



OPERATOR MANUAL

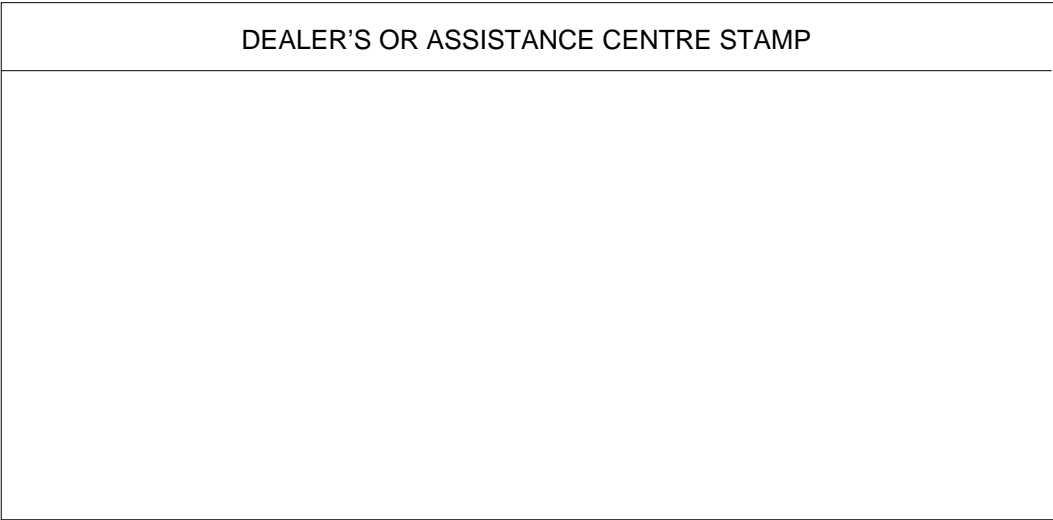
Document 51-19-M-2-OM - 2ND Edition 10/2000

Handler with telescopic boom

TEREXLIFT 51-19M

CONTRACT NO. M67854-00-C-3014





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■ INTRODUCTION

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

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

The handbook is divided into six sections:

Section A	GENERAL INFORMATION
Section B	SAFETY
Section C	OPERATING INSTRUCTIONS
Section D	MAINTENANCE
Section E	OPTIONAL ATTACHMENTS
Section F	TABLES AND ENCLOSURES

Section **A** introduces general concepts which are decisive for the knowledge of the main parts of the machine. Additionally, it contains all necessary data for a correct identification, it explains the technical features of the machine, etc.

Section **B** is especially addressed to both the personnel, who shall set up and repair the machine, and, in case of companies with a wide fleet of machines, the safety responsible.

It describes the essential compulsory qualities of the

personnel in charge and other important information for the safety of persons and things.

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

Section **D** is addressed to the workshop responsible and the operators who must service the machine.

The section describes the maintenance schedule and the relevant intervals. Specific chapters are dedicated to the failure diagnostics, the tables and the reference specifications to be used for the maintenance schedule.

Section **E** makes a list of the main interchangeable attachments to be coupled to the machine: dimensions, weight, application field and limits of the different attachments.

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

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

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

SYMBOLS

Handler with telescopic boom TX51-19-M series



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 utilization, this handbook stresses these specific instructions by means of **SPECIAL SYMBOLS**

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

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

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



DANGER – Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



WARNING – Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION – Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.



ATTENTION – Indicates a situation which, if not avoided, may result in property or equipment damage.



THIS SYMBOL MEANS YOUR SAFETY IS INVOLVED!
READ, UNDERSTAND, AND FOLLOW ALL DANGER,
WARNING, AND CAUTION DECALS ON YOUR
MACHINE.

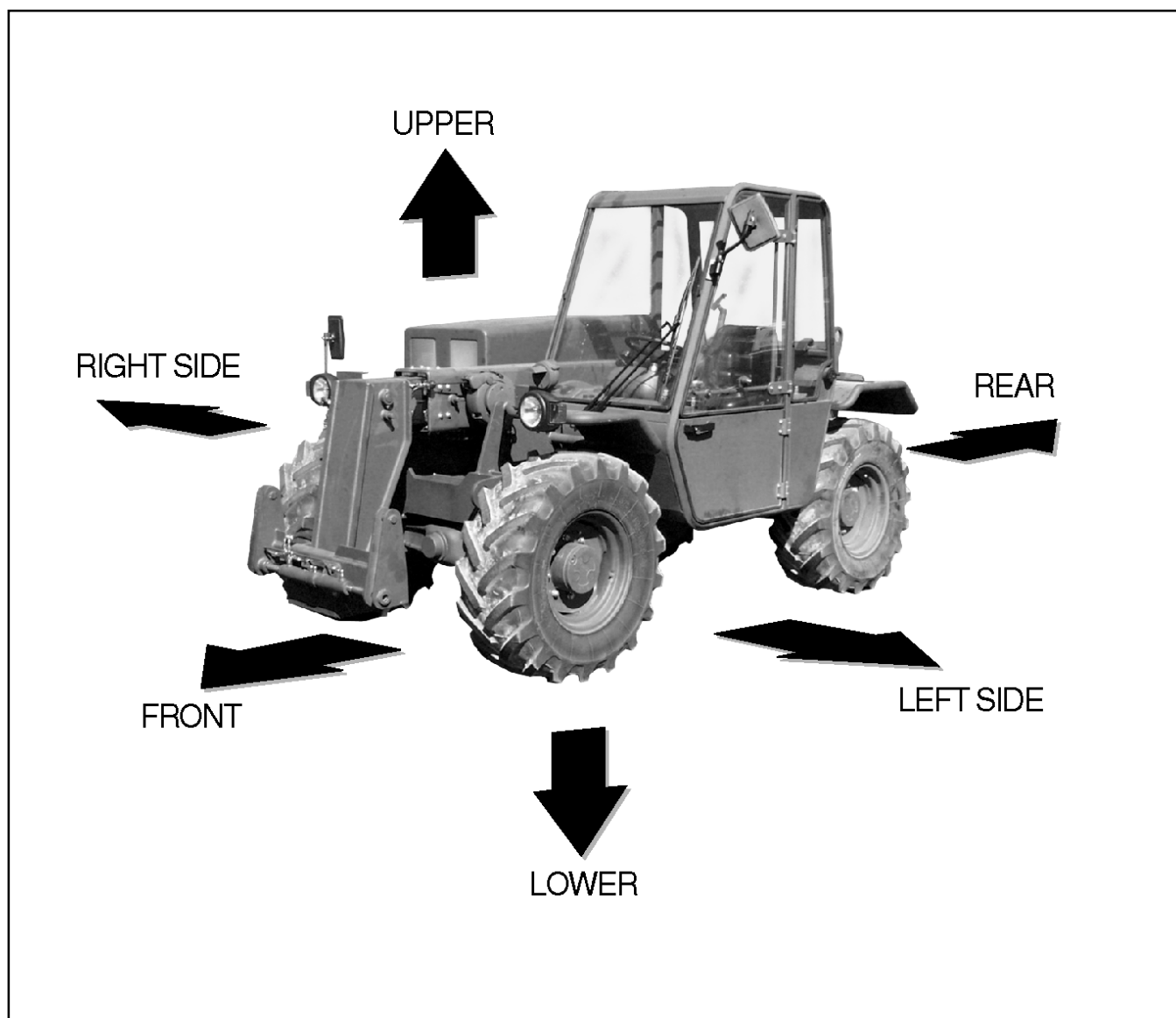
Section **A**

GENERAL INFORMATION

A-1 MACHINE REFERENCES**■ A-1.1 MACHINE POSITION**

The machine should be considered positioned as shown in the figure.

If it 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 which can be found when special attachments are coupled to the machine.



The familiarization with these labels is never a waste of time.

Make sure they are easy to read. For this purpose, clean them or replace those which 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 labeled as required or apply a new label.



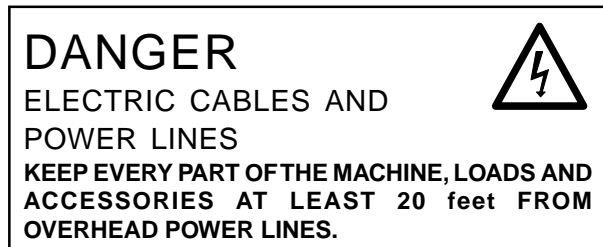
Description:
red/white label "Keep out of the working range of the machine".

Meaning:

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

Location:

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



Description:

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

Meaning:

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

Location:

within the cab, on the windsheild, to the right of the operators position.

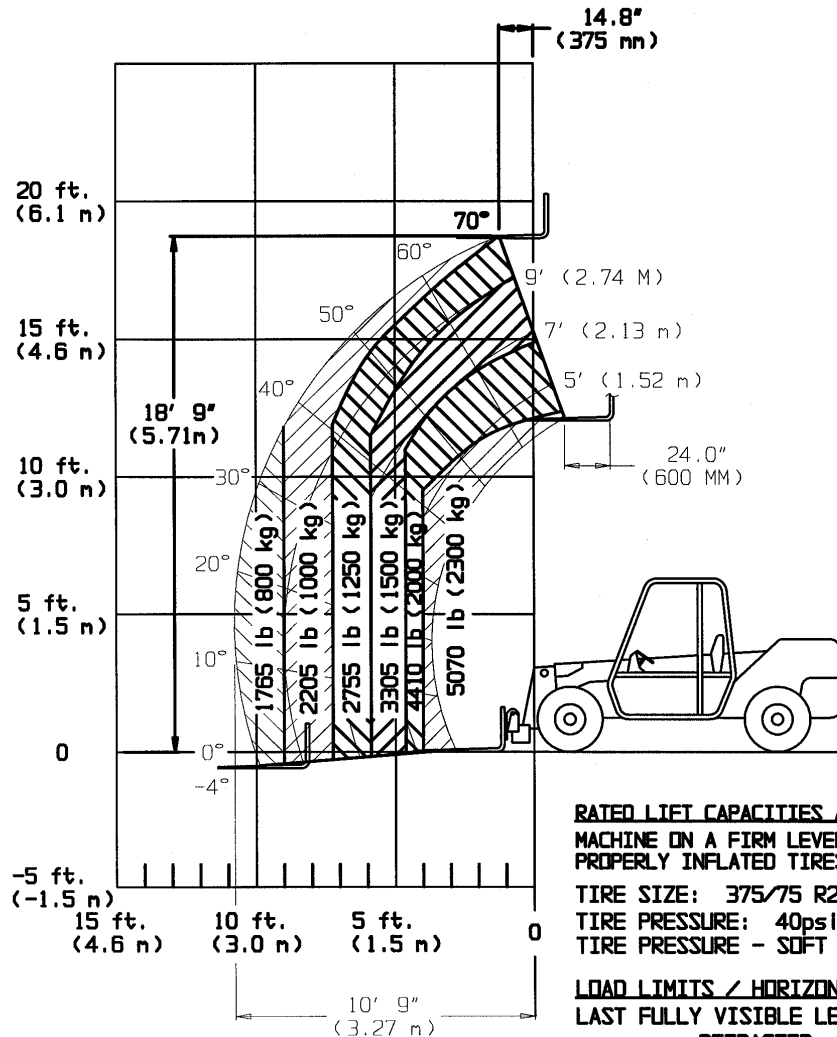
Meaning:

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

Location:

Within the operators cab, on a cable / chain.

TEREXLIFT TX51-19M



RATED LIFT CAPACITIES ARE WITH:
MACHINE ON A FIRM LEVEL SURFACE WITH UNDAMAGED,
PROPERLY INFLATED TIRES.

TIRE SIZE: 375/75 R20

TIRE PRESSURE: 40psi

TIRE PRESSURE - SOFT GROUND: 26 psi

LOAD LIMITS / HORIZONTAL BOOM

LAST FULLY VISIBLE LETTER

RETRACTED = 5070 LBS

(A) LETTER VISIBLE = 4410 LBS

(B) LETTER VISIBLE = 3305 LBS

(C) LETTER VISIBLE = 2755 LBS

(D) LETTER VISIBLE = 2205 LBS

(E) LETTER VISIBLE = 1765 LBS

S/N

32327932_A



WARNING

Your safety and the safety of those around you depends your using care and judgement in the operation of this equipment. Know the positions and functions of all controls before attempting to operate. All equipment has limitations. Understand the speed, braking, steering and load characteristics of the machine before starting the operate. Read the Operator's Manual and ask questions of our supervisor until you know the limitation.

Do not operate TEREXLIFT TELEHANDLER while people and property are within a 50 foot (15.24 M) minimum radius. Falling objects from the forks or attachment can cause serious injury or property damage. The 50 foot (15.24 M) minimum radius should be used as a guideline and should be enlarged if warranted by working conditions.

Always remain completely within canopy enclosure while operating machine. Falling debris can cause serious personal injury.

Never extend a load beyond the load chart band. Machine tip over, component damage, injury or death could occur.

Absolutely no riders on machine or attachment.

Never lower a maximum load before retracting, it. Machine tip over, component damage, injury or death could occur.

Always wear the seat belt when operating the machine.

Always inspect the machine daily. Check for missing guards and screens, loose bolts or anything out of the ordinary. Repair and/or replace immediately. Failure to do so can cause injury or death.

Do not travel on terrain or in dangerous areas that may cause the machine to tip over causing component damage, injury or death.

Carry a load so that you have maximum machine stability.

Always level the machine as indicated on the gauge before raising the boom. Raising the boom with an unlevel machine may cause the machine to tip over causing component damage, injury or death.

Use sway control to level the machine when the boom position is horizontal or lower. Using the sway control when the boom is higher than the horizontal position may cause the machine to overturn causing tip over damage, injury or death.

TEREXLIFT
CONWAY, S.C. 29526

3232Z796-A

Description:

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

Location:

within the cab, on the side window, to the right of the operator position.

Meaning:



























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

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

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

ATTENTION

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

Symbol	Description	Symbol	Description	Symbol	Description
	Hazard indicator lights		Steering selection		Lift/Tie Down
	Windsheild wiper		Brake pressure		Work - road setting
	Windsheild washer		Engine oil pressure		
	Cab ventilation fan		Boom raising		
	Diesel engine water temperature		Boom lowering		
	Fuel level		Boom extension		
	Hydraulic oil temperature		Boom retraction		
	High beam		Attachment locking device		
	Turn signals		Attachment releasing device		
	Parking brake		Fork pitching forward		
	Battery charge		Fork pitching back		
			Oil filter clogged		
			Air filter clogged		

A-2 MACHINE IDENTIFICATION

ATTENTION

Check that the operator and maintenance 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 **Terexlift 51-19-M**

■ A-2.2 MANUFACTURER

TEREXLIFT CONWAY

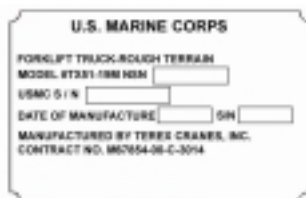
Highway 501 East / PO Box 260002

Conway, SC 29528-26002

Phone: 843-349-6900 Fax: 843-349-7078

■ A-2.3 MACHINE IDENTIFICATION PLATES

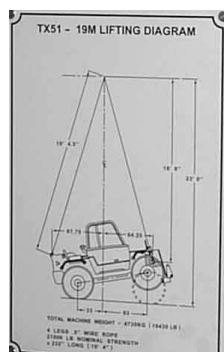
Identification plates are applied on the machine. They are located inside operators cab.



A Machine Lifting Diagram.

***Driver side, rear of machine, left of the
indentification plate.***

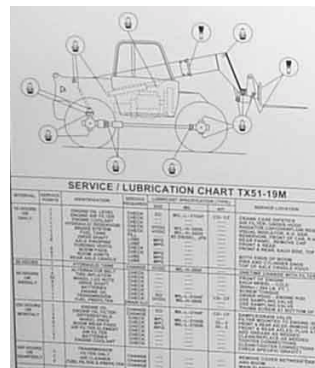
This is to be used only as a reference. You should always use the current rating



B Service Lubrication Chart.

Placed on the inside door of the operators cab.

This should be used to locate all lubraction points and will tell you what type of lubraction is required.



■ A-2.4 CHASSIS SERIAL NUMBER

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

■ A-2.5 IDENTIFICATION PLATES OF THE MAIN PARTS

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

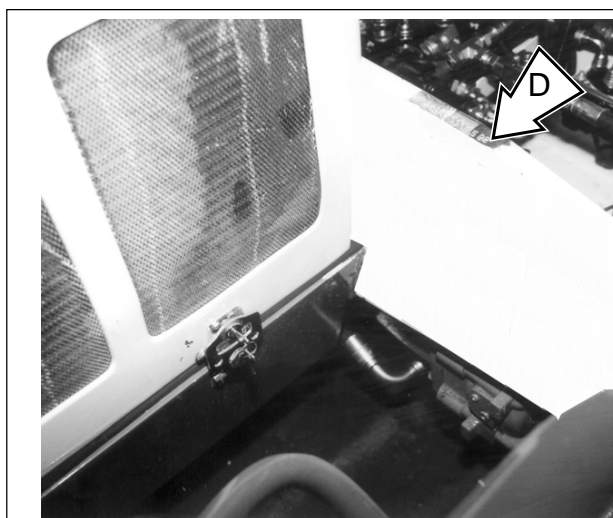


Fig. A10



ALLOWED USE

Handler with telescopic boom TX51-19-M series



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 E).

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 use, maintenance and repair of the handler shall be carried out by skilled operators only who know well the special characteristics of the machine and the safety precautions to be taken.



The Manufacturer disclaims any responsibility for damage to persons or things arising from arbitrary modifications carried out on the machine.

A-3.2 IMPROPER USE

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



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

- **Carrying passengers on the machine**
- **Not strictly complying with the operation and maintenance instructions of this handbook**
- **Working beyond the handler working limits**
- **Working on unstable edges of ditches**
- **Working on steep slopes**
- **Using attachment other than those recommended**

- **Using attachments which are not approved or directly manufactured by Terexlift**
- **Working in potentially explosive environments.**

A-3.3 APPLICABLE STANDARDS

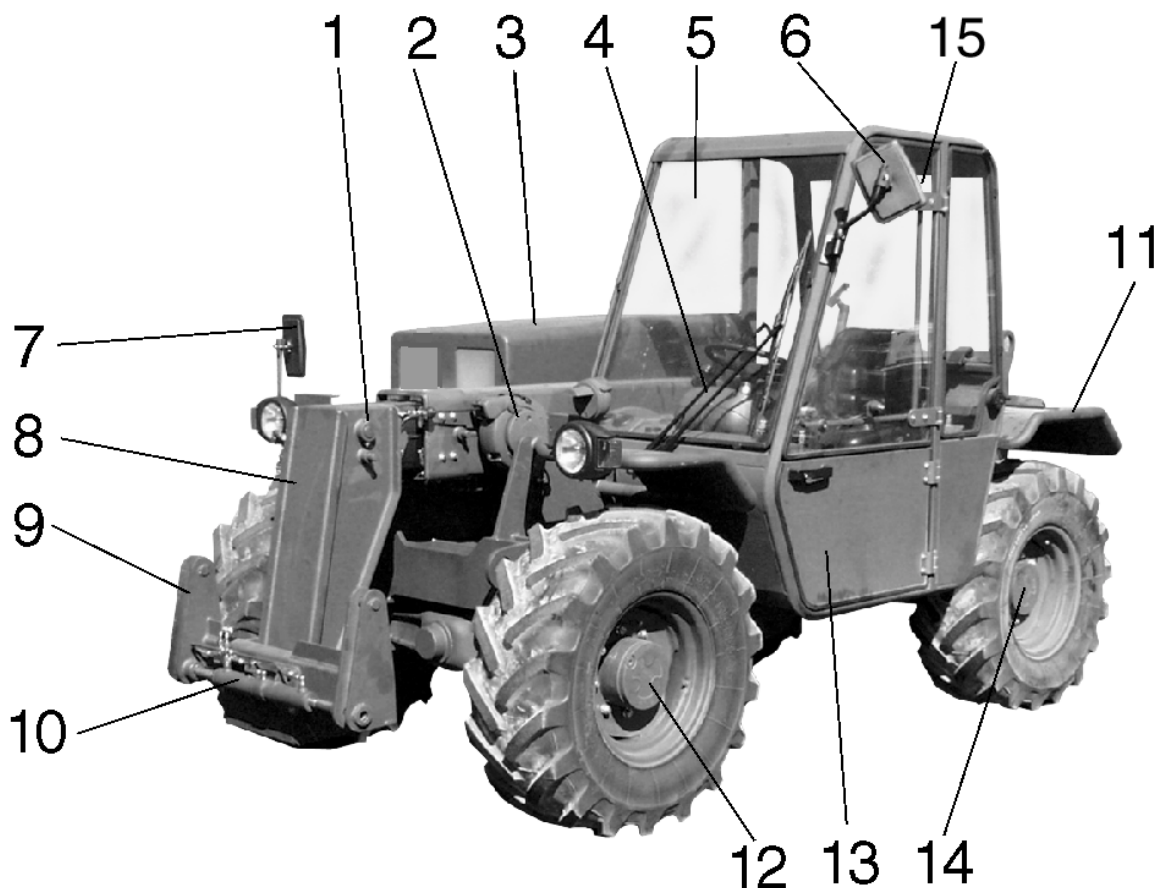
For ensuring the operator's safety, the following standards were followed during the risk analyse of the handler with telescopic boom:

Directive	Title
89/392 CEE	Machine Directive
98/39 CEE	Steering devices
86/295 CEE - 91/368 CEE	ROPS - FOPS
86/296 CEE - 91/368 CEE	Driving place
88/465 CEE	Seats - Type-approval
98/40 CEE	Rear view mirrors for agricultural machines
73/23 CEE - 93/68 CEE	Low Voltage Directive
74/151 CEE	Tractors - Weight, plate, etc.
79/532 CEE	Tractors - Lighting and signalling devices
80/720 CEE - 97/54 CEE	Tractors - Working ranges
89/391 CEE	Safety and health of workers at work
89/336 CEE - 92/31 CEE	Electromagnetic compatibility
96/627 CEE	Agricultural tractors - Noise levels within the driving cab

Standard	Title
EN 292-1/2	Machine safety - Designing principles
EN 294	Machine safety - Safety distance
EN 418	Machine safety - Emergency stop
EN 457	Machine safety - Audible hazard signalling devices
EN 563	Machine safety - Surface temperature
EN 574	Machine safety - Control devices
EN 811	Machine safety - Safety distance
EN 349	Machine safety - Minimum spaces
EN 842	Machine safety - Visible hazard signalling devices
EN 982	Machine safety - Hydraulic systems
EN 1032/5007/5008	Measurement of vibrations
EN 1033/1037	Machine safety - Prevention of accidental starting
EN 1050	Machine safety - Risk evaluation
EN 1088	Machine safety - Locking devices
EN 4871/ISO 5131/7216	Acoustics
NC 337-01/ISO 5010	Steering devices
NC 344-01/05/10	Braking devices
UNI EN 25353	Seat reference point
ISO 3767-1/2	Pictorial signs for the operator's controls
EN ISO 6682	Access to the operation controls
EN 22860/ISO 4252/4253	Minimum access dimensions
ASME B56.6 STABILITY	Safety standard for rough terrain forklift trucks

A-4 GENERAL DESCRIPTION

A-4.1 LIST OF THE MAIN COMPONENTS



- 1 - 2ND BOOM SECTION
- 2 - ELECTRICAL REEL
- 3 - ENGINE HOOD
- 4 - FRONT WINDSHEILD WIPER
- 5 - DRIVING CAB ACCORDING TO ROPS-FOPS PROVISIONS
- 6 - LEFT REARVIEW MIRROR
- 7 - RIGHT REARVIEW MIRROR
- 8 - 1ST BOOM BASE SECTION
- 9 - ATTACHMENT HOLDING FRAME
- 10 - ATTACHMENT LOCKING CYLINDER
- 11 - LEFT REAR WHEEL MUDGUARD
- 12 - LEFT FRONT WHEEL REDUCTION GEAR
- 13 - CAB DOOR
- 14 - LEFT REAR WHEEL REDUCTION GEAR
- 15 - REAR WINDSHIELD WIPER

■ A-4.2 DESCRIPTION OF THE MAIN COMPONENTS

Transmission

It consists of a pump with variable displacement directly applied on the engine.

From the power distributor, through a Drive shaft transmission, the motion is transmitted to the rear axle of the handler.

Steering axles/(front and rear) differential gears

The differential axles transmit the motion to the wheels. Less maintained surfaces on the front axle enables the machine to move. Limited slip differential lock.

Tires

The machine is equipped with tires suitably sized for the maximum load allowed on the handler.

When replacement is necessary, they shall be replaced with new ones having the same dimensions and loading capacity.

Overload warning system

The standard overload warning system installed on the vehicle enables the operator to work under the safest conditions. A five-LD display shows the stability variation. When the 5th red LED lights up, all machine movements are stopped, but for the boom retraction under safe conditions.

Boom hydraulic circuit

It consists of a gear pump connected to the engine which, through a special valve, dispenses oil to the hydraulic drive and a distributor for the following functions:

- boom lifting/lowering
- telescopic boom sections extension/retraction
- attachment rotation
- attachment locking
- fork titling

Braking circuit

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

■ A-4.3 OPTIONAL ACCESSORIES

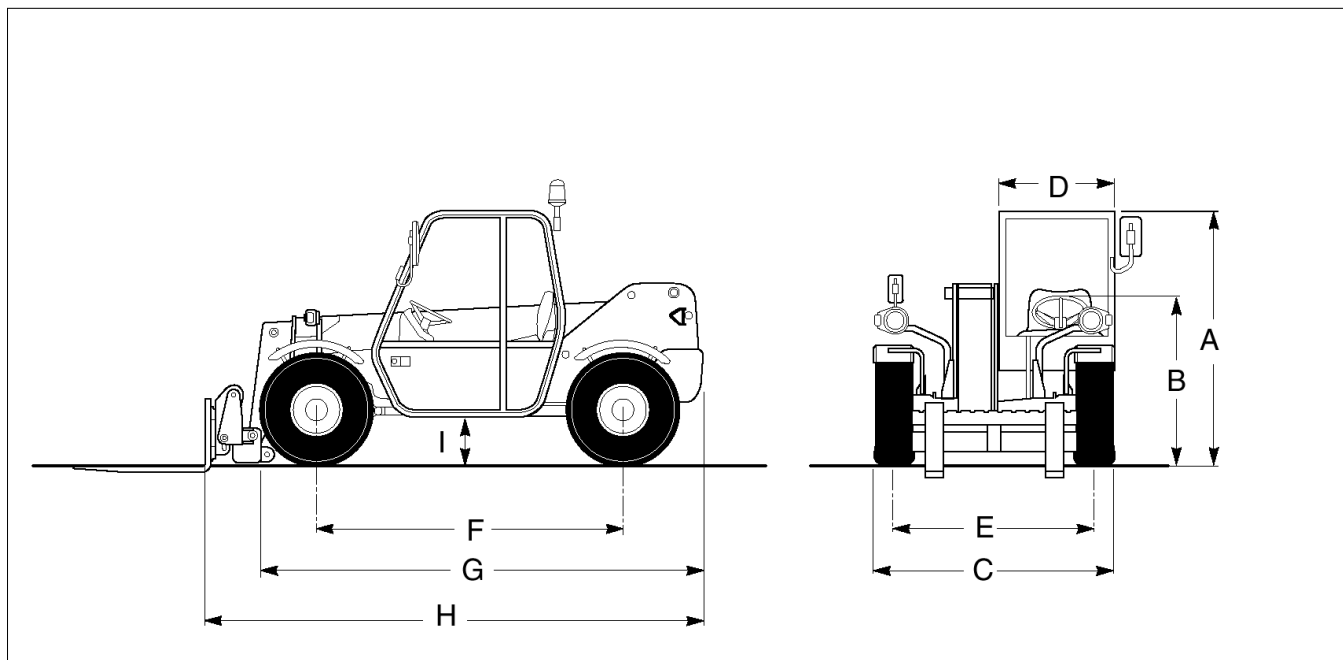
The machine can be fitted with a wide range of optional accessories: please address to Terexlift sales network.

ATTENTION

Please check the accessories which can be fitted on your machine.

■ A-5 TECHNICAL DATA AND

PERFORMANCE



■ A-5.1 MAIN DIMENSIONS

			TERELIFT 51-19-M
A	Overall height	ft. in.	7' 6"
B	Height of steering wheel	ft. in.	4' 11"
C	Overall width	ft. in.	6' 6"
D	Inside cab width	ft. in.	3' 0"
E	Track	ft. in.	4' 11"
F	Wheelbase	ft. in.	7' 7"
G	Length at front wheels	ft. in.	12' 0"
H	Length at fork-holder plate	ft. in.	13' 6"
I	Ground Clearance	ft. in.	1' 4"
•	Outside turn radius	ft. in.	26' 8"

■ A-5.1.1 Characteristic angles

• Angle of approach	90°
• Departure angle	70°

■ A-5.2 WEIGHT

• Weight in running order	lb (kg)	1150
---------------------------	---------	------

TEREXLIFT 51-19-M

■ **A-5.3 SPEED**

- Working speed (*)	mph	5.0
- Travel speed (*)	mph	20
- Max. slope with full load		45%

(*) = either forward or reverse motion

■ **A-5.4 PAYLOAD AND REACH**

- Max. lifting height	ft. in.	18' 9"
- Reach at max. height	ft. in.	14' 8"
- Max. reach forward	ft. in.	10' 9"
- Implement holding plate rotation		135°
- Payload at max. height	lb	2755
- Payload at max. reach	lb	1765

Overturning factor according to the stability regulations pr EN 1459, annex B.

■ **A-5.5 DIESEL ENGINE**

- Make		PERKINS
- Model/type		704-30T
- Features:		Diesel
		4 strokes
		direct injection
- Cylinders		4 cylinders in line
- Bore x Stroke		3.8 x 3.9 (97 x 100)
- Total displacement	cu in	180.4 (2956)
- Power at 2600 rpm (*)	hp	80

(*) = Gross power, calculated according to the DIN 70020 standard.

■ **A-5.6 ELECTRIC SYSTEM**

- Voltage	V	24
- Self-regulated alternator (on Diesel engine)	V	24
- Battery	Ah	2 x 80

■ **A-5.7 MACHINE NOISE LEVELS**

- Acoustic power (*)	dB	
- Acoustic pressure (*)	dB	

(*) = Values calculated according to the EC-directive 86/662.

Section **B**

SAFETY



B-1 GENERAL REMARKS

Most accidents which occur while working, repairing or maintaining operation machines, are caused by not complying with the basic safety precautions.

Therefore, it is necessary to pay steady attention to the potential hazards and the effects which may come of operations carried out on the machine.

If you recognize hazardous situations, you can prevent accidents!

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

The instructions given in this handbook are the ones established by TEREXLIFT. They do not exclude other safe and most convenient ways for the machine installation, operation and maintenance which 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 TEREXLIFT Assistance Service for any suggestion and the necessary written permission.

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

B-2 QUALIFICATIONS OF THE PERSONNEL IN CHARGE

■ B-2.1 QUALIFICATION OF THE MACHINE OPERATORS

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

health:

before and during any operation, operators shall never

consume alcoholic beverages, medicines or other substances which 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 familiarize with this handbook, its enclosed graphs and diagrams, the identification and hazard warning plates. They shall be skilled and trained about the machine use.

The operator might be required to 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 QUALIFICATIONS OF THE MAINTENANCE STAFF

The staff charged with the machine maintenance shall be qualified, specialized in the maintenance of these 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 familiarize with this handbook, its enclosed graphs and diagrams, the identification and warning plates. They shall be skilled and trained about the machine functioning.



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

■ B-2.3 WORKING GARMENTS

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

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



Use only type-approved personal protective equipment 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-plugs or hearing protection.
- Goggles or protection masks.

■ B-3 SAFETY PRECAUTIONS

■ B-3.1 JOB SITE

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

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



Pay the greatest attention to overhead electric lines. Always keep at a minimum safe distance of at least 20 feet from the telescopic boom and the lifted load. Electrical hazards!

- When assembling the machine or part of it on site, you need a well-equipped area of suitable dimensions. The surface shall be even, compact and stable.
- 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 GETTING READY TO WORK

Before any operation, following precautions should be taken:

- First of all, make sure that all maintenance have been carried out with care according to the established schedule (see section **D - Maintenance**).
- Ensure you have enough fuel to avoid a sudden stop of the engine, especially during a crucial maneuver.
- Clean instruments, data plates, lights and the cab windsheild 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 supervisor at once. Never start working under unsafe conditions.

■ B-3.3 DURING WORK OR MAINTENANCE

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

- Do not pass 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 **5 feet** from the ground), always use type-approved safety belts or fall preventing devices.
- Do not get into or off the machine while it is running.
- Do not leave the operators seat when the machine is running.
- Neither stop nor carry out repairs 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 repairs on electric components with voltage over **48V**.
- Do not connect wet plugs or sockets.
- Plates and hazard warning stickers shall never be removed, hidden or become unreadable.
- Except for maintenance purposes, do not remove safety devices, shields, protection cases, etc. Should their removal be necessary, stop the engine, remove them with the greatest care and always remember to refit them before starting the engine and using the machine again.
- Before any maintenance or repair work, stop the engine and disconnect the batteries.
- Do not lubricate, clean or adjust moving parts.
- Do not carry out operations manually when specific tools are provided for this purpose.
- Absolutely avoid to use tools in bad conditions or in an improper way i.e. pliers instead of adjustable wrenches, etc.
- Before carrying out operations on hydraulic lines under pressure or disconnecting hydraulic components, ensure the relevant line has been previously depressurized and does not contain any hot fluid.

Any repairs made on the hydraulic circuit must be carried out by authorized personnel.

The hydraulic circuit of this machine is fitted with pressure accumulators. You and others could be seriously injured if accumulators are not completely depressurized.

For this purpose, shut the engine down and step on the brake pedal 8-10 times.

- Neither smoke nor use open flames in areas subject to fire dangers and in presence of fuel, oil or batteries.
- Do not leave fuel cans or bottles in unsuitable places.
- Do not empty catalytic mufflers or tanks containing burning substances without taking the necessary measures.
- Carefully handle all flammable or dangerous substances.
- Do not tamper with fire-extinguishers or pressure accumulators: **explosion hazard!**
- After any maintenance or repair work, make sure that no tool, cloth or other object has been left within machine compartments, fitted with moving parts, or where suction and cooling air circulates.
- When working, do not give instructions or signals to several people at the same time. Instructions and signals must be given by one person only.
- Always pay the due respect to the instructions given by the supervisor.
- Never distract the operator during working phases or crucial maneuver.
- Avoid to call an operator suddenly, if unnecessary.
- Avoid to frighten an operator or to throw objects by no means.
- After work, never leave the machine under potentially dangerous conditions.

Section **C**

OPERATING INSTRUCTIONS



INTRODUCTION

This section provides the operator a practical guide for the gradual learning of the machine use.

The operator should get into the operators cab and carry out the preliminary adjustments, then memorize the position of the different controls and instruments.

The familiarization with the controls ensures not only a correct use during the working phases, but also a prompt and timely response of the operator, when he shall carry out sudden manoeuvres to safeguard his safety and the machine integrity.

It is necessary to learn how to use and foresee the machine reactions. Learn how to operate the machine controls in a safe and open place, without obstacles and anybody standing around. Do not ram the controls. Operate them slowly to understand their effect on the machine.

C-1 BEFORE GETTING INTO THE MACHINE

Checks and cleaning

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

Checking the tires

- Check the correct inflation of the tires; see par. "Tire inflation" in the Maintenance section.
- Make sure that the tire plies are not cut or worn.



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

C-2 GETTING INTO THE MACHINE

■ C-2.1 GETTING INTO THE CAB

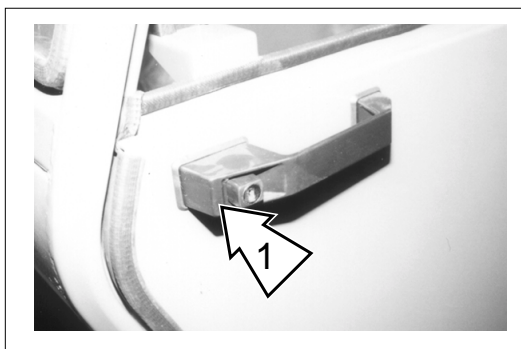


Always make sure that your hands and shoe soles are clean and dry before getting into the driving cab. Always face the machine when entering and leaving it and hold to the suitable handles.

The cab is fitted with an access door on the left side.

Door opening from outside:

- Press the button and open the door.

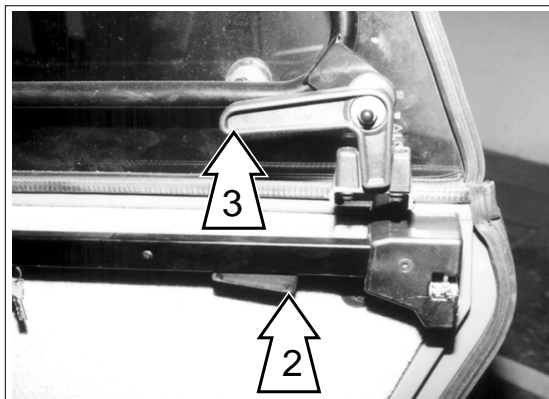


Door closing from inside:

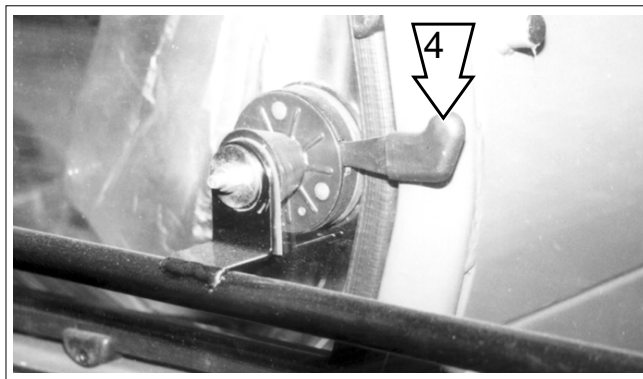
- Pull the door with force: it locks automatically.

Door opening from inside:

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



- Operate lever 4 to unlock and close the upper door section.



■ C-2.2 ADJUSTING THE SEAT

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

• **Seat distance from the controls**

The operators seat is fitted with an adjusting device that allows sliding the same seat forward or back with respect to the steering column.

To slide the seat, pull lever 1 outwards and push the seat as required. Then release the lever and make sure that the seat locks in position.

• **Springing adjustment**

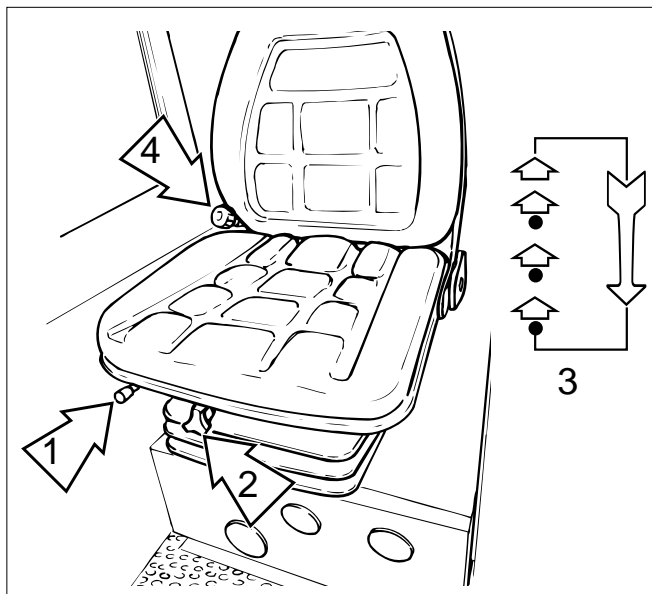
Rotate knob 2 clockwise or counterclockwise until obtaining the required springing. Rotate clockwise to increase the seat springing or counterclockwise to reduce it.

• **Height adjustment**

The seat height can be set to three different positions. To adjust, lift the seat until hearing the characteristic "clack" coupling sound. To lower the seat, raise to stroke end to unlock the mechanism, then release the seat; it automatically sets to the lowest position.

• **Backrest angle adjustment**

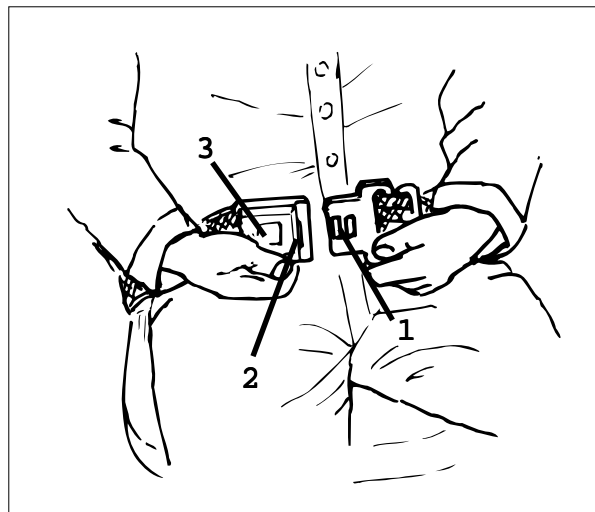
The backrest can be adjusted by means of knob 4. Rotated clockwise, it increase the backrest angle; counterclockwise it reduces it.



■ C-2.3 FASTENING THE SEAT BELTS

Sit correctly in the driving seat; then:

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



■ C-2.4 ADJUSTING THE STEERING COLUMN

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

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



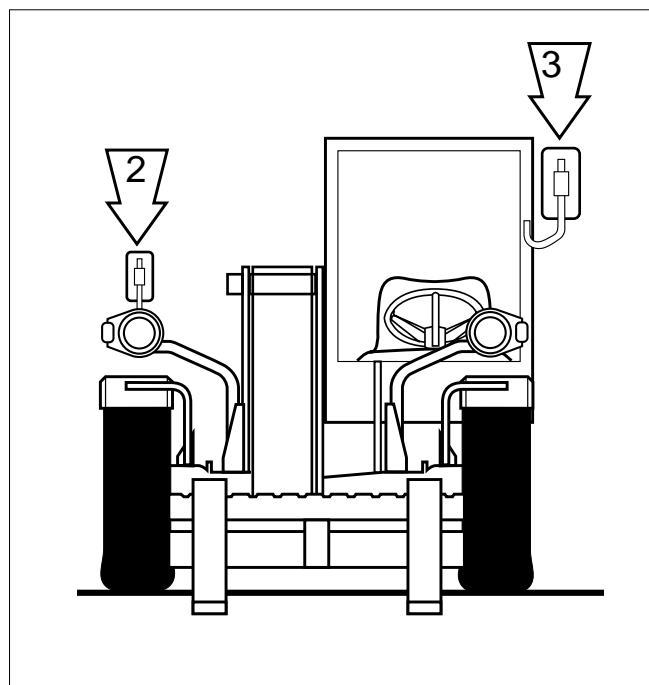
Before driving the machine, ensure the steering wheel is properly clamped.

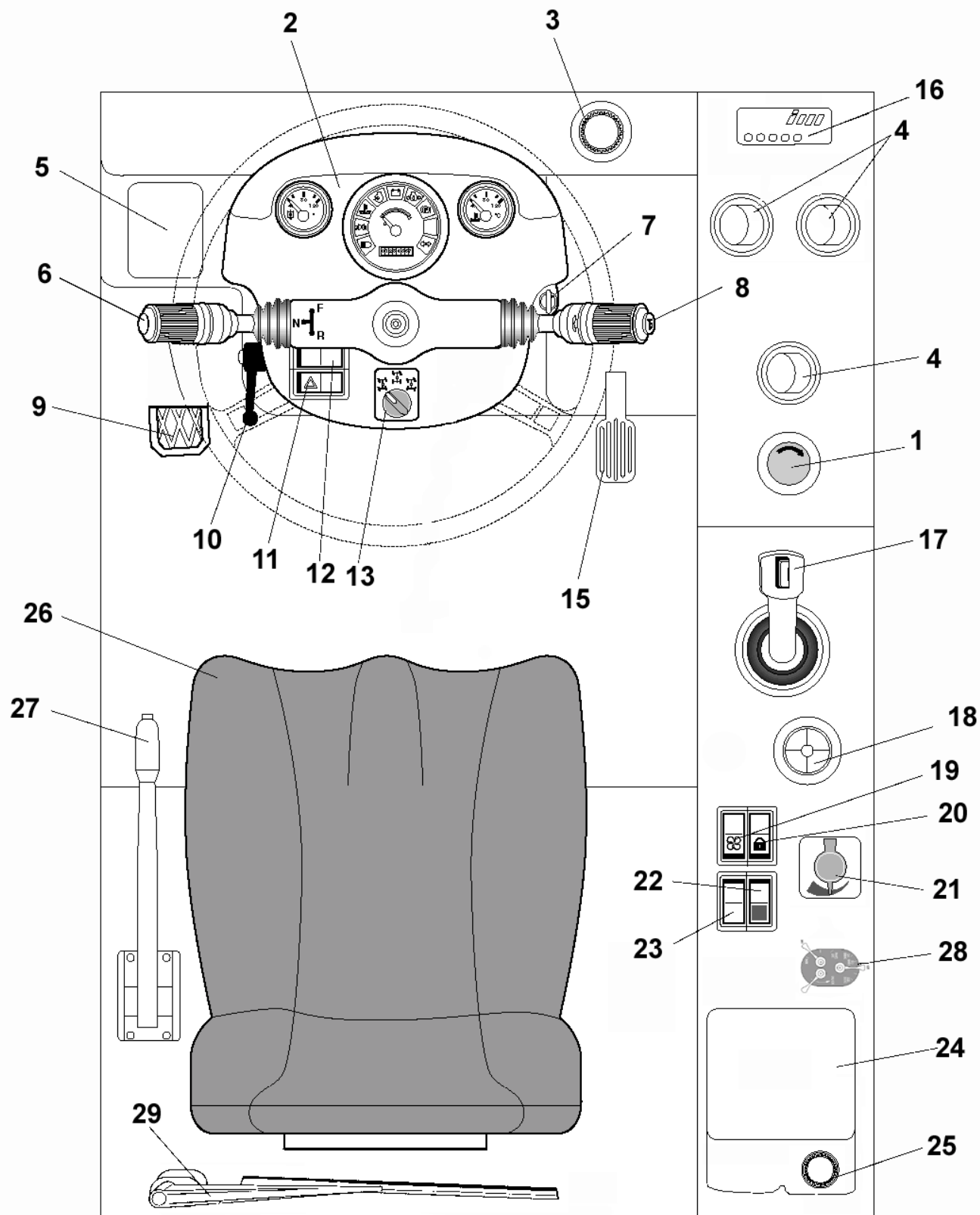


■ C-2.5 ADJUSTING THE REAR VIEW MIRRORS

The machine is fitted with two rear view mirrors:

- Rear view mirror 2 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.
- Rear view mirror 3 is placed on the left upper post of the windsheild 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-3 OPERATOR CAB

C-3.1 CONTROLS AND INSTRUMENTS





- 1 Emergency stop button
- 2 Dashboard
- 3 Brake oil reservoir
- 4 Fresh air flap
- 5 Fuse compartment
- 6 Forward/reverse speed selection lever
- 7 Ignition switch
- 8 Turn signals - lights - horn switch
- 9 Brake pedal
- 10 Steering column locking lever
- 11 Hazard light switch
- 12 Not used
- 13 Steering selection switch
- 14 Not used
- 15 Gas pedal
- 16 Overload / Stability warning system display
- 17 Boom operation joystick
- 18 Machine level
- 19 Fan switch
- 20 Road/Cab switch
- 21 Cab heater control valve
- 22 Hydraulic function switch
- 23 Blank
- 24 Storage Tray
- 25 Windsheild water reservoir
- 26 Seat
- 27 Parking brake lever
- 28 B.O. Lighting Control Switch
- 29 Rear Wipper



C-3.2 ENGINE CONTROLS AND INSTRUMENTS

■ C-3.2.1 Ignition switch

Four-position switch:

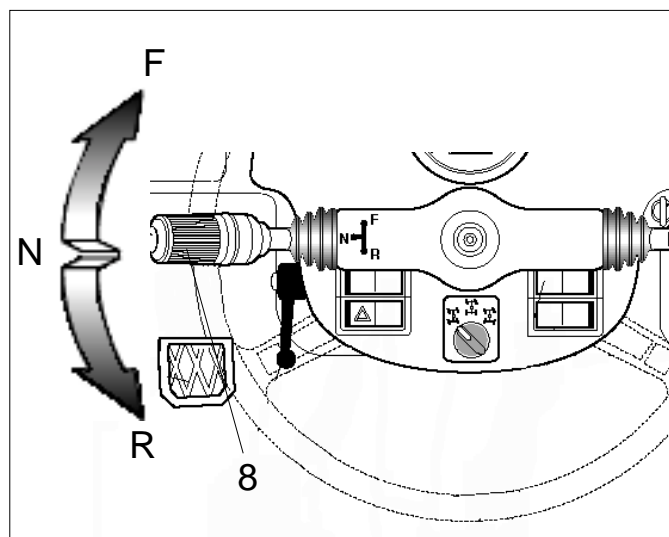
-  No circuit under voltage, key can be removed and engine is stopped.
-  Thermal starter for cold climates. Rotate the key to this position and hold it for 10-15 seconds.
-  Circuits under voltage, pre-setting for the engine starting. Board controls and instruments are on.
-  Engine starting; when released, key springs back to pos. I automatically.



■ C-3.2.2 Forward/reverse speed selection lever

Three-position switch with locking in neutral position:

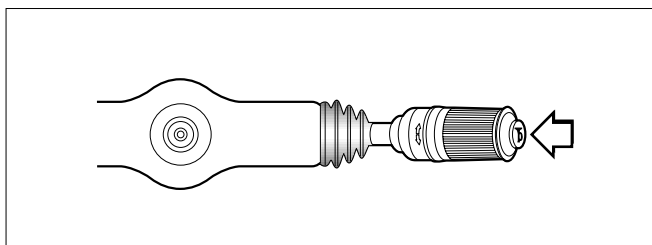
- N** Neutral position; no gear engaged
- F** Raise and shift lever to pos. **F** to select the forward gear
- R** Raise and shift lever to pos. **R** to select the reverse gear



■ C-3.2.3 Turn signal - windshield washer - horn - light switch

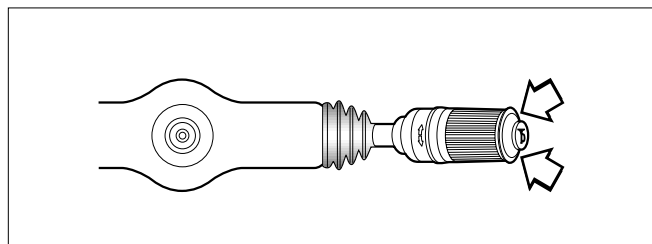
■ Horn function:

By pressing the lever built-in button, horn switches on, independently from other pre-set functions.



■ Windshield washer function:

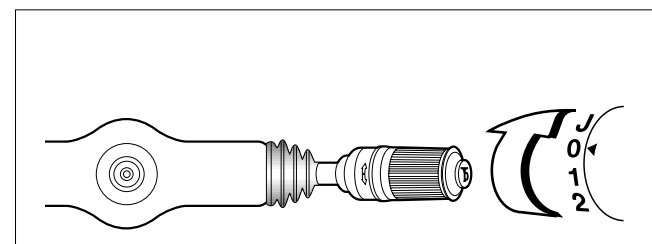
Push the second stage of the lever along its axis to direct a jet of water onto the cab windshield.



■ Windshield wiper function:

To operate the windshield wiper, rotate the lever tip to one of the four positions:

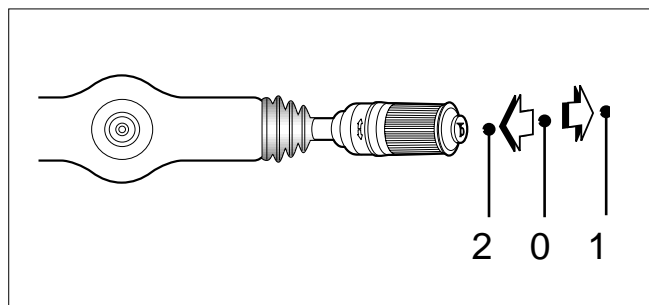
- 0 Wiper OFF
- J Timed wiper (if fitted)
- 1 Low speed
- 2 High speed



■ Light function:

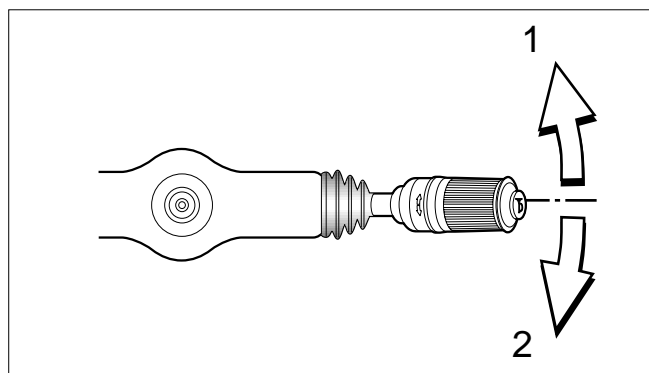
To switch the handler lights, lever is fitted with three position along its vertical axis:

- 0 position lights ON,
- 1 low beam ON,
- 2 low beam ON for intermittent signalling; by releasing the lever, it springs back to position 0.



■ Turn signal function:

Set lever to pos. 1 to indicate a turn left or to pos. 2 to indicate a turn to the right.



■ C-3.2.4 Brakes

9 Service brake pedal

Gradually step on the brake pedal to decelerate and stop the machine. The pedal operates on the front axle.

27 Parking brake

To engage the parking brake, pull the lever upward while holding the locking button pressed. Release the button when reaching the required braking tension. This brake when engaged, by means of a proximity switch that controls the power distributor, cuts off both forward and reverse gear.

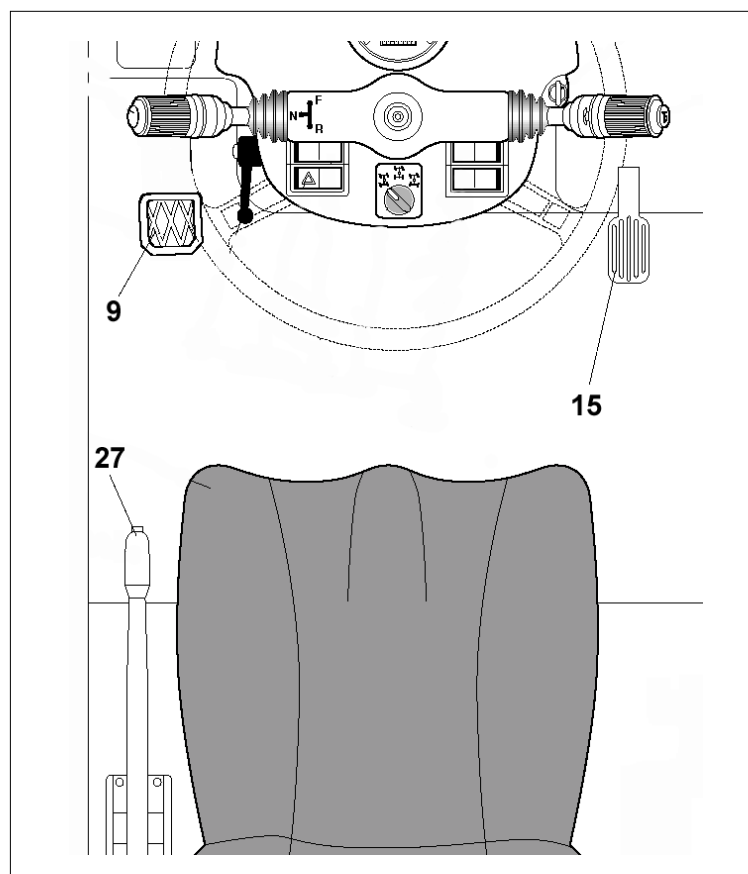


Never use the parking brake to slow down the machine, unless in an emergency, since this might reduce the brake efficiency.

■ C-3.2.5 Accelerator control

15 Gas pedal

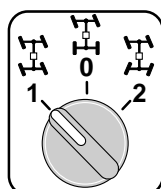
Controls the engine r.p.m. and, in combination with the gearbox, the machine speed. It is fitted with an adjustable stop located behind the pedal in cab.



■ C-3.2.6 Steering selection

13 Steering selection switch

Three-position switch for selecting the steering mode:



- 1 Crab steering
- 0 Two-wheel steering
- 2 Four-wheel steering

■ C-3.2.7 Attachment safety lock pushbutton

20 Selection button

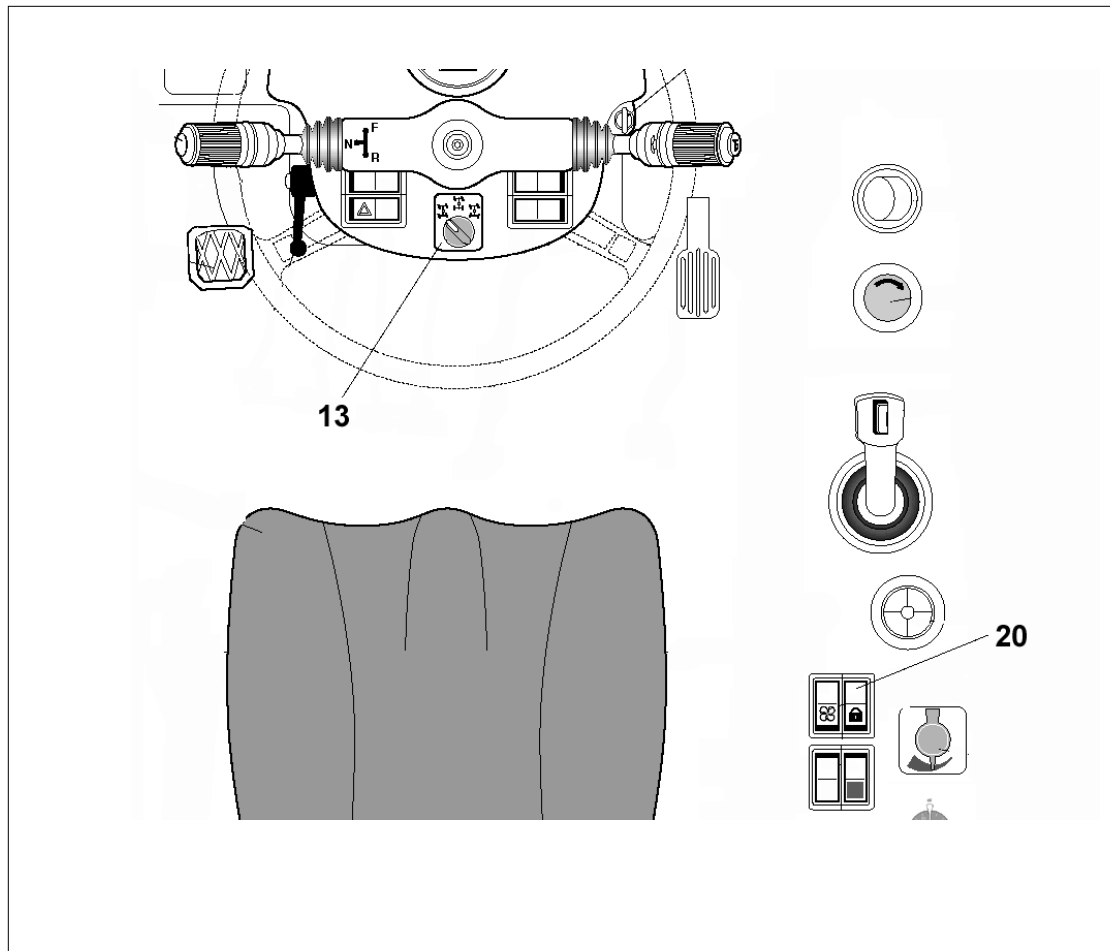


Every time you change the attachment, press the safety lock button to prevent an accidental release of the attachment and the fall of the load.

Two-position button:



- 1 Press to select the road setting. This disables all boom functions except boom raise, lower and tilt.
- 2 Press the button again to select the site setting and enable the boom control. By reactivating the switch will enable all disable hydraulic functions.



■ C-3.2.8 Auxiliary drive controls
11 Hazard lights switch


Fitted with on-off position, it switches on the hazard indicator lights simultaneously.

21 Cab heater cock

Located on the right side of the driving seat base.

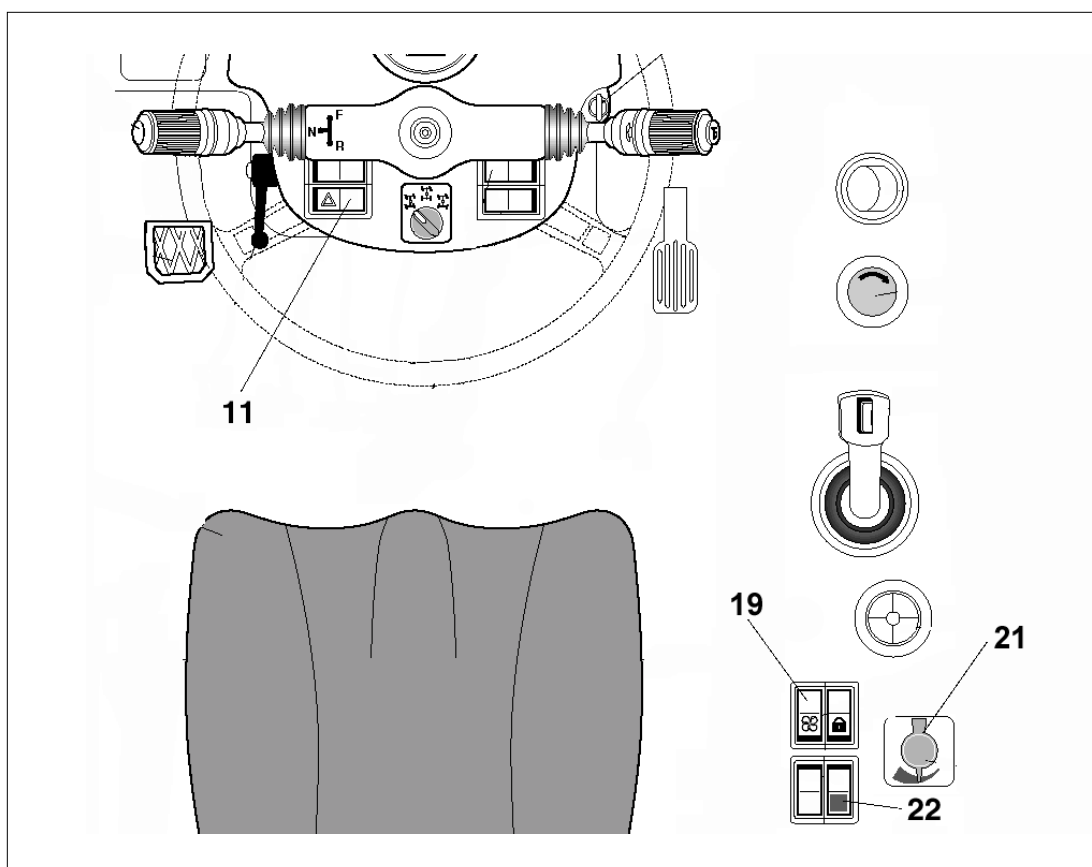
- Rotate clockwise for fresh air
- Rotate counterclockwise for warm air
- Adjust the amount of warm air within the cab by the air conditioning fan switch **19**.

19 Fan switch

Three-position switch:



- 0** OFF
- 1** Low speed
- 2** High speed



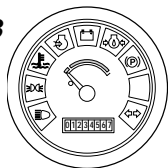
C-3.3 LIGHT INSTRUMENTS AND INDICATORS

■ C-3.3.1 Instruments

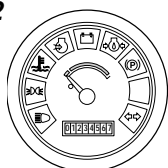
- 54** **Engine coolant temperature indicator**
Signals the engine coolant temperature.



- 53** **Fuel gauge**
Signals the fuel level within the tank.



- 52** **Hourmeter**
Signals the total running time of the machine.



- 51** **Hydraulic oil temperature indicator**
Signals the oil temperature within the reservoir.



■ C-3.3.2 Light indicators

- 60** **High beam indicator**
Blue indicator signaling when high beam is ON.



- 61** **Position light indicator**



Green indicator signaling when position lights are ON.

- 62** **Water temperature indicator**



When this warning lamp and the indicator **31** switch on, the engine coolant is getting overheated.

- 63** **Indicator - air filter clogged**



When this lamp sets to on, change the filter immediately.

- 64** **Indicator - low battery charge**



Signals a low charge of the alternator.

- 65** **Indicator - low engine oil pressure**



It lights up when the engine oil pressure is too low.

- 66** **Indicator - parking brake engaged**



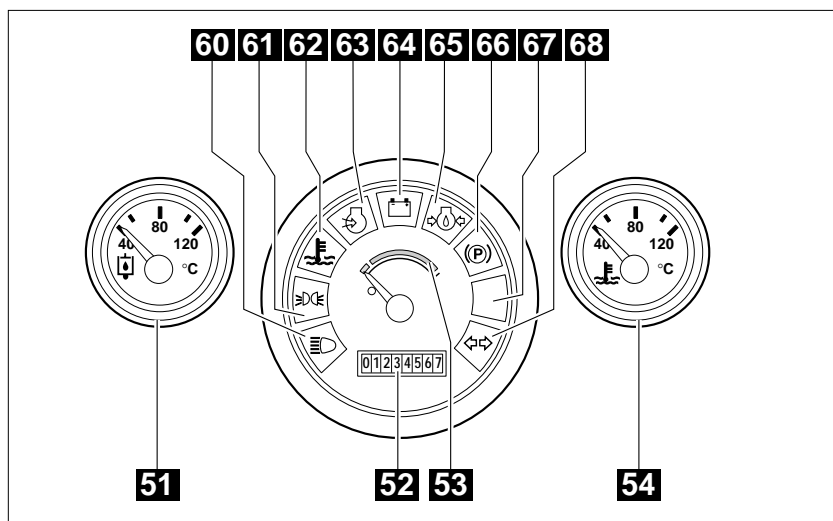
Indicates that the parking brake is engaged.

- 67** **Available**

- 68** **Turn signal indicator**



Green indicator signaling when turn signals are ON.



C-3.4 CONTROL LEVER

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

The lever is equipped with a two-position button that returns to central position for the selection of the functions.

Additionally, when operated in the four directions (right/left, forward/back) it allows for the control of the mast lifting/lowering and the attachment forward/back tilting.



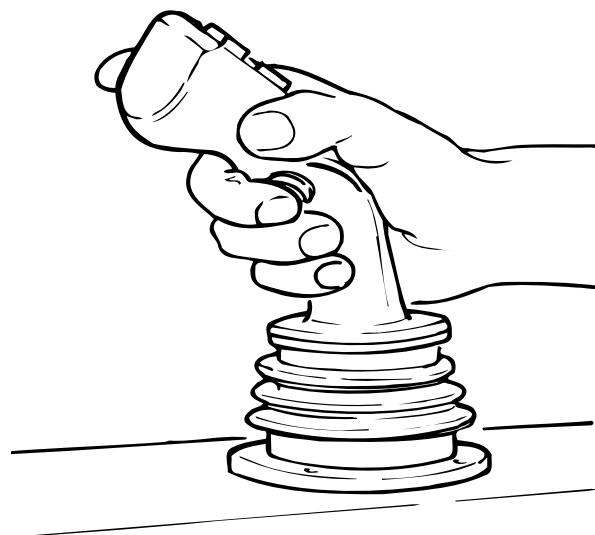
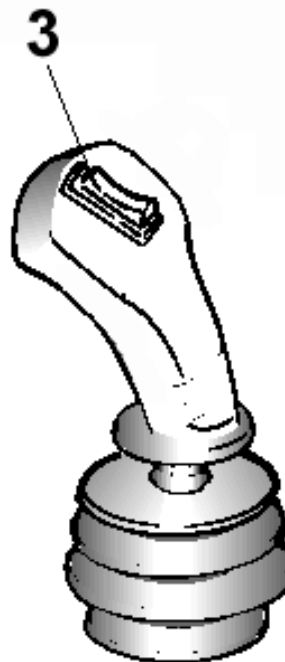
Smoothly move the control lever. The motion speed of the actuators depends on the lever position: a small motion results in a slow control movement of the actuators; vice versa, a full range motion of the lever corresponds to the max. speed of the actuator.



The control lever must be operated only when correctly seated in the operator's seat.



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



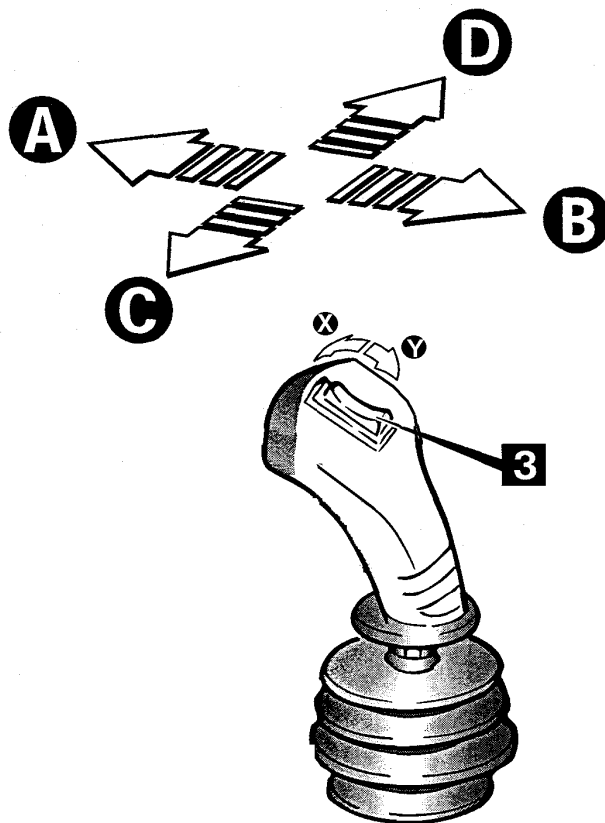
■ C-3.4.1 Selecting the functions

The control lever is enabled to carry out the following functions:

- Boom lifting/lowering by shifting the lever to position **A - B**
- Boom retraction/extraction by shifting lever to position **C - D**
- Fork tilting attachment forward/back tilting by pressing button **3** to **X** and by shifting lever to position **A - B**.
- Attachment coupling/release by pressing button **3** to **Y** and by shifting lever to position **A - B**

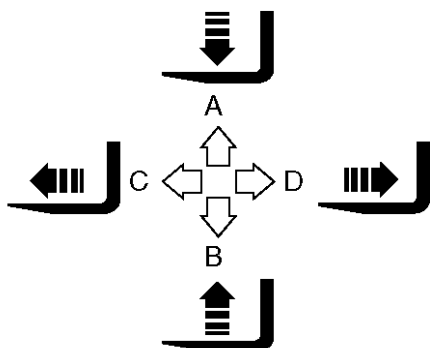


Before performing any motion with the boom, make sure there are no persons within the working range of the machine. Otherwise, wait until they are clear of the working range before operating the lift.

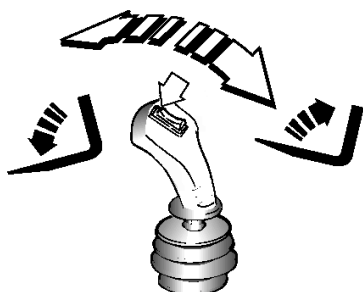


■ C-3.4.2 Boom controls

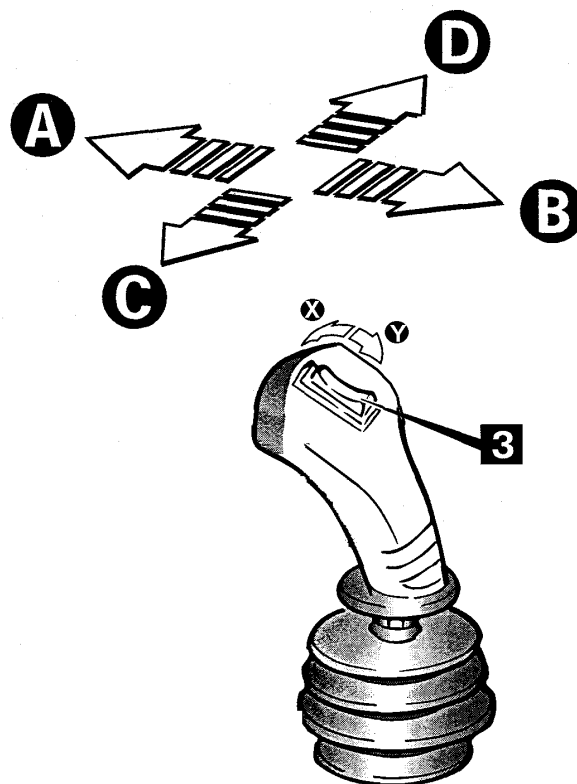
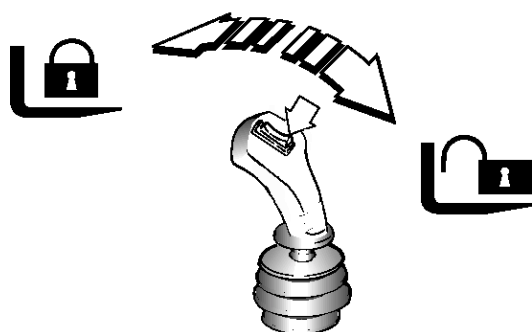
Perform the required function by shifting the lever to position A - B - C - D



Press button 3 to Y and shift the control lever to position A or B to tilt the carriage/fork attachment. With indicator on switch 22 green must be lit on the side console.



Press button 3 to Y and shift the attachment lever to position A or B to lock / release the attachment or to side-shift and / or sway the forks by pressing button 22.

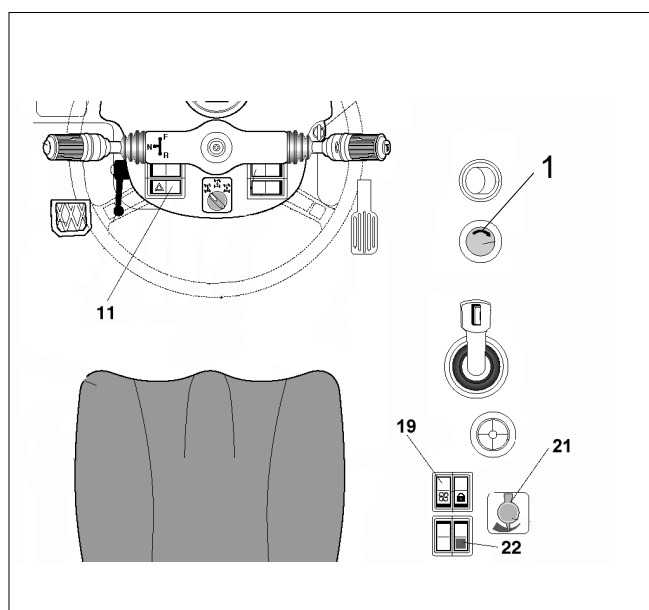


■ C-3.4.3 Emergency stop

Any operated function can be stopped by pressing the emergency stop button 1.

This button allows shutting the engine down.

To reset, rotate the button clockwise.



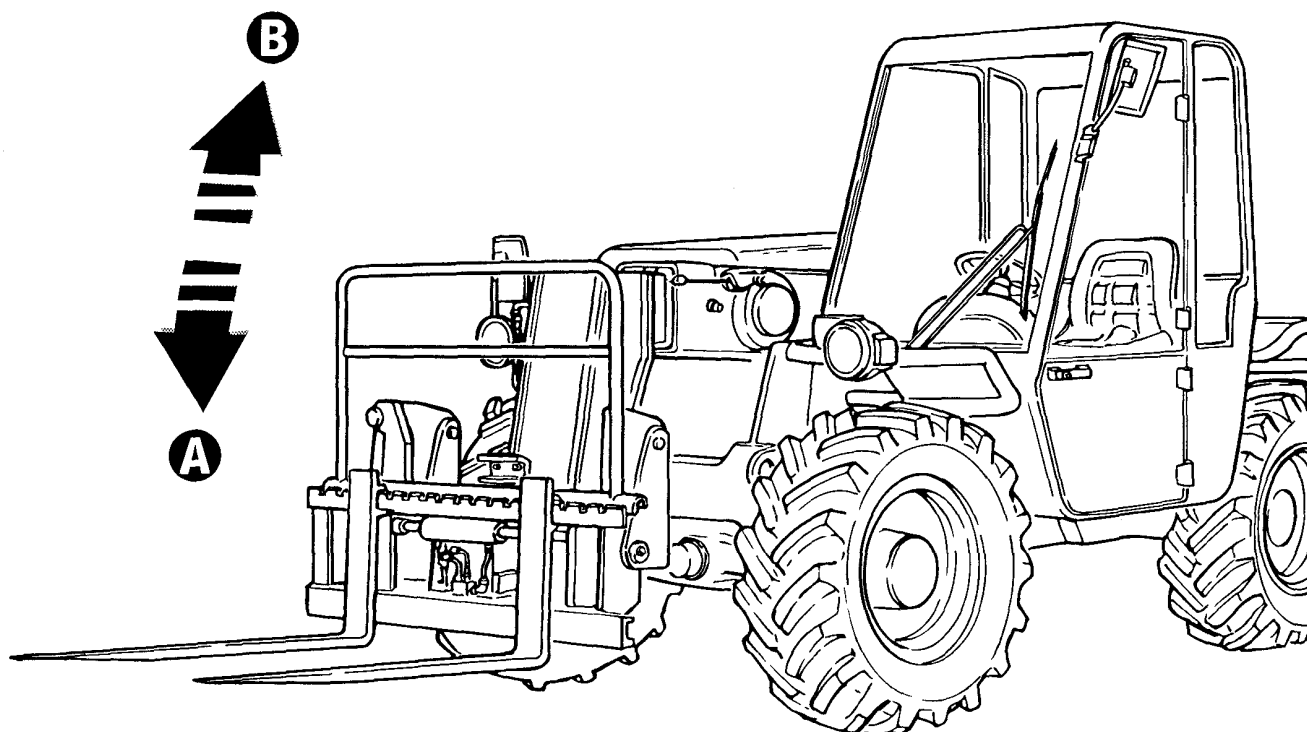
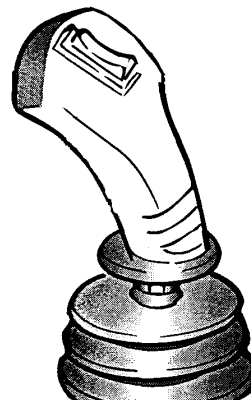
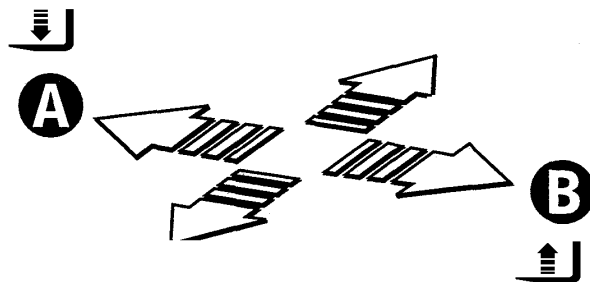
■ C-3.4.5 Lifting/lowering the boom



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 B to lift the boom or to position A to lower it.



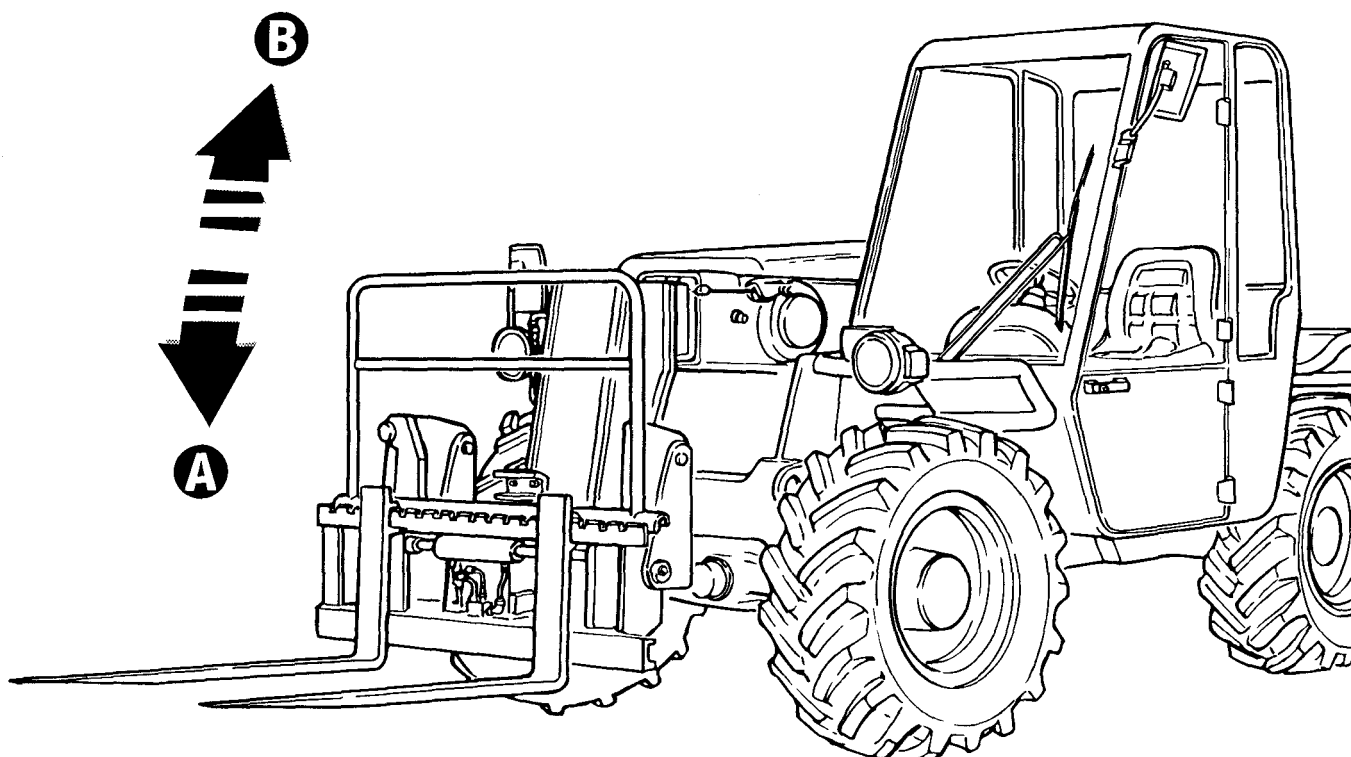
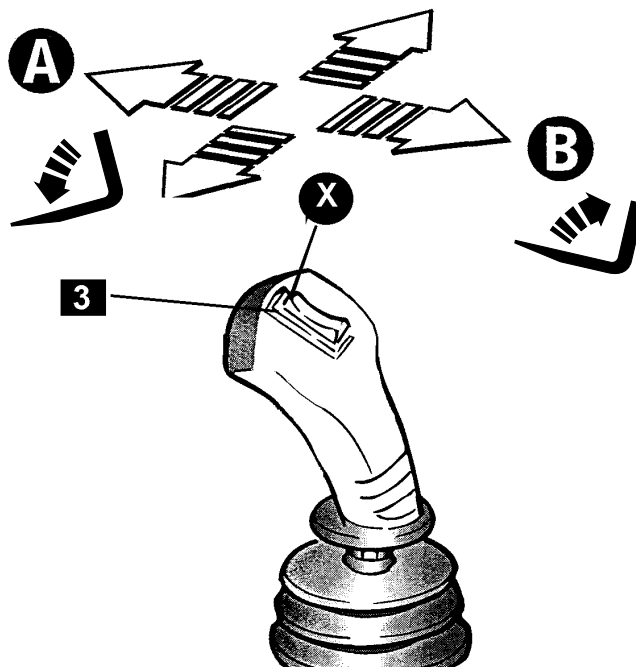
■ C-3.4.6 Tilting the implement holding frame forward/back



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

To tilt the attachment holding frame:

- Press button 3 to X and shift the control lever to position A to tilt the frame forward or to B to tilt back.



■ C-3.4.7 Extending/retracting the boom



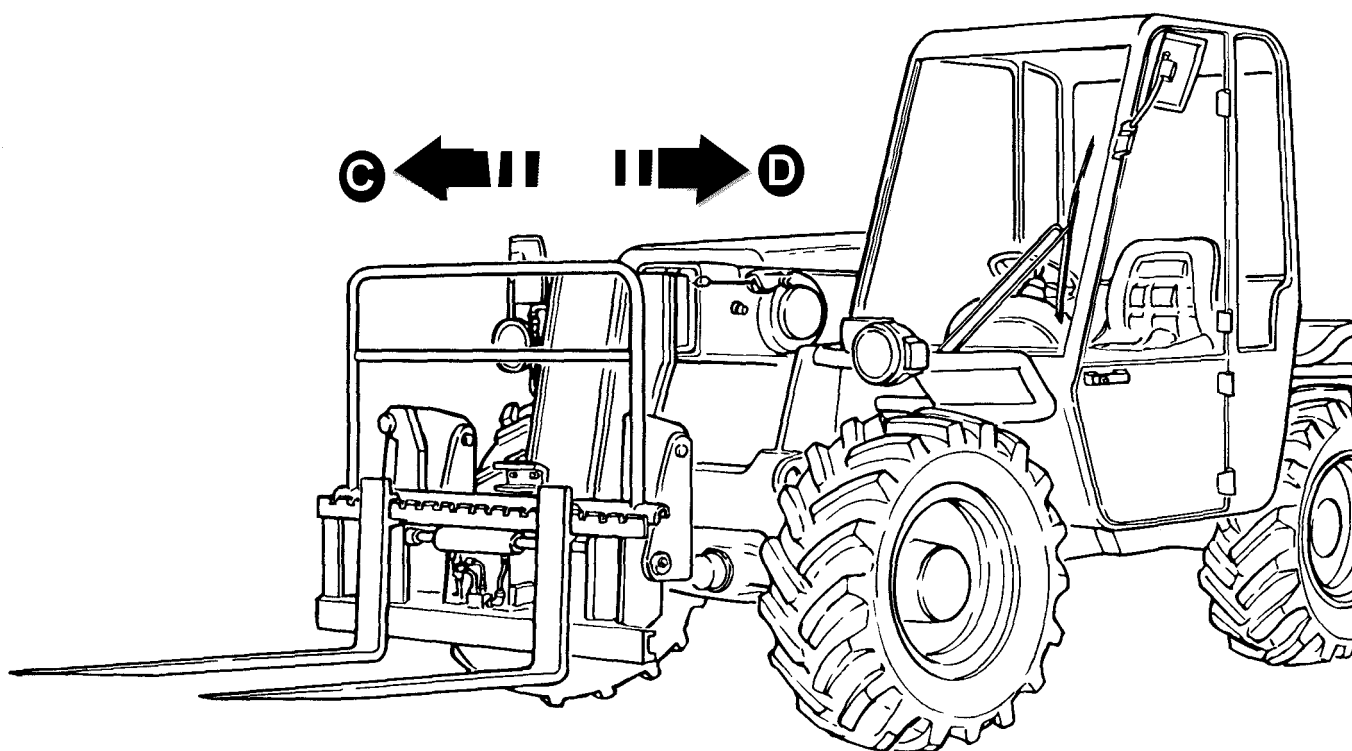
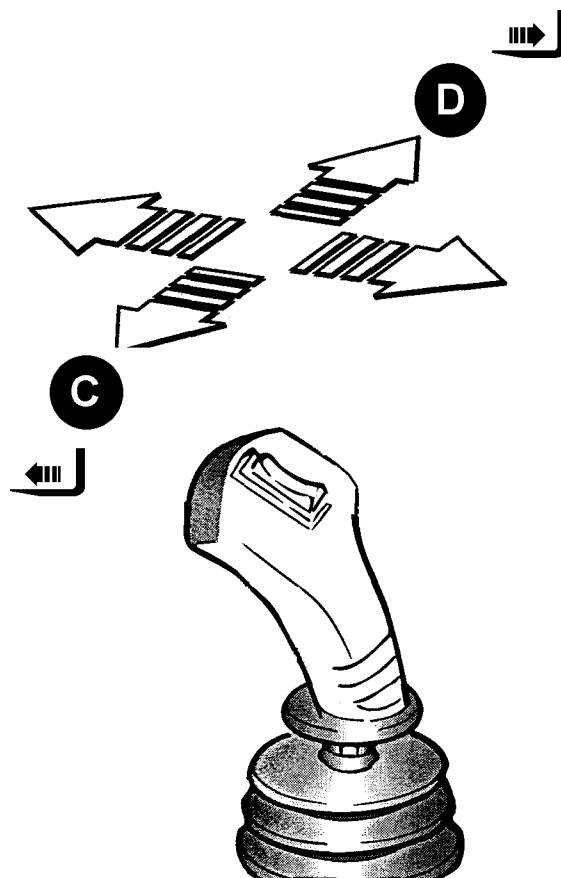
Before operating the boom, make sure that nobody is within the working range of the machine.

To extend or retract the telescopic sections of the boom:

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



When the servo-controlled lever is hydraulically driven, the extension/retraction of the telescopic boom is not fitted with proportioning control.



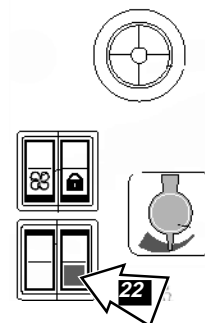
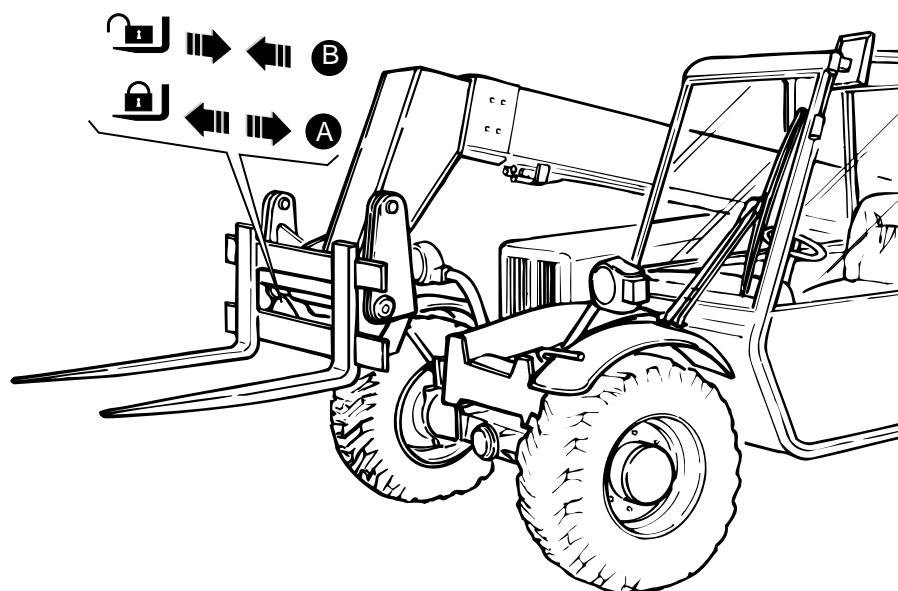
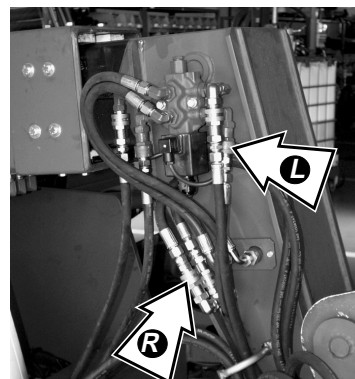
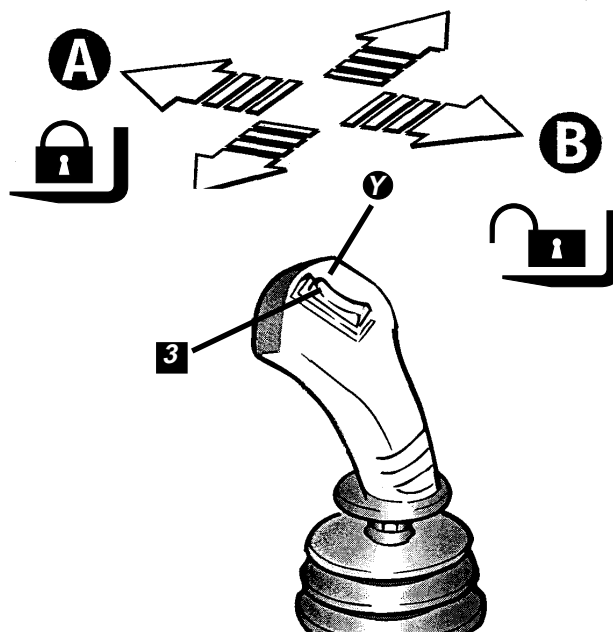
■ C-3.4.8 Quick-coupling the attachment



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

To lock/unlock the attachment couplings, it is necessary to change the connection of the hydraulic lines to the control valve placed in the terminal of the first boom section on the end:

- Disconnect both quick couplings **L** controlling the fork swaying.
- Connect hoses **R** that feed the locking cylinder whose quick couplings are coupled to the hose holding attachment.
- Press button **3** to **Y** and shift the control lever to position **A** to lock the attachment coupling or to position **B** to unlock the attachment coupling.



■ C-3.4.9 Side - shifting

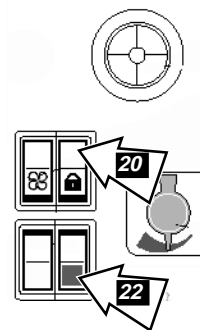
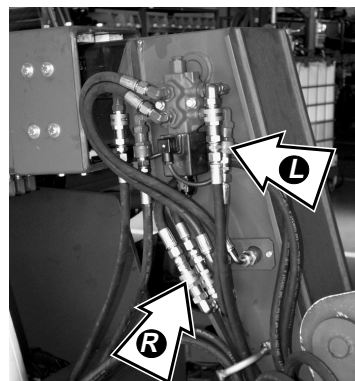
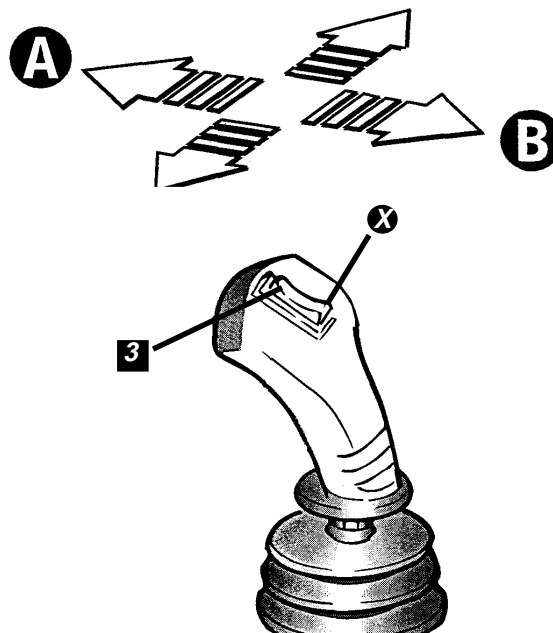


Before operating the boom, make sure that nobody is within the working range of the machine.

For a more exact and rapid collection of the load or release in the desired position, the handler is equipped with fork side-shift feature.

For this operation:

- When the green light of button 22 is off, press button **3** to **X** and shift the control lever to position **A** to shift the forks to the right or to direction **B** to shift the forks to the left.



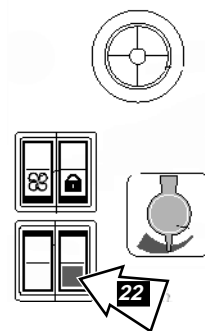
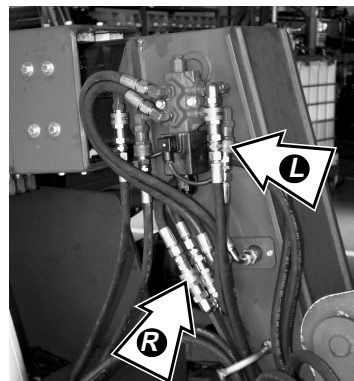
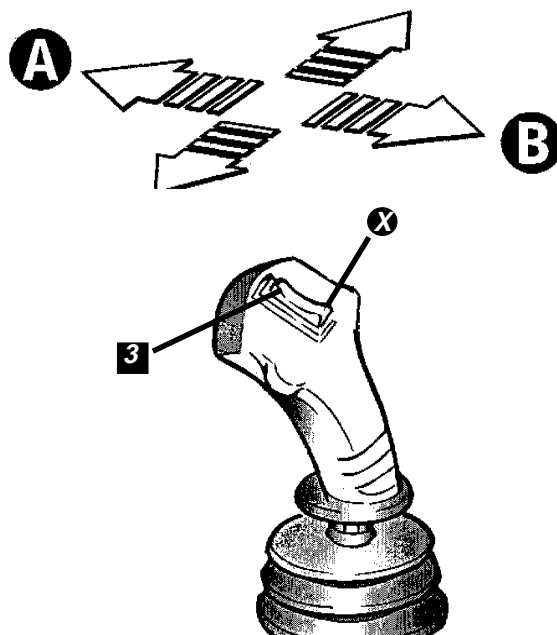
■ C-3.4.10 Fork swaying



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

To sway the forks:

- Press button 22 (the built-in green light switches on); press button **3** to **X** and shift the control lever to position **A** to lower the right side of the forks or to position **B** to raise the right side.




C-4 STARTING THE MACHINE

ATTENTION

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-4.2 STARTING THE ENGINE

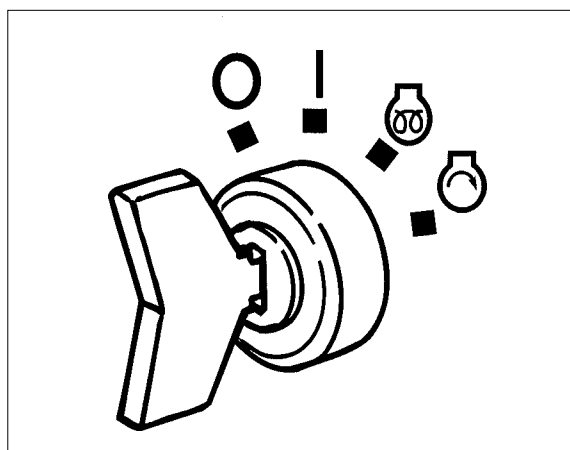
- Thoroughly read chapter C-4.1 before starting the engine.
- Put the gear switch to neutral.
- Step on the gas pedal.
- To start the engine, rotate the ignition switch to position  and release when the engine starts. If the engine does not start within 20 seconds, release the key and wait at least 2 minutes before attempting again.
- After the engine starting, slow down the r.p.m. and wait some seconds before engaging a gear; this allows for a gradual warm up of the engine oil and a better lubrication.
- In case of engine jump-starting, remove the connecting cables (see following chapter).

ATTENTION

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

ATTENTION

Engine cannot be started if the parking brake is not engaged.



C-4.3 JUMP-STARTING THE ENGINE



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 with Nato Slave Connection:

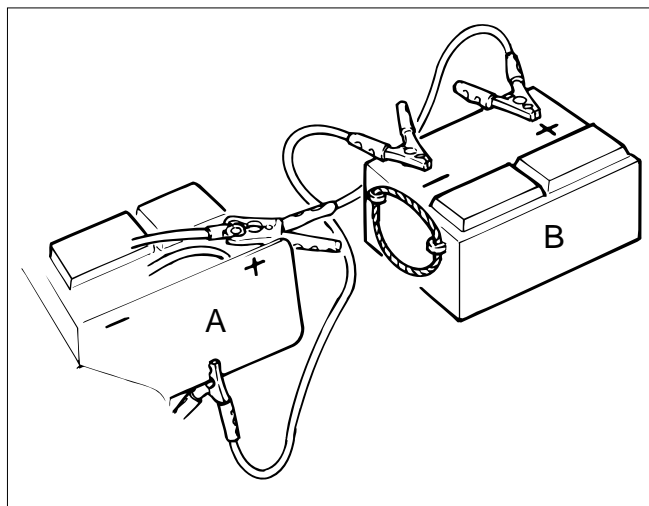
- Check that the brake is set on disabled machine.
- Remove cover from Nato slave connection.
- Install the slave connection support cable into the disabled unit.
- Check that brakes on supporting machine are set.
- Then install the supply end to the supporting machine. Start the supporting machine to supply maximum voltage to the disable system.
- Only from the operator's seat of disabled unit, attempt to start the unit, using proper starting procedures.
- Upon the starting of disabled machine disconnect the slave cable from the supporting machine. Then from the machine that was disabled.
- Re-install weather cover on both units.

To jump-start the engine:

- Turn any users off by the special control levers.
- Set the gear switch 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.

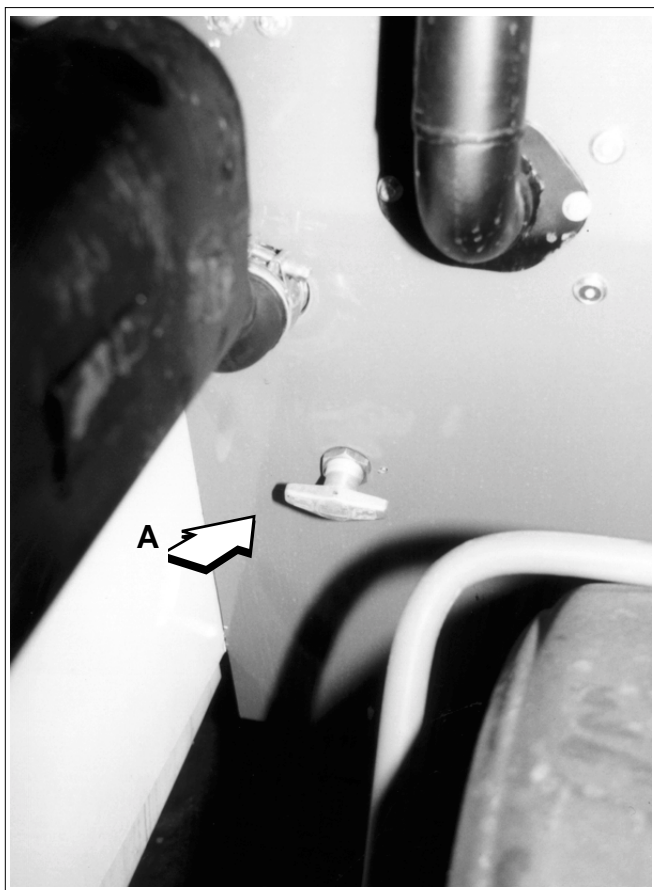
- Connect the two batteries as shown. Connect first the positive terminals of the two batteries, then the negative terminal of the booster supply B to the machine frame earth.
- If the booster supply is installed on a second vehicle, make sure that the latter does not touch the handler; then start the vehicle and reach an r.p.m. corresponding to 1/4 of full throttle.
- Rotate 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.



Use only two 12V powered batteries connected in series to 24V; other devices like battery chargers, etc. may cause an explosion of the battery or result in damage to the electric system of the machine.

C-4.4 DISCONNECTING THE BATTERY

During maintenance or repair work, and especially while welding, cut out the battery main switch A, located in an accessible position behind the rear right wheel.



C-4.5 STARTING THE MACHINE

When the engine reaches the running temperature, ensure all parts are in transfer position and the speed change lever is in neutral. Then:

- Select the required steering mode.
- Select the motion direction (forward or reverse).
- Release the parking brake.
- Slowly step on the gas pedal to start moving off.



Only operate the forward/reverse speed selection lever when the machine is running from the operator's position. Failure to do so could, you could be seriously injured.



C-4.6 STOPPING AND PARKING THE MACHINE

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

- Bring the machine to a smooth stop by easing up the gas pedal and stepping down on the brake pedal.
- Set the forward/reverse speed selection lever to neutral.
- Engage the parking brake and ensure its indicator lights up.
- Release the service brake pedal.
- Rest the attachment coupled to the boom flat on the ground.
- Get out the operators cab and lock the cab door.
- Set the battery cutout switch to OFF position .



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.



Always engage the parking brake when stopping the machine to prevent any accidental motion of the vehicle.

C-5 USING THE HANDLER

This chapter describes some techniques and provides instructions for a safe use of the machine fitted with standard forks. For different attachments please refer to the specific chapter: "Optional attachments".



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 which may cause you to lose the control of the machine.



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 20 feet from the power lines.



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



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

C-5.1 USING THE LOAD CHARTS

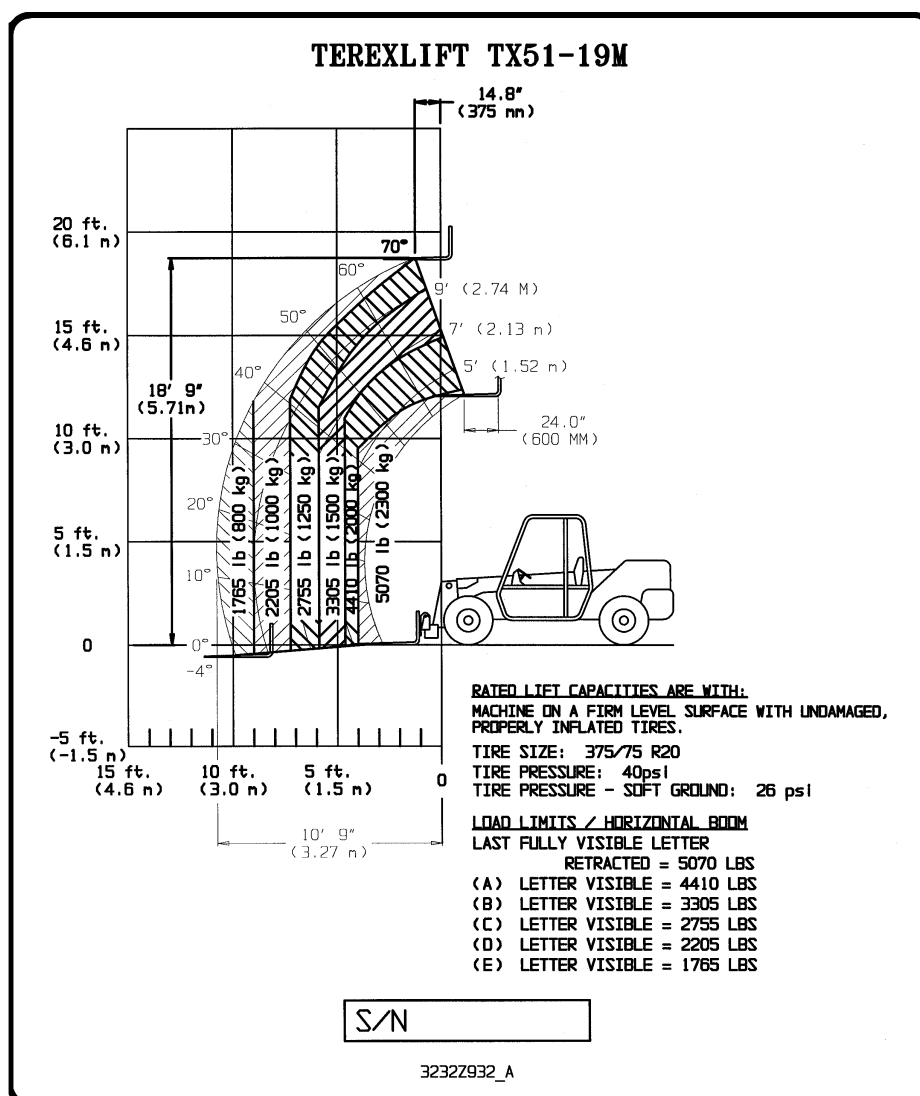
The load charts indicating the maximum allowed payload with respect to the boom extension are attached on inside of the cab.

Always refer to these charts to operate under safe conditions.



The load charts applied within the cab refer to a stationary machine stopped on a solid and level ground.

Raise the load a few inches and check its stability before raising it completely.



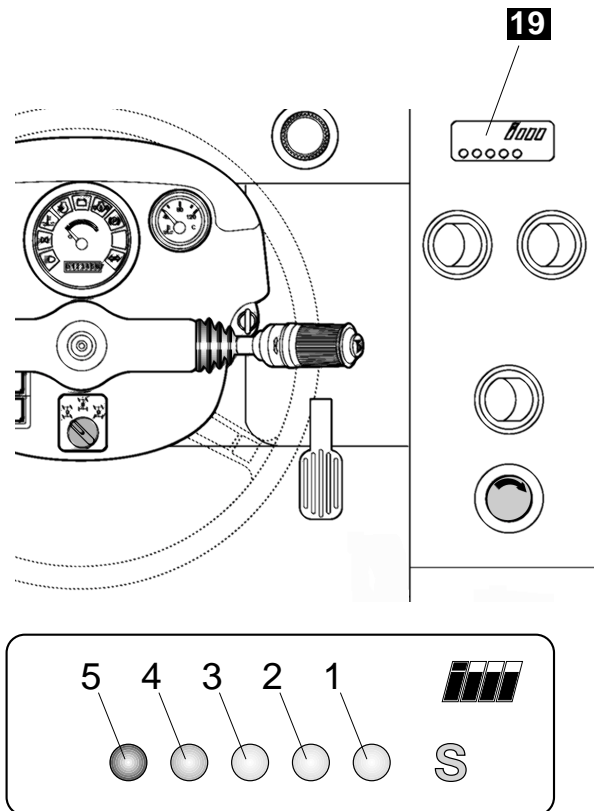
C-5.2 OVERLOAD WARNING SYSTEM DISPLAY

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

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

S yellow • outriggers at work (if equipped)

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



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

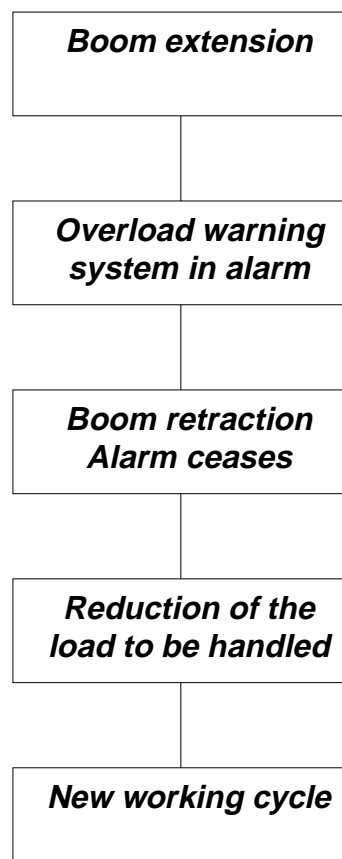
The overload warning system must not be used to check the load going to be lifted: it has only been designed to signal possible unbalances of the machine along its motion axis.

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

ATTENTION

This machine is equipped with overload warning, when machine is on side slope and rear axle reaches maximum angle.

Examples of use of the overload warning system



C-5.3 HANDLING LOADS

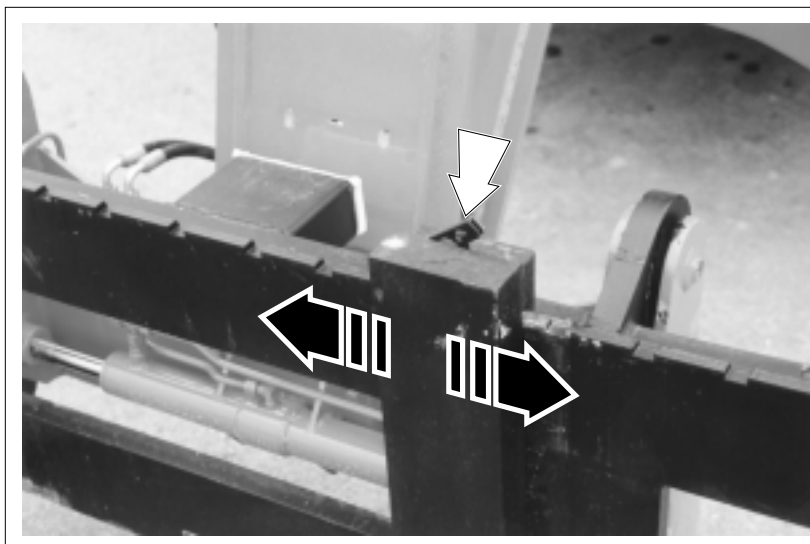
■ C-5.3.1 Adjusting the forks

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

- Lift the clamping lever of the forks (A).
- Slide the forks to the desired position, then reset the lever in locking position.



- *The center 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 rating chart book, which is in the operator's cab.*
- *Space the forks as wide as possible to suit the load being handled.*



■ C-5.3.2 Working phases

When forks are correctly spaced, the handler is ready to use.

Work can be subdivided into three different phases: loading, transfer and unloading.

Loading phase

- Approach the load to the handler perpendicularly.
- Insert the forks under the load and raise the load a few inches to check its stability.
- Tilt the forks back and make sure that the stability warning system LEDs are in limits.

Transfer phase

- Do not start or brake abruptly.
- Drive to the unloading point cautiously and keep the load as close to the ground as possible.
- Adjust 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.



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

Unloading

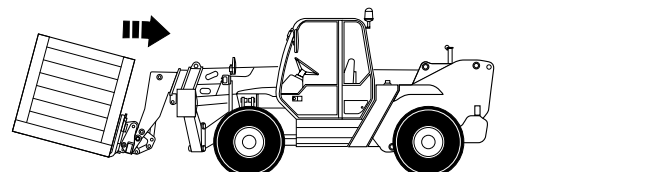
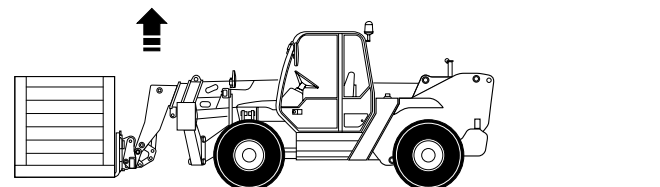
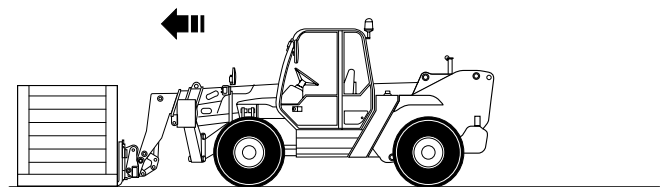
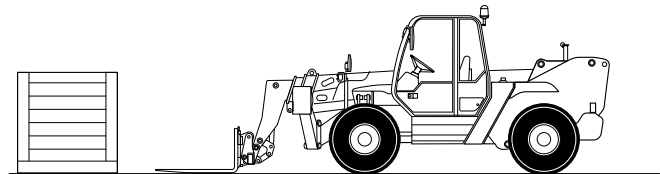
- Drive to the unloading point with straight wheels and smoothly stop the machine leaving enough space to operate the boom.
- Apply the chassic brake and move the drive selector to neutral position.
- Position the load a few inches above the desired position and set the forks level.
- Lower the load and make sure it is level.
- Carefully withdraw the forks by operating the boom retraction control. According to the load height, it is

possible you have to raise or lower the boom as the forks come out.

- When forks are clear of the load, reset them to transfer position.
- Choose direction required and move F/R selector as needed.
- Release the chassic brakes.



Do not raise the load being handled more than 1 1/2 feet. Risk of overturning or load fall.



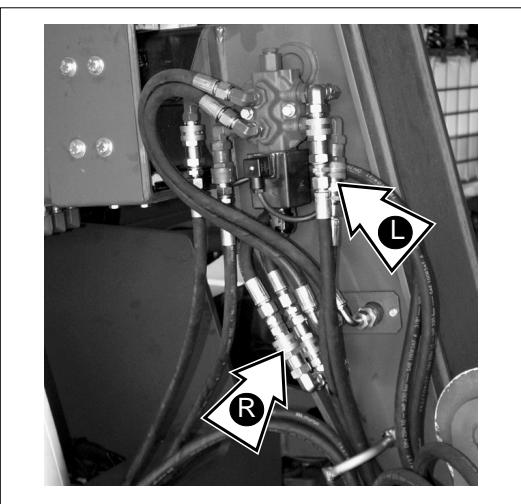
C-5.4 REPLACING THE ATTACHMENTS



Use only attachments directly designed and manufactured by Terexlift for its handlers and detailed in the manual section “Optional Attachments”.

To change an attachments, operate as follows:

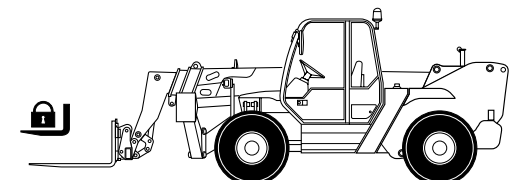
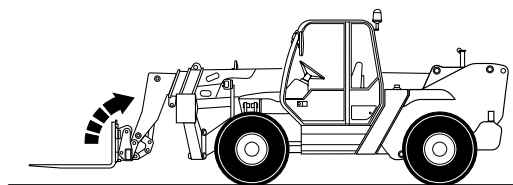
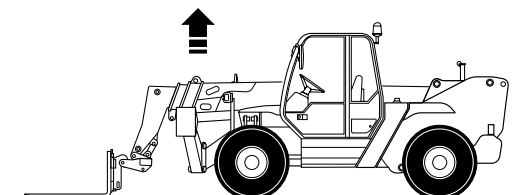
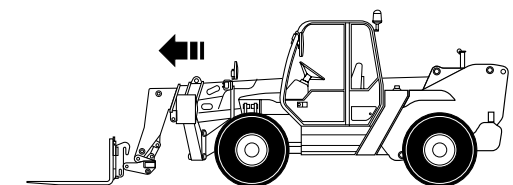
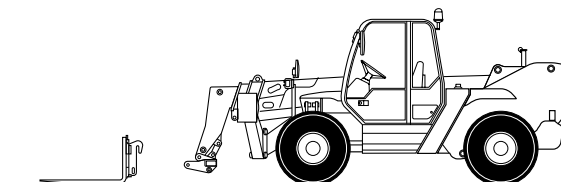
- Drive to the place where you will release the mounted attachments (when possible, a solid and sheltered site).
- Disconnecting the quick connectors of the attachment, if any, and connect the hydraulic locking pipes R of the attachment to couplings L.
- Operate the Joystick function (see section C-3.4.8) to unlock attachment pins.
- Rest the attachment flat on the ground.
- Tilt the holding frame forward and lower the boom to release the implement upper lock.
- Move back with the machine (or with the boom) and drive to the new attachment going to be coupled.
- Hold the frame tilted forward and hook the upper lock of the new attachment.
- Retract and raise the attachment some inches. Attachment will center automatically on the quick coupling frame.
- Operate the joystick function (see section C-3.4.8) to lock the attachment.



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



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.





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.
- Move the speed selection lever to neutral.

- When possible, start the engine and use the hydraulic drive and the braking system.

■ C-6.2 ROAD OR SITE TRANSFER

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

Additionally, always take into account the following general precautions:

- Set the “ROAD/CAB” switch to “ROAD” position.
- Select the two-wheel steer.
- Retract both boom and attachment to transfer position.
- Make sure that lights, horn and turn signals are in working order.
- Engage the gear.
- The motion speed of the vehicle will depend on the engine r.p.m. and the engaged gear.

ATTENTION

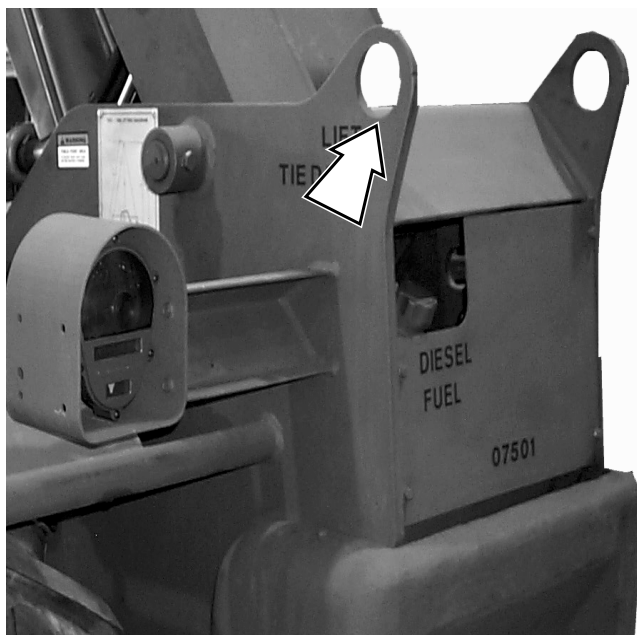
Public road use is allowed only for transferring unloaded machines.



■ 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 chapter of this manual and on the identification plate.

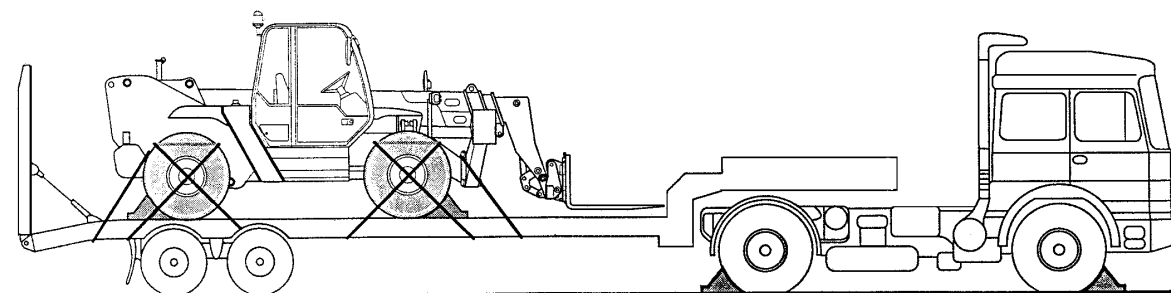
For the machine lifting, anchor the chains to the special lugs on the machine (Lift/Tie down).



■ C-6.4 TRANSPORTING THE MACHINE ON OTHER VEHICLES

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

- Put chocks at the transporting vehicle wheels.
- Ensure ramps are correctly positioned.
- Retract the handler boom to transfer position.
- Carefully drive the handler 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 operators cab of the handler.
- Secure the handler to the vehicle platform by wheel-chocks.
- Anchor the handler 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.
- Engage the parking brake.
- Remove the key from the ignition switch and lock the cab door.
- Disconnect the battery by the special cutout control ("Battery cutout switch").

■ C-6.5.2 Machine storage

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

- Wash the machine thoroughly. For a better cleaning, remove grills and protection casings.
- Carefully dry all machine parts.
- 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, apply protection to its terminals with vaseline and store it in a dry place, if the battery can be used for other purposes. Otherwise, periodically check its charge level.

- Refuel the tank to prevent internal oxidation.
- Store the machine in a sheltered and well-ventilated place.
- Start the engine for about 10 minutes at least once a month.
- When weather is particularly cold, empty the radiator.
- Wrap and lubricate cylinder rods.



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, preform a maintenance schedule and carefully check all mechanical, hydraulic and electrical components.

■ C-6.6 MACHINE DISPOSAL

At the end of the machine life, dispose of it properly. Address to a specialized firm for scrapping the machine in compliance with the local or national regulations.

Section D

MAINTENANCE

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 schedule are based on the machine working hours. Regularly check the hourmeter and keep it in good condition to define the maintenance intervals correctly.

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

ATTENTION

For the engine maintenance, please refer to the specific Operation and Maintenance 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 ORDINARY MAINTENANCE

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 schedule are based on the machine working hours. Regularly check the hourmeter 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.



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

During the first 10 working hours

- 1 Check the oil level within reduction and differential gears and the power distributor
- 2 Regularly check the tightening of the lug nuts
- 3 Check the tightening of all bolts and nuts
- 4 Check for oil leaks from the couplings.

Within the first 50 working hours

- 1 Change the hydraulic oil filter element

Every 10 working hours or daily

- 1 Check the engine oil level
- 2 Clean the air suction filter

- 3 Check the engine coolant level
- 4 Clean the radiator, if necessary
- 5 Check the hydraulic oil level within the reservoir
- 6 Ensure the overload warning system functions properly
- 7 Ensure the lighting electric system is efficient
- 8 Ensure the braking system and parking brake are efficient
- 9 Ensure the steering selection system is efficient
- 10 Ensure the fork balance system is efficient.

Every 50 working hours or weekly

Jobs to be carried out in addition to those above.

- 1 Check the level of the battery electrolyte
- 2 Check the tension of the alternator belt
- 3 Check the tire inflation
- 4 Check the tightening of the lug nuts
- 5 Check the tightening of the Drive shaft screws
- 6 Make sure that the boom telescopic elements are well -greased close to the sliding pads
- 7 Grease the attachment holding plate
- 8 Grease all boom joints, the rear axle shaft joint, the transmission shafts, both front and rear axles and any equipment of the machine

Every 250 working hours or monthly

Jobs to be carried out in addition to those above.

- 1 Change the engine oil and relevant filter
- 2 Check the oil level in both front and rear differential gears
- 3 Check the oil level in the four wheel reduction gears
- 4 Check the integrity of the main filter element of the engine air filter. Replace, if necessary
- 5 Check the clamping of the cable heads to the battery terminals

- 6 Check the integrity of the air suction hose between engine and filter
- 7 Check the conditions of the cylinder chromium-plated rods
- 8 Check the hydraulic lines are not worn because of rubbing against the frame or other mechanical components
- 9 Ensure electric cables are not rubbing against the frame or other mechanical components
- 10 Check the wear of the sliding pads of the boom sections
- 11 Adjust the slack of the sliding pads of the boom sections
- 12 Remove any old grease from the boom, then re-grease the sliding parts of the boom sections.

Every 500 working hours or every six months

Jobs to be carried out in addition to those above.

- 1 Visually check the quantity of smoke from the engine exhaust
- 2 Check the tightening of the engine motor mounts
- 3 Check the tightening of the cab mounts
- 4 Check the backlash between pins and bushings in all joints
- 5 Change the hydraulic oil filter of the transmission
- 6 Have the hydraulic system checked by a qualified technician
- 7 Change the main filter element of the engine air filter

Every 1000 working hours or yearly

Jobs to be carried out in addition to those above.

- 1 Change the safety element of engine air filter
- 2 Change the oil in the front and rear differential gears
- 3 Change the oil in the four wheel reduction gears
- 4 Change the hydraulic oil

Every 2000 working hours or every 2 years

Jobs to be carried out in addition to those above.

- 1 Change the engine coolant

D-3 MAINTENANCE SCHEDULES



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



When raising a component for maintenance purposes, secure it in a safe way before any maintenance or repairs are performed.



*Any repair 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 depressurized.
For this purpose, shut the engine down and step on the brake pedal 8-10 times.*

ATTENTION

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 depressurize 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 repairs.

D-3.1 DISCONNECTING THE BATTERY

During maintenance or repair works, and while welding, turn off the battery cutout switch, located behind the rear right wheel (see C-4.4, p. 43).

D-3.2 ACCESS TO THE ENGINE AND FUEL TANK COMPARTMENTS

Engine compartment

For any operation within the engine compartment, open the hood.

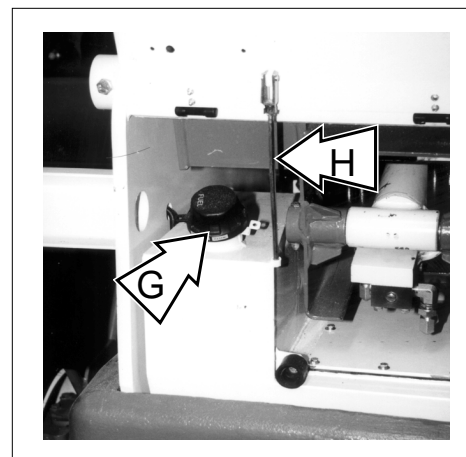
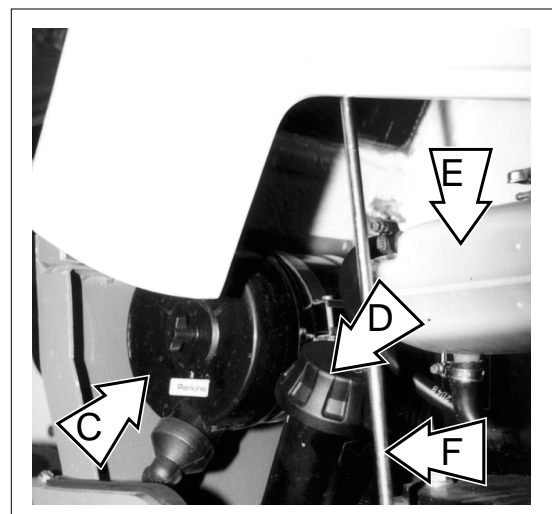
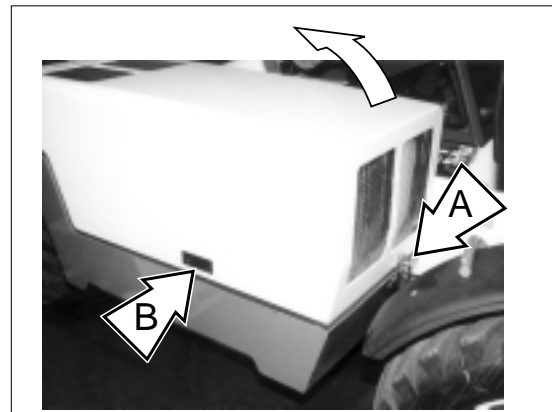
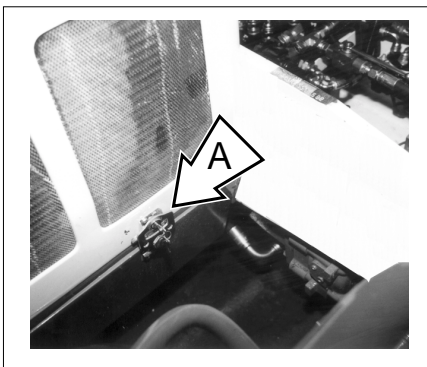
The hood is equipped with lock & key and a supporting rod to hold it in position.

From the engine compartment, you get access to:

- Engine
- Engine air filter C
- Hydraulic oil reservoir plug D
- Radiator fluid compensation cup E
- Battery

To get access to the engine compartment:

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



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

Always use protective gloves.

D-3.3 GREASING

ATTENTION



Before injecting grease into the zirts, thoroughly clean them to avoid that mud, dust or other matters can mix with the lubricant and reduce or annihilate the lubrication effect.

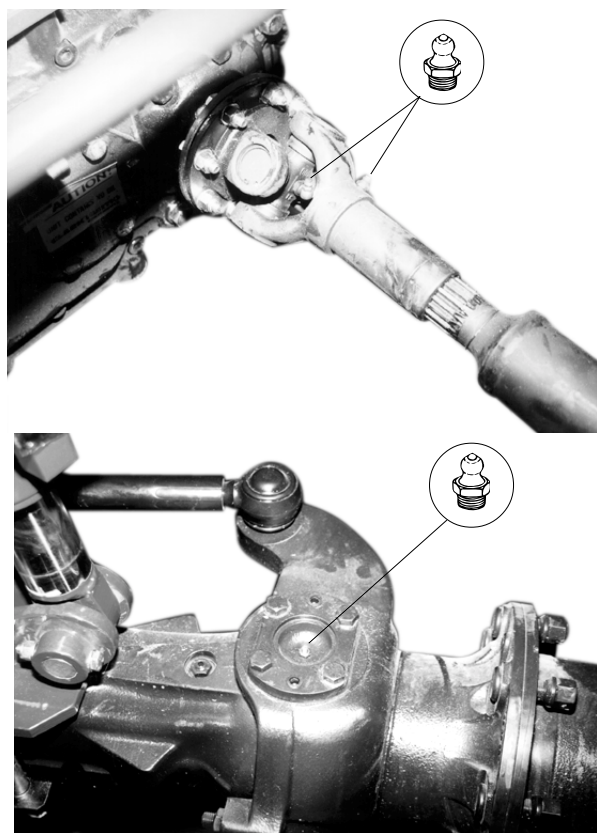
Regularly grease the machine to keep it in efficient conditions and lengthen its life.

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

As the fresh grease comes out, stop the operation.

The greasing points are shown in the following figures:

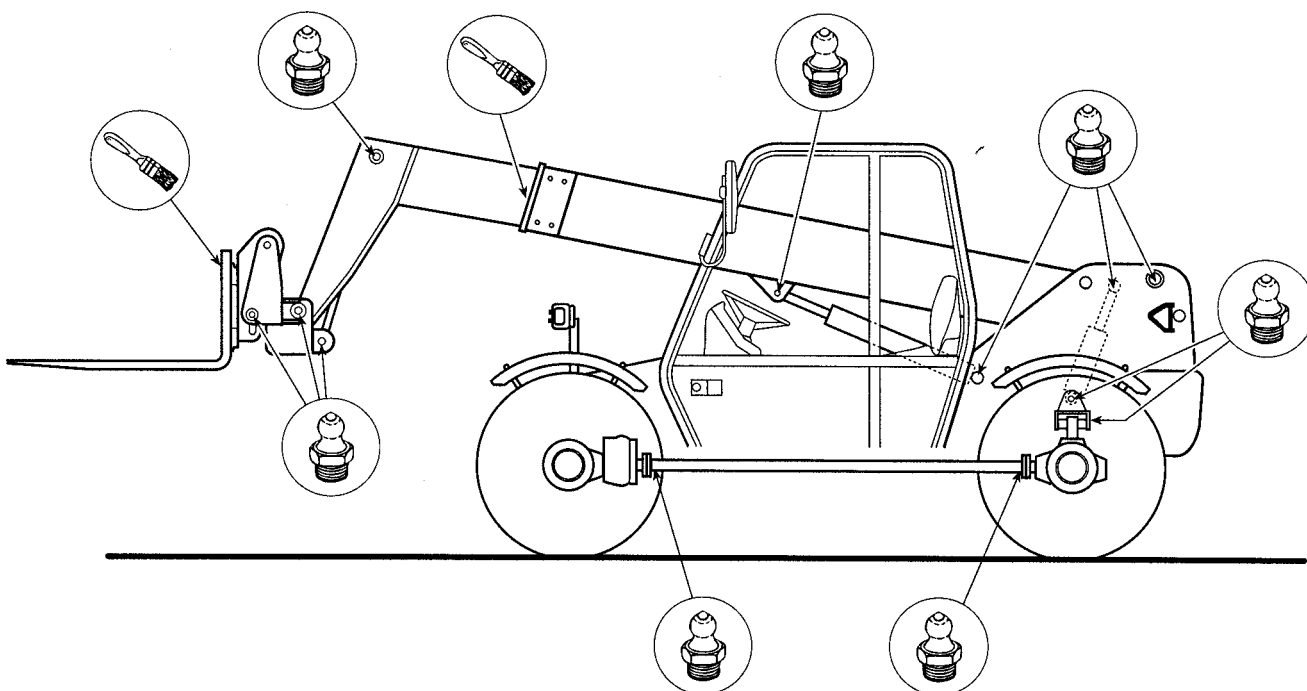
- the symbol  represents the points to be greased by a pump
- the symbol  represents the points to be greased by a brush.



SERVICE INTERVAL

Running-in period _____ None

Ordinary maintenance _____ Every 10 hours



D-3.4 TIRES AND WHEELS



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

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

		TX51-19-M	
		Standard	
Dimensions		375/75 R20 XM27	
Load index		155A	
Rim		11" X 20"	
Wheel disc		8 holes DIN 70361	
Pressure	bar	1.8 (soft)	2.8 (standard)
	Psi	26 (soft)	40 (standard)

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. See torque chart page 86.



Always use tires having the dimensions indicated in the vehicle registration document.

SERVICE INTERVAL

Running-in period ____ **Within the first 10 hours**

Ordinary maintenance ____ **Every 250 hours**

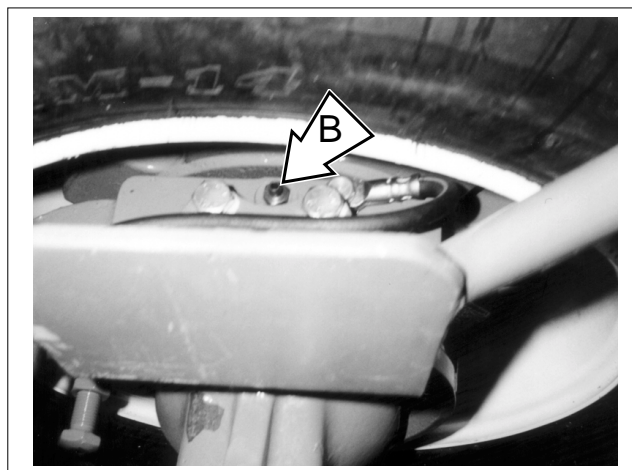
D-3.5 BRAKES

- If a fault of the braking system is detected (adjustment and/or substitution of the brake discs), call in a specialized technician.

The malfunctioning of the braking system may depend on the presence of air within the hydraulic circuit.

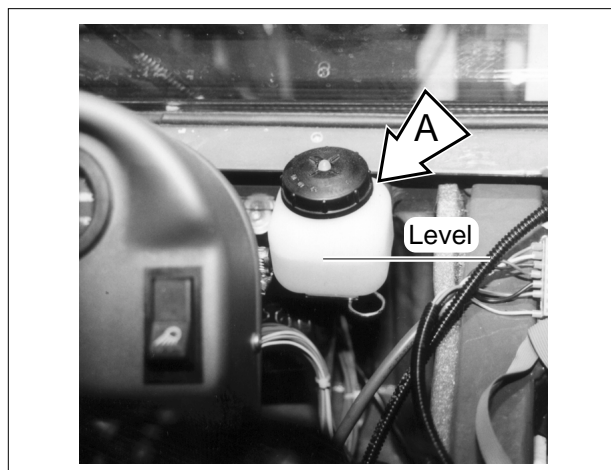
To bleed the circuit, proceed as follows:

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



D-3.5.1 Checking the brake oil level

The oil within the braking circuit must be at about 1/8" from the reservoir cap (**A**).



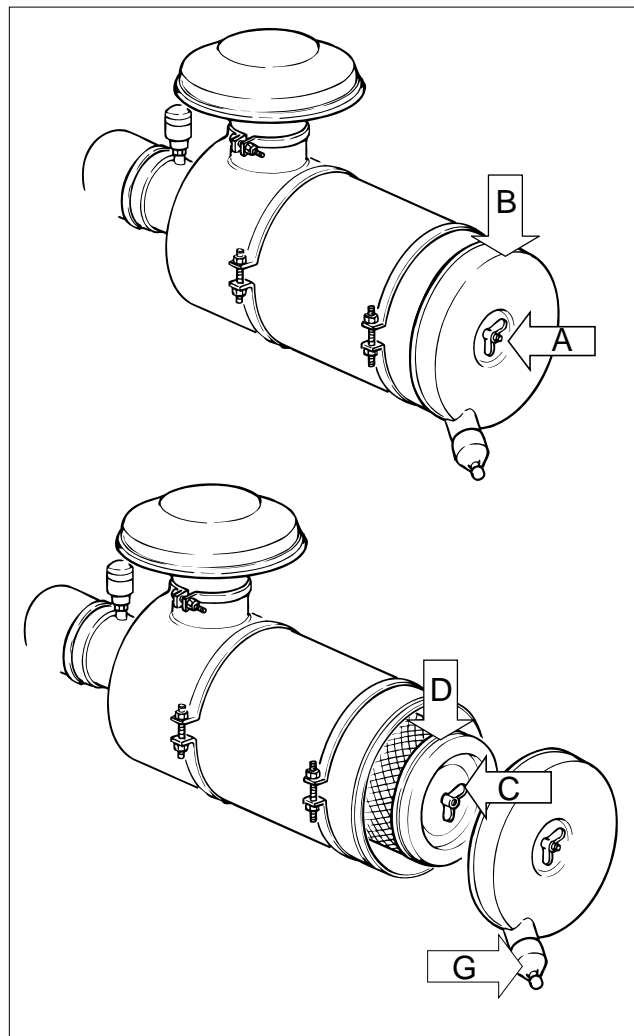
D-3.6 ENGINE AIR FILTER

Clean the engine air filter; replace the elements, if necessary.

- 1 Cleaning and changing the filtering element:
 - Shut the engine down and engage the parking brake.
 - Unscrew wing nut **A** and remove cover **B**.
 - Unscrew wing nut **C** and remove the filtering element **D**.
 - Clean the filter bowl.
 - Dry clean the cartridge (at max. 6 bar pressure) and direct the air jet from inside to outside.
 - Check for cracks in the filter element by introducing a lamp inside.
 - Apply a small amount of grease to the seal, then refit the element.
 - Re-tighten wing nut **C**, close cover **B** and tighten it with wing nut **A**.

ATTENTION

*Daily check it and remove any collected dust.
To remove the dust bowl, unscrew wing nut G.*



SERVICE INTERVAL

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

D-3.7 ENGINE COOLING SYSTEM

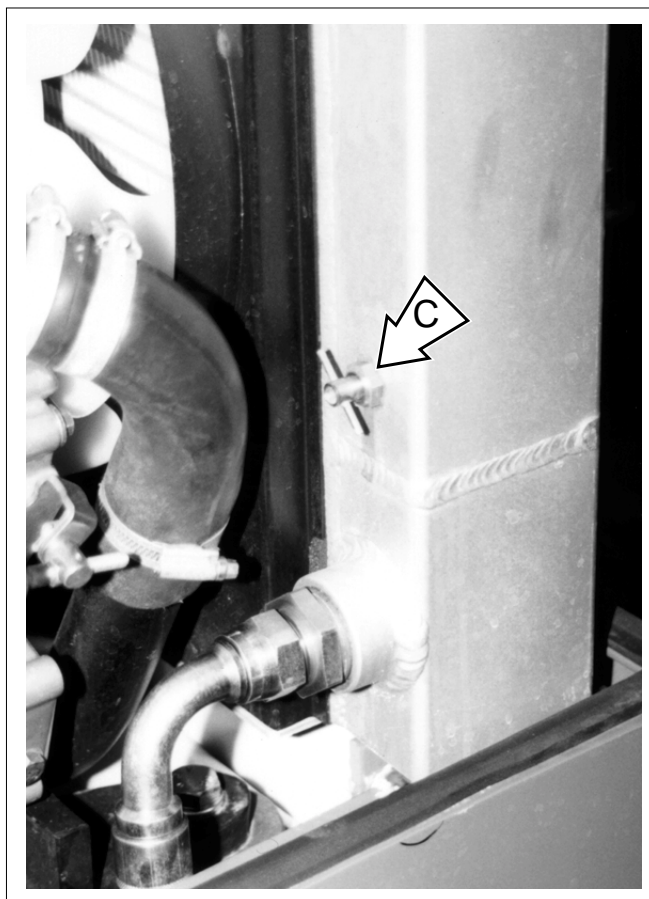
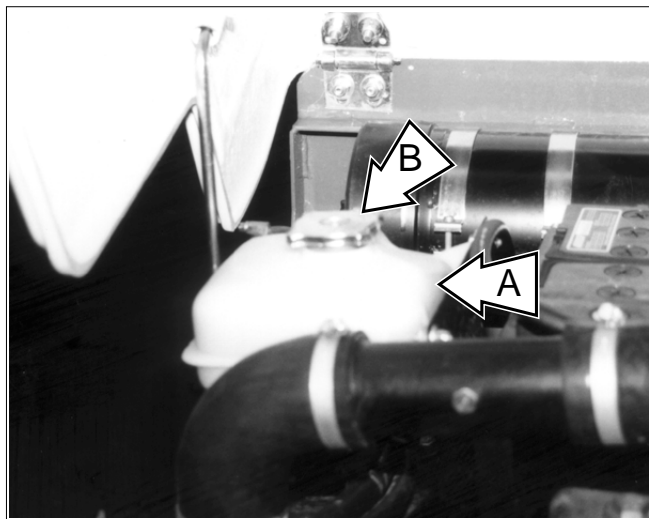


When the coolant is hot, the cooling system is under pressure. With warm engine, loosen the radiator plug slowly and carefully, without removing it, to drain the pressure. Use protection gloves and keep your face at a safe distance.

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

To drain the antifreeze:

- Let the engine cool down.
- Unscrew cock **C**, allow the fluid to flow out into a special container, then re-close the cock.
- After emptying, pour new antifreeze (50% water-antifreeze). This proportion will provide protection up to 40°F.
- Daily clean the radiator grille.



SERVICE INTERVAL

Running-in period _____ None

Ordinary maintenance _____ Every **50** hours

D-3.8 CHECKING THE OIL LEVEL IN THE RESERVOIR



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 through level **B** fitted on the reservoir.

If necessary, add new oil through filler **A**.

ATTENTION

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



SERVICE INTERVAL

Running-in period ____ **Within the first 10 hours**

Ordinary maintenance ____ **Every 50 hours**

If oil must be changed, proceed as follows:

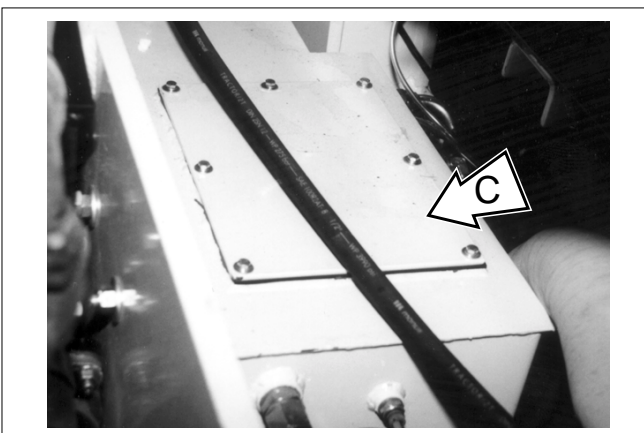
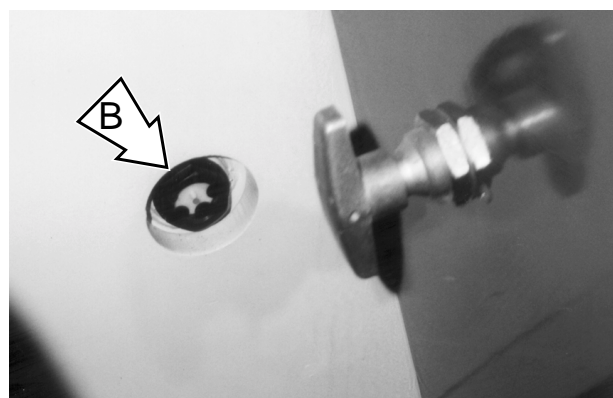
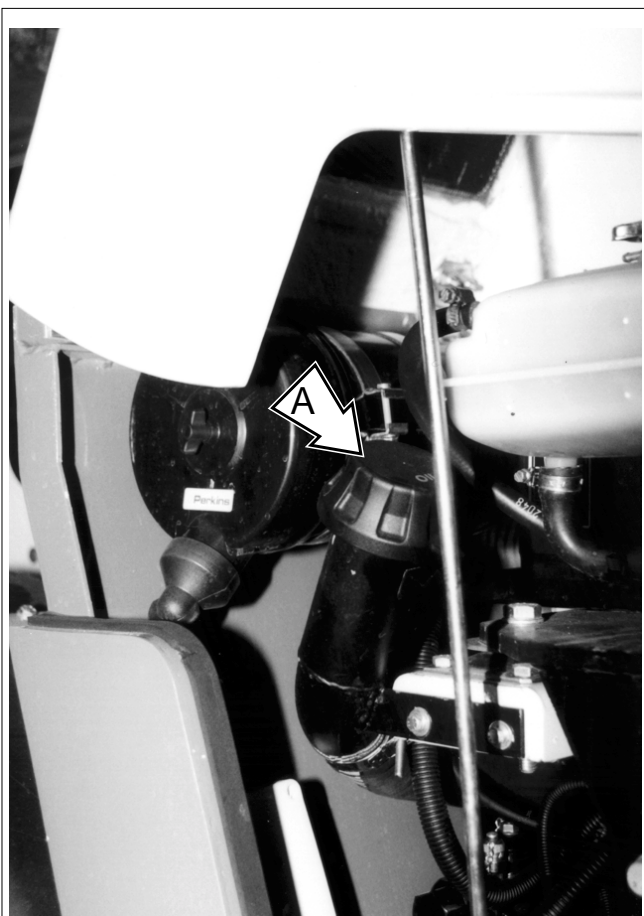
- 1 Stop the machine on a level ground and engage the parking brake.
- 2 Eliminate any residual pressure from the hydraulic circuit.
- 3 Place a container of suitable size under the drain plug to collect any oil leaks.
- 4 Remove the drain plug and allow oil to flow out into the container.
- 5 Remove the inspection hatch of tank **C**.



SERVICE INTERVAL

Running-in period ____ **None**

Ordinary maintenance ____ **Every 1000 hours**



- 6 Wash the tank thoroughly with solvent and a jet of compressed air.
- 7 Refit the oil drain plug and the inspection hatch.
- 8 Add new oil until it is level with the hole after having checked it corresponds to the type indicated in paragraph D-5.2.2.

D-3.9 CHANGING THE OIL FILTER ELEMENTS

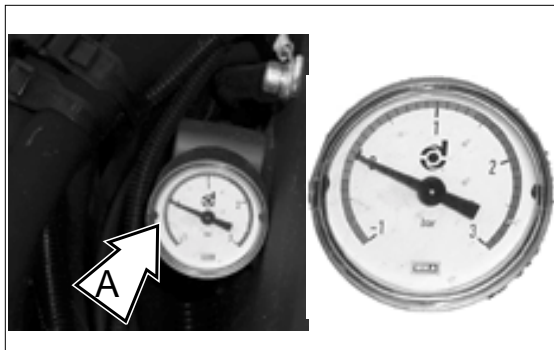
■ D-3.9.1 Transmission oil filter

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

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

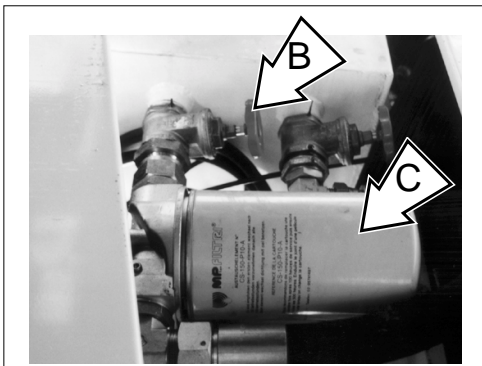
1 - Green area: Normal condition

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



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

- 1 Stop the machine on a level ground and engage the parking brake.
- 2 Place a container of suitable size under the filter to collect any oil leaks, then close valve **B**.
- 3 Remove the filtering element **C** using a wrench.
- 4 Change the filtering element, then, before fitting a new one, thoroughly clean and grease both seat and gasket.
- 5 Hand-tighten and re-open valve **B**.



ATTENTION

The hydraulic oil filtering elements 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).

ATTENTION

Handling and disposal of exhausted oils may be ruled by local or national regulations. Dispose of the exhausted oils through the special authorized centers.



SERVICE INTERVAL

Running-in period ____ **Within the first 50 hours**

Ordinary maintenance ____ **Every 500 hours**

When the dashboard indicator switches on

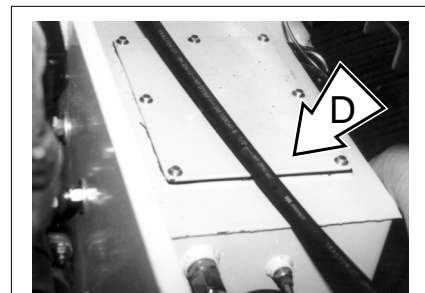
ATTENTION

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

■ D-3.9.2 Service oil filter

To change the service filtering element, proceed as follows:

- 1 Stop the machine on a level ground and engage the



parking brake.

- 2 Remove the inspection hatch D 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.

D-3.10 OIL LEVEL IN THE DIFFERENTIAL GEARS

■ D-3.10.1 Front differential gear

To check the oil level in the front differential gear:

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

For the oil change:

- Place a container of suitable size under the drain

plug **B**.

- Loosen both drain plug and level plug **A** and allow oil to flow out from the reduction gear.
- Refit and tighten drain plug **B**.
- Add new oil through plug **A** until it is level with the hole.
- Refit and tighten level plug **A**.

■ D-3.10.2 Rear differential gear

To check the oil level in the rear differential gear:

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

For the oil change:

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

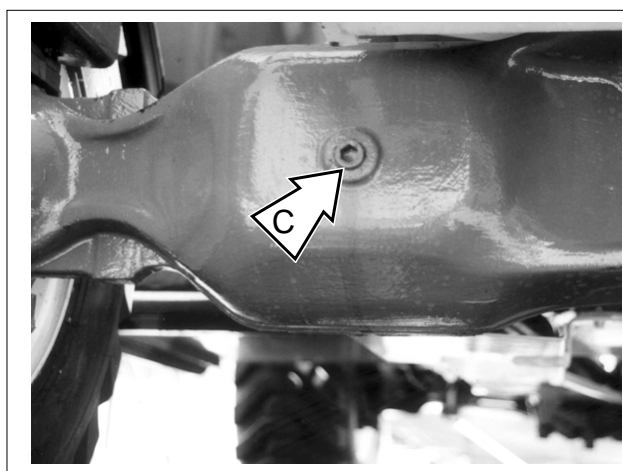
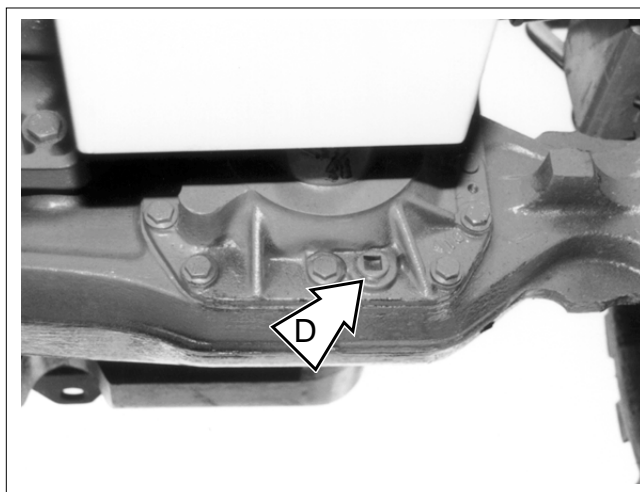
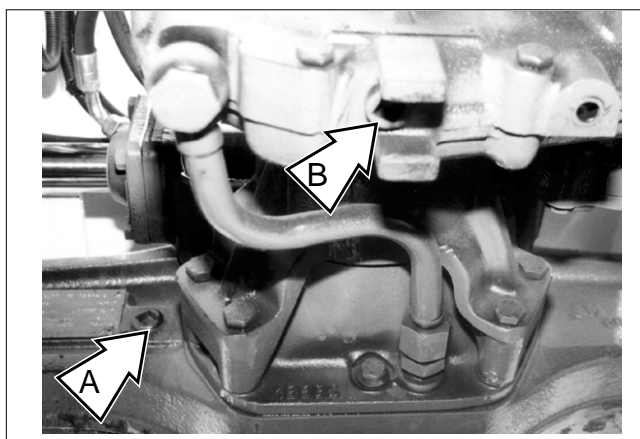
D-3.11 OIL LEVEL IN THE (front/rear) WHEEL



SERVICE INTERVAL

Running-in period ____ **Within the first 10 hours**

Ordinary maintenance ____ **Every 250 hours**



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 **A** 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 **A** until it is level.
- Refit the plug.

For the oil change:

- Stop the machine and ensure the plug is oriented toward the vertical axis.
- Place a container of suitable size under the reduction gear plug.
- Unscrew plug **A** 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 **A**.
- Refit and tighten plug **A**.



SERVICE INTERVAL

Running-in period ____ **Within the first 10 hours**

Ordinary maintenance ____ **Every 250 hours**

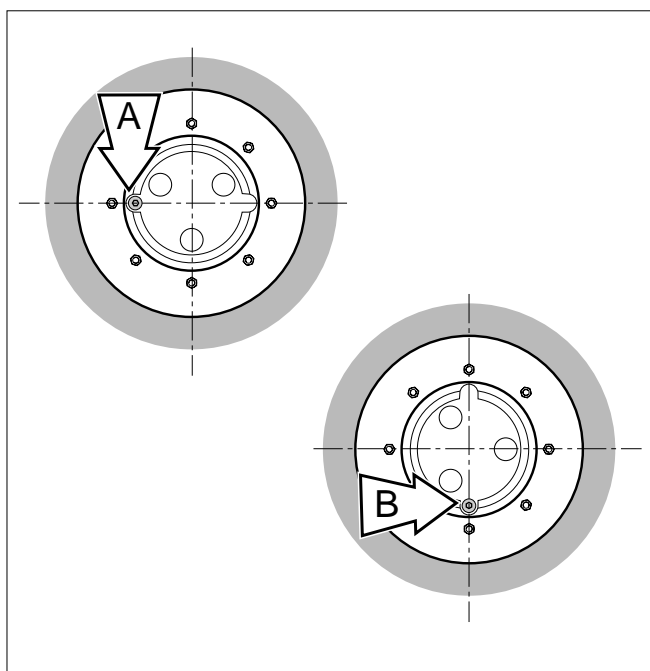
ATTENTION

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

ATTENTION

Handling and disposal of exhausted oils may be ruled by local or national regulations. Dispose of the exhausted oils through the special authorized centers.

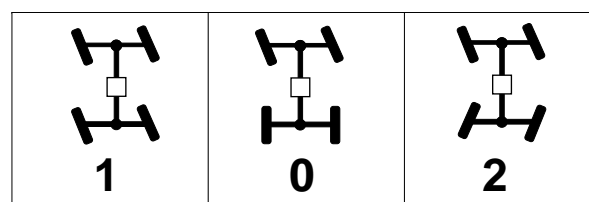
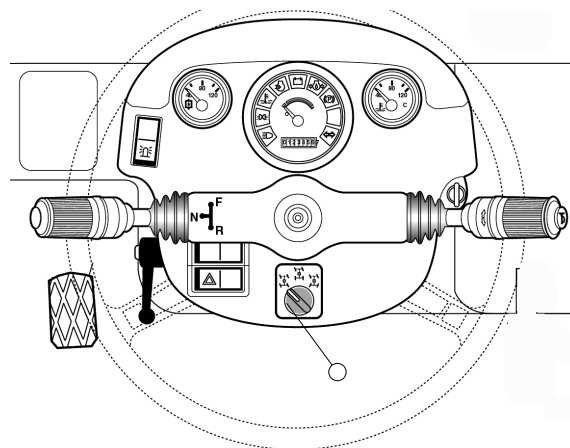
D-3.12 STEERING / TIRE ALIGNMENT



During operation, the alignment of both front and rear axles of the machine can be subject to variations. This can depend on an oil bypass 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, follow the procedure below rather than checking the alignment visually:

- Move to a solid and level ground.
- Set the steering selection switch **15** to “four-wheel steer” (pos. **2**)
- Rotate the steering up to its stop (either to the right or to the left)
- Set the steering selection switch to “two-wheel steer” (pos. **0**)
- Rotate the steering up to its stop in the opposite direction to the above
- Reset the steering selection switch to “four-wheel steer” (pos. **2**)
- Rotate the steering so that the rear axle reaches its stop (either to the right or to the left)
- Reset the steering selection switch to “two-wheel steer” (pos. **0**)
- Rotate the steering so that the front axle reaches its stop (see rear axle)
- Reset the steering selection switch to “four-wheel steer” (pos. **2**)
- Set the wheels parallel to the longitudinal axis of the machine and move forward for 5 to 10 feet, then reset the steering selection switch to “two-wheel steer” (pos. **0**).


SERVICE INTERVAL

Running-in period _____ **None**

Ordinary maintenance _____ **When necessary**

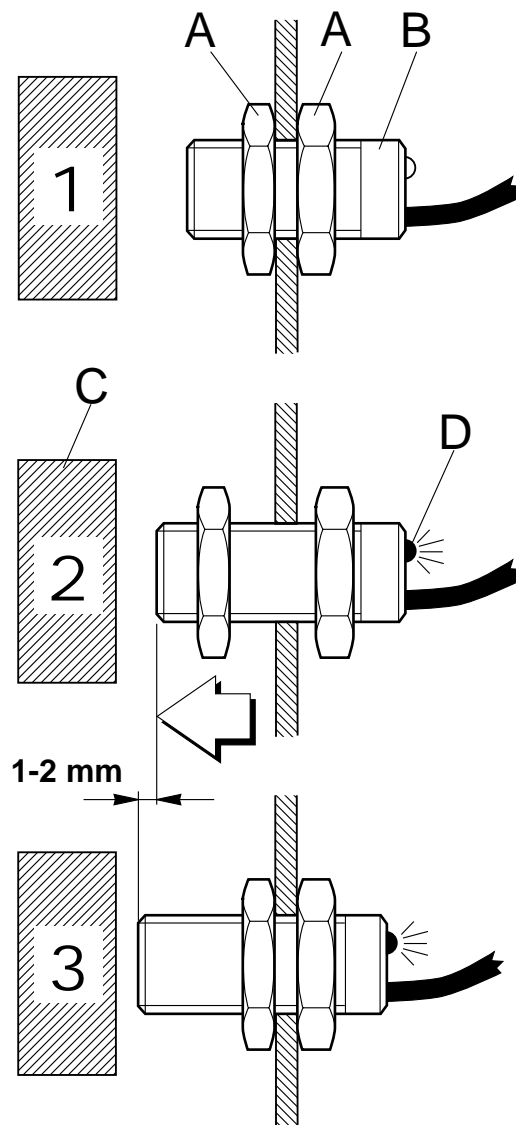
D-4 ELECTRIC SYSTEM

D-3.13 ADJUSTING THE SENSOR DISTANCE

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

- 1 Loosen nuts **A** which fix sensor **B**.
- 2 Set the mobile part **C** of the machine, controlled by the sensor, as close as possible to the same sensor.
Near the sensor to the component until the LED indicator **D** lights up.
- 3 Further near the sensor by 1/8".
Smoothly tighten the sensor fixing nut and the relevant lock nut.

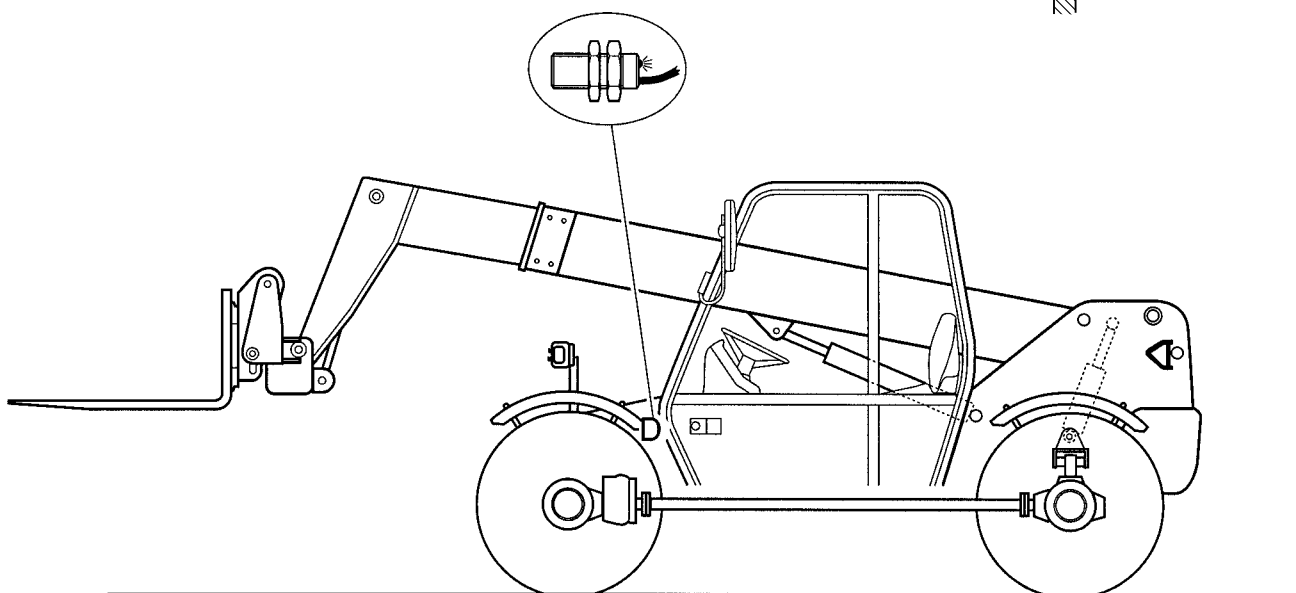
The machine is equipped with a proximity switch located in the parking brake. This prevents any starting when the parking brake is not engaged.



SERVICE INTERVAL

Running-in period _____ None

Ordinary maintenance _____ When necessary



D-3.14 ADJUSTING THE SLIDING PADS OF THE BOOM SECTION

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 Terexlift parts.

Adjusting the pads:

- Remove the screws which fix the pads.
- Fit the necessary shims or, when necessary, replace them.
- Refit and tighten the pad fixing screws.

ATTENTION

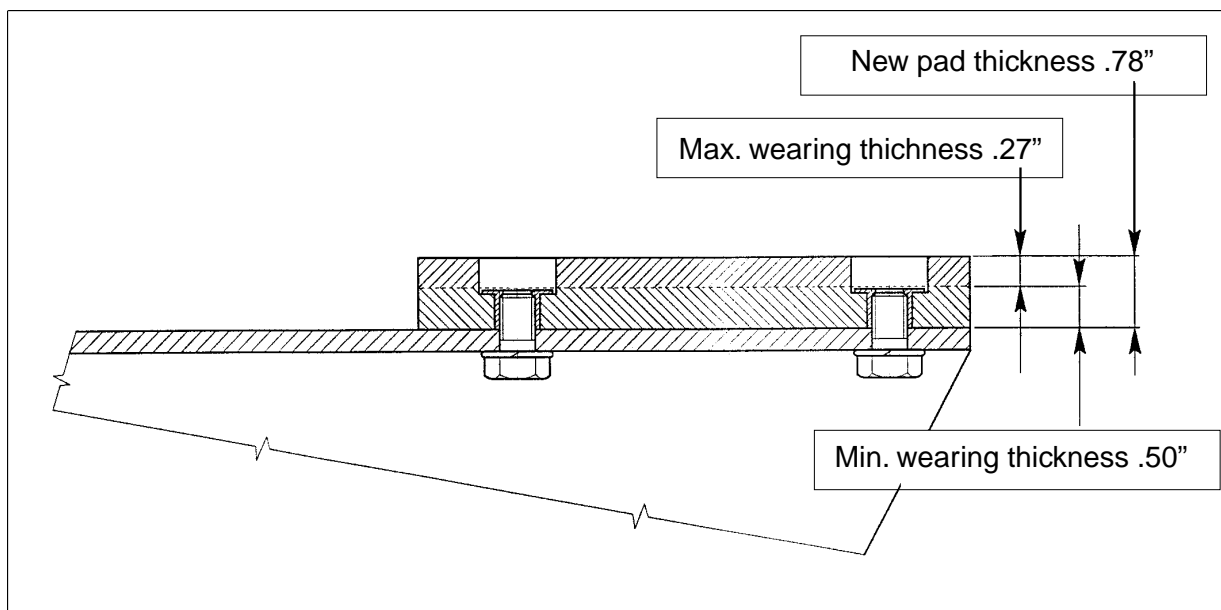
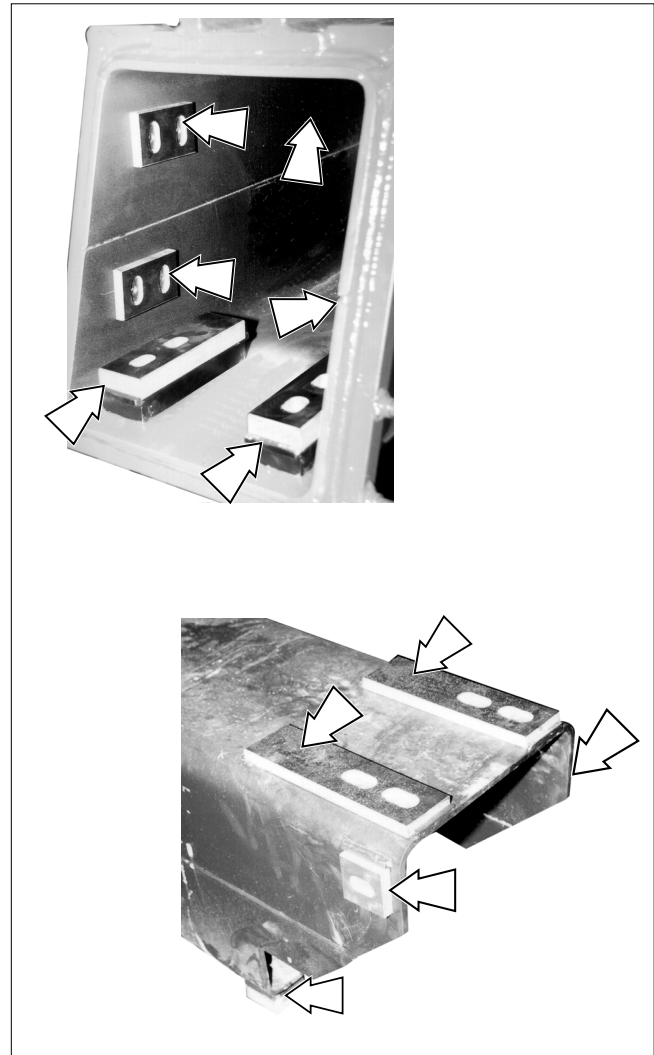
Pads must absolutely be replaced when their thickness is 1/2" as shown in the drawing below.



SERVICE INTERVAL

Running-in period _____ None

Ordinary maintenance _____ When necessary





All maintenance or repairs must be carried out with engine stopped, parking brake engaged, working attachments on the ground and speed selection lever in neutral.



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



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 depressurize the hydraulic circuit.

D-4.1 BATTERY

- Check the electrolyte level every 50 working hours; if necessary, add distilled water.
- Ensure the fluid is 1/4" 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 by applying them with pure vaseline to them.
- Remove the battery and store it in a dry place, when the machine is not used for a long time.



- ***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.***

D-4.2 FUSES

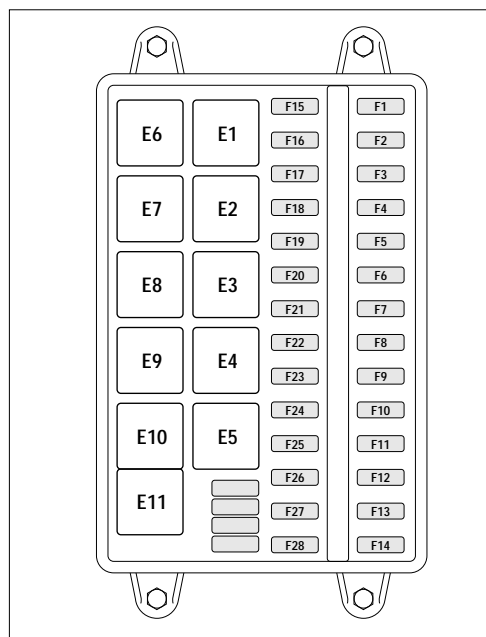
The electric system is protected by fuses placed into the driving cab, on the left. Before replacing a blown fuse with a new one having the same amperage, find out why the fuse has blown.

Fuses

Ref.	Circuit	Amp.	Ref.	Circuit	Amp.
F1	Interior lamp - Beacon switch		F15	Parking brake sensor power supply	
	Emergency switch - Turn signals	15		Relay E1/2 enabling control	5
F2	Relay E9 power supply	10	F16	Hydraulic stop power supply - Hydraulic coil	
F3	Relay E4 power supply	10		temperature indicator - Fuel gauge - Hour meter	
F4	Front right/rear left position lights - License plate			Warning lamps - Water temperature indicator	
	lights - Position light indicator - Hydraulic coil			Relay E3 enabling control	10
	temperature indicator lighting		F17	Emergency switch and turn signal power supply	10
	Relay E4 enabling control	10	F18	Power supply: light switch, windshield	
F5	Front left/rear right position lights - Fuel gauge			washer switch, windshield washer motor	15
	indicator, hour meter, warning lamp, water		F19	Air conditioning system power supply	25
	temperature indicator lighting		F20	Road safety switch power supply	
	Position light switch lighting	10		High speed switch	15
F6	Right low beam	7.5	F21	Available	15
F7	Left low beam	7.5	F22	Engine stop mushroom-head button power supply	15
F8	Right high beam - High beam warning lamp	10	F23	Relay E2/E5 power supply	15
F9	Left high beam	10	F24	Relay E8 power supply	5
F10	Horn	10	F25	Available	5
F11	Windshield washer kit	10	F26	Available	5
F12	Available	15	F27	Available	5
F13	Available	10	F28	Available	5
F14	Available				

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 oxidized.



Engine compartment fuses

Ref.	Circuit	Amp.
F29	Glow plug	70
F30	Dashboard power supply	50

Relé

Ref.	Involved circuit	Rif.	Involved circuit
E1	Starting enabling control	E6	Parking brake indicator power supply enabling control - Relay E1 / E2 enabling control
E2	Relay E3 power supply enabling control with parking brake engaged	E7	Boom extraction solenoid valve enabling control
E3	Steering column switch power supply enabling control with seat switch pressed down	E8	ARB solenoid valve enabling control
E4	Work light switch power supply enabling control	E9	Relay E7 enabling control
E5	Back-up horn cut-out switch power supply enabling control - Back-up lamp	E10	ARB control unit power supply enabling control
			Available

D-4.3 12V DC LAMPS

Use	Voltage	Power
• Front low/high beam	24 V	
• Front position lights	24 V	
• Side/tail turn signals	24 V	
• Stop lights and rear position lights	24 V	
• Dashboard and light indicators	24 V	
• Interior lamp	24 V	



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



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

D-5. REFUELING

D-5.1 REFUELING

<i>Part</i>	<i>Product</i>	<i>Capacity (litres)</i>	<i>Product specifications see par.</i>
Diesel engine	Engine oil	8.5 Qts.	D-5.2.1
Engine cooling system	Water+antifreeze	6.6 Gal.	D-5.2.5
Fuel tank	Diesel fuel	26.0 Gal.	D-5.2.3
Hydraulic system reservoir	Hydraulic oil	18.5 Gal.	D-5.2.2
Front differential gear with reduction gear	Oil	6.3 Qts.	D-5.2.2
Front differential gear	Oil	5.3 Qts.	D-5.2.2
Front wheel reduction gears	Oil	1.6 Qts.	D-5.2.2
Rear wheel reduction gears	Oil	1.5 Pint	D-5.2.2
Brake oil reservoir	Oil	1 Pint	D-5.2.2

D-5.2 PRODUCT SPECIFICATIONS

D-5.2.1 Engine oil

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

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

D-5.2.2 Lubrication oils and filtering elements

Refill the machine with following lubricants:

<i>Use</i>	<i>Product</i>	<i>Definition</i>
Power distributor		
Differential gears - Reduction gears	SHELL SUPER GEAR 90 LS	SAE 90 W MIL-L 2105B
Hydraulic system and brakes	SHELL TELLUS T 46	DENISON HF-1 DIN 51524 parts 2 & 3

ATTENTION

Never mix oils of different type or features: this may result in troubles and component breaks.

The machine is fitted with the following filter elements:

<i>Filter</i>	<i>Flow rate l/1'</i>	<i>Filtering</i>	<i>Coupling</i>
Transmission oil filter	150	10 µ	1"1/4 BSP
Service oil filter	100	60 µ	2" NPT

**D-5.2.3 Fuel**

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

ATTENTION

In cold climates (temperature under 0°F) 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 Greases

For the machine greasing, use:

SHELL lithium-based grease, type SUPER GREASE EP	When greasing by pump
AGIP graphitized grease, type GR NG 3	When greasing by brush
Grasso INTERFLON FIN GREASE LS 2	For the telescopic boom

ATTENTION

Avoid mixing greases of different type or features: this may result in troubles and component breaks.

D-5.2.5 Engine coolant

It is advisable to use an antifreeze mixture (50% water-50% antifreeze). At the delivery, the machine is refilled with:
CALTEX POLAR ANTIFREEZE (ASTM D3306-74)

D-6 FAULTS AND TROUBLESHOOTING

This chapter represents a practical guide for the operator for fixing the most common failures and, at the same time, detecting those repairs 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.



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.

D-6.1 Fault - Cause - Solution

FAULT	CAUSE	SOLUTION
DASHBOARD DOES NOT TURN ON	<ul style="list-style-type: none"> The 50A fuse F30 supplying power to the dashboard is blown (engine compartment) Battery disconnected Battery down Battery cut-out switch OFF 	<ul style="list-style-type: none"> Replace the fuse Connect the battery using the relevant switch Check the battery condition Switch it on
ENGINE DOES NOT START <i>Starter does not run</i>	<ul style="list-style-type: none"> Forward/reverse gear selector not in neutral position Parking brake not engaged Proximity switches inefficient Battery down Battery cut-out switch OFF 	<ul style="list-style-type: none"> Selector to neutral position Engage the parking brake and ensure the relevant light on the dashboard switches on Check and adjust the distance (see paragraph D-3.13, page 68) Recharge or replace the battery Switch it on
ENGINE DOES NOT START <i>Starter runs, but engine does not start</i>	<ul style="list-style-type: none"> Fuse F15 blown No Fuel Diesel fuel filter clogged Diesel fuel hose empty (fuel used up) 	<ul style="list-style-type: none"> Check the fuse Refuel See Perkins engine operator manual Refuel, then refer to Perkins engine operator manual
MACHINE DOES NOT MOVE	<ul style="list-style-type: none"> Steering column switch in neutral Parking brake engaged Fuse F3 blown 	<ul style="list-style-type: none"> Set the steering column switch correctly Disengage Check the fuse; replace, if necessary
THE MACHINE DRIVE IS NOT ENOUGH	<ul style="list-style-type: none"> Hydraulic oil filter clogged 	<ul style="list-style-type: none"> Replace the filter
NO SELECTION OF THE STEERING MODE “ROAD” FUNCTION ON, EVEN	<ul style="list-style-type: none"> Fuse F20 controlling the steering selection blown “ROAD/CAB” switch set to “ROAD” 	<ul style="list-style-type: none"> Replace the fuse Set to “CAB”

FAULT	CAUSE	SOLUTION
WHEN SELECTING THE “CAB” FUNCTION	<ul style="list-style-type: none"> No “ROAD/CAB” selection 	<ul style="list-style-type: none"> Check and replace fuse F20, if necessary
LOW PARKING BRAKE ACTION	<ul style="list-style-type: none"> Insufficient cable tensioning 	<ul style="list-style-type: none"> Check and adjust the cable tension by means of the hollow screws Check and adjust the lead tightening on the cable heads
NO BOOM LOWERING AND EXTENSION, NO HOLDING FRAME TILTING	<ul style="list-style-type: none"> Fuse blown Emergency button ON 	<ul style="list-style-type: none"> Replace fuses F2 and/or F24 Reset the button
ARB SYSTEM IN ALARM (red LED ON)	<ul style="list-style-type: none"> Alarm of the overload warning system 	<ul style="list-style-type: none"> Retract the boom within safety limits
THE HYDRAULIC OIL THERMOMETER DOES NOT WORK	<ul style="list-style-type: none"> 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 operating temp. 	
THE PARKING BRAKE LIGHT DOES NOT LIGHT UP	<ul style="list-style-type: none"> Fuse blown 	<ul style="list-style-type: none"> Replace fuse F15
THE OVERLOAD WARNING SYSTEM DOES NOT WORK	<ul style="list-style-type: none"> Fuse blown 	<ul style="list-style-type: none"> Check and replace fuse F2, if necessary
BOOM DOES NOT MOVE	<ul style="list-style-type: none"> Fuse blown “ROAD/CAB” switch set to “ROAD” Emergency button ON 	<ul style="list-style-type: none"> Check and replace fuse F22, if necessary Set to “CAB” Reset the button
NO SHIFTING BETWEEN LOW AND HIGH HYDRAULIC GEAR	<ul style="list-style-type: none"> Fuse blown 	<ul style="list-style-type: none"> Replace fuse F20

ATTENTION

For all faults which are not listed in this chapter, address to the TEREXLIFT Technical Assistance, your nearest authorised workshop or dealer.

Section **E**

TABLES AND ENCLOSURES

TABLES AND ENCLOSURES

E-1 TORQUE WRENCH SETTINGS

D x p	Torque wrench setting (Nm)			
	4.8	8.8	10.9	12.9
M 4 x 0,7	1.2	2.3	3.2	3.9
M 5 x 0,8	2.3	4.5	6.3	7.5
M 6 x 1	3.9	7.7	10.8	12.10
M 8 x 1,25	9.1	18.2	25.6	30.7
M 8 x 1	9.6	19.2	26.8	32.4
M 10 x 1,5	18.6	36.10	54.10	62.5
M 10 x 1,25	19.4	38.7	54.4	65.3
M 12 x 1,75	31.3	62.6	87.8	105.6
M 12 x 1,25	33.5	66.9	93.8	112.10
M 14 x 2	49.8	99.7	140.3	168.3
M 14 x 1,5	52.9	105.6	149.1	178.6
M 16 x 2	75.3	151.3	212.6	255.4
M 16 x 1.5	78.10	157.10	222.9	267.2
M 18 x 2,5	104.8	208.9	293.8	352.8
M 18 x 1,5	113.7	227.3	320.3	383.8
M 20 x 2,5	147.6	295.2	414.8	497.4
M 20 x 1,5	159.4	318.1	447.10	537.3
M 22 x 2,5	196.3	392.7	552.1	661.10
M 22 x 1,5	211.1	421.4	592.7	711.5
M 24 x 3	254.6	509.10	716.6	863.5
M 24 x 2	269.4	539.5	760.2	907.8
M 27 x 3	372.7	745.4	1047.10	1254.6
M 27 x 2	394.1	789.7	1107	1328.4
M 30 x 3,5	506.3	1011.1	1424.4	1704.8
M 30 x 2	544.7	1092.3	1535.1	1837.7

ATTENTION

Sensor maximum driving torque: 15 Nm.