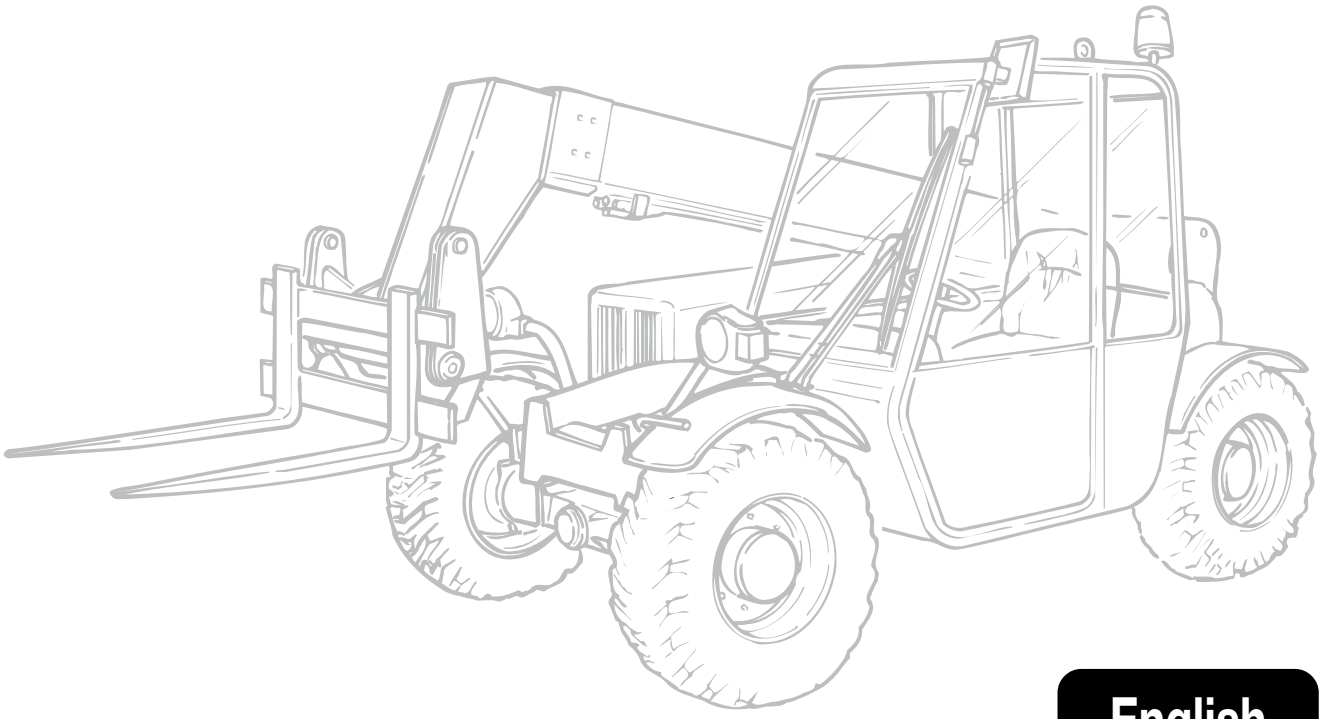
OPERATOR HANDBOOK

Document 57.0002.2200 - 12/2002

Handler with telescopic boom

GTH-2306



English
Edition

CAUTION: THOROUGHLY READ AND UNDERSTAND THIS HANDBOOK BEFORE OPERATING THE MACHINE
CAUTION: KEEP THIS HANDBOOK IN THE MACHINE AT ALL TIMES

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Operator Handbook ***57.0002.2200 - GTH-2306***

Produced by: vega

■ INTRODUCTION

This handbook provides information for a safe and proper operation and maintenance of the machine.

STRICTLY COMPLY WITH THE INSTRUCTIONS GIVEN IN THIS HANDBOOK!
READ AND UNDERSTAND THIS HANDBOOK BEFORE STARTING, USING AND CARRYING OUT ANY OPERATION WITH AND ON THE MACHINE.

The handbook is divided into seven sections:

Sect. **A** **GENERAL INFORMATION**
Sect. **B** **SAFETY**
Sect. **C** **OPERATING INSTRUCTIONS**
Sect. **D** **MAINTENANCE**
Sect. **E** **TROUBLESHOOTING**
Sect. **F** **OPTIONAL ATTACHMENTS**
Sect. **G** **TABLES AND ENCLOSURES**

Section **A** contains general concepts that are decisive for the knowledge of the main parts of the machine.
It also contains all necessary data for a correct identification of the machine, the technical features of the machine, etc.

Section **B** is especially addressed to the personnel, who shall operate, repair and service the machine, and, in case of companies with a wide fleet of machines, to the safety responsible.
It describes the essential compulsory qualities of the personnel in charge and other important information for the safety of persons and things.

Section **C** is mainly addressed to the operators who operate the machine. This section illustrates all control devices.
Additionally, it contains the main use instructions -i.e. engine starting, machine parking, machine storing.

Section **D** is addressed to the maintenance responsible and the servicemen.
The section describes the maintenance schedule and the relevant intervals.

Section **E** deals with the failure diagnostics.

Section **F** makes a list of the main interchangeable attachments that can be coupled to the machine: dimensions, weight, application field and limits of use.

Section **G** contains tables and various enclosed documents like load charts, wiring diagrams, hydraulic schemes, torque wrench setting table, etc.

Sections are subdivided into chapters and paragraphs that are numbered progressively.

The quickest way to look for an information is the reference to the general index or the titles of the single chapters and paragraphs that represent keys for an easy consultation.

Take care of this handbook and keep it in an accessible place within the machine, even after its reading, so that it will always be within reach if in doubt.

If you are unsure about anything, please address to GENIE Assistance Service or to your agent/dealer: addresses, phone and fax numbers are printed in the cover and in the title-page of this manual.

IMPORTANT

Any difference between the contents of this manual and the real functional character of the machine can be attributed to either a machine manufactured before the issue of this manual or to a manual going to be updated after some changed effected on the machine.
Always contact Genie Assistance Service for any updated version of this manual and any additional information.

■ SYMBOLS

When using the machine, operators could have to face some situations requiring special care and particular knowledge.

When these situations involve the safety of operators or bystanders, the machine efficiency and proper utilisation, this handbook stresses these specific instructions by means of **SPECIAL SYMBOLS**.

There are six special (or safety) symbols in this manual, always combined with keywords that class the situations according to their danger degree.

The symbols are always followed by a text explaining the situation taken into account, the attention to be paid to such situation, the method and the behaviour to be adopted. When necessary, it stresses prohibitions or supplies instructions to prevent dangers.

Sometimes, it can be followed by illustrations.

We list below the special (or safety) symbols according to the relative seriousness of the hazard situation:

DANGER

Draws the attention to situations that involve your own as well as the others' safety and that can result in serious or lethal injury.

ELECTRICAL DANGER

Draws the attention to situations that involve your own as well as the others' safety and that can result in serious injury or lethal injury.

CAUTION

Draws the attention either to situations that involve your own as well as the others' safety and that can result in minor or moderate injury or to situations that involve the machine efficiency.

ATTENTION

Draws the attention to situations that involve the machine efficiency.

IMPORTANT

Draws the attention to important technical information or practical advice that allows for a safer and more efficient use of the machine.

PROTECT THE ENVIRONMENT

Draws the attention to important environment-related information.

WHEN READING THIS MANUAL, PAY THE GREATEST ATTENTION TO THESE SPECIAL SYMBOLS AND THE EXPLANATION OF THE SITUATIONS THEY EMPHASIZE.

The manual in electronic format also contains the following symbol:

which enables the user to return to the table of contents

GENERAL INDEX

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Section A

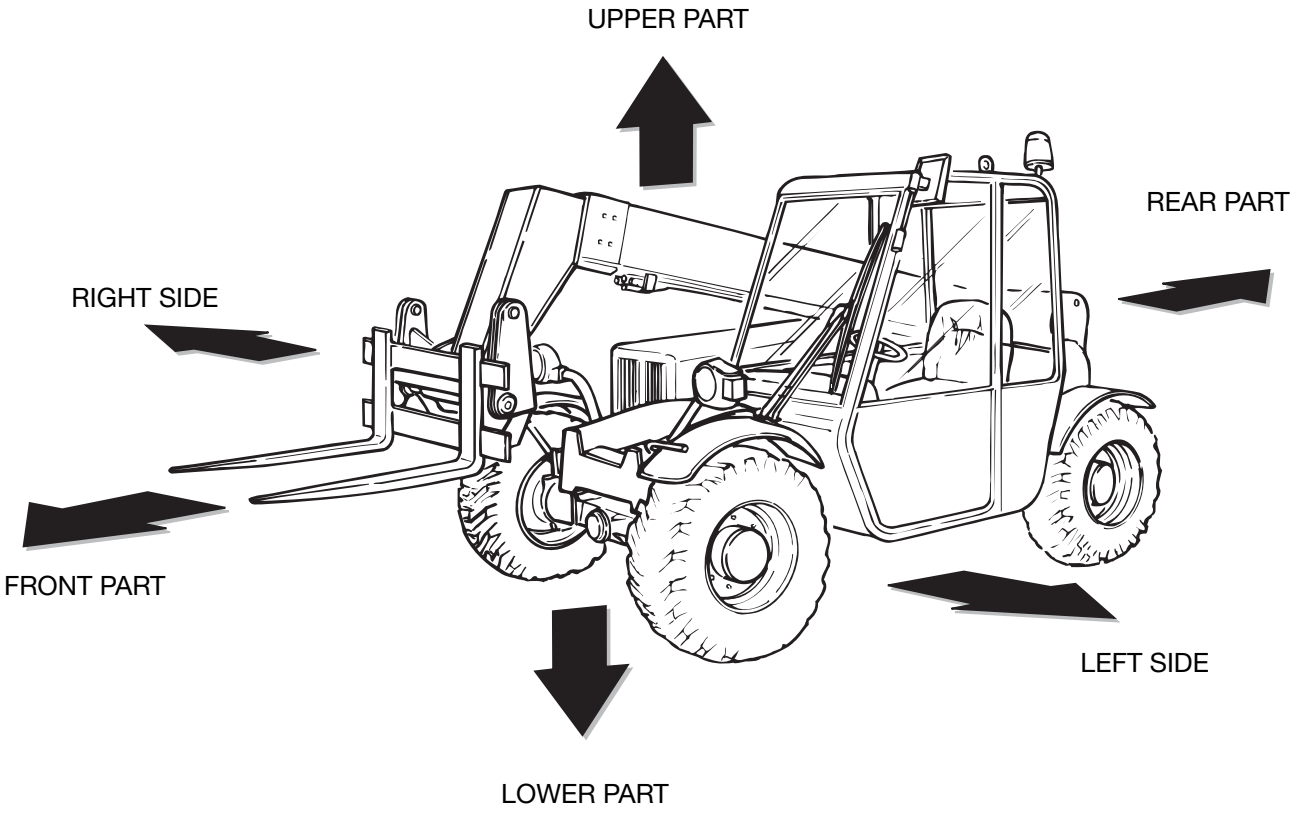
GENERAL INFORMATION

TABLE OF CONTENTS

A-1 CONVENTIONAL REFERENCES

A-1.1 MACHINE POSITION

Conventionally the machine should be considered positioned as shown in the figure.
This convention is necessary to make any reference of this handbook to different machine parts (front, rear, etc.) clear and unmistakable.
Any exception to this rule will always be specified.



■ A-1.2 LABELS AND WARNING PLATES APPLIED ON THE MACHINE

This paragraph lists the labels and warning plates normally applied on standard machines or on special attachments coupled to the machine.

IMPORTANT

The familiarisation with these labels is never a waste of time.
Make sure they are easy to read. For this purpose, clean them or replace those that become unreadable (either graphic or text).
To clean labels, use of a soft cloth, water and soap. Never use solvents, petrol, etc.
When a label is applied on a part to be replaced, make sure that the replaced part is already labelled as required or apply a new label.

Description:
red/white label "**Keep out of the working range of the machine**".

Meaning:
when the machine is running, entering the working range of the machine is prohibited.

Location:
on the telescopic boom, both on the right and on the left.

Description:
label with white background "**Keep out of the working range of the machine**".

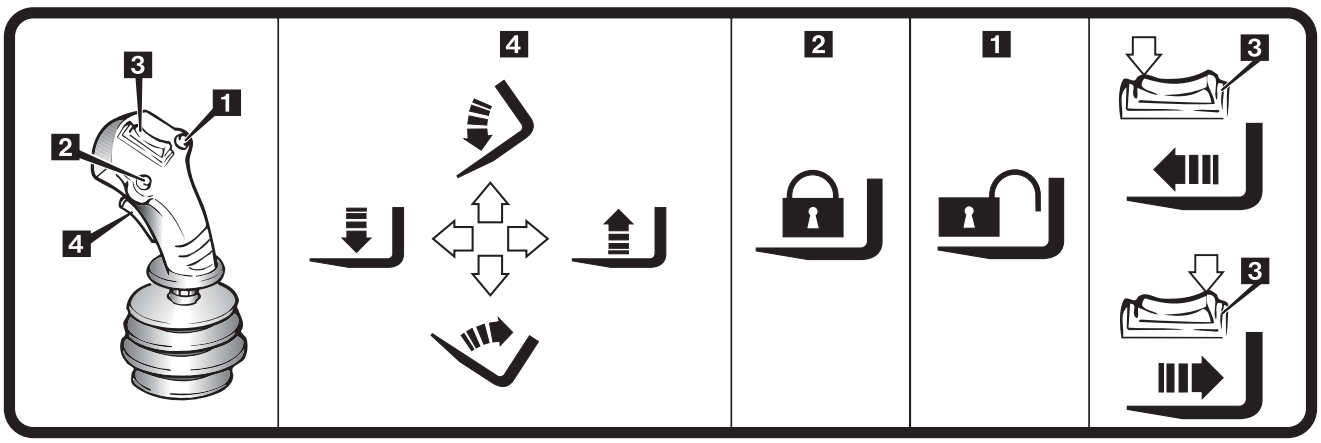
Meaning:
when the machine is running, entering the working range of the machine is prohibited.

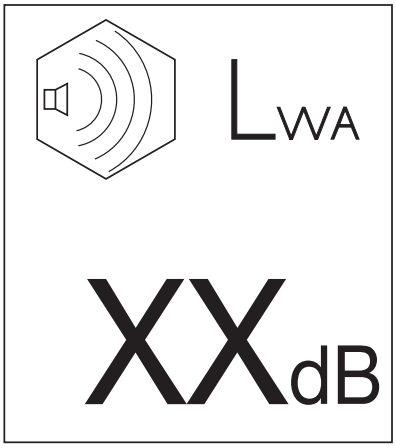
Location:
one on the right side in the casing of the engine compartment
one on the left side on the fuel tank

Description:
label with transparent background explaining the use of the control lever.

Meaning:
through the use of special symbols, this label explains all possible functions and motions of the control lever and the built-in pushbuttons.

Location:
in the cab, on the windscreen, to the right of the driving place.

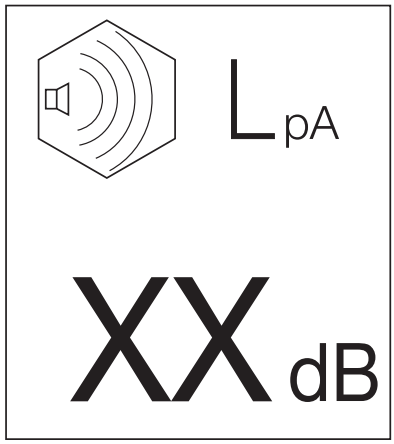




Description:
label with yellow background and black inscription showing the "**Sound power level**".

Meaning:
it indicates the guaranteed sound power level measured in accordance with the Directive **2000/14/EC**

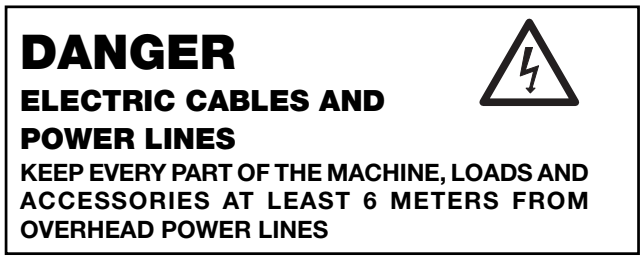
Location:
in the cab, on the rear left-side glass.



Description:
label with yellow background and black inscription showing the "**Sound pressure level**".

Meaning:
it indicates the guaranteed sound power level measured in accordance with the Directive **2000/14/EC**

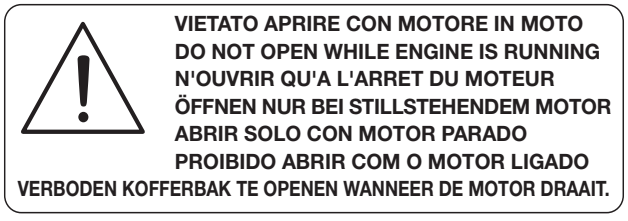
Location:
in the cab, on the rear left-side glass.



Description:
label with transparent background "**Use limits close to electric lines**".

Meaning:
it defines the minimum distance to be kept when the machine is used close to aerial electric lines.

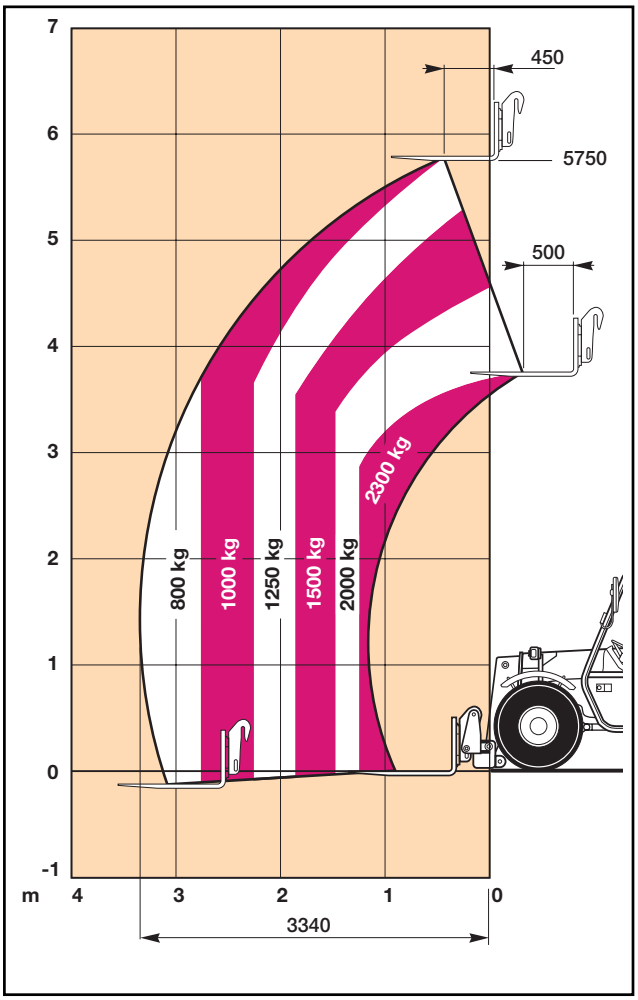
Location:
in the cab, on the windscreen, to the right of the driving place.



Description:
label on yellow background "**Do not open while engine is running**".

Meaning:
do not open the engine bonnet when engine is running, since this may result in serious injury due to moving parts or hot components.

Location:
on the engine bonnet.



Description:
label with transparent background **"Load chart".**

Meaning:
it defines the exact working limits of the machine (in terms of **payload** and **reach**) to be strictly respected by the operator when using the machine.

Location:
in the cab, on the windscreen, to the right of the driving place.

IMPORTANT

The load charts shown in these pages are supplied as mere example. For the payload limits, see the load charts referring to the specific machine model.

WARNING

ONLY AUTHORIZED PERSONNEL CAN OPERATE THIS EQUIPMENT. THE MANUFACTURER/DEALER TAKE NO RESPONSABILITY FOR DAMAGE OR INJURY CAUSED BY MISUSE OF THIS EQUIPMENT.

BEFORE OPERATING THE MACHINE ENSURE YOU HAVE READ AND UNDERSTOOD THE SAFETY GUIDELINES GIVEN IN THE MACHINE'S MANUAL.

THE INSTRUCTIONS ARE DELIVERED WITH THE MACHINE; ADDITIONAL COPIES MAY BE OBTAINED FROM YOUR DEALER OR DIRECTLY FROM TEREXLIFT.

WARNING

DO NOT RAISE BOOM ON UNSTABLE OR SLOPING GROUND.

NEVER EXCEED MAXIMUM PERMITTED LOADS (SEE LOAD CHARTS).

EXERCISE CAUTION WHILE USING THE BOOM IN A RAISED POSITION.

BEFORE LEAVING THE CAB ENSURE THE FOLLOWING:

- TRANSMISSION IS NEUTRAL.
- PHAND BRAKE IS ON.
- BRING ANY LOAD TO THE GROUND.
- IGNITION SWITCH IS OFF AND KEY REMOVED.

WARNING

SAFETY GUIDELINES FOR MACHINES EQUIPPED WITH STABILIZERS

NEVER USE THE STABILIZERS IF THE LOAD IS ALREADY RAISED; THE STABILIZERS CAN BE USED ONLY TO INCREASE THE STABILITY OF THE MACHINE.

IMPROPER USE OF THE STABILIZERS CAN CAUSE INSTABILITY.

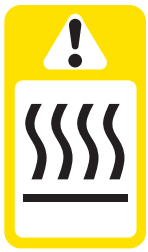
ENSURE THAT THE STABILIZER INDICATOR LAMP IS ON BEFORE USING THE BOOM.

BEFORE RAISING ANY LOAD, LEVEL THE MACHINE BY MEANS OF THE LEVEL INDICATOR.

Description:
label with transparent background "**General application limits**".

Meaning:
it defines the main limits to be strictly obeyed by the operator when using the machine.

Location:
in the cab, on the windscreen, to the right of the driving place.



Description:
label on yellow background with black drawing "**Hot surfaces. Risk of burns**".

Meaning:
Applied on those surfaces which during operation can become hot and cause burns.

Location:
In all parts involved such as exhaust silencer, thermal engine, heat exchanger.

Description:
label on yellow background with black drawing "**Unscrew the plug with extreme caution: hot water. Risk of burns!**".

Meaning:
Warns the operator of the risk of burns when unscrewing the plug of the compensation tank of the heat exchanger.

Location:
Applied on the compensation tank of the fluid of the heat exchanger.

■ A-1.3 EXPLANATION OF THE DIFFERENT SYMBOLS USED ON THE MACHINE

This paragraph illustrates those symbols that are normally applied on the main control devices and instruments of a standard machine, and those that can be applied on accessories or special attachments. They are mainly (ISO) standardised symbols that are now part of the common life. But we consider useful to explain them once again.

IMPORTANT

Spend the necessary time to become familiar with these symbols and to learn their meaning.

Symbol	*Description*
	Hazard warning lights
	Windscreen wiper
	Windscreen washer
	Cab ventilation fan
	Diesel engine water temperature
	Fuel gauge
	Hydraulic oil temperature
	Position lights
	High beam
	Turn signals
	Parking brake
	Battery charge
	Attachment pushbutton

Symbol	*Description*
	Steering mode switch
	Engine oil pressure
	Boom up
	Boom down
	Boom out
	Boom in
	Attachment locked
	Attachment unlocked
	Fork pitching forward
	Fork pitching back
	Oil filter clogged
	Air filter clogged
	Front (optional) work light

Symbol	Description	Symbol	Description
	Lifting point		
	Road/cabin selector switch		

A-2 MACHINE IDENTIFICATION

IMPORTANT

Check that the operator handbook refers to the delivered machine.
When asking for information or technical assistance, always specify model, type and serial number of the machine.

A-2.1 MACHINE MODEL AND TYPE

Handler with telescopic boom:

❑ model ***GTH-2306***

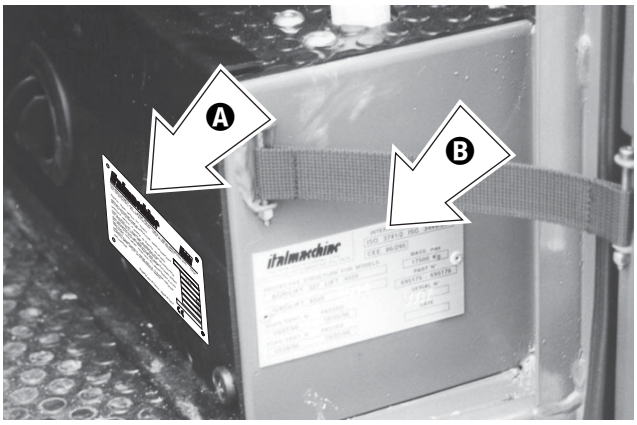


Fig. A 8

A-2.2 MANUFACTURER

TEREXLIFT srl

Zona Industriale (Ind. Estate) - I-06019 UMBERTIDE (PG) - ITALY

Enrolled in the register of companies at the Court of Perugia under no. 4823

C.C.I.A.A. n° 102886

Fiscal Code/V.A.T. no. 00249210543

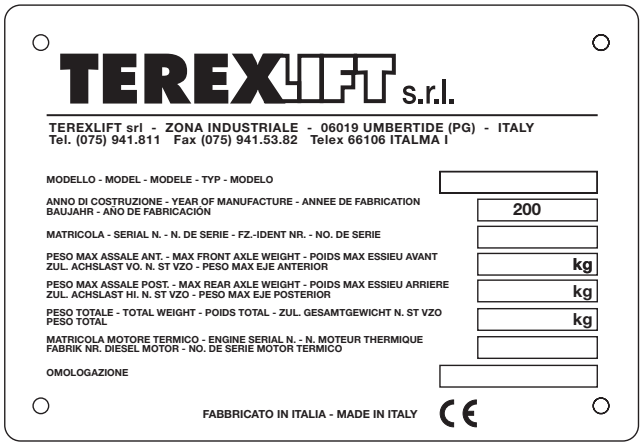


Fig. A 9

A-2.3 MACHINE IDENTIFICATION PLATES

Three identification plates are applied on the machine. They are:

Ⓐ ***Machine data plate.***

Placed on the driving seat base in a well visible position when opening the cab door (*Fig. A8*) or instead of the road traffic data plate (*Fig. A10*) on machines destined for foreign markets.

The identification plate (*Fig. A9*) contains the main identification data of the machine like model, serial number and year of manufacture.

Ⓑ ***ROPS-FOPS cab type-approval plate.***

Placed on the driving seat base in a well visible position when opening the cab door (*Fig. A8*).

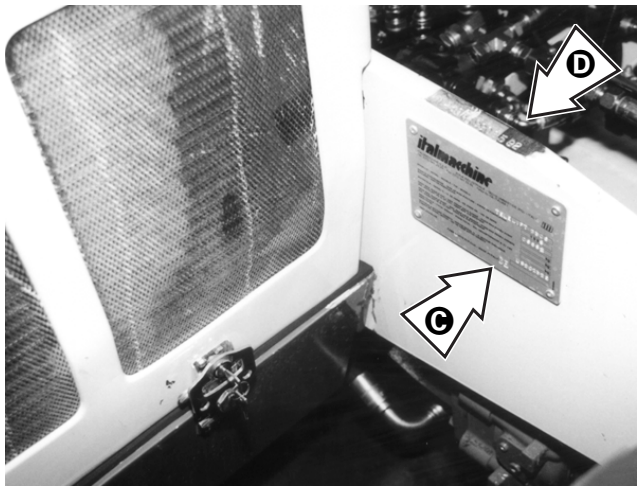


Fig. A10

Ⓒ ***Road traffic data plate.***

Placed on the front right side of the chassis (only for machines destined for the Italian market). This plate contains the road traffic related data and the weights of the specific machine model.

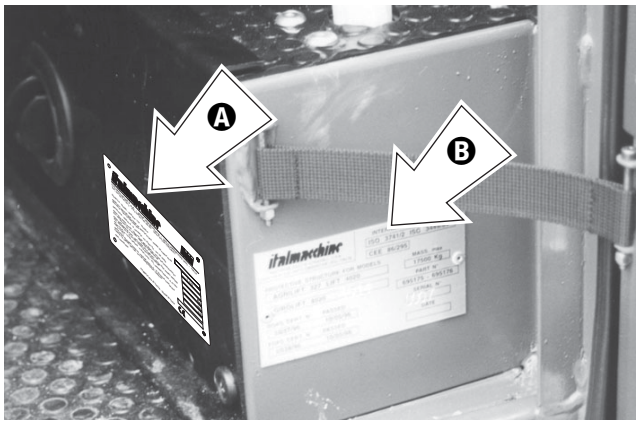


Fig. A 8

■ A-2.4 CE MARK

This machine fulfils the safety requirements of the Machinery Directive.The conformity has been certified and the placing of the **CE** marking on the machine demonstrates compliance with the regulatory requirements.

The **CE** marking is placed directly on the identification plate of the machine. (Ⓐ *Fig. A8 and A9*).

■ A-2.5 CHASSIS SERIAL NUMBER

The chassis serial number is punched on the front left part of the chassis side member (Ⓓ *Fig. A10*).

■ A-2.6 IDENTIFICATION PLATES OF THE MAIN PARTS

The plates of the main components, not directly manufactured by ***TEREXLIFT srl*** (for instance, engines, pumps, etc.), are located where originally applied by the manufacturers.

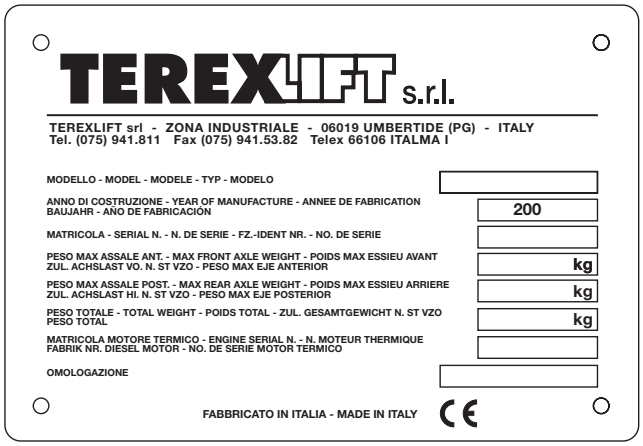


Fig. A 9

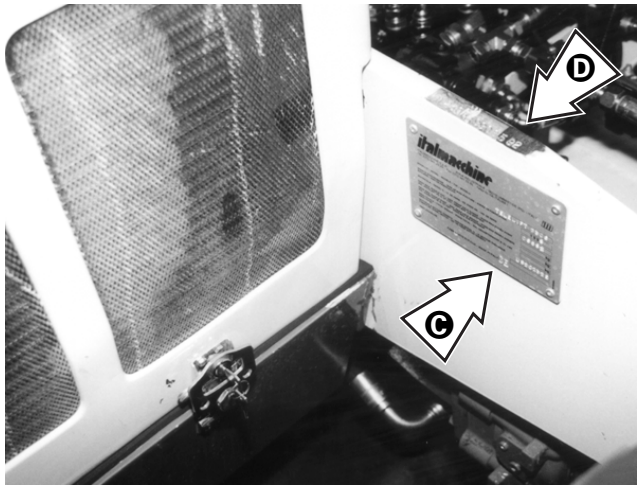


Fig. A10

A-3 ALLOWED USE

■ A-3.1 ALLOWED USE

The handlers have been designed and manufactured for lifting, handling and transporting agricultural or industrial products by means of specific attachments (see section **F**) manufactured by TEREXLIFT srl.

Any other use is considered contrary to that established and, therefore, improper.

The compliance with and the strict respect of the operation, maintenance and repair conditions, indicated by the Manufacturer, represent an essential part of the allowed use.

The handler must be used and serviced only by operators knowing its characteristics and the safety procedures in depth.

It is also essential to comply with the safety at work legislation, the precautions concerning safety and industrial medicine as well as the local and national road traffic regulations.

IMPORTANT

Effecting changes or carrying out interventions on the machine or the platform other than those of routine maintenance is expressly forbidden. Any modification of the machine or the platform not carried out by TEREXLIFT or an authorised assistance centre involves the automatic invalidation of the conformity of the machine to the Directive 98/37/EC.

■ A-3.2 IMPROPER USE

Improper use means a utilisation of the handler following working criteria that do not comply with the instructions of this manual, and that, in general, may result in risks for both operators and bystanders.

DANGER

We list below some of the most frequent and hazardous situations of improper use:

- ***Carrying passengers on the machine***
- ***Not strictly complying with the operation and maintenance instructions of this handbook***
- ***Working beyond the handler working limits***
- ***Working on unstable edges of ditches***
- ***Working during a storm***
- ***Working on steep slopes***
- ***Using attachments other than those recommended***
- ***Using attachments not approved or directly manufactured by Terexlift***
- ***Working in potentially explosive areas***
- ***Working in confined and non-ventilated environments.***

■ A-3.3 RESIDUAL HAZARDS

Although the machine has been designed and manufactured according to the latest technology and all expected hazards have been eliminated, some operations performed by the machine operator can result in potentially hazardous situations. Among them:

- Hazards deriving from a too high work or transfer speed in relation to the load handled or the ground condition of the jobsite.
- Hazards deriving from work procedures adopted during the check or replacement of a block valve (residual pressure - uncontrolled movements).
- Hazards deriving from work procedures adopted while disassembling parts of the machine -e.g. the cylinders, without supporting mobile parts suitably (risk of uncontrolled fall of the mobile part).
- Hazard deriving from an accidental overturning of the machine in the event the operator has not fastened the safety belts.

■ A-3.4 APPLICABLE STANDARDS

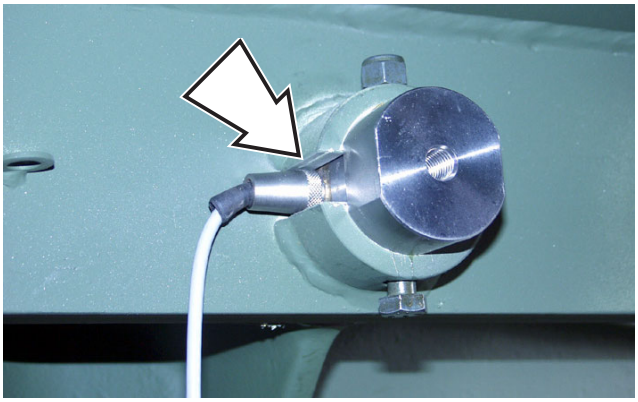
For the operator's safety, the following standards were obeyed during the risk assessment of the handler fitted with telescopic boom:

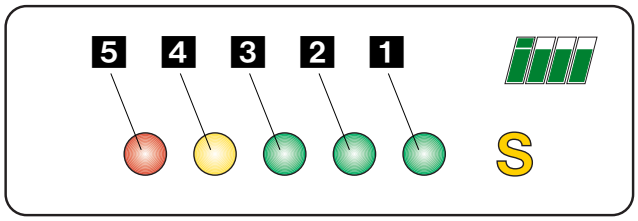
Directive	*Title*
98/37/CE	Machinery Directive
89/336/CEE	Electromagnetic compatibility
73/23/CEE	Low Voltage
2000/14/CE	Environment Acoustic Emissions

Standard	*Title*
EN 1459:1988	Harmonised standard. Safety of industrial trucks - Self- propelled variable reach trucks.
EN 281:1988	Self-propelled industrial trucks sit- down rider-controlled. Rules for the construction and layout of pedals.
EN 292-1:1991	Safety of machinery. Basic concepts, general principles for design. Basic terminology, methodology.
EN 292-2:1991	Safety of machinery. Basic concepts, principles for design. Technical principles and specification.
EN 1175-2:1998	Electrical requirements - General requirements of internal combustion engine powered trucks
prEN ISO 13564:1996	Test method for measuring visibility from self-propelled trucks.
ISO 2330:1995	Fork-lift trucks - Fork arms - Technical characteristics and testing.
ISO/DIS 3287	Powered industrial trucks. Pictorial signs. Control symbols.
ISO 3449:1992	Earth-moving machinery - Falling-object protective structures - Laboratory tests and performance requirements.
EN 13510: 2002	Earth-moving machinery - Roll-over protective structures - Laboratory tests and performance requirements.
ISO 3776:1989	Tractors for agriculture - Seat belt anchorages.
ISO 3795:1989	Road vehicles, tractors and machinery for agriculture and forestry - Determination of burning behaviour of interior materials.
ISO 5053:1987	Powered industrial trucks - Terminology.
ISO 6055:1997	High-lift rider trucks - Overhead guards - Specification and testing.
ISO 6292:1996	Powered industrial trucks and tractors - Brake performance and component strength.
ISO 9533:1989	Earth-moving machinery - Machine-mounted forward and reverse audible warning alarm - Sound test method.
prEN 13059:1997	Safety of industrial trucks - Test methods for measuring vibration
EN 50081-1: 1997	Electromagnetic compatibility – Generic requirements on emissions - Part 1
EN 50082-1: 1997	Electromagnetic compatibility – Generic requirements on immunity - Part 1
EN 60204-1:1998	Safety of machinery - Electrical equipment of machines - Part 1

■ A-3.5 SAFETY DEVICES

- Overload warning device (ARB). It is a load limiter fitted to the kingpin of the front axle. The cab display with 5 LEDs (3 green, 1 yellow and 1 red) enables the operator to check the stability variation of the machine.

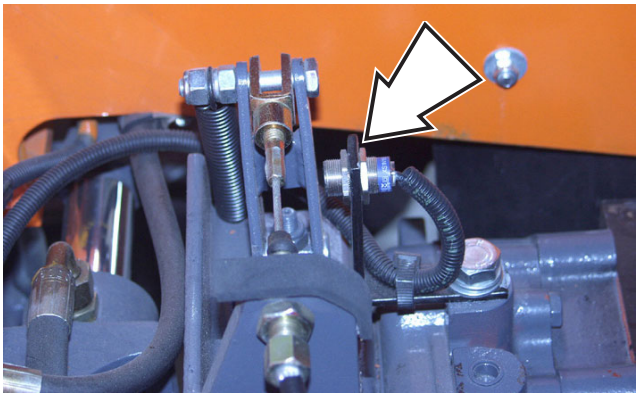




- Emergency stop pushbutton: when pressed down, it stops the engine and blocks the movements of the machine.

  Before starting work again, find and rectify the causes which compelled to an emergency stop, then reset the button to neutral position pressing it down while turning clockwise.

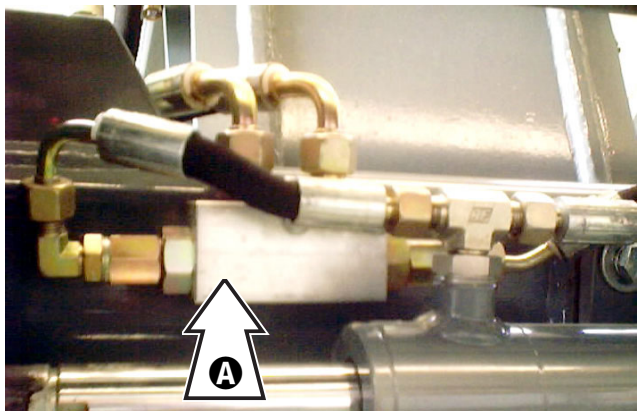
- Presence micro-switch on the parking brake which prevents any machine starting when the parking brake is not engaged.

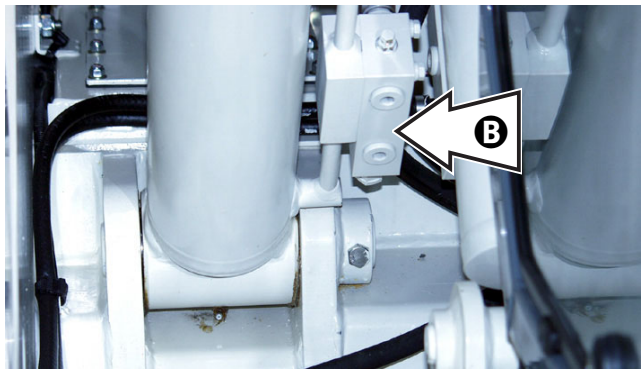


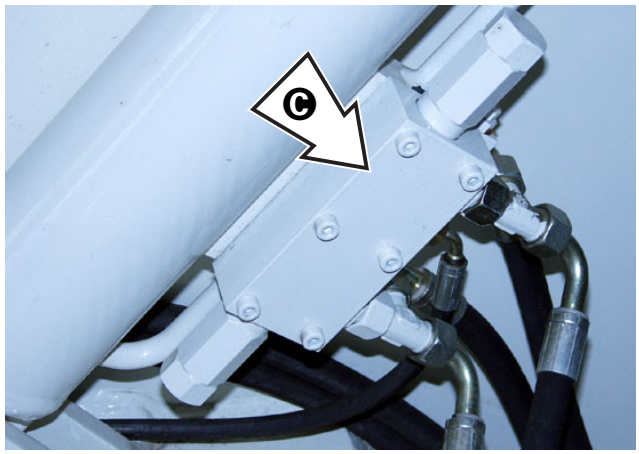
- Presence micro-switch in the driving seat (inside the seat cushion) which prevents any machine starting if the operator is not correctly seated in the driving seat.

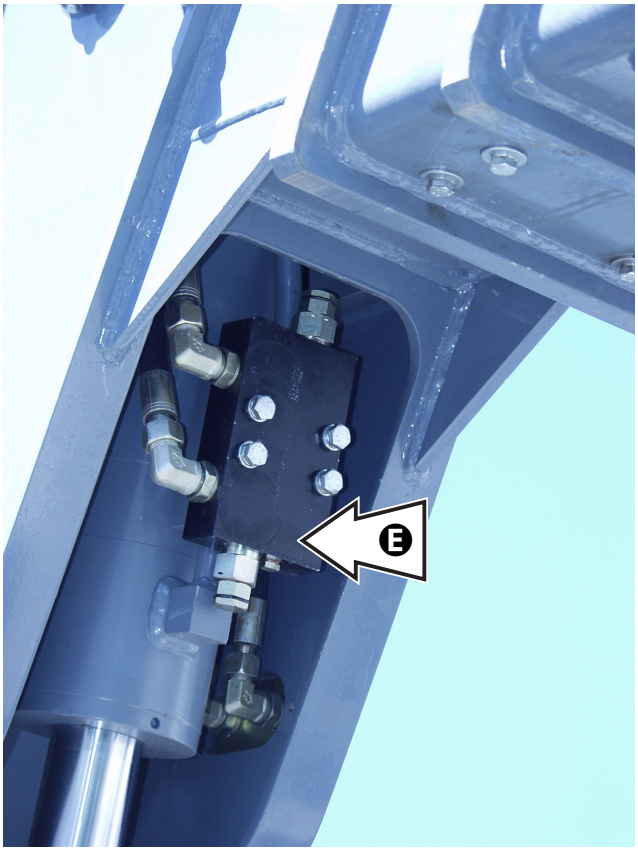
- Safety pushbutton on joystick (dead man button). This button must be pressed and held down while executing a function with the control lever. If the button is released, the movement in progress will be blocked.

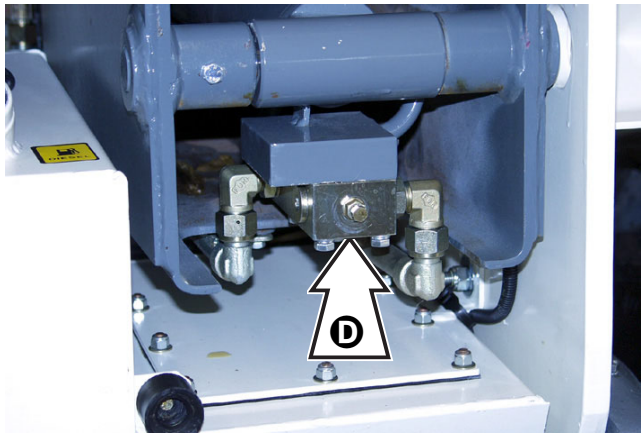
- ***Block valves fitted to all cylinders:***
  - **A** Block valve on attachment coupling cylinder
  - **B** Block valve on lifting cylinder
  - **C** Block valve on balance cylinder
  - **D** Block valve on boom extension cylinder
  - **E** Block valve on attachment pitching cylinder





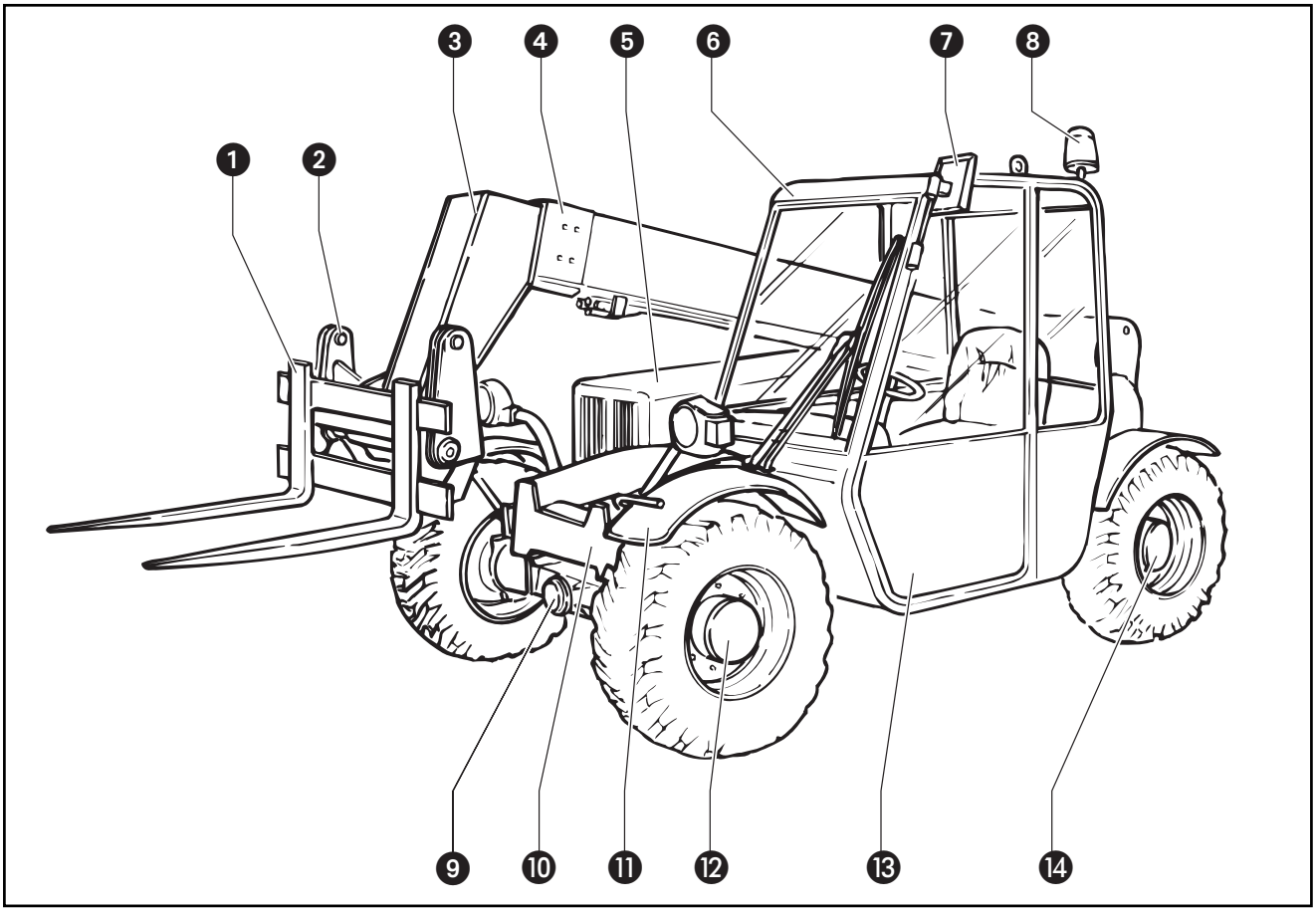






A-4 GENERAL DESCRIPTION

A-4.1 LIST OF THE MAIN COMPONENTS



1 - Forks
2 - Attachment holding frame
3 - 2nd boom section
4 - 1st boom section
5 - Engine hood
6 - Driving cab according to ROPS-FOPS provisions
7 - Left rear view mirror
8 - Beacon
9 - Front axle
10 - Chassis
11 - Left front wheel mud-guard
12 - Left front wheel reduction gear
13 - Access door
14 - Left rear wheel reduction gear

■ A-4.2 DESCRIPTION OF THE MAIN COMPONENTS

Transmission
It consists of a pump with variable displacement directly applied on the thermal engine, and of a dual displacement engine applied on the power distributor and directly connected to the front axle.
From the power distributor, through a Cardan shaft transmission, motion is transmitted to the rear axle of the handler.

Steering axles/(front and rear) differential gears
The differential axles transmit the motion to the wheels. The locking device acting on the front axle enables the machine to move also on low grip grounds.

Tyres
The machine is equipped with tyres suitably sized for the maximum load allowed on the handler.
When worn, they shall be replaced with new ones having the same dimensions and loading capacity.

Overload warning system
The overload warning system installed on the vehicle enables the operator to work under absolute safety conditions. A five-LED display shows the stability variation. When the fifth red LED lights up, all machine movements are stopped, but for the boom retraction under safe conditions.

Boom hydraulic circuit
It consists of a gear pump connected to the thermal engine which, through a special valve, dispenses oil to the hydraulic drive and a distributor for the following functions:
- boom lifting/lowering
- telescopic boom extension/retraction
- attachment rotation
- attachment locking

Braking circuit
It consists of an independent circuit: the pedal directly acts on the brake pump which dispenses oil to the locking cylinders of the front axle.

Driving cab
Type-approved driving cab in compliance with standards ISO 3449 and EN 13510 (ROPS and FOPS).

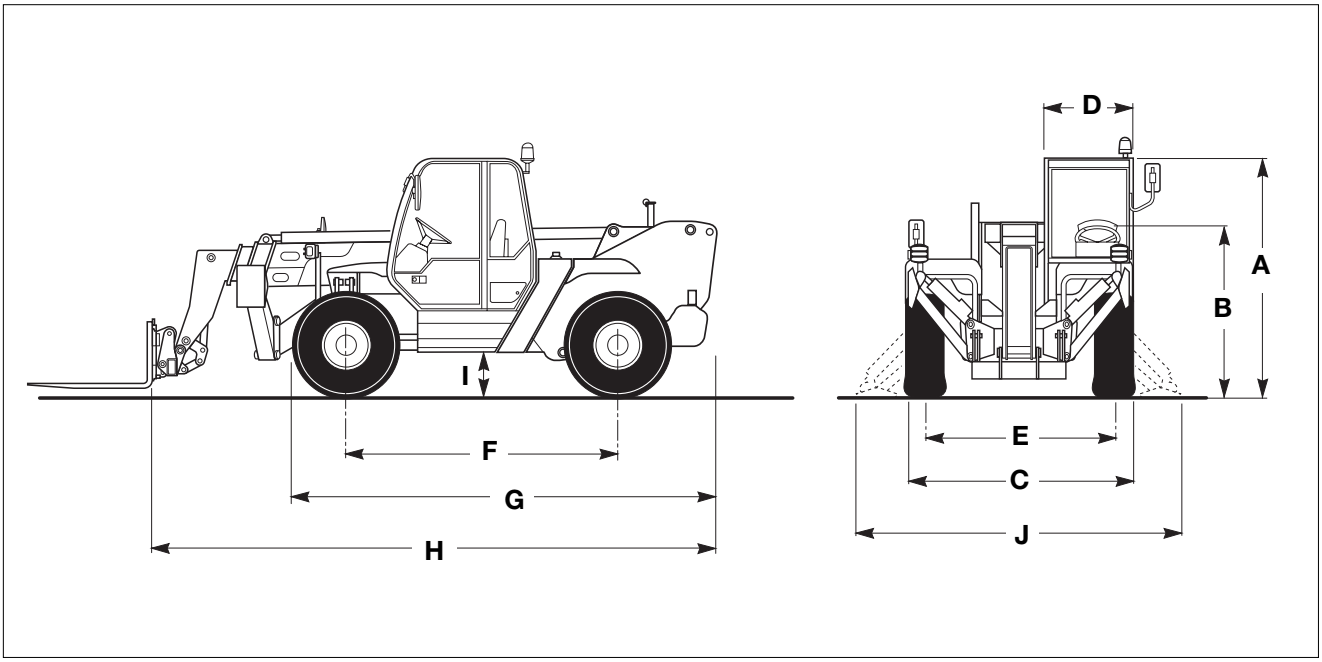
■ A-4.3 OPTIONAL ACCESSORIES

The machine can be fitted with a wide range of optional accessories: please address to ***Genie*** sales network.

IMPORTANT

Please check the accessories available for your machine.

A-5 TECHNICAL DATA AND PERFORMANCE



A-5.1 MAIN DIMENSIONS

			GTH-2306
A	Overall height	mm	1920
B	Height to the steering wheel	mm	1230
C	Overall width	mm	1800
D	Cab width	mm	860
E	Track	mm	1500
F	Wheel-base	mm	2280
G	Length to the front tyres	mm	3270
H	Length to the attachment holding plate	mm	3720
I	Ground clearance	mm	360
•	Internal steering radius	mm	1680
•	External steering radius	mm	3345

A-5.1.1 RESTRICTIONS OF USE

•	Angle of approach		90°
•	Departure angle		70°
•	Ambient temperature	°C	-20°/+40°

A-5.2 WEIGHT

•	Weight in working order	kg	4300

A-5.3 SPEED

-	Working speed (*)	km/h	8
-	Travel speed (*)	km/h	24
-	Max. slope with full load		60%

(*) = either forward or reverse motion.

■ A-5.4 PAYLOAD AND REACH

		GTH-2306
- Max lifting height	mm	5715
- Reach at max height	mm	375
- Max reach forward	mm	3270
- Attachment holding plate rotation		135°
- Payload at max height	kg	1250
- Payload at max reach	kg	800

Overturning factor according to FEM 4.001 F stability regulations.

■ A-5.5 FORKS (fixed type)

- Dimensions	mm	1200x100x35
- Weight	kg	45
- Fork holding frame - class		FEM II A

■ A-5.6 DIESEL ENGINE

		Aspirated version
- Make		PERKINS
- Model/Type		704-30
- Features:		Diesel 4 cylinders in line 4 strokes direct injection
- Bore x Stroke	mm	97 x 100
- Total displacement	cc	2956
- Power at 2300 rpm	kW	47

■ A-5.7 ELECTRICAL SYSTEM

- Voltage	V	12
- Starter (power)	kW	3
- Battery	Ah	80

■ A-5.8 MACHINE SOUND LEVELS

- Sound power (*)	dB	Lwa = 102
- Sound pressure (*)	dB	Lpa = 80

(*) = Values calculated according to the Directive 2000/14/CE

■ A-5.9 VIBRATION LEVELS

- Mean assessed vibration level transmitted to arms	m/s^2	< 2.5
- Mean assessed vibration level transmitted to body	m/s^2	< 0.5

Values calculated in accordance with standard prEN13059

IMPORTANT

This is a device of Class A. In a residential environment, such device can cause radio disturbance. In such cases, the operator is required to take suitable measures.

A-6 LIFETIME

The lifetime of the machine is 10 000 hours provided all checks, service jobs and overhauls are done at the times scheduled.

DANGER

After this time, the machine must compulsorily be inspected and tested by the Manufacturer before being used again.

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Section B

SAFETY

TABLE OF CONTENTS

B-1 GENERAL REMARKS

Most accidents occurring while working, repairing or maintaining operation machines, are caused by not complying with the basic safety precautions.
Therefore, it is necessary to pay steady attention to the potential hazards and the effects that may come of operations carried out on the machine.

IMPORTANT

If you recognise hazardous situations, you can prevent accidents!

For instance, this handbook makes use of special ***safety symbols*** to stress any potentially hazardous situation.

CAUTION

The instructions given in this handbook are the ones established by GENIE. They do not exclude other safe and most convenient ways for the machine installation, operation and maintenance that take into account the available spaces and means.

If you decide to follow instructions other than those given in this manual, you shall absolutely:

- be sure that the operations you are going to carry out are not explicitly forbidden;
- be sure that the methods are safe, say, in compliance with the rules and provisions given in this section;
- be sure that the methods cannot damage the machine directly or indirectly or make it unsafe;
- contact GENIE Assistance Service for any suggestion and the necessary written permission.

IMPORTANT

If in doubt, it is always better to ask! For this purpose, contact GENIE: the assistance service is at your disposal. Addresses, phone and fax numbers are given in the cover and in the title-page of this manual.

B-2 PREREQUISITES OF THE PERSONNEL IN CHARGE

B-2.1 PREREQUISITES OF THE MACHINE OPERATORS

The operators who use the machine regularly or occasionally (i.e. for transport reasons) shall have the following prerequisites:

health:
before and during any operation, operators shall never take alcoholic beverages, medicines or other substances that may alter their psycho-physical conditions and, consequently, their working abilities.

physical:
good eyesight, acute hearing, good co-ordination and ability to carry out all required operations in a safe way, according to the instructions of this manual.

mental:
ability to understand and apply the enforced rules, regulations and safety precautions. They shall be careful and sensible for their own as well as for the others' safety and shall desire to carry out the work correctly and in a responsible way.

emotional:
they shall keep calm and always be able to evaluate their own physical and mental conditions.

training:
they shall read and familiarise with this handbook, its enclosed graphs and diagrams, the identification and hazard warning plates. They shall be skilled and trained about the machine use.

IMPORTANT

The operator shall have a licence (or a driving licence) when provided for by the laws enforced in the country where the machine works. Please, ask the competent bodies. In Italy the operator must be at least 18 year old.

■ B-2.2 PREREQUISITES OF THE SERVICEMEN

The personnel charged with the machine maintenance shall be qualified, specialised in the maintenance of earth-moving machines, and shall have the following prerequisites:

physical:

good eyesight, acute hearing, good co-ordination and ability to carry out all required maintenance operations in a safe way, according to this manual.

mental:

ability to understand and apply the enforced rules, regulations and safety precautions. They shall be careful and sensible for their own as well as for the others' safety and shall desire to carry out the work correctly and in a responsible way

training:

they shall read and familiarise with this handbook, its enclosed graphs and diagrams, the identification and warning plates. They shall be skilled and trained about the machine functioning.

IMPORTANT

From a technical point of view, the ordinary maintenance of the machine is not a complex intervention and can be carried out by the machine operator, too, provided he has a basic knowledge of mechanics.

■ B-2.3 WORKING CLOTHES

During work, but especially when maintaining or repairing the machine, operators must wear suitable protective clothing:

- Overalls or any other comfortable garments. Operators should wear neither clothes with large sleeves nor objects that can get stuck in moving parts of the machine.
- Protective helmet.
- Protective gloves.
- Working shoes.

IMPORTANT

Use only type-approved working clothing in good condition.

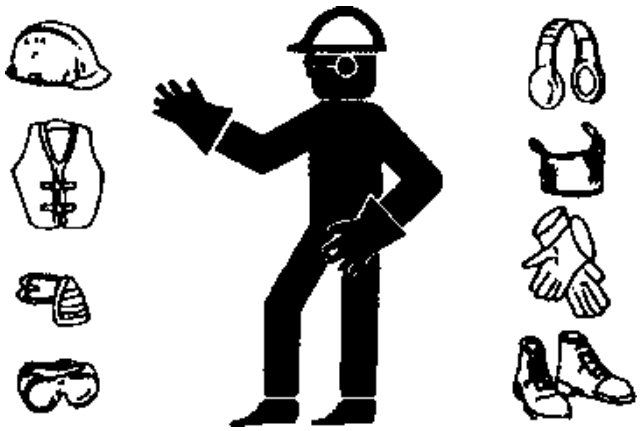
■ B-2.4 PERSONAL PROTECTIVE EQUIPMENT

Under special working conditions, the following personal protective equipment should be used:

- Breathing set (or dust mask).
- Ear-protectors or equivalent equipment.
- Goggles or facial masks.

IMPORTANT

Use only type-approved protective equipment in good condition.



B-3 SAFETY PRECAUTIONS

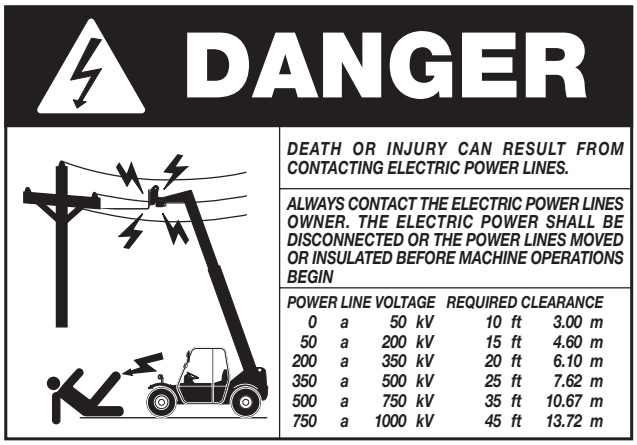
B-3.1 JOB SITE

Always take into account the features of the job site where you are going to work:

- Always examine the working area and compare it with the machine dimensions in the different configurations.

ELECTRICAL DANGER

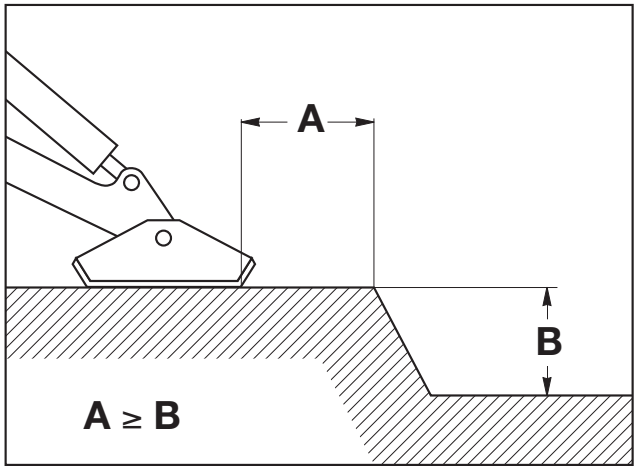
Pay the greatest attention to overhead electric lines.
Always keep at a minimum safe distance from the telescopic boom and the lifted load. Electrical hazards!



CAUTION

Make sure the machine (wheels and stabilisers) rests on a firm ground to prevent hazardous unstable conditions.
If the ground is not firm enough, position some supporting planks under the stabilisers or the wheels. These plates must grant a specific pressure of 1.2 to 1.5 kg/cm² (500x500mm plates are sufficient).

- Look for the best route to the job site.
- When the machine is running, nobody can enter its working range.
- While working, keep the working area in order. Never leave objects scattered: they could hinder the machine movements and represent a danger for personnel.
- In presence of trenches, lower the stabilisers at a safe distance from the trench edge.



DANGER

Do not at any time use the machine during a storm.

■ B-3.2 GETTING READY TO WORK

Before any operation, following precautions should be taken:

- First of all, make sure that the maintenance interventions have been carried out with care according to the established schedule (see section **D - Maintenance**).

CAUTION

Set the machine to working configuration and sway it. Use the special inclinometer to the right of the driving place to check that the machine is level before operating it.

- Ensure you have enough fuel to avoid a sudden stop of the engine, especially during a crucial manoeuvre.
- Clean instruments, data plates, lights and the cab windscreen thoroughly.
- Check the correct functioning of all the safety devices installed on the machine and in the job site.
- In case of troubles or difficulties, inform the foreman at once. Never start working under unsafe conditions.
- Do not carry out any repair work in a makeshift way to start working!

■ B-3.3 DURING WORK OR MAINTENANCE

During work, and especially maintenance, always pay the greatest attention:

- Do not walk or stop under raised loads or machine parts supported by hydraulic cylinders or ropes only.
- Keep the machine handholds and access steps always clean from oil, grease or dirt to prevent falls or slips.

- When entering/leaving the cab or other raised parts, always face the machine; never turn the back.
- When carrying out operations at hazardous heights (over **1.5 meters** from the ground), always use type-approved safety belts or fall preventing devices.

- Do not enter/leave the machine while it is running.
- Do not leave the driving place when the machine is running.
- Neither stop nor carry out interventions under or between the machine wheels when engine is running. When maintenance in this area is required, stop the engine.

- Do not carry out maintenance or repair works without a sufficient lighting.
- When using the machine lights, the beam should be oriented in order not to blind the personnel at work.
- Before applying voltage to electric cables or components, check their connection and proper functioning.
- Do not carry out interventions on electric components with voltage over **48V**.
- Do not connect wet plugs or sockets.
- Plates and hazard warning stickers shall never be removed, hidden or become unreadable.

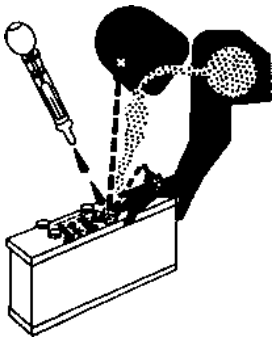
- Except for maintenance purposes, do not remove safety devices, shields, protection cases, etc. Should their removal be necessary, stop the engine, remove them with the greatest care and always remember to refit them before starting the engine and using the machine again.
- Before any maintenance or repair work, stop the engine and disconnect the batteries.
- Do not lubricate, clean or adjust moving parts.
- Do not carry out operations manually when specific tools are provided for this purpose.
- Absolutely avoid to use tools in bad conditions or in an improper way i.e. pliers instead of adjustable wrenches, etc.
- Before carrying out operations on hydraulic lines under pressure or disconnecting hydraulic components, ensure the relevant line has been previously depressurised and does not contain any hot fluid.

DANGER

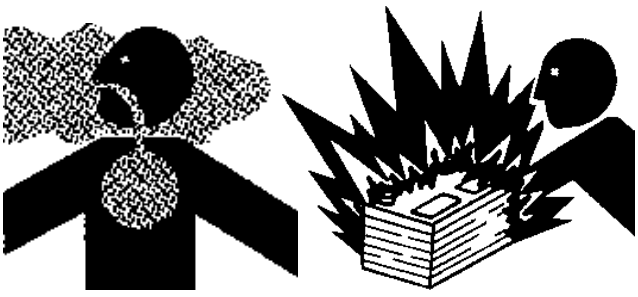
Any intervention on the hydraulic circuit must be carried out by authorised personnel.
The hydraulic circuit of this machine is fitted with pressure accumulators. You and others could be seriously injured if accumulators are not completely depressurised.
For this purpose, shut the engine down and step on the brake pedal 8÷10 times.

- Neither smoke nor use open flames in areas subject to fire dangers and in presence of fuel, oil or batteries.

- Do not leave fuel cans or bottles in unsuitable places.
- Do not empty catalytic mufflers or other vessels containing burning materials without taking the necessary precautions.
- Carefully handle all flammable or dangerous substances.



- Do not tamper with fire-extinguishers or pressure accumulators: **explosion hazard!**
- After any maintenance or repair work, make sure that no tool, cloth or other object has been left within machine compartments, fitted with moving parts, or where suction and cooling air circulates.
- When working, do not give instructions or signs to several people at the same time. Instructions and signs must be given by one person only.
- Always pay the due attention to the instructions given by the foreman.
- Never distract the operator during working phases or crucial manoeuvres.
- Do not call an operator suddenly, if unnecessary.
- Do not frighten an operator or throw objects by no means.
- After work, never leave the machine under potentially dangerous conditions.



B-4 Safety devices

DANGER

Several safety devices have been fitted to the machine. They must never be tampered with or removed (see chap. A-3.5).

Regularly check the efficiency of such devices (see check card, chap. G-5).

In case of faults, stop working immediately and proceed in replacing the defective device.

For the checking procedures, read chap. D-3.15.

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Section C

OPERATING INSTRUCTIONS

TABLE OF CONTENTS

INTRODUCTION

This section provides the operator a practical guide for the gradual learning of the machine use.
The operator should get into the driving cab and carry out the preliminary adjustments, then memorise the position of the different controls and instruments.
The familiarisation with the controls ensures not only a correct use during the working phases, but also a prompt and timely intervention of the operator, when he shall carry out sudden manoeuvres to safeguard his safety and the machine integrity.
It is necessary to learn how to use and foresee the machine reactions. Learn how to operate the machine controls in a safe and open place, without obstacles and anybody standing around. Do not ram the controls. Operate them slowly to understand their effect on the machine.

C-1 BEFORE ENTERING THE MACHINE

Checks and cleaning

- Clean glasses, lights and rear view mirrors.
- Check that pins, joints and bolts are well tightened in position.
- Check for oil, fuel or coolant leaks.

Checking the tyres

- Check the correct inflation of the tyres; see par. "**Tyre inflation**" in the Maintenance section.
- Make sure that the tyre plies are not cut or worn.

DANGER

A tyre burst may result in serious injury; never use the machine if tyres are worn, wrongly inflated or damaged.

C-2 ENTERING THE MACHINE

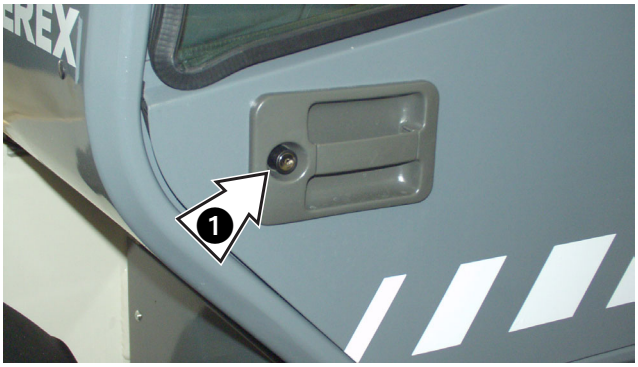
C-2.1 ENTERING THE CAB

CAUTION

Always make sure that your hands and shoe soles are clean and dry before getting into the driving cab. Always face the machine when entering and leaving it and hold to the suitable handles.

The handler cab is equipped with an access door on the left-hand side.

Door opening from outside:
- Insert the key and release lock **1**.
- Open the door using the built-in handle.



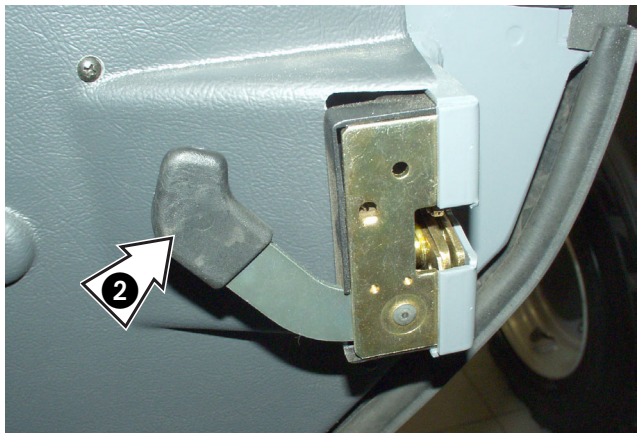
Door closing from inside:
- Pull the door with force: it locks automatically.

Door opening from inside:
- Lift lever **2** and release the lock to open the door completely.
- Rotate handle **3** to open the upper section of the door and lock it against the special catch.

To unlock the door latched in open position:
- Press button **4** to unlock the door from the catch, close and latch the door to the lower section using handle **3**.

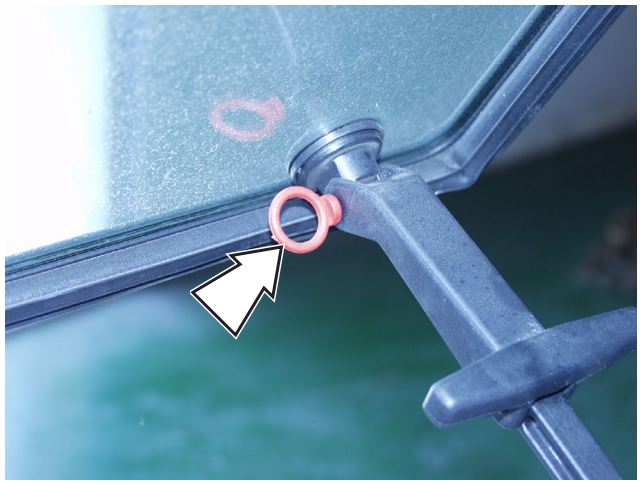
CAUTION

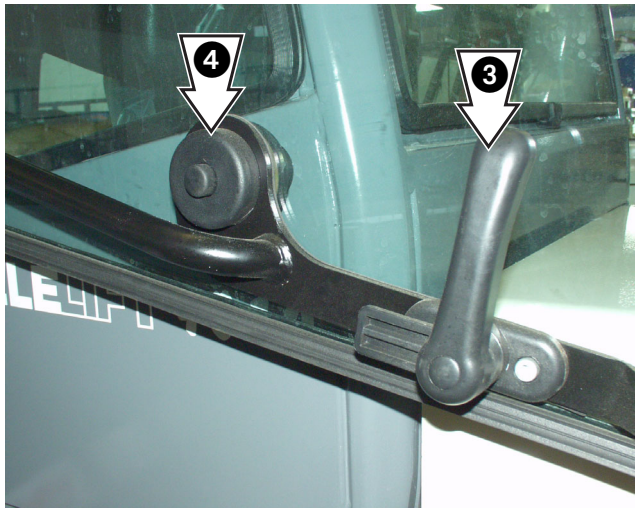
The upper section of the door must be secured to the rear part of the driving cab or latched to the lower section of the same door.



C-2.1.1 *Leaving the cab in an emergency*

In an emergency, use the rear window of the cab as safety exit-way.
This window has special locking handles with plastic pins easy to pull out when you need to fully open the glass.





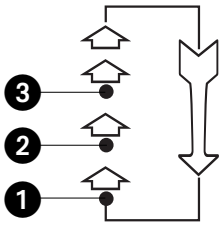
■ C-2.2 ADJUSTING THE SEAT

A correct adjustment of the seat ensures the operator a safe and comfortable driving. The handler seat is fitted with devices which allow for the adjustment of the springing, the height and the distance from the controls.

- **Seat distance from the controls**
  The seat is equipped with an adjusting device to slide the same seat forward or back with respect to the steering column.
  To adjust the seat, pull lever **1** outwards and push the seat to the desired direction. Then release the lever and make sure that the seat locks in position.

- **Springing adjustment**
  Rotate lever **2** clockwise or anticlockwise according to the springing degree required. Rotate clockwise/ anticlockwise to increase/reduce the seat springing. To reverse this control, pull out and rotate the lever knob by 180°.

- **Height adjustment**
  Turn knob 3 clockwise to lift the seat; turn it counter-clockwise to lower the seat.

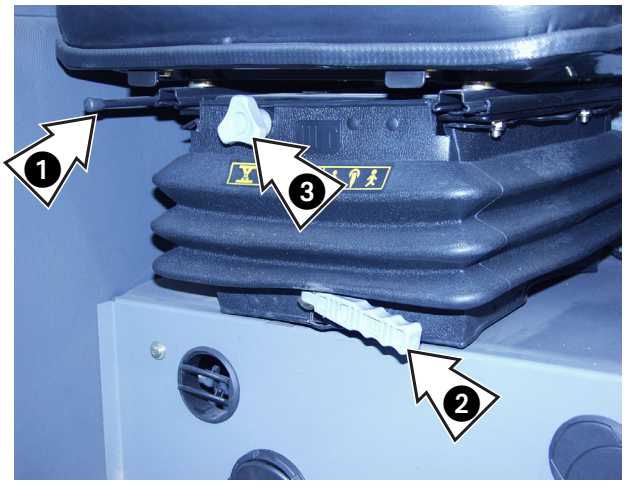


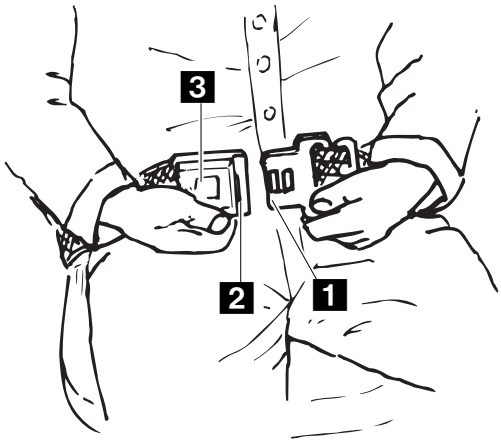
In some seats height can be adjusted to three different positions. Lift the seat until you hear the click signalling that the seat is locked in position. To lower the seat, raise to end of stroke to release the mechanism, then release the seat: it will return to the bottom position.

■ C-2.3 FASTENING THE SEAT BELTS

Sit correctly in the driving seat; then:

- Check that belts are not tangled, then push tab **1** into buckle **2** until it latches.
- To release the belt, push button **3** and remove the tab from the buckle.
- Make sure that belts lay on the hips and not on the stomach.
- The two ends of the buckle can be adjusted separately, by keeping the buckle in central position.





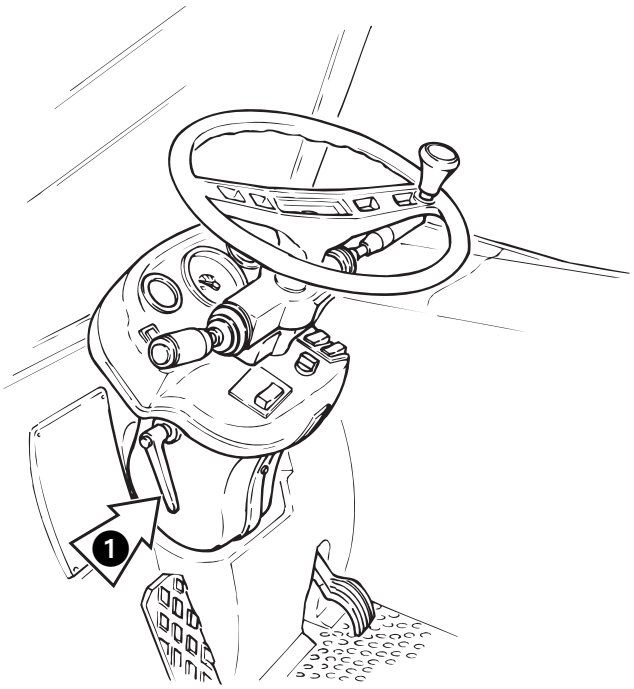
■ C-2.4 ADJUSTING THE STEERING COLUMN

Both steering column and dashboard can be set to a different angle. For this purpose:

- Loosen lever **1** and adjust as required, then re-tighten lever **1**.

DANGER

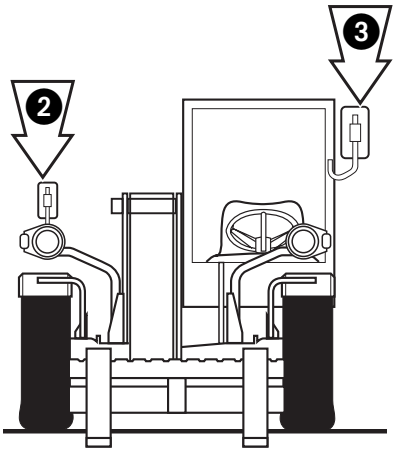
Before driving the machine, ensure the steering wheel is perfectly clamped.



■ C-2.5 ADJUSTING THE REAR VIEW MIRRORS

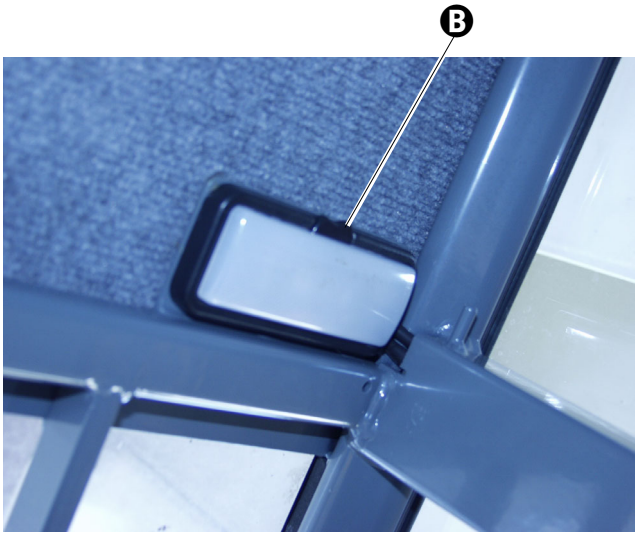
The machine is fitted with two rear view mirrors:

- The right rear view mirror is located on a special supporting bracket in advanced position and allows checking the area behind the machine, on the right-hand side. To adjust its position, manually rotate the joint it is fitted with.
- The left rear view mirror is placed on the left upper post of the windscreen and allows checking the area behind the machine, on the left- hand side. To adjust its position, manually rotate the joint it is fitted with.



■ C-2.6 SWITCHING THE CAB INTERIOR LAMP

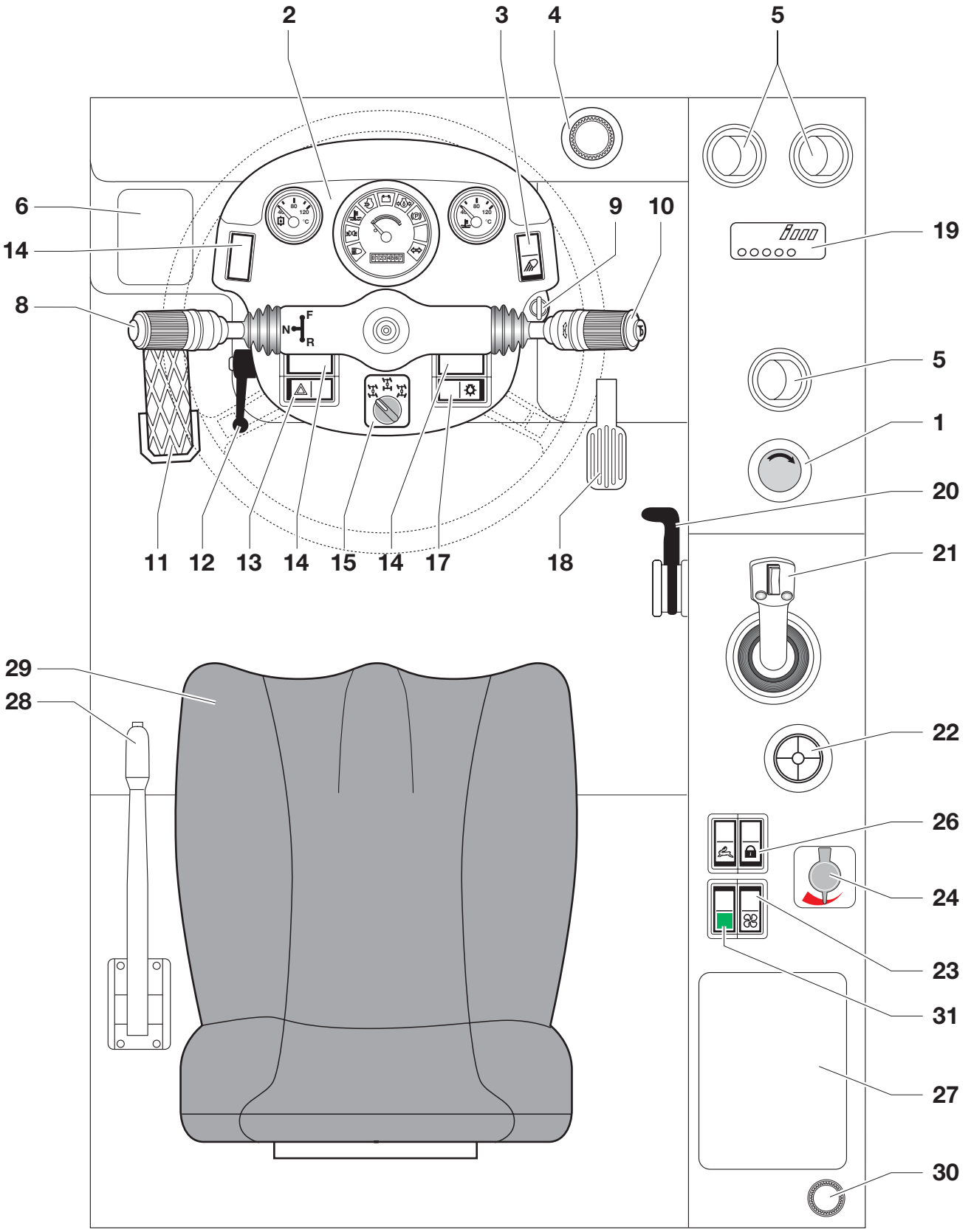
To switch on the cab lights, use switch **B** on the ceiling fixture.



C-3 DRIVING PLACE

C-3.1 CONTROLS AND INSTRUMENTS

1 Emergency stop button
2 Dashboard
3 Work light switch
4 Brake oil tank
5 Fresh air flap
6 Fuse compartment
8 Forward/reverse speed selection lever
9 Ignition switch
10 Turn signals - windscreen wiper - horn switch
11 Brake pedal
12 Steering column locking lever
13 Hazard lights switch
14 Available compartment for optional controls
15 Steering selection switch
17 Road light switch
18 Gas pedal
19 Overload warning system display
20 Manual accelerator
21 Control lever
22 Water level
23 Air conditioning fan switch
24 Cab heater cock
26 Road/Cab switch
27 Storage tray
28 Parking brake lever
29 Seat
30 Windscreen water reservoir
31 Optional attachment switch with built-in green lamp (if any)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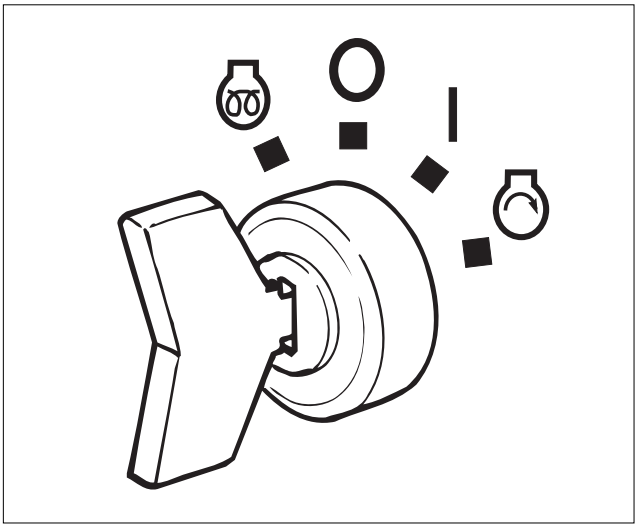
R

C-3.2 ENGINE CONTROLS AND INSTRUMENTS

■ *C-3.2.1 Ignition switch*

Four-position switch:

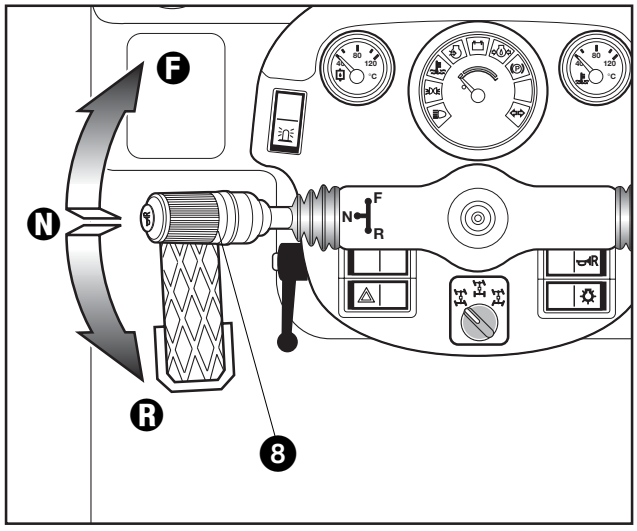
- **O** No circuit under voltage, key can be removed and engine is stopped
- Thermostarter for cold climates. Turn the key to this position and hold it for 10÷15 seconds, then turn it to pos. I to start the engine
- **I** Circuits under voltage, presetting for the engine starting. Board controls and instruments are on.
- Engine starting; when released, key springs back to pos. **I** automatically.



■ *C-3.2.2 Forward/reverse gear selector switch*

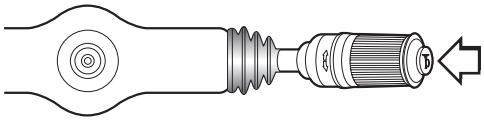
Three-position switch with lock in neutral position:

- **N** Neutral position; no gear engaged
- **F** Shift lever to pos. **F** to select the forward gear
- **R** Shift lever to pos. **R** to select the reverse gear

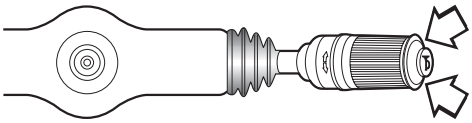


■ *C-3.2.3 Turn signals - Windscreen wiper - Horn - Lights*

■ ***Horn function***:
When sliding the lever along its axis, horn switches on, independently from other pre-set functions.



■ ***Windscreen washer function***:
Push the second stage of the lever along its axis to direct a jet of water onto the cab windscreen.



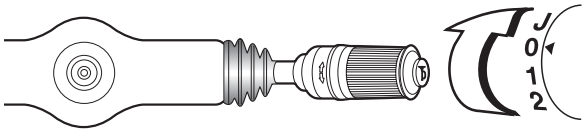
■ ***Windscreen wiper function***:
To operate the windscreen wiper, rotate the lever tip to one of the four positions:

0 Wiper OFF

J Timed wiper (if fitted)

1 Low speed

2 High speed

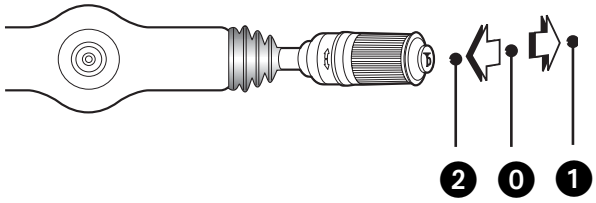


■ ***Lights function***:
To switch the handler lights, lever can be set to three different positions along its vertical axis:

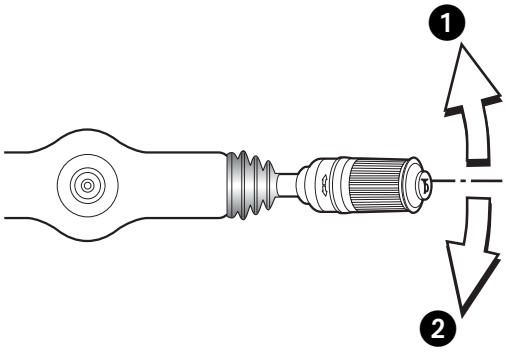
❶ low beam ON, stable condition

❶ high beam ON, stable condition

❷ high beam used for intermittent signalling; when released, the lever springs back to position ❶.



■ ***Turn signals function***:
Set lever to pos. ❶ to indicate a turn leftwards or to pos. ❷ to indicate a turn rightwards.



■ C-3.2.4 Brakes

11 Service brake pedal

Gradually step on the brake pedal to decelerate and stop the machine. The pedal operates on the front axle. Fully depressing the brake pedal causes a reset of the displacement of the power drive pump making the brake action more powerful.

28 Parking brake

To engage the parking brake, pull the lever upward while holding the locking button pressed down. Release the button when reaching the required braking tension. This brake operates on the power distributor of the front axle and, when engaged, it cuts off both forward and reverse gear.

CAUTION

Never use the parking brake to slow down the machine, unless in an emergency. It may reduce the brake efficiency.

■ C-3.2.5 Accelerator control

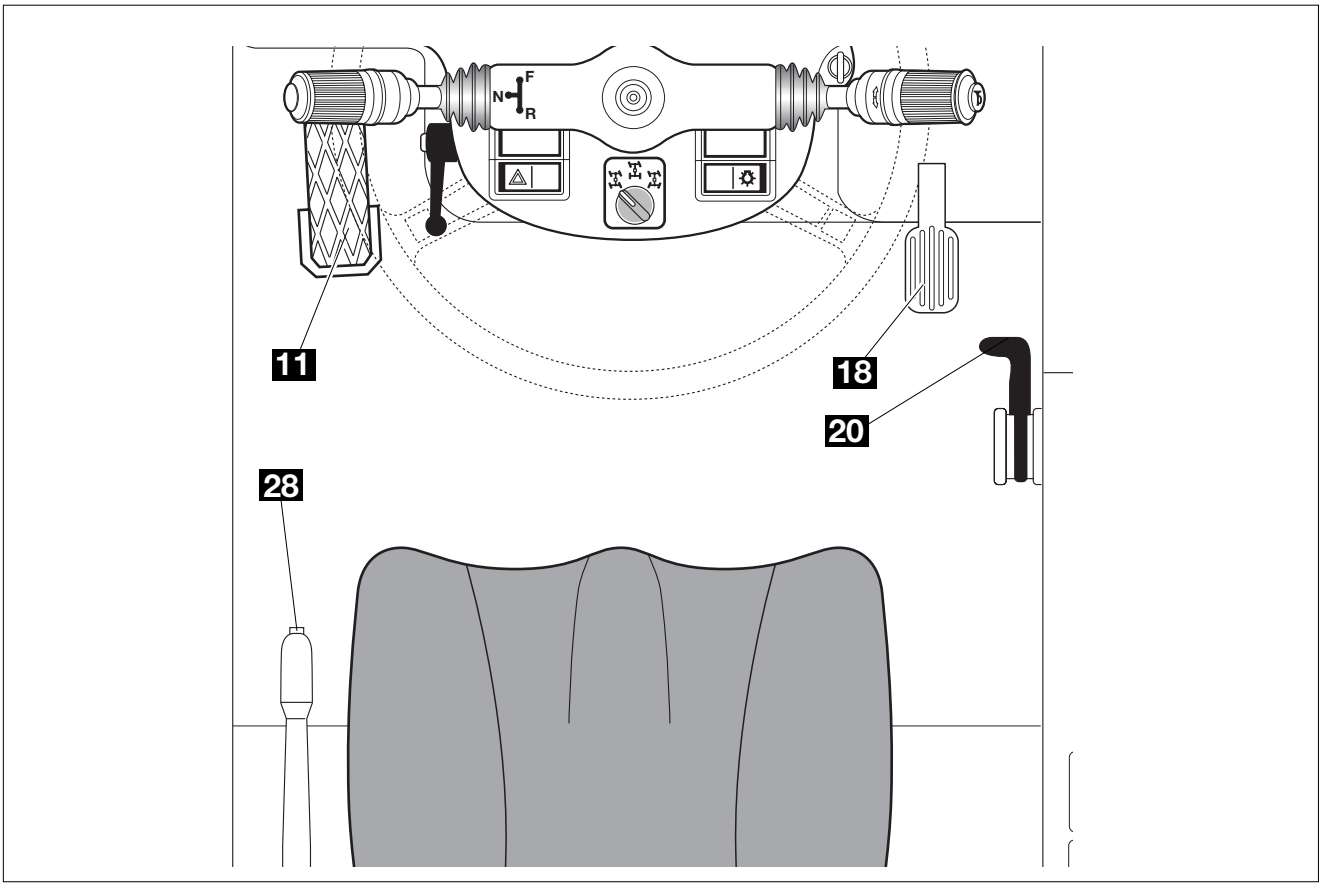
18 Gas pedal

Its pressure controls the engine rpm and, coupled to the gearbox, the machine speed. It is fitted with an adjustable stop in the lower part

20 Manual accelerator

By pulling the lever up, the engine rpm increases gradually.

To reduce the rpm, set the lever down.



■ C-3.2.6 Hydraulic gearbox

25 Selection button

Two-position button for changing between low and high hydraulic speed.

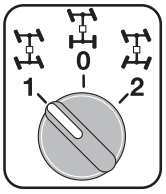
1 Press the button to select the high speed; the button lights up.

2 Press the button again to select the low speed; the button light switches off.

■ C-3.2.7 Steering mode selection

15 Steering mode switch

Three-position switch for the selection of the steering mode:



1 Crab steering

2 Two-wheel steering

3 Four-wheel steering

■ C-3.2.8 Road/Cab switch

26 Selection button

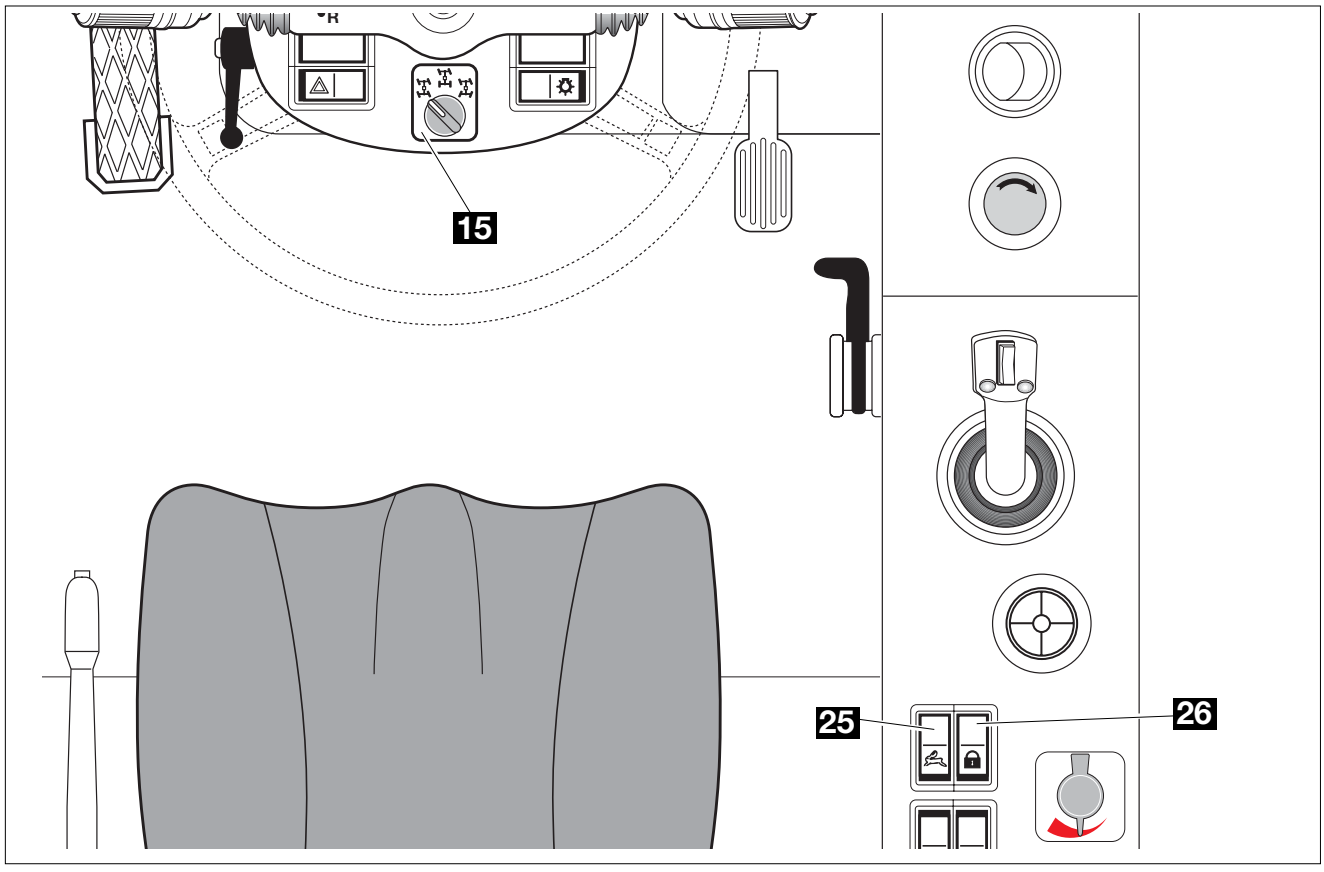
Button with two stable positions:

1 Press to select the road setting. The high speed can be engaged, the boom control is disabled and only the two-wheel steering is enabled. The built-in button light switches on.

2 Press the button again to select the work setting and enable the boom control and the four-wheel steering. The built-in button light switches off.

DANGER

Before switching on the ROAD function, align the rear wheels of the machine.



■ C-3.2.9 Auxiliary drive controls

3 Work light switch

Two-position switch placed on the dashboard on the right-hand side, over the ignition switch:

0 Work lights OFF

1 Work lights ON (the built-in lamp lights up).

13 Hazard warning lights switch

Fitted with on-off position, it switches on the turn signals simultaneously

17 Road lights switch

Two-position switch placed on the dashboard on the right-hand side over the ignition switch:

0 Lights OFF

1 Lights ON (the built-in lamp lights up).

23 Air conditioning fan switch

Three-position switch:

0 OFF

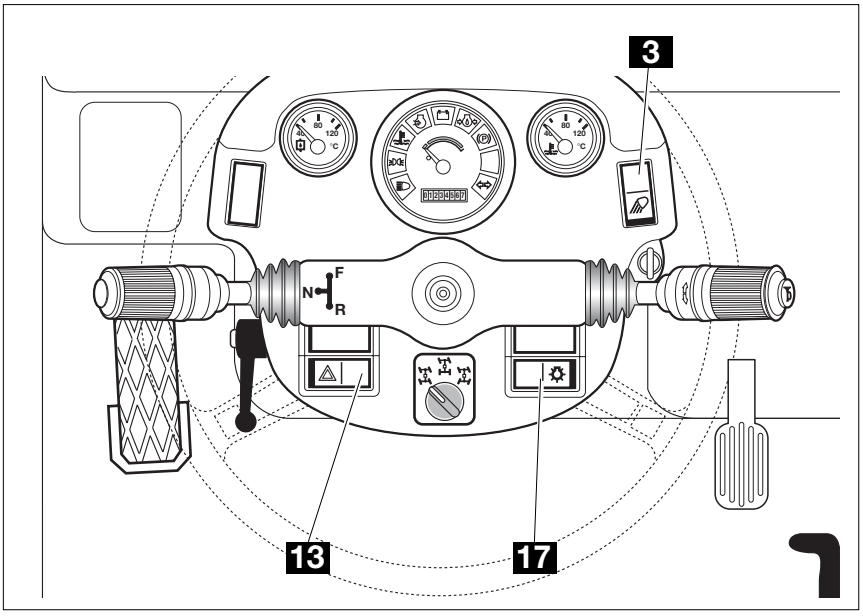
1 Low speed

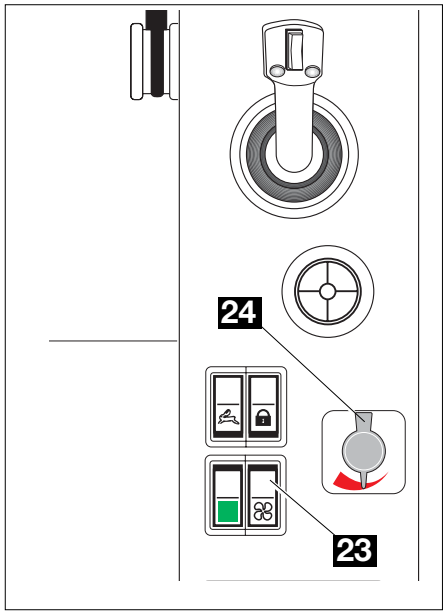
2 High speed

24 Cab heater control cock

To the right of the driving seat.

- Rotate clockwise for fresh air
- Rotate anticlockwise for warm air
- Adjust the flow of warm air within the cab by the air conditioning fan switch **23**.





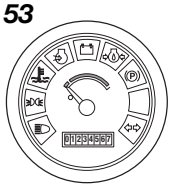
C-3.3 INSTRUMENTS AND LIGHT INDICATORS

■ C-3.3.1 *Instruments*

54 Engine coolant temperature indicator

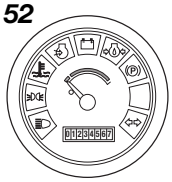
Signals the engine coolant temperature.

53 Fuel gauge



Signals the fuel level within the tank.

52 Hour-meter



Signals the total operating hours of the machine.

51 Hydraulic oil temperature indicator

Signals the temperature of the hydraulic oil within the reservoir.

■ C-3.3.2 *Light indicators*

60 Indicator light - high beam

Blue indicator light that signals when high beam is ON.

61 Indicator light - position lights

Green indicator light that signals when position lights are ON.

62 Indicator light - water temperature

When this indicator light and the indicator **31** switch on, the coolant is getting overheated in an anomalous way.

63 Indicator light - hydraulic oil filter clogged

Not activated.

64 Indicator light - low battery charge

Signals a low charge by the alternator.

65 Indicator light - low engine oil pressure

It lights when the engine oil pressure is too low.

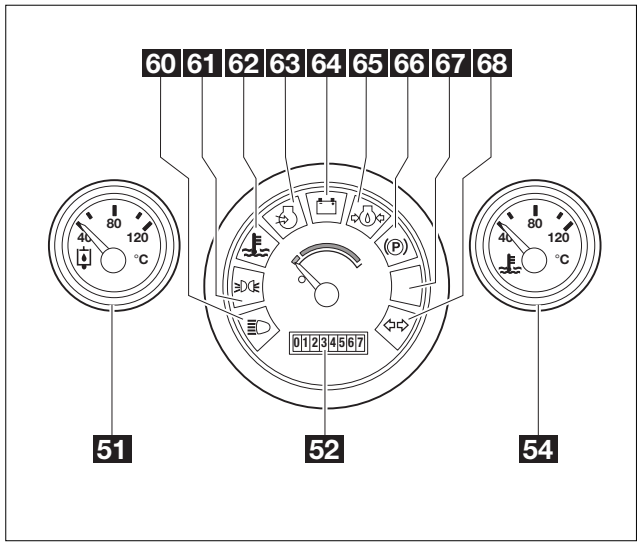
66 Indicator light - parking brake engaged

When ON, this light indicates that the parking brake is engaged.

67 Blank

68 Indicator light - turn signals

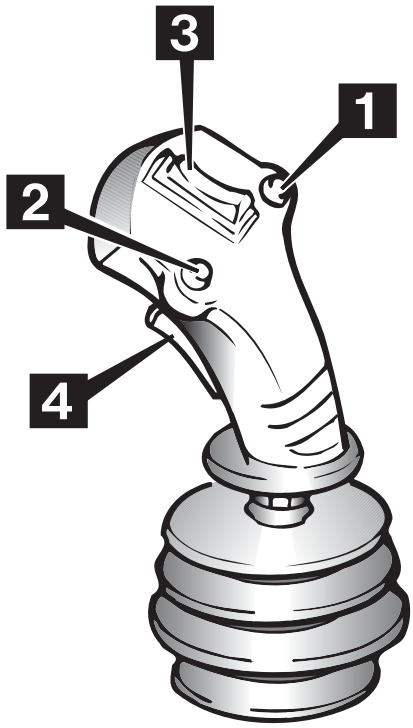
Green indicator light that signals when turn signals are ON.



C-3.4 CONTROL LEVER

Handlers are equipped with an hydraulically driven servo-controlled lever.

The lever is equipped with buttons for locking/releasing the attachments (1 and 2) and for extending/retracting the telescopic boom (3).
Additionally, when operated in the four directions (right/left, forward/back) it allows for the control of the boom lifting/lowering and the forward/back tilting of the attachment.
It is also equipped with an intentional control button 4 that must be pressed and held in position until the movement is completed.
If the button is not pressed down, the lever, though operated, does not perform any function.



IMPORTANT

Seize the control lever correctly and move it gently. The motion speed of the actuators depends on the lever position: a small motion results in a slow motion of the actuators; vice versa, a full range motion of the lever corresponds to the max. speed of the actuator.

CAUTION

The control lever shall be operated only when correctly seated in the driving place.

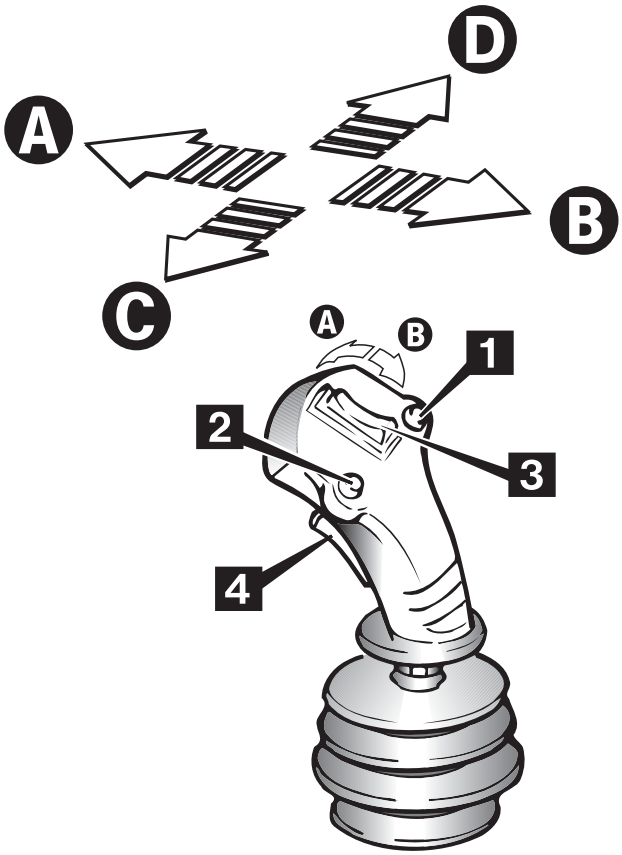
CAUTION

Before operating the control lever, make sure that nobody is within the working range of the machine.

■ *C-3.4.1 Function selection*

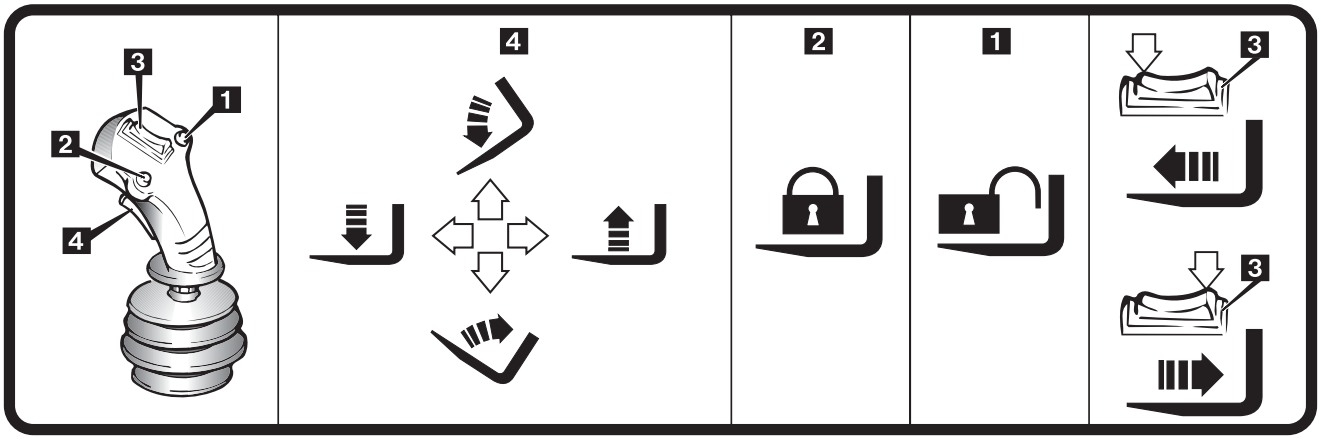
After pressing the intentional control pushbutton 4, the lever is enabled to carry out the following motions:

- **Boom lowering/lifting**
  shift the control lever to Ⓐ or Ⓑ
- **Attachment back/forward tilting**
  shift the control lever to Ⓒ or Ⓓ
- **Boom extraction/retraction**
  press and shift button 3 to direction Ⓐ - Ⓑ without moving the control lever
- **Attachment coupling/release**
  press button 1 or 2 without moving the control lever



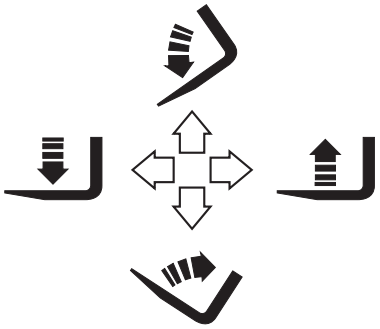
DANGER

When pressing the intentional control* button 4 *and the lever is not correctly set to central position, the control of the selected actuator is operated immediately.

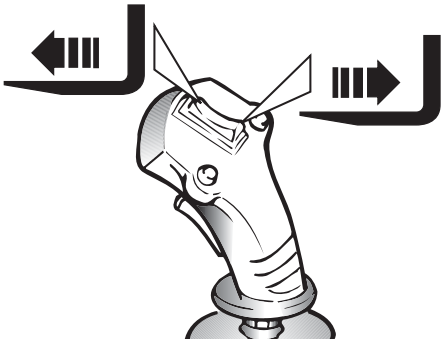


■ C-3.4.2 Boom controls

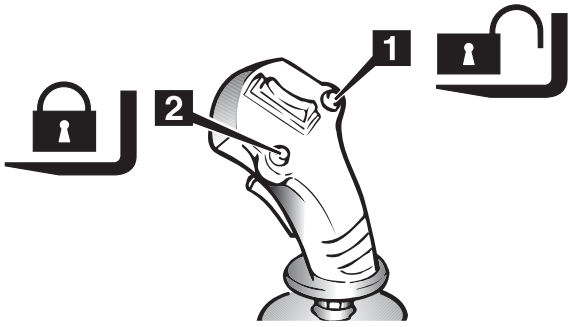
Press button 4 and perform the required function by shifting the lever to position Ⓐ-Ⓑ-Ⓒ-Ⓓ



Press button 4 and operate button 3 to the desired position



Press button 4 and perform the required function by pressing button 1 or 2



■ C-3.4.3 Emergency stop

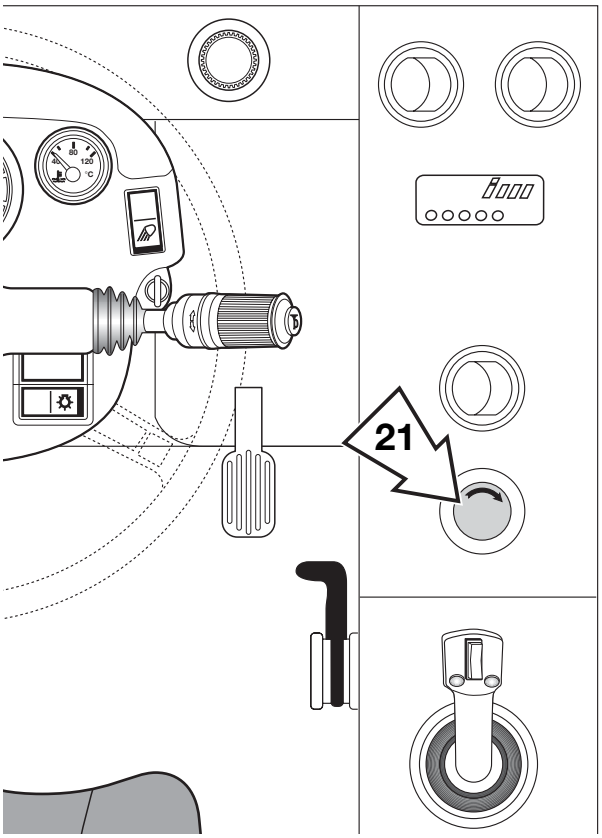
The operated functions can be stopped at any time by pressing the emergency stop button.

By pressing this button, the engine of the machine is shut down.

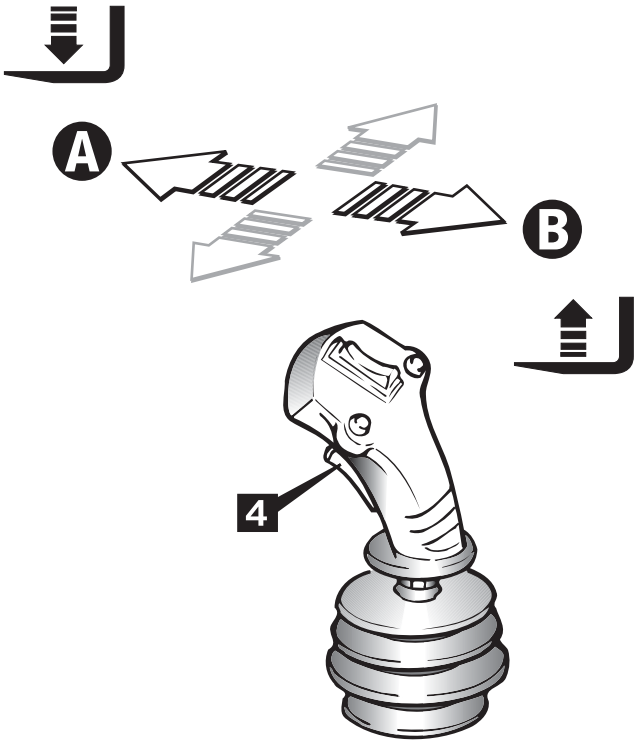
Before restarting the machine, it is necessary to reset the pushbutton by rotating clockwise.

CAUTION

Before restarting the machine, find and rectify the faults that caused the emergency



■ *C-3.4.4 Lifting/lowering the boom*

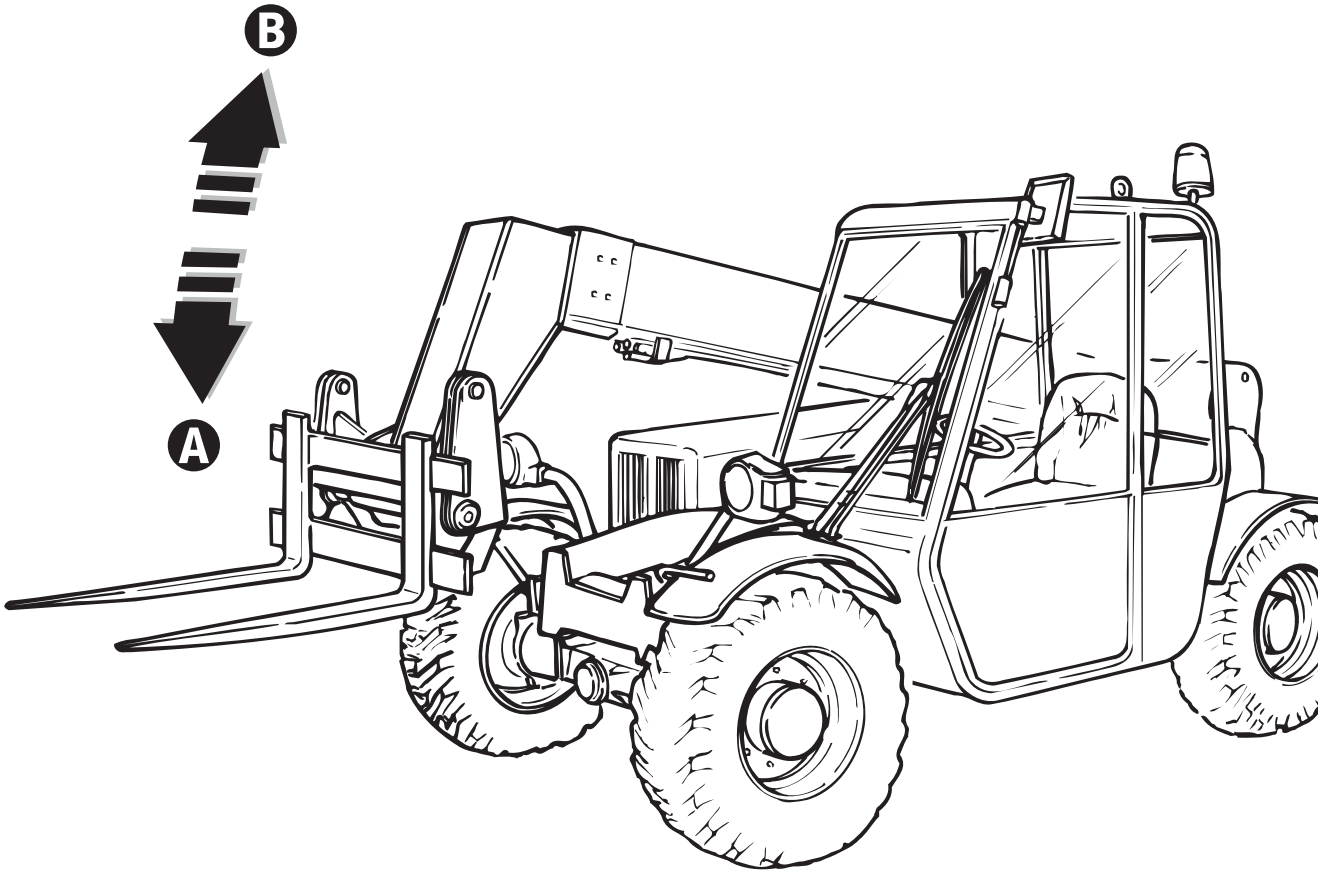


CAUTION

Before operating the boom, make sure that nobody is within the working range of the machine.

To lift or lower the boom:

- Set the control lever to central position and press button 4
- Smoothly shift the lever to position Ⓑ to lift the boom or to position Ⓐ to lower it.



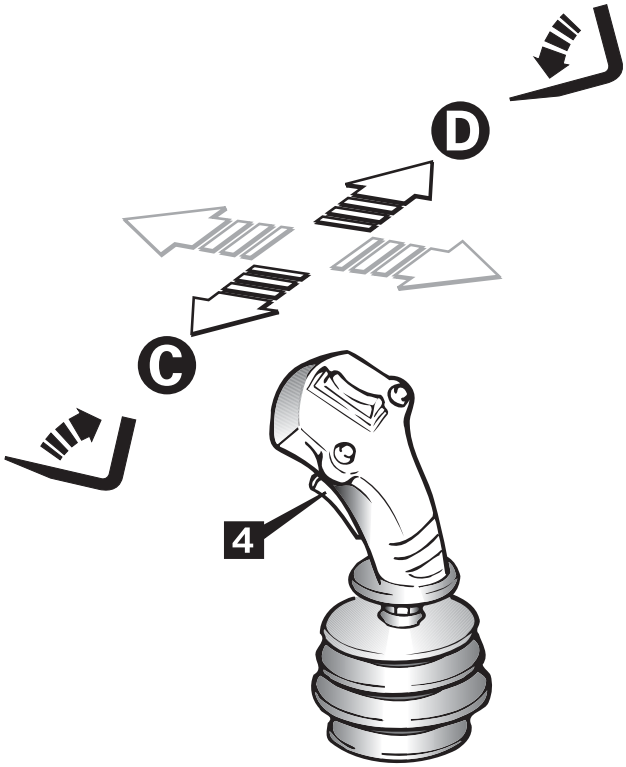
■ C-3.4.5 *Pitching the attachment holding frame forward/back*

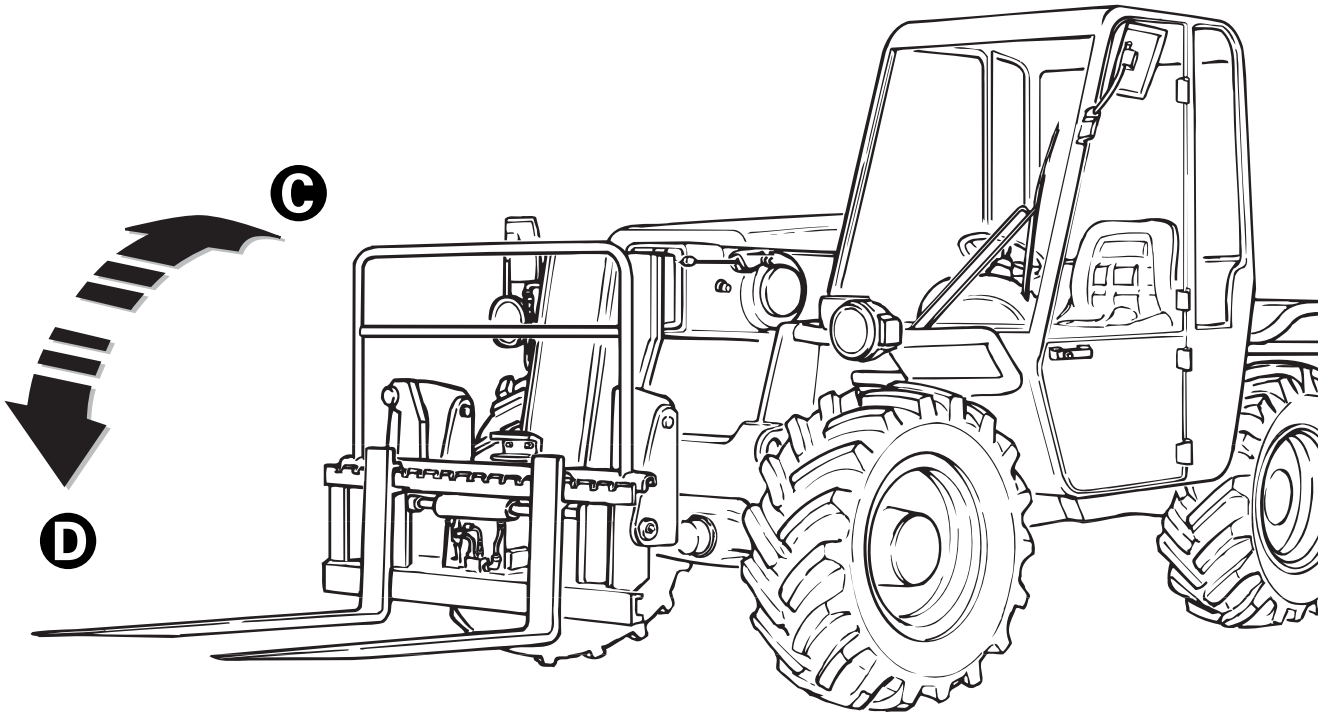
CAUTION

Before operating the boom, make sure that nobody is within the working range of the machine.

To tilt forward/back the attachment holding frame:

- Set the control lever to central position and press button 4
- Smoothly shift the lever to position Ⓓ to tilt the frame forward or to position Ⓒ to tilt it back.

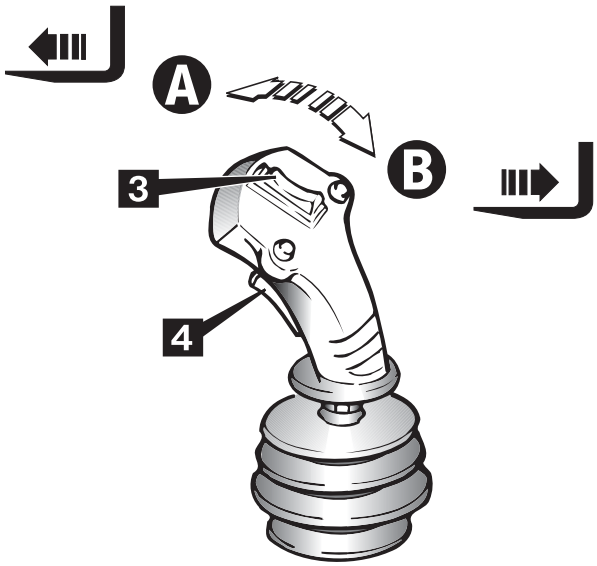




■ C-3.4.6 Extending/retracting the boom

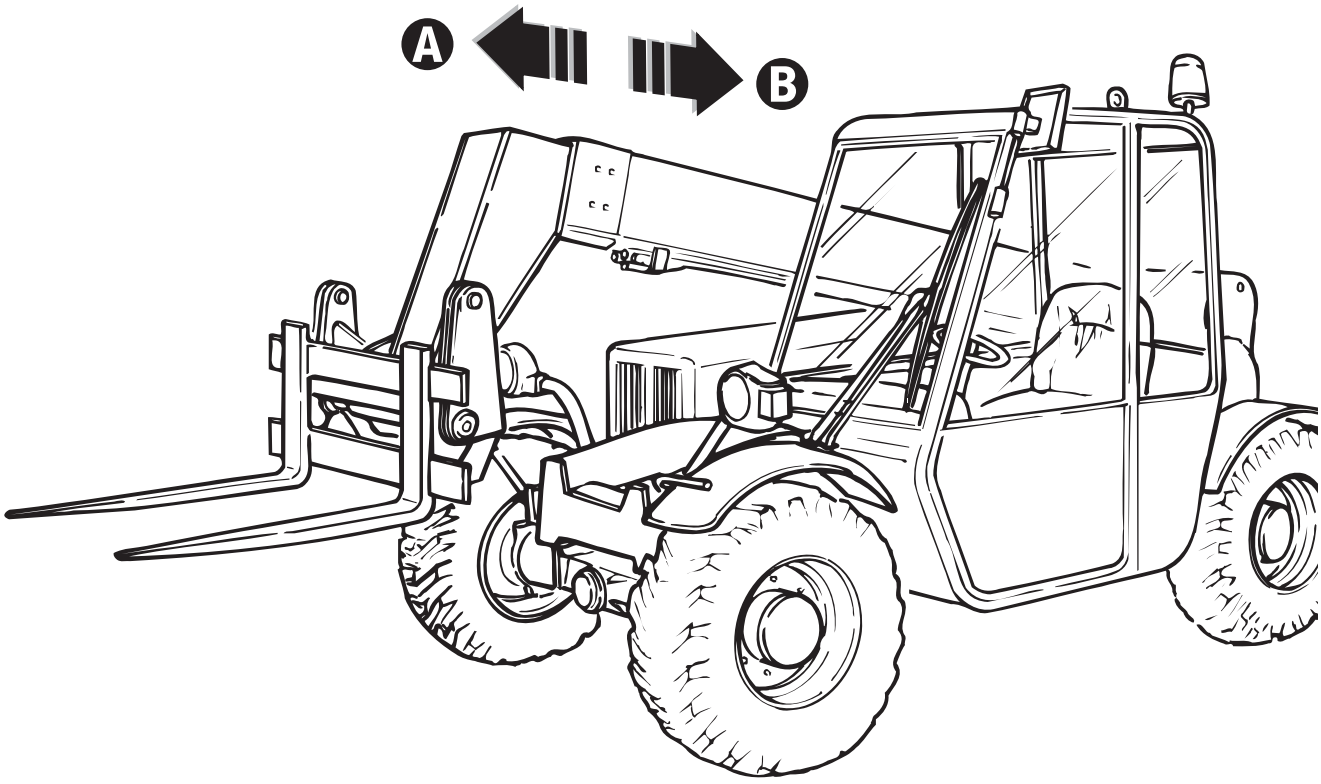
CAUTION

Before operating the boom, make sure that nobody is within the working range of the machine.



To extend or retract the telescopic elements of the boom:

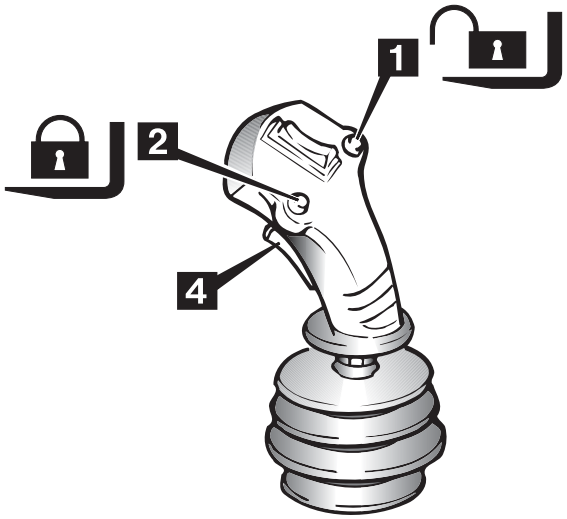
- Set the control lever to central position and press button 4
- Set button 3 to position Ⓐ to extend the boom or to position Ⓑ to retract it.



■ C-3.4.7 Quick-coupling the attachments

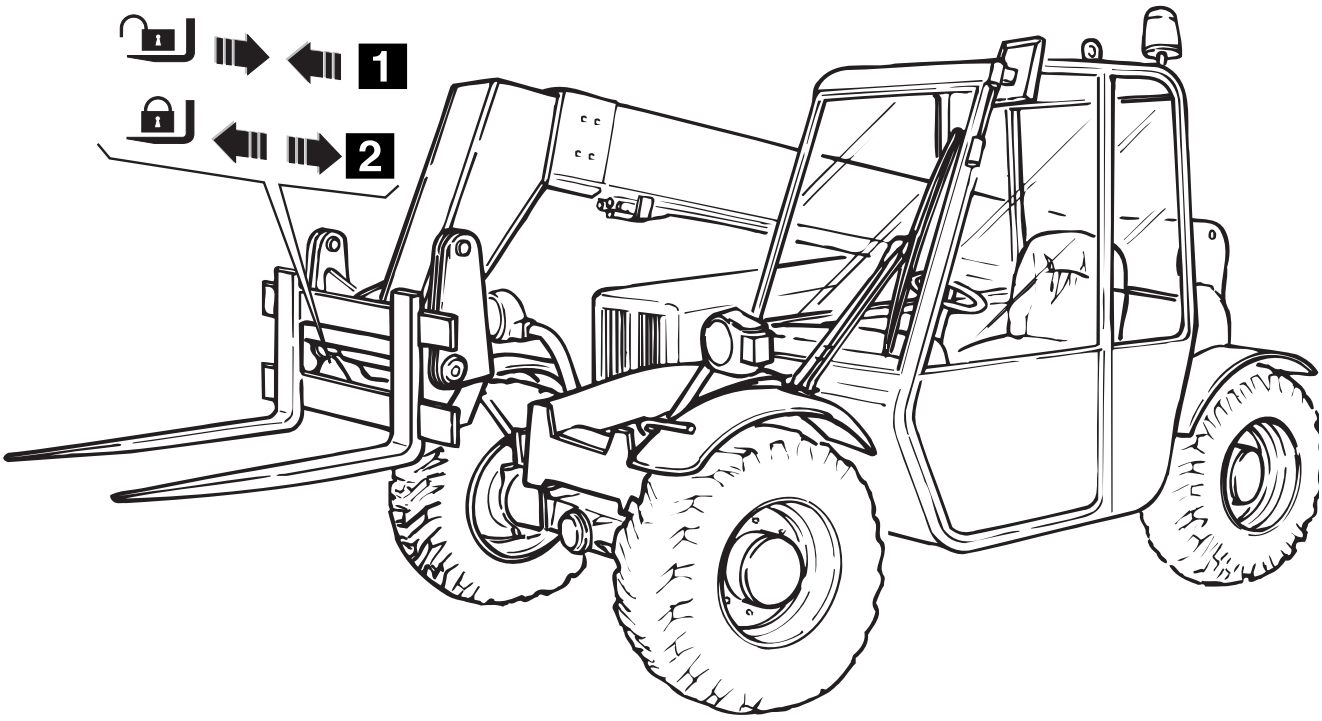
CAUTION

Before operating the boom, make sure that nobody is within the working range of the machine.



To lock the attachments:

- Shift the control lever to central position and press button 4
- Press button 1 to unlock the attachment or press button 2 to lock the attachment.



C-4 SETUP

C-4.1 BEFORE STARTING THE ENGINE

- To ensure safe conditions to the operators and the bystanders, and a longer life to your machine, perform a walk-around inspection before starting the engine.
- Remove any dirt or rubbish from the cab interior, and especially from pedals and control levers.
- Remove oil, grease and mud from pedals and control levers.
- Make sure that your hands and shoe soles are clean and dry.
- Check the seat belts can be fastened properly.
- Check that lights, indicators, side/tail lights, hazard indicator lights, wipers and horn are in working order.
- Adjust the driving seat so that you can reach all control levers comfortably and fully depress the brake pedal without moving your back from the driving seat.
- Adjust the rear view mirrors to give you a good view close behind the machine when you are correctly seated.
- Check the parking brake is engaged.

C-4.1.1 Checks at the machine start-up

When the electrical panel is switched on, the overload warning system carries out a diagnostics to of the system. All LEDs come on and go off in sequence, then the first green LED comes on with a fixed light to signal the proper functioning of the instrument.

If the red LED does not go off, there are two possibile reasons:

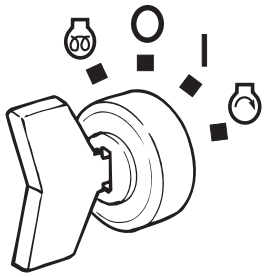
- the machine is in alarm due to an overload of the forks;
- the machine is in alarm due to a failure.

Also check the efficiency of the safety devices as described in **chap. D-3.15**, namely:

- overload warning system
- joystick pushbutton
- seat micro-switch
- parking brake proximity switch
- emergency pushbutton

C-4.2 STARTING THE ENGINE

- Put the mechanical gear lever to neutral.
- Step on the gas pedal.
- To start the engine, rotate the ignition switch to position , and release when the engine starts. If the engine does not start within 20 seconds, release the key and wait at least 2 minutes before attempting again.
- After the engine starting, slow down the rpm and wait some seconds before engaging a gear; this allows for a gradual warm up of the engine oil and a better lubrication.



- In case of engine jump-starting, remove the connecting cables (see following chapter).

ATTENTION

If the light indicators do not switch off/on when engine is running, immediately stop the machine and find and rectify the fault.

IMPORTANT

Engine cannot be started if the parking brake is not engaged, the speed switch is not in the neutral position and the operator is not correctly seated in the driving seat.

DANGER

After the start-up, when leaving the driving place, the engine continues to run. DO NOT LEAVE THE DRIVING PLACE BEFORE HAVING SHUT THE ENGINE DOWN, LOWERED THE BOOM TO THE GROUND AND ENGAGED THE PARKING BRAKE.

■ C-4.3 JUMP-STARTING THE ENGINE

DANGER

When jump-starting the engine through the battery of another machine, make sure that the two vehicles cannot collide to prevent formation of sparks. Batteries give off a flammable gas and sparks may burn it and cause an explosion

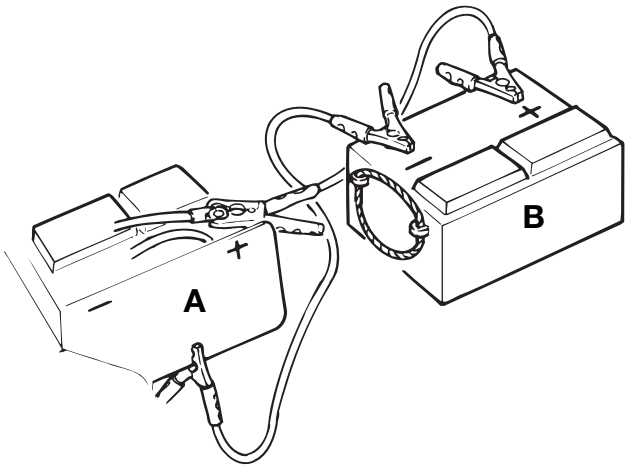
Do not smoke when checking the electrolyte level.

Keep any metal object like buckles, watch straps, etc. clear of the battery positive (+) terminal. These elements can short between the terminal and nearby metal work and the operator can get burned.

The booster supply must have the same rated voltage and output of the battery installed on the handler.

To jump-start the engine:

- Turn any users off by the special control levers.
- Put the gear lever to neutral and engage the parking brake.
- Ensure the machine battery **A** is connected to the frame earth, the terminals are well tightened and the electrolyte level is regular.
- Connect the two batteries as shown in the figure. Connect first the positive terminals of the two batteries, then the negative terminal of the booster supply **B** to the machine frame earth.
- If the booster supply is installed on a second vehicle, make sure that the latter does not touch the handler; then start the vehicle and reach an rpm corresponding to 1/4 of full throttle.
- Turn the ignition key and start the handler, then follow the procedure explained in chapter C-4.2 “Starting the engine”.
- Disconnect the cables. Remove first the negative terminal from the frame earth, then from the booster supply. Disconnect the positive terminal from the machine battery, then from the booster supply.

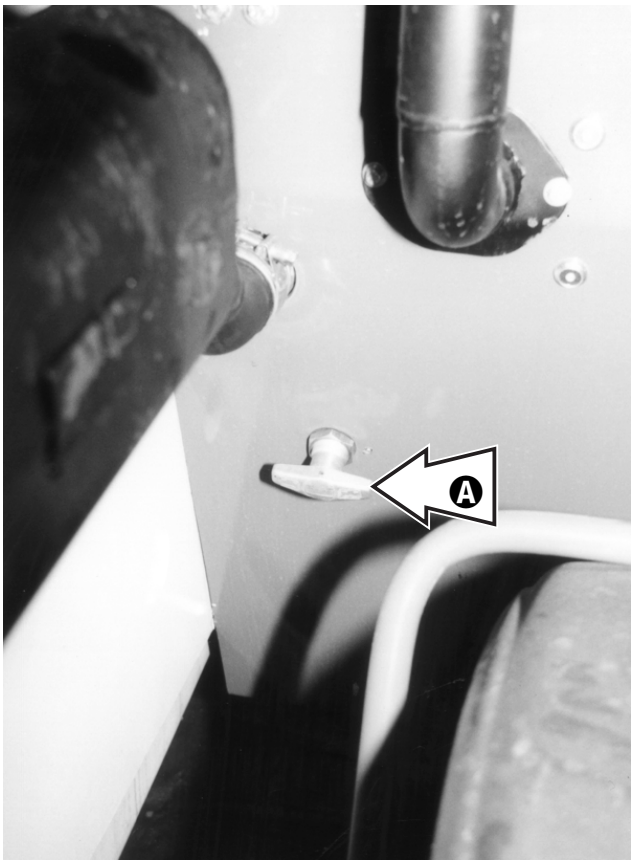


DANGER

Use only a 12V battery; other devices like battery chargers, etc. may cause an explosion of the battery or result in damage to the electrical system.

■ C-4.4 DISCONNECTING THE BATTERY

During maintenance or repair works, and while welding, turn off the battery main switch Ⓐ, located behind the front right wheel compartment.



■ C-4.5 STARTING THE MACHINE

When the engine reaches the running temperature, ensure all parts are in transfer position and the gearbox lever is in neutral. Then, proceed as follows:

- Select a gear suiting the job you are going to carry out and the conditions of the job site.
- Select the required steering mode.
- Select the required gear (forward or reverse).
- Release the parking brake.
- Slowly step on the gas pedal to start moving off.

CAUTION

Do not operate the forward/reverse gear lever when the machine is running. The machine would reverse the running direction abruptly and you could seriously be injured.

C-4.6 STOPPING AND PARKING THE MACHINE

When possible, stop the machine on a dry, level and solid ground. Then:

- Bring the machine to a smooth stop by easing up the gas pedal and stepping down on the brake pedal.
- Set the forward/back speed lever to neutral position.
- Engage the parking brake and ensure its indicator light switches on.
- Release the service brake pedal.
- Rest the attachment coupled to the boom flat on the ground.
- Rotate the ignition key to “**0**” and remove the key.
- Leave the driving cab and lock the cab door.
- Set the battery cut-out switch to **OFF** position.

DANGER

Always face the machine when getting off the driving cab; make sure that your hands and shoe soles are clean and dry, and hold to the handholds to prevent falls or slips.

DANGER

Always engage the parking brake after stopping the machine to prevent possible accidental motions of the vehicle.

C-5 USING THE HANDLER

This chapter describes some techniques and provides instructions for a safe use of the machine fitted with standard forks. Before using different attachments, thoroughly read the chapter “Optional attachments".

CAUTION

Before using the machine, inspect the job site and check for possible hazardous conditions. Make sure that there are no holes, moving banks or debris that may cause you to lose the control of the machine.

ELECTRICAL DANGER

Pay the greatest attention when working close to electric lines. Check their position and ensure that no part of the machine operates at less than 6 meters from the power lines.

CAUTION

For a safe use of the machine, always check the weight of the loads going to be handled.
Always refer to the load charts applied on the cab windscreen.

■ C-5.1 USING THE LOAD CHARTS

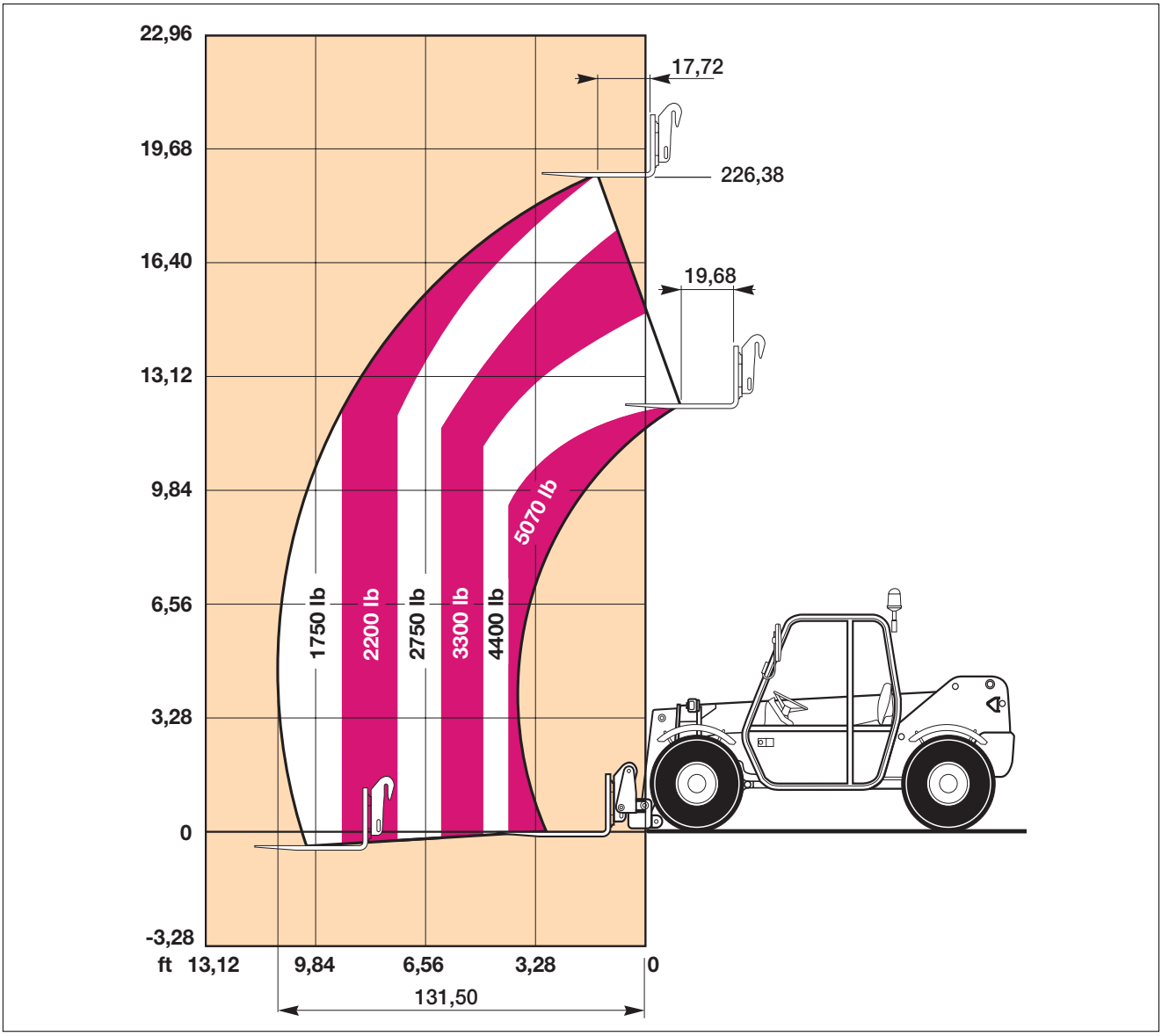
On the cab windscreen, there are the load charts that indicate the operator how far a load can be extended. The load chart indicates the payload limits of the machine under safe conditions.
To operate under safe conditions, always refer to these charts.

CAUTION

The load charts illustrated in this manual are given only as a mere example. To define the payload limits, refer to the load charts applied within the cab of your machine.

CAUTION

The load charts applied on the cab windscreen refer to a stationary machine standing on a solid and level ground.
Raise the load some centimetres and check its stability before raising it completely.



C-5.2 OVERLOAD WARNING SYSTEM DISPLAY

The driving cab dashboard is equipped with a 5-LED warning display **19**. The 5 LEDs switch on in sequence from the right to the left and indicate the gradual variation of the machine stability as it follows:

1	**green LED**	• instrument ON • machine stable
2	**green LED**	• machine stable but tending to variation
3	**green LED**	• machine stable but strongly tending to variation
4	**yellow LED**	• machine unstable
5	**red LED**	• hazardous overload; machine stops and allows only for the load return within safety limits.

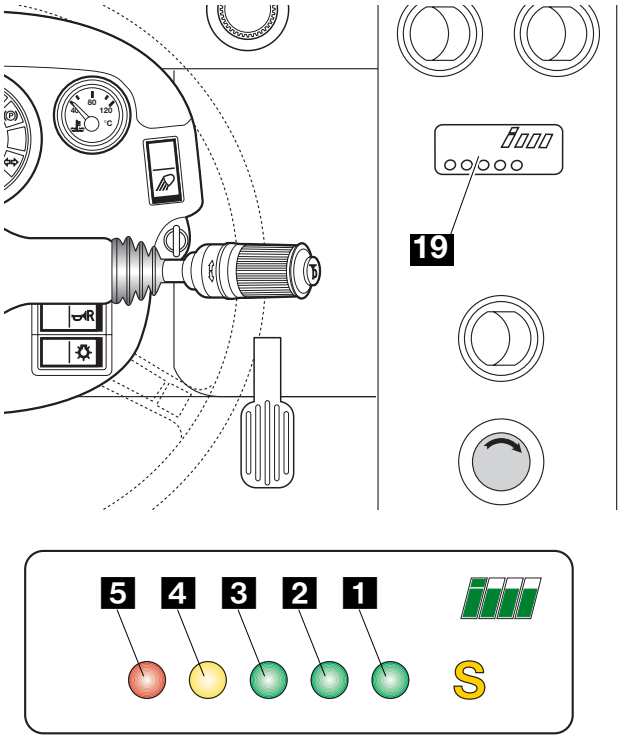
At the machine starting, the overload warning system carries out a diagnostics of all LEDs, then sets to the first green LED signalling the proper functioning of the instrument.

DANGER

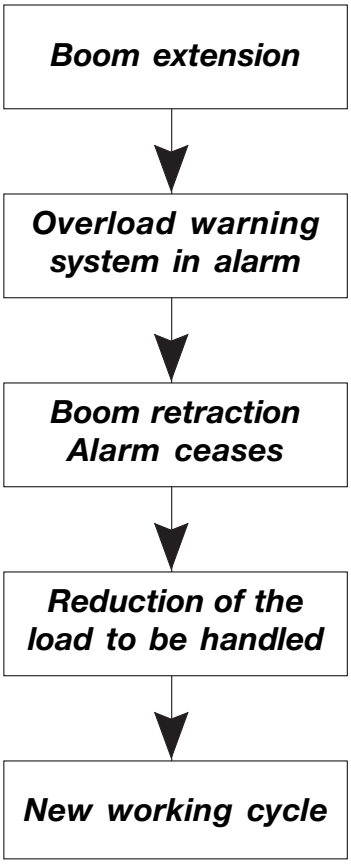
Before using the machine, make sure that the first green LED of the overload warning system is ON.

The overload warning system must not be used to check the load going to be lifted: it has only been designed to signal possible unbalances of the machine along its motion axis.

Such unbalances may also be caused by an abrupt operation of the levers during the load handling. If, during work, several indicators light up, operate the levers more smoothly.



Example of use of the overload warning system



■ C-5.3 HANDLING LOADS

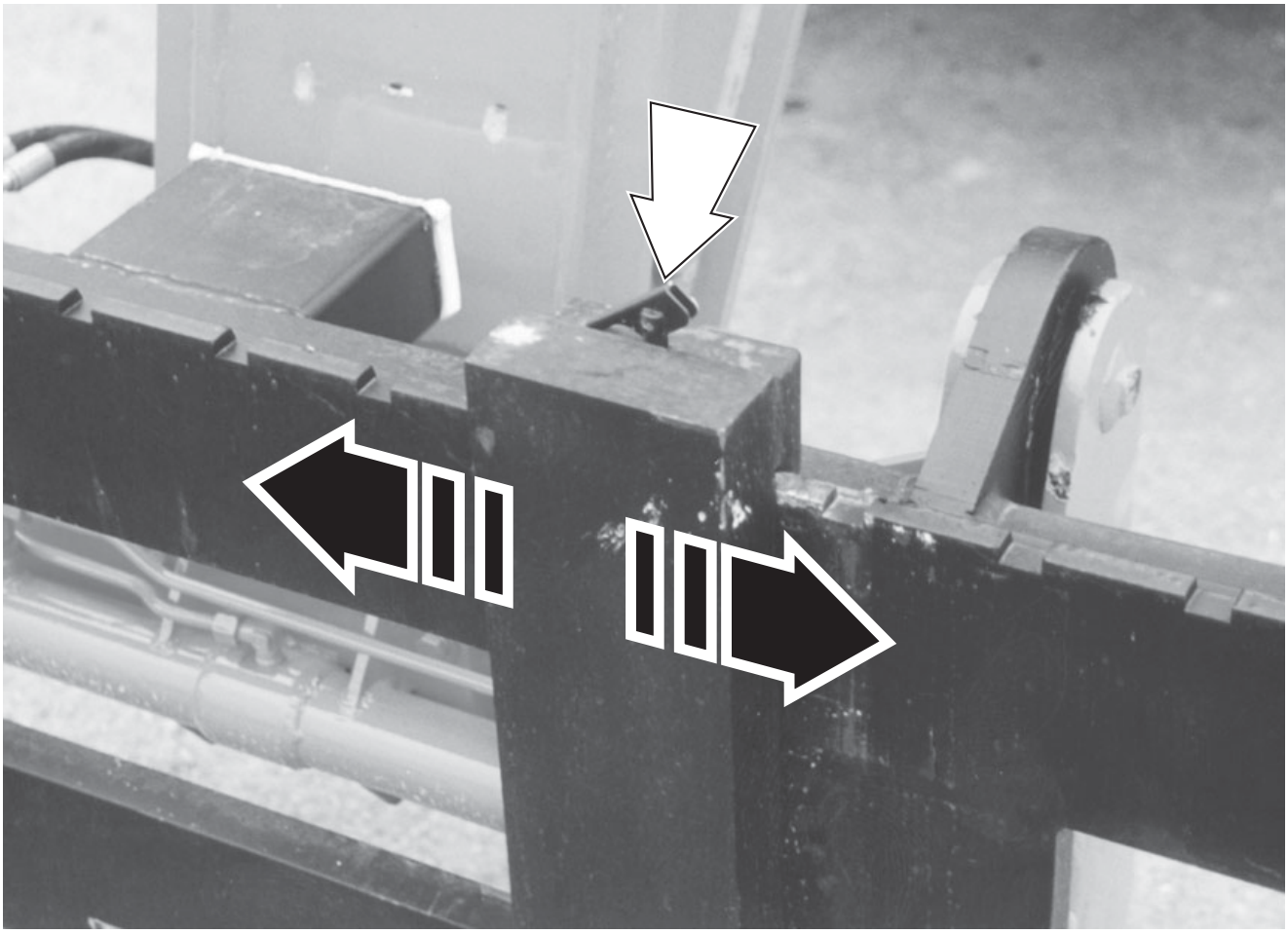
■ C-5.3.1 Adjusting the forks

Forks shall be spaced to suit the load going to be handled. For this purpose:

- Lift the clamping lever of the forks.
- Slide the forks to the desired position, then re-lock the lever.

CAUTION

- ***The centre of gravity of the load must always be halfway between the forks.***
- ***Ensure you exactly know the weight of the load before handling it.***
- ***When extending the boom, do not exceed the payload limit.***
- ***Refer to the payload limits given in the load chart applied on the cab windscreen.***
- ***Space the forks as wide as possible to suit the load being handled.***



■ C-5.3.2 Working phases

When forks are correctly spaced, the handler is ready to use.
Work can be subdivided into three different phases: loading, transfer and unloading.

Loading phase

- Approach the load to the handled perpendicularly and check that the machine is level on the inclinometer.
- Insert the forks under the load and raise the load some centimetres.
- Pitch the forks back and make sure that the overload warning system LEDs are in limits.

Transfer phase

- Do not start or brake abruptly.
- Drive to the unloading point cautiously and keep the load 20÷30 cm from the ground.
- Suit the machine speed to the ground conditions to avoid dangerous jumps, side skids of the vehicle and possible load falls.
- When driving on slopes or ramps, hold the load uphill.

DANGER

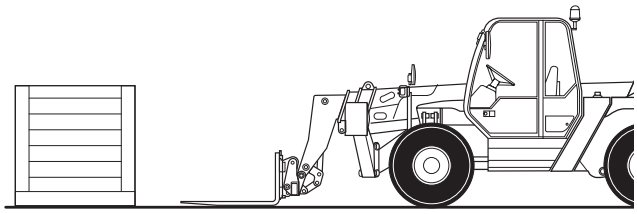
Do not drive on slopes sideways; this wrong manoeuvre is one of the main reasons for accidents due to vehicle overturning.

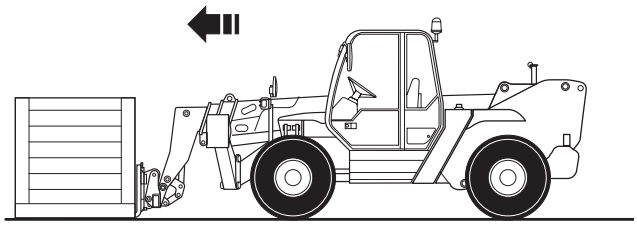
Unloading phase

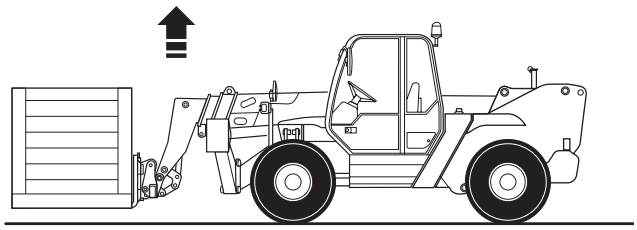
- Drive to the unloading point with straight wheels and bring the machine to a smooth stop leaving enough space to operate the boom.
- Put the parking brake and set the transmission to neutral.
- Position the load some centimetres above the desired position and set the forks level.
- Lower the load and make sure it is level.
- Carefully withdraw the forks by operating the boom retraction control and, if necessary, raise or lower the boom as forks come out.
- When the forks are clear of the load, set them to transfer position.
- Release the parking brake and start a new working cycle.

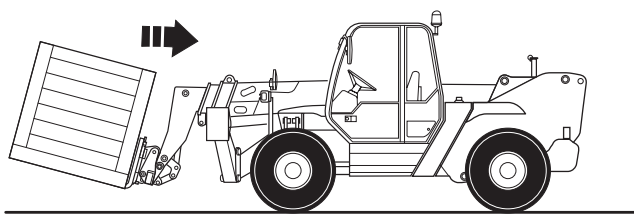
CAUTION

Do not move off when the load is raised 20÷30 cm above the ground. Risk of machine overturning or load fall.









■ C-5.4 CHANGING THE ATTACHMENT

ATTENTION

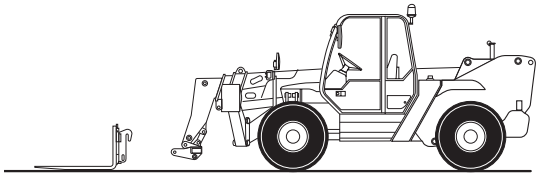
Use only attachments directly manufactured or recommended by Terexlift and detailed in the "Optional attachments" section.

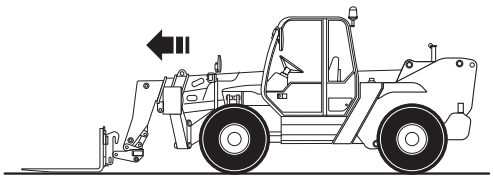
CAUTION

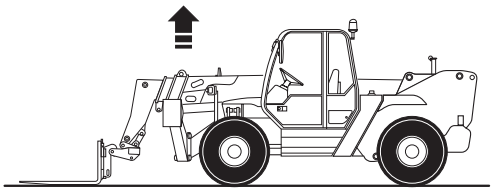
After substitution, visually check the attachment is correctly coupled to the boom, before operating the machine. A wrongly coupled attachment may result in damage to persons or things.

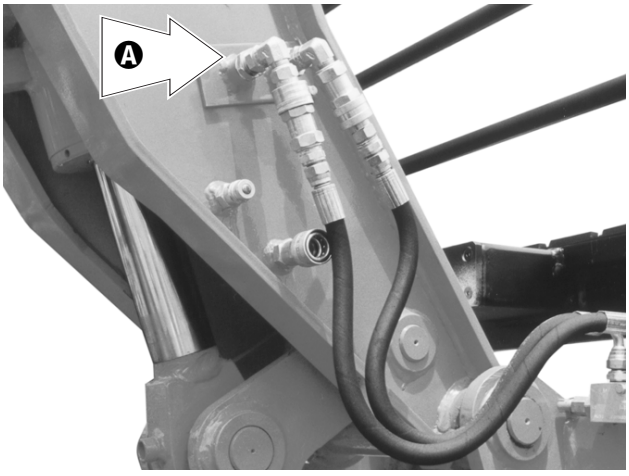
To change an attachment, operate as follows:

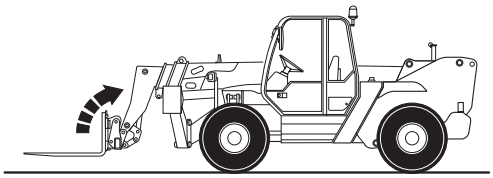
- Drive to the place where you will release the mounted attachment (when possible, a solid and sheltered site).
- Disconnect the quick connectors of the attachment (if any), and connect the hydraulic locking pipes of the attachments to couplings **A**.
- Rest the attachment flat on the ground.
- Pitch the attachment holding frame forward and lower the boom to release the attachment upper lock.
- Move back with the machine (or with the boom) and drive to the new attachment to be coupled.
- Hold the frame pitched forward and hook the upper lock of the new attachment.
- Retract and raise the attachment some centimetres. It will centre automatically on the quick coupling frame.
- Operate the control lever to lock the attachment.

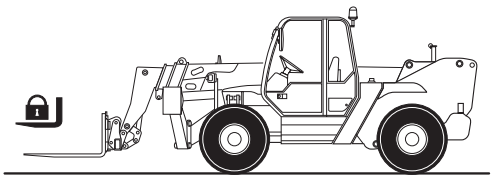












- Couple the connectors of the attachment, if any, to the quick couplings of the frame.

DANGER

After the substitution of an attachment or after any coupling operation, visually check the attachment. A wrongly coupled attachment may result in damage to persons or things.

C-6 TRANSPORTING THE MACHINE

C-6.1 MOVING A DISABLED MACHINE

Tow the machine only when no alternative is possible, since this operation may result in serious damage to the transmission. When possible, repair the machine on site.

When the machine shall absolutely be towed:

- Tow the machine for short distances and at a low speed only.
- Use a rigid drawbar.
- Select the two-wheel steer.
- Set the gearbox lever to neutral.
- When possible, start the engine and use the hydraulic drive and the braking system.
- Raise the front wheels of the machine and remove the Cardan shaft of the transmission.

■ C-6.2 ROAD OR SITE TRANSFER

When travelling on public roads, strictly obey the local or national road traffic regulations.

Besides, take into account the following general precautions:

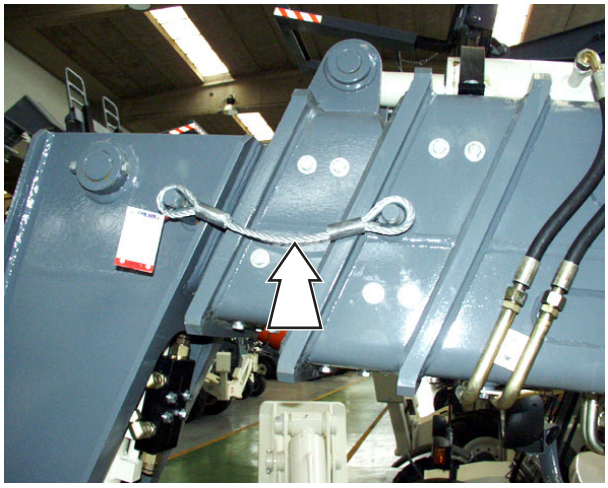
- Align the rear wheels.
- Select the two-wheel steer.
- Set the ROAD-CAB switch to “ROAD” position.
- Lock the machine as indicated in the Registration Card:

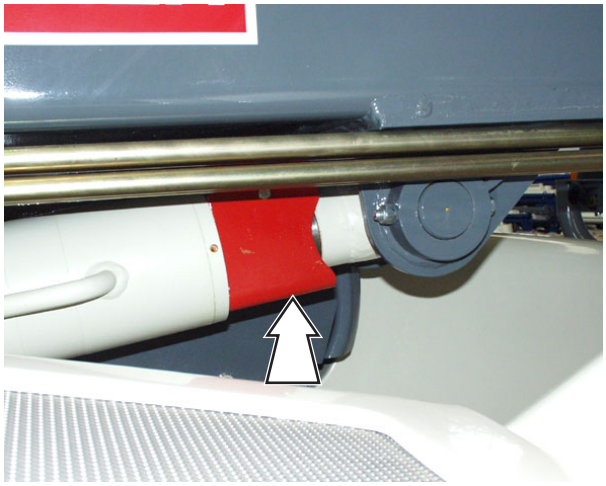
  Lock the boom sections, the lifting cylinder, the attachment rotation cylinder, the stabilisers (see photo).
- Cover the fork teeth with the special guard.
- Retract boom and attachment to transfer position.
- Make sure that lights, horn and turn signals are in working order.
- Start the machine (the beacon will switch on automatically).
- Engage a high speed.
- The transfer speed of the vehicle will depend on the engine rpm and the position of the control lever.

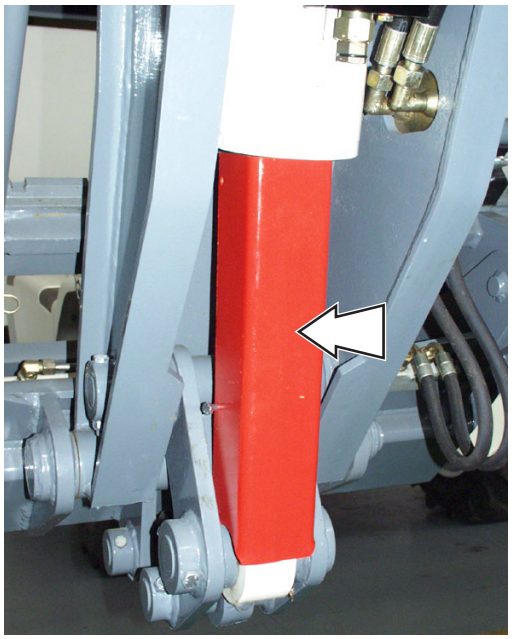
CAUTION

Public road circulation is allowed only for transferring an unloaded machine.

Do not use the machine to tow trailers.



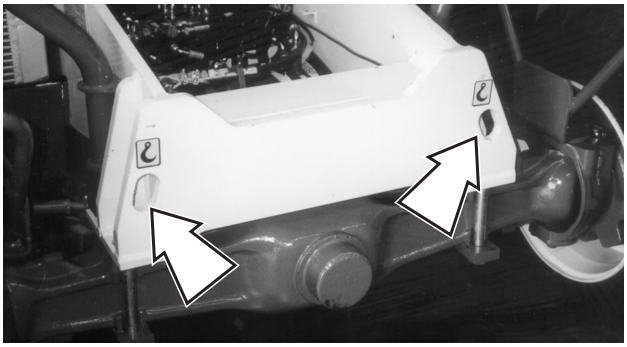


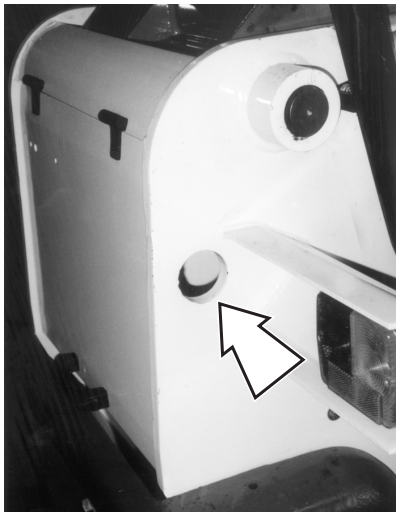


■ C-6.3 LIFTING THE MACHINE

When the machine shall be lifted, use only means having a suitable capacity. The characteristic data are detailed in the relevant chapter of this manual and on the identification plate.

For the machine lifting, anchor the chains to the special lugs on the machine (marked with the decal below).

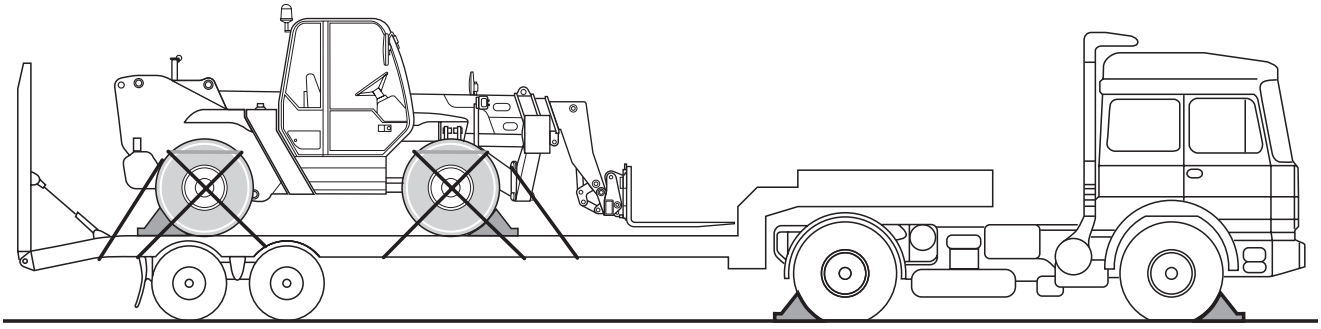




■ C-6.4 TRANSPORTING THE MACHINE ON OTHER VEHICLES

To transport the machine on another vehicle, follow the steps below:

- Put chocks at the machine wheels.
- Ensure ramps are correctly positioned.
- Retract the boom to transfer position.
- Carefully drive the machine onto the transporting vehicle.
- Put the parking brake and rest the attachment flat on the vehicle platform.
- Ensure the overall dimensions do not exceed the allowed limits.
- Shut the engine down and close the driving cab of the machine.
- Secure the machine to the vehicle platform by wheel-chocks.
- Anchor the machine to the transporting vehicle with suitable chains.



■ C-6.5 PARKING AND STORAGE

■ C-6.5.1 Short inactivity

Always park the machine in a safe way after a working day, a shift and at night.

Take all precautions to prevent damage to those persons who will approach the machine while stationary:

- Park the machine so that it does not hinder other operations.
- Lower the boom fitted with attachment on the ground.
- Disengage the transmission and put the parking brake.
- Remove the key from the ignition switch and lock the cab door.
- Disconnect the battery by the appropriate switch ("Battery cut-out switch").

■ C-6.5.2 Machine storage

In case of extended inactivity of the machine, follow the above precautions. Additionally:

- Wash the machine thoroughly. For a better cleaning, remove grills and protection casings
- Carefully dry all machine parts by blowing some compressed air.
- Lubricate the machine thoroughly.
- Do a walk-around inspection and replace any worn or damaged part.
- Re-paint any worn or damaged part.
- Remove the battery, smear its terminals with vaseline and store it in a dry place. Battery can be used for other purposes. Otherwise, periodically check its charge level.
- Refuel the tank to prevent internal oxidation.
- Store the machine in a sheltered and well-ventilated place.
- Start the engine for about 10 minutes at least once a month.
- When weather is particularly cold, empty the radiator.

IMPORTANT

Always remember that the ordinary maintenance must be carried out even during the machine inactivity. Pay particular attention to the fluid levels and to those parts subject to ageing. Before re-starting the machine, carry out an extraordinary maintenance and carefully check all mechanical, hydraulic and electrical components.

■ C-6.6 MACHINE DISPOSAL

At the end of the machine life, call in a specialised firm to dispose of it in compliance with the local or national regulations.

■ C-6.6.1 BATTERY DISPOSAL

Used lead-acid batteries cannot be disposed of as normal industrial solid wastes. Because of the presence of harmful substances, they must be collected, eliminated and/or recycled in accordance with the laws of the UE.

In Italy, used or discarded batteries have been classified as "Toxic wastes" in accordance with Presidential decree n. 397 of 09/09/1988 and Law n. 475 O.G. n. 18 of 09/11/1988 because they contain lead and sulphuric acid. Their disposal through recycling must be done only through companies authorised and belonging to the "Consorzio Obbligatorio Batterie Esauste e dei rifiuti piombosi" (Cobat) which collect and dispose of used lead-acid batteries throughout the national territory.
Used batteries must be kept in a dry and confined place. Make sure the battery is dry and the cell plugs are tight. Place a sign on the battery to warn of not using it. If before disposal the battery is left in the open air, it will be necessary to dry, smear the box and the elements with a coat of grease and tighten the plugs. Do not rest the battery on the ground; it is always advisable to rest it on a pallet and cover it. The disposal of batteries shall be as rapid as possible.

Section D

MAINTENANCE

TABLE OF CONTENTS

INTRODUCTION

A thorough and regular maintenance keeps the machine in a safe and efficient working condition.

For this reason, it is advisable to wash, grease and service the machine properly, especially after having worked under particular conditions (muddy or dusty environments, heavy operations, etc.).

Always ensure all machine components are in good condition. Check for oil leaks or loosening of guards, and make sure that the safety devices are efficient. In case of defects, find and rectify them before using the machine again.

The maintenance interventions are based on the machine working hours. Regularly check the hour-meter and keep it in good condition to define the maintenance intervals correctly.

Not respecting the ordinary maintenance schedule of this manual automatically voids GENIE warranty.

IMPORTANT

For the engine maintenance, please refer to the specific Operator handbook supplied with the machine.

D-1 LUBRICANTS - HEALTH AND SAFETY PRECAUTIONS

Health

A prolonged skin contact with oil can cause irritation. Use rubber gloves and protective goggles. After handling oil, carefully wash your hands with soap and water.

Storage

Always keep lubricants in a closed place, out of the children's reach. Never store lubricants on the open air and without a label indicating their contents.

Disposal

New or exhausted oil is always polluting! Never drain oil on the ground. Store new oil in a suitable warehouse. Pour exhausted oil into cans and deliver them to specialised firms for disposal.

Oil leaks

In case of accidental oil leaks, cover with sand or type-approved granulate. Then scrape off and dispose of it as chemical waste.

First aid

Eyes : In case of accidental contact with the eyes, wash with fresh water. If the irritation persists, seek medical advice.

Intake : In case of oil intake, do not induce vomiting, but seek medical advice.

Skin : In case of a prolonged contact, wash with soap and water

Fire

In case of fire, use carbon dioxide, dry chemical or foam extinguishers. Do not use water.

D-2 ROUTINE MAINTENANCE

A wrong or neglected maintenance can result in possible risks for both operator and bystanders. Make sure maintenance and lubrication are carried out according to the manufacturer's instructions to keep the machine safe and efficient.

The maintenance interventions are based on the machine working hours. Regularly check the hour-meter and keep it in good conditions to define the maintenance intervals correctly. Make sure any defect detected during the maintenance is promptly rectified before using the machine.

ATTENTION

All " ▲ " marked operations must be carried out by a skilled technician.

During the first 10 working hours

1 Check the oil level within reduction gears, power divider and differential gears
2 Regularly check the tightening of the wheel bolts
3 Check the tightening of all bolts and nuts
4 Check the couplings for oil leaks

Within the first 50 working hours

1 Change the oil for the first time

Every 10 working hours or daily

1 Check the engine oil level
2 Clean the air suction filter
3 Check the engine coolant level
4 Clean the radiator, if necessary
5 Check the hydraulic oil level in the tank
6 Check the greasing of the boom section pads
7 Grease the attachment holding frame
8 Grease all joints of the boom, the rear axle shaft joint, the transmission shafts, the front and rear axles and any equipment of the machine
9 Check the efficiency of the lighting electric system
10 Check the efficiency of braking system and parking brake
11 Check the efficiency of the steering selection system
12 Check the efficiency of the fork balancing system.
13 Make sure the safety devices installed are in efficient working order - see procedure in **chap. D-3.15**.

Every 50 working hours or weekly

Jobs to be done in addition to those above

1 Check the tension of the alternator belt
2 Check the tyre inflation
3 Check the tightening of the wheel nuts
4 Check the tightening of the Cardan shaft screws

Every 250 working hours or monthly

Jobs to be done in addition to those above

1 Change the engine oil and relevant filter
2 Check the oil level in the front and rear differential gears
3 Check the oil level in the four wheel reduction gears
4 Check the condition of the canister of the engine air filter; renew the canister if necessary
5 Check the clamping of the cableheads to the battery terminals
6 Check the air suction hose between engine and filter
7 Check the cylinder chromium-plated rods
8 Check the hydraulic lines are not worn because of rubbing against the frame or other mechanical components
9 Check the electric cables do not rub against the frame or other mechanical components
10 ▲ Check the wear of the sliding pads of the boom sections
11 ▲ Adjust the play of the sliding pads of the boom sections
12 Remove any grease from the boom, then re-grease the sliding parts of the boom sections
13 Check the level of the battery electrolyte

Every 3 working months

1 Check the efficiency of the block valves - see **chap. D-3.15.**

Every 500 working hours or every six months

Jobs to be done in addition to those above.

1. Visually check the smoke quantity evacuated from the engine exhaust
2. Check the tightening of the engine fixing screws
3. Check the tightening of the cab fixing screws
4. Check the backlash between pins and bushings in all joints
5. Change the hydraulic oil filter of the transmission
6. Change the hydraulic oil filter in the tank
7. Have the hydraulic system checked by a skilled technician
8. Change the main cartridge of the engine air filter

Every 1000 working hours or yearly

Jobs to be done in addition to those above

1. Change the oil in the front and rear differential units and in the power divider
2. Change the oil in the four wheel reduction gears
3. Change the hydraulic oil

Every 2000 working hours or every two years

Jobs to be done in addition to those above

1. Change the engine coolant

D-3 MAINTENANCE JOBS

DANGER

All maintenance interventions must be carried out with engine stopped, parking brake engaged, working attachments flat on the ground and gear lever in neutral.

CAUTION

When raising a component for maintenance purposes, secure it in a safe way before any maintenance intervention.

CAUTION

Any intervention on the hydraulic circuit must be carried out by skilled personnel.
The hydraulic circuit of this machine is fitted with pressure accumulators. You and others could be seriously injured if accumulators are not completely depressurised.
To depressurise the accumators, just steer the machine wheels some times with engine shut down until noticing a gradual binding of the handwheel.

CAUTION

Before any operation on hydraulic lines or components, make sure there is no residual pressure. For this purpose, stop the engine, engage the parking brake and operate the control levers of the distributors in both working directions (alternately) to depressurise the hydraulic circuit.

ATTENTION

High pressure lines must be replaced by qualified personnel only.
Any foreign matters entering the closed circuit may result in a sudden deterioration of the transmission.

ATTENTION

The qualified staff charged with the maintenance of the hydraulic circuit must clean all areas around with care before any intervention.

PROTECT THE ENVIRONMENT

The handling and disposing of used oils can be ruled by local or national regulations. Address to authorised centres.

D-3.1 DISCONNECTING THE BATTERY

During maintenance or repair works, and while welding, turn off the battery main switch, located behind the front right wheel compartment (**C-4.4, p. C-23**).

■ D-3.2 ACCESS TO THE ENGINE AND TANKS COMPARTMENTS

■ Engine compartment

For any operation within the engine compartment, open the protection bonnet.

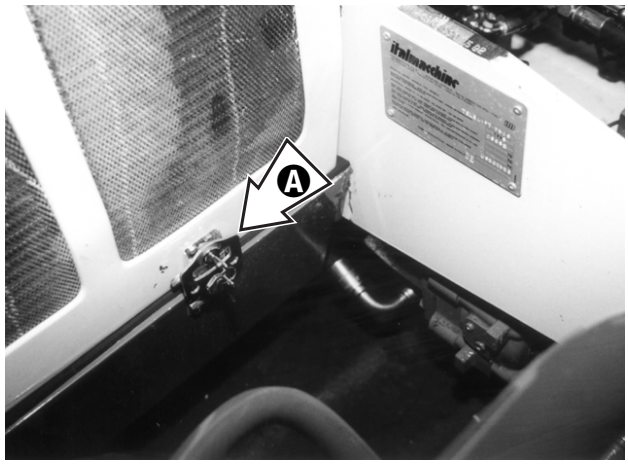
Hood is equipped with lock & key and a supporting rod that holds it in position.

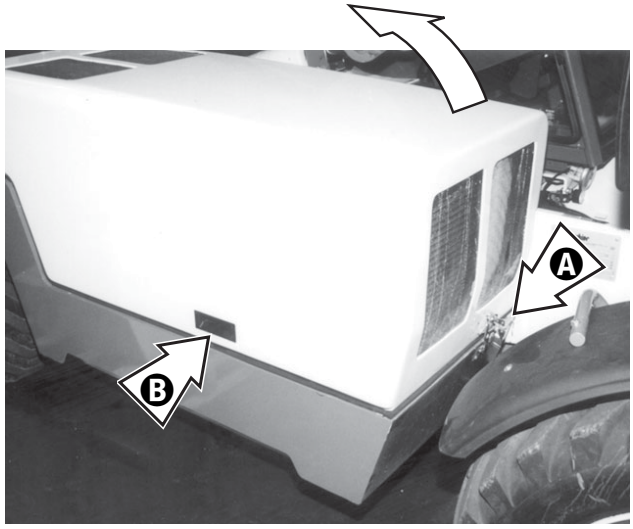
From the engine compartment, you get access to:

- Thermal engine
- Engine air filter Ⓒ
- Hydraulic oil tank plug Ⓓ
- Radiator fluid compensation cup Ⓔ
- Battery

To get access to the engine compartment:

- Shut the engine down and put the parking brake.
- Unlock the hood lock Ⓐ.
- Lift the hood using the special handle Ⓑ.
- Position the supporting rod Ⓕ into its seat.





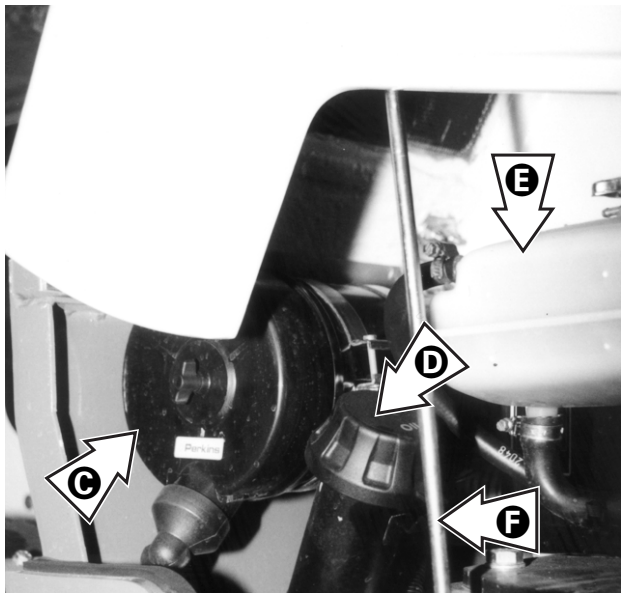
DANGER

Take all precautions when approaching the engine compartment. Some parts of the engine may be very hot. Always use protective gloves.

■ Diesel fuel tank compartment

To gain access to the fuel tank, open the rear cover of the machine as follows:

- Shut the engine down and put the parking brake.
- Fully raise the cover by means of the special handle.



■ D-3.3 GREASING

ATTENTION

Before injecting grease into the greasers, thoroughly clean them to avoid that mud, dust or other matters can mix with the lubricant and reduce or annihilate the lubrication effect.
Remove any old grease with a degreaser from the telescopes before smearing them with new grease.

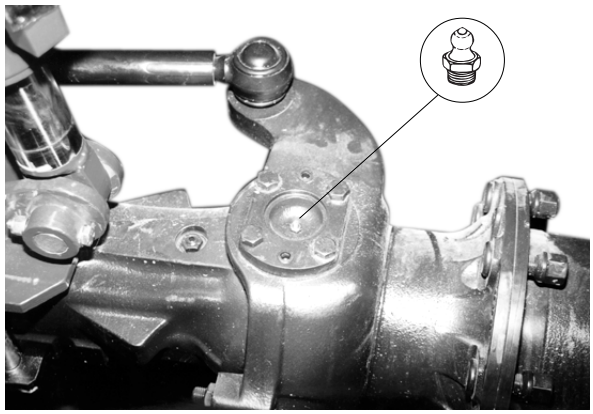
Regularly grease the machine to grant it efficient conditions and a long life.

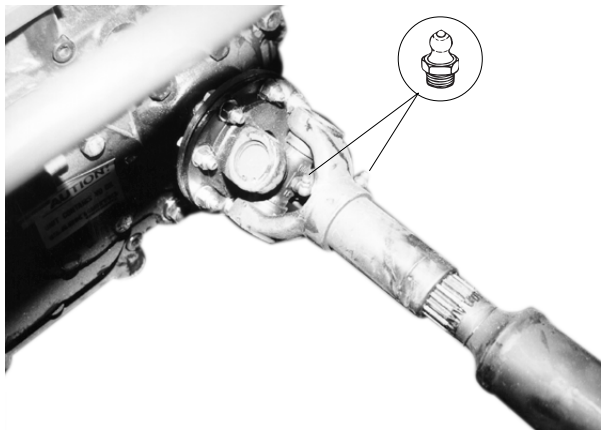
By means of a pump, inject grease into the special greasers.

As the fresh grease comes out, stop the operation.

The greasing points are shown in the following figures:

- the symbol  represents the points to be greased by a pump
- the symbol  represents the points to be greased by a brush.

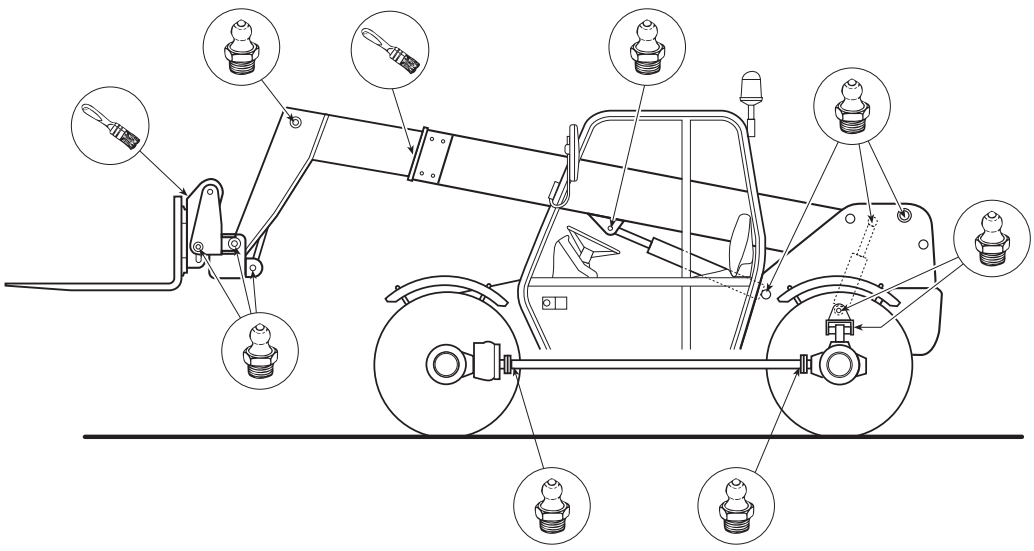




SERVICE INTERVAL

Running-in _____ **None**

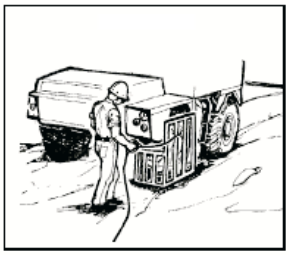
Ordinary _____ **Every 10 hours**

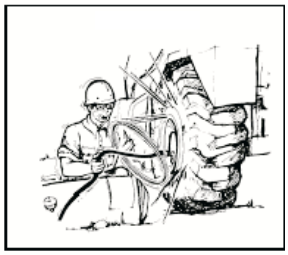


■ D-3.4 TYRES AND WHEELS

DANGER

Over-inflated or overheated tyres can burst. Do not flame-cut or weld the wheel rims. For any repair work, call in a qualified technician.





For the tyre inflation or substitution, please refer to the table below:

		GTH-2306	
		standard	optional
Dimensions		12-16.5 EM14	11.5/80-15.3
Load index		pr 8	pr 10
Rim		9.75x16	9.00x15.3
Wheel disc		8 holes DIN 70361	
Pressure	bar	3.5	3.5
	Psi	50.8	50.8

On new machines, and when a wheel has been disassembled or replaced, check the nut torque of the wheels every 2 hours until they stay correct.

ATTENTION

Always use tyres having the dimensions indicated in the vehicle registration card.

SERVICE INTERVAL

Running-in _____ **Within the first 10 hours**

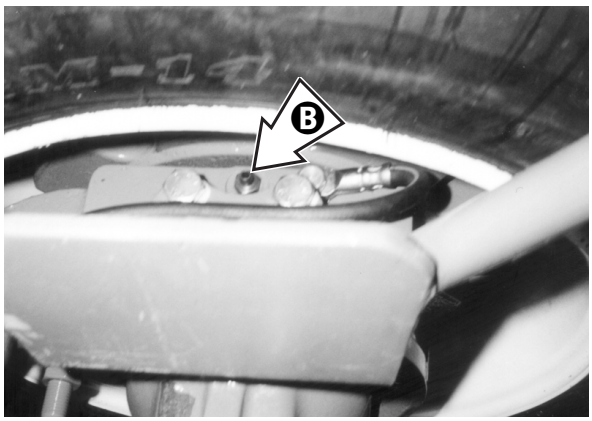
Ordinary _____ **Every 250 hours**

■ D-3.5 BRAKES

- For any intervention on the braking system (adjustment and/or substitution of the brake discs) call in a specialised technician.

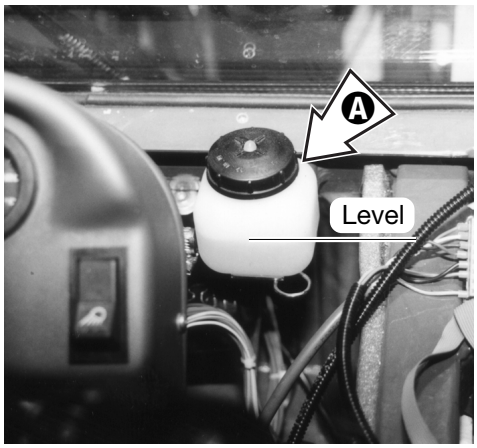
The malfunctioning of the braking system may depend on the presence of air within the hydraulic circuit.
To bleed the circuit, proceed as follows:

- Make sure that the oil is level within the feeding tank Ⓐ.
- Step on the brake pedal repeatedly.
- While stepping on the brake pedal, slowly unscrew valve Ⓐ and re-close it as soon as oil mixed with air bubbles comes out.
- Repeat the operation until bubble-free oil comes out.
- Bleed from both sides of the machine.



■ D-3.5.1 Checking the brake oil level

The oil within the braking circuit must be at about 2 cm from the tank plug Ⓐ.

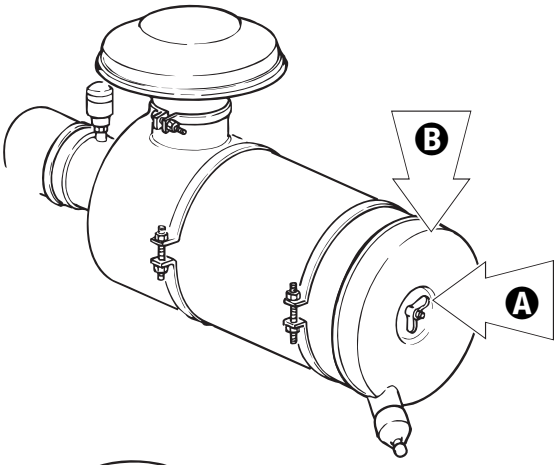


■ D-3.6 ENGINE AIR FILTER

Clean the engine air filter every 10 hours; replace the filtering element, if necessary.

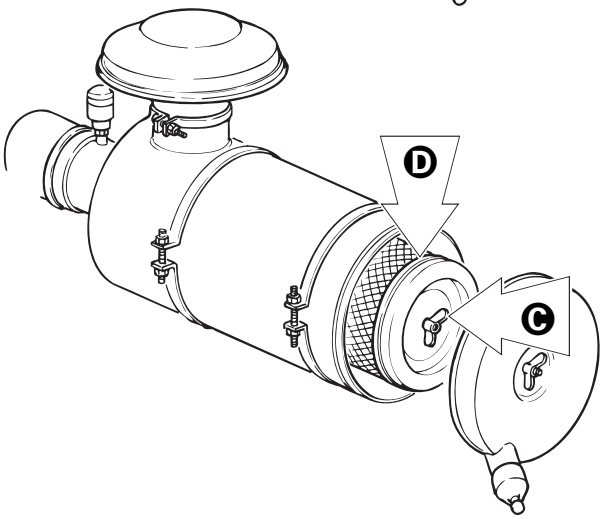
1 Cleaning and changing the external element:

- Stop the engine and engage the parking brake.
- Unscrew wingnut **A** and remove cover **B**.
- Unscrew wingnut **C** and remove the outer element **D**.
- Clean the filter bowl.
- Dry clean the canister (max. pressure: 6 bar) and direct the air jet from inside to outside.
- Check for cracks in the filtering element introducing a lamp inside.
- Smear the seal with grease, then refit the element.
- Tighten wingnut **C**, close cover **B** and tighten with wingnut **A**.



ATTENTION

When the cab indicator comes on, replace the outer element immediately.

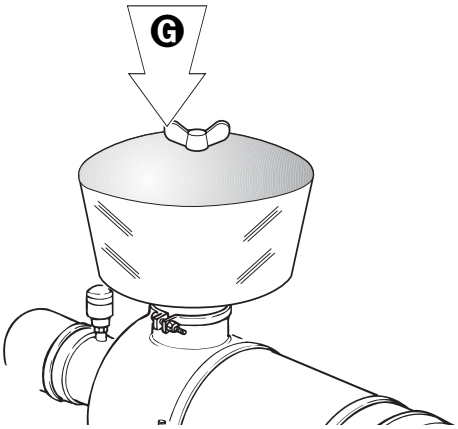


ATTENTION

The handlers of the agricoltural series are equipped with centrifugal pre-filter.

Daily check it and remove any collected dust.

To empty the dust bowl, unscrew wing nut G and remove the dust canister.



SERVICE INTERVAL

Running-in	**None**
Cleaning	**Every 10 hours**
Filtering element substitution	**Every 500 hours**

■ D-3.7 ENGINE COOLING SYSTEM

DANGER

When the coolant is hot, the cooling system is under pressure. With warm engine, loosen the radiator plug slowly and carefully, without removing it, to drain the pressure. Use protection gloves and keep your face at a safe distance.

- Weekly check the coolant level within pan Ⓐ before starting working (when coolant is cold).
- When necessary, add clean water or an antifreeze mixture through cap Ⓑ.
- Change the antifreeze mixture every two years.

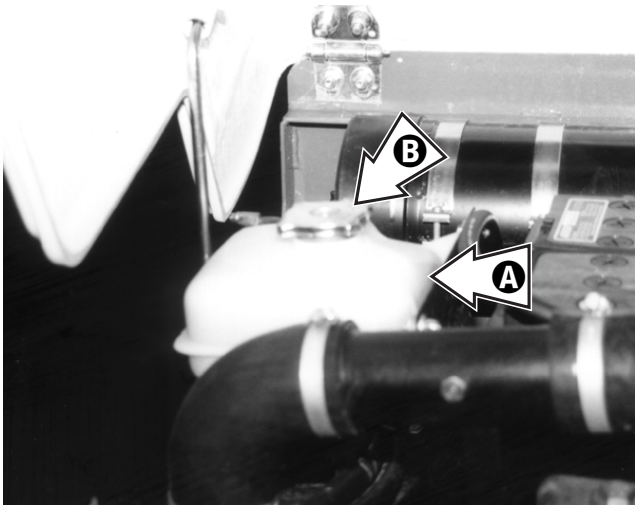
  To drain the antifreeze:

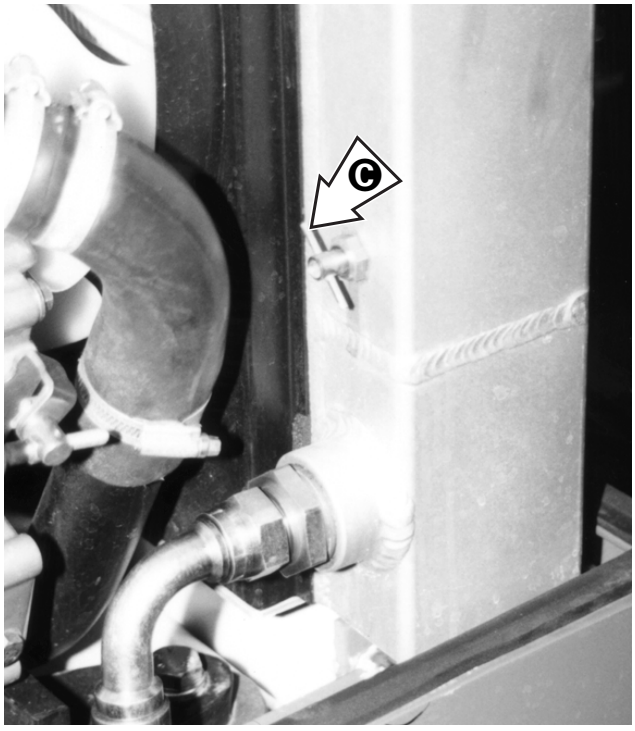
  - Let the engine cool down
  - Unscrew the plug at the bottom of the radiator or disconnect the rubber hose, if no plug is present. Allow the coolant to flow out into a special container.
  - Refit the hose and pour new antifreeze (50% water-antifreeze). This proportion will provide protection up to -38°C.
- Daily clean the radiator grille.

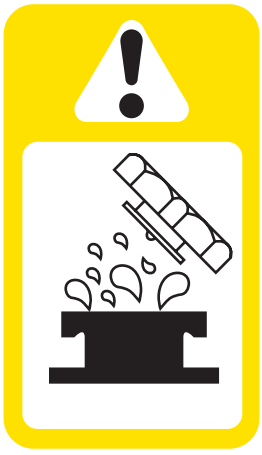
SERVICE INTERVAL

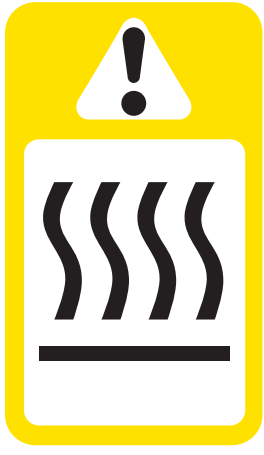
Running-in _____ **None**

Ordinary _____ **Every 50 hours**









■ D-3.8 CHECKING THE OIL LEVEL IN THE TANK

DANGER

Fine jets of hydraulic oil under pressure can penetrate the skin. Do not use your fingers, but a piece of cardboard to detect oil leaks.

Check the hydraulic oil level (visually) through the special level Ⓑ fitted into the tank.

When necessary, add new oil through filler Ⓐ.

CAUTION

Check the oil level with handler set to transfer position (lowered boom and retracted telescopic element).

SERVICE INTERVAL

Running-in _____ **Within the first 10 hours**

Ordinary _____ **Every 50 hours**

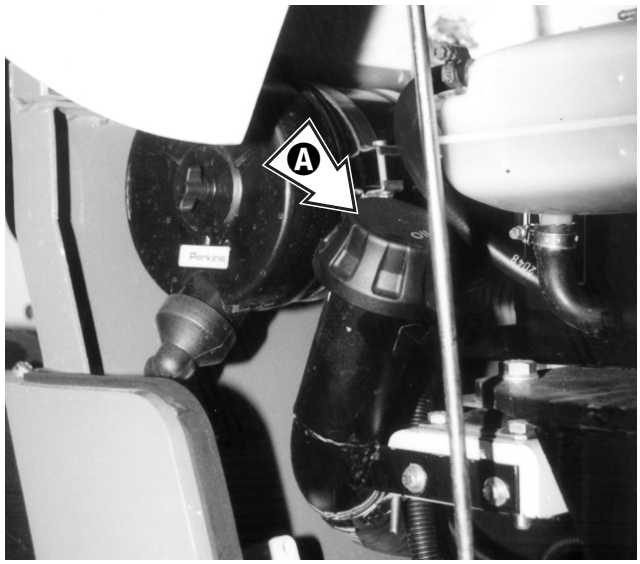
If oil must be changed, proceed as follows:

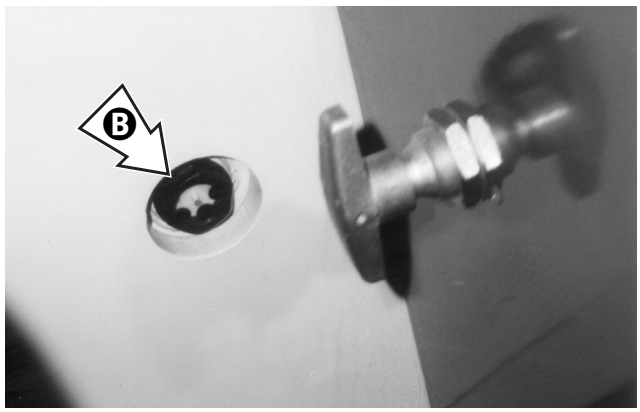
1. Stop the machine on a level ground and make sure the parking brake is engaged.
2. Release the pressure from the hydraulic circuit.
3. Place a container of suitable size under the drain plug, placed in the lower part of the reservoir, and collect any oil leaks.
4. Remove the drain plug and allow oil to flow out into the container.
5. Remove the inspection cover of tank Ⓒ.
6. Carefully wash the tank with Diesel oil and blow a jet of compressed air.
7. Refit the drain plug and the inspection cover.
8. Add new oil by making sure that it matches the recommended type indicated in paragraph D-5.2.2. until it is level with Ⓑ.

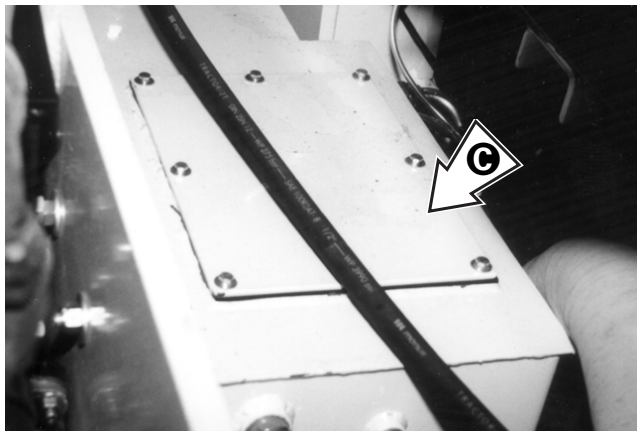
SERVICE INTERVAL

Running-in _____ **None**

Ordinary _____ **Every 1000 hours**







PROTECT THE ENVIRONMENT

The handling and disposing of used oils can be ruled by local or national regulations. Address to authorised centres.

■ D-3.9 CHANGING THE OIL FILTER CANISTERS ON THE INTAKE LINE

■ D-3.9.1 Transmission oil filter

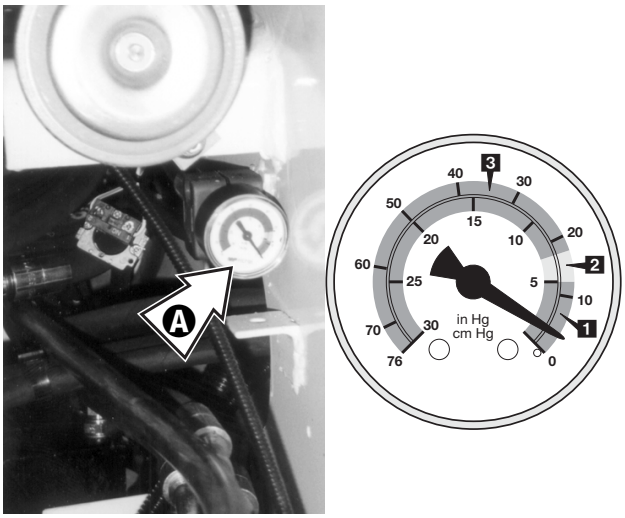
Every 50 hours, check the clogging degree of the filtering element using the vacuometer Ⓐ.

The indexed scale of the vacuometer is divided into 3 areas:

1 - Green area: Normal condition

2 - Yellow area: Replace the filter as soon as possible

3 - Red area: Shut the engine down to prevent damage to the hydraulic system. Change the filter and/or check for the fault reasons.



To change the hydraulic oil filter element on the suction line, proceed as follows:

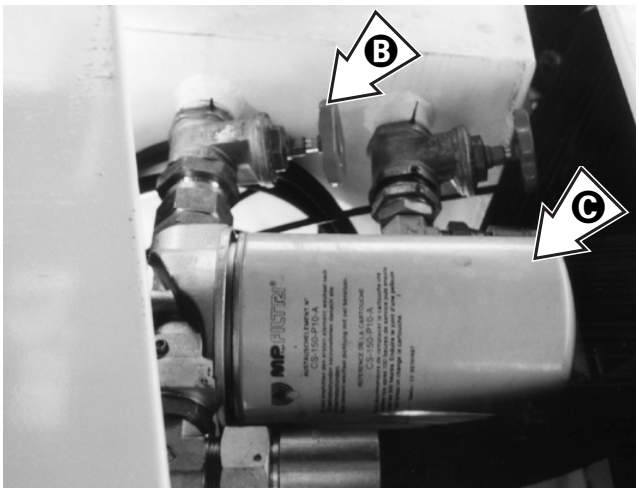
1 Stop the machine on a level ground and engage the parking brake.

2 Place a container of suitable size under the filter to collect any oil leaks, then close cock Ⓑ.

3 Remove the filtering element Ⓒ using a wrench.

4 Change the filtering element, then, before fitting a new one, thoroughly clean and grease both seat and gasket.

5 Hand-tighten and re-open cock Ⓑ.



IMPORTANT

Hydraulic oil filter cartridges cannot be cleaned or washed and refitted.
They must be replaced with new ones of the type recommended by the manufacturer (see par. D-5.2.2).

PROTECT THE ENVIRONMENT

The handling and disposing of used oils can be ruled by local or national regulations. Address to authorised centres.

IMPORTANT

When changing the oil, drain it when it is still hot and the polluting substances are in suspension.

SERVICE INTERVAL

Running-in _____ **None**

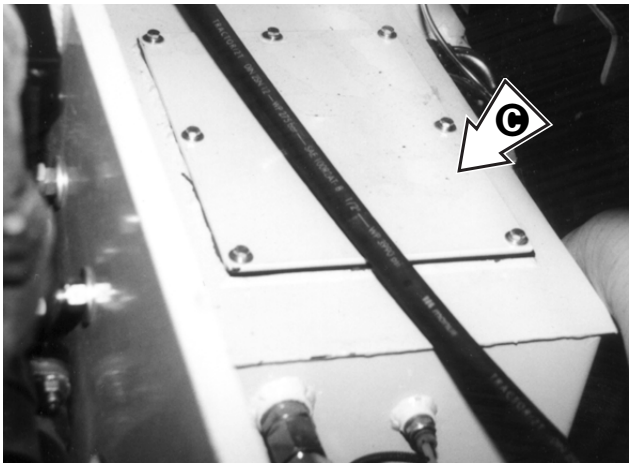
Ordinary _____ **Every 500 hours**

When the dashboard indicator switches on

■ D-3.9.2 Auxiliary circuits oil filter

To change the hydraulic oil filter cartridge of the service circuits, proceed as follows:

1. Stop the machine on a level ground and engage the parking brake.
2. Remove the inspection hatch Ⓓ and unscrew the oil filter fitted inside the tank.
3. Check the tank is clean, then fit a new filtering element and refit the inspection hatch.
4. Check the oil level within the tank. Add new oil, if necessary.



SERVICE INTERVAL

Running-in _____ **None**

Ordinary _____ **Every 500 hours**

D-3.10 OIL LEVEL IN THE DIFFERENTIAL GEARS

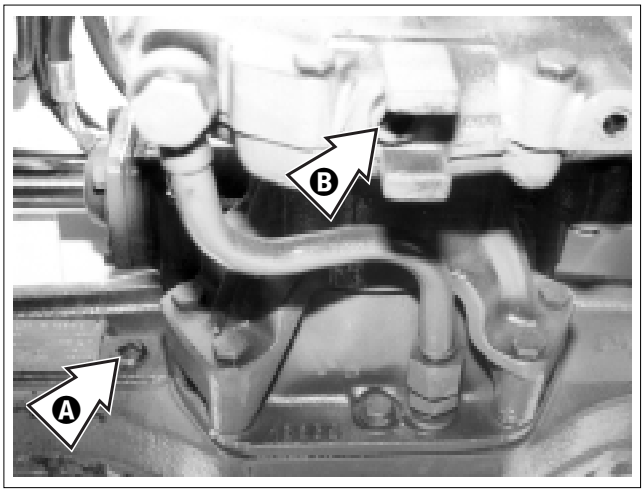
D-3.10.1 Front differential gear

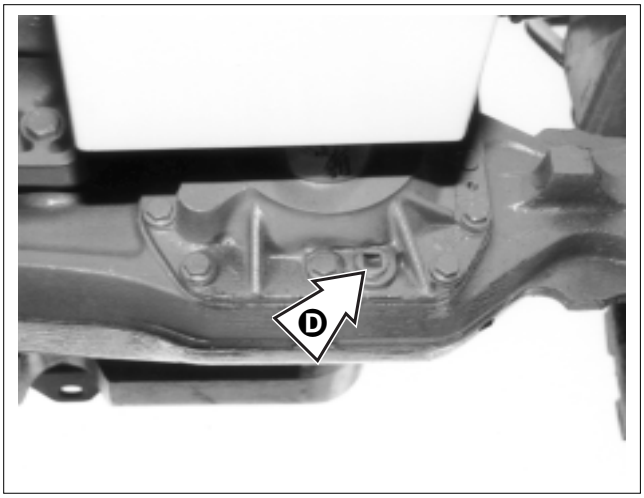
To check the oil level in the front differential gear:

- Stop the machine on a level ground and engage the parking brake.
- Loosen level plug Ⓐ and check if oil is level with the hole.
- If necessary, add new oil through the hole of the level plug until it comes out.
- Refit and tighten plug Ⓐ.

For the oil change:

- Place a container of suitable size under drain plug Ⓑ.
- Loosen the drain plug and the level plug Ⓐ and allow oil to flow out from the reduction gear.
- Refit and tighten drain plug Ⓑ.
- Add new oil through plug Ⓐ until it is level with the hole.
- Refit and tighten level/filler plug.





D-3.10.2 Rear differential gear

To check the oil level in the rear differential gear:

- Stop the machine on a level ground and engage the parking brake.
- Loosen level plug Ⓒ and check if oil is level with the hole.
- If necessary, add new oil through the hole of the level plug until it comes out.
- Refit and tighten plug Ⓒ.

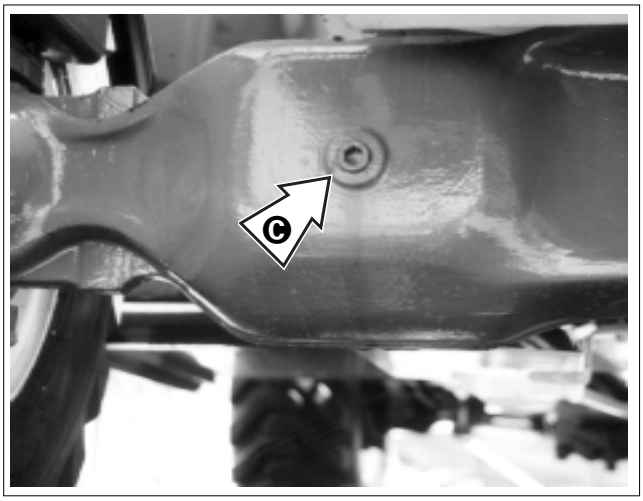
For the oil change:

- Place a container of suitable size under drain plug Ⓓ.
- Loosen the drain plug and the level plug Ⓒ and allow oil to flow out from the reduction gear.
- Refit and tighten drain plug Ⓓ.
- Add new oil through plug Ⓒ until it is level with the hole.
- Refit and tighten level/filler plug.

SERVICE INTERVAL

Running-in _____ **Within the first 10 hours**

Ordinary _____ **Every 250 hours**



■ D-3.11 OIL LEVEL IN THE (front/rear) WHEEL REDUCTION GEARS

To check the oil level within the wheel reduction gears:

- Stop the machine on a level ground and ensure the parking brake is engaged and plug Ⓐ finds on the horizontal axis.
- Clean the plug all around, then remove it and check if oil is level with the hole.
- If necessary, add new oil through hole Ⓐ until it is level.
- Refit the plug.

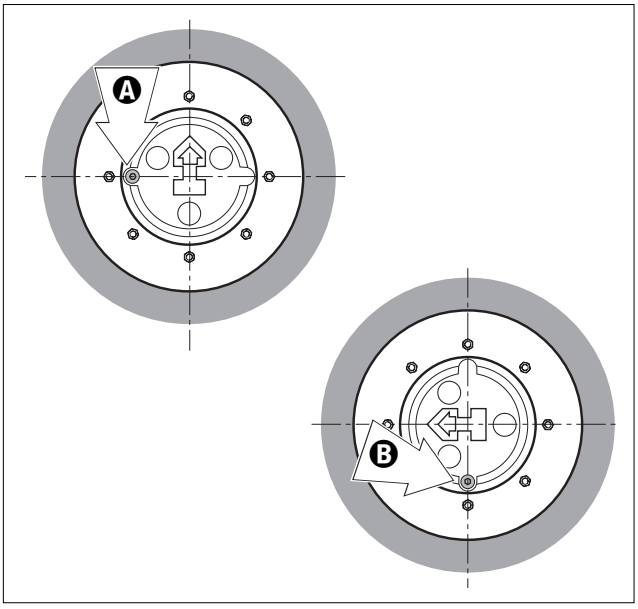
For the oil change:

- Stop the machine and ensure the plug is oriented along the vertical axis.
- Place a container of suitable size under the reduction gear plug.
- Unscrew plug Ⓐ and drain any oil from the reduction gear.
- Rotate the wheel by 90° until the plug finds again on the horizontal axis.
- Add new oil through hole Ⓐ.
- Refit and tighten plug Ⓐ.

SERVICE INTERVAL

Running-in _____ **Within the first 10 hours**

Ordinary _____ **Every 250 hours**



PROTECT THE ENVIRONMENT

The handling and disposing of used oils can be ruled by local or national regulations. Address to authorised centres.

IMPORTANT

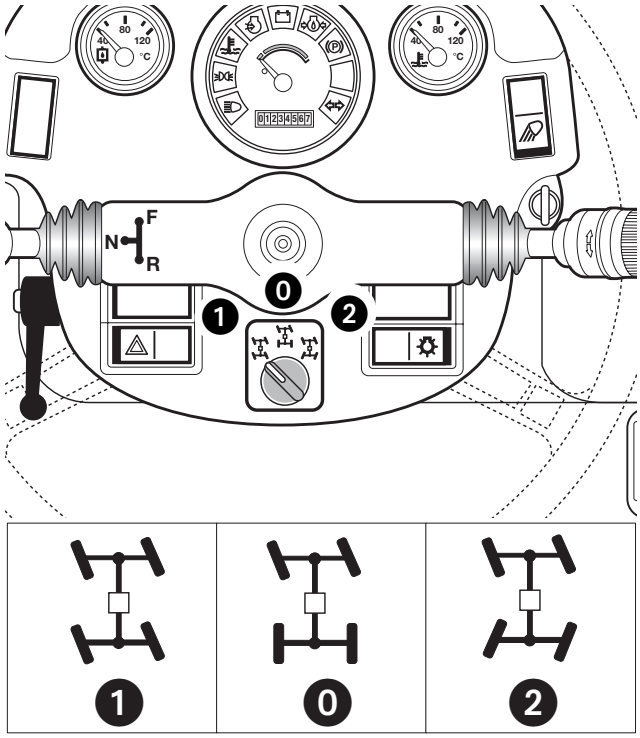
When changing the oil, drain it when it is still hot and the polluting substances are in suspension.

D-3.12 SHAFTING ALIGNMENT

During operation, the alignment of the front and rear axles of the machine can be subject to variations. This can depend on an oil blow-by from the steering control circuit, or on a steering of both axles when front and rear wheels are not perfectly aligned.

To fix this problem, rather than checking the alignment visually, follow the procedure below:

- Move to a solid and level ground
- Set the steering selection switch **12** to "***four-wheel steer***" (pos. **2**)
- Rotate the steering up to its stop (either to the right or to the left)
- Set the steering selection switch to "***two-wheel steer***" (pos. **0**)
- Rotate the steering up to its stop in the opposite direction to the above
- Reset the steering selection switch to "***four-wheel steer***" (pos. **2**)
- Rotate the steering so that the rear axle reaches its stop (either to the right or to the left)
- Reset the steering selection switch to "***two-wheel steer***" (pos. **0**)
- Rotate the steering so that the front axle reaches its stop (see rear axle)
- Reset the steering selection switch to "***four-wheel steer***" (pos. **2**)
- Set the wheels parallel to the longitudinal axis of the machine and move forward for 10÷15 meters, then reset the steering selection switch to "***two-wheel steer***" (pos. **0**).



SERVICE INTERVAL

Running-in _____ **None**

Ordinary _____ **When necessary**

■ D-3.13 ADJUSTING THE SENSOR DISTANCE

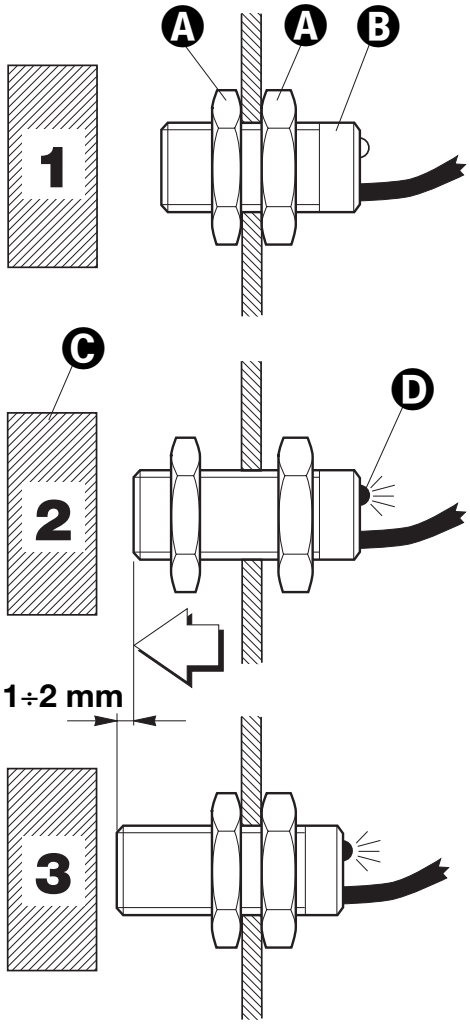
In case of a failure or complete malfunctioning of the sensors due to a loosening of their fixing ring nuts, re-adjust their position:

1 Loosen nuts **A** fixing sensor **B**.

2 Set the mobile part **C** of the machine, controlled by the sensor, as close as possible to it.
Near the sensor to the component until the LED indicator **D** lights up.

3 Further near the sensor by 1÷2 mm. Smoothly tighten the sensor fixing nut and the relevant lock nut.

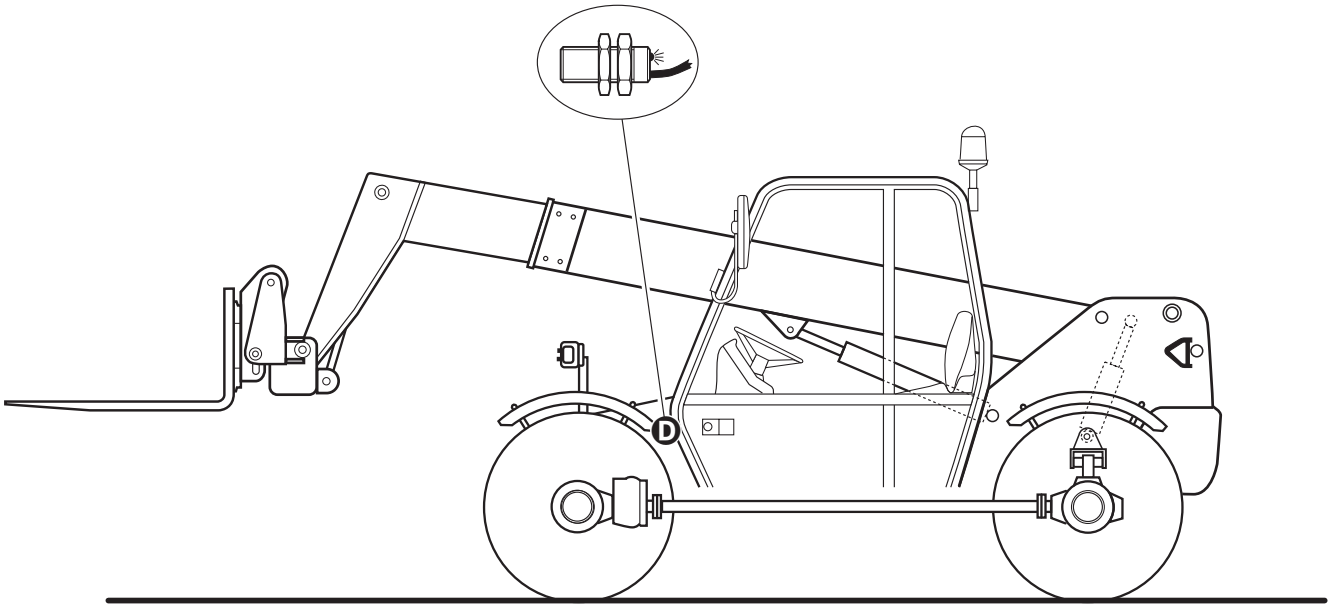
The machine is also equipped with a proximity switch located in the parking brake which prevents any machine starting when the parking brake is not engaged.



SERVICE INTERVAL

Running-in _____ **None**

Ordinary _____ **When necessary**



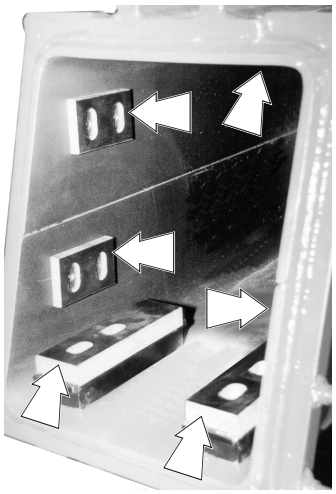
■ D-3.14 ADJUSTING THE SLIDING PADS OF THE BOOM SECTIONS

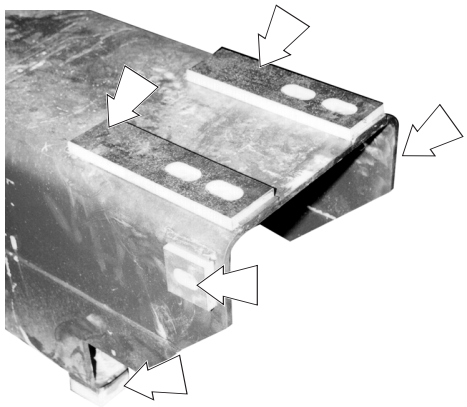
Any boom section is fitted with adjustable pads located on the four sides of the profile. These pads are secured to both fixed and mobile part of every section.

All pads can be adjusted by the special shims supplied by GENIE upon demand.

Adjusting the pads:

- Remove or loosen the screws fixing the pads in relation to type of shims used (with or without slots).
- Fit the necessary amount of shims.
- If the residual thickness of the pad is insufficient or near the maximum wearing limit, renew the pad.
- Tighten the screws fixing the pads at the recommended torque (see below). Use a dynamometric wrench.





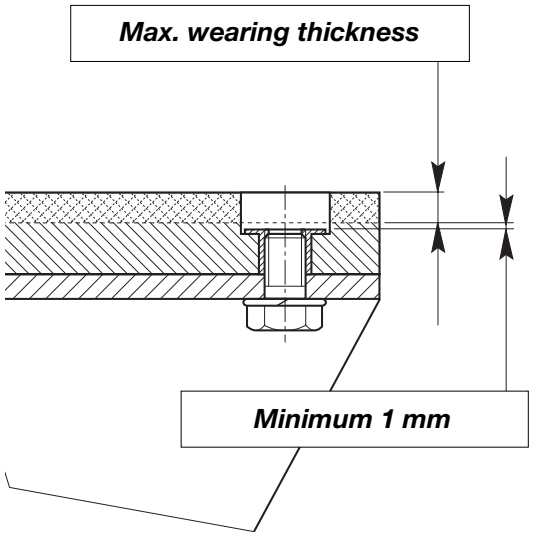
Tightening torques of the pad screws in relation to the screw diameter

Screws M10	Nm 30
Screws M14	Nm 50

Tightening torques higher than those recommended can cause the break of the pad or of the locking threaded bush.

ATTENTION

Pads must compulsorily be replaced if the residual thickness of the plastic layer with respect to the iron bush fixing the block is equal or inferior to 1 mm.



SERVICE INTERVAL

Running-in _____ **None**

Ordinary _____ **When necessary**

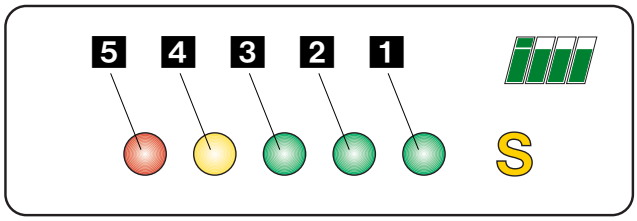
■ D-3.15 CHECKING THE SAFETY DEVICES

■ Checking the overload warning system

(at every use)

At the machine start-up, the overload warning system carries out an automatic check. In the case of troubles, the red LED come on, a buzzer sounds to warn of the error, the machine enters in alarm and cannot be operated.

To do a manual check, it will be enough to load a weight exceeding the maximum permitted with the boom fully out and attempt to lift it. The system shall enter in alarm; should that not be the case, the power unit of the system must be replaced.



■ Checking the joystick pushbutton (at every use)

To check if the pushbutton on the control lever is in efficient working order, it will be enough to attempt to operate the lever without pressing this button.

In this condition, the lever shall not operate any movement. Should that not be the case, replace the joystick.

■ Checking the seat micro-switch

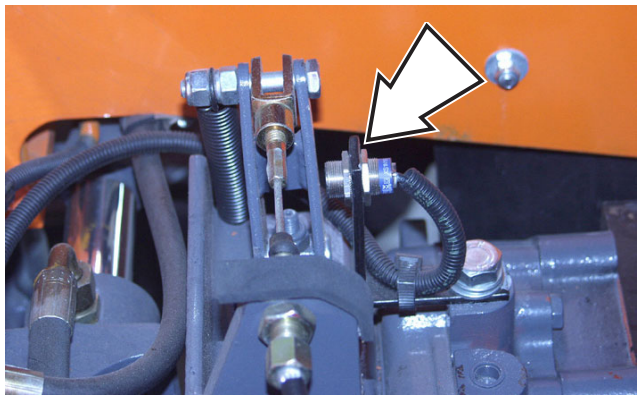
(at every use)

To check if the seat micro-switch is in efficient working order, simply attempt to start the machine without being seated. The machine must remain stopped. Should that not be the case, replace the driving seat.

■ Checking the parking brake micro-switch

(at every use)

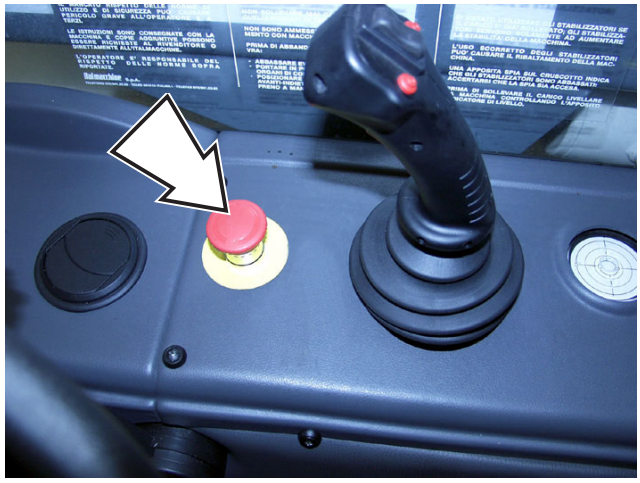
To check if the micro-switch of the parking brake is in efficient working order, simply sit on the driving place and attempt to start the machine without engaging the brake. The machine must remain stopped. Should that not be the case, replace or adjust the distance of the proximity switch on the parking brake. Read **chap. D-3.13** for this adjustment.



■ Checking the emergency stop pushbutton

(at every use)

To check the efficiency of this pushbutton, simply press it down during a movement. The pressure of the pushbutton shall cause the movement to stop and the engine to shut down.



■ Checking the block valves (every 3 months).

The piloted blocking valves allow to held the load in position in case of burst of a flexible hose.

To check the efficiency of a valve, proceed as follows:

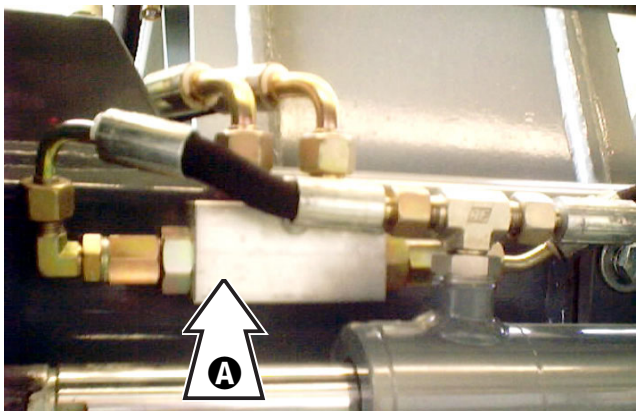
- Load a weight near the maximum payload (2000 kg roughly) onto the boom.
- Raise the load some centimetres above the ground (max 10 cm). To check the valve on the telescope extension cylinder move the boom to maximum height and extend it some centimetres.
- Loosen the oil hoses to the cylinder of which you are checking the valve with caution.

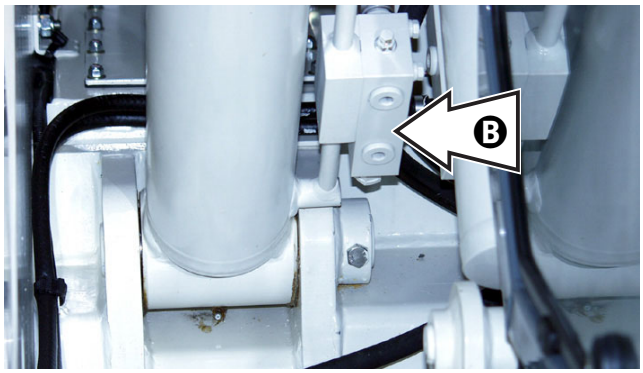
During the check, the oil will flow out of the hoses and the load shall remain blocked in position.

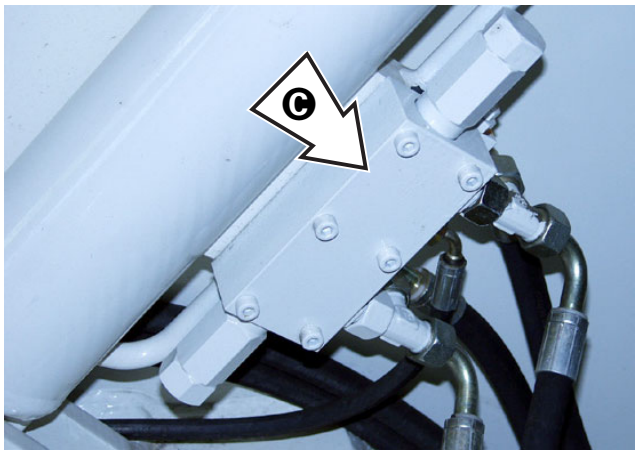
Should that not be the case, the valve must be replaced.

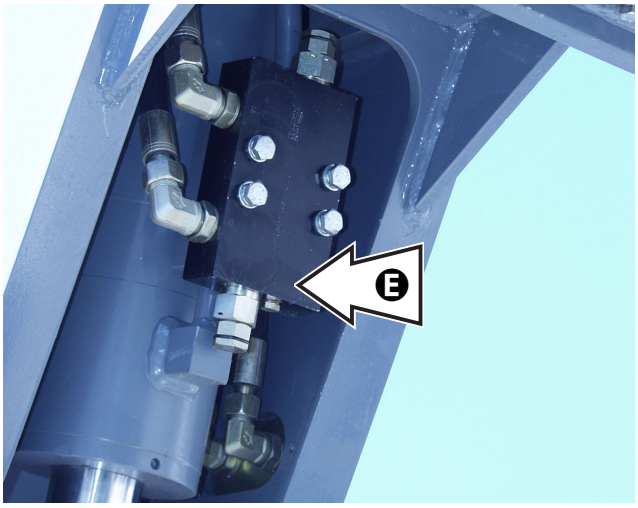
DANGER

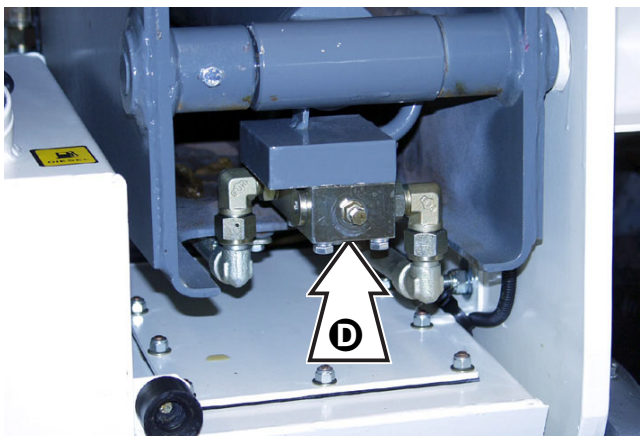
- ***Wear safety glasses***
- ***Wear safety gloves***
- ***Wear safety shoes***
- ***Wear suitable working clothes***
- ***Use guards against leaks of oil at high pressure***
- ***Do the check in a free space with barriers all around to keep non-authorised people away***
- ***During the check proceed with extreme caution.***
- ***Ensure that the part to be checked is in safe condition and that the action generated does not result in an uncontrolled movement of the machine***











D-4 ELECTRICAL SYSTEM

DANGER

All maintenance interventions must be carried out with engine stopped, parking brake engaged, working attachments on the ground and gearbox lever in neutral.

DANGER

When raising a component for maintenance purposes, secure it in a safe way before carrying out any maintenance.

DANGER

Before any operation on hydraulic lines or components, make sure there is no residual pressure. For this purpose, stop the engine, engage the parking brake and operate the control levers of the distributors (in both working directions alternately) to release the pressure from the hydraulic circuit.

D-4.1 BATTERY

- Check the electrolyte level every 250 working hours; if necessary, add distilled water.
- Ensure the fluid is 5÷6 mm above the plates and the cell levels are correct.
- Check the cable clips are well secured to the battery terminals. To tighten the clips, always use a box wrench, never pliers.
- Protect the terminals smearing them with pure vaseline.
- Remove the battery and store it in a dry place, when the machine is not used for a long time.

DANGER

- ***Battery electrolyte contains sulphuric acid. It can burn you if it touches your skin and eyes. Always wear goggles and protective gloves, and handle the battery with caution to prevent spillage. Keep metal objects (watch straps, rings, necklaces) clear of the battery leads, since they can short the terminals and burn you.***
- ***Before disconnecting the battery, set all switches within the cab to OFF.***
- ***To disconnect the battery, disconnect the negative (-) lead from the frame earth first.***
- ***To connect the battery, connect the positive (+) lead first.***
- ***Recharge the battery far from the machine, in a well-ventilated place.***
- ***Keep out of items which can produce sparks, of naked flames or lit cigarettes.***
- ***Do not rest metal objects onto the battery. This can result in a dangerous short especially during a recharge.***
- ***Because the electrolyte is highly corrosive, it must never come in contact with the frame of the handler or electric/electronic parts. If the electrolyte comes in contact with these parts, contact the nearest authorised assistance centre.***

DANGER

Risk of explosion or shorts. During the recharge, an explosive mixture with release of hydrogen gas forms.

DANGER

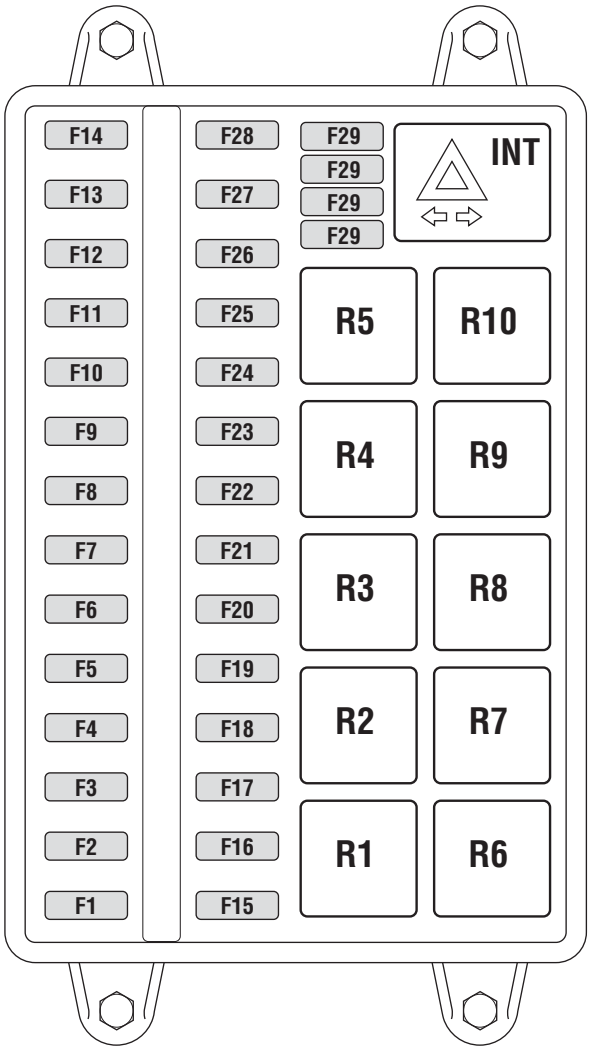
Do not add sulphuric acid; add only distilled water.

D-4.2 FUSES AND RELAYS

The electrical system is protected by fuses placed in the driving cab, on the left. Before replacing a blown fuse with a new one having the same amperage, find out and rectify the fault.

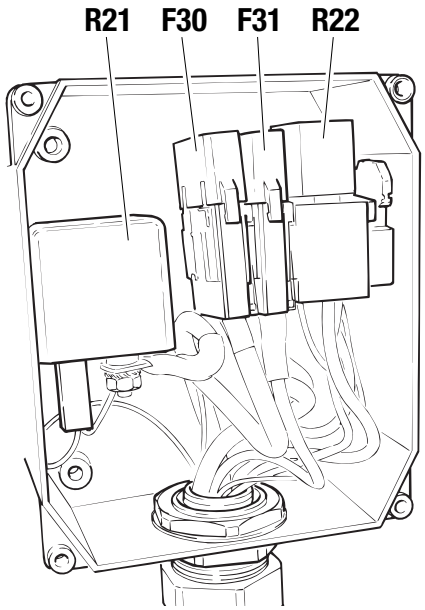
Fuses

Ref.	Circuit	Amp.
F1	Power supply: interior lamp, beacon switch, emergency switch, turn signals	15
F2	Power supply: R9 relay	10
F3	Power supply: R4 relay	10
F4	Front right/rear left position lights, license plate lights, position lights indicator, hydraulic oil temperature indicator lighting, relay R4 enabling command, front left/rear right position lights, fuel gauge indicator lighting	10
F5	Fuel gauge-hourmeter-warning lights, water temperature indicator light, position lights switch lighting	10
F6	Right low beam	7.5
F7	Left low beam	7.5
F8	Right high beam - High beam warning lamp	10
F9	Left high beam	10
F10	Horn	10
F11	Windscreen washer kit	10
F12	Blank	10
F13	Blank	5
F14	Blank	
F15	Power supply: arking brake sensor, relay R1 enabling command, relay R2 enabling command, hydraulic stop, fuel gauge-hourmeter-warning lamps indicator	5
F16	Hydraulic oil temperature indicator, water temperature indicator, power supply:R10 relay, R9 relay pickup	10
F17	Power supply: hazard warning light and turn signals switch	10
F18	Power supply: light switch - windscreen washer switch, windscreen washer motor	15
F19	Heating system fan power supply	25
F20	Road safety switch power supply High speed switch	15
F21	Power supply: beacon	15
F22	Engine stop mushroom-head button power supply	15
F23	Relay R2/Relay R5 power supply	15
F24	Relay R8 power supply	5
F25	Blank	5
F26	Blank	5
F27	Blank	5
F28	Blank	5
F29	Spare fuses	--



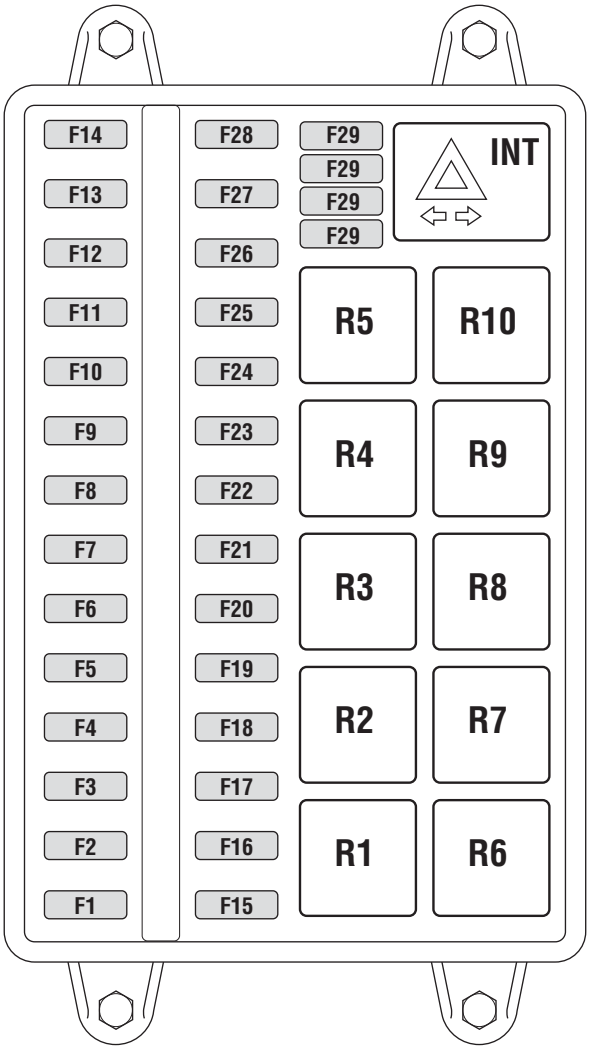
■ *Engine compartment fuses and relays*

Ref.	Circuit	Amp
F29	Glow plugs fuse	70
F30	Dashboard power supply fuse	50
R21	Glow plug pre-heating relay	
R22	Start relay	



■ *Fuse box relays*

Ref.	Circuit
R1	Starting enabling command
R2	Relay R3 power supply enabling command with parking brake not engaged
R3	Speed switch power supply enabling command with seat switch pressed down
R4	Work light switch power supply enabling command
R5	Back-up horn cut-out switch power supply enabling command, back-up lamp
R6	Parking brake indicator power supply enabling command, relay R1 enabling command, relay R2 enabling command
R7	Boom extraction solenoid valve enabling command
R8	ARB solenoid valve enabling command, relay R7 enabling command
R9	ARB control unit power supply enabling command
R10	Command enabling the speed switch with hydraulic stop switch off
INT	Flashing



ATTENTION

- ***Do not use fuses having a higher amperage than that recommended, since they can damage the electric system seriously.***
- ***If the fuse blows after a short time, look for the fault source by checking the electric system.***
- ***Always keep some spare fuses for an emergency.***
- ***Never try to repair or short blown fuses.***
- ***Make sure the contacts of fuses and fuse-sockets ensure a good electric connection and are not oxidised.***

■ D-4.3 12V DC LAMPS

Use	Voltage	Mount type	Power
• Front low/high beam	12 V	P45t	45/40 W
• Front position lights	12 V	BA 9s	3 W
• Side/tail turn signals	12 V	BA 15s	21 W
• Stop lights and rear position lights	12 V	BAY 15d	21/5 W
• Beacon - Work lights (OPTIONAL)	12 V	H3	55 W
• Dashboard indicators and cab lighting	12 V	W 2x4,6d	1,2 W
• Interior lamp	12 V	SV 8,5-8	5 W
• License plate lights	12 V	BA 15s	5 W
• Back-up lamps	12 V	BA 15s	21W

CAUTION

When switched on, lamps get hot. Before touching a lamp with your fingers, let it cool down.

IMPORTANT

Never touch the bulb of halogen lamps (mount type H3) with your fingers: this may damage the lamp (use of a clean cloth or a paper tissue). If you touch it accidentally, thoroughly clean with a paper tissue and some ethyl alcohol.

D-5 REFUELLING

D-5.1 REFUELLING

Part	*Product*	*Capacity (litres)*	*Product specifications see par.*
Diesel engine	Engine oil	8	D-5.2.1
Engine cooling system	Water+antifreeze	14	D-5.2.5
Fuel tank	Diesel fuel	60	D-5.2.3
Hydraulic system tank	Hydraulic oil	120	D-5.2.2
Front differential gear with reduction gear	Oil	6	D-5.2.2
Front differential gear	Oil	5	D-5.2.2
Front wheel reduction gears	Oil	1.5 + 1.5	D-5.2.2
Rear wheel reduction gears	Oil	0.7 + 0.7	D-5.2.2
Brake oil tank	Hydraulic oil	0.1	D-5.2.2

D-5.2 PRODUCT SPECIFICATIONS

D-5.2.1 Engine oil

Use the oil recommended by the Diesel engine Manufacturer *(see the relevant handbook delivered with the machine).*
At the delivery, the machine is refilled with:

SHELL MYRINA D SAE 15W-40 (API CD-CF ; MIL-L 2104 F)

D-5.2.2 Lubrication oils and relevant filtering elements

Refill the machine with following lubricants:

Use	*Product*	*Definition*	
Power divider-Differential gears-Reduction gears	SHELL SUPER GEAR 90 LS	SAE 90 W	MIL-L 2105B
Hydraulic system and brakes	SHELL TELLUS T 46	DENISON HF-1	DIN 51524 part 3 Cat. HV

ATTENTION

Never mix different oils: this may result in troubles and component breaks.

Oils for hydraulic system:

Arctic climates:	Temperatures below -10°C	Use SHELL Tellus T22
Mild climates:	Temperatures from -15°C to + 45°C	Use SHELL Tellus T46
Tropical climates:	Temperatures above + 30°C	Use SHELL Tellus T68

Filtering elements:

Filter	*Flow l/1'*	*Filtering*	*Coupling*
Transmission oil filter	150	10 µ	1"1/4 BSP
Auxiliary circuit oil filter (inside the tank)	100	60 µ	2" NPT

■ D-5.2.3 Fuel

Use only Diesel fuel with less than 0.5% sulphur content, according to the specifications of the diesel engine operation handbook.

ATTENTION

In cold climates (temperature under -20 °C) use only "Arctic" type Diesel fuel, or oil-diesel fuel, or oil-diesel fuel mixtures. The composition of the latter can vary in relation to the ambient temperature up to max. 80% oil.

■ D-5.2.4 Grease

For the machine greasing, use:

• Lithium-based SHELL grease, type SUPER GREASE EP	When greasing by pump
• Graphitized SHELL grease, type GR NG 3	When greasing by brush
• INTERFLON FIN GREASE LS 2	For the telescopic boom sliding blocks

ATTENTION

Avoid mixing greases of different type or features and do not use greases of lower quality.

■ D-5.2.5 Engine coolant

It is advisable to use an antifreeze mixture (50% water-50% antifreeze). At the delivery, the machine is refilled with:

CALTEX POLAR ANTIFREEZE (ASTM D3306-74)

ATTENTION

Use an antifreeze mixture in the proportions recommended by the manufacturer in relation to the ambient temperature of the jobsite.

Section E

FAULTS AND TROUBLESHOOTING

TABLE OF CONTENTS

E-6 FAULTS AND TROUBLESHOOTING

This chapter represents a practical guide for the operator for fixing the most common failures and, at the same time, detecting those interventions which must be carried out by qualified technical engineers.
If you are unsure about anything, do not carry out operations on the machine, but call in a skilled technician.

DANGER

Any repair work, maintenance or troubleshooting must be carried out with machine stopped, boom in rest position or laid on the ground, parking brake engaged and ignition key removed.

E-6.1 Fault - Cause - Solution

DASHBOARD DOES NOT SWITCH ON	• The 50A fuse **F31** supplying power to the dashboard is blown (engine compartment) • Battery disconnected • Battery down • Battery cut-out switch OFF	• Replace the fuse • Connect the battery using the relevant switch • Check the battery • Switch it on
ENGINE DOES NOT START ***Starter does not run***	• Forward/reverse gear selector switch not in neutral position • Parking brake not engaged • Proximity switches inefficient • Battery down • Battery cut-out switch OFF	• Set switch to **0** • Engage the parking brake and ensure the relevant indicator on the dashboard switches on • Check and adjust the distance (see paragraph D-3.13, page D-17) • Recharge or replace the battery • Switch it on
ENGINE DOES NOT START ***Starter runs, but engine does not start***	• Fuse **F15** blown • No fuel • Diesel fuel filter clogged • Diesel fuel hose empty (fuel used up)	• Check the fuse • Refuel • See Perkins engine operator manual • Refuel, then refer to Perkins engine operator manual
MACHINE DOES NOT MOVE	• Speed selector switch in neutral • Parking brake engaged • Fuse **F3** blown	• Set the speed selector switch correctly • Disengage • Check the fuse; replace, if necessary
THE MACHINE DRIVE IS NOT ENOUGH	• Hydraulic oil filter clogged	• Replace the filter
NO SELECTION OF THE STEERING MODE	• Fuse **F20** controlling the steering selection blown • “ROAD/CAB” switch set to “ROAD”	• Replace the fuse • Set to “CAB”

"ROAD" FUNCTION ON, EVEN WHEN SELECTING THE "CAB" FUNCTION	• No "ROAD/CAB" selection	• Check and replace fuse **F20**, if necessary
LOW PARKING BRAKE ACTION	• Insufficient cable tensioning	• Check and adjust the cable tension by means of the hollow screws • Check and adjust the lead tightening on the cable heads
NO BOOM LOWERING AND EXTENSION, NO HOLDING FRAME TILTING	• Fuse blown • Emergency button ON	• Replace fuses **F2** and/or **F24** • Reset the button
ARB SYSTEM IN ALARM (red LED ON)	• Alarm of the overload warning system	• Retract the boom within safety limits
THE HYDRAULIC OIL THERMOMETER DOES NOT WORK	• This is normal, when the outside temperature is low and/or the machine is used for short periods, since the hydraulic oil cannot warm up over 40÷50°C	
THE PARKING BRAKE LIGHT DOES NOT LIGHT UP	• Fuse blown	• Replace fuse **F15**
THE OVERLOAD WARNING SYSTEM DOES NOT WORK	• Fuse blown	• Check and replace fuse **F2**, if necessary
BOOM DOES NOT MOVE	• Fuse blown • "ROAD/CAB" switch set to "ROAD" • Emergency button ON	• Check and replace fuse **F22**, if necessary • Set to "CAB" • Reset the button
NO SHIFTING BETWEEN LOW AND HIGH HYDRAULIC GEAR	• Fuse blown	• Replace fuse **F20**

ATTENTION

In case of faults not listed in this chapter, address to the GENIE Technical Assistance, your nearest authorised workshop or dealer.

NOTES .....

Section F

OPTIONAL ATTACHMENTS

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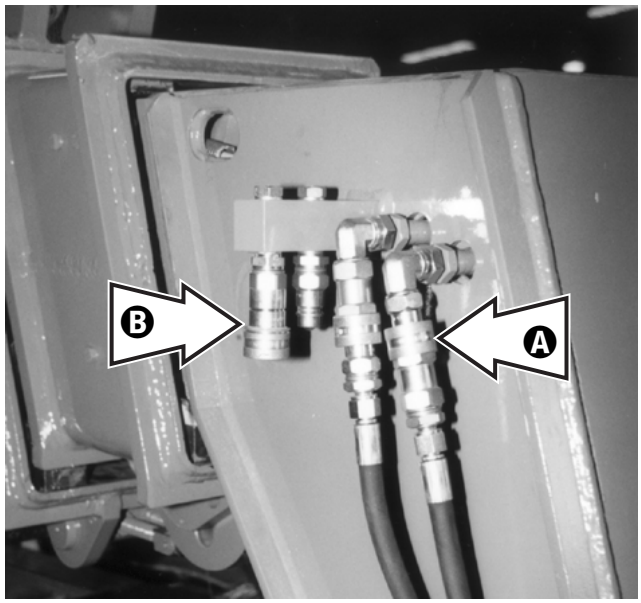
INTRODUCTION

This section provides information on the optional interchangeable attachments, especially manufactured for the handlers.
Use only genuine attachments, described in this section, after having read their features thoroughly and understood their use.
To install and remove the attachments, follow the instructions supplied in the **OPERATION section, par. C-5.4.**



DANGER

When replacing interchangeable attachments, keep any person clear of the working area.

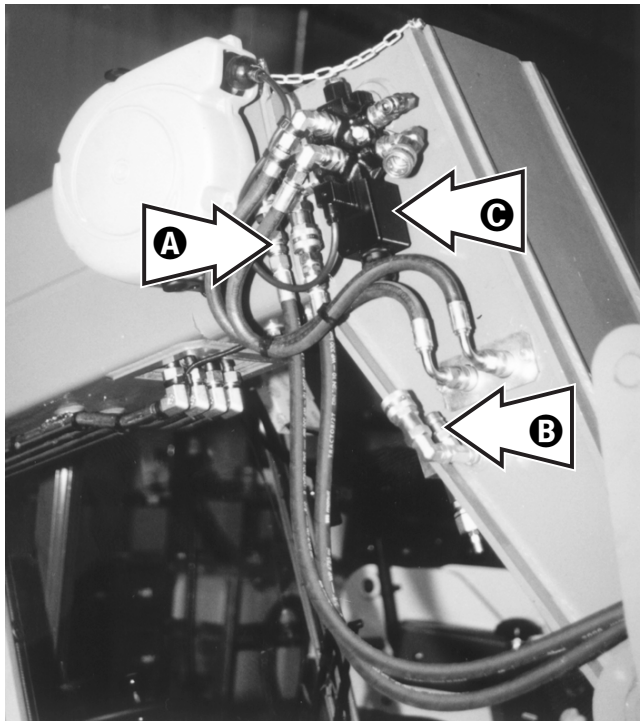
DANGER

Mounting optional attachments, and especially the extension jib, can change the centre of gravity of the machine. Before handling a load, check its weight and compare it with the values on the load charts. The weight of the used attachment must always be deducted from the rated payload.

Procedure to connect hydraulic lines:

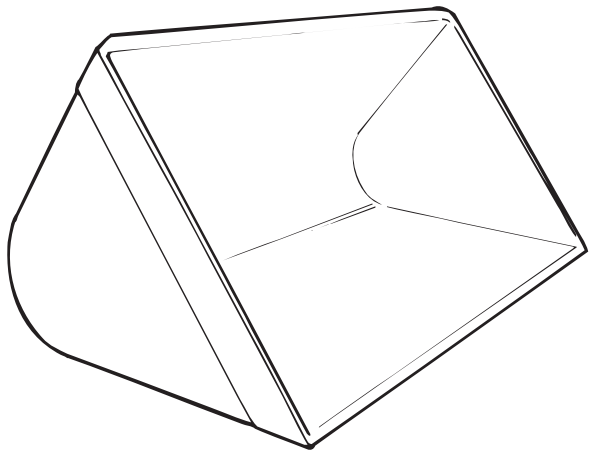
- Couple the new attachment and lock it hydraulically.
- Disconnect the quick couplings Ⓐ of the attachment locking cylinder and connect them to the false connectors Ⓑ to prevent them from getting dirty.
- Connect the feeding hoses of the new attachment to the quick couplings previously set free.

When the new attachment has two hydraulic motions like, for instance, the pole and pipe planter, a flow selecting valve Ⓒ shall be installed on the machine or the attachment and operated from the cab by means of switch **44**.



■ F-1.1 SHOVEL

Code	*2306*
Litres 500	59.0200.0000



Technical data

Capacity		*litres*	*500*
A	*Width*	*mm*	***1850***
B	*Length*	*mm*	***760***
H	*Height*	*mm*	***700***
-	*Weight*	*kg*	***290***

Application

Quick-coupling fitted attachment for moving soil, sand, debris, cereals, etc.

Safety

Strictly obey the general safety precautions given in section **B** “SAFETY”.

Operation

ATTENTION

When using a shovel, load the material only when the boom is completely retracted and push against the heap with straight wheels.

To load/unload the material, operate the rotation lever of the attachment holding plate.

Maintenance

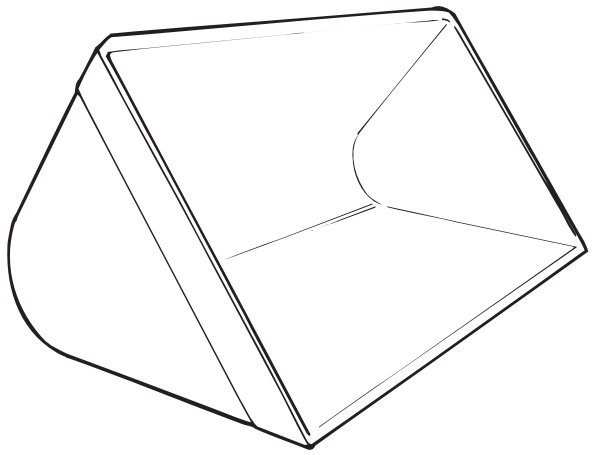
Visually check the shovel for damage before using it.

ATTENTION

Attachment suitable for moving loose material. Do not use for digging operations.

■ F-1.2 CEREAL SHOVEL

Code	*2306*
Litres 800	59.0200.1000



Technical data

Capacity		*litres*	*800*
A	*Width*	*mm*	***1850***
B	*Length*	*mm*	***800***
H	*Height*	*mm*	***1150***
-	*Weight*	*kg*	***350***

Application

Quick coupling attachment for loading cereals or inert materials, etc.

Safety

Strictly obey the general safety precautions given in section **B** “SAFETY”.

Operation

ATTENTION

When using a shovel, load the material only when the boom is completely retracted and push against the heap with straight wheels.

To load/unload the material, operate the rotation lever of the attachment holding plate.

Maintenance

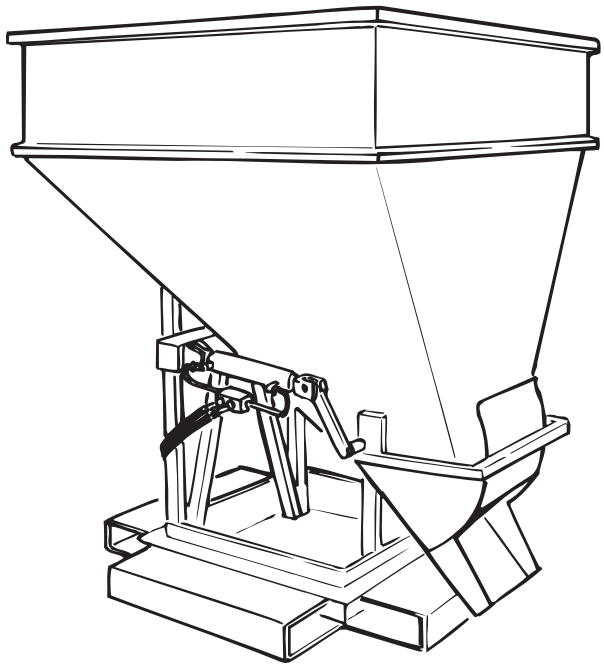
Visually check the shovel for damage before using it.

ATTENTION

Attachment suitable for moving loose material. Do not use for digging operations.

■ F-1.3 CONCRETE SKIP

Code	*Man. unloading*	*Hydr. unloading*
Litres 500	59.0400.0000	59.0400.1000



Application

Attachment coupled to the standard forks of the handler and fixed by means of the special tie-rods provided.

Safety

Strictly obey the general safety precautions given in section **B** “SAFETY”.

Operation

Fork the skip taking into account the product unloading side.
Secure the skip to the forks using the tie-rods, screws and lock nuts provided.
To unload the concrete, manually operate the gate opening lever if the skip opening is done by hand.
If the skip is equipped with hydraulic cylinder for the gate opening, operate the attachment locking lever after connecting the feeding lines of the new attachment to the quick couplings (see page F-2).

Maintenance

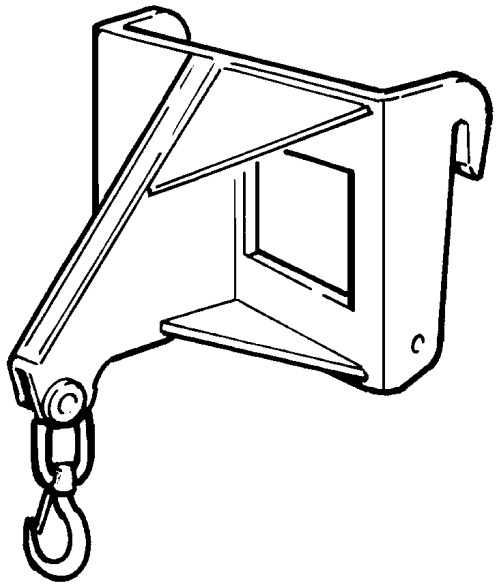
Visually check the skip for damage before using it.
Wash with water after use or in case of prolonged inactivity to prevent the mix or residues from hardening.
Check for oil leaks from hoses and connectors.
Carefully protect the quick connectors once disconnected to prevent impurities from entering the circuit.

Technical data

Litres		***500***
Width	mm	1200
Length	mm	1200
Height	mm	1270
Weight	kg	220
SAE capacity	m^3	0,5

■ F-1.4 FIXED HOOK ON PLATE

Payload	*Code 2306*
2600 kg	59.0700.0000



Technical data

Payload	*kg*	*2600*
Width	mm	920
Length	mm	615
Height	mm	500
Weight	kg	120

Application
Quick-coupling fitted attachment for lifting loads by means of special slings.

Safety
Strictly obey the general safety precautions given in section **B** “SAFETY”.
Do not oscillate the load.
Do not drag hooked loads.
Lift the load before extending the boom.

Operation
Fork the hook and hold it in position by means of the locking cylinder.
All loads must be bridled with special textile slings or chains in compliance with all pertinent regulations.
To handle the load, raise and rotate the telescopic boom of the handler.

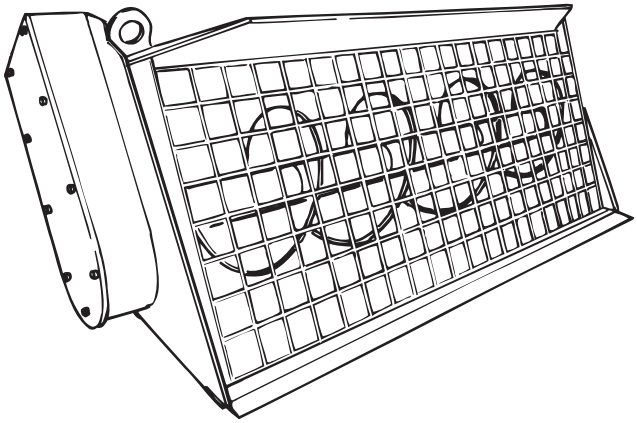
Maintenance
Visually check the hook for damage before using it.
Check the safety catch is in good working order.

IMPORTANT

Make sure this attachment can be used in the destination country of the machine. In Italy, this attachment must be enrolled at ISPESL and submitted to yearly test.
Application must be submitted directly by the user.

■ F-1.5 MIXING BUCKET

Code	*2306*
Litres 250	59.0400.9000



Technical data

	Litres	*250*
Width	mm	....
Length	mm	...
Height	mm	...
Weight	kg	...
SAE capacity	m^3	...

Application

Quick-coupling fitted attachment for mixing and distributing concrete.

Safety

Strictly obey the general safety precautions given in section **B** “SAFETY”.

Operation

To load/unload the material, operate the rotation lever of the attachment holding plate.
To start the mixing auger, operate the attachment locking lever after connecting the feeding lines of the new attachment to the quick couplings (see page F-2).

Maintenance

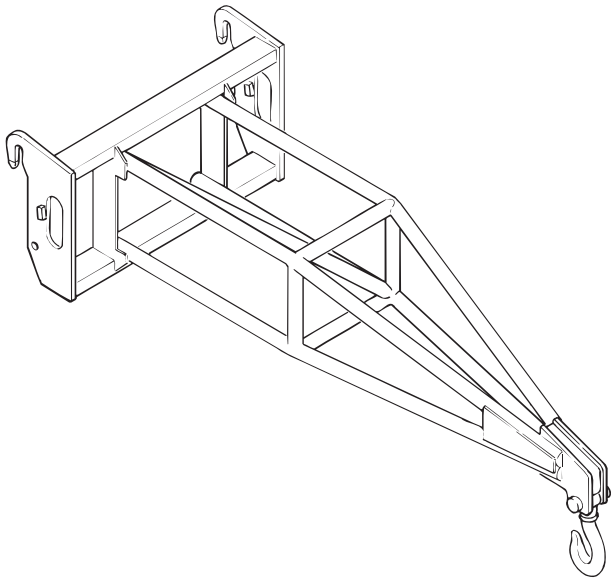
CAUTION

Before any maintenance, rest the bucket on the ground, stop the machine, remove the starter key and lock the cab door to prevent anybody from gaining access to the control panel.

Visually check the bucket for damage before using it.
Wash thoroughly with water after use or in case of prolonged inactivity to prevent the mix or residues from hardening.
Check for oil leaks from hoses and connectors.
Carefully protect the quick connectors once disconnected to prevent impurities from entering the circuit.

■ F-1.6 EXTENSION JIB

Code	2306
400 kg	59.0800.0000



Characteristics			
-	*Payload*	**kg**	**400**
A	*Length*	**mm**	**2100**
B	*Width*	**mm**	**920**
H	*Height*	**mm**	**630**
-	*Weight*	**kg**	**115**

IMPORTANT

Make sure this attachment can be used in the destination country of the machine. In Italy, this attachment must be enrolled at ISPESL and submitted to yearly test.
Application must be submitted directly by the user.

Application

Quick-coupling fitted attachment for maintenance interventions at high working heights.

Safety

Strictly obey the general safety precautions given in section **B** “SAFETY”.
Never lift wrongly slung loads.
Avoid abrupt acceleration or deceleration.
Avoid load oscillations, and especially do not move the load from the vertical pull line.
Do not pull crosswise and do not tow.

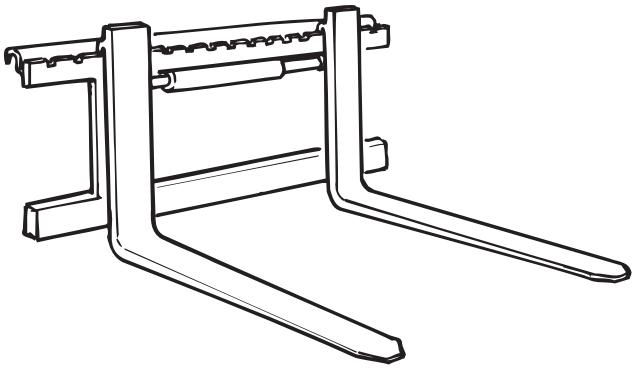
Operation

To change the working height, operate the rotation lever of the attachment holding plate.

Maintenance

Visually check the jib for damage before using it.
Check the safety catch is in good working order.
Daily grease the joints using the greasing gun.

■ F-1.7 FORKS WITH HYDRAULIC SIDE-SHIFT



Application
Quick-coupling fitted attachment for handling palletised loads.

Safety
Strictly obey the general safety precautions given in section **B** “SAFETY”.

Operation
To adjust the tilting, operate the rotation lever of the attachment holding plate.
To side-shift, operate the attachment locking lever after connecting the feeding lines of the new attachment to the quick couplings (see page F-2).

Maintenance
Visually check the attachment for damage before using it.
Check for hydraulic oil leaks.
Daily grease the joints using a greasing gun, and smear the sliding guides with graphitized grease.

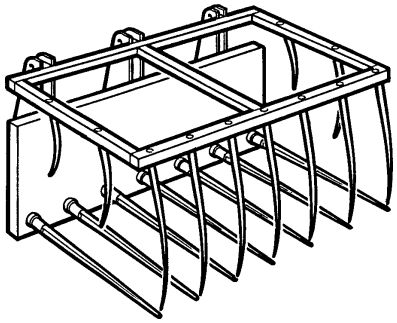
Machine	***2306***
Code	59.0600.0000

Technical data

Payload kg		***2600***
Width	mm	1240
Length	mm	1600
Height (with protection)	mm	1000
Weight	kg	180
Stroke	mm	± 100
Fork attachments		FEM 2

■ F-1.8 FORK WITH JAW

Machine	*2306*
Fork with jaw	59.1300.1000



Characteristics		
Width	mm	1980
Length	mm	
Height	mm	
Weight	kg	
Payload	kg	

Application

Interchangeable quick-coupling attachment for loading and handling manure, shrubs and other loose agricultural products.

Safety

Strictly obey the general safety precautions given in section **B** “SAFETY”.

Operation

To adjust the fork tilting, operate the rotation lever of the holding plate.

For loading operations, act on the locking lever after connecting the feeding lines of the new attachment to the quick couplings (see page F-2).

Maintenance

Visually check for damage before using the fork. Check for hydraulic oil leaks. Daily grease the joints using a greasing pump, and the sliding profiles with graphitized grease.

Section G

TABLES AND DOCUMENTS ENCLOSED

TABLE OF CONTENTS

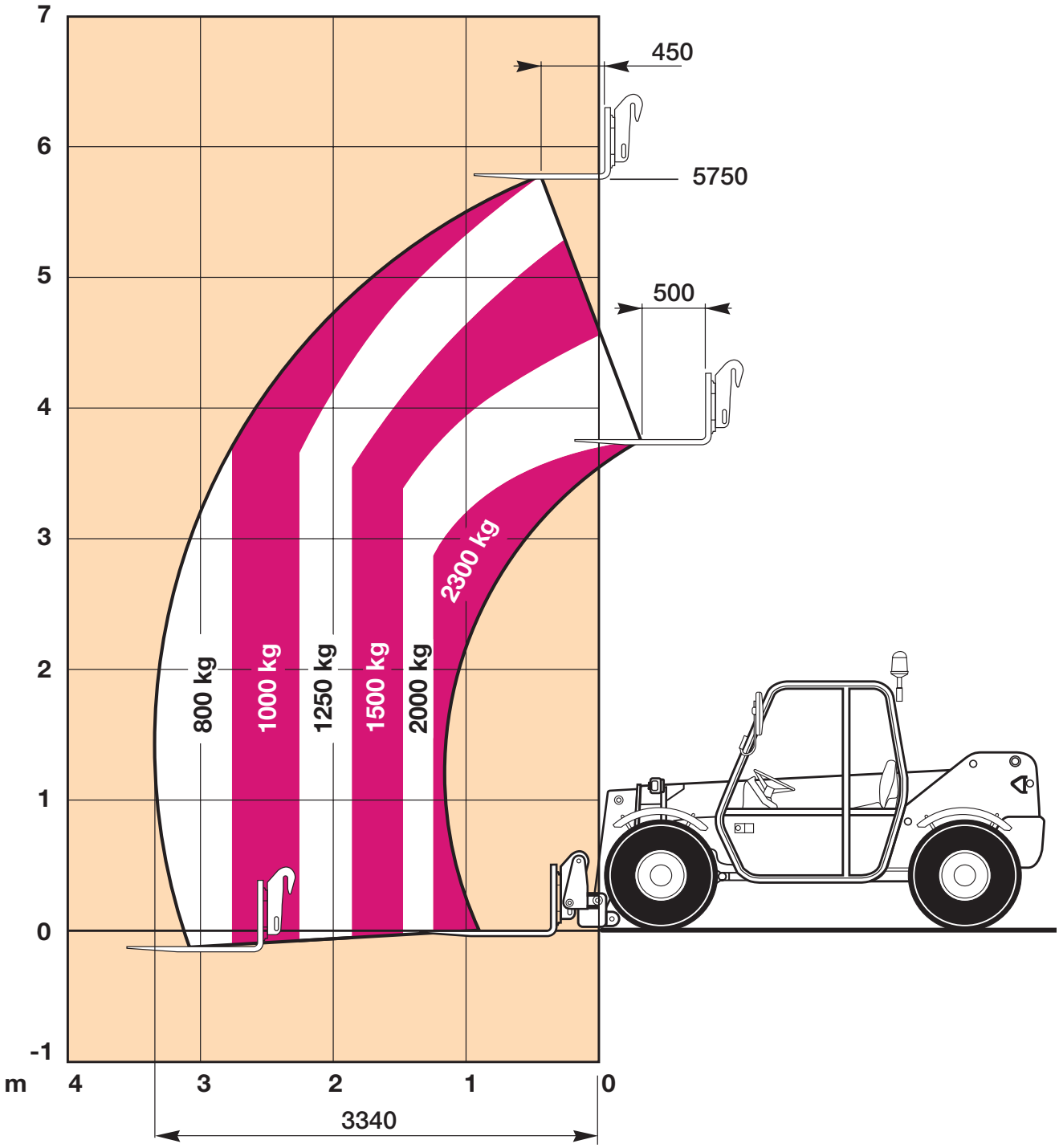
G-1 TORQUE WRENCH SETTINGS

D x p	Pre-loading (N)				Torque wrench setting (Nm)			
	4.8	**8.8**	**10.9**	**12.9**	**4.8**	**8.8**	**10.9**	**12.9**
M 4 x 0,7	1970	3930	5530	6640	1,5	3,1	4,3	5,2
M 5 x 0,8	3180	6360	8950	10700	3	6	8,5	10,1
M 6 x 1	4500	9000	12700	15200	5,2	10,4	14,6	17,5
M 8 x 1,25	8200	16400	23100	27700	12,3	24,6	34,7	41,6
M 8 x 1	8780	17600	24700	29600	13	26	36,6	43,9
M 10 x 1,5	13000	26000	36500	43900	25,1	50,1	70,5	84,6
M 10 x 1,25	13700	27400	38500	46300	26,2	52,4	73,6	88,4
M 12 x 1,75	18900	37800	53000	63700	42,4	84,8	119	143
M 12 x 1,25	20600	41300	58000	69600	45,3	90,6	127	153
M 14 x 2	25800	51500	72500	86900	67,4	135	190	228
M 14 x 1,5	28000	56000	78800	94500	71,7	143	202	242
M 16 x 2	35200	70300	98900	119000	102	205	288	346
M 16 x 1.5	37400	74800	105000	126000	107	214	302	362
M 18 x 2,5	43000	86000	121000	145000	142	283	398	478
M 18 x 1,5	48400	96800	136000	163000	154	308	434	520
M 20 x 2,5	54900	110000	154000	185000	200	400	562	674
M 20 x 1,5	60900	122000	171000	206000	216	431	607	728
M 22 x 2,5	67900	136000	191000	229000	266	532	748	897
M 22 x 1,5	74600	149000	210000	252000	286	571	803	964
M 24 x 3	79100	158000	222000	267000	345	691	971	1170
M 24 x 2	86000	172000	242000	290000	365	731	1030	1230
M 27 x 3	103000	206000	289000	347000	505	1010	1420	1700
M 27 x 2	111000	222000	312000	375000	534	1070	1500	1800
M 30 x 3,5	126000	251000	353000	424000	686	1370	1930	2310
M 30 x 2	139000	278000	391000	469000	738	1480	2080	2490

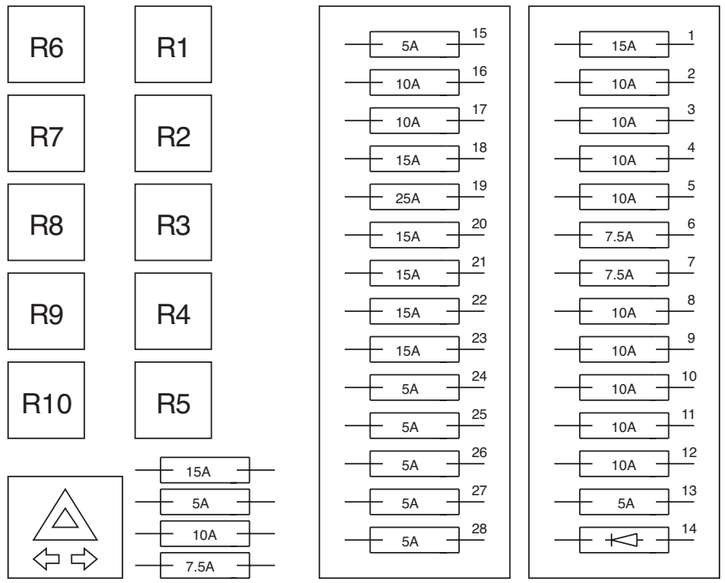
IMPORTANT

Sensor maximum driving torque: 15 Nm.

G-2.1 LOAD CHART WITH FORKS - GTH-2306



G-3.1 WIRING DIAGRAM - FUSES

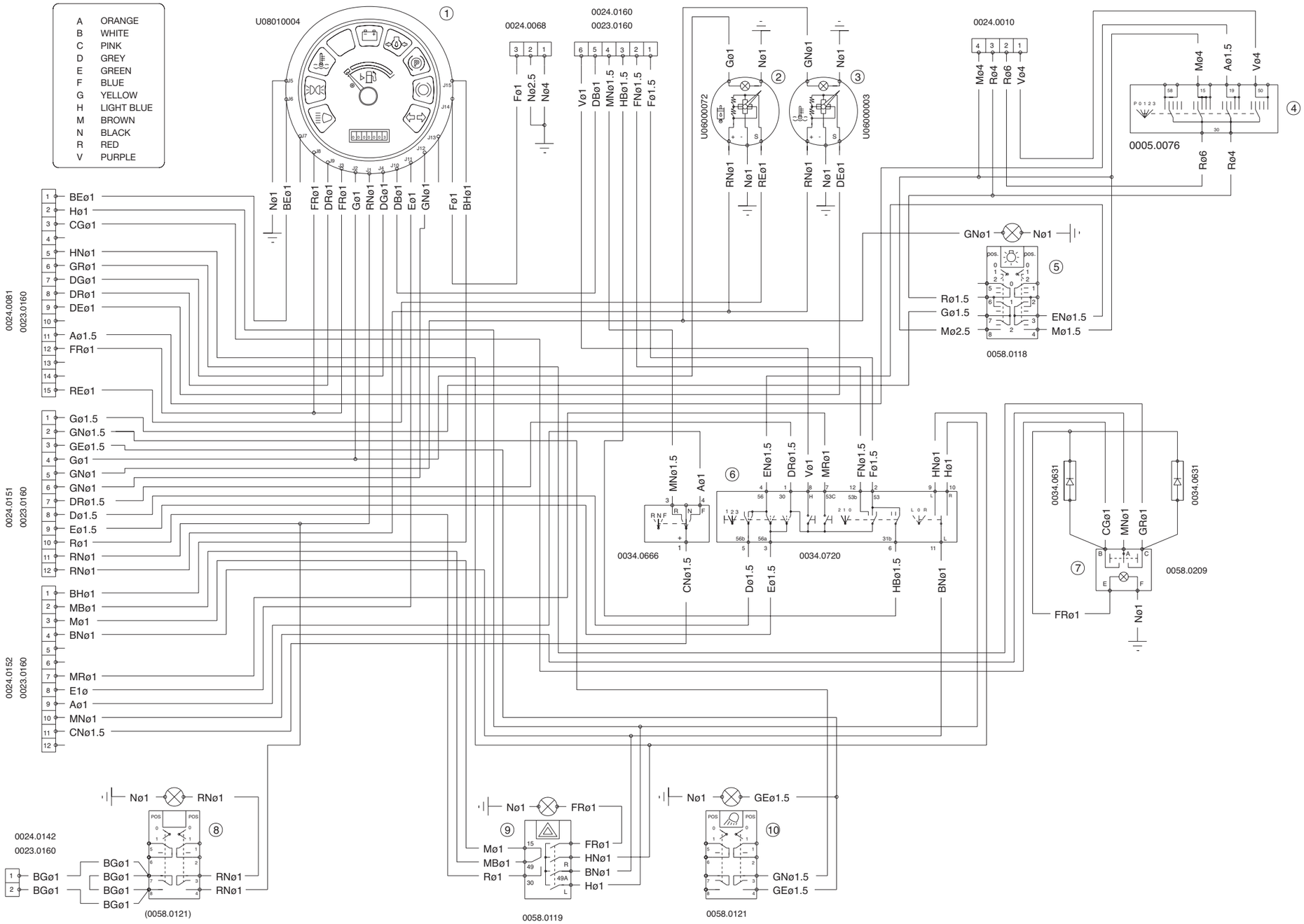


Pos.	Protected circuit
1	Power supply: interior lamp, beacon switch, emergency switch, turn signals
2	Power supply: R9 relay
3	Power supply: R4 relay
4	Front right/rear left position lights, license plate lights, position lights indicator, hydraulic oil temperature indicator lighting, relay R4 enabling command, front left/rear right position lights, fuel gauge indicator lighting
5	Fuel gauge-hourmeter-warning lights, water temperature indicator light, position lights switch lighting
6	Right low beam
7	Left low beam
8	Right high beam - High beam warning lamp
9	Left high beam
10	Horn
11	Windscreen washer kit
12	Optional
13	Optional
14	Optional
15	Parking brake sensor power supply, relay R1 enabling command, relay R2 enabling command, hydraulic stop power supply, fuel gauge-hourmeter-warning lamps indicator
16	Hydraulic oil temperature indicator, water temperature indicator, power supply: R10 relay, R9 relay pickup
17	Emergency switch and turn signals power supply
18	Power supply: lights switch - windscreen washer switch, windscreen washer motor
19	Heating system fan power supply
20	Road safety switch power supply, High speed switch
21	Power supply: beacon
22	Engine stop mushroom-head button power supply
23	Relay R2/Relay R5 power supply
24	Relay R8 power supply
25	Optional
26	Optional
27	Optional
28	Optional

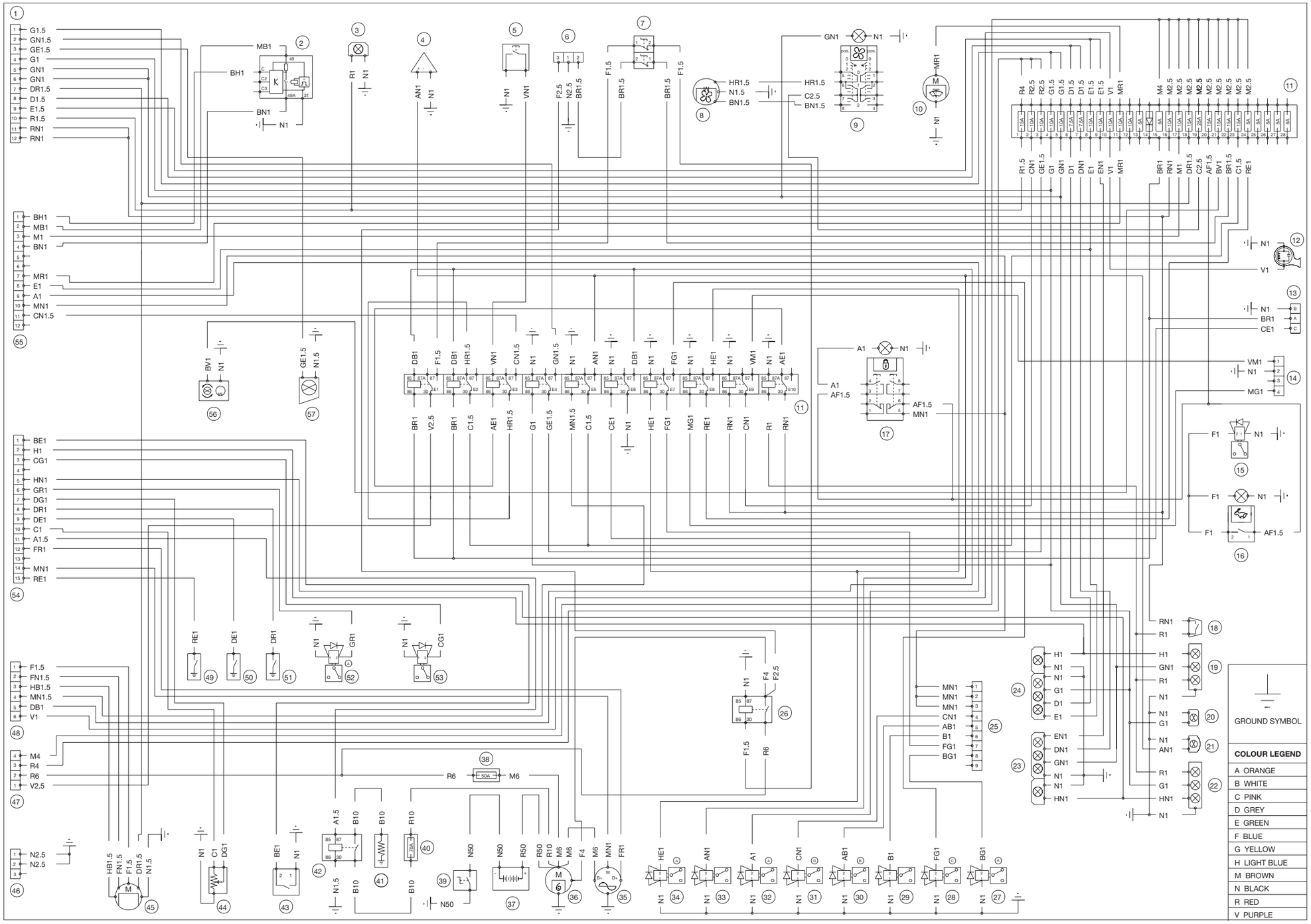
RELAYS

R1 relay:	Starting enabling command
R2 relay:	Relay R3 power supply enabling command with parking brake not engaged
R3 relay:	Speed switch power supply enabling command with seat switch pressed down
R4 relay:	Work light switch power supply enabling command
R5 relay:	Back-up horn cut-out switch power supply enabling command, back-up lamp
R6 relay:	Parking brake indicator power supply enabling command, relay R1 enabling command, relay R2 enabling command
R7 relay:	Boom extraction solenoid valve enabling command
R8 relay:	ARB solenoid valve enabling command, relay R7 enabling command
R9 relay:	ARB control unit power supply enabling command
R10 relay:	Command enabling the speed switch with hydraulic stop switch off

■ G-3.2 WIRING DIAGRAM - STEERING COLUMN



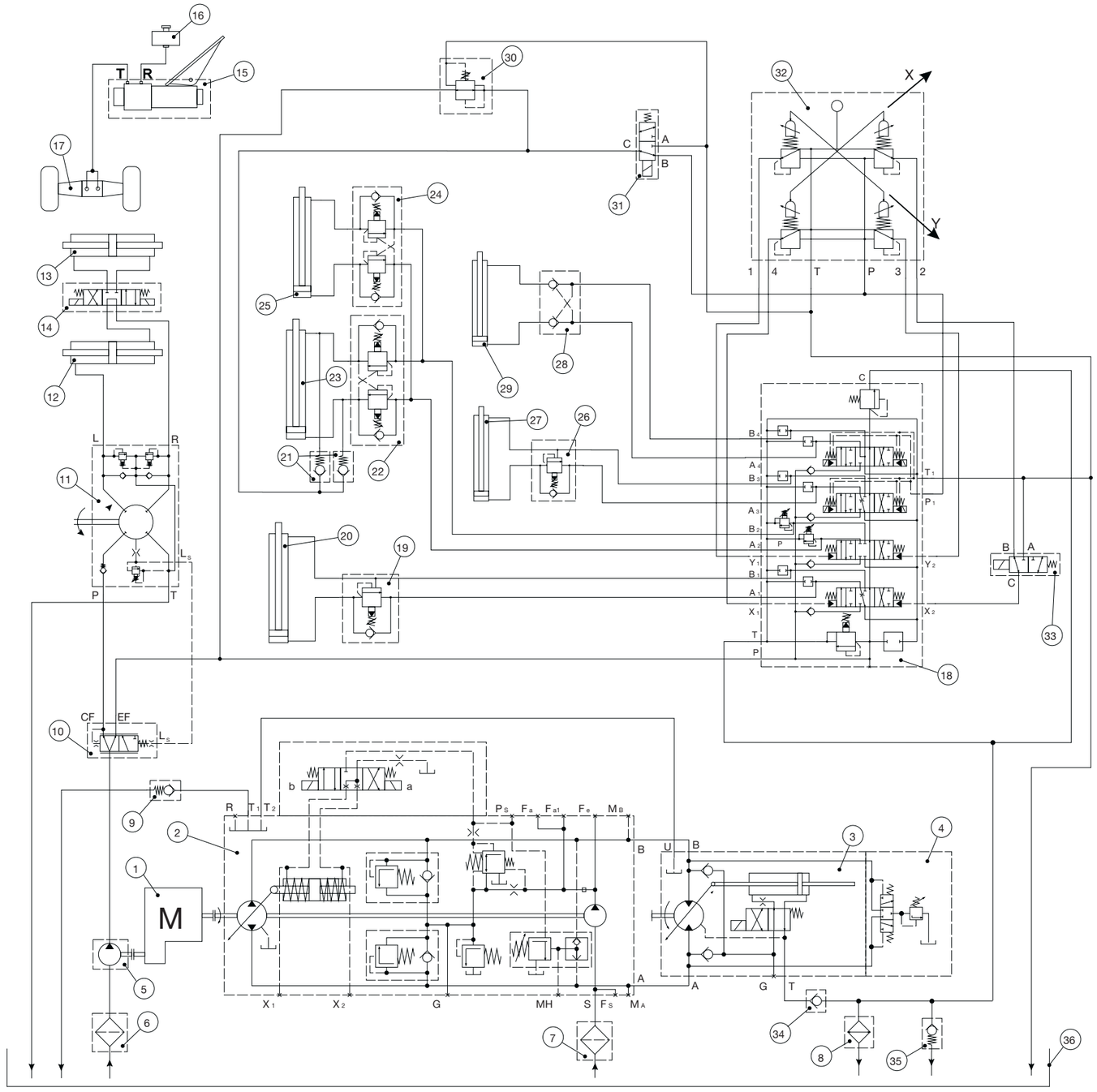
■ G-3.3 GENERAL WIRING DIAGRAM



G-3.3.1 GENERAL WIRING DIAGRAM (description)

Ref.	Description
1	12-way female connector - steering column
2	Turn signals flashing
3	Cab lighting
4	Back-up horn
5	Seat micro-switch
6	Engine stop solenoid connector
7	Mushroom-head button
8	Heating fan motor
9	Heating fan switch
10	Windscreen washer motor
11	Fuses and relays box
12	Horn
13	Parking brake micro-switch
14	Overload warning system power unit connector
15	High speed solenoid valve
16	High speed switch
17	Road safety switch
18	Hydraulic stop
19	Rear right-hand light
20	License plate lamp
21	Back-up lamps
22	Rear left-hand light
23	Front light lamp - left turn signal
24	Front light lamp - right turn signal
25	Joystick connector
26	Power relay
27	Solenoid valve - attachment release
28	Solenoid valve - boom extension
29	Dead man solenoid valve
30	Solenoid valve - attachment coupling
31	Solenoid valve - boom retraction
32	Solenoid valve - FWD speed
33	Solenoid valve - reverse speed
34	Solenoid valve - Overload warning system
35	Alternator
36	Starter motor
37	12V battery
38	System protection fuse
39	Batteery cut-out
40	Thermostarter maxi-fuse
41	Thermostarter
42	Thermostarter maxi-relay
43	Engine water temperature transducer
44	Fuel float
45	Front wiper motor
46	2-way male giant connector - steering column
47	4-way male power connector - steering column
48	6-way female connector - steering column
49	Hydraulic oil temperature sensor
50	Water temperaturre sensor
51	Engine oil temperature transducer
52	Wheel steering solenoid valve
53	Wheel steering solenoid valve
54	15-way female connector - steering column
55	12-way male connector - steering column
56	Beacon
57	Work light

■ G-4.1 HYDRAULIC SCHEME



Ref.	*Description*
1	Diesel engine
2	Hydraulic drive pump
3	Hydraulic drive motor
4	Flushing alve
5	Service hydraulicc pump
6	Injection filter
7	Injection filter
8	Thermal exchanger
9	One-way valve
10	Load sensing priority valve
11	Hydraulic steering
12	Front axle steering cylinder
13	Rear axle steering cylinder
14	Steering selection solenoid
15	Brake pump
16	Brake oil sump
17	Front axle
18	4-section enbloc distributor
19	Block valve - lifting cylinder
20	Lifting cylinder
21	One-way valve
22	Block valve - sway cylinder
23	Sway cylinder
24	Block valve - fork motion cylinder
25	Fork motion cylinder
26	Block valve - extension cylinder
27	Extension cylinder
28	Block valve - attachment locking cylinder
29	Attachment locking cylinder
30	Pressure relief valve
31	Electric flow divider (dead man)
32	Hydraulic lever-servocontrol
33	Electric flow divider (ARB)
34	One-way valve
35	One-way valve
36	Hydraulic oil tank

G-5 ROUTINE CHECK SCHEDULE - SAFETY DEVICES

Date	COMPONENT																					Result/Notes		Signature
	Block.Valve 1	Block.Valve 2	Block.Valve 3	Block.Valve 4	Block.Valve 5	Block.Valve 6	Block.Valve 7	Block.Valve 8	Block.Valve 9					Micro 1	Micro 2	Micro 3	Micro 4	Micro 5	ARB + Display	EMERGENCY	Joystick button	Positive	Negative	
																						❑	❑	
																						❑	❑	
																						❑	❑	
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TABLES AND DOCUMENTS ENCLOSED

Table key explanation:

Block valve 1	**Block valve on lifting cylinder**
Block valve 2	**Block valve on fork balance cylinder**
Block valve 3	**Block valve on telescope extension cylinder**
Block valve 4	**Block valve on attachment moving cylinder**
Block valve 5	**Block valve on attachment locking cylinder**
Block valve 6	
Block valve 7	
Block valve 8	
Block valve 9	
Micro 1	**Presence micro-switch in driving seat**
Micro 2	**Presence micro-switch on parking brake**
Micro 3	
Micro 4	
Micro 5	
ARB + Display	**Overload warning system - Electronic card and display**
EMERGENCY	**Emergency stop pushbutton**
Joystick button	**Dead man pushbutton on control lever**