

Operator's manual

Edition 01/15

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1. Introduction

Dear customer,
we compliment and thank you for having chosen our company.
We have prepared this manual as a guide for the correct and safe use of the machine and its rational maintenance.
Constant observance of the standards contained in this manual guarantees the best performance, low running costs, long machine life and prevents the most common causes of accidents which may arise during working or maintenance.
We therefore recommend that you to read all parts of this manual carefully and scrupulously observe the instructions indicated on the following pages.
All of our spare parts are exclusively available from our distributors or our headquarters. We ask you to please always kindly specify the serial number of your excavator and the model and spare part code which you will find in the "spare parts" catalogue supplied enclosed here; in this way we will be able to satisfy all of your requests rapidly.
For answers to any other questions, curiosities, information concerning old models, suggestions or ideas to improve our products, our Customer service is always at your disposal on the following telephone number:

A copy of this manual is supplied with every machine.
The descriptions and illustrations in this publication are in no way binding.

2. Identification data

At the moment of the order of spare parts or assistance to your excavator, it is necessary to specify always the serial number of your machine (easy to find in the cab).

TIPO	TYPE	TIP	TYP	
NUMERO	NUMMER	NUMERO	NUMMER	
ANNO	YEAR	ANNEE	BAUJAHR	
POTENZA	POWER	PUISSANCE	LEISTUNG	
PESO	WEIGHT	POIDS	GEWICHT	

2.TAB.1

3. Technical characteristics

3.1 Structure

- Load bearing structure made of high mechanical strength steel.
- Joints equipped with bushes made of tempered and ground steel.
- Tempered and round pins.
- 2 tours basic bearing with tempered and corrected toothing by 28 ton/mt c. (external diameter 705 mm)

3.2 Motor

- See the enclosed Use and Maintenance handbook

3.3 Noise level

- Noise level complying with European directive 2000/14/CE

3.4 Performance

- Maximum speed:
 - o 1[^] speed 2,5 Km/h
 - o 2[^] speed 4,5 Km/h

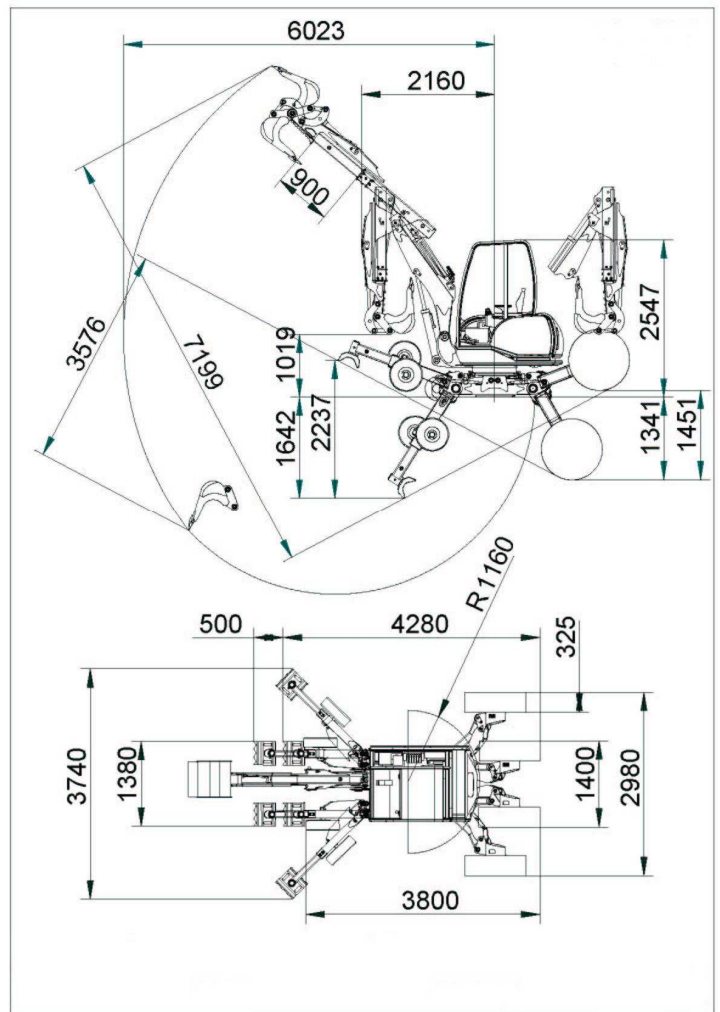


Fig 3

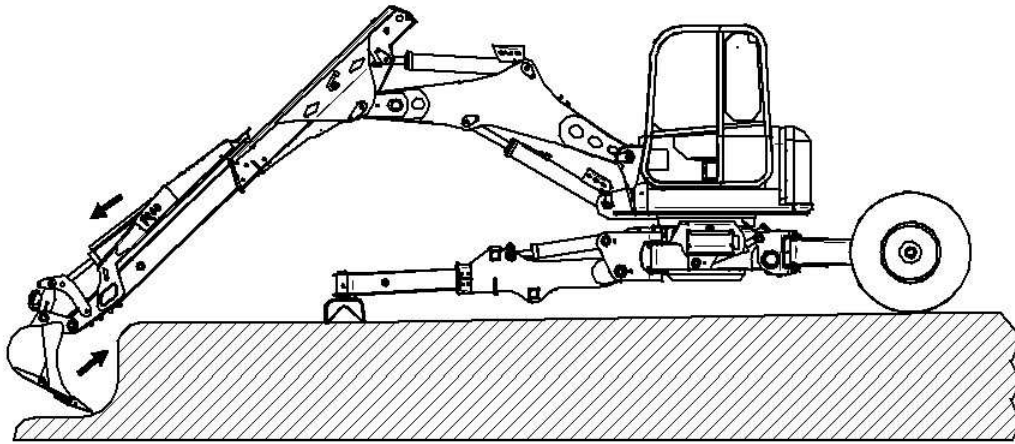
3.5 Traction

- Rear wheel drive through two wheel reducers, complete with negative brake commanded by a hydraulic pedal.

3.6 Hydraulic work circuit

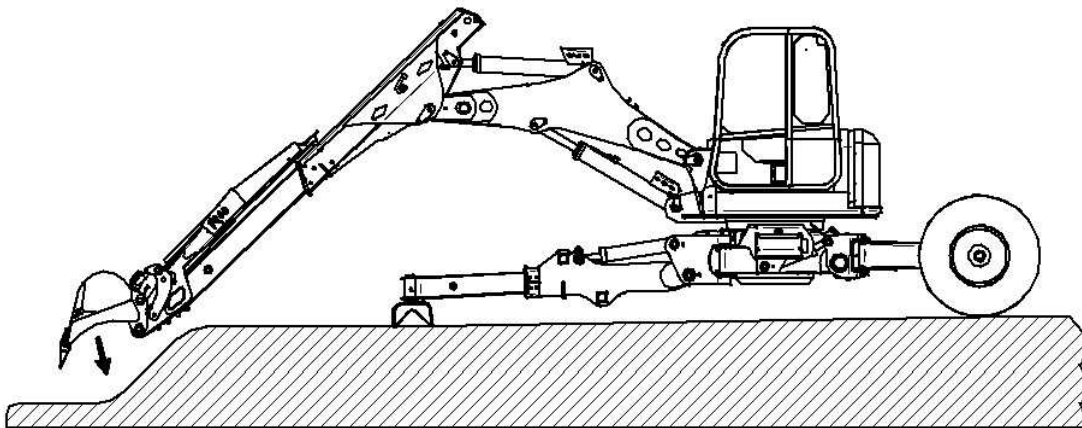
- Pump with pistons and variable cylinder dimensions with an adjuster for constant delivery.
- Capacity 90 lit/min (max capacity with the pump not in regulation).
- Piston pump with body in cast iron; displacement 48 Lit/min
- N. 2 distributors piloted hydraulically with anti-shock and anti-cavitation valves on every element.
- Calibration of the general work circuit: 240 bar
- Rotary hydraulic motor with axial pistons coupled to an epicycloid reducer with a negative brake safety device.
- Rotation speed: 10 RPM circa
- Hydraulic cylinders with case hardened rods and travel limit brakes.
- Oil heat exchanger coupled to a water radiator.
- Hydraulic oil tank capacity: 20 lt
- Total hydraulic oil circuit capacity: 190 lt.

Tearing Force (Iso 6015): 3100 Kg (3.6 Fig. 1)



3.6 Fig.1

Penetration Force (Iso 6015): 2330 Kg (3.6 Fig. 2)



3.6 Fig. 2

3.7 Positioning hydraulic circuit

- Commanded by a section of the main distributor: Delivery capacity: 20 *lit/min*
- 7 section distribution valve composed of electrical valves
- Maximum calibration of the distribution valve: 220 *bar*
- Positioning cylinders equipped with case hardened rods and safety valve

3.8 Electrical system

- Power supply voltage. 12 *V* - 75 *A/h*

3.9 Weight *

- Working weight 4500 Kg (weight without bucket, without foots, with full oil, min. level of the main fuel tank. It is possible a difference of 3% (+-))

*** NOTE:**

The weights refer to the version without non-standard accessories.

Maximum working temperature: +40°C

Minimum working temperature: -15°C

3.10 Sound pressure levels

On a significant sample machine were performed the tests concerning the sound pressure levels emitted by the machine; the tests were conducted in compliance with the Directive 2000/14/CE.

- The level of acoustic power emitted by the machine LWM were 95,4 dB(A); considering an uncertainty coefficient K equal to 0,8 dB(A), we can say that the guaranteed sound power level LWA is equal to 96 dB(A)
- The measured sound pressure level in the operator's place LpA (cabin) is 80 dB(A)

4. Standard equipment and accessories

- Cabin with roll-over protection (ROPS) according to ISO 3471/1 (on request, protection grill against falling objects FOPS according to ISO 3449), soundproofed, easy to tip, hydraulically heated with heat fan, supplied with tempered and coloured windows, electric windscreen wiper. work light and acoustic warning device.
- Work commands/hydraulic remote commands grouped onto two levers and two hydraulic pedals.
- Accelerator command by lever.
- Positioning commands by electrical buttons.
- Specific clawed wheels for hydraulic rotations.
- Michelin 18R x 22.5F driven wheels.
- Adjustable sprung seat with head-rest and safety belt.



Lighting

The excavator is equipped with proper lights to operate where the ambient temperature is not sufficient. If the operator requires more light, inform the manufacturer who will supply lights of the capacity required.

5. Supplies

- Main fuel tank (including reserve): *50 lit.*
- Radiator water: *12 lit.*
- Motor lubrication system (engine sump, filter, etc.) see enclosed handbook.
- Towing reducer oil: *1,5 lit.*
- Hydraulic system oil: *190 lit.*

5.1 Front and rear tyre pressures

Front (idle): *9 Bar*

Rear (driven): *7 Bar*

5.2 Recommended fuels and products

All types of fuels or oils which correspond to the characteristics shown in Table 1.
The list of lubricants is purely indicative and refers to products of equivalent quality.

A=lubricant;

B=reducer oil;

C=hydraulic oil;

D =motor oil.

TYPE	A	B	C	D
AGIP	AUTOL TOP 2000	ROTRA MP 80W90	OSO 46	SIGMA FEO 10W40
ASEOL	CALLIT EP 10/42	TOPRESS 11/118	HYDRO HVI 16 - 705	PERLA LD 15 - 75
BP	ENERGREASE L21	ENERGREAR 80/90	BARTRAN SHFS46	BP VANELLUS FE 10/40
ESSO	MULTI PURPOSE GREASE MOLY	GEAR OIL GX80 W90	NUTO H 46	UNIFARM 10/30
MOBIL	MOBILREASE HP	MOBILUBE HD85W - 90A	MOBIL DTE 25 M	DELVAC SUPER FL 10W/40
ROLOIL	FILCAR 2	VARIAX 140	GAVIA	GAVIA HD30
AG	228	GL5 80W/90	ISO 46	10W/40
PANOLIN	MOLYGREASE 23	SUPERDUTY G1 - 5 90	HLP UNIVERSAL 37	UNIVERSAL FE 10W/40
SHELL	RETINAX AM	SPIRAX HD 90	SHELL HYDROL HV46	MULITCHANTI ER 10W/40
STRUB	GRASSO A LUNGA DURATA	UNIVERSAL	VULVOLUBE	SUPERMULTI
VALVOLINE	MULTILUBE MO - 2	X - 18/MD 80W/90	ULTAMAX AW 46 HVI	HDS TOPFILE 10W/40

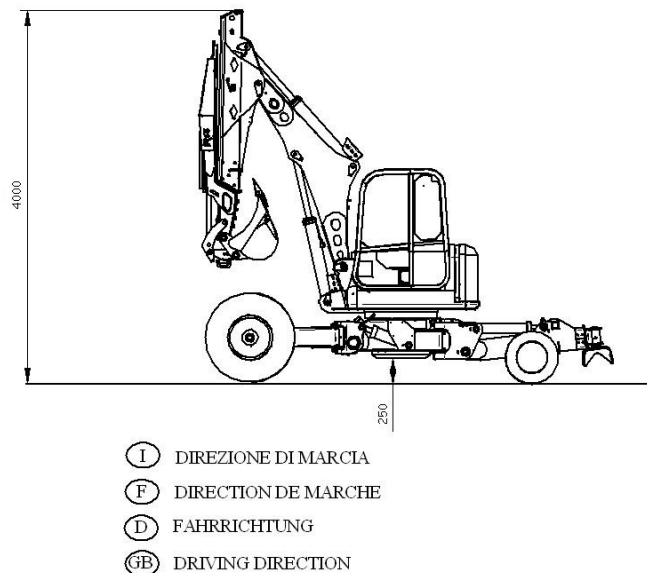
Tab 1: Lubricants

6. Running the excavator

6.1 Running direction

The correct running :

- Position the arm towards the driver wheels in the collection position (6.1 Fig.1).
- Align the brackets of the front "idle" wheels so that they remain parallel to allow the machine to steer.



6.1 Fig. 1

-  Fix the magnetic flasher (standard equipment) to the upper part of the cabin, the attachment is in the rear part of the machine (picture 3) and press the correspondent button for the activation (picture 2)



6.1Fig.2



6.1 Fig.3

- The excavator must not exceed 25 cm from the ground (6.1 Fig.1).

-  The arm must not exceed 4 m in height

-  **Emergency and parking brake;** in case of any failure to the excavator hydraulic system, use the machine emergency boom as a brake. When the excavator stops, always rest the boom on the ground as a parking brake.



ATTENTION:

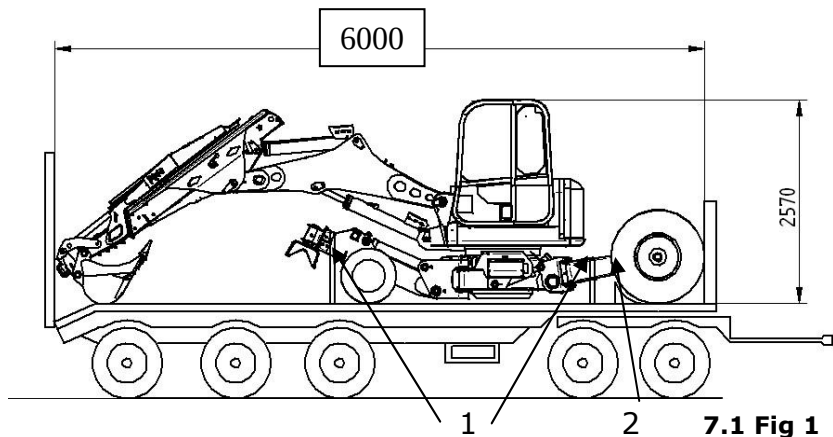
The mobile excavators are not type tested for circulation on the road.

7. Vehicle transport

7.1 Loading the excavator onto a transportation trolley

Only use special transport trolley (min. length 8 m) equipped with ramps (7.1 Fig. 1).

- The arm must be in the collection position towards the rear side.
- Align the machine to the trolley



- Start up the excavator and proceed with care until the operation is complete.
- Rest the arm in the rest position on the flat-bed (7.1 Fig. 1).
-  Block the wheels with the special wedges (not standard equipment) (1- 7.1 Fig.1).
- Switch off the engine.
-  Tie the machine with bands or safety cables (2- 7.1 Fig.1).

The operator have the responsibility to find the correct fixing points on the machine and to assure that it is not a danger for the circulation during the transport.



ATTENTION:

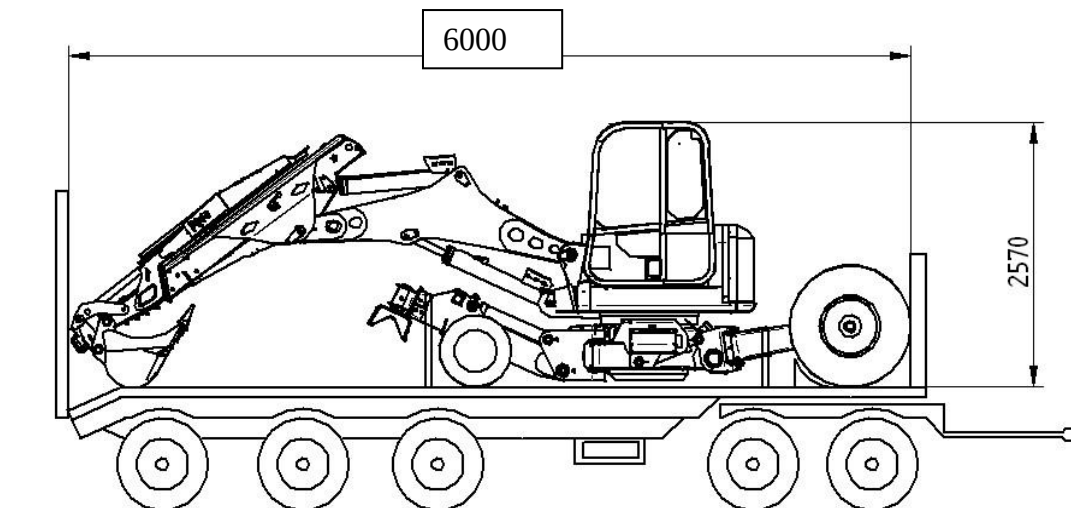
Never exceed on overall height of 4 m. when the machine is on the trolley.

7.2 Loading onto flat-beds or trailers without ramps



The machine can be positioned on trailers or lorry flat-beds only by lifting with a crane.

- It is dangerous to remain inside the cabin during lifting.
- The flat-bed must have a minimum width of 2.5 m. and a minimum length of 8 m. to accommodate the machine (7.2 Fig. 1).
- Once the excavator has been positioned on the lorry, fix the wheels with the special wedges (not standard equipment), to prevent any movement (7.2 Fig. 1).
- Hook the cables to the front and rear brackets of the excavator (7.2 Fig. 1).



7.2 Fig. 1



ATTENZIONE:

- The crane must have a minimum load capacity of 5000 Kg (it should be more capacity in relationship to eventual accessories which are mounted during the loading).
- Load the excavator using two clamps around the rear wheels reducers and one around the boom.
- Do not stop on the action extension of the crane during the loading operations.

7.3 Loading the excavator with protrusion



7.3 Fig. 1a-b

The excavator can be loaded onto a camion with a shorter trolley. In this case it is necessary to verify the following points:

- The protrusion must be in compliance with the highway code of the nation where the transport is effected;
- The weights distribution must be in compliance with the weight allowed by the vehicle used for the transport.

7.4 Transport by helicopter

Transporting the excavator by helicopter

WHEN THE EXCAVATOR IS TO BE TRANSPORTED BY HELICOPTER, ASK MENZI MUCK FOR THE WEIGHT REFERENCE TABLE.

ATTENTION:



Do not transport the excavator under hazardous conditions. EUROMACH can't be held liable for any damage or injury following transportation without their prior authorisation.

8. Lifting weights

CAUTION:



The standard machine is not for lifting loads, thus EUROMACH can't be held liable for any damage or injury resulting from such operations carried out without using the relevant kit.

Mount the special kit containing the safety valves onto the boom cylinders, if you have the intention of lift weights exactly in the 1st cylinder and 2nd cylinder (optional) (Figs. A and B on page 21).



8 Fig. 1



Although the excavator is fitted with these safety valves on the boom cylinder, it is not equipped with safety systems and has not received the same test approvals as a crane: it is **merely** an excavator.

EUROMACH is not liable for any damage or injury arising out of operations not carried out in compliance with the specified rules.

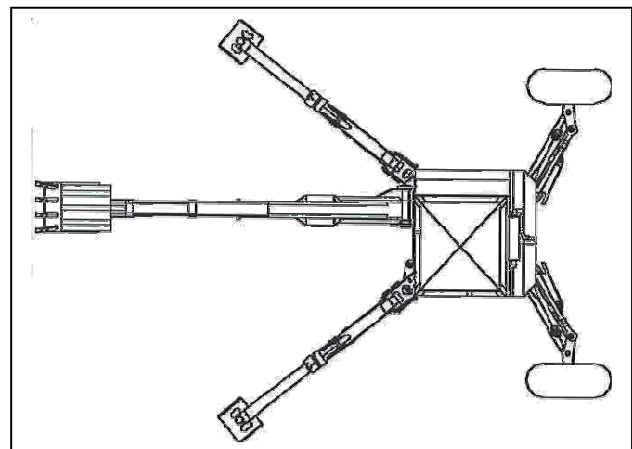
Proceed as follows when using the excavator with the special safety valves:

- Press the button on the control dashboard (see 8 Fig.1)



8 Fig. 1

- Position the four supports of the machine at their maximum width so that the four supporting points are as shown in the figure. This is to avoid excavator instability problems (Fig.8 Fig. 2).



8 Fig. 2

- Lower the feet into the ground until they are securely anchored.
- Position the machine at a maximum of 20 cm from the ground (8 Fig.3).
- Verify the solidity of the soil under the fixing points.



CAUTION:

- **If the brackets cannot be positioned as described above, do not carry out any lifting operations.**
- **Make the necessary calculations to see what type of cables to use and the maximum expected weight.**

When the maximum admissible weight is exceeded on the machine, this condition will be indicated by an acoustic signal.



The buzzer is only an auxiliary device for the operator and he have to verify that the weight loaded is correct in relationship to the weight indicated on the loading tables.

The maximum admissible weights are shown in the longitudinal lifting table (see 8 Fig. 3) and the traverse lifting table (see 8 Fig. 4). Do not try to lift or hold any weight exceeding the values at the specified load radii and heights.

The diagrams shown here have been prepared in compliance with **ISO 10657**.



The test results in the diagram have been obtained with the excavator without bucket and accessories, so all the masses for slings and other auxiliary lifting devices must be subtracted from the nominal load to determine the net load to lift.

The lifting point is situated on the boom at the point where the shovel is fixed.

Ask for the apposite hook homologated for the loading (option).

9. General regulations for the use of the excavator

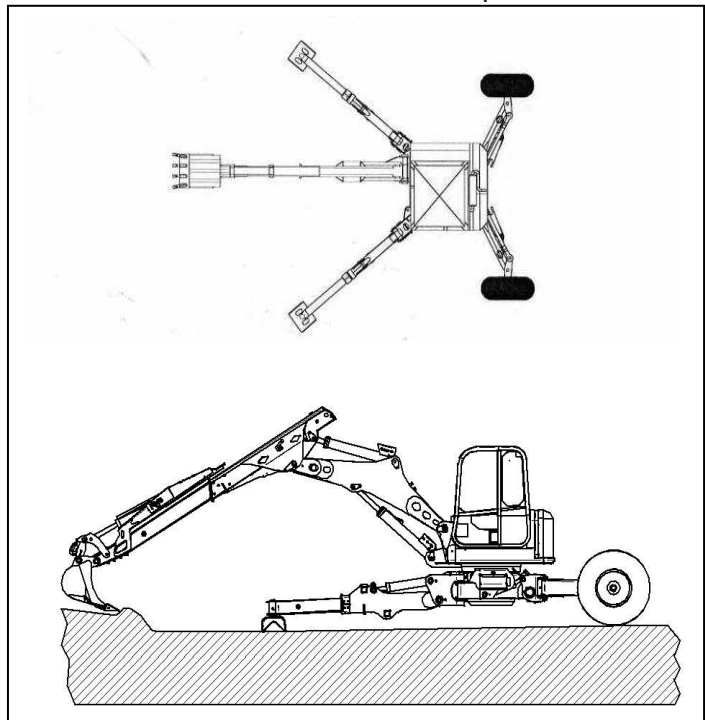
9.1 Special requirements for operators of construction machines

-  The excavator may only be driven by persons possessing good working experience of "spider" type operating machines.
- The ordinary maintenance can be performed by the owner of the machine without any difficulty; for more complicated operations we advise contacting the Service Centres listed at the beginning of this manual.
- It is necessary to follow the procedures advised in this manual carefully for the use, maintenance and transport of the excavator.
- Always use original spare parts and the lubricants recommended by the same company (see table).
-  Variations or alterations to the functions of the excavator even by the authorised Service Centres are not permitted. (should this happen, the guarantee is no longer valid).
-  Do not try to be an expert. Consult one of the Service Centres for any mechanical operations not foreseen by this manual.

9.2 Advice for new operators of "spider" type machines

 These machines are very particular and are completely different to any other type of mobile excavator given that they do not have stabilisers (three point machines, track driven etc.). We therefore advise a brief trial period at the headquarters or at your building sites so as to learn the particular options which distinguish the above mentioned machines. Generally, however, follow the following procedure:

- Initially, work only on flat ground.
- Position the machine with the four stabiliser brackets very wide so as to prevent the excavator from overbalancing and tipping itself over (9.2 Fig.1)
- Always keep the machine close to the ground.
- Move the commands carefully, paying attention to avoid obstacles (objects or persons) present in the working radius of the machine.



9.2 Fig. 1

9.3 Advice and regulations for the use of the excavator

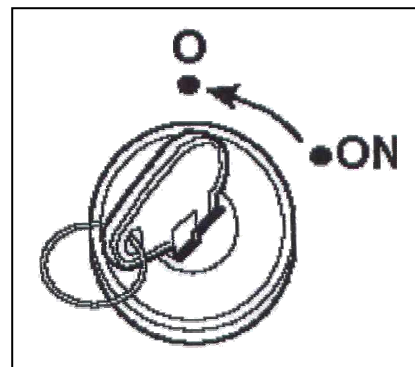


9.3.1 Use regulations

The regular checking and servicing of your excavator are the indispensable conditions for its long life. When the machine is delivered, the sales office personnel supply the customer with the main instructions inherent to the use and maintenance. These instructions are summarised in the list which follows:



- Make certain that there are no persons in the manoeuvre zone before starting the machine.
- Keep persons far away from the elevated tools so as to avoid damage (see 9.3.1 fig.1).
- Mobile type excavators are not type tested to circulate on the roads (See transportation on vehicles).
- Constantly check the work zone to avoid the points of most danger.
- Pay maximum attention to unsafe walls, falling objects and unforeseen landslides.
- Never try to make the machine work or to use its tools in unsuitable positions, or better, always sit in the driving seat. In all circumstances, keep your head, body and limbs inside the cabin to reduce the risk of exposure to any external dangers to a minimum.
- Do not start up, re-supply or perform interventions on the machine without having examined this manual.
- Do not run the engine in enclosed places or where there is a lack of air.
- Never leave the machine with the engine running.
- Do not leave the keys in the dashboard.
- Before performing any maintenance operation it is necessary to switch off the engine. Make sure also that no one can start it without permission (9.3.1 Fig. 2).



9.3.1 Fig. 2



CAUTION:

Always fasten the security belts applied on the seat, before operating with the excavator.

- Damaged parts must be substituted in good time so as to prevent greater damage (always use original spare parts).
- Clean the excavator after each time it is used.
- To avoid damage from corrosion after long periods of disuse, grease the cylinder rods.
- If there are any loose screws contact the Service Centres.

- If any hydraulic joints become loose, tighten them carefully (or contact the Service Centres).
- Immediately substitute any damaged hydraulic pipe work not concerning the engine.
- Clean the greaser thoroughly before using it.
- Avoid climbing on the excavator when it is being moved by persons other than the operator.
- When the hydraulic hammer is being used avoid opening the front window.
- Do not mix different types of lubricants (see the lubricant table); lubricate according to the prescribed maintenance program.
- Make sure to eliminate, collect and dispose of degraded oils through specialised bodies. This is important in conserving the environment and in the fight against pollution.

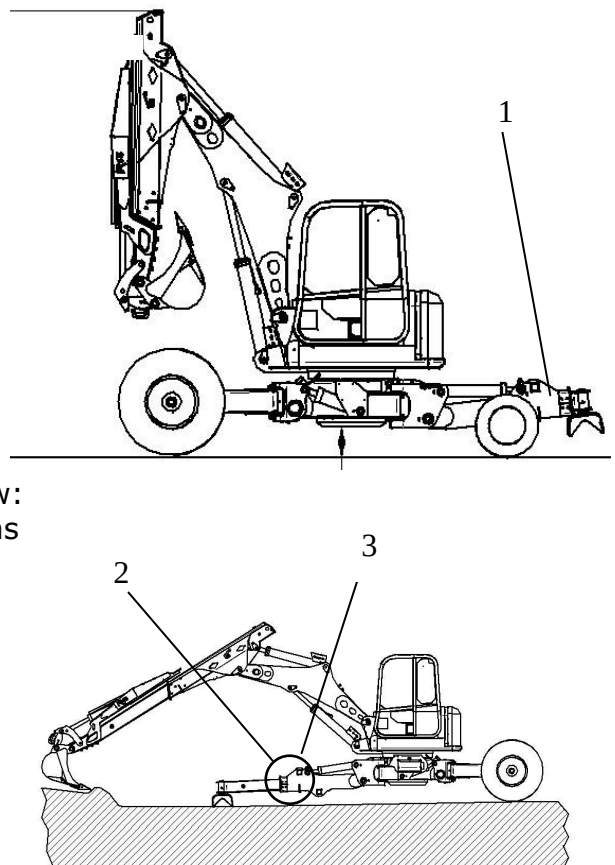


- **When using the hydraulic hammer we advise against extracting the rod of the second hydraulic arm so as to avoid dangerous stress to the machine.** Ask for the characteristics of the most suitable hammer for your machine (see accessories).

9.3.2 Dismounting the front idle wheels

Whenever the excavation is obstructed by the front wheels (1- 9.3.2 Fig. 1), proceed as follow:

- Remove the two split pins of the wheel pins
- Slide out the lock pin from the wheel pin.
- Slide the two wheel pins out of the hole (3- 9.3.2 Fig. 1).
- Position the wheels above the brackets in the support provided (2 – 9.3.2 Fig. 1).



9.3.2 Fig. 1



CAUTION:

Only experienced persons must use the machine. The EUROMACH company is not responsible for damage to persons or things consequent on the improper use of the machine. Follow the advice in this manual scrupulously.



At the end of the digging operation, if necessary, re-place the idle wheels to move the machine. Don't forget to lock the pin using the security split pins.

10. The cabin and the commands

10.1 General description of the cabin

This is constructed in compliance to the tipping prevention ROPS standard according to the DIN ISO 3471 standard. It is positioned on anti-vibration supports. The cabin can be tipped forward by using a manual hydraulic pump for maintenance and repair work.

It is equipped with:

- Tempered window glass in compliance with the standards, a front window which slides toward the internal side (10.1 Fig. 1).
- A three speed fan-assisted heating system to facilitate any demisting of the front window.
- The driver's seat is equipped with a safety belt, is comfortable and has two arm-rests with the servo controls on the ends. The weight, back-rest and arm-rests can be adjusted.



ATTENTION:

When the left arm-rest is in the raised position all of the excavator commands are disabled.

The commands can be divided into:

- The right hand servo command and the left hand servo command for arm movements and rotation of the machine.
- Three hydraulic pedals which command the extension of the arm, the traction of the machine and the various optional accessories (demolition hammer, directional bucket, etc..)
- The electrical buttons positioned on the two servo commands permit the adjustment of the front and rear brackets of the machine.
- A hydraulic lever on the dashboard, alongside the operator, allows the machine to be steered while running.

10.2 Dashboard

DASHBOARD

with the following information

- Gasoil level
- Engine revolutions
- Engine water temperature
- Hours counter
- Battery alimentation tension
- Working pilot lights

KEYS BLOCK

- At the first release (unstable position) the engine glow plugs are alimented and a timer switch on the glow plugs pilot light. Maintain the keys in this position to aliment the glow plugs.
- At the second release the starting motor is alimented

EMERGENSCY BUTTON

- Press it to stop immediately the excavator (it stops the engine and the hydraulic alimentation to the pistons)
- If this button is pressed, it is impossible to restart the engine: turn it in anticlockwise direction to restart the engine



SWITCHES

- Front working headlights
- Rear working headlights - OPTION
- Alimentation for additional hydraulic circuit - OPTION
- Front windshield wiper
 - Alternated speed
 - Continuous speed
- 2nd motion speed
- Claxon (on some model, this control can be located on the manipulator)
- Alimentation for rotating headlight
- Alimentation for buzzer of the overcoming the lifting load capacity - OPTION

- **Manual accelerator for the diesel engine**
- **3 position switch for the cabin heating**
- **Switch for the heating level in the cabin**



Door to enter to the fuses and relays of the machine



Manual Accelerator.

The engine ignition should be always in the min. rpm.

Wait some minutes before accelerating in case of very cold temperatures.

Rotate the keys block in the instable position to start the engine and wait for the stop of the glow plugs pilot lights. When the pilot light is OFF, start the machine.



Attention: the glow plugs alimentation is defined by the keys block; stay in the instable position after the glow plugs stop means that glow plugs are still alimented.

10.3 Servo commands

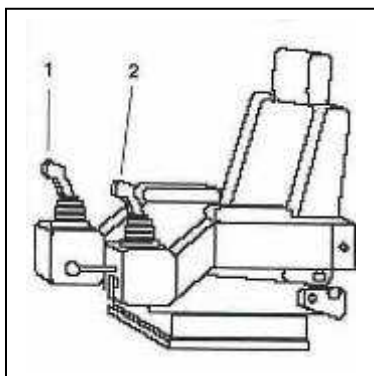
Right hand servo command (1 - 10.3 Fig.1):

- When the lever is pulled the first arm is raised (1 - 10.3 Fig.2).
- When the lever is pushed the arm is lowered (2 - 10.3 Fig. 2).
- Move the lever right to open the bucket (3 - 10.3 Fig. 2).
- Move the lever left to close the bucket (4 - 10.3 Fig. 2).

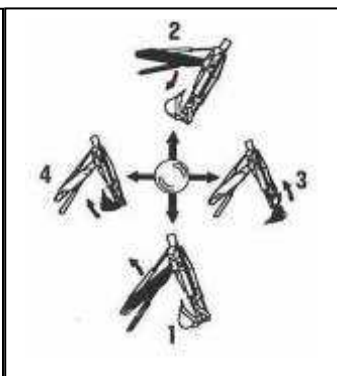
Left hand servo command (2 - 10.3 Fig.1):

- When the lever is pulled the second arm closes (1 - 10.3 Fig.3).
- When the lever is pushed the second arm opens (2 - 10.3 Fig.3).

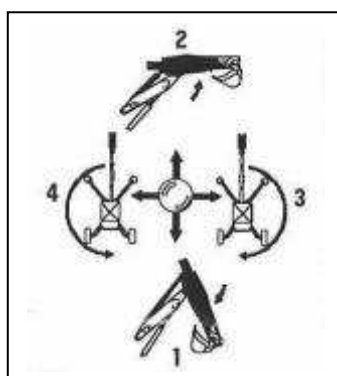
- When the lever is moved to the right the turret and the arm rotate clockwise through 360° (3 - 10.3 Fig.3).
- When the lever is moved to the left the turret and the arm rotate in an anti-clockwise direction (4 - 10.3 Fig.3).



10.3 Fig. 1



10.3 Fig. 2



10.3 Fig.3

10.4 The pedals

Left hand pedal:

- When pressure is applied to the front of the pedal, the rod of the second arm extends.
- When pressure is applied to the pedal the rod of the second arm re-enters

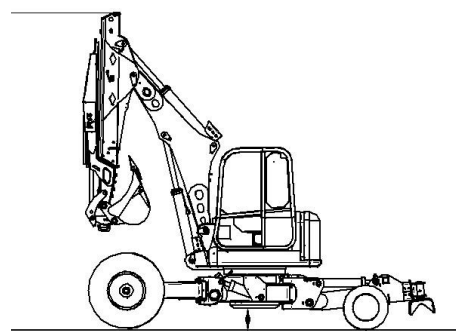
Central pedal:

- When pressure is applied to the front of the pedal, the accessory at the end of the arm works (adjustable bucket, hammer)
- When pressure is applied to the rear of the pedal, the accessory at the end of the arm works (adjustable bucket, hammer)

Right hand pedal:

- When pressure is applied to the front the machine advances.*
- When pressure is applied to the rear the machine reverses.*

**The drive direction is considered with the machine position with the arm towards the driving wheels.*



ATTENTION:

When the excavator is pulled or pushed with its own arm, the pedal must always be lightly pressed in the direction in which you wish to proceed, to release the reducer lock brake.

10.5 Steering

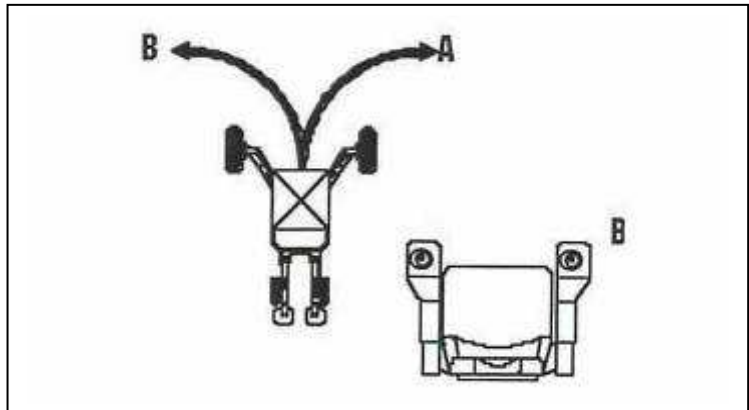
Servo command with steering function



ATTENTION:

Before towing and using the steering function, position the machine for driving (with the arm towards the driving wheels to increase the adhesion)

Pushing the buttons on the left manipulator 9-10 (10.6Fig1); is possible to activate the steering operation (left and right).



10.5 Fig. 1

10.6 Brackets movements

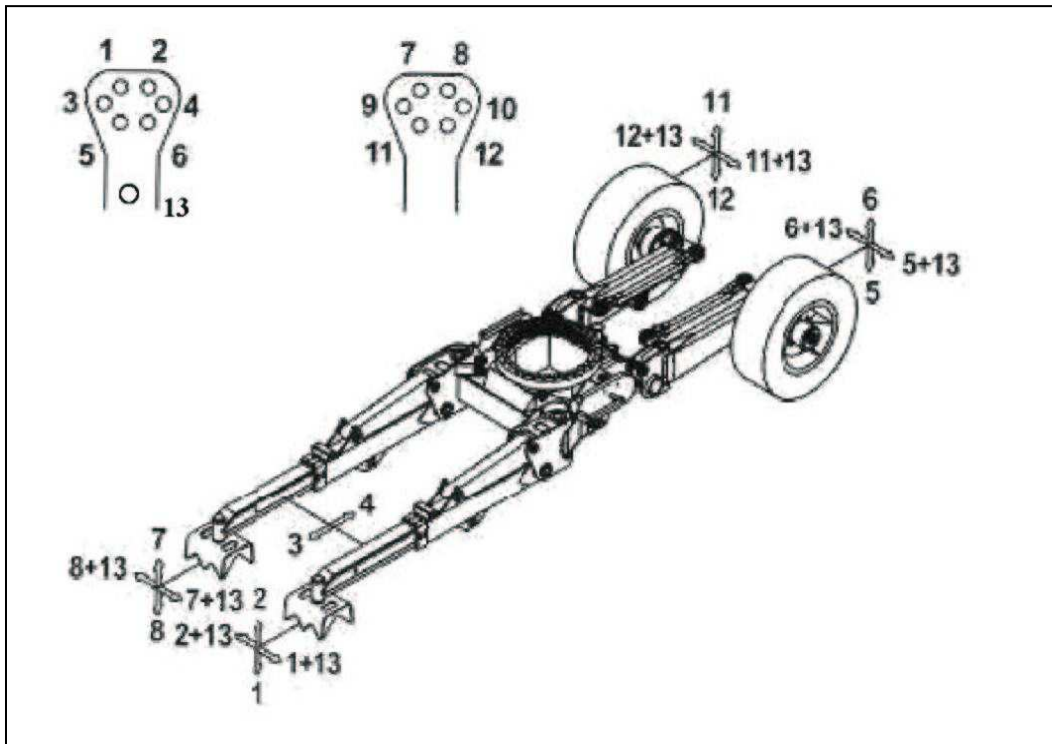


ATTENTION: The description of the functions must always be considered with the arm turned towards the front brackets.



• **DO NOT INVERT THE COMMANDS OF THE BUTTONS. ANY TAMPERING, EVEN BY THE SERVICE CENTRES CAUSES IRREPARABLE DAMAGE TO THE ELECTRICAL CIRCUIT AND INVALIDATES ANY GUARANTEES.**

10.6.1 Bracket movements with buttons



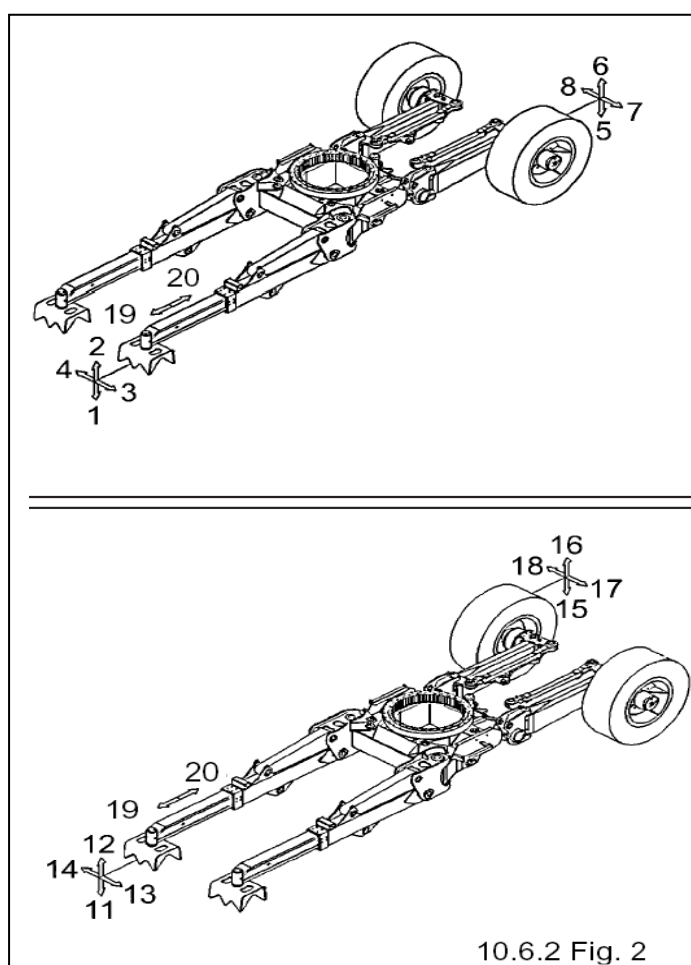
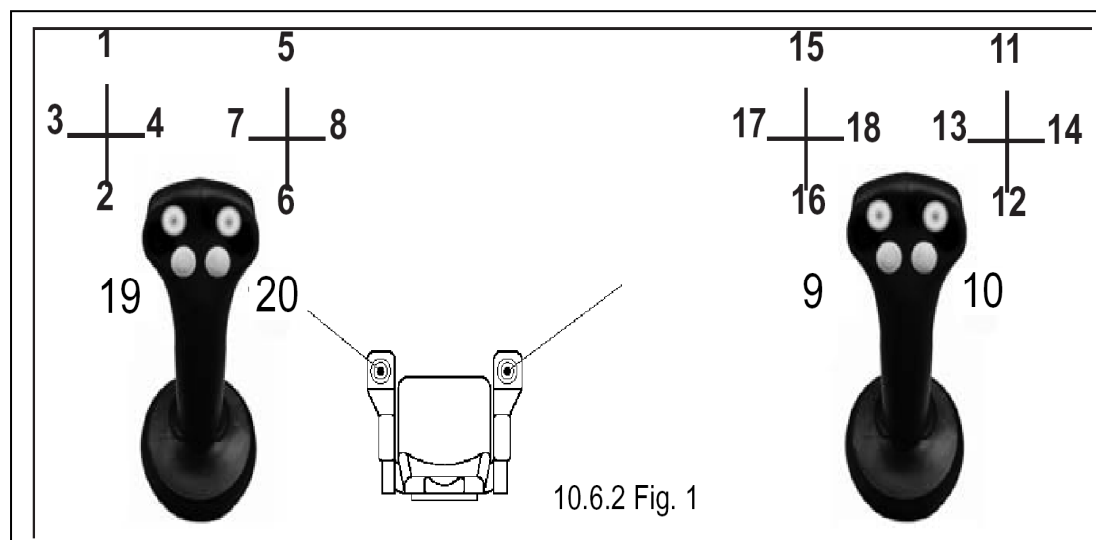
10.6.1 Fig.1

In the figure (10.6 Fig. 1) there is the correspondence between electrical buttons and the movement effectuated;

The button n. 13 near the manipulator have the function of deviator;

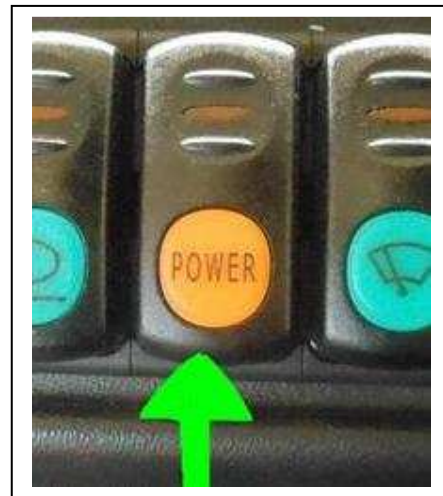
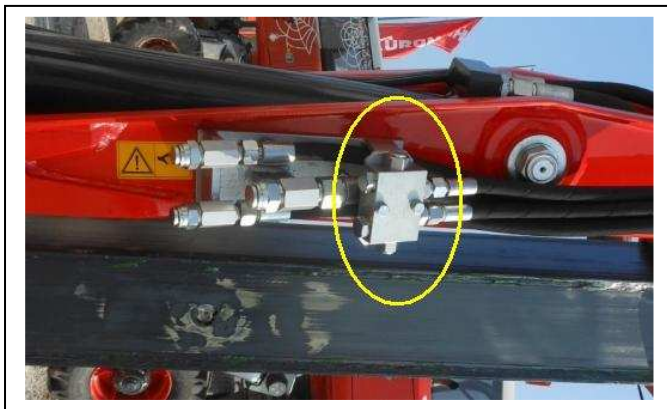
Pushing it with another electrical button, it is possible to effectuate other manoeuvres (ex. 11+13)

10.6.2 Bracket movements with mini-joysticks (option)



10.7 Use of special equipment controls

10.7.1 Control for rotation grab pipes (option)



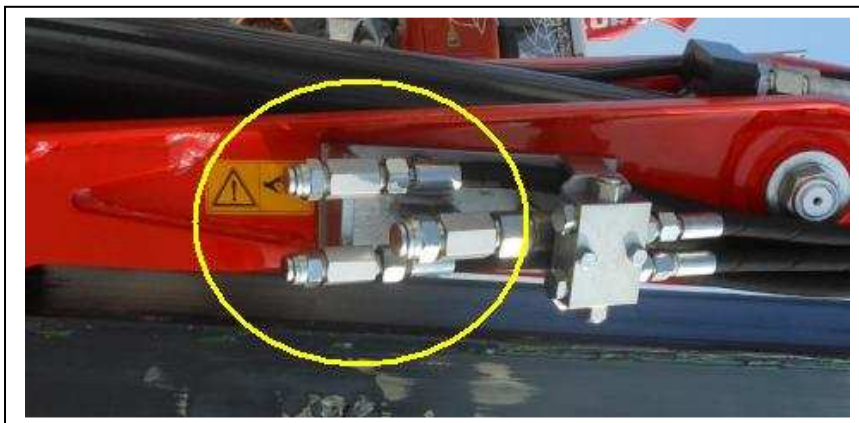
10.7.1 Fig.1 & 2

These pipes with 3/8 connectors are low pressure pipes and low displacement (200 bar) and they are suited for the command of the accessory rotation (for ex. grab) or for the command of the Power Tilt rotation (10.7.1 Fig. 1).

To start the accessory select the switch on the dashboard (10.7.1 Fig. 2) and the foot extension manoeuvre.

10.7.2 Control double effect accessory / hammer

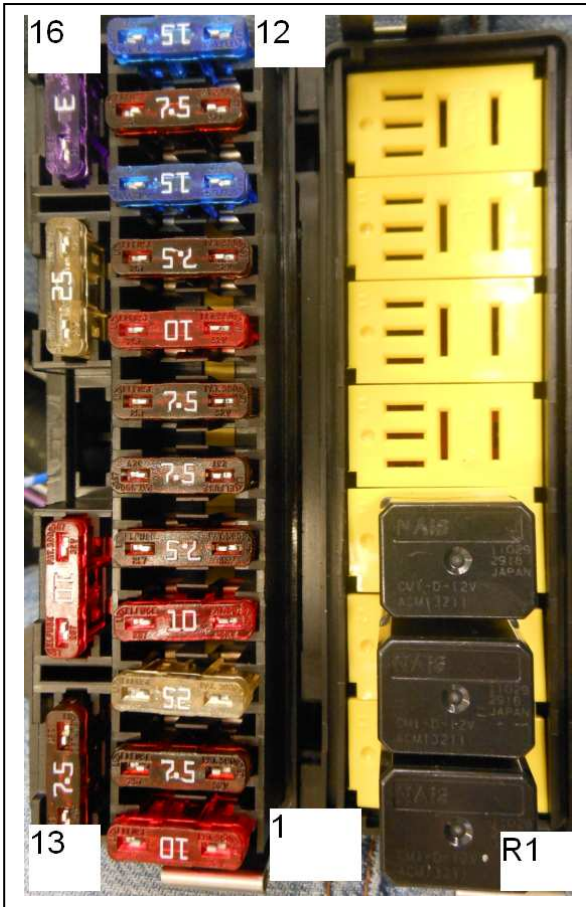
This pipes group is composed by n. 2 pipes (controlled by the central pedal) with 1/2" connectors for a double effect (maximum displacement about 60 lit/min - maximum pressure 230 bar) and by n. 1 central pipes of 3/4" that goes directly to the tank by-passing the filter (10.7.2 Fig. 1).



10.7.2

10.8 Fuse box

If a fusion don't work correctly, verify the correspondent fuse (10.8 Fig.1).



Relays description:

- R1 – relay for rear working headlight
- R2 – relay for front working headlight
- R3 – Claxon

Fuses description:

- 1 – 10 A – Alimentation really services / alimentation relay manipulators and electro-valves box
- 2 – 7,5 A – Windscreen wiper
- 3 - 25A - Heating group
- 4 - 10A - Seat compressor
- 5 – 7,5A – Rotating headlight
- 6 – 7,5A – Working headlight on the boom
- 7 – 7,5A – 2nd speed, micro arm rest
- 8 – 10A – Car radio; revolutions sensor; instruments panel
- 9 – 7,5A – Elettrostop; alternator
- 10 - 15A – Front working headlight
- 11 – 7,5A - Claxon
- 12 – 15A – Relay front working headlights
- 13 – 7,5A – Car radio - Roof lamp
- 14 - 10A – Outlet 12V
- 15 - 25 A – Elettrostop / Pre-heater control unit
- 16 - 3A – Pre-heater control unit

10.8 Fig.1

10.9 Seat (Fig.43)

The machine can be supplied by different types of seats. See in the specific the possible regulations.



Before descending or mounting on the cabin, the arm rest must be lifted (use the specific lever, see fig. 10.9 Fig.1), in this case the machine commands are deactivated thanks an specific micro (10.9 Fig.2). This operation exclude the ranger of involuntary manoeuvres.



ATTENTION:
Before operating the excavator, always put on the seat belts attached to the seat.



10.9 Fig.1

11. Engine bonnet opening and tipping the cabin

11.1 Opening the engine bonnet



The opening of the bonnets should be effectuated only for maintenance operations, switch off always the engine before the operation and lock the bonnets in opening position using the lock hook supplied.



Opening the rear engine bonnet: pull the handle to the up part to open the rear bonnet (11.1 Fig.1

11.1 Fig.1



Opening the right lateral engine bonnet: pull the handle and open the bonnet. Block it with the lever supplied. (11.1 Fig.2).

11.1 Fig.2



11.2 Cabin tipping



The cabin tipping must be effectuated only for special maintenance operations; before tipping the cabin always stop the engine and block the bonnets in open position using the levers supplied.

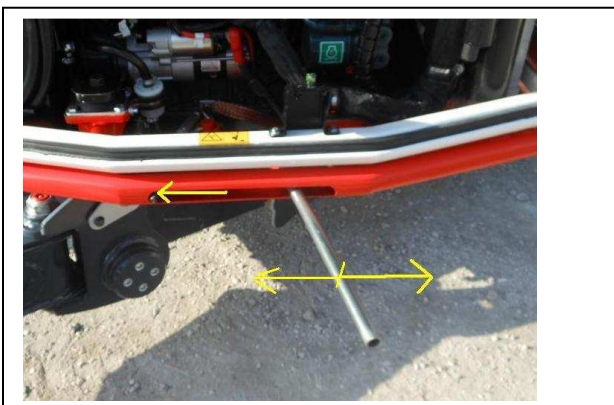
- Open the rear bonnet.
- Remove the safety pins of the two cabin lock hooks.
- Insert the lever supplied into the two bushes and release the stops of the cabin (11.2 Fig.1)

11.2 Fig.1



- Move the lever to the left of the hydraulic deviator for the pump.
- With the lever pump to left and right until the needed position

11.2 Fig.2



To tip the cabin it is necessary to extend the boom and lower it at the maximum possible. If the boom will not lowered enough, the front glass of the cabin can have an interference with the boom.

11.2 Fig.3

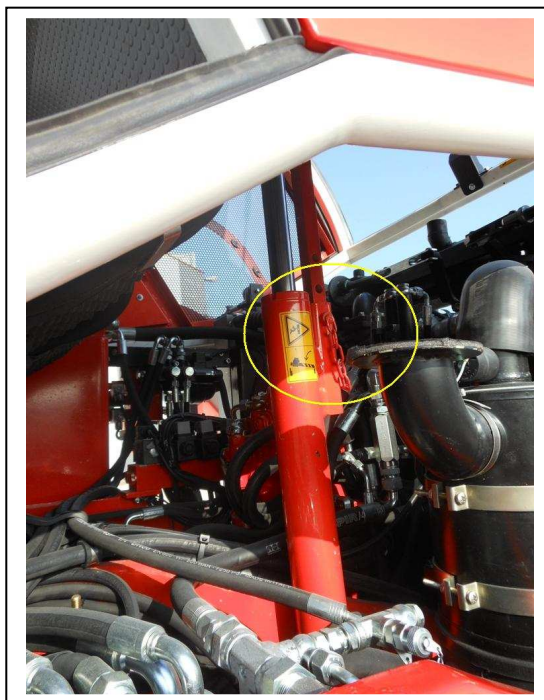




ATTENTION:

- Always use the safety pin. Never trust performing maintenance or other operations with the cabin raised without the stop pin. (11.2 Fig.4)
- Never trust leaving lever (11.2 Fig.2) in the release position (toward the right)

11.2 Fig.4



11.3 Closing of the cabin

- To raise the cabin pump with lever to free the stop.
- Remove the safety stop on the tipping cylinder.
- Very slowly rotate the pump lock lever towards the right until the cabin has completely descended.



- With the supplied lever block again the pins of the cabins in the closing position
- Remove the lever (1) and reposition it in the engine compartment.
- Re-close the engine bonnet.



NOTE:

The EUROMACH company is not responsible for damage to persons or objects deriving from a lack of observance of the precautionary regulations described.

12. Fuel refilling

12.1 Fuel refilling in the main tank



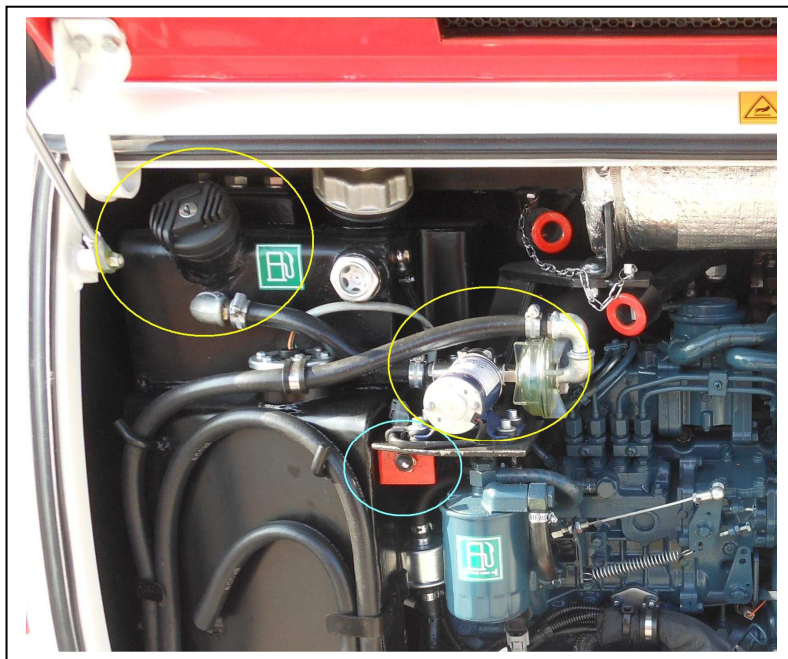
ATTENTION:

Always switch off the excavator before performing any fuel refilling operation.

Do not smoke and keep it away from flames.

The machine is supplied with a fuel tank of about 50 lit.
There are 2 different possibilities for the refilling:

1. Using the filler on the tank
2. Using the supplied electrical pump



The first way can be applied if you have a gasoil pump for the refilling.

The second way can be applied if you have a tank; it is enough to use the tube fixed to the fuel tank:

- insert the tube in the tank;
- take off the cap of the fuel tank to permit the outlet of the air;
- press the button to start the pump that will suck the gasoil and will send it directly in the fuel tank of the machine;
- control the level in the tank and stop the pump once the gasoil is at the maximum level.



ATTENTION:

once finished the refilling, stop the pump to avoid that it will burned.

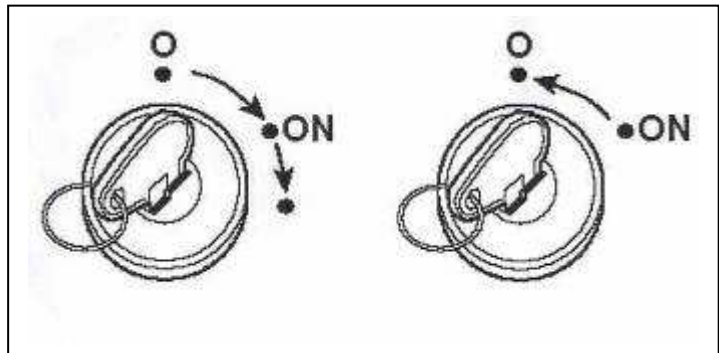
13. Starting up the excavator



Before starting up the excavator always check the level of the engine oil, hydraulic oil, reducer oil and the level of the cooling circuit.

13.1 Starting up

- Insert the key into the switch and turn it towards the right to the ON position (13.1 Fig. 1). The oil pressure control and battery charge lights should now come on. In this position the heating of the injectors takes place automatically. Wait until the yellow pilot light goes out.
- Turn the key towards the right: the engine will start (13.1 Fig. 1).
- As soon as the engine begins to turn over, release the key. If the engine does not start immediately, we advise against insisting with the key for more than 10 seconds.



13.1 Fig.1

NOTE:

If the engine does not start, wait at least a minute between each attempt to prevent the battery from becoming flat after a few tries.

When the engine is running, let it turn over at intermediate rpm for several minutes to permit good warming up: a guarantee of long life.



When the engine is running smoothly, the oil pressure and battery charge lights must be out. If the oil pressure light does not go out, **stop the engine immediately and telephone a Service Centre immediately.**

13.2 Operations at the end of work

Before a break in the work, or at the end of the day the operator must park the excavator: the arm is lowered to the ground so that no accidental movements may take place (rest position).

- With the accelerator lever, lower the rpm: we advise letting the engine idle for three minutes to stabilise the engine temperature before stopping.
- Turn the ignition key to 0 and the engine will stop (13.1 Fig 1).

14. Maintenance

14.1 General information



Remove always the pressure before every machine maintenance.
Attention: remove the current from the battery before every electrical or mechanical maintenance.

14.2 Daily maintenance operations

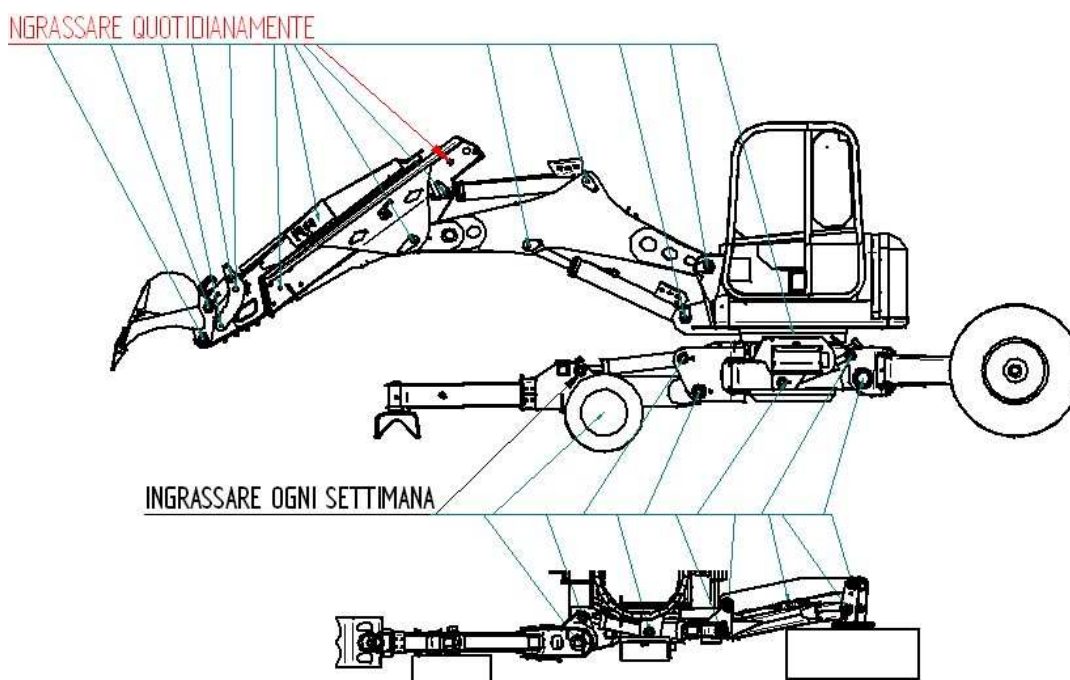


ATTENTION:

For the engine maintenance see the enclose handbook.

Greasing

- Grease the points defined (14.2 Fig.1), after each time the machine is used.
- Use only the type A greases recommended (see table).
- Check the oil levels in the engine, hydraulic circuit and the cooling liquid.
- Check for any leaks and top up the tank.
- Check that the air filter is not blocked (pilot light on the dashboard).



14.2 Fig.1

14.3 Periodical maintenance operations (every 200 hours of working)

NOTE:

- For maintenance of the engine see the handbook enclosed.
- Perform the first programmed service(new machine) within the first 100 hours of work or the first month.
- Have the successive programmed services performed at a Service Centre every 300 working hours or every 6 months.



- Change the engine oil (see Engine handbook).
- Change the engine oil filter (see enclosed engine handbook).
- Change the fuel filter on the tank and clean the container.
- Clean the air filter (change every 1000 hours or once a year).
- Check the tension of the fan belt.
- Check if the fan belt has any visible damage.
- Check that the water / oil radiator is always clean.
- Check that the pipes of the cooling circuit.
- Check and if necessary refill the radiator with the special cooling liquid (water + anti-freeze).
- Check the engine rpm: when running the engine can reach a maximum of 2000 rpm; the minimum rpm for idling must be 900 rpm.
- Check the battery liquid level.
- Check the working of the electrical system (pilot lights, lights, etc.).
- Check the tightness of the screws, the engine supports and of the connected groups.
- Check the working of the air filter blockage pilot light.
- Check that all the valves and cylinders haven't oil leakages (the changing of the seal kit must be effectuated by a service center)
- Check that all the structures of the machine haven't cracks.
- Check the tow reducer oil.
- Check the hydraulic oil filter.



ATTENTION:

The lubrication, maintenance or adjustment operations must be performed with the engine switched off, except for those operations described in the Use and Maintenance manual; in this way the risk of accidental and dangerous contacts with moving parts of the machine is avoided.

14.4 Periodical maintenance operations (every 1000 hours of working)

These operations should be effectuated with the periodical maintenance of the 300 hours.

Changing the hydraulic oil filter

Changing the hydraulic oil (remember to change the hydraulic oil every 3000 hours)

Changing the pins bushes

When the pins bushes need to be changed, please consult a service center .

Changing the cooling water inside the cooler

Changing the tow oil

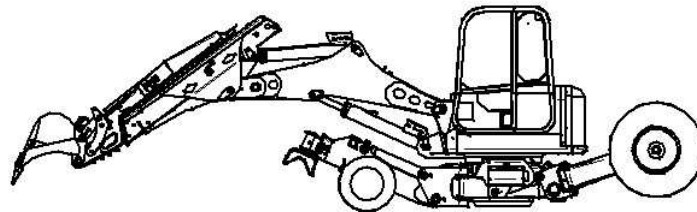
Changing the air filter

14.5 Information about the maintenance operations

Hydraulic oil top-up

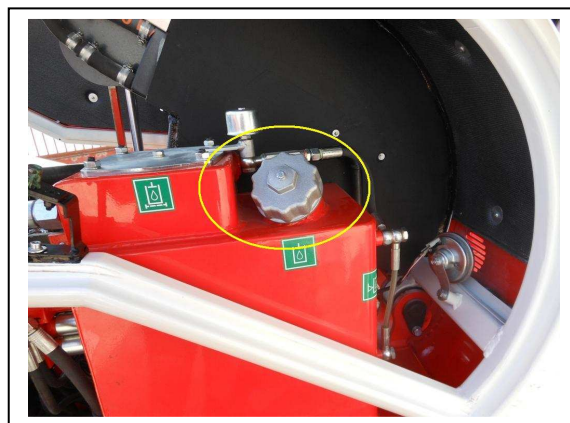
NOTE:

Before performing this operation, lie the arm down and completely open the bucket, lower the machine completely so that all of the cylinder rods re-enter their cylinders (14.4 Fig. 1).



14.4 Fig. 1

- Check the oil level with the external tube (3 -14.4 Fig. 3) located on the right side of the tank. The level should be around half way up the tube. If this is not the case, top-up by unscrewing the tank plug(2 - 14.4 Fig.2). For the refilling it is necessary to tip the cabin



14.5 Fig. 2



14.5 Fig.3

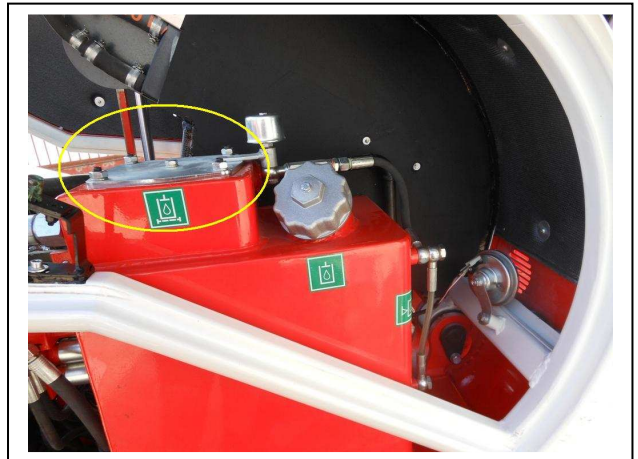
- Replace the plug when the operation is finished.



During the refilling not enter dirty or contaminants parts; take all the cares to avoid this situation.

Changing the hydraulic oil filter

- Open the lateral bonnet.
- Tip the cabin
- Unscrew slowly the cap on the tank and effectuate the vent.



14.5 Fig. 4



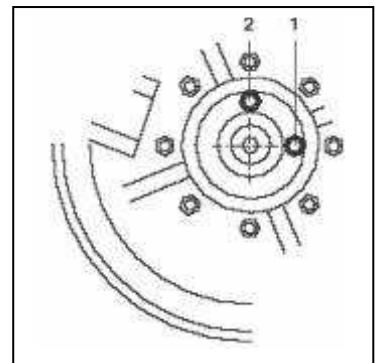
ATTENTION:

The oil tank is under pressure. Take care to vent before unscrewing the cap that close the filter.

- Unscrew the 4 fixing screws with the 4 washers on the cap of the oil filter (14.5 Fig. 4).
- Take of the cap and take the filter.
- Change the filter after cleaning with a dry cloth the box of the filter.
- Close the cap and the 4 screws.
- Close the tank cap.

Topping-up the tow oil

- Position the two Allen key screws of the reducer of the rear wheel as in figure 68 (90°).
- Unscrew the right lateral screws (1 - 14.4 Fig.5) to check the level: if oil comes out the level is correct. If not, unscrew also the upper screw (2 - 14.4 Fig. 5) and top-up until oil comes out of the right hand screw.
- When the operation is complete, close the two plugs.



14.4 Fig. 5

Topping-up the cooling liquid

Open the rear door and raise the cabin

ATTENTION:

The cooling liquid must only be topped-up with the engine cold because the circuit is under pressure and the liquid could come out in a violent manner causing burns to the operator.

- Unscrew the plug of the radiator.
- Top-up through the expansion tank until the liquid comes out of the hole in the radiator plug.
- Re-close the radiator plug
- Lower the cabin and close the rear door



14.5 Fig 6

15. Malfunction

15.1 Hydraulic system

<i>PROBLEM</i>	<i>POSSIBLE CAUSE</i>	<i>SOLUTION</i>
Oil overheating in the hydraulic oil circuit	The oil level is too low The radiator is obstructed The fan is not well-fixed	Put hydraulic oil Clean the radiator Regulate the distance between fan and radiator
The hydraulic system command doesn't work or works with difficulty.	The arm rest is in high position Malfunction of the end work button activated by arm rest The fuse on the dashboard is burned	Lower the arm rest Verify the functions of the end work button or change it Change the fuse
The machine and the arm can't move or they move with difficulty	Defect of the main hydraulic pump Defect of the manipulators Anomaly main command lock of the hydraulic circuit	Control the pump and contact the customer service Contact the customer service Contact the customer service
The machine can't make the translation or make it with difficulty	Malfunction of the traction reducers Problem on the pedal of traction command	Contact the customer service Contact the customer service
The brackets can't move or move with difficulty	Malfunction of the hydraulic system pump Malfunction of a solenoid valve	Verify the pump functions and contact the customer service Contact the customer service
The turret rotation is not correct or it rotate with difficulty	Malfunction of the turret rotation pump Malfunction of the rotation engine	Verify the pump functions and contact the customer service Contact the customer service

15.2 Electric system

<i>PROBLEM</i>	<i>POSSIBLE CAUSE</i>	<i>SOLUTION</i>
The electric system doesn't work	The battery is exhausted The battery terminals are disconnected or corroded	Verify the battery tension Clean the terminals and re-connect them
The start engine doesn't work correctly	The battery is exhausted The battery terminals are disconnected or corroded Malfunction of the start engine	Verify the battery tension Clean the terminals and re-connect them Contact the customer service
The pilot light of the battery is on	Malfunction of the alternator Malfunction of the electric system or the sensors The belt is released or worn	Contact the customer service Contact the customer service Verify the belt tension or change it
The work lights don't work	The lights are defected The fuse is broken	Change the lights Change the fuse
The bracket movements don't work or work with difficulty	The fuse is broken Malfunction of the command electric card	Change the fuse Contact the customer service
The lights inside the cabin, the radio and the electric lighter don't work	The fuse is broken	Change the fuse
The windshield wiper and the heating fan don't work	The fuse is broken Malfunction of the windshield wiper engine Malfunction of the heating fan engine	Change the fuse Change the engine Change the engine

15.3 Engine (verify also with the engine manual)

<i>PROBLEM</i>	<i>POSSIBLE CAUSE</i>	<i>SOLUTION</i>
The battery light pilot is on	The belt is release or worn	Change the belt or verify the tension
Engine malfunctions	Starting error The min. starting temperature is not respected The battery is defected or exhausted The starting circuit cables are not well jointed or have oxide The emergency stop button is activated Fuel missing The starting device is defected or the pinion don't mesh Anomaly to the electric starting magnet Air in the fuel equipment The oil viscosity is not correct The fuel quality is not the same of the manual suggestions The fuel equipment is encrusted The injection valve is defected Loss on the injection conduit Injector anomaly Overload of the engine Air filter encrusted or obstructed	Follow the suggestions for the starting Verify the temperature Verify the battery tension Verify the cable jointed and remove the oxide Deactivate the emergency stop button Verify the fuel level Contact the customer service Control the malfunction of the two electric magnets Clean the fuel equipment Employ the correct oil Use a fuel correct for the machine service temperature Clean the fuel completely Contact the customer service Contact the customer service Contact the customer service Reduce the overload Clean or change the air filter
The engine have a black smoke	The engine is overload Air filter encrusted or obstructed The turbine is defected Loss on the air conduit of supercharged Injector anomaly The injector valve is defected	Reduce the overload Clean or change the air filter Contact the customer service Contact the customer service Contact the customer service Contact the customer service
The engine have a white smoke	The fuel quality is not the same of manual suggestions The starting temperature is too low Injector anomaly The injector valve is defected The valve slack is not correct	Use a fuel correct for the machine service temperature Verify the temperature Contact the customer service Contact the customer service Contact the customer service

	The preheating doesn't work Engine oil combustion	Contact the customer service Contact the customer service
The engine consume a lot of oil	Loss of oil Engine oil combustion	Find the loss and close it Contact the customer service
The engine oil pressure is not enough	The oil level is not enough The oil viscosity is not correct	Verify the oil level Employ an oil with a correct viscosity
The engine doesn't rotate with all cylinders	Loss of the injection conduit Injector anomaly	Contact the customer service Contact the customer service
Heating of the engine	The injector valve is defected The air filter is encrusted or obstructed The fan is defected High resistance in the cooling water cycle The radiator reeds are encrusted	Contact the customer service Clean or change the air filter Contact the customer service Control and clean the cooling cycle Clean the radiator reeds
The engine have no power	The injector valve is defected Loss in the injector conduit The fuel quality is not the same of the manual suggestions The air filter is encrusted or obstructed The gas drain turbine is defected	Contact the customer service Contact the customer service Use a correct fuel Clean or change the air filter Contact the customer service

16. Periodical maintenance of the excavator



SERIAL NUMBER:

INTERVENTIONS TABLE

NOTE:

- ☞ For the engine maintenance see the engine manual.
- ☞ For information on the maintenance see the chapter n. 14 of this manual
- ☞ Make the first coupon (new machine) in the first 100 hours of work or in the first month.
- ☞ **Make the next coupons every 200 hours of work in a repair shop.**

ATTENTION: Send us back this page complete in each part. If you don't return this page the warranty is not valid.

EVERY 200 HOURS OF WORK	EVERY 1000 HOURS OF WORK
·Change the engine oil (see engine manual).	·Change hydraulic oil
·Change the engine oil filter (see engine manual).	·Change the engine oil filter
·Change the fuel filter on the tank and clean the container.	·Change the engine oil
·Clean the air filter (change every 600 hours or once a year).	·Change axes and bushes wear
·Control the tension of the fan belt.	·Change the refrigerant water
·Control if the fan belt have damages	·Change the cylinder gasket
·Control that the oil and water radiator is cleaned	·Change the reducer oil
·Control the pipes of the cooling circuit	·Change the traction oil
·Control, and if necessary fill, the radiator with the cooling liquid (water + antifreeze).	·Change the air filter
·Control the number of the engine turns: during the functioning the engine can have a max. turns number of 2400 g/min; for the loadless functioning of the engine the min. turns number should be 750 g/min.	NOTE: with this interventions the customer should do also the interventions of 200 hours
·Control the level of the battery liquid.	
·Control the electric system functioning (pilot lights, lights, etc.).	
·Control the lock of screws, of the engine supports and of the connected groups	
·Control the functioning of the pilot light of the obstructed air filter	
·Control the oil level for the rotation reducer	
·Control the oil level for the traction reducer	
·Control and clean the hydraulic oil filter	

SERIAL NUMBER:	SERIAL NUMBER:	SERIAL NUMBER:
HOURS COUNTER:	HOURS COUNTER:	HOURS COUNTER:
DATE:	DATE:	DATE:
REPAIR SHOP 100 ore	REPAIR SHOP 300 ore	REPAIR SHOP 500 ore
TIMBRE AND SIGNATURE	TIMBRE AND SIGNATURE	TIMBRE AND SIGNATURE

SERIAL NUMBER:	SERIAL NUMBER:	SERIAL NUMBER:
HOURS COUNTER:	HOURS COUNTER:	HOURS COUNTER:
DATE:	DATE:	DATE:
REPAIR SHOP 700 ore	REPAIR SHOP 900 ore	REPAIR SHOP 1100 ore
TIMBRE AND SIGNATURE	TIMBRE AND SIGNATURE	TIMBRE AND SIGNATURE

SERIAL NUMBER:	SERIAL NUMBER:	SERIAL NUMBER:
HOURS COUNTER:	HOURS COUNTER:	HOURS COUNTER:
DATE:	DATE:	DATE:
REPAIR SHOP 1300 ore	REPAIR SHOP 1500 ore	REPAIR SHOP 1700 ore
TIMBRE AND SIGNATURE	TIMBRE AND SIGNATURE	TIMBRE AND SIGNATURE

SERIAL NUMBER:	SERIAL NUMBER:	SERIAL NUMBER:
HOURS COUNTER:	HOURS COUNTER:	HOURS COUNTER:
DATE:	DATE:	DATE:
REPAIR SHOP 1900 ore	REPAIR SHOP 2100 ore	REPAIR SHOP 2300 ore
TIMBRE AND SIGNATURE	TIMBRE AND SIGNATURE	TIMBRE AND SIGNATURE

SERIAL NUMBER:	SERIAL NUMBER:	SERIAL NUMBER:
HOURS COUNTER:	HOURS COUNTER:	HOURS COUNTER:
DATE:	DATE:	DATE:
REPAIR SHOP 2500 ore	REPAIR SHOP 2700 ore	REPAIR SHOP 2900 ore
TIMBRE AND SIGNATURE	TIMBRE AND SIGNATURE	TIMBRE AND SIGNATURE

SERIAL NUMBER:	SERIAL NUMBER:	SERIAL NUMBER:
HOURS COUNTER:	HOURS COUNTER:	HOURS COUNTER:
DATE:	DATE:	DATE:
REPAIR SHOP 3100 ore TIMBRE AND SIGNATURE	REPAIR SHOP 3300 ore TIMBRE AND SIGNATURE	REPAIR SHOP 3500 ore TIMBRE AND SIGNATURE

SERIAL NUMBER:	SERIAL NUMBER:	SERIAL NUMBER:
HOURS COUNTER:	HOURS COUNTER:	HOURS COUNTER:
DATE:	DATE:	DATE:
REPAIR SHOP 3700 ore TIMBRE AND SIGNATURE	REPAIR SHOP 3900 ore TIMBRE AND SIGNATURE	REPAIR SHOP 4100 ore TIMBRE AND SIGNATURE

SERIAL NUMBER:	SERIAL NUMBER:	SERIAL NUMBER:
HOURS COUNTER:	HOURS COUNTER:	HOURS COUNTER:
DATE:	DATE:	DATE:
REPAIR SHOP 4300 ore TIMBRE AND SIGNATURE	REPAIR SHOP 4500 ore TIMBRE AND SIGNATURE	REPAIR SHOP 4700 ore TIMBRE AND SIGNATURE

SERIAL NUMBER:	SERIAL NUMBER:	SERIAL NUMBER:
HOURS COUNTER:	HOURS COUNTER:	HOURS COUNTER:
DATE:	DATE:	DATE:
REPAIR SHOP 4900 ore TIMBRE AND SIGNATURE	REPAIR SHOP 5100 ore TIMBRE AND SIGNATURE	REPAIR SHOP 5300 ore TIMBRE AND SIGNATURE

SERIAL NUMBER:	SERIAL NUMBER:	SERIAL NUMBER:
HOURS COUNTER:	HOURS COUNTER:	HOURS COUNTER:
DATE:	DATE:	DATE:
REPAIR SHOP 5500 ore TIMBRE AND SIGNATURE	REPAIR SHOP 5700 ore TIMBRE AND SIGNATURE	REPAIR SHOP 5900 ore TIMBRE AND SIGNATURE