Genie®
A TEREX COMPANY

Operator's Manual

Serial number range

GTH - 5519

From: 16381
To: 16382

From: 17548
To: 17565

From: 17822
To: 17825

From: 18154
To: 18168

From: 18556
To: 18586

Part No. 57.0008.6200
Rev B
March 2009

A TEREX COMPANY

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Operator's manual ***57.0008.6200 - GTH-5519***

Produced by: TEREXLIFT Technical Literature Dept. - Umbertide- Perugia

Genie
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REVISED PAGE LIST

Revision N.	Revision Date	Revised pages	Notes	Issued by
1	03/2009	Section A, Section C, Section G	Revision	
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INTRODUCTION

This manual 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 PRECAUTIONS**
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 those responsible for safety.
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 those responsible for maintenance 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 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 manual 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 seven 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 degree of a hazard:

Safety Alert symbol: when you see this symbol, be alert to the possibility of personal injury. Strictly obey all the safety messages accompanying this symbol to avoid the risk of serious injury or death.

Red: used to indicate an imminently hazardous situation which, if not avoided, will result in death or serious injury.

Orange: used to indicate a potentially hazardous situation which, if not avoided, could result in death or serious injury.

Yellow with safety alert symbol: used to indicate a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

Yellow without safety alert symbol: used to indicate a potentially hazardous situation which, if not avoided, may result in damage to the machine or the systems.

Green: used to draw the attention to important information on environment protection.

Green: used to indicate operation and maintenance information

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

GENERAL INDEX

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Section A

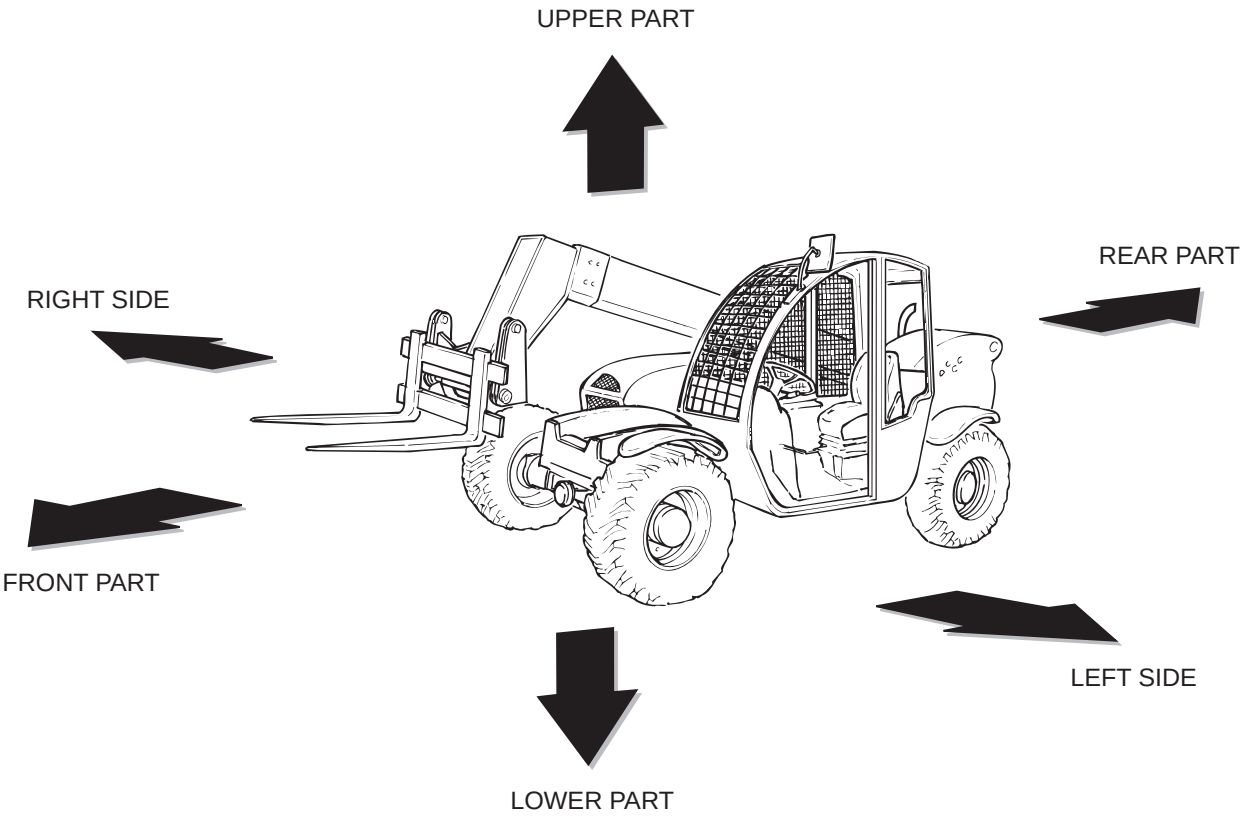
GENERAL INFORMATION

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.



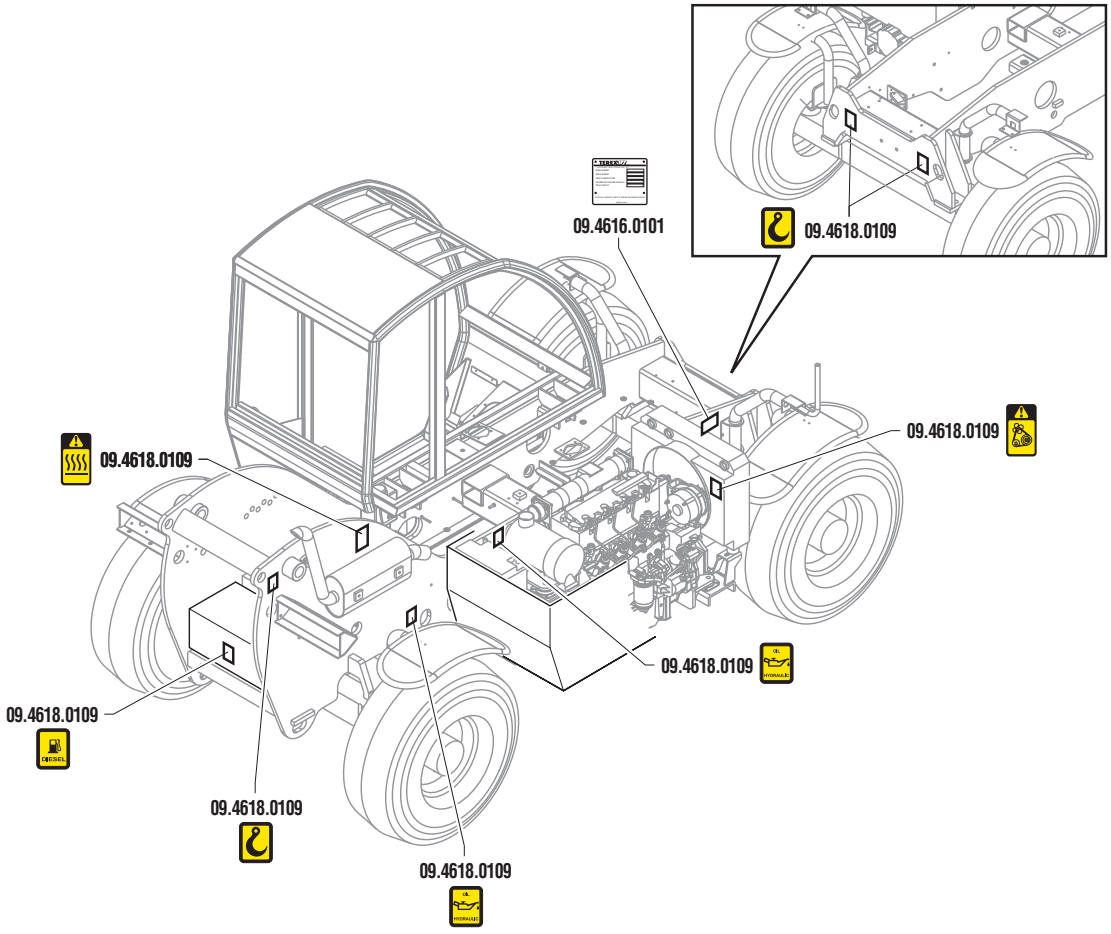
■ A-1.2 LABELS AND WARNING PLATES APPLIED ON THE MACHINE

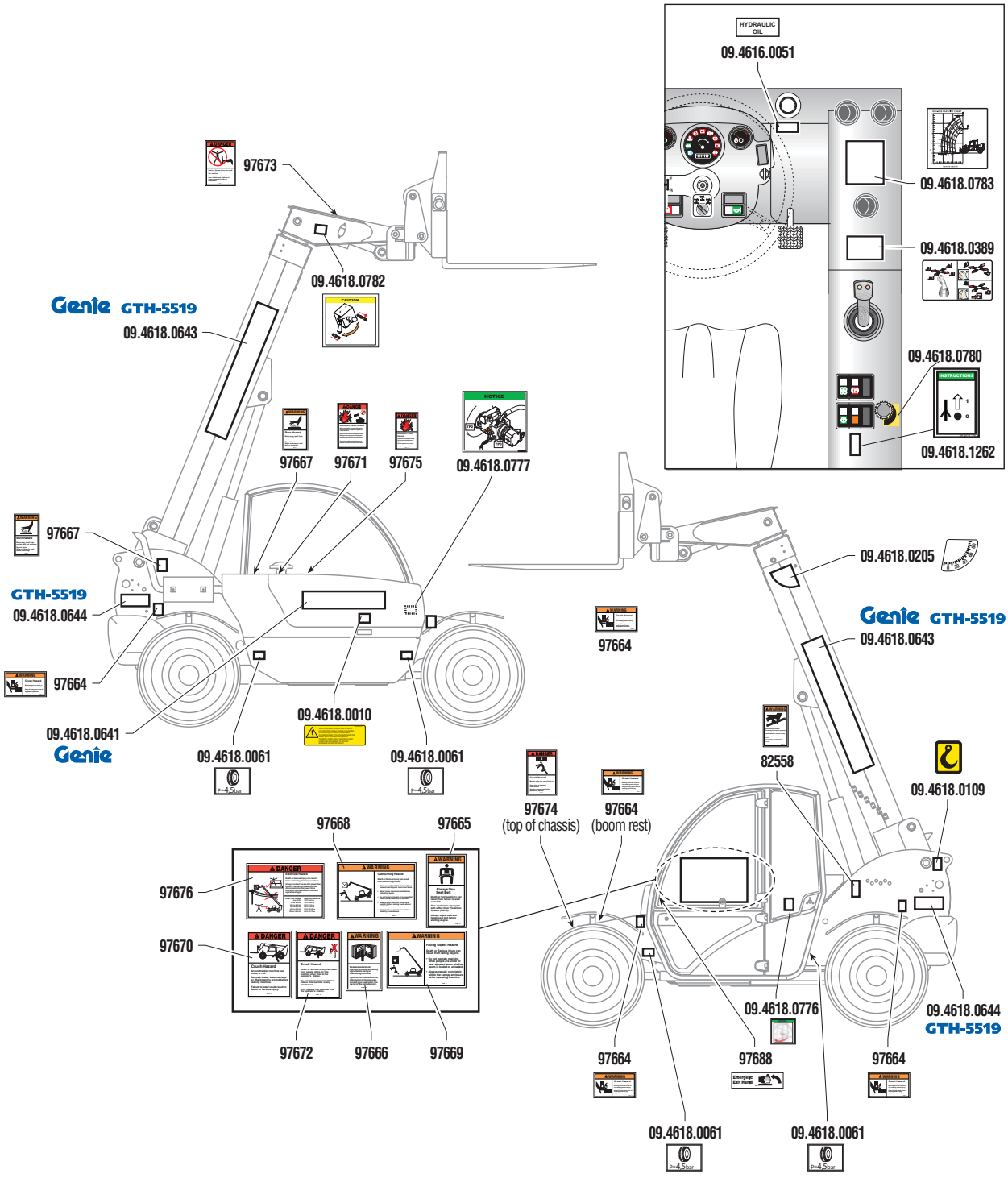
This paragraph lists the labels and warning plates normally applied on standard machines or on special attachments coupled to the machine.

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.

■ A-1.2.1 Position




HYDRAULIC OIL
09.4616.0051
09.4618.0783
09.4618.0389
09.4618.0780
09.4618.1262
97673
09.4618.0782
GTH-5519
09.4618.0643
97667
97671
97675
09.4618.0777
97667
GTH-5519
09.4618.0644
97664
09.4618.0641
09.4618.0010
09.4618.0061
09.4618.0061
97664
09.4618.0205
GTH-5519
09.4618.0643
82558
09.4618.0109
97674
(top of chassis)
97664
(boom rest)
97668
97665
97676
97670
97672
97666
97669
09.4618.0776
09.4618.0644
GTH-5519
97664
97688
97664
09.4618.0061
09.4618.0061

Code	Description
82558	Fluid at pressure
97664	Risk of crushing hands
97665	Safety belts
97666	Read the user's manual
97667	Risk of burns and scalds
97668	Risk of overturning
97669	Risk due to falling objects
97670	Risk of crushing
97671	Risk of explosion / burns
97672	Risk of crushing
97673	Prohibition to lift people
97674	Risk of crushing
97675	Risk of explosion / burns
97676	Electrical hazard
97688	Emergency exit handle
09.4616.0051	Hydraulic oil
09.4616.0101	Machine data plate
09.4618.0010	Prohibition to open with the engine running
09.4618.0061	Tyre inflation pressure
09.4618.0109	Sticker with various warnings
09.4618.0205	Boom tilting degree
09.4618.0389	Control lever controls
09.4618.0641	Sticker: "Genie"
09.4618.0643	Sticker: "Genie GTH-5519"
09.4618.0644	Sticker: "GTH-5519"
09.4618.0783	Load chart
09.4618.0782	Connect./disconnect. quick coupling
09.4618.0777	Testing ports TP2 - TP3
09.4618.0776	Upper door unlock system
09.4618.1262	Flow reversal button
09.4618.0780	Continuous flow knob sticker

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
	Fuel gauge
	Hydraulic oil temperature
	Position lights
	High beam
	Turn signals
	Parking brake
	Battery charge

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
	Glow plug preheating

Symbol	Description	Symbol	Description
	Front (optional) work light		
	Road/jobsite selector switch		
	Lifting point		
	Fuel plug		
	Engine oil filler		

A-2 MACHINE IDENTIFICATION

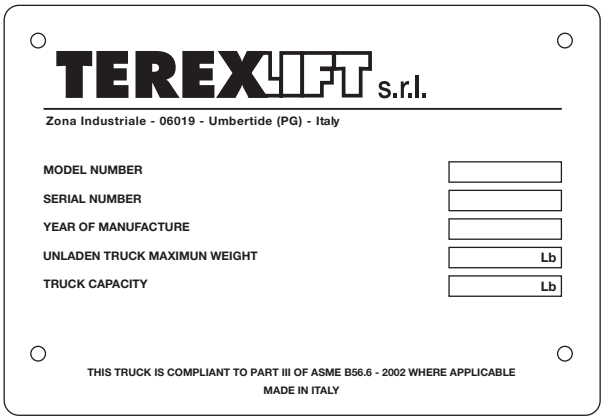
IMPORTANT

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-5519***



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

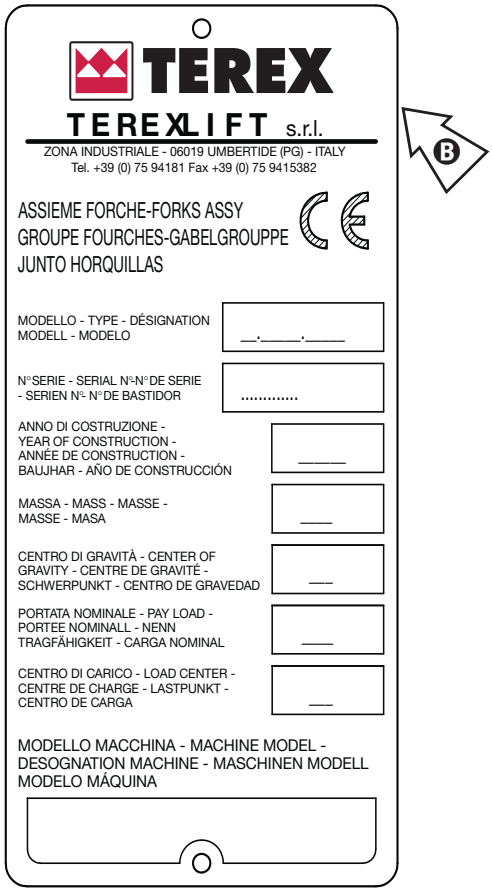
Fiscal Code/V.A.T. no. 00249210543

A-2.3 MACHINE IDENTIFICATION PLATES

Ⓐ ***Machine data plate.***

At the front, on the right side of the chassis.

The identification plate contains the main identification data of the machine like model, serial number and year of manufacture.



Ⓑ *Fork data plate*

Placed on the left side of the fork frame.This plate shows the identification data of fork such as model, serial number, year of manufacture, weight, nominal payload, centre of the load and model of the machine on which the forks are installed.

■ A-2.4 CHASSIS SERIAL NUMBER

The chassis serial number Ⓓ is punched on the front left part of the chassis side member.

■ A-2.5 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.

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.

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***
- ***Driving crosswise on slopes or hills***
- ***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

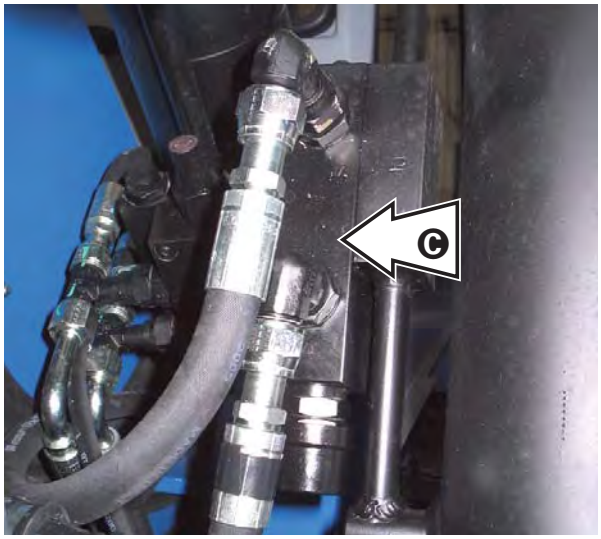
For the operator's safety, the following standards were obeyed during the risk assessment of the handler fitted with telescopic boom:

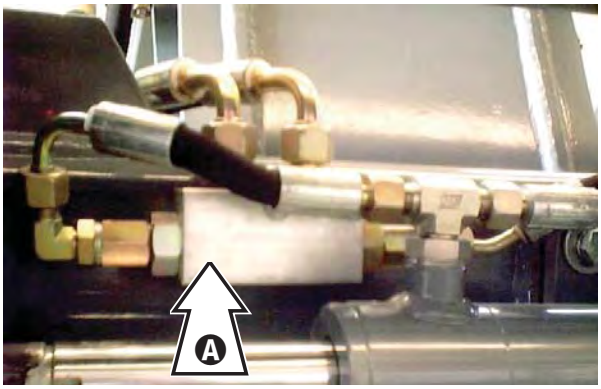
Standard	*Title*
ANSI/ASME B56.6-2002 part III where applicable.	

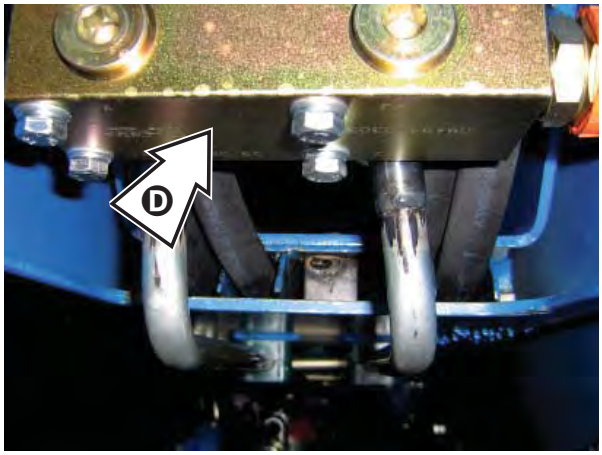
A-3.5 SAFETY DEVICES

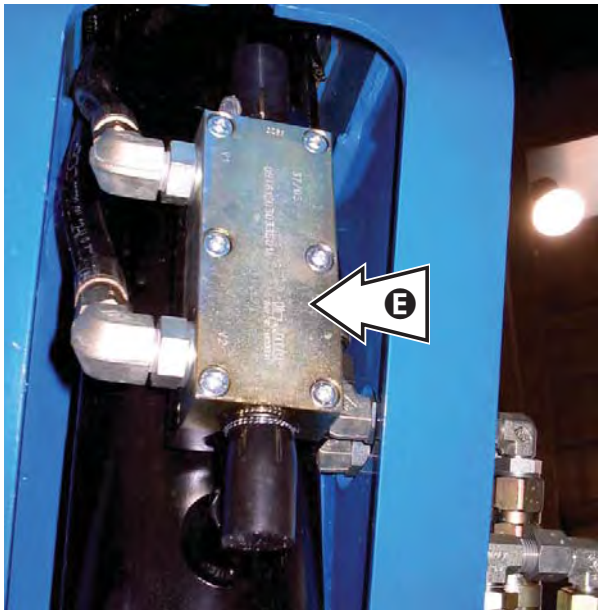
- The machine is equipped with a negative brake on the front axle which engages automatically when the engine stops.
  When this brake is disengaged, the engine start-up is inhibited.

- ***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



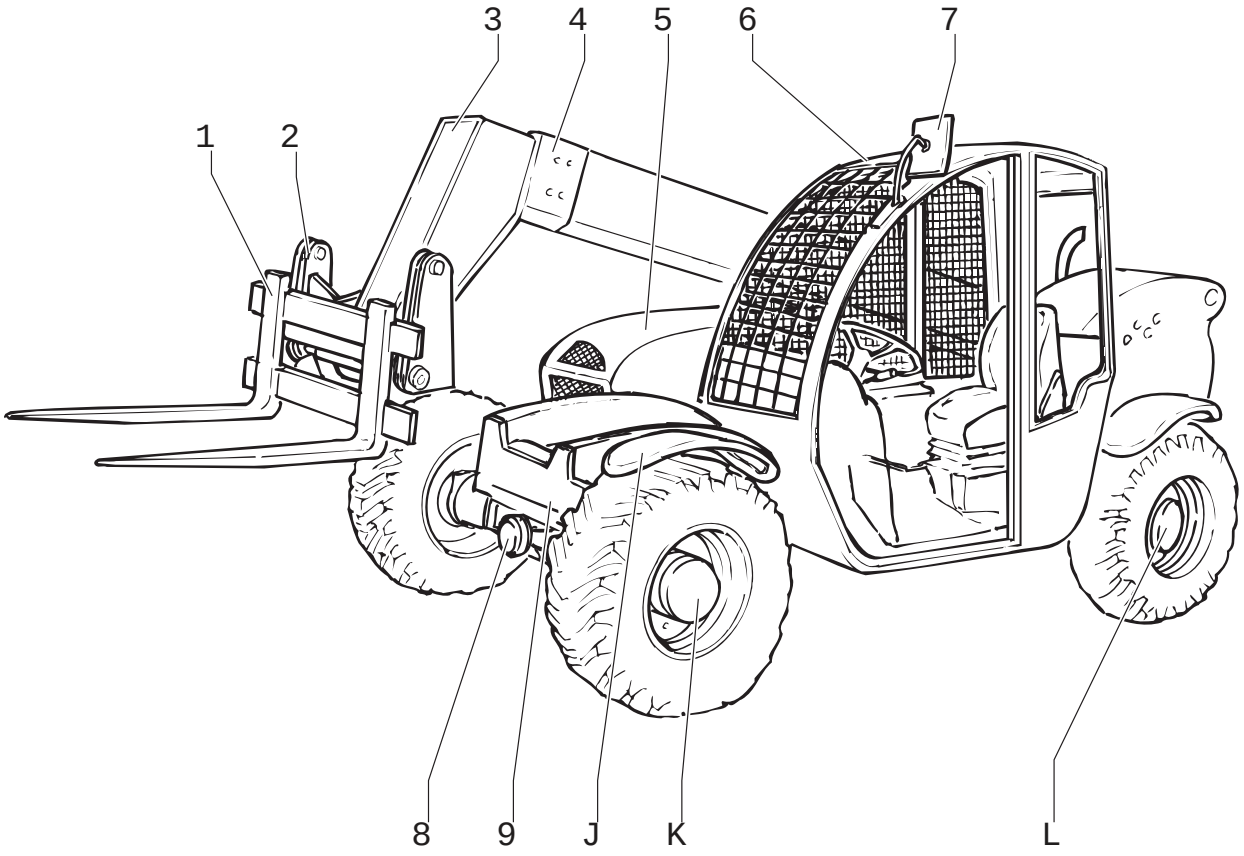






A-4 GENERAL DESCRIPTION

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
7 - Left rear view mirror
8 - Front axle
9 - Chassis
10 - Left front wheel mud-guard
11 - Left front wheel reduction gear
12 - Left rear wheel reduction gear

A-4.2 DESCRIPTION OF THE MAIN COMPONENTS

Hydrostatic transmission
This unit consists of parts which drive the machine shifting, and namely:
- a variable displacement pump connected to the thermal engine by an elastic joint
- a motor with variable displacement and automatic adjustment in relation to the wheel torque required, complete with power divider, directly applied on the rear axle
- a hydraulic oil filter, placed on the discharge line to the tank
- a heat exchanger to cool the circuit down.

Motion is transmitted to the rear axle from the power divider through a Cardan shaft.

Engine
The thermal engine is equipped with a heat exchanger which uses the engine oil as cooling medium.

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.

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 front axle braking unit with discs in oil bath.
The parking brake, of negative type, acts on the braking unit of the service brake. This brake is engaged every time the handler's engine is stopped or pressing down the light pushbutton located to the right of the driving place.

Telescopic boom
The machine is equipped with a telescopic boom with hydraulic-driven extension. The telescopes slides on interchangeable pads made of wearproof material.

Driving cab
Type-approved driving cab in compliance with standards ANSI/ASME B56.6-2002.

A-4.3 OPTIONAL ACCESSORIES

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

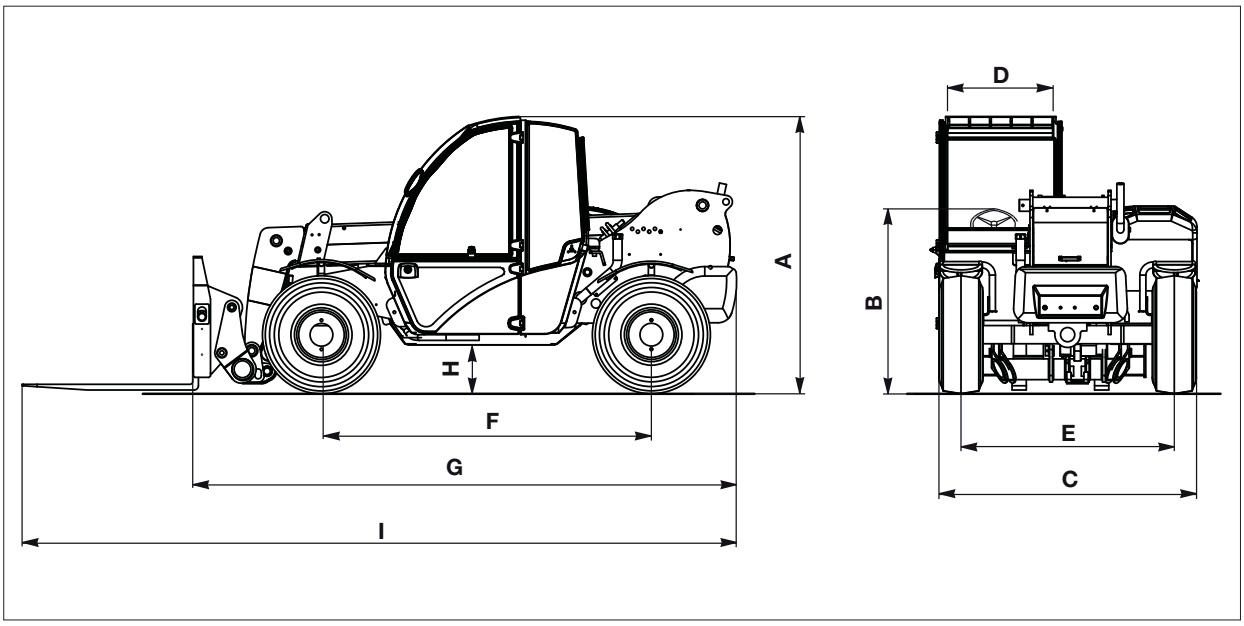
IMPORTANT

Please check the accessories available for your machine.

A-4.4 KITS SUPPLIED ON REQUEST

The machine is prepared for the installation of the following assembly kits:
- Driving cab glasses (including door)
- Heater
- Air conditioning
- Work lights (including courtesy lamp in the cab)
- Beacon

A-5 TECHNICAL DATA AND PERFORMANCE



	Measurements	Metric	Imperial
A	Height	1935 mm	6 ft 4 in
B	Height at steering whell	1250 mm	4 ft 1 in
C	Width	1810 mm	5 ft 11 in
D	Inside cab width	750 mm	2 ft 6 in
E	Track	1500 mm	4 ft 11 in
F	Wheelbase	2320 mm	7 ft 7 in
G	Length at fork-holder plate	3840 mm	12 ft 7 in
H	Ground clearance	330 mm	1 ft 1 in
I	Overall Length	5040 mm	6 ft 7 in
	Lifting height (max)	5790 mm	19 in
	Lifting capacity (max)	2500 kg	5500 lbs
	Lift capacity at maximum height	2000 kg	4400 lbs
	Lift capacity at maximum reach	860 kg	1900 lbs
	Forward reach (max)	3350 mm	11 ft
	Reach at maximum height	605 mm	2 ft
	Fork-holder plate rotation	130°	130°
	Weight ***	4450 kg	9810 lbs

*Max Load; ** No Load; ***With Fork

Productivity	Metric	Imperial
Lifting/lowering speed **	7/4 s	7/4 s
Extension/retraction speed **	7/4 s	7/4 s
Inside/outside turning radius	1750mm / 3000mm	5ft 9in / 9ft 10in
Break-out force (with 500lt shovel SAE J732/80)	3700 kg	8157 lbs
Towing capacity al dinamometro */**	4230 kg/3100 kg	9325 lbs/6835 lbs
Travel speed (max)	24 km/h	15 mph
Chassis levelling on both axles	2,3°	2,3°
Floating forks ... lenght	1200 mm	3ft 11in
section	100 x 40 mm	3,9 in x 1,6 in
Tyres (DIN 70631)	12-16.5, 8 holes	12-16.5, 8 holes

Power	Metric	Imperial
Engine		
	Perkins 804C-33	
Displacement	3,331 litres	203 in^3
Cylinder arrangement	Vertical in-line	
Combustion System	In-direct injection	
Max Power Output (@ 2600rpm)	47,0 kW	63,0 hp
Max Torque Output (@ 1600rpm)	190 N-m	140 lb-ft
Aspiration	Aspirated	
Cylinder's number	4	4
Hydraulic		
Hydraulic output/pressure	80 l/min / 270 bar	21 USgal/min / 3916 psi

Tank Capacities	Metric	Imperial
Petrol	60 litres	16 USgal
Engine oil	10 litres	2,5 USgal
Hydraulic oil	70 litres	18,5 USgal

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 10000 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.

IMPORTANT

Five years or 6000 hours after the first placing into operation of the machine (whichever occurs first), check the state of the structure paying an extreme attention to the welded supporting joints and the pins of both boom and platform (see chap. D-3.20).

A-7 ITEMS SUPPLIED

The following items are supplied together with the machine:

Description	*GTH-5519*
- Spanner CH 19 (for fork positioning)	✘
- Allen wrench CH 6 (for fork positioning)	✘
- 12 V lamps (spare)	✘

A-7.1 LITERATURE SUPPLIED

The machines comes with the following literature:
- Machine operator's handbook
- PERKINS engine use and maintenance manual
- Spare parts catalogue
- Warranty and handing over certificate

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Section B

SAFETY PRECAUTIONS

TABLE OF CONTENTS

DANGER

Not observing the instructions and safety rules in this manual may result in death or serious injury.

Do not operate the machine unless:

- ☛ You learn and practice the principles of safe machine operation contained in this operator's manual.
  1. **Avoid hazardous situations.** Read and understand the safety instructions before going on to the next chapter.
  2. **Always perform a pre-operation inspection.**
  3. **Always test the machine functions prior to use.**
  4. **Inspect the work place.**
  5. **Only use the machine for the intended application.**

- ☛ Read, understand and obey the manufacturer's instructions and the safety rules, the safety and operator's manuals, and the decals applied on the machine.

- ☛ Read, understand and obey the employer's safety rules and worksite regulations.

- ☛ Read, understand and obey the applicable national regulations.

- ☛ Only trained personnel informed on the safety rules can operate the machine.

B-1 GENERAL REMARKS

Most accidents occurring while working, repairing or maintaining 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.

DANGER

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 REQUISITES OF THE PERSONNEL IN CHARGE

B-2.1 REQUISITES 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 be familiar 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.

B-2.2 REQUISITES 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 be familiar with this handbook, its enclosed graphs and diagrams, the identification and warning plates. They shall be skilled and trained about the machine functioning.

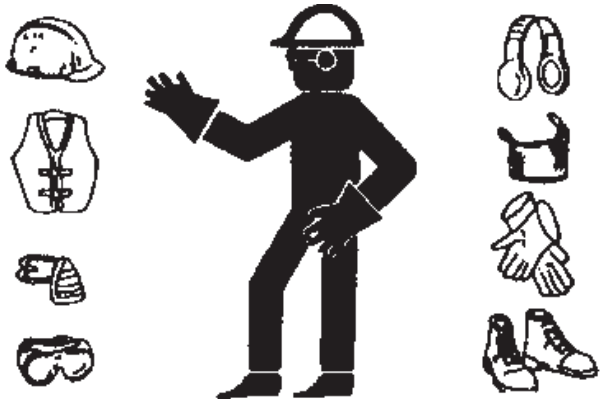
IMPORTANT

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 not wear clothes with large sleeves or 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

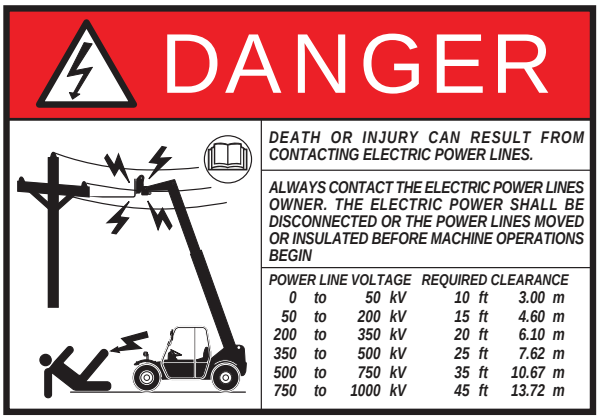
■ B-3.1 HAZARDS ON THE JOBSITE

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.

DANGER

The machine is not electrically insulated and does not provide protection from contact with or proximity to electrical power lines.
Always keep at a minimum safe distance from the telescopic boom and the lifted load. Electrical



hazards!

- Keep away from the machine in case of contact with energized power lines. Personnel on the ground must never touch or operate the machine until energized power lines are shut off.

DANGER

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

DANGER

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.

B-3.2 OPERATION OR MAINTENANCE HAZARDS

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**).

DANGER

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!

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 approved fall restraint or fall arrest 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.
- Avoid the use of tools in bad condition or use in an improper way i.e. pliers instead of adjustable wrenches, etc.
- Applying loads in different points of the attachment holding plate is forbidden.
- 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.

- Do not empty catalytic mufflers or other vessels containing burning materials without taking the necessary precautions.
- 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 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 any means.
- After work, never leave the machine under potentially dangerous conditions.

■ B-3.3 MACHINE OPERATION HAZARDS

Absolutely avoid the following work situations:

- Do not handle loads beyond the maximum capacity of the machine.
- Do not raise or extend the boom if the machine is not on a firm, level surface.
- Do not operate the machine in strong wind. Do not increase the surface area of the machine or forked load exposed to the wind. Increasing the area exposed to the wind will decrease machine stability.
- Use extreme caution and slow speeds when the machine is driven across uneven or unstable grounds, slippery surfaces or near trenches or drop-offs.
- Limit travel speed according to ground conditions, slopes, presence of personnel or other factors which may cause collision.
- Do not place or attach overhanging loads to any part of the machine.

■ B-3.4 DAMAGED COMPONENT HAZARDS

- Do not use battery chargers or batteries with a voltage above 12V to start the engine.
- Do not use the machine as a ground for welding.

■ B-3.5 EXPLOSION OR FIRE HAZARDS

- Do not start the engine if you smell or detect LPG, gasoline, diesel fule or other explosive substances.
- Do not refuel the machine with the engine running.
- Refuel the machine and charge the battery only in a well ventilated area away from sparks, naked flames and lighted cigarettes.
- Do not operate the machine in dangerous environments or in places with flammable or explosive gases or materials.
- Do not inject ether in engines equipped with glow plugs.
- Do not leave fuel cans or bottles in unsuitable places.
- Neither smoke nor use open flames in areas subject to fire dangers and in presence of fuel, oil or batteries.
- Carefully handle all flammable or dangerous substances.
- Do not tamper with fire-extinguishers or pressure accumulators: **explosion hazard!**

B-3.6 DAMAGED MACHINE HAZARDS

- Do not use a damaged or defective machine.
- Do a thorough pre-operation inspection of the machine and test all functions before each work shift. Tag and remove from service a damaged or defective machine.
- Make sure that all maintenance jobs have been carried out as specified in this manual and the appropriate service manual.
- Make sure that all decals are in place and legible.
- Make sure that the operator's, safety and responsibilities manuals are intact, legible and placed in the special container located in the machine.

B-3.7 PERSONAL INJURY HAZARDS

- Do not operate the machine in case of hydraulic oil or air leak. Air or hydraulic oil leaks can penetrate or burn the skin.
- Always operate the machine in a well ventilated area to avoid carbon monoxide poisoning.
- Do not lower the boom if the area underneath is not clear of personnel or obstructions.

B-4 SAFETY DEVICES

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-3.16.***

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 PRE-OPERATION INSPECTION

Do not operate the machine, unless:

- You learn and practice the principles of safe machine operation contained in this operator's manual.
  1 Avoid hazardous situations.
  Read and understand the safety rules before going on to the next chapter.
  2 Always perform a pre-operation inspection.

  Read and understand the safety rules before going on to the next chapter.
  3 Always test the machine functions prior to use.
  4 Inspect the work place.
  5 Only use the machine for the intended application.

Fundamentals

It is the operator responsibility to perform a pre-operation inspection and routine maintenance.

Pre-operation inspection means a visual inspection performed by the operator prior to each work shift.

The inspection has to be carried out on the machine to detect possible faults before the operator starts testing the machine functions.

The pre-operation inspection also helps understand if some routine maintenance procedures are required. The operator can only perform the routine maintenance procedures envisaged in this manual.

See the list on the next page and check each single component.

If the machine is damaged or a non-authorized modification has been done, the machine must be tagged and removed from service.

Repairs must be carried out by qualified technical personnel according to the manufacturer's specifications. After any repair, the operator should repeat the pre-operation inspection before testing the machine functions.

Scheduled maintenance procedures must be performed by qualified technical personnel according to the technical specifications of the manufacturer and the requirements envisaged in the responsibilities manual.

Pre-operation inspection

- ☛ Make sure the operator's manuals are intact, legible and placed inside the machine.
- ☛ Make sure all decals are present and legible. See "Decals" chapter.
- ☛ Check for engine oil leaks and proper oil level. Top up if necessary. See "Maintenance" chapter.
- ☛ Check for axle oil leaks and proper oil level. Top up if necessary. See "Maintenance" chapter.
- ☛ Check for hydraulic oil leaks and proper oil level. Top up if necessary. See "Maintenance" chapter.
- ☛ Check for engine coolant leaks and proper coolant level. Add coolant if necessary. See "Maintenance" chapter.
- ☛ Check for battery fluid leaks and proper fluid level. Add distilled water if necessary. See "Maintenance" chapter.

Check the following components or zones for damage, missing or wrongly fitted parts or non-authorised modifications:

- electrical components, wiring and electrical cables
- hydraulic hoses, fittings, cylinders and distributors
- fuel and hydraulic oil tanks
- drive pump and motor and transmission axles
- steering system
- braking system
- boom telescopes sliding pads
- clean glasses, lights and rear view mirrors
- engine and relevant components
- limit switches and horn
- lights
- ***machine ignition control***
- nuts, bolts and other fasteners.

Check the entire machine for:

- cracks on welds or structural components
- dents or damage to the machine.

- ☛ Make sure that all structural and other critical components are present and the relevant fasteners and pins are fitted and properly tightened
- ☛ After inspection, check that all the compartment covers are in place and latched.

DANGER

If even one single item is damaged or defective, do not start work. Stop the machine and repair the fault.

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.

ATTENTION

If the machine shall be used in a marine or equivalent environment, protect it against salt deposits with an adequate treatment against saltiness to prevent rust formation.

C-2 ENTERING THE MACHINE

C-2.1 ENTERING THE CAB (ONLY WITH CABIN CLOSED OR GLASS KIT INSTALLED)

DANGER

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**.
- Press the pushbutton and open the door.

Door closing from inside:

- Pull the door with force: it locks automatically.

Door opening from inside:

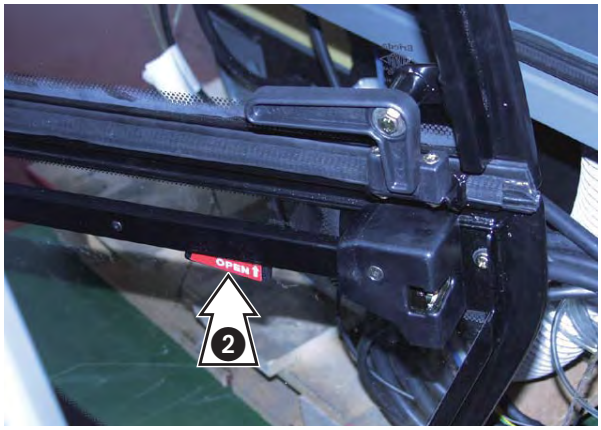
- Lift lever **2** and release the lock to open the door completely.
- Rotate handle **3** to open the upper section of the door and lock it against the special catch.

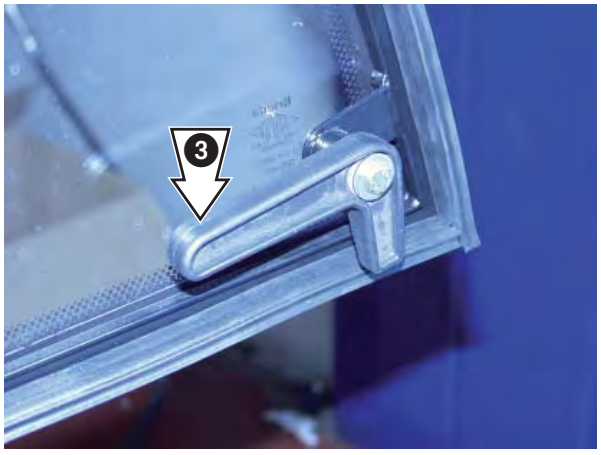
To unlock the door latched in open position:

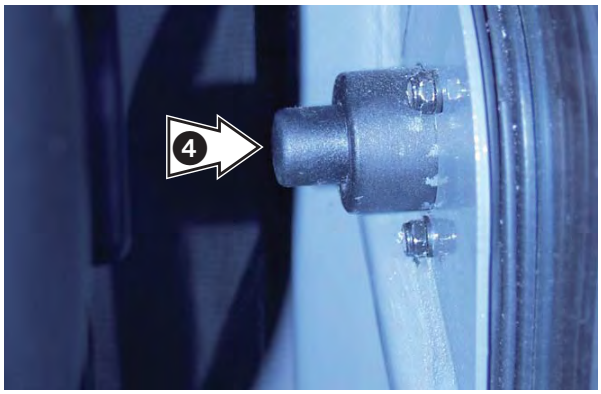
- Press button **4** to unlock the door from the catch, close and latch the door to the lower section using handle **3**.

ATTENTION

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.

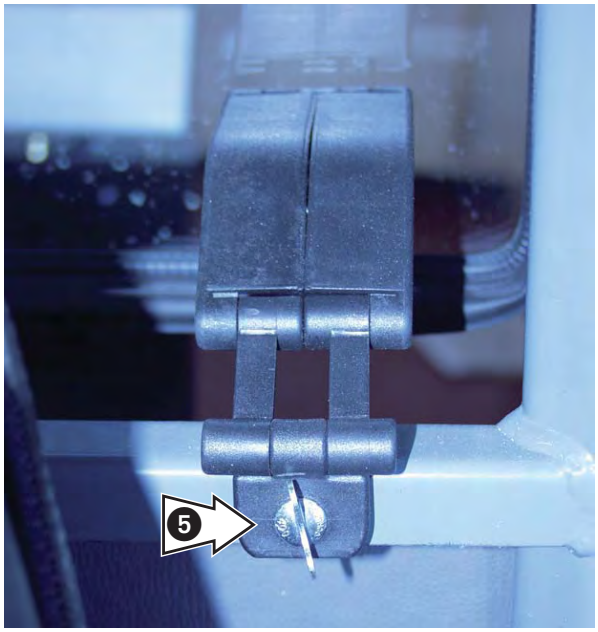


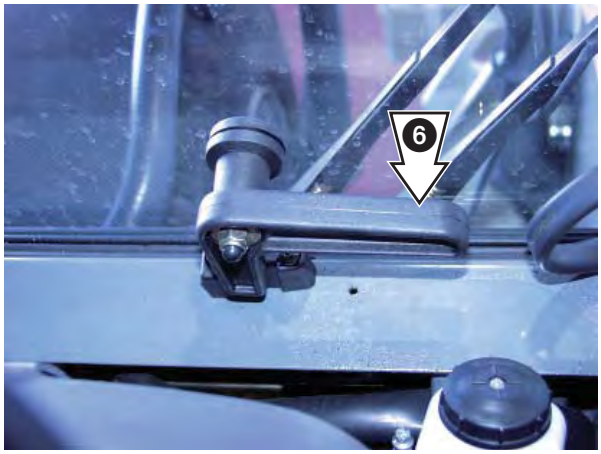




C-2.1.1 Leaving the cab in an emergency (ONLY WITH CABIN CLOSED OR GLASS KIT INSTALLED)

In an emergency, the operator can use he front or the rear window as safety exit-ways.
The rear window has handles for partially opening the glass. Such handles are locked in position by some wing nuts **5** which, if driven out, allow opening the glass completely.
The front window has two handles **6** which, if turned, enable the operator to pass through.





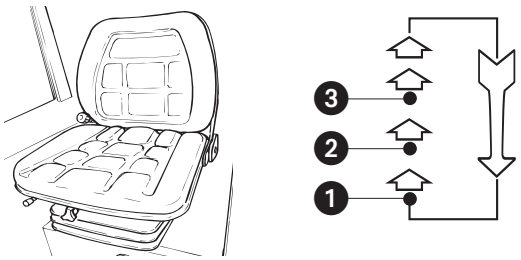
■ C-2.2 ADJUSTING THE SEAT

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 (optional)**
  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 (optional)**
  Turn knob **3** clockwise to lift the seat; turn it counter-clockwise to lower the seat.

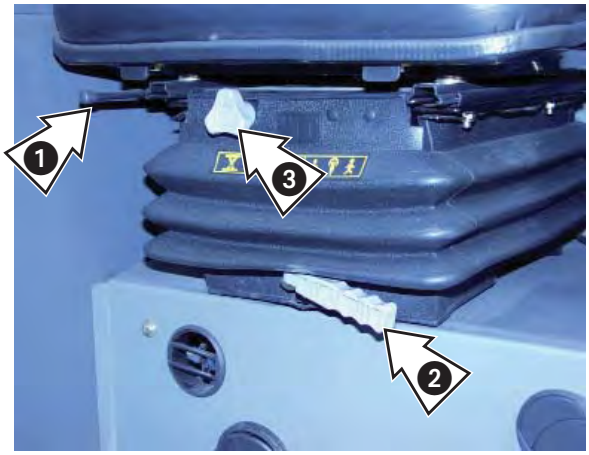


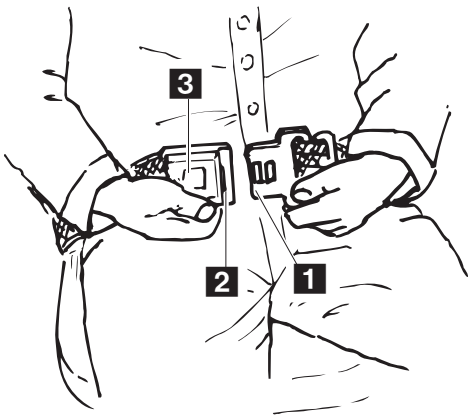
In some seats height can be adjusted to three different positions. Lift the seat until you hear the click signalling that the seat is locked in position. To lower the seat, raise to end of stroke to release the mechanism, then release the seat: it will return to the bottom position.

■ C-2.3 FASTENING THE SEAT BELTS

Sit correctly in the driving seat; then:

- The safety belts are equipped with reel retractor. To fasten the belt, pull tab **1** and push it into buckle **2**.
- To release the belt, push button **3** and remove the tab from the buckle.
- Make sure that the buckle is correctly located at the hip point and not on the stomach.
- Operate the end adjusters to reach the length you wish and make sure the buckle is always in the middle.





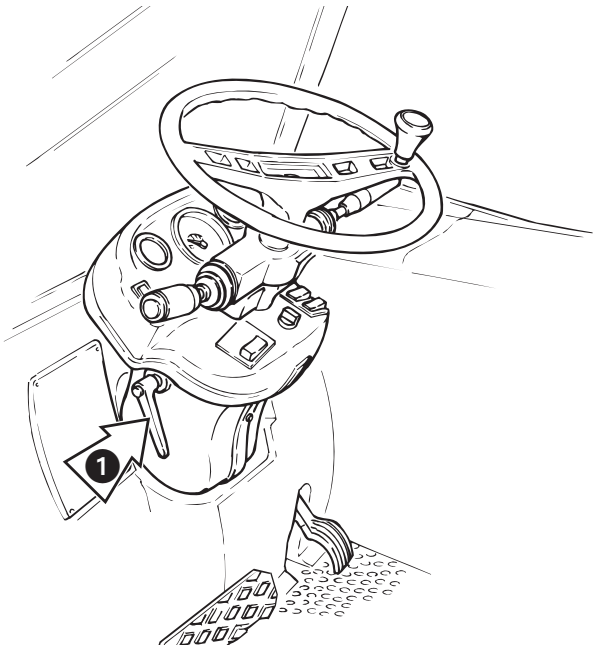
■ C-2.4 ADJUSTING THE STEERING COLUMN

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

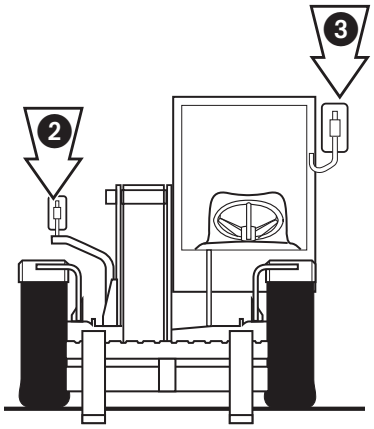
Before driving the machine, ensure the steering wheel is perfectly clamped.

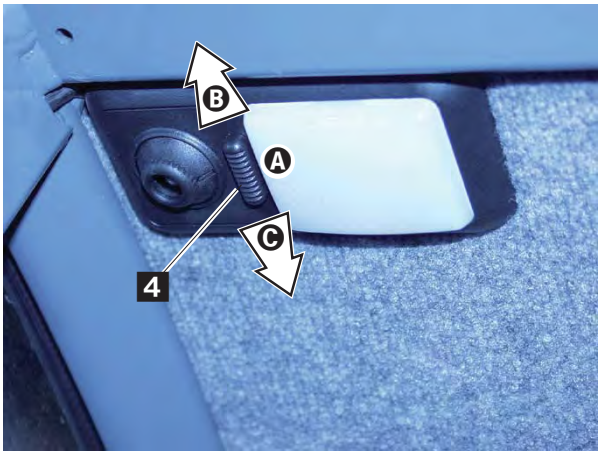


■ C-2.5 ADJUSTING THE REAR VIEW MIRRORS

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 ON THE CAB LIGHTS

The ceiling light fixture of the cab has an internal lamp and a courtesy lamp.

To switch on the cab interior lights:

- Switch **4** in pos. **A** cab interior lights OFF
- Switch **4** in pos. **B** cab interior lights ON.
- Switch **4** in pos. **C** courtesy lamp ON

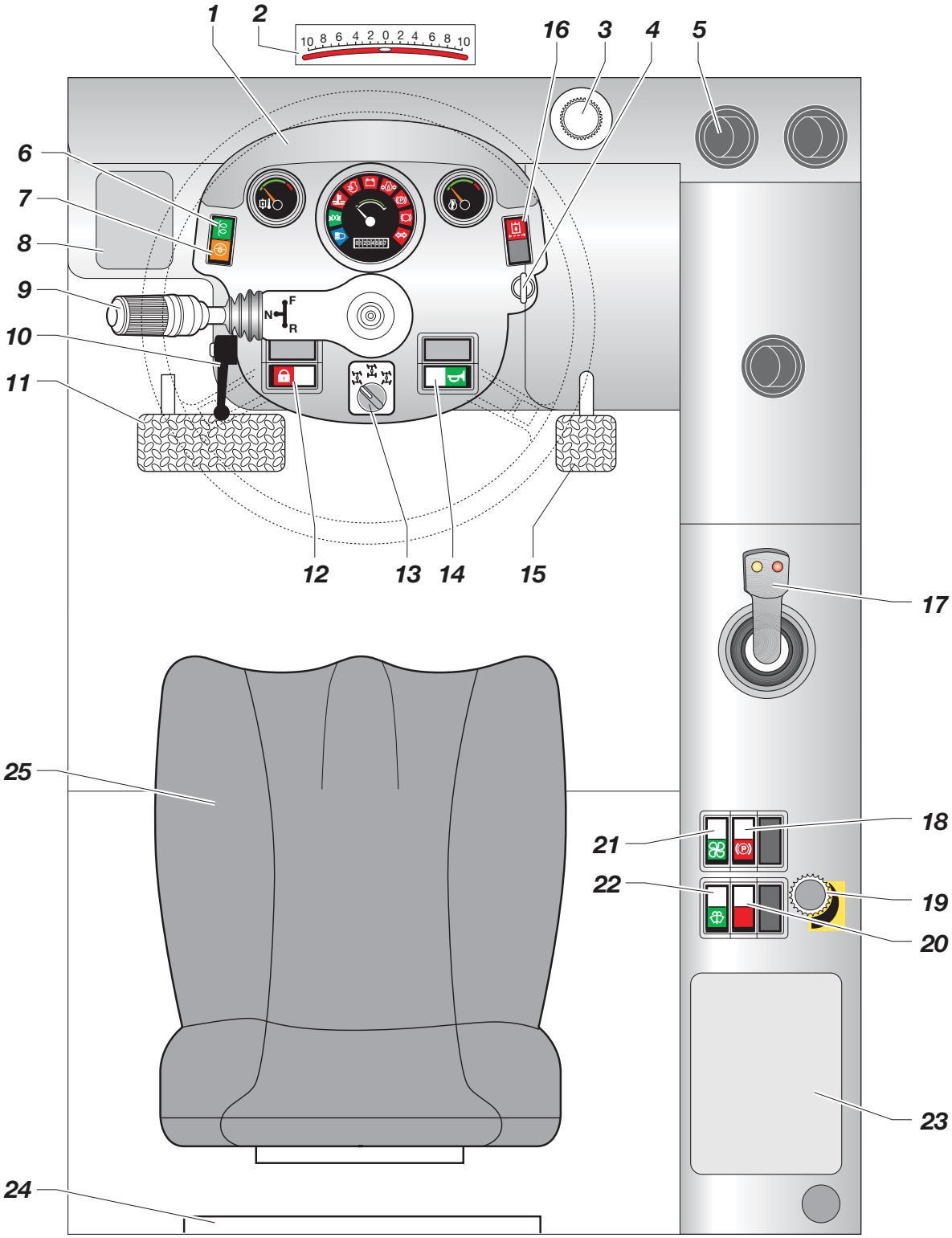
C-3 DRIVING PLACE

C-3.1 CONTROLS AND INSTRUMENTS

1 Dashboard
2 Water level
3 Brake oil tank
4 Ignition switch
5 Fresh air flap
6 Warning light - glow plugs preheating
7 Warning light - air filter clogged
8 Fuse compartment
9 Forward/reverse speed selection lever
10 Steering column locking lever
11 Brake pedal
12 Pushbutton enabling the attachment coupling/release
13 Steering selection switch
14 Horn pushbutton
15 Gas pedal
16 Warning light - engine filter soiled
17 Control lever
18 Negative brake on/off switch
19 Continuous oil flow potentiometer
20 Flow reversal button
21 Air conditioning fan switch (only with cabin closed)
22 Windscreen washer pushbutton (only with cabin closed)
23 Storage tray
24 Storage pocket
25 Seat

IMPORTANT

The warning lights, controls and instruments not indicated in this list or in the drawings on the following pages are part of the optional assembly kits. When looking for one of such devices, please refer to the pages of the specific assembly kit at the end of this manual or to the specific installation instructions.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■ C-3.2 ENGINE CONTROLS AND INSTRUMENTS

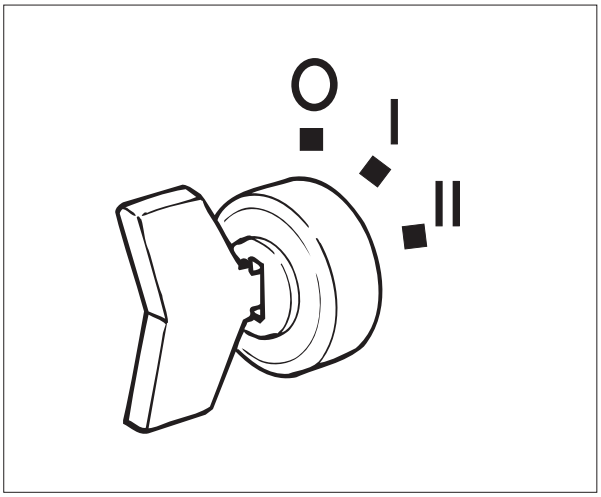
■ C-3.2.1 Ignition switch

Three-position switch:

O No circuit under voltage, key can be removed and engine is stopped

I Circuits under voltage, presetting for the engine starting. Board controls and instruments are on.
The warning light **6** signalling the glow plugs preheating comes on. Wait until the light goes off before starting the engine.

II 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:

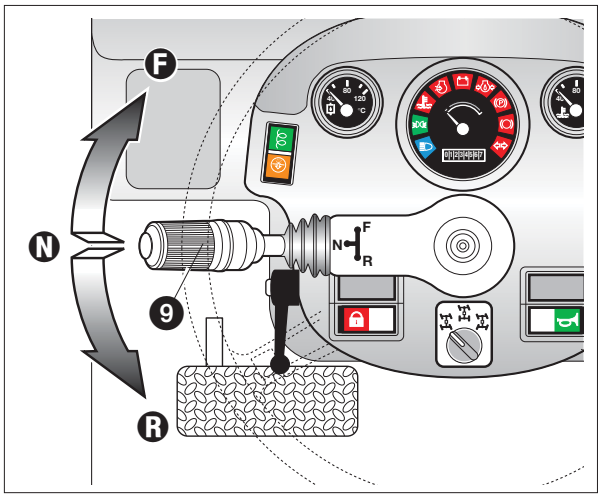
N Neutral position; no gear engaged

F Shift lever to pos. **F** to select the forward gear

R Shift lever to pos. **R** to select the reverse gear

ATTENTION

Once the reverse gear is engaged, a sound allarm will be activated



■ C-3.2.3 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 and makes the braking action more powerful.

18 Parking brake

The parking brake of negative type engages automatically when the engine is stopped.
When the handler's engine is restarted, pressing the pushbutton switch **18** unlocks the parking brake.
To stop the handler without shutting down the engine, press the pushbutton switch **18** to engage the parking brake and push it once again to disengage the brake.
Every pressure of the pushbutton switches the warning light on and off. When the red warning light is on, the parking brake is engaged.

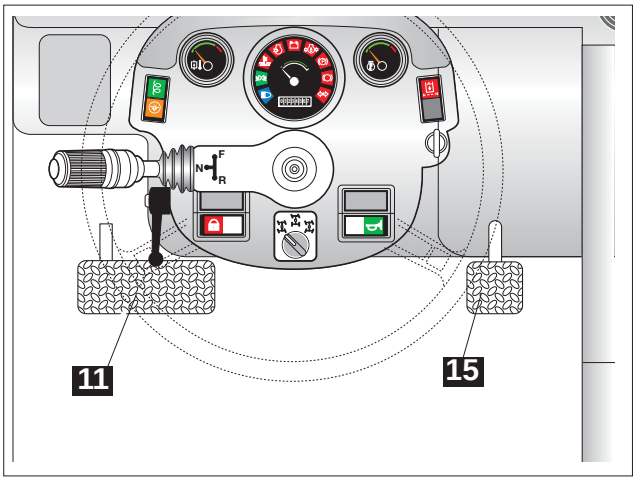
ATTENTION

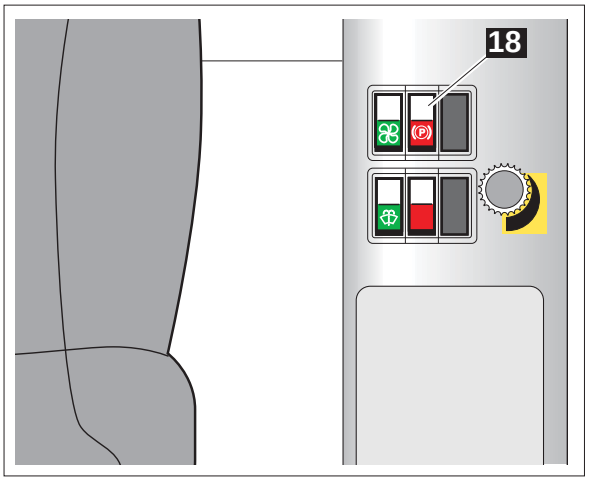
Never use the parking brake to slow down the machine, unless in an emergency. It may reduce the brake efficiency.

■ C-3.2.4 Accelerator control

15 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





■ C-3.2.5 Pushbutton enabling the attachment coupling/release

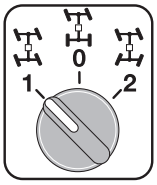
12 Selection button

Two-position button with return to the neutral point. Press this button every time you wish to couple/release an attachment. Hold the button pressed down until the movement has been completed.

■ C-3.2.6 Steering mode selection

13 Steering mode switch

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



1 Crab steering

0 Two-wheel steering

2 Four-wheel steering

IMPORTANT

Clock wise, rottation of the steering wheel steers the truck to the operator's right

■ C-3.2.7 Continuous oil flow

20 Flow reversal button

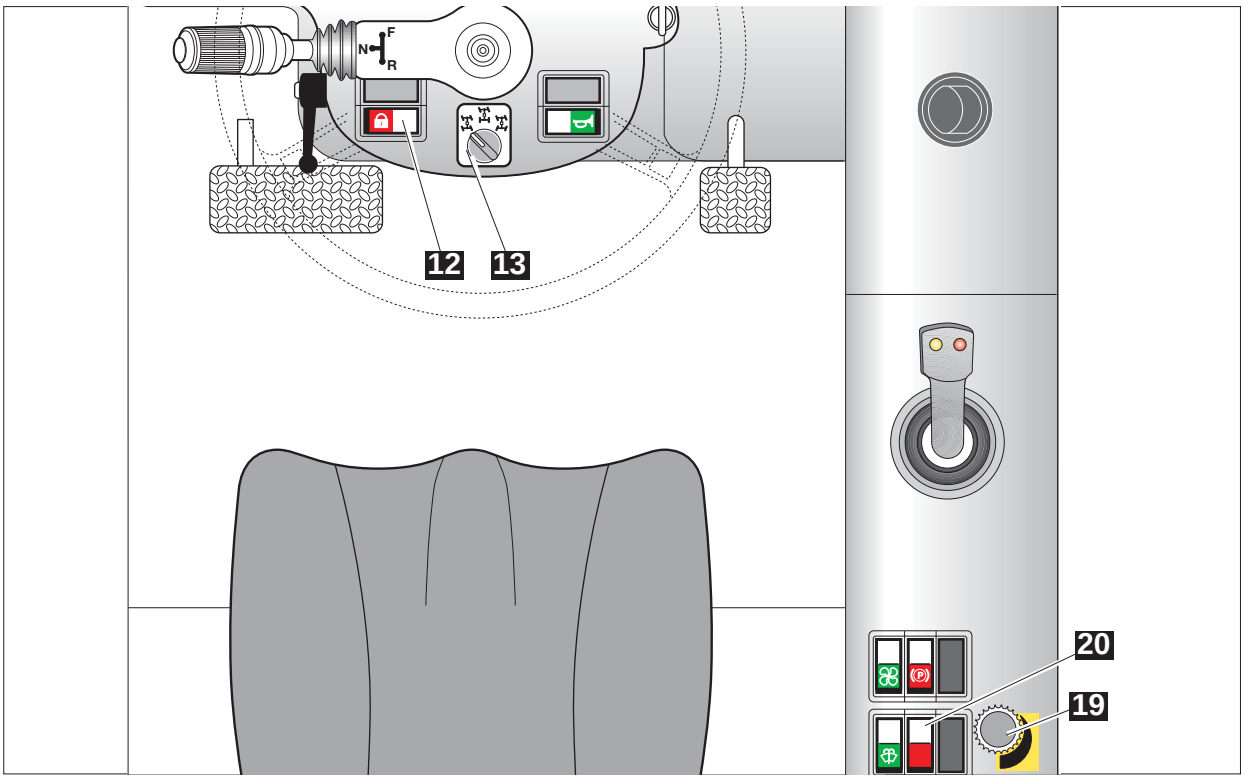
Pushbutton with orange glass cap, with two stable positions. Press this button to switch the hydraulic circuit feeding the attachments with auxiliary lines.

1 Continuous oil flow delivery to the used attachment.

0 No oil flow.

19 Continuous oil flow potentiometer

By turning the potentiometer clockwise, the flow rate in the circuit feeding the attachments' movement lines is increased.



■ C-3.2.8 Auxiliary drive controls

14 Horn pushbutton

Pushbutton with green glass
Press this button to operate the horn.

22 Windscreen washer button

0
1

By holding this button pressed down, a jet of water is sprayed on the windscreen and the rear window.

23 Air conditioning fan switch (only with cabin closed)

0
1
2

Three-position switch:
0 OFF
1 Low speed
2 High speed

■ C-3.3 INSTRUMENTS AND LIGHT INDICATORS

■ C-3.3.1 Instruments

54 Engine coolant temperature indicator

Signals the engine coolant temperature. (engine oil)

53 Fuel gauge

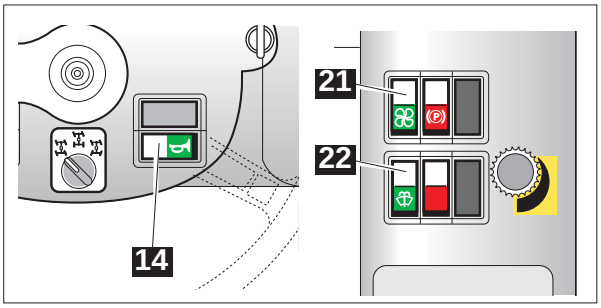
Signals the fuel level within the tank.

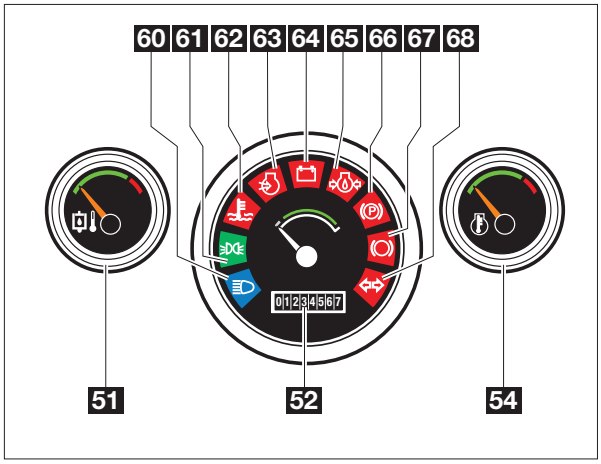
52 Hour-meter

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.
This indicator is active only when the lights kit is installed.

61 ***Indicator light - position lights***

Green indicator light that signals when position lights are ON.
This indicator is active only when the lights kit is installed.

63 ***Indicator light - engine air filter restricted***

When this lamp come on, proceed with cleaning or changing the air filter cartridge (see “Maintenance” section).

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 ***Indicator light - negative brake accumulator***

Not activated.

68 ***Indicator light - turn signals***

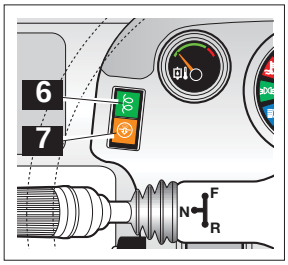
Green indicator light that signals when turn signals are ON.
This indicator is active only when the lights kit is installed.

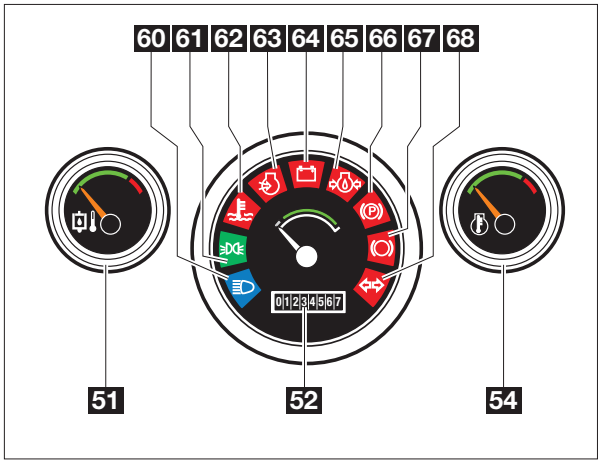
6 ***Indicator light - glow plugs preheating***

Green light indicators which signal the preheating phase of the engine glow plugs. Before starting the engine wait for these lights to go off.

7 ***Indicator light - air filter soiled***

Orange light indicator which signals when the air intake filter of the engine is getting soiled.
Clean or replace the filtering cartridge immediately.

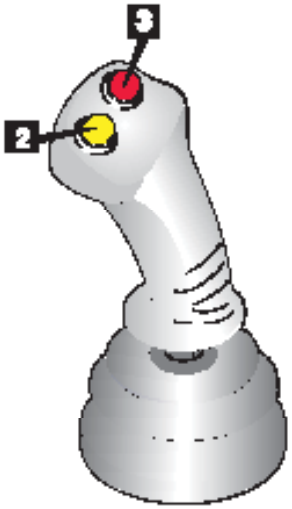




■ C-3.4 CONTROL LEVER

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

The lever has two pushbuttons: one for coupling/releasing the attachments 3 and the other for pitching the attachment frame forwards/backwards 2.
Shifting the lever to one of the four directions (right/left, forwards/backwards) moves the boom up and down and the telescope out and in.



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.

DANGER

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

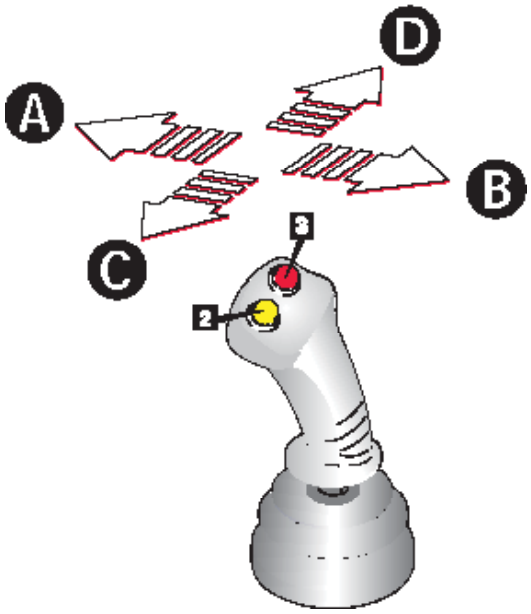
DANGER

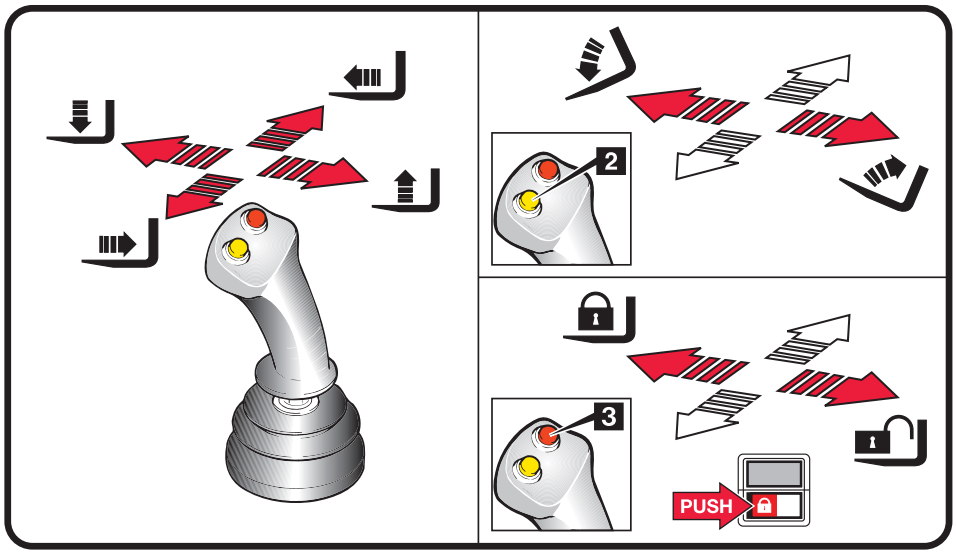
Before operating the control lever, make sure that nobody is within the working range of the machine.

■ C-3.4.1 Function selection

The lever is enabled to carry out the following motions:

- **Boom lowering/lifting**
  shift the control lever to Ⓐ or Ⓑ
- **Boom extraction/retraction**
  shift the control lever to Ⓒ or Ⓓ
- **Attachment back/forward tilting**
  press button 2 and shift the control lever to Ⓐ or Ⓑ
- **Attachment coupling/release**
  press button 3 together with the dashboard enabling button and shift the lever to Ⓐ or Ⓑ





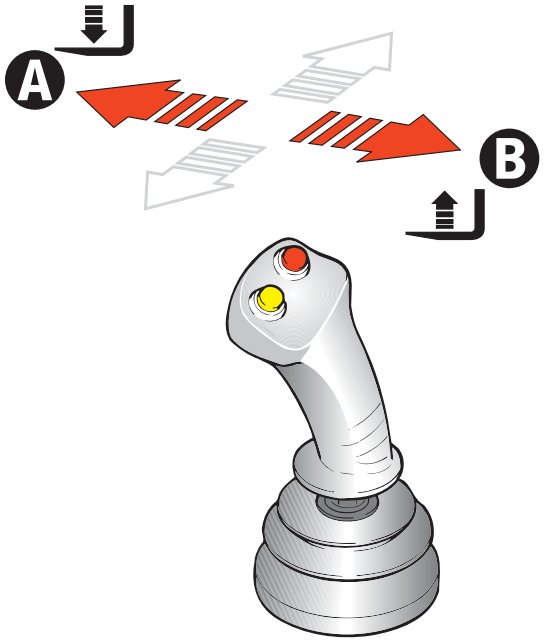
■ C-3.4.2 Lifting/lowering the boom

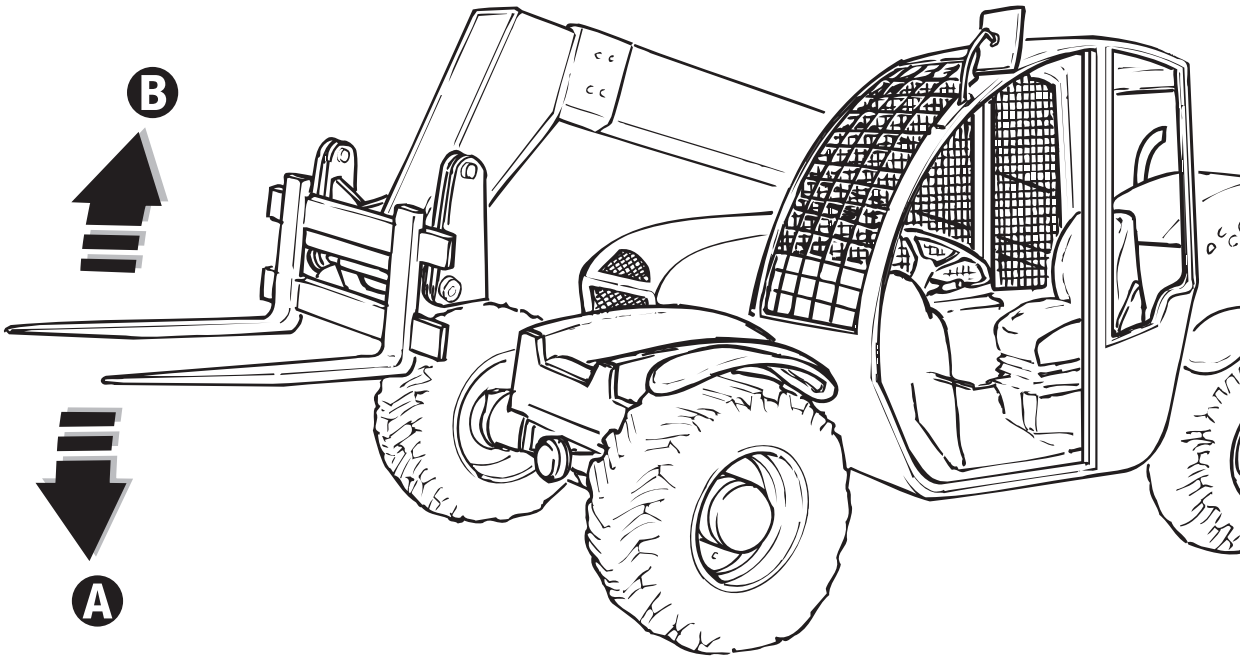
DANGER

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

To lift or lower the boom:

- Smoothly shift the lever to position Ⓑ to lift the boom or to position Ⓐ to lower it.





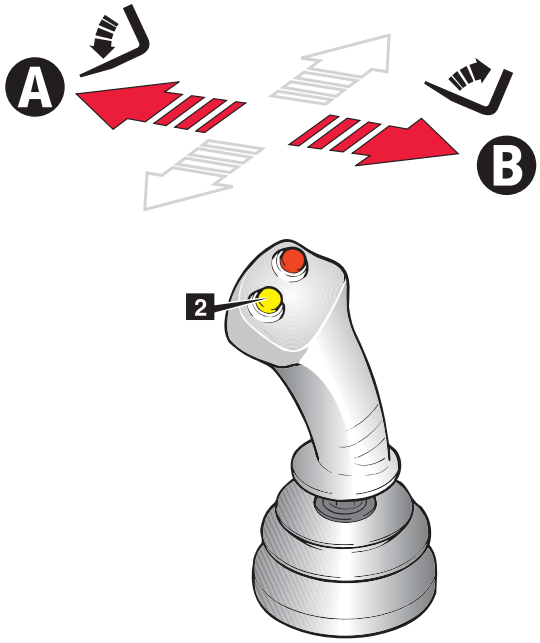
■ C-3.4.3 Pitching the attachment holding frame forwards/backwards

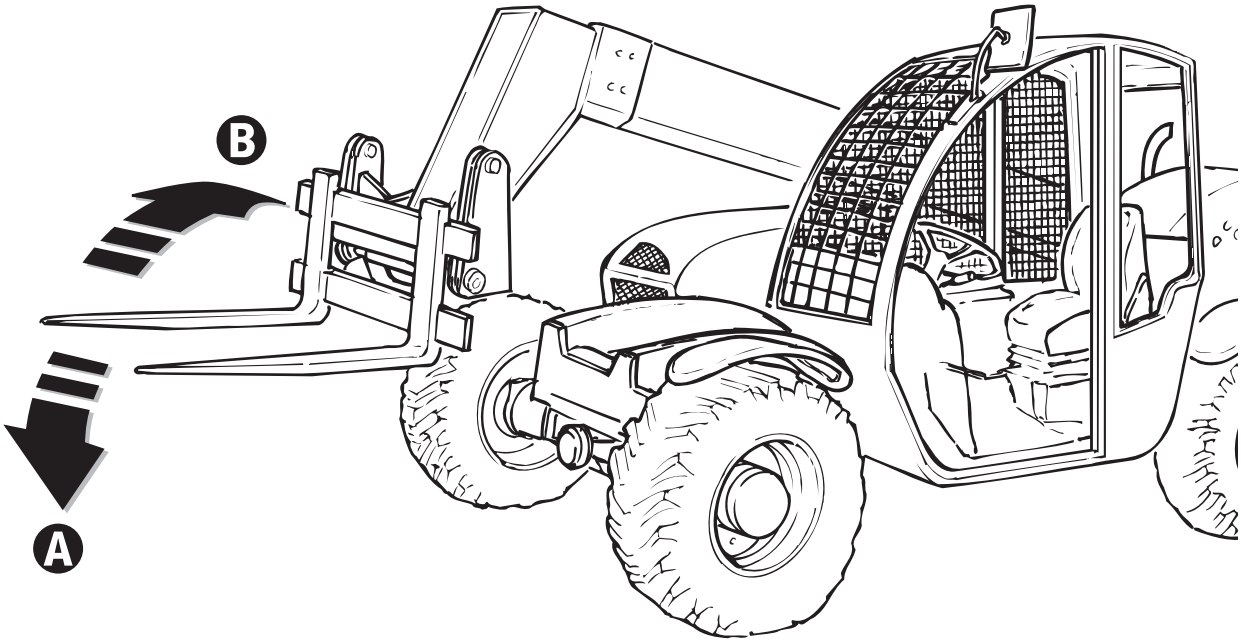
DANGER

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

To tilt the attachment holding frame forwards/backwards:

- Press button 2 and shift the lever to position A to tilt the frame forwards or to position B to tilt it backwards.





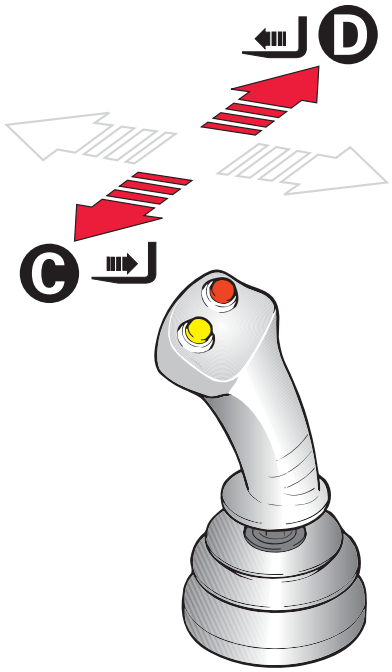
■ C-3.4.4 Extending/retracting the telescope

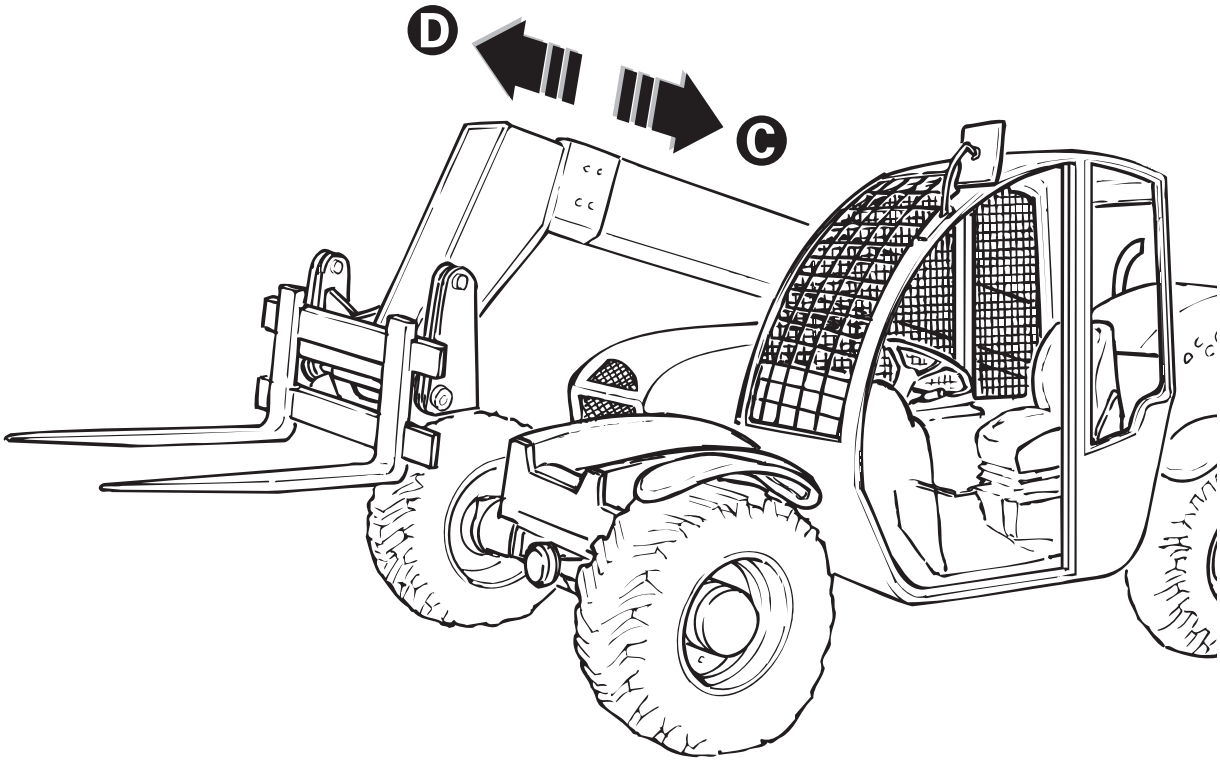
DANGER

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

To extend or retract the boom telescope:

- Smoothly shift the lever to position Ⓓ to extend the boom or to position Ⓒ to retract it.





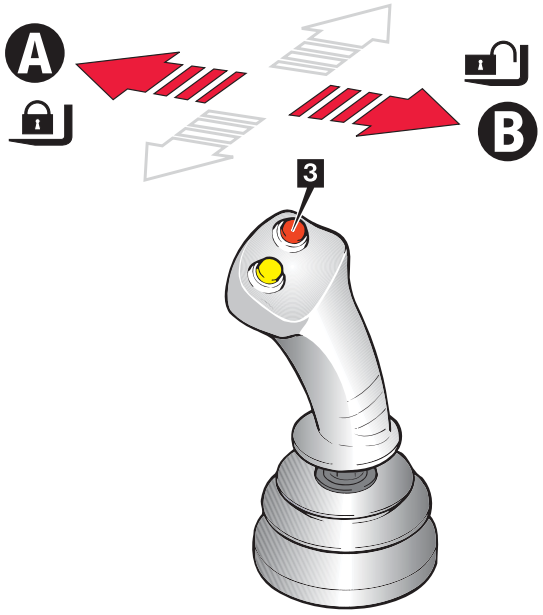
■ C-3.4.5 Quick-coupling the attachments

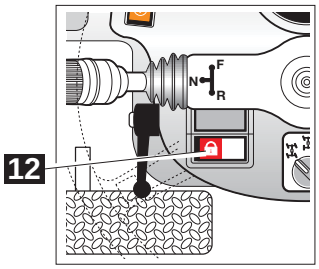
DANGER

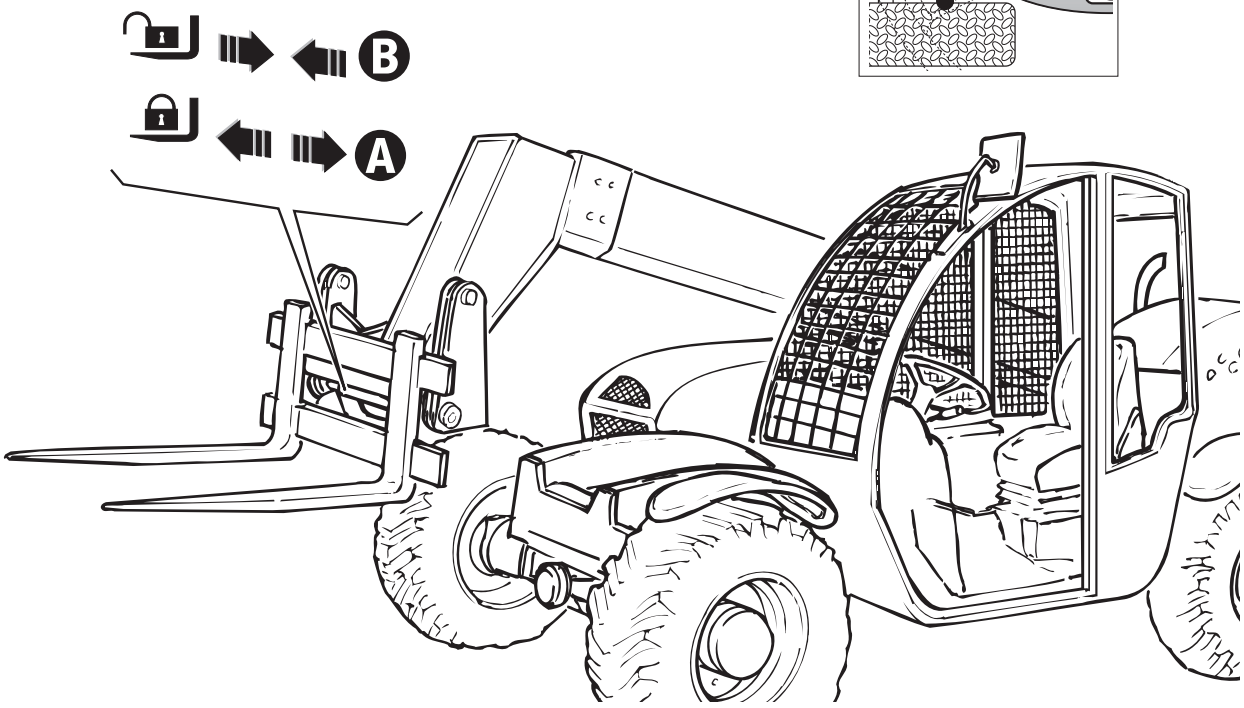
Before operating the boom, make sure that nobody is within the working range of the machine.

To lock the attachments:

- Press button 3 together with the dashboard enabling button (**12**) and shift the lever to position Ⓑ to unlock the attachment or to position Ⓐ 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

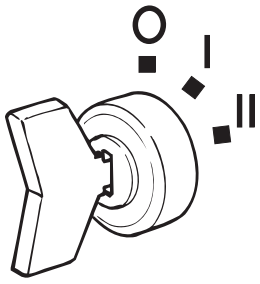
Check the efficiency of the safety devices as described in **chap. D-3.16**, namely:

- machine start control.

C-4.2 STARTING THE ENGINE

For the low temperature starting, see paragraph C-4.4.

- Engage the parking brake.
- Put the forward/reverse speed selection lever to neutral.
- Step on the gas pedal.
- To start the engine, turn the ignition switch to position **II**. Release the switch 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 start-up, let the engine run at idle for 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 booster 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.

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

ATTENTION

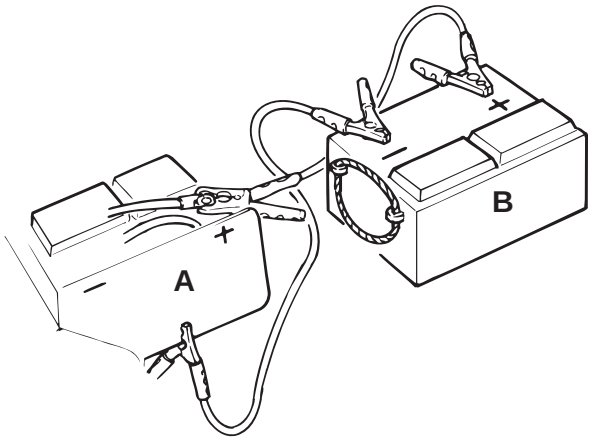
Do not start the engine using a quick charge booster to avoid any damage to the electronic boards.

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. **To avoid damage to the electronic instruments of the machine, the engine of the machine where the booster supply is installed, must be stopped.**
- Turn the ignition key and start the handler, then follow the procedure explained in chapter C-4.2 “Starting the engine”.



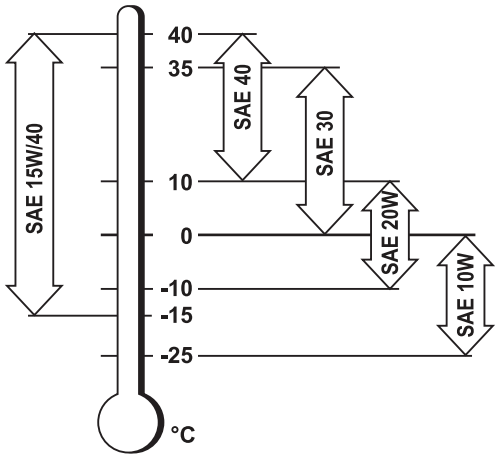
- Disconnect the cables. Remove first the negative terminal from the frame earth, then from the booster supply. Disconnect the positive terminal from the machine battery, then from the booster supply.

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 LOW TEMPERATURE STARTING

In case of cold starting, use an oil with a SAE viscosity adequate to the ambient temperature.
Please refer to the engine use and maintenance manual.
The machine is supplied with oil SAE 15W/40.



To start the engine from cold, proceed as follows:

- Engage the parking brake.
- Turn the ignition switch to position **I** and wait until the warning light **6** signalling the glow plugs preheating goes off. Step down on the gas pedal and start the engine turning the ignition switch to **II**. Release as soon as the engine starts.
- Let the engine run at idle for a few seconds before putting 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 booster ables (see chapter C-4.3).

■ C-4.5 DISCONNECTING THE BATTERY

Before any maintenance or repair work, and especially before welding any components on the machine, remove the cables at the battery.

ATTENTION

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.

■ C-4.6 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 the required steering mode.
- Select the required gear (forward or reverse).
- Release the parking brake pressing button **18** (the warning light on the pushbutton must be off).
- Slowly step on the gas pedal to start moving off.

DANGER

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-4.7 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 pressing button **18** (the warning light on the pushbutton must be 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.
- Disconnect the battery (see chapter C-4.5).

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.

ATTENTION

Leaving a battery connected can result in shorts and, as a consequence, in a fire.

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".

DANGER

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.

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.

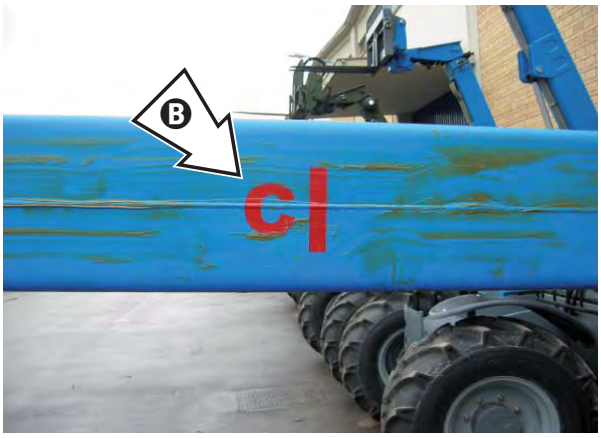
DANGER

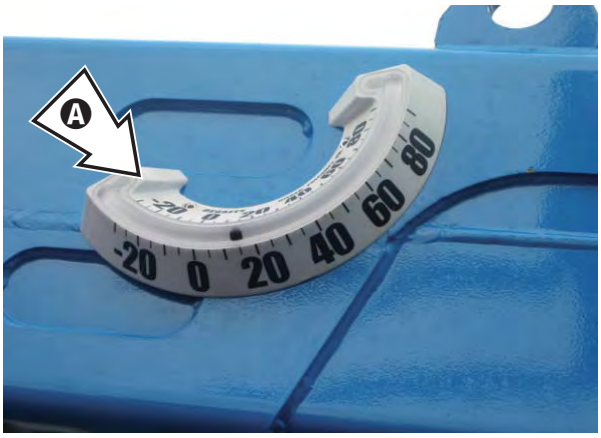
For a safe use of the machine, always check the weight of the loads going to be handled.
Always refer to the load charts applied in the cab.

■ 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.

The extension level of the boom can be checked with the help of the letters A (A, B, C) painted on the same boom and compared with the load chart, while the actual degrees of inclination of the boom are shown by the angle indicator B.



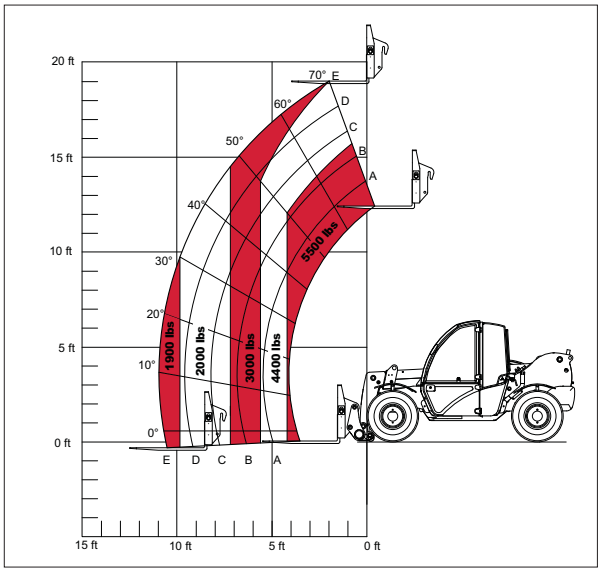


IMPORTANT

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 in the cab of your machine.

DANGER

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.

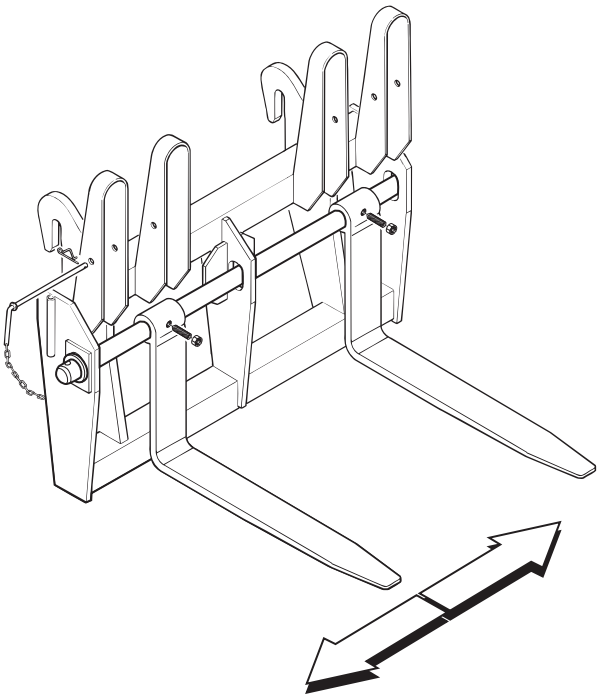


C-5.2 HANDLING LOADS

C-5.2.1 Adjusting the floating forks

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

- Loosen the nut of the locking screws.
- Raise the forks and slide them on the pivot until correct spacing.
- Lock the screws re-tightening the nut.



DANGER

- ***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 in the cab or in the quick user's guide.***
- ***Space the forks as wide as possible to suit the load being handled.***

C-5.2.2 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 backwards and check the machine stability before handling a load.

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

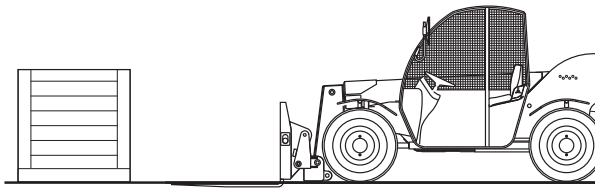
Do not drive on slopes sideways; this wrong manoeuvre is one of the main reasons for accidents due to vehicle overturning.

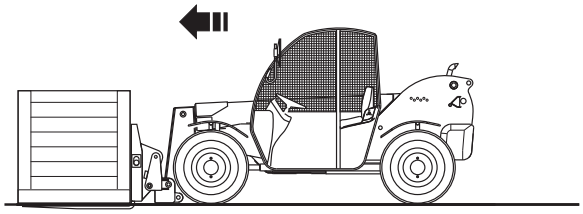
Unloading phase

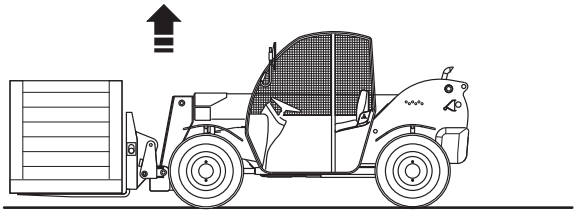
- Drive to the unloading point with straight wheels and bring the machine to a smooth stop leaving enough space to operate the boom.
- Put the parking brake and set the transmission to neutral.
- Position the load some centimetres above the desired position and set the forks level.
- Lower the load and 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.

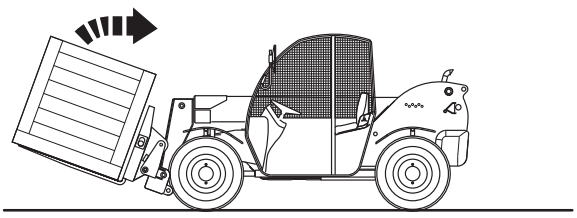
DANGER

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









C-5.3 CHANGING THE ATTACHMENT

DANGER

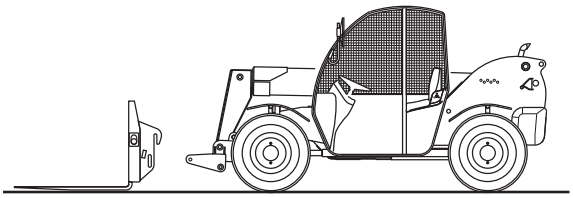
Use only attachments directly manufactured or recommended by Terexlift and detailed in the "Optional attachments" section.

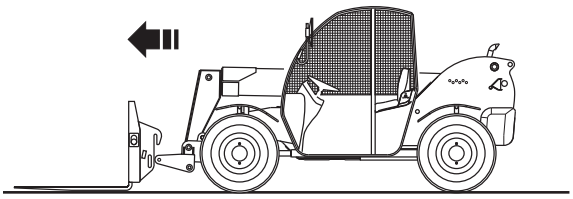
DANGER

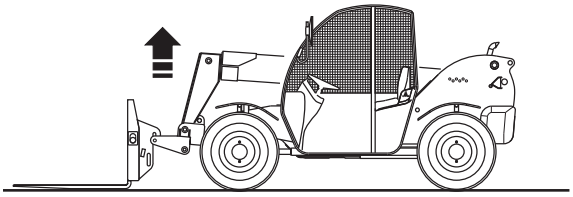
After substitution, visually check the attachment is correctly coupled to the boom, before operating the machine. A wrongly coupled attachment may result in damage to persons or things.

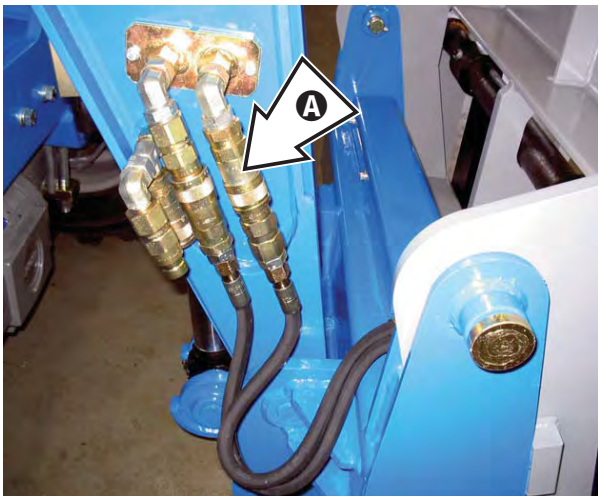
To change an attachment, operate as follows:

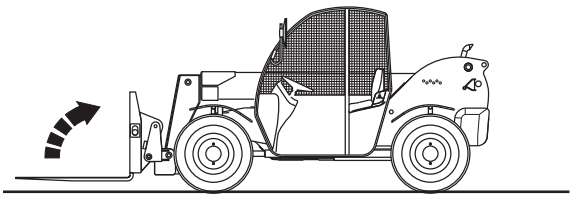
- Drive to the place where you will release the mounted attachment (when possible, a solid and sheltered site).
- Disconnect the quick connectors of the attachment (if any), and connect the hydraulic locking pipes of the attachments to couplings **A**.
- Rest the attachment flat on the ground.
- Pitch 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.

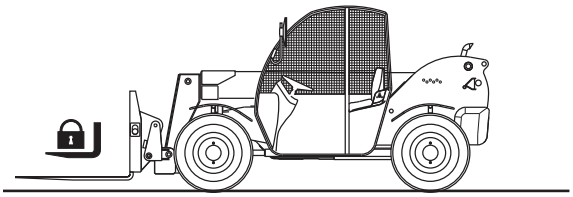












- Couple the connectors of the attachment, if any, to the quick couplings of the frame.

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:

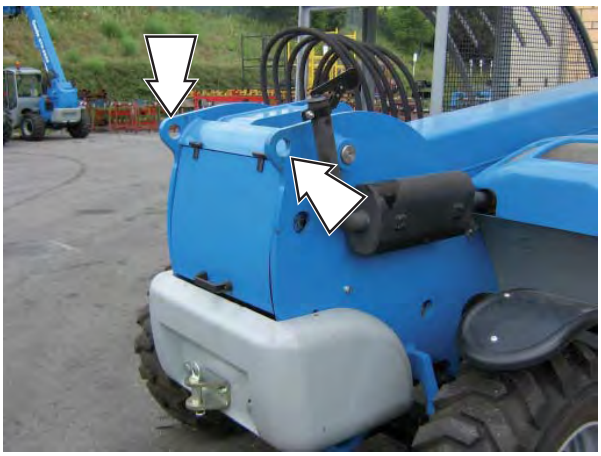
- Tow the machine for short distances and at a low speed only.
- Use a rigid drawbar.
- Select the two-wheel steer.
- Set the gearbox lever to neutral.
- When possible, start the engine and use the hydraulic drive and the braking system.
- Raise the front wheels of the machine and remove the Cardan shaft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

C-6.2 ROAD OR SITE TRANSFER

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

C-6.3 LIFTING THE MACHINE

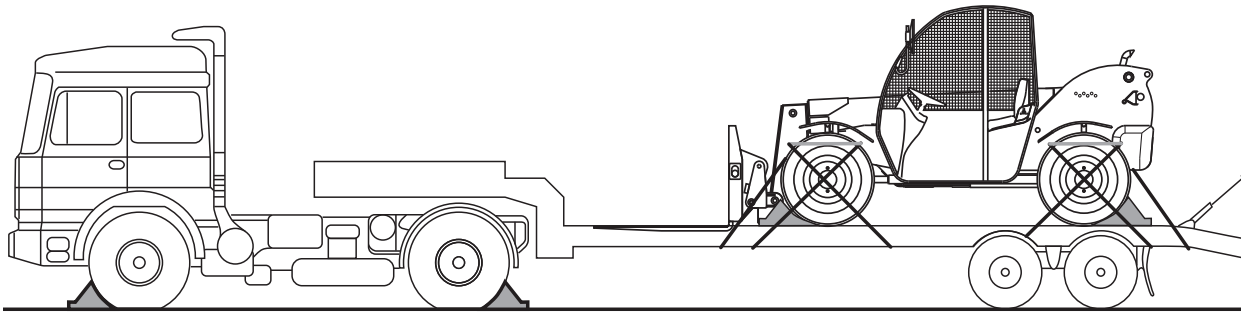
When the machine shall be lifted, use only means having a suitable capacity. The characteristic data are detailed in the relevant chapter of this manual and on the identification plate.
For the machine lifting, anchor the chains to the special lugs on the machine (marked with the decal below).



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.
- Remove the key from the ignition switch. Leave the driving cab and lock the cab door.
- Disconnect the battery (see chapter C-4.5).

ATTENTION

Leaving a battery connected can result in shorts and, as a consequence, in a fire.

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.

ATTENTION

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 CLEANING AND WASHING THE MACHINE

C-6.6.1 Cleaning instructions

Clean the machine in accordance with the following instructions:

- Remove any oil or grease traces with a dry solvent or a volatile mineral alcohol
- Before assembling a new part, remove any protection product (rust-preventer, grease, wax etc.)
- Remove any trace of rust from metal parts with some emery cloth before smearing the part with a protection product (rust-preventer, paint, oil etc.).

C-6.6.2 Washing instructions

ATTENTION

Never use water at pressure for washing components of the machine such as main valve, solenoid valves, electric and electronic parts.

External washing

Before washing the machine, check that the engine is shut down and the doors and windows are closed.
Do not, at any times, use fuel to clean the machine. Use water or some steam. In cold climates, dry the locks after washing or smear them with an antifreeze.
Before using the machine again, check its conditions.

Internal washing

Wash the machine interior with some water and a sponge. Do not use water at high pressure. After washing, dry with a clean cloth.

Washing the engine

Before washing the engine, protect the air intake filter to prevent water from entering the circuit.

ATTENTION

If the machine shall be used in a marine or equivalent environment, protect it against salt deposits with an adequate treatment against saltiness to prevent rust formation.

C-6.7 MACHINE DISPOSAL

PROTECT THE ENVIRONMENT

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

Section D

MAINTENANCE

TABLE OF CONTENTS

Observe and obey:

- The operator can only perform the routine maintenance operations envisaged in this manual.
- Scheduled maintenance procedures shall be completed by qualified technical personnel according to the manufacturer's specifications.

Maintenance symbol legend:

IMPORTANT

The following symbols are used in this manual to help you understand better the instructions provided. When one or more symbols appear at the beginning of a maintenance procedure, they indicate the following:

Indicates that tools are required to perform the procedure.

Indicates that new parts are required to perform the procedure.

Indicates that a cold engine is required to perform the procedure.

SERVICE INTERVAL

Running-in _____

Ordinary _____

Indicates the time interval for the maintenance jobs expressed in working hours.

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 Clean the radiator, if necessary
4 Check the hydraulic oil level in the tank
5 Check the greasing of the boom section pads
6 Grease the attachment holding frame
7 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
8 Check the efficiency of the lighting electric system
9 Check the efficiency of braking system and parking brake
10 Check the efficiency of the steering selection system
11 Check the efficiency of the fork balancing system.
12 Make sure the safety devices installed are in efficient working order - see procedure in **chap. D-3.16**.

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 and the reducer
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-3.16.**

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

9 Clean or replace, if nececessary, the air filter in the cab

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

■ D-2.1 OIL CHANGE SCHEDULE

	Job	operating hours*	service interval*	Oil type
Engine	Oil level check	10	daily	SHELL RIMULA 15W-40
	First change	50	-	
	Subsequent changes	250	monthly	
Axles and power divider	Oil level check	250	monthly	FUCHS TITAN GEAR LS 85 W-90
	First change	-	-	API GL-5 LS / GL-5
	Subsequent changes	1000	yearly	
Hydraulic oil	Oil level check	250	monthly	SHELL TELLUS T 46
	Subsequent changes	1000	yearly	DENISON HF-1, DIN 51524 part 3 Cat. HV

* whichever occurs first

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.

DANGER

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

DANGER

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.

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 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

Before any maintenance or repair work, and especially before welding any components on the machine, remove the cables at the battery.

DANGER

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.

■ 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 and raise the hatch Ⓑ with handle Ⓐ. The gas springs Ⓓ will help the operation.

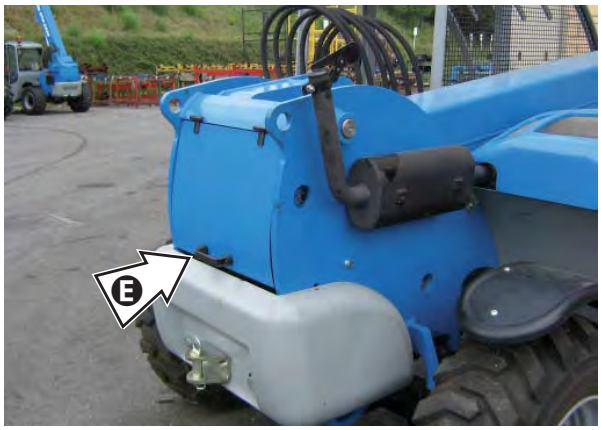
DANGER

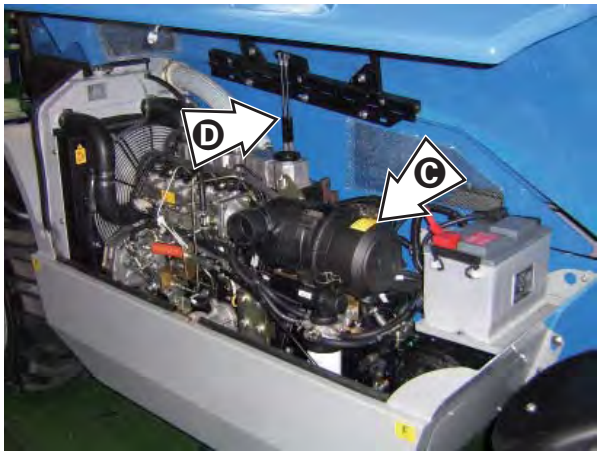
Take all precautions when approaching the engine compartment. Some parts of the engine may be very hot. Always use protective gloves.

■ 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.





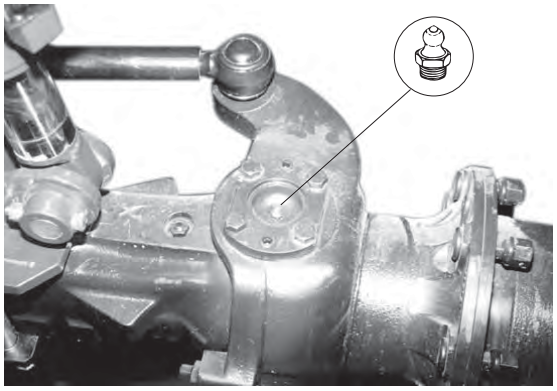
■ D-3.3 GREASING

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:

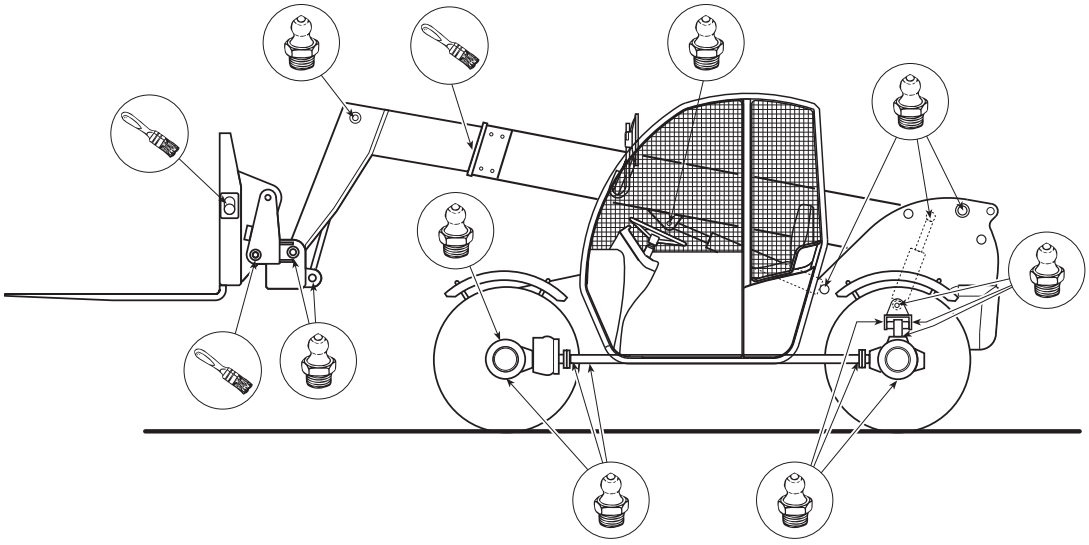
- the symbol  represents the points to be greased by a pump
- the symbol  represents the points to be greased by a brush.



SERVICE INTERVAL

Running-in _____ **None**

Ordinary _____ **Every 10 hours**

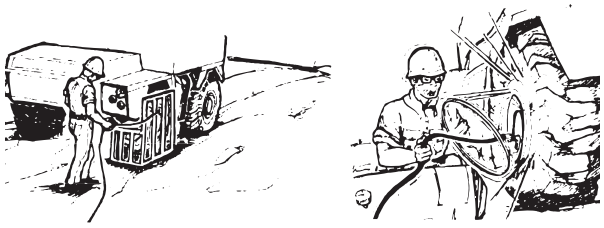


■ D-3.4 TYRES AND WHEELS

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.

YES *NO*



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

		GTH-5519
Dimensions		12-16.5
Load index		pr 10
Rim		9.75x16.5
Wheel disc		8 fori DIN 70361
Pressure	bar	4.5
	Psi	65

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.

IMPORTANT

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

SERVICE INTERVAL

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

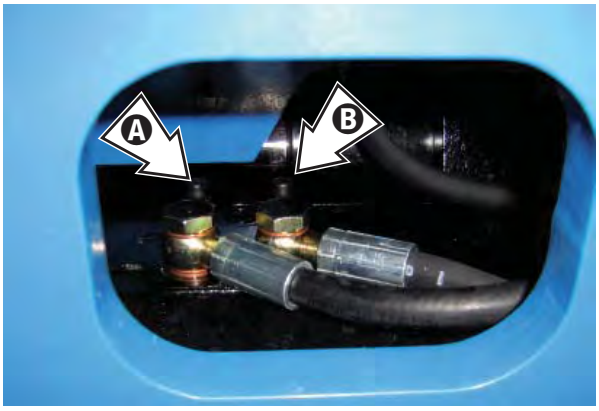
Ordinary _____ **Every 250 hours**

■ D-3.5 CHECK THE EFFICIENCY OF BRAKING SYSTEM AND PARKING BRAKE

ATTENTION

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

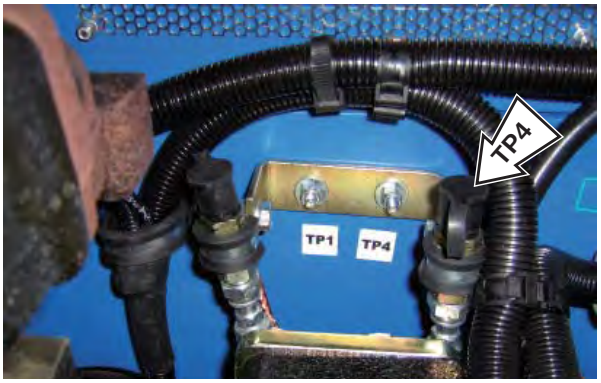
The malfunctioning of the braking system may depend on the presence of air in the hydraulic circuit.
The braking system is equipped with two purge valves Ⓐ and Ⓑ to eliminate any air from the circuit. The first valve is used to purge the service brake circuit (Ⓑ); the second valve is used to purge the negative parking brake circuit (Ⓐ). Both valves can be easily reached through the slot located on the front part of the chassis.



To bleed the circuit of the service brake, proceed as follows:

- Make sure that compressor Ⓕ contains sufficient quantity of oil so you can proceed with the circuit bleeding.

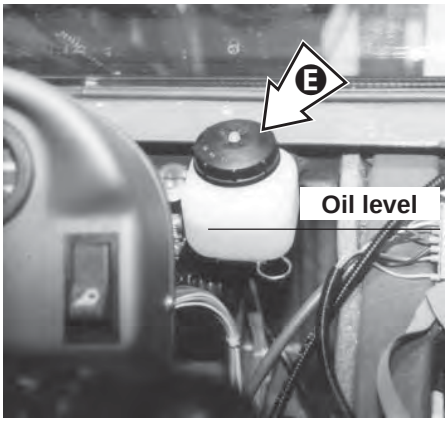
- Connect the flexible hose of the compressor to the mini-socket **TP4** placed inside the engine compartment.



- Connect the compressor to an air source and pressurise the system
- Unscrew valve Ⓑ to help air flow out of the braking circuit.
- Open the cap of the feeding tank Ⓓ

- Open the tap of the compressor Ⓕ which has been previously connected to mini-socket **TP4**.

- Check the air flows out of valve Ⓑ. As soon as oil without air bubbles starts flowing out of this valve, close the same.
- Check that the fluid in tank Ⓔ reaches the recommended level.



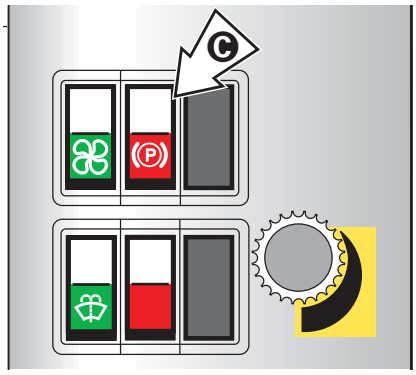
- Close the tap of the compressor.
- Disconnect the hose from mini-socket TP4
- Test the efficiency of the braking system.

In order to bleed the service brake circuit WITHOUT A COMPRESSOR (for this operation, two service technicians are needed - one in the driving place and the other near the drain valve Ⓑ):

1. Fill tank Ⓓ with oil
2. With the machine stopped, step down on the brake pedal 5-6 time.
3. Hold the pedal pressed down and slowly unscrew valve Ⓑ. Close the valve as soon as oil mixed with air starts flowing out.
4. Ease up the brake pedal.
5. Repeat steps **2**, **3** and **4** until oil without air bubbles starts flowing out of the valve.
6. Test the efficiency of the braking system.

TO BLEED THE CIRCUIT OF THE PARKING BRAKE, DO THE FOLLOWING:

- Start the diesel engine
- Press pushbutton Ⓒ to unlock the parking brake.
- Slowly unscrew valve Ⓐ and close the same as soon as oil mixed with air bubbles starts flowing out.
- Repeat until oil without air bubbles starts flowing out of the valve.
- Test the efficiency of the braking system.

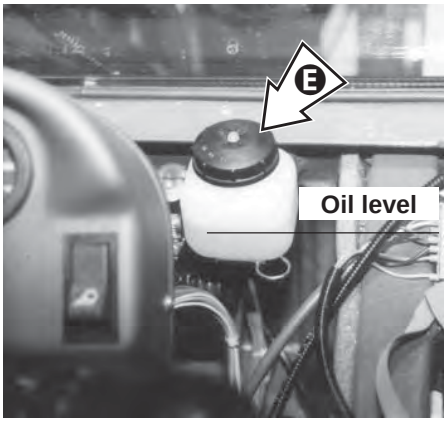


CAUTION

Once the circuit has been bled, make sure the brake circuit is in efficient working order.

■ 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 and replace the elements, when necessary.

1 Cleaning and changing the outer element:

- Shut the engine down and engage the parking brake.
- Unlatch the fasteners Ⓐ and remove cover Ⓑ .
- Pull out the filter cartridge Ⓒ.
- Clean the filter bowl.
- Dry clean the cartridge (at max. 6 bar pressure) and direct the air jet from inside to outside.
- Check the filter element for cracks by introducing a lamp inside.
- Refit the cartridge and make sure it is properly positioned.
- Close cover Ⓑ and lock in place with fasteners Ⓐ.

ATTENTION

As soon as the warning lamp 63 on the cab dashboard switches on, replace the outer element.

2 Changing the inner element:

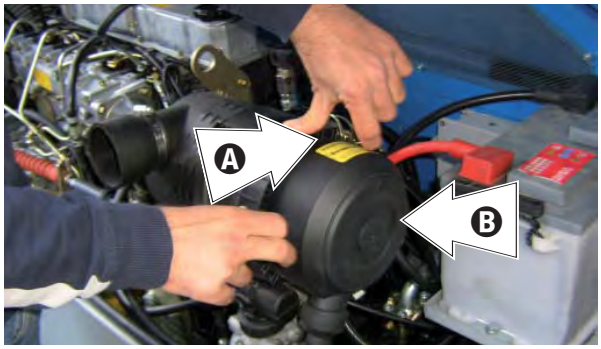
- See step **1** for removing the outer element.
- Extract the internal cartridge Ⓓ.
- Clean the filter bowl.
- Mount the new element and make sure it is correctly positioned.
- Fit the main filter and the cap as described in point **1**.

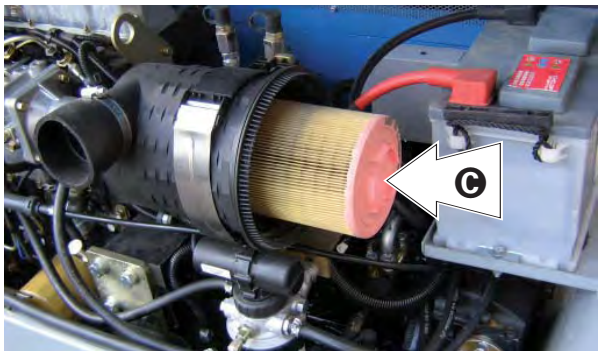
ATTENTION

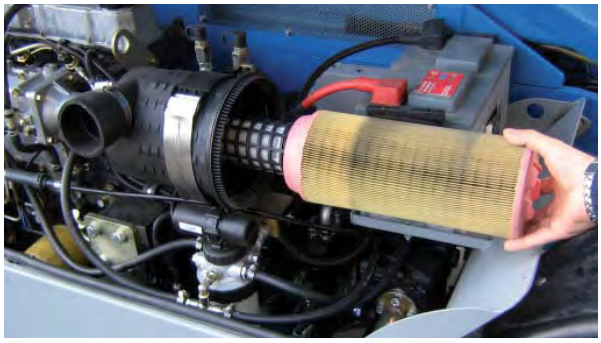
The inner element should be replaced every two times the outer element is replaced.

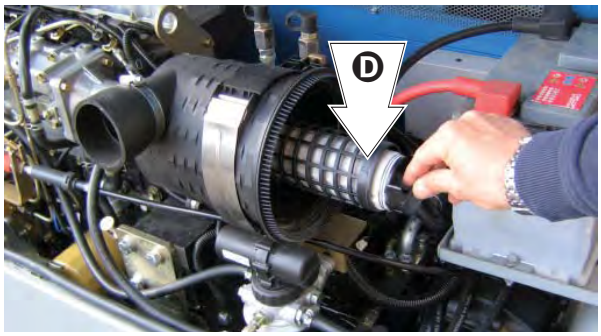
ATTENTION

Never wash the cartridge with water or solvents.









SERVICE INTERVAL

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

■ D-3.7 CAB AIR FILTER (only with cabin closed or glass kit installed)

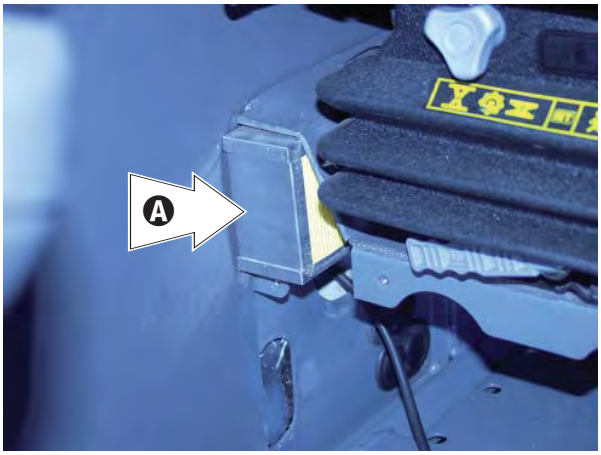
Every six months clean the air filter in the cab. Replace the cartridge if the filtering cloth is damged.

1 Cleaning and changing the cartridge:

- Shut the engine down and engage the parking brake.
- Pull out the filter **A** located to the left of the driving place.
- Clean the filter bowl.
- Clean the filter cartridge and replace in case of damage.

ATTENTION

Paper filters must never be cleaned using compressed air or washed with water and/or solvents.



■ D-3.8 ENGINE COOLING CIRCUIT

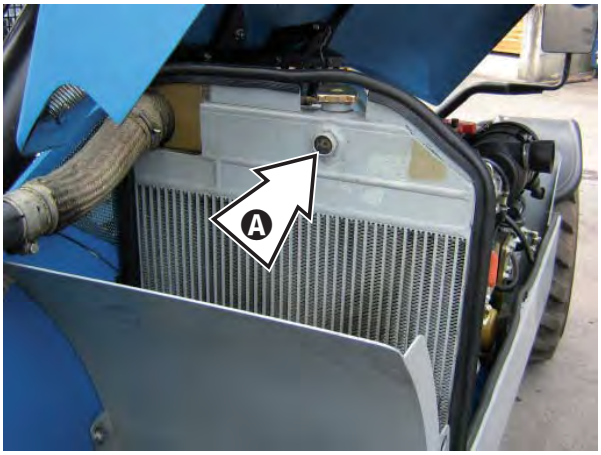
DANGER

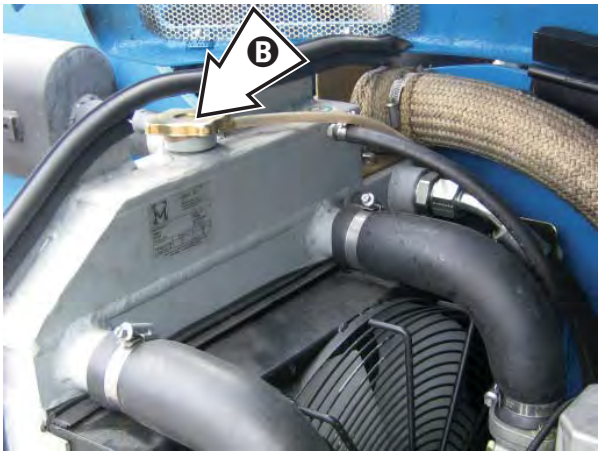
When the coolant is hot, the cooling system is under pressure. With warm engine, loosen the radiator plug slowly and carefully, without removing it, to drain the pressure. Use protection gloves and keep your face at a safe distance.

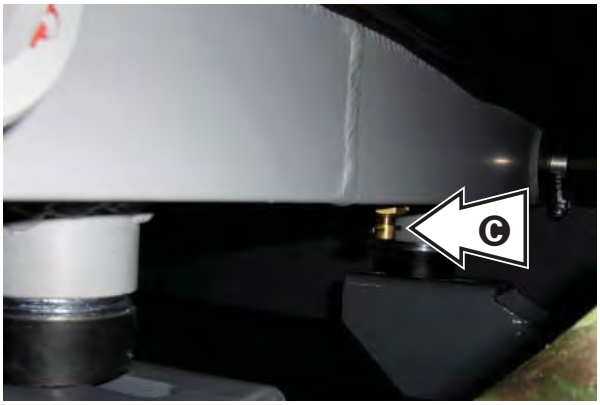
- Every week, before starting working (with the coolant cold), check the coolant level through the glass cap of plug Ⓐ.
- When necessary, add clean water or an antifreeze mixture through cap Ⓑ.
- Change the antifreeze mixture every two years.
  To drain the antifreeze:
  - Let the engine cool down
  - 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 using a brush with hard bristles or compressed air at a max pressure of 6 bar.

On delivery, the machine is filled with a cooling mixture consisting of 50% water and 50% anti-freeze.

TEREX PRO COOL Protection against boiling / freezing		
Product %	Freezing point	Boiling point
33	-17 °C	123 °C
40	-24 °C	126 °C
50	***-36 °C***	***128 °C***
70	-67 °C	135 °C







SERVICE INTERVAL

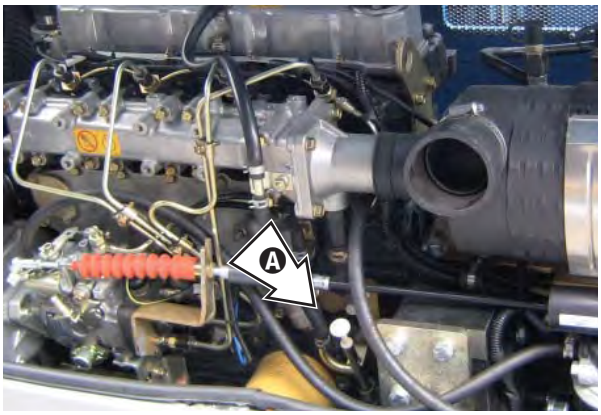
Running-in _____ **None**

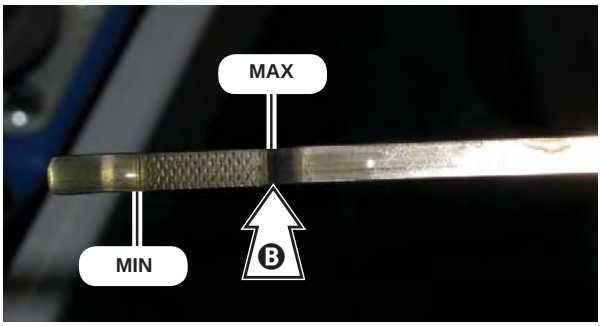
Ordinary _____ **Every 50 hours**

■ D-3.9 ENGINE OIL LEVEL

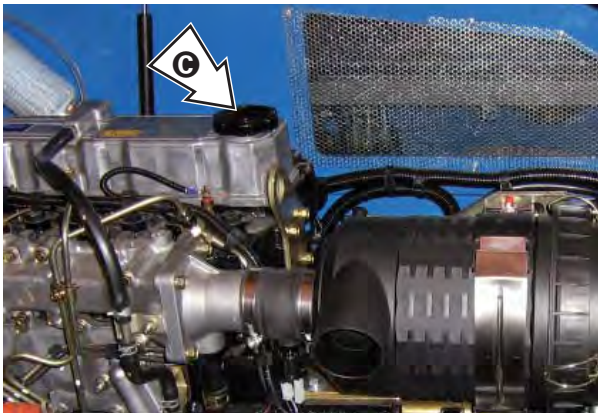
To check the engine oil level:

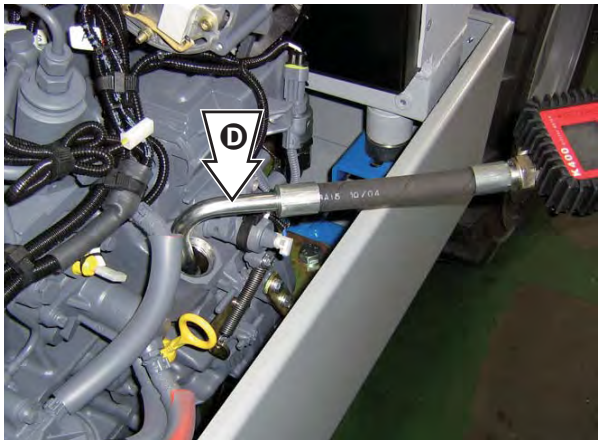
- Park the machine on a flat ground, stop the engine and check the parking brake is engaged.
- Remove dipstick Ⓐ and check if oil reaches the max mark Ⓑ.





- If oil is below this mark, remove plug Ⓒ and pour new oil into the engine using the special appliance Ⓓ.

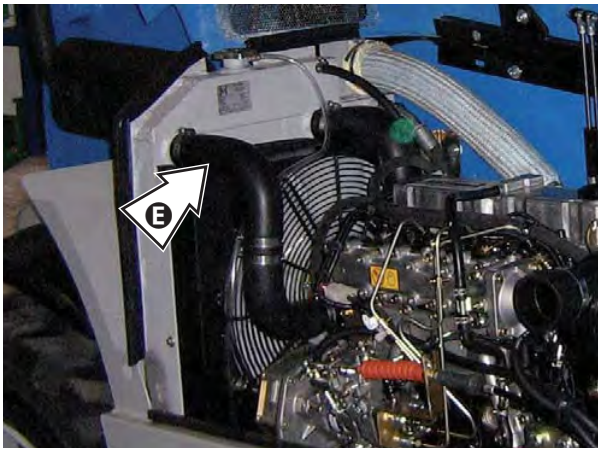




- Remove dipstick Ⓐ once again and check if oil reaches the max mark Ⓑ.
- Refit the plug.

If one of the connecting pipes of radiator Ⓔ breaks:

- Stop the machine immediately, if possible on a flat ground; stop the engine and check the parking brake is engaged.
- Change the damaged pipe.
- Remove dipstick Ⓐ and check if oil reaches the max mark Ⓑ.
- If oil is below this mark, remove plug Ⓒ and pour new oil into the engine using the special appliance Ⓓ.
- Restart the machine and let oil circulate in the engine and the radiator.
- Stop the machine and check again the oil level. If necessary, add new oil step by step until reaching the max level by starting and stopping the engine at every step.



■ D-3.10 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 Ⓐ.

ATTENTION

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**

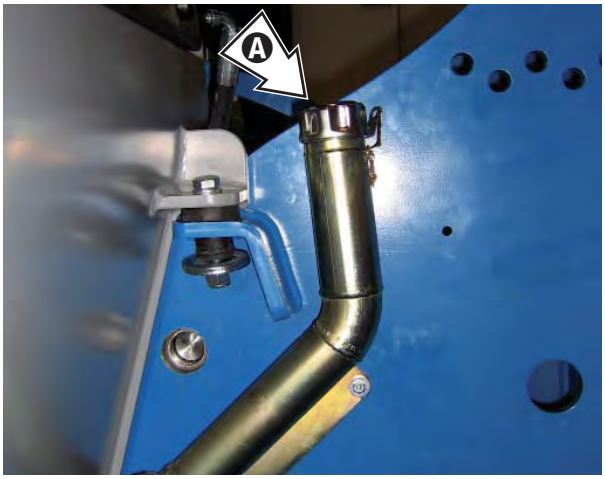
If oil must be changed, proceed as follows:

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-3.11 CHANGING THE OIL FILTER CARTRIDGE

To change the hydraulic oil filter element, 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.
3 Remove the filter cover B per accedere alla cartuccia A.
4 Change the filter element, then, before fitting a new one, thoroughly clean and grease both seat and gasket.
5 Refit and tighten the filter cover.

ATTENTION

Hydraulic oil filter canisters 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).

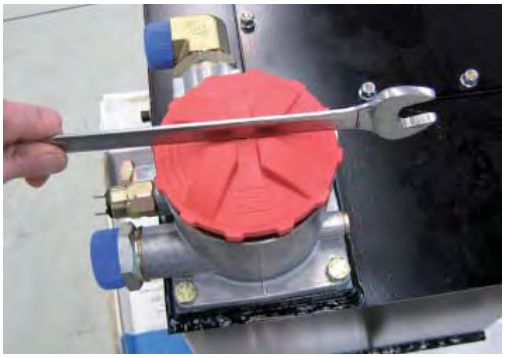
PROTECT THE ENVIRONMENT

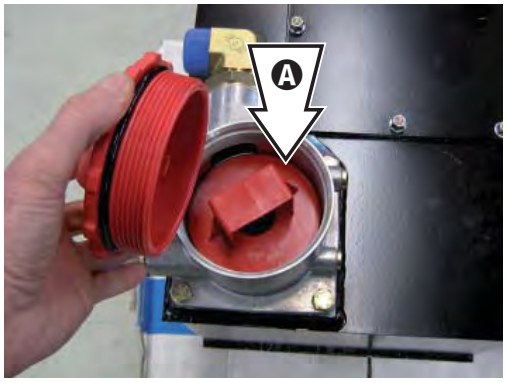
The handling and disposing of used oils may be ruled by local or national regulations. Address to authorised centres

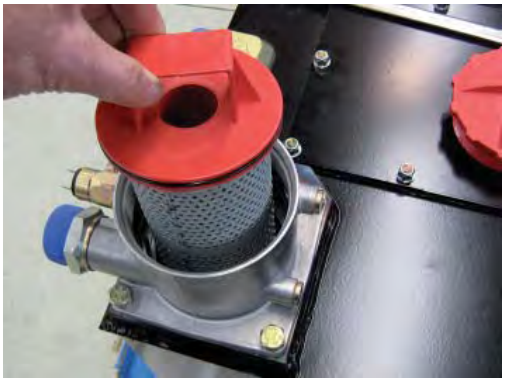
SERVICE INTERVAL

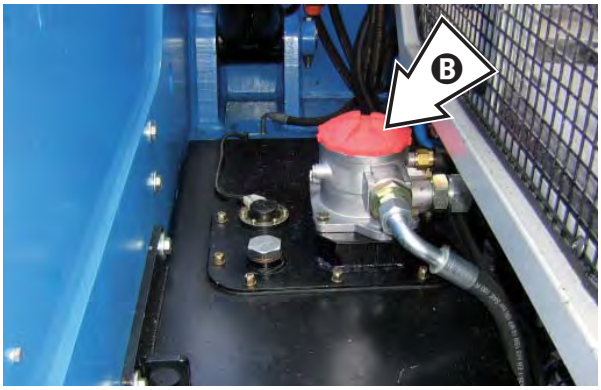
Running-in _____ **None**

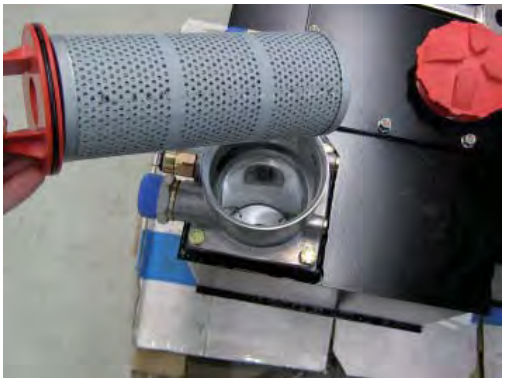
Ordinary _____ **Every 500 hours**







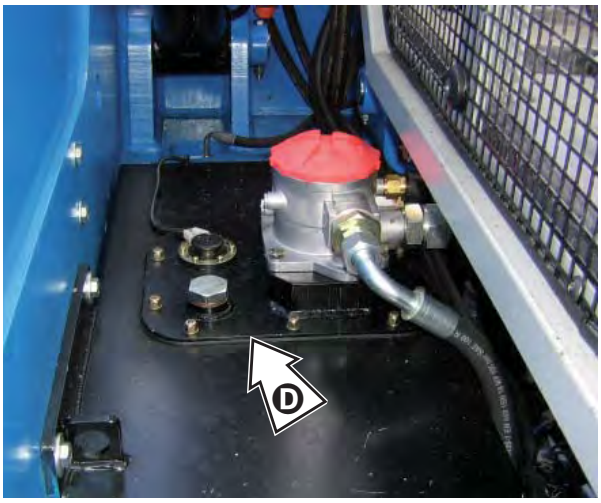




■ D-3.11.1 Auxiliary circuits oil filter

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-3.12 OIL LEVEL IN THE DIFFERENTIAL GEARS AND THE REDUCER

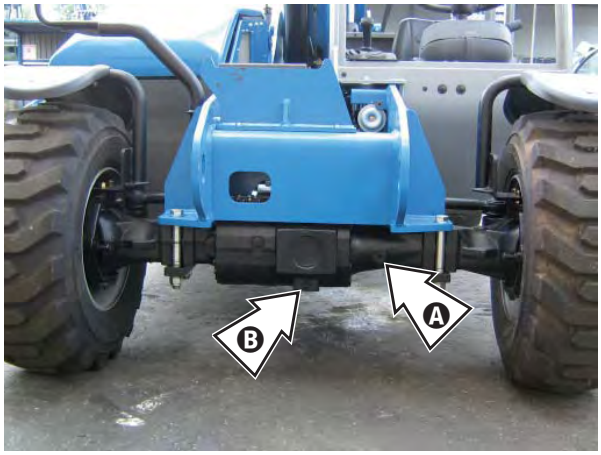
■ D-3.12.1 Front and differential gears

To check the oil level in the front and rear differential gears:

- 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 differential gears.
- 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**

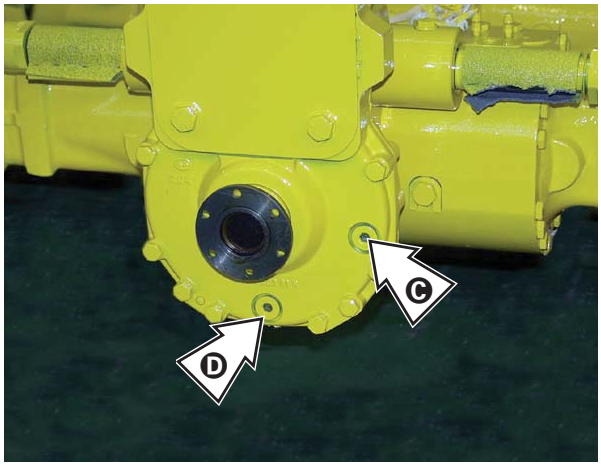
■ D-3.12.2 Reducer

To check the oil level in the reducer

- 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 plug Ⓒ.



SERVICE INTERVAL

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

Ordinary _____ **Every 250 hours**

D-3.13 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 Ⓐ.

PROTECT THE ENVIRONMENT

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

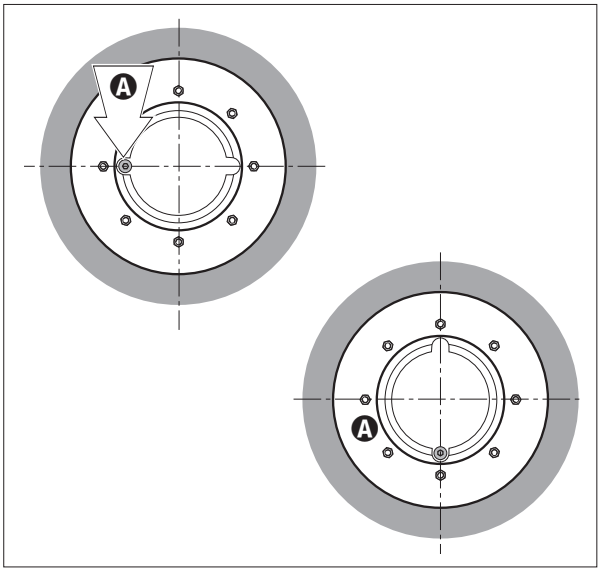
IMPORTANT

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

SERVICE INTERVAL

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

Ordinary _____ **Every 250 hours**



■ D-3.14 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:

1) Move to a solid and level ground

2) Set the steering selection switch **13** to "***four-wheel steer***" (pos. **2**)

3) Rotate the steering up to its stop (either to the right or to the left)

4) Set the steering selection switch to "***two-wheel steer***" (pos. **0**)

5) Rotate the steering up to its stop (turn in the same direction as above)

6) Reset the steering selection switch to "***four-wheel steer***" (pos. **2**)

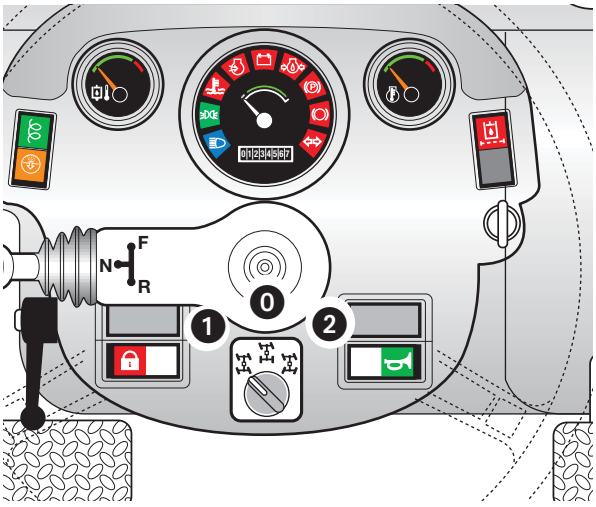
7) Rotate the steering (to the side opposite to point **3**) so that the rear axle reaches its stop

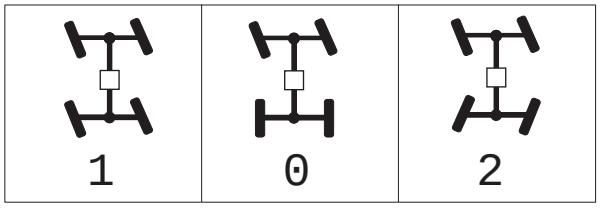
8) Reset the steering selection switch to "***two-wheel steer***" (pos. **0**)

9) Rotate the steering (to the same side as in point **7**) so that the front axle reaches its stop

10) Reset the steering selection switch to "***four-wheel steer***" (pos. **2**)

Now the wheels should be re-aligned.





SERVICE INTERVAL

Running-in _____ **None**

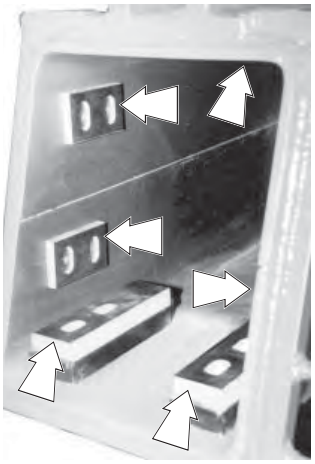
Ordinary _____ **When necessary**

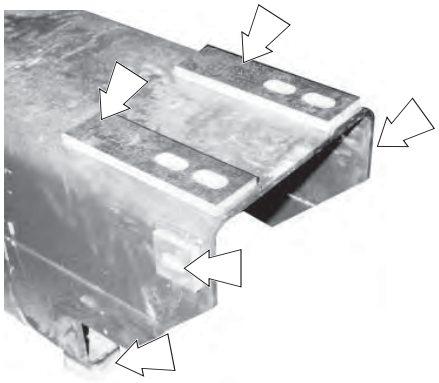
■ D-3.15 ADJUSTING THE SLIDING PADS OF THE BOOM SECTIONS

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.





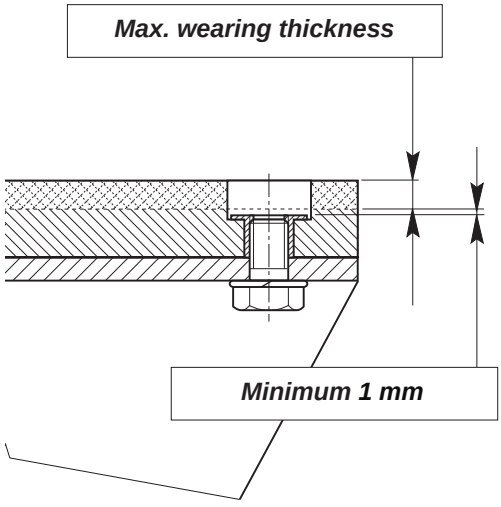
Tightening torques of the pad screws in relation to the screw diameter

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-3.16 CHECKING THE SAFETY DEVICES

■ **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.

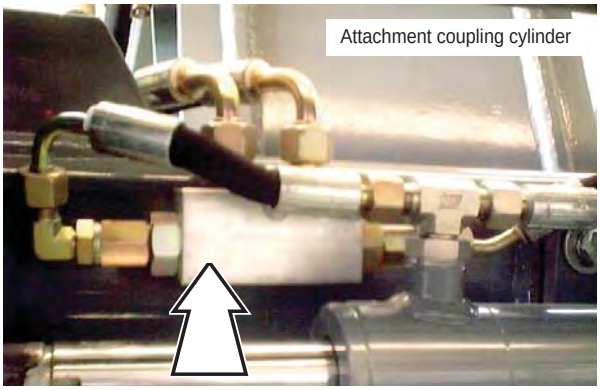
To check the efficiency of a valve, proceed as follows:

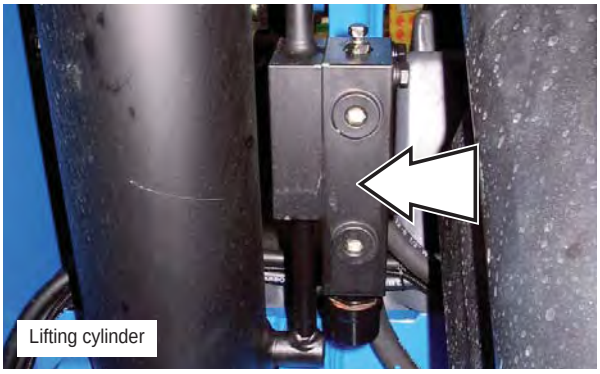
- Load a weight near the maximum payload onto the boom.
- Raise the load some centimetres above the ground (max 10 cm). To check the valve on the telescope extension cylinder move the boom to maximum height and extend it some centimetres.
- Loosen the oil hoses to the cylinder of which you are checking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

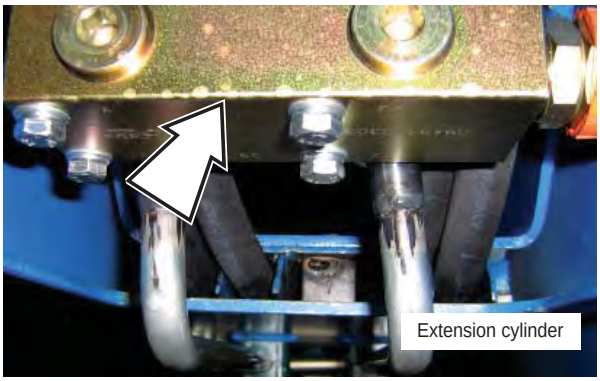
During the check, the oil will flow out of the hoses and the load shall remain blocked in position. Should that not be the case, the valve must be replaced. Contact GENIE Technical Service.

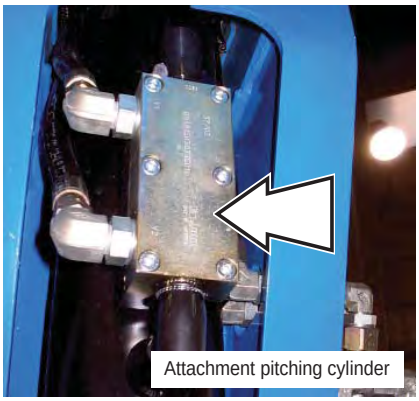
DANGER

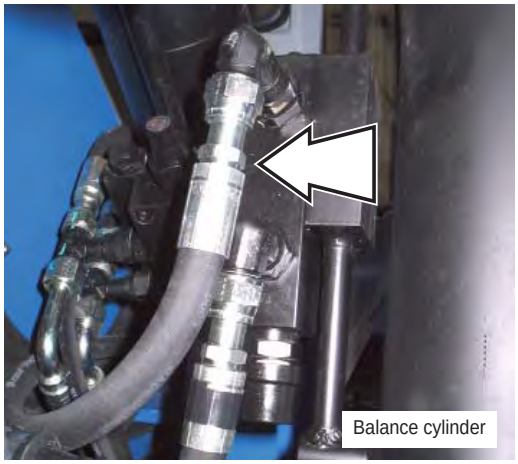
- ***Wear safety glasses***
- ***Wear safety gloves***
- ***Wear safety shoes***
- ***Wear suitable working clothes***
- ***Use guards against leaks of oil at high pressure***
- ***Do the check in a free space with barriers all around to keep non-authorised people away***
- ***During the check proceed 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***


Attachment coupling cylinder


Lifting cylinder


Extension cylinder


Attachment pitching cylinder


Balance cylinder

Checking the machine start control
(at every use)

Attempt to start the engine with the forward or reverse gear put.

The engine must not start. If the engine starts, contact the GENIE Technical Service.

Repeat the operation putting first one gear, then the other.

D-3.17 CHECKING THE STATE OF THE STRUCTURE

Five years after the first placing into operation of the machine or after 6000 hours (whichever occurs first), check the state of the structure paying attention to the welded supporting joints and the boom pins.

After the first 5 years, repeat this check every 2 years.

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

Any intervention on the electrical system unless performed by authorized personnel, is expressly forbidden.

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.

ATTENTION

Do not add sulphuric acid; add only distilled water.

■ D-4.2 FUSES AND RELAYS

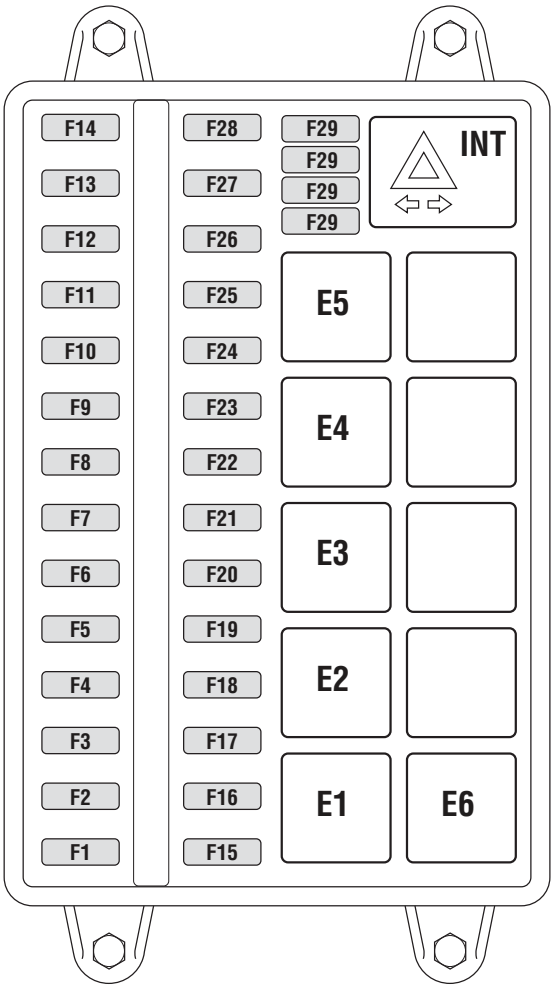
The electrical system is protected by fuses placed in the driving cab, on the left. Before replacing a blown fuse with a new one having the same amperage, find out and rectify the fault.

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.***

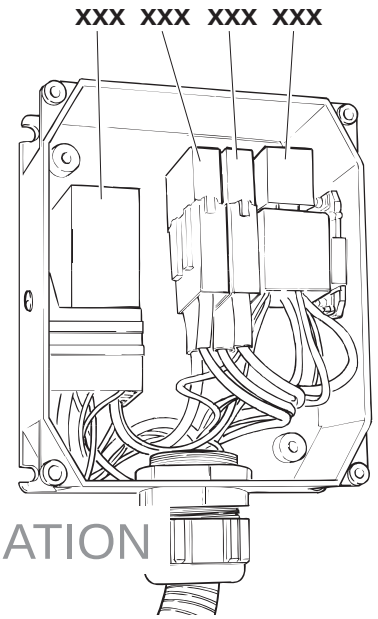
■ *Fuses*

Ref.	Circuit	Amp.



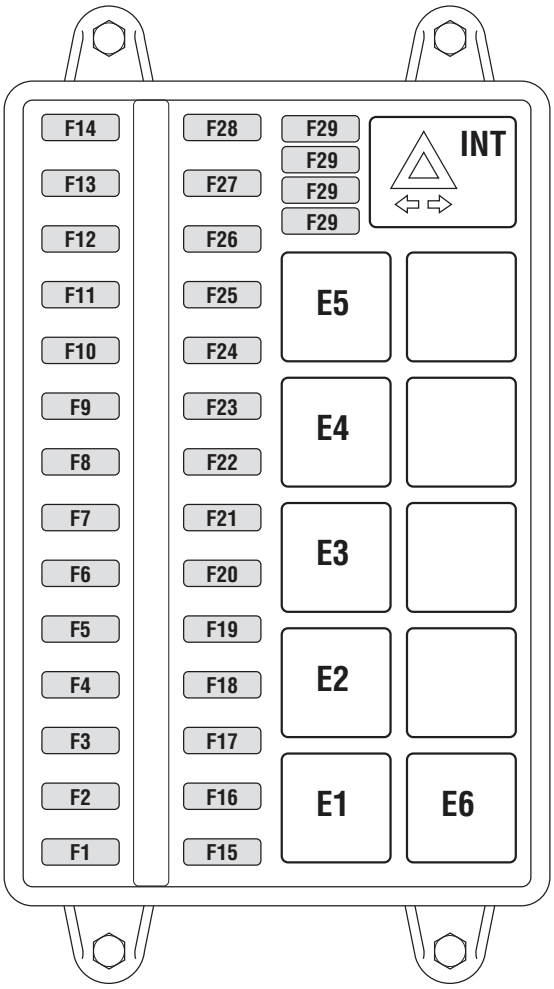
■ Engine compartment fuses and relays

Ref.	Circuit	Amp



■ Fuse box relays

Ref.	Circuit



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-5 REFUELLING

D-5.1 REFUELLING

Part	Product	Capacity (litres)	Product specifications see par.
Diesel engine	Engine oil	11 + 3.5	D-5.2.1
Fuel tank	Diesel fuel	60	D-5.2.3
Hydraulic system tank	Hydraulic oil	62	D-5.2.2
Front differential gear with reduction gear	Oil	6	D-5.2.2
Rear 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 RIMULA 15W-40

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	FUCHS TITAN GEAR LS 85 W-90	API GL-5 LS / GL-5	
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.

Filtering elements:

Filter	Flow l/1'	Filtering	Code
Transmission oil filter	MPS 150	10 µ	09.4604.0001
Auxiliary circuit oil filter (inside the tank)	STR 100/1	60 µ	09.4604.0004

■ 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 Vanguard LIKO grease, type EP2	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:

TEREX PRO COOL by VALVOLINE

The use of this product guarantees protection to the circuit for 3 years or 7000 hours without having to add any dry coolant additive.

TEREX PRO COOL Protection against boiling / freezing		
Product %	Freezing point	Boiling point
33 40 50 70	-17 °C -24 °C -36 °C -67 °C	123 °C 126 °C 128 °C 135 °C

ATTENTION

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

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Section E

FAULTS AND TROUBLESHOOTING

TABLE OF CONTENTS

E-1 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-1.1 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***	• Parking brake not engaged • Battery down • Battery cut-out switch OFF	• Engage the parking brake and ensure the relevant indicator on the dashboard switches on • 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) • Solenoid valve - engine stop	• Check the fuse • Refuel • See engine operator manual • Refuel, then refer to engine operator manual • Check the solenoid valve; replace, if necessary
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	• Replace the fuse
"ROAD" FUNCTION ON, EVEN WHEN SELECTING THE "JOBSITE" FUNCTION	• No "ROAD/JOBSITE" selection	• Check and replace fuse **F20**, if necessary

NO BOOM LOWERING AND EXTENSION, NO HOLDING FRAME TILTING	• Fuse blown	• Replace fuses **F2** and/or **F24**
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**
BOOM DOES NOT MOVE	• Fuse blown • Emergency button ON	• Check and replace fuse **F22**, if necessary • Reset the button

IMPORTANT

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

NOTES

Section F

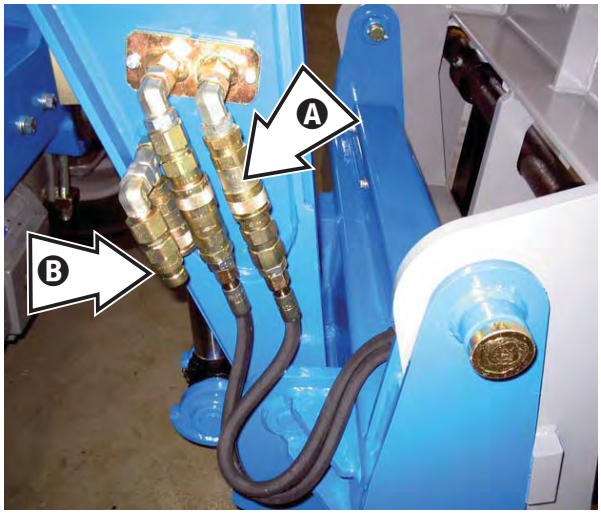
OPTIONAL ATTACHMENTS

TABLE OF CONTENTS

OPTIONAL ATTACHMENTS

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-5.3.**



DANGER

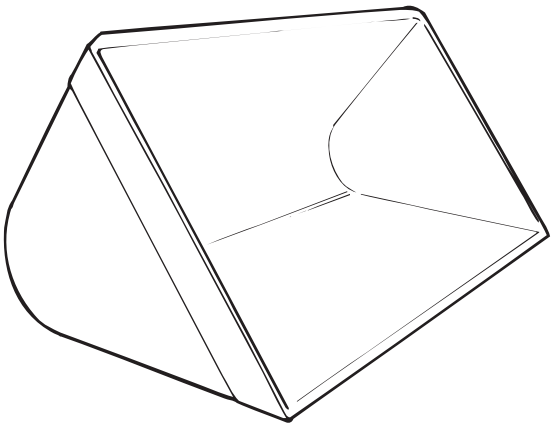
When replacing interchangeable attachments, keep any person clear of the working area.

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.

■ F-1.1 SHOVEL

Code	GTH-5519
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.

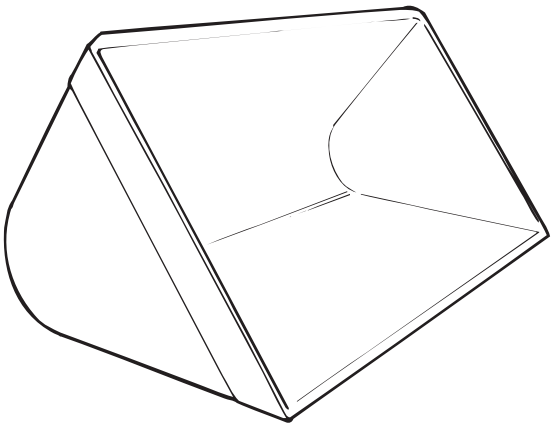
Maintenance
Visually check the shovel for damage before using it.

ATTENTION

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

■ F-1.2 CEREAL SHOVEL

Code	GTH-5519
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***

ATTENTION

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

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.

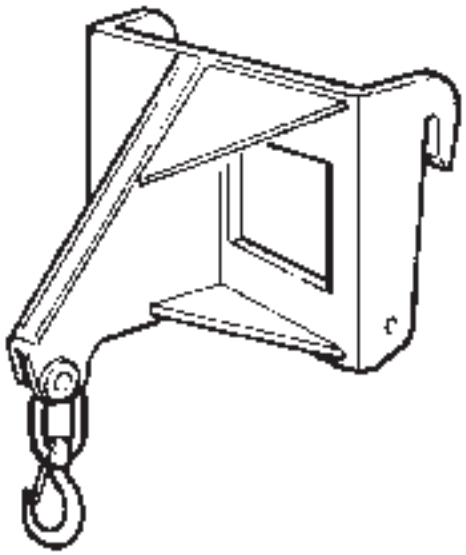
To load/unload the material, operate the rotation lever of the attachment holding plate.

Maintenance

Visually check the shovel for damage before using it.

■ F-1.3 FIXED HOOK ON PLATE

Payload	*Code*
2500 kg	59.0700.0000



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.

Technical data

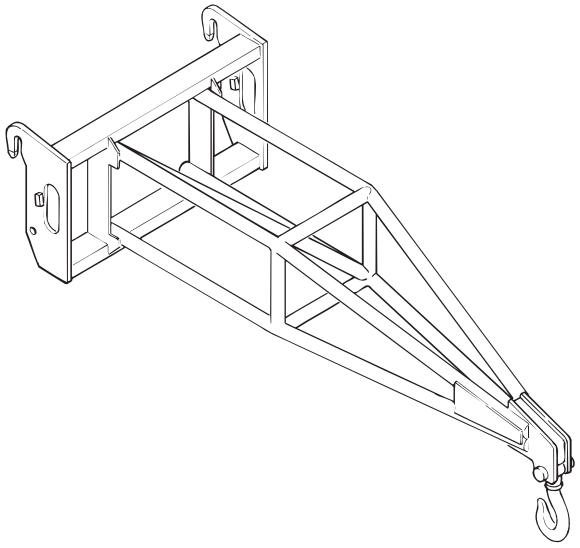
Payload	*kg*	*2500*
Width	mm	970
Length	mm	620
Height	mm	600
Weight	kg	105

IMPORTANT

The fixed hook has been designed to support a load of 2500 kg. The max payload corresponds to the nominal capacity rating of the handler on which it is installed and is indicated on the load charts supplied with the equipment.

■ F-1.4 EXTENSION JIB

Code	GTH-5519
400 kg	59.0800.0000



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

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.

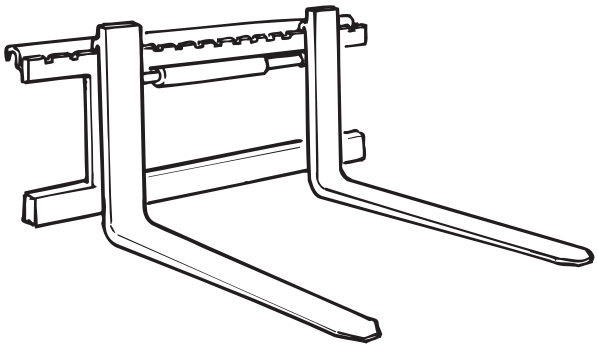
Operation

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-1.5 FORKS WITH HYDRAULIC SIDE-SHIFT



Machine	*GTH-5519*
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

Application

Quick-coupling fitted attachment for handling palletised loads with possibility of shifting the load to the side by ± 100 mm.

Safety

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

- Do not load loose materials
- Do not move superposed pallets

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.

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Section G

TABLES AND DOCUMENTS ENCLOSED

TABLE OF CONTENTS

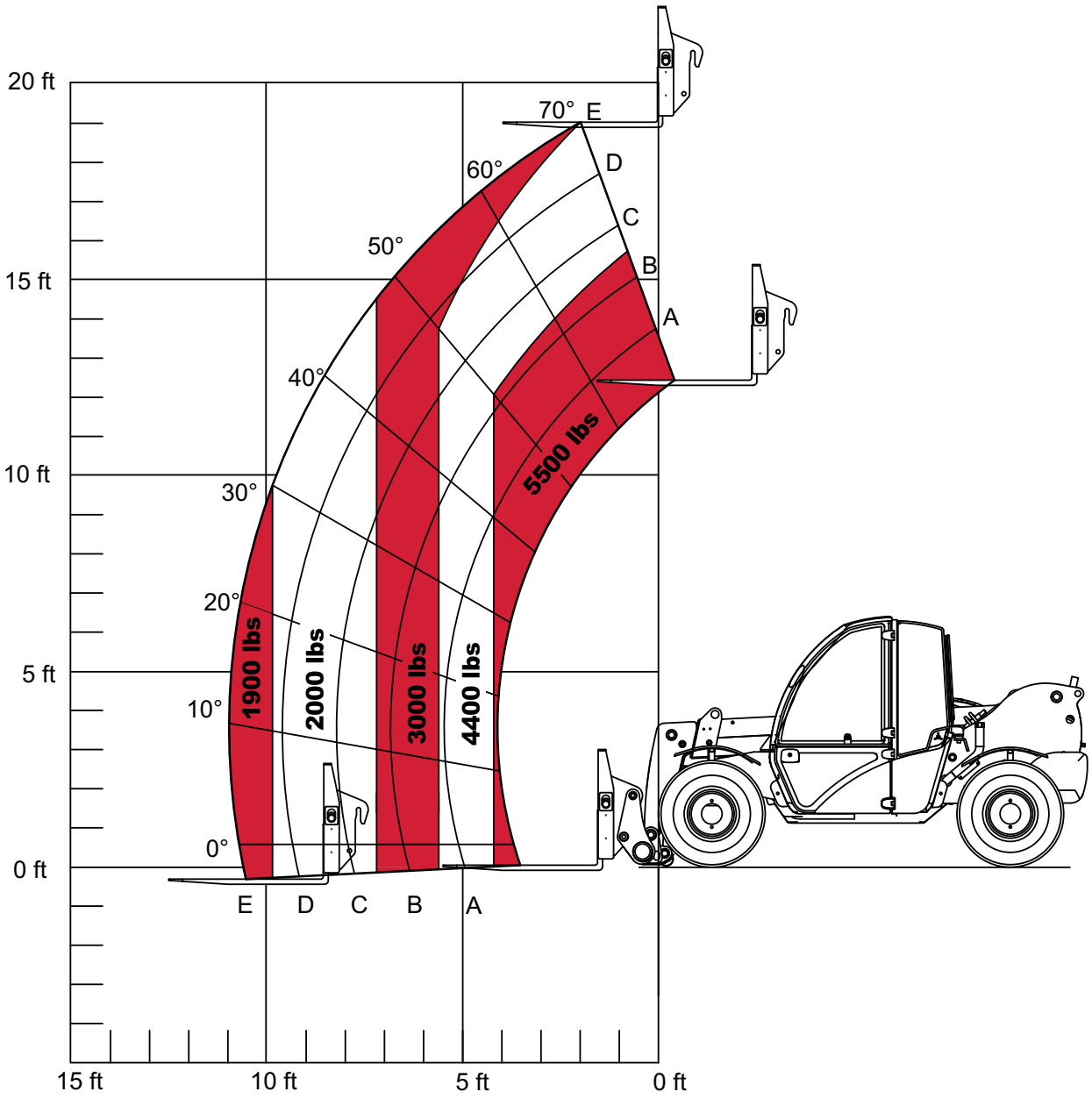
G-1 TORQUE WRENCH SETTINGS

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

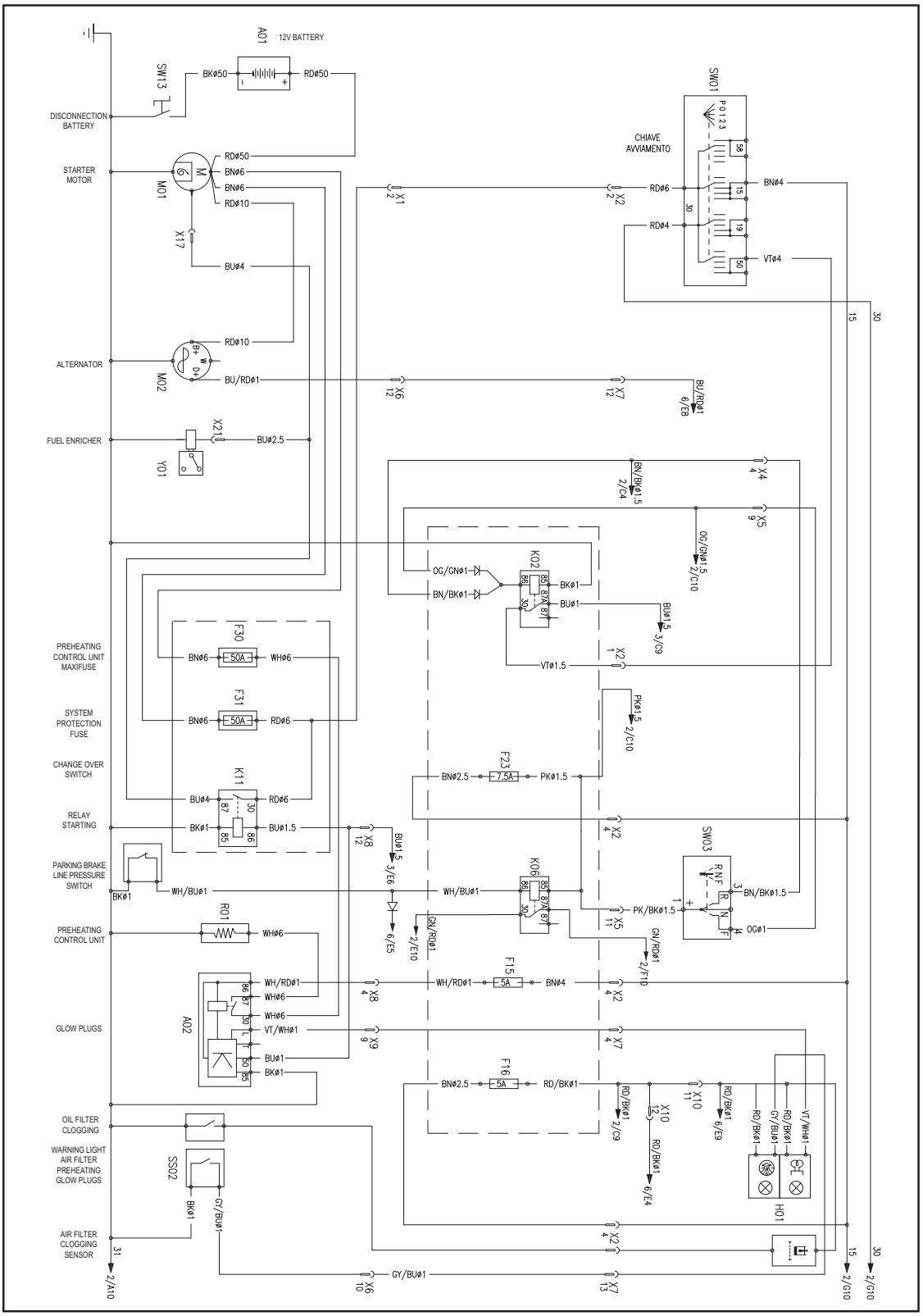
IMPORTANT

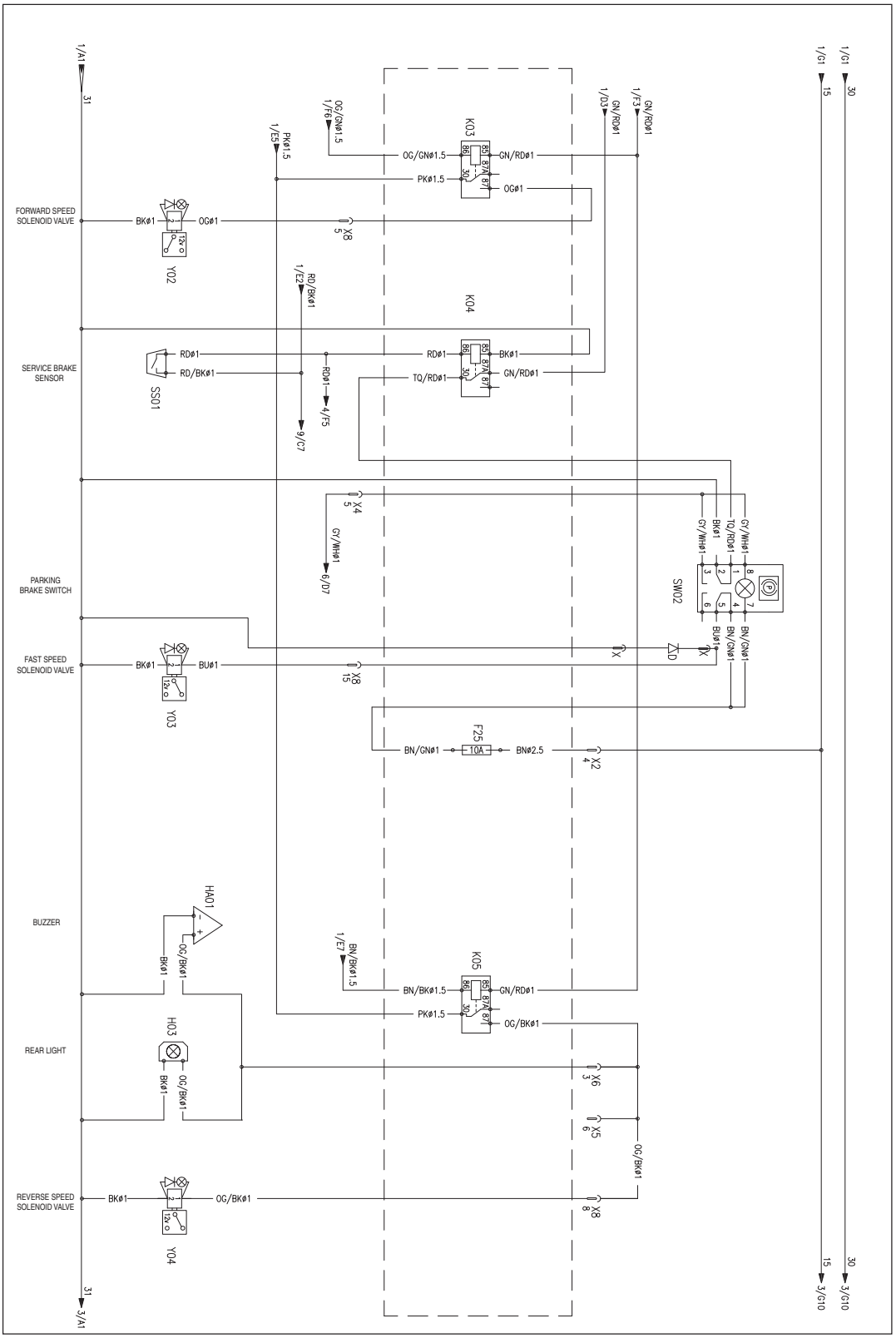
Sensor maximum driving torque: 15 Nm.

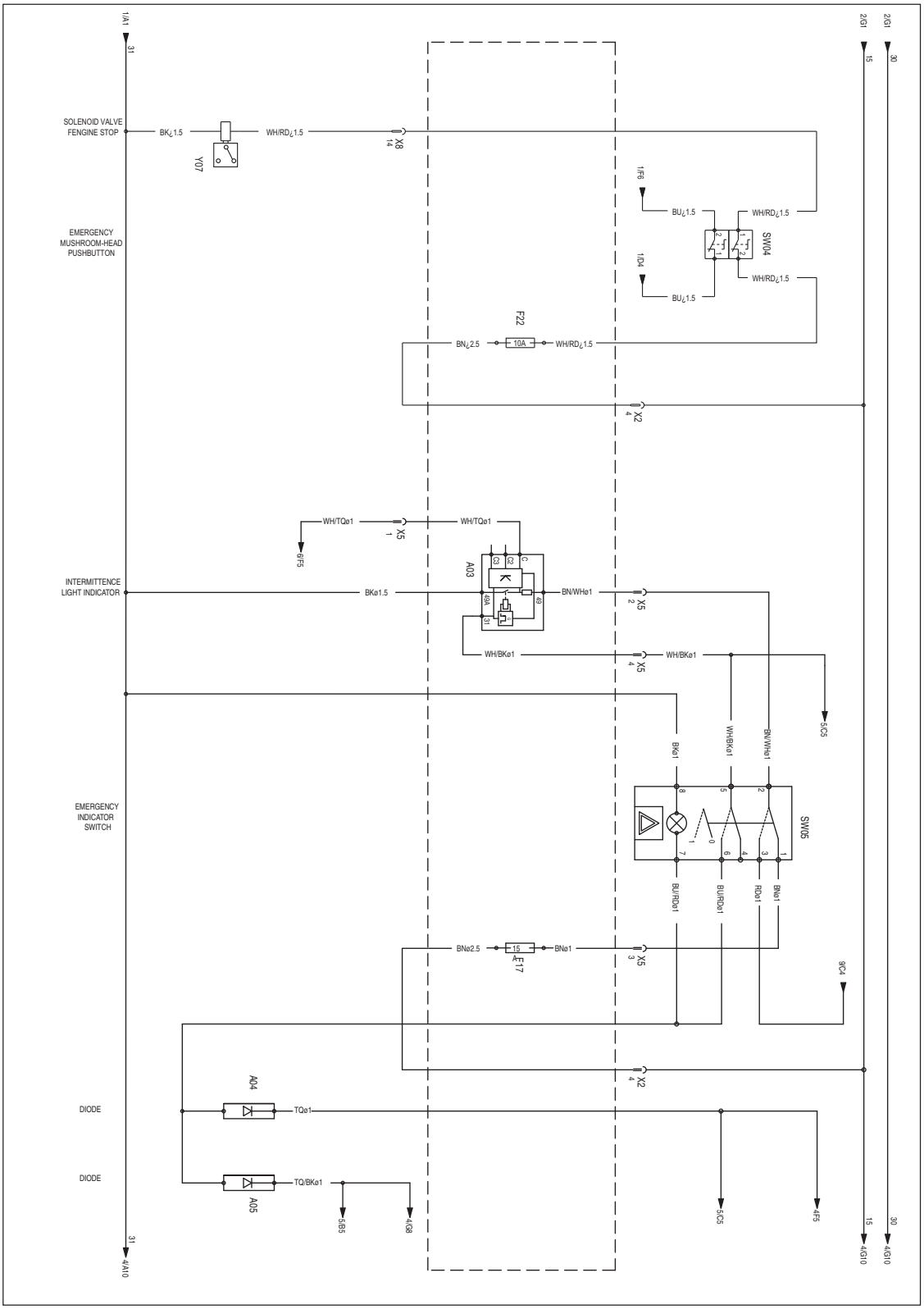
G-2.1 LOAD CHART WITH FORKS - GTH-5519

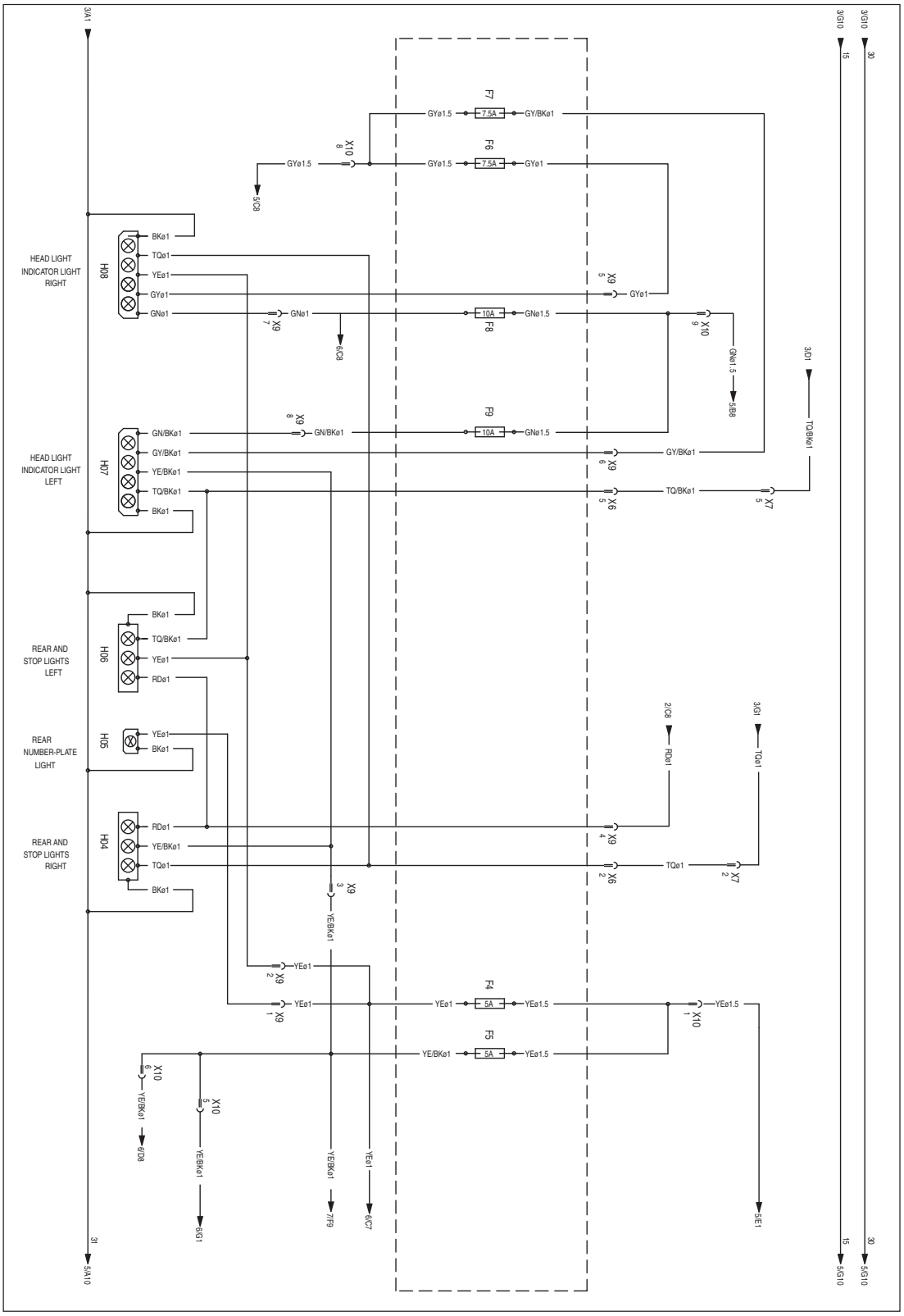


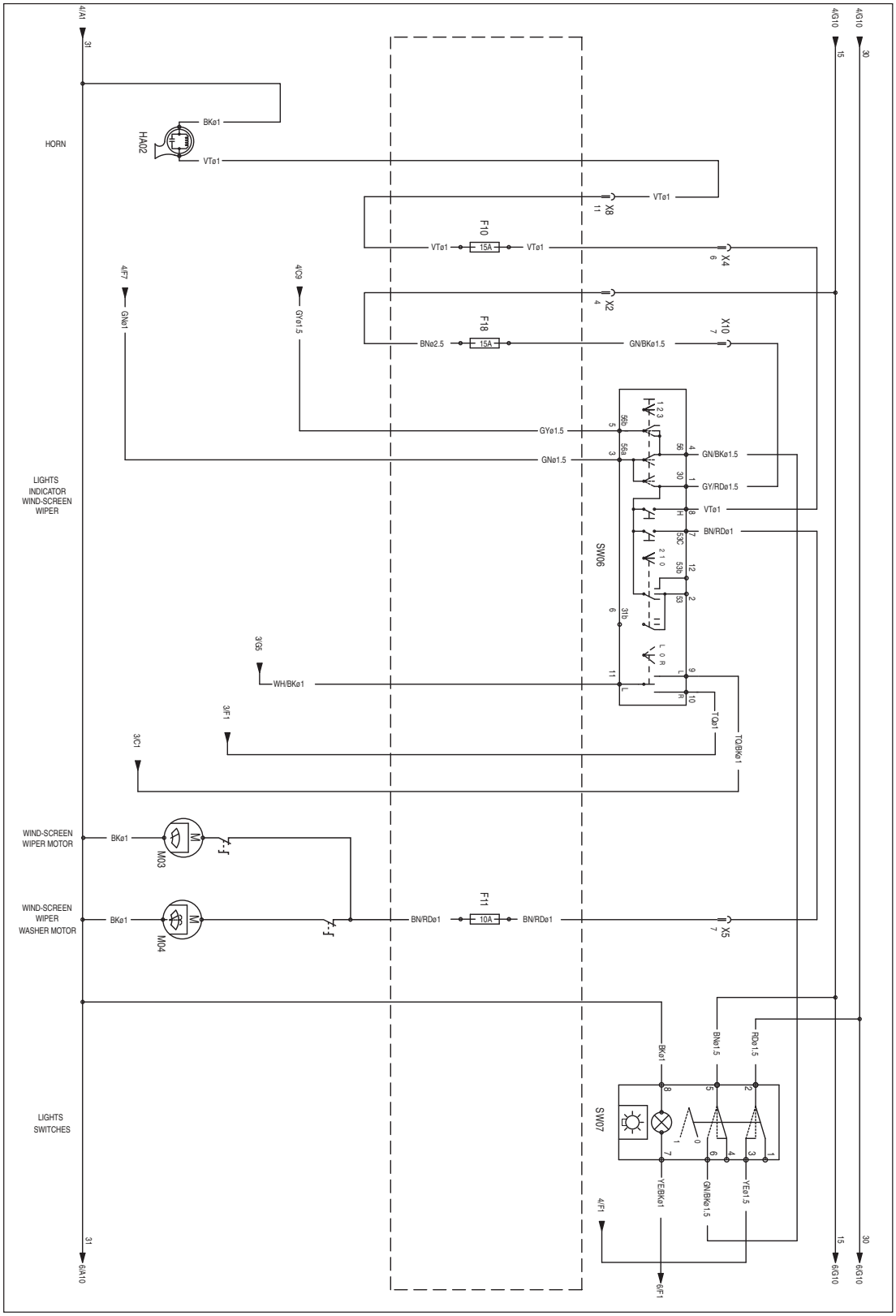
G-3.1 WIRING DIAGRAM

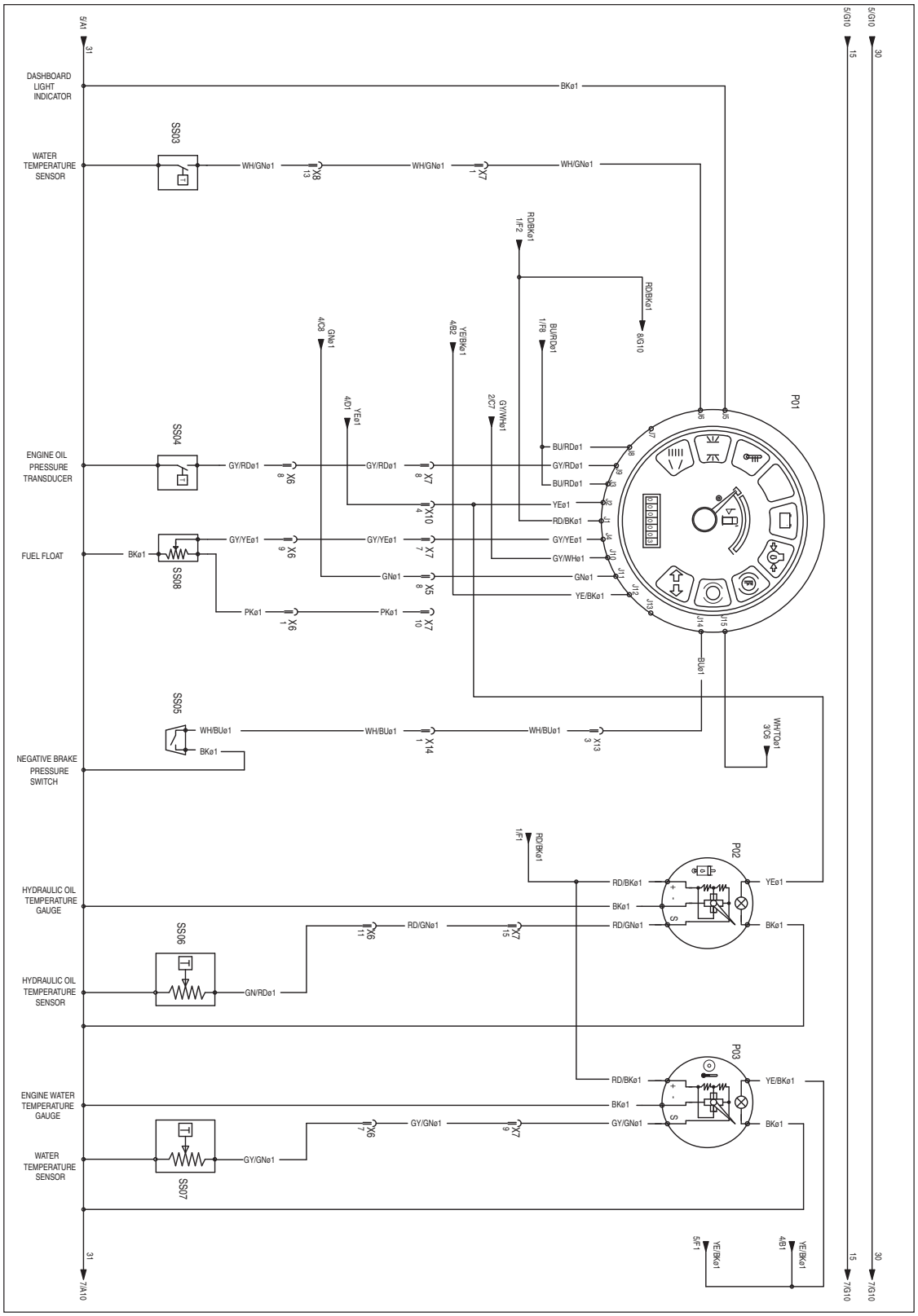


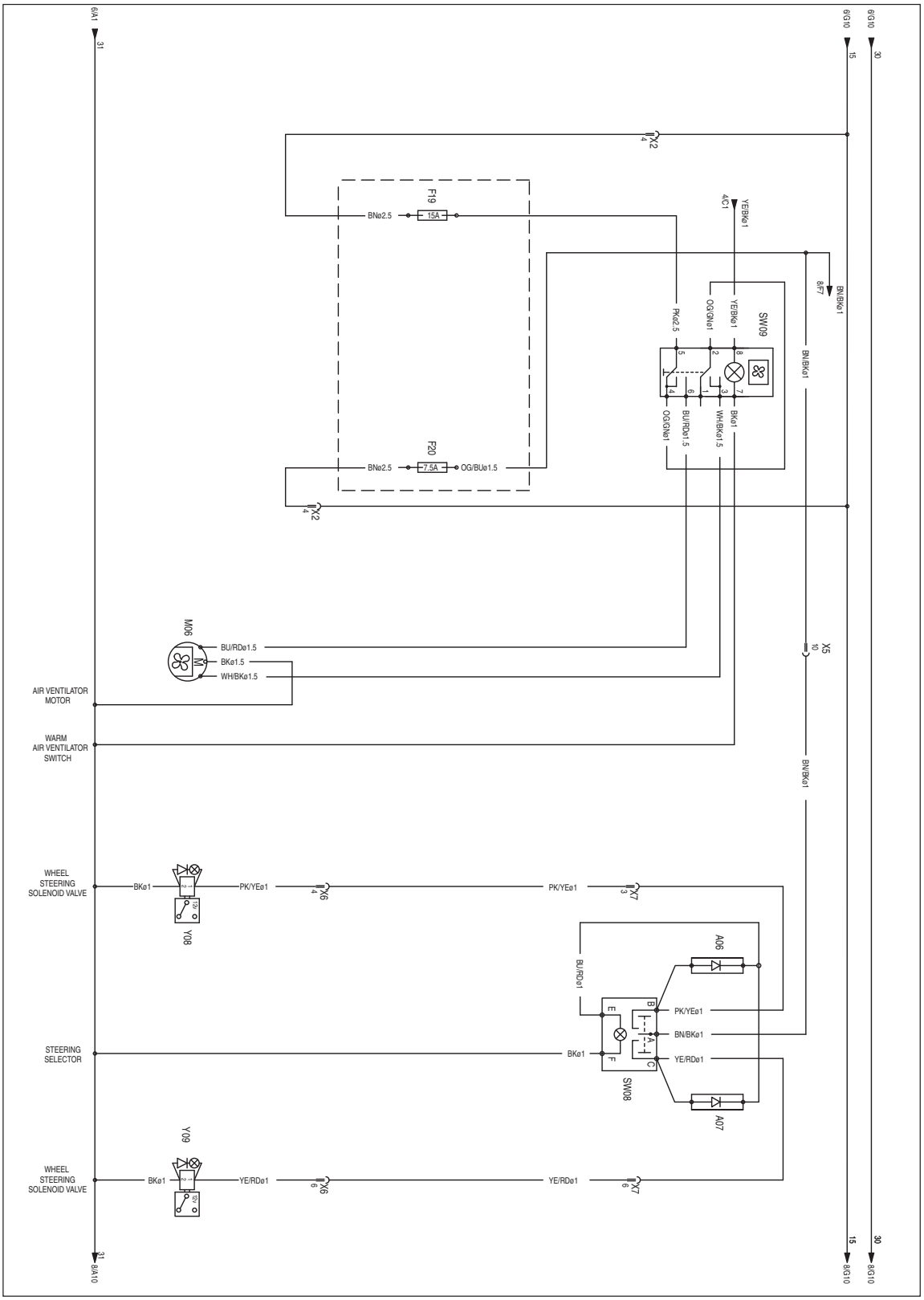

FORWARD SPEED SOLENOID VALVE
SERVICE BRAKE SENSOR
PARKING BRAKE SWITCH
FAST SPEED SOLENOID VALVE
BUZZER
REAR LIGHT
REVERSE SPEED SOLENOID VALVE
K03
K04
K05
SM02
HA01
H03
Y02
Y03
Y04
SS01
F25
10A
1/A1
31
3/A1
1/C1
30
15
3/C10
1/D3
GN/RDø1
1/F3
1/E5
PKø1.5
1/F6
OG/GNø1.5
OG/GNø1.5
PKø1.5
OGø1
BKø1
X8
3
RDø1
RD/BKø1
1/E2
RD/BKø1
RDø1
4/F5
9/C7
TQ/RDø1
BKø1
GN/RDø1
X4
5
GY/WHø1
6/D7
GY/WHø1
BKø1
TQ/RDø1
GY/WHø1
BUø1
BN/GNø1
X8
15
BN/GNø1
BN2.5
X2
4
1/E7
BN/BKø1
BN/BKø1.5
BN/BKø1.5
PKø1.5
OG/BKø1
X6
3
X5
6
OG/BKø1
X8
8

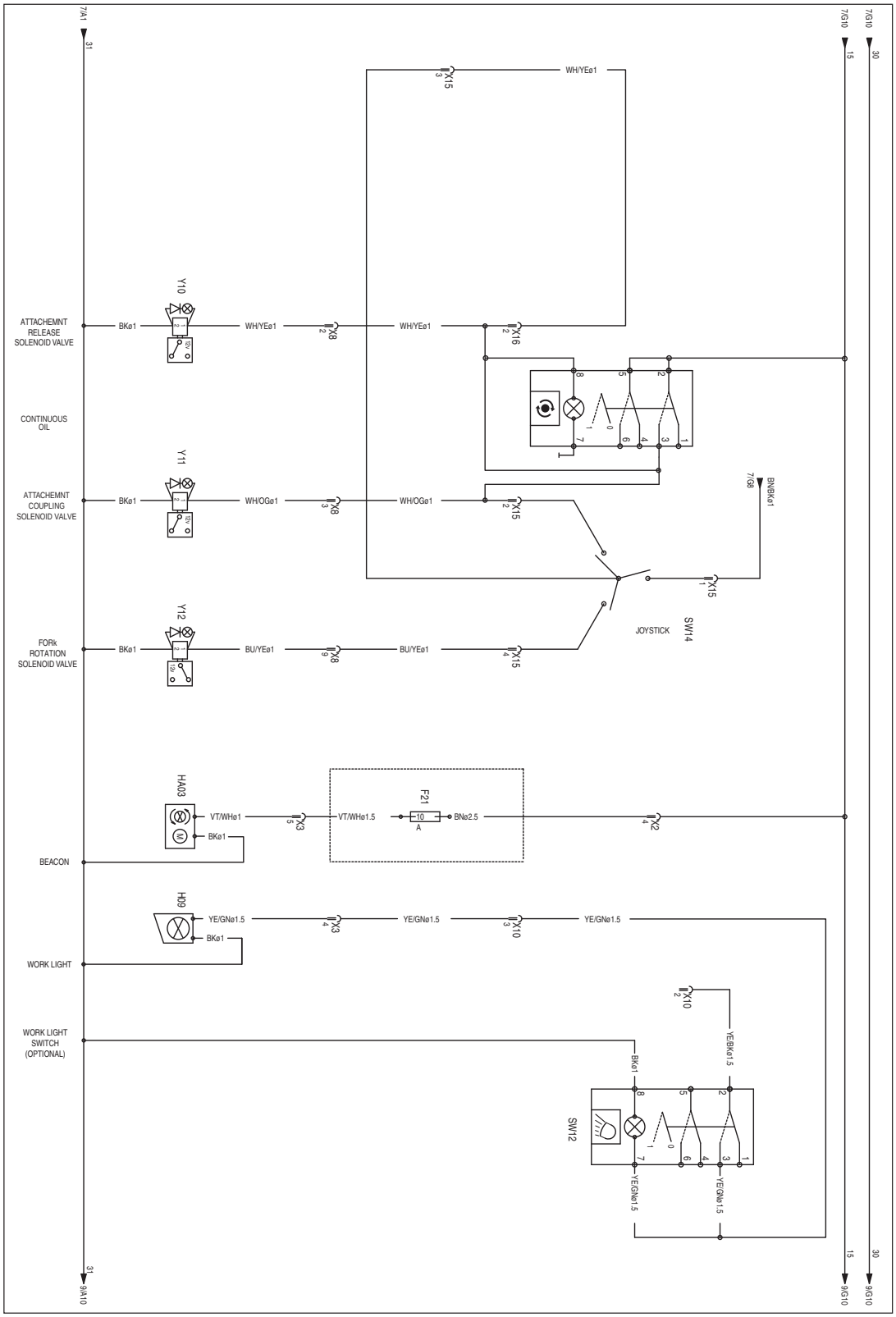

SOLENOID VALVE FENGINE STOP
EMERGENCY MUSHROOM-HEAD PUSHBUTTON
INTERMITTENCE LIGHT INDICATOR
EMERGENCY INDICATOR SWITCH
DIODE
DIODE
SW04
SW05
A03
A04
A05
F22
F17
Y07
X2
X5
X8


HEAD LIGHT INDICATOR LIGHT RIGHT
HEAD LIGHT INDICATOR LIGHT LEFT
REAR AND STOP LIGHTS LEFT
REAR NUMBER-PLATE LIGHT
REAR AND STOP LIGHTS RIGHT
F7 7.5A
F6 7.5A
F8 10A
F9 10A
F4 5A
F5 5A
GYø1.5
GY/BKø1
GYø1
GNø1
GNø1.5
BKø1
TQø1
YEø1
TQ/BKø1
YE/BKø1
RDø1
3/A1
5/A10
3/G10
5/G10
3/D1
3/G1
2/C8
5/C8
6/C8
5/B8
5/E1
6/C7
7/F9
6/G1
6/D8


HORN
HA02
BKø1
VTø1
X8
F10
15A
X4
X2
F18
BNø2.5
GN/BKø1.5
X10
GYø1.5
GNø1.5
LIGHTS INDICATOR WIND-SCREEN WIPER
SW06
GY/RDø1.5
BN/RDø1
WH/BKø1
TQø1
TQ/BKø1
WIND-SCREEN WIPER MOTOR
M03
WIND-SCREEN WIPER WASHER MOTOR
M04
F11
10A
X5
LIGHTS SWITCHES
SW07
BKø1.5
RDø1.5
YE/BKø1
GN/BKø1.5
YEø1.5
4/A1
4/F7
4/C9
4/G10
3/G5
3/F1
3/C1
6/A10
6/F1
6/G10


DASHBOARD LIGHT INDICATOR
WATER TEMPERATURE SENSOR
ENGINE OIL PRESSURE TRANSDUCER
FUEL FLOAT
NEGATIVE BRAKE PRESSURE SWITCH
HYDRAULIC OIL TEMPERATURE GAUGE
HYDRAULIC OIL TEMPERATURE SENSOR
ENGINE WATER TEMPERATURE GAUGE
WATER TEMPERATURE SENSOR
SS03
SS04
SS08
SS05
SS06
SS07
P01
P02
P03
5/A1
31
7/A10
5/G10
15
30
7/G10
BKø1
WH/GNø1
GY/RDø1
GY/YEø1
GNø1
PKø1
WH/BUø1
RD/BKø1
BU/RDø1
YEø1
GY/WHø1
YE/BKø1
BUø1
WH/TOø1
RD/GNø1
GN/RDø1
GY/GNø1
YE/BKø1


6A1
31
6G10
15
30
X2
F19
BNø2.5
15A
4C1
YE/BKø1
8F7
BN/BKø1
SW09
RKø2.5
OG/GNø1
YE/BKø1
BN/BKø1
BU/RDø1.5
WH/BKø1.5
BKø1
F20
BNø2.5
7.5A
OG/BUø1.5
M06
BU/RDø1.5
BKø1.5
WH/BKø1.5
X5
10
AIR VENTILATOR MOTOR
WARM AIR VENTILATOR SWITCH
WHEEL STEERING SOLENOID VALVE
BKø1
PK/YEø1
X6
X7
Y08
A06
BU/RDø1
PK/YEø1
BN/BKø1
YE/RDø1
SW08
A07
STEERING SELECTOR
BKø1
Y09
WHEEL STEERING SOLENOID VALVE
BKø1
YE/RDø1
8A10
8G10


7/A1
31
7/G10
15
30
WH/YEø1
X15
Y10
ATTACHEMNT RELEASE SOLENOID VALVE
BKø1
WH/YEø1
X8
WH/YEø1
X16
CONTINUOUS OIL
Y11
ATTACHEMNT COUPLING SOLENOID VALVE
BKø1
WH/OGø1
X8
WH/OGø1
X15
7/G8
BN/BKø1
X15
JOYSTICK
SW14
Y12
FORk ROTATION SOLENOID VALVE
BKø1
BU/YEø1
X8
BU/YEø1
X15
HA03
VT/WHø1
X3
VT/WHø1.5
F21
10 A
BNø2.5
X2
BEACON
BKø1
H09
YE/GNø1.5
X3
YE/GNø1.5
X10
YE/GNø1.5
WORK LIGHT
BKø1
WORK LIGHT SWITCH (OPTIONAL)
X10
YE/BKø1.5
BKø1
SW12
YE/GNø1.5
YE/GNø1.5
31
9/A10
15
30
9/G10

G-3.1.1 Wiring diagram - Components description

Ref	Description	Sheet
2	10 A FUSE	
F3	10 A FUSE	
F4	5 A FUSE	
F5	10 A FUSE	
F6	10 A FUSE	
F7	5 A FUSE	
F8	5 A FUSE	
F9	15 A FUSE	
F10	5 A FUSE	
F11	7,5 A FUSE	
F12	7,5 A FUSE	
F13	5 A FUSE	
F14	2 A FUSE	
F15	2 A FUSE	
F16	20 A FUSE	
F17	10 A FUSE	
F18	5 A FUSE	
F19	20 A FUSE	
F20	10 A FUSE	
F21	15 A FUSE	
F22	5 A FUSE	
F23	15 A FUSE	
F24	5 A FUSE	
F25	7,5 A FUSE	
F26	7,5 A FUSE	
F27	5 A FUSE	
F28	5 A FUSE	
F29	SPARE FUSES (15A - 10A - 7,5A - 5A)	
F30	PREHEATING CONTROL UNIT MAXIFUSE	
F31	SYSTEM PROTECTION FUSE	
H01	WARNING LIGHTS: AIR FILTER SOILED, PREHEATING GLOW PLUGS WARNING LIGHT	1
H03	BACK-UP LAMPS	2
H04	REAR RIGHT-HAND LIGHT	4
H05	LICENSE PLATE LAMP	4
H06	REAR LEFT-HAND LIGHT	4
H07	FRONT LIGHT LAMP - LEFT TURN SIGNAL	4
H08	FRONT LIGHT LAMP - RIGHT TURN SIGNAL	4
H09	WORK LIGHT	8
HA01	BACK-UP HORN	2
HA02	HORN	5
HA03	BEACON	8
K01	OPTIONAL WORK LIGHT	
K02	STARTING ENABLING COMMAND	1
K03	FORWARD SPEED ENABLING COMMAND	2
K04	INHIBITION WITH SERVICE BRAKE ENGAGED	2
K05	REVERSE SPEED ENABLING COMMAND	2
K06	GEAR ENGAGEMENT FROM PARKING BRAKE LINE LOW PRESSURE BULB	1
K11	START RELAY	1
M01	STARTER MOTOR	1
M02	ALTERNATOR	1
M03	WINDSCREEN WIPER MOTOR	5
M04	WINDSCREEN WIPER/WASHER MOTOR	5
M06	FAN MOTOR	7
P01	WARNING LIGHTS - FUEL GAUGE INSTRUMENT	5
P02	ENGINE OIL TEMPERATURE INDICATOR	5
P03	ENGINE OIL COOLING TEMPERATURE INDICATOR	5
R01	GLOW PLUGS	1
SW01	IGNITION KEY	1
SW02	PARKING BRAKE SWITCH	2
SW03	CHANGE OVER SWITCH	1
SW04	MUSHROOM-HEAD BUTTON	3
SW05	HAZARD WARNING LIGHT / TURN SIGNALS SWITCH	3
SW06	LIGHT SWITCH-TURN SIGNALS-WINDSCREEN WIPER/ WASHER	5
SW07	LIGHTS SELECTION SWITCH	5
SW08	STEERING SELECTOR	7
SW09	HEATING FAN SWITCH	7
SW11	CONTINUOUS OIL SWITCH	8
SW12	OPTIONAL WORK LIGHT SWITCH	8
SW13	BATTERY CUTOFF	1
SW14	JOYSTICK	8
SS01	SERVICE BRAKE SENSOR	2
SS02	AIR FILTER CLOGGING SENSOR	1
SS03	WATER TEMPERATURRE SENSOR	6
SS04	ENGINE OIL PRESSURE SENSOR	6
SS05	NEGATIVE BRAKE PRESSURE SWITCH	6
SS06	HYDRAULIC OIL TEMPERATURE SENSOR	6
SS07	WATER TEMPERATURE SENSOR	6
SS08	FUEL FLOAT	6
Y01	FUEL ENRICHER SOLENOID	1
Y02	SOLENOID VALVE - FWD SPEED	2
Y03	SOLENOID VALVE - PARKING BRAKE	2
Y04	SOLENOID VALVE - REVERSE SPEED	2
Y07	ENGINE STOP SOLENOID	3
Y08	WHEEL STEERING SOLENOID VALVE	7
Y09	WHEEL STEERING SOLENOID VALVE	7
Y10	SOLENOID VALVE - ATTACHMENT RELEASE	8
Y11	SOLENOID VALVE - ATTACHMENT COUPLING	8

TABLES AND DOCUMENTS ENCLOSED

Ref	Description	Sheet
Y12	SOLENOID VALVE - FORK ROTATION	8
A01	12V BATTERY	1
A02	PREHEATING CONTROL UNIT	1
A03	TURN SIGNALS FLASHING	3
A04	DIODE	3
A05	DIODE	3
A06	DIODE	7
A07	DIODE	7
X01	4-WAY CONNECTOR - ENGINE FUSES LINE	
X02	4-WAY CONNECTOR - STEERING COLUMN	
X03	6-WAY CONNECTOR - CAB	
X04	6-WAY CONNECTOR - STEERING COLUMN	
X05	12-WAY CONNECTOR - STEERING COLUMN	
X06	12-WAY CONNECTOR - EN(	
X07	15-WAY CONNECTOR - STE	
X08	15-WAY CONNECTOR - ENGINE	
X09	9-WAY CONNECTOR - ENGINE	
X10	12-WAY CONNECTOR - STEERING COLUMN	
X15	4-WAY CONNECTOR - JOYSTICK	
X16	2-WAY CONNECTOR - STEERING COLUMN	

Ref	Description	Sheet

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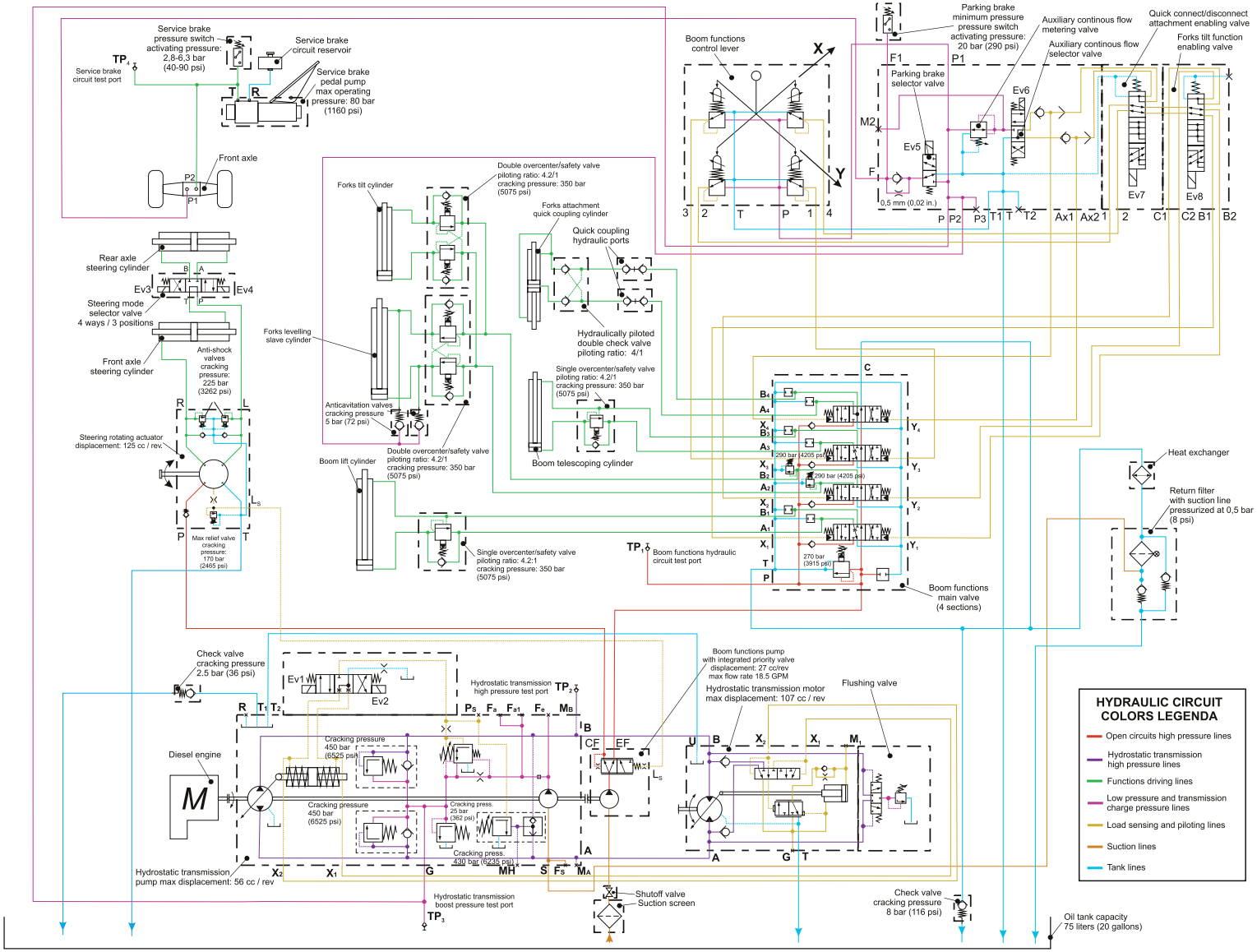
G-4.1 HYDRAULIC SCHEME (Drw. 57.2201.3000 - rev. B)



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G-5 ROUTINE CHECK SCHEDULE - SAFETY DEVICES

	COMPONENT																					Result/Notes		
Date	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													Positive	Negative	Signature
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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	