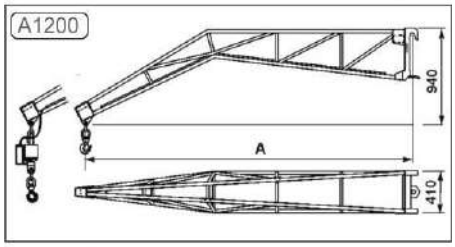
All load charts refer to the machine standing still on flat, firm ground, with its wheels aligned with its chassis.

• FLY JIB

Light weight trestle structure, highly rigid under load. A shape bent forward permits to reach an operating height as high as that of the machine combined with the jib height, keeping the hook clear of the machine.
Safety hook slewing over 360°.



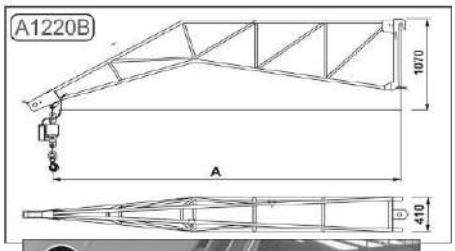
Assemble the attachment on the carriage as described in the paragraph INSTALLATION OF QUICK-COUPLING ATTACHMENTS in this chapter and use it with the auxiliary controls in the cab as described in the paragraph CONTROL OF HYDRAULICALLY FUNCTIONING ATTACHMENTS.



• (P37.12 PLUS - P38.12 PLUS - P38.13 PLUS - P38.14 PLUS - P40.9 PLUS – P40.17 PLUS – P38.12 – P38.13 – P38.14 – P40.17 – P38.13EE – P40.17EE)

(A1200A)
A = 3225 mm; Weight: 115 kg; Attachment capacity: 600kg

(A1210A)
A = 1908 mm; Weight: 85 kg; Attachment capacity: 1500 kg



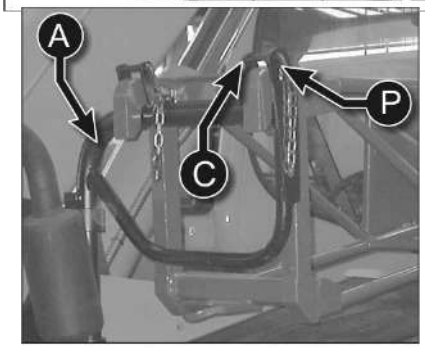
• (P60.10 - P72.10 – P60.10EE – P72.10EE)

(A1220B)
A = 3897 mm; Weight: 165 kg; Attachment capacity: 900 kg

WARNING! For machines equipped with stabilisers, the use of this attachment is foreseen with the machine properly stabilized.

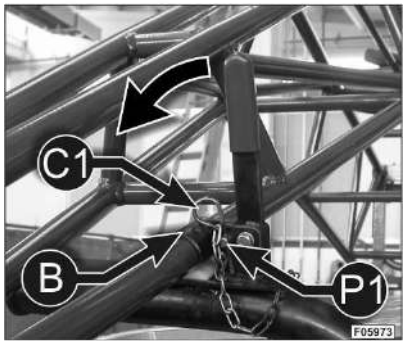
This attachment has a rated load capacity lower than the maximum load capacity of your machine. Therefore, before installing the attachment, please check that your machine is equipped with a load limiter.

All load charts refer to the machine standing still on flat, firm ground, with its wheels aligned with its chassis.



To transport the attachment on the machine, follow these instructions:

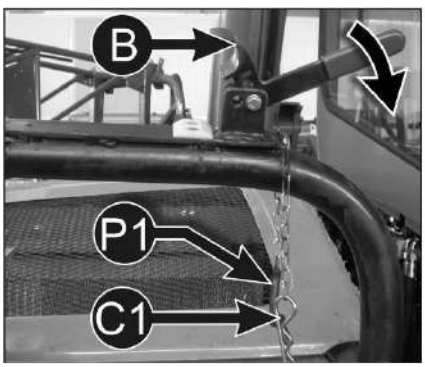
- place the attachment on specific support "A"
- secure the rear part of the attachment by fitting pin P" and cotter pin "C" in the specific holes on both sides.
- secure the front part of the attachment using specific fastener "B" and locking it with pin "P1" and cotter pin "C1"



In this condition, it is not possible to open the engine bonnet; if the bonnet has to be opened, perform the following operations:

- release the front part of the attachment by removing fastener "B", pin "P1" and cotter pin "C1".
- rotate the attachment outwards until it is possible to open the engine bonnet completely.

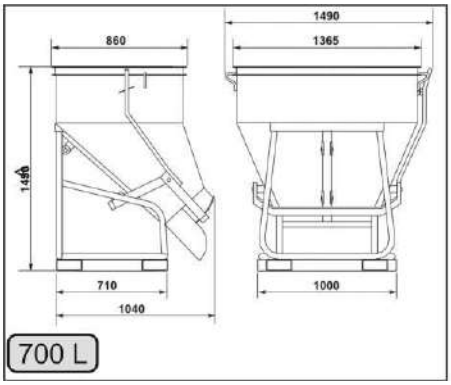
WARNING! FLY-JIB WITH WINCH When you place the attachment on the ground, check that the rope is not crushed.

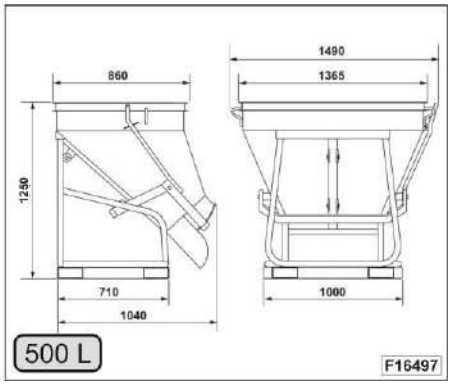


• CONCRETE SKIP

(500 l)
- Weight: 255 kg
- Door opening: Manual (A1400) or Hydraulic (A1410)
- Max capacity: 500 l

(700 l)
- Weight: 275 kg
- Door opening: Manual (A1420) or Hydraulic (A1430)
- Max capacity: 700 l





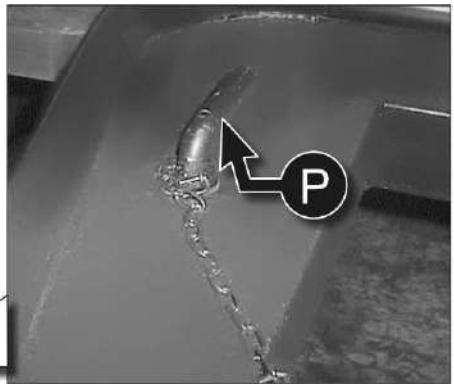
To assemble the concrete skip on the machine proceed as follows:

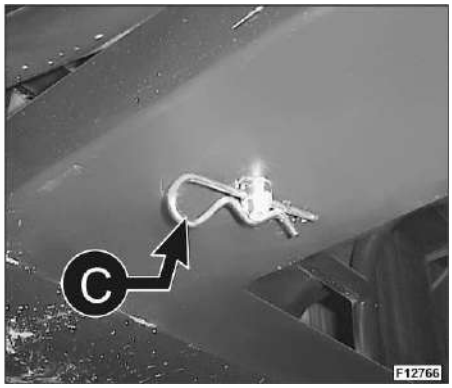
- Insert the forks into the appropriate locations
- Fix the forks to the concrete skip inserting the relative pins "P" into the relative slots,
- Insert spring clips "C".

The skip can be mounted both on the front or side in relation to the machine.

WARNING!

Always ensure that the pins are correctly mounted to prevent the risk of the tools accidentally becoming unhitched.





The concrete may be unloaded in two ways, according to the chosen configuration:

- MANUAL
- HYDRAULIC

MANUAL

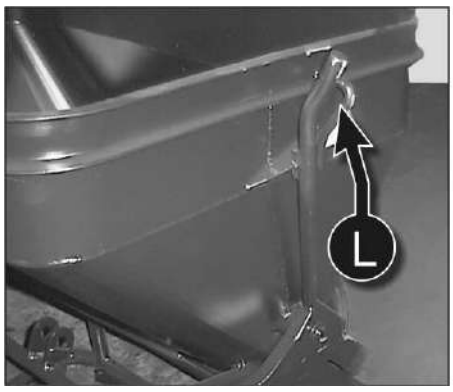
Open the concrete unloading flap by means of lever "L".
Re-close once all the concrete has been unloaded.

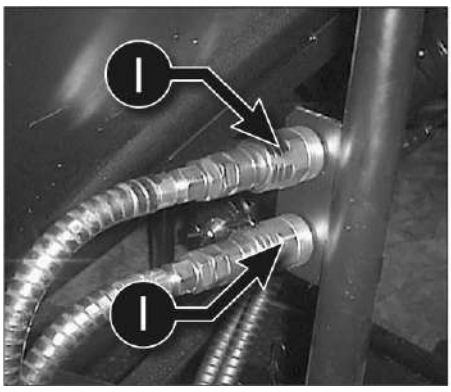
SYSTEM

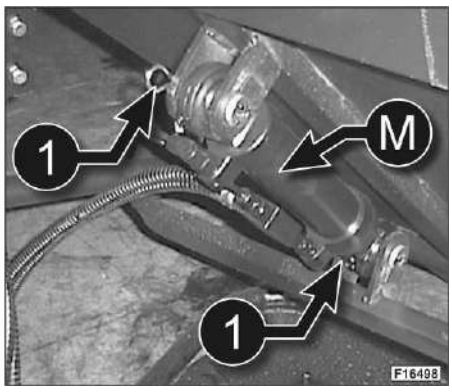
Connect the hydraulic hoses "I" of the attachment to the hydraulic fittings located on the boom head.
The concrete unloading flap is hydraulically opened by means of cylinder "M" controlled by the attachment control lever located inside the cab (see relative paragraph in the chapter entitled "CONTROLS AND INSTRUMENTS").
Once operations are complete disconnect the hydraulic hoses "I" and replace in their respective holders.

ATTACHMENT MAINTENANCE

Lubricate the concrete unloading flap operating cylinder "M" every 50 working hours, on the lubrication points shown (ref. 1)

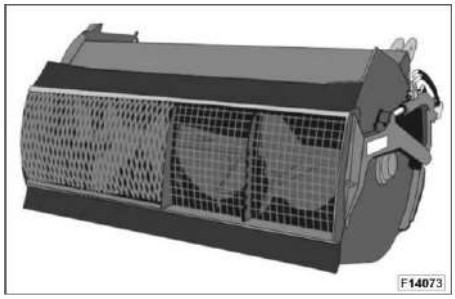






• CONCRETE MIXER

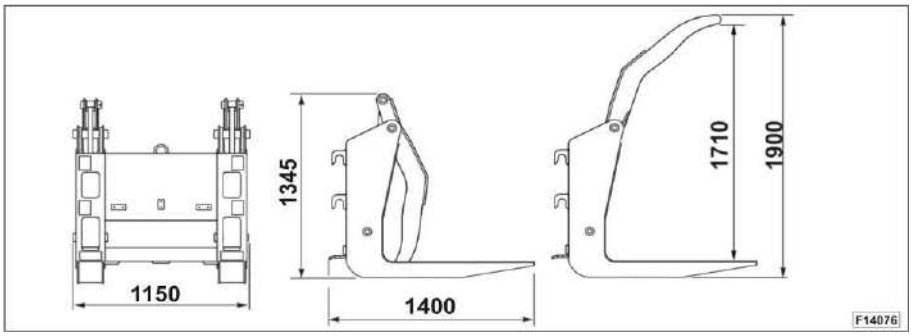
For attachment assembly, operating and maintenance instructions, refer to the relevant manual.



• DOUBLE LOG CLAMP

Assemble the attachment on the carriage as described in the paragraph INSTALLATION OF QUICK-COUPLING ATTACHMENTS in this chapter and use it with the auxiliary controls in the cab as described in the paragraph CONTROL OF HYDRAULICALLY FUNCTIONING ATTACHMENTS.

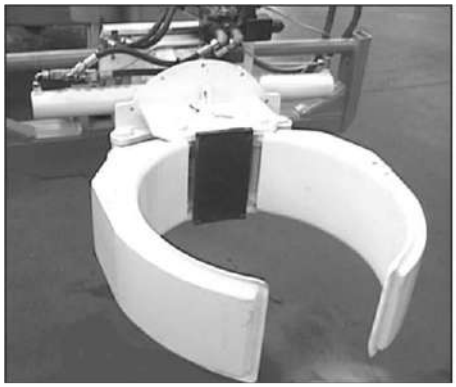
- Weight: 480 kg
- Attachment load corresponds to the machine's diagram

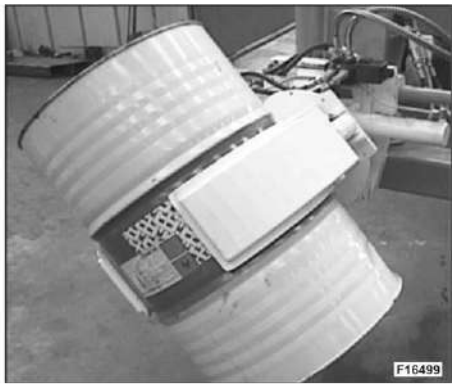


• DRUM CLAMP

Attachment for grasping 1 drum or similar items.
Clamp rotation of 180° or 360°.
This attachment requires the machine to be pre-set for a DUAL-FUNCTION ACCESSORY.

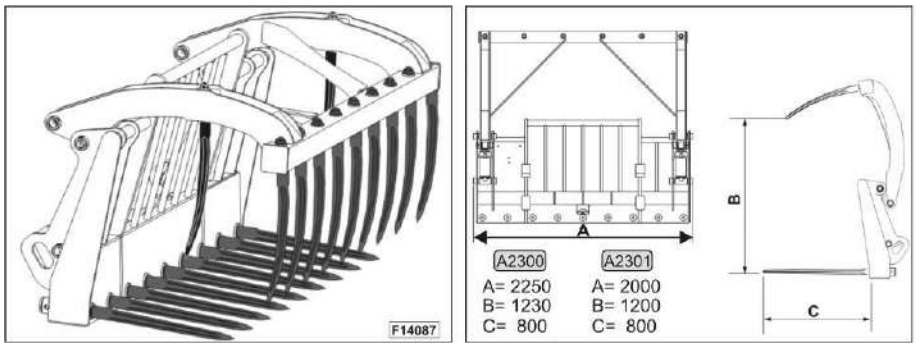
- Weight: 220 kg
- Load of attachment: 600kg





• MANURE FORK WITH CLAW

Assemble the attachment on the carriage as described in the paragraph INSTALLATION OF QUICK-COUPLING ATTACHMENTS in this chapter and use it with the auxiliary controls in the cab as described in the paragraph CONTROL OF HYDRAULICALLY FUNCTIONING ATTACHMENTS.



- Weight: (A2300) = 550 kg; (A2301) = 430 kg
- Attachment:capacity (A2300) = 1200 kg; (A2301) = 1000 kg

• HAY BALE FORK WITH CLAW

Assemble the attachment on the carriage as described in the paragraph INSTALLATION OF QUICK-COUPLING ATTACHMENTS in this chapter and use it with the auxiliary controls in the cab as described in the paragraph CONTROL OF HYDRAULICALLY FUNCTIONING ATTACHMENTS.

Fork suitable for loading one or two bales on top of each other, with hydraulically-positioned upper retainer claw.

- Weight: 240 kg
- Maximum load of attachment: 1500 kg

• BALE FORK WITH 2/3 TIPS, TIP-OVER

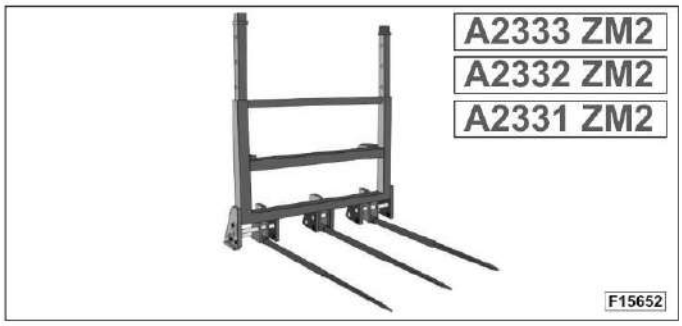
Fork suitable for loading one or two bales on top of each other, with pull-out upper guard.
Assemble the attachment on the carriage as described in the paragraph ASSEMBLY OF ATTACHMENTS WITH QUICK COUPLING in this chapter and use it with the auxiliary controls in the cab.

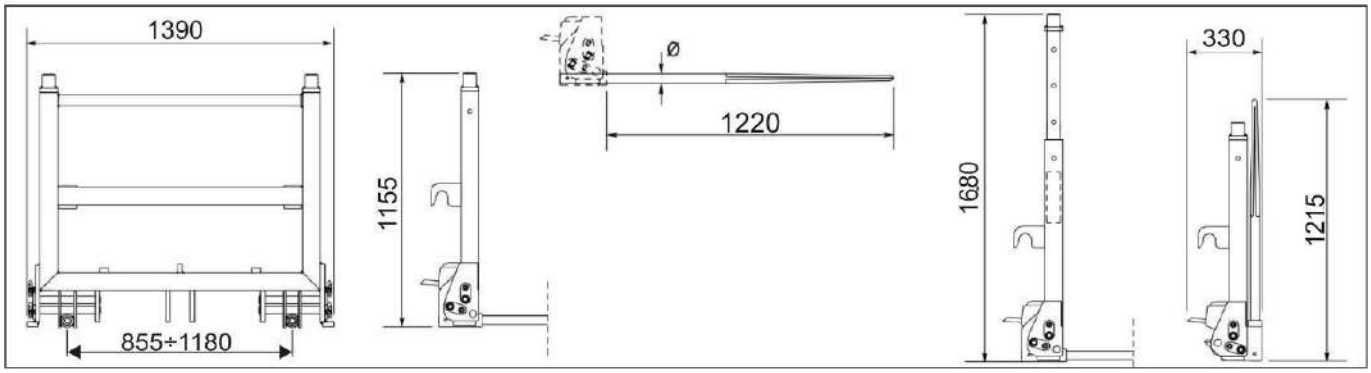
(A2333)
- Weight: 215 kg
- Load of attachment: 1500 kg

(A2331)
- Weight: 205 kg
- Attachment capacity: 1500 kg

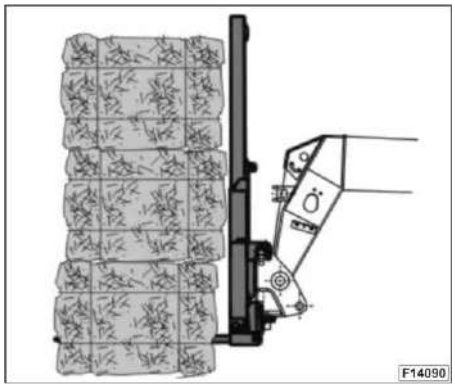
(A2334)
- Weight: 190 kg
- Attachment:capacity 1000 kg

(A2332)
- Weight: 210 kg
- Attachment capacity: 1000kg





• HAY BALE FORK WITH SLIDING GUARD



Fork suitable for loading one or two bales on top of each other, with height-adjustable, hydraulically operated upper guard. height adjustment means that this equipment is ideal for stacking bales up to the roof where the height of the last load is variable.
Assemble the attachment on the carriage as described in the paragraph INSTALLATION OF QUICK-COUPLING ATTACHMENTS in this chapter and use it with the auxiliary controls in the cab as described in the paragraph CONTROL OF HYDRAULICALLY FUNCTIONING ATTACHMENTS.

- Weight: 255 kg
- Maximum load of attachment: 1500 kg

• CARRIAGE WITH WINCH

For attachment assembly, operating and maintenance instructions, refer to the relevant manual.

• (P37.12 PLUS - P38.12 PLUS - P38.13 PLUS - P38.14 PLUS - P40.9 PLUS – P40.17 PLUS – P38.12 – P38.13 – P38.14 – P40.17 – P38.13EE – P40.17EE)

- Weight: 215 kg
- Attachment:capacity 2400 kg

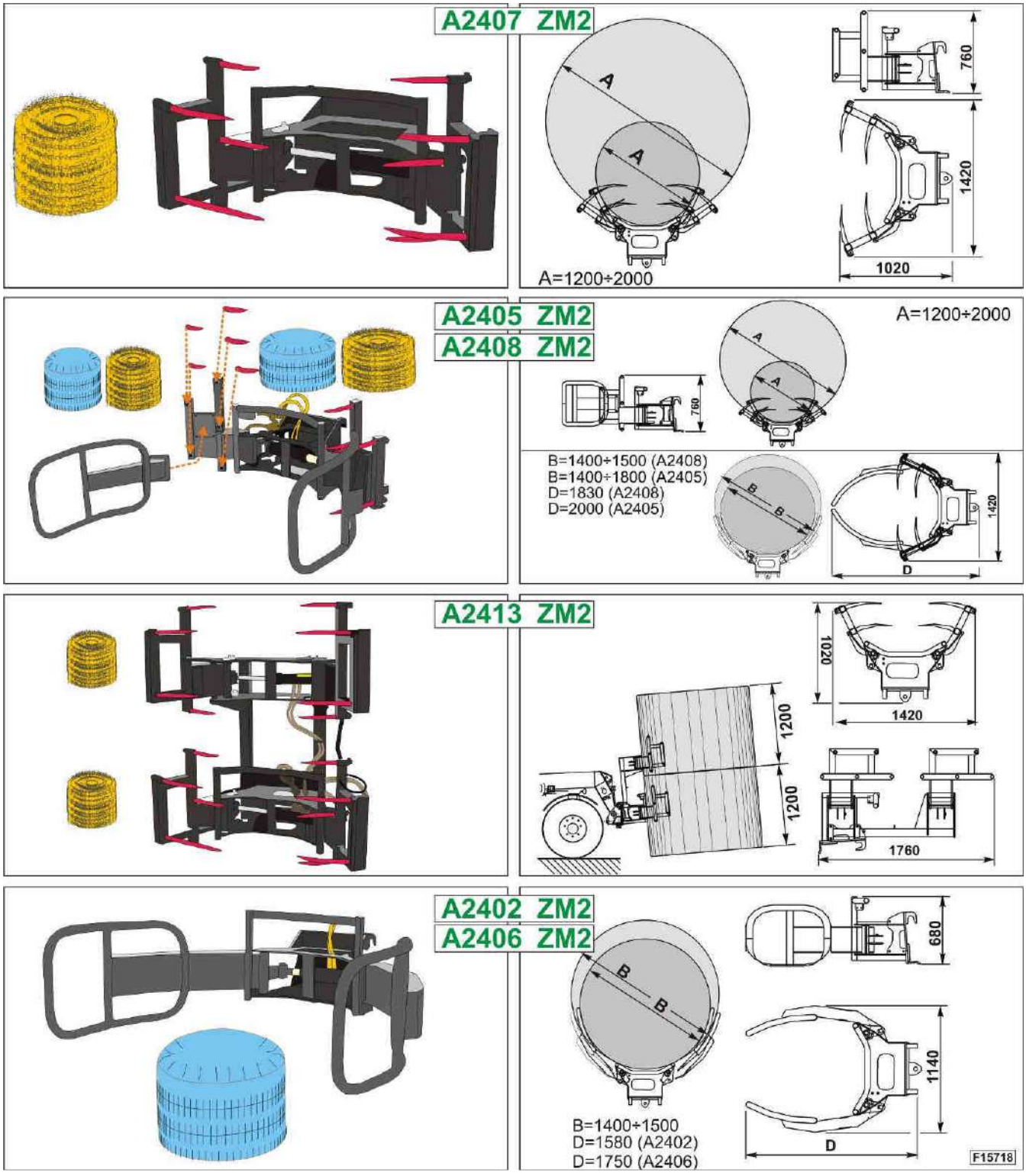
• (P60.10 - P72.10 – P60.10EE – P72.10EE)

- Weight: 500kg
- Attachment:capacity 5000 / 6000 kg

• BALE GRIPPER

Assemble the attachment on the carriage as described in the paragraph INSTALLATION OF QUICK-COUPLING ATTACHMENTS in this chapter and use it with the auxiliary controls in the cab as described in the paragraph CONTROL OF HYDRAULICALLY FUNCTIONING ATTACHMENTS.

(A2402) • Weight: 195 kg; • Capacity: 1000 kg / (A2405) • Weight: 250 kg; • Capacity: 1200 kg
(A2406) • Weight: 195 kg; • Capacity: 1000 kg / (A2407) • Weight: 175 kg; • Capacity: 1200 kg
(A2408) • Weight: 250 kg; • Capacity: 1200 kg / (A2413) • Weight: 295 kg; • Capacity: 1200 kg



VARIANTS AND ACCESSORIES

This chapter describes all the available accessories for this vehicle, based on the Merlo official price list.

WARNING! Use Merlo S.p.A. approved accessories only, type-approved for use on your vehicle.

Before using any accessory mentioned in the present chapter, it is necessary to read and fully understand the instructions on its operation. If the installation or operation of the accessory is not entirely clear, please contact your dealership or Merlo Technical Support Service.

WARNING! It is forbidden to use an accessory without reading and understanding its installation and operation instructions.

Should more than one accessory be installed on the machine, the relative controls may be in a position that differ from that indicated in the manual supplied with the machine. In any event please refer to the symbol that appears next to the command itself, so that even if it should be in a different position it can be identified by the relative symbol which is described in the manual.

GENERAL INSTRUCTIONS FOR THE USE OF THE MACHINE APPROVED AS ITALIAN OPERATIVE

NOTE!

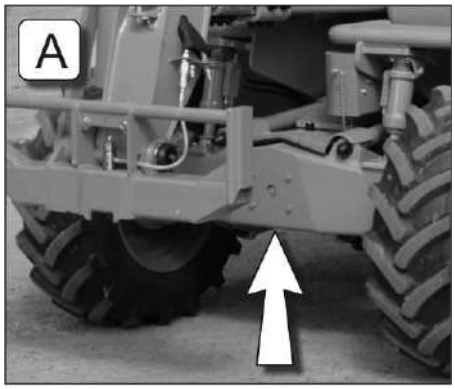
The items in annex II of the Directive 2009/144/CE, as amended by the Directive 2010/52/CE, point 4.1 to the letter d,f,p,q, point 4.2 to the letter b,d,e,g,k and the points 4.5.1.3, 4.5.2, 4.5.3 do not apply.

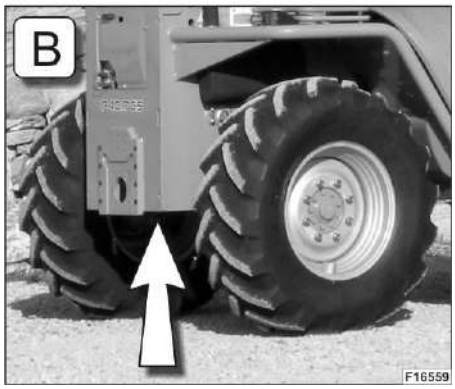
• POSITIONING POINTS FOR THE HYDRAULIC JACKS APPLICATION

If the machine has to be lifted in order to replace a tyre, the hydraulic jacks can be applied at the points indicated below:

A) front jacking point: place the hydraulic jack in correspondence to the central part of the machine's front axle, as indicated by the arrow
B) rear jacking point: place the hydraulic handler in the central-rear part of the machine, as indicated by the arrow

Refer to "DETERMINATION TABLE OF THE TOTAL MASS, THE LOADS PER AXLE AND THE LOAD CAPACITY OF THE TYRES" in this chapter to select the hydraulic jack type to suit Your needs.





• GENERAL INDICATIONS ON THE USE OF ATTACHMENT OR TRAILERS CONNECTED TO THE MACHINE

Before using Your machine with a towed attachment or fitted on a trailer, carefully observe the instructions shown in the use and maintenance manual of the machine and in the manual of the attachment or trailer connected. Otherwise do not use the above indicated combinations.

WARNING!

It is forbidden to linger in the area between the machine and the vehicle or the attachment being towed.

• DETERMINATION TABLE OF THE TOTAL PERMITTED MASS, THE LOADS PER AXLE AND THE LOAD CAPACITY OF THE TYRES

Refer to following table for information on the total permitted masses on the front and rear axle and the maximum applicable load on the tyres of Your machine.

This information is also useful for the determination of the hydraulic jack to be used for the tyre replacement operations. (see paragraph "POSITIONING POINTS FOR THE HYDRAULIC JACK APPLICATION" of this chapter).

MACHINE	TECHNICALLY PERMISSIBLE MASS (kg)			PERMITTED LOAD ON TYRES PER AXLE (kg)	
	TOTAL	FRONT	REAR	FRONT	REAR
P37.12 PLUS	8900	5000	5000	5000	5000
P38.12 / PLUS	8900	5000	5000	5000	5000
P38.13 / PLUS / EE	9050	5000	5000	5000	5000
P38.14 / PLUS	9400	5500	5600	5500	5600
P40.9 PLUS	8360	5000	5000	5000	5000
P40.17 / PLUS / EE	10980	5000	6500	5000	6500
P60.10 / EE	10000	7300	7500	7300	7500
P72.10 / EE	10500				

• DETERMINATION TABLE OF THE MAXIMUM ALLOWED LIMITS FOR TOWED MASSES

Refer to the following table for information on the maximum allowed limits for towed masses, the determination of the maximum load on the rear towing hook and the available braking systems for the trailer.

NOTE! The information regarding maximum allowed limits for towed masses are also shown in the type approval plate in the front part of the cab (see paragraph "IDENTIFICATION AND TYPE APPROVAL PLATES" in chapter "MACHINE TECHNICAL SPECIFICATIONS").

MACHINE	TOWING CAPACITY (kg)	VERTICAL LOAD ON HOOK (kg)
	NO BRAKES	
P37.12 PLUS	1500 (on request)	250
P38.12 / PLUS	-	-
P38.13 / PLUS / EE	-	-
P38.14 / PLUS	-	-
P40.9 PLUS	-	-
P40.17 / PLUS / EE	1250 (on request)	
P60.10 / EE	-	-
P72.10 / EE		

• DETERMINATION TABLE OF THE VIBRATIONS LEVEL (complying with the Directive 78/764/EEC)

The following table contains the vibration values transferred from the driver's seat divided according to the brand and type of the seat installed on the machine. Check what model is in Your cab and refer to the information shown below.

SEAT MODEL	CATEGORY	CLASS	APPROVAL	DRIVER'S MASS	Aws [m/s²] (*) (Dir.78/764)
KAB Seating 11T6	A	I / II / III	e11 0997	light	1,13
				heavy	1,01
KAB Seating 156, 15T6, 15E1, 15T1	A	I / II / III	e11 0995	light	1,13
				heavy	1,01
SEAT ACTIVIO SERIES – S698	A	II / III	e13 0021	light	1,64
				heavy	0,64
SEAT ACTIVIO SERIES – S55	A	II / III	e13 0020	light	1,17
				heavy	0,98
GRAMMER MSG95	A	II / III	100514	light	1,04
				heavy	0,64
SEAT FULLY	---	---	---	light	0,68 (**)
				heavy	0,55 (**)

(*) Aws = correct value of the rms value of the weighted seat vibration (complying with Directive 78/764/EEC)

(**) according to EN13490:2001

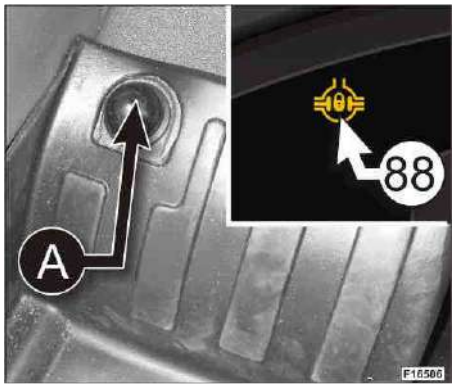
REAR DIFFERENTIAL LOCKING

Operated using button (A):

button pressed = lock engaged
button released = lock disengaged

When warning light (88) is ON, it indicates that the differential lock is engaged.

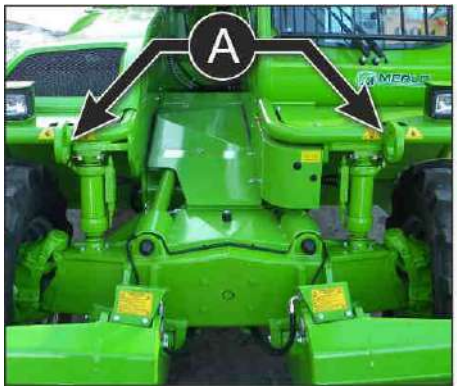
IMPORTANT! Do not operate the steering with differential lock engaged on tarmac or compact surfaces.
Leave the lock ON only for operations with silage.



SECURING THE MACHINE FOR TRANSPORTATION BY TRAILER

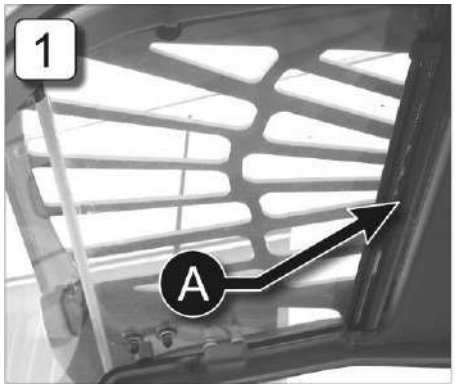
To secure your machine correctly to a trailer (e.g. for transportation), you must use appropriate ropes or chains attached exclusively to the rings marked "A" welded on to the chassis. The machine has a total of 4 anchorage rings (2 at the front and 2 at the rear).

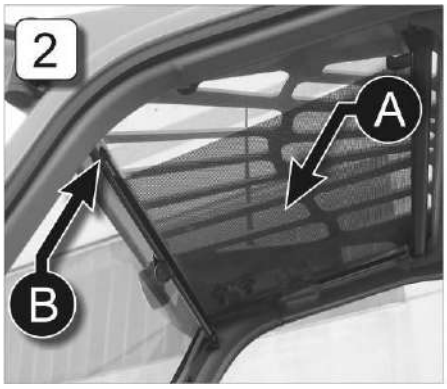
WARNING! Do not use the anchorage rings marked "A" to tow or lift the machine.

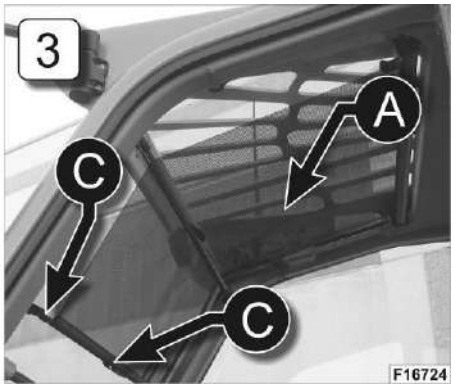


SUN BLIND

In the rest condition, the sun blind "A", is rolled up at the upper end of the cab window. (Fig1).
In order to cover the upper area of the cab window, unroll the sun blind "A" until it is hooked to the appropriate fastening brackets "B" (Fig. 2).
If you also need to cover a part of the cab's front window, unroll the sunblind "A" further until it is hooked to fastening brackets "C" (Fig. 3).







REAR HYDRAULIC OUTLET

The provision for mixing bucket control may be of 2 types depending on the distributor fitted to the machine:

- if the machine is fitted with levers, the mixing bucket is operated using control lever (2) (configuration 1)

- if the machine is fitted with a joystick, the mixing bucket is operated using the joystick (1) (configuration 2)

The 2 options available are analysed separately below; cross-check your machine to verify which configuration applies and refer to the relative section for the operating instructions.

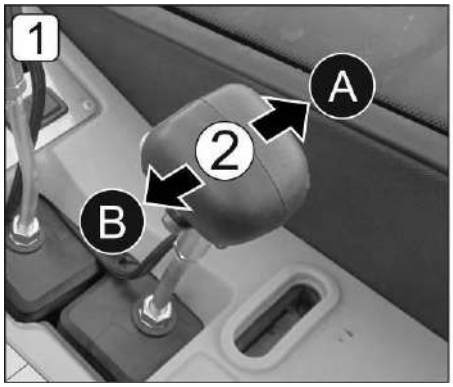
• CONFIGURATION 1

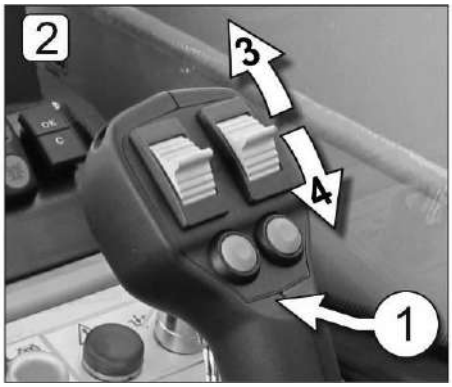
- place the lever (2) in direction "L" or "M" to activate the corresponding rear hydraulic sockets (see photo)

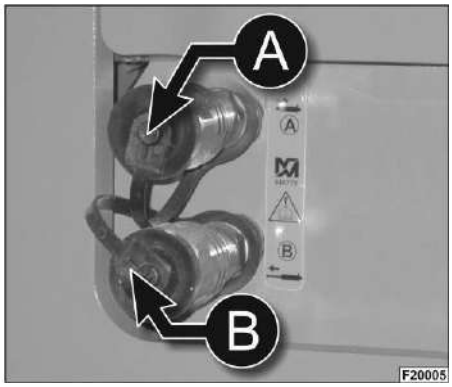
• CONFIGURATION 2

- rotate the right roller of the joystick (1) to position "3A" to activate the corresponding hydraulic connection.

- rotate the right roller of the joystick (1) to position "4B" to activate the corresponding hydraulic connection.







WARNING! The hydraulic system of the rear hydraulic outlet is not equipped with valves or seals able to support lifted loads (for example a dumb body). For these kind of use verify that the attachment is equipped with appropriate blocking system against accidental load descent.

Before operating with the rear hydraulic outlet, be sure to have disconnected both the hydraulic circuit of the attachment locking system and the hydraulic line to the attachment fitted to the front carriage.

With work completed, disconnect the rear hydraulic outlets; if not, when using the attachment fitted to the front carriage, the equipments linked to the rear hydraulic outlet would be activated.

The maximum working pressure of the rear hydraulic outlet is 210 bar.

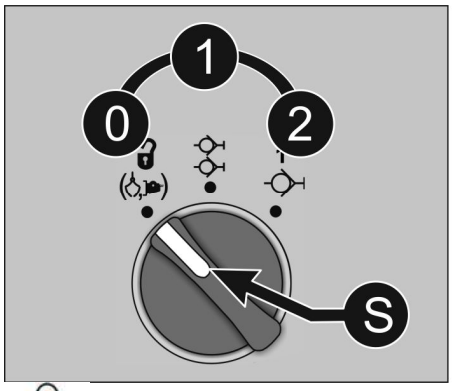
REAR HYDRAULIC OUTLET

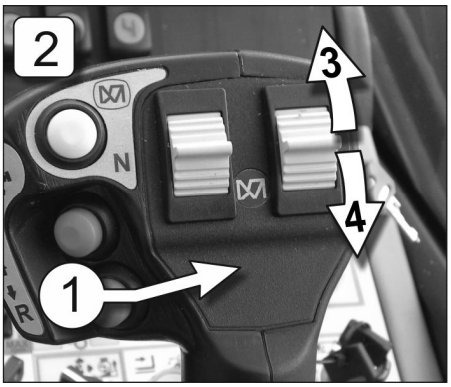
To understand the operation of the rear hydraulic connection, refer to the following instructions:

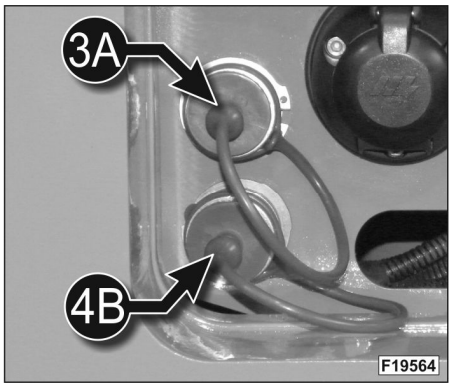
- selector "S" on "0": the rear hydraulic connections are deactivated and the functions of the joystick (1) are those described in chapter "COMMANDS AND INSTRUMENTS"

- selector "S" on "1": to control the rear hydraulic connection, turn the right wheel of the joystick (J) to "3A" or "4B" to use the corresponding rear hydraulic connections

- selector "S" on "2": the oil is sent in a continuous manner to the hydraulic connection "3A" without using the joystick (J).







WARNING! The hydraulic system of the rear hydraulic outlet is not equipped with valves or seals able to support lifted loads (for example a dumb body). For these kind of use verify that the attachment is equipped with appropriate blocking system against accidental load descent.

Before operating with the rear hydraulic outlet, be sure to have disconnected both the hydraulic circuit of the attachment locking system and the hydraulic line to the attachment fitted to the front carriage.

With work completed, disconnect the rear hydraulic outlets; if not, when using the attachment fitted to the front carriage, the equipments linked to the rear hydraulic outlet would be activated.

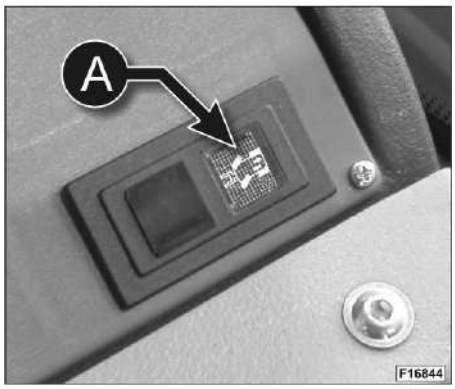
The maximum working pressure of the rear hydraulic outlet is 210 bar.

REAR WHEEL CENTRING INDICATOR ON THE MACHINE AXIS

Before carrying out a transfer on public roads, it is mandatory to align the wheels of the rear bridge to the longitudinal axis of the machine by proceeding as follows:

- select the four wheel coordinated steering or crab steering
- carry out the steering manoeuvre until the rear axle wheels are parallel to the machine axis. the operator is notified that alignment is completed by indicator "A" which lights up on control panel "P1".

Before carrying out a transfer on public roads, select steering on the front axis (lever 29 in position "B").

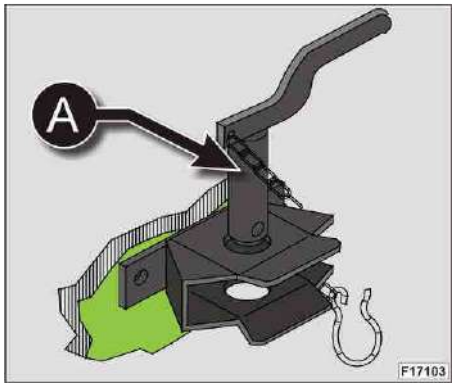


FIXED BUILDING SITE TOW HOOK

Mount the fixed tow hook (A) for building sites if:
- it is necessary to tow the vehicle on public roads (see also paragraph "MACHINE TOWING" in chapter "OPERATING INSTRUCTIONS")

- it is necessary to tow trailers or other equipment within a building site. In this case, the maximum towable weight must be less than 4000 kg.

The maximum vertical load on the towing hook is indicated inside the registration documents for public road circulation.



WARNING!

It is forbidden to use this type of hook to tow trailers or other equipment on public roads.

"EEC" MULTI-POSITION TOWING HOOK

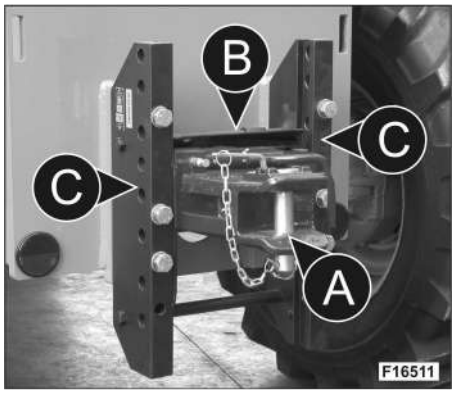
The "EEC" towing hook is used to tow farm equipment without braking systems, with a maximum gross weight of 6000 kg.

The maximum vertical load on the towing hook is indicated inside the registration documents for public road circulation.

The towing hook is installed on a plate with lateral slides so as to vertically slide in multiple positions.

• nomenclature

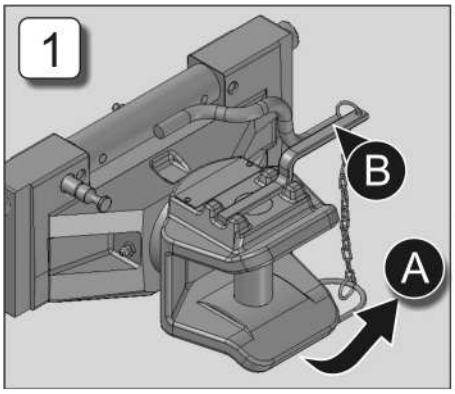
A) "EEC" towing hook
B) upper position
C) slides for the sliding of the hook

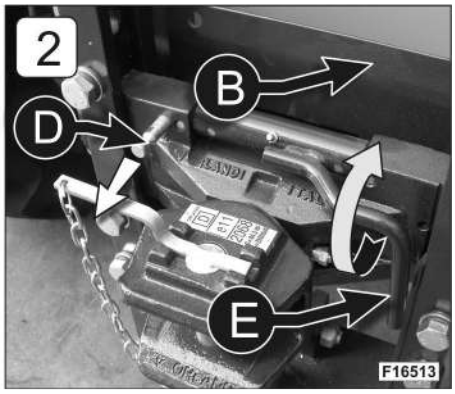


WARNING! The use of the "EEC" towing hook on public roads may be subject to restrictions in certain countries. The user must contact their local dealer before towing loads or equipment on public roads.

To attach a trailer to the "EEC" towing hook (figure 1), proceed as follows:

- remove the lower clip "A"
- remove the retaining pin "B"
- insert the eyelet of the equipment inside the housing of the hook
- insert the pin "B"
- secure the pin "B" with the clip "A"
- connect the trailer lights to the appropriate electrical outlet (see relevant paragraph)





To move the towing hook onto the multi-position plate, follow the instructions below (figure 2):

- if you want to use the highest positions of the slide, lift the upper guard "B"
- extract the release device "D"
- grasp the handle "E", lift and move the hook to the desired height
- lower the handle "E" and check that the device "D" is correctly inserted

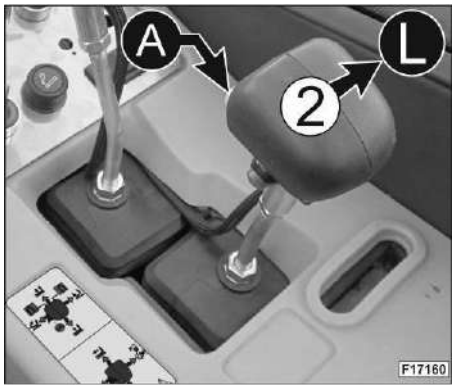
PROVISION FOR MIXING BUCKET CONTROL

The provision for mixing bucket control may be of 2 types depending on the distributor fitted to the machine:

- if the machine is fitted with levers, the mixing bucket is operated using control lever (2) (configuration 1)
- if the machine is fitted with a joystick, the mixing bucket is operated using the joystick (1) (configuration 2)

The 2 options available are analysed separately below; cross-check your machine to verify which configuration applies and refer to the relative section for the operating instructions.

- CONFIGURATION 1



OPENING THE PROPELLER HOUSING

Press the button (A) and move the lever (2) to position "L"; when the guard is completely open, release the button.

CLOSING THE PROPELLER GUARD

The propeller guard will close automatically when the mixing bucket is rotated upwards.

PROPELLER ROTATION

Place the lever (2) in position (L) and hold it there.

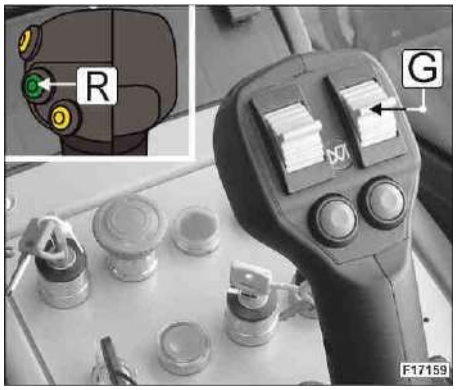
WARNING! If the button (A) is pressed and the lever (2) is in position "L", when the bucket is rotated upwards, the safety device prevents propeller rotation. If the machine remains in this condition, the oil may overheat.

Propeller rotation with the guard open is only allowed when loading inert material, operating from the cab and using the bucket as a loader.

OPENING AND CLOSING THE CONCRETE DISCHARGE HATCH

Activate propeller rotation first and then the discharge using the remote control supplied (see relative paragraph in the equipment manual).

- CONFIGURATION 2



To use the mixing bucket correctly on a machine equipped with the optional joystick, refer to the following instructions:

OPENING THE PROPELLER HOUSING

Press the button (R) and turn the RH thumb-wheel into position "G"; when the guard is completely open, release this button.

CLOSING THE PROPELLER GUARD

The propeller guard will close automatically when the mixing bucket is rotated upwards.

PROPELLER ROTATION

Turn the RH wheel into position (G) and hold it there

WARNING! If the button (R) is pressed and the RH thumb-wheel is turned to position "G", when the bucket is rotated upwards, the safety device prevents propeller rotation. If the machine remains in this condition, the oil may overheat.

Propeller rotation with the guard open is only allowed when loading inert material, operating from the cab and using the bucket as a loader.

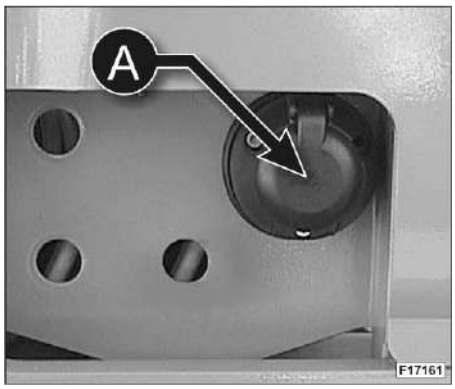
OPENING AND CLOSING THE CONCRETE DISCHARGE HATCH

Activate propeller rotation first and then the discharge using the remote control supplied (see relative paragraph in the equipment manual).

REAR ELECTRICAL CONNECTION

For the electrical connection of the direction indicators and all the lights of the towed equipment use "A" socket.

For the electric connection (according to ISO 1724-80) consult the enclosed electric diagram.



CAR RADIO

The radio is installed in the compartment under the left glove box.

The image is by way of example only and may not correspond to the radio actually fitted in the vehicle.

For information on the use of the radio, refer to the corresponding manual.

WORK LIGHTS

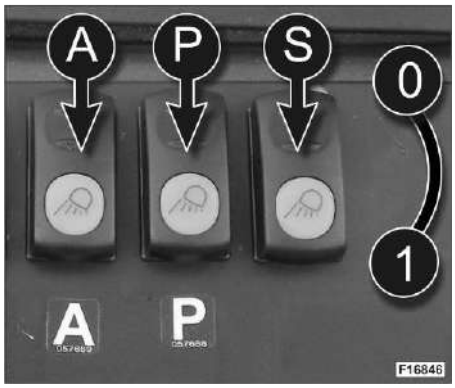
To use the work lights, follow the instructions below:

• ON THE CAB

- Turn the ignition key (8) to position "R" (instrument panel on).
- Press the button (A) to switch on the front work headlights.
- Press the button (P) to switch on the rear work headlights.

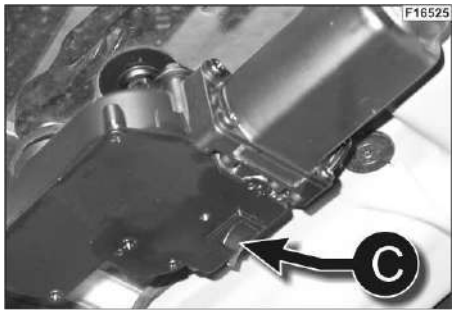
• ON THE TELESCOPIC BOOM

- Turn the ignition key (8) to position "R" (instrument panel on).
- Press the button (S) to switch on the work headlights on the boom.



WINDSCREEN WIPER ON ROOF

To activate the windscreen wiper on the vehicle roof, press button "C" located on the electric motor of the wiper itself.



FITTING ACTIVE HYDRO-PNEUMATIC SUSPENSIONS FOR PANORAMIC

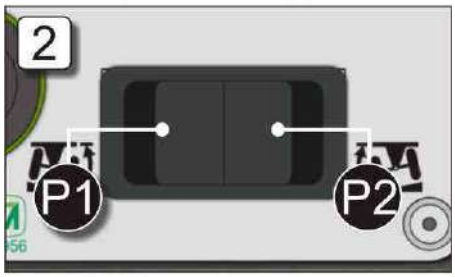
PROCEDURE

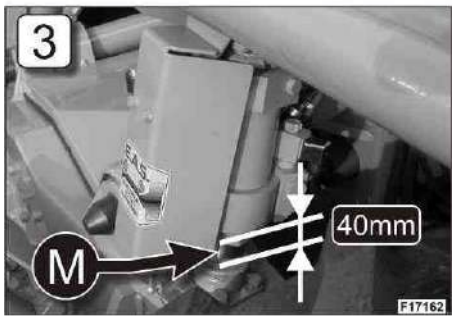
The active hydro-pneumatic suspension system ensures better comfort for the operator in the cab while driving a medium-high speed and at the same time improves machine road-holding while also protecting the mechanical structures and the load carried against blows caused by road bumps and travel over irregular ground.
It is also advised to use these suspensions for transporting loads over irregular ground since the active system is designed to adapt to the weight carried (from 0 to MAX) without affecting ground clearance .
When loading-unloading materials on flattish and firm ground (e.g. asphalted depots), it is advisable to deactivate the active hydro-pneumatic suspension system to ensure better working precision.

OPERATING INSTRUCTIONS

The system envisages two user modes - MANUAL and AUTO - selected using selector switch "S". (Fig. 1)
in MANUAL mode, it is possible to perform commands involving the crossways tilt corrector.
Movement is obtained by pressing buttons "P1" and "P2" and halts automatically when these buttons are released. The command must only be given with the machine at a standstill. (Fig.2)

P1 = anticlockwise chassis levelling
P2 = clockwise chassis levelling





IMPORTANT! In MANUAL mode, if the machine boom is raised beyond the locking device intervention limit, operation of the crossways tilt correcter is prevented.

In AUTO mode, the suspension effect as such is obtained, ensuring maximum driving comfort during trips with and without loads.
By turning the selector switch "S" into position AUTO, the machine presets for this operation; if all safety conditions are respected, a led comes ON, the suspension is activated and jacks "M" slide out by approx. 40mm. (Fig.3)

In AUTO mode, the suspension activates itself only if:

- the machine boom is not raised beyond the lock device intervention limit
- crossways chassis movement is in the central position (indicator light 56 OFF).

If these safety conditions are not upheld, the led does not come ON and the suspension is not activated. In the event of system faults, contact Merlo Technical Assistance service.

WARNING!!

If, when turning selector switch "S" into the AUTO position, the jacks do not slide out or slide out incorrectly, contact Merlo Technical Assistance Service.

When the machine is fitted with active suspensions on the front axle (EAS), it is not possible to perform crossways levelling operations at full load but exclusively with a maximum weight of 3000Kg.

If absolutely necessary, it is possible to perform crossways machine levelling with loads greater than 3000 kg by performing complete movement in advance of the part opposite to jack "M" which is to be lifted.

Make sure that machine is correctly levelled before attempting any lifting operations.

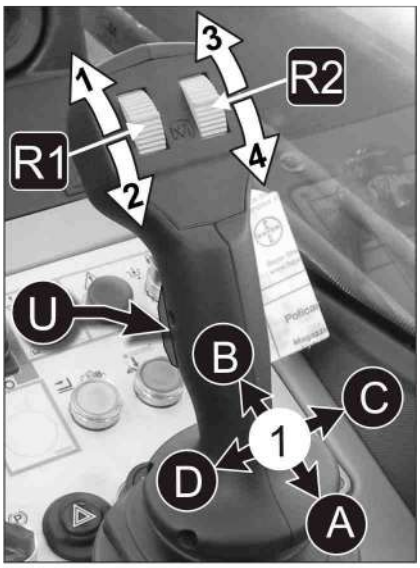
Pay careful attention when activating/deactivating the suspension system since the machine is raised/lowered by about 40mm.

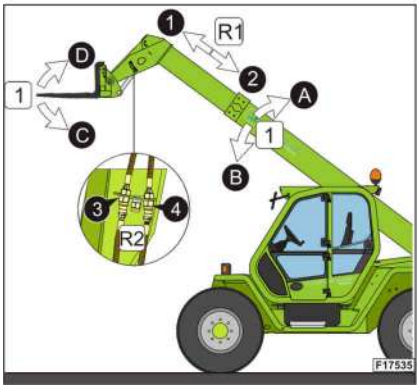
Load handling on uneven surfaces is permitted by using frame levelling device to level the machine chassis to the proper position. Check correct levelling using the spirit level in the cab.

PERIODICAL SAFETY CONTROLS

Check the calibration of the hydro-pneumatic accumulators every 1000 hours.
This operation must be carried out by Merlo Technical Assistance Service.

JOYSTICK (4 FUNCTIONS)





4 main movements can be performed with this joystick (2 movements controlled by the lever of the joystick and 2 movements controlled by wheels R1 and R2).

1) LIFTING/LOWER OF THE TELESCOPIC BOOM
2) UPWARD/DOWNWARD ROTATION OF THE FORKS
3) EXTENSION/RETRACTION OF THE TELESCOPIC BOOM
4) COMMAND FOR ATTACHMENTS INSTALLED ON THE CARRIAGE

The first two movements are carried out by moving the joystick in the longitudinal and transverse direction, while the remaining two movements are performed using the control wheels "R1" and "R2".

The speed of the movement to be made is proportional to:

- the inclination given to the control joystick (the greater the movement of the joystick, the greater the speed of the movement)

- the rotation of the control wheels "R1" and "R2" (the greater the rotation, the greater the speed of the movement)

- the rpm of the diesel engine (the higher the rpm of the engine, the greater the speed of movement).

The movement stops automatically when the joystick or related wheel is released. Depending on load conditions, it is possible to combine movements.

• JOYSTICK LEVER (1) IN POSITION:

A = boom lifting
B = boom descent
C = tilting of forks downward
D = tilting of forks upward

- CONTROL WHEEL "R1"

1 = extension of the telescopic boom
2 = retraction of the telescopic boom

- CONTROL WHEEL "R2"

3 = attachments release/attachments command
4 = attachments command

- JOYSTICK "U" ENABLING BUTTON

Press and hold button "U" to enable the joystick (1) commands. The indicator light (209) on the control panel (P1) lights to indicate to the operator the enabling of the joystick controls

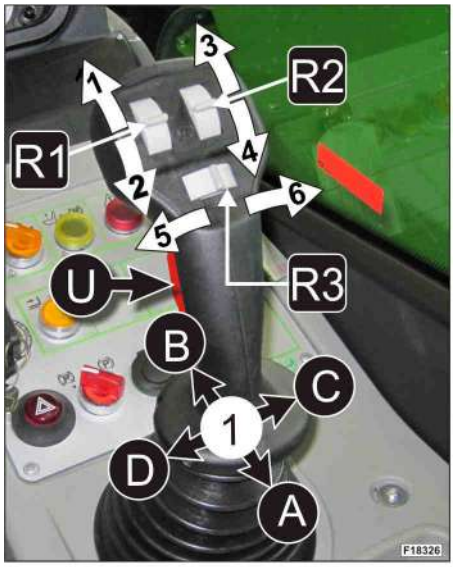
WARNING! Before operating the machine, please mark off the area where the machine needs to be operated, in order to keep both people and vehicles away from it.

Should you need to operate the machine near overhead lines, the person in charge of safety shall require the minimum safety distance from such lines to the manager of said lines, as well as from the authorities in charge of safety and health in the workplace; in this way all necessary precautions shall be taken and potential accidents shall be prevented. For further information please refer to paragraph "INSTRUCTIONS FOR A CORRECT USE OF THE MACHINE NEAR OVERHEAD LINES" in chapter "OPERATING INSTRUCTIONS".

JOYSTICK (5 FUNCTIONS)

5 main movements can be performed with this joystick (2 movements controlled by the lever of the joystick and 3 movements controlled by wheels R1, R2 and R3).:

1) LIFTING/LOWER OF THE TELESCOPIC BOOM
2) UPWARD/DOWNWARD ROTATION OF THE FORKS
3) EXTENSION/RETRACTION OF THE TELESCOPIC BOOM
4) COMMAND FOR ATTACHMENTS INSTALLED ON THE CARRIAGE (AUX)
5) COMMAND FOR ATTACHMENTS INSTALLED ON THE CARRIAGE (AUX 1)



Press and hold button "U" to enable the joystick (1) commands.

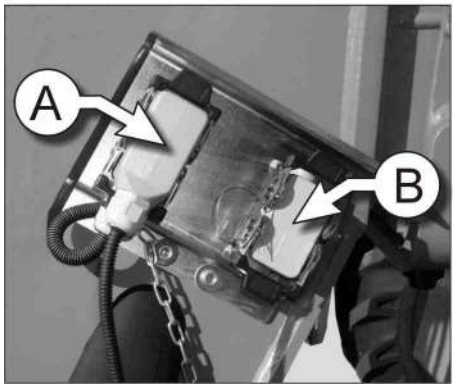
The first two movements are carried out by moving the joystick in the longitudinal and transverse direction, while the remaining three movements are performed using the control wheels "R1", "R2" and "R3". The speed of the movement to be made is proportional to:

- the inclination given to the control joystick (the greater the movement of the joystick, the greater the speed of the movement)

- the rotation of the control wheels "R1", "R2" and "R3" (the greater the rotation, the greater the speed of the movement)

- the rpm of the diesel engine (the higher the rpm of the engine, the greater the speed of movement).

The movement stops automatically when the joystick or related wheel is released. Depending on load conditions, it is possible to combine movements.



• JOYSTICK LEVER (1) IN POSITION:

A = boom lifting
B = boom descent
C = tilting of forks downward
D = tilting of forks upward

- CONTROL WHEEL "R1"

1 = extension of the telescopic boom
2 = retraction of the telescopic boom

- CONTROL WHEEL "R2" (AUX)

3 = attachments release/attachments command
4 = attachments command

- CONTROL WHEEL "R3" (AUX 1)

5 = attachments command
6 = attachments command

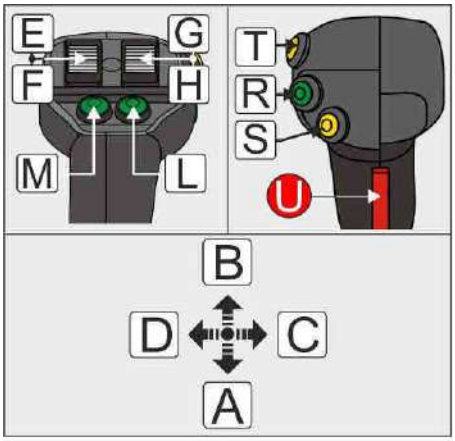
WARNING! Before operating the machine, please mark off the area where the machine needs to be operated, in order to keep both people and vehicles away from it.

Should you need to operate the machine near overhead lines, the person in charge of safety shall require the minimum safety distance from such lines to the manager of said lines, as well as from the authorities in charge of safety and health in the workplace; in this way all necessary precautions shall be taken and potential accidents shall be prevented. For further information please refer to paragraph "INSTRUCTIONS FOR A CORRECT USE OF THE MACHINE NEAR OVERHEAD LINES" in chapter "OPERATING INSTRUCTIONS".

- ELECTRICAL CONNECTION OF DUAL-FUNCTION ACCESSORIES

Move the plug from socket "A" to support socket "B". The dual-function attachments are equipped with an electric cable which must be connected to the electrical outlet "A" on the head of the boom.

MULTI-FUNCTION CONTROL JOYSTICK



Thanks to this accessory, your machine is fitted with an electro-mechanical single-lever joystick for performing 8 hydraulic functions

• Position A: lift telescopic boom
• Position B: lower telescopic boom

• Position C: rotate carriage upwards
• Position D: rotate carriage downwards

• Position E: extend telescopic boom
• Position F: retract telescopic boom

• Position G: release attachments installed on carriage
• Position H: • command for attachments installed on carriage

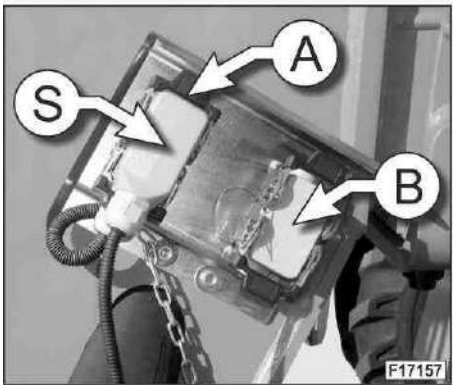
• Button L: shift machine to right
• Button M: shift machine to left

• Button R: AUX1 (first hydraulic function)

To activate the first hydraulic function of the attachment mounted on the machine, press the button (R) and simultaneously turn the right-hand thumb-wheel in position "G" or "H" to select the movement direction.

• Button S: AUX2 (second hydraulic function)

To activate the second hydraulic function of the attachment mounted on the machine, press the button (S) and simultaneously turn the right-hand thumb-wheel in position "G" or "H" to select the movement direction.



• Button T: AUX3 (third hydraulic function)

To activate the third hydraulic function of the attachment mounted on the machine, press the button (T) and simultaneously turn the right-hand thumb-wheel in position "G" or "H" to select the movement direction.

The movement speed required is proportional to the angle given to the joystick (the larger the angle of the joystick the higher the movement speed), the rotation of the control thumb-wheels (the larger the rotation of the thumb-wheels the higher the movement speed) and diesel engine rpm (the higher the diesel engine rpm the higher the movement speed).
Depending on load conditions, it is possible to combine machine movements.
Movements stop automatically when the joystick, control thumb-wheel or button are released.

To enable the operation of the joystick it is necessary to press and keep pressed the red button (U) located on the rear.

WARNING! Before operating the machine, please mark off the area where the machine needs to be operated, in order to keep both people and vehicles away from it.

Should you need to operate the machine near overhead lines, the person in charge of safety shall require the minimum safety distance from such lines to the manager of said lines, as well as from the authorities in charge of safety and health in the workplace; in this way all necessary precautions shall be taken and potential accidents shall be prevented. For further information please refer to paragraph "INSTRUCTIONS FOR A CORRECT USE OF THE MACHINE NEAR OVERHEAD LINES" in chapter "OPERATING INSTRUCTIONS".

On request, it is possible to have the control joystick (1) mounted on the right armrest of the seat; in this case, however, the joystick installed is a proportional electronic type, although the commands and functions available are the same as those described in this paragraph.
Before starting to use the proportional electronic joystick, check the correct locking of the armrest in the work position.

To electrically connect the attachment to the machine proceed as follows:

- remove the protection from the support connection "B"
- move the electrical plug "S" from the socket "A" to the support socket "B"
- connect the plug coming from the equipment to the electrical connection "A" on the machine

GRAMMER EXTRA-COMFORT PNEUMATIC SEAT

The pneumatic seat Grammer is installed in place of the standard one. Therefore, the following instructions replace those found in chapter "CAB" of the present operator manual.

WARNING! It is forbidden and it is extremely dangerous to adjust the driver's seat while the vehicle is moving. Position the driver's seat so that the driver can easily reach the vehicle controls.

1) SEAT FORWARD/BACKWARD SLIDING

To regulate the seat horizontal sliding, lift lever "A" and move the seat forwards or backwards until the desired position is reached. Once the seat has been adjusted, release lever "A" and check that the seat is locked into the desired position.

2) BACKREST ADJUSTMENT

Rest your back on the backrest, then lift lever "B" to incline it as desired. Once the seat has been adjusted, release lever "B" and check that the backrest is locked into the desired position.

3) LUMBAR ADJUSTMENT

Rotate handle "C" in both directions to adjust the desired lumbar support level.

4) SUSPENSION ADJUSTMENT

This pneumatic seat can automatically adjust to the ideal height and suspension level according to your body weight.
To correctly adjust the seat height and suspension, properly sit on the seat, then lift lever "D" for a few seconds; the seat automatically assumes the ideal position.
If the set height is not comfortable, you can still manually use lever "D" to raise or lower the seat.
If, while driving, the seat dampens the roughness of the road by reaching its top or bottom end stop, the system automatically regulates the seat height, so that the maximum driving comfort is always ensured.

5) ACTIVATION OF THE LONGITUDINAL ANTI-SHOCK SYSTEM

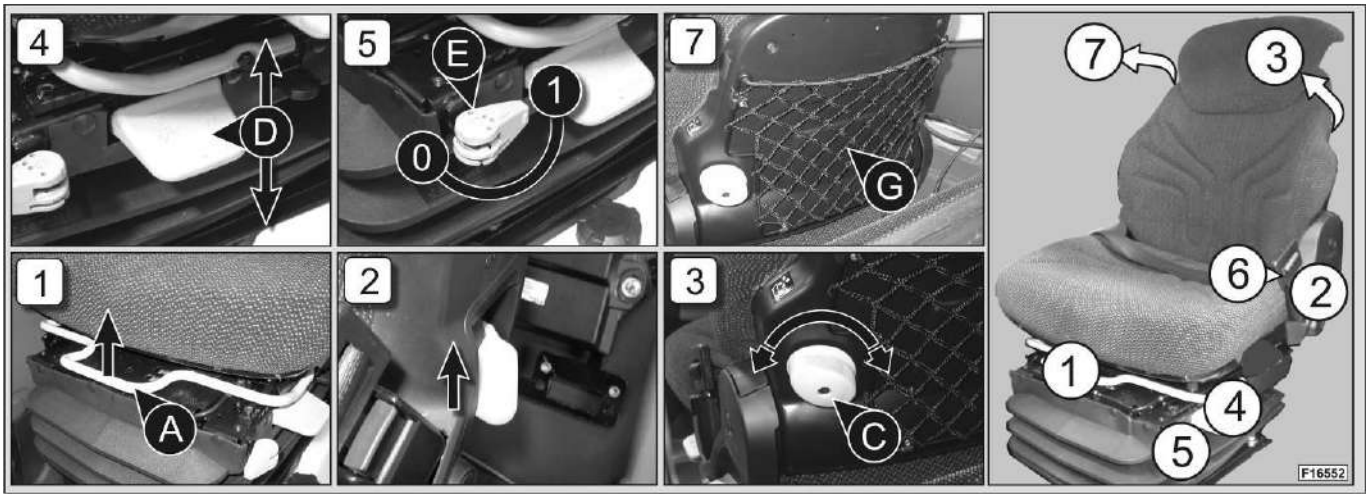
Your pneumatic seat is fitted with a longitudinal anti-shock system which makes driving on roads and working at a building site more comfortable.
Lever "E" is used to activate the anti-shock system: when in position "1" the anti-shock is enabled, in position "0" it is disabled.

6) SAFETY BELT

The safety belt use conditions are the same as those found in paragraph "CAB".

7) DOCUMENT POCKET

Always keep the use and maintenance manual of your vehicle in the document pocket "G", located behind the seat.



TYRE SEAT

SEAT SHIFT (1):
Lift lever "S" upwards, slide the seat forwards or backwards to obtain the required position and release the lever.

HEIGHT ADJUSTMENT (2):
The seat height can be adjusted by means of the hand lever "M", placed on the front side of the seat frame.
To lower the seat, pull the hand lever "M" outwards
To lift the seat, turn the ignition key in position "R" and press the hand lever "M".

SUSPENSION ADJUSTMENT (3):
To adjust the seat suspension use handle "A" located at the front side of the seat frame. Sit on the seat and turn the handle until just the right degree of suspension is achieved for one's weight. (direction "R" to harden the suspension, direction "S" to soften the suspension)

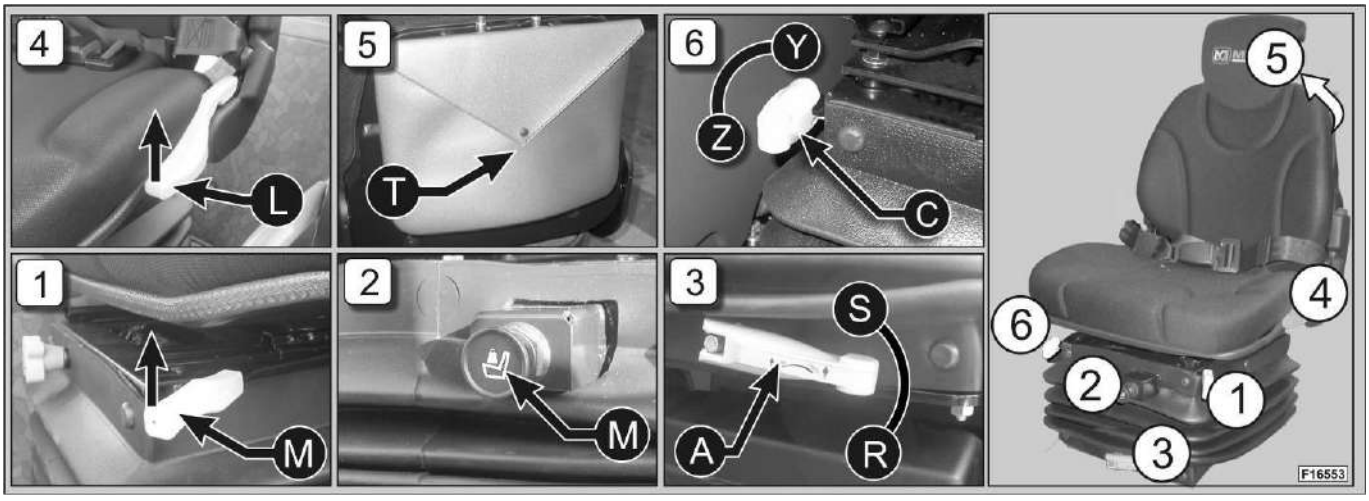
BACKREST ADJUSTMENT (4):
Sit with your back firmly against the backrest.
Lift lever "L" upwards to position the backrest to the required angle.

DOCUMENT HOLDER POCKET (5)
Located behind the seat for holding the machine documentation and small objects.
Always keep the "USE AND MAINTENANCE INSTRUCTIONS MANUAL" in the document holder pocket (T).

The machine is fitted with a pneumatic seat with a longitudinal anti-shock system making driving on the road and site operations more comfortable (6):

- rotate lever "C" to position "Z" to engage the longitudinal suspension
- rotate lever "C" to position "Y" to disengage the longitudinal suspension making the seat rigid.

WARNING! It is forbidden and it is extremely dangerous to adjust the driver's seat while the vehicle is moving. Position the driver's seat so that the driver can easily reach the vehicle controls.

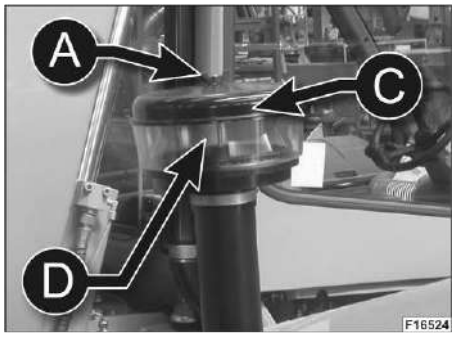


CYCLONE PRE-FILTER

Remove the material deposited in pre-filter "A" as follows:

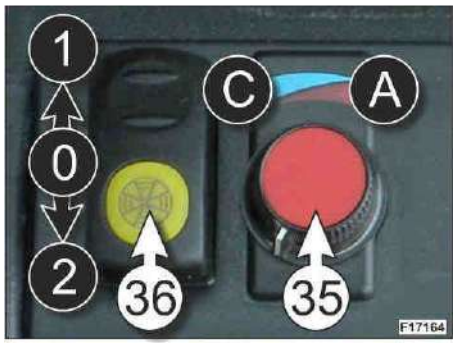
- remove wing nut "A"
- remove cover "C"
- remove decanting unit "D" and empty it completely taking care not to allow impurities to fall in the air inlet hole.

WARNING!! Whenever the container becomes completely full, the pre-filter function is lost.



A/C SYSTEM

To cool your cab correctly, follow the advice below:



- open all the air vents in the cab
- after a prolonged stay in the sun it is necessary to air the cab by opening all the windows for a few minutes and putting the ventilation control (36) on the second speed (for further information see the section "HEATING" in the chapter "CONTROLS AND INSTRUMENTS").
- check that the heating controls (35) are on "C". If this is not the case, turn the knob to close the heating cock.
- For maximum efficiency and reliability of the A/C system, we recommend that you periodically clean the condenser; this component is located in the top spoiler behind the driver's cab.
- should the A/C system become less efficient, check the coolant level. Have this operation carried out by qualified and competent personnel

CLASSIFICATION OF COMPONENTS

- knob (35) in position "A": heating on
- knob (35) in position "C": air-conditioning on

- selector (36) on "0": ventilation off (not to be used with the selector switch "35" in position "C")
- selector (36) on "1": ventilation activated at the first speed
- selector (36) on "2": ventilation activated at the second speed

OPERATING INSTRUCTIONS

To correctly activate the air-conditioner "A", follow the instructions below:

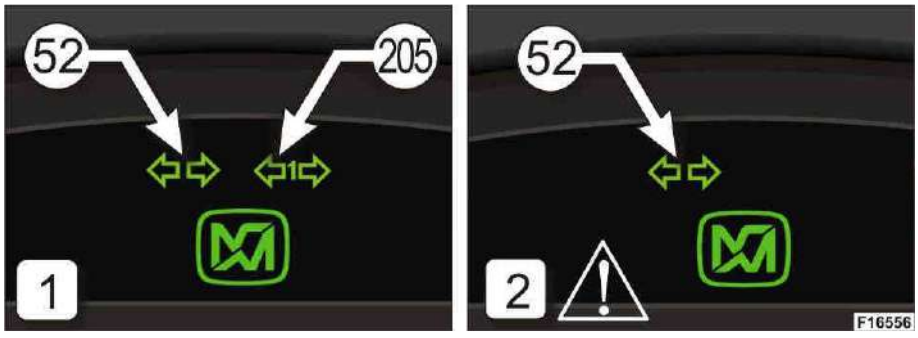
- place the knob (35) in position "C";
- turn the selector (36) to "1" or "2"
- Turn the selector "A" to position "1"

WARNING! Do not activate the air-conditioner "A" if the fan control (36) is on "0" since it drastically reduces the system's efficiency and can produce ice on the evaporator. Any water leaks under the vehicle are due to the normal discharge of condensate produced by the dehumidification effect of the air-conditioner.

FAULTS WITH DIRECTION INDICATORS ON AGRICULTURAL TRAILERS

(only for models P37.12PLUS E P40.9PLUS)

If the machine is equipped on request with type approval as an agricultural tractor and a trailer has been correctly connected, operation of the LED (205) on the instrument panel (C) is activated. The operation of this LED (205) may bring about possible faults in the direction indicator system. Consequently, carry out the following instructions:



• trailer not connected to the machine: Indicator light (205) always OFF

• trailer connected to the machine, direction indicators activated and LED (205) ON and flashing simultaneously with LED (52):
→no fault in the trailer's direction indicator system (fig.1)

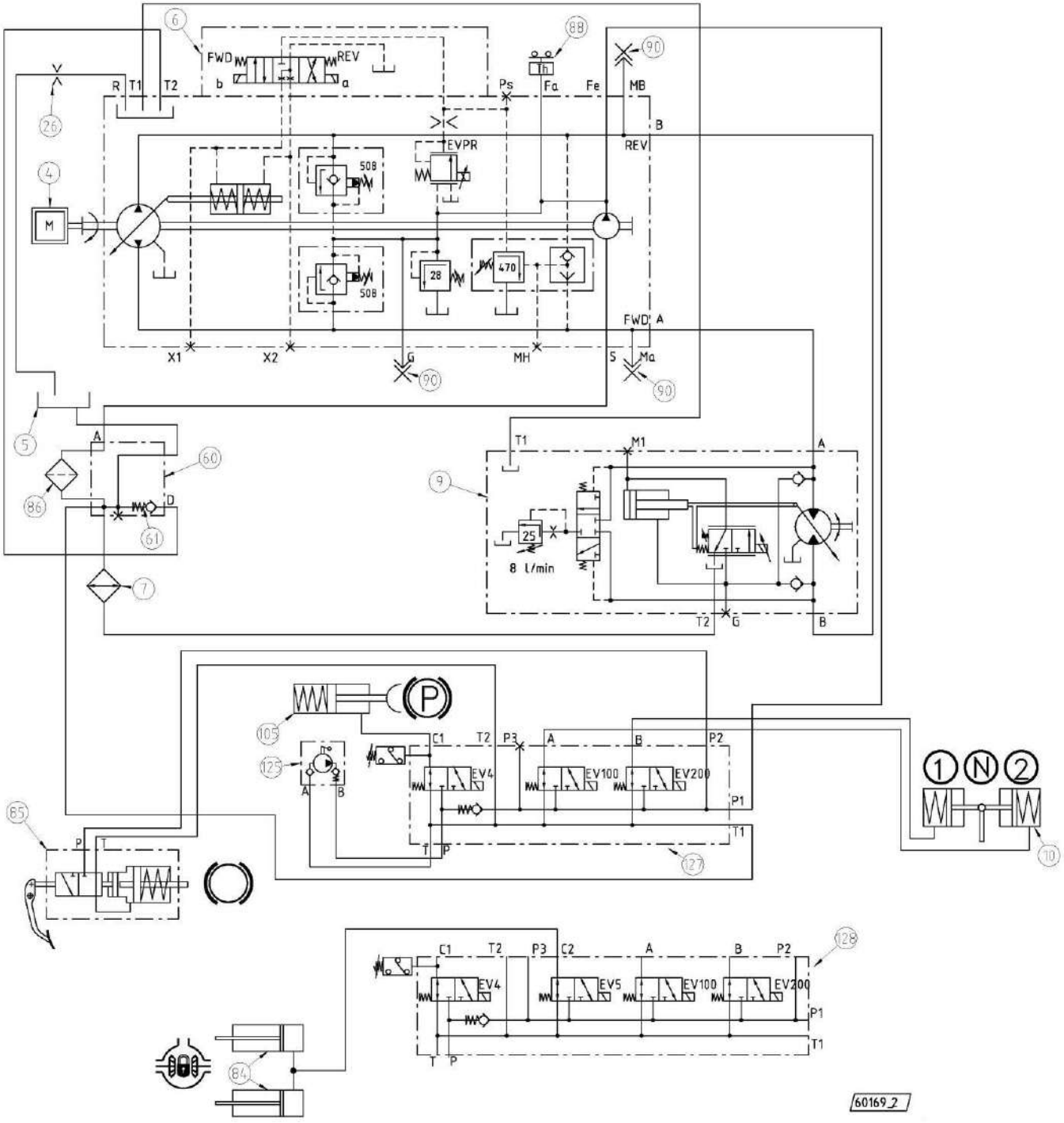
• trailer connected to the machine, direction indicators activated and LED (205) ON and flashing in alternation with LED (52):
→fault in the direction indicator system. Identify the cause of the problem and carry out the action needed to solve it. (for example, replace the bulb, check the connection, etc) (fig.2)

END OF SECTION

CONTENTS

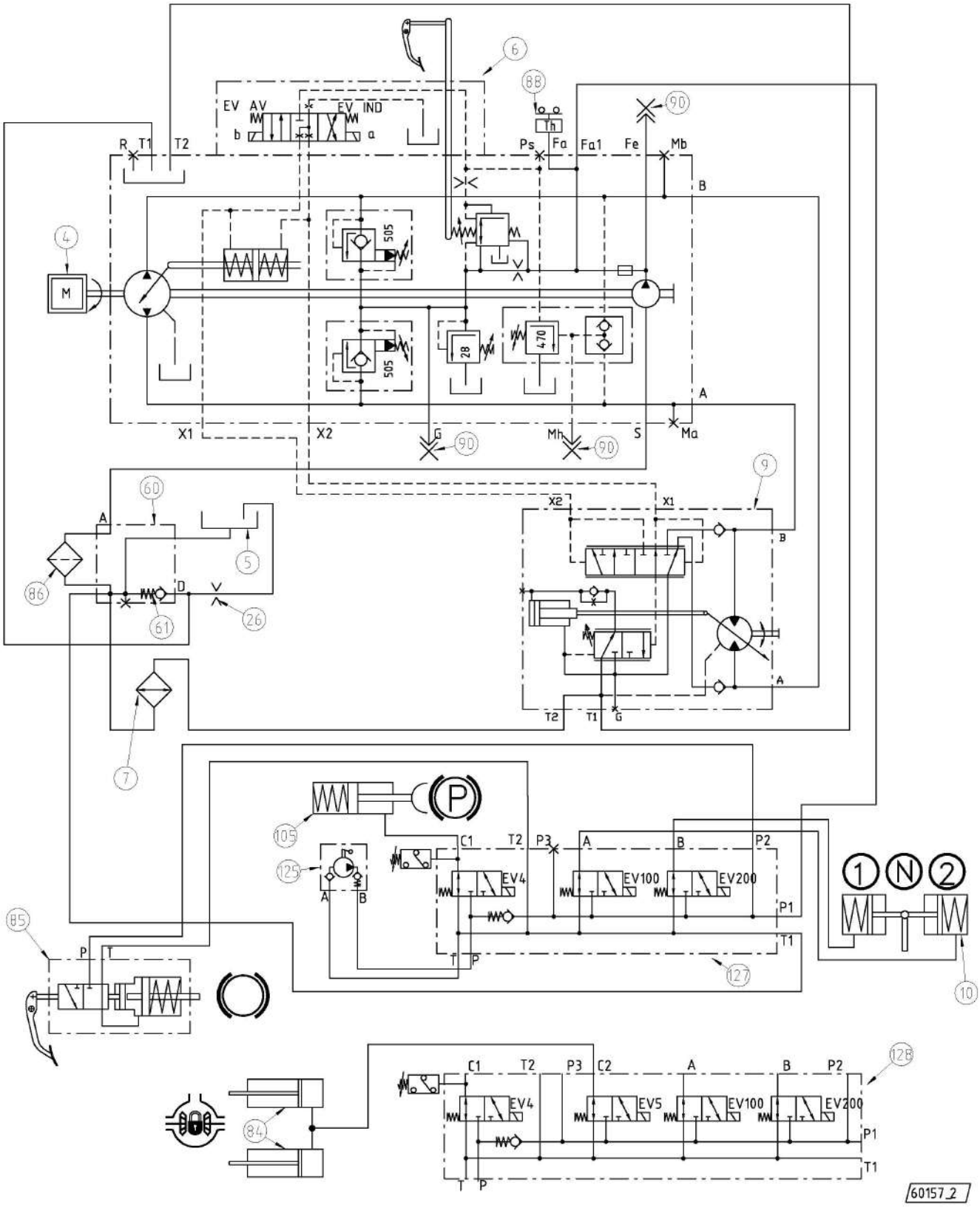
HYDROSTATIC TRANSMISSION DIAGRAM

(valid for models P37.12PLUS – P38.12PLUS – P38.13PLUS – P38.14PLUS – P40.17PLUS – P60.10 – P72.10)



REFERENCE	*DESCRIPTION*
4	Diesel engine
5	Hydrostatic oil tank
6	Variable delivery hydrostatic pump
7	Heat exchanger
9	Variable displacement hydrostatic engine
26	Throttle
10	Speed selection rams
60	Filter-holder block
61	Bypass
84	Rams for differential-lock (OPTIONAL)
85	Servobrake
86	Cartridge filter
88	Thermal contact
90	Pressure connection
105	Parking brake calliper
125	Emergency pump
127	Solenoid valve block
128	Solenoid valves block (OPTIONAL)

(valid for models P38.12 – P38.13 – P38.14 – P40.17 – P38.13EE – P40.17EE – P60.10EE – P72.10EE)



REFERENCE	DESCRIPTION
4	Diesel engine
5	Hydrostatic oil tank
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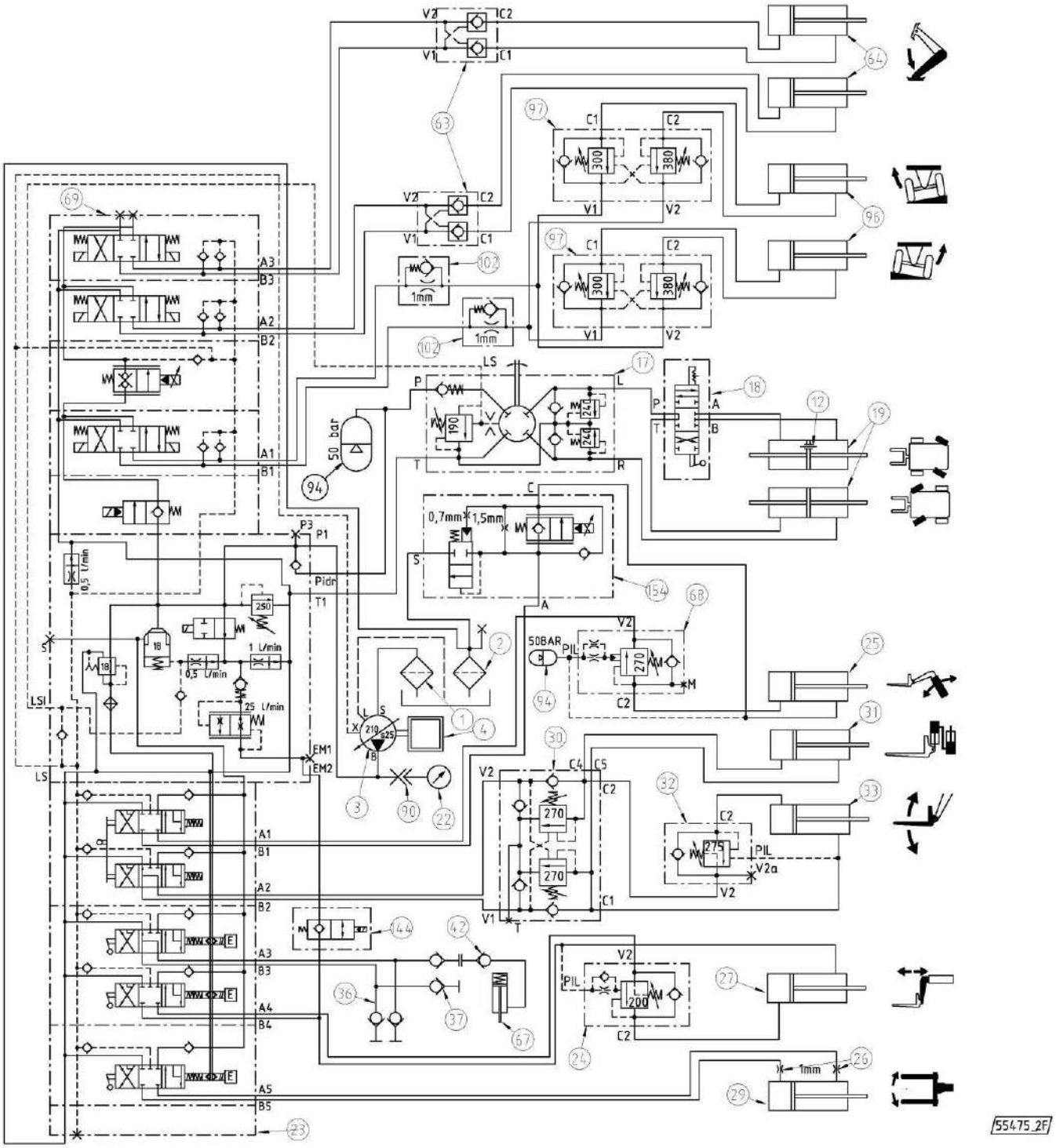
7	Heat exchanger
9	Variable displacement hydrostatic engine
26	Throttle
10	Speed selection rams
60	Filter-holder block
61	Bypass
84	Rams for differential-lock (OPTIONAL)
85	Servobrake
86	Cartridge filter
88	Thermal contact
90	Pressure connection
105	Parking brake calliper
125	Emergency pump
127	Solenoid valve block
128	Solenoid valves block (OPTIONAL)

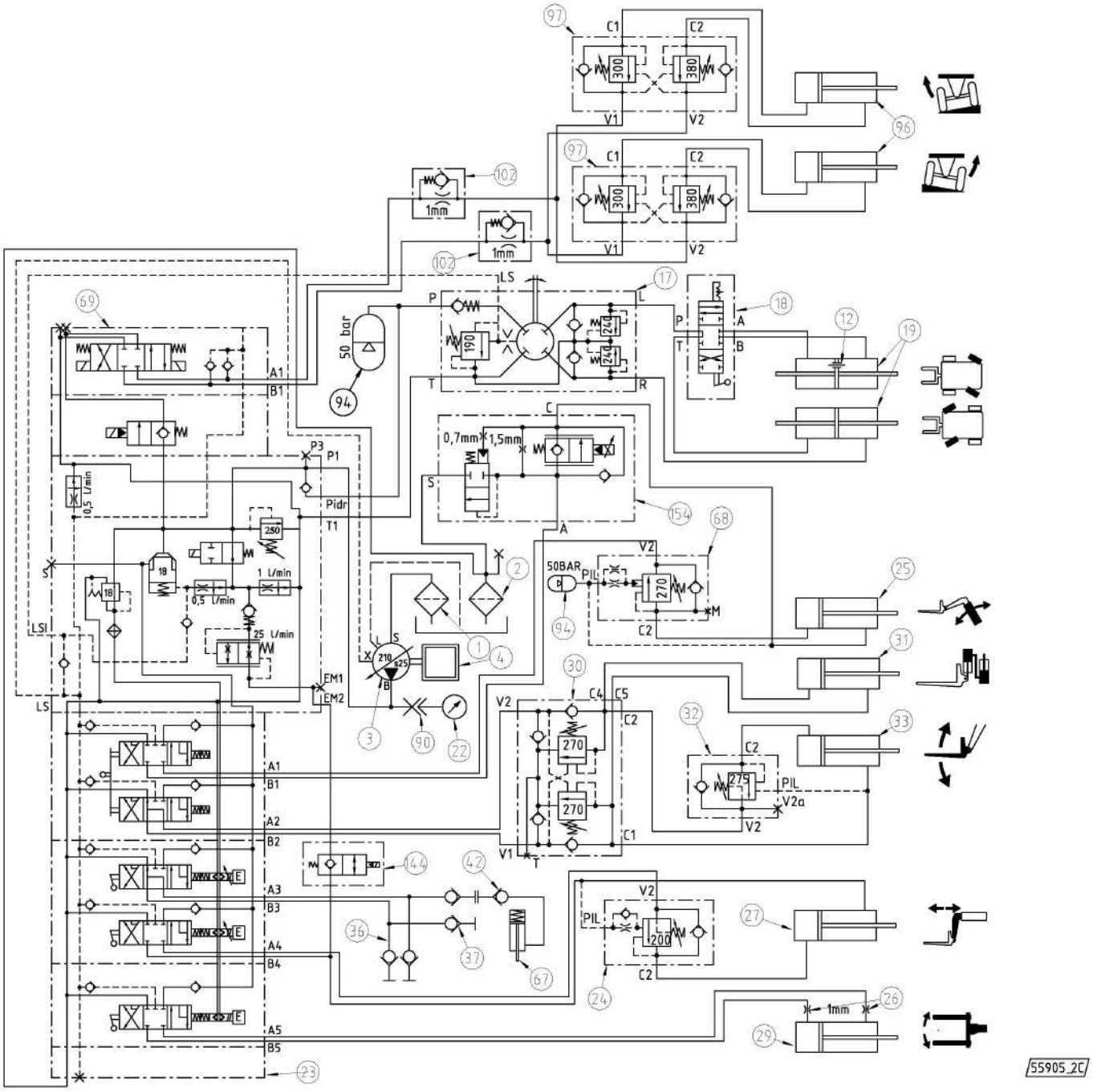
HYDRAULIC SYSTEM DIAGRAM

(valid for models P38.12PLUS – P38.13PLUS – P38.14PLUS – P40.17PLUS)



REFERENCE	DESCRIPTION
1	Inlet filter
2	Return filter
3	Variable delivery pump
4	ENGINE
12	Volume recovery valve
17	Power steering unit
18	Steering distributor
19	Steering jack
22	Pressure gauge
23	Main distributor
24	Extension jack lock valve
25	Lifting jack
26	Throttle ø1mm
27	Extension jack
29	Chassis side movement jack
30	Fork / compensation (offset) valve
31	Compensation (offset) jack
32	Fork jack lock valve
33	Fork jack
36	Front fast-acting couplings
37	Front fast-acting couplings
42	Quick coupling
63	Stabilisers jack lock valve
64	Stabiliser jacks
67	Quick-uncoupling jack
68	Lifting jack lock valve
69	Levelling distributor
90	Pressure connection
94	Accumulator
96	Angle correction jacks
97	Angle correction jack block valves
102	One-way choke valve
144	Emergency over-ride solenoid
154	3-way capacity adjustment valve

(valid for models P37.12 PLUS – P40.9 PLUS – P60.10 – P72.10 – P60.10EE – P72.10EE)



REFERENCE	DESCRIPTION
1	Inlet filter
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4	Diesel engine
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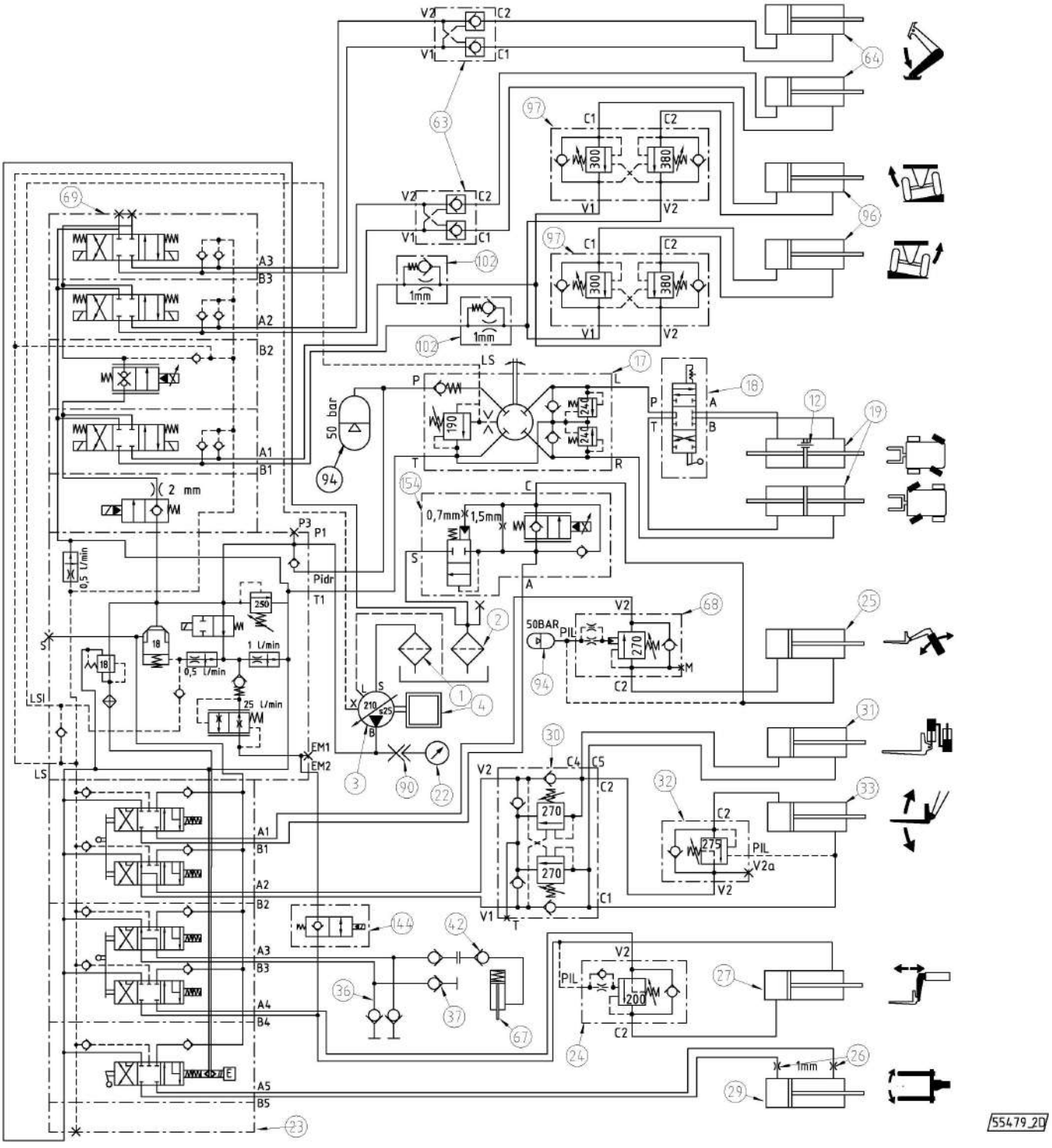
17	Power steering unit
18	Steering distributor
19	Steering jacks
22	Pressure gauge
23	Main distributor
24	Extension jack lock valve
25	Lifting jack
26	Throttle ø 1 mm
27	Extension jack
29	Side movement jack
30	Fork / compensation (offset) valve
31	Compensation (offset) jack
32	Fork jack lock valve
33	Fork jack
36	rear quick couplings Ø 1/2" (OPTIONAL)
37	Front fast-acting couplings Ø 1/2"
42	Fast-acting coupling Ø 1/2"
67	Quick-uncoupling jack
68	Lifting jack lock valve
69	Levelling distributor
90	Pressure connection
94	Accumulator
96	Angle correction jacks
97	Angle correction jack block valves
102	Unidirectional throttling valves
144	Emergency over-ride solenoid
154	3-way capacity adjustment valve

(valid for models P38.12 – P38.13 – P38.14 – P40.17 – P38.13EE – P40.17EE)



REFERENCE	DESCRIPTION
1	Inlet filter
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64	Stabiliser jacks
67	Quick-uncoupling jack
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69	Levelling distributor
90	Pressure connection
94	Accumulator
96	Angle correction jacks
97	Angle correction jack block valves
102	Unidirectional throttling valves
144	Emergency over-ride solenoid
154	3-way capacity adjustment valve

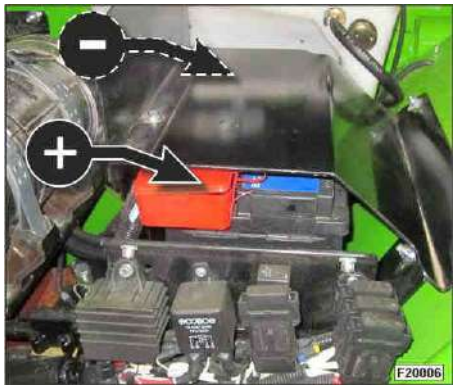
END OF SECTION

CONTENTS

GENERAL FEATURES

Your telescopic handler is equipped with a 12 volt electrical system with the negative pole grounded.

BATTERY



The battery on your machine is located inside the engine compartment.

NOMENCLATURE OF THE BATTERY COMPARTMENT:

(+) Positive pole
(-) Negative pole

The main features of the battery are listed below:

- Capacity in 20 hours = 100 Ah
- Cold start current = 850 A
- Specific weight: a fully charged battery shall have an electrolyte with a specific weight of 1.260. If this value is lower than 1.215, the battery needs to be charged.

  The specific weight of the electrolyte may only be different if you work in countries having either a tropical climate or a cold climate.
  In a tropical climate the readout for a fully charged battery shall be equal to 1.225.
  In a cold climate the readout for a fully charged battery shall be equal to 1.280.

- Inspection of the electrical equipment: regularly check the condition of cable harnesses and electrical connections.

WARNING! All inductive loads (electric motors, solenoid valves, etc.) are protected by internal diodes in order to avoid current peaks when switched off, for this reason never swap the input polarities.

• sulphuric acid:

WARNING!! Sulphuric acid in batteries is a poison and can cause severe burns. Avoid contact with skin, eyes, and clothes. When working around batteries, protect eyes and face from battery fluid and possible explosions.

If you accidentally come into contact with the sulphuric acid contained in the battery, proceed as follows:

External measures:

- wash your skin with water
- rinse your eyes for 15 minutes
- seek immediate medical advice

Internal measures:

- drink plenty of water or milk
- soon afterwards drink milk of magnesia, beaten eggs, or vegetable oil
- seek immediate medical advice

IMPORTANT! Before carrying out any work on the electrical equipment, disconnect the negative cable from the battery. The gases contained in the battery may explode. Keep cigarettes, sparks and flames away from the battery.

Never use connection cables and never work on the connections if you are not familiar with the correct procedure to be followed.

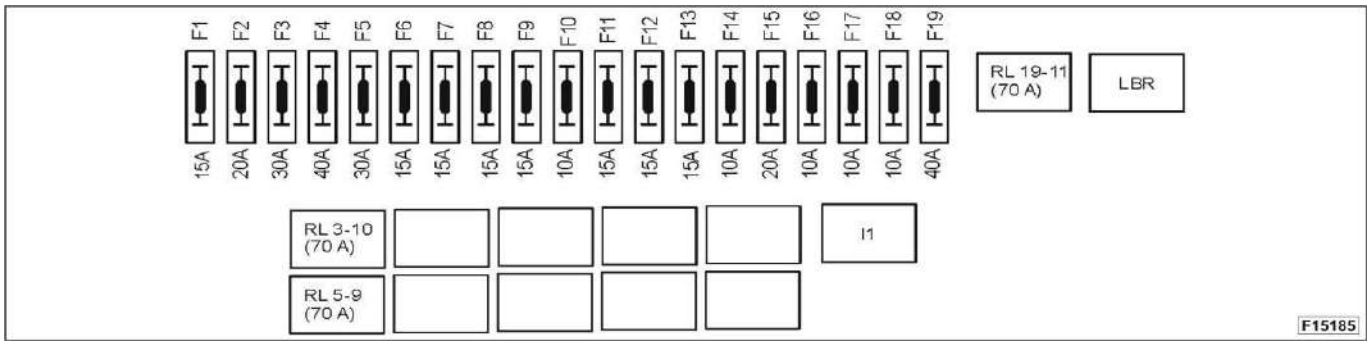
When you either charge a battery or use a battery in an enclosed room, make sure that the room is well ventilated. Keep batteries away from children. Make sure that the vent plugs are tightened correctly, and check the electrolyte level at regular intervals.

FUSES

Electrical circuits are protected by fuses and relays located in the ENGINE COMPARTMENT and COVER "7" in the cab (see paragraph COVERS in section "ORDINARY MAINTENANCE"). If a fuse blows, first find the cause and then replace it with a new one with the same features.

If any accessories on request have been ordered, the affected fuses are placed on the side of the general one.

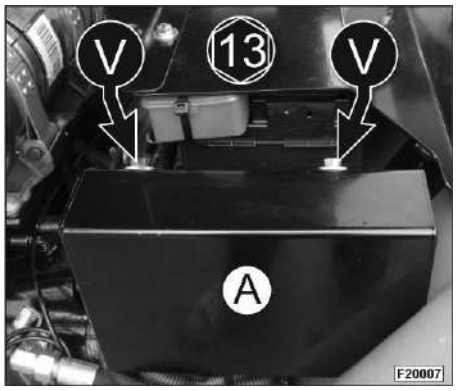
• FUSES IN COVER 7



	Position	Type	Description
FUSE	F1	15A	Power supply UAE Starting key
	F2	20A	Electric socket inside cab (25A) Portable light socket (cigarette lighter)
	F3	30A	Air conditioning compressor clutch Direct power supply for accessories (BVC)
	F4	40A	Glowplug (if present)
	F5	30A	Power supply starting motor relay
	F6	15A	Car-radio (fitting) Optional cab connector Power supply accessories under key (BSC)
	F7	15A	Joy-stick supply UAE signal
	F8	15A	Horn
	F9	15A	Beam lights
	F10	10A	Lower beam lights
	F11	15A	Fitted for rear work lights on cab (on request)
	F12	15A	Hazard light 2nd hazard light (if present)
	F13	15A	Fitted for front work lights on cab (on request)
	F14	10A	Car-radio fitting Cab light
	F15	20A	Cab air circulation electro-fan
	F16	10A	Direction indicator flasher power supply
	F17	10A	Roof wiper (upon request) Front and rear wiper Direct accessory power (BD)
	F18	10A	Power supply UPD
	F19	40A	Power supply UCM
	Position	**Type**	**Description**
RELAYS AND BLINKING	I1		Direction lights blinker, emergency lights
	LBR		Flat battery restoring
	RL 5-9	70A	Starter motor
	RL 19-11	70A	UAE signal and Output UCM power supply
	RL 3-10	70A	Air conditioning compressor

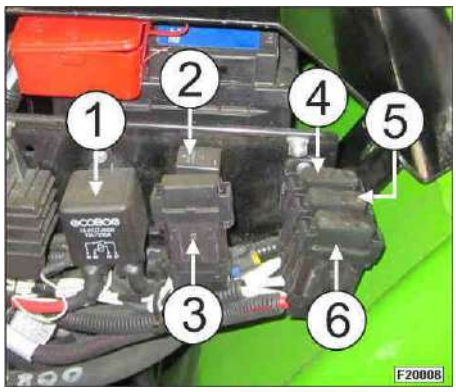
• FUSES IN ENGINE COMPARTMENT

The fuses and relays located in the engine compartment are protected by cover (A). Remove cover (A) by unscrewing screws “V” with the hex wrench indicated.



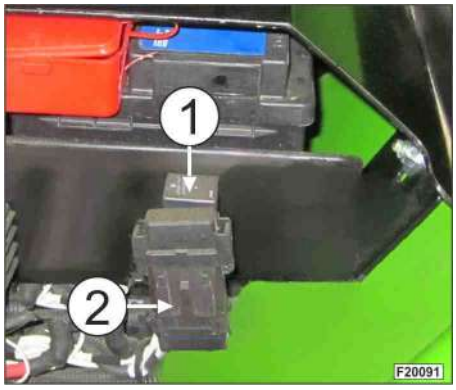
DEUTZ 74 kW (100CV) ENGINE

1) Glow plug relay
2) Fuel pump relay
3) Fuel pump fuse (20A)
4) Engine ECU fuse (30A)
5) Air conditioning fuse (40A)
6) General system fuse (80A)



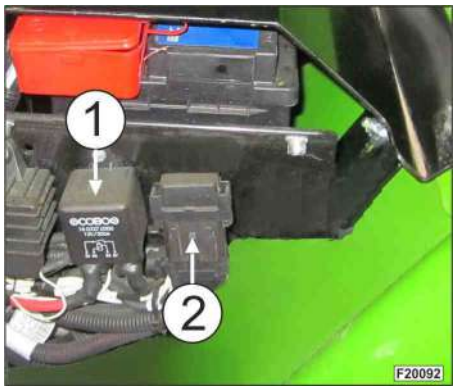
KUBOTA 55.4 kW (75 CV) ENGINE

1) Glow plug relay
2) Glowplugs fuse (40A)



KUBOTA 55.4 kW (75 CV) ENGINE

1) Glowplug relay
2) Glowplugs fuse (80A)



END OF SECTION

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