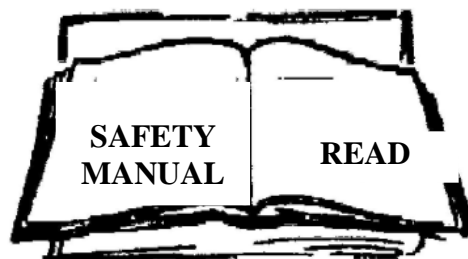
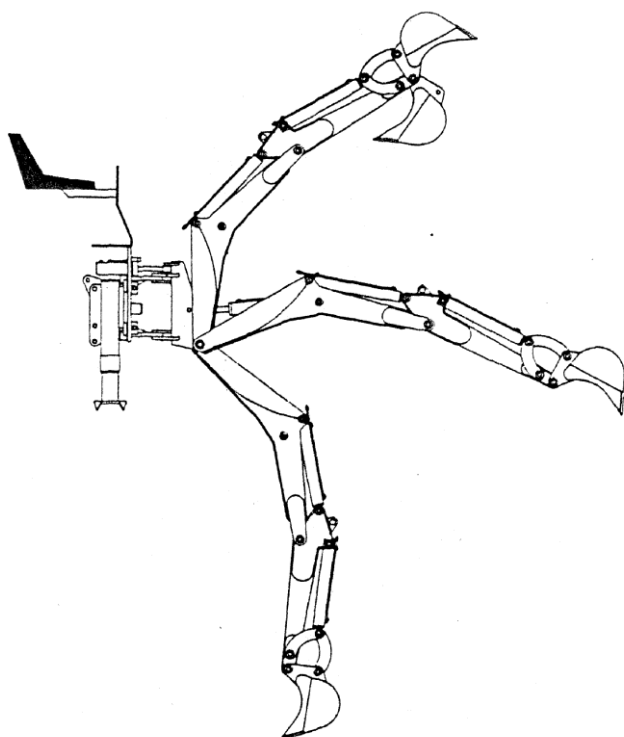


INSTALLATION, USE AND MAINTENANCE MANUAL

Cod. 09007/R

BACKHOES



**BEFORE
PERFORMING
ANY KIND OF WORK,
WITH THE MACHINE
READ THIS
MANUAL**

TECNOAGRI

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***THE INFORMATION CONTAINED IN THIS MANUAL
CONCERNS YOUR SAFETY
AND GIVES INSTRUCTIONS FOR THE INSTALLATION AND
CORRECT USE AND MAINTENANCE OF THE MACHINE, HOW TO
MAKE THE BEST USE OF ITS POWER AND EFFICIENCY AND
MAINTAIN IT THROUGHOUT ITS LIFE***

THE MANUAL IS AN INTEGRAL PART OF THE MACHINE AND MUST ACCOMPANY IT
WHENEVER THE MACHINE CHANGES OWNERS

IT PROVIDES A GUIDE TO
UNDERSTANDING THE MACHINE AND ITS FUNCTIONS.
IT ALSO PROVIDES
INSTALLATION INSTRUCTIONS - FOR USE AND MAINTENANCE AND
ACCIDENT PREVENTION

ALL RESPONSIBILITY FOR DAMAGE CAUSED BY
NOT FOLLOWING THE ADVICE AND INSTRUCTIONS
CONTAINED IN THIS MANUAL
IS THE USER'S.

RETAILER OR SERVICE CENTRE (stamp)

TECNOAGRI

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Installation, Use and Maintenance Manual

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Part A - General

1. GENERAL INFORMATION ABOUT THE MANUAL

1.1 Structure, content and end users of the manual

❖ The original manual has been compiled in Italian. The copies in other languages are translations.

❖ The manual is made up of 59 pages numbered from 1 to 59:
- the front cover is not included in the page numbering

❖ This publication is intended for the use of:

- personnel responsible for putting the machine into use and starting it
- the workers responsible for using the machine
- the operators in charge of the cleaning and maintenance of the machine

❖ The manual must be kept in a suitable place, in the care of the person responsible for its use as specified, so that it is preserved in a good condition and can be consulted at any time.

CHECK THAT THE INTEGRITY OF THE MANUAL IS COMPLETE.

❖ In the event that there are faults with the printing or pages are missing or in case of loss or deterioration, a replacement must be requested from:

TECNOAGRI SRL

Via Marconi 49 - 48017 CONSELICE (RA) ITALY

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e-mail: tecnoagri@tecnoagri.it

The information and the figures given in the manual are valid at the time of printing. TECNOAGRI SRL reserves the right to change the characteristics or the design without prior warning and without assuming any responsibility.

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THE INSTALLER, THE USER AND THOSE RESPONSIBLE FOR MAINTENANCE AND SECURITY MUST HAVE READ AND UNDERSTOOD THE MANUAL AND THE PRECAUTIONS LAID DOWN HEREIN BEFORE BEGINNING ANY KIND OF WORK.






ALL THE RECOMMENDATIONS CONTAINED IN THE MANUAL MUST BE COORDINATED WITH THE USAGE AND MAINTENANCE MANUAL OF THE TRACTOR ON WHICH THE DEVICE WILL BE MOUNTED

1.2 Symbols : meaning and use

In the manual, various symbols are used to attract the reader's attention and underline some particularly important aspects of handling.

The following table shows the list and the meaning of the symbols used in the manual.

SYMBOL	MEANING	EXPLANATIONS, ADVICE, NOTES
	Danger	Indicates danger with risk of accident, possibly fatal, if the danger is not avoided. Ignoring the instructions associated with this symbol can endanger the safety of the operator and/or others.
	Attention	Indicates a warning of possible damage to the machine or to a personal object of the operator. Ignoring the instructions associated with this symbol can cause serious damage to the machine.
	Warning Note	Indicates a warning or a note regarding key functions or useful information. Pay close attention to sections of the text indicated by this symbol.

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Dear Customer,

Thank you for showing confidence in us, we are certain that you have made a wise purchase.

Our efforts are aimed at ensuring high quality and guaranteeing excellent reliability and safety in the equipment we manufacture. This allows us to export our products to many countries throughout the world.

We would like to remind you that the full efficiency of any machine and maintaining that efficiency throughout its life do not rely only on quality construction and avant-garde technical expertise, but also on proper use as well as efficient and constant maintenance.



GUARANTEEING THE PROPER FUNCTIONING AND FULL OPERATIONAL CAPABILITIES OF THE MACHINE, IN LINE WITH ITS INTENDED USE, IS STRICTLY DEPENDENT ON CORRECTLY FOLLOWING ALL THE INSTRUCTIONS WHICH ARE CONTAINED IN THIS MANUAL.

1.3 Manufacturer's guarantee and responsibility

❖ **TECNOAGRI SRL** declines all responsibility in case of:

- use of the machine in a manner contrary to national laws on safety and accident prevention
- incorrect preparation for the installation and of the premises on which the machine will operate
- failure to observe or incorrect following of the instructions contained in this manual
- unauthorised modifications to the machine
- use of spare parts other than those approved by the manufacturer
- machine usage by non-qualified personnel

❖ To secure the rights provided by the guarantee, the purchaser must scrupulously observe the warnings and instructions indicated and in particular:

- operate the machine within its intended limits
- always carry out constant maintenance
- allow the machine to be used only by operators of proven ability and attitudes, who have been properly instructed in the operation of the machine
- always use only original spare parts as recommended by the manufacturer



- **Do not attempt to use the machine in any way not in accordance with the recommendations of the instructions.**
- **The instructions contained in this manual do not replace but are in addition to the requirements of existing safety and accident prevention laws.**

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1.4 Updating the manual and collaboration with the user

❖ The machines are subject to constant updating to increase efficiency and reliability. The manual reflects the prevailing state of technology at the time the machine was put on the market and is an integral part of it. The manufacturer is at the disposal of his customers to provide them with additional information and consider any suggestions for improvement in order to make this manual as helpful as possible with regards to the uses for which it was prepared.

❖ Eventual modifications, adjustments, etc. to machines produced after the model to which this manual relates do not place the manufacturer under any obligation with regard to machines supplied prior to this, nor does it render such machines and their manuals lacking or inadequate.

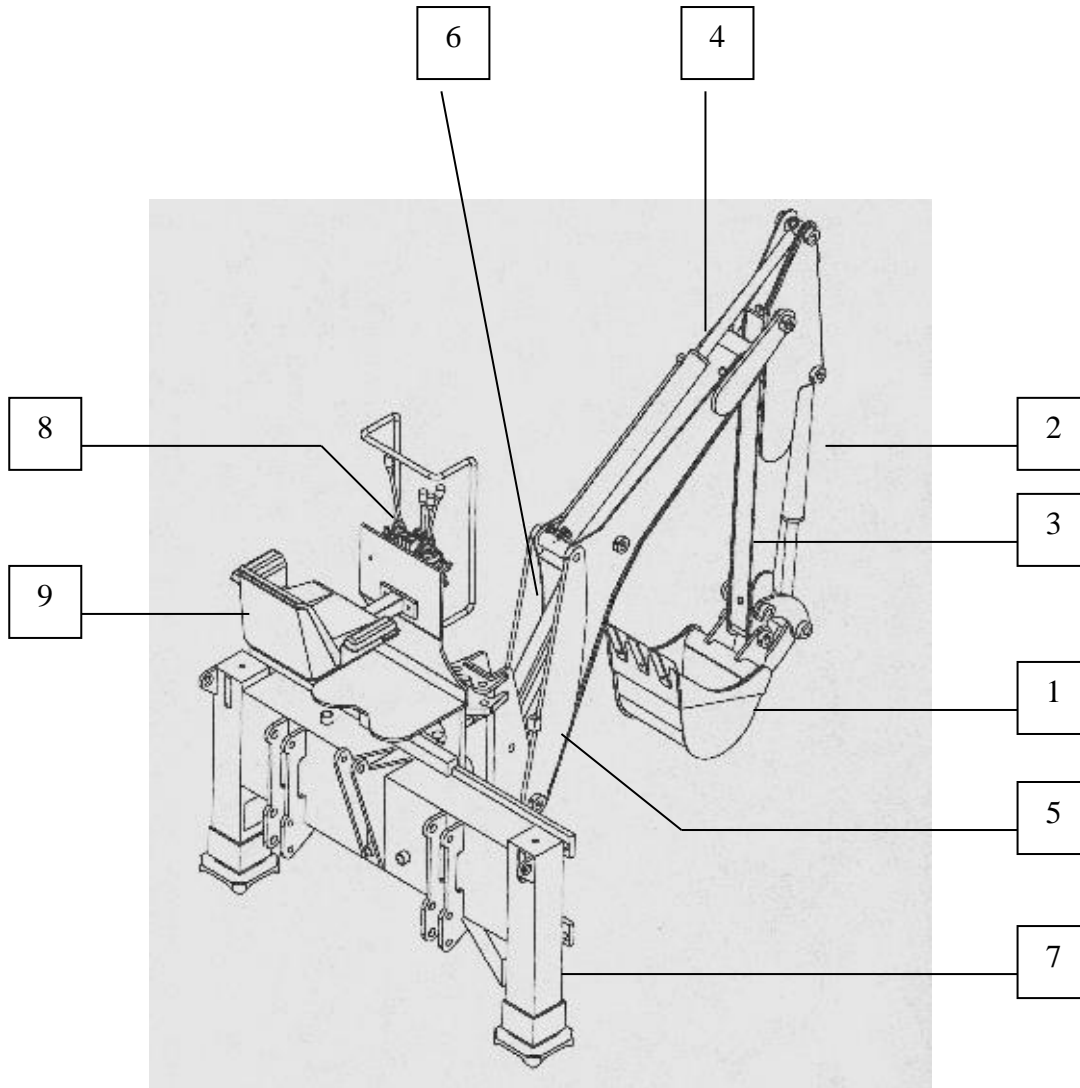
1.5 Illustrations - Diagrams

The diagrams and illustrations of mechanical parts shown in the manual are sometimes simplified.

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1.6 Overview of the machine and Terminology of main components (Fig.1)



1. BUCKET
2. BUCKET CYLINDER
3. SECOND ARM
4. SECOND-ARM CYLINDER
5. FIRST ARM
6. FIRST-ARM CYLINDER
7. HYDRAULIC STABILIZER-FEET
8. HAND- LEVERS DISTRIBUTOR
9. DRIVER SEAT

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Installation, Use and Maintenance Manual

1.7 Manufacturer

MANUFACTURER

TECNOAGRI srl

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Via Marconi, 49 - 48017 CONSELICE (RA) - Italy - Tel. +39 0545 85023 Fax +39 0545 85123 e-mail: tecnoagri@tecnoagri.it - web: www.tecnoagri.it		
Tipo di macchina/Type of machine Type de machine/Maschinentyp Tipo de máquina	<input type="text"/>	CE
Matricola/Serial number Número de matricule/Seriennummer Numero de matricula	<input type="text"/>	
Pressione esercizio Operation pressure Pression travail Betriebsdruck Presion trabajo	<input type="text" value="bar"/>	Anno di costruzione Year of manufacture Année de fabrication Baujahr Año de fabricación
Peso Gewicht Weight Peso	<input type="text" value="kg"/>	<input type="text" value="200"/>

Indicate the type of machine and registration number every time you ask for assistance or technical help.

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2. TRANSPORT AND INSTALLATION

2.1 Delivery, transport and packaging

- ❖ Transport of the machines and their parts must be carried out with care and are the responsibility of the purchaser. It must be carried out by qualified movers who can guarantee the proper handling of the material being moved. **TECNOAGRI SRL** assumes no responsibility in the case of transportation being carried out by the purchaser or by movers chosen by him.
- ❖ Check the machine visually before moving it in order to be able to ascertain its condition should breakage or damage occur during transit.
- ❖ The machine and its accessories, properly kept, can be stored for a period of approximately 2 years in a covered environment in which the temperature is between -15°C and + 60°C with a humidity level not higher than 80%. For different environmental conditions, appropriate packaging will be required.

2.2 Movement, lifting and unloading

- ❖ Personnel who undertake the transport of the machine must be capable of carrying out such tasks and of avoiding incorrect operations which could result in damage to the machine during the subsequent transportation.
- ❖ Verify on the packing list, or the delivery note of supplied documentation (including the installation, use and maintenance manual).

2.2.1 Lifting points and methods



Before undertaking the movement of the machine and accessories, ensure that the instructions for use being followed correspond to the machine intended to be used.

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❖ Identify the lifting points of each item, as indicated by the following symbol:



- ❖ Prepare a properly defined flat paved area on which to unload the machine.
- ❖ Have ready the necessary equipment for the unloading and movement of the machine and/or its parts, bearing in mind the requirements of each part or component (weight, dimension, lifting point).
- ❖ Lifting should be carried out taking into consideration the dimensions and the weight.
- ❖ The weight is indicated on the “CE” label
- ❖ Lifting by slings may be done with chains, bands or ropes, all of which must be suited to the load being moved.



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To lift the machine, proceed in the following manner:

- Lift the machine with slings of a suitable length, applied to the lifting points indicated.
- Using appropriate equipment, lift the load.
- Carry out the first lifting movement very slowly to ensure the load is properly balanced.
- Move the load to the area set aside to receive it, taking care to not allow swinging during the unloading.
- Gently lower the load at the place in which it is to be installed.



- **The security margins currently in force under law must be taken into consideration.**
- **Never use lifting equipment which does not comply with security standards.**



TECNOAGRI is not responsible for eventual harm or damage to people or goods brought about as a result of incorrect moving of the loads carried out by incompetent personnel and/or with inappropriate lifting equipment.

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3 ENVIRONMENTAL OPERATING CONDITIONS

3.1 Visibility

The machine should be used in the daytime in conditions of good visibility and light. In particular the operator's working position must ensure good visibility in relation to the use the machine is intended for.

3.2 Ground

It is essential that the work surface is appropriate in particular as regards the nature of the ground which must not be too rough (holes, depressions, etc.).

❖ Never work on slopes or embankments as this will jeopardise the stability of the machine.

3.3 Noise

Not having a motor, the only noise of the backhoe is the flow of oil and the mechanical movements of the equipment while operating.

THE AUCUSTIC PRESSURE LEVEL IS BELOW 70 Db(A)

3.4 Disposal

The disposal of metals, plastic and rubber materials and of old hydraulic oil must be done by authorised companies, in accordance with current regulations in force.

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Part B – SAFETY RULES AND ACCIDENT PREVENTION

4. GENERAL SAFETY RULES

- ❖ The machine has been designed and built in line with the latest technology and may be used with every confidence as to its safety.
- ❖ The instructions in this manual are those deemed necessary by **TECNOAGRI** company. That does not exclude the possibility that there may be more convenient and equally safe ways to start, use, maintain and repair the equipment, having regard to the means available to the purchaser.
- ❖ Danger to those in charge of operating the equipment can only be eliminated if the machine is put into operation and used correctly according to the instructions contained in this technical manual. Such instructions are to be observed and carried out only by authorised people who have been properly trained and have sufficient technical knowledge.
- ❖ If the procedures for working safely and avoiding damage to the machine have not been properly understood or if there are any doubts about them, contact **TECNOAGRI** or your local dealer.

Personnel in charge of machine operations are responsible for the following operations:

- ❖ Putting the machine into use or, however, its operation;
- ❖ Effecting various types of work on the equipment in such a way as the maintenance, control and repair of any of its parts require before starting work, during operation and also when work undertaken has come to a stop.
- ❖ Personnel must above all be aware of both the potential dangers involved in his work and also of the functions and proper use of the safety systems the machine is provided with.






Clothing and personal protection

- ❖ Do not wear bulky or loose-fitting clothing, watches or rings. Do not approach moving parts with loose long hair which could become entangled in moving parts and cause serious harm.
- ❖ Do not wear clothing stained with oil or petrol as they are inflammable.
- ❖ Always wear personal protective items such as overalls, gloves, safety shoes, hard hat, and, during maintenance work, safety goggles.

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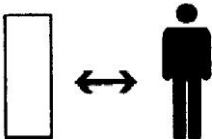
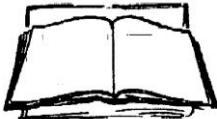



BACKHOES
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4.1 Warning Signs



SIGN	MEANING
<p>GENERAL DANGER</p> 	<p>Warning of general danger (followed by an indication of the type of danger)</p>
<p>DANGER OF HAND OR FOOT CRUSHING</p> 	<p>Warning of danger to hands or feet by crushing caused by moving surfaces or mechanical parts</p>
<p>DO NOT REMOVE PROTECTION</p> 	<p>Safety devices must not be removed while the machine is in operation.</p>
<p>DO NOT INTERVENE WHILE PARTS ARE MOVING</p> 	<p>Technical operations such as repairs, maintenance and adjustments must not be done while any mechanical parts, devices and components are moving.</p>
<p>ACCESS DENIED</p> 	<p>Indicates that access to the area where the machine is in operation is denied to all non-authorized personnel.</p>

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<p style="text-align: center;">DO NOT WALK NEAR OR STAND CLOSE TO THE BACKHOE WHILST IN USE</p> 	<p>It is absolutely forbidden to walk near or stand close to the backhoe</p>
<p style="text-align: center;">CONSULT THE MANUAL</p> 	<p>Whenever this warning sign appears either before or included in any directions (instructions, fine tuning, maintenance, etc.), consult the SAFETY MANUAL.</p>
<p style="text-align: center;">GLOVES MUST BE WORN</p> 	<p>Protective gloves must be worn.</p>
<p style="text-align: center;">GOGGLES MUST BE WORN</p> 	<p>Face protection must be worn (either goggles or mask).</p>
<p style="text-align: center;">HARD HAT MUST BE WORN</p> 	<p>A hard hat is obligatory</p>

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<p>PROTECTIVE SHOES MUST BE WORN</p> 	<p>Protective, anti-slip footwear must be worn.</p>
<p>WORK CLOTHES MUST BE WORN</p> 	<p>Work overalls must be worn when carrying out maintenance operations</p>


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Installation, Use and Maintenance Manual


5. QUALIFICATIONS OF THE OPERATOR AND OPERATING RULES


5.1 Instructions for the Buyer and the Operator


- ❖ Before starting any operations using the machine, carry out the following operations:
 - check the condition of the machine visually
 - carry out all preliminary checks as described in paragraph 5.2 “WHAT TO DO ALWAYS”
 - Carefully read and comply with what is written in paragraph 5.3 “WHAT NEVER TO DO”

	<ul style="list-style-type: none">• The machine must be operated by qualified personnel who have read and understood the instructions given in the manual.• In the event of serious or unrecognisable irregularities, stop the machine and await the assistance of qualified personnel.• Ask for help from the Technical Service Centre
---	--

	<p>THE OPERATOR WHO USES THE EQUIPMENT MUST BE COMPETENT AND FAMILIAR WITH THE USE OF AGRICULTURAL MACHINES, MUST HAVE STUDIED THE MANUAL, THE GRAPHICS, THE INSTRUCTIONS AND THE WARNING LABELS BEFORE UNDERTAKING ANY KIND OF OPERATION. ADDITIONALLY, HE MUST BE A RESPONSIBLE PERSON WITH A GOOD SAFETY SENSE - BOTH REGARDING HIMSELF AND OTHERS.</p>
---	---

	<p>VERIFY AT LEAST ONCE A DAY THAT THE OPERATOR IS FOLLOWING ALL THE SAFETY AND ACCIDENT PREVENTION RULES AS LAID OUT IN THIS MANUAL AND THE SAFETY WARNING SIGNS ON THE MACHINE</p>
---	---

	<p>DO NOT ALLOW THE MACHINE TO BE USED BY CHILDREN OR BY PERSONS WHO ARE NOT FAMILIAR WITH IT OR THE HARM AND DANGERS IT CAN CAUSE</p>
---	---

	<p>IF IN THE COURSE OF MANOEUVRES USE IS MADE OF SIGNALLING BY ANOTHER PERSON, MAKE SURE YOU HAVE REACHED AN UNDERSTANDING REGARDING THE SIGNALS TO BE USED. DO NOT ALLOW SIGNALLING TO BE GIVEN BY MORE THAN ONE PERSON: SUCH ACTION COULD CAUSE CONFUSION AND PANIC TO THE OPERATOR.</p>
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	<p>DO NOT ALLOW ANYTHING TO BE THROWN AT THE OPERATOR</p>
---	--

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It is obligatory for the purchaser to provide adequate signalling and warning systems, or if necessary, isolation of the danger zones to forbid, or limit access to them by non-qualified persons or strangers and/or all persons not working in areas where the machine is in use, as stated by current regulations.

❖ **Operator**

- An operator is defined as a person who, when required, performs any of the following:
 - transport and movement of the machine parts
 - starting and usage
 - cleaning, maintenance and repairs
 - disassembly, dismantling, scrapping

- The operator must be suitable for the job and physically and mentally able to handle the requirements demanded by the machine in its intended use
- The operator in charge of the machine must not allow anyone near it whilst in operation and must prevent its use by strangers, especially minors.
- Whilst the equipment is being manoeuvred, he must position himself in such a manner as to ensure his own safety.
- Neither before nor during work may the operator consume alcohol, or take any medication or other substances which could affect his mental or physical capabilities.
- He must ensure that the vehicle on which the equipment is mounted never runs out of fuel whilst in operation to make sure that it does not stop suddenly during a critical manoeuvre.
- He must follow the instructions given to obtain the best results, the least fuel consumption and the highest levels of safety possible both for himself and for others in using the machine. In particular, he must scrupulously observe the warnings given in this manual during all stage of work.



OBSERVE THE TRAFFIC LAWS. MAKE SURE YOU COMPLY WITH THE REGULATIONS FOR TRAVELLING ON PUBLIC ROADS IN FORCE IN THE COUNTRY WHERE THE MACHINE IS BEING USED.



DURING TRANSPORT IMMOBILISE THE ARMS OF THE BACKHOE USING THE EQUIPMENT PROVIDED

BACKHOES
Installation, Use and Maintenance Manual

5.2 What to do always !

- ❖ **ALWAYS** follow the advice and instructions given in the manuals for installation and use and ensure that the components and parts of the machine are intact
- ❖ **ALWAYS** observe the instructions and warnings given and the signs on the machine and in the operating areas.
- ❖ **ALWAYS** verify the capabilities of the machine in relation to the task it is going to perform (duration of the job)
- ❖ **ALWAYS** check the structural soundness of the machine and its component parts.
- ❖ **ALWAYS** make sure that working areas are free of obstacles and people before undertaking any manoeuvre.
- ❖ **ALWAYS** check the adequacy of the condition of the machine (cleanliness, lubrication) and of its maintenance and that of its main components (hydraulic tubes, stops, levers, etc.).
- ❖ **ALWAYS** verify that all movements both of the machine itself and also of its main components are synchronous.
- ❖ **ALWAYS** make sure that moving parts are not damaged and that the mechanisms function correctly.
- ❖ **ALWAYS** before starting operations, give acoustic and visual signals to personnel working in the area that operations are about to begin.
- ❖ **ALWAYS** work under the best lighting conditions in the area and within the working range of the machine.
- ❖ **ALWAYS**, in carrying out the various movements avoid as much as possible control impulses .
- ❖ **ALWAYS**, when work is over, take the machine and moveable components to its designated parking, taking care to position it in such a manner as not to cause an accident
- ❖ **ALWAYS**, before leaving the manoeuvring area, make sure the breaks are applied and remove the ignition key from the dashboard of the machine on which the equipment is attached.
- ❖ **ALWAYS**, for all operations use proper working clothes and/or suitable safety apparel (shoes, gloves, etc.), in accordance with the safety standards in force in the working area.
- ❖ **ALWAYS** report any eventual operational irregularities (faulty performance, suspected breakage, incorrect movements or unusual noises) to those in charge and put the machine out of service.
- ❖ **ALWAYS** make sure the tractor is designed to have equipment mounted onto it or it is permitted by consulting the tractor's operation manual or by asking its manufacturer.

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5.3 What never to do !

❖ Use of the machine for unauthorised operations, its improper use and lack of maintenance **can constitute serious hazards for personal safety** and cause damage to the working area as well as compromising the inherent safety of the machine. The actions described below, which obviously cannot cover the entire range of potentially incorrect use of the machine, embrace nonetheless those reasonably deemed most foreseeable, and are **to be considered absolutely forbidden**:

- ❖ **NEVER** use the machine for transporting people.
- ❖ **NEVER** operate while there are people exposed within the danger area of the machine.
- ❖ **NEVER** allow the machine to be used by non-qualified personnel nor by minors.
- ❖ **NEVER** use the machine if you are not physically or mentally fit.
- ❖ **NEVER** work unless you are adequately and suitably dressed in protective clothing.
- ❖ **NEVER** work without paying careful attention to manoeuvres.
- ❖ **NEVER** exceed the intended capabilities of the machine.
- ❖ **NEVER** use the machine or its accessories for haulage or dragging.
- ❖ **NEVER** run into load-bearing structures, other machines or installations.
- ❖ **NEVER** use the machine or carry out a maintenance operation on it in conditions of insufficient illumination and/or bad visibility.
- ❖ **NEVER**, during operations, make abrupt inversions .
- ❖ **NEVER** modify the functional characteristics of the machine and/or its components.
- ❖ **NEVER** modify or adjust the settings of the security devices and/or allow the machine to be tampered with.
- ❖ **NEVER** carry out temporary repairs or restoration works which do not conform to the instructions.
- ❖ **NEVER** use other than original spare parts or parts which have not been recommended by the manufacturer.
- ❖ **NEVER** entrust repair and maintenance work to personnel who are not qualified or trained.
- ❖ **NEVER** abandon the machine without first implementing the safety procedures.
- ❖ **NEVER** apply the backhoe to tractors of an insufficient weight.
- ❖ **NEVER** use the equipment as a lifting apparatus.
- ❖ **NEVER** start moving abruptly or accelerate unexpectedly, nor decelerate suddenly or make abrupt inversions.
- ❖ **NEVER** lean against or grasp the command levers.
- ❖ **NEVER** carry out routine maintenance work, inspections or repairs without having put the machine out of service and started the procedures required.
- ❖ **NEVER** use the machine if not in complete compliance with all its operational functions.
- ❖ **NEVER**, during maintenance:
 - use inappropriate devices
 - lean ladders against moveable parts,
- ❖ **NEVER** move the tractor if the operator of the backhoe is not got down the backhoe seat.

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BACKHOES
Installation, Use and Maintenance Manual

Part C – STARTING

6. THE FUNCTIONS OF THE MACHINE

6.1 Intended use - Projected use - End use

The TECNOAGRI backhoes were designed to be attached to tractors at three points and built to perform excavation, trench digging, and transporting the earth which results from the digging works.

6.2 Approved accessories - Compatible interchangeable parts

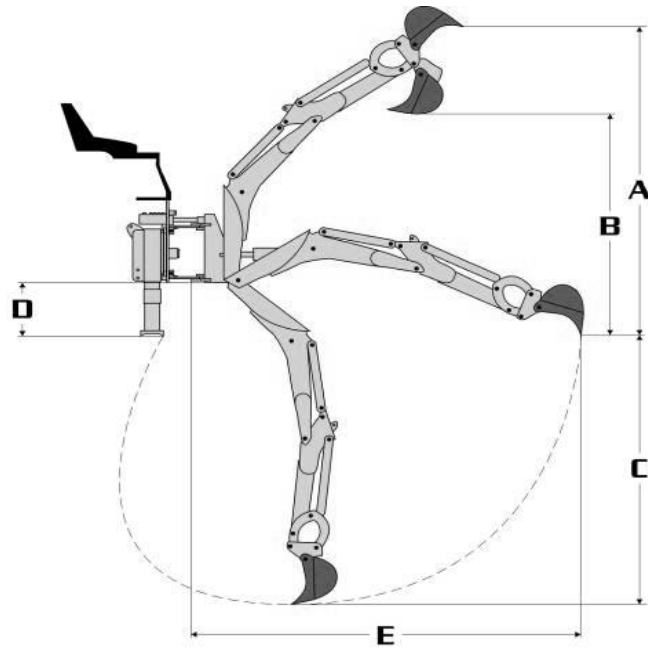
All checking operations and adjusting of the equipment, and the mounting and dismounting of the interchangeable accessories allowed **MUST BE CARRIED OUT BY THE OPERATOR HIMSELF**. To carry out these operations, he must leave his command post after having taken all the necessary precautions for the prevention of accidents, and after making sure that the machine cannot be moved during his absence from the control post.



BEFORE APPLYING AND USING OPTIONAL TERMINAL ATTACHMENTS CONSULT TECNOAGRI. READ CAREFULLY THE RELEVANT INSTRUCTION MANUAL AND SCRUPULOUSLY OBSERVE THE INSTRUCTIONS CONTAINED THEREIN.

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6.3 Technical characteristics



		E15	F19	F20	F23	F24	F25	F28	F30	F34	F36
			E19	E20	E23	E24	E25	E28	E30	E34	E36
A	mm.	1600	2350	2450	2750	3550	2950	3400	3500	3700	4150
B	mm.	1300	1600	1850	2150	2750	2350	2450	2500	3280	3380
C	mm.	1450	1900	2000	2280	2380	2500	2850	3050	3450	3650
D	mm.	300	250	450	550	400	550	550	550	550	550
E	mm.	2500	2550	3000	3250	3400	3450	3680	3900	4650	4850
Side shift	mm.	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES
Rotation		140°	180°	180°	180°	180°	180°	180°	180°	180°	180°
Tearing power	Kg.	1200	2000	2600	2600	2600	2600	3200	3200	4300	4300
Bucket width	mm.	250	300	300	400	300	400	400	400	500	500
Total width	mm.	1000	1000	1200	1200	1200	1400	1400	1400	1800	1800
Operating pressure	bar	170	170	170	170	170	170	170	170	170	170
Tank capacity	liters	12	12	34	34	34	45	45	45	70	70
Weight without oil	Kg.	208	327	562	604	568	652	735	773	1462	1506
			321	546	586	562	648	717	745	1446	1490
For tractor	CV	from 15	from 20	from 40	from 50	from 50	from 50	from 70	from 70	from 90	from 90
		to 25	to 30	to 70	to 70	to 80	to 90	to 90	to 90	to 200	to 200

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THE FIGURES CONTAINED IN THIS TABLE ARE VALID AT THE TIME OF PRINT TECNOAGRI RESERVES THE RIGHT TO CHANGE THE TECHNICAL SPECIFICATIONS RESULTING FROM MODIFICATIONS, ADJUSTMENTS, ETC.



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7. Conditions for use

The BACKHOE is designed to be attached to the tractor's hoist, by three mounting points connecting a stiff locking system of the lifting gear arms, by means of braces or third point arms, which are connected to the tractor and tool fixed parts (Fig. 2BF, page 28).

IMPORTANT

	<ul style="list-style-type: none">• MAKE SURE THE TRACTOR IS DESIGNED TO HAVE EQUIPMENT ATTACHED TO IT AND THAT SUCH ATTACHMENTS ARE PERMITTED, BY CONSULTING THE TRACTOR'S OPERATING MANUAL OR BY ASKING ITS MANUFACTURER.• THE ATTACHMENT AND USE OF THE BACKHOE ONTO THE TRACTOR MEAN A VARIATION OF THE WEIGHT ON ITS AXLES AND THEREFORE A CHANGE IN BALANCE AND A DISPLACEMENT OF THE TRACTOR'S CENTRE OF GRAVITY.
	<ul style="list-style-type: none">• TO MAINTAIN THE TRACTOR'S STABILITY, APPLY ADDITIONAL COUNTER-WEIGHTS TO COUNTER BALANCE.

	<p>THE TRACTOR ONTO WHICH THE BACKHOE IS TO BE MOUNTED MUST COMPLY WITH THE CURRENT REGULATIONS IN FORCE AND BE IN A GOOD STATE OF UPKEEP.</p>
---	---

	<p>The task of preparing the machine for use is a delicate and important one. If carried out badly, the risk of accidents for the personnel involved increases and safety is compromised both during the starting stage and also during subsequent use.</p> <p>Therefore both tasks must be carried out by workers who are professionally qualified, who are competent and have an understanding of mechanical matters. Their tools and personal safety equipment must conform to the legislative rules in force regarding work safety and accident prevention, and they must have read carefully this manual.</p>
---	--

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ADEQUATE WORK SPACE MUST BE PROVIDED IN ORDER TO GUARANTEE THE SAFETY OF BOTH THE OPERATOR AND MAINTENANCE PERSONNEL.



DO NOT USE THE EQUIPMENT IN AN EXPLOSIVE OR POTENTIALLY EXPLOSIVE ATMOSPHERE i.e. WHEREVER THE USE OF EXPLOSIVE-PROOF EQUIPMENT IS ORDERED.

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8. Attachment to the tractor

- 1) Select a flat area on which to place the backhoe.
- 2) To begin with, note the instructions on Pg. 10 in paragraph 2.2. "MOVEMENT, LIFTING AND UNLOADING" 10 and following pages.
- 3) Carry out a general visual check of the equipment and in particular, check that the seat and the oil filter on the tank are firmly in place; if necessary secure them.
- 4) Slowly bring the tractor towards the backhoe.
- 5) Lower the lifting arms to allow the insertion of the rotating joints of the braces on the lifting gear into the pivots in the lower part of the backhoe, securing them with the safety cotter pins.



NEVER STAND BETWEEN THE TRACTOR AND THE BACKHOE EVEN WHEN THEY ARE BEING COUPLED

To prevent the backhoe from swaying sideways



THE ARMS OF THE LIFTING GEAR MUST BE LOCKED IN PLACE: use the equipment (braces and chains) made for this purpose


- 6) Fix the backhoe, using an adjustable stabilising arm (central strut) at the third point of the tractor, securing it by means of the pivot/s and fasten with safety cotter pins, so ensuring that the pivots do not come out.

IMPORTANT



A STIFF LOCKING SYSTEM OF THE LIFTING GEAR ARMS SHOULD BE ATTACHED BY MEANS OF A SAFETY LOCKING DEVICE AS INDICATED BELOW, WHICH ARE CONNECTED TO THE TRACTOR AND THE TOOL FIXED PARTS (Fig. 2BF), AS TO CREATE ONE STRUCTURAL BLOCK IN ORDER TO AVOID ANY RECIPROCAL MOVEMENT OF THE TOOL AS REGARDS THE TRACTOR

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	BESIDES, THE MECHANICAL LOCKING OF THE HOIST REPRESENTS A SAFETY GUARANTEE IN THE EVENT OF ACCIDENTAL STARTING OR MALFUNCTIONING OF THE LIFTING GEAR.
---	--

	THE MECHANICAL LOCKING OF THE HOIST IS ALSO USEFUL TO OPTIMIZE DIGGING OPERATIONS AS IT AVOIDS THAT DURING OPERATING THE HOIST LOWER ARMS (BRACES) WILL MOVE UPWARD MAKING WORK DIFFICULT
---	--

The hoist can be locked by using the safety locking device, as shown in the illustration, or with other devices suited to prevent the movement of the hoist.







(Fig. 2BF)

IMPORTANT

	LOCK THE STARTING LEVER OF THE HOIST TO AVOID ACCIDENTAL STARTING.
---	---

	Adequate work space areas must be provided in order to ensure the safety of the operator and persons responsible for maintenance.
---	--

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	ALWAYS SWITCH OFF THE TRACTOR MOTOR AND APPLY THE HAND BRAKE BEFORE MAKING ADJUSTMENTS TO THE 3 POINT ATTACHMENTS OR TO THE DEVICE.
	OPERATOR SEAT POSITION OF THE BACKHOE MUST GUARANTEE A CORRECT POSITION AS REGARDS THE STRUCTURE OF THE ANTI-TILT PROTECTION OR THE STRUCTURE OF THE TRACTOR CAB. IN PARTICULAR AN ADEQUATE SPACE BETWEEN THE STRUCTURE OF THE ANTI-TILT PROTECTION OR THE STRUCTURE OF THE CAB AND THE OPERATOR SEAT MUST BE GUARATEED, AS TO LET THE OPERATOR MAKE ALL THE OPERATIONAL FUNCTIONS IN A COMFORTABLE AND EASY WAY, WITH LARGE SPACES AROUND THE OPERATOR IN ORDER TO WORK IN THE UTMOST SAFETY CONDITIONS.
	ANY APPLICATION ON THE TRACTOR OF THE BACKHOE IS FORBIDDEN IF THE INFORMATION ABOVE MENTIONED IS NOT OBSERVED.
	THE MAXIMUM HEIGHT OF THE OPERATOR SAT ON THE BACKHOE SEAT SHOULD BE LOWER THAN THE HEIGHT OF THE STRUCTURE OF THE ANTI-TILT PROTECTION OR THE STRUCTURE OF THE TRACTOR CAB.

8.1 Hydraulic connections between the BACKHOE and the tractor


The backhoe can function by means of two systems of hydraulic connection to the tractor.

- a) Independent operation by means of a pump assembly and multiplier TECNOAGRI **(method advised)**
- b) Operation by means of the hydraulic system of the tractor

A) Independent operation by means of a pump assembly and multiplier and oil tank

INSTALLATION

- 1- Fill the tank with hydraulic oil ISO 68 or check the oil level if the tank has already been filled.
- 2- Attach the pump assembly and multiplier to the tractor's power take-off

	FASTEN THE PUMP ASSEMBLY AND MULTIPLIER TO A FIRM MOUNTING POINT BY MEANS OF THE BRACKET TO PREVENT IT ROTATING AND COMING OUT OF THE POWER TAKE-OFF DURING OPERATION
---	--

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! •	MAKE SURE THAT THE TRACTOR'S POWER TAKE-OFF IS SET TO A MAXIMUM SPEED OF 540 rpm
---------------	---

! •	DO NOT START THE TRACTOR MOTOR IF THE TANK OF THE HYDRAULIC SYSTEM IS EMPTY. SERIOUS DAMAGE COULD RESULT TO THE PUMP, OR THE ENTIRE SYSTEM.
---------------	--

B) Operation by means of the tractor's hydraulic system

Before making hydraulic connections, the following checks must be carried out

- Make sure that the tractor has a distributor with the ability to lock the lever.
- Make sure that the rapid cut-off couplings are clean.

After having carried out the above-mentioned checks, proceed as follows:

- 1) Locate the feed pipe next to the distributor's maximum pressure valve (on some distributors the direction of the oil flow is indicated by an arrow) and connect it to the tractor's fast delivery attachment.
- 2) Locate the discharge tube and connect it to the return-flow rapid coupling.

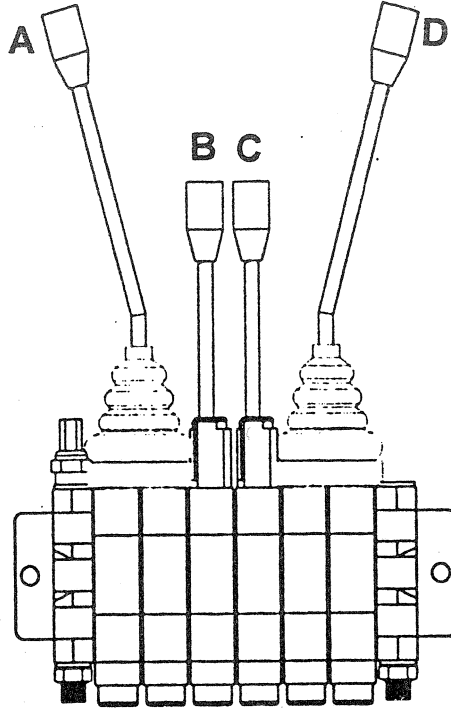
Make sure that the distributor lever is in the required position, ensuring that the direction of the flow of the oil agrees with the delivery and return selected when the tubes of the rapid coupling were connected.

! •	DO NOT EVER REVERSE THE FEED AND RETURN-FLOW PIPE DURING THE LINKAGE TO THE TRACTOR: THERE IS THE RISK THAT THE MACHINE DISTRIBUTOR WILL BURST.
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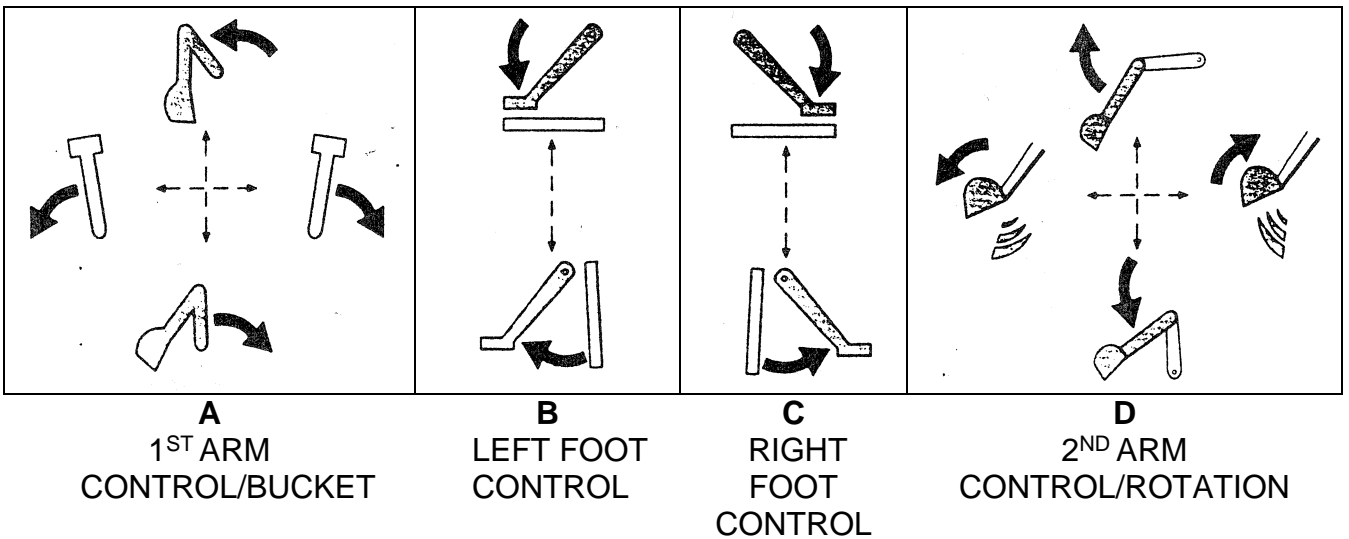
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9. INSTRUCTIONS FOR USE:

A Operations with lever-controlled distributor



The distributor controlling the movements of the BACKHOE operates as shown in the following diagram:



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CONTROL LEVER FOR ARM NO.1- ROTATION

The control lever **A** controls the first arm and rotation.
Moving the lever forward arm No.1 is lowered.
Moving the lever backward arm No.1 is raised
With a movement to the left, the arm rotates to the left .
With a movement to the right, the arm rotates to the right.

B CONTROL LEVER LEFT SUPPORTING FOOT

The control lever **B** controls the left supporting foot.
Moving the lever forward, the hydraulic supporting foot is lowered.
Moving the lever backward the hydraulic supporting foot is raised.

C CONTROL LEVER RIGHT SUPPORTING FOOT

The control lever **C** controls the right supporting foot.
Moving the lever forward the hydraulic supporting foot is lowered.
Moving the lever backward the hydraulic supporting foot is raised.

D CONTROL LEVER FOR ARM NO. 2- BUCKET

The control lever **D** controls the second arm and the movements of the bucket.
Moving the lever forward the 2nd arm opens.
Moving the lever backward the 2nd arm is closed.
Moving the lever to the left, the bucket is closed .
Moving the lever to the right, the bucket is opened.

The order in which the coupling controls function depends on the correct positioning of the hydraulic tubes.

For direct attachment (without pump-assembly multipliers) to JOHN DEER and CASE INTERNATIONAL tractors, the distributor must have a closed circuit.

- ! **If this is not specified at the time of ordering the backhoe, ask for a distributor modification kit together with relevant mounting instructions from TECNOAGRI.**



THE MAXIMUM PRESSURE VALVE OF THE HYDRAULIC SYSTEM IS CALIBRATED AND SET AT THE TIME OF BENCH-TESTING IN OUR WORKSHOP. DO NOT TAMPER WITH IT.

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9.2 Lateral movement and locking the arm

Model E 15 has a fixed arm and cannot make lateral movements.

In all other models it is possible to move the arm along the supporting frame. This allows “straight to the wall” excavations.

The locking and unlocking of the arm support are effected mechanically (by screws) in the E models and by hydraulics (using small hydraulic pistons) in the F models.

In E type models, to move the arm along the supporting frame, proceed as follows:

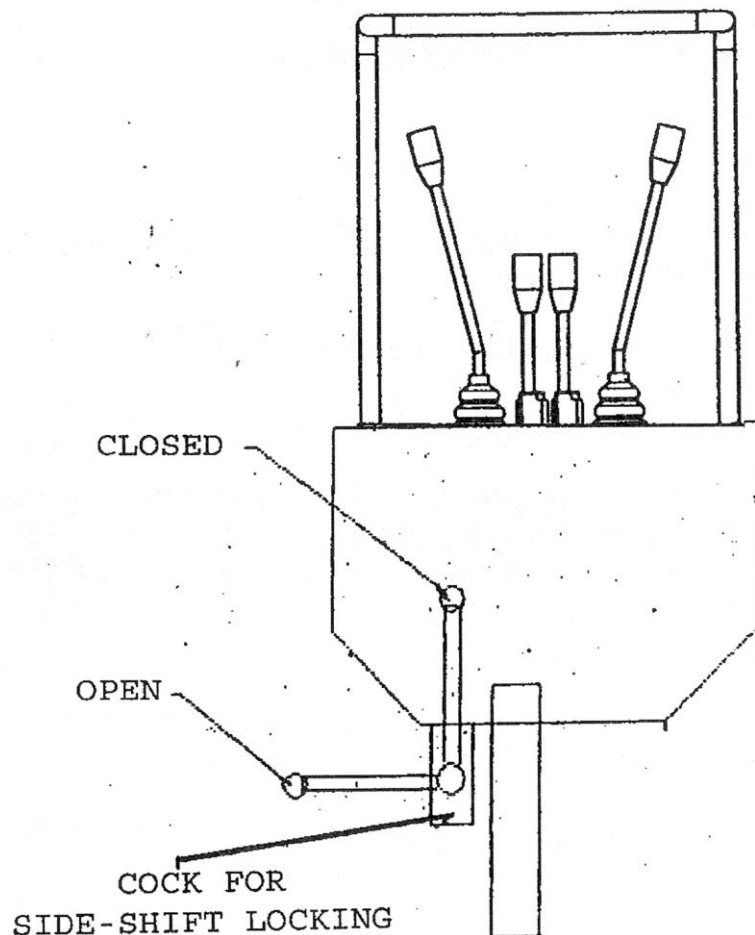
- 1) Rest the bucket on the ground
- 2) In the case of independent functioning with a pump-assembly and multiplier, disconnect the power take off from the tractor.
- 3) Switch off the tractor, remove the key and apply the hand brake;
- 4) Loosen the screws which hold the arm support to the frame;
- 5) Start the tractor and, in the case of independent functioning with a pump-assembly and multiplier, connect the power take-off . Then, by means of the backhoe’s oleodynamic controls, execute a full rotation of the arm to the left or right, sink the teeth of the bucket into the ground and exert pressure by activating the cylinder of the second arm until the arm has moved to the desired position.
- 6) Disconnect the power take-off from the tractor. If working by using the pump-assembly and multiplier, turn the tractor off, remove the keys and operate the hand brake.
- 7) Tighten the arm-support screws in order to ensure that it remains locked in the desired position.

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In F type models, to move the arm along the support frame, proceed as follows:

- 1) Rest the bucket to the ground
- 2) Open the cock to release the transfer cylinders;
- 3) Close the cock;
- 4) Execute a full rotation of the arm to the left or right, sink the teeth of the bucket into the ground and exert pressure by activating the cylinder of the second arm until the arm has moved to the desired position;
- 5) Open the cock again: press any lever of the distributor as far as it will go to re-generate pressure in the system and, holding it down at the same time, close the cock.

THE BACKHOE ARM WILL NOW BE LOCKED IN THE DESIRED POSITION.

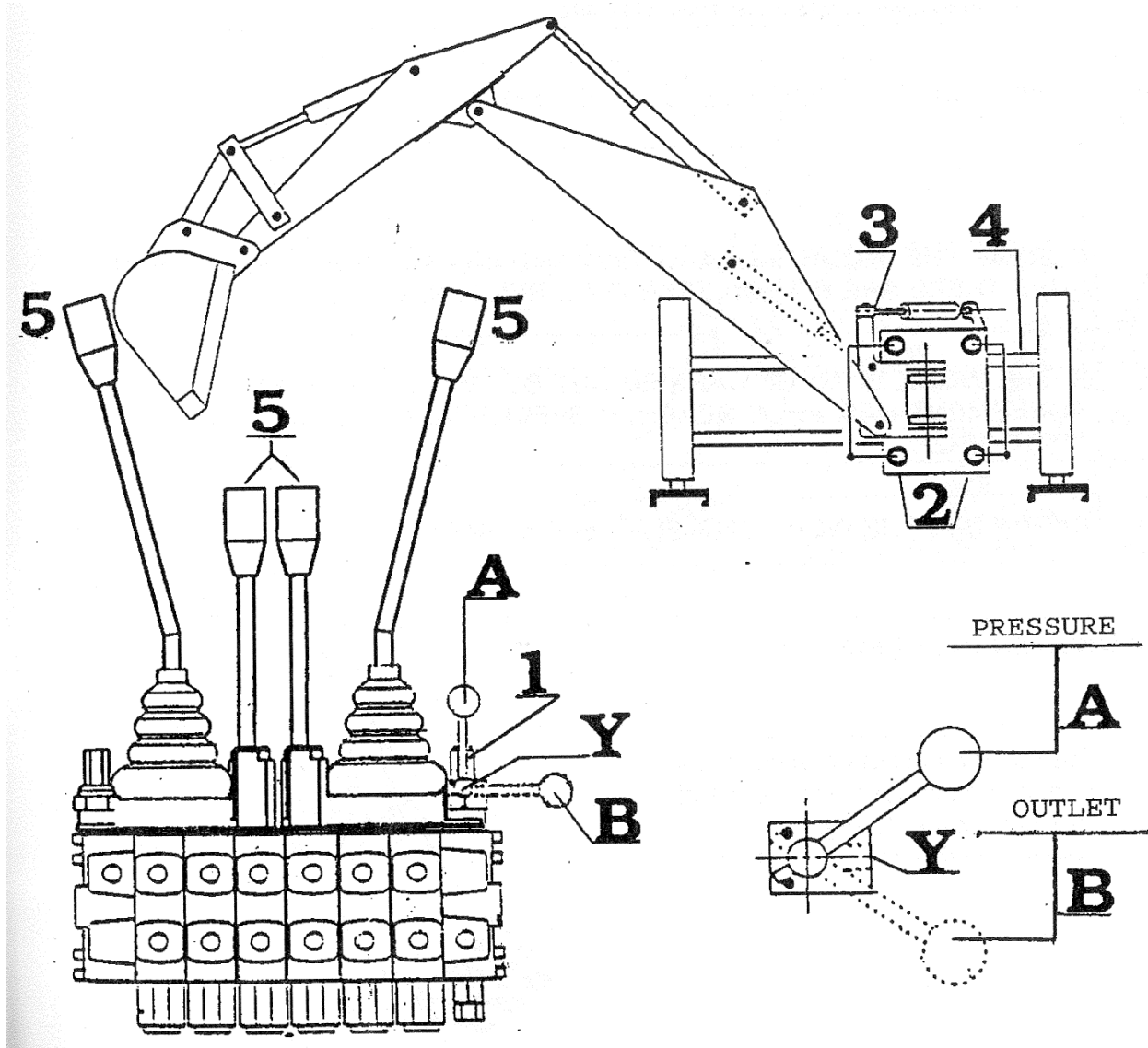


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If the backhoe is equipped with a distributor having a lock control cross piece incorporated in it (as illustrated below) proceed as follows:

- 1) Move lever **1** to position **B** (moving it clockwise) and push or pull any lever **5** of the distributor: by so doing, the small hydraulic cylinders **2** will unlock;
- 2) execute a full rotation of the arm to the left or right, sink the teeth of the bucket into the ground and exert pressure by activating the cylinder of the second arm until the arm has moved to the desired position;
- 3) Return lever **1** of the distributor to position **A**, which will cause the hydraulic clamps **2** to exert pressure;

THE BACKHOE ARM WILL NOW BE LOCKED IN THE DESIRED POSITION.



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9.3. DISMANTLING AND MOUNTING THE BUCKET

9.3.1 Security regulations

Mounting and dismantling the bucket must be carried out by personnel who is professionally qualified, who is competent and has an understanding of mechanical matters.



WHEN PIVOTS ARE MOUNTED OR DISMANTLED, ALWAYS WEAR GLOVES, PROTECTIVE GOGGLES AND A HELMET TO GUARD AGAINST SPLINTERS. ALWAYS WEAR ANTI-SLIP FOOTWEAR.



NEVER USE YOUR FINGERS TO CHECK THE ALIGNMENT OF THE HOLES.



DURING THE MOUNTING AND DISMANTLING OF THE BUCKET, MAKE SURE THERE ARE NO NON-ESSENTIAL PERSONNEL NEARBY



IF THE WORK IS TO BE CARRIED OUT BY TWO PEOPLE, ENSURE THAT AGREEMENT HAS BEEN REACHED BEFOREHAND ON THE SIGNALLING TO BE USED.

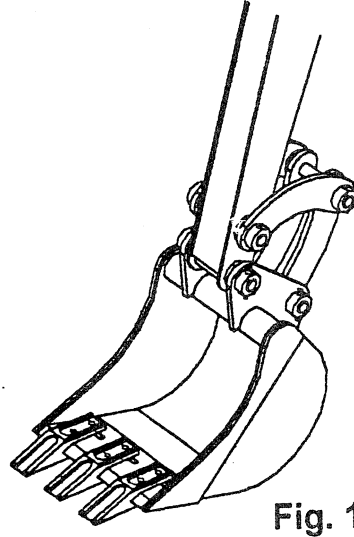


CARRY OUT THE WORK ON A FLAT, SOLID SURFACE

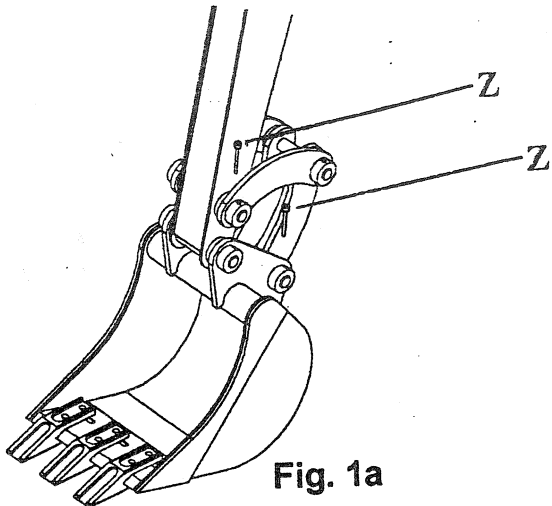
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9.3.2 Dismantling of the bucket

- 1) Position the bucket on a solid, flat surface with the base set on the ground as shown in Fig 1



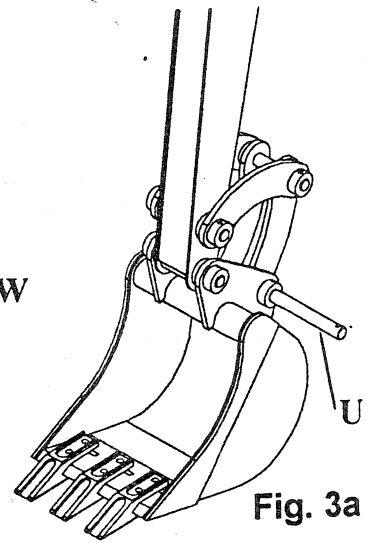
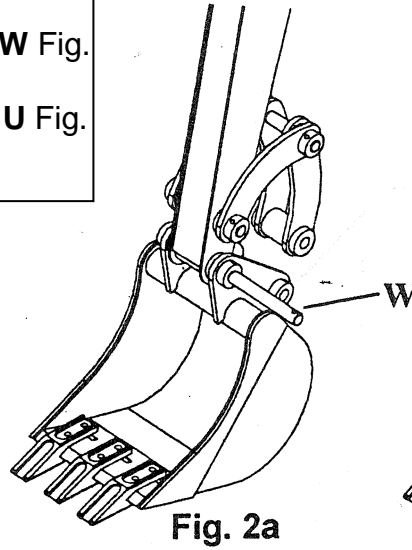
- 2) Stop the tractor, remove the keys and apply the hand brake;



- 3) Remove the safety pivot stops **Z** Fig.1a

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- 4) Remove the stud of the pivot **W** Fig. 2a and the pivot of connecting rod **U** Fig. 3a

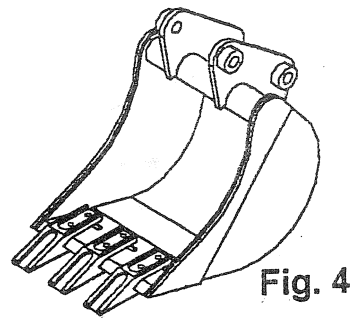


- 5) After making sure that the area surrounding the equipment's work place is clear, raise the arm carefully using the oleodynamic control, until it is free from the bucket

- 6) Remove the bucket

9.3.3 Mounting of the bucket

- 1) Position the bucket on the ground on a solid, flat surface with the base set on the ground Fig. 4;



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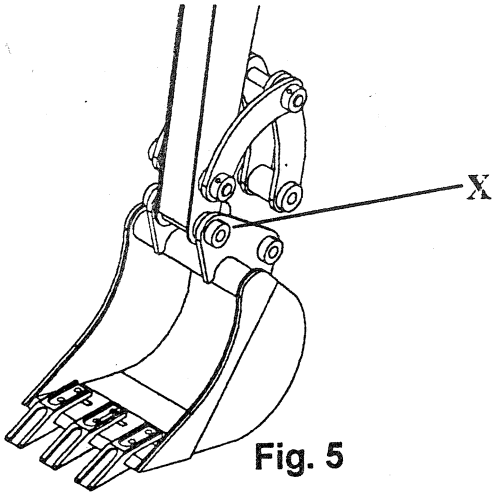


Fig. 5

2) Align the arm of the equipment with the bucket until it is in alignment with the pivot opening **X** Fig. 5;

3) Stop the tractor, remove the keys and apply the hand brake;

4) Insert the stud of the pivot **W** Fig. 5a;

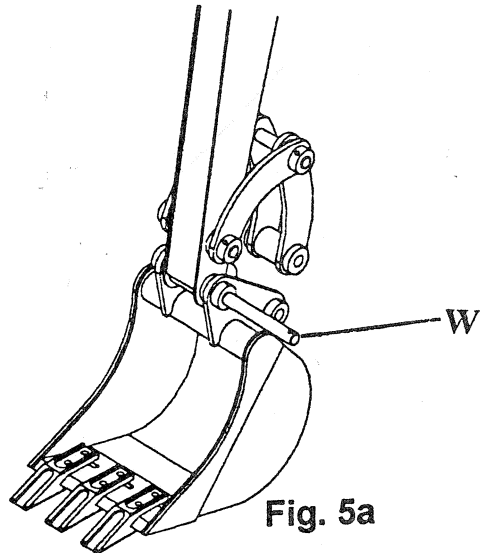


Fig. 5a

5) After making sure that the area is clear, align the hole of the connecting rod **y** by means of the oleodynamic controls Fig.6

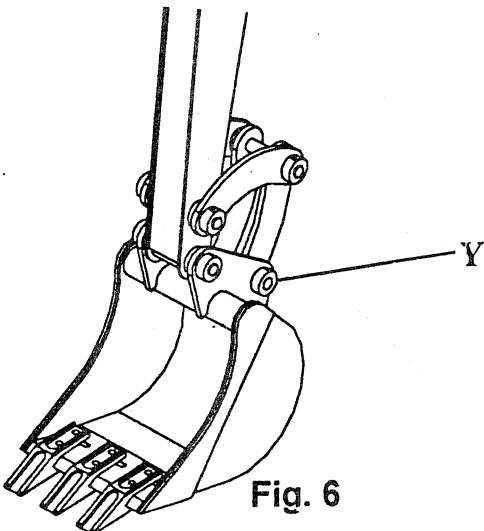


Fig. 6

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6) Stop the tractor, remove the keys and apply the hand brake;

7) Insert the connecting rod pivot **U** Fig. 6a;

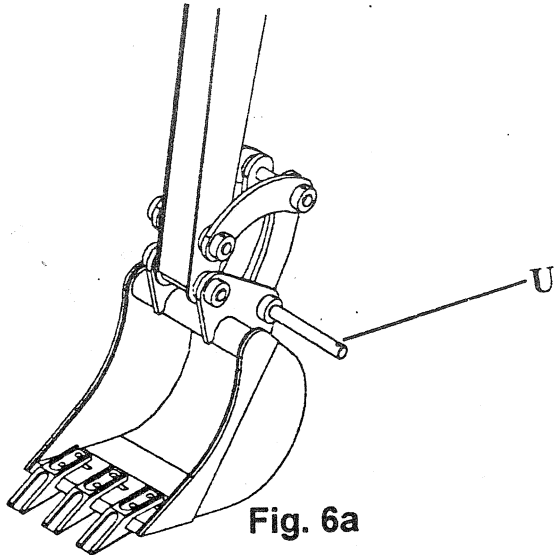


Fig. 6a









8) Lock pivot **U** and pivot **W** with the proper pivot stops **Z** Fig. 7

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9.4 Working Stages

During work which involves excavation, trench digging and transporting materials which result from these works, particular care and attention must be used, in compliance with what is contained in this manual.

Particularly:

	BEFORE CLIMBING ON BOARD THE MACHINE, WALK AROUND AND INSPECT IT. DO NOT START THE MOTOR IF THERE ARE LABELS INDICATING MALFUNCTIONS OR DANGER ATTACHED TO THE CONTROL LEVERS OR IN THE DRIVER'S CABIN
	BEFORE STARTING THE MOTOR CHECK THE AREA WHERE WORK IS TO BE CARRIED OUT TO ENSURE THAT THERE ARE NO IRREGULARITIES WITH THE GROUND WHICH COULD CONSTITUTE DANGERS
	AFTER HAVING EXAMINED THE AREA WHERE WORK IS TO BE CARRIED OUT, AND BEFORE STARTING THE TRACTOR'S MOTOR, FAMILIARISE YOURSELF WITH THE WORK PLAN AND THE BEST MEANS OF WORKING SAFELY
	WHEN TURNING THE MOTOR ON, GIVE A SHORT ACOUSTIC SIGNAL
	MAKE SURE THERE IS NOBODY WORKING WITHIN THE BACKHOE'S RANGE OF OPERATIONS DURING DIGGING AND TRANSPORT AND LOADING OPERATIONS
	DO NOT STOP OR WORK BENEATH THE ARMS OF THE MOVING PARTS.
	DO NOT ATTEMPT TO MOVE ON OBSTACLES WHICH COULD TILT THE TRACTOR
	TO AVOID SLIDING, DO NOT WORK ON SLOPES, WET GRASS OR AREAS COVERED WITH LEAVES

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DO NOT OPERATE CLOSE TO POWER SUPPLY LINES AND OBSERVE MINIMUM DISTANCES FROM THE OVERHEAD CONDUITS AS PRESCRIBED BY THE REGULATING AUTHORITIES AND/OR BY THE ACCIDENT PREVENTION LAWS IN FORCE. ASCERTAIN FROM THE AUTHORITIES CONCERNED THE MINIMUM SAFETY DISTANCE FROM POWER LINES; THIS CAN VARY ACCORDING TO THE VOLTAGE FROM COUNTRY TO COUNTRY AND IN RELATION TO THE CLIMATE AND HUMIDITY PRESENT IN THE AIR.



DO NOT OPERATE AT THE FOOT OF HIGH GROUND WHICH COULD COLLAPSE, CAUSING FALLING DEBRIS



DO NOT DIG BENEATH THE FRONT OF THE EQUIPMENT, BECAUSE THE EARTH COULD COLLAPSE



DO NOT USE THE MOMENTUM OF THE BUCKET AS A PILE-DRIVER, WRECKER OR ROAD-BREAKER



DO NOT USE THE BACKHOE AS A HOIST TO LIFT LOADS



WHILST TRACTOR MOVING THE OPERATOR OF THE BACKHOE SHOULD GET DOWN OFF THE BACKHOE SEAT.

9.4.1 Excavations

During excavation operations the maximum digging force will be obtained when the bucket cylinder is perpendicular to the joint, and the second arm cylinder is perpendicular to the second arm.

9.4.2 Trench digging


When undertaking this type of operation it is advisable to use a bucket whose width is in proportion to the size of the trench to be dug.


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9.4.3 Loading

During loading operation the truck to be loaded must be parked in a position clearly visible to the operator of the backhoe, with the motor switched off and hand brake applied.

	WHILST MOVING THE BACKHOE, LIFT THE BUCKET ABOUT 20 - 30 cm FROM THE GROUND
---	---

	IF OBSTACLES SUCH AS BOULDERS, TREE TRUNKS ETC. ARE IN THE WAY, REMOVE THEM. DO NOT DRIVE THE BACKHOE OVER THEM
---	---

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10. Precautions

IMPORTANT



Sufficient working space must be provided to ensure the safety of both the operator and maintenance personnel



UNDER NO CIRCUMSTANCES OPERATE THE TRACTOR'S HYDRAULIC HOIST WHEN THE BACKHOE IS ATTACHED TO THE TRACTOR. TAKE ADEQUATE SAFETY MEASURES (locking, bracing, etc...) SO AS TO PREVENT ACCIDENTAL ACTIVATION OF THE HYDRAULIC HOIST. FAILURE TO COMPLY WITH THIS INSTRUCTION CAN CAUSE DANGEROUS ACCIDENTS



ALL MOVEMENTS MUST BE CARRIED OUT BY THE OPERATOR WHO, AFTER HAVING TAKEN ALL NECESSARY ACCIDENT PREVENTION MEASURES, WILL LEAVE THE BACKHOE OPERATOR'S POST FOR THE TRACTOR DRIVER'S SEAT AND MOVE THE TRACTOR TO WHICH THE BACKHOE IS ATTACHED



WHEN READY TO BEGIN MAKE SURE THE EQUIPMENT IS NOT LEFT UNATTENDED



IN CASE OF BREAKAGE OR DAMAGE TO THE EQUIPMENT, MAKE ABSOLUTELY SURE THAT IT IS TAKEN OUT OF SERVICE UNTIL IT HAS BEEN COMPLETELY RESTORED TO ITS PROPER WORKING ORDER



DO NOT UNDERTAKE WORK ON AND/OR MAKE CHANGES TO THE EQUIPMENT WHICH INVOLVE CHANGES TO THE MACHINE ITSELF



DO NOT REMOVE THE SAFETY SIGNS FROM THE EQUIPMENT AND MAKE SURE THEY ARE ALWAYS CLEARLY VISIBLE AND LEGIBLE. SHOULD THEY BE DAMAGED, ASK TECNOAGRI SRL OR YOUR DISTRIBUTOR FOR REPLACEMENTS

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11. Driving on public roads



OBSERVE ALL TRAFFIC REGULATIONS. ENSURE YOU COMPLY WITH THE REGULATIONS FOR TRAVELLING ON PUBLIC ROADS IN FORCE IN THE COUNTRY WHERE THE MACHINE IS BEING USED

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Part D – Putting Out of Service

12. Dismantling from the Tractor

Should it be required to detach the backhoe from the hoist, proceed as follows:

- 1) Locate a flat, solid area;
- 2) Rest the bucket and the hydraulic feet on the ground;
- 3) Stop the engine, remove the ignition keys from the tractor and apply the hand brake;
- 4) Dismount from the tractor and disconnect the rapid release couplings or the pump assembly and multiplier, depending on whether the tractor's functions are being performed via an hydraulic system or an independent pump assembly and multiplier;
- 5) Lower the hoist arms and loosen the anti-vibrations and locks (chains and/or rods);
- 6) Remove the safety pins from the mounting studs in order to disconnect the lower arms of the lifting device (braces).
- 7) Remove the pivots of the stabilizer arm from the third upper point on the tractor.



DO NOT STAND BETWEEN THE TRACTOR AND THE EQUIPMENT DURING DISASSEMBLY.



PUT THE BACKHOE IN A SAFE AREA WHERE IT WILL NOT FALL OR TILT OVER.



WHEN NOT IN USE PROTECT THE MACHINE FROM BAD WEATHER

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13. Storage of parts

13.1 Storing and conservation

In the event of the machine and/or its component parts being put in storage and kept for any length of time, before putting it to use, and in order to avoid damage or deterioration, proceed as follows:

- Before storing, protect the structural parts and the working surfaces with an antioxidant product.
- The equipment may be stored in locations having the following characteristics:
 - dry, covered places or at least, protected from atmospheric conditions and from corrosive agents (acid vapours, salt-laden fog, etc.).
- For storage periods longer than two years, ask the manufacturer for proper storage instructions.

13.2 Assembly after storage

Before putting machines and component parts back into service after having been stored for long periods of time, the following operations must be carried out :

❖ **For the structural parts**

- remove all traces of oil, grease and anti-rust agents;
- clean the mating surfaces of all joints.
- repair structural damage (distorted corners, scratched surfaces, chipped paint, etc.).

❖ **For the working mechanisms**

- check for damage, wear and tear or play in the joints, in the cylinders, and in the hydraulic tubes;
- check for loss of lubricants and replace any defective washers;
- top up the oil levels;
- check that all components are bolted tightly to the main structure;
- remove all traces of lubricants and anti-rust protection;
- remove all traces of rust from sliding surfaces and from controls
- remove any water found lying in hollow parts or in working mechanisms;
- lightly grease sliding parts.

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Part E - MAINTENANCE

14. Information

- ❖ Before mounting the machine, carry out the following operations:
 - Carefully read the technical documents;
 - Familiarise yourself with the machine's functioning;
 - Learn what protection and safety measures are available on the machine, their location and their working.

- ❖ Undertaking maintenance work may expose the workman to serious risks. Therefore the following instructions must be scrupulously followed:
 - The person who is to carry out the above mentioned operations must be authorised to do so and must have been taught how to do it, especially with regard to the operational procedures to be followed, dangerous situations which could arise, and the correct way to avoid them. Persons carrying out such work must, without fail, exercise extreme caution and prudence at all times.

 - If, in exceptional cases and in order to carry out specialized technical maintenance, inspection or repair work, the personnel in charge finds it necessary to completely deactivate or partially remove protective covers, it is his strict obligation that on completing of the job, **the covers be immediately replaced**. When carrying out overhauls the personnel in charge must make sure that on completion of the work, all the normal safety precautions are back in force. Upon completion of the task, the personnel in charge must also ensure that no foreign objects have been left inside the machine such as mechanical parts, tools, or equipment used in carrying out the job which could cause damage or malfunctions.

 - Before starting work, personnel in charge of maintenance, inspection and repair work must disconnect the power supply of the machine and take all the required safety measures.

 - Before starting work, the personnel in charge must first check the following:
 - The machine must be on a flat and solid surface with any attached equipment resting on the ground
 - The tractor's ignition keys must have been removed, the hand brake must have been applied and all necessary preventive measures must have been put into effect (warning signs, immobilising devices, etc.) in order to avoid the accidental starting of the machine or its parts during the operation.
 - Mechanical systems or assemblies powered by their own self-contained sources of energy, be in a non-working mode or turned off.
 - To safeguard their own safety, personnel in charge of maintenance, inspection and repair work must follow the warnings displayed on the signs.


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- ❖ Personnel required to drive the machine or who are in charge of maintenance must be well trained and have a sound knowledge of accident prevention regulations. Unauthorised personnel must not enter the area whilst work is in progress.
- ❖ The accident prevention precautions laid out in this paragraph must always be strictly observed when the equipment is in use or undergoing maintenance in order to prevent harm to the workers or damage to the machine.
- ❖ Such precautions are highlighted and treated in detail in the Manual, which should be consulted every time a procedure which could incur risk of damage or accidents is called for, under the headings **WARNING** and **DANGER** :
 - **WARNING** instructions precede an operation which, if not properly executed, may cause damage to equipment.
 - **DANGER** instructions precede an operation which, if not properly executed, may cause an accident.

14.1 Warning instructions

	During maintenance work pay attention to the following warnings !
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- Before using the machine after a breakdown or malfunction, it must be carefully inspected and checked for possible damage.
- Never interfere with the adjustments and positioning of the safety devices, unless expressly required to do so to repair damages.
Tampering with them can cause serious harm to both persons and the machine.

	Should maintenance work have to be carried out in poorly lit areas, install additional lighting to ensure safe working conditions as required by the current legislative rules in force.
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14.2 Danger warnings

	During maintenance work pay attention to the following dangers !
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- Disconnect all the machine's power supplies – both main and auxiliary – before undertaking any maintenance work. Display warning signs **MACHINE UNDER MAINTENANCE – DO NOT START**.

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- Never remove the safety and protective devices which are installed on the machine. Should it be necessary to do so, however, display warning signs and proceed with the greatest care.
- Failure to ground the equipment properly can cause serious harm to people. Always ensure that earthing connections are in place and that they comply with the regulations.
- Avoid the use of flammable or toxic solvents such as petrol, benzene, ether and alcohol. Avoid prolonged exposure to solvents and the inhalation of their fumes. Avoid using them near open flames or heat sources; ensure proper ventilation.
- Before starting the machine, always ensure that maintenance personnel are at a safe distance and that no equipment or materials have been left on the machine or close to it.
- Equipment installation must always be carried out in compliance with accident prevention regulations.
- Always ensure that all protective devices are in place and properly closed before starting the machine.
- Always ensure that the tools to be used are in good condition. Never use equipment which is worn out or damaged, or which is of poor quality or improvised.
- Never use fingers to check the alignment of holes.
- Never perform manually tasks which require the use of tools.
- Equipment to be mounted on to the machine or which has been detached from it must be placed in a safe area and in such a way as to ensure that they cannot fall or be overturned.
- Ensure that cables or chains and lifting hooks to be used in the setting up or dismantling of the main equipment are in good condition and strong enough to carry the weight which is to be lifted.
- Wear personal protection:



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15. QUALIFICATION OF THE PERSONNEL IN CHARGE OF MAINTENANCE

15.1 General requirements of the personnel


In order to resolve problems regarding the maintenance of the machine, personnel responsible for maintenance must :


- know the regulations regarding accident prevention during the course of machine operations which are in force and be able to apply them;
- have read and understood the chapter "Safety and Accident prevention";
- know how to consult and use the manual;
- be interested in the machine's functioning;
- be able to recognise a malfunction if it occurs and, if the situation requires, apply the necessary measures.


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16. RECOMMENDATIONS REGARDING MAINTENANCE

- ❖ Remember that well-executed maintenance work will greatly reduce the time a machine is out of service following a breakdown.
- ❖ Repair work carried out without delay when needed will eliminate further problems. Use original spare parts and undertake repairs to damaged components with care. Such repairs should be done on the owner's premises or send the machine to the manufacturer.
- ❖ To prepare the machine for maintenance work, the following instructions must be followed:
 - Those who are to undertake both routine and special maintenance must have carefully read and understood all the instructions contained in this chapter and in Part B of the manual.
- ❖ Both routine and special maintenance work must only be performed by qualified and authorised personnel.
- ❖ Ensure that the machine undergoing repairs is clearly and visibly indicated for the benefit of others so as to prevent its use by others.

	<ul style="list-style-type: none">• All repair work must be carried out while the machine is at a standstill when the bucket or arm-ended attachments resting safely on the ground, using the appropriate equipment and personal safety equipment in compliance with the laws in force.• Before undertaking any repair work, always ensure that the pressure systems have been de-pressurised, and affix a sign with the warning: "machine under repair".
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	<p>As certain operations related to control, maintenance, repair and replacement are carried out at a dangerous height above ground level, the personnel in charge must have available suitable equipment (elevating platform, ladders etc.) which will allow the work to be carried out safely, in compliance with the safety laws in force. Workers must also be in possession of all devices required for personal protection as required by the regulations.</p>
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	<p>During maintenance or adjustments of the equipment or any of its parts, it is forbidden to undertake work manually for which special tools are required.</p>
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- ❖ During all maintenance work, attention must be paid to the signs which could indicate a forthcoming breakdown. In particular:
 - the presence of traces of corrosion;
 - signs of wear.

- ❖ For any problems arising or when ordering spare parts refer to **TECNOAGRI's** Technical Assistance Service.

16.1 Routine maintenance

Includes maintenance operations which can be carried out directly by the operator or by qualified maintenance personnel in accordance with the instructions given in this documentation and which do not require the use of special tools or equipment. Such operations fall into the following category:

- ❖ **daily checks by the operator :**
 - general visual checking;
 - functional checks (lever, movements, etc.);
 - checking of the condition of rubber and metal tubing;
- ❖ **weekly checks by qualified maintenance workers :**
 - visual check of all mechanisms and checking for oil loss;
 - movement check and if necessary, greasing of the sliding surfaces of the moving parts and joints, to ensure their proper working and to minimise wear;
 - checking rubber and metal tubing and pivots ;
- ❖ **monthly checks by qualified maintenance personnel :**
 - check the proper functioning and possible wear of pivots and sockets;
 - check the wear of the rubber and steel tubing, pivots and sockets;
 - check that moving parts and joints slide and bend properly;
 - check that moving parts and joints are greased.

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16.2 Periodic maintenance

Includes the maintenance work, carried out by qualified maintenance workers who have been trained as such by means of this manual and relates to checks and eventual replacements as outlined in the timetable of the maintenance schedule.

The parts of the machine which must be checked and when necessary replaced are:

- **Rubber tubes :**

Before starting, check periodically - weekly or monthly - the condition of the hydraulic tubes to ensure that they are not in a state of deterioration.

Always take the necessary action, whether by repairing or replacing, every tube which is loose or which shows signs of abrasion, tear, defective mounting, or oil loss even from the connections.

Check the connections and ensure that they have been properly joined in relation to each other before pressurising the hydraulic circuits.

- **Treatment of hydraulic tubing:**

- Avoid bending, or scratching tubes of the hydraulic system with sharp or abrasive objects.
- Replace tubes which show any signs of damage caused by crushing, cracking, use, or with defective connections and avoid using them again. They could explode during use.



The hydraulic circuits are under pressure and therefore, before adding or removing hydraulic oil, inspect the circuit, place the equipment on the ground and completely discharge the remaining pressure in the system, operating the control lever several times, having first switched off the tractor motor.



THE HYDRAULIC SYSTEM IS UNDER PRESSURE. SLOWLY UNSCREW THE FILLING PLUG TO LET OUT THE REMAINING PRESSURE



The jet of oil which small losses from the tubes under pressure can generate is dangerous: it can pierce the skin or damage the eyes.
Always wear thick gloves and safety goggles.



The hydraulic oil in the system is hot, even when use is no longer being made of the machine. Wait for the oil to cool down before carrying out any work on hydraulic lines.



CAREFULLY AND IMMEDIATELY CLEAN UP ANY OIL SPLASHES AS THEY CAN CAUSE SLIPS.

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• **Oil Filter :**

The first change of the hydraulic oil filter cartridge must be done after 60 hours of operation.

After the first oil change, the oil filter cartridge should be replaced every 400 hours. REQUEST AN **ORIGINAL** REPLACEMENT FROM TECNOAGRI.



The hydraulic oil in the system is hot, even when use is no longer being made of the machine. Wait for the oil to cool down before carrying out THE REPLACEMENT



THE HYDRAULIC SYSTEM IS UNDER PRESSURE. SLOWLY UNSCREW THE FILLING PLUG TO LET OUT THE REMAINING PRESSURE



THE DISPOSAL OF THE OIL AND FILTERS MUST BE CARRIED OUT BY COMPANIES AUTHORISED TO DO SUCH WORK AND IN ACCORDANCE WITH THE CURRENT REGULATIONS IN FORCE

- 1) Disconnect the backhoe on flat, solid ground;
- 2) Unscrew and remove the oil filter cartridge;
- 3) Clean the base on which the fastening washer which holds the filter support rests;
- 4) Grease the fastening washer of the new filter and screw it in place until it sits firmly on the support, and then make a half turn.

16.3 Cleaning



Cleaning operations must be carried out whilst the machine is switched off, after having removed the ignition keys and applied the hand brake of the machine on which the backhoe is mounted.



Those who are to perform the cleaning must wear the right working overalls as well as being in possession of suitable personal safety equipment enabling them to work in conditions of safety and in accordance with the rules and legislation currently in force.

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❖ **To undertake the cleaning you need to :**

- Remove any foreign objects and dirty substances using suction devices, cloths, etc.
- Wipe off excess grease/oil on parts.
- Wash with hot water jets or steam and detergent liquids such as are readily available on the market.



For cleaning: do not use diesel oil or petrol as they form an oily layer to which dust can easily adhere. Do not use solvents as they damage the rubber parts and paint.

16.4 Lubrication of the machine

❖ Lubricating the moving parts is necessary to avoid direct contact of the rolling load-bearing surfaces and plain bearings.

It prevents wear of these parts and helps make the operations carried out by the machine smoother.

❖ The careful lubrication of the machine and its parts is necessary to ensure the efficient performance of the use to which it is to be put, as well as prolonging its life-span.

❖ In time the lubricating power of the lubricant diminishes as a result of what it is required to do, therefore replenish or change the lubricant as needed.

❖ It is advisable to use only the amount of lubricant needed to lubricate the parts involved. Bear in mind that the minimum quantity of lubricant needed also depends on auxiliary functions which it must perform, for example the dispersal of heat.


❖ Use only lubricants of known and tested quality.

❖ An excess of lubricant can be as detrimental to the proper functioning of the machine as a lack of it.

❖ Lubricating the machine is very simple and can be carried out by personnel who are not highly specialised. They must however scrupulously follow the instructions contained in this manual and observe the following:

- Carefully clean the grease nipples before injecting grease to prevent the introduction of foreign matter such as dust and mud which, contaminating the grease, would diminish its lubricating ability.
- After lubrication, remove all excess grease.


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	<ul style="list-style-type: none">• Lubricants, solvents and detergents are toxic and harmful to health:<ul style="list-style-type: none">• if they come into direct contact with skin, they can cause irritations• if inhaled they can provoke serious intoxication• if swallowed they can lead to death• Handle them with care and use sufficient personal protection as laid down in the rules currently in force.• Do not litter the environment. Ensure they are disposed of in accordance with the current legislative rules waste disposal.
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16.5 Spare parts

❖ Damaged and/or worn out parts in need of replacement must **ONLY BE REPLACED WITH ORIGINAL SPARE PARTS** made by **TECNOAGRI** they being the only party able to provide a guarantee of quality and inter-changeability. They can be ordered directly from:

<p>TECNOAGRI SRL Via Marconi, 49 – 48017 CONSELICE (RA) ITALY Tel. +39 0545 85023 - Fax. +39 0545 85123 e-mail : tecnoagri@tecnoagri.it</p>
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	<p>The use of non original spare parts, in addition to rendering the guarantee null and void, can also compromise the proper functioning of the machine.</p>
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17. MALFUNCTIONS AND SOLUTIONS

- The main causes of malfunctions related to the various operational functions of the machine – such as can be reasonably foreseen – are here listed. The table below shows the nature of problems, possible causes, and suggests solutions for restoring the machine to its operational state.

PROBLEM	CAUSE	SOLUTION
The cylinders are slow in their movements, with oil loss and a drop in pressure of the system.	Gasket wear and tear/ distributor leaks/ broken or cut pipes/ lack of oil in the hydraulic circuit/ insufficient supply of oil from the pump	Replace the gaskets/ replace the distributor/ replace the pipes/ add oil/ change the pump
Once the translation has been effected, the arm bearing moves.	Incorrect locking of the translatable bearing/ The flexible tubes lose oil/ The locking device (or stop-cock) allows oil to leak	Repeat the operation correctly/ Replace the pipes/ Replace the gasket of the locking cylinders/ Replace the locking device or the cock
The arm support does not move when translation is to be done.	Incorrect release of the translatable bearing/ The small hydraulic locking and releasing cylinders of the translatable bearing are blocked	Repeat the operation correctly/ Check the wear and tear and the state of maintenance of the small locking and releasing cylinders. Replace the gaskets, remove dirt and foreign bodies

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17.1 Failure of attempted repairs

In the event of an unsuccessful attempt at reparation, follow the procedures required for putting the machine out of service, indicate the machine is out of use by means of clear signs and submit a request for servicing.

18. DISMANTLING, DISPOSAL AND SCRAPPING

If the machine is to be scrapped, the disposal of its parts must be carried out differentiating between the various compositions of its parts (i.e. metals, oils and lubricants, plastic and rubber, etc.) by entrusting the task to companies specialised and qualified in the field, and in any event, the task must be performed in compliance with regional laws regarding the disposal of industrial waste.

Before undertaking dismantling or scrapping work, prepare a suitably sized area around the machine in which authorised personnel may safely work.

To dismantle and then demolish the machine you must:

- Dismantle the components separating them according to their material and type.
- Pre-arrange for the recycling of the materials and components which allow it.
- Send the materials and components which cannot be recycled to the authorised disposal areas.



- **The eventual demolition of the machine at the end of its life-cycle must be entrusted to specialised and authorised personnel in compliance with the current rules in force.**
- **Do not disperse polluting substances into the environment**

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