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Menzi IHI

Operator's manual

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**menzi
muck**



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EUROCOMACH®

**Operation and maintenance manual
COMPACT TRACKED EXCAVATOR**

YANMAR ENGINE

ES 850 ZT

ES 850 SB

ES 950 TR

ES 900 UR



This manual must always be kept on-board the machine.

**01-10-12 Release
Rev. 01
Code B000201209**

"Translation of the original instruction"

TESTING REPORT AND CERTIFICATE OF GUARANTEE

Machine
Serial No.
Motor type
Serial No.
Date of delivery
Dealer
The undersigned.....
Company Proprietor / Representative.....
Residing at
Via No. Tel.....

carried out the working tests and checked the proper functioning of the operating machinery in question and related accessories, under his/my/the manufacturer's personal responsibility

CERTIFIES

that the testing was deemed to be satisfactory and that the abovementioned equipment is accepted in its entirety, without reserve. He also confirms that he has taken note of the manufacturer's general GUARANTEE conditions listed overleaf and that he accepts them. In addition, declares himself satisfied with the verbal technical explanations given and, having ascertained that the operating machinery in question complies with what was ordered, hereby signs in acceptance of this TESTING REPORT AND CERTIFICATE OF GUARANTEE.

On, ...Signed.....

GUARANTEE CONDITIONS

This certificate forms an integral part of the "operation and maintenance" manual and, in order to validate GUARANTEE, it must be fully compiled by the Customer and sent by registered mail to the Company, SAMPIERANA S.p.A., Via L. Da Vinci, 40 - 47026 S. Piero in Bagno (FC), within ten days from the date of delivery.

Delivered by Mr.

From the Company

Technician's signature

CUSTOMER's copy



GUARANTEE

The Manufacturer furnishes this certificate to every Purchaser of this machine. The Manufacturer hereby certifies that all parts of the machine to which this certificate refers are free of defects in terms of materials, workmanship and assembly.

The Manufacturer undertakes to replace, or arrange for replacement by an authorised workshop and to repair, or arrange for repairs by an authorised workshop of any defective parts for a period of 12 (twelve) months from the date of delivery, or the first 1000 (one thousand) working hours, whichever is the shorter.

In terms of this guarantee, the Manufacturer or Vendor will debit the User with any travel costs, travelling expenses and any other costs incurred in the carrying out of any interventions away from the Vendor's Premises, while the cost of any spare parts replaced will not be debited to the User.

This guarantee specifically does not cover tyres, inner tubes, electrical components, starter motor nor any component not produced by the machine Manufacturer himself.

This guarantee shall become null and void in the following cases:

- where the machine has been used for purposes other than those for which it was built;
- where someone other than an authorised workshop has carried out repairs or replacements;
- where the reported defects derive from accidents or negligence, or from improper utilisation of the machine;
- where the machine has been fitted with any parts not produced by the machine Manufacturer and where the utilisation of such parts has led to the reported defects;
- where the machine has been modified, repaired or disassembled by unauthorised workshops.

This guarantee certificate completely replaces any other implicit or explicit guarantee contained in any previous agreement, legal provision or use.

In terms of art. 1341 and 1342 of the Civil Code, the undersigned confirms that he fully understands and unconditionally accepts all the exclusions from the guarantee contained in point 2, as well as the limits of the validity of the guarantee, as listed in point 1 of this certificate.

The Company, **SAMPIERANA S.p.A.**, declines any responsibility for whatever injury to persons or damage to equipment, or issues arising from the utilisation of, or for reasons of, or relating to the products supplied, even during the pre-delivery testing.

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Delivered by Mr.

From the Company

Technician's signature

DEALER's copy

.....



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Delivered by Mr.

From the Company

Technician's signature

MANUFACTURER's copy

.....



GUARANTEE

The Manufacturer furnishes this certificate to every Purchaser of this machine. The Manufacturer hereby certifies that all parts of the machine to which this certificate refers are free of defects in terms of materials, workmanship and assembly.

The Manufacturer undertakes to replace, or arrange for replacement by an authorised workshop and to repair, or arrange for repairs by an authorised workshop of any defective parts for a period of 12 (twelve) months from the date of delivery, or the first 1000 (one thousand) working hours, whichever is the shorter.

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REPLACEMENT OF MANUALS

In the event that the Use and maintenance manual is lost, please contact your local EUROCOMACH service centre.

For any communications relating to the machine purchased, as well as any questions or comments on this operation manual, please refer to the following address:

SAMPIERANA S.p.A.

40 Via Leonardo da Vinci

47026 S. Piero in Bagno (FC)

Tel. ++39 0543 904211

Fax ++39 0543 903108/918520/901246

E-Mail: info@sampierana.com

<http://www.eurocomach.com>

MANUAL

CODE	B000201209
SERIAL NUMBER	CS 00051 →  CM 00051 →  CR 00051 →  CP 00051 → 
PRINTING DATE	01-06-10
YEAR OF MANUFACTURE	20_ _

ENGINE

BRAND	YANMAR
MODEL	4TNV98 - ZSPR
DISPLACEMENT	3319 cc
SERIAL NUMBER	

1.0 Introduction

The safe use of your machine is first and foremost the responsibility of the persons using the same on a daily basis.

It is therefore important for the operators to have access to detailed information on the correct use and maintenance of the machine.

WARNING

IMPORTANT:

- the "driver-operator" is deemed to be a competent operator charged with the task of moving and manoeuvring the machine;

- Use of the machine by a "competent operator" is included as one of the normal operating conditions;

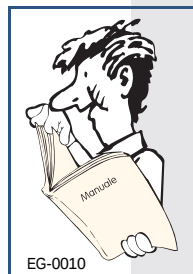
- It is the employer's duty to provide the necessary training and skills, especially when introducing any new piece of work equipment (Leg. Dec. 626, art. 22, paragraph C);

- An integral part of any training and skill-building programme is ensuring that the operator reads, studies carefully and proves his understanding of this manual, particularly as regards the safety provisions contained therein.

1.1 General precautions

The Use and Maintenance Manual forms an essential and integral part of the machine and must be made available to the user.

This manual must always be kept on-board the machine or, in any event, somewhere where the operators have access to it, and must accompany the machine in the event of its sale.



It must be kept in the special lockable compartment (1) provided and consulted carefully since it contains important information regarding operator safety, vehicle operation and proper maintenance.



The personnel authorised to operate the machine must read this manual before using the machine for the first time.

The machine must only be used for the purpose for which it was specifically intended. All other uses are deemed to be improper and, therefore, dangerous.

This manual contains necessary information for machine operation, maintenance and lubrication.

Constant adherence to the instructions in this manual will result in a longer, trouble-free working life and a reduction in maintenance costs and down time. Furthermore, it will be possible to eliminate the most common causes of accidents that may be encountered during operation and maintenance activities.

It is in everyone's interest that these rules be followed and that the purchaser understands that this manual is an integral part of the machine and that he accepts full responsibility for ensuring that the operator consults the manual and that the instructions contained herein are followed scrupulously.

The manufacturer shall not be contractually or otherwise liable for any damage resulting from the incorrect utilisation or handling of the vehicle, or from any failure to comply with the manufacturer's instructions.

The maximum expected life span of this machine is deemed to be 10 years or 10,000 work hours. The life span is subject to the regular inspections and maintenance operations being carried out as specified in the applicable manual. Once either of the abovementioned deadlines has been reached, the machine must undergo a complete overhaul, to be performed by the manufacturer or an authorised dealer, in order to ascertain the level of wear and tear and the remaining working life of the machine. If not, the machine must be decommissioned.



IMPORTANT

Eurocomach reserves the right to modify the product and amend the associated technical documentation without in any way constituting any form of obligation towards third parties.

This version of the operation and maintenance manual describes the characteristics of the standard machine, at the time of going to print.

1.2 Consulting the manual and the terminology used

1.2.1 Consulting the safety signs in the manual

For a better understanding of the information in this manual, those instructions deemed to be critical or hazardous are highlighted with the following symbols:



DANGER

DANGER

Information or message that, if not strictly observed, may result in serious injury or even death.



CAUTION

CAUTION

Information that, if not strictly observed, could cause minor injury or serious damage to the machine.



WARNING

WARNING

Information or precautions that should be observed to avoid damaging the machine, or in any case part of the text that should be noted.

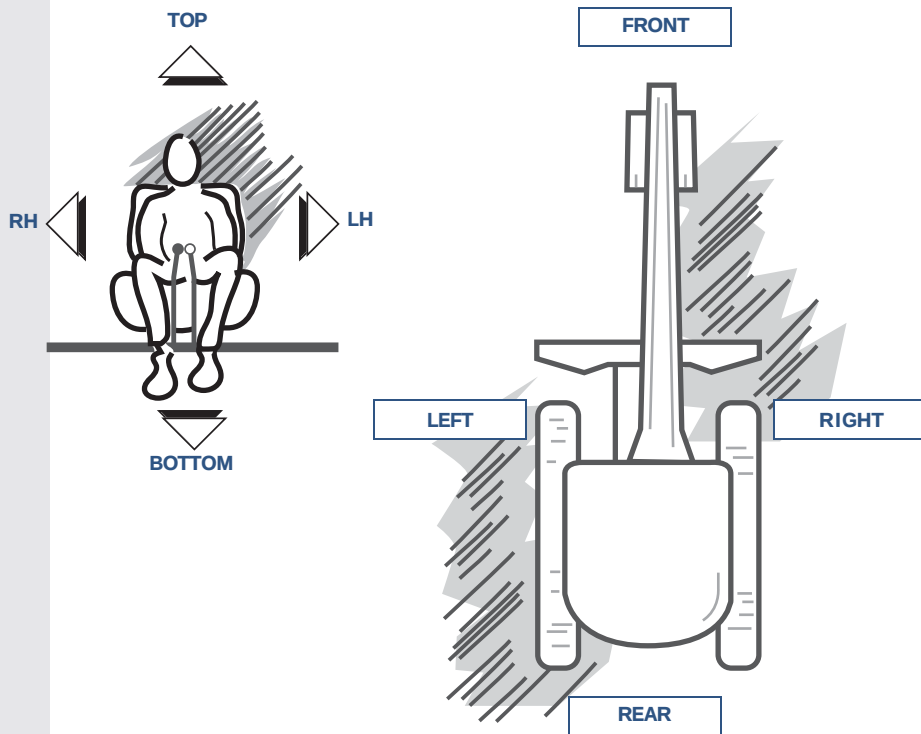
NOTES ON SAFETY

It is impossible for Eurocomach to foresee every possible situation that may constitute a potential hazard during machine operation or maintenance; for this reason, the safety messages in the manual and on the machine data plates may not entirely cover all possible precautions to be taken. If you are unsure of the safety requirements for some of the procedures, contact EUROCOMACH or the local dealer.

1.2.2 Terminology used in the manual

The manual has been drafted using conventional terminology, as explained below:

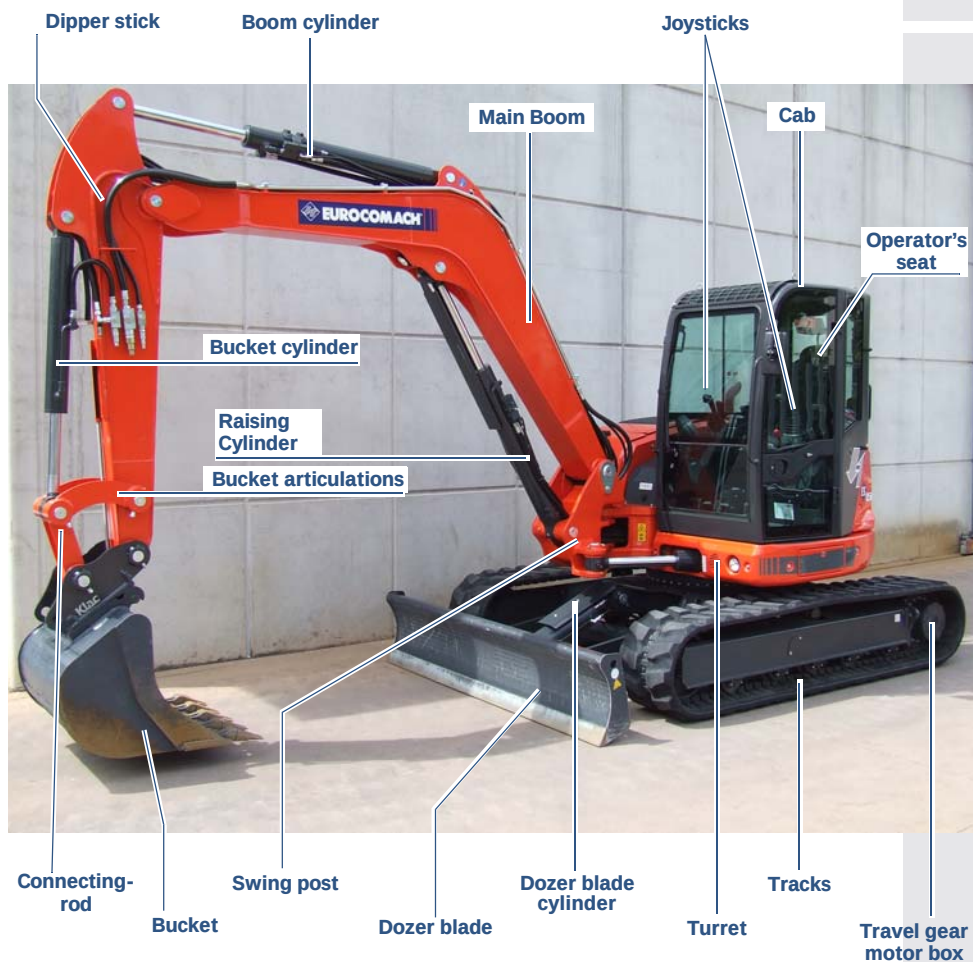
- "left" and "right" mean on the left and right hand side of the operator when he is sitting in the driving seat.
- "front" is always the part of the vehicle where the dozer blade is fitted.
- "rear" is always the part of the vehicle opposite to the dozer blade position.



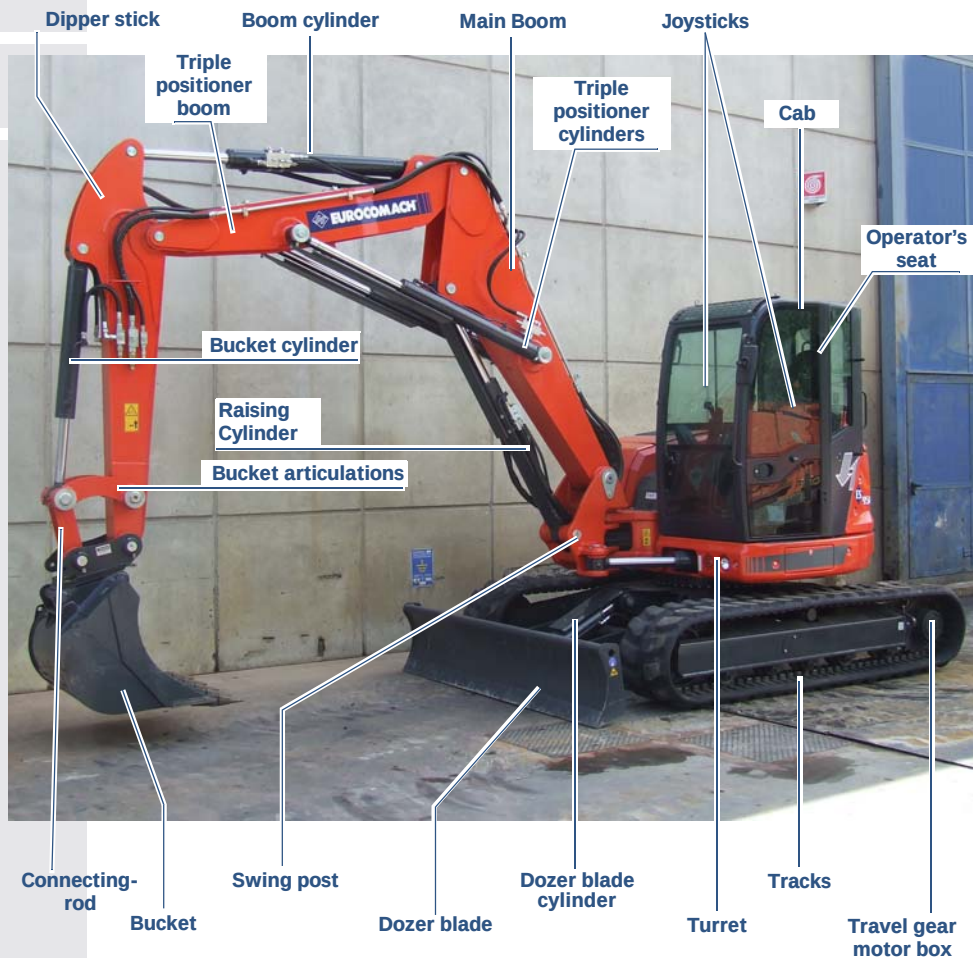
EG-0020

For ease of use and maintenance, the following are the names of some of the machine parts, which will be referred to in the descriptions provided in the manual:

VERSION ES850ZT

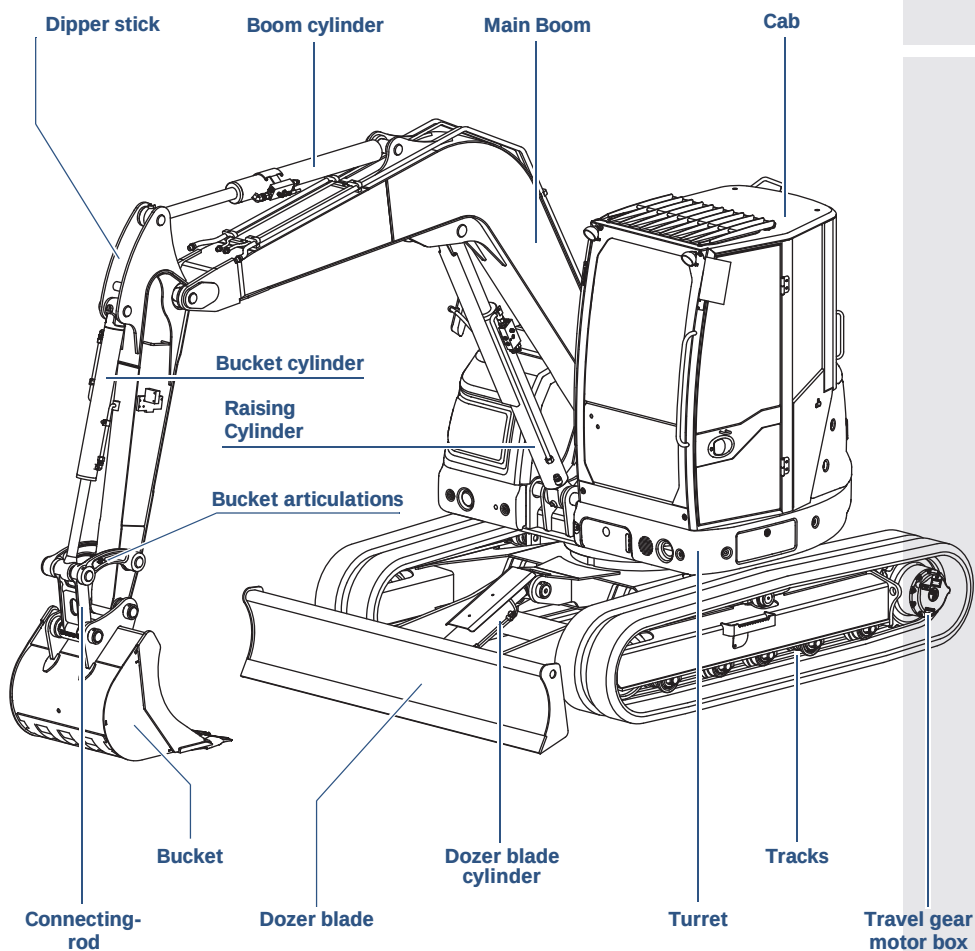


ES1-0020

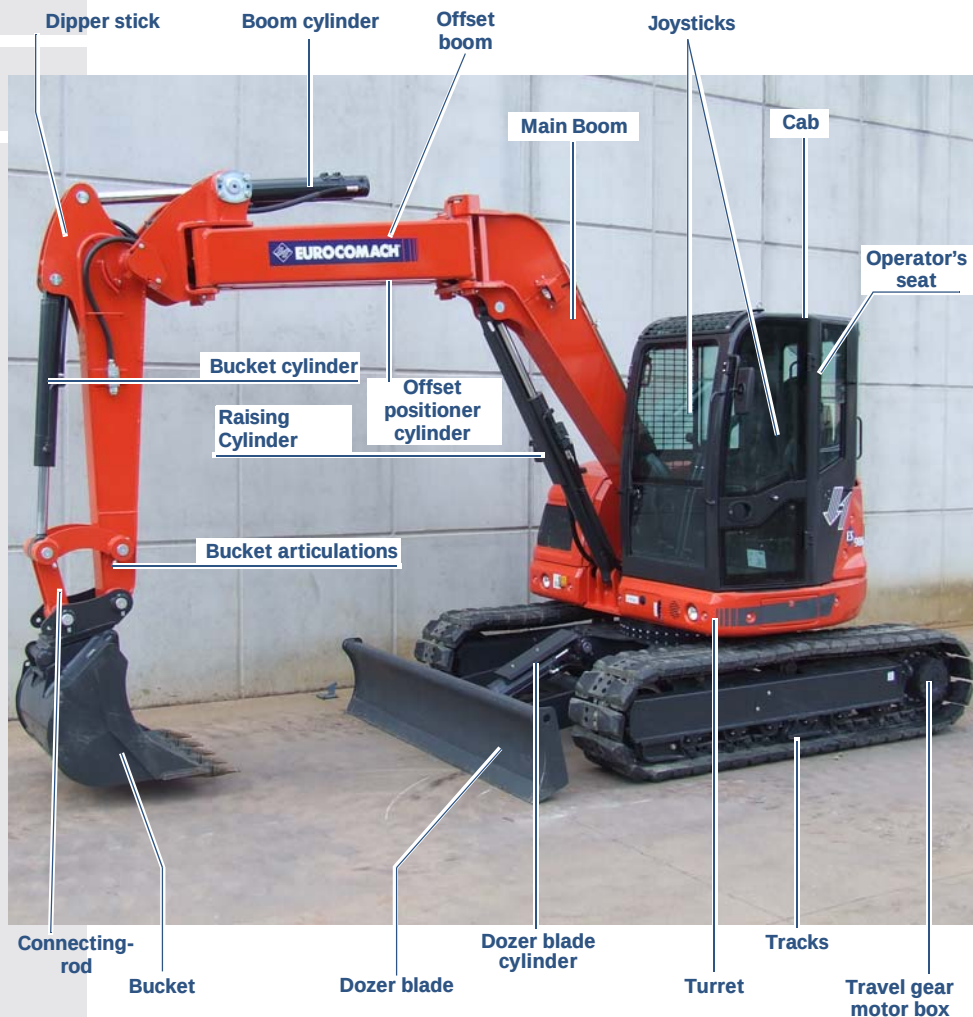
VERSION ES950TR

ES1-0030

VERSION ES850SB



ES1-1980

VERSION ES900UR

ES1-0050

**IMPORTANT**

The descriptions and illustrations in this manual may not coincide with the actual machine due to modifications that have been effected. Contact your local EUROCOMACH service centre with regard to any parts of the manual that may be unclear.

1.3 Manufacturer

This operation and maintenance manual refers to the following machine:

SERVO-CONTROLLED MINI-EXCAVATOR	
MODEL:	ES850ZT
	ES950TR
	ES850SB
	ES900UR

The 'excavator' machines are manufactured exclusively by:

SAMPIERANA S.p.A.

40 Via Leonardo da Vinci

47026 S. Piero in Bagno (FC)

Tel. ++39 0543 904211

Fax ++39 0543 903108/918520/901246

E-Mail: info@sampierana.com

<http://www.eurocomach.com>

The Eurocomach **service centre** is at the customers' disposal to assist with any technical problems and spare parts orders.

For any communications relating to the machine purchased, the following information should always be provided

- a** - machine model
- b** - serial number
- c** - year of manufacture
- d** - date of purchase
- e** - engine model and serial number
- f** - details regarding the problems encountered.

Only original spare parts should be used when replacing machine parts; Eurocomach cannot accept any liability whatsoever for any deterioration of machine performance or damage to the machine due to the utilisation of non-original spare parts.

Maintenance operations that cannot be carried out easily with the means normally available to the private individual should be undertaken by a dealer who has access to trained technicians, appropriate means and original spare parts.

The Eurocomach service centre is at the customer's disposal to provide any required explanations and advice, or to intervene with the company's own specialised technicians if there are any doubts regarding machine performance.

1.4 Machine identification data

The machine nameplate is located at the front right of the turret; this identifies the machine type and model number; The information on this plate and the engine tag are necessary when requesting spare parts or indicating any malfunction to the service centre.



IMPORTANT

The data on the information plate must not be changed for any reason.



ES1-0060

**Engine
Identification plate**



ES1-0070

Version ES850ZT and ES950TR



**Engine
Identification plate**

ES1-0080

Version ES850SB and ES900UR



**Engine
Identification plate**

ES1-0090

1.5 CE Conformity Declaration

The CE Conformity Declaration is the document signed by the manufacturer that guarantees and proves that the machine complies with all the reference standards in terms of safety.

This document must be kept on board the vehicle at all times and must accompany the machine until it is finally decommissioned.

The declaration shows all the identification details regarding the machine, the manufacturer and all the reference standards that apply. The following is a facsimile of a CE declaration:

DICHIARAZIONE CE DI CONFORMITÀ

secondo allegato II A della Direttiva 2006/42/CE

(EC declaration of conformity according annex II A of Directive 2006/42/EC)



Il sottoscritto (*The undersigned*) PARA CESARE, legale rappresentante della ditta (*legal representative of the firm*) **SAMPIERANA S.p.a.** - Via L. da Vinci, 40, 47026 S. Piero in Bagno (FC) in qualità di costruttore (*in quality of manufacturer*)

DICHIARA (*DECLARES*)

sotto la propria personale responsabilità che la macchina (*under his own responsibility that the machine*)

MACCHINA	(MACHINERY)	HYDRAULIC TRACKED EXCAVATOR
FUNZIONE	(FUNCTION)	DIGGING
TIPO-MODELLO	(TYPE-MODEL)	EUROCOMACH - ES xxx xx
N° MATRICOLA	(SERIAL N°)	Cx xxxxx
ANNO FABBRICAZIONE	(CONSTRUCTION YEAR)	XXXX
POTENZA NETTA (CFR. 97/68/CE)	(POWER, KW)	xx
COMPONENTI DI SICUREZZA FORNITI CON LA MACCHINA	(SAFETY COMPONENTS SUPPLIED WITH THE MACHINE)	TOPS-FOPS STRUCTURE

ATTREZZATURE INSTALLATE	(EQUIPEMENTS INSTALLED)	BUCKET MOD. XXX
-------------------------------	-------------------------------	-----------------

- è conforme alle disposizioni della Direttiva 2006/42/CE (*complies with the requirements of Directive 2006/42/EC*)
- Persona autorizzata a costituire il fascicolo tecnico (*person authorised to compile the technical file*):
 - Nome (*Name*): Fabbri Giuseppe
 - Indirizzo (*Address*): Via L. da Vinci, 40, 47026 S. Piero in Bagno (FC)
- è conforme alle disposizioni della Direttiva 2000/14/CE – “Direttiva emissione acustica ambientale delle macchine ed attrezzature destinate a funzionare all’aperto” – alla Direttiva 2005/88/CE e ai decreti di trasposizione nella legge nazionale (*complies with the provision of the Directive 2000/14/CE – “Noise emission in the environment by equipment for use outdoors” – the Directive 2005/88/CE and the regulations transposing into national law*)
 - Tipo di macchina: Escavatore idraulico, in accordo alla definizione n. 20 dell’Allegato I - Direttiva 2000/14/CE (*Machine type: Hydraulic Excavator, in accordance with definition n. 20 Annex I - Directive 2000/14/CE*)
 - Procedura applicata per la valutazione della conformità: Controllo interno della produzione con valutazione della documentazione tecnica e controlli periodici, Allegato VI - 2° procedura Direttiva 2000/14/CE (*Procedure applied for the conformity assessment: Internal control of production with assessment of technical documentation and periodical checking, annex VI- 2nd procedure directive 2000/14/CE*)
 - Organismo notificato (*Notified body*): ECO S.p.a Via Mengolina, 33, 48018 FAENZA (RA) ITALY

LIVELLO DI POTENZA SONORA MISURATA	(MEASURED POWER ACOUSTIC LEVEL)	dB (A): xx LwA
LIVELLO DI POTENZA SONORA GARANTITO	(GUARANTEED POWER ACOUSTIC LEVEL)	dB (A): xx LwA

- Depositario file tecnico: SAMPIERANA S.p.a – Via L. da Vinci, 40, 47026 S. PIERO in BAGNO (FC) ITALY (*Technical files kept by: SAMPIERANA S.p.A. – Via L. da Vinci, 40, 47026 S. PIERO in BAGNO (FC) ITALY*)
- è conforme alla Direttiva 2004/108/CE (*is in accordance with the Directive 2004/108/CE*)
- è conforme alla Direttiva 97/68/CE e successive modifiche (*is in accordance with the Directive 97/68/CE and following modifications*)

Variente per la movimentazione dei carichi sec. EN 474-5 punto 5.6.4 (<i>variation for lifting loads</i> (EN 474-5 point 5.6.4)	SÌ	NO
		X

S. Piero in Bagno, xx-xx-xxxx

Il legale rappresentante (the legal representative of the firm)

Cesare Para

EG-0030

2.0 Intended use and contraindications

2.1 Intended use

EUROCOMACH has designed and manufactured its excavators so that they comply with the following EC directives:

- 2006/42/EC (Machine directive)
- 2004/108/EC (EMC Directive)
- 2000/14/EC and 2005/88/EC (noise Emission directive)

and to satisfy any requirements that may be encountered on a construction site; it is a powerful, quiet and reliable machine even under the most demanding working conditions.

The machines described in this manual are built to be operated by persons mainly trained to carry out the job of "earth moving and excavations" using the dozer blade and the bucket.

If equipped with suitable safety systems, they may be used with authorised optional pieces of equipment and in any case with the characteristics stated in point 8.0.

All machines are designed and built on the basis of the work for which they are intended. Therefore, the technical characteristics of each machine must be understood to be limited to the intended use of the machine.

Maintenance is simple and minimal.

The excavator is the natural choice for work on road-building sites, on building projects, industrial maintenance operations, building renovation sites, railway works, laying of pipelines and cables and work in public parks and cemeteries.

The quiet Diesel engine transmits the maximum power to the hydraulic system, which has its own regulation valves.

The control console was designed to elicit an immediate response from the hydraulic motors and cylinders.

The rubber tracks are suitable for working environments where the ground must be protected against permanent damage.

No modification may be made to the machine without EUROCOMACH's authorisation, since the modification may involve certain dangers.

It is nevertheless necessary to adhere strictly to the safety regulations contained in this manual.

2.2 Contraindications



CAUTION

This machine is designed for use solely in the sectors referred to in the previous section.

This section states some of the improper or non-authorised uses; as it is impossible to foresee all likely improper uses, if particular occasions for using the machine arise, before embarking in the work contact the EUROCOMACH service centre.



IMPORTANT

The use of the excavator for any task other than those described is strictly forbidden.

The instructions for the authorised optional equipment are described in the respective use and maintenance booklets; if the equipment is supplied by EUROCOMACH, the booklets are enclosed with this manual.

The instructions for fitting the authorised equipment, any controls that required connection to the machine and the hydraulic attachments need to make the equipment work are grouped together in point 8.0.

- Eurocomach can accept no liability in the event of unauthorised uses or any failure to comply with the manufacturer's instructions.
- Never use the excavator as a lifting tool unless it is fitted with the specific optional equipment.
- Never use the excavator in enclosed spaces unless there is an effective system in place for the extraction and discharge of exhaust gasses.
- Whenever possible, avoid driving over large obstacles, very uneven ground, boulders, fallen logs, steps, ditches, etc., which may cause the vehicle to tip over.
- Never drive along railway sleepers and rails that may damage the rubber tracks.
- Do not transport persons on board the excavator.
- Do not use the excavator to transport loads or to tow other vehicles.
- Never use the bucket for lifting or transporting people.
- Never use the excavator when it is not in peak condition for the job at hand, if it malfunctions, if the controls do not respond perfectly, if the cab is damaged or if visibility through the windows is not good.

- The machine is built to operate at temperatures ranging from 0°C to 45°C, therefore, avoid operating in temperatures falling outside this range.
- DO NOT allow the machine to be used by minors or unskilled persons .
- DO NOT transport containers carrying flammable liquids or any that are considered dangerous.
- DO NOT use the bucket as a pile driver or for extracting piles.



WARNING

Eurocomach cannot accept any responsibility in the event of accidents involving persons or property caused by non-compliance with the regulations and instructions listed in this manual and by failure to comply with safety regulations and accident prevention rules.



CAUTION

If the machine is used in an improper manner, the operator is personally responsible for his own safety and that of any other people possibly involved.



CAUTION

It is strictly prohibited to drive the machine on public roads, since the vehicle is not approved for this purpose. Therefore, the machine may only be operated on private property and/or construction sites that are closed to the public.

2.3 Machine operator

The machine must only be operated and maintained by persons who:

- Are over 18 years of age.
- Are physically and mentally fit for the task and are able to meet the requirements of machine operations at peak performance.
- Have been trained to operate and maintain the machine and know its technical specifications, its overall dimensions and its performance and limitations.
- Know the rules and regulations relating to safety in the workplace.
- Can prove their ability.

The owner company's legal representative must appoint these persons for the task.

The operator is also responsible for:

- Not allowing anyone to approach the machine when it is working.
- Not allowing unauthorised and untrained persons to operate the machine.
- Following daily the safety procedure learned during the training course.
- Recognising and avoiding potential dangers in the workplace.
- Understanding the warning notices and following their instructions.
- Inspecting the machine and checking that it is working properly before starting work.
- Reporting any operating problems encountered before or while operating the machine.
- Avoiding reckless or careless actions that may endanger themselves or others.
- Always applying common sense and make safety an absolute priority.

If in any doubt about machine utilisation, contact your local EUROCOMACH service centre who will provide you with all the necessary information.



WARNING

The purchaser and operator of this vehicle must read the user manual carefully before utilising this machine for the first time.

If this vehicle is supplied with a utilisation contract or is subject to a rental arrangement, the owner must ensure that the new user reads and understands the user manual. Also make sure that the new operator has inspected the vehicle from all sides, is familiar with all the decals and equipment and has tested all of the controls to establish their proper use.

At the time of the initial sale, the vendor informs the purchaser regarding the requirements for the safe utilisation and operation of the vehicle. If the vehicle is to be used by any person other than the initial purchaser, e.g. an employee, or is to be hired out, lent or sold to anyone other than the purchaser, ensure that the new operator reads and understands the **User Manual** supplied with the hydraulic mini-excavator before using the machine for the first time.

3.0 Safety

3.1 Before starting work

- Only authorised persons may operate the machine.
- Read the instruction manual before using the machine.
- Wear suitable clothing.
- Inspect the machine carefully every day, or at every shift change, checking the exterior of the machine prior to starting it, so as to avoid causing any damage or injury to persons.
- Always fasten your seat belt before starting the machine.
- Familiarise yourself with location and function of all pedals, control levers, instruments and luminous indicator lights.
- Top up the fuel and oil with the engine turned off and in well-ventilated areas suitable for this purpose.
- Wear a safety helmet in order to protect your head.
- Test the luminous indicators before starting the engine.
- Carry out all the required checks as indicated.
- Never drive the machine while under the influence of alcohol, medicines or other drugs.
- Before starting the machine, check that there is no one within its range of action.
- When climbing on or off the vehicle, always do so facing the vehicle and making use of either the steps or handholds provided, or the cab posts. Do not jump off!
- Never try to climb on or off the machine while it is moving.
- Do not use any of the controls as a handhold.
- Prior to climbing on or off the machine, always check whether the footplate, steps or handholds are slippery.

BASIC SAFETY PRECAUTIONS**CAUTION**

It is forbidden to make any modifications to the machine

- The machine may not be modified without the manufacturer's prior approval.
- Making any modifications without such approval will result in a reduced level of safety, thereby increasing the possible hazards. Effecting any modifications will not only negatively affect machine performance, but will also shorten its life.
- We accept no responsibility for any accident or failure resulting from modifications made without our permission.
- When needing to effect any modifications, first make enquiries at our offices or at our sales agent.

**CAUTION**

Anticipate any precautions with regard to optional parts and accessories

- Do not fit any item or accessory to the machine that has not been approved either by our company or our sales agent.
- The use of parts or accessories not approved by our company will result in a reduced level of safety, thereby increasing any possible hazards.
- We accept no responsibility for any injury, accident, or machine failure resulting from the use of any parts or accessories not approved by us.

3.2 Working area – danger zone

The **WORKING AREA** is defined as the area around the machine where only those people responsible for the machine and who understand the operational abilities of the machine may operate.

The working area must be suitably signposted, even if the site area is already demarcated.

When operating on a construction site, be aware of other machines operating in the vicinity and avoid encroaching on their range of action.

Within this area there is a zone where there is potential DANGER for whoever works there and that is, therefore, called the **DANGER ZONE**.

The **NO-ENTRY ZONE** is off limits to everyone while the machine is in operation.

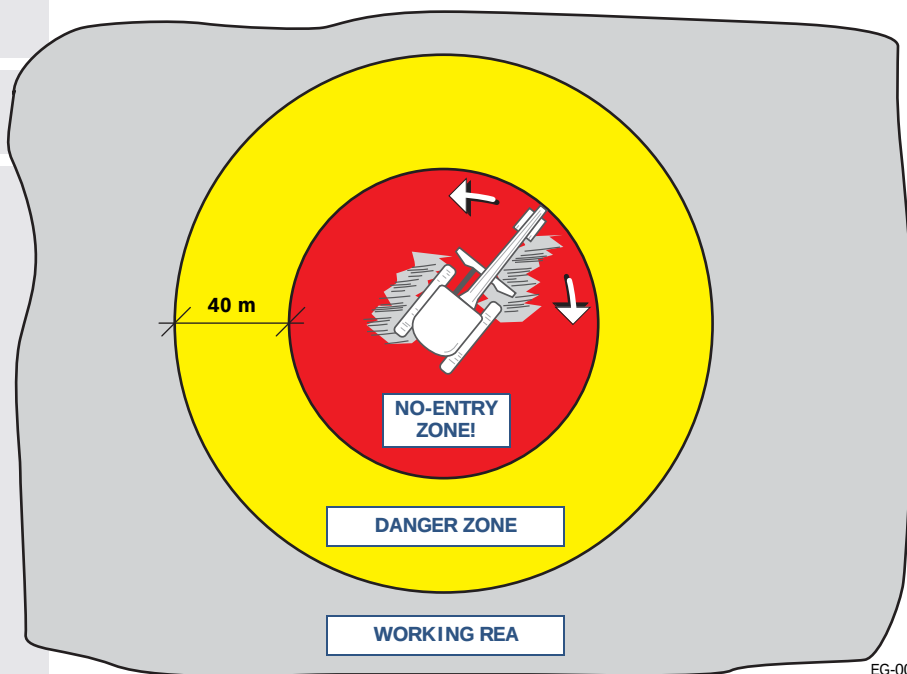


DANGER

No one may loiter inside the no-entry zone around the machine.

The **PROHIBITED AREA** is deemed to be that area around the machine where you could be struck by moving parts during operation, by a load falling accidentally or where you are within range of the moving machine or its working parts or accessories.

Each machine has decals, marked with long-lasting text, which clearly indicate the danger deriving from standing within the machine's range of action.



IT IS FORBIDDEN TO STAY WITHIN THE NO-ENTRY ZONE (the machine's range of action).

The decals are an essential safety element and should therefore be kept legible and in good condition.

The driver should only operate the machine if there is NO ONE standing within the range of action.

The driver must warn anyone in the vicinity of the machine of the danger they are in.

This warning is usually given by sounding the horn on the dashboard, or by voice.

To avoid any accidental knocks or contacts when working near scaffolding or unstable structures, stay at a safe distance from them so that an accidental manoeuvre won't cause contact with these structures.

3.3 Safety decals on the machine

There are self-adhesive plates stuck on the machine, bearing warning and safety symbols for the operator and anyone working near the machine; each decal is located close to the part of the machine where there is a potential risk.

Learn these symbols and what they mean before using the machine.

Check the presence and legibility of the SAFETY warnings daily; Repair or replace them immediately whenever they are damaged or missing.



WARNING

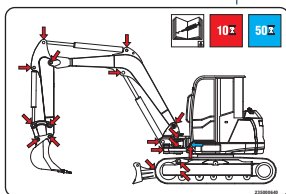
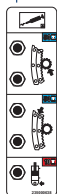
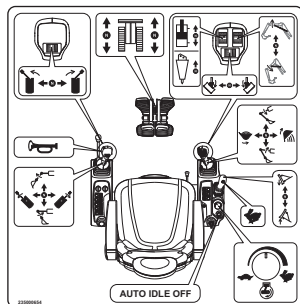
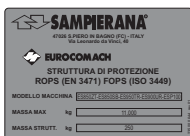
The manufacturer declines any responsibility for injury to persons or damage to property caused by any non-compliance with the regulations and instructions on the plates or as a result of said plates being in a poor condition so they become illegible. Therefore, keep the plates in good condition so they are always legible and properly positioned; if necessary, order new plates from our Spare Parts Service.

- 1 - Wash the labels with soap and water and dry with a soft cloth.
- 2 - Replace any damaged or missing labels with original stickers obtained from your EUROCOMACH service centre.
- 3 - Should a part with safety and warning labels be replaced with a new part, make sure that the same labels appear on the new part.
- 4 - When replacing labels, make sure that the application surface is clean, dry and free of oil or grease. Squeeze any air bubbles toward the outside edges.

The decals applied to the machine relate to three different types of operations:

- safety decals;
- operational decals;
- maintenance decals.

DECALS ON ES850ZT VERSION

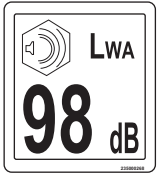
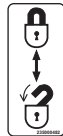


ES1-0100



ES1-0101





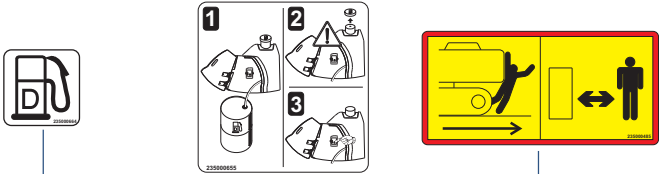


ES1-0110

ES1-0111

24

ES 850 ZT - ES 950 TR - ES 850 SB - ES 900 UR

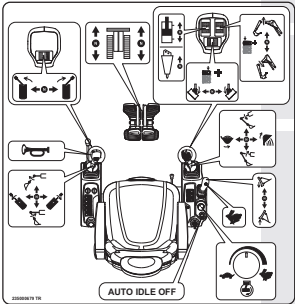
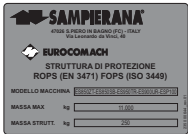


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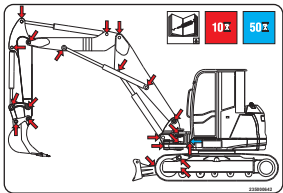


ES1-0121

DECALS ON ES950TR VERSION



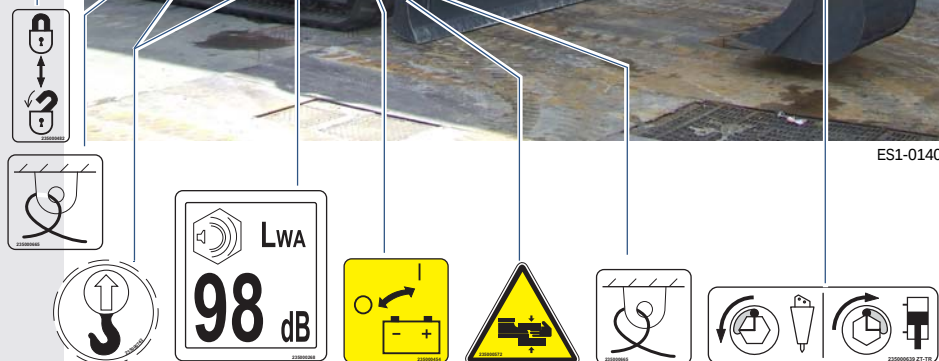
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ES1-0131



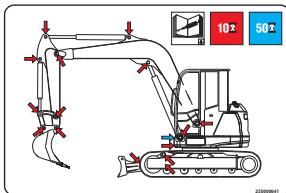
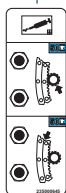
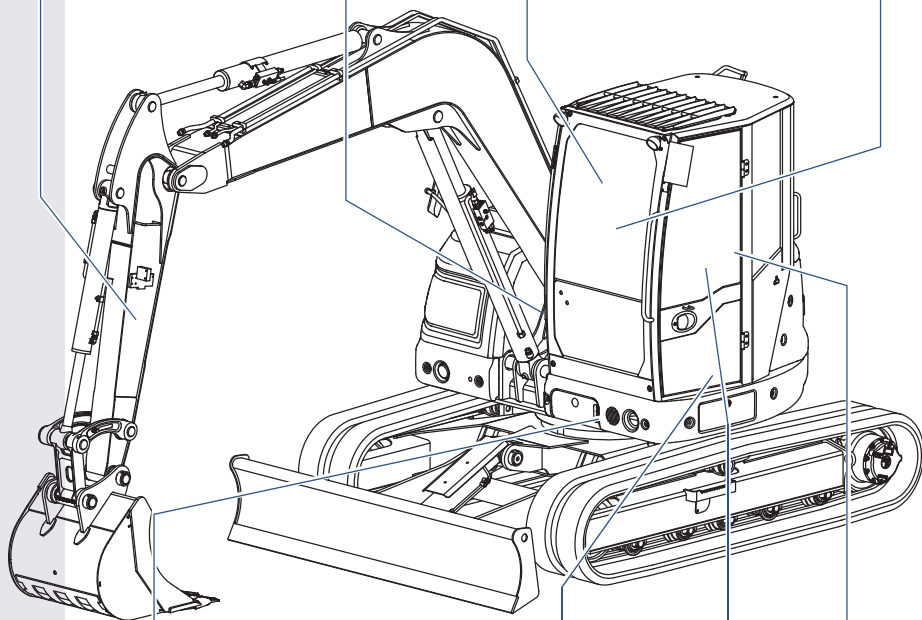
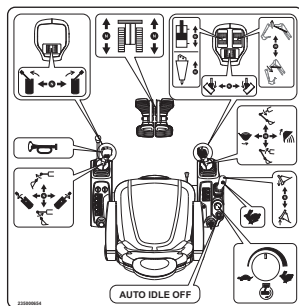
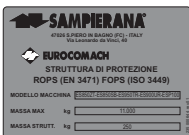
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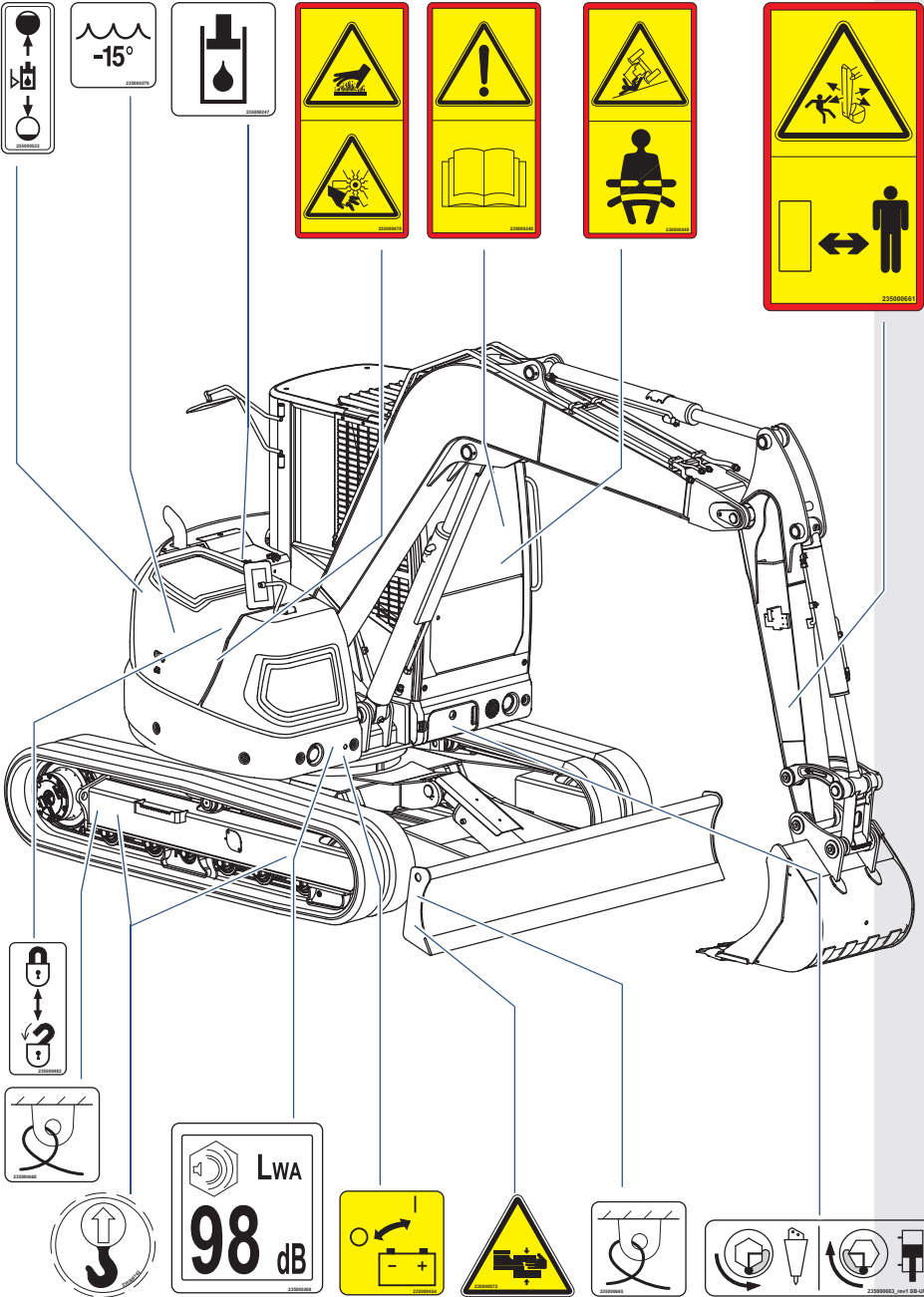
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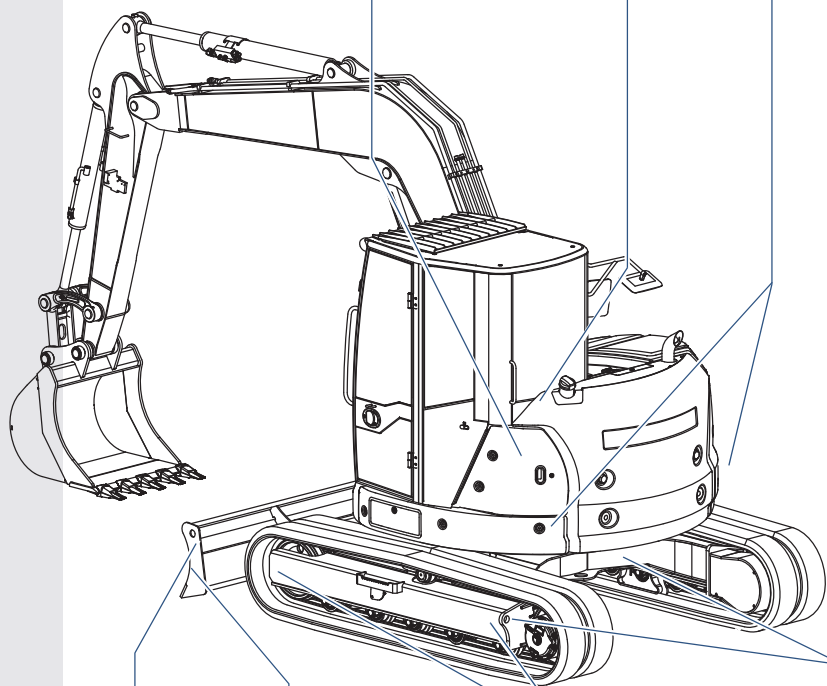
DECALS ON ES850SB VERSION



ES1-0160

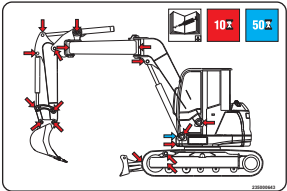
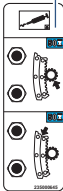
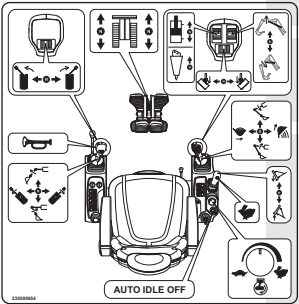
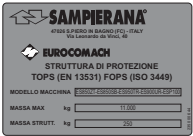


ES1-0170



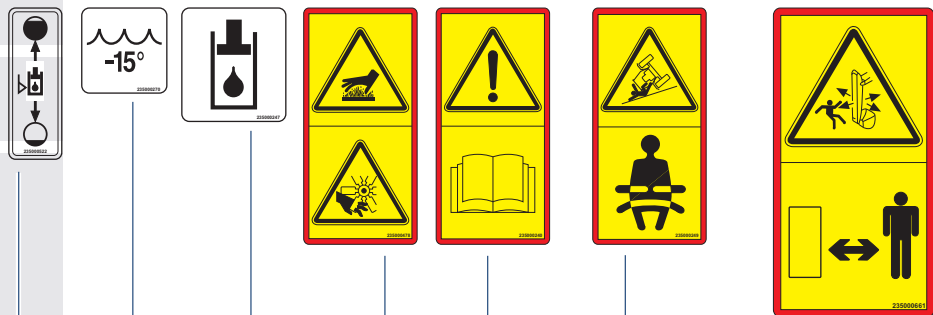
ES1-0180

DECALS ON ES900UR VERSION

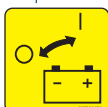
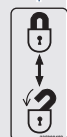


ES1-0190

ES1-0191



ES1-0200



ES1-0201



ES1-0210

ES1-0211

Key for safety decals

Caution:

Read the use and maintenance manual before operating the machine, in order to avoid risk or injury.



EG-0050

Caution:

Always wear the seat belt when operating the machine. If the machine overturns, do not abandon the driving position but hold on firmly to the seat.



EG-0060

Caution: Hot surfaces

Keep hands and arms away from hot surfaces.

Danger: Shearing

To avoid any risk of injury, make sure the engine is stopped before working on any part inside the engine compartment.



EG-0070

Danger: Stay clear of the rear of the machine

To avoid any risk of injury, stay well away from the machine's turning circle.



EG-0080

Danger: Stay clear of the front of the machine

Do not stand or allow anyone to get within the range of action of the machine, particularly the area of the boom.



EG-0090

Danger: Stay clear of working equipment

To avoid any risk of injury, stay well away from the range of action of the boom, dipper stick, bucket and any other equipment.



EG-0100

Danger: Fire – Explosion

Do not approach the machine with flammable materials and, above all, do not go anywhere near the tanks and the battery.



EG-0110

Danger: Crushing

Stay well away from the machine in order to avoid any possibility of limbs being crushed.



EG-0120

Danger: Electric shock hazard

Keep to the machine distance stated and pay particular attention to the height of the boom from any overhead cables.



EG-0130

CABLE VOLTAGE	MINIMUM HEIGHTS TO BE MAINTAINED
1.0 kV (power line)	5.0 m
6.6 kV (2-3 insulators)	5.2 m
33 kV (minimum 3 insulators)	5.5 m
66 kV (minimum 6 insulators)	6.0 m
154 kV (minimum 10 insulators)	8.0 m
275 kV (minimum 19 insulators)	10.0 m

3.4 List of hazards



DANGER

SEAT BELT NOT FASTENED

Choose the most comfortable driving position according to your own build. Adjust the position of the seat and the control levers. Adjust the seat belt tension so that it restrains the operator at hip level, leaving the abdomen completely free. Do not commence with work until the abovementioned safety conditions have been checked.



EG-0140



DANGER

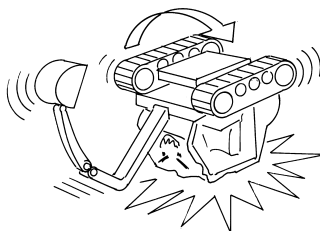
TIPPING

The excavator's centre of gravity moves depending on the size and position of the load, the slope of the ground and the movement of the machine.

Analyse and memorise the topography and geological features of the site in order to take suitable preventive measures against possible overturning of the machine against landslips or slides. Level the ground in the machine's operating area.

Reckless operating and driving procedures not suited to the type of machine may cause the excavator to tip over.

Never exceed the vehicle's rated operational lifting capacity (see the applicable tables in point 4.0).



EG-0150



DANGER

CRUSHING OR SERIOUS INJURY

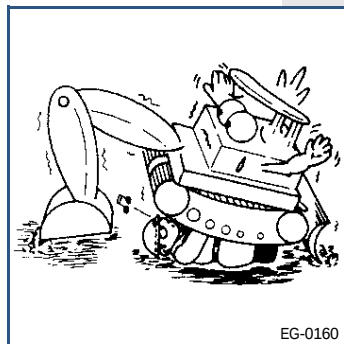
The excavator remains, to all intents and purposes, a machine and, therefore, when operating the machine, pay particular attention to any people, animals or objects appearing in the vicinity of the working area.

Before reversing, rotating and/or lifting the boom, always make sure there is enough space to operate safely.

Do not stand under the working equipment.

- Nobody may stand under the working equipment.
- When the machine is lifted using the working equipment, do not stand under the machine itself under any circumstances.

Sudden or normal descent of the machine's boom can lead to serious accidents, with the possibility of injury or even death.



DANGER

INTOXICATION

Exhaust gasses produced by the engine of the excavator, if inhaled directly and continuously, may be extremely dangerous and/or lethal for the human body. If work must be carried out in enclosed areas, take all possible precautions to ensure the circulation of fresh air and protect the respiratory tract by wearing a suitable mask.

Avoid inhalation or contact with battery acids, which are extremely toxic and may cause serious burns.

Explosive fuel.

The fuel used for the engine is flammable and may therefore cause fires and/or explosions. Avoid hazardous situations by keeping sparks, naked flames and materials for smokers well away from the vehicle and from the fuel when filling the tank or when servicing the fuel system. Find out where the work-site fire extinguishers are situated and how to use them.





DANGER

SHEARING OR TRAPPING OF HANDS

Certain parts of the excavator house components that may cause serious injuries to limbs.

It is strictly prohibited to place any parts of the body into these components when the machine is running.

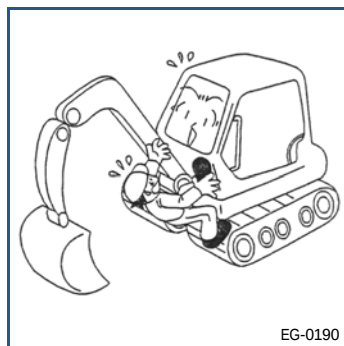
Wear appropriate clothing that cannot become entangled in any of the machine's moving parts.



CAUTION

DANGER OF SLIPPING

- Be sure to check the steps and handrails. Should any damage, looseness or any other abnormality be encountered, repair it.
- If there is any slippery substance such as oil or grease on the steps, handrails and tracks, remove it completely.



CAUTION

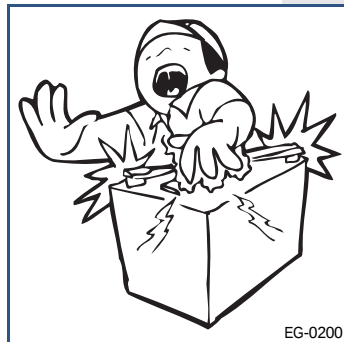
ELECTRICAL HAZARD

Only a skilled person may carry out any type of work on the machine's electrical system or battery.

Before working on the electrical system, disconnect the battery, starting with the earth terminal.

Ensure that the electrical connection wires and terminals do not show any signs of corrosion, cracking or scorching; if not, contact your local EUROCOMACH service centre.

Never approach any overhead electrical cables with the boom.



CAUTION

DANGER OF SHORT CIRCUIT

Starting the machine by hot-wiring is prohibited.

- Do not, under any circumstances, start the engine by short-circuiting the starter terminals or battery.
- The machine may move suddenly, creating a hazardous situation and, in addition, the electric system may be damaged.

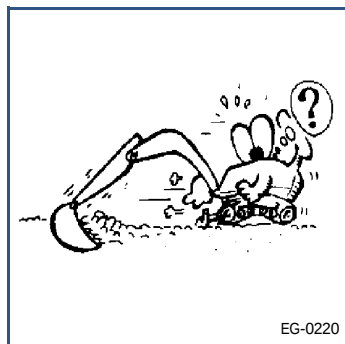


CAUTION

DAMAGE HAZARD

Before starting work in a new area, check for the presence of any electrical power lines, pipelines and telephone lines.

All these items are a source of danger for the careless operator, and damaging them is a potential economic cost.



CAUTION

TRANSPORT OF PERSONS PROHIBITED

The excavator is not approved for carrying persons. Only the operator may be in the driving position.

Do not allow any unauthorised persons, particularly children, to approach the excavator while it is working.

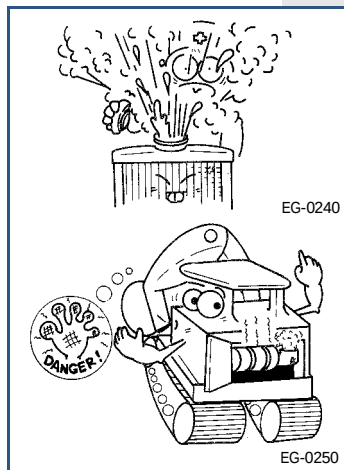


! CAUTION

DANGER OF BURNS

Do not remove the cap from a hot radiator. The radiator cap may only be removed after the boiling hot liquid has cooled sufficiently. The latter could cause injury.

Do not touch the exhaust pipe immediately after turning off the engine. A hot exhaust system may cause physical injury.



! CAUTION

HAZARDOUS WORKING CONDITIONS

Beware of hazards. Always be aware of where you are. Look out for hanging tree branches, cables, recesses and overhangs.

Take care when working alongside reservoirs, tracks, embankments and slopes. Keep well away from cliff-edges.

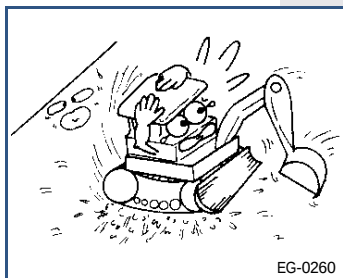
Take care when working under overhangs. Do not undermine them. Beware of rock falls and landslides. Landslides can be hazardous.

Take care when backfilling. Do not go too close to edges. The weight of your equipment may cause the edge of the ground to give way.

When excavating on a slope or in a tunnel, beware of falling materials, for example, falling rocks.

The equipment may not be used in:

- Areas at risk of fires;
- Corrosive atmospheres;
- Explosive atmospheres;
- Areas containing dust that may constitute a health hazard for the operator;
- Closed environments;
- Densely populated areas (residential areas, etc.) Without first having taken the necessary safety precautions.



CAUTION

PRESSURISED FLUIDS

The hydraulic system is pressurised whenever the engine is running and may maintain its pressure even after switching off.

Move all hydraulic system control levers and other controls after finishing work.

If fluid penetrates the skin or gets into the eyes, seek medical attention immediately.

Hydraulic fluid

Hot hydraulic fluid causes serious burns. Wait for the fluid to cool before disconnecting any hydraulic lines. Pressurised fluid leaks may be invisible. **NEVER** use your hands to check for leaks. Use a piece of cardboard or paper for this purpose. Wear gloves to protect your hands from any oil splashes.

NEVER try to repair or tighten any hydraulic hoses or joints with the machine's pneumatic system under pressure. **STOP** the engine and then release the pressure from all the cylinders and vent the pressure from any accumulators present in the machine's system. Pressurised hydraulic fluid can penetrate the skin and may cause permanent damage to the eyes. Wear suitable goggles when performing any maintenance or servicing the vehicle.

Should any fuel or oil leakages occur, stop machine operations immediately and carry out the necessary repairs.

Lubricant under high pressure

- The grease cylinder that adjusts the track tension is pre-packed with grease, which may itself be under high pressure. In this situation, if the plug is loosened carelessly, both the plug and the grease could be forced out, creating a dangerous situation.
- When reducing the pressure by turning the cartridge valve (lubrication valve), do not turn the valve by more than one turn.
The person performing this operation must not face the front of the cartridge valve, nor put his face close to it.

Do not disassemble the recall spring, as this may lead to a serious accident resulting in injury or death.



IMPORTANT

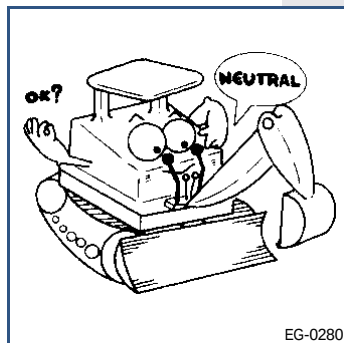
*If the user or others are injured by contact with hydraulic oil or where the oil has penetrated the skin, immediately seek medical attention.
Failure to seek medical attention may lead to further serious injury.*



WARNING

CONTROL NEUTRAL POSITION

Before starting the engine, always ensure that every pedal and operating lever is in the neutral position.



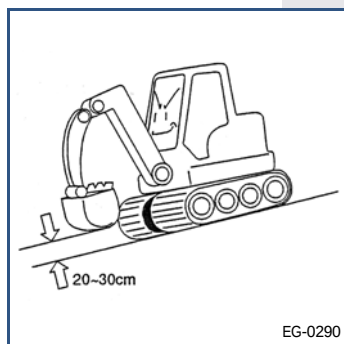
WARNING

CORRECT DRIVING PROCEDURES

When moving from one working zone to another, keep the boom and dipper stick in the retracted position.

When reversing, always look in the direction of travel of the excavator.

Watch out for other people; should anyone enter the manoeuvring area, immediately stop the excavator.

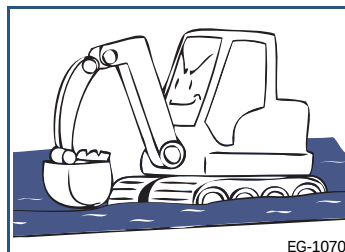




CAUTION

MAXIMUM IMMERSION DEPTH

Do not immerse the machine in water beyond the permitted depth (top of the track). If there are any lubrication points in parts of the machine that have remained under water for a long time, grease them using the relative pump until grease seeps out from the junctures.



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WARNING

CLOTHING AND SAFETY EQUIPMENT

Operators must wear clothing that is appropriate for work on the site: do not wear any chains, laces or other objects that may become entangled in moving parts of the machine. Clothes must not be greased or soaked with oil.

Wear protective clothing appropriate for the working conditions, such as:

- a helmet
- safety footwear
- safety goggles
- thick gloves
- ear defenders
- high visibility clothing
- waterproofs for bad weather
- respirator or filter mask.



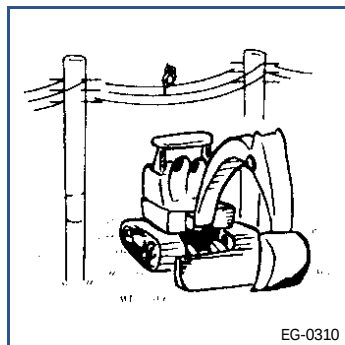
EG-0300

Wear whatever is necessary and do not take any unnecessary risks.

WARNING

BEWARE OF HEIGHTS

Check the size of doorways and the available space in the vicinity of any projections and obstructions. Be aware of the machine's overall dimensions, paying particular attention to the height of the boom.



WARNING

DISPOSING OF FLUIDS

Improper disposal of waste fluids may cause serious damage to the environment. Before disposing of waste fluids, contact the competent local bodies for information regarding the correct procedures.

Use suitable containers. Never use empty containers to store food.

NEVER pour oils out onto the ground, down drains, or into streams, lakes or ponds. Adhere to the environmental protection regulations in force when disposing of oils, fuels, brake fluids, batteries and other waste materials.

- When discharging the following toxic substances, observe the specified rules.
 - Oil and lubricant,
 - filters,
 - battery,
 - coolant liquids,
 - other toxic substances.





WARNING

PROPER MAINTENANCE

Use the correct tools, make sure that spanners and tools are in the correct position. Treat machined and polished surfaces with care.

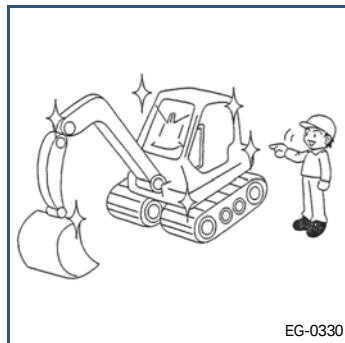
Engine parts that turn at high speed must be inspected for cracks and other damage during repairs and replacement.

Faulty parts may break and emit splinters causing injuries or death.

Never re-use broken, damaged or badly worn parts.

Tighten all bolts, unions and accessories to the torques specified in the specific sections.

Replace all guards and covers.



3.5 Safety procedures

1 - UNAUTHORISED MODIFICATIONS

- No modification may be made to the machine without Eurocomach's approval, since modifications may involve certain hazards.
- Consult your EUROCOMACH service centre before making any modifications. Eurocomach cannot accept any responsibility for injury or damage resulting from unauthorised modifications.

2 - SEAT BELT

Always adjust the seat and fasten the seat belt securely before starting the engine. Follow the appropriate instructions contained in the applicable point 7.4.

3 - CHECK FOR ADEQUATE VISIBILITY BEFORE STARTING TO OPERATE

Ensure that the work area is fully visible.

- Wipe all floor surfaces, levers, handrails, windows, and lights in order to ensure visibility.
- In the event that the windscreen is dislodged or broken, do not operate the machine until repairs have been carried out.

Inspection of safety devices.

- Check all safety devices including the locking lever and guards to make sure they are properly installed, function properly and are undamaged. If any problem is encountered, carry out the necessary repairs.
Improper use of the safety devices will lead to serious accidents that may result in injury or death. Be sure to use all safety devices correctly.

4 - PRE-START INSPECTIONS

Carry out all the required pre-start inspections. Should any problem be encountered, carry out the required repairs to the machine immediately. Using a faulty machine may cause an accident.

Always warm up the machine before starting work.

5 - CHECK THE SURROUNDING AREA PRIOR TO STARTING UP.

Look around you to ensure that the surrounding area is safe prior to starting up. Fasten the seat belt securely prior to starting the engine,. Do not carry out any maintenance work whilst the machine is held off the ground by means of the dozer blade or dipper stick.

6 - SIGNAL BEFORE STARTING UP

Before starting the engine, travelling or swivelling, always signal your intentions to other workers by means of the horn, etc.

7 - ENTRY/EXIT FROM THE MACHINE

DO NOT get off the digger until you have done the following:

- close the bucket, retract the dipper stick and completely lower the digger boom.
- stop the engine and remove the ignition key,
- raise the servo-control cut-out lever;
- unbuckle the seat belt;
- exit from the vehicle, climbing out backwards and using the handholds provided very calmly;
- Do not jump down from, or onto the machine, either when it is stationary or in movement.

Do not get on and off the operator's seat by holding on to the work equipment control levers.

Do not jump on or off the machine: ensure that both hands and one foot, or both feet and one hand are resting on the machine at all times.

Do not get on or off the machine while it is in operation as this could pose a danger; the machine may overturn or the tracks may break, posing the risk of a serious accident and a consequent risk of injury or death.

Tighten the bolts that secure the handles if they become loose and clean the driver's floor area if it becomes dirtied with oil, grease or mud.

8 - Chemical Hazards

- Exhaust Fumes

Fumes from the engine exhaust may lead to injury or death.

DO NOT operate the vehicle in an enclosed area without a ventilation system capable of extracting the hazardous fumes.

- Battery

The following WARNING is intended to supplement rather than replace the warnings and information provided on the battery by the battery manufacturer.

When jump-starting the vehicle, adhere strictly to the instructions provided in the point 7.14 contained in this manual.

This vehicle is equipped with a lead-acid battery. Batteries of this type contain an acid electrolyte and generate explosive gases. Never create sparks or flames, or smoke near the battery. Incorrect procedures may lead to contact with the battery electrolyte and result in serious chemical burns to the eyes and skin, or damage to clothing.

Always wear safety glasses and proper protective gear when performing any maintenance work or servicing the battery.

FIRST AID FOR BATTERY ELECTROLYTE

External contact - Flush with water

-Eyes - Flush with water for at least 15 minutes and seek medical attention immediately!

- Swallowing- Drink large quantities of water, followed by milk of magnesia, beaten egg or vegetable oil. Seek medical attention immediately!



IMPORTANT

In case of swallowing, DO NOT administer any fluids that induce vomiting!

9 - MOVING PARTS HAZARD

DO NOT place limbs or other parts of the body close to moving or rotating parts of the vehicle during operation. Failure to comply with this warning may lead to serious injury or death due to crushing or amputation.

STOP the engine and wait for all moving and rotating parts to come to a standstill before carrying out maintenance work or other service activities on the vehicle.

10 - MACHINE INSPECTIONS AND MAINTENANCE

Stop the engine before commencing with any inspection and maintenance work on the machine.

- It is extremely hazardous to carry out inspections or maintenance work while the engine is running. Ensure that the engine has been stopped beforehand.
Only commence with the task after every device in the engine compartment has cooled down.

Inspection and maintenance operations with the engine running

- In the event that maintenance tasks need to be performed with the engine running, set the locking lever to the "Locked" position and be sure to perform the work with two or more workers, including one assistant.
- The assistant should sit in the operator's seat so that he can immediately turn off the engine in an emergency.
In this case, do not touch any lever other than the one required.

11 - TRACK ADJUSTER: PRESSURE RELIEF SYSTEM HAZARD

ALWAYS follow the instructions contained in this manual when adjusting the vehicle's track tension. The track adjuster unit contains grease under very high pressure . Grease may escape and penetrate the skin unless the proper procedures are followed and suitable protective shields and clothing are worn.

12 - PREPARATION AND PREVENTION

Know the location and function of all vehicle controls.

Before starting the engine, make sure that all persons have been cleared from the work area and that you are not activating any of the control levers or pedals.

Holes, obstructions, debris and other work area related hazards may cause injury or death. Always inspect the work area, taking care to identify the hazards before operating the vehicle.

Avoid hazards when you move the vehicle around the worksite. Know the rules for movement of people and vehicles on the worksite. Comply with all signals and signs.

DO NOT operate the vehicle unless:

- all equipment is in working order,
 - all covers are in place;
 - all warning decals are in place and legible.
- Replace all missing, illegible, or damaged warning decals.

When you operate the vehicle on a road or highway, use accessory lights and devices to warn other vehicle drivers. Comply with all applicable local laws and regulations.

13 - TIPPING: RISKS

The centre of gravity of the excavator shifts when the vehicle is operated on rough ground or slopes, and when loads are lifted and lowered.

Keep the vehicle under control at all times. When travelling, plan the direction in which the vehicle is to move. Avoid making any jerky turns, starts, or stops. Travel with extreme caution and at the slowest possible speed.

DO NOT exceed the vehicle's rated operating load capacity (see the corresponding tables in point 4.0), since failure to adhere to the specified limit values may result in the vehicle becoming unstable and in dangerous operating conditions.

**IMPORTANT**

Travelling with an extended load is dangerous and could cause the vehicle tip-over. If it is necessary to travel with a load, keep the load as close to the vehicle as possible and maintain a maximum clearance of 30 cm between the bottom of the load and the travelling surface.

The protective structure (cab or canopy) makes the driver's position the only safe place to be if the machine should overturn.

During overturning:

- - KEEP THE SEAT BELT FASTENED
- NEVER LEAVE THE DRIVER'S SEAT
- REMAIN SEATED, HOLDING FIRMLY ONTO THE SEAT WITH YOUR HANDS BETWEEN YOUR LEGS
- - LEAN AWAY FROM THE POINT OF IMPACT

Once the machine has stopped tipping:

- Ensure that the machine is stable and will not tip any further;
- unbuckle the seat belt;
- quickly exit from the driving position via the side of the machine that is facing upwards.

Do not try to leave the machine by sliding out under the protection structure. If the main exit route is obstructed, use the emergency exit.

Emergency exit

The emergency exit is via the front windshield, which can be opened completely and is indicated by the decal in the figure.

If the front windscreen mechanism is jammed, break the glass with the hammer provided (see point 7.8.8).



14 - Vehicle Stability

When the turret and/or digger boom assembly is at a 90° angle to the front or rear of the undercarriage, vehicle stability is at its lowest point.

Vehicle tip-over caused by improper loading or operation is more likely to occur with the vehicle in this position.

To provide maximum vehicle stability while working:

- Whenever possible, position the vehicle so that the tracks are parallel with the turret and boom assembly;
- keep the dozer blade lowered and in contact with the ground.

15 - Operation on Slopes

Travelling or working on any slope can be hazardous. Ascend or descend slopes slowly and cautiously. Unexpected obstacles or changes in gradient can cause loss of vehicle control that may result in tip-over.

When travelling on a slope with an angle less than 15°, always reduce vehicle speed and maintain a slow, steady motion. Apply braking by smoothly returning both travel control levers to the NEUTRAL position.

If travel on a slope with an angle greater than 15° is required, take the following additional precautions:

- only travel straight up or down and NEVER across steep slopes;
- The front of the vehicle must always face the DOWNHILL side of the slope;
- Position the dozer blade in front of the operator, to the front of the vehicle and swing the boom assembly straight ahead;
- Once travel has begun, maintain a maximum clearance of 30 cm between the bucket bottom and ground at all times.

If working on a slope with an angle of less than 15°, position the dozer blade to face the DOWNHILL direction before lowering it down to the ground.

DO NOT work on a slope with an angle greater than 15° without first levelling the work area.

DO NOT park the vehicle or leave it unattended on a slope at any time.

16 - Use of the machine on decks or raised surfaces

Always check the space available for movement, as well as the size and load-bearing limitations of the work area. Should it be necessary to work on any form of deck or raised surface, always check the load-bearing capacity beforehand. Pay particular attention to the machine rotation radius.

17 - Passenger transportation hazards

DO NOT allow anyone to ride on the vehicle with the operator.

DO NOT use the vehicle as a man hoist or working platform.

18 - Clearances

Always check overhead and side clearances carefully before driving around or under any fixed structures, such as buildings, bridges, towers, etc.

19 - Underground Hazards

Know the location of all underground hazards before operating the vehicle in a new work area. Contact with electrical cables, telephone lines, gas or water pipes, sewers, or other underground utilities may lead to injury or death. Before starting work, contact your local telephone service supplier and request them to locate and mark these utilities.

20 - Electrocuting Hazards

NEVER operate this vehicle in an area where there are overhead or underground power lines, cables, or other power sources, without first requesting that the appropriate power or utility companies isolate the lines or taking other adequate precautions.

Electrical components have a very low water tolerance.

Infiltration of water into the various sensors, connectors or electrical system components may result in malfunctions. Do not clean the machine using steam and water.

21 - Visual Obstructions

Dust, smoke, fog, etc. can decrease vision and cause an accident. Always stop or slow the vehicle down until the obstruction clears and the work area is once again clearly visible.

22 - Movement over frozen or snow-covered surfaces

If work must be performed on surfaces coated with ice or frozen snow, reduce speed and avoid making any jerky movements. Sideways sliding may easily occur and machine functions become more sensitive.

When a large amount of snow has fallen, the road edges and any equipment provided are difficult to see. Exercise extreme caution in such situations.

Frozen ground will often get softer as the temperature rises. Exercise extreme caution in such situations.

23 - Work Site Conditions

Before commencing work, carefully analyse and take into account the topography and geological features of the work site in order to take proper precautions to prevent the machine from overturning and the earth/soil from collapsing.

Certain other conditions may also affect the work site. People may enter the area, or equipment and material may be moved away or brought in. Always be aware of the existing conditions on the work site and always look in the intended direction before starting any movement.

Do not commence with any task before confirming the safety conditions.

24 - Ventilation

Good ventilation is very important when operating this vehicle. Sparks from the electrical system and engine exhaust may cause an explosion. Carbon monoxide fumes from the engine exhaust can cause suffocation in an enclosed area. DO NOT operate this vehicle in an area containing flammable dust or fumes. Provide good ventilation and wait until the hazard has been eliminated.

25 - Unusual noises emanating from the machine

During operation, be aware of any unusual noises emanating from the engine, hydraulic devices, transmission components, working equipment, etc.

The following may be deemed to be unusual noises.

- Is there any squeaking sound as a result of insufficient lubricating oil?
- Is there any scraping sound?
- Is there any unusual vibration or rattling sound?
- Is there any spluttering sound?
- Is there an unusual sound coming from the hydraulic devices?
- Is there any regular knocking sound?
- Is there any rumbling sound?

If any of these sounds are detected, stop the machine at once and carry out an inspection.

26 - Driving Cab

- **DO NOT** modify, repair or remove the operator protection structure.
The protection offered by the protective structure will be compromised, creating a hazard that may result in death or serious injury if the structure suffers any structural damage or modification such as welding or drilling.

- The protective structure, driver's seat, seat belt and all mounting hardware must be carefully inspected after any type of accident. Any components showing signs of damage must be replaced. The replacement parts utilised must be original equipment, as listed in the Vehicle Parts Catalogue. These parts are available from any authorized Eurocomach Service Centre.



WARNING

Protective structure:

Our machines are always supplied with an approved protective structure that is either open sided or enclosed (cab).

The removal or modification of the protective structure is prohibited. It is prohibited to operate the machine with no protective structure in place.

Keep the area around the operator's seat clean.

- Always keep the cab and access ways clean. Do not climb into the machine with soiled or greasy boots.
- Do not place anything at the foot of the operator's seat or around the pedals, and refrain from hanging anything from the control levers. These control levers may be engaged accidentally, causing the machine to run away or the work equipment to be activated, which constitutes a danger.
- Stow away any items not required for the current operations in their proper places.
- This vehicle has been designed primarily for digging and backfill operations.



IMPORTANT

All the capacity ratings are based on the assumption that the machine is resting on firm, level ground. Should the machine be operating in conditions that differ from those above (for example, loose soil or uneven ground, on an incline, with lateral loads), the operator must take this factor into account and reduce the load accordingly.

- **ALWAYS** lower the dozer blade before commencing with any task. Operator safety, maximum load ratings for the digger, and vehicle stability are dependent upon lowering the dozer blade whenever the vehicle is active in any work situation.
- The vehicle's hydraulic system is equipped with an accumulator that allows limited operational control in the event of any loss of normal hydraulic system pressure. Before maintenance or service of any type is performed on any component of the hydraulic system, it may be necessary to first discharge the accumulator. Contact your authorised Eurocomach Service centre for assistance.

- In the event that any fault or malfunction is encountered with any of the vehicle controls or features, STOP the vehicle immediately and contact the authorized Eurocomach Service centre for assistance.

27 -Precautions for welding repairs

- Have a fire extinguisher at hand in the area where the welding repairs are being carried out.
- Only qualified persons may be permitted to weld.
- Welding operations may only be carried out in an area equipped with a good ventilation system.
- Before beginning to weld, remove any paint from the surface of the part to be welded.
- Do not weld or gas-cut any pipe containing a combustible solution: this may cause a fire or an explosion.
- Only begin with welding or gas cutting after having cleaned the area with a non-flammable solution.
- When any welding repair work is being carried out, the heat generated may scorch the paint and hazardous gases may be released.

28 -Prevention of fuel and oil fires

Fuel, oil and some types of anti-freeze are highly inflammable if they come into contact with a naked flame; fuel is particularly inflammable and therefore highly dangerous.

- Keep naked flames well away from inflammable liquids.
- Shut down the engine and do not smoke while filling up with fuel.
- Only fill up with fuel and oil with the engine shut down, and in well-ventilated areas.
- Dedicate a clearly marked area for filling up with fuel and do not allow access to any unauthorised persons.
- When filling up with fuel, keep a firm grip on the spout and always keep it in contact with the intake until filling is complete, so as to prevent any sparks due to static electricity.
- After filling, carefully tighten the safety caps on the fuel and oil tanks.
- Never fill the tank completely; leave room for the fuel to expand.
- Dry up any fuel spills immediately.
- Do not heat up fuel tanks or hydraulic devices or bring any naked flames near them: this constitutes a fire hazard.
- Keep fuel and oil in appropriate containers and store them in a safe place, with access restricted solely to persons authorised to handle these materials.

29 - Storing the vehicle

Ensure that you remove the key.

Before leaving the machine, lower the bucket and the dozer blade to the ground. Stop the engine and remove the key. Cover the swing and PTO pedals.

Park the machine on a level surface.

Select a safe and level surface when parking the machine. If it is necessary to park on a slope, block the tracks with chocks at right angles to the slope. Drive the bucket teeth and the dozer blade into the ground.

After operation, inspect the entire machine and lubricate.

OPERATIONAL PRECAUTIONS

- Do not try to crush concrete or boulders using the sideways motion of the bucket.

Do not allow the bucket to free-fall when digging.

Do not extend the cylinders completely. Always leave a safety margin.

When travelling down a steep slope, reduce speed to within a safety range using the travelling lever.

Do not dig or use the bucket to hammer a pile into the ground.

Do not attempt to start moving or to dig with the bucket dug into the ground.

When scraping the ground, do not dig the bucket in too deeply. Instead, dig with the bucket at a fairly shallow level and far away from the body of the machine: this puts less strain on the bucket.

This machine can be used in water as long as the turret is above the water level. Check that the engine exhaust is always above the water level, keeping a suitable safety margin.

When travelling or transporting the machine with the boom folded, do not allow the bucket to come in contact with the dozer blade.

After having operated in water or mud, always clean and inspect the machine and grease the pins on the bucket, the swing post, and any other parts that have been submerged.



DANGER

When operating near any overhead power lines, either barricade them off or apply insulating guards around them. In addition, it is extremely hazardous to operate in the vicinity of any high-voltage power lines: the driver could even be electrocuted when the machine makes contact with this line.



CAUTION

Digging with the machine facing the rear will prevent the boom cylinder from fouling against the dozer blade.

Do not use this machine to lift or move materials under any circumstances, se non con opportune e dedicate optional equipment, at all times following the specific warnings.

Do not move the boom rapidly, particularly downwards: the track frame may suffer damage.

Do not lift the machine with the turret turned from its normal travelling direction: or the machine may tip over.

Do not operate the machine with heavy loads while it is swinging, as this may damage the boom.

When working in areas of uneven ground, level the surface before starting work.

Ensure that the rear of the machine does not hit anything while turning.

Before starting work, always ensure that any ancillary equipment fitted does not interfere with the booms.

When digging deep, ensure that the cylinder of either boom does not accidentally hit the ground.

Do not attempt to move any rocks or similar items using the blade: this may damage both the dozer blade and the blade cylinder.



CAUTION

When lifting up the machine with the dozer blade, the machine supports must be on either side of the blade and not on one side only.

The dozer blade must not be used to increase stability/support, as there is no electrical cut-out or mechanical locking device present.

Do not undermine sheer cliff faces, as the edges may break away or the soil may give way, resulting in serious injury or death.

Do not lift, move or rotate the bucket above any person or above the truck cab. Loads dropping from the bucket or bumps against the bucket may cause serious injury or damage the machine.

3.6 Safety devices

3.6.1 Protective structure: (cab)

The cab has been approved in accordance with the regulations in force, and has successfully passed the ROPS and FOPS tests:

- ROPS ISO 3471
- FOPS ISO 3449 Level I.

In the event of damage, contact Eurocomach so that they can check the strength level.

- **DO NOT** modify, repair or remove the operator protection structure.
The protection offered by the protective structure will be compromised, creating a hazard that may result in death or serious injury if the structure suffers any structural damage or modification such as welding or drilling.
- The protective structure, driver's seat, seat belt and all mounting hardware must be carefully inspected after any type of accident. Any components showing signs of damage must be replaced. The replacement parts used must be original equipment, as listed in the Vehicle Parts Catalogue. These parts are available from any authorized Eurocomach Service Centre.



WARNING

Our machines are always supplied with an approved protective structure.

The removal or modification of the protective structure is prohibited. It is prohibited to operate the machine with no protective structure in place.

3.6.2 FOPS Level II protection grid (Optional)

Use of this protection is mandatory when working under conditions where there is the risk of heavy objects falling from above.

Places with the greatest risk of these dangers are:

- Tunnels
- Escarpments with falling rocks

It is the operator's duty to assess these risks and so his responsibility to fit the protection.

3.6.3 FRONT-GUARD Level II protective grid (Optional)

Use of this protection is mandatory when working with certain types of equipment such as:

- Log grapple
- Selection grapple

For instructions on fitting these types of equipment see point 8.0.

3.6.4 Seat belts

Seat belts are essential in the event of the machine overturning, as they will restrain the operator firmly in his seat. The condition, cleanliness and mechanical mountings of the seat belt must be checked regularly.



IMPORTANT

Inspections before starting

Before starting the engine or using the machine, the operator must fasten his seat belt, having checked that it is in good working order.

Operations before leaving the machine

The operator may only undo his seat belt once the engine has been switched off.

3.6.5 Servo-control cut-out lever

When raised, the servo-control cut-out lever cuts off the control circuit and prevents the servo-controls from being activated accidentally.

The servo-control cut-out lever must be raised whenever the operator leaves the machine.

3.7 Remote diagnosis and geolocation system (optional)

The system uses wireless communication to monitor the machines.

It can only be used after contacting the EUROCOMACH service centre and once a contract has been made.

As the device is wireless, it uses radio frequency; for this reason authorisation must be obtained and the applicable laws in the country or territory of use must be complied with.

Before selling or exporting the machine with the equipment installed, contact the EUROCOMACH service centre.

The system can be removed or inhibited by the EUROCOMACH service centre if required, in the event that the Machine is sold or exported.

EUROCOMACH and the authorised service centre cannot be held responsible for problems or damage caused by failure to comply with the precautions stated .

WARNING

Do not remove, repair, modify or move the communication terminal, the antenna or cables, as this could cause a breakdown or short-circuit in the equipment or to the machine itself.

EUROCOMACH service centre will take care of removal disinstalling the equipment .

Prevent cables or wires from being crushed or damage, do not pull cables or wires forcefully. Short-circuits or disconnected wires could lead to the equipment or the machine breaking down or catching fire.



ES1-1490

Anyone wearing a pacemaker, should check that the communication antenna (1) is located at least 30 cm from the pacemaker as the radio waves could exert a negative action on the way it works.

**IMPORTANT**

Even if the relative key is turned to OFF, the system absorbs a minimum amount of power. In the event of prolonged machine inactivity, follow closely the instructions given point 9.12.

Take care to prevent water from forming on the communication terminals or on cables.

Because the system relies on wireless communication, it cannot be used in tunnels, in underground locations, inside buildings or in mountainous areas where radio frequencies cannot be received. Even when the machine is located outdoors, it cannot be used in areas where the radio signal is weak or in areas with no signal coverage.

Do not disconnect or tamper with the communication terminal; if any faults arise, contact the EUROCOMACH service centre.

3.8 Automatic anti-collision system (only on ES900UR version)

Because of the particular arrangement of the booms, there is the risk of the equipment impacting with the cab during operation.

The **ES900UR** version machine is equipped with a series of sensors, on the lifting boom, digger boom and offset positioner, which allow the position of the work equipment to be identified in relation to the machine at all times, especially in relation to the cab.



ES1-1040

Together with the control box, these constitute an “Automatic Anti-collision System”, the purpose of which is to guarantee operator safety, preventing the working equipment from accidentally colliding with the cab.

WARNING

When the machine and the oil are cold the anti-collision system may not work properly.

Before starting work, keep the engine at half speed for 5 minutes making small movements.

After the warm-up, check the system is working correctly by bringing the bucket towards the machine slowly, it should stop before colliding with the cab.



CAUTION

When the sensors are knocked or damaged, always check the anti-collision system is working properly, if even one of the sensors is faulty the whole system will be compromised.

Never submerge the sensors in water, if this does happen remove all residual water immediately and check the system is working correctly.

Do not remove/refit or disassemble the sensors to repair them.

This may cause the whole system to malfunction, in the event of a breakdown contact the EUROCOMACH service centre.

How the anti-collision system works is explained in detail in point 7.13.

4.0 Technical information

4.1 Engine

MODEL	ES850ZT	ES950TR	ES850SB	ES900UR
Brand	Yanmar			
Model	4 TNV 98			
Power output (ref. 97/68/CE)	46.3 kW (63.2 hp) a 2200 rpm			
Displacement	3319 cc			
Bore	98 mm			
Stroke	110 mm			
Number of cylinders	4			
Cooling	Liquid			
Fuel	Diesel			
Idle speed	900 rpm			
Maximum (under load)	2250 rpm			
Air filter	Dry filter with safety cartridge			



IMPORTANT

As regards the description and the specific operation of the internal combustion engine, (injector pump, alternator, starter system), please refer to the engine operation and maintenance manual supplied with the machine.

4.2 Undercarriage

MODEL	ES850ZT	ES950TR	ES850SB	ES900UR
Undercarriage structure	FIXED, 'X' box-frame			
Lower rollers	5 RH + 5 LH - version with rubber tracks - oil bath			
	6 RH + 6 LH - version with metal tracks - oil bath			
Upper rollers	1 - oil bath			
Idle wheels	oil bath			
Rubber tracks	450 x 82 x 76			
Track tensioners	hydraulic adjustment by grease pressure			

4.3 Dozer blade

MODEL	ES850ZT	ES950TR	ES850SB	ES900UR
Width	2320			
Height	500			
Height extension	460			
Depth extension	450			
Distance from fifth wheel centre	1960			

4.4 General data

MODEL	ES850ZT	ES950TR	ES850SB	ES900UR
Operating weight (rubber tracks) kg	8600	9200	8200	9000
Operating weight (metal tracks) kg	8920	9520	8520	9320
Travel speed 1st and 2nd Km/H	2.6 - 5.2			
Turret rotation speed rpm	12			
Specific pressure at the tracks, with cab, rubber tracks and standard bucket fitted, KPa (kgf/cm ²)	0.42	0.45	0.40	0.44
RH boom swing	50°	50°	N.A.	N.A.
LH boom swing	80°	80°	N.A.	N.A.

The **total net weight** of the machine is deemed to be the sum of the operating weight and that of the various accessories or buckets fitted.



IMPORTANT

Always take the weight of the accessory or bucket fitted to the boom into account.

4.5 Performance

MODEL	ES850ZT	ES950TR	ES850SB	ES900UR
Jerk strain limit at the bucket. (standard boom) ISO 6015 Kg	5500			
Breaking strain limit at the boom (standard boom) ISO 6015 Kg	4000			
Traction strain limit Kg	7960			
Traversable incline	60% - 30°			

4.6 Hydraulic system

MODEL	ES850ZT	ES950TR	ES850SB	ES900UR
Pump type	1 load sensing axial piston pump with variable capacity + 1 gear pump			
Pumping capacity	185 L +20 L			
Operating Pressures: 1 - lifting boom, 2 - bucket, 3 - boom, 4 - travel - Dozer blade - chassis rotation motor - Servo-controls	290 bar 290 bar 260 bar 35 bar			
Total hydraulic capacity	205 l			
Auxiliary hydraulic capacity	100 L/min			
Hydraulic servo-controls for operational functions	3 joysticks + 1 control pedal			
Travel	hydraulic gear motors with axial pistons and "AUTO TWO SPEED" automatic speed changer			
Turret rotation	hydraulic gear motors with axial pistons and negative parking brake			

4.7 Table of rated load capacities



DANGER

The machine is not designed for lifting loads and so such operations are prohibited.

The machine can be used for lifting loads once it is equipped with the devices prescribed by EN474-5 and all the national regulating laws are complied with.

The table of rated load capacities that follows has been drafted in accordance with the ISO 10567 standard.

The load capacities refer to:

- Machines positioned on virgin, firm and level ground;
- The indicated capacities remain valid for the full swivelling range of the turret;
- The indicated capacities refer to the bucket hinge pin;
- Reach from centre of fifth wheel;
- Max manifold pressure: 290 bar;
- The indicated capacities refer to the machine configuration with non-articulated boom (**ES850ZT - ES950TR - ES900UR**).
- The load capacities do not exceed 75% of the tipping limit or 87% of the hydraulic limit, in accordance with ISO 10567.

ES850ZT
MACHINE CONFIGURATION:

- one-piece, 3271 mm lifting boom;
- 1760 mm digging boom with cylinder and connecting-rod bucket leverage system;
- with no bucket, quick-release attachment or other accessory fitted;
- standard ballast of 1720 Kg;
- 450 mm rubber tracks.

REACH (M)	3	3.5	4	4.5	5	5.5	MAX
LOAD (kg)	2860	2210	1880	1450	1320	1130	1000

ES850SB
MACHINE CONFIGURATION:

- one-piece, 3705 mm lifting boom;
- 1760 mm digging boom with cylinder and connecting-rod bucket leverage system;
- with no bucket, quick-release attachment or other accessory fitted;
- standard ballast of 1720 Kg;
- 450 mm rubber tracks.

REACH (M)	3	3.5	4	4.5	5	MAX
LOAD (kg)	2860	2290	1820	1480	1290	1140

ES900UR

MACHINE CONFIGURATION:

- one-piece, 1900 mm lifting boom;
- 1590 mm offset lever;
- 1760 mm digging boom with cylinder and connecting-rod bucket leverage system;
- with no bucket, quick-release attachment or other accessory fitted;
- standard ballast of 1720 Kg;
- 450 mm rubber tracks.

REACH (M)	3	3.5	4	4.5	5	MAX
LOAD (kg)	2590	2050	1690	1420	1210	1010

ES950TR

MACHINE CONFIGURATION:

- one-piece, 2298 mm lifting boom;
- 2099 mm triple positioner boom;
- 1760 mm digging boom with cylinder and connecting-rod bucket leverage system;
- without bucket, quick-release attachment or other accessory fitted;
- standard ballast of 1720 Kg + supplementary internal 452 Kg ballast;
- 450 mm rubber tracks.

REACH (M)	3	3.5	4	4.5	5	5.5	6	MAX
LOAD (kg)	2800	2360	1850	1470	1250	1100	960	840



IMPORTANT

The capacities shown must be reduced depending on the type of bucket, quick-release attachment or other accessory fitted.

The capacities shown must be reduced depending on the slope and the ground adhesion conditions.

4.8 Standard equipment

- ROPS - FOPS cab complete with air conditioner, heating, front windshield wiper and stereo.
- 450 mm rubber tracks.
- Dozer blade width 2320 mm.
- Automatic parking brake on swing and traverse.
- Dual travel-speed with "AUTO TWO SPEED".
- 1760 mm digging boom.
- Servo assisted hydraulic joysticks with proportional electro-hydraulic controls for:
 - Boom swing;
 - single/double effect hydraulic system hose kit (e.g. hammer or auger);
 - low capacity double effect hydraulic system hose kit (e.g. swivelling bucket or lifting grab with rotor);
 - hydraulic system with flow rate of 100 lt/min at 200 bar constant for cutters and cutter heads.
- 3 rear view mirrors.
- Unique ignition key operates all locks on the vehicle.
- Sprung seat with arms and safety belt with winder.
- Dry air filter with safety cartridge and electric blockage indicator.
- Use and maintenance manual, spare parts catalogue and tool kit.
- Working lights on boom and turret.
- Guard on raising cylinder and blade.
- Electronically controlled diesel filler pump.
- Maintenance tool storage compartment (for versions **ES850ZT** and **ES950TR**).
- Safety shut-off valves on main boom and dipper stick (for versions **ES950TR** and **ES900UR**).
- Safety shut-off valves on swing (for versions **ES850ZT** and **ES950TR**).
- Safety shut-off valves on triple position (for versions **ES950TR**) and offset positioner (for version **ES900UR**).
- Parking brake on travel:
 - mechanical negative brake with automatic hydraulic release;
- Parking brake on rotation:
 - mechanical negative brake with automatic hydraulic release.
- Service brake on hydraulic rotation and travel.

4.9 Optional extras

- FOPS Level II protective grid.
- FRONT-GUARD Level II protective grid.
- Steel tracks or rubber pads in steel/rubber.
- 2110 mm digging boom.
- Safety shut-off valves (main boom and dipper stick, bucket, blade) for versions **ES850ZT** and **ES850SB**.
- Safety shut-off valves (bucket, blade) for versions **ES900UR** and **ES950TR**.
- Working lights and rotating light on the cab.
- Various accessories to be fitted to the digger boom (described in point 8.1.1)
- EUROCOMACH satellite monitoring system (with integral anti-theft alarm).
- Satellite anti-theft system.
- Supplementary internal 450 kg cast ballast for versions **ES850ZT** and **ES850SB**.
- Supplementary external 800 kg cast ballast (rear rotation radius 1300 mm).

4.10 Rotating structure

The excavator's superstructure (turret, booms) is able to rotate independently from the bottom section (undercarriage). This movement is permitted by the fifth wheel, which ensures the movement of parts with the minimum amount of friction. The fifth wheel consists of two rings free to rotate with each other; one is securely joined to the undercarriage, the other to the turret.

4.11 Fluid capacities

MODEL	ES850ZT	ES950TR	ES850SB	ES900UR
Engine oil with replaceable filter	10 l			
Fuel tank	105 l			
Cooling system	25 l			
Hydraulic fluid reservoir	90 l + 30l (system)			

4.12 Operation at low temperatures or during winter

PRE-START PREPARATIONS

The engine may be difficult to start in cold weather and the radiator water and battery fluid may freeze. Therefore, pay attention to the following.

1 - Lubricant

Engine oil	SAE10W-30
------------	-----------

2 - Fuel

Use diesel fuel with a flowing point that is five degrees lower than the lowest outdoor temperature.

3 - Coolant

Add anti-freeze to the cooling water to prevent the cooling system from freezing. The following table shows freezing temperatures against the amount of anti-freeze added.

The total coolant capacity is 4 L, including the overflow tank.

Before leaving the factory, the machine is filled with sufficient anti-freeze to cope with temperatures of -15°C .

When upgrading the cooling liquid for operating at temperatures below -15°C , refer to this manual and to the one provided by the engine manufacturer.



IMPORTANT

Allow the engine and hydraulic fluid to warm up properly because, if they are not sufficiently warm before the control levers are activated, the machine will operate sluggishly, which may lead to accidents.



WARNING

Take care when using open flames as anti-freeze is flammable.



CAUTION

When the coolant level needs to be topped up, add the new coolant just before starting up the machine and not at the end of the shift, so as to prevent freezing.

4 - Battery

Battery capacity is reduced at low temperatures. If the charge voltage is inadequate, the battery fluid may freeze. If this happens, cover the battery or remove it from the machine, keep it in a warm place and fit it again the next time the machine is used.



CAUTION

If the battery is recharged using a booster cable, make sure that the earth cable is attached and the engine is switched off. Remove the filler cap and connect the cable to the battery.



WARNING

Since dilute sulphuric acid is used as electrolyte, take care not to let any of the liquid come into contact with hands or eyes.



CAUTION

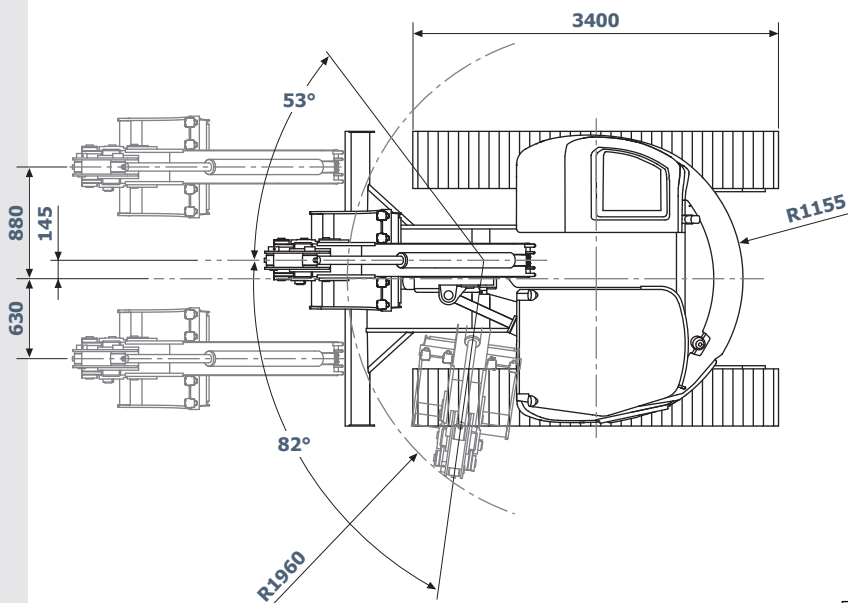
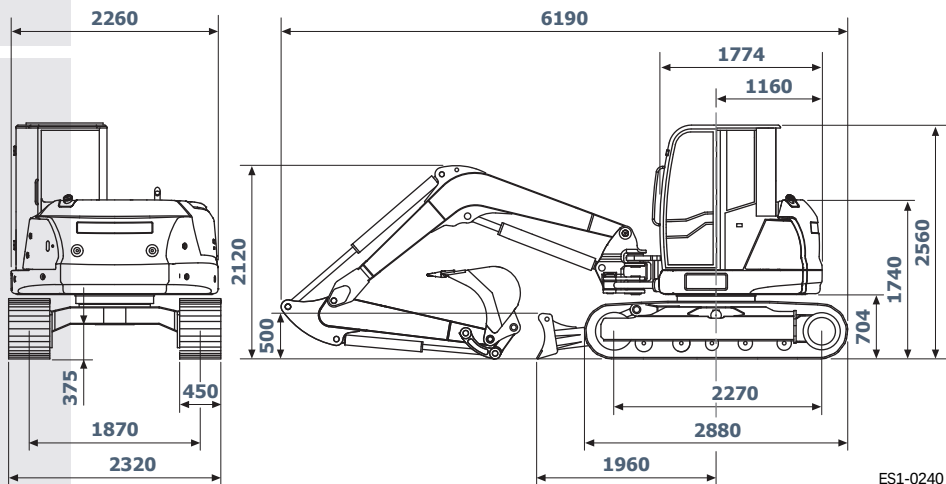
- When disconnecting the terminals, START with the (-) terminal.***
- Instead when connecting them, connect the (-) terminal LAST.***
- When using any instrument near the battery, be sure not to touch the + terminal because the machine's body is (-).***

4.13 Electrical system

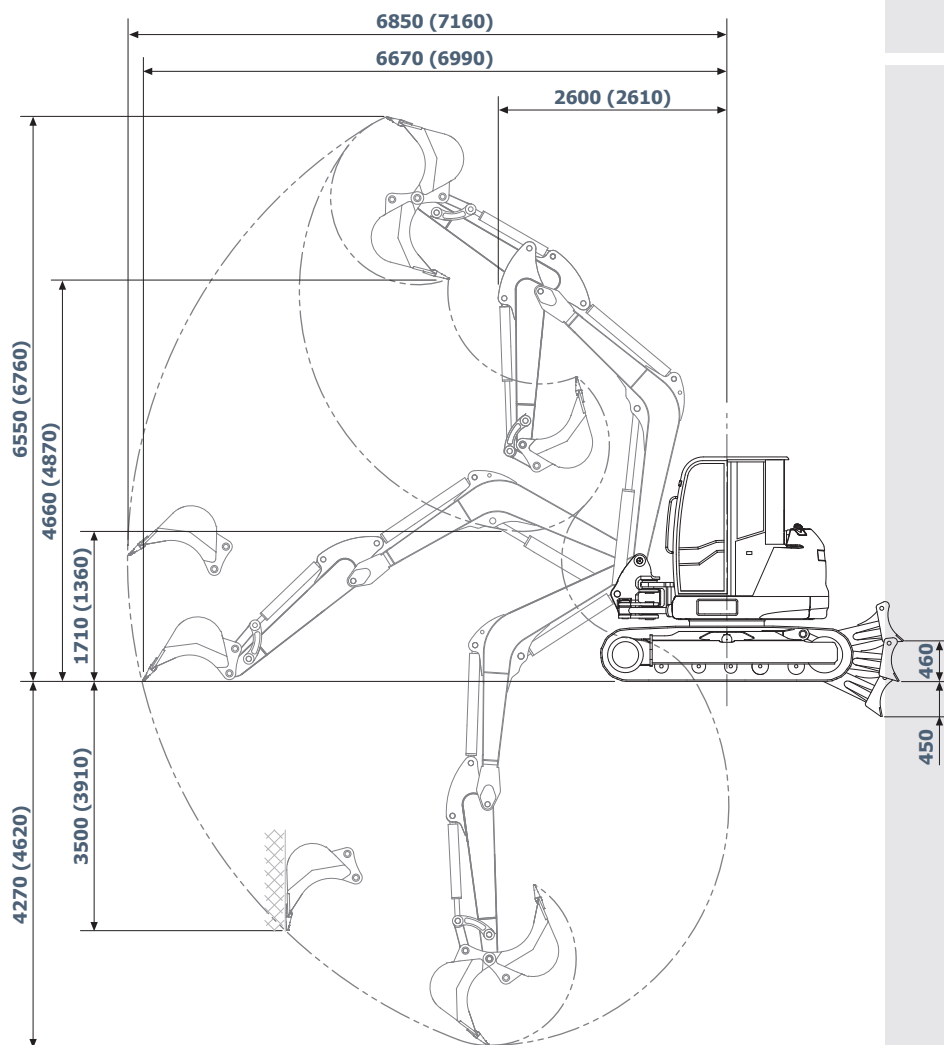
Electrical system	12V DC, negative earth
Lead-acid battery with liquid electrolyte.....	12V 105 Ah
Alternator	12V 55 Amp
Starter motor	12V 3.0 KW

4.14 Vehicle dimensions (in mm) with standard 900 mm bucket

Version ES850ZT



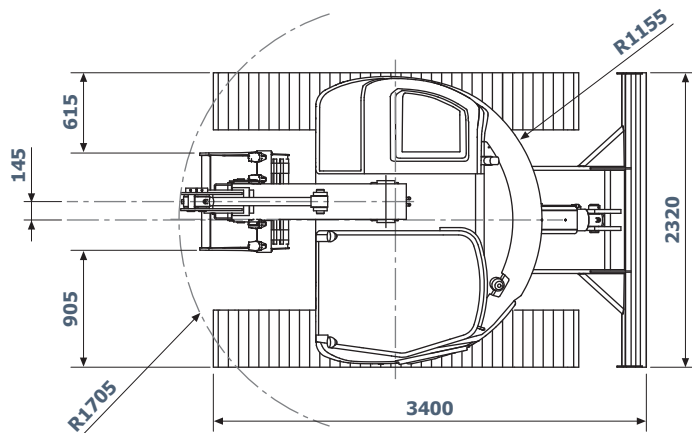
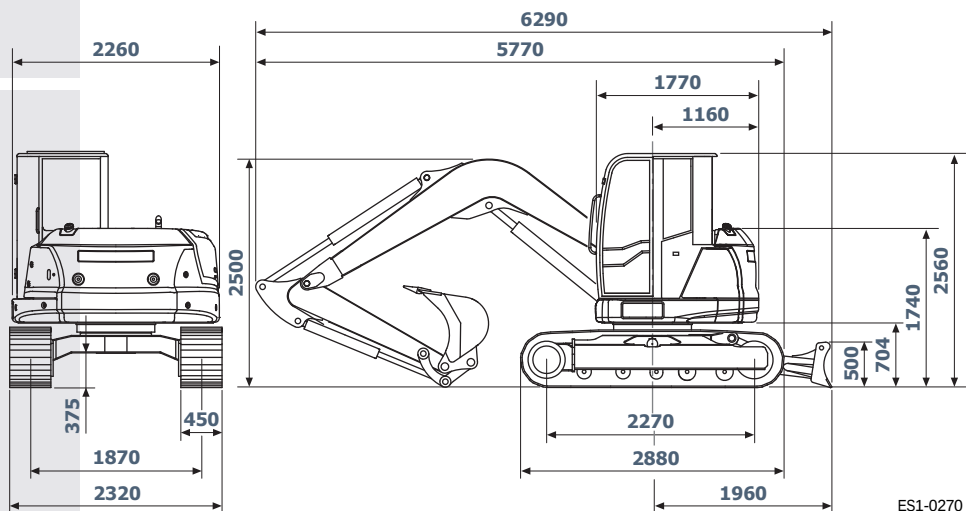
Version ES850ZT



*
Standard boom 1760 mm (Long boom 2110 mm)

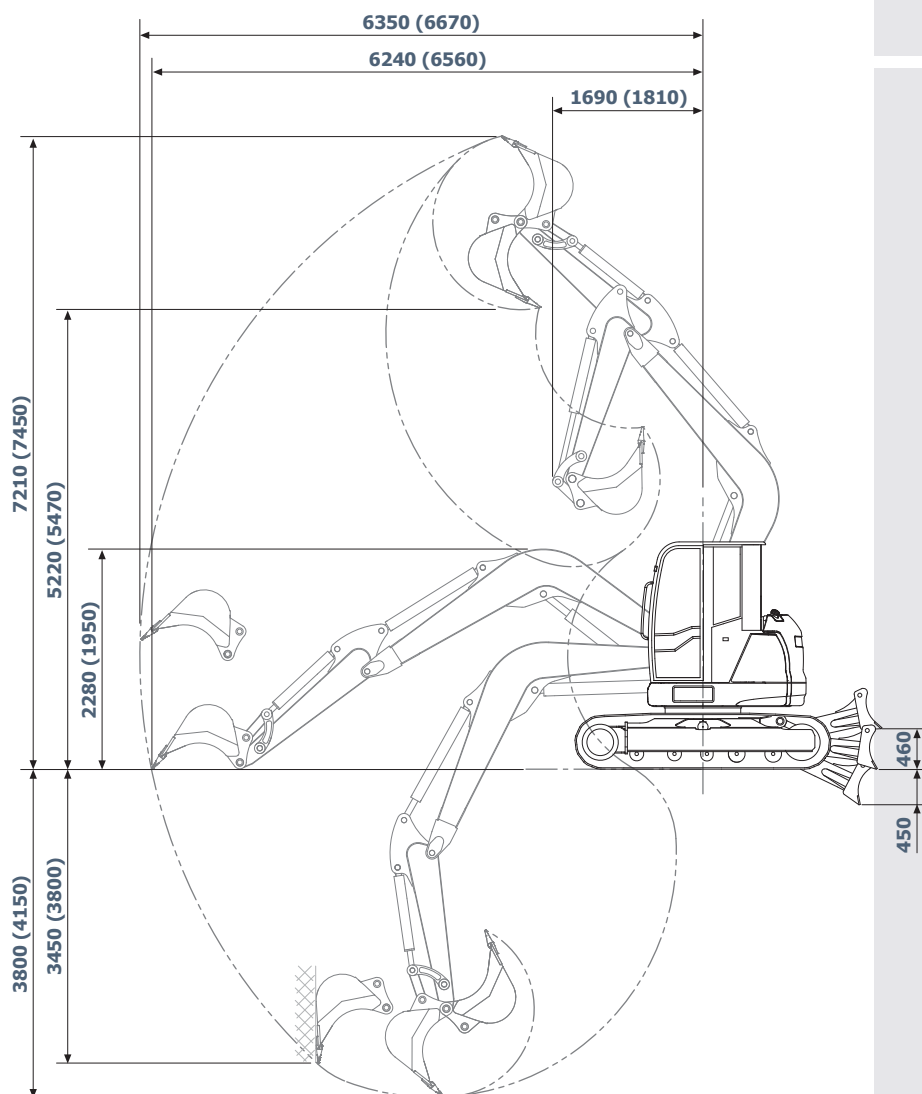
ES1-0260

Version ES850SB



ES1-0280

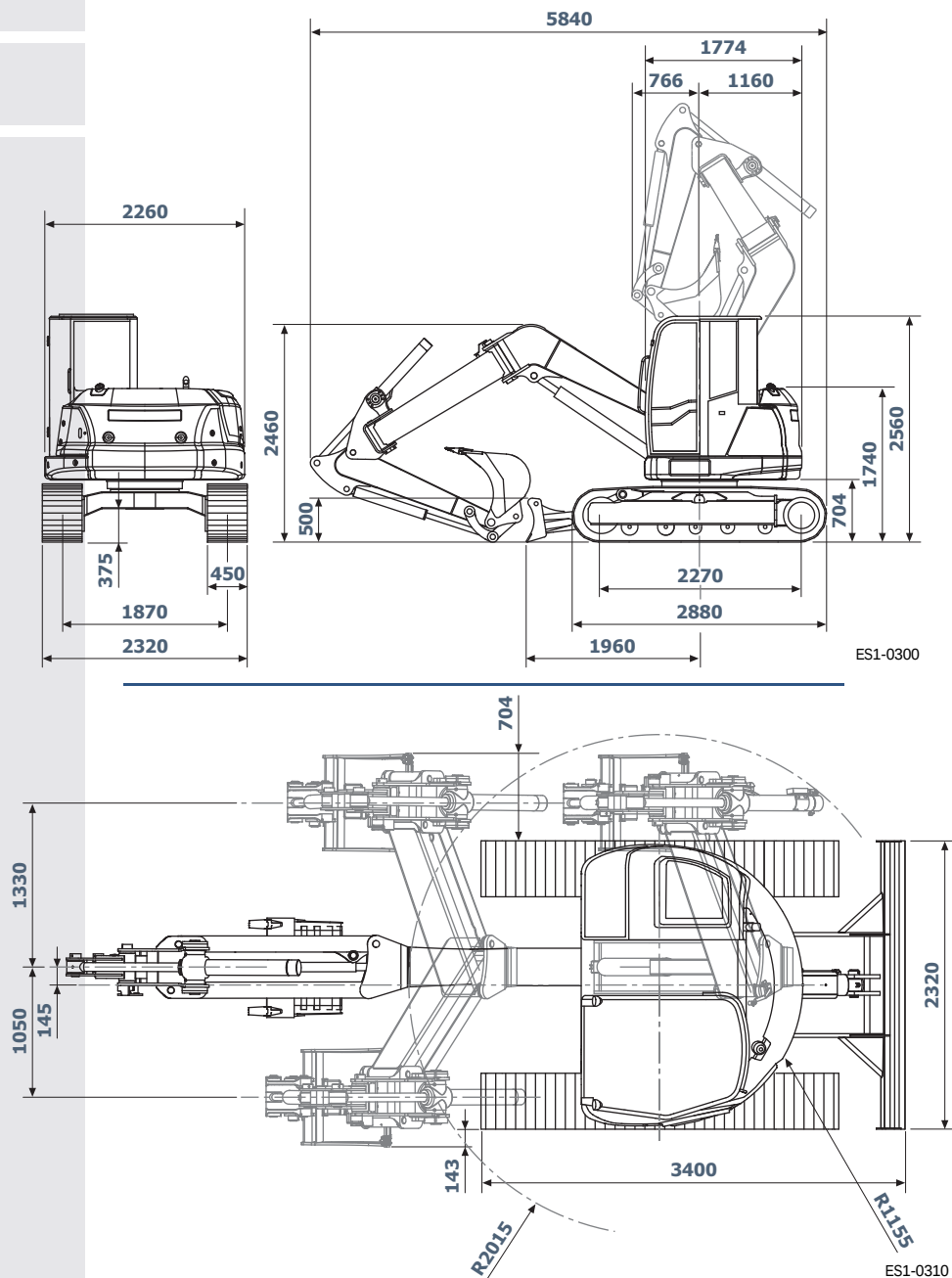
Version ES850SB



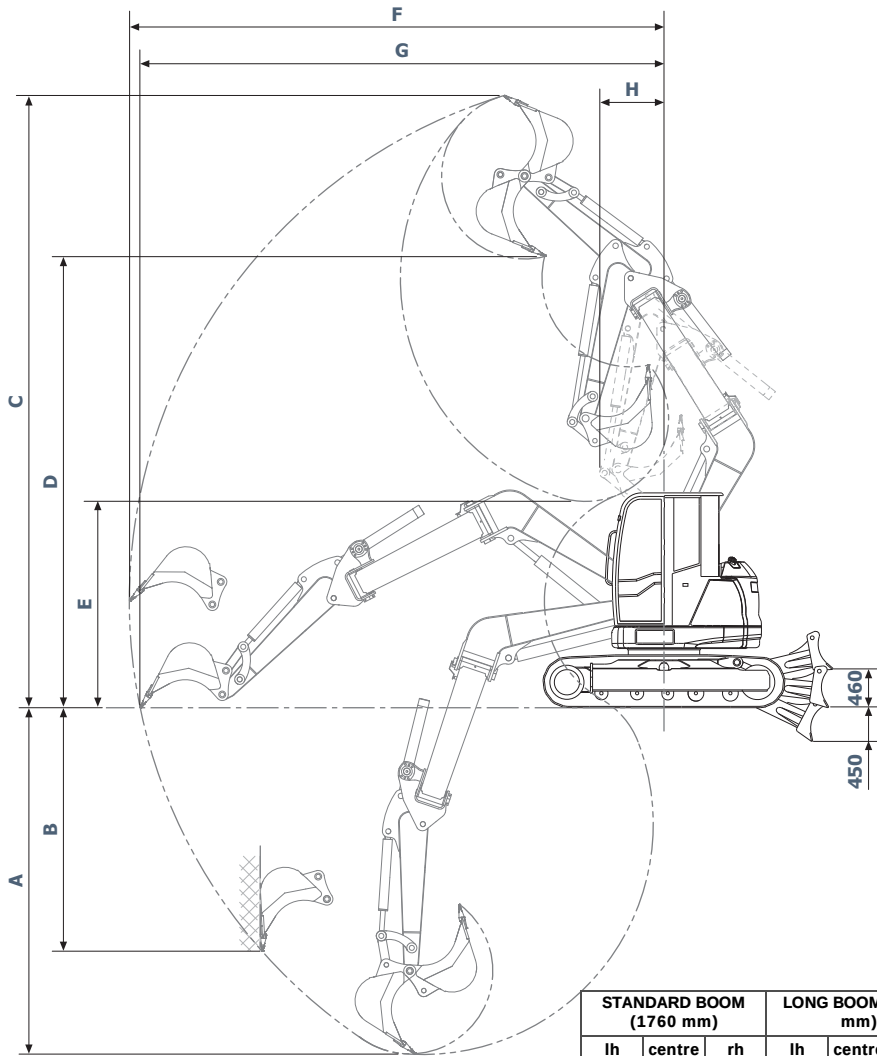
*
Standard boom 1760 mm (Long boom 2110 mm)

ES1-0290

Version ES900UR



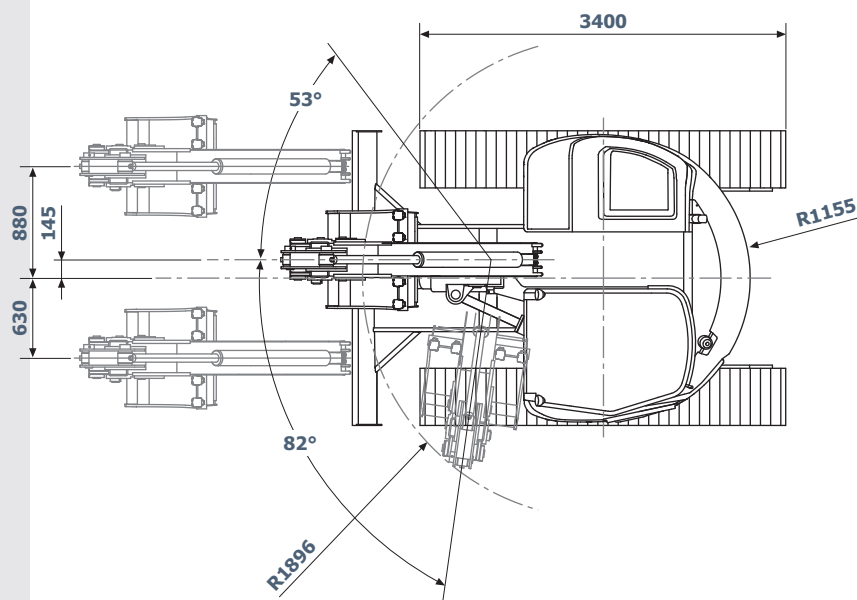
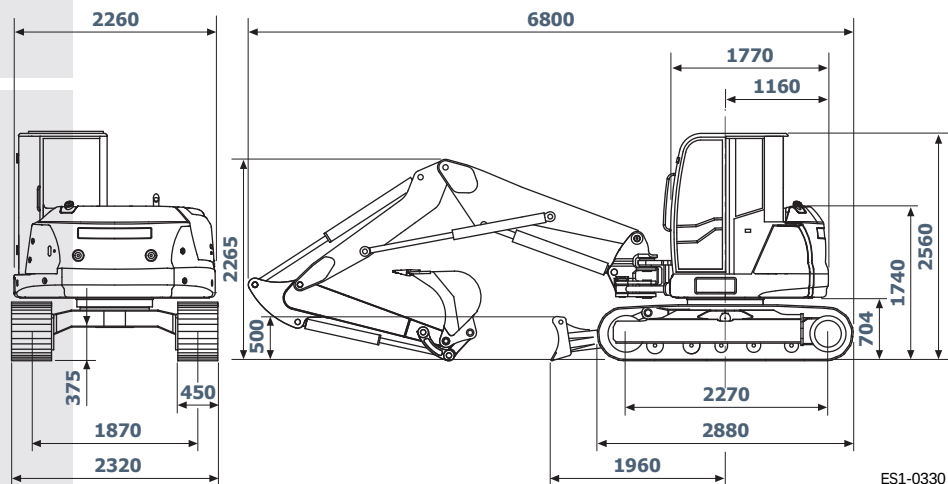
Version ES900UR



	STANDARD BOOM (1760 mm)			LONG BOOM (2110 mm)		
	lh	centre	rh	lh	centre	rh
A	3840	4220	3530	4195	4580	3880
B	2860	3200	2575	3230	3590	2950
C	7050	7380	6780	7280	7600	7010
D	5130	5450	4860	5340	5670	5070
E	2120	2460	1860	1795	2120	1540
F	6070	6450	5770	6380	6760	6075
G	5030	6320	5610	6240	6630	5920
H (R min)	1465	1180	2080	1540	1260	2090

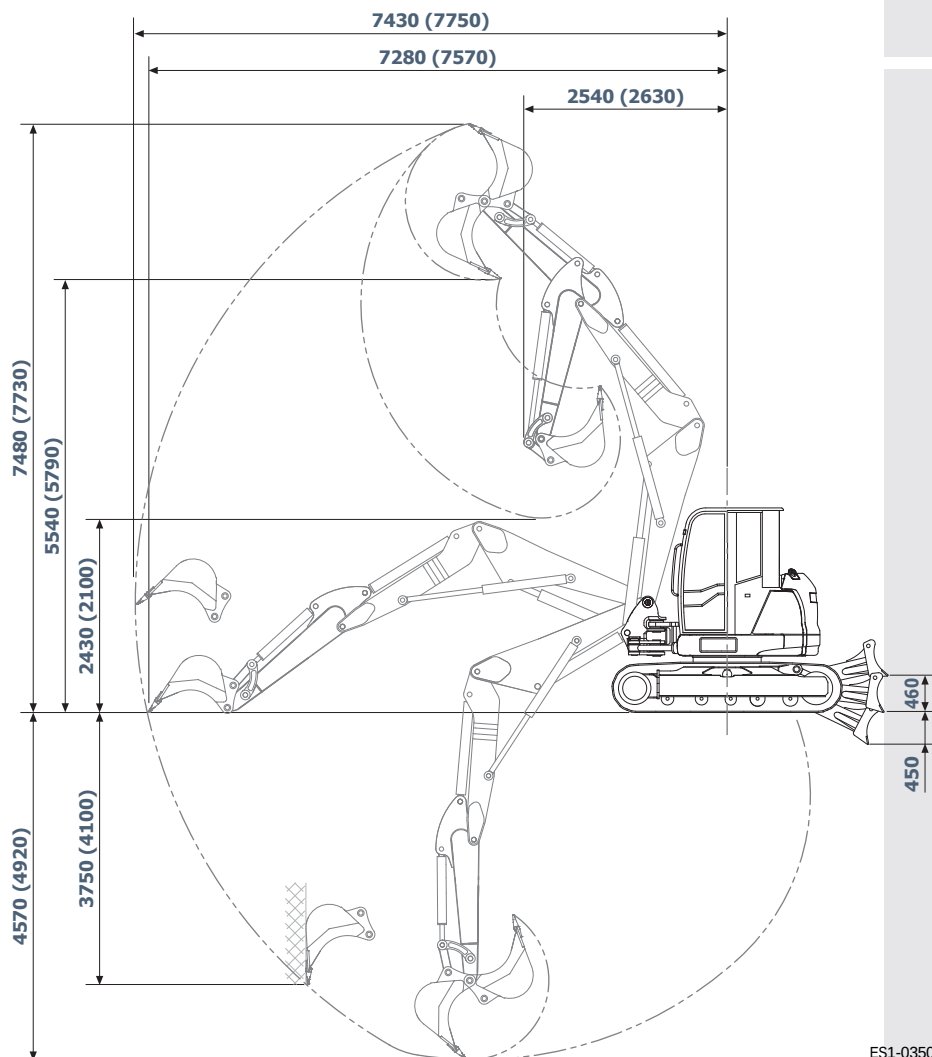
ES1-0320

Version ES950TR



ES1-0340

Version ES950TR



*
Standard boom 1760mm (Long boom 2110 mm)

4.15 Noise characteristics

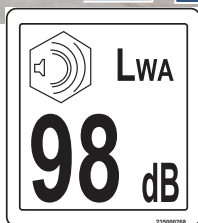
The machine complies with specifications 2000/14/EC, 2005/88/EC and subsequent amendments relating to noise levels.

The noise characteristics indicate the guaranteed noise level in dB (A). It is indicated as LWA 98, as displayed on the decal applied on the right front side of the vehicle.

The acoustic noise pressure level (LpA), as recorded at the driving position in accordance with ISO 6396:1992, is equivalent to 79 dB (A) and, therefore, in accordance with the standards, no special hearing protection equipment is required.



ES1-0200



EG-0350

4.16 Machine vibration characteristics

The level of vibration transmitted through to the operator depends mainly on the ground conditions in which the machine is operating, the work methods being applied and the accessories fitted to the machine.

Exposure to vibration can be reduced substantially by complying with the following suggestions:

- make use of accessories that are suitable for the type of machine and the type of task to be performed;
- adjust and lock the seat in the appropriate position; In addition, regularly inspect the seat suspension, making any necessary adjustments and performing any necessary maintenance;
- regularly perform any necessary maintenance in the area around the driving position;
- operate the accessories smoothly, as far as possible avoiding any sudden movements or excessive jolts;
- adjust your speed and route and, as far as possible, avoid particularly bad routes and hitting possible obstacles, so as to minimise the level of vibration.

The average quadratic frequency value on acceleration to which the operator's upper limbs is exposed, does not exceed 2.5m/s^2 .

The average weighted quadratic frequency value on acceleration to which the operator's body (feet or seat) is exposed, does not exceed 0.5m/s^2 .



IMPORTANT

This machine is equipped with a driver's seat that complies with the requirements of standard ISO 7096:2000.

This ensures that the level of exposure of the operator's body to vibration complies with the requirements, in terms of protection against vibration, when the machine is utilised as envisaged by the intended use, and in accordance with the provisions of this manual.

5.0 Transportation of the vehicle

CAUTION

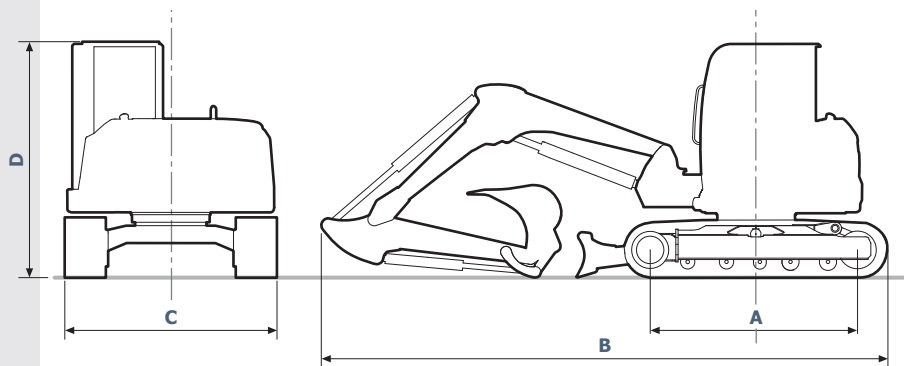
Ensure that the vehicle used to transport the machine has an adequate loading capacity.

Before loading the machine, check that there is no grease, oil, soil, ice or other slippery material on the loading platform and ramp.

Do not turn on the ramps. Align the machine tracks with the ramps before proceeding and move in a straight line. If the machine is off line when going up the ramps, stop the machine, reverse back down and try again.

Use the appropriate fixing points when tying the machine down on the vehicle.

5.1 Transportation dimensions

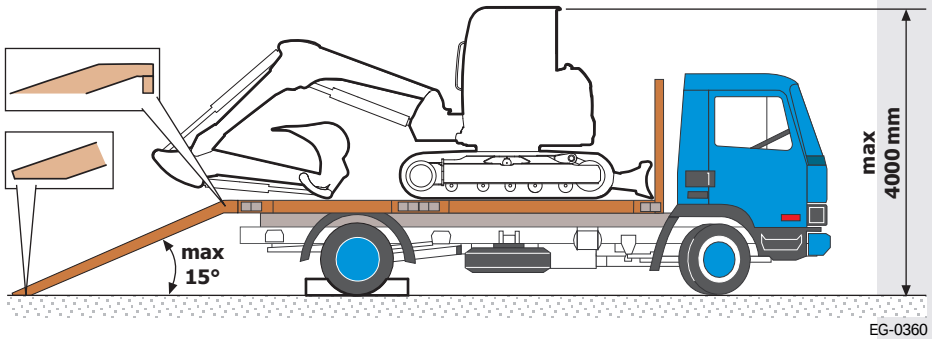


EG-0670

MODEL		ES850ZT	ES950TR	ES850SB	ES900UR
A	chassis length	2270 mm	2270 mm	2270 mm	2270 mm
B	machine-side length	6190 mm	6800 mm	5770 mm	5840 mm
C	track width	2320 mm	2320 mm	2320 mm	2320 mm
D	height – top of protective structure	2560 mm	2560 mm	2560 mm	2560 mm

Before using ramps to load or unload this vehicle:

- the loading and unloading of the excavator must be carried out with the ramps resting on level ground;
- make certain that the ramp load rating is adequate for the gross vehicle weight of the excavator.
If a pair of ramps is required, ensure that each ramp has an adequate load rating, and is at least 300 mm wide;
- The angle of the loading ramp(s) must NOT exceed 15°;



- install the two ramps so that the axis of the machine is aligned with that of the truck;
- the ramps must be rigidly connected to the truck deck in order to avoid possible disconnection while the machine is being loaded;
- make sure that the truck parking brake is engaged and then fit non-slip chocks in front of and behind the tyres.



IMPORTANT

During the winter, warm up the excavator's engine and hydraulic system before commencing with any loading/unloading operations.

5.2 Loading-unloading operations

When loading or unloading the machine onto or off a transport vehicle, a special platform must be used.

If ramps are used, load the vehicle in the following manner:

- 1 - Align the vehicle in a straight line with the truck. Load the excavator onto the truck in reverse and unload by driving the excavator off forwards.
Before driving on or off, check to ensure that the alignment is correct; if not, repeat the alignment operation.



CAUTION

To reduce the risk of personal injury caused by the machine tipping, DO NOT attempt to turn the vehicle or swing the turret or boom while the vehicle is in motion on a loading ramp or on a truck or trailer deck. The vehicle must be properly positioned before commencing with the loading.

- 2 - Begin to load the vehicle. Have an observer watch the loading or unloading operation from a safe distance, to warn the operator of any otherwise unseen situation that may develop;
- 3 - as the vehicle passes over the top of the ramps during loading, the vehicle will pivot on the centre of its tracks towards the level of the truck or trailer deck. Maintain slow, steady progress until the vehicle completes this pivot movement and both tracks are in full contact with the deck of the truck or trailer;
- 4 - position the vehicle on the trailer and lower the dozer blade onto the deck;
- 5 - close the bucket or the equipment, retract the dipper stick and lower the digger boom onto the deck;
- 6 - secure the vehicle to the deck of the truck or trailer.

To unload the vehicle, follow the above procedure in reverse order.



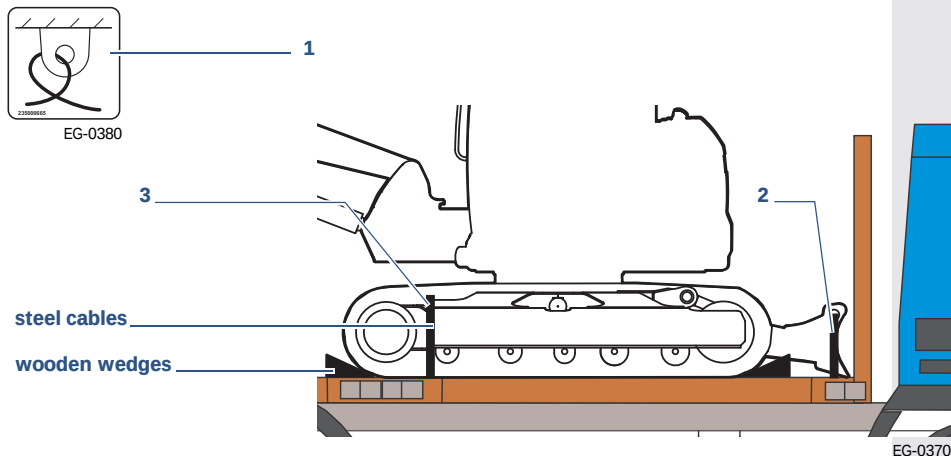
IMPORTANT

During unloading, the vehicle will pivot again as it crosses over the top of the ramps. Maintain slow, steady progress until the vehicle completes this pivot movement and both tracks are fully in contact the ramp(s).

5.3 Tying down the excavator on the truck

After loading the excavator properly onto the truck, tie it down securely as follows:

- Place wooden wedges at right angles behind and in front of the tracks;
- secure the machine using suitable chains or cables to prevent the vehicle from moving in transit. The fixing points are the holes shown on the decals **(1)**, on the blade **(2)** and on the undercarriage frame **(3)**;



- make the excavator safe by following the instructions provided in point 7.35.

5.4 Lifting the machine.



DANGER

When lifting the machine, comply with the regulations in force in the machine's country of utilisation.

Before lifting the machine ensure that the crane to be used has a suitable load-bearing capacity to lift the weight of the machine.

Do not use worn or frayed cables.

Only hook the cables at the special anchoring points.

Never lift the machine with the operator on board.

Clear any persons in the vicinity of the machine.

The operator lifting the machine with a crane must be suitably qualified .

Always make sure that the metal cable used to lift the machine is of sufficient size for the weight to be lifted.

Never lift the machine with the turret turned to the side. Before lifting the machine, turn the working equipment so that it is on the blade side and place the undercarriage and the turret parallel with each other.

While lifting, keep the machine in the horizontal position.

Never pass under the machine while it is being lifted.

Never attempt to lift the machine in a position different from what is illustrated below, because the machine could lose its stability.



IMPORTANT

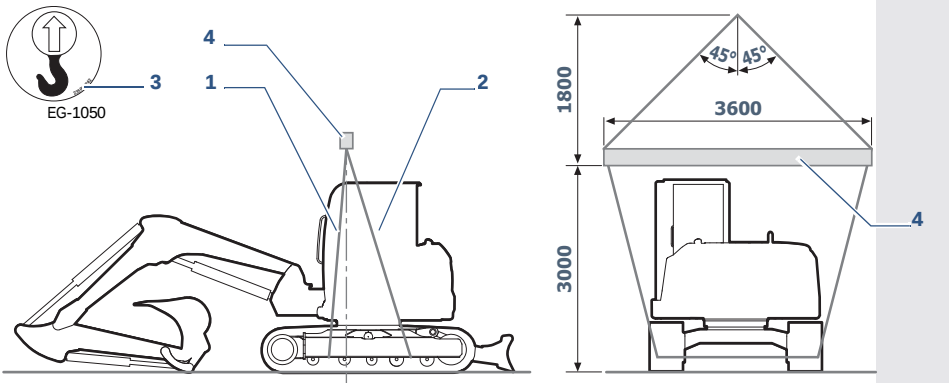
For details of the machine weight, see point 4.4

The lifting procedure described applies to machines with standard specifications.

The lifting method varies depending on the equipment and accessories fitted. In such cases, contact the EUROCOMACH service centre for more specific information.

The machine must be lifted on a flat and compact surface and must be lifted by the following procedure:

- 1 - start the engine, turn the turret so that the working equipment is on the opposite side to the blade, with the undercarriage and the turret parallel with each other;
- 2 - move the boom to a swing angle of "0" (if present);
- 3 - extend completely the bucket cylinder and the dipper stick cylinder, then lower the working equipment to the ground as shown in the diagram, using the main boom cylinder;
- 4 - lower the blade to the ground;
- 5 - raise the servo-control cut-out lever;
- 6 - stop the engine and make sure there are no obstacles around the operator area, close the windows and the windshield in the cab, then get down from the machine. Close the cab door;
- 7 - Pass the metal cables (1-2) between the first and second bottom roller starting from the front and between the first and second bottom roller starting from the back (these points are indicated on the relative decals 3);
- 8 - Connect the cables to a suitably sized bar (4) with a length of 3600 mm.



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CAUTION

Do not use the wires of the counter weight to lift the machine.



IMPORTANT

Do not attempt to lift the machine by attaching a metal cable to the bracket provided for fixing the machine while in transit, because this could damage the undercarriage frame.

- 9** - Adjust the length of the metal cables so that the angle between them is the same as shown in the figure, then lift the machine slowly;
- 10** - when the machine is off the ground, check the conditions of the hook and the lifting position which **MUST BE HORIZONTAL**, then lift slowly;
- 11** - lower the machine slowly onto a flat and compact surface until it rests fully on the ground.
Detach the cables.



DANGER

To minimize the possibility of accidents and serious bodily injury, all crane operation and rigging personnel must be properly qualified and experienced. It is their responsibility to ensure that the proper equipment is used to lift this vehicle. The lifting equipment must be correctly rated and properly connected to the designated lifting points on the vehicle.



DANGER

NEVER allow anyone to stand on or under the vehicle while it is being lifted. Failure of the lifting equipment may cause the excavator to fall, potentially leading to serious injury or death.

5.5 Use of the excavator for towing purposes

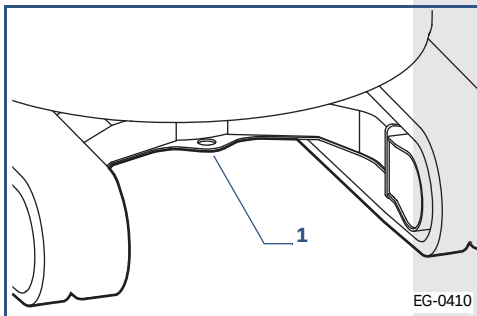


CAUTION

THE TOWING OF THE EXCAVATOR WITH ANOTHER MACHINE IS PROHIBITED.

This vehicle may only be used to tow other vehicles over short distances, since the excavator is not equipped to control the steering and braking functions of the towed vehicle and, therefore, towing must only be carried out when absolutely necessary and completely subject to the following conditions:

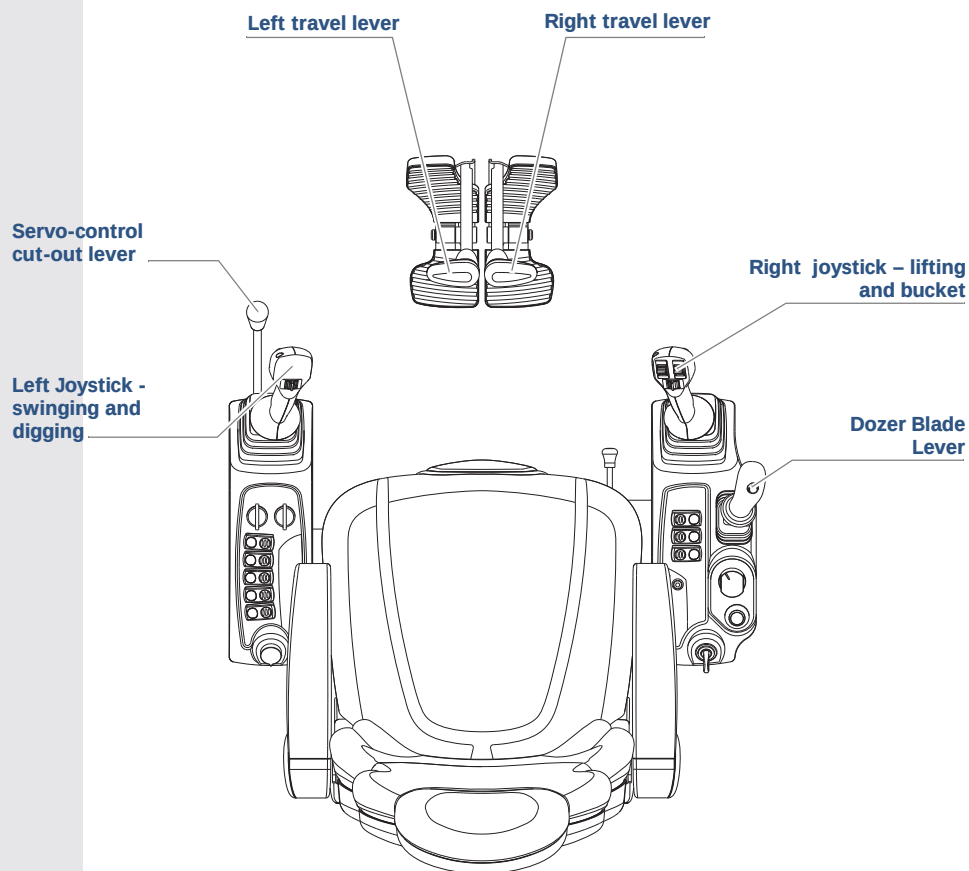
- 1 - the gross vehicle weight of the towed vehicle must not exceed the unladen weight of the excavator.
- 2 - **NEVER** use the speed control system while towing another vehicle; the broken down vehicle must be towed at a speed not exceeding 2 km/h..
- 3 - **NEVER** secure the towing cable or chain to any component of the upper part of the vehicle structure, including the boom, the dipper stick, the bucket or any fitted accessory. The towing cable or chain may only be fixed to the rear tow hitch mounted on the chassis (1).
- 4 - **NEVER** continue towing unless both tracks are fully in contact with the ground.
- 5 - Tow for short distances only. Stop towing immediately if the vehicle starts to overheat.
- 6 - When towing, keep the towing chain or cable taut throughout the operation.



6.0 Controls and instrumentation

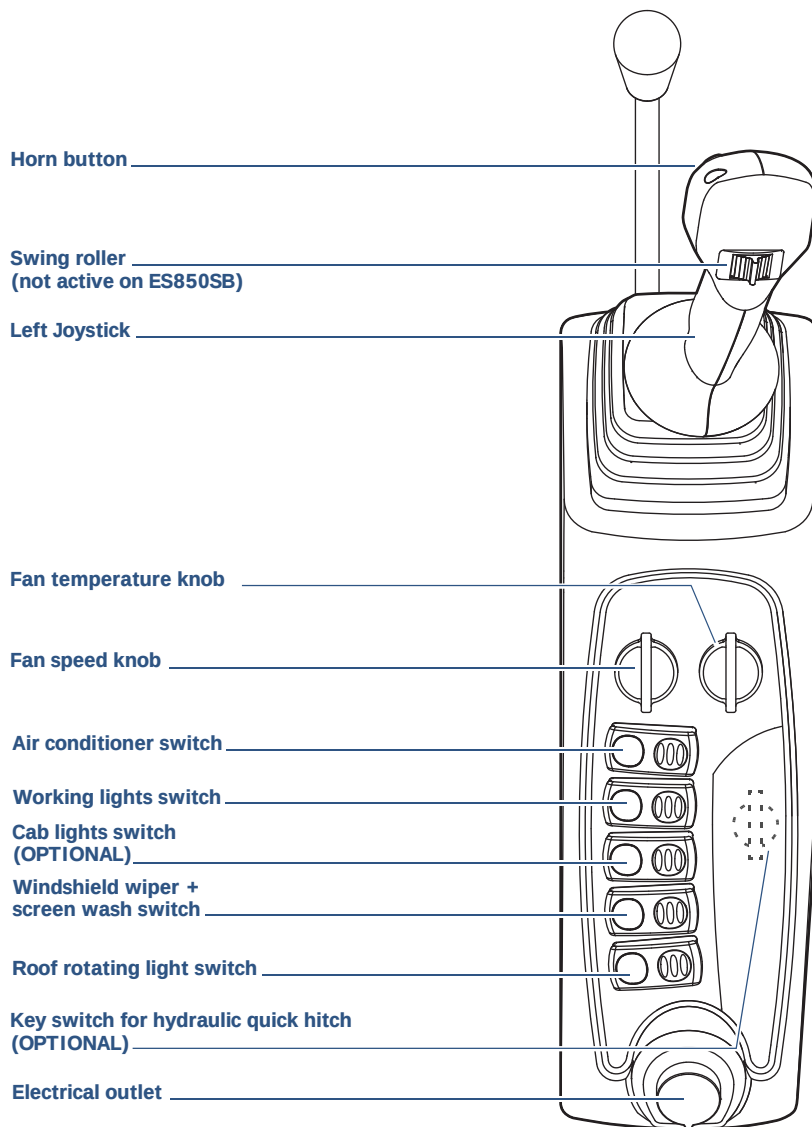
How each control and instrument works is described in point 7.0.

6.1 Description of control levers



ES1-0370

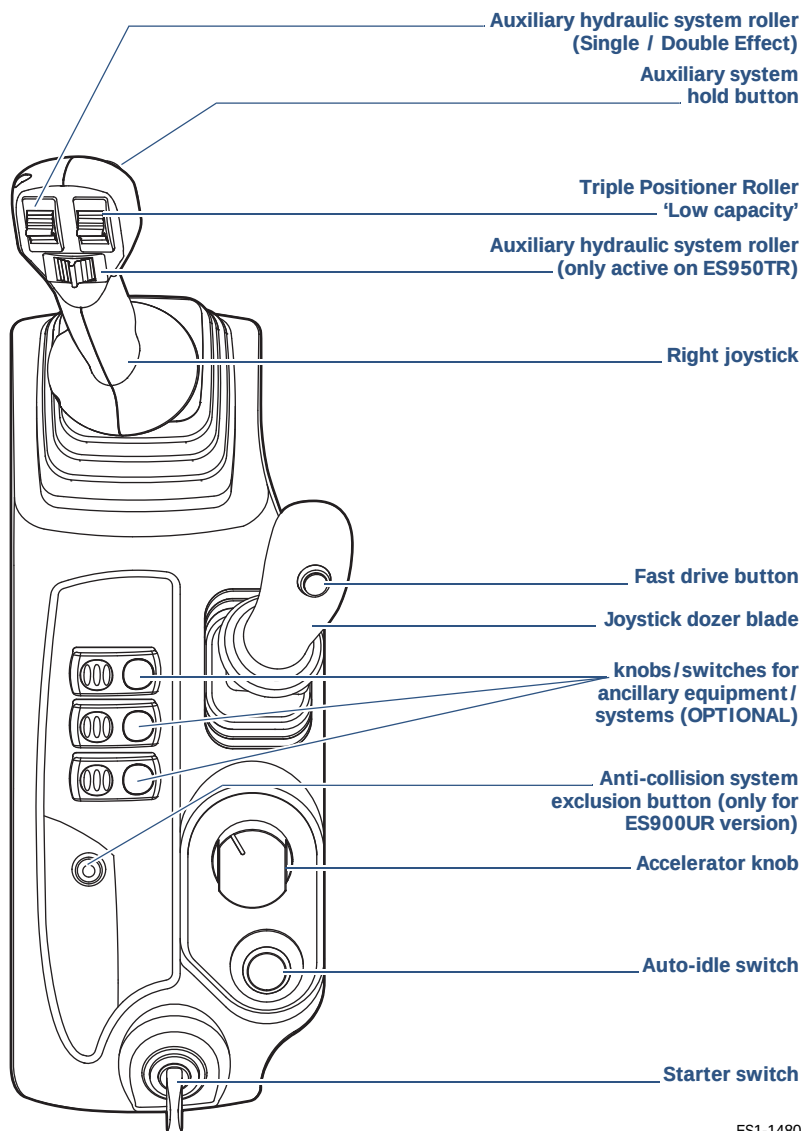
6.2 Description - left control console



ES1-1470

The power socket on the left control console can be used for the roof rotating light or for any other equipment that uses a "cigarette lighter" type socket.

6.3 Description - right control console



ES1-1480

**IMPORTANT**

The rollers are proportional controls, not to be held with constant pressure which, depending on the installation, can turn to the right/left or up/down.

A greater movement of the roller gives a proportionally quicker response from the associated function.

Rollers are electro-proportional commands which control the hydraulic functions. These are very sensitive, so take care when working not to touch them by accident, an unwanted hydraulic function could occur compromising the safety of the operator and anyone nearby.

6.4 Dashboard

Display

Menu Navigation
Button

Menu Confirm Button
(Enter)

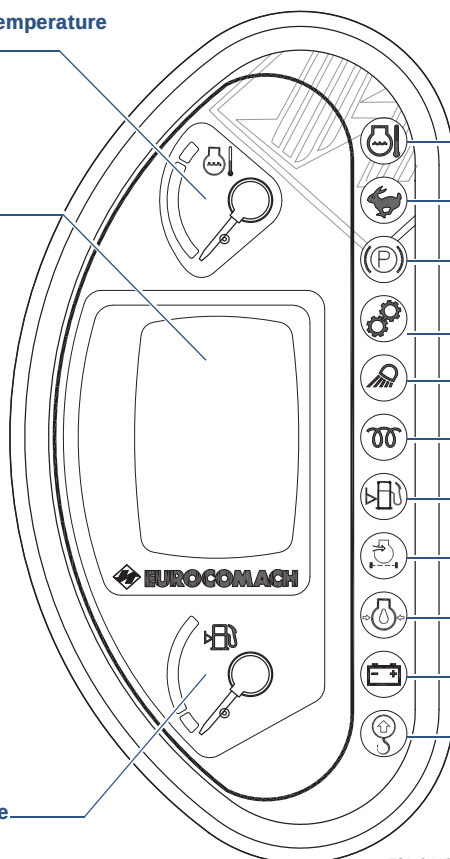


ES1-0400

Coolant Temperature
Gauge

Display

Fuel gauge



Coolant Temperature
Warning Light

Fast drive indicator light

Servo-controls lock cut-out
indicator light

Auxiliary system indicator light
(electrically held)

Working lights indicator light

Pre-heating indicator light

Fuel level indicator light

Air filter blocked
indicator light

Engine oil low pressure
indicator light

Alternator light

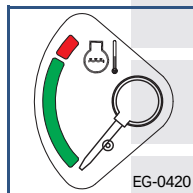
Overload alarm indicator light
(only works with optional
'lifting hook')

ES1-0410

1 - Coolant Temperature Gauge

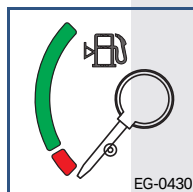
Indicates the engine coolant temperature.

After starting and warming up, the engine temperature gauge should be in the green zone. If, instead, it is in the red zone, open the cover to allow the engine to cool down. When the pointer goes down, shut down the engine, wait for it to cool, then check that the coolant level in the radiator reservoir is correct, check for leakages, check that the radiator core is clean and that the fan belt has not worked itself loose.



2 - Fuel gauge

Indicates the fuel level in the tank: Refill the tank when the pointer is close to the red band.



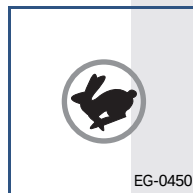
3 - Coolant Temperature Warning Light

If the light comes on, it means that the coolant temperature is too high. Open the engine cover to allow the engine to cool down. When the pointer goes down, shut down the engine, wait for it to cool, then check that the coolant level in the radiator reservoir is correct, check for leakages, check that the radiator core is clean and that the fan belt has not worked itself loose.



4 - Fast drive indicator light

Lights up when fast drive is engaged.



5 - Servo-controls lock cut-out indicator light

Lights up when the servo-control cut-out lever is raised.

When this indicator light is on, no movements can be made with the machine.



6 - Auxiliary system light

Comes on when the hydraulic system with electrical latching is turned on.



EG-0470

7 - Work lights indicator light

Comes on when the work lights are turned using the button on the left console



EG-0480

8 - Pre-heating indicator light

When the starter switch key is turned to the RUN position, this indicator light comes on for six seconds.

Instead, if the engine is already warm, it does not light up at all.



EG-0490

9 - Fuel level indicator light

Lights up when the fuel level is very low.

Stop the machine as soon as possible and refuel.

When working on slopes, refuel the first time the light comes on; The engine could stop suddenly and make it difficult to control the machine which can be very dangerous for the operator.



EG-0500

10 - Air filter indicator light

Lights up when the air filter element is clogged; remove and clean the intake filter, replace it if necessary.

The procedure for this operation is described in point 9.11.18.



EG-0510



IMPORTANT

If the air filter is clogged, engine performance is reduced.

11 -Engine oil pressure indicator light

It comes on when the engine is not running the moment the key is inserted in the starter switch in the RUN position and goes out as soon as the engine lubrication circuit becomes pressurised.

If this light remains on or comes on while the engine is running, stop the machine immediately and look for the cause of the fault.



EG-0520



IMPORTANT

In cold conditions with the engine just started, the light may remain on for a little longer than usual.

If this happens for too long, stop the machine and look for the cause of the fault .

12 -Alternator Indicator light

Comes on when the starter circuit is powered up and goes out when the engine reaches idling speed; If this light stays on when the engine is at idling speed, it means that the alternator is not working and so the battery is not being charged properly.



EG-0530



IMPORTANT

If the light remains off when the starter switch has been turned to the RUN position , it means that the alternator is faulty or broken, so check the alternator and the tension on the belt.

13 -Overload indicator light

(ONLY works with the optional "Type approved lifting hook")

This comes on when an excessive weight is being lifted.

When this light comes on, interrupts the lifting operations and adjust the load properly.



EG-0540



IMPORTANT

The signals, lights and buttons only operate once the key starter switch has been turned to the RUN position .

Check the fuel level prior to starting work.

6.5 Display

By means of software designed and custom made for each machine, the display on the operator panel shows information and any machine operating errors.

The information is displayed in the form of numbers and letters.

The way it works is described in point 7.9



6.6 Scroll / navigation button

Press this button to display in sequence the pages or menu options available.



6.7 Selection / confirm button

This button is pressed to confirm and call up the page selected.



6.8 Mechanical counter

Records the working hours carried out by the machine; it is located at the bottom left of the operator station. The two red digits on the right show the hundredths of an hour (36 seconds).



IMPORTANT

*This meter keeps running whenever the engine is running.
Take a reading on a daily basis.*

For maintenance operations refer to the electronic counter on the display, see point 7.10.2.

6.9 Battery cut-off switch

The battery cut-off switch (1) is located at the rear right of the excavator guard. Power from the battery to the machine's electrical system can be cut off by turning the switch counter-clockwise.

To turn the power back on turn the switch clockwise.

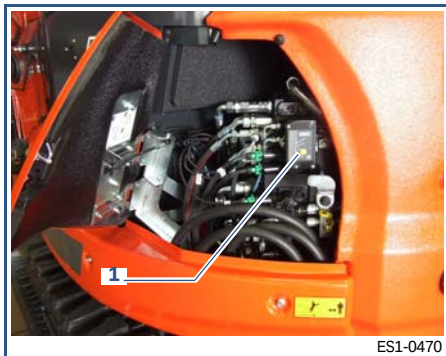


6.10 Electric refuelling pump

Inside the pump cover there is an electric pump for refuelling with diesel. This is used when it is not possible to pour fuel directly into the fuel tank filler.

A rubber tube can be used to siphon diesel from any container or from the tank of another vehicle by means of.

The pump is operated using the ON/OFF (1) button, follow the procedure described in point 7.12.



7.0 Using the machine



CAUTION

For the most part, increased safety is dependent on the operator's actions and attitude.

Incorrect use of the machine can be dangerous.

Before starting work, concentrate all your attention on what you are about to do, and take all the necessary precautions.

After ensuring that the machine is safe and in good working order, remember that everyone using the excavator must be suitably trained in its use, must be well informed about the hazards deriving from the use of the vehicle and must be aware of all the procedures to be followed in order to ensure its proper use.

7.1 Start-up



WARNING

Carefully read through the information below and always comply with the requirements. Should any malfunctions occur with the excavator's functions, contact the local Eurocomach Service Centre:

- Remove any dirt from the windshield in order to ensure good visibility.
- Remove all dirt from the working lights and check to ensure that they switch on properly.
- Check the levels of coolant, fuel and oil in the engine sump, check whether the air filter is blocked and check for any damage to the electrical system.
- Check that no mud or dirt has accumulated around any of the moving parts and ensure that the controls are functioning properly.
- Adjust the driver's seat to a comfortable position that facilitates machine operation, and check for any signs of damage or wear on the seat belt and its locking mechanism;
- Check that the warning lights are working properly and check the angle of the headlights and working lights.

- Prior to starting up the engine, fasten the seat belt and lower the control cut-out lever.
- Check that there are no people or obstacles on, under or anywhere in the vicinity of the machine.
- Never check or fill up the fuel tank, batteries, hydraulic fluid tank etc. in the vicinity of any naked flames or sparks.
- Before moving the vehicle or operating the accessory, ensure that no persons are present in the surrounding working area.
- Acquaint yourself with the rules relating to the use of vehicles in the working area.
- The boom drive cylinders are fitted with end of stroke dampers. Therefore, it is normal for the extension or retraction movement to slow down, and this does not indicate poor performance or malfunction of the cylinders themselves.
- While working, always keep the dozer blade down in contact with the ground. This will provide the machine with optimum stability and ground adherence.
- Always maintain a safe distance from other machines and obstacles in order to ensure ideal conditions of visibility.
- When reversing, rotate the turret so as to always look in the direction of travel of the excavator.
Watch out for other people; Should anyone enter the manoeuvring area, stop the excavator.
- Only use one of the types of bucket indicated in the relative table in the "Technical Specifications" section".
- Comply with the provisions of the excavator load capacity tables and ascertain whether there are any load restrictions imposed by the ground, paving or ramps on which you are to work.
- Observe the indicator lights. The red ones call for immediate action. See the instructions in the section "Controls and instrumentation".
- Do not leave the vehicle unless the dozer blade and the bucket have been fully lowered to the ground and the engine has been shut down.
- The operator is responsible for any outside persons operating the machine controls.
- Do not allow anyone to climb onto the machine while it is working.

- While using the machine, avoid any sudden swerves, abrupt acceleration or braking and making sharp turns. If you get confused, turn the engine off.
- Never leave the machine unsupervised with the engine running.
- After having shut down the engine, release the pressure in the hydraulic system by moving the control levers backwards and forwards repeatedly.

**IMPORTANT**

DO NOT utilise the vehicle at 100% of load capacity until the hydraulic fluid has reached normal operating temperature (about 50°C).

7.2 Battery cut-off switch

Before putting the machine into service check the status of the battery cut-off switch (1).

If the lever is in the "0" position the machine cannot be started, move the lever to position "1" to start the machine.

ALWAYS SWITCH OFF:

- before carrying out maintenance on the machine, so that it cannot be turned on accidentally by others;
- At the end of the working day before leaving the machine, to prevent any short circuits that could set fire to the machine.

When the switch is in the "0" position (Off) the lever can be removed by pulling it towards you.

**IMPORTANT**

Always cut off the power by means of switch (1) before working on the battery or on the electrical system and before carrying out any welding on the machine

7.3 Getting on and off the vehicle

When getting on and off the vehicle, the operator must be facing the machine and use the handholds provided on the cab frame.

Always enter and leave the vehicle from the left, after raising the servo-control cut-out lever, which is on the joystick panel.

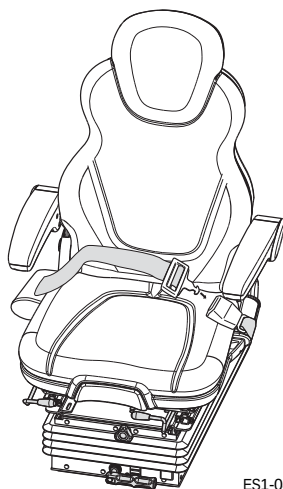


IMPORTANT

Never use the control cut-out lever as a handhold when getting on and off the vehicle, as it could suffer serious damage.

7.4 Driving seat

The driving seat is of the approved type and complies with workplace safety legal requirements. It is fitted with a damping system and permits adjustment to the optimum setting for the operator's weight.



ES1-0480



DANGER

Do not adjust the seat lever while the machine is working.

WARNING

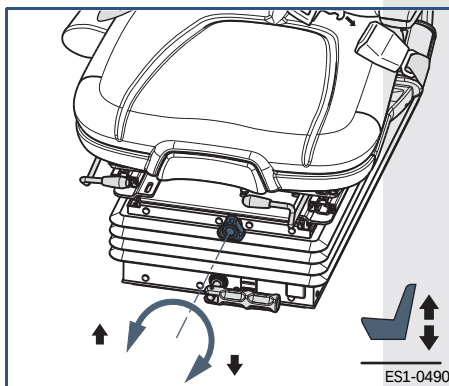
To avoid injury, no objects may be left within the swinging radius of the operator's seat.

1 - HEIGHT ADJUSTMENT

Adjustment should be made continuously and carried out with the operator's full weight resting on the seat.

The seat can be adjusted upwards (for short operators) or downwards (for tall operators), by turning the height adjuster knob.

After adjusting the height, always adjust for weight.

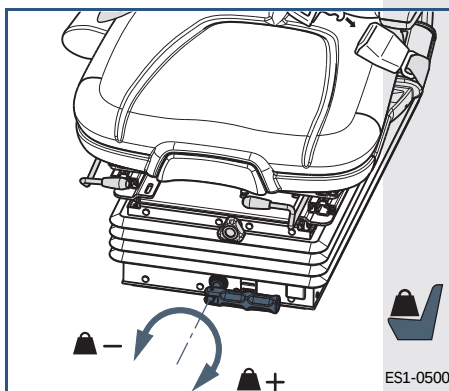


2 - WEIGHT ADJUSTMENT

Make the adjustment with the operator's full weight resting on the seat, by turning the lever

The correct adjustment is made when the height of the seat is half the suspension travel.

The seat is equipped with a window with an indication of the weight next to the adjuster lever; make the adjustment according to the weight reading on the indicator.



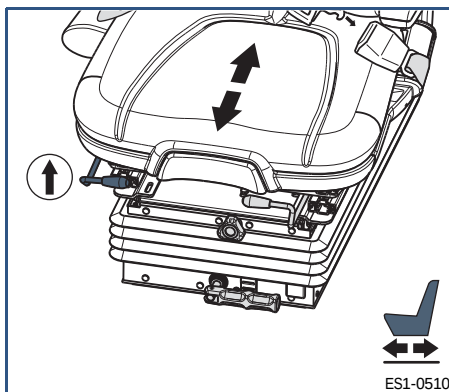
WARNING

Seats that have not been adjusted correctly have a smaller range movement. To prevent injury to persons, each time before the vehicle is started or whenever the driver is changed, the weight must be adjusted according to the weight of the driver.

3 - LENGTHWISE SEAT ADJUSTMENT IN RELATION TO JOYSTICKS

Move the adjuster lever upwards to release the runners, adjust the seat lengthwise in relation to the joystick holders.

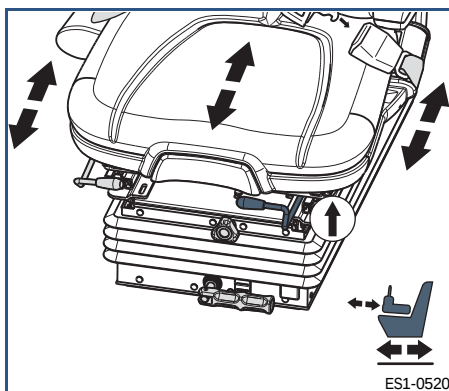
After making the adjustment make sure that lever "clicks" to secure the runners. Check that the seat will not move any further backwards or forwards.



4 - LENGTHWISE ADJUSTMENT OF THE SEAT AND JOYSTICK HOLDERS IN RELATION TO THE TRAVEL LEVERS/ PEDALS

Move the adjuster lever upwards to release the runners, adjust the seat block and joystick holders lengthwise in relation to the pedal positions.

After making the adjustment make sure that lever "clicks" to secure the runners. Check that the seat will not move any further backwards or forwards.



5 - TILTING THE BACKREST

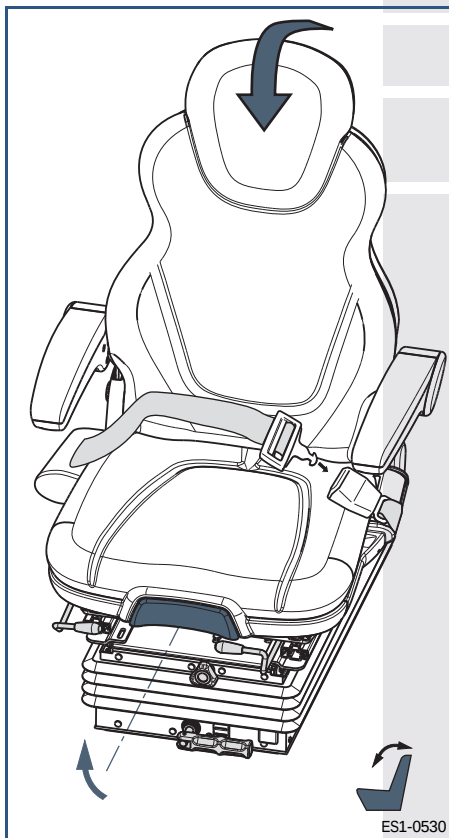
Make the adjustments with the operator in the seat and resting up against the backrest.

Pull the locking lever upwards to release the adjustment mechanism.

Keeping the lever in the released position, with your back counteract the rotary movement of the backrest (push towards the operator) until the best angle is found.

Still keeping your back against the backrest, release the locking lever and make sure the mechanism "clicks" to secure the backrest in place.

The backrest can be collapsed completely forwards until it is horizontal.



IMPORTANT

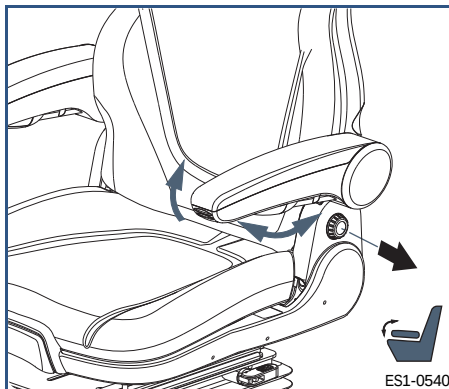
If the operator is not sitting down, activate the locking lever keeping one hand on the top of the backrest to stop it from jumping forwards

6 - ARMS

The arms can be tilted upwards until they are vertical.

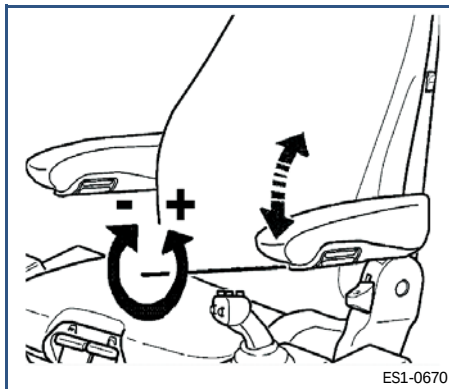
Height adjustment (4 positions) can be made for each arm:

- undo the locking knob, by unscrewing the nut underneath with a no. 13 Allen key, adjust the vertical position of the arm, tighten the nut and screw the knob back in place.

**7 - TILTING THE ARM**

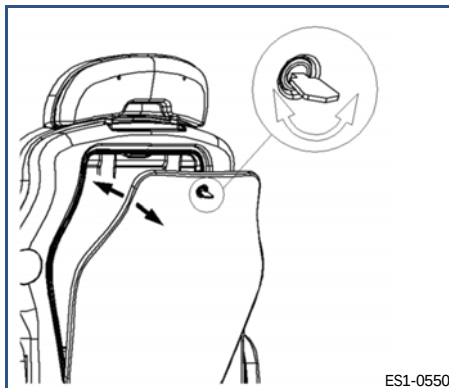
The lengthwise tilting of the arm can be adjusted by turning the ring under the arm.

Turning the ring outwards (+) raises the front of the arm, turning the ring inwards (-) lowers the arm.

**8 - DOCUMENT COMPARTMENT**

Including lock and key, to hold documents in A4 format.

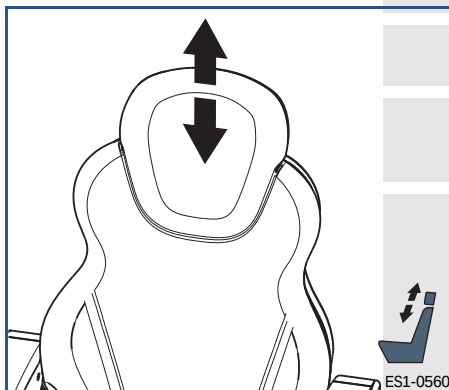
The compartment is opened and closed by turning the key; The compartment cover must be turned backwards to gain access to the compartment.



9 - HEADREST

Adjust the headrest by pulling it upwards or pushing it downwards, until one of the 5 available positions is reached.

The backrest extension can be removed by pulling firmly upwards.

**WARNING**

The seat position should always be adjusted to suit the operator's physique. A seat adjustment that is unsuited to the operator or to the type of work to be performed may lead to premature operator tiredness and result in the improper operation of the machine.

- ***The seat position should be individually adjusted for each machine operator.***
- ***The operator must be in a position to press the pedals down fully and to operate the control levers properly, with his back resting comfortably against the backrest.***
- ***If not, move the seat forwards or backwards and then try again.***

**CAUTION**

To prevent accidents, before starting the vehicle check that all the adjustments have clicked into place properly.

The controls for adjusting the driver's seat must not be used while the machine is operating.

7.5 Pneumatic driving seat (optional)



ES1-0580

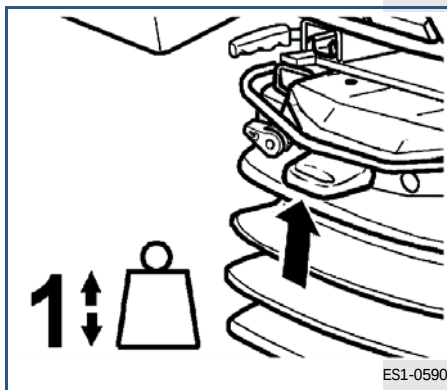


CAUTION

***Be careful not to allow any objects or water to penetrate the driver's seat
The seat is not waterproof and must be protected from water spray!***

1 - WEIGHT ADJUSTMENT

The seat position should always be adjusted to suit the operator's weight. Sit down, pull briefly the automatic weight and height activation lever upwards.



IMPORTANT

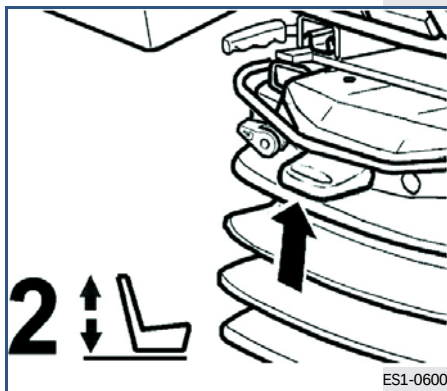
Before activating the weight adjustment set the shock absorbers to the "soft" position.

To prevent health problems, before starting the vehicle check and adjust the individual driver's weight mechanism.

2 - HEIGHT ADJUSTMENT

The height adjustment can be adapted automatically and continuously.

The height of the seat can be set by pulling or pushing completely the lever that activates the automatic weight and height adjustment. If the top or bottom end of travel for the height is reached, an automatic height adaptation takes place to guarantee a minimum spring travel.



IMPORTANT

Before activating the height adjustment set the shock absorbers to the "soft" position"

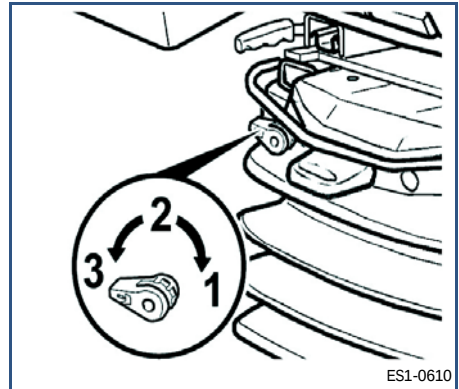
In order to prevent any damage, do not activate the compressor for more than 1 minute.

3 - DAMPING

The seat suspension (damping) can be adapted to the different road and ground conditions. The type of suspension can therefore be adjusted individually.

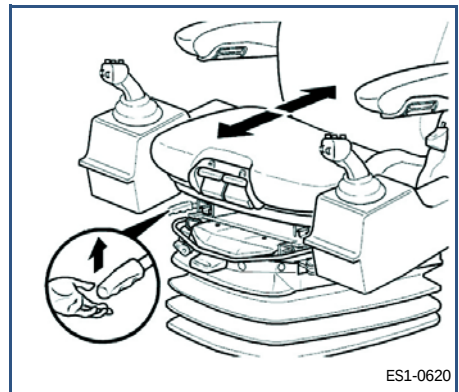
Turn the lever to the required position and leave it there.

- a** - soft
- b** - medium
- c** - hard

**4 - LENGTHWISE SEAT ADJUSTMENT IN RELATION TO JOYSTICKS**

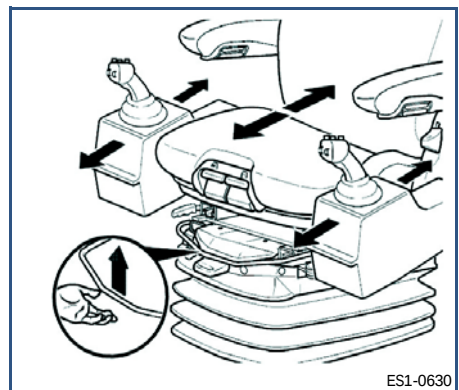
Move the adjuster lever upwards to release the runners, adjust the seat lengthwise in relation to the joystick holders.

After making the adjustment make sure that lever "clicks" to secure the runners. Check that the seat will not move any further backwards or forwards.

**5 - LENGTHWISE ADJUSTMENT OF THE SEAT AND JOYSTICK HOLDERS IN RELATION TO THE TRAVEL LEVERS/ PEDALS**

Move the adjuster lever upwards to release the runners, adjust the seat block and joystick holders lengthwise in relation to the pedal positions.

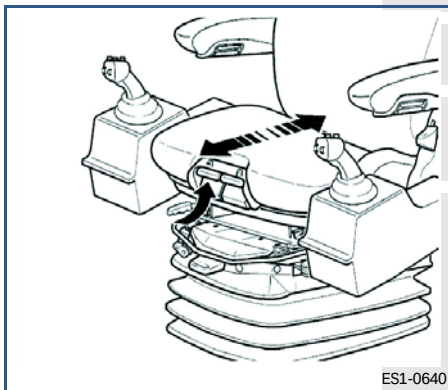
After making the adjustment make sure that lever "clicks" to secure the runners. Check that the seat will not move any further backwards or forwards.



6 - ADJUSTING THE DEPTH OF THE CUSHION

The depth of the cushion must be adjusted individually.

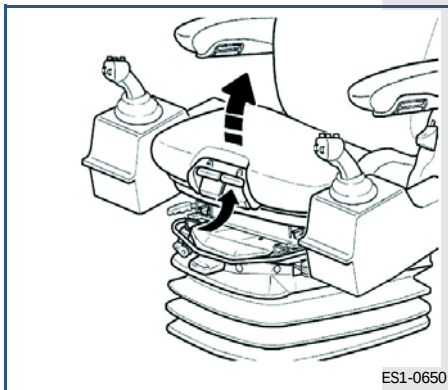
To do this raise the right lever and at the same time move the cushion backwards or forwards to the required position.



7 - ADJUSTING THE ANGLE OF THE CUSHION

The cushion angle must be adjusted individually.

To do this raise the left lever and set the cushion to the required position.

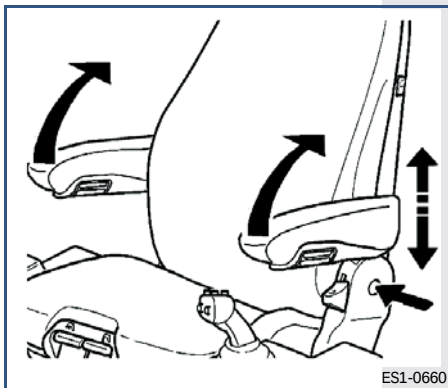


8 - ARM

The arms can be tilted upwards until they are vertical.

Height adjustment (5 positions) can be made for each arm:

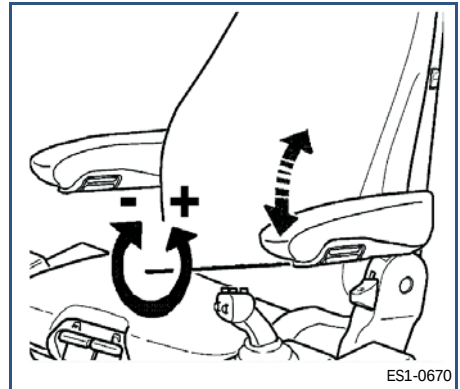
- a - undo the locking knob, by unscrewing the nut underneath with a no. 13 Allen key, adjust the vertical position of the arm, tighten the nut (25 Nm) and screw the knob back in place.



9 - TILTING THE ARM

The lengthwise tilting of the arm can be adjusted by turning the ring under the arm.

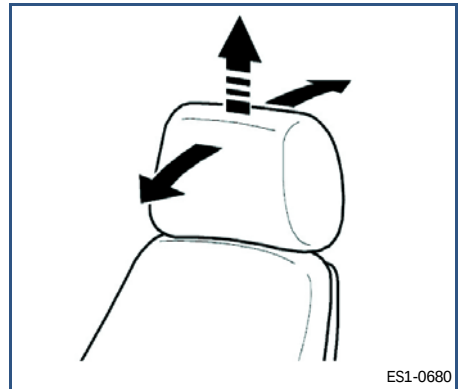
Turning the ring outwards (+) raises the front of the arm, turning the ring inwards (-) lowers the arm.

**10 - HEADREST**

The height of the headrest can be individually adjusted by pulling it upwards or pushing it downwards (notches can be felt until the final stop).

The backrest extension can be removed by pulling firmly upwards.

To remove the headrest pull firmly upwards, overcoming the final stop.



11 - ADJUSTING THE BACKREST

To release the backrest pull the locking lever upwards.

Do not press on the backrest while releasing it.

The most comfortable position is found by increasing or decreasing the pressure on the backrest.

To secure the backrest in place release the lever.

**IMPORTANT**

Once the lever is locked, the position of the backrest cannot be changed any more.

**CAUTION**

To prevent accidents, before starting the vehicle check that all the adjustments have clicked into place properly.

The controls for adjusting the driver's seat must not be used while the machine is operating.

7.6 Seat belts



CAUTION

Serious bodily injury or death may result from any failure to use the seat belt fitted to this vehicle. The seat belt is a critical component of the operator protection system and is provided for the operators' safety in the event of the vehicle overturning. The seat belt MUST be used whenever this vehicle is being operated.

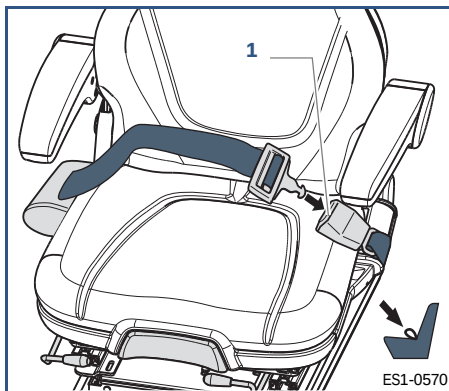


IMPORTANT

Inspect the seat belt on each occasion prior to use, in order to identify any cuts or worn webbing, or any defect in the latch assembly. If any wear or damage is noted, DO NOT operate the vehicle until the seat belt has been replaced.

Before starting the engine, first adjust the seat as required for optimum reach and comfort. Then adjust the seat belt as follows:

- 1 - Take the end of the seat belt (on the right side of the seat) and pull it across to the other side.
- 2 - With your back straight against the backrest and the belt buckle as low on your body as possible, clip the end of the belt into the part on the left side of the seat.
- 3 - To release the belt, press the red button (1) pulling the free end out of the buckle, accompany the belt as it rewinds and then get down from the machine.



CAUTION

Following an accident the safety belts must be replaced, the driver's seat and the seat fixings must be checked by technicians

7.7 Servo-control cut-out lever

The servo-control cut-out lever (safety lever) is located on the left joystick holder assembly.

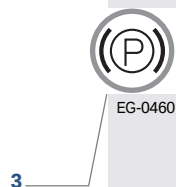
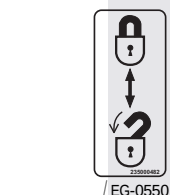
Pulling lever (1) upwards raises the whole assembly, in position (2) all the controls are disabled.

When the lever 1 is pushed down again, the joystick unit returns to operating mode and the control circuit is restored.

This operation must be carried out whenever the driver leaves the vehicle and while the excavator is being transported.

Once the control console has been raised, the "control locked" warning light on the dashboard illuminates (3).

In order to work, the excavator must have the lever (1) lowered, the decal (4) affixed to the side of the joystick holder shows how the lever works.



7.8 Driving Cab

The excavator has an enclosed air-conditioned cab (heated or cooled as required).

The cab consists of a single unit, secured to the structure by flexible supports to dampen vibrations for increased operator comfort.



ES1-0720



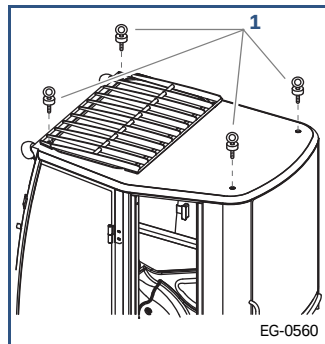
CAUTION

If the cab is bumped or the machine tips over for any reason, contact the local Eurocomach dealer immediately to check the cab's rigidity and the active protection that it must provide to the operator.

7.8.1 Cab assembly/dismantling

To assemble the cab a crane and cables of adequate diameter are needed, using the holes provided on the roof (1), to which the eyebolts must be attached.

Skilled staff must carry out this operation.



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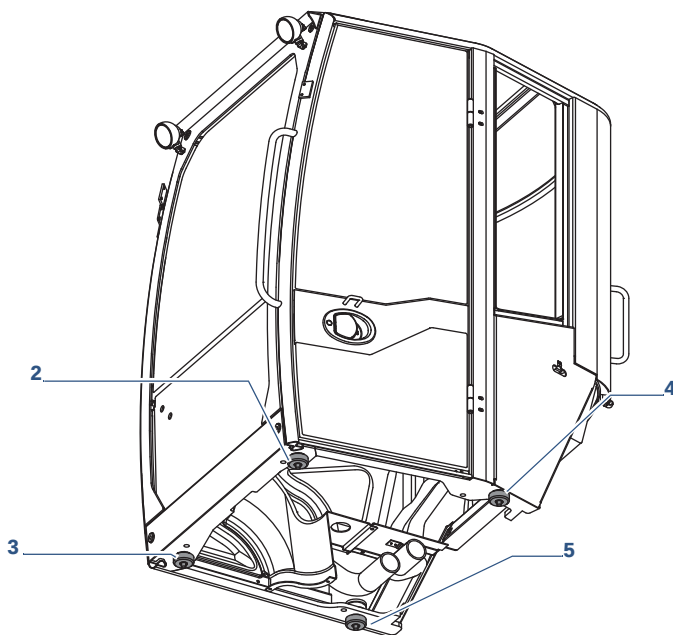


CAUTION

It is forbidden to lift the excavator by means of the eyebolts on the cab.

The cab is held in place by four holding screws.

Two screws (**2-3**) at the front, located under the rubber mat and two screws (**4-5**) at the back, located under the ABS covers.



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IMPORTANT

To dismantle the cab (for maintenance, cleaning, etc.) carry out the above procedure in reverse order.

7.8.2 Entering and leaving the driving cab

When getting in and out of the cab, raise the servo-control cut-out lever; this deactivates the servo-assisted controls.

ENTRY TO THE DRIVING CAB

Access to the enclosed cab is by means of the left hand side door.

To enter the enclosed cab, unlock the door with the key provided, depress the knob (1) to release the latch, and pull the handle to open. After entry, grasp the interior handhold and pull to close and latch the door.

The door can be locked from the outside using the key provided.

It is advisable to note the number of the key so that a spare can be ordered if necessary.



CAUTION

The driving cab door should be kept locked when operating the excavator, in order to prevent it from opening accidentally.

EXIT FROM THE DRIVING CAB

To exit the enclosed cab, grasp the latch release lever (2) and pull inwards, then push the door to open. After exiting, close and lock the door.



IMPORTANT

If an emergency occurs which prevents this door from being used, the front windshield of the cab can be used as an emergency exit.

OPEN DOOR RESTRAINT RELEASE

The left cab door will be secured in the open position when it is opened and swung 180°.

To release the door and allow it to close, push down the lever that controls the lock, **(3)** located on the left upright.



IMPORTANT

For easier connection, grease the connecting parts periodically

7.8.3 Dome light

The dome light is positioned on the left upright of the cab. To switch on the dome light, move the lever switch to the centre **(1)**.

To replace the dome lamp bulb, insert a screwdriver between the lens and light housing **(2)** in order to release the retainer tabs on the lens, then remove.

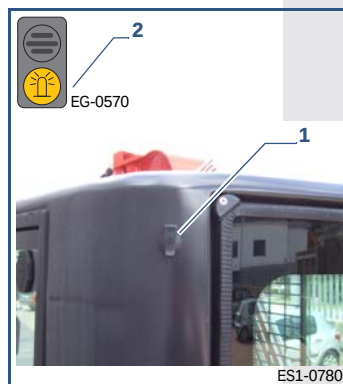
The power rating of the replacement lamp must not exceed 5W. Reinstall the lens by pushing it into the housing until the retainer tabs lock into place.



7.8.4 Auxiliary socket for roof rotating light

An auxiliary socket **(1)**, used to power the roof rotating light is located on the rear left upright (outside the cab). The socket is a two-pin to ISO 4165 standard, powered by 12V.

To activate the socket use the switch for the rotating light located on the left control console **(2)**.



7.8.5 Windshield wiper

To activate the windshield wiper use the switch (1) located on the left control console, the first position turns the wiper on, the second position turns on the screen washer; when sufficient cleaning fluid has been dispensed, release the switch.

The starter key switch must be in the "RUN" position for the windshield wiper to operate.

Clean the wiper blades periodically with suitable detergents or alcohol. Make sure that they are not damaged or the cleaning will be streaky. Replace the wiper blades if the rubber is permanently deformed or shows any signs of wear.

In case of especially cold conditions (below 0°C) check that the wipers have not frozen to the windshield: if necessary, free them with a de-icing product.

If the windshield washer (2) fails to operate, check that the supply circuits are not blocked; if necessary clear the spray nozzles using a pin.



IMPORTANT

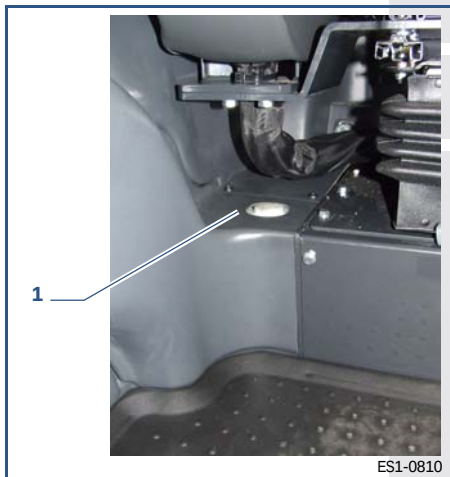
Failure to follow the above procedures will cause premature wear of the wiper blade rubber.

7.8.6 Water bottle for windshield wiper

The cap of the windshield washer water bottle (1) is located in the cab at the driver's feet, allowing quick and easy access for topping up the liquid.

Remove the cap and fill as required.

If ambient air temperatures are expected to drop below 0°C, use a special washer fluid formulated for temperatures below zero.



7.8.7 Opening and tilting the windshield

The front windshield can be easily opened and left open for ventilation purposes.



CAUTION

Always open or close the windshield with the machine switched off avoiding any accidental movements on the tracks and/or equipment .

- 1 - Take hold of both handles (1) one on each side and push downwards with the thumbs on the buttons (2);
- 2 - at the same time pull both handles backwards tilting the windshield inwards;

- 3** - with the aid of the gas strut, push the windshield upwards parallel with the cab roof in the fully open position until you hear both locks “click” into place.



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- The windshield can be lowered by following the same procedure in reverse order until the locking “click” is heard. At this point the windshield will be completely closed.



CAUTION

When closing the windshield, take care not to injure your fingers or your head.

Never use the machine without the windshield properly locked in place at the front (windshield closed) or at the top (windshield open).

7.8.8 Hammer for emergency exit

WARNING

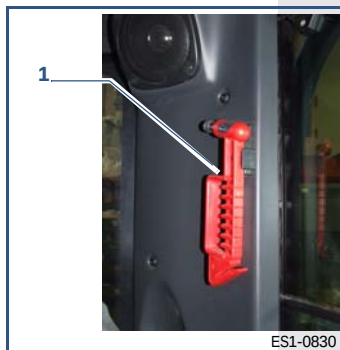
In the event that it is necessary to break the glass with the hammer, be careful not to injure yourself with the shards of glass.

Before leaving the cab, remove the fragments of glass left around the edge of the windshield to avoid injury.

Take care also not to slip on the glass spread out all over the ground.

On machines equipped with a cab there is an emergency exit identified and marked on the front opening windshield.

In the event of an emergency, if the windshield does not open by the normal means, break the glass with the hammer (1).



IMPORTANT

Make sure the hammer is always left inside the cab and fixed to the right upright.

7.8.9 Opening the right side window

The right side of the cab has window that slides open.

Follow the procedure below to open and close it:

- 1 - Take hold of the closing handle;
- 2 - move the window slowly (backwards to open the window, forwards to close it) to the required position;
- 3 - let go of the handle.



To lock the window closed, push the rear of the closing system forwards until a “click” is heard.

7.8.10 Opening the left side window

The left side of the cab has window that slides vertically.

Follow the procedure below to open and close it:

- 1** - With both hands take hold of the two closing handles, **(1)**;
- 2** - move the window vertically (downwards to open the window, upwards to close it) to the required position;
- 3** - let go of the handles.



7.8.11 Sun shade

The large top window can be covered with a sun shade to protect from being dazzled by the sun.

Pull the end **(1)** to extend the shade and hook it onto the clip provided at the front **(2)**.

To open the shade again, unhook it and accompany it as it rewinds.



IMPORTANT

Do not let go of the shade suddenly, rewinding too abruptly could damage it .

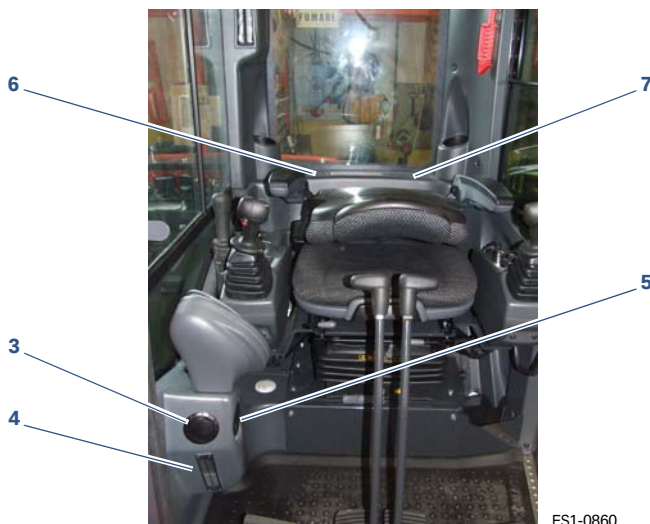
7.8.12 Ventilation and heating

The unit is located under the operator's seat.

The ventilation and heating systems make driving the excavator a comfortable job in summer or winter. A three-speed fan installed inside the unit provides ventilation and fresh air.

The fan speed and the temperature of the cool air are controlled by two knobs on the left control console

- To adjust the fan speed:
turn the knob (1) and set to the desired speed.
- To adjust the cool air temperature:
turn the knob (2) to the left for cold air,
towards the right for hot air).



The air vents can be adjusted and are arranged in such a way that to make the cab comfortable and well ventilated.

Two adjustable air vents (3-4) are provided to direct the airflow to the front windshield, as required, in order to keep the glass clear.

A third adjustable vent (5) is provided to direct air to the bottom section of the cab.

There are further two air vents behind the driver's seat (6-7).

7.9 Air conditioning



DANGER

The coolant used in the air conditioning unit is very dangerous.

If it is accidentally sprayed into the eyes or makes contact with the skin, rinse immediately under running water and seek medical advice. In addition, to avoid possible explosions, do not generate sparks or use a naked flame in the vicinity of the unit.

The coolant used in the air-conditioning system is considered special waste and as such must be collected and disposed of in accordance with the applicable anti-pollution laws.

For specific maintenance operations to be carried out on the air-conditioning unit contact the EUROCOMACH service centre. Failure to comply with this instruction could lead to serious or even fatal injury.

The air conditioner is activated by pressing switch **1**, located on the left control console.

Once the conditioner is switched on (switch LED comes on), set the temperature and the fan speed.



IMPORTANT

The recommended temperature is 5 or 6°C lower than the outside temperature.



CAUTION

Even when the conditioner is not being used, run the compressor at low revs for approx. 3-5 minutes at least once a month. Doing this keeps all the moving parts of the compressor lubricated.

7.10 Dashboard controls

There is a dashboard inside the cab which houses a display, pushbuttons, indicators and warning lights.

There is also a buzzer (alarm signal) in the dashboard to call the operator's attention and which makes sure that certain messages are brought to the operator's attention.



CAUTION

Before making any changes to the settings on the dashboard, disable the controls by raising the servo-control cut-out lever.

If this is not done, while reading/changing the parameters on the display you may knock the controls making the machine carry out involuntary movements and causing damage to property and/or persons.

7.10.1 Basic display pages

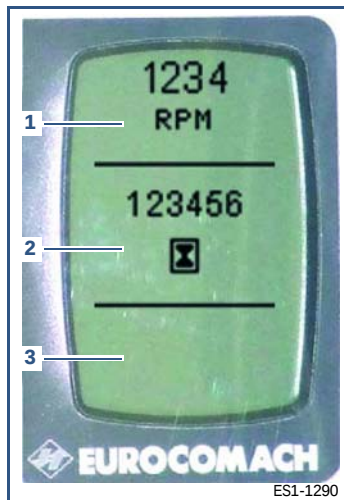
When the machine is started up the panel carries out a general check on the machine during which :

- all the lights come on for 2 sec.;
- the buzzer sounds for 1 sec.;
- the EUROCOMACH symbol appears on the display for 5 sec.



During normal machine operation, the display is divided into 3 areas:

- 1 - engine revolutions (followed by RPM);
- 2 - machine hours (followed by the hour glass symbol);
- 3 - communications area (any faults found, service and/or warning messages).



7.10.2 Service page

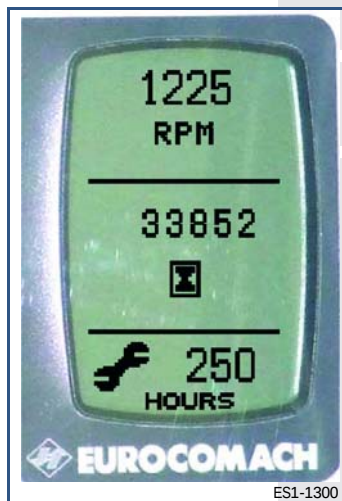
After the initial check, for 20 sec. the display shows and indication of the hours until the next scheduled service

When there are less than 20 hours left, the warning remains written on the display and if the number of hours becomes negative (service has not been carried out) the image of the spanner with flash continually.

Check the counters on the display every day, on the basis of this indication it will be necessary to carry out the scheduled maintenance operations described in point 9.0.

Once the machine has been serviced, the hour counter can be reset to zero (see dedicated page).

All error or warning messages (e.g. anti-collision system for ES900UR) take precedence over service messages.



7.10.3 Machine faults page

Each time a fault is detected on the machine, the bottom part of the display:

- shows the relative error message;
- the buzzer starts sounding intermittently;
- the error is memorised inside the panel so it can later be read again (see dedicated page).

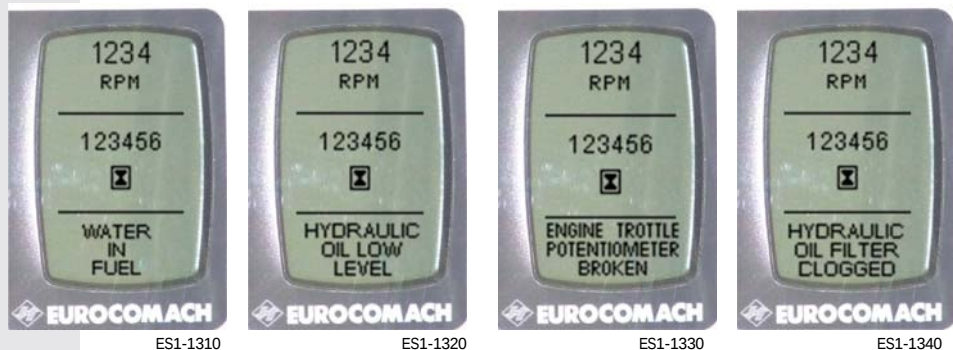
When one of the two buttons is pressed, the buzzer stops while the error remains on the display for as long as the fault persists or until another error message appears.

Following the appearance of any error/fault message, position the machine in a safe place and stop the engine.

Make a note of the message shown and contact the EUROCOMACH service centre for the relevant checks and to remedy the fault.

The types of error that can appear on the bottom of the Display can be divided into three categories:

1 - ERRORS EXPLICITLY INDICATED



If the message "ACCELERATOR POTENTIOMETER BROKEN" appears the engine automatically cuts its speed down to 1400 rpm to prevent any irreversible damage.

2 - ERRORS DUE TO ENGINE FAULTS (DM1)

In the event of a fault with the heat engine, the message will show the code SPN and FMI according to standard J1939.



3 - ERRORS TO DO WITH ELECTRONIC CONTROL BOXES

Lastly, the bottom of the display may show a whole series of error messages coming from the electronic control boxes, such as faults with the Joysticks, with the boxes themselves or problems with the electrical components in general.

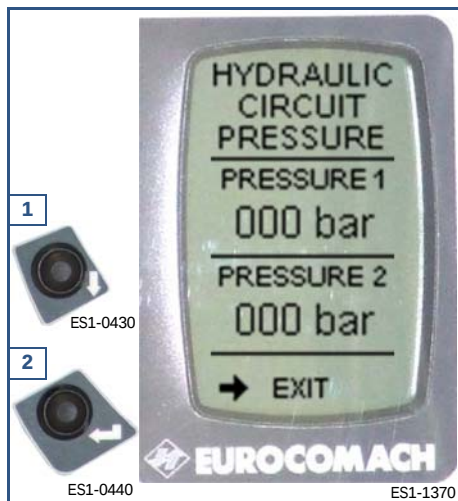


7.10.4 Display/Pushbutton panel controls

From the initial page, pressing button **1** calls up the page with the hydraulic circuit pressures:

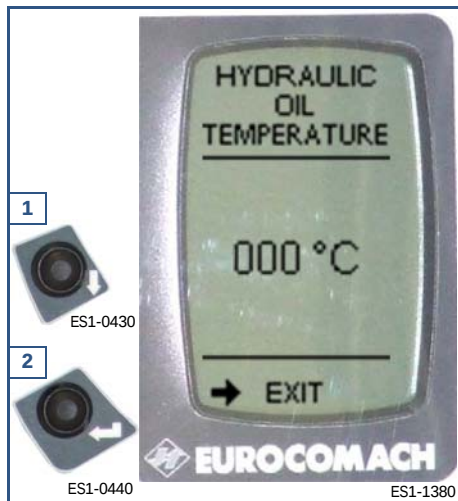
- pressure 1: pressure of main user units' circuit;
- pressure 2: servo-controls pressure.

Press button **2** to exit the page and return to the initial page.



From the initial page, pressing button **2** calls up the hydraulic oil temperature page, shown in the centre of the display followed by °C.

Press button **2** once again to exit the page and return to the initial page.



From the initial page, pressing at the same time buttons **1** and **2**, for 2 sec., calls up the main menu page.

Press on button **1** again to scroll in sequence through the menu, as the arrow moves down next to the various headings.

Pressing button **2** will activate the heading indicated by the arrow.



The ERRORS menu:

Shows the history of all errors found on the machine, up to a maximum number of 8, in one or two pages, in chronological order.

If there are more than four, the first page will show the first 4 errors and the and the arrow is at the side of the word NEXT.

- Press button **2** to move on to the next page in where the arrow will now be at the side of the word EXIT.
- Press button **2** once again to return to the initial page.



In the LANGUAGE menu:

By pressing button **2** the language can be changed from Italian to English and vice versa.

Each time the button is pressed the language changes and the text on the display is updated.

**In the RESET SERVICE menu:****IMPORTANT**

This page is for use by EUROCOMACH service technicians only.

A page is called up on which it is possible to reset any service request from the initial page, by entering a 6 character password.



In the **RESET ERRORS MENU**:

**IMPORTANT**

This page is for use by EUROCOMACH service technicians only.

A page is called up on which it is possible to reset any errors memorised on the panel, by entering a 6 character password.

**CAUTION**

On ES900UR version excavators only, the display has different or additional pages to manage the automatic anti-collision system. See the dedicated point 7.13.

7.11 Starting the engine

Precautions for starting the engine

- Start the engine and operate the machine only from the driving seat.
- Never attempt to start the engine by short-circuiting the starter motor. This could cause a fire, as well as resulting in serious or fatal injury.
- When starting the engine, sound the horn to warn everyone.
- Do not allow anyone other than the operator to climb onto the machine.

7.11.1 Inspections prior to starting

Always carry out all the checks described in this section before switching on the engine.

Neglecting any of the inspections may result in problems being experienced with the machine, including the hydraulic equipment.



WARNING

In order to perform the inspections, always park the machine on a level surface.

Keep unauthorised persons away from the machine while inspecting it.

Ensure that the engine has been shut down prior to performing any inspection or maintenance operations.

Take a reading of the hour meter in order to ascertain whether it is time to perform any of the normal maintenance tasks indicated in the table on point 9.11.

1 - CHECKING THE AMOUNT OF OIL IN THE ENGINE SUMP.

- a** - Pull out the dipstick (1);
- b** - clean it, wiping off the oil with a rag;
- c** - insert it again;
- d** - pull the dipstick out again and check how high the oil is up the stick.

If the level is low, add engine oil through the oil filler spout.

**IMPORTANT**

Use high-quality engine oil.

It is advisable to utilise the engine oil indicated in the applicable section.

**CAUTION**

Do not check the engine oil level immediately after stopping the engine, the engine oil is extremely hot and dangerous and it takes 30 minutes for all the oil to return to the oil sump. Inspect it either before commencing with work, or 30 minutes after the engine has been shut down.

Take care not to add too much engine oil.

Check the engine oil level 30 minutes after topping up.

**IMPORTANT**

Also check the oil on the dipstick to check for any deposits and the degree of viscosity. When topping up with oil, take care not to spill any. Clean up any spillage carefully.

As any traces of oil may start a fire or pose a risk of personal injury and equipment damage.

2 - CHECK THE COOLANT LIQUID LEVEL.

WARNING

Do not remove the radiator cap unless absolutely necessary.

Before checking the coolant level, always wait for the engine to cool down and check the expansion tank.

Immediately after the engine has stopped the temperature of the coolant is very high and the radiator is under pressure; if the cap is removed to check the level of coolant under these conditions the operator runs the risk of being scalded. Wait until the temperature drops, then unscrew the cap slowly to discharge the residual pressure before removing it completely.

Do not use dirty coolant otherwise the fins could become blocked.

Open the engine compartment and check whether the level of coolant is between the MIN and MAX marks on the radiator overflow tank (1).

If the level is low:

- a** - unscrew the filler cap;
- b** - If the level is low, add coolant through the filler spout until the MAX level is reached;
- c** - screw on the filler cap.

If the expansion tank is empty, there may be a leak. After checking, repair immediately if necessary.

If nothing unusual is found, check the level of liquid in the radiator by removing the cap (2). If the level is low, add liquid to the radiator and then to the expansion tank (1).

On completion of these operations, tighten all caps.

After one hour's work check again the level of the liquid in the reservoir (1).



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3 - CHECKING THE OIL LEVEL IN THE HYDRAULIC FLUID TANK

Make sure the hydraulic oil level is between the MIN and MAX level marks.

If the oil level is low add some more.

The tank is fitted with an internal low oil level sensor.

If the oil drops to a level insufficient to run the machine normally, an alarm message will appear on the display and the buzzer begins to sound.

For topping up operations, see point 9.11.7.



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WARNING

It is dangerous to pour oil in the hydraulic fluid tank immediately after shutting down the engine.

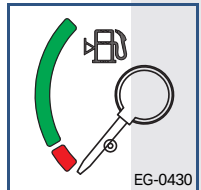
The hydraulic fluid is very hot. or may be under pressure.

To prevent serious personal injury wait until the oil cools down.

4 - CHECKING THE FUEL LEVEL IN THE FUEL TANK

Check the fuel level reading on the fuel gauge located on the dashboard.

If the needle moves into the, red zone add more fuel.



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WARNING

Do not expose the fuel to flames or sparks, as diesel fuel is an inflammable substance; this may cause a fire, with the risk of personal injury and machine damage.



IMPORTANT

The fuel gauge on the fuel tank does not move until the fuel level is almost full. This is for confirmation purposes only.



WARNING

When topping up with fuel, take care not to spill any, clean up any spillage carefully.

As any traces of fuel may start a fire or pose a risk of personal injury and equipment damage.

5 - CHECKING THE FAN BELT

Pressing with the thumb midway between the alternator and crankshaft pulleys, check that the belt has 13 mm of slack, and also check for any signs of cracking; For the correct procedure follow the instructions given in point 9.11.16.

6 - CHECKING TRACKS FOR WEAR

Check to ensure that the tracks show no signs of cracks, breaks or excessive wear, and that the track tension is correct (see the section on maintenance for adjustment procedures).

7 - CHECKING THE CONDITION OF THE EQUIPMENT

Check the equipment fitted to the digger boom in order to ensure that it has been properly installed and fixed in place, as indicated in the respective manufacturer's manuals.

Also check the level of wear and inspect for any signs of oil leaks or accumulation of debris on the equipment, in which case immediate action must be taken to repair the leaks and remove the debris in order to avoid any machine breakdowns.

8 - CHECKING THE MACHINE FOR LEAKS

Check the whole machine for any liquid leaks, even if only slight.

These could lead to malfunctions and machine breakdown.

All the fitted parts must be inspected, including: pipes and hoses, hydraulic jacks, pumps and motors and the engine cooling system.

9 - CHECKING THE MACHINE FOR WEAR

Check the machine for any signs of worn or even missing parts.

If so, replace or refurbish them prior to starting up the machine.

10 - CHECKING THAT THE MACHINE IS CLEAN

Check the cleanliness of the machine so as to avoid any operating problems or even faults occurring while the machine is working.

Clean away from the machine all material that has built up during use (e.g. dirt, dust, stones, grass, etc.) especially in the areas of movement and articulation .

Check the outside as well as the inside the machine to avoid any problems of manoeuvrability during operation.

11 - CHECKING THE WATER SEPARATOR

Any water left in the supply circuit is collected in the water separator (1).

When the water in the separator reaches a critical level an alarm will appear on the display and the buzzer will come on to signal the need for maintenance.

When this alarm occurs, stop the machine and drain out the water following the procedure described in point 9.11.20.



IMPORTANT

After cleaning or fitting new parts, any air left in the circuit must be purged, for the procedures involved refer to point 9.11.22.

12 - CHECKING THE HORN IS WORKING

Make sure the horn is working properly, see "point 7.32" for the procedure .

If the horn does not work, repair it.

7.11.2 Engine starting procedure

Before starting the engine for the first time, familiarise yourself with the following procedure in **11** steps to be carried out at each start up.

Each control, gauge and indicator light involved in starting the engine and monitoring its status once it is running are listed in the order that they will be encountered.



WARNING

Prior to starting up the engine, read carefully the safety procedures described in the manual and check that you are familiar with the controls.

As soon as the engine is started, the operator is directly responsible for any damage that may be caused due to incorrect manoeuvring and failure to comply with safety and driving laws.

Never attempt to start the engine by short-circuiting the terminals of the starter motor. This could cause serious injury or fire.

Only start the engine when you are in the driving seat and with the safety belt fastened.

Before starting the engine, check that there is no one within the working range of the machine and then signal start up by sounding the horn.

The exhaust gasses are toxic. When starting the engine in a closed environment, make sure there is sufficient ventilation.



IMPORTANT

Do not attempt to start the engine with the accelerator at maximum, because the engine parts could become damaged.

1 - Starter switch

The starter switch and other locks used on this vehicle use the same key.

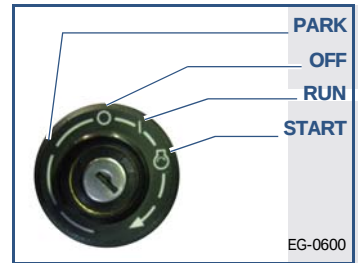
The starter switch has four positions -

"PARK",

"OFF",

"RUN" E

"START".



- "PARK" position:

In this position power is supplied only to the stereo, the courtesy lights in the cab and to the fuel pump; in this position the key can be inserted or removed.

- "OFF" position:

This position has the same effect as the "PARK" position.

With the engine running and the key in the RUN position, when the key is turned to OFF, the engine switches off.

- "RUN" position:

When the key is inserted and turned to this position, the following electrical circuits are supplied with power:

- dashboard lights and gauges,
- joystick servo relays,
- glow plugs,
- horn,
- front working lights,
- enclosed cab and cab equipment.

- "START" position:

When the key is turned to this spring-loaded position, the engine starter motor will engage. When the engine starts, release the key and it will return to the **"RUN"** position.



IMPORTANT

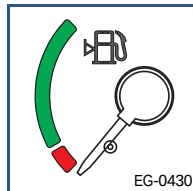
The engine is fitted with an automatic device that disengages the starter after 8-10 seconds of activity to prevent overheating of the starter motor. Turn the key to the OFF position, wait 10-15 seconds and then repeat the start operation.

2 - Fuel gauge

The fuel gauge indicates the approximate level of fuel remaining in the tank.

Prior to engine start-up, briefly turn the ignition key to the "RUN" position to check the fuel level displayed on the gauge.

With the key in this position, a warning light on the dashboard will come on if the fuel level is low.



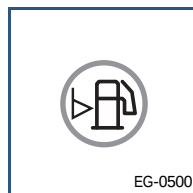
IMPORTANT

The vehicle should be refuelled at the end of each workday in order to reduce the condensation of moisture inside the fuel tank, which is harmful to the fuel injection system.

3 - Low Fuel Warning Light

This warning light will switch on to alert the operator that the fuel tank requires refilling.

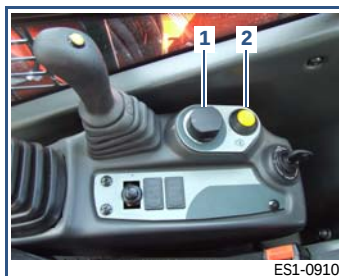
If this warning light turns ON during operation, refill the fuel tank immediately. After topping up, with the engine running, the indicator light goes out.



4 - Accelerator knob

The knob (1) governs the engine speed electromechanically and is on the right control console

- moving the lever counter-clockwise reduces engine speed to low idle;
- for engine starting and initial warm-up, move the throttle knob to its mid-range position;
- move the knob counter-clockwise for maximum engine speed;
- the auto-idle (2) switch must be off.



IMPORTANT

A complete description of how the accelerator knob works is given in point 7.18.

5 - Pre-heater



WARNING

The excavator's engine may only be run on the type of fuel indicated in the "Technical Specifications" section.

The glow plugs are electronically controlled, and are supplied with power whenever the ignition key is turned to the **"RUN"** position.

An indicator light on the dashboard will come on whenever power is supplied to the glow plug circuit.

After a period of 5 to 10 seconds, the glow plugs will be heated and power to the circuit will be cut automatically.



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Before starting the engine:

- if the ambient air temperature is 10°C or lower, it is necessary to wait for the glow plug indicator lamp to go out before engaging the starter to start the engine;
- If the temperature is above 10°C, or the engine is warm following recent use, the starter can be engaged immediately.

After a cold engine start, run the engine with the accelerator knob in the mid-range position to allow the engine and hydraulic system to warm up (without load) to normal operating temperature. As the various systems warm up, check all dashboard lights and gauges for any indication of a condition requiring any maintenance or service tasks to be performed.

6 - Engine Oil Pressure Warning Light

When starting up the engine, this warning light will come on when the ignition key switch is turned to the **"RUN"** position.

The light will go OFF within seconds after engine start-up.



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**IMPORTANT**

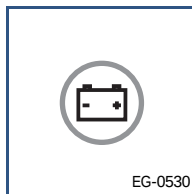
if the warning light DOES NOT light up when the ignition key switch is set to the "RUN" position, DO NOT continue attempting to start the engine. If the warning light DOES NOT go out after start-up, shut down the engine immediately. The cause of the warning light malfunction must be identified and eliminated before using the vehicle again.

If the warning light comes on during normal operation, the engine automatically cuts its speed down to 1400 rpm to prevent any irreversible damage. Position the machine in a safe place and stop the engine. Contact the EUROCOMACH service centre in order to carry out inspection of the vehicle and eliminate all possible faults.

7 - Alternator Charging Light

When starting the engine, this warning light will come on when the ignition key switch is turned to the "RUN" position.

The light will go OFF within a few seconds after engine start-up.



EG-0530

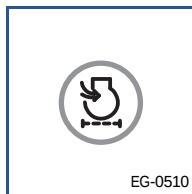
**IMPORTANT**

in the case where the indicator light DOES NOT light up when the ignition key switch is set to the "RUN/PREHEAT" position, DO NOT continue attempting to start the engine. If the indicator light DOES NOT go off after start-up, immediately shut down the engine. The cause of the indicator light malfunction must be identified and eliminated before the vehicle can be used once again.

8 - Air filter warning light

This warning light comes on to indicate that the air filter is clogged and requires maintenance.

Refer to the "Maintenance" section of this manual for the proper service procedure.



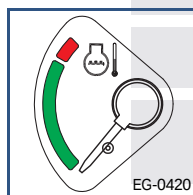
EG-0510

**IMPORTANT**

If the warning light comes on during normal machine operation, the engine automatically cuts its speed down to 1400 rpm to prevent any irreversible damage. Position the machine in a safe place and stop the engine.

9 - Coolant Temperature Gauge

This gauge indicates the temperature of the engine coolant. Normal engine operating temperature is between 80°C and 95°C.



10 - Coolant Temperature Warning Light

If this light comes on, it means that the operating temperature is over 105°C.



IMPORTANT

If the warning light comes on during normal machine operation, the engine automatically cuts its speed down to 1400 rpm to prevent any irreversible damage. Position the machine in a safe place and stop the engine. Contact the EUROCOMACH service centre in order to carry out inspection of the vehicle and eliminate all possible faults.

Identify and remedy the cause of the overheating before continuing to use the machine.

On early morning start-up with a cold engine, do not accelerate sharply or rev the engine to the maximum. Before accelerating to the maximum wait until the coolant temperature is around 1/3 of the permitted scale value (green part).

11 - Display

Check that the display shows no errors. If any errors are showing, follow the instructions given in point 6.5.

7.12 Electric fuel pump

Before starting to refuel move the machine to level, compact ground, then lower the bucket or equipment fitted and the blade to the ground.

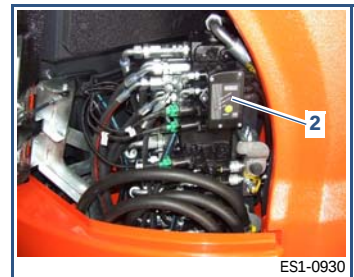
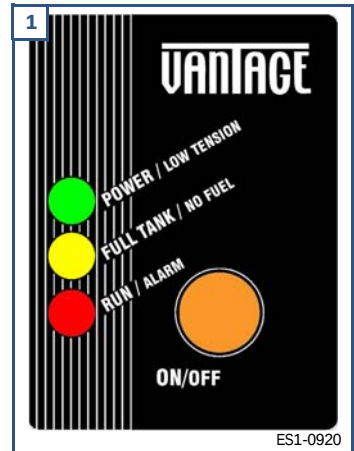
Stop the engine and get down from the machine.

USER INTERFACE

Vantage (1) interfaces with the user by means of a control button and three diagnostic/signal LEDs.

The control box is located inside the pump cover (2).

- The ON / OFF button has 2 different functions depending on how long it is held down:
 - pressing briefly takes the card out of the stand-by phase, in which all the LEDs are off to keep power consumption to the minimum;
 - a longer press starts (ON) or stops (OFF) the pump.



IMPORTANT

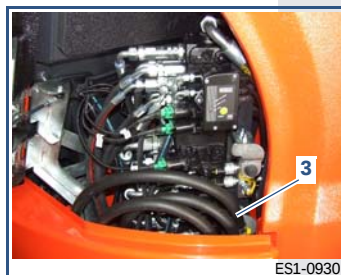
The system enters the stand-by phase turning off all 3 LEDS after 1 minute from the end of the last operation.

- Make sure there is more diesel fuel in the donor tank than the amount you wish to transfer.
- Make sure that the residual capacity of the receiving tank is greater than the amount you wish to transfer.
- Do not run the pump empty; this could cause serious damage to its components.
- Make sure that the pipes and line accessories are in good condition. Diesel fuel leaks can cause damage to persons and objects.
- Never activate switches with wet hands.

- Prolonged contact with diesel fuel can damage the skin. The use of goggles and gloves is recommended.

Follow the procedure described below:

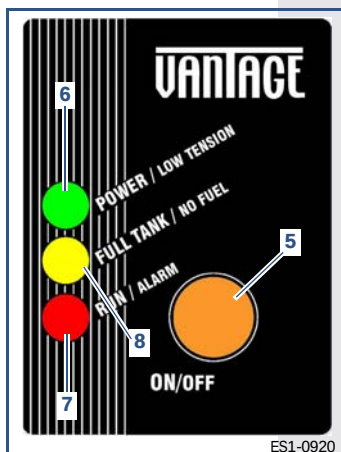
- 1 - open the pump cover;
- 2 - unwind the rubber hose (3);
- 3 - open the bottom valve (4) by turning it: hold the hose still and turn the end with the metal mesh to move it to the green position;
- 4 - place the hose into the recipient from which you wish to take the diesel fuel;
- 5 - press the ON/OFF key (5) for 1 second to begin transfer.
Transfer can only start if the warning light (6) is on permanently, confirming that the battery is charged;
- 6 - remove the fuel tank cap (9);
- 7 - The transfer is confirmed by the red LED (7) coming on.



ES1-0930



ES1-0940



ES1-0920

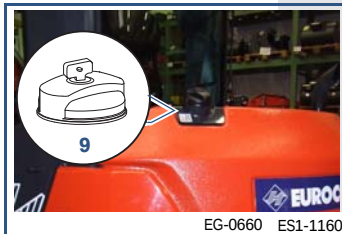
The priming phase can take from a few seconds to a minute depending on the system characteristics.

In the priming phase the pump must discharge from the flow line any air initially present in the entire installation.

If priming continues beyond a time limit set of 1 minute, the electronics cut in to stop the pump from being damaged by turning while dry.

This alarm situation is displayed once the pump has been switched off by the yellow LED flashing (8).

If priming continues beyond the time limit set, check the following:



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- that the pump is not turning fully dry;
- that the suction hose has no leaks;
- that the suction filter is not blocked;
- That the suction height is no more than 2 m (if it is greater, fill the suction hose with liquid);
- that the flow hose guarantees air discharge.

the transfer can be stopped in one of three ways:

- by pressing the ON / OFF key **(5)**;
- when the maximum transfer time has elapsed (time cannot be changed);
- because of an alarm condition or because the level sensor has been triggered (machine tank full).

After refuelling:

- close the bottom valve by turning it to the red position **(10)**;
- Wind the hose into the casing and put the bottom valve back into its container;
- close the pump cover;
- screw on the fuel tank cap.



Once the refuelling procedure is complete, work can be started with the machine.



IMPORTANT

During refuelling the fuel tank cap must be removed. If this is not done both the electric pump and the tank itself could be damaged.

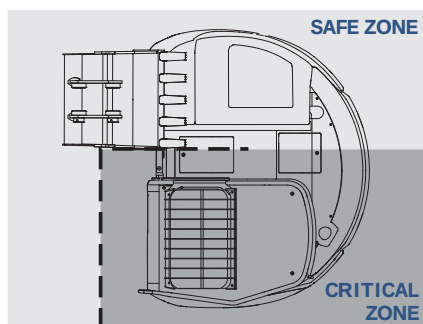
If the pump does not work as described above, refer to the tables shown in point 11.0.

7.13 Automatic anti-collision system (only for ES900UR version)

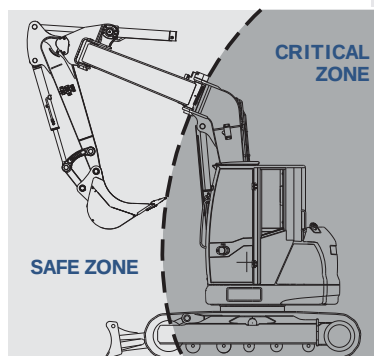
As described in the section on Safety, the anti-collision system safeguards the operator from any possibility of work equipment impacting against the cab.

While the machine is working, the equipment may be in any of the following positions in relation to the cab:

- safe zone;
- critical zone.



ES1-1450



ES1-1460

- **SAFE ZONE:** there is no danger to the operator; all movements are permitted; The display shows page 1.
- **CRITICAL ZONE:** If the equipment comes any nearer to the cab, there could be a definite risk of impact and therefore danger to the operator. The movements of the main boom, digger boom closing and offset rotation to the left are all electronically blocked, while movements needed to move back into the safe zone in the opposite direction remain possible.



ES1-1080



CAUTION

During a normal working phase, page 1 shows the anti-collision system is enabled.

When you move out of the safe zone and into the critical zone, the display shows page **2**, and the buzzer begins to sound on and off for 10 seconds.

Movements towards the cab will be blocked until you leave the critical zone; when this is done the display returns to the standard page appearance **1**.



ES1-1120



CAUTION

If message 3 appears, the machine control box has detected an error with the anti-collision system. Consequently all movements that may represent a danger to the operator will be inhibited (raising the main boom, closing the digger boom or offset rotation to the left).



ES1-1090

RESOLVING THE PROBLEM

- Check the machine is fitted with sensors;
- check they have been installed correctly;
- check the wiring to the sensors.

If the above points are all satisfactory, calibrate/reset the sensors (see point 7.13.3).

If the problem persists, park the machine in the safe mode (see point 7.20) and contact the EUROCOMACH service centre.

7.13.1 Managing the anti-collision system: setting the machine configurations

When the machine is started up, after the initial check, the display shows page **1** on which the specific working configuration can be set, such as the length of the digger boom and other equipment used.

The display always shows the last configuration set and the arrow appears at the side of the word 'CONFIRM' and so by pressing on selection key **(B)** the proposed configuration is confirmed.



When the scroll button **(A)** is pressed, the arrow moves onto CHANGE, after which by pressing selection key **(B)** the various configurations possible are scrolled through.

Once the configuration installed has been identified, go back to **(A)** CONFIRM using the scroll key and confirm with selection key **(B)**.



Once the required configuration has been selected, or if no buttons have been pressed for 10 seconds (in which case the last configuration confirmed will remain active), the display returns to the initial page (2).

Always check that the configuration shown on the display really is the correct one for the machine.

If it is not, update the software configuration before starting work.

The specific machine configuration can be changed as often as is necessary (for example each time work equipment is changed).

From the initial page (2), holding down at the same time the scroll key and the selection key (**A** and **B**) for 2 seconds, calls up the main menu page **ES900UR** (3).

The arrow appears next to the words ANTI-COLLISION CONFIGURATION so by pressing selection key (**B**) it is possible to go back to the page (1) on which the machine configuration can be changed and save it in the system.





CAUTION

The machine configuration should be reset each time the digger boom or the work equipment are changed. Only in this way will the safety system be able to calculate correctly the position of the equipment in relation to the cab.

The anti-collision system is only calibrated to work with standard buckets or trench cleaning buckets; on the display these are indicated respectively as NARROW BUCKET and WIDE BUCKET.

If other equipment is fitted, the system may not work properly.

In particular, with bulky equipment there is the risk of it colliding with the cab.

The utmost care must be taken when moving equipment in the direction of the cab.

7.13.2 Disabling the anti-collision system

The machine offers the option of “VOLUNTARILY” disabling the anti-collision system.

CAUTION

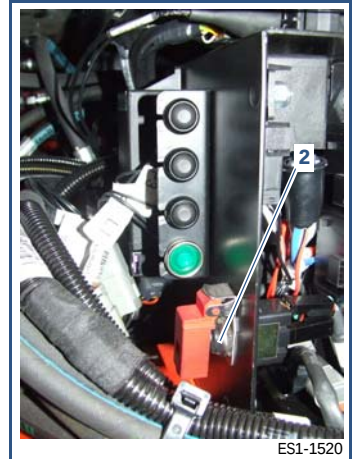
The anti-collision system is system to safeguard the operator.

It should only be disabled for the occasional movement and as infrequently as is absolutely necessary, so voluntarily and with full awareness of the consequences. Any time the machine is being manoeuvred with the anti-collision system disabled, make very slow movements and pay particular attention to the possibility of impact with the cab.

EUROCOMACH cannot be held responsible for any injury to persons or objects caused by improper machine use, as described in this manual.

In particular, the system may be disabled:

- “temporarily” by holding down button (1) located on the right control console and at the same time making the movement required;
- “permanently” using (after releasing the relative safety device) switch (2) located in the control box.



Disabling the anti-collision system will call up specific pages on the display and cause the buzzer to sound, depending on the specific position taken up by the work equipment.

In particular:

- with the anti-collision system disabled and equipment in the SAFE zone, the buzzer sounds intermittently, one second ON one second OFF;



- with the anti-collision system disabled and equipment in the CRITICAL zone, the buzzer sounds continuously.



7.13.3 Reset the anti-collision sensors

In the event of:

- substituting metalwork on the boom assembly;
- repositioning a sensor
- an error is detected with the anti-collision system;

a sensor resetting operation is necessary, setting the two reference positions.

CAUTION

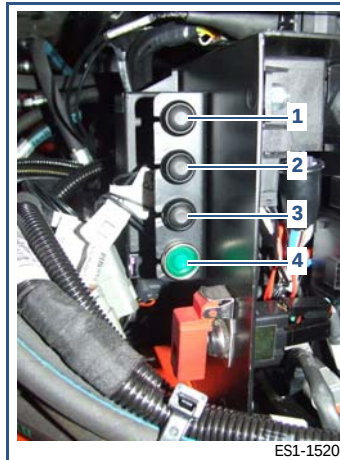
ALWAYS carry out the sensor resetting operation under the supervision of EUROCOMACH service technicians.

Incorrect sensor resetting could lead to incorrect detection of the equipment positions by the control box and could therefore endanger the operator.

Once the sensors have been reset, check that the anti-collision system is working properly making slow movements and making sure that "dangerous" movements are inhibited when entering the critical zone.

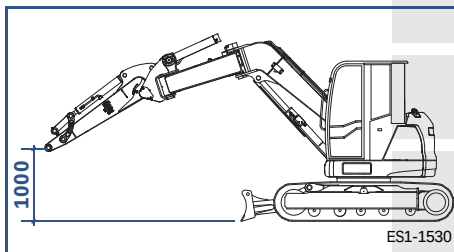
To reset the sensors hold down the three buttons (1 - 2 - 3) on the panel in the control box

As soon as light (4) comes on, release all three buttons.

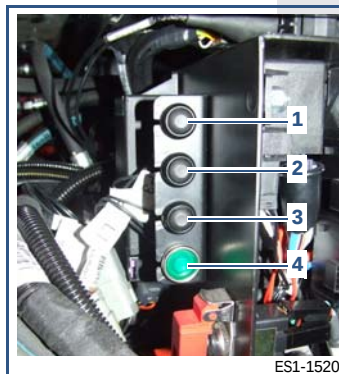


Place the boom assembly in the **RESET 1** position:

- the digger boom at its end of travel in the open position;
- offset positioner at left end of travel;
- lifting boom to have a height above ground of the bucket pin on the digger boom of 1000 mm.

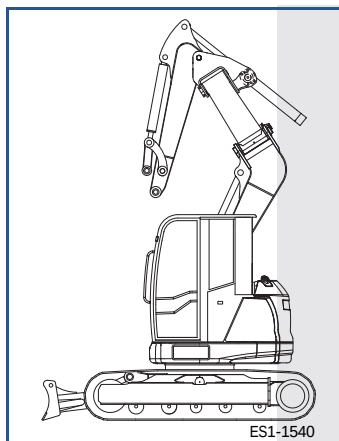


Press button **1** to memorise the first position.



Place the boom assembly in the **RESET 2** position:

- the digger boom at its end of travel in the closed position;
- offset positioner at right end of travel;
- lifting boom at top end of travel.



Press button **2** to memorise the second position.

Press button **3** to confirm the new setting for the sensors and to exit the resetting procedure.



7.14 Jump starting procedure

If the engine does not start when following the point 7.11.2 procedure, check that the battery is properly charged. Replace the battery if necessary.

If the battery charge is low, use the following procedure to start the engine.



CAUTION

If the vehicle has to be jump started directly on the starter motor or its solenoid, protect your face and hands with a mask and gloves. There is a risk of electric arcing because of the high starting current, with the risk of emission (ejection) of red-hot splinters from the contact point.



CAUTION

To avoid personal injury or death when jump-starting the vehicle, ensure that the two vehicles are not touching each other.

Keep sparks, flames, and all smoking materials away from the battery.

Lead acid batteries generate explosive gases when charging and when the engine is running. Wear safety glasses when you work near a battery.

The vehicle used to jump-start must be equipped with a 12V negative earth system and a battery of at least 500 CCA (cold start amperes).



IMPORTANT

Before jump-starting, be sure the battery is not frozen. If the liquid inside the battery is frozen, remove the battery from the vehicle and wait until the liquid thaws before jump-starting or charging the battery.

To gain access to the battery and to carry out the jump start procedure, the engine cover must be opened by the following procedure point 9.2.

The following procedure should be followed to jump start the engine:



- 1 - Connect one end of the positive (+) jumper cable to the positive (+) terminal of the flat battery (1) in the vehicle.
- 2 - Connect the other end of the positive (+) jumper cable to the positive (+) terminal of the booster battery (2).
- 3 - Connect one end of the negative (-) jumper cable to the negative (-) terminal of the booster battery (3).
- 4 - Connect the other end of the negative (-) jumper cable to an earthed point (4) on the vehicle.
- 5 - Start the engine.
- 6 - Once the engine is running, remove the jumper cables in the opposite sequence to the above, following steps 4, 3, 2, and 1.

7.15 Inspections prior to starting work

- In order to carry out the inspections, move the machine to a large area that is free of any obstacles and operate slowly. Do not allow anyone to stand in the vicinity of the machine;
- always fasten the seat belt;
- check the functioning of the drive system, steering and brakes, as well as the working equipment control system;
- check for any faults, such as noises coming from the machine, vibrations, heat, odours and instruments. Also check to ensure that there are no oil or fuel leaks;
- if any faults are encountered, arrange for immediate repairs;
- before driving the vehicle or commencing with any operations, check to ensure that the control cut-out lever has been lowered correctly.



DANGER

The control devices must only be activated from the driving seat with the safety bars lowered.

ALWAYS FASTEN THE SEAT BELT AND LOWER THE SAFETY BARS BEFORE MAKING ANY MOVEMENTS WITH THE MACHINE.

Precautions when moving forwards or in reverse

- Before commencing any movement, check that there are no people or obstacles in the surrounding area.
- Before commencing any movement, sound the horn to warn everyone in the immediate vicinity.
- Only ever operate the machine from the driving seat.
- Do not allow anyone other than the operator to climb onto the machine.
- Always lock the door and the windows of the cab in either the open or the closed position (if fitted).
- In areas where there is a danger that any items thrown up may invade the cab, check that the door and windows are locked in the closed position (if fitted).
- If there are any blind spots behind the machine, place a person there to signal the operator. Take particular care not to bump into other vehicles or people when turning or rotating the vehicle.
- Before driving the vehicle or commencing with any operations, check to ensure that the control cut-out lever has been lowered correctly.

7.15.1 During operation



DANGER

***The control devices must only be operated from the driving position.
ALWAYS FASTEN THE SEAT BELT.***

- Check for the proper operation of all controls (travel levers and control levers) for the machine and any accessories fitted.
- Never use the bucket to lift persons or as a work platform.
- Never transport other persons.
- Avoid making sudden, sharp movements.
- When working on uneven ground, always proceed slowly and operate with the bucket as low as possible.
- Carefully check the conditions of the area in which you will be working, in order to ascertain whether there are any anomalies in the terrain that could make the work hazardous.
- If possible, level the ground where the machine will be used, prior to starting work.
- Note the position of any overhead or buried pipes or electrical cables, as well as any open or filled trenches.
- When traversing, move carefully near the edge of excavations or trenches, and exercise extreme caution in cramped working spaces, or when working on uneven or steeply sloping ground.
- If you have to work indoors or in cramped spaces, ensure that the area is well ventilated.
- The exhaust gases of the engine can be fatal.
- Never try to start or use the machine unless you are sitting in the driver's seat.
- Only use the controls when you are sure of the movement the machine will make and do not take any chances if you're unsure, especially in obligatory work conditions or in the presence of dangers for your safety or the safety of others.
- Do not rest your feet on the control pedals (LH and RH travel control pedals) when not in use, but rather rest your feet on the floor, or alternatively on the supports provided at the side of the travel levers.
- Always fasten your seat belt before starting the machine. Familiarise yourself with location and function of all pedals, control levers, instruments and luminous indicator lights.
- Drive slowly and keep the bucket as low as possible when moving over uneven ground.

- Exercise extreme caution when negotiating any depressions, kerbs or railway lines.
- Do not use the bucket as a ram.
- When working on slopes, always keep the bucket lowered.
- Never stand under a raised bucket.

7.16 Stopping the engine

To stop the engine, proceed as follows:

- Park the vehicle on a level surface.
- Lower the dozer blade and boom assembly, as well as any accessories that may be fitted to it, down to the ground.
- In the event that the machine needs to be stopped on an incline; block the tracks by placing wedges perpendicular to the direction of slope, dig the teeth of the bucket and the dozer blade into the ground.
- Turn the accelerator knob to reduce the engine rpm to the minimum.
- Allow the engine to idle for 4-5 minutes in order to permit the temperature to stabilise.
- Turn the ignition key switch to the "OFF" position and remove the key.
- Raise the servo-control cut-out lever, unfasten the seat belt and exit the vehicle using the handholds provided.

If you need to park on a public road, signal the obstacle in accordance with the provisions of the local Highway Code (lighting signal fires, road works signs, etc.).



DANGER

***Do not get off the machine with the booms and the bucket raised.
NEVER leave the machine unattended with the ENGINE RUNNING.
NEVER leave the lifting booms IN THE RAISED POSITION.***

7.17 Refuelling

Fill the fuel tank at the end of each working day. This will assist in preventing the formation of condensation in the tank.

To prevent dirt, water and other contaminants from entering the fuel system, proceed as follows:

- clean the area around the filler spout before unscrewing and removing the tank filler cap
- add diesel fuel from clean containers through a filtering funnel.
- the use of diesel fuel additives is not recommended. Follow the instructions on the product label when using any fuel additive.



7.17.1 Refuelling with the electric pump

To refuel using the electric pump the machine is provided with, follow the instructions in point 7.12.

7.18 Accelerator knob

This control (**1**) is used to control electromechanically the engine speed and power.

- 1 - Minimum position: the control is turned fully to the left (counter-clockwise direction).
- 2 - Maximum position: the control is turned fully to the right (clockwise direction).



7.18.1 Auto-idle switch



WARNING

Before using the auto-idle switch always put the working and travelling controls back into the neutral position.

This switch (**1**) is used to cut down the engine speed and fuel consumption when no power is required of the engine, for example when the travel levers and the work control levers are in the neutral position.

It is called the “automatic idle” switch and brings the engine down to idling speed when no movements are being made with the machine.

The switch lights up when it is pressed, after 5 seconds of the levers or equipment controls not being used, the engine speed cuts down to idling speed, and the machine is said to be in “automatic idle” mode.

As soon as a hydraulic accessory is started the engine speed automatically returns to the speed set previously with the accelerator knob.

If the auto-idle switch is turned off while in the automatic idle mode, the machine automatically returns to the number of rpm set with the accelerator knob.



**IMPORTANT**

When the accelerator knob is in the minimum position, the engine speed will not go any lower even if the auto-idle switch is pressed.

If the engine speed does not increase after a movement has been carried out, it is a sign that the accelerator knob is set to the minimum.

If the machine is topped with the auto-idle switched on, it will remain like this the next time the machine is started as well.

7.19 Machine movement**CAUTION**

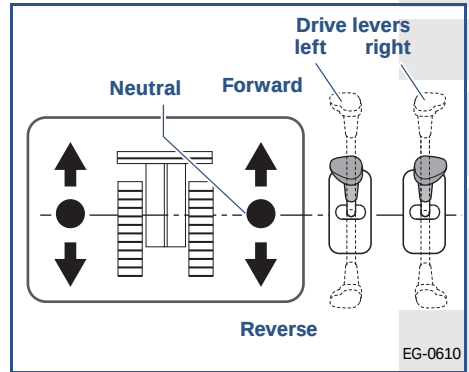
The levers control the vehicle's FORWARD and REVERSE motion, as well as LEFT and RIGHT steering and braking. The lever on the left controls the left track drive and the lever on the controls the right track drive.

The functions of both controls are locked out when the servo-control cut-out lever is raised to allow entry or exit from the vehicle. To enable the controls, the servo-control cut-out lever must be fully lowered, see the procedure in point 7.7.

**IMPORTANT**

For safe movement of the excavator, always move the travel control lever slowly and smoothly. Operators unfamiliar with tracked vehicles should initially operate the vehicle at 50% of its maximum travel speed until they master the control function and feel confident on the vehicle.

- With both levers in the NEUTRAL position, both tracks are motionless and hydraulic braking is engaged on the travel motors.
- Whenever either lever is moved from its NEUTRAL (N) position, the brake for the respective track drive is released and movement commences.
- Whenever either lever is returned to its NEUTRAL position, movement of the respective track drive ceases and braking is reapplied.



CAUTION

Unless specifically noted, all references to direction in this manual, including travel and turn instructions, are deemed to be from the operator's point of view and with the blade at the front.

The travel control levers operate the track drive motors mounted on the undercarriage.

The vehicle movements follow the driver's commands; if the operator is turned 180° in relation to the dozer blade, then the vehicle movements are the reverse of those indicated in the operating instructions.



IMPORTANT

Both the hand travel control levers have projecting pedals near the bottom of each lever.

These pedals allow the driver to operate the tracks without taking his hands off the joysticks; It is not advisable to use the pedals to control vehicle travel during loading and unloading operations using ramps, or in any dangerous situations where the sensitivity of the hands is required to control the vehicle.

The pedals have rear parts that can be folded forwards to reduce their size. This gives more room for climbing into and out of the cab and for placing the feet while working.



ES1-1190



ES1-1200

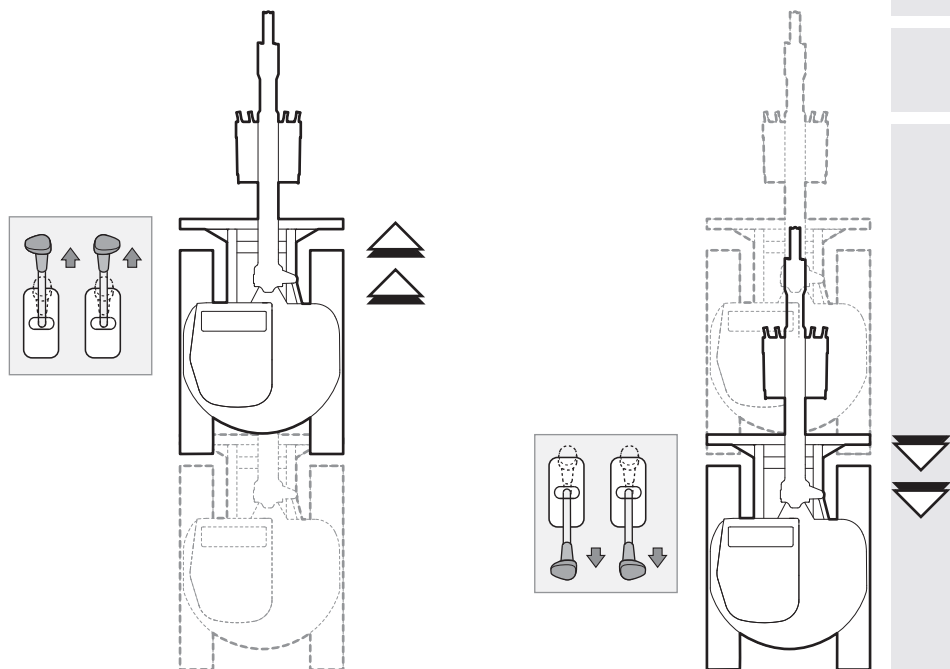
When moving the machine, keep it configured as follows:

- 1** - fold the booms. Raise the equipment 40 to 50 cm off the ground;
- 2** - raise the dozer blade to its minimum travel;
- 3** - check the direction in which you want to go. Move the left and right track drive levers forwards to move forwards, or backward to move in reverse.



ES1-1180

7.19.1 Forward and reverse travel



EG-0680

To begin FORWARD travel, move both control levers forward equally. As additional pressure is applied on the control levers, the machine's speed will increase. To STOP forward travel, slowly return both controls to their NEUTRAL (N) position.

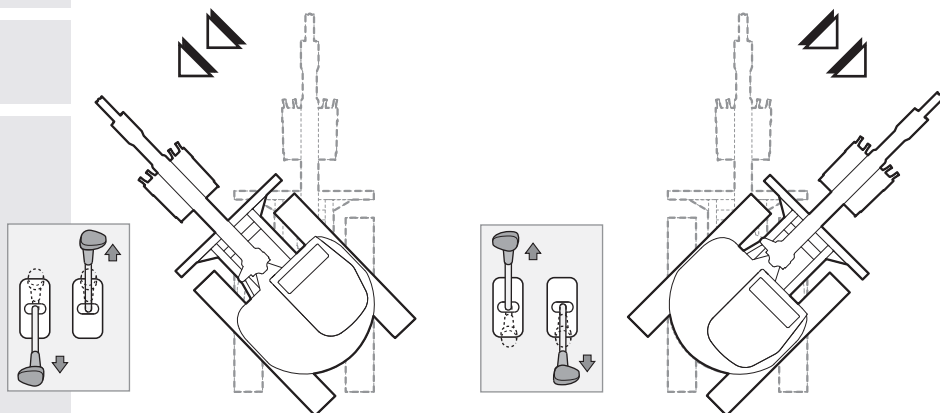


IMPORTANT

Any forced, quick return of either travel control lever to its NEUTRAL position will cause an immediate braking response from the respective track drive.

To travel in REVERSE, slowly pull back on both control levers. The further the controls are moved, the more the speed of movement will increase. To STOP reverse travel, slowly return both controls to their NEUTRAL (N) position.

7.19.2 Pivot turns



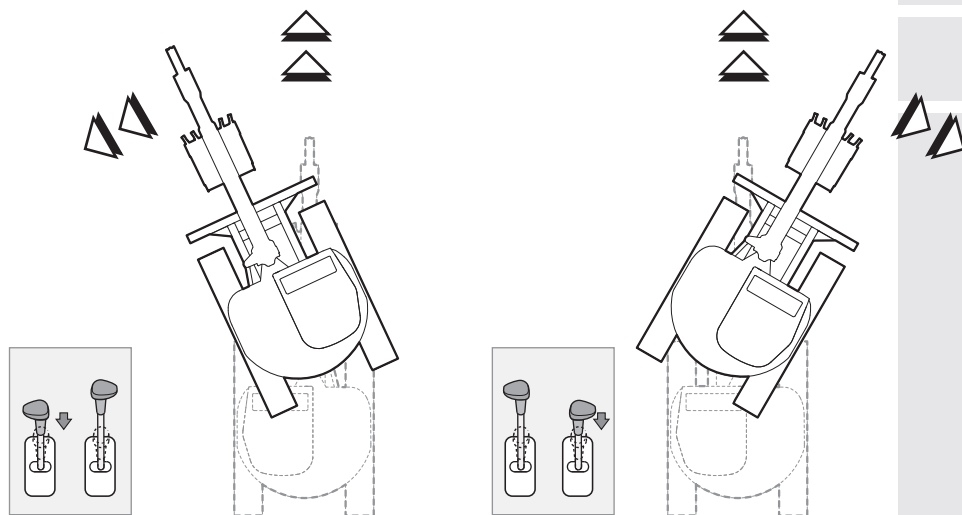
EG-0690

- To pivot the vehicle to the LEFT on its axis, push the right control lever forward while pulling the left lever to the rear.
- To pivot the vehicle to the RIGHT on its axis, push the left control lever forward while pulling the right lever to the rear.

Pivot or spin turns cannot be carried out at high speed.

Executing spin turns on a concrete surface may damage the rubber tread and the relative undercarriage components.

7.19.3 Turning while moving forward

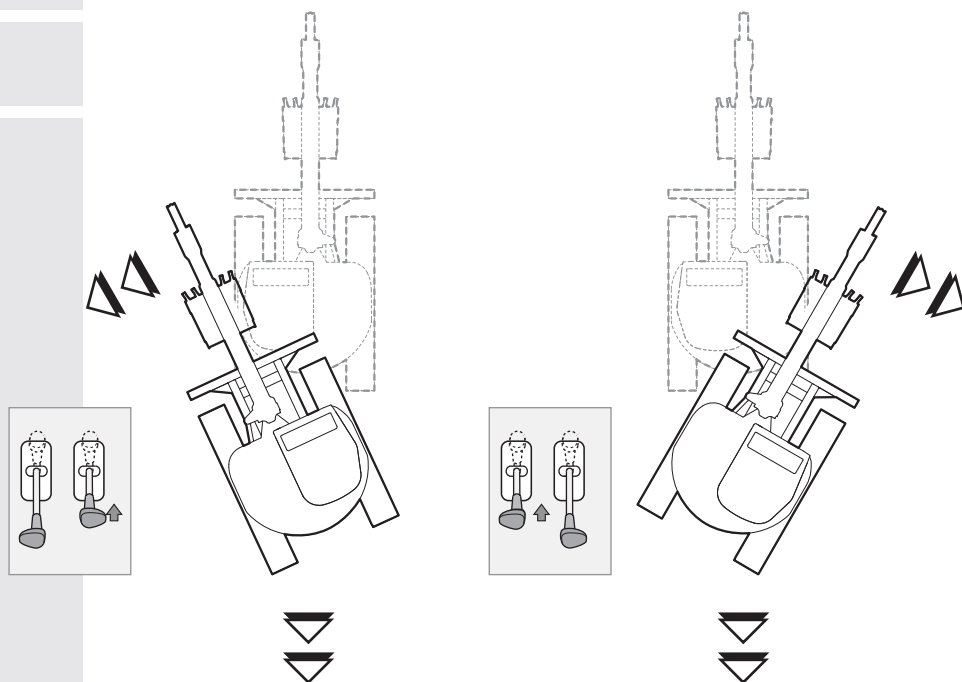


EG-0700

With the vehicle travelling straight AHEAD, both control levers must be pushed forward by equal amounts.

- To turn LEFT while travelling FORWARD, reduce forward pressure slightly on the left hand lever, thus slowing down the left track. The vehicle will turn toward the LEFT.
- To turn RIGHT while travelling FORWARD, reduce forward pressure slightly on the right hand lever so that the vehicle will turn toward the RIGHT.

7.19.4 Turning while reversing



EG-0710

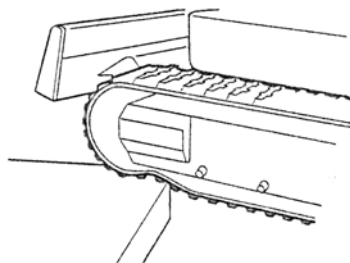
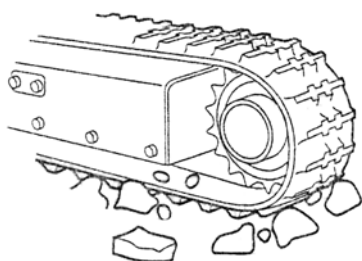
With the vehicle moving straight in REVERSE, both control levers must be pulled back by equal amounts.

- To turn LEFT while REVERSING, reduce rearward pressure slightly on the right hand lever, thus reducing the speed of the right track.
The vehicle will turn toward the LEFT.
- To turn RIGHT while REVERSING, reduce rearward pressure slightly on the left hand lever so that the vehicle will turn toward the RIGHT.

7.19.5 Precautions when working with rubber tracks

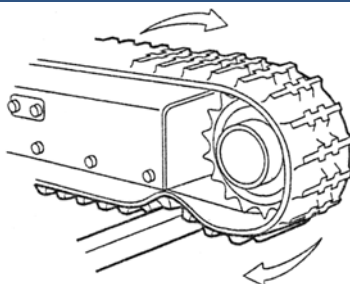
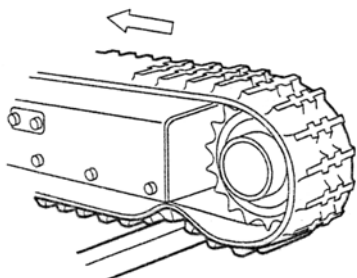
When moving, do not ride over or turn on any sharp edges or steps.

If you drive over or turn on a projecting edge or on steps, the machine will place additional strain on the rubber track, splitting or cutting the treads of the rubber track and the inner steel cord.



EG-0620

- Prevent any foreign bodies from getting into the rubber track as they may cause twisting or cuts.



EG-0630

- Do not turn sharply on high-friction road surfaces such as concrete roads.
- If any fuel or hydraulic fluid is spilt onto the rubber track, it must be cleaned off.
- Do not operate on the beach. (Internal metal parts will rust due to salt corrosion.)
- All of the above precautions are applicable to both rubber tracks and the optional steel tracks.



WARNING

Exercise extreme caution when operating a machine with rubber pads. Rubber pads are no more stable than steel ones due to their flexibility.



CAUTION

Rubber pads can also easily slip on iced or snow-covered surfaces. Exercise extreme caution when travelling and working in these conditions.



WARNING

Driving or slewing over projecting or other similar edges causes the rubber pad to slacken, which will probably cause it to come off the guides or cut the inner steel cord.

Driving and slewing with the track roller banked against the rubber pad may cause the rubber pad to come off the guides.

7.20 Parking the machine

Drive the machine to an area with a firm surface and level the area if necessary.

Lower the bucket or the equipment to the ground.

Proceed with shutting down the engine in accordance with the procedures specified in "point 7.16".

Then turn the starter switch to the OFF position and remove the key.

Pull the control cut-out lever (upwards), ensuring that it comes up all the way.

Close all the windows (if fitted).

Close and lock the cab access door (if fitted), as well as all of the following covers:

- electrical control box compartment cover;
- oil tank flap;
- pump cover;
- engine cover.



IMPORTANT

Inside the swivel motor, there is a negative mechanical brake, consequently with the heat engine turned off it is impossible to turn the turret and there is no need to activate it manually.

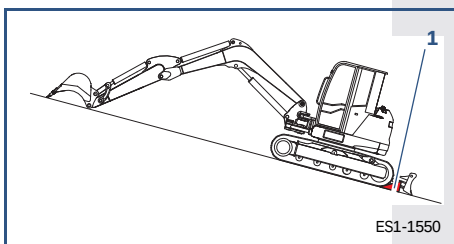


WARNING

Wherever possible, avoid parking the machine on an incline.

Should it be unavoidable to park the machine on an incline, in addition to the above:

- ensure that the bucket teeth are dug into the ground;
- point the blade down the slope and dig it in the ground
- block both tracks appropriately (using wedges **1**), as shown in the figure.



**IMPORTANT**

Always ensure that electrical components in the cab are protected against bad weather by ensuring that all windows, the sunroof and the access door are properly closed.

7.21 Operating the digger boom**CAUTION**

The joystick controls operate the vehicle's boom, dipper stick, bucket and turret swing.

The functions of both controls are locked out when the servo-control cut-out lever is raised to allow entry or exit from the vehicle. To enable both joysticks, the control cut-out lever must be fully lowered, see the procedure in point 7.7

**IMPORTANT**

DO NOT leave any of the hydraulic controls engaged after the cylinder reaches its limit stop in any direction. This practice forces the hydraulic oil to pass through the main relief valve, causing a rapid build-up of heat in the system resulting in overheating and loss of power, in addition to reducing component life.

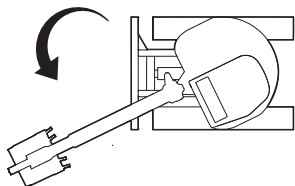
Certain boom and dipper stick movements are equipped with a shock-damping feature that slows down the hydraulic cylinder travel when nearing the end of its run. This minimises the shock load to the vehicle during operations.

7.21.1 Left Joystick

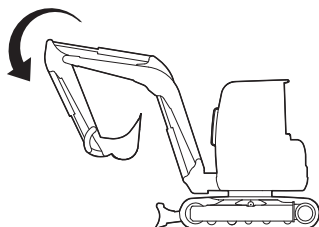
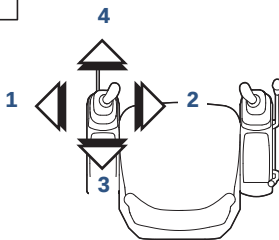
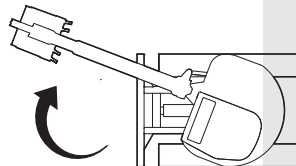
The left joystick controls the extension and retraction of the dipper stick, as well as the RH and LH rotation of the digger boom and turret.

- moving the left joystick to the LEFT will swing the turret to the left (**1** - counter-clockwise direction);
- moving the left joystick to the RIGHT will swing the turret to the right (**2** - clockwise direction);
- pulling the left joystick BACKWARDS will lower the dipper stick (**3**);
- pushing the left joystick FORWARDS will raise the dipper stick (**4**).

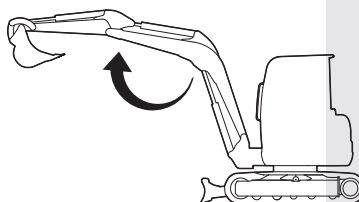
1 turret rotation and digger boom swing to the left



2 turret rotation and digger boom swing to the right



3 position of the dipper stick when closed



4 position of the dipper stick when open

EG-0720



IMPORTANT

The horn button is located on the top of the left joystick, at the front (opposite the operator) is .

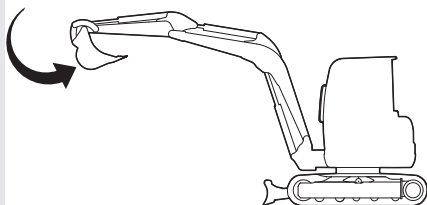
When the joystick is in the neutral position (in the centre), the turret swing service brake is automatically activated; This braking is of a mechanical type (negative) and is therefore always on during normal machine use, also acting as a parking brake.

7.21.2 Right joystick

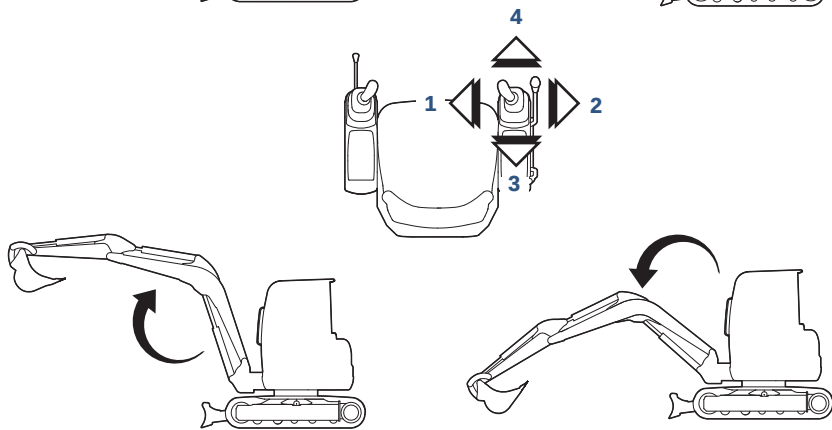
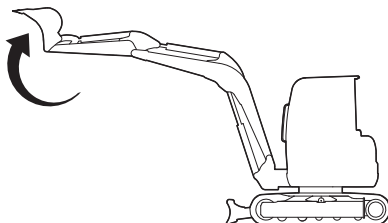
The right joystick controls the raising and lowering of the digger boom and controls the movement of the bucket. The bucket works according to the deviators on the dipper stick which must be in DIG mode.

- moving the right joystick to the **LEFT** will tilt the bucket to the closed position **(1)**
- moving the right joystick to the **RIGHT** will tilt the bucket to the open position **(2)**
- pushing the right joystick **FORWARD** will extend the digger boom **(3)**
- pulling the right joystick **BACKWARD** will retract the digger boom **(4)**.

1 bucket closed position



2 bucket open position



3 digger boom extended position

4 digger boom retracted position

EG-0730



IMPORTANT

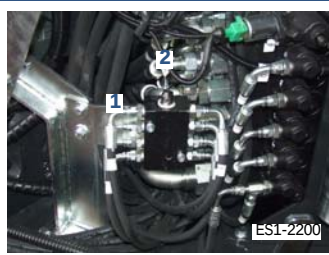
Always check the position of the deviators on the digger boom before starting work. To move the bucket they must be in DIG mode, see the procedure in point 7.27.

7.21.3 TPSS control inversion valve (Optional)

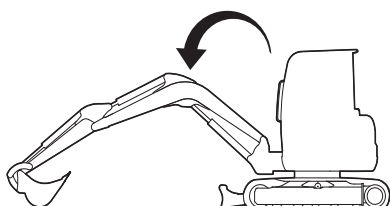
A device known as a TPSS valve is available as an optional which allows the digger boom controls to be changed from ISO (European) standard to SAE (American).

The SAE controls are activated by turning the valve to position 1.

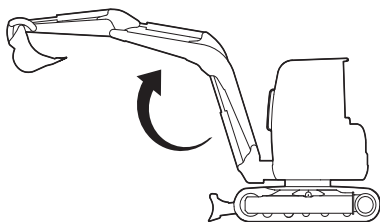
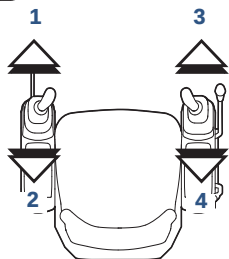
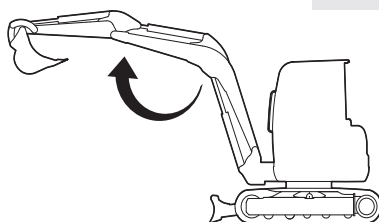
In SAE configuration functions 1-2 of the Left Joystick are carried out by the Right joystick 3-4 and vice versa (see the figure below). All the other machine functions remain unchanged.



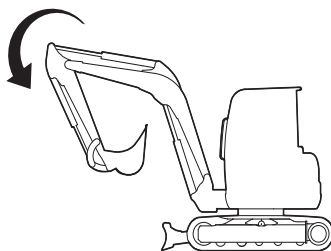
1 lowering the boom



3 opening digger boom



2 raising the boom



4 closing digger boom

ES1-2150

Turn the valve in the opposite direction, to position 2, to return to the ISO controls.



DANGER

Before commencing digging, check the controls are working properly. Using the machine with controls unfamiliar to the operator could lead to serious injury to persons or damage to property.

Using the machine with controls unfamiliar to the operator could lead to serious injury to persons or damage to property.

7.22 Swing roller

The electric roller located on the left joystick is used to turn the digger boom to the left or to the right of the turret frame; this boom movement is called the swing.

Version **ES850SB** does not have the boom swing function, the roller is present but is not used to activate any function.

To activate the command:

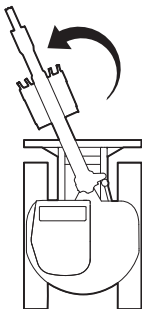
- press the roller (1) to the left to swing the digging boom to the left;
- release the roller when the digger boom has reached the required position;
- press the roller (2) to the right to swing the digging boom to the right.
- release the roller when the digger boom has reached the required position;



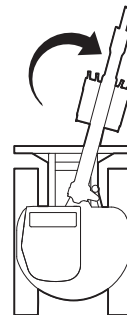
IMPORTANT

DO NOT leave any of the hydraulic controls engaged after the cylinder reaches its limit stop in any direction. This practice forces the hydraulic fluid to pass through the main relief valve, causing a rapid build-up of heat in the system resulting in overheating and loss of power, in addition to reducing component life.

VERSION ES850ZT - ES950TR



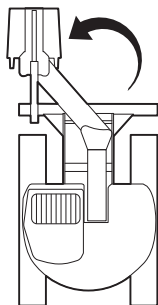
1 - pressing the roller to the left swings the digger boom to the left side.



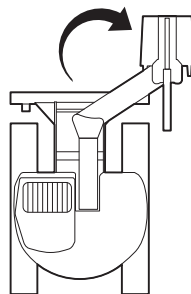
2 - pressing the roller to the right swings the digger boom to the right side.

ES1-1590

On the **ES900UR** version the swing is at the top of the main boom.
This type of swing is called "DEPORTE" or OFFSET.

VERSION ES900UR

1 - pushing the roller to the left makes the offset movement up to the left.



2 - pushing the roller to the right makes the offset movement up to the right.

ES1-1600



IMPORTANT

The hydraulic system is equipped with a shock absorber that reduces the speed of the boom's travel when the cylinders approach their limit stops.

7.23 Triple Positioner Roller (only on ES950TR version)

The vertical roller located on the right joystick (**1**), is only used to move the triple positioner boom on version **ES950TR**.

The roller only works if the button on the right console (**3**) is turned off.



IMPORTANT

On the **ES950TR** only, there is a button (**3**) on the right console to enable the horizontal roller that controls the swinging bucket (**2**) and at the same time disables the triple positioner roller.

To move the triple positioner, make sure the button (**3**) is not enabled.



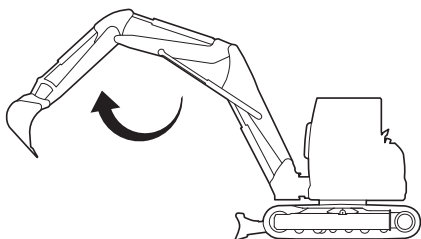
To enable the triple positioner, proceed as follows:

- 1 - push the roller upwards (4) to open the triple boom;
- 2 - release the roller when the boom reaches the required position;
- 3 - push the roller downwards (5) to close the triple boom;
- 4 - release the roller when the boom reaches the required position.

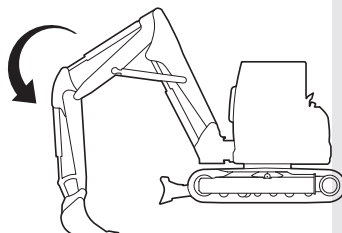


ES1-1250

VERSION ES950TR



4 - pressing the roller upwards opens the triple boom.



5 - pressing the roller downwards closes the triple boom.

EG-0740

CAUTION

When the triple boom is closed any equipment fitted will gradually move towards the cab. Be very careful not to collide with the cab or the undercarriage while working.

This could cause damage to the machine and serious injury to the operator.



IMPORTANT

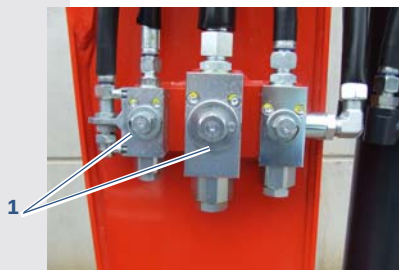
DO NOT leave any of the hydraulic controls engaged after the cylinder reaches its limit stop in any direction. This practice forces the hydraulic oil to pass through the main relief valve, causing a rapid build-up of heat in the system resulting in overheating and loss of power, in addition to reducing component life.

7.24 Operation of the taps on the dipper stick

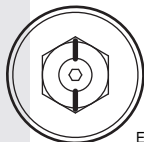
The hoses of the auxiliary circuit are located on either side of the digger boom. These are fitted with taps at the end which stop dirt from entering the hydraulic system and prevent oil loss if no equipment is connected.

While using the auxiliary systems the taps must be left open but then closed before disconnecting the equipment:

- to open the taps, use the appropriate box spanner (supplied with the machine), to turn the hexagon until the incision is in line with the pipe **(1)**;
- to close the taps turn the hexagon until the incision is perpendicular to the pipe **(2)**.

TAP OPEN

ES1-1560



EG-0780

TAP CLOSED

ES1-1570



EG-0790

7.25 Auxiliary hydraulic system

The auxiliary hydraulic system consists of two pipes which terminate at the taps (1) fitted to the dipper stick, one on the right and one on the left. It can work in either of two ways; standard mode (single-action) and dual-action mode. Switching between the two modes is done manually by means of a 3-way valve, to turn it use the appropriate box spanner supplied with the machine, following the instructions in point 7.25.1 and point 7.25.2.

The single action auxiliary hydraulic system provides a continuous supply of hydraulic fluid to a pipe, while the other is discharged directly into the tank, the system used for equipment such as demolition hammers.

The dual-action auxiliary hydraulic system provides pressure alternately to one of two outlets, the system used for equipment such as augers.

The hydraulic equipment must be connected to the taps (1) by means of two flexible rubber pipes.

The auxiliary hydraulic circuit is able to provide a hydraulic accessory with a maximum fluid flow rate of 100 l/min. Set the fluid flow rate using the throttle knob; if the demolition hammer is being used, the manufacturer's recommended flow rate should not be exceeded, since the reciprocating motion and pulses caused in the hydraulic system by the hammer are detrimental to the system.



LEFT side of boom

ES1-1220

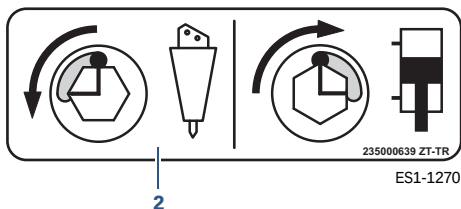
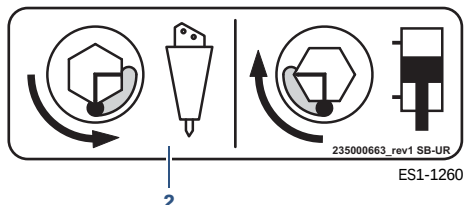


RIGHT side of boom

ES1-1230

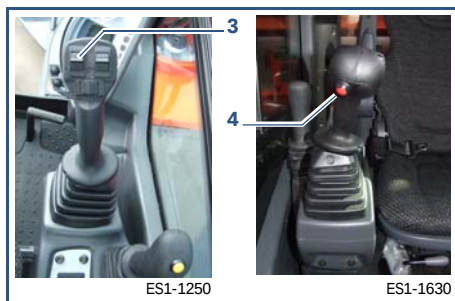
7.25.1 Single action mode

When the three-way valve is moved to position **1** single-acting mode is selected (**2**), whereby pressure is supplied to the left connection only, while the right connection remains without pressure.

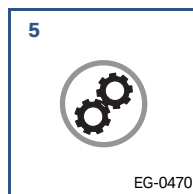
VERSION ES850ZT - ES950TR**VERSION ES850SB - ES900UR**

To operate the equipment:

- 1** - push the roller(**3**) UP and hold it there to provide a constant flow of hydraulic fluid to the left pipe;
- 2** - release the roller to stop the flow;



- 3** - while pressing the roller the automatic hold can be activated by pressing the red button (**4**) under the joystick, so the control will remain on without having to keep it pressed up; the automatic hold for the oil flow to the equipment can be activated at any stage of the roller travel, in this way making it possible to provide a partial flow and keep it constant at the required level. When the automatic hold is activated the relevant light on the dashboard comes on (**5**).



- 4 - to deactivate the hold press again button (4), or move the roller (3) to its neutral position;
- 5 - no function is enabled by pressing the auxiliary hydraulic control roller down if activated in single action mode.

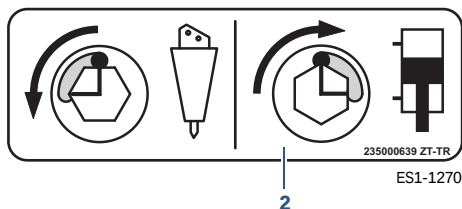
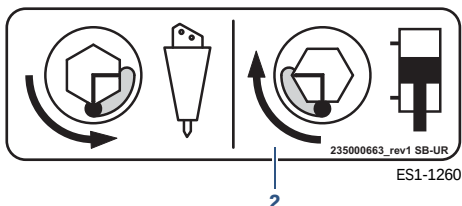


WARNING

DO NOT keep the roller pressed down for long periods. The hydraulic circuit does not activate any function but is still under pressure and so there is the risk of the hydraulic fluid overheating.

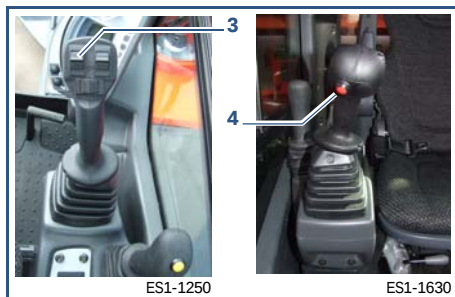
7.25.2 Dual action mode

Turning the three-way valve to position **1** selects the double-acting mode (**2**), which allows the flow to be reversed, while one of the pipes is pressurised, the other is discharged.

VERSION ES850ZT - ES950TR**VERSION ES850SB - ES900UR**

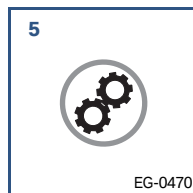
To operate the equipment:

- 1** - push the roller (**3**) UP and hold it there to provide a constant flow of hydraulic fluid to the left pipe;
- 2** - release the roller to stop the flow;



- 3** - while pressing the roller the automatic hold can be activated by pressing the red button (**4**) under the joystick, so the control will remain on without having to keep it pressed up; the automatic hold for the oil flow to the equipment can be activated at any stage of the roller travel, in this way making it possible to provide a partial flow and keep it constant at the required level. When the automatic hold is activated the relevant light on the dashboard comes on (**5**).

Automatic hold can only be activated when the roller is pushed upwards: i.e. when the oil flow is activated on the left pipeline.



- 4 - to deactivate the hold press again button (4), or move the roller (3) to its neutral position;
- 5 - in this way, pushing the auxiliary hydraulic command roller downwards the flow of oil used is inverted, pressurising the side previously discharged and vice versa.

7.26 Second auxiliary hydraulic circuit (low flow rate)

The low flow rate hydraulic circuit works on a dual action and is suitable for the type of equipment that requires a lower oil flow rate such as for example, swinging buckets or grab rotors.

DESCRIPTION AND COMMAND

The command that activates the “low flow rate” circuit is given using the roller (1) located on the right joystick.

On the **ES950TR** only, to activate the roller (1) the switch located on the right console (2) must first be enabled.



It works as follows:

- 1 - push the roller (1) to the right to send the oil flow to the right attachment;
- 2 - release the roller (it will automatically return to the centre position), to stop the flow;
- 3 - push the roller (1) to the left to send the oil flow to the left attachment;



IMPORTANT

To see the commands refer to the sticker on the right side window and the information given in the user manual.

CONNECTION TO THE HYDRAULIC CIRCUIT

 WARNING

Read the contents of the equipment instruction manual carefully before using the machine or carrying out any maintenance operations.

The pipes of this system are situated on the dipper stick (on the left **3** and on the right **4**), and end with two taps with a female 3/8" GAS connection.



LEFT side of boom

ES1-1220



RIGHT side of boom

ES1-1230

 WARNING

Never connect any equipment to the hydraulic lines before it is correctly installed mechanically and locked in place on the machine dipper stick.

Before carrying out any work on the hydraulic circuit stop the engine and discharge the residual pressure to the equipment, by repeatedly moving the controls, and the oil tank and then slowly unscrewing the filler cap. Carefully clean up the dirtied areas immediately.



WARNING

All equipment fitting and removal operations must be done with the machine parked on solid level ground.

When removing hydraulic connections, be very careful that impurities do not enter the pipes

Once the equipment has been installed mechanically, park the machine on solid level ground, stop the engine, discharge the residual pressure from the circuit and then proceed as follows:

- 1** - remove the caps from the ends of the taps indicated, take care not to damage or lose the parts removed;
- 2** - connect the pipes from the equipment to the taps, making sure that the characteristics and sizes of the fittings are the same as those prescribed.



IMPORTANT

As far as the threads and functions of the equipment connections are concerned, see the manufacturer's manual.

- 3** - After connecting the pipes, start the engine (see "STARTING THE ENGINE") and allow it to idle at low revs for at least 10 minutes;
- 4** - Lift the equipment off the ground and send pressurised oil for around 10 times, alternately to the two connections, in order to purge any air left in the circuit;
- 5** - after purging the air, stop the engine and wait at least 5 minutes before commencing work. This will eliminate any air bubbles that have built up in the tank;
- 6** - make sure there are no oil leaks and clean up any oil spilled.



IMPORTANT

For any doubts that may arise concerning the connection of the equipment to the hydraulic circuit, contact the EUROCOMACH service centre.

If the equipment has reached its end of travel do not keep the roller pressed down for long periods.

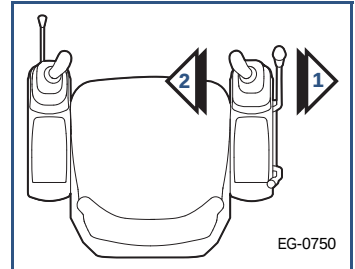
This will cause the hydraulic system to be put under pressure needlessly and the oil may overheat.

7.27 Deviators on the bucket circuit

A third auxiliary circuit can also be obtained. The bucket cylinder pipe can be intercepted using two deviators. This circuit can be used when there is no need to use the bucket cylinder.

DESCRIPTION AND COMMAND

The command that activates the third hydraulic line with deviators on the bucket cylinder is given with the right joystick.



It works as follows:

- 1 - moving the joystick (1) to the right, sends the flow of oil to the left connection;
- 2 - Release the joystick in the centre position to stop the flow;
- 3 - moving the joystick (2) to the left sends the flow of oil to the right connection.



LEFT side of boom

ES1-1220



RIGHT side of boom

ES1-1230



IMPORTANT

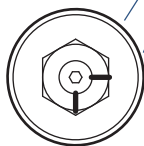
To see the commands refer to the sticker on the right side window and the information given in the user manual in this point and in point 7.21.2.

CONNECTION TO THE HYDRAULIC CIRCUIT

In "third circuit" mode the deviators(**3 - 4**) must be turned as follows:.

RIGHT SIDE DEVIATOR

ES1-1640

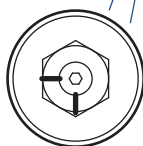


EG-0760

**3 - TURN
'CLOCKWISE'**

LEFT SIDE DEVIATOR

ES1-1650



EG-0770

**4 - TURN 'COUNTER-
CLOCKWISE'**

Digging mode: turn both deviators in the opposite direction.

**CAUTION**

Never leave the deviators half way, always move them to their end of travel.

**Before deviating the circuit retract the bucket cylinder completely.
If it is left extended it could impact with other equipment and become damaged.**

**WARNING**

Never connect any equipment to the hydraulic lines before it is correctly installed mechanically and locked in place on the machine dipper stick.

**Before carrying out any work on the hydraulic circuit stop the engine and discharge the residual pressure to the equipment, by repeatedly moving the controls, and the oil tank and then slowly unscrewing the filler cap.
Clean immediately any areas dirtied with oil.**



WARNING

All equipment fitting and removal operations must be done with the machine parked on solid level ground.

When removing hydraulic connections, be very careful that impurities do not enter the pipes

Once the equipment has been installed mechanically, park the machine on solid level ground, stop the engine, discharge the residual pressure from the circuit and then proceed as follows:

- 1** - remove the caps from the ends of the taps indicated, take care not to damage or lose the parts removed;
- 2** - connect the pipes from the equipment to the taps, making sure that the characteristics and sizes of the fittings are the same as those prescribed.



IMPORTANT

As far as the threads and functions of the equipment connections are concerned, see the manufacturer's manual.

- 3** - After connecting the pipes, start the engine (see "STARTING THE ENGINE") and allow it to idle at low revs for at least 10 minutes;
- 4** - Lift the equipment off the ground and send pressurised oil for around 10 times, alternately to the two connections, in order to purge any air left in the circuit;
- 5** - after purging the air, stop the engine and wait at least 5 minutes before commencing work. This will eliminate any air bubbles that have built up in the tank;
- 6** - make sure there are no oil leaks and clean up any oil spilled.



IMPORTANT

For any doubts that may arise concerning the connection of the equipment to the hydraulic circuit, contact the EUROCOMACH service centre.

7.28 Drainage line (direct to tank)

For equipment (e.g. bush cutter) that requires drainage without back pressure the dipper stick has a drainage line. This discharges directly into the tank and is suitable for low oil flow rates.

DESCRIPTION AND COMMAND

As it is a drainage line it requires no controls.

The equipment drainage pipe should be connected to the bulkhead connector(1) fitted on the right side of the boom.



CONNECTION TO THE HYDRAULIC CIRCUIT

- 1 - remove the cap from the end of the bulkhead connector indicated, take care not to damage or lose the parts removed;
- 2 - connect the equipment "drainage" pipe (3/8" GAS thread).



IMPORTANT

As there is no tap, with the equipment dismantled, impurities could enter which may damage the entire hydraulic system, so it is important to replace the cap as soon as the pipe is disconnected.

7.29 Dozer blade adjustment lever

WARNING

Before making any machine movements, make sure the dozer blade is raised completely.

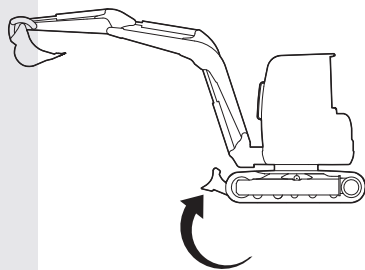
This lever controls the raising/lowering of the dozer blade.

- 1 - Raising: pull the lever back.
- 2 - Lowering: push the lever forwards.

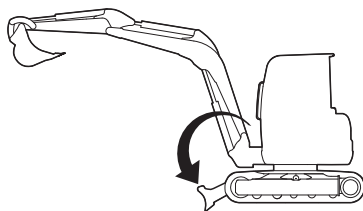


IMPORTANT

All movements are inhibited when the servo-control cut-out lever is in the Up position (see point 7.7).



1 dozer blade raised position



2 dozer blade lowered position

ES1-1050



IMPORTANT

Before starting any digging operation, LOWER the dozer blade until it is completely touching the ground.
When parking the machine, the dozer blade must be LOWERED to the ground.

7.30 Fast drive mode

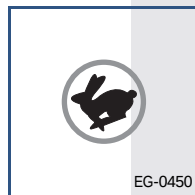
This vehicle is equipped with a system that, if engaged, allows an increase in the speed of travel, both forwards and in reverse.

The upper pushbutton-switch (1) of the dozer blade control lever controls the operation of the travel speed regulation system.

The system is engaged by pressing the top button on the dozer blade lever, releasing it when the command stays on.



An indicator light on the dashboard will light up when the system is engaged. The system can be engaged either at standstill or while in motion. Pressing the activation button again will disengage the system, and the driving speed automatically reverts to the minimum. There is also an “auto shift down” function, which activates automatically as the tractive effort increases and puts the machine back into slow speed once an effort threshold is exceeded; when the machine effort lowers the machine goes back to fast speed. This function only works if the fast speed is engaged and cannot be disabled.



7.31 Working light

On the machine there are work lights that are to be used when visibility is low.

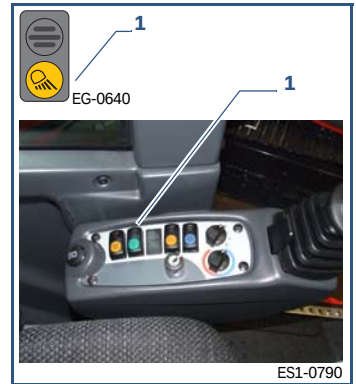
These are on the main boom (**two lights** on the versions ES950TR and ES900UR and **one light** on versions ES850ZT and ES850SB) and on the front of the turret (one on the right and one on the left for all versions).

The lights are activated by pressing switch **1**, located on the left dashboard.

Turn the switch ON to turn the lights on and OFF to turn them off.

The ON switch has two positions:

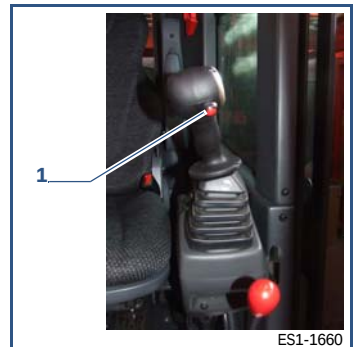
- the first position turns on the boom lights;
- the second position turns on all the work lights.



7.32 Horn

The horn button(**1**) is located at the bottom of the left joystick and is activated when the ignition key switch is set to the "RUN" position".

Sound the horn every time you climb aboard and start working, use it especially when it is noticed that anyone in the vicinity is in danger.



7.33 Procedure for installing and removing supplementary ballast

WARNING

To lift the supplementary ballast use adequately sized cables; never use cables that show signs of wear or have broken strands.

Do not lift the supplementary ballast differently than as illustrated below; there is the risk of losing balance.

When lifting the supplementary ballast, make sure it is well balanced and, that it is being lifted evenly and that no one approaches the load.

Before lifting the supplementary ballast, make sure the eyebolts are correctly secured to the top holes.

When supplementary ballast is installed, the overall machine weight changes.

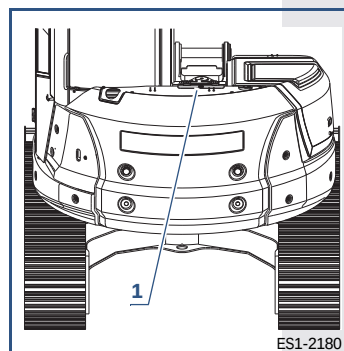
Take this into consideration when transporting the machine.

To lift the ballast use a cable, and eyebolts of sufficient size.

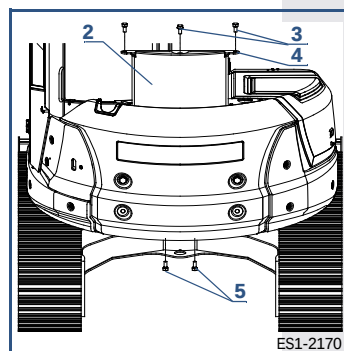
7.33.1 Internal supplementary ballast (weight 450 kg)

This ballast is fitted as standard on model ES950TR.

- 1 - Remove the top cover (1).



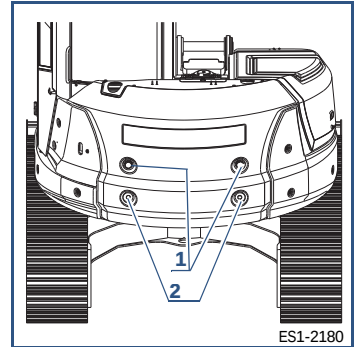
- 2 - Lift with a crane and fit the supplementary ballast (2) inside the standard ballast.



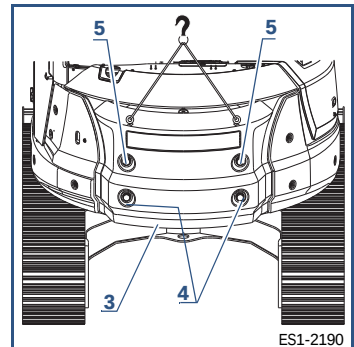
- 3 - Fit the top screws (3) together with the fixing bar (4).
- 4 - Fit the bottom screws (5) and fix the supplementary ballast to the turret.
- 5 - Refit the top cover (1).
- 6 - To remove the ballast carry out the operations in reverse order.

7.33.2 External supplementary ballast (weight 800 kg)

- 1 - Remove the screws (1).
- 2 - Remove the supplementary reflectors (2).



- 3 - Lift with a crane and fit the supplementary (3) on the back of the standard ballast.



- 4 - Fit the bolts (4).
- 5 - Fit the screws (5) and fix the supplementary ballast to the standard ballast.
- 6 - To remove the ballast carry out the operations in reverse order.



IMPORTANT

Use bolts of suitable size and length to ensure the ballasts are fixed properly and to stop them moving or dropping while working.

7.34 Emergency lifting-boom lowering procedure



CAUTION

Ensure that nobody is standing under or near the front accessory before and while the lifting-boom is being lowered.

This procedure is to be carried out if the engine stops and cannot be restarted or, if any other failure occurs that stops the machine with the booms and equipment not resting on the ground.

Lower the lifting boom in the following manner until the bucket or equipment are resting on the ground:

- 1 - turn the starter switch (ignition key) to the **ON** position;
- 2 - lower the servo-control cut-out lever;
- 3 - moving the right hand side joystick control forwards will cause the main boom to begin descending;
- 4 - keep the joystick pushed forwards until the equipment reaches the ground.



CAUTION

If in carrying out the above procedure the boom does not lower to a position where the equipment is resting on the ground, contact the EUROMACH service centre. IN THE MEANTIME DO NOT ALLOW ANYONE TO COME NEAR TO THE BOOM.

7.35 Daily storage

Park the excavator on a firm, horizontal surface, in an area where it will not hinder other operators, in accordance with the procedures specified in “point 7.20”. Minimise obstruction by lowering the digging boom and resting the dozer blade on the ground.

Move all the controls to their respective rest position and remove the ignition key.

8.0 Authorised optional equipment



CAUTION

If optional equipment is fitted and used, read the relative user manual carefully and follow strictly the instructions contained in it.

Use only optional or special equipment recommended by EUROCOMACH and complying with the specifications given in the table in point 8.1.1.

For any damage, accidents or reduced machine efficiency caused by the use of unauthorised equipment, EUROCOMACH cannot be held responsible.



CAUTION

On the ES900UR version, the machine configuration should be reset each time the digger boom or the work equipment is changed. Only in this way will the safety system be able to calculate correctly the position of the equipment in relation to the cab.

The anti-collision system is only calibrated to work with standard buckets or trench cleaning buckets; on the display these are indicated respectively as NARROW BUCKET and WIDE BUCKET.

If other equipment is fitted, the system may not work properly.

In particular, with bulky equipment there is the risk of it colliding with the cab.

The utmost care must be taken when moving equipment in the direction of the cab.

8.1 Safety precautions

The installation of accessories or optionals other than those authorised by EUROCOMACH not only compromises the machine life, but can also cause safety problems.

When installing accessories not indicated in this use and maintenance manual, it is best to contact the EUROMACH service centre.

Otherwise, EUROCOMACH declines all responsibility for accidents or damage.

The use of equipment on the vehicle can affect its stability.

The stability of the centre of gravity depends on the dimensions and weight of the vehicle with the accessory, as well as on the weight and position of any resulting loads applied to the vehicle (load capacity).

The load capacities for this vehicle are listed in the relative tables in the "Technical Specifications" section"; always refer to this table.

The machine load capacity is reduced by the weight of the equipment installed.

Third party accessory suppliers may or may not supply accessory load capacity tables. The rated load capacity values for this type of accessory must be requested from these suppliers.

Eurocomach does not issue any declarations nor grant any implicit or explicit warranties with regard to the design, manufacture or suitability of accessories supplied by third parties for use on the vehicle. This vehicle does not envisage the use of, and must not be used with, any accessories that affect the stability of the centre of gravity and exceed the maximum permitted load capacity for the vehicle.



WARNING

When removing or installing equipment, take the following precautions and pay attention to safety conditions during the operations.

Carry out the installation and dismantling operations on a solid level surface.

Where the operations are carried out by two or more operators, agree on signals to be given for communication and follow them during the operations.

Use a crane to move objects weighing in excess of 25 kg.

Always support heavy parts before removing them. When lifting heavy parts, always pay attention to the position of the centre of gravity.



WARNING

It is dangerous to carry out operations with suspended loads. Always place the load on a support and check that it has been set down safely.

When installing or removing equipment, make sure it is positioned in a stable manner and so that it cannot fall.

Never pass under a load suspended by a crane. Always choose a safe position in order not to run any risks if the load should drop.

Keep unauthorised people out of the equipment storage area.



IMPORTANT

Cranes should only be operated by specialised persons. Never allow non specialised persons to use a crane.

For further information on installation and dismantling operations, contact the EUROMACH service centre.

8.1.1 Specifications of authorised equipment



CAUTION

Use only equipment authorised by EUROCOMACH.

Pay particular attention to safety criteria and, before starting any operations, (in a safe place) perform a test to check the operating area of the equipment and its centre of gravity.

Some equipment, when in the fully retracted position, could interfere with certain parts of the machine (in particular with the operator cab). Therefore be attentive at all times so no impact occurs.

BUCKETS / QUICK RELEASE ATTACHMENTS	WIDTH (mm)	WEIGHT WHEN EMPTY (kg)	CAPACITY (Lt)
Backhoe	300	92	76
Backhoe	400	104	113
Backhoe	500	121	153
Backhoe	600	137	196
Backhoe	700	153	240
Backhoe	800	169	286
Backhoe (standard)	900	185	333
Backhoe	1000	201	379
Trench clearing bucket	1200	193	326
Trench clearing bucket	1400	222	387
Trench clearing bucket	1600	250	447
Trench clearing bucket	1800	279	507
Swivelling trench-clearing bucket	1200	295	326
Swivelling trench-clearing bucket	1400	324	387
Swivelling trench-clearing bucket	1600	352	447
Swivelling trench-clearing bucket	1800	381	507
Trapezoidal bucket	52° - 60°	176 - 156	318 - 254
Mechanical or hydraulic quick-release attachment	AR 70	85	-
Mechanical or hydraulic quick-release attachment	CR 70	102	-
Mechanical or hydraulic quick-release attachment	CS 80	95	-
Mechanical or hydraulic quick-release attachment	KLAC MOD. F	72	-



IMPORTANT

For backhoes the same weight and capacity can be considered with all types of quick-release attachment available.

EQUIPMENT	MAX DIMENSIONS		MAX WORKING PRESSURE (bar)	MAX FLOW RATE (l/min)	MAX WEIGHT (kg)
	WIDTH mm	HEIGHT mm			
Demolition hammer	-	1890	200	80 - 90	570
Bush cutter	1200	-	200	80 - 90	650
Tar cutter	450	-	200	80 - 90	650
Bough shears	1910	-	200	80 - 90	250
Sorting grapple	1570	-	200	80 - 90	535
Grapple	1510	-	200	80 - 90	410
Crushing grapple	480	-	200	80 - 90	490
Shears	240	-	200	80 - 90	650
Auger	Ø 600	-	200	80 - 90	200
Chain-type ditch digger	-	1100	200	80 - 90	250



IMPORTANT

The total weight of the equipment with material loaded and any quick release attachment must not exceed the value of the lifting capacity.

Total weight = bucket weight (+ any quick release attachment) + [capacity x material density].

The specific weight considered "standard" for earth and rubble is 1.8 t/m³.

The maximum weight permitted for the equipment is equal to the nominal load capacity given in the table in point 4.7.



DANGER

In order to install the bough shears, the grapple or any type of grab for moving material, the machine must be certificated for moving loads.

An integrative user manual must be provided with all the indications for safety and the procedures to be followed while lifting loads.

Making the machine compliant with regulations as a lifting apparatus is the responsibility of the equipment installer.

8.2 Bucket

Several types of bucket are available from the EUROCOMACH service centres. Specifications for these buckets can be found in point 8.1.1 of this manual.

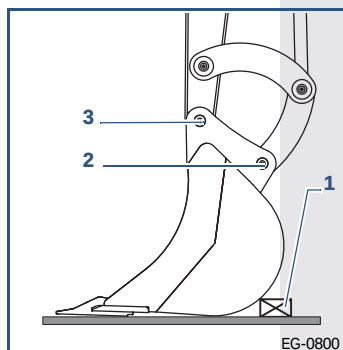
8.2.1 Bucket removal and replacement



To avoid personal injury from loose material or flying debris, always wear safety glasses and proper protective clothing when removing or reinstalling pivot pins.

To remove the bucket, proceed as follows:

- 1 -** Where necessary, move the vehicle to level ground.
- 2 -** Lower the digger boom, positioning the dipper stick and bucket so that the latter is resting on the ground, as illustrated.
- 3 -** Block the bucket (**1**) so that it remains in this position while both the bucket pivot pins are being removed.
- 4 -** Remove both pins (**2-3**) and raise the dipper stick in order to free the bucket, thereby completing the operation.



To fit the bucket, proceed as follows:

- 1** - The bucket must be securely blocked **(1)** and resting on the ground, as illustrated.
- 2** - Clean both pivot pins and their mounting holes **(2-3)**.
- 3** - Align the dipper stick with the bucket pivot pin mounting holes **(2)**. Install the pin and secure.
- 4** - Align the bucket linkage with the mounting holes for the second pivot pin **(3)**. Install the pin and secure.
- 5** - Grease both pivot pins. Start the engine, and move the bucket back and forth to ensure that it operates smoothly.

If there is no abnormal friction or jamming when moving the bucket, this means that the operation has been carried out correctly; if not, repeat the entire operation from the first point.

8.3 Demolition hammer

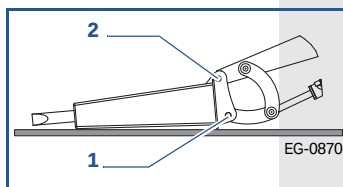
The excavator is equipped to accept the installation of a hydraulic demolition hammer. A suitable hammer must be chosen, bearing in mind its intended use.

The excavator is subject to increased strain when operating with this accessory and, since the hammer is heavier than the bucket, the machine's balance will be affected.

The local EUROCOMACH service centre is able to supply a variety of demolition hammers suitable for the requirements of the job, as well as being able to regulate the flow rate and operating pressure to the levels required for the selected accessory.

8.3.1 Installation and removal of the demolition hammer

- Ensure that the demolition hammer is in a stable position, laying it on the ground as in the figure.
- Clean the pivot pins and the respective mounting holes (**1-2**).
- Align the dipper stick with the pivot pin mounting holes (**2**) of the demolition hammer. Install the pin and secure.
- Align the demolition hammer linkage with the mounting holes for the second pivot pin (**1**). Install the pin and secure.
- Grease both pivot pins. Start up the engine and move the hammer back and forth to check that it operates smoothly. If not, repeat the operations from the beginning.
- Connect the hammer feed hose to the auxiliary single-action feeder circuit on the left hand side of the dipper stick.
Connect the hammer discharge hose to the single-action feeder circuit on the right hand side of the dipper stick (single-action mode).

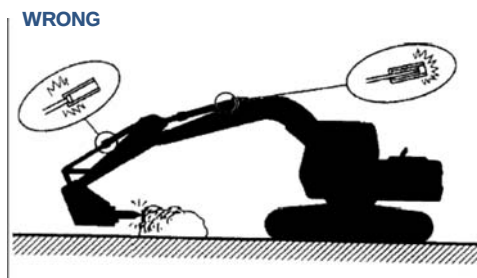


8.3.2 Precautions when using the hydraulic hammer

CAUTION

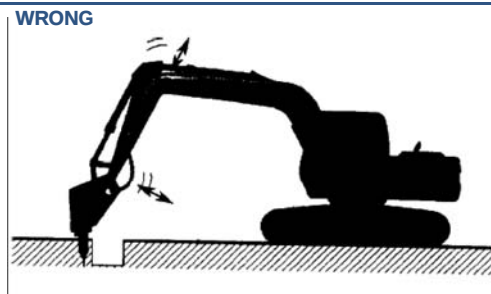
Since the hydraulic hammer is much heavier than the bucket, it reduces vehicle stability and increases the risk of the vehicle overturning. Whilst working, splinters or flying debris may invade the cab or other parts of the excavator. Take the following precautions and exercise extreme caution so as to prevent the occurrence of accidents that may damage the excavator and result in injury to the operator.

Avoid operating with the excavator's cylinders near their limit stop (maximum extension or retraction), so as not to damage the accessory or the cylinders themselves.



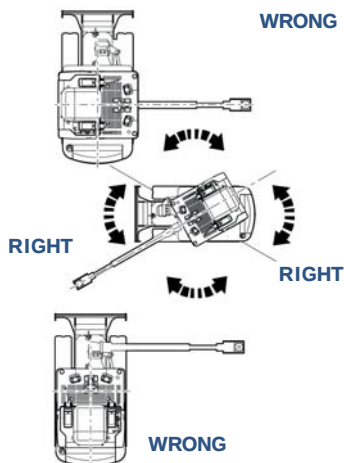
EG-0810

Stop work immediately if the hydraulic hoses bend in the wrong way. Then contact the dealer.



EG-0820

Do not operate with the hydraulic hammer in a sideways position; the machine will become unstable and the undercarriage components will be subjected to increased wear and tear.



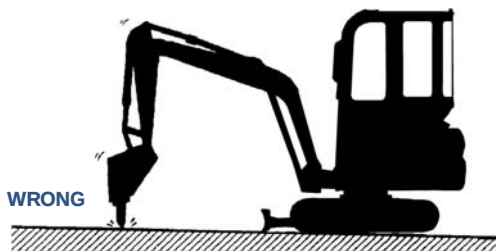
EG-0830

When operating the excavator, do not bump against the lifting boom with the hydraulic hammer.



EG-0840

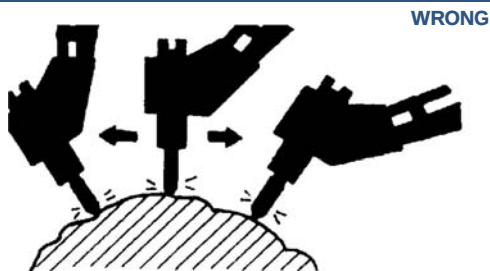
Do not engage the hydraulic hammer with the driving boom in a vertical position; excessive vibration on the driving cylinder may cause oil leaks.



EG-0850

Do not run the hydraulic hammer for more than one minute at a time, since this may result in wear to the cutting edge or the hydraulics.

If the object fails to break within one minute, move the cutting edge to a new position, without remaining in one position for longer than one minute.



EG-0860

8.3.3 Operation

For operations involving the demolition hammer, refer to the "Operations" section; Having purchased this accessory, always consult the handbook provided.

When working with the hydraulic hammer, do not exceed the specified engine rpm; for this reason, a sticker has been applied close to the throttle lever in order to show the engine speed that must not be exceeded.

8.4 Necessary tools

All the tools required for normal replacement of the bucket and/or demolition hammer are included in the tool kit supplied with the machine, and housed in the tool storage compartment.

8.5 Precautions

Whenever any of the accessories are being replaced, it is important to wear suitable clothing, such as work overalls, safety glasses and leather gloves, so as to avoid coming into contact with grease, jets of oil under pressure or, even worse, with metal splinters.

It is equally important to ensure that the accessory is resting on level ground prior to disconnecting the accessory, so that it is unable to roll over once freed from the machine and thus bumping into persons or other articles.

9.0 Maintenance

This section contains a complete list of requirements and procedures relating to the maintenance of this vehicle. This user manual must always accompany the vehicle. Proper maintenance involves routine procedures, with checks and inspections performed directly by the operator and/or by staff trained to carry out normal in-company maintenance, and regular services, which include cleaning, adjustment and replacement operations, carried out by staff trained for this purpose.

If you do not understand any of the information or procedures in this section, contact your local EUROCOMACH Service centre for explanations before proceeding.

YOU ARE URGED:

Not to carry out any procedure, modification or repair of any kind, except for those indicated in this handbook. Only technical staff trained or authorised by the manufacturer have the necessary knowledge of the machine and the experience to carry out all the procedures correctly.



CAUTION

NEVER carry out any maintenance or servicing work on this vehicle with the engine running. Contact with moving or hot parts, or with any high-pressure fluid leaks, may cause serious injury or death.



IMPORTANT

Eurocomach recommends the adoption of good waste storage and disposal practices. Do not discharge liquids into the ground or drains, or into dams. Use suitable containers for the collection of these liquids, then store and/or dispose of them in the safe and approved manner. Check and observe all government and/or municipal regulations regarding the storage, disposal and recycling of waste



IMPORTANT

This vehicle has been assembled using instruments based on the metric decimal system. Use metric tools of suitable type and size for the performance of maintenance and service procedures.

It is recommended that only original spare parts be used.

Any additional instruments or tools required for maintenance and adjustment purposes, and not included in the tool kit, are included in the following table.

	Part on which maintenance is carried out	Manual - 1	Hexagonal spanners set	Hexagonal socket spanners 2	Allen keys for grub	Screwdriver	Pliers	Oil filter spanner	Hammer	Feeler gauge	Grease gun	Torque wrench	Battery terminal brush
Engine	1) Engine oil	x		x									
	2) Pump (Fuel and water)	x	x	x							x		
	3) Filter	x	x	x				x				x	
	4) Screw and nut (intake and exhaust manifold and air cleaner		x	x									
Instrumentation	5) Set of valves		x			x				x			
	1) Amp meter		x										
	2) Temperature gauge		x										
	3) Pressure gauge		x										
Air intake, cooling, fuel supply system	1) Injection system	x											
	2) Radiator	x	x	x									
	3) Cylinders			x								x	
	4) Air filter	x					x						
	5) Fuel filter		x	x								x	
	6) Injectors		x	x									
	7) Fan belt		x	x							x		
Electrical system	1) Battery		x				x						x
	2) Lights	x	x				x						
	3) Ignition system		x	x							x		
	4) Alternator		x	x									
Power transmission	1) Manifold	x	x	x					x			x	
	2) Swivel motor	x	x	x								x	
	3) Travel motors			x	x				x			x	
	4) Components	x	x	x			x					x	
Hour meter	1) Engine		x								x		
	2) Steering		x								x		
Undercarriage	1) Rollers			x							x		
	2) Drive gear			x							x		
	3) Idler wheel			x							x		
	4) Ground contact components			x								x	
	5) Tensioner spring			x									
	6) Track tension adjustment		x	x							x		
	7) Tracks			x							x		

1) "Manually" means that the maintenance or adjustment operation can be done by hand, without using any tools.

2) Various tools may be used to tighten the screws and nuts found on the machine.

9.1 Safety

Carry out maintenance operations on a hard, level surface.

Before doing any work on the machine, read the instructions in the manual carefully.

During maintenance operations, observe the precautions printed on the warning plates on the machine.

Do not try to carry out any maintenance unless you have the necessary skills, the right information, the safety gear and the instruments and equipment necessary to do the job properly.

Check that the equipment used to lift and support the machine is in good working order and is able to take the weight of the machine.

Maintenance operations must be carried out with the bucket or accessory resting on the ground.



DANGER

Do not carry out any maintenance, servicing or adjustment operations with the bucket, accessory or blade raised.

Any operations requiring that the boom, bucket or blade be raised must be carried out having ensured adequate support and restraint of the raised part in order to prevent it from falling accidentally.

Non compliance with the safety regulations and proper maintenance procedures could cause damage or faults on the machine and result in injury or even death of the operator or other persons in the vicinity.

Before commencing with any maintenance, it is recommended that warning signs be attached to the ignition switch and/or control levers to prevent anyone inadvertently starting the engine.

Do not start the engine of the machine in inadequately ventilated, enclosed areas, so as to avoid a build-up of exhaust gases.

Before starting the machine, evacuate everyone in the area from the machine's range of action.

Never leave the machine unattended with the engine running.

Wash the machine regularly and remove all traces of accumulated grease, oil and debris, so as to prevent any form of personal injury and machine damage.

Do not spray water or steam inside the cab or anywhere near the driving position.

Clean the machine, avoiding pointing high-pressure water jets directly at the radiator.

When washing, protect the connectors of the electrical system and do not wet the ignition switch.

When working in dusty areas:

- check frequently for air filter blockage;
- clean the radiator frequently to prevent the fins from becoming blocked;
- change the diesel filter more often;
- clean electrical components; in particular, remove any dust from the alternator and starter motor.

Do not use inflammable liquids to clean any parts; avoid naked flames and do not smoke.

Keep the machine scrupulously clean; this will help to locate any faulty parts.

Keep all grease nipples, breather pipes and areas around the dipsticks particularly clean to prevent any dirt getting in.

Keeping the machine clean makes it easier to spot any oil leaks or other problems, and makes them easy to fix as soon as they occur.

Before performing any inspections or maintenance operations on the electrical system and before carrying out any welding, disconnect the battery (see procedure in point 6.9).

9.2 Access covers

Some areas that require maintenance are protected by covers that can be opened, as listed below.



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SYSTEM CERTIFIED BY DNV
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