TEREX®

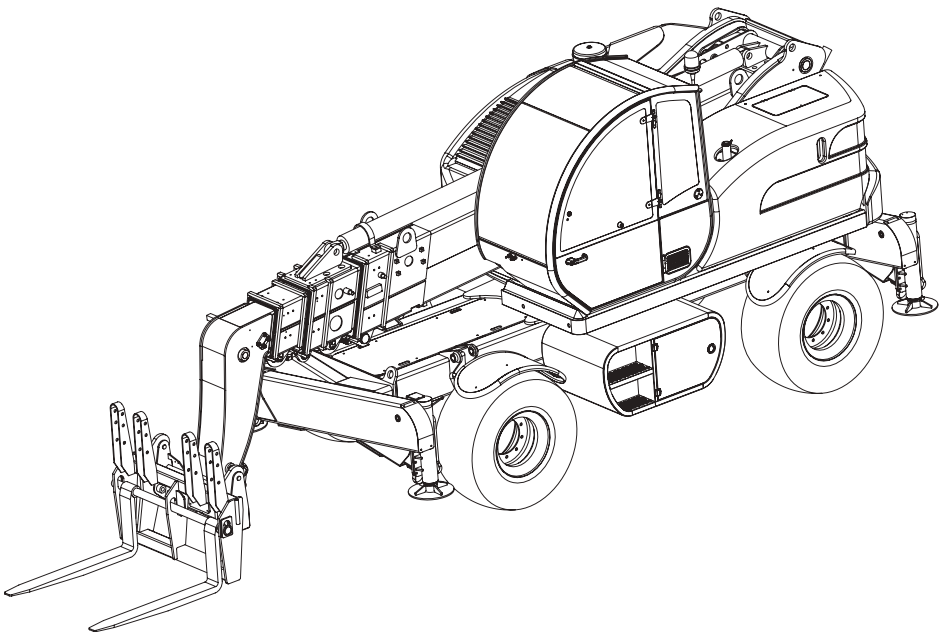
SERVICE MANUAL

Code 57.4402.8200 - 1st Edition 03/2007

Handler with telescopic boom

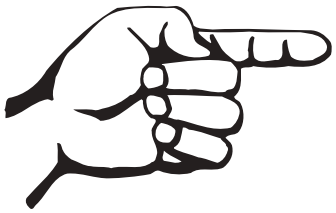
Gyro 4020 *(From serial n. 12888)*

Gyro 4518 *(From serial n. 12508)*



English
Edition

INDEX



Intentionally blank page

SERVICE MANUAL

Code 57.4402.8200 - 1st Edition 03/2007

Number: .....

Consigned to: .....

DECLARATION

I, the undersigned.....

declare I have received the ***Service Manual for TEREX handlers of the Gyro 4020 - 4518 series***.

Copies consigned: n° ..... on paper

n° ..... on CD-Rom

The undersigned is obliged to use the manual in their workshop, without disclosing the information in the same in any way, to unauthorised workshops and third parties in general, and not to photocopy or reproduce this manual or parts of the same in any way without the prior written authorisation of TEREXLIFT to do so.

If business relations between the undersigned and TEREXLIFT should come to an end, the undersigned is obliged to return the copies received without charges for TEREXLIFT.

Yours sincerely

Date .....

For acceptance

The consignee	Company stamp and signature of the Legal representative
.....	.....

Copy to return stamped and signed for acceptance by the Legal representative of the company receiving the copies of the manual.

SERVICE MANUAL

Code 57.4402.8200 - 1st Edition 03/2007

Number: .....

Consigned to: .....

DECLARATION

I, the undersigned.....

declare I have received the ***Service Manual for TEREX handlers of the Gyro 4020 - 4518 series***.

Copies consigned: n° ..... on paper

n° ..... on CD-Rom

The undersigned is obliged to use the manual in their workshop, without disclosing the information in the same in any way, to unauthorised workshops and third parties in general, and not to photocopy or reproduce this manual or parts of the same in any way without the prior written authorisation of TEREXLIFT to do so.

If business relations between the undersigned and TEREXLIFT should come to an end, the undersigned is obliged to return the copies received without charges for TEREXLIFT.

Yours sincerely

Date .....

For acceptance

The consignee	Company stamp and signature of the Legal representative
.....	.....

LIST OF REVISED PAGES

Revision		Revised pages	Notes	Issued by
No.	Date			
1	03-2007		Publication	
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				
31				
32				
33				
34				
35				
36				
37				
38				
39				
40				

MANUAL CONTENTS

SERIAL NUMBER IDENTIFICATION

Machine denomination	Literature valid up to serial number
Gyro 4020	12888
Gyro 4518	12508

INTRODUCTION

Important
Read, understand and obey the safety rules and operating instructions in the **Gyro 4020 and Gyro 4518 Operator's Handbook** before attempting any maintenance or repair procedure.
This manual provides the machine owner and user with detailed information on the scheduled maintenance. It also provided qualified service technicians with infromation on troubleshooting and repair procedures.
Basic mechanical, hydraulic and electrical skills are required to perform most procedures. However, several procedures require specialized skills, as well as specific tools and equipment.
In these instances, we strongly recommend letting service and repair the machine at an authorized TEREXLIFT service center.

Technical Publications
No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means without prior written permission from TEREXLIFT srl.
In pursuing a policy of constant quality improvement, TEREXLIFT srl reserves the right to make changes at any time and without undertaking to give prior notice; therefore, also this publication may be subject to modifications.

Contact Us
http://www.terexlift.com
e-mail: info@terexlift.it

DESCRIPTION OF THE MACHINE OPERATION

The oil-pressure system of this machine consists of two macro sections, namely turntable and undercarriage, corresponding to the machine's main parts. From an oil-pressure point of view, these two sections are connected with one another by the 13-way hydraulic rotary joint (**9**).
The source of mechanical energy of this machine is a Deutz turbo-compressed diesel engine (**1**), model BF4M2012, which supplies 74.9 kW at 2300 rev/min and with a max torque of 390 Nm at 1500 rev/min.
On the flywheel side of the engine, and connected to this engine by a Technodrive coupler with elastic joint and with a 1-to-1 ratio, there is a Linde closed-loop pump for hydrostatic drives, model HPV 75-02RE112V (**2**) with electroproportional adjustment valves.
The max displacement of this swashplate pump is 75 cm^3 and the max calibration pressure is 445 bar.
This pump is used to supply hydraulic power under form of pressure and flow rate which is then used for moving the machine.
This pump is used to supply hydraulic power under form of pressure and flow rate which is then used for moving the machine.
On the through-shaft of such drive pump there is a Bosch-Rexroth variable displacement piston pump with swashplate suitable for open lopp circuits, model A10VO45DFR (**3**), equipped with flow and pressure control valve.
The displacement of this pump is 45 cm^3. The function of this pump, through the “load sensing” priority valve (**6**) is to provide hydraulic power, under form of pressure and flow rate to the steering cylinder of the machine (priority side of the valve) and to the telescopic boom and slewing turntable circuits (secondary side of the valve).
This "load sensing" pump is adjusted through an adequate piloting line which provides the pump a pressure signal corresponding to the max load of all the users fed by this pump.
Between pump (**3**) and priority valve (**6**), a one-way valve (**5**) is placed to avoid that oil at pressure, produced by the power-driven emergency pump (**48**), may escape from pump (**3**) when this is stopped.
The assembly of the two pumps involves they have a rotation velocity equal to the speed of the diesel engine.
A third Casappa fixed displacement gear pump suitable for open loop circuits (**4**) with a displacement of 25 cm^3, is installed on the PTO of the engine located on the distribution side.
This pump feeds the servo-assisted braking system (**35**) and the hydraulic motor (**42**) of the heat exchanger fan (**43**) used to cool down the diesel engine and the hydraulic circuit.

The circuit of pump (**4**) is protected by a pressure relief valve **33**) calibrated to 160 bar.
The suction lines of the open-loop pumps (**3**-**4**) and the power-driven emergency pump (**48**) are not protected by filters and are conveyed to a single port on the hydraulic fluid tank (**32**).
Between this port and the suction lines of the aforesaid pumps, there is a gate valve (**31**) that allows to perform important maintenance interventions on the oil-pressure circuit of the machine without emptying the oil tank. This tank has a capacity of 230 litres.
On the contrary, the drive pump (**2**) is protected by a special filter (**45**), placed on the discharge line of pumps (**3**-**4**). This filter purifies the oil from the open circuits of the machine (boom-turntable control circuit and service and parking brake feeding circuit) and allows to have an additional oil port for the drive suction line with a minimum pressure of 0.5 bar.
This construction feature of the filter guarantees significant advantages in terms of absence of cavitation in the drive suction line, especially when the machine is started from cold.
The one-way valve (**34**) set to 1.5 bar protects the pump housing against high pressures and guarantees a certain circulation of the drain oil to the hydrostatic motor reducing, in this way, the temperature.
From port “X” of the drive pump (**2**) low-pressure oil is taken (25-30 bar). This oil is first conveyed to the undercarriage through port 11 of the hydraulic rotary joint (**9**), and then used for the two-speed mechanical gearbox circuit (**51**), for the adjustment of the hydrostatic drive motor (**50**) and for the differential anti-slip circuit through the mechanism placed inside the front axle (**57**).
The hydraulic energy produced by the drive pump (**2**) and conveyed to the undercarriage through ports n.1 and n.2 of the hydraulic rotary joint (**9**), is converted into mechanical power by a closed-loop hydrostatic motor, model Linde HMV 75-02E112V (**50**) equipped with an electroproportional adjustment valve and with a flush valve for reducing the max temperatures inside the drive circuit.
In addition to the high-pressure connections with pump (**2**) throughj ports n. 1 and n. 2 of the hydraulic rotary joint (**9**), the motor (**50**) is hydraulically connected to the turntable through port n.12 of the aforesaid joint from which it receives the flow from the drain circuit of the drive pump (**2**), through port n. 7, to which it conveys all the drain flow, and through port n. 11, from which it takes the low pressure needed for its adjustment.
The electroproportional valves of pump (**2**) and motor (**50**) are controlled by a dedicated electronic control unit (Linde) which is connected to the remaining control devices of the machine through the digital network.

The motor is flanged to a two-speed mechanical gearbox, model 357 (**51**) manufactured by Dana. Speeds are engaged by a special oil-dynamic cylinder (**52**) located inside the gearbox, while the selection of the first and second speed is controlled by a 4-way/3-position solenoid valve (**53**) of the on/off type.
The mechanical torque at the gearbox output is transmitted to the front axle (**57**) and the rear axle (**58**), both model 212HY manufactured by Dana, through Cardan shafts.
The hydraulic drive (**7**) of “load sensing” type with a displacement of 315 cm^3, receives oil from the priority valve (**6**) in relation to the “load sensing” signal sent by the hydraulic drive and connected to such valve with function of pilot signal. In this way, the input flow to the hydraulic drive will be exactly the one needed for the instantaneous steering functions; any excess flow of the valve will be available for the functions of the telescopic boom asn other auxiliary functions.
The steering circuit is protected against input overpressures by a pressure reducing valve set to 140 bar. On the two delivery lines, there are other two reducing valves with anti-shock function set to 200 bar. The scope of these two valves is limiting possible shocks on the steering wheel due to overstress on the steering cylinders. The three pressure reducing valves are installed in the hydraulic drive (**7**) and cannot be regulated from the outside.
The steering circuit is completed by the front steering cylinder (**55**), the rear steering cylinder (**56**) (these cylinders being integral part of the front axle (**57**) and the rear axle (**58**) respectively) and by a 4-way/3-position solenoid valve (**54**) for the selection of the three different steer modes (rear wheels straight, co-ordinate front/rear steering and independent front/rear steering). When the solenoid valve (**54**) is not energised, the front steering cylinder is fed by the hydraulic drive and the rear cylinder is blocked. When one magnet or the other of the solenoid valve (**54**) is energised, the chambers of the cylinders are connected in a different manner thus causing the desired effect on the steering mode.
The connection of the steering circuit between the section integral of the turntable and the one integral of the undercarriage is done through ports n.8 and n. 9 of the hydraulic rotary joint (**9**).
The Bucher/Tecnord electro-proportional distributor (**8**), with 5 modular sections, receives oil from the secondary line of the priority valve (**6**) and feeds all of the movements of the telescopic boom and the turntable and provides an oil flow to the auxiliary lines for the secondary functions such as turntable lock, outriggers and frame levelling.
This main valve consists of an input head with 3-way pressure compensator used as a flow regulator for the user which works at max load (load sensing), and as a

discharge valve when the pump flow is not used for the boom movements, and of 5 modules.
Four of these modules control specific functions of the telescopic boom (lifting/lowering, attachment holding frame rotation, extension/retraction, attachment lock/unlock) and the fifth module controls the rotation of the turntable of the machine.
In the head there is a pressure relief valve set to 300 bar which, acting on the line of the “load sensing” signal, limits the maximum pressure at the inlet of the main valve through such 3-way compensator.
On the main inlet head of the main valve, there is the pilot line head which includes an inlet safety filter, a pressure relief valve acting on the pilot line, and a safety solenoid valve which, when de-excited, discharges the input pilot pressure, thus preventing the main valve from working.
This solenoid valve is used as a “dead man” control and is activated by the relevant button on the joysticks in the driving cab.
The pilot head delivers oil at pressure to the 5 pilot modules of the main valve. These modules operate the relevant main sliders in relation to the command signal they receive from the joysticks via the control unit.
Module 1 of the main valve controls the telescopic boom lifting cylinder (**12**). This cylinder has one single-acting compensation valve (**13**) with safety function. The control module of element 2 of the main valve is the electro-proportional type with electrical feed-back and integrated electronics. The 1,5-lt. accumulator prefilled at 35 bar (**14**) and located on the line of the differential chamber of the lifting cylinder (**12**), allows for damping the boom swings when the same boom is moved down.
Module 2 of the main valve controls the boom telescopes extension cylinder (**15**). This cylinder is equipped with a double-acting compensation valve (**16**) with safety function. The control module of this element of the main valve is the electro-proportional type with electrical feed-back and integrated electronics.
Module 3 of the main valve controls the cylinder operating the attachment holding plate of the telescopic boom (**17**). This cylinder is equipped with a double-acting compensation valve (**18**) with safety function. Paralleled to this cylinder we find the fork levelling cylinder (**19**) (or balancing cylinder) equipped with a special double-acting compensation valve (**20**). Inside this valve, the one-way valves are installed in a reverse manner with respect to the normal position to avoid the pressurisation of the cylinder when the rotation command of the attachment holding plate is operated.
Again inside this valve, there are other two one-way valves set to 5 bar with anti-cavitation function (**21**). These valves are used to deliver oil, sucked from the low pressure line coming from the pressure relief valve (**11**), to the fork levelling compensation circuit, when such

circuit cannot do it alone.
The control module of element 3 of the main valve is the electro-proportional type with electrical feed-back and integrated electronics.
On the two control lines of the cylinder (**17**), and integral to module 3, there are two pressure relief valves set to 320 bar which protect the automatic levelling system of the forks when the boom is moved up and down and in case of overload on the attachment holding plate (ex. use of the bucket).
Module 4 of the main valve controls the attachment locking cylinder (**23**). This cylinder has a double one-way valve with hydraulic release, acting as safety valve (**24**). The pilot module of element n. 4 of the main valve is the electroproportional type with integrated electric and electronic feedback.
On one of the two hydraulic control lines of this section of the main valve, there is a 3-way/2-position electric divider with on/off control (**22**).
When this divider is not energised, the oil at pressure coming from the module of the main valve, is sent to the attachment locking cylinder. On the contrary, when the divider (**22**) is energised, the oil at pressure from element n.4 of the main valve (**8**), is made available for the auxiliary feeding line of the turntable lock/unlock function and, through port n. 3 of the hydraulic rotary joint (**9**), for the operation of the outriggers and the frame levelling.
On the feeding lines of this cylinder and close to the terminal part of the end trunk, there are two quick-fit connectors (**25**) for the connection of the hydraulic lines of any optional equipment needing a hydraulic power for their operation (e.g. hydraulic winch and jib, mixing bucket, etc.).
Module n. 5 of the main valve controls the hydraulic slewing motor of the turntable (**26**), equipped with brake with internal mechanical block and external hydraulic release. The mechanical torque produced by this motor is transmitted to the turntable through an epicyclic reduction gear with two stages and a slewring with internal toothing.
The feeding line of this motor is equipped with a double-acting compensation valve (**27**), used also as safety and anti-cavitation valve.
The pilot module of this element of the main valve is of electroproportional type with integrated electric and electronic feedback.
Inside this module of the main valve, there is a two-way pressure compensator which keeps the proportionality of the slewing control of the turntable as the loads on this table and the pressure entering the main valve modules change. The pressure of the main valve is adjusted by the three-way compensator placed on the inlet head.
The main valve (**8**) is equipped with a pilot line of the “load sensing” type which, through the exchange valve (**10**), is connected to the priority valve (**6**), which, at

its turn, receives an analog pressure signal from the hydraulic drive (**7**). The exchange valve (**10**) is then connected to the "load sensing" port of pump (**3**), thus guaranteeing the adaptation of the pump adjustment to the maximum load on the various users served by this pump under any conditions.
The pressure relief valve (**11**) calibrated to 30 bar is placed upstream of the pressure inlet port of the main valve (**8**). This valve is used to deliver low-pressure oil (30 bar) to the anti-cavitation circuits of automatic fork levelling system and to feed the pilot line of the same main valve (**8**).
The block cylinder of the slewing turntable (**28**) is equipped with a double one-way valve (**29**) with hydraulic release, acting as safety valve, and is controlled by the 4-way/3-position solenoid valve of the on/off type (**30**).
As already mentioned, the turntable lock/unlock is possible through the simultaneous energisation of module n.4 of the main valve (**8**), the electric divider (**22**) and the solenoid valve (**30**).
The SAFIM S6 servo-assisted braking system with pedal (**35**) receives oil from the pump (**4**) and uses this oil to pressurise 3 hydraulic accumulators (**36**-**37**) connected to the same system.
The oil at pressure contained in these accumulator is then used to operate the service brakes of the two axles (**57**-**58**) and to release the parking brake located inside the rear axle (**58**).
The fill valve inside the braking system takes the flow from the feeding line so the pressure on the line of the accumulators reaches the calibration value of the cutout valve set to 140 bar. When this pressure is reached, the valve gradually releases all the flow to line B for other uses.
The brake pedal located in the driving cab, which is an integral part of the braking system S6, is connected to two proportional sliders which control the two separated lines of the service brake, one for each axle.
Such lines connect the part of circuit in the turntable with the one in the undercarriage through ports n. 5 and n. 6 of the hydraulic rotary joint (**9**). In relation to the stroke of these sliders, a gradual communication between the feeding line, connected to two accumulators (**36**) which, at their turn, are connected to ports R1 and R2 (the accumulators have 0.5-lt. capacity and 50 bar fill pressure), and the service brake lines is established so the flow is distributed to such lines and the discharge line increasing, in this way, the pressure (and as a result the braking force) on the lines of the service brakes. When the sliders are in the rest position, the lines of the service brakes are connected to the discharge.
The pressure switch (**38**) set to 2-10 bar, paralleled to on of the two lines of the service brake, sends an electrical signal when this brake is engaged.

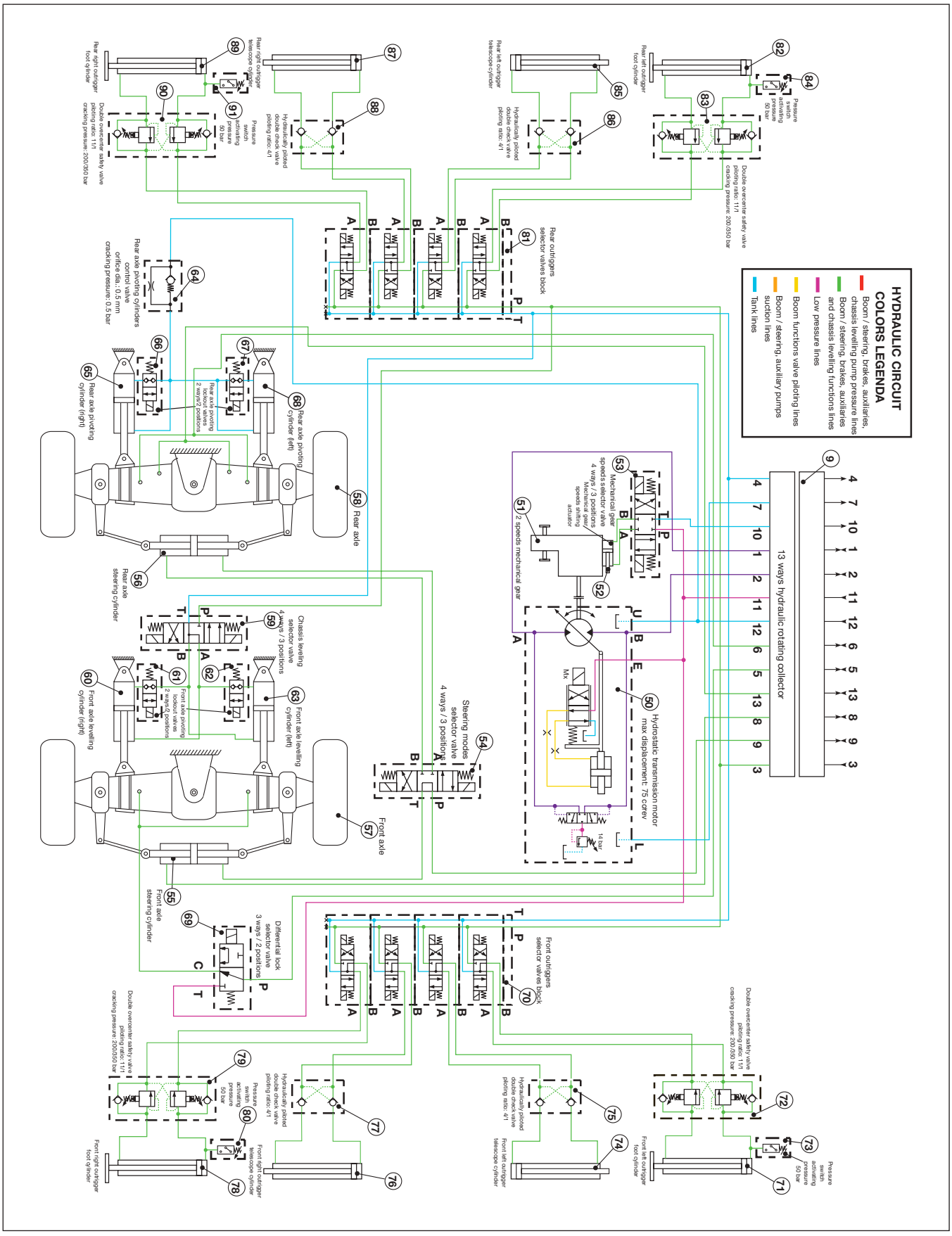
The pressure switch (**39**) set to 70 bar and connected to port F, sends an electrical warning signal when the pressure inside the feeding circuit of the brake lines is too low to guarantee the minimum braking efficiency.
The accumulator (**37**) with 0.5-lt. capacity and 50 bar fill pressure is connected to port R of system S6 and is used to unlock the parking brake of the rear axle (**58**).
The connection of the part of this circuit placed in the turntable to the one of the undercarriage is done through port n. 13 of the hydraulic rotary joint (**9**).
The command of the parking brake is controlled by a special valve with lever control (**40**) located in the driving cab. In relation to the position of the lever, the release line of the parking brake is connected to the pressure line (parking brake unlocked) or the discharge line (parking brake locked).
The two pressure switches (**41**) set to 10-20 bar send an electrical warning signal when the parking brake is activated (brake locked).
The oil which is not used by the SAFIM S6 servo-assisted braking system with pedal, is sent to the Casappa hydraulic geared motor (**42**) with a displacement of 20 cm^3, for the operation of the cooling fan of the heat exchanger (**43**).
Inside the motor housing, there are an anti-cavitation valve and a pressure relief valve with by-pass function set to 140 bar, as well as a solenoid valve which, once electrically energised, directly sends the oil entering to the motor, to the drain.
The function of this solenoid valve, suitably controlled by a thermostatic circuit, is to avoid an operation of the cooling fan of the heat exchnager when the oil is cold. This allows reaching the ideal working temperature of the hydraulic oil faster.
The heat exchanger (**43**) is divided in two sectors; one absorbs heat from the cooling circuit of the diesel engine and the other absorbs heat from the hydraulic circuit of the machine.
The flows of pumps (**3**-**4**) and the partial flow of the drain circuit of the hydrostatic transmission are conveyed to this second sector.
The oil cooled down by the heat exchanger is sent back to tank (**32**).
A one-way valve (**44**) with an opening pressure of 5 bar is installed parallel to heat exchanger (**43**) to protect the same exchanger. In all the cases in which the pressure drop in the exchanger exceeds 5 bar (starts from cold, partial obstruction of the heat exchanger, etc.), valve (**44**) opens so that a part of the flow to the exchanger can be conveyed through this valve by reducing the maximum pressure inside the exchanger (**43**).
On the drain line from the drive motor (**50**), passing through port n.7 of the hydraulic rotary joint (**9**), there are two one-way valves (**46**-**47**) with an opening pressure of 0.5 bar and 1.5 bar, respectively.

The function of these valves is to avoid a pressure of the drain line of motor (**50**) above 1.5 bar which is the admissible limit for the seals placed on the motor shaft.
This circuit allows for the partial passage through the heat exchanger (**43**) of the flow from the pump drain circuit (**2**) and the drive motor (**50**) to keep within the pressure limits mentioned above. Any excess flow will pass through valve (**47**) to directly reach the tank (**32**).
Ports n.4 and n.10 of the hydraulic rotary joint (**9**) are used to connect some drain lines between undercarriage and turntable. In particular, port n.10 is the one which can guarantee the lowest counter-pressure values on the drain, being directly connected to tank (**32**).
The motor-driven pump (**48**), supplied with power by the battery, is used as emergency feeding pump in the event of a failure of the primary control circuit of the telescopic boom. Just downstream of the motor-driven pump (**48**) there is a one-way valve (**49**) which avoids that oil at pressure, produced by the main pump (**3**), may escape through pump (**48**) when this is stopped.
The movements of the front outriggers are controlled by four 4-way/3-position solenoid valves of the o/off type, installed on the oil-pressure block (**70**). This block, through port 3 of the hydraulic rotary joint (**9**), is fed by the simultaneous operation of the 4th element of the electro-proportional main valve (**8**) and of the electric divider (**22**).
The solenoid valve n. 1 of block (**70**) controls the cylinder (**71**) operating the front left stabilising foot. This cylinder is equipped with a double-acting compensation valve(**72**) used also as safety valve.
On the rod side of this cylinder, there is a pressure gauge (**73**) calibrated to 50 bar which detects when the outrigger is lowered to the ground.
The solenoid valve n. 2 of block(**70**) controls the extension cylinder (**74**) of the front left outrigger. This cylinder is equipped with a double one-way valve with hydraulic release, acting as a safety valve (**75**).
The solenoid valve n. 3 of block (**70**) controls the extension cylinder (**76**) of the front right outrigger.
This cylinder is equipped with a double one-way valve with hydraulic release, acting as a safety valve (**77**).
The solenoid valve n. 4 of block (**70**) controls the cylinder (**78**) operating the front right stabilising foot.
This cylinder is equipped with a double-acting compensation valve (**79**) used also as safety valve.
On the rod side of this cylinder, there is a pressure gauge (**80**) calibrated to 50 bar which detects when the outrigger is lowered to the ground.
The movements of the rear outriggers are controlled by four solenoid valves installed on the oil-pressure block (**81**).
This block, through port 3 of the hydraulic rotary joint (**9**), is fed by the simultaneous operation of the 4th element of the electro-proportional main valve (**8**) and of the electric divider (**22**).

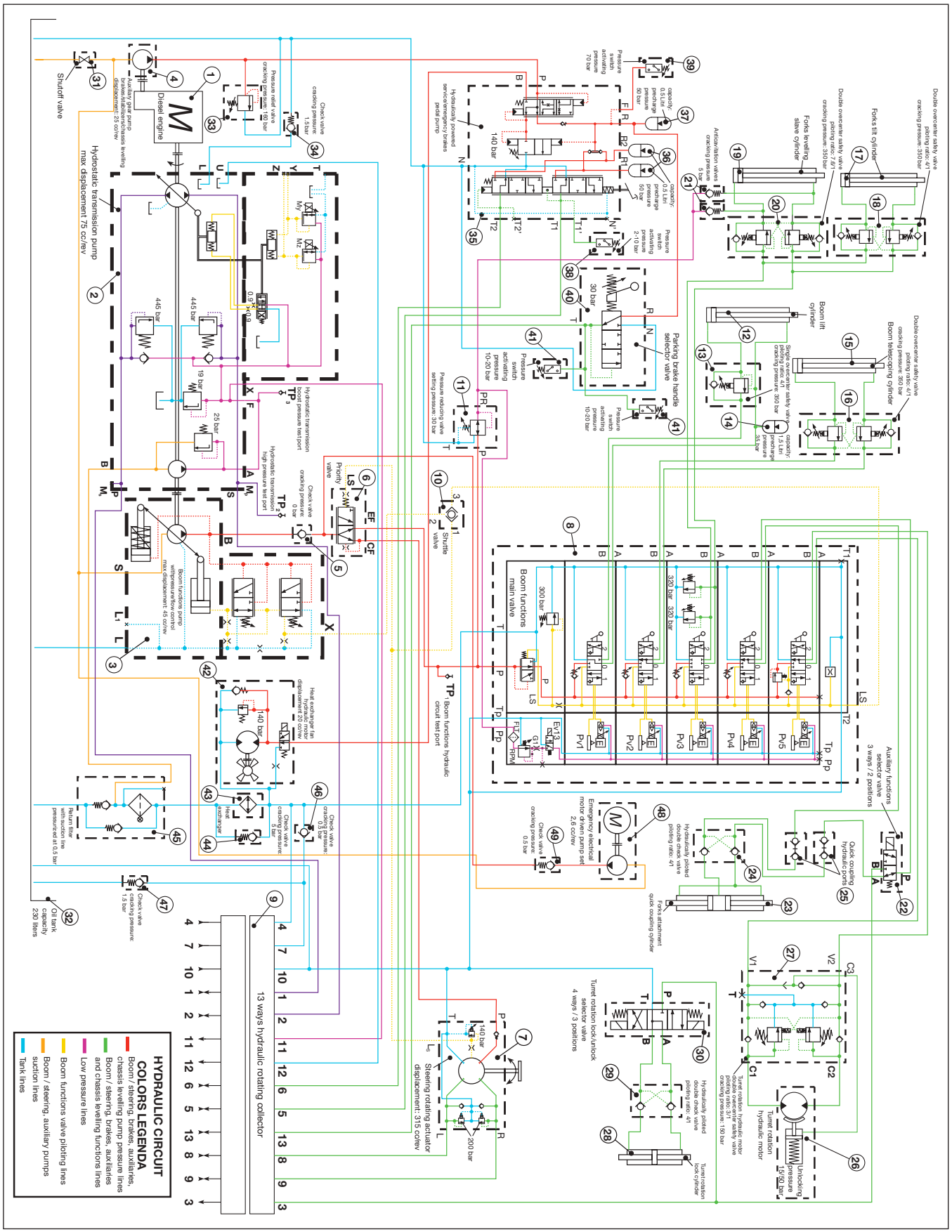
The solenoid valve n. 1 of block (**81**) controls the cylinder (**82**) operating the rear left stabilising foot.
This cylinder is equipped with a double-acting compensation valve (**83**) used also as safety valve. On the rod side of this cylinder, there is a pressure gauge (**84**) calibrated to 50 bar which detects when the outrigger is lowered to the ground.
The solenoid valve n. 2 of block (**81**) controls the extension cylinder (**85**) of the rear left outrigger.
This cylinder is equipped with a double one-way valve with hydraulic release, acting as a safety valve (**86**).
The solenoid valve n. 3 of block (**81**) controls the extension cylinder (**87**) of the rear right outrigger.
This cylinder is equipped with a double one-way valve with hydraulic release, acting as a safety valve (**88**).
The solenoid valve n. 4 of block (**81**) controls the cylinder (**89**) operating the rear right stabilising foot.
This cylinder is equipped with a double-acting compensation valve (**90**) used also as safety valve. On the rod side of this cylinder, there is a pressure gauge (**91**) calibrated to 50 bar which detects when the outrigger is lowered to the ground.
The differential anti-slip circuit is controlled by the 3-way/2-position solenoid valve (**69**). When this valve is not energised, the service brake control line of the front axle (**57**), coming from the SAFIM braking system (**35**) through port 5 of the hydraulic rotary joint (**9**), is connected to the service brake ports of the front axle (**57**). On the contrary, when valve (**69**) is energised, a condition corresponding to the anti-slip control "ON", the service brake ports of the front axle (**57**) are connected to the 25-30bar low-pressure line and help the action of the differential anti-slip system.
The oscillation of the front axle (**57**) is controlled by two cylinders (**60**-**63**) equipped with block solenoid valves (**61**-**62**). The movement of cylinders (**60**-**63**), and thus the front axle oscillation (**57**), is only possible when solenoid valves (**61**-**62**) are energised.
The frame levelling is controlled by a 4-way/3-position ON/OFF solenoid valve (**59**) which feeds in a crossed manner the cylinders (**60**-**63**).
This solenoid valve, through port 3 of the hydraulic rotary joint (**9**), is activated by the simultaneous operation of the 4th element of the electro-proportional main valve (**8**) and of the electric divider (**22**).
The oscillation of the rear axle (**58**) is controlled by two cylinders (**65**-**68**) equipped with block solenoid valves (**66**-**67**). The movement of cylinders (**65**-**68**), and thus the rear axle oscillation (**58**), is only possible when solenoid valves (**66**-**67**) are energised.
The flow control valve (**64**) allows for the free passage of the oil coming from the drive drain circuit during the filling of the cylinders (**65**-**68**) (air venting) and avoids pressure peaks in the circuit of such cylinders when high oscillation speed conditions of the rear axle produce potentially dangerous overpressures in the drive drain

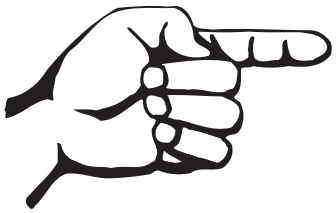
circuit.
As already mentioned, the undercarriage levelling function is possible through the simultaneous energisation of the two spools of the solenoid valve (**59**) and the spools of the solenoid valves (**61**-**62**-**66**-**67**).

Gyro 4020 - 4518 carrier hydraulic scheme



Gyro 4020 - 4518 turntable hydraulic scheme





Intentionally blank page

Section 1
SAFETY INFORMATION

SECTION INDEX

1.1 SAFETY RULES

1.1-1 Personal Safety

In this manual, any important information is preceded by a **SPECIAL SYMBOL**.
All operators who work or service the machine must know the exact meaning of these safety symbols.

There are six special (or safety) symbols in this manual, always combined with keywords that class the situations according to their danger degree.
The symbols are always followed by a text explaining the situation taken into account, the attention to be paid to such situation, the method and the behaviour to be adopted. When necessary, it stresses prohibitions or supplies instructions to prevent dangers.
Sometimes, it can be followed by illustrations.

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

Draws the attention to situations that involve your own as well as the others' safety and that can result in serious or lethal injury.

⚠DANGER

Draws the attention to situations that involve your own as well as the others' safety and that can result in serious or lethal injury.

⚠WARNING

Draws the attention either to situations that involve your own as well as the others' safety and that can result in minor or moderate injury or to situations that involve the machine efficiency.

⚠CAUTION

Draws the attention either to situations that involve your own as well as the others' safety and that can result in minor or moderate injury or to situations that involve the machine efficiency.

CAUTION

Draws the attention to important technical information or practical advice that allows for a safer and more efficient use of the machine.

NOTICE

Draws the attention to important environment-related information.

Be sure to wear protective eye wear and other protective clothing if the situation warrants it.

Be aware of potential crushing hazards such as moving parts, free swinging or unsecured components when lifting or placing loads. Always wear approved steel-toed shoes.

1.1-2 Workplace Safety

Be sure to keep sparks, flames and lighted tobacco away from flammable and combustible materials like battery gases and engine fuels. Always have an approved fire extinguisher within easy reach.

Be sure that all tools and working areas are properly maintained and ready for use. Keep work surfaces clean and free of debris that could get into machine components and cause damage.

Be sure that your workshop or work area is properly ventilated and well lit.

Be sure any forklift, overhead crane or other lifting or supporting device is fully capable of supporting and stabilizing the weight to be lifted. Use only chains or straps that are in good condition and of ample capacity.

Be sure that fasteners intended for one time use (i.e., cotter pins and self-locking nuts) are not reused. These components may fail if they are used a second time.

Be sure to properly dispose of old oil or other fluids. Use an approved container. Please be environmentally safe.

1.2 GENERAL REMARKS

Most accidents occurring while working, servicing or maintaining operation machines, are caused by not complying with the basic safety precautions.
Therefore, it is necessary to pay steady attention to the potential hazards and the effects that may come of operations carried out on the machine.

CAUTION

If you recognise hazardous situations, you can prevent accidents!

For instance, this handbook makes use of special **safety symbols** to highlight potentially hazardous situations.

⚠CAUTION

The instructions given in this handbook are the ones established by GENIE. They do not exclude other safe and most convenient ways for the machine commissioning, operation and maintenance that take into account the available spaces and means.

If you decide to follow instructions other than those given in this manual, you must:

- be sure that the operations you are going to carry out are not explicitly forbidden;
- be sure that the methods are safe and in compliance with the indications given in this section;
- be sure that the methods cannot damage the machine directly or indirectly or make it unsafe;
- contact GENIE Assistance Service for any suggestion and the necessary written permission.

CAUTION

Do not hesitate to pose questions if you are in doubt! Contact GENIE: the assistance service is at your disposal. Addresses, phone and fax numbers are given in the cover and in the title-page of this manual.

1.3 SERVICEMEN'S REQUISITES

The operators who use the machine regularly or occasionally (e.g. for maintenance or transport) shall have the following requisites:

health:
before and during any operation, operators shall never take alcoholic beverages, medicines or other substances that may alter their psycho-physical conditions and, consequently, their working abilities.

physical:
good eyesight, acute hearing, good co-ordination and ability to carry out all required operations in a safe way, according to the instructions of this manual.

mental:
ability to understand and apply the rules, regulations and safety precautions. They shall be careful and sensible for their own as well as for the others' safety and shall desire to carry out the work correctly and in a responsible way.

emotional:
they shall keep calm and always be able to evaluate their own physical and mental conditions.

training:
they shall read and familiarise with this handbook, its enclosed graphs and diagrams, the identification and hazard warning plates. They shall be skilled and trained about the machine use.

CAUTION

It is recommended to take part in at least one technical training course organised by GENIE Assistance Office.

CAUTION

Ordinary and extraordinary maintenance of the machineare quite complex from a technical point of view and should be performed by an authoirsed service centre.

1.3-1 PERSONAL PROTECTIVE EQUIPMENT

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

- Overalls or any other comfortable garments. Operators should wear neither clothes with large sleeves nor objects that can get stuck in moving parts of the machine
- Protective helmet when working under or in the vicinity of suspended load
- Protective gloves
- Working shoes
- Breathing set (or dust mask)
- Ear-protectors or equivalent equipment
- Goggles or facial screen.

CAUTION

Use only type-approved protective equipment in good condition.

1.4 SAFETY PRECAUTIONS

⚠DANGER

Read and understand the following safety instructions before servicing the machine.
The following list contains safety rules which must absolutely be obeyed to prevent accidents and injuries.

1.4-1 WORKING AREA

- Make sure the area all around the machine is safe. Always be aware of potential risks.
- During work, keep the working area in order. Never leave objects scattered: they could hinder the machine movements and represent a danger for personnel.

1.4-2 PRECAUTIONS DURING WORK

- Do not walk or stop under raised loads or machine parts supported by hydraulic cylinders or ropes only.
- Keep the machine handholds and access steps always clean from oil, grease or dirt to prevent falls or slips.
- When entering/leaving the cab or other raised parts, always face the machine; never turn the back.
- When carrying out operations at hazardous heights (***over 3 meters from the ground***), always use type-approved safety belts or fall preventing devices.
- Do not enter/leave the machine when it is running.
- Before servicing the engine, let its parts cool down.
- Do not leave the driving place when the machine is running.
- Neither stop nor carry out interventions under or between the machine wheels when engine is running. When maintenance in this area is needed, stop the engine, engage the parking brake and chock the wheels to prevent accidental movements.
- Do not carry out maintenance or repair works without a sufficient lighting.
- When using the machine lights, the beam should be oriented in order not to blind the personnel at work.
- Before applying voltage to electric cables or components, ensure they are properly connected and efficient.
- Do not carry out interventions on electric components with voltage over 48V.

- Do not connect wet plugs or sockets.
- Signs and stickers shall never be removed, hidden or become unreadable.
- Except for maintenance purposes, do not remove safety devices, covers, guards,. Should their removal be necessary, stop the engine, remove them with the greatest care and always remember to refit them before starting the engine and using the machine again.
- Aleays stop the engine and disconnect the batteries before maintenance or service.
- Do not lubricate, clean or adjust moving parts.
- Do not carry out operations manually when specific tools are provided for this purpose.
- Absolutely avoid to use tools in bad conditions or in an improper way.
- Before carrying out operations on hydraulic lines under pressure (hydraulic oil, compressed air) and/or before disconnecting hydraulic components, ensure the relevant line has been previously depressurised and does not contain any hot fluid.

⚠ DANGER

Any intervention on the hydraulic or pneumatic circuit must be carried out by authorised personnel. Before any operation on lines under pressure, release any residual pressure from the circuit.
Do not use your fingers to check for pressure leaks. Fine jets of air, oil or fuel can injure you.

- Neither smoke nor use open flames if there is a risk of fire or close to fuel, oil or batteries.
- Do not leave fuel cans or bottles in unsuitable places.
- Do not empty catalytic mufflers or other vessels containing burning materials without taking the necessary precautions.
- Carefully handle all flammable or dangerous substances.
- After any maintenance or repair work, make sure that no tool, cloth or other object has been left within compartments with moving parts or in which suction and cooling air circulates.
- Never give orders to several people at a ime. Instructions and signs must be given by one person only.
- Always pay the due attention to the instructions given by the foreman.
- Never distract the operator during working phases or crucial manoeuvres.
- Do not call an operator suddenly, if unnecessary.
- Do not frighten an operator or throw objects by no means.
- After work, never leave the machine under potentially dangerous conditions.

NOTICE

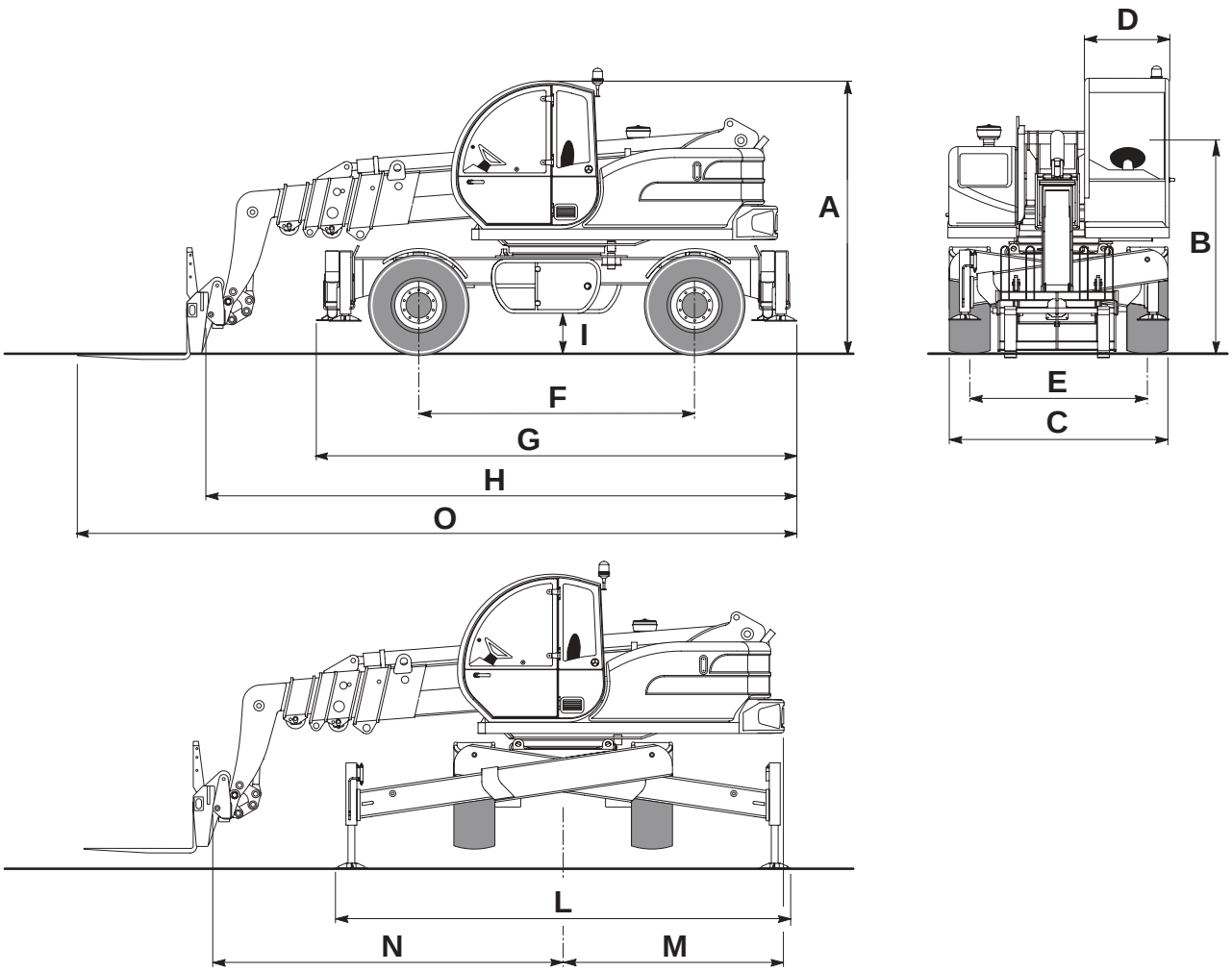
Treatment and disposal of used oils is subject to federal, national and local laws and regulations. Collect and deliver these wastes to authorised centres.

- Use the assistance of a second person to handle loads weighing 30 to 50 kg.
- For loads over 50 kg, the use of special hoisting equipment in good condition and equipped as per enforced regulations is mandatory.

Section 2
TECHNICAL SPECIFICATIONS

SECTION INDEX

2.1 MAIN DIMENSIONS



			Gyro 4020	Gyro 4518
A	Overall height	mm	3020	3020
B	Height to the steering wheel	mm	2135	2135
C	Overall width	mm	2430	2430
D	Cab width	mm	910	910
E	Track	mm	1950	1950
F	Wheel-base	mm	3030	3030
G	Length to the front tyres	mm	5280	5280
H	Length to the attachment holding plate	mm	7085	6485
I	Ground clearance	mm	440	440
L	Max width with extended outriggers	mm	5015	5015
M	Rear reach from the rotation centre	mm	2425	2425
N	Front reach from the rotation centre	mm	4445	3485
O	Length to the forks	mm	8500	7900

2.2 TYRES

			Gyro 4020	Gyro 4518
•	Dimensions		18-19.5	18-19.5
•	- P. R. (or load index)		16	16
•	- Rim		14x19.5	14x19.5
•	- Wheel disc		10 holes DIN 70361	
•	- Pressure	bar/Psi	6/87	6/87

2.3 LIMIT OF USE

			Gyro 4020	Gyro 4518
•	Angle of approach	°	20	20
•	Departure angle	°	20	20
•	Min/max ambient temperature	°C	-20÷+46	-20÷+46

2.4 WEIGHT

			Gyro 4020	Gyro 4518
•	Weight in working order	kg	15200	14800

2.5 SPEED

			Gyro 4020	Gyro 4518
•	Working speed (*)	km/h	5	5
•	Travel speed	km/h	32	32
•	Max. slope with full load	%	40	45

(*) either forward or reverse motion

2.6 PAYLOAD AND REACH

			Gyro 4020	Gyro 4518
•	Max lifting height:			
	with outriggers	mm	19645	17250
	without outriggers	mm	19395	17000
•	Reach at max height	mm	4180	3650
•	Max reach forward	mm	17415	14900
•	Attachment holding plate rotation	°	145	145
•	Payload at max height with outriggers	kg	2500	3000
•	Payload at max. front reach with outriggers	kg	250	750
•	Payload at max. side reach with outriggers	kg	250	750

2.7 FORKS (floating type)

			Gyro 4020	Gyro 4518
•	Dimensions	mm	1200x130x50	1200x130x50
•	Weight	kg	70	70
•	Fork holding frame - class		FEM III	FEM III

2.8 DIESEL ENGINE

			Gyro 4020	Gyro 4518
•	Make		DEUTZ	DEUTZ
•	Model/Type		BF4M 2012	BF4M 2012
•	Features		Diesel, 4 cylinders in line 4 strokes, direct injection	
•	Bore x Stroke	mm	101x126	101x126
•	Total displacement	cc	4038	4038
•	Power at 2300 rpm (*)	kW	74,9	74,9

(*) gross power calculated according to DIN/SO 3046 IFN

2.9 ELECTRICAL SYSTEM

			Gyro 4020	Gyro 4518
•	Voltage	V	12	12
•	Self-regulated alternator	V	14	14
•	Starting motor (power)	kW	3	3
•	Battery	Ah	160	160

2.10 MACHINE SOUND LEVELS

			Gyro 4020	Gyro 4518
•	Guaranteed sound power level (in accordance with the Directive 2000/14/CE)	dB	Lwa = ...	
•	Measured sound pressure level (in accordance with the Directive 98/37/CE)	dB	Lpa = ...	

2.11 VIBRATION LEVELS

			Gyro 4020	Gyro 4518
•	Average level of transmitted vibrations (*)	m/s^2	< 2.5	< 2.5

(*) Values calculated in accordance with standard prEN13059

CAUTION

This is a Class A device. In a residential environment, such device can cause radio disturbance. In such cases, the operator is required to take suitable measures.

2.12 REFUELLING

			Gyro 4020	Gyro 4518
•	Diesel engine	l	10,3	10,3
•	Engine cooling system	l	45	45
•	Fuel tank	l	145	145
•	Hydraulic oil tank	l	230	230
•	Gearbox	l	2,7	2,7
•	Differential gears	l	8,5	8,5
•	Wheel reduction gears	l	0,6	0,6
•	Turret rotation reduction gear	l	2,8	2,8

Products:

Engine oil: **SHELL RIMULA SAE 15W-40 (API CH-4 / CG-4 / CF-4 / CF, ACEA E3, MB 228.3)**

Gearbox-Differential gears-Reduction gears (but for turntable rotation): **TRACTORENAULT THFI 208 LF SAE 80W (API GL-4 / FORD M2C 86B - Massey Ferguson M 1135)**

Turntable rotation reduction gear: **SHELL OMALA 150 (DIN 51 517-3 CLP, ISO 12295-1 TYPE CKC, US STEEL 224, DAVID BROWN 51.53.101)**

Hydraulic system and brakes: **SHELL TELLUS T 46 (DENISON HF-1 DIN 51524 part. 2 e 3)**

2.13 TIGHTENING TORQUES

Thread diameter	Pitch	Wrench measure mm				Tightening torques Material class					
		S	S			8.8		10.9		12.9	
			UNI	UNI	UNI	Normal	Galvanized	Normal	Galvanized	Normal	Galvanized
mm	mm		5931/32	5933÷36	5923÷30	Nm	Nm	Nm	Nm	Nm	Nm
4	0,7	7	3	2,5	2	3,2	2,8	4,4	3,9	5,3	4,8
5	0,8	8	4	3	2,5	6,1	5,5	8,7	7,8	10,3	9,3
6	1	10	5	4	3	10,6	9,5	14,8	13,3	17,8	16,0
8	1,25	13	6	5	4	25,1	22,5	35,4	31,8	42,5	30,2
	1	13	6	5	4	26,5	23,8	37,3	33,5	44,7	40,3
10	1,5	17	8	6	5	51,1	46,0	71,9	64,7	86,3	77,6
	1,25	17	8	6	5	53,4	48,1	75,1	67,5	90,2	81,1
12	1,75	19	10	8	6	86,5	77,8	121,4	109,2	145,9	131,3
	1,25	19	10	8	6	92,4	83,2	129,5	116,6	156,1	140,5
14	2	22	12	10	6	137,7	123,9	193,8	174,4	232,6	209,3
	1,5	22	12	10	6	145,9	131,3	206,1	185,5	246,9	222,0
16	2	24	14	10	8	209,1	188,2	293,8	264,4	353,0	317,7
	1,5	24	14	10	8	218,3	196,5	308,1	277,3	369,3	332,4
18	2,5	27	14	12	8	288,7	259,8	406,1	365,5	487,7	436,9
	1,5	27	14	12	8	314,2	282,8	442,8	398,5	530,6	477,5
20	2,5	30	17	12	10	408,1	367,3	573,4	516,1	687,7	618,9
	1,5	30	17	12	10	439,7	395,8	619,3	557,4	742,8	662,5
22	2,5	32	17	-	12	542,3	488,5	763,2	686,9	915,3	823,7
	1,5	32	17	-	12	582,6	524,3	819,3	737,4	983,6	885,3
24	3	36	19	-	12	705,1	634,5	990,8	891,7	1193,3	1074,4
	2	36	19	-	12	745,3	671,3	1051,0	945,9	1255,1	1129,5
27	3	41	19	-	-	1036,0	927,5	1448,9	1304,0	1734,6	1561,2
	2	41	19	-	-	1091,8	982,6	1530,6	1377,5	1836,7	1653,0
30	3,5	46	22	-	-	1307,9	1258,1	1989,3	1772,4	2357,1	2121,4
	2	46	22	-	-	1510,2	1359,1	2122,4	1910,2	2540,8	2286,7
33	3,5	50	24	-	-	2000,0	1800,0	2800,0	2520,0	3400,0	3060,0
	2	50	24	-	-	1610,0	1450,0	2300,0	2070,0	2690,0	2420,0
36	4	55	27	-	-	2600,0	2340,0	3700,0	3330,0	4300,0	3870,0
	3	55	27	-	-	2800,0	2520,0	3900,0	3510,0	4600,0	4140,0
39	4	60	27	-	-	3400,0	3060,0	4800,0	4320,0	5600,0	5040,0
	3	60	27	-	-	3600,0	3240,0	5100,0	4590,0	5900,0	5310,0

Thread diameter	Pitch	Standard nuts		Low nuts	
		5S Nm	8G Nm	5S Nm	8G Nm
4	0,7	5,5		3,5	
5	0,8	5,5		3,5	
6	1	9,5	13,0	6,0	8,0
8	1,25	23,0	32,0	14,0	20,0
	1	25,0	35,0	16,0	22,0
10	1,5	46,0	64,0	29,0	40,0
	1,25	49,0	68,0	31,0	42,0
12	1,75	80,0	110,0	50,0	69,0
	1,25	88,0	125,0	55,0	78,0
14	2	125,0	180,0	78,0	110,0
	1,5	140,0	195,0	88,0	120,0
16	2	195,0	275,0	120,0	170,0
	1,5	210,0	295,0	130,0	185,0
18	2,5	270,0	390,0	170,0	245,0
	1,5	305,0	425,0	190,0	265,0
20	2,5	305,0	540,0	190,0	340,0
	1,5	425,0	600,0	260,0	375,0
22	2,5	510,0	720,0	320,0	450,0
	1,5	570,0	800,0	360,0	500,0
24	3	660,0	930,0	410,0	580,0
	2	720,0	1000,0	450,0	630,0
27	3	980,0	1400,0	610,0	880,0
	2	1050,0	1500,0	660,0	940,0
30	3,5	1350,0	1850,0	850,0	1160,0
	2	1450,0	2050,0	910,0	1280,0
33	3,5	1650,0	2310,0	1050,0	1470,0
	2	1980,0	2770,0	1270,0	1780,0
36	4	2120,0	2970,0	1360,0	1900,0
	3	2550,0	3570,0	1630,0	2280,0
39	4	2730,0	3820,0	1750,0	2450,0
	3	3250,0	4550,0	2080,0	2910,0

2.14 DRILL DIAMETERS FOR THREADS

Thread x pitch	*DRILL DIAMETER LIMITS*		*DRILL BIT DIAMETER*
	max	*min*	
M 4 x 0,7	3,42	3,24	3,30
x 0,5	3,60	3,46	3,50
M 5 x 0,8	4,33	4,13	4,20
x 0,5	4,60	4,46	4,50
M 6 x 1	5,15	4,92	5,00
x 0,75	5,38	5,19	5,20
M 8 x 1,25	6,91	6,65	6,80
x 1	7,15	6,92	7,00
M 10 x 1,5	8,87	8,38	8,50
x 1,25	9,38	9,19	9,20
M 12 x 1,75	10,44	10,10	10,20
x 1,5	10,68	10,38	10,50
M 14 x 2	12,21	11,83	12,00
x 1,5	12,68	12,38	12,50
M 16 x 2	14,21	13,84	14,00
x 1,5	14,68	14,38	14,50
M 18 x 2,5	15,74	15,29	15,50
x 1,5	16,68	16,38	16,50
M 20 x 2,5	17,74	17,29	17,50
x 1,5	18,68	18,38	18,50
M 22 x 2,5	19,74	19,29	19,50
x 1,5	20,68	20,38	20,50
M 24 x 3	21,25	20,75	21,00
x 2	22,21	21,83	22,00
M 27 x 3	24,25	23,75	24,00
x 2	25,21	24,83	25,00
M 30 x 3,5	26,77	26,21	26,50
x 3	27,25	26,75	27,00
M 33 x 3,5	27,77	29,21	29,50
x 2	31,21	30,83	31,00
M 36 x 4	32,27	31,65	32,00
x 3	33,25	32,75	33,00
M 39 x 4	35,27	34,67	35,00
x 3	36,25	35,75	36,00

2.15 STANDARD TIGHTENING TORQUES FOR FITTING SEALS

■ 60° CONICAL SEALS

Thread diameter		TIGHTENING TORQUES (0+10%)
inc.	mm	60° CONICAL SEALS Nm
G 1/8"		15
G 1/4"	M 10 x 1	20
9/16"-18		25
11/16"-16		40
13/16"-16		55
3/4"-16		62
1"-14		80
7/8"-14		80
1.1/16"-12		110
1.3/16"-12		115
1.5/16"-12		160
1.7/16"-12		130
1.11/16"-12		190
1.5/8"-12		225
1.7/8"-12		270
2"-12		245
2.1/4"-12		360

■ FRONT O-LOK (Parker) SEALS

Thread diameter		TIGHTENING TORQUES (0+10%)
inc.	mm	FRONT O-LOK (Parker) SEALS Nm
9/16"-18		25
11/16"-16		40
13/16"-16		55
1"-14		80
1.3/16"-12		115
1.7/16"-12		130
1.11/16"-12		190
2"-12		245

■ 37° COUNTER-SUNK CONICAL SEALS (JIC)

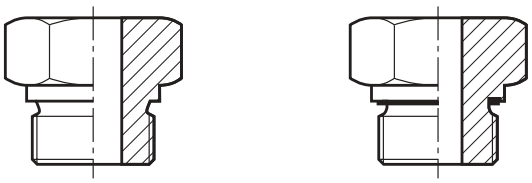
Thread diameter		TIGHTENING TORQUES (0+10%)
inc.	mm	37° CONICAL SEALS (JIC) Nm
7/16"-20	M10x1	15
1/2"-20	M12x1.5	20
9/16"-18	M14x1.5	28
	M16x1.5	62
3/4"-16	M18x1.5	62
7/8"-14	M22x1.5	80
1.1/16"-12	M27x2	110
1.3/16"-12		141
1.5/16"-12	M33x2	160
1.5/8"-12	M42x2	225
1.7/8"-12	M48x2	270
2.1/4"-12	M10x1	360

■ SEALS WITH GRIP-RING

Thread diameter				TIGHTENING TORQUE (0+10%) SEALS WITH GRIP-RING
inc.	mm	Fitting Series	Pipe ø mm	Nm
G 1/8"	M10x1	LL	4	10
G 1/8"	M10x1	LL	6	10
G 1/8"	M10x1	L	6	25
G 1/4"	M12x1.5	L	8	50
G 1/4"	M14x1.5	L	10	50
G 1/8"	M20x1.5	L	12	130
G 1/8"	M20x1.5	L	15	190
G 1/8"	M20x1.5	L	18	245
G 1/8"	M20x1.5	L	22	130
G 1/8"	M20x1.5	L	28	190
G 1/8"	M20x1.5	L	35	245
G 1/8"	M20x1.5	L	42	245
G 1/4"	M12x1.5	S	6	50
G 1/4"	M14x1.5	S	8	50
G 3/8"	M16x1.5	S	10	80
G 3/8"	M18x1.5	S	12	80
G 1/2"	M22x1.5	S	16	105
G 3/4"	M27x2	S	20	220
G 1"	M33x2	S	25	370
G 1.1/4"	M42x2	S	30	500
G 1.1/2"	M48x2	S	38	600

■ FITTING ASSEMBLY

Thread diameter		TIGHTENING TORQUES (0+10%) JOINTS	
		A	B
inc.	mm	Nm	Nm
G 1/8"	M10x1	25	12
	M12x1.5	30	18
G 1/4"		40	18
	M14x1.5	50	20
	M16x1.5	60	35
	M18x1.5	80	50
G 3/8"		95	40
	M20x1.5	140	60
G 1/2"	M22x1.5	140	75
	M26x1.5	220	85
G 3/4"		250	110
	M27x2	250	100
G 1"		400	190
	M33x2	400	150
G 1.1/4"		600	240
	M42x2	600	260
G 1.1/2"		800	300
	M48x2	800	350



A **B**

A Male face
Mechanical seal or copper washer

B Male face
Soft seal with O-ring

2.16 LOCKING MATERIAL

THREAD LOCKERS

Product	*APPLICATION*	*Characteristics* *Temp. °C*	*Thread*	*Locking speed*	*Resistance*
Loctite 290	Thread locking	to 150°	M 12	Rapid	Medium
Loctite 222	Thread locking	to 150°	M 20	Moderate	Low
Loctite 243	Thread locking	to 150°	M 20	Rapid	Medium
Loctite 262	Thread locking	to 150°	M 20	Moderate	High
Loctite 270	Thread locking	to 150°	M 20	Moderate	Very high
Loctite 277	Thread locking	to 150°	M 36	Slow	High
Loctite 272	Thread locking	to 200°	M 36	Slow	High

THREAD SEALANT *For hermetic sealing. Not suitable for thermoplastic materials*

Product	*APPLICATION*	*Characteristics* *max °C*	*Thread max*	*type*	*Locking speed*	*Disassembly difficulty*
Loctite 511	Fitting sealant	150°	M80	Con./Cyl.	Rapid	Low
Loctite 542	Fitting sealant	150°	M36	Con./Cyl.	Rapid	Moderate
Loctite 545	Fitting sealant	150°	M36	Con./Con.	Moderate	Low
Loctite 565	Fitting sealant	150°	M80	Con./Cyl.	Instantaneous	Low
Loctite 572	Fitting sealant	150°	M80	Con./Cyl.	Moderate	Low
Loctite 577	Fitting sealant	150°	M80	Con./Cyl.	Rapid	Moderate

GASKETS *Total sealing in 24-72 hours*

Product	*APPLICATION*	*Characteristics* *max °C*	*Play max mm*	*Formation time*	*Resistance to fluids*
Loctite 518	Formed-in-place gasket	150°	0,5	Moderate	Excellent
Loctite 509	Formed-in-place gasket	150°	0,2	Moderate	Excellent
Loctite 573	Formed-in-place gasket	150°	0,2	Slow	Excellent
Loctite 574	Formed-in-place gasket	150°	0,5	Rapid	Excellent
Loctite 510	Formed-in-place gasket	200°	0,2	Moderate	Excellent
Loctite 5699	Formed-in-place gasket	200°	6,0	Rapid	Excellent
Loctite 5999	Formed-in-place gasket	200°	6,0	Instantaneous	Excellent
Loctite 5910	Formed-in-place gasket	200°	6,0	Rapid	Excellent
Loctite 5900	Formed-in-place gasket	200°	6,0	Instantaneous	Excellent
Loctite 5920	Formed-in-place gasket	250°	M 36	Slow	Good

2.17 HOISTING INSTRUCTIONS

⚠ DANGER

All parts weighing more than 25 kg MUST COMPULSORILY be handled with suitable hoisting means.
In the Disassembly and Assembly section there is a clear indication of the weight of the part to handle, while chapter A.12 contains a summary table with the weight of the single components.

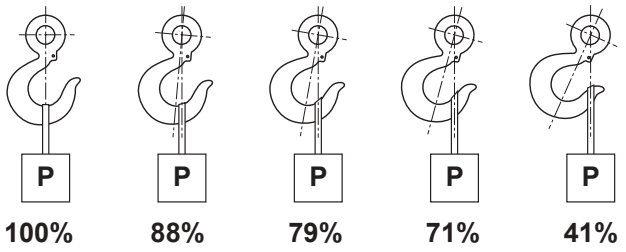
Before removing parts of the machine, make sure that:
- all fixing bolts have been removed
- all hydraulic and electrical parts have been disconnected
- the part to be removed is not blocked.

STRANDED ROPES
- Use ropes or other hoisting accessories suitable to the weight of the part to be handled. For ropes, refer to the following table:

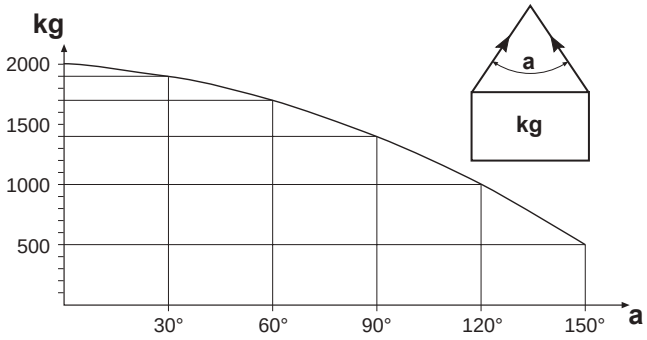
STRANDED ROPES	
Rope diameter mm	Max admissible load kg
10	1000
11.2	1400
12.5	1600
14	2200
16	2800
18	3600
20	4400
22.4	5600
30	10000
40	18000
50	28000
60	40000

The value of the admissible load has been considered as equal to 1/6 the rope breaking load.

- Attach the load to the natural seat of the hook. Attaching a load to an end can cause the load to fall down during raising and result in serious injury.



- Do not attach a heavy load to ropes forming a wide suspension angle. The total capacity of the ropes reduces proportionally to the angle as shown in the following chart.



2.18 ADVICE TO RENEW FLEXIBLE HOSES

NOTICE

Before disconnecting a hydraulic pipe, place containers of suitable size underneath to prevent oil spillage.

CAUTION

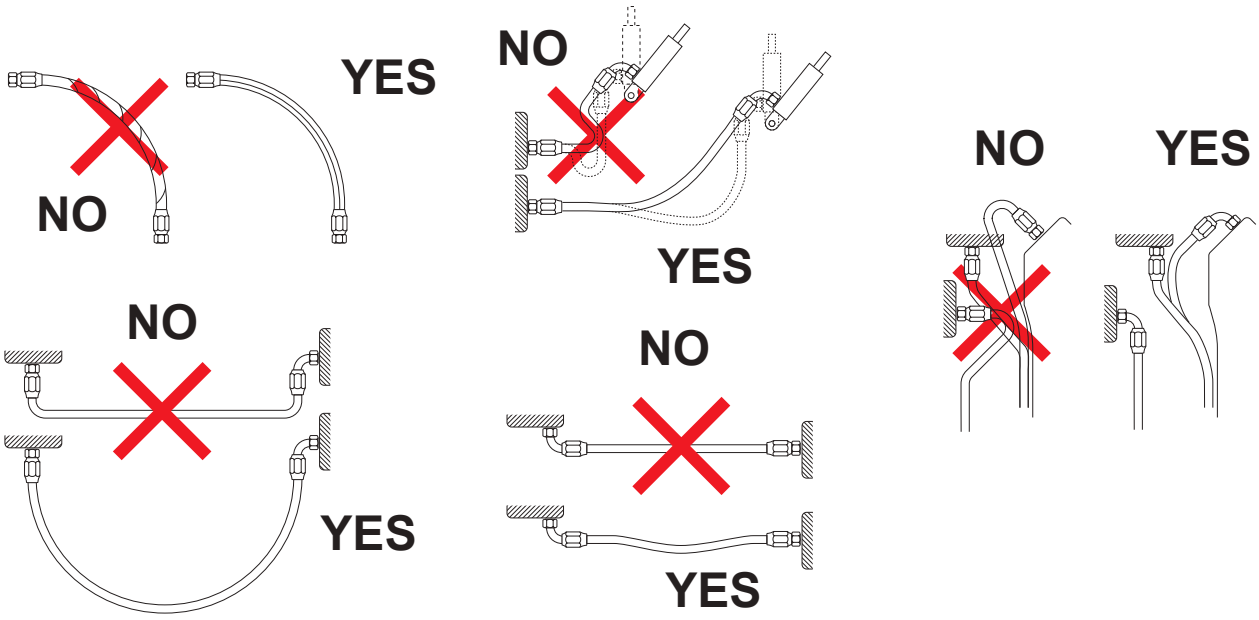
Plug all disconnected parts to prevent dust or impurities from entering the circuit. They can cause serious damage.

⚠ DANGER

Before disconnecting the hydraulic pipe, check that there is no residual pressure. In case, eliminate the pressure operating the control levers with the engine stopped.
In any case, disconnect the hydraulic pipe with extreme caution and always wear suitable personal protection equipment -e.g. goggles, gloves, facial screen, etc.
Wrap up the end of the pipe to be disconnected with some rags and slowly loosen the pipe connector so that air comes out as slow as possible.

1 Before disconnecting or refitting a flexible hose, carefully clean the area all around.
2 Blow some compressed air to remove any impurity.
3 For an easier renewal of the hoses, whose run is not clearly visible, proceed as follows:
- disconnect the hose to be replaced from both sides
- tie a cord to one end of the hose
- remove the hose pulling the cord until it comes out completely
- untie the cord and tie it to the new hose
- pull the cord from the other side to refit the hose until reaching the connecting point to the line.

Useful advice for mounting flexible hoses:



2.19 LISTS OF RECOMMENDED SPARE PARTS

Gyro 4020

Code	Description	Q.ty
09.4610.0022	Cylinder	2
07.0740.0050	Handle	1
07.0740.0192	Lock	1
04.4240.0024	Valve	4
636519	Seals kit	4
07.0740.0186	Lever-fitted lock	1
07.0740.0066	Filter	1
07.0740.0087	Glass	1
07.0740.0088	Wiper arm	1
07.0740.0089	Wiper blade	1
07.0740.0104	Door stop	1
07.0740.0202	Driving mirror	1
07.0740.0157	Wiper blade	1
07.0740.0119	Heater	1
07.0740.0218	Tap	1
09.4610.0002	Driving mirror	2
09.4661.0015	Plug	1
09.4661.0014	Plug	1
639981	Seals kit	4
54.0702.0027	Sliding guide	12
638337	Seals kit	4
695971	Sliding guide	12
54.0200.0000	Bushing	26
54.0702.0024	Sliding guide	2
695970	Sliding guide	4
695959	Sliding guide	2
695957	Sliding guide	2
695959	Sliding guide	4
02.0117.0101	Grease nipple	2
04.0605.0363	Flex hose	1
04.0605.0364	Flex hose	1
07.0738.0000	Star wheel	4
09.0803.0281	Mud-guard	2
09.0803.0290	Mud-guard	2
07.0728.0006	Seals kit	2
04.4239.0030	Valve	4
54.0702.0036	Sliding guide	10
54.0702.0034	Sliding guide	10
09.4605.0006	Plug	1
09.4605.0005	Tank	1
09.4656.0006	Gas pedal	1
09.0803.0295	Guard	1
638004	Seals kit	1
07.0730.0034	Seals kit	1
06.0401.0219	O-ring	8
04.4229.0040	Flex hose	1
04.4229.0041	Flex hose	1
04.4229.0043	Flex hose	1
04.4229.0042	Flex hose	1
07.0742.0011	Oil seal	2

Code	Description	Q.ty
07.0706.0043	Seals kit	1
07.0723.0354	Fan	1
640591	Bushing	2
04.4239.0000	Valve	1
640536	Seals kit	1
07.4529.0063	Seals kit	1
07.4529.0065	Seals kit	1
04.4239.0078	Valve	1
54.0001.0001	Pin	2
07.0703.0421	Road/Jobsite selector key	1
07.0740.0050	Handle	1
07.0740.0051	Lever-fitted lock	1
07.0740.0029	Handle	1
07.0703.0125	Key	1
07.0740.0041	Glass	1
07.0709.0497	Articulated tie rod	2
07.0709.0419	Seals kit	1
637536	Seal	2
07.0736.0000	Cable	1

Gyro 4020 electrical components

Code	Description	Q.ty
04.4240.0041	Solenoid	4
07.0728.0007	Solenoid	2
56.0016.0043	Control lever	1
07.0741.0011	Pushbutton	1
07.0741.0010	Cap	1
56.0021.0051	Linde control unit	1
56.0010.0032	Right front light	1
56.0009.0001	Horn	1
56.0013.0004	Sensor	4
56.0010.0030	Left rear light	1
56.0010.0031	Right rear light	1
56.0010.0005	Beacon	1
07.0703.0384	Bulb	1
09.4661.0005	Level indicator	1
07.0703.0418	Turn signals lever	1
07.0703.0436	Speed lever	1
04.4656.0008	Selector	1
07.0741.0012	Dead man button	2
07.0703.0441	Emergency pushbutton	1
56.0016.0042	Control lever	1
07.0740.0072	Wiper motor	1
07.0728.0007	Solenoid	16
637650	Fuse - 3A	2
07.0703.0193	Fuse - 5A	1
634972	Fuse - 7,5A	4
634974	Fuse - 10A	15
634973	Fuse - 15A	5
07.0703.0485	Relay	22
07.0703.0488	Relay	1

Code	Description	Q.ty
07.0703.0487	Relay	1
56.0021.0047	Card	1
05.4329.0000	Accumulator	2
07.0705.0089	Solenoid	1
05.4329.0017	Pressure switch	1
07.0742.0008	Solenoid	2
627043	Solenoid	1
07.0742.0009	Solenoid	1
07.0741.0027	Solenoid	1
56.0013.0000	Sensor	1
07.0722.0013	Solenoid	1
07.0741.0006	Solenoid	1
56.0017.0003	Switch	1
07.0703.0029	Ignition switch	1
07.0703.0577	Contact	1
07.0709.0442	Security switch	1
56.0013.0015	Sensor	1
56.0012.0016	Micro-switch	2
56.0012.0010	Micro-switch	2
56.0012.0021	Sensor	2
07.0709.0730	Sensor	2
56.0005.0000	Fuse	1
07.0703.0069	Fuse - 30A	1
07.0703.0192	Relay	2
07.0703.0535	Relay	1
641143	Fuse	1
05.4329.0002	Pressure switch	1
05.4329.0001	Pressure switch	1
56.0013.0004	Sensor	1
56.0013.0000	Transmitter	1
56.0013.0006	PNA 10A pressure switch	1
56.0012.0000	Sensor	3
07.0703.0486	Relay	4
634973	Fuse - 15A	1

Gyro 4020 filters

Code	Description	Q.ty
07.4501.0070	Oil filter	1
07.4501.0071	Fuel filter	1
07.0700.0020	Cartridge	1
639399	Safety cartridge	1
639400	Cartridge	1
07.0700.0002	Filter cartridge	1

Gyro 4518

Code	Description	Q.ty
09.4610.0022	Cylinder	2
07.0740.0050	Handle	1
07.0740.0192	Lock	1
04.4240.0024	Valve	4
636519	Seals kit	4
07.0740.0186	Lever-fitted lock	1
07.0740.0066	Filter	1
07.0740.0087	Glass	1
07.0740.0088	Wiper arm	1
07.0740.0089	Wiper blade	1
07.0740.0104	Door stop	1
07.0740.0202	Driving mirror	1
07.0740.0157	Wiper blade	1
07.0740.0119	Heater	1
07.0740.0218	Tap	1
09.4610.0002	Driving mirror	2
09.4661.0015	Plug	1
09.4661.0014	Plug	1
639981	Seals kit	4
54.0702.0027	Sliding guide	12
638337	Seals kit	4
695971	Sliding guide	12
54.0200.0000	Bushing	26
54.0702.0024	Bushing guide	2
695970	Sliding guide	4
695959	Sliding guide	2
695957	Sliding guide	2
695959	Sliding guide	4
02.0117.0101	Grease nipple	2
04.0605.0363	Flex hose	1
04.0605.0364	Flex hose	1
07.0738.0000	Star wheel	4
09.0803.0281	Mud-guard	2
09.0803.0290	Mud-guard	2
07.0728.0006	Seals kit	2
04.4239.0030	Valve	4
09.4605.0006	Plug	1
09.4605.0005	Tank	1
09.4656.0006	Gas pedal	1
09.0803.0295	Guard	1
638004	Seals kit	1
07.0730.0034	Seals kit	1
06.0401.0219	O-ring	8
04.4229.0040	Flex hose	1
04.4229.0041	Flex hose	1
04.4229.0043	Flex hose	1
04.4229.0042	Flex hose	1
07.0742.0011	Oil seal	2
07.0706.0043	Seals kit	1
07.0723.0354	Fan	1
640591	Bushing	2
04.4239.0000	Valve	1

Code	Description	Q.ty
640536	Seals kit	1
07.4529.0063	Seals kit	1
07.4529.0065	Seals kit	1
04.4239.0078	Valve	1
54.0001.0001	Pin	2
07.0703.0421	Road/Jobsite selector key	1
07.0740.0050	Handle	1
07.0740.0051	Lever-fitted lock	1
07.0740.0029	Handle	1
07.0703.0125	Key	1
07.0740.0041	Glass	1
07.0709.0497	Articulated tie rod	2
07.0709.0419	Seals kit	1
637536	Seal	2
07.0736.0000	Cable	1

Gyro 4518 electrical components

Code	Description	Q.ty
04.4240.0041	Solenoid	4
07.0728.0007	Solenoid	2
56.0016.0043	Control lever	1
07.0741.0011	Pushbutton	1
07.0741.0010	Cap	1
56.0021.0051	Linde control unit	1
56.0010.0032	Right front light	1
56.0009.0001	Horn	1
56.0013.0004	Sensor	4
56.0010.0030	Left rear light	1
56.0010.0031	Right rear light	1
56.0010.0005	Beacon	1
07.0703.0384	Bulb	1
09.4661.0005	Level indicator	1
07.0703.0418	Turn signals lever	1
07.0703.0436	Speed lever	1
04.4656.0008	Selector	1
07.0741.0012	Dead man button	2
07.0703.0441	Emergency pushbutton	1
56.0016.0042	Control lever	1
07.0740.0072	Wiper motor	1
07.0728.0007	Solenoid	16
637650	Fuse - 3A	2
07.0703.0193	Fuse - 5A	1
634972	Fuse - 7,5A	4
634974	Fuse - 10A	15
634973	Fuse - 15A	5
07.0703.0485	Relay	22
07.0703.0488	Relay	1
07.0703.0487	Relay	1
56.0021.0047	Card	1
05.4329.0000	Accumulator	2
07.0705.0089	Solenoid	1

Code	Description	Q.ty
05.4329.0017	Pressure switch	1
07.0742.0008	Solenoid	2
627043	Solenoid	1
07.0742.0009	Solenoid	1
07.0741.0027	Solenoid	1
56.0013.0000	Sensor	1
07.0722.0013	Solenoid	1
07.0741.0006	Solenoid	1
56.0017.0003	Switch	1
07.0703.0029	Ignition switch	1
07.0703.0577	Contact	1
07.0709.0442	Security switch	1
56.0013.0015	Sensor	1
56.0012.0016	Micro-switch	2
56.0012.0010	Micro-switch	2
56.0012.0021	Sensor	2
07.0709.0730	Sensor	2
56.0005.0000	Fuse	1
07.0703.0069	Fuse - 30A	1
07.0703.0192	Relay	2
07.0703.0535	Relay	1
641143	Fuse	1
05.4329.0002	Pressure switch	1
05.4329.0001	Pressure switch	1
56.0013.0004	Sensor	1
56.0013.0000	Transmitter	1
56.0013.0006	PNA 10A pressure switch	1
56.0012.0000	Sensor	3
07.0703.0486	Relay	4
634973	Fuse - 15A	1

Gyro 4518 filters

Code	Description	Q.ty
07.4501.0070	Oil filter	1
07.4501.0071	Fuel filter	1
07.0700.0020	Cartridge	1
639399	Safety cartridge	1
639400	Cartridge	1
07.0700.0002	Filter cartridge	1

2.20 MACHINE PAINT COLOUR

STANDARD machines

GREY RAL 7012

WHITE RAL 1013

MAT BLACK RAL 9005 (from June 2004 for cylinders)

AUSA machines

ORANGE RAL 2004

GENIE machines

BLUE GENIE

GREY GENIE

BLACK RAL 9500

MZ IMER machines

ORANGE RAL 2010

2.21 CHECKING THE CYLINDER MOVEMENT TIMES

CAUTION

The check of the movement times of the cylinders shall be done with the hydraulic oil at a temperature of 60°.

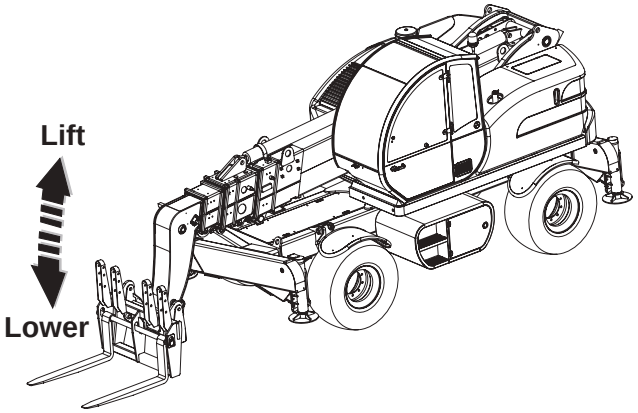
CAUTION

To check the engine speed, the area easy to reach is the external pulley of the output shaft.

BOOM LIFTING/LOWERING

Gyro 4020	Time (s)	
	up	down
Max engine speed	17	11
Min. engine speed	44	30

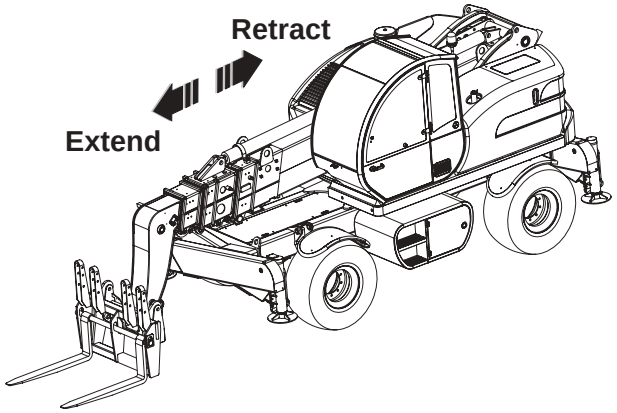
Gyro 4518	Time (s)	
	up	down
Max engine speed	17	11
Min. engine speed	44	30



BOOM EXTENSION/RETRACTION

Gyro 4020	Time (s)	
	out	in
Max engine speed	21,3	17,3
Min. engine speed	90	40

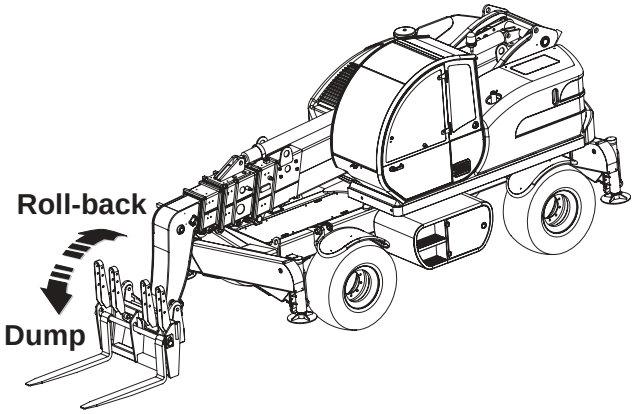
Gyro 4518	Time (s)	
	out	in
Max engine speed	21,3	17,3
Min. engine speed	90	40



ATTACHMENT DUMPING

Gyro 4020	Time (s)	
	roll-back	dumping
Max engine speed	3,8	3,7
Min. engine speed	12	8,6

Gyro 4518	Time (s)	
	roll-back	dumping
Max engine speed	3,8	3,7
Min. engine speed	12	8,6



VERTICAL MOVEMENT 1 OUTRIGGER

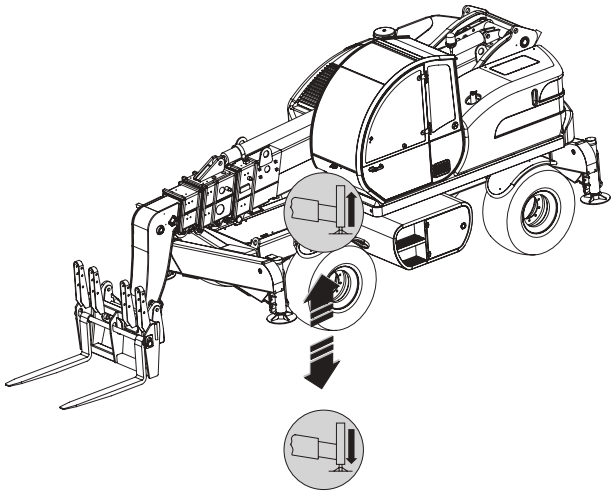
Gyro 4020	Time (s)	
	up	down
Max engine speed	4,6	3,6
Min. engine speed	4,6	6,3

Gyro 4518	Time (s)	
	up	down
Max engine speed	4,6	3,6
Min. engine speed	4,6	6,3

VERTICAL MOVEMENT 2 OUTRIGGERS

Gyro 4020	Time (s)	
	up	down
Max engine speed	5,7	5
Min. engine speed	6,8	11,7

Gyro 4518	Time (s)	
	up	down
Max engine speed	5,7	5
Min. engine speed	6,8	11,7



VERTICAL MOVEMENT 4 OUTRIGGERS

Gyro 4020	Time (s)	
	up	down
Max engine speed	7,3	8,3
Min. engine speed	11,5	23

Gyro 4518	Time (s)	
	up	down
Max engine speed	7,3	8,3
Min. engine speed	11,5	23

HORIZONTAL MOVEMENT - OUTRIGGERS

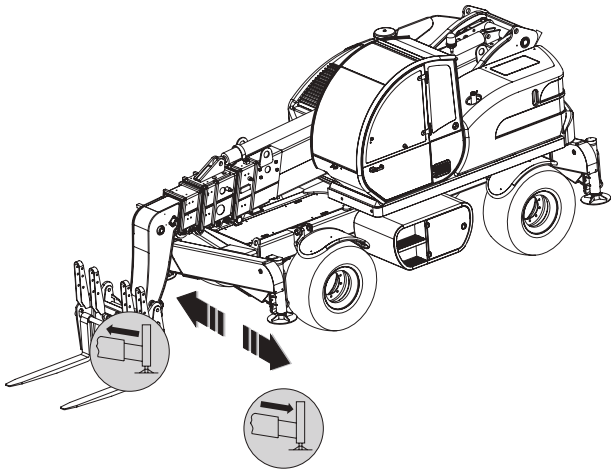
Gyro 4020	Time (s)	
	out	in
Max engine speed	**4,5**	**5,9**
Min. engine speed	**8**	**6,3**

Gyro 4518	Time (s)	
	out	in
Max engine speed	**4,5**	**5,9**
Min. engine speed	**8**	**6,3**

HORIZONTAL MOVEMENT - OUTRIGGERS

Gyro 4020	Time (s)	
	out	in
Max engine speed	**5,4**	**6,8**
Min. engine speed	**13,4**	**9**

Gyro 4518	Time (s)	
	out	in
Max engine speed	**5,4**	**6,8**
Min. engine speed	**13,4**	**9**



HORIZONTAL MOVEMENT - OUTRIGGERS

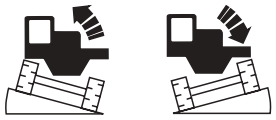
Gyro 4020	Time (s)	
	out	in
Max engine speed	**10**	**9**
Min. engine speed	**26,9**	**17**

Gyro 4518	Time (s)	
	out	in
Max engine speed	**10**	**9**
Min. engine speed	**26,9**	**17**

MACHINE SWAY

Gyro 4020	Time (s)	
	left to right	right to left
Max engine speed	**5**	**5**
Min. engine speed	**10**	**10**

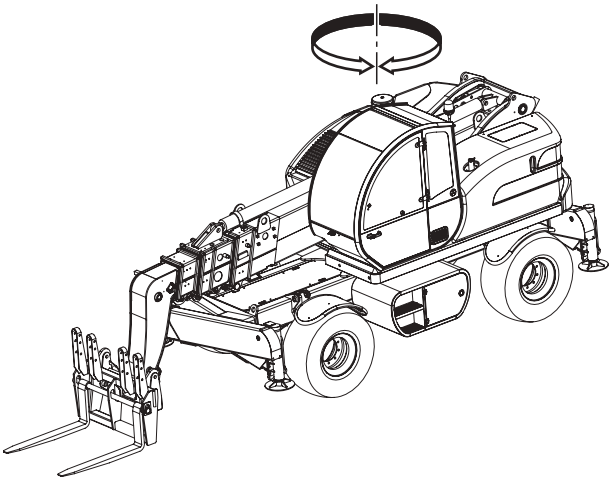
Gyro 4518	Time (s)	
	left to right	right to left
Max engine speed	**5**	**5**
Min. engine speed	**10**	**10**



TURNTABLE ROTATION

Gyro 4020	Time (s)
	360°
Max engine speed	**58**
Min. engine speed	**70**

Gyro 4518	Time (s)
	360°
Max engine speed	**58**
Min. engine speed	**70**



2.22 HYDRAULIC CALIBRATIONS

1. PRELIMINARY OPERATIONS

Warm up the hydraulic oil to 60°C by keeping one of the elements of the boom distributor to full stroke under pressure.
To reach this temperature in a faster way, cover the oil core of the radiator with a carton in the case of a water-oil combined cooler, or the oil radiator if the machine is equipped with a separate oil radiator.

2. SETTING THE BOOM DISTRIBUTOR

Find the manometer mini-socket **ref. 30** on the **Tecnord** distributor (encl. **1**).

2.1 SETTING THE STAND-BY

Connect a 0-60bar manometer to the mini-socket **ref. A**.
Calibrate valve **B** (encl. **4**) on the pump to 40 bar.

CAUTION

The operation shall be carried out with the engine running at idle and without moving any lever of the main valve.

2.2 SETTING THE DISTRIBUTOR PRESSURE CONTROL VALVE

- Remove the 0-60bar pressure gauge from the mini-socket **ref. A** and fit a 0-400bar pressure gauge before lifting the boom to end-of-stroke.
- Calibrate the max pressure valve ref. **C** (encl. **1**) to 330 bar.

CAUTION

If it is not possible to reach 330 bar when setting the main valve, tighten the valve ref. D (see encl. 4) of the Hydromatik pump with variable displacement.

- Once the main valve has been calibrated, proceed with the calibration of valve ref. **D** (encl. **4**) of the variable displacement boom pump to a value of 315 bar.
- Recalibrate the max pressure valve ref. **C** (encl. **1**) to 300 bar.
- During calibration, check that the two safety valves **W** of the main valve (encl. **1**) discharge the pressure exceeding 330 bar.
- Remove the pressure gauge from the mini-socket and re-tighten the protective cap.

3. SETTING THE PRESSURE RELIEF VALVE

- Connect a 0-60bar manometer to the mini-socket **ref. E** (encl. **2**) located on valve **ref. F**. With the engine running at idle, move any of the element of the main valve to end of stroke and then set the valve ref. **F** to 30 bar.
- Remove the pressure gauge from the mini-socket and re-tighten the protective cap.

4. CHECKING THE PRESSURE OF THE LINDE PUMP HYDROSTATIC DRIVE

Do the calibration of the hydrostatic transmission with the hydraulic oil at a temperature of 80°C.

- Connect a 0-60 bar manometer to the mini-socket **ref. G** (encl. **3**) to read the low-pressure value.
- Connect a 0-600 bar manometer to the mini-socket **ref. H** (encl. **3**) to read the high-pressure value.

⚠DANGER

Never connect the pressure gauge to the èpoint corresponding to the reverse speed as this is may result in serious damage for the technicians or the inspector checking the drive calibration.

- Hold the selector to neutral position.
- With the engine running at max speed, make sure that the feeding pressure is 19/20 bar.
  The feeding pressure has no fixed value as it varies from pump to pump.
- Engage the 2nd mechanical speed.
- Ask a second operator to step down on the brake pedal.
- Set the forward-neutral-reverse selector to the forward position.
- Let the engine run at max speed and check that the high pressure value is 445 bar.

5. CALIBRATING THE BRAKING SYSTEM PRESSURE (encl. 3)

- Connect a 0-250 bar pressure gauge to position **L** (encl. **5**).
- Depress the foot brake some times until the value shown on the pressure gauge starts increasing. When the pressure gauge stops, the value shown corresponding to the calibration value of valve **ref. M** (encl. **5**) should be 150 bar. If the value is below 150 bar, loosen valve **ref. L**; if the value is above 150 bar, tighten the valve.

CAUTION

To check the pressure, it is necessary to depress the foot brake some times until the pressure gauge restarts increasing; when it stops in stable position, it shows the calibration value.

⚠DANGER

Fully discharge the pressure from the accumulators before disconnecting the hose. Fluids at pressure are hazardous!

6. CALIBRATING THE POWER STEERING

- Connect a 0-250 bar pressure gauge to position **N** (encl. **6**).
- Select the front-wheel steering mode.
- Move the steering cylinder to end of stroke and make sure the value of the power steering **ref. O** is 140 bar. If the value is below 140 bar, tighten valve **ref. P**; if the value is above 140 bar, loosen the valve.

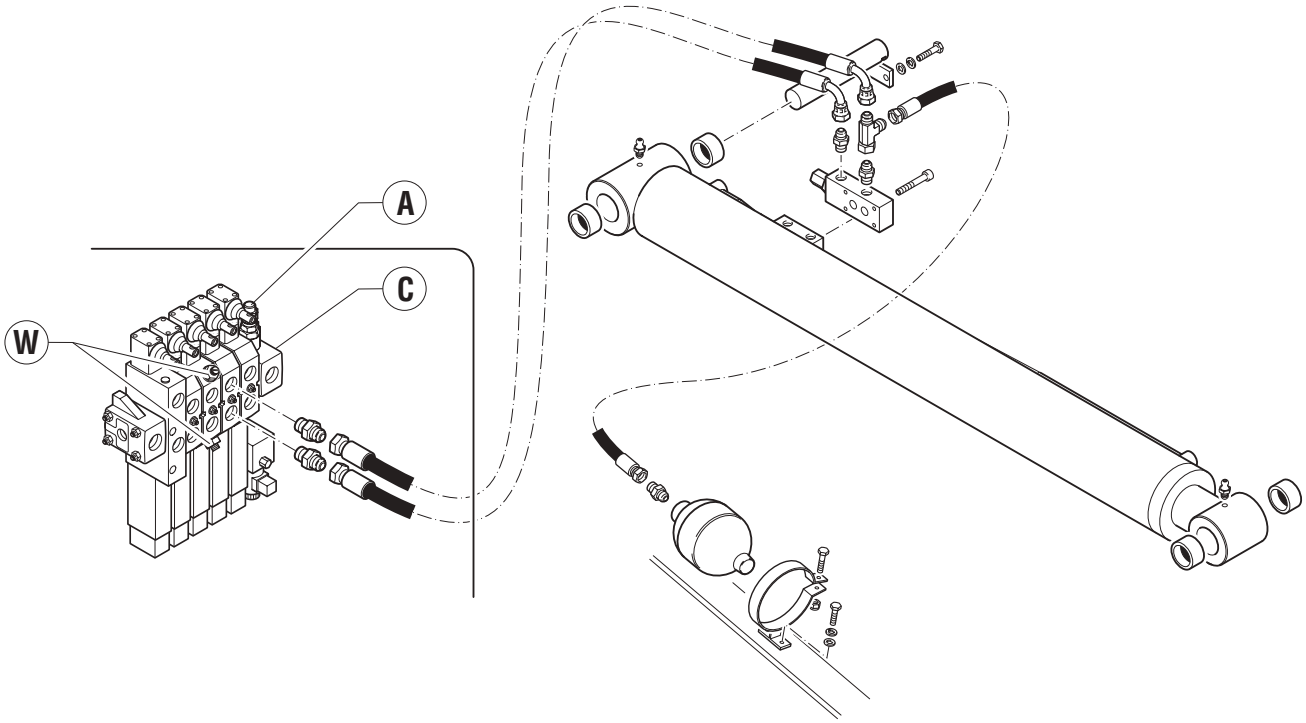
CAUTION

To reach valve ref. P, remove the protection cap (encl. 6).

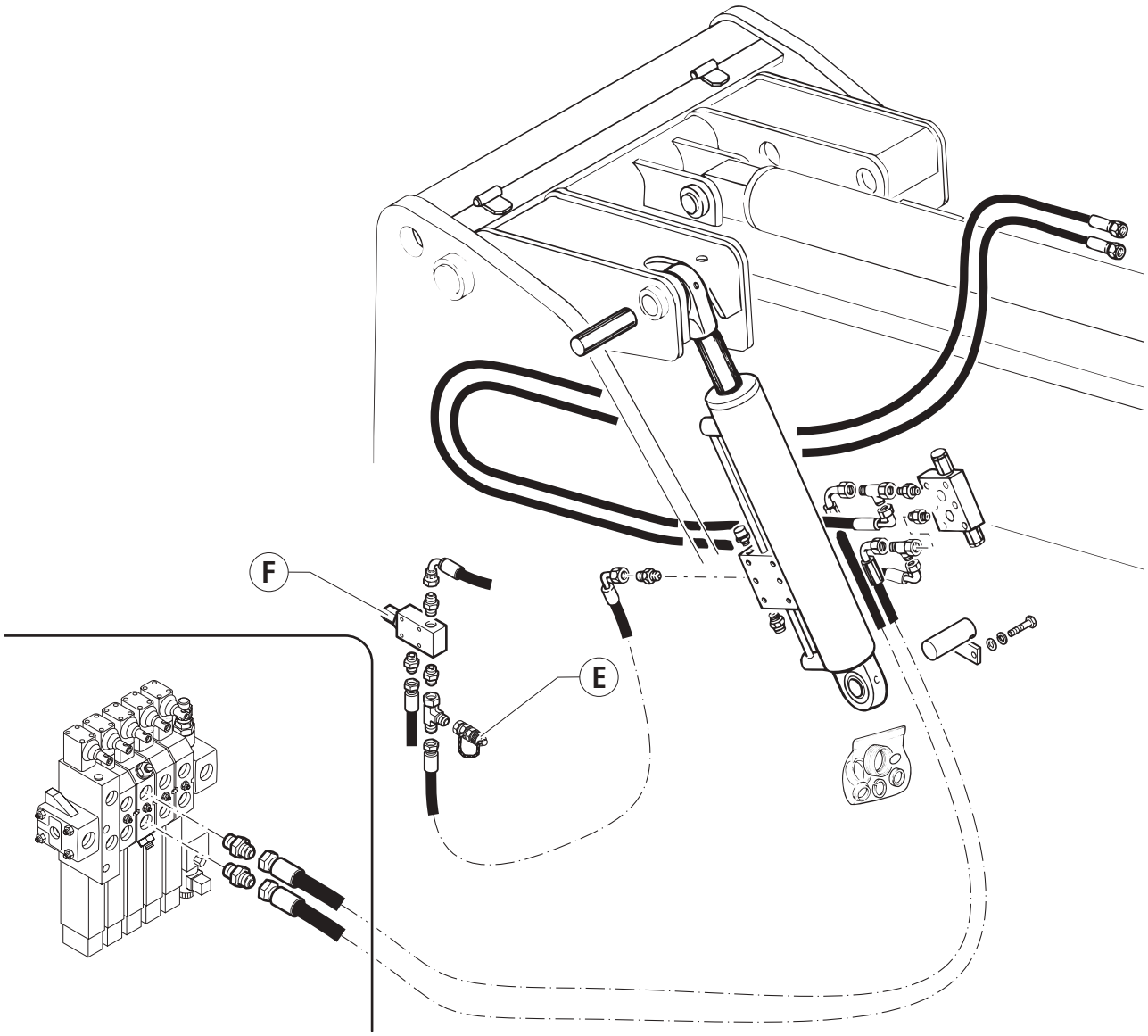
6. SETTING THE SAFETY VALVES OF THE COUNTER-FRAME ROTATION

- Disconnect the two flexible hoses **ref. Q** (encl. **7**) and connect a 0-250bar pressure gauge to both of them.
- Operate the turntable rotation in one direction and verify that the value displayed on the pressure gauge is 150 bar.
- Operate the turntable rotation in the opposite direction and verify that the value displayed on the pressure gauge is 150 bar.
- If the pressure shall be adjusted, remove caps **R** (encl. **7**) and turn the internal screws until reading the correct value on the pressure gauges.

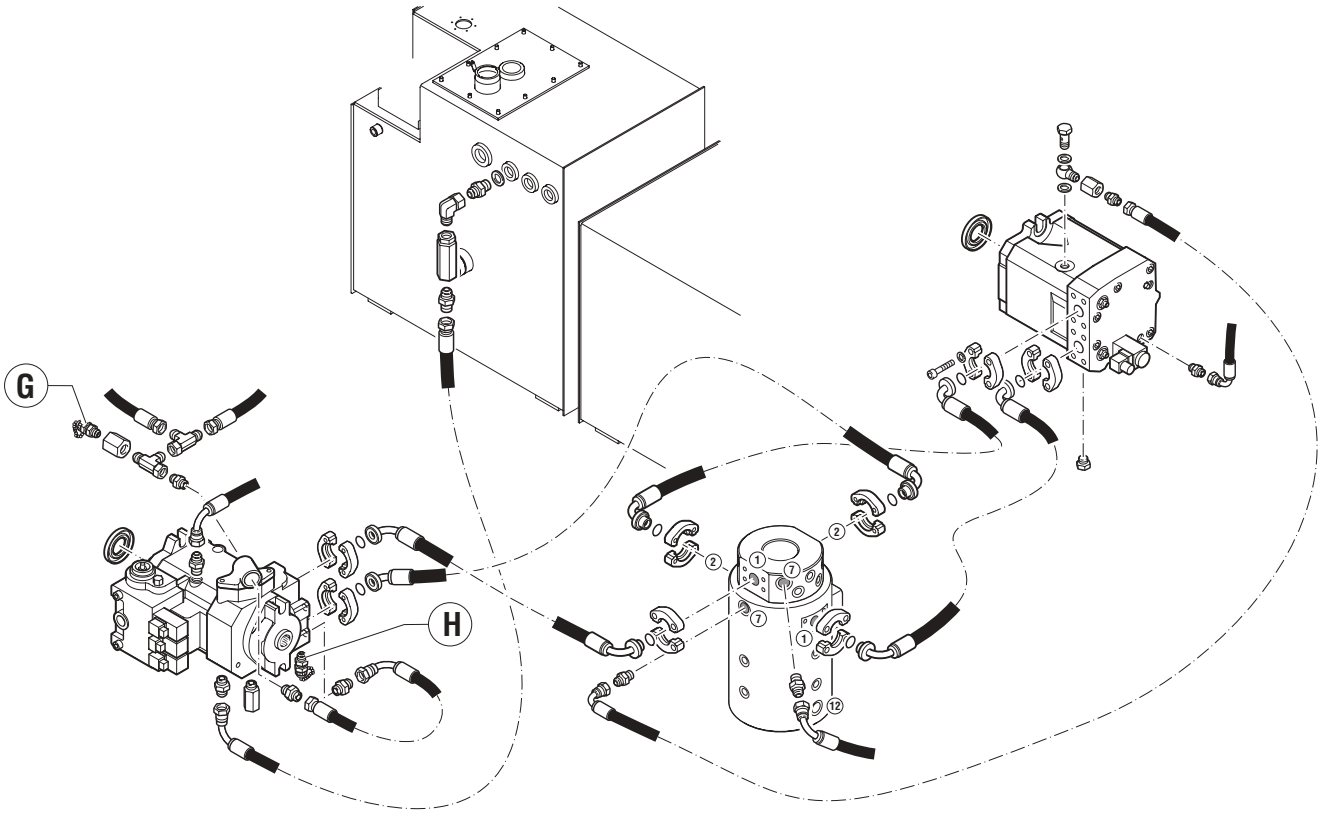
HYDRAULIC SYSTEM - LIFTING	Encl. 1



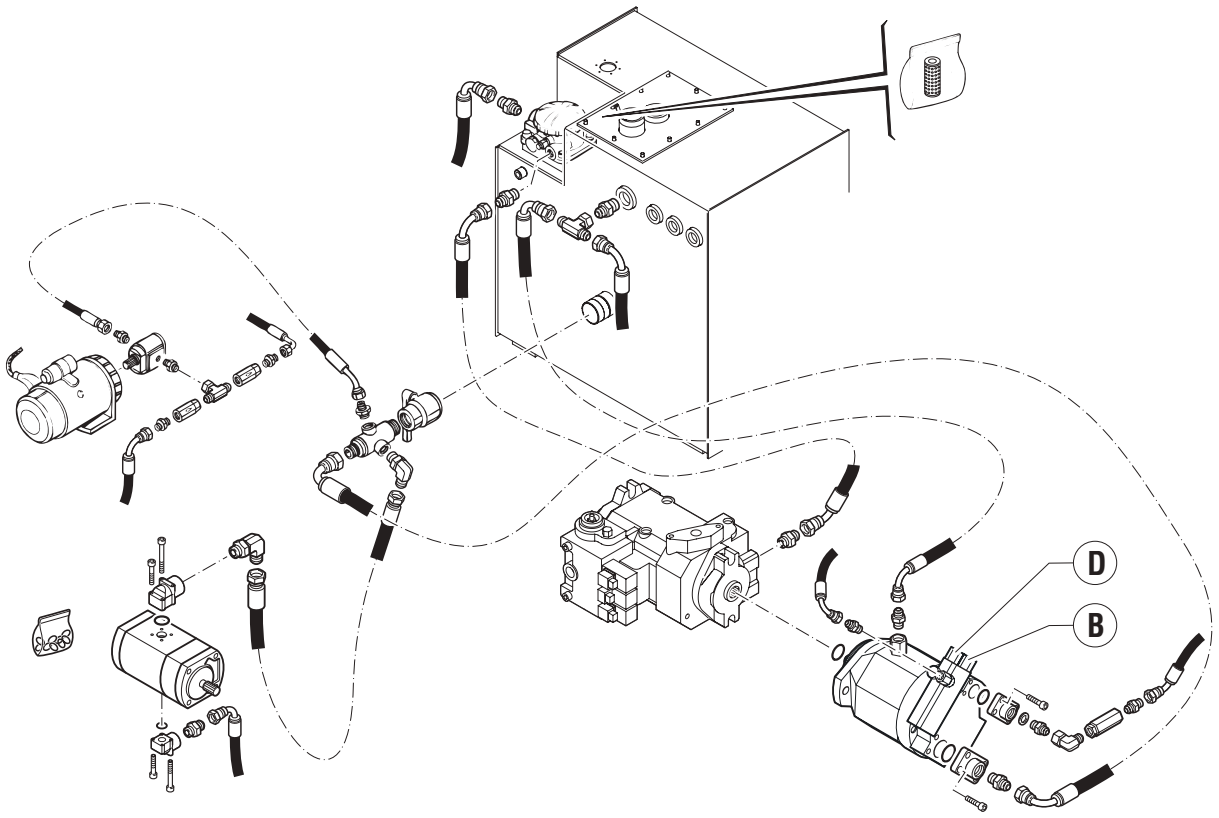
HYDRAULIC SYSTEM - FORK BALANCE	Encl. 2



HYDRAULIC SYSTEM - TRANSMISSION	Encl. 3

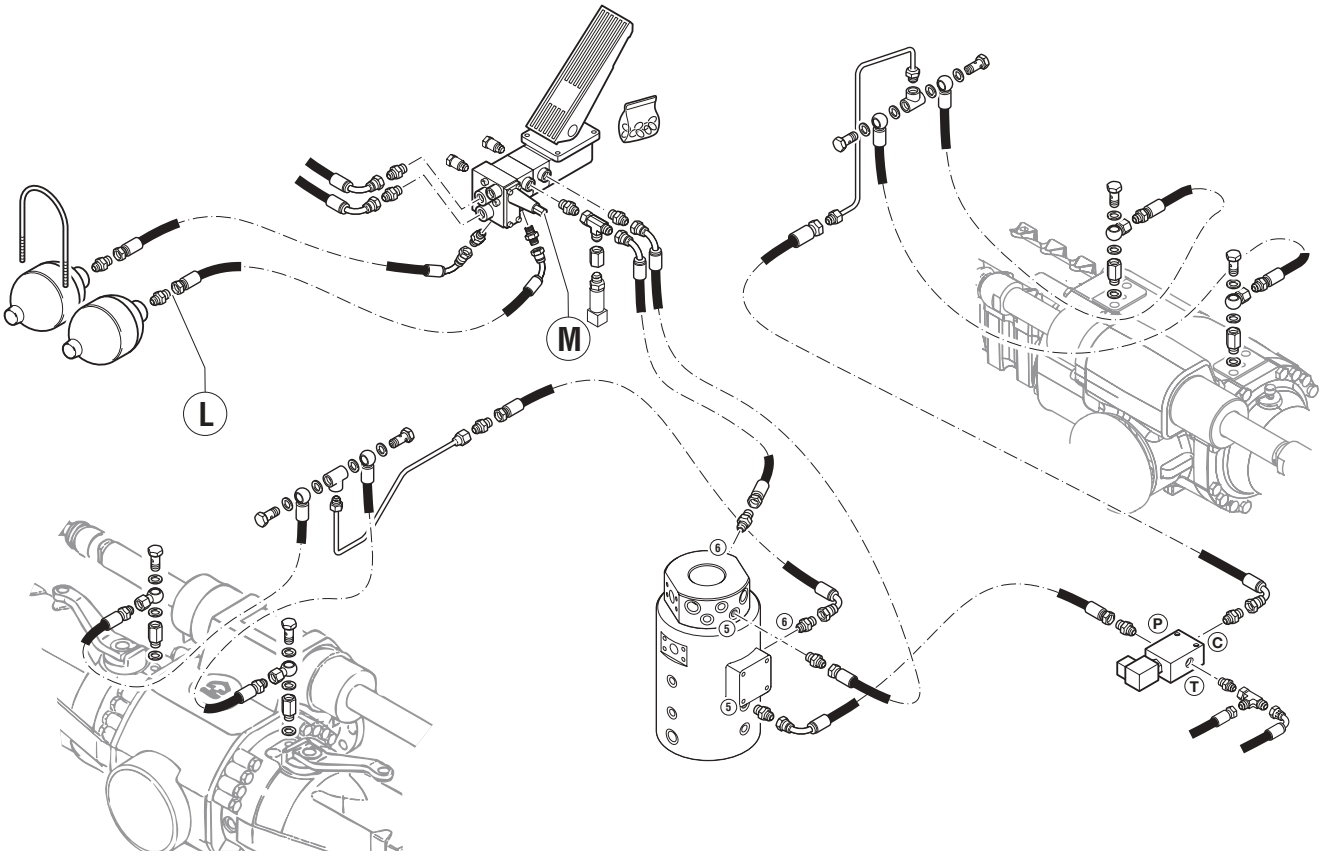


SUCTION SYSTEM HYDRAULIC PUMPS	Encl. 4

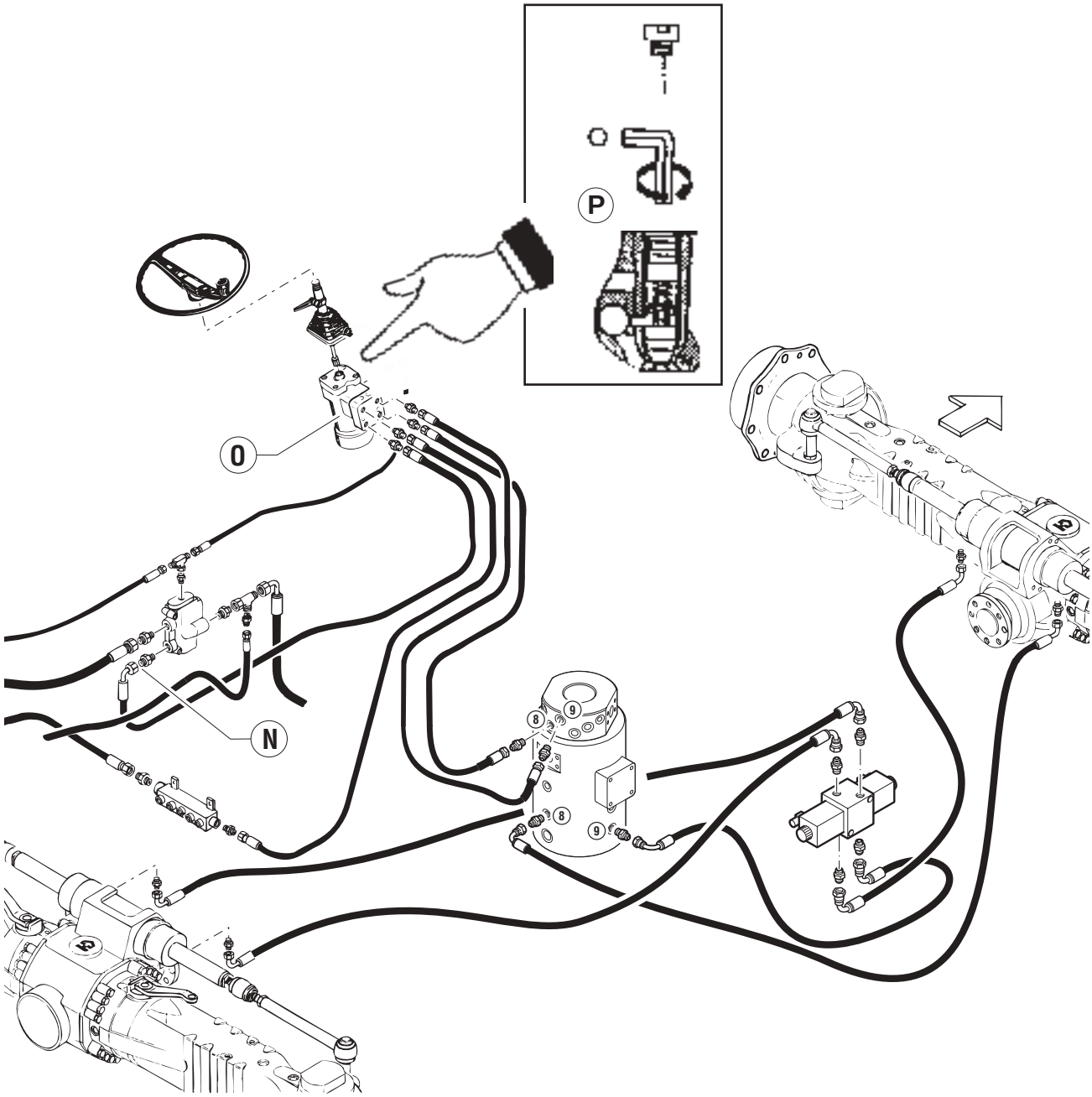


HYDRAULIC SYSTEM - SERVICE BRAKE

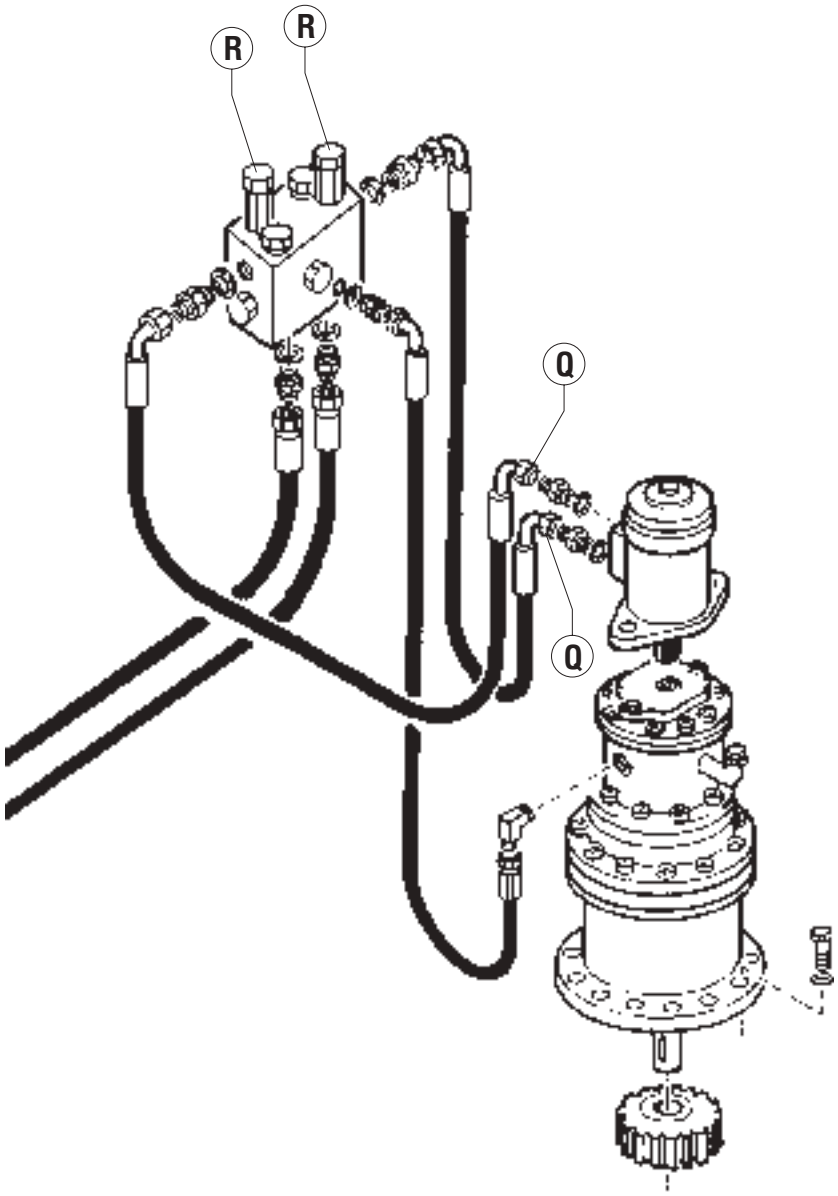
Encl. 5



HYDRAULIC SYSTEM - POWER STEERING	Encl. 6



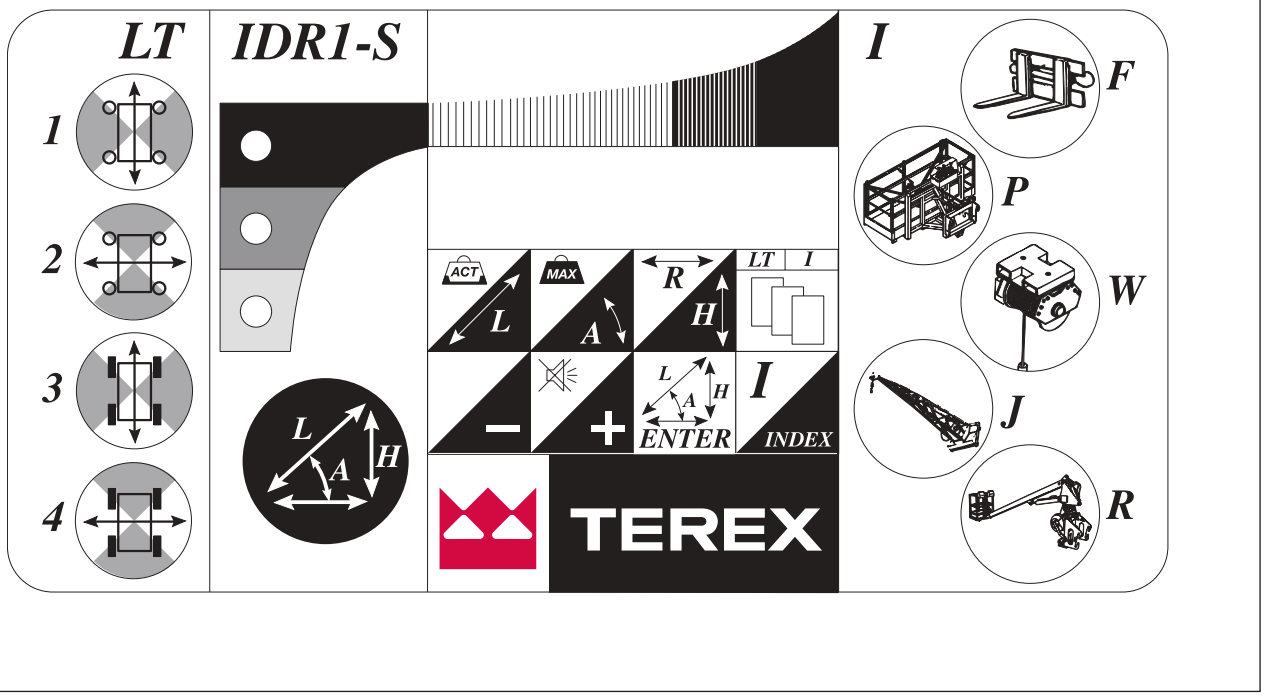
HYDRAULIC SYSTEM - TURNTABLE ROTATION	Encl. 7



2.23 PLATFORM CALIBRATION

- CALIBRATING THE PLATFORM

1. Couple the platform.
2. Stabilise the machine.
3. Stop the engine.
4. Connect the plug on the platform to the power socket on the boom and then turn the platform key to the ON position.
5. Go back to the driving place and turn the dashboard to the ON position and wait until the message "**FORK PLEASE CONFIRM**" appears on the display and then turn the road/jobsite/platform selector to the "platform" position.
6. Wait until the machine recognises the platform automatically and then press "**ENTER**" and type in the password.
7. Press key **+** several times until displaying page 60 "**BASKET EMPTY**" and then press "**ENTER**" and "**INDEX**". In this way, the tare weight value is sent to the platform.
8. Press key **+** several times until displaying page 61 "**BASKET AC.**" and then press "**ENTER**" and, using the "**INDEX**" key, go to the asterisk "*****". Using the "**+**" or "**-**" key, edit the known weight to be applied to the platform (for instance, .70 corresponds to 700 kg) and then press "**ENTER**" once again.
9. Press key **+** several times until displaying page 62 "**BASKET LADEN**" and then load the known weight indicated in point 7 and then press "**ENTER**" and "**INDEX**".
   In this way, the value of known weight is transmitted to the platform for comparison.
10. Press key **+** several times until displaying a page with the "**SAVE**" command, then press "**ENTER**" and wait until the message "**DONE**" is displayed. Wait for two minutes and then stop the engine of the machine.
11. Now the platform is ready for operation.



PROCEDURE FOR CONNECTING AND USING THE PLATFORM

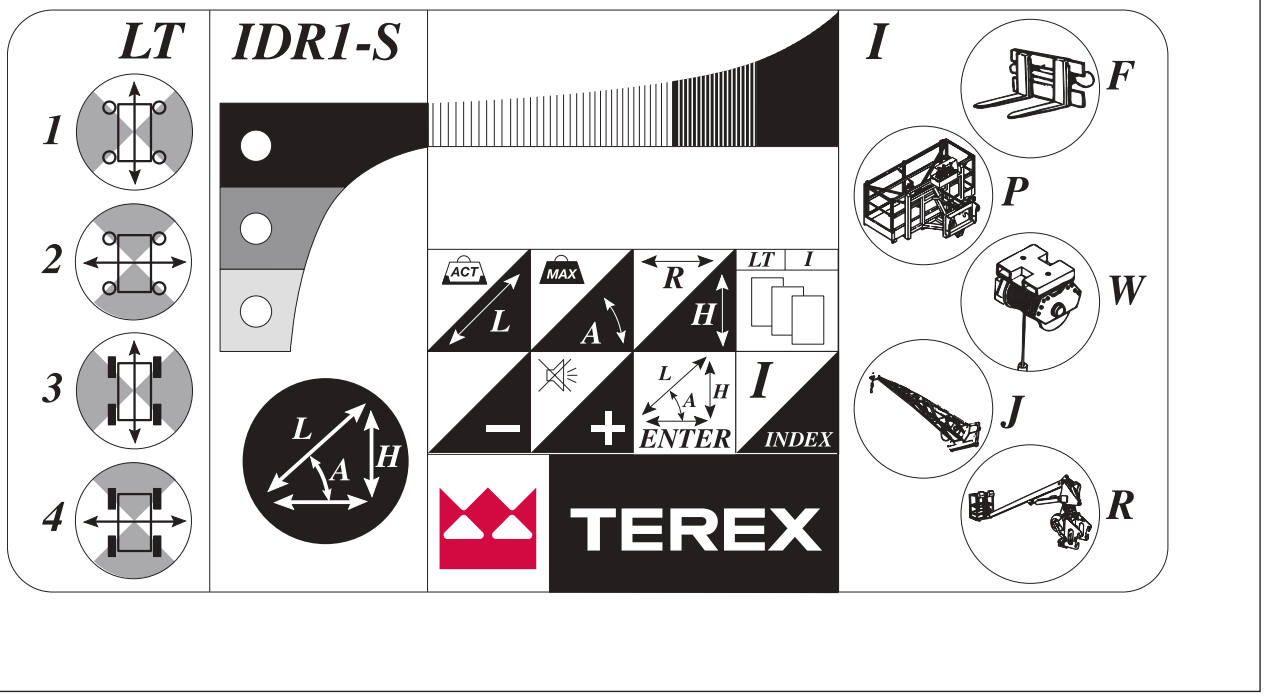
1. Couple the platform.
2. Move to the work area and stabilise the machine.
3. Stop the engine.
4. Connect the plug on the platform to the power socket on the boom and then turn the platform key to the ON position.
5. Go back to the driving place and turn the dashboard to the ON position and:

   A- If the date of the software is the one shown in the picture to the side, turn the road/jobsite/ platform selector to the "platform" position then go to the point 6;

   B- If the software has an older date, wait until the message "FORK PLEASE CONFIRM" appears on the display and then turn the road/jobsite/ platform selector to the "platform" position then go to the point 6.
6. Wait until the machine recognises the platform automatically.
7. Now the platform is ready for operation.

2.24 SETTING THE OVERLOAD WARNING SYSTEM

1. Start the engine and before the audible alarm of the overload warning system stops sounding, press **ENTER** and type in the password **4482** acting on **INDEX** to move the cursor on the digits.
2. The display will ask to confirm the equipment "forks". Press **ENTER** and then, by means of the **+** key, find and open page **55 OUTRIGGER IN** and make sure that the outriggers are fully retracted; then press **ENTER** and **INDEX** to confirm.
3. Press key **+** several times until displaying page **56 OUTRIGGER OUT** and then extend all the outriggers and press **ENTER** and **INDEX** to confirm.
4. Press key **+** several times until displaying page **57 ROTAX**; move the turntable to the 0-degree position, lock in place with the pin and then press **ENTER** and **INDEX** to confirm.
5. Press key **+** several times until displaying page **58 LEVELLING** and, using a spirit level, make sure that the machine is level with the two axes, then press **ENTER** and **INDEX** to confirm.
6. Stabilise the machine and, by pressing key **+** several times, open page **12 TRANSDUCER MIN**. Lower and retract the boom completely and then press **ENTER**.
7. Press key **+** several times until displaying page **13 TRANSDUCER MAX** and, once the machine is stabilised, raise the boom up to the maximum angle (check that the boom reaches the max height by turning the load limiter inhibition key) and then extend the boom to max length and then press **ENTER**.
8. Press key **+** several times until displaying page **01 SAVE** and then press **ENTER** and wait until the message **DONE** is displayed.
   Wait for some 2 minutes and then turn off the machine.
9. The first setting phase is completed. Now test all the possible configurations with different weights and make sure that the values given in the load charts in the driving place are respected.



2.25 ECO MATRICE PANEL

1 GENERAL DESCRIPTION

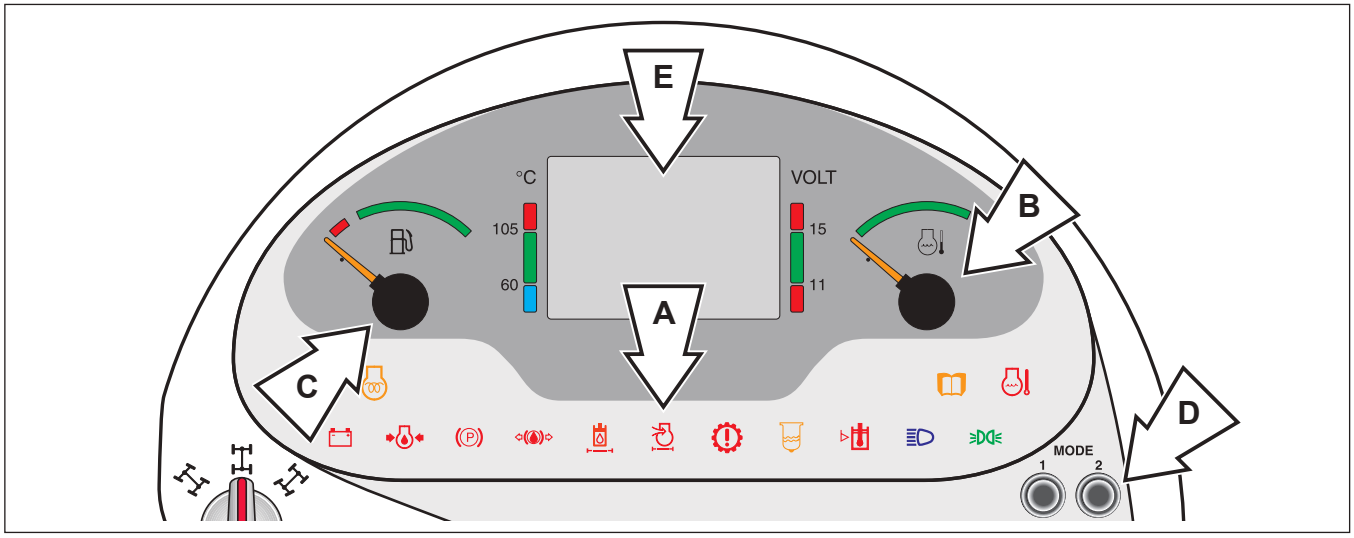
This panel has been developed and is installed on the machine of the GYRO series.
The machine is equipped with the folllowing electronic control units:

1 - Display panel (Unideck)
2 - Engine controller (Deutz)
3 - Linde control unit (Linde)

Control units 1, 2 and 3 share a communication bus with Can-Bus SAE J1939 protocol (250Kbit/s).

2 FUNCTIONS

The panel shall receive and display information from the engine controller (via Can) and from the sensors or contacts positioned on the machine.
In the case of a faults, a buzzer starts sounding.
There is a 128x64 matrix display in the central area of the panel to show information such as engine RPM, hydraulic oil thermometer, voltmeter, total hours of work and error messages.
There are also 15 alarm and/or warning lights **ref. A** and two analog gauges, one for the engine coolant temperature **ref. B** and the other for the fuel level **ref. C**.
At night, the different warnings are signalled by red LEDs.
There are also 2 external pushbuttons **ref. D** to access to different functions of the display.



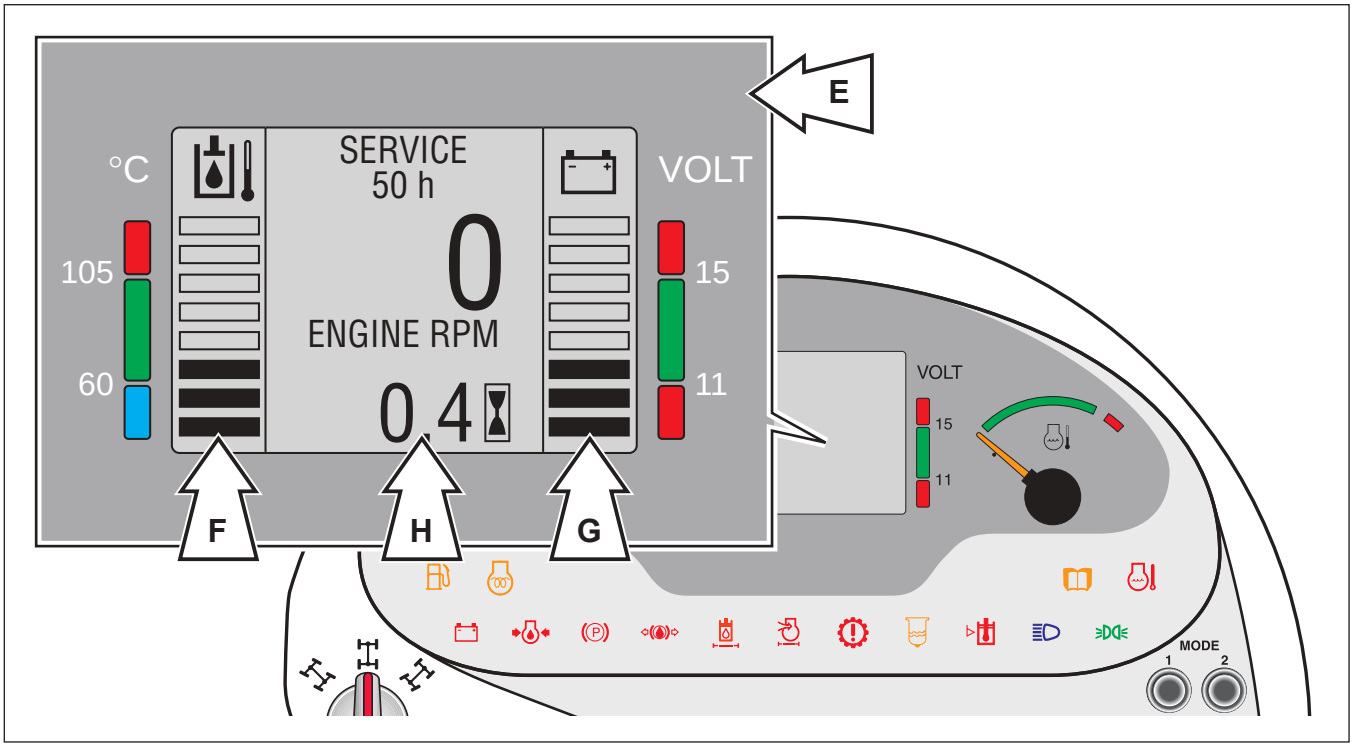
When the machine is started, the display **ref. E** shows:

- Engine rpm
- Hour-meter
- Engine oil temperature
- Battery voltage
- Service (next service intervals)

Additionally, the function buttons **MODE 1** and **MODE 2 rif. D** let you access to and scroll through the menus and sub-menus with the following functions:

- Language selection (Italian/English)
- Service (password-protected function reserved to authorised repair shops)
- Display of the diesel engine errors.

- Central unit multipurpose display



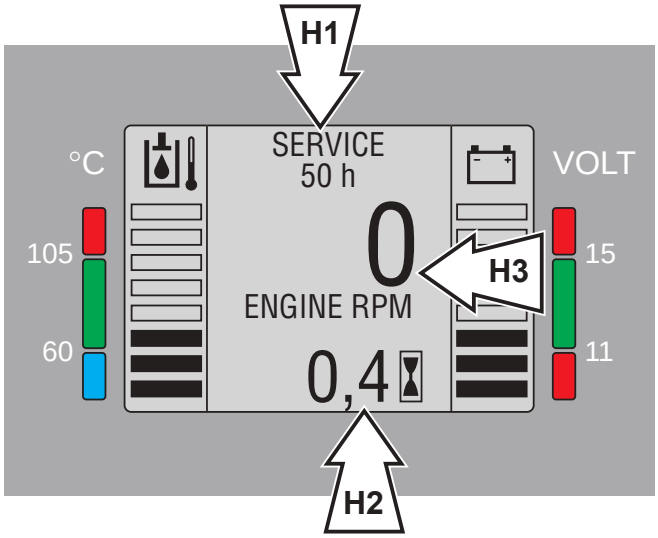
When the machine is turned on, the display ref. **E** will appear as shown in the picture above:

- The black bars **ref. F** on the left indicate the engine oil temperature.
  During normal operation, the temperature should be comprised between 60 and 105 degrees corresponding to the green section of the scale shown on the left of the display.
  If a higher temperature is reached (and the bars of the red zone of the scale come on), you should stop the machine and find and rectify the problem before restarting the machine.

- The black bars ref. G on the right show the battery charge when the engine is stopped, and the alternator charge voltage when the engine is running.
  During normal operation, the temperature should be comprised between 11 and 15 volt corresponding to the green section of the scale on the right of the display.
  If the voltage displayed is less than 11 Volt, the alternator charge could be insufficient or the battery could be discharged. If the voltage is above 15 Volt, the alternator voltage is above the normal working voltage. In both cases, you should stop the machine and find and rectify the problem.

• In the central part **ref. H**, of the display, starting from the top, you find:
  H1: this indicates when next maintenance operations should be done.
  H2: this indicates the diesel engine rpm.
  H3: this is the hour-meter indicating the running time of the machine.Use this meter to correctly gauge the service intervals.

  In the case of faults, field **H1** will be immediately replaced by the message **ERROR** followed by the code of the signalled error.

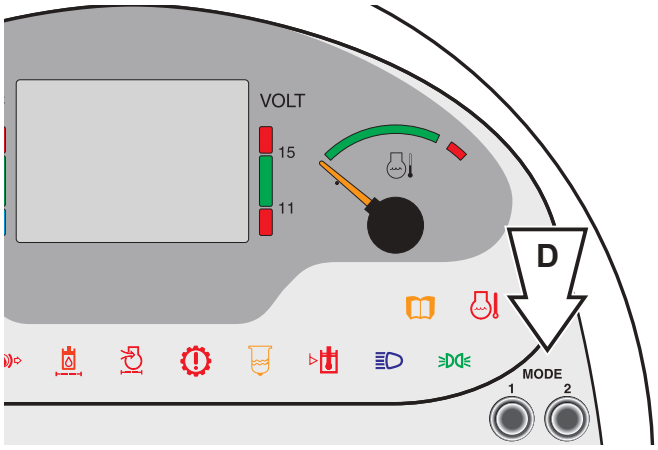


CAUTION

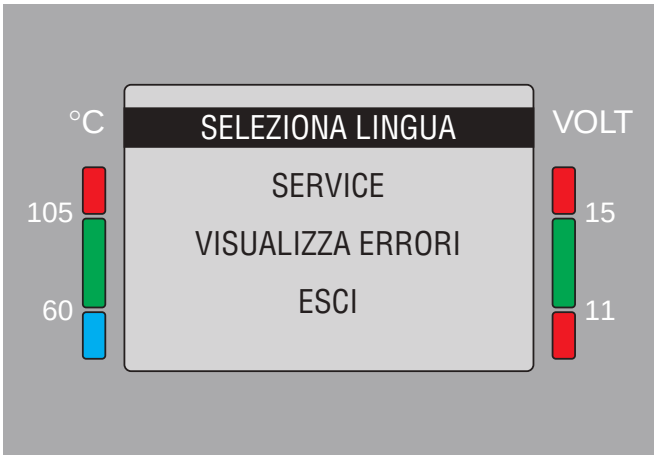
To read the meaning of the numeric code displayed, refer to the errors list in chapter 5 "Troubleshooting".

- Use of menus and sub-menus

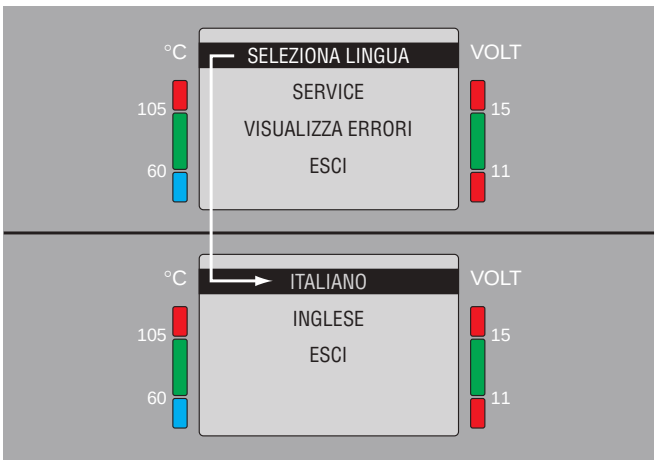
Use the two buttons **MODE 1** and **MODE 2 ref. D** to gain access and scroll through menus and sub-menus.



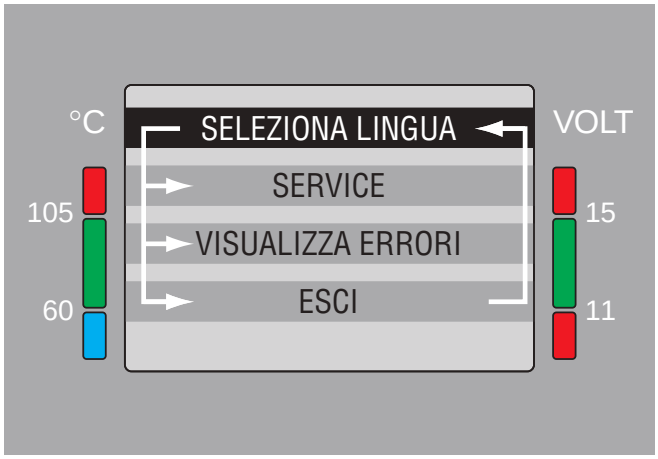
Press the two buttons **MODE 1** and **MODE 2** simultaneously to access to the menu.



Press button **MODE 1** to confirm any selection made.

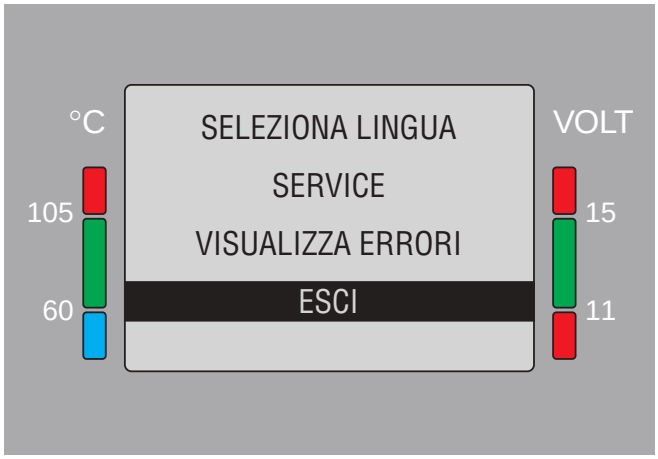


Press button **MODE 2** to scroll through the menu lists (when the last item of the list is reached, the first item is displayed).

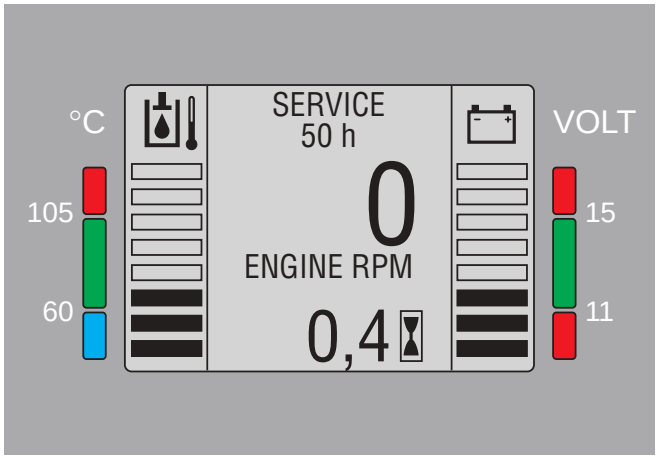


Quitting the menu

- Select **ESCI** using button **MODE 2**.

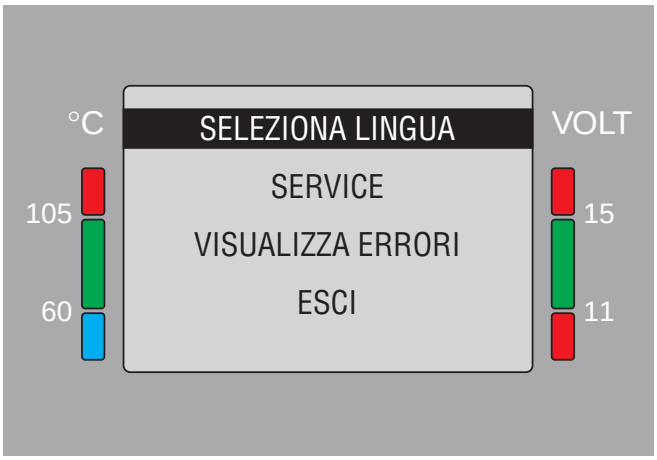


- Press button **MODE 1** to quit and display the home page.

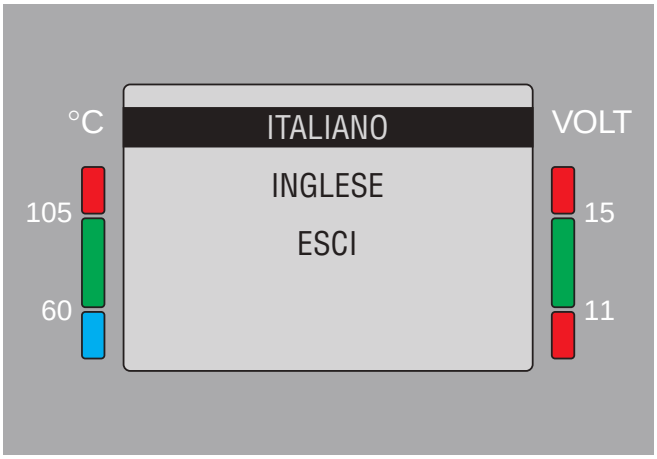


Language selection sub-menu

- Select **SELECT LANGUAGE** using button **MODE 2**.



- Press button **MODE 1** to open the sub-menu.

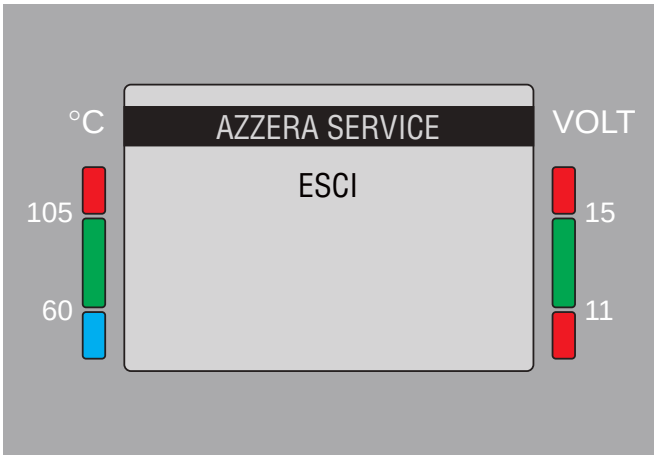


- Press button **MODE 2** to scroll through the list.
- Press button **MODE 2** to select the language and quit the sub-menu (the **EXIT** command lets you quit the menu without changing any settings)
- By quitting the sub-menu, you will go back to the **SERVICE** window of the main menu.

Password protected service sub-menu

- Access to this sub-menu is reserved to authorised service centres and is therefore password protected.
- Select **SERVICE** using button **MODE 2**.

- Press button **MODE 1** to open the sub-menu.



- Press button **MODE 2** to scroll through the list.
- Press button **MODE 1**, type in the password 4482 using buttons **MODE 1** and **MODE 2**, and then check that the text **"Service Reset"** appears.

CAUTION

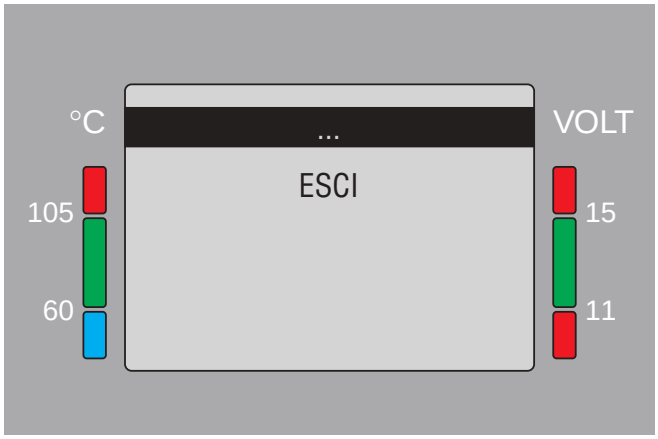
The service can be reset only after verifying that the scheduled service operations have have been carried out.

- Press the **ESC** button to quit the menu without changing the settings.
- By quitting the sub-menu, you will go back to the **DISPLAY ERRORS** window of the main menu.

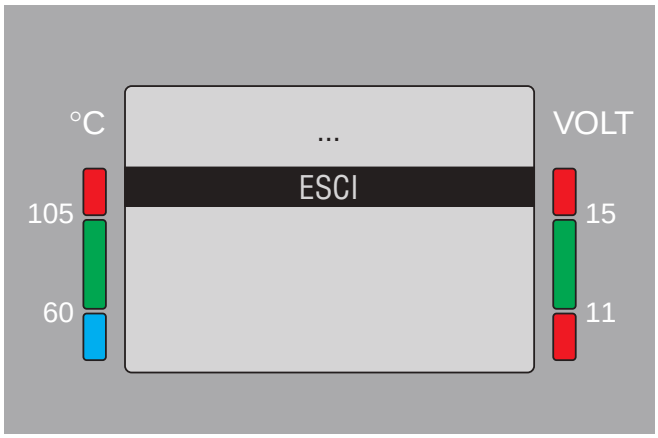
Error display sub-menu

- Select **DISPLAY ERRORS** using button **MODE 2**.

- Press button **MODE 1** to open the sub-menu.



- Press button **MODE 2** to scroll through the errors list.
- To quit the sub-menu, select **EXIT** (using button **MODE 2**) and then press button **MODE 1** to confirm.



- By quitting the sub-menu, you will go back to the **EXIT** window of the main menu.

- Fault display

As already mentioned, when the **DEUTZ** or **LINDE** units detect an internal malfunction, they send an error message.
The system activates the buzzer intermittently and the display shows the corresponding error message.
If the operator presses one of the two buttons **MODE 1** or **MODE 2**, the buzzer stops sounding, but the displayed message remains until the fault is rectified.
If an error is already present (also when the buzzer stopped) and a second error triggers, the panel warns of this second error by turning the relevant light on and by activating the buzzer.
All pressent and active errors are alternate displayed on the screen.
The system can display up to 10 errors. To view the errors list, you can enter the **CONFIGURATION** menu and select the item **VIEW ERRORS**.
If a second error triggers before the operator presses button **MODE 1** or button **MODE 2**, the system store the error in emory and doesn't display the relevant message. Once the operator presses button **MODE 1** or **MODE 2** to stop the buzzer warning of the first error, the second error is displayed on the screen after a few seconds.
If there is at least an error when the machine is turned on, the system activates the buzzer immediately and intermittently and the relevant error message is displayed.
If there are no errors, the system display the message **NO ERROR** which, after a few seconds, turns into the maintenance interval.

- Initial check

When the machine is turned on, the system turns on all the display pixels and the 15 warning lights for one second so the operator can check the proper operation.
Likewise, an audible signal allows to check the buzzer operation.

- Connector

The connector is placed at the back of the panel and is an AMP 36-way type.

Pin	Function
1	Warning light L1 - Alternator
2	NC
3	"Platform mode" digital input CA/+12V
4	NC
5	+12V Key
6	NC
7	NC
8	Warning light L6 - Engine air filter
9	Fuel gauge (ohm)
10	Warning light L7 - Change fault alarm
11	Warning light L10 - Red generic
12	GND
13	NC
14	NC
15	NC
16	Hydraulic oil temperature (ohm)
17	NC
18	+12V Batteria
19	Warning light L9 - Hydraulic oil level
20	NC
21	Left pushbutton
22	Warning light L11 - position lights
23	NC
24	Right pushbuttons
25	Warning light L12 - Fuel reserve
26	NC
27	Warning light L8 - Water in fuel filter
28	NC
29	NC
30	NC
31	NC
32	Warning light L5 - Hydraulic oil filter
33	Warning light L4 - Low brake oil pressure
34	Can H
35	Can L
36	Warning light L3 - Parking brake

2.26 CONTROLLING AND SETTING THE MACHINE WITH WINSCOPE

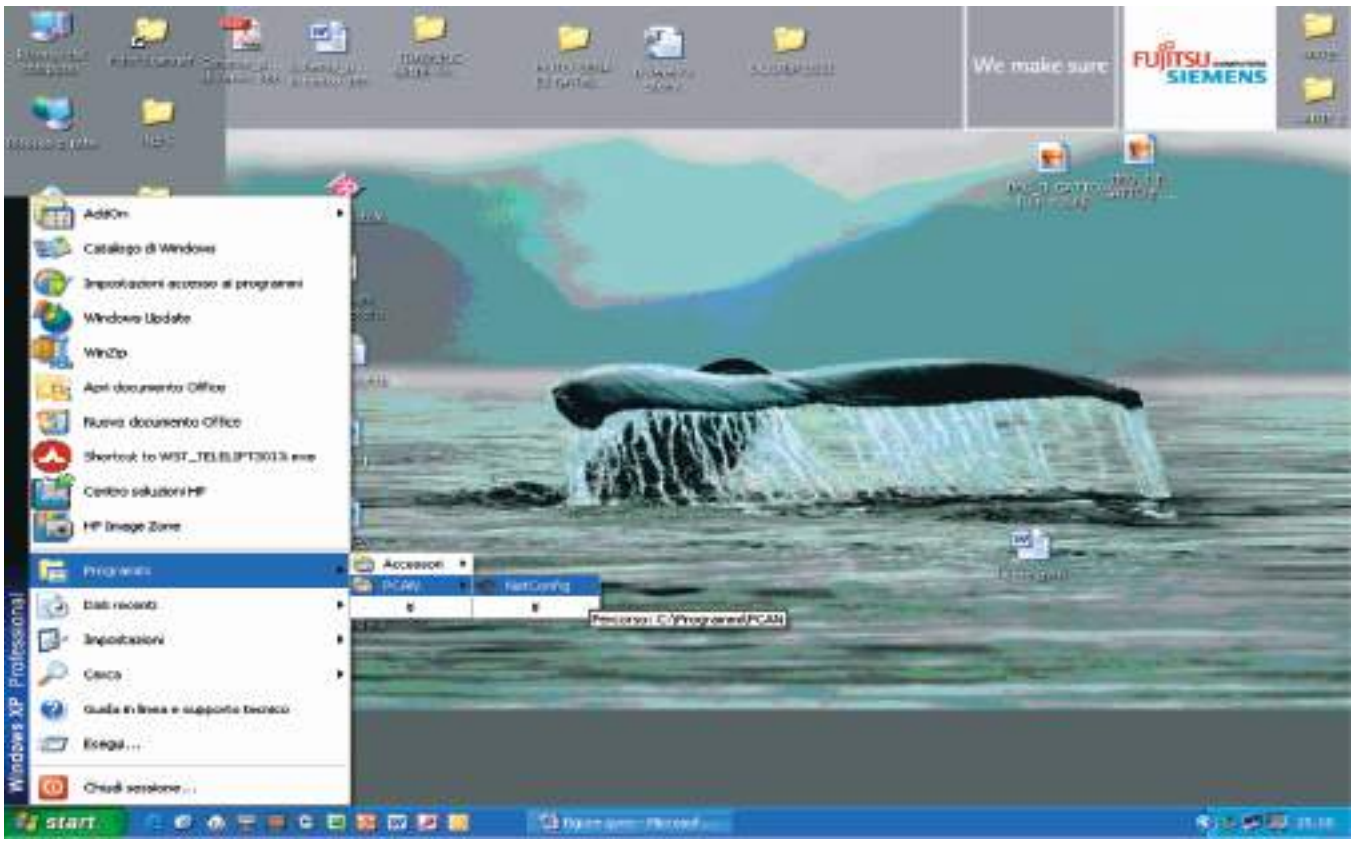
In order to control the system, you shall install 2 programmes:

- **CAN VIEW**
- **WINSCOPE**

CAN VIEW is a tool which lets you display the messages relevant to the CAN network and to interact with the relevant units connected.
WINSCOPE is a programme which lets you display the state of the machine and modify some parameters relevant to the speed of some movements of the machine boom.

- **Configuring the machine: installing and configuring the software**

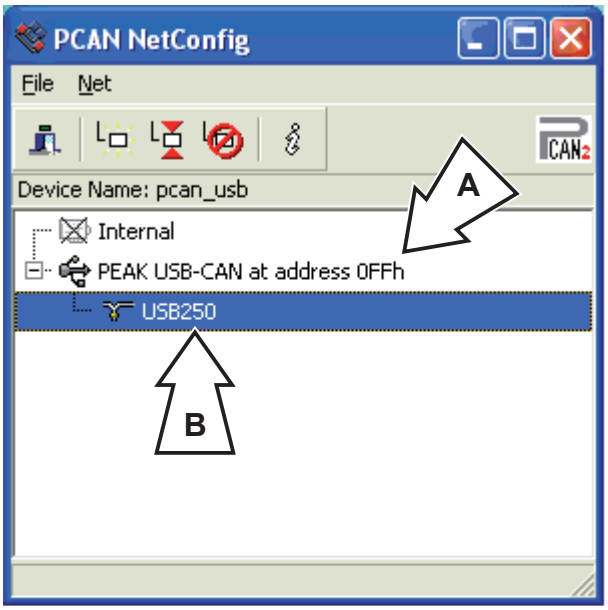
Once the **CAN VIEW** programme has been installed on the PC, you shall configure the same so it can “see” the CAN network.
This operation shall be performed on each single PC unless, for some reasons, the set parameters are changed.
To set the network, launch the programme from the **START => Programmes => PCAN => NetConfig.** menu.



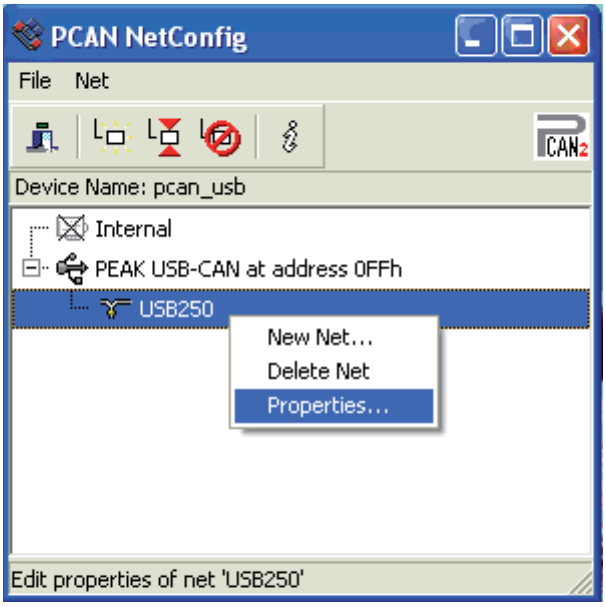
A window equivalent to the one to the side, will appear.

Select the network (if any) under the **PEAK USB-CAN at address 0FFh** node (ref. A). In the example above, this is identified with **USB250** (ref. B) but it could also have another denomination.

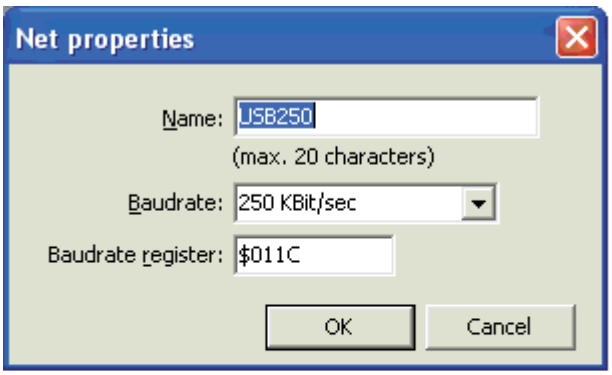
If no network exists, select the **PEAK USB-CAN at address 0FFh** node.



Once the existing network has been selected, press the right button of the mouse and select the **Properties** menu.
If you have selected the **PEAK USB-CAN at address 0FFh** node, choose the **New Net** menu.



In both cases, a window like the one to the side, will appear.
Type in the name you wish to assign to the network (in the example the chosen name is **USB250**) and then select the value 250 Kbit/sec in the **Baudrate** window. The last field present will be filled in automatically.
Press **OK** to quit and save the settings.



Now the network is configured. Unless the set parameters are changed, you shall not repeat this procedure on your PC.

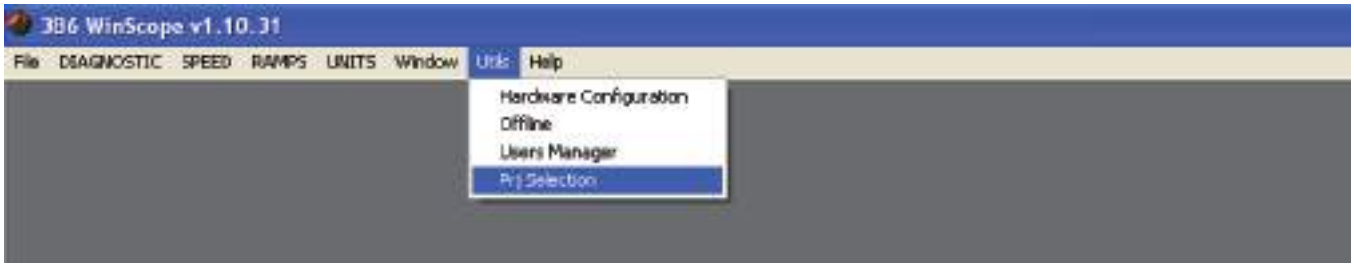
At this point, install the **WINSCOPE** programme on your PC.
The settings are loaded by TEREXLIFT during the machine assembly (e.g.: movement speeds, ramps, etc.).

CAUTION

These data have been empirically evaluated and vary from a machine model to the other; they can changed at any times and for each machine, if necessary.

Installing **WINSCOPE**

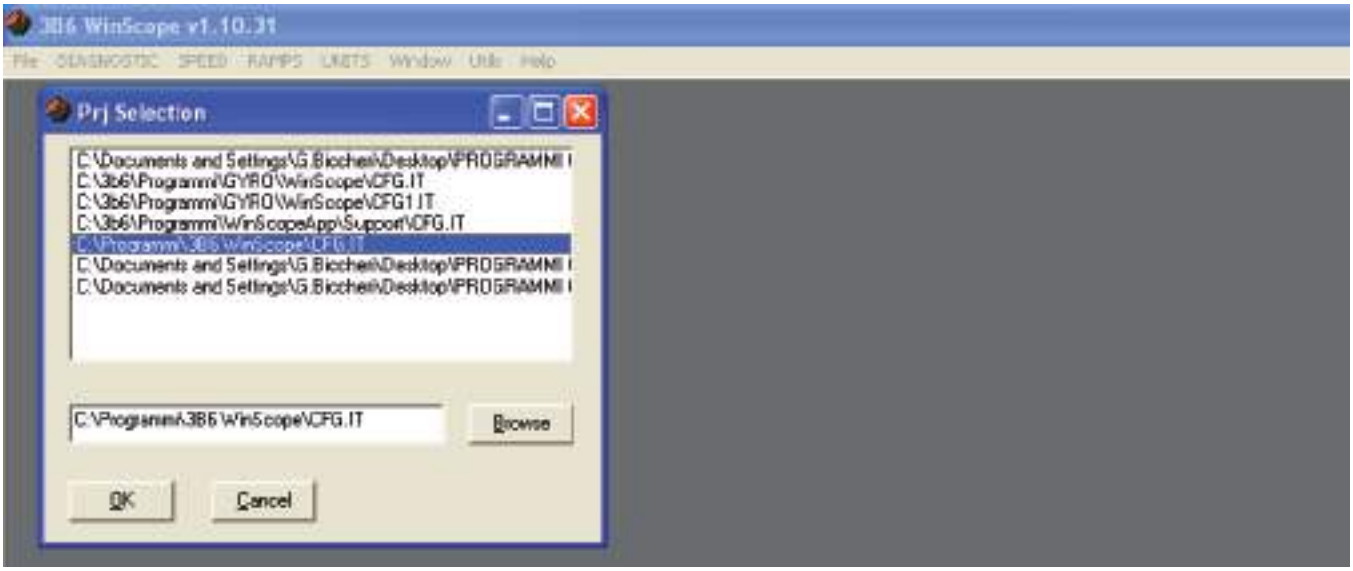
This programme lets you carry out a number of adjustments, including the adjustment of the movement speeds and the ramps.



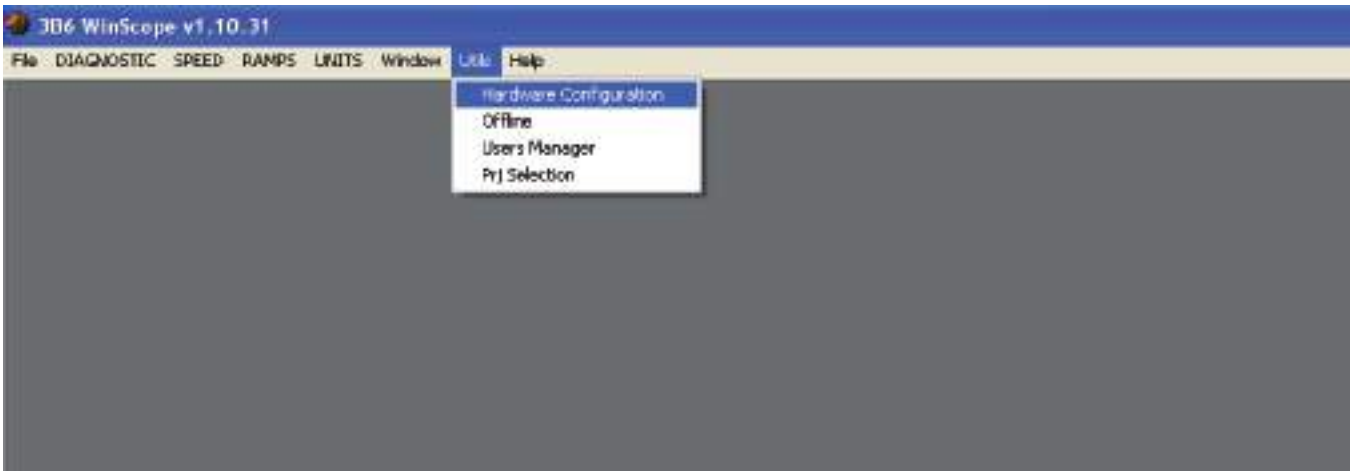
When you use the programme the very first time, you shall configure the same.
Select the **Prj Selection** item from the **Utils** menu.

Select the position of the **CFG.IT** file or press the **Browse** button to search for the same on your PC.
Selecting this file lets you load the menus and parameters of the machine to be used.

Press the **OK** button to close the window.

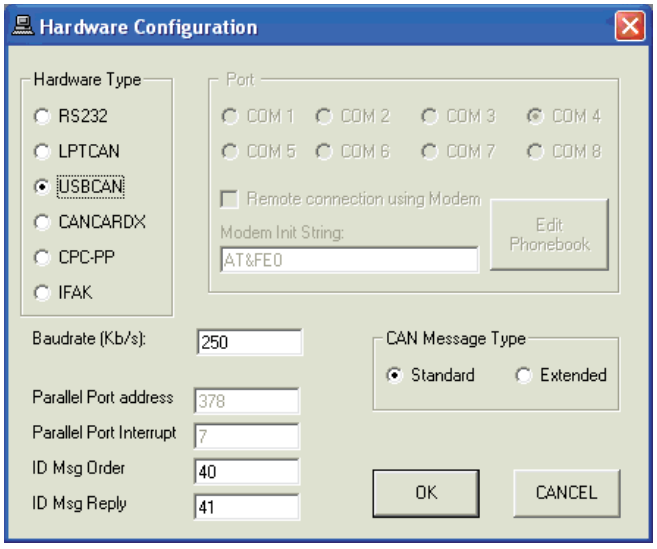


Select the **Hardware Configuration** item from the **Utils** menu.



A window like the one to the side, will appear.

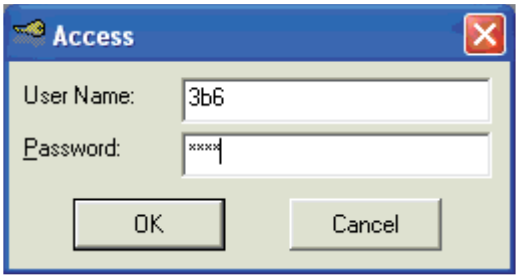
Type the values shown in the picture and press the **OK** button to close the window.
Quit and re-launch the **WINSCOPE** programme to activate the chosen configuration.



Now the programme configuration is completed and this procedure shall never be repeated.

The menu of the main page shows the functions which can be changed.

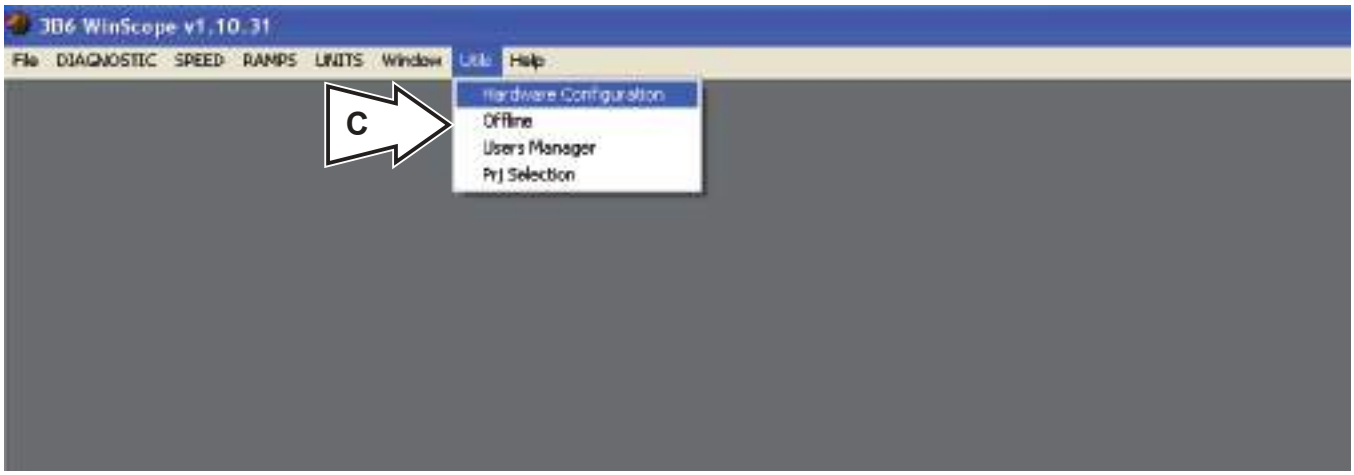
When you launch the **WINSCOPE** programme and select a menu field, the system will ask you to type in your **User Name** and **Password**.
If you want to view the parameters without effecting any changes, press the **Cancel** button.
If, on the contrary, you want to change some parameters, you shall type in **3b6** in the User Name field and **4482** in the Password field and then confirm by pressing the "**OK**" button.



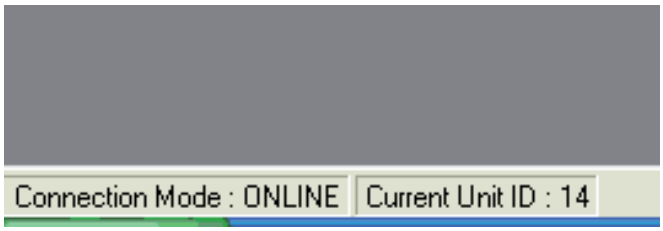
CAUTION

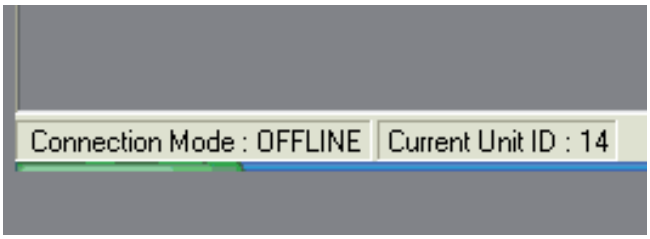
In order to change the machine parameters, you shall turn on the electronic control unit by turning the relevant key to the ON position (this can also be done without starting the diesel engine).

Check that the **WINSCOPE** programme is active (Offline); if the programme is deactivated (Online), as shown in the picture below, press on **C**.

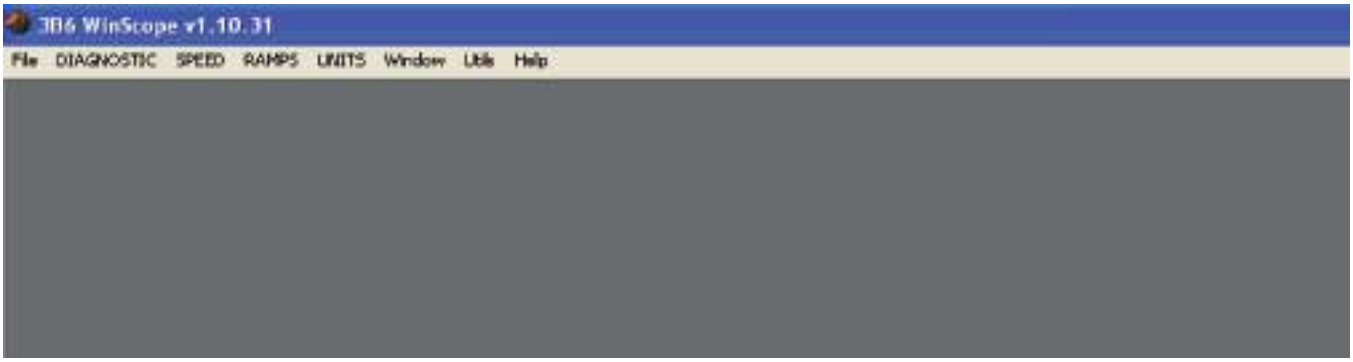


In order to verify if the programme is running properly, check the message in the box on the bottom left of the window. If the message near “Connection Mode” is TIMEOUT, there is no connection with the machine. Check the reason of the disconnection and restart **WINSCOPE**.

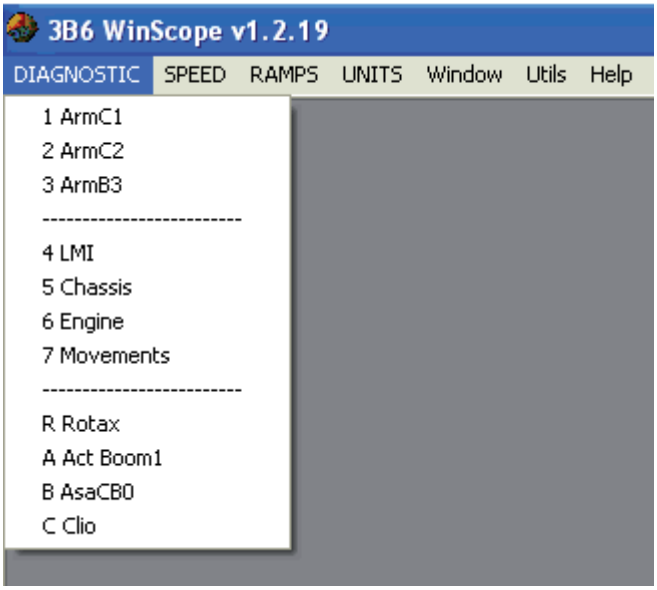




Now you can start using the **WINSCOPE** programme to set the machine parameters.
The main window is similar to the one shown below.

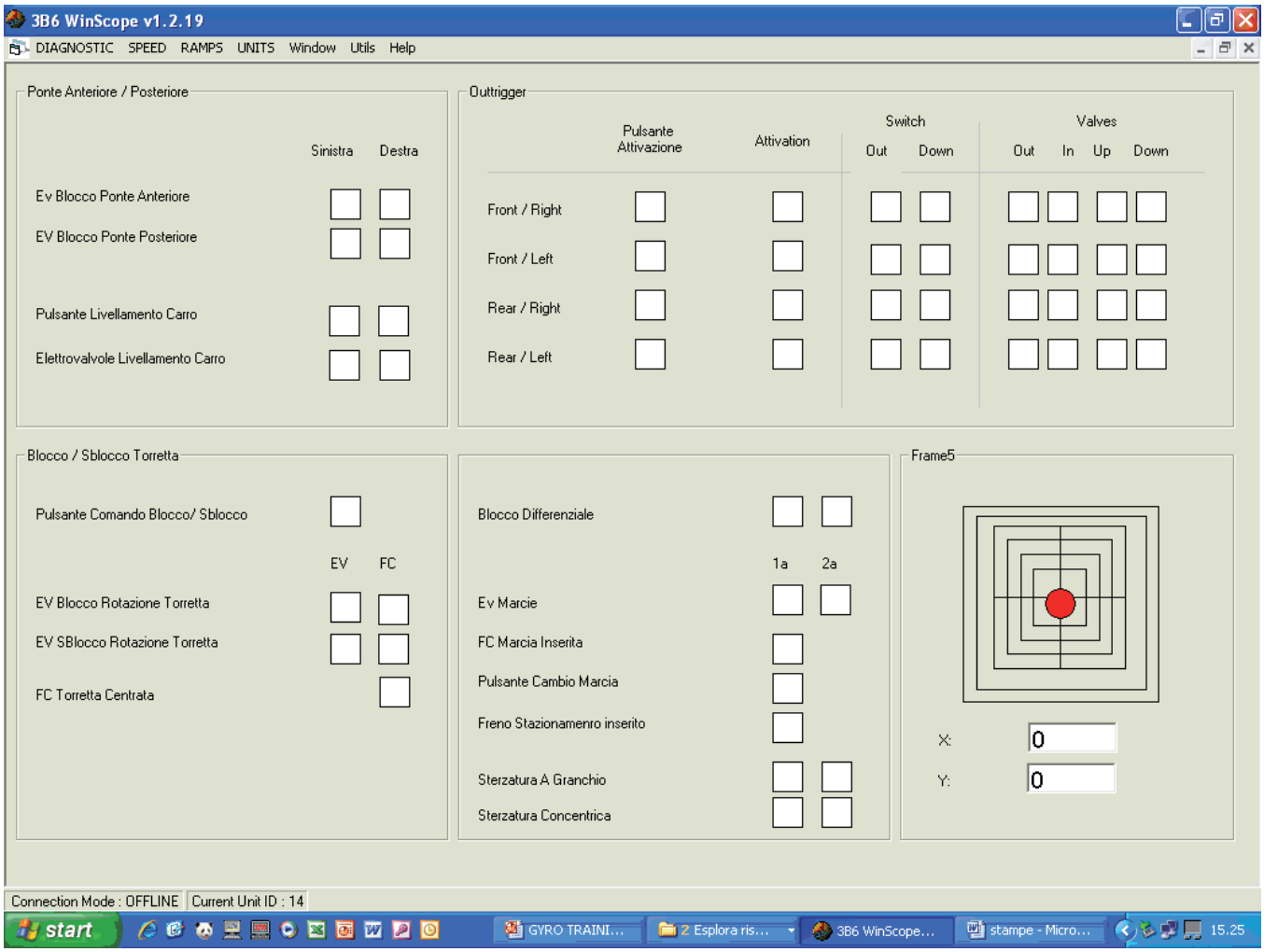


There are 7 drop-down menus at the top of the window.
The first main menu is the **DIAGNOSTIC** menu; the sub-menus are shown in the picture to the side and are relevant to the inputs and outputs of the main electronic board, as well as other features.



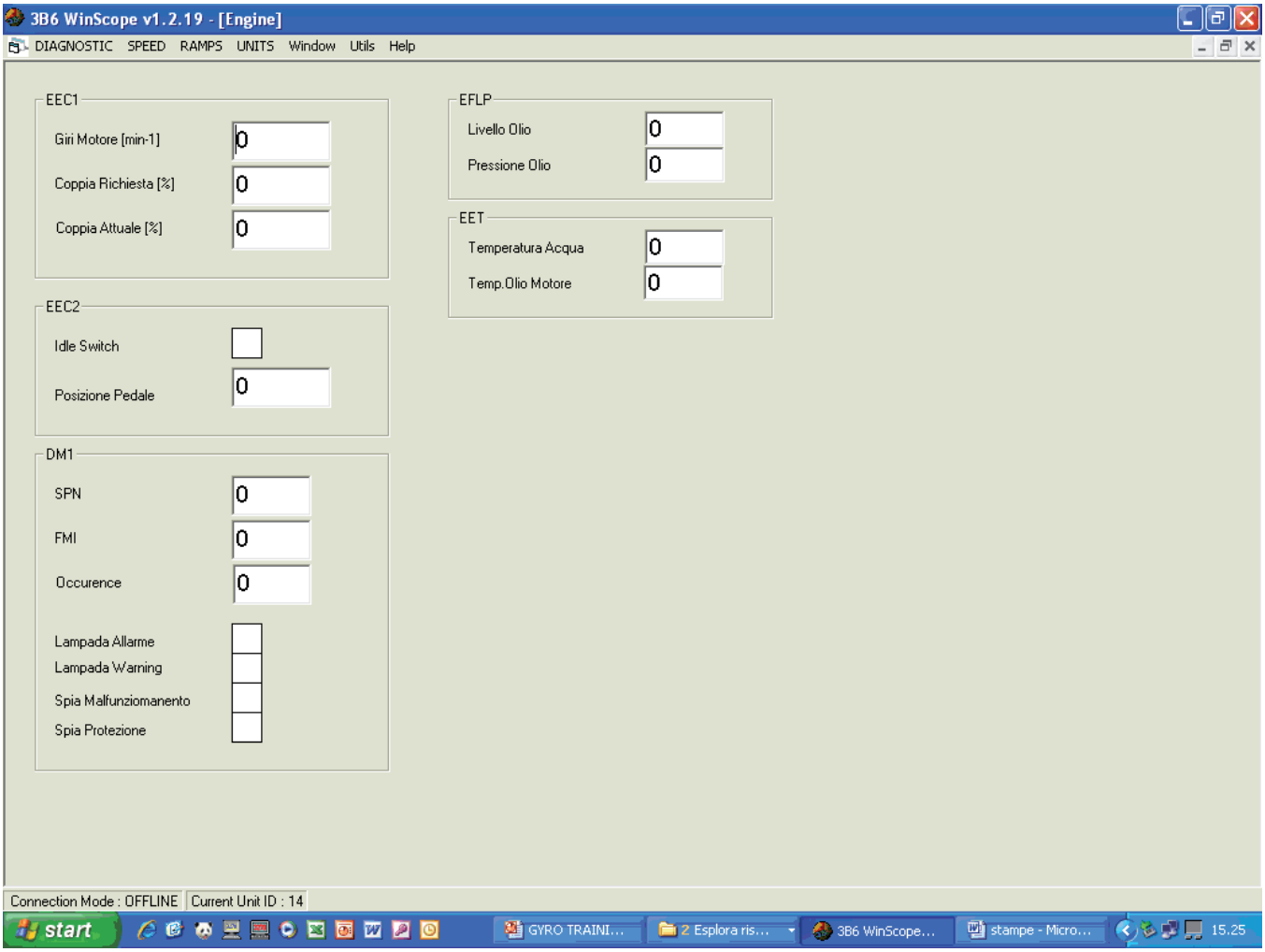
You find the **IN/OUT** description, with the PIN number and a small flag showing if **IN/OUT** is active or not. Additionally, there is a small box where you can view the **CAN** messages from the **BOOM** and to the **BOOM**.
ArmC1 corresponds to the front axle.
ArmC2 and **ArmB3** have equivalent windows; the first is relevant to the rear axle; the second to the machine boom.
These windows display information on the boom position (redundant), the weight value, the pressure transducers, the stabilizers position and the activation of the stabilizer valves.

The **Chassis** sub-menu is similar to the one shown below.

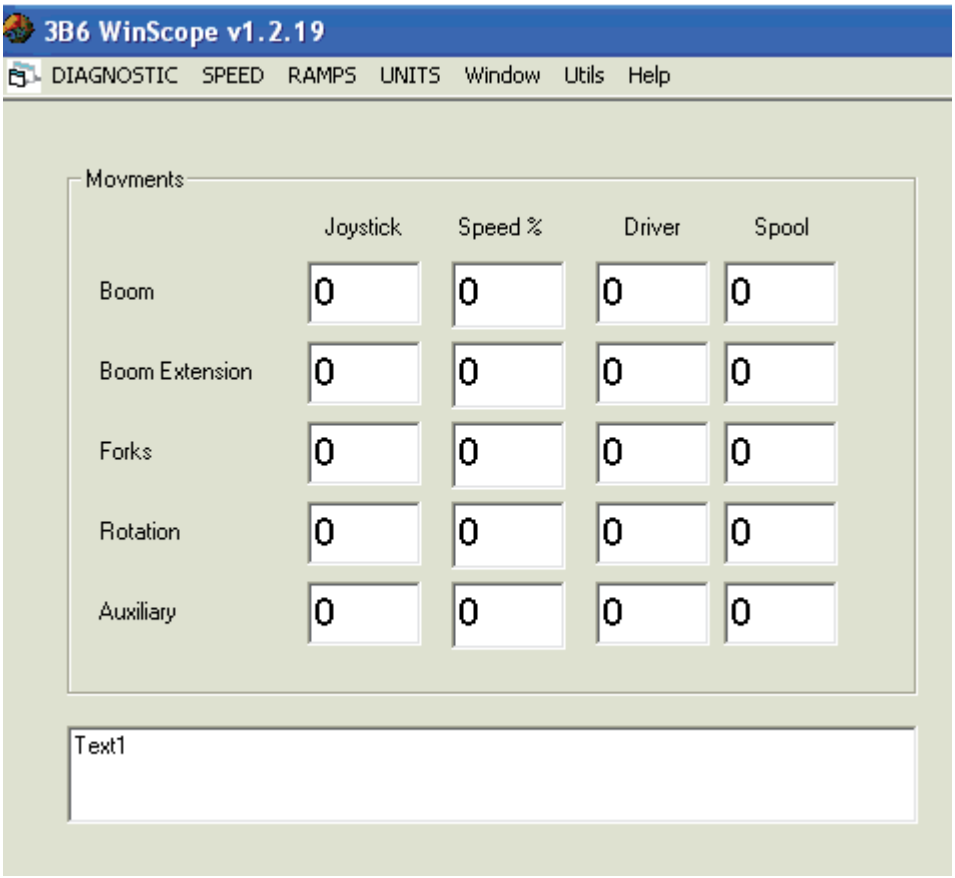


This window displays information on the switches and the stabilizers.

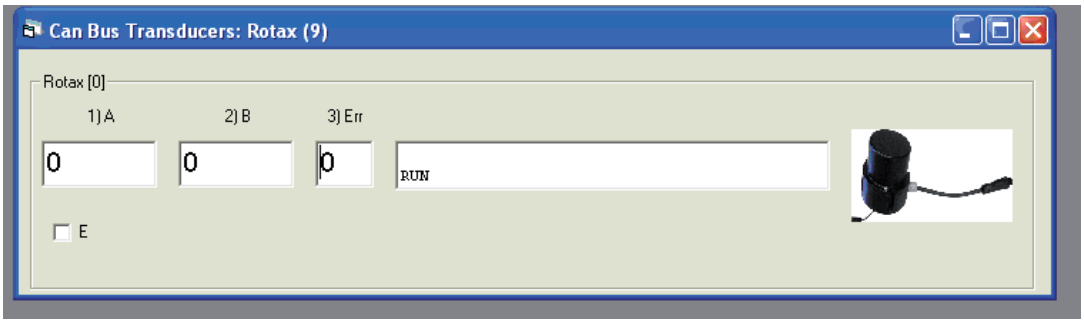
The **Engine** sub-menu displays the main parameters of the diesel engine of the machine.

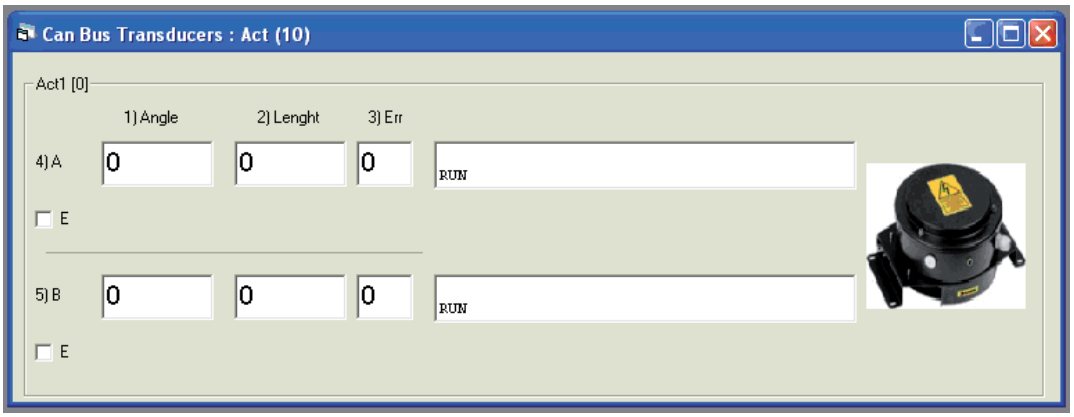


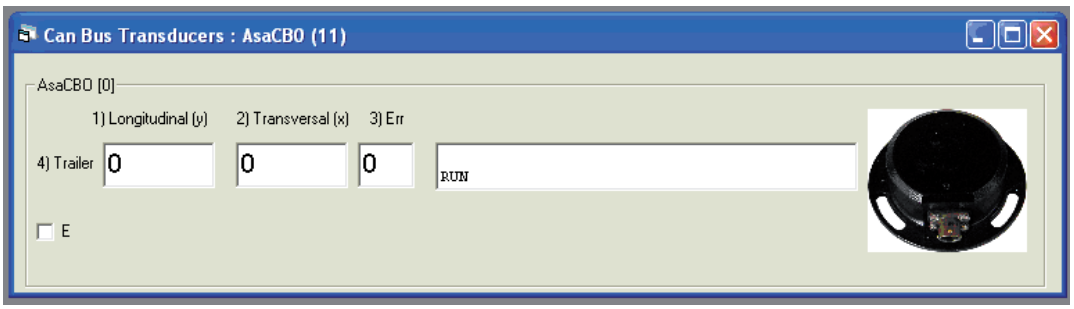
The **Movements** sub-menu indicates the position of the lift, and the speed and position of the boom cursor.

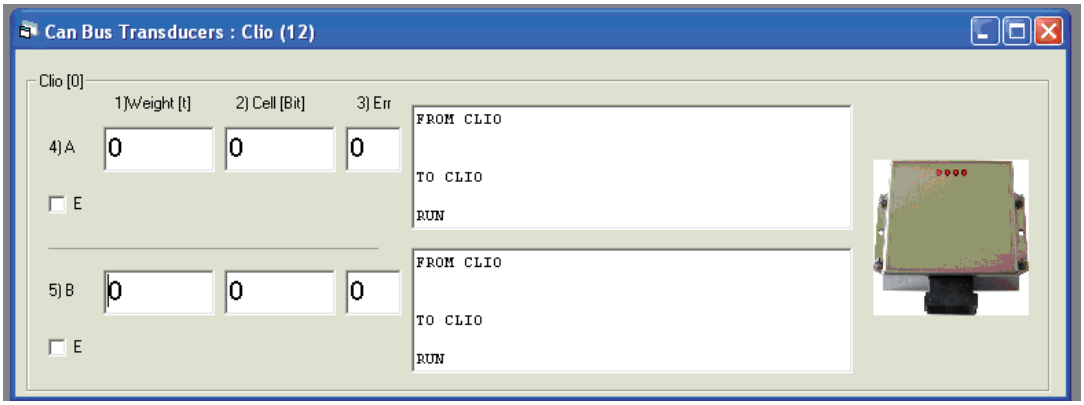


The last four sub-menus are relevant to the **Rotax**, **ACT**, **ASA** and **CLIO** units; they show the actual values and the CAN messages exchanged among these units.

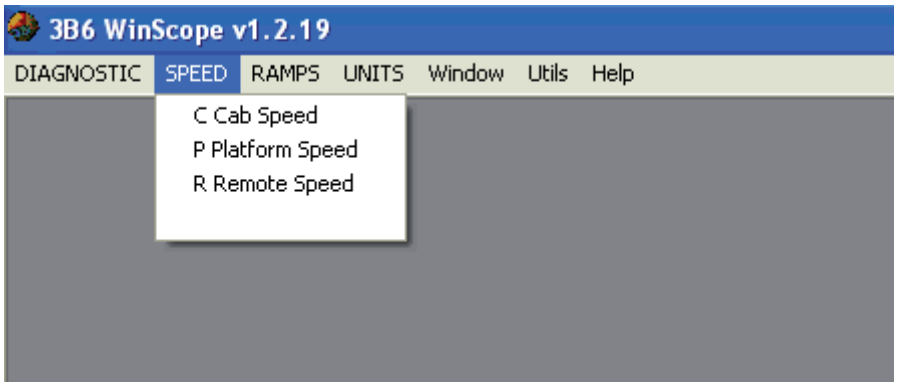








The second main menu is the **SPEED** menu and has 3 sub-menus as shown in the picture below.



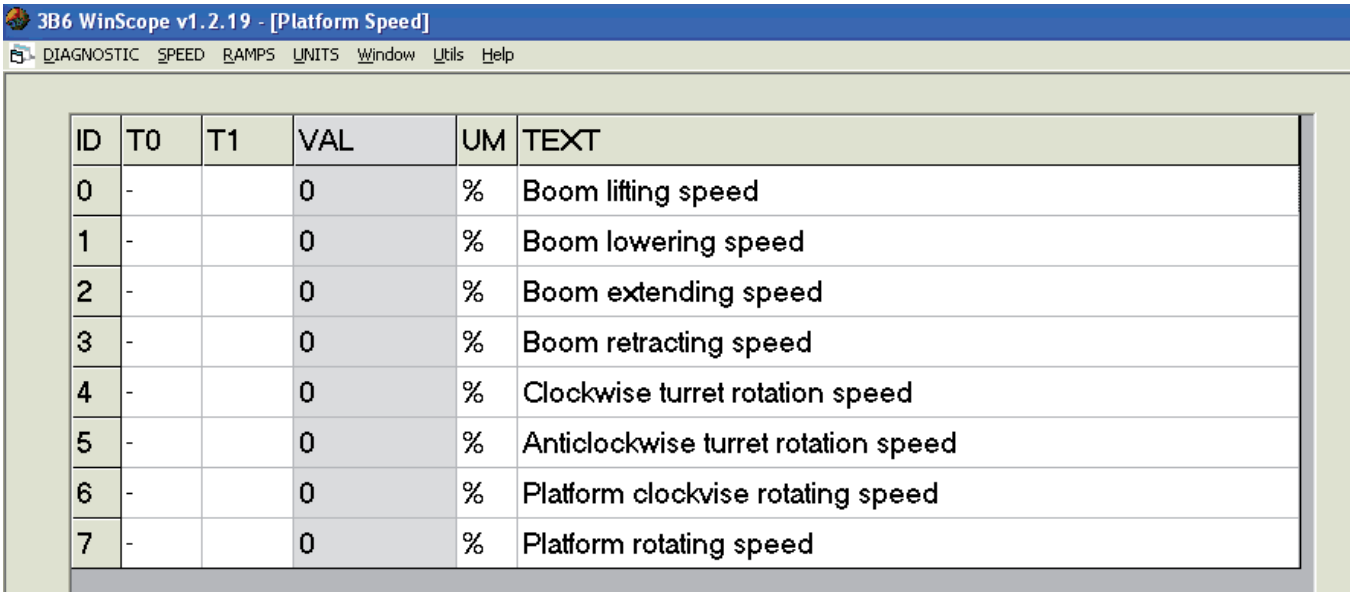
From these menus you can adjust the speed of each single movement from any control position. All of them are independent.
Adjust the values in the **VAL** column (some of these parameters have a range within which you shall keep).

3B6 WinScope v1.2.19 - [Cab Speed]

DIAGNOSTIC SPEED RAMPS UNITS Window Utils Help

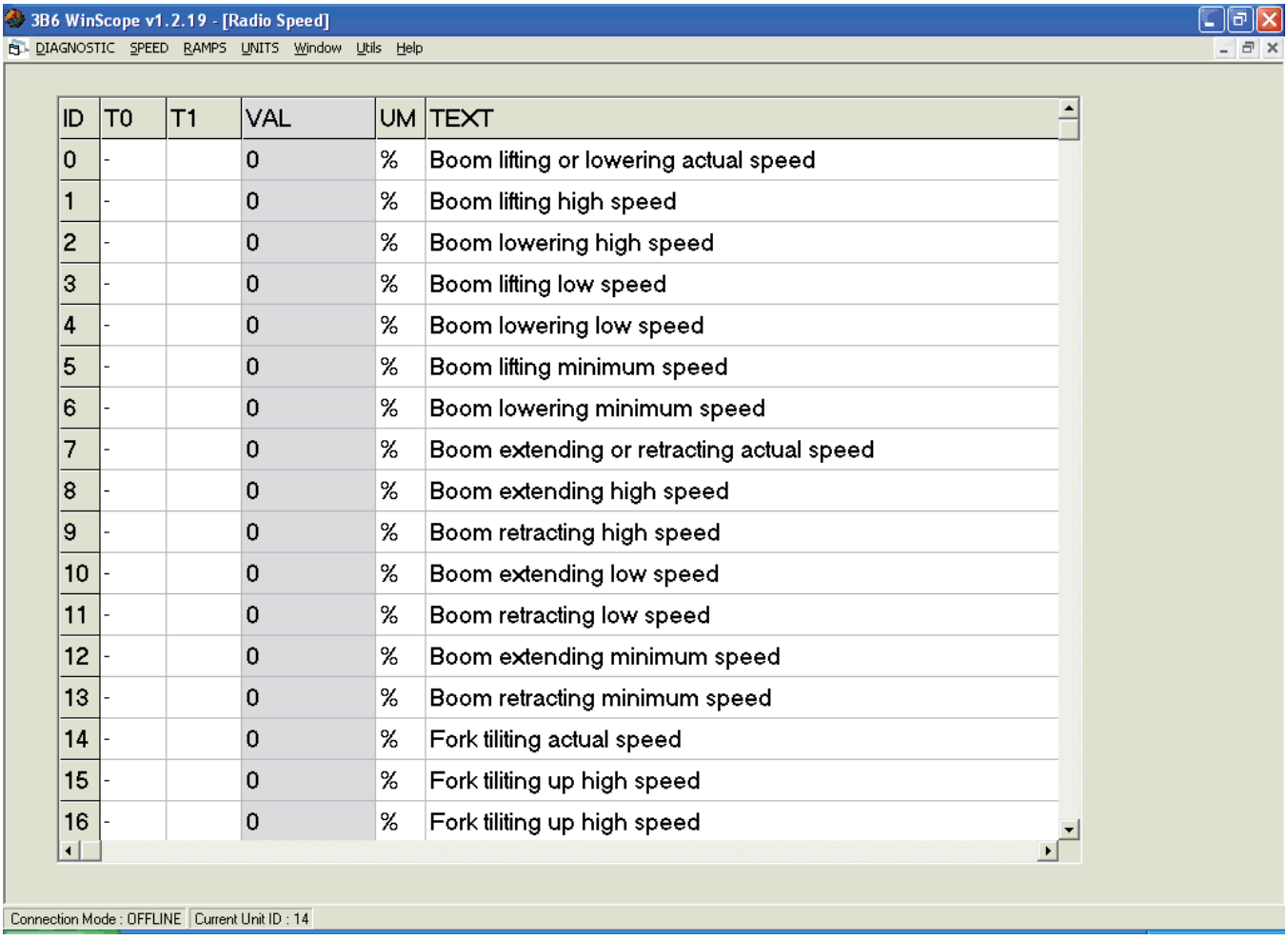
ID	T0	T1	VAL	UM	TEXT
0	-		0	%	Boom lifting speed
1	-		0	%	Boom lowering speed
2	-		0	%	Boom extending speed
3	-		0	%	Boom retracting speed
4	-		0	%	Clockwise turret rotation speed
5	-		0	%	Anticlockwise turret rotation speed
6	-		0	%	Fork tilting up speed
7	-		0	%	Fork tilting down speed
8	-		0	%	Auxiliary direction 1 speed
9	-		0	%	Auxiliary direction 2 speed

Cab Speed menu



ID	T0	T1	VAL	UM	TEXT
0	-		0	%	Boom lifting speed
1	-		0	%	Boom lowering speed
2	-		0	%	Boom extending speed
3	-		0	%	Boom retracting speed
4	-		0	%	Clockwise turret rotation speed
5	-		0	%	Anticlockwise turret rotation speed
6	-		0	%	Platform clockvise rotating speed
7	-		0	%	Platform rotating speed

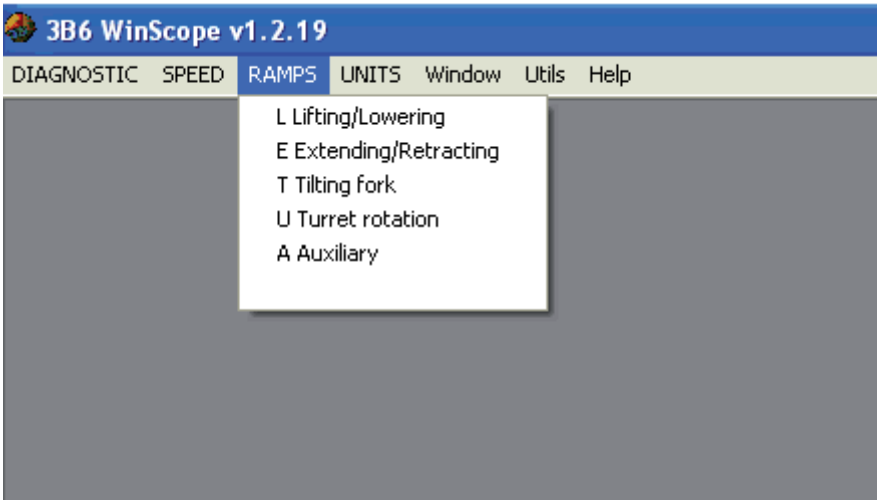
Platform Speed menu



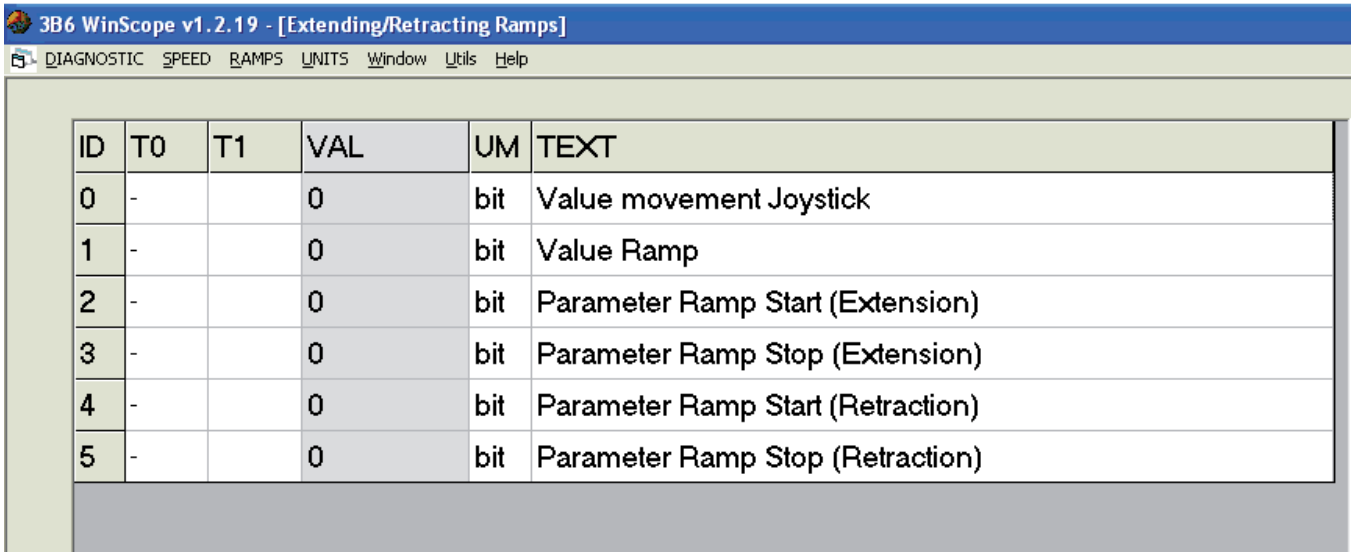
ID	T0	T1	VAL	UM	TEXT
0	-		0	%	Boom lifting or lowering actual speed
1	-		0	%	Boom lifting high speed
2	-		0	%	Boom lowering high speed
3	-		0	%	Boom lifting low speed
4	-		0	%	Boom lowering low speed
5	-		0	%	Boom lifting minimum speed
6	-		0	%	Boom lowering minimum speed
7	-		0	%	Boom extending or retracting actual speed
8	-		0	%	Boom extending high speed
9	-		0	%	Boom retracting high speed
10	-		0	%	Boom extending low speed
11	-		0	%	Boom retracting low speed
12	-		0	%	Boom extending minimum speed
13	-		0	%	Boom retracting minimum speed
14	-		0	%	Fork tiliting actual speed
15	-		0	%	Fork tiliting up high speed
16	-		0	%	Fork tiliting up high speed

Radio Remote Control Speed menu

The third main menu is the **RAMPS** menu and has 5 sub-menus (as shown in the picture below), each of them representing a double function of the boom.



As the 5 menus are quite similar, we propose one single example for all of them.



ID	T0	T1	VAL	UM	TEXT
0	-		0	bit	Value movement Joystick
1	-		0	bit	Value Ramp
2	-		0	bit	Parameter Ramp Start (Extension)
3	-		0	bit	Parameter Ramp Stop (Extension)
4	-		0	bit	Parameter Ramp Start (Retraction)
5	-		0	bit	Parameter Ramp Stop (Retraction)

Extending/retracting ramps menu

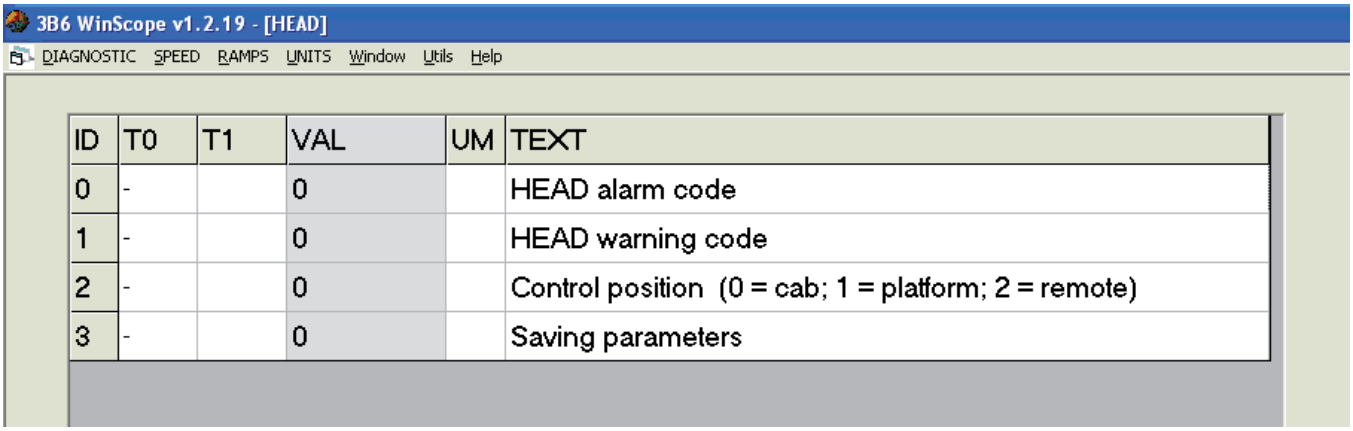
The value entered in the Ramp field is R, the acceleration time is **T** = 100/R (s); so if you enter R=1000, you will obtain a slow-down/acceleration time of 0.1 seconds.

CAUTION

It is advisable not to go below the value of R=100.

The last main menu is the **UNITS** menu and has 4 sub-menus as shown in the picture below.

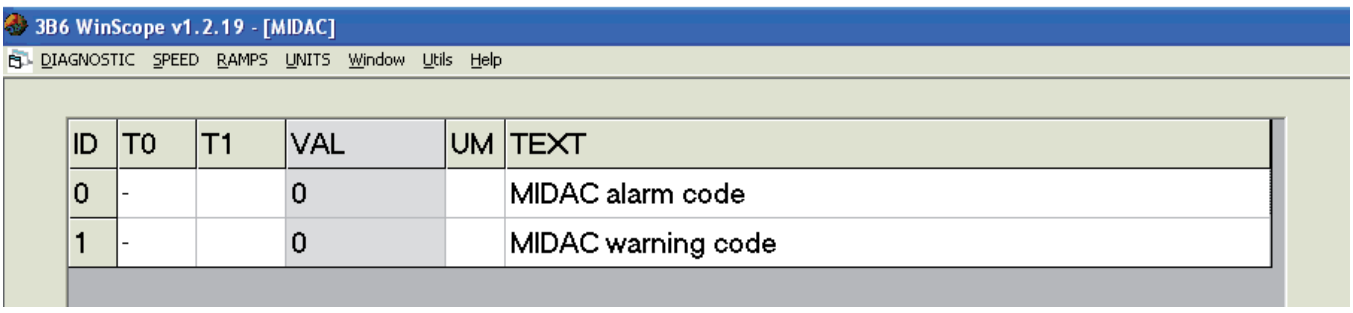
The **HEAD** sub-menu is as follows:



ID	T0	T1	VAL	UM	TEXT
0	-		0		HEAD alarm code
1	-		0		HEAD warning code
2	-		0		Control position (0 = cab; 1 = platform; 2 = remote)
3	-		0		Saving parameters

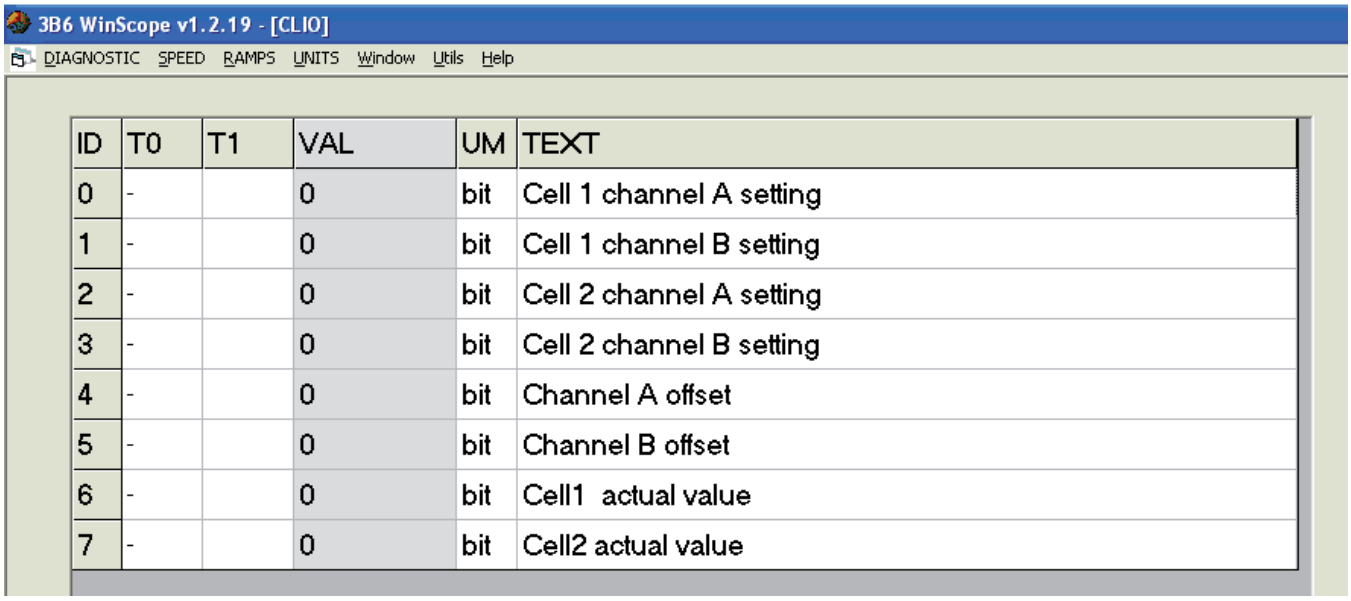
It shows the alarms, the warnings, the flags of the control mode and the **saving parameters** field. The latter is quite important as, after having set the speed and time of the response, you shall save the parameters to turn the same permanent.
Type in **1** in this field and wait for a few seconds until **0** is displayed again to show that the new settings have been saved in memory.

The **MIDAC** sub-menu displays the alarms and warnings for this unit.



ID	T0	T1	VAL	UM	TEXT
0	-		0		MIDAC alarm code
1	-		0		MIDAC warning code

The **CLIO** sub-menu shows some important parameters of this unit, used with aerial platform.



ID	T0	T1	VAL	UM	TEXT
0	-		0	bit	Cell 1 channel A setting
1	-		0	bit	Cell 1 channel B setting
2	-		0	bit	Cell 2 channel A setting
3	-		0	bit	Cell 2 channel B setting
4	-		0	bit	Channel A offset
5	-		0	bit	Channel B offset
6	-		0	bit	Cell1 actual value
7	-		0	bit	Cell2 actual value

The first six are referred to the platform calibration, the last two show the output values of the load cell for the first two channels.

The **DOWNLOAD BLACKBOX** sub-menu lets you display the events which have occurred on the machine on your PC (up to max 1000 events).

Using the **SAVE** button, the current settings are downloaded and saved in your PC, while, by pressing the **LOAD** button, you can load the parameters saved in your PC directly into the machine.

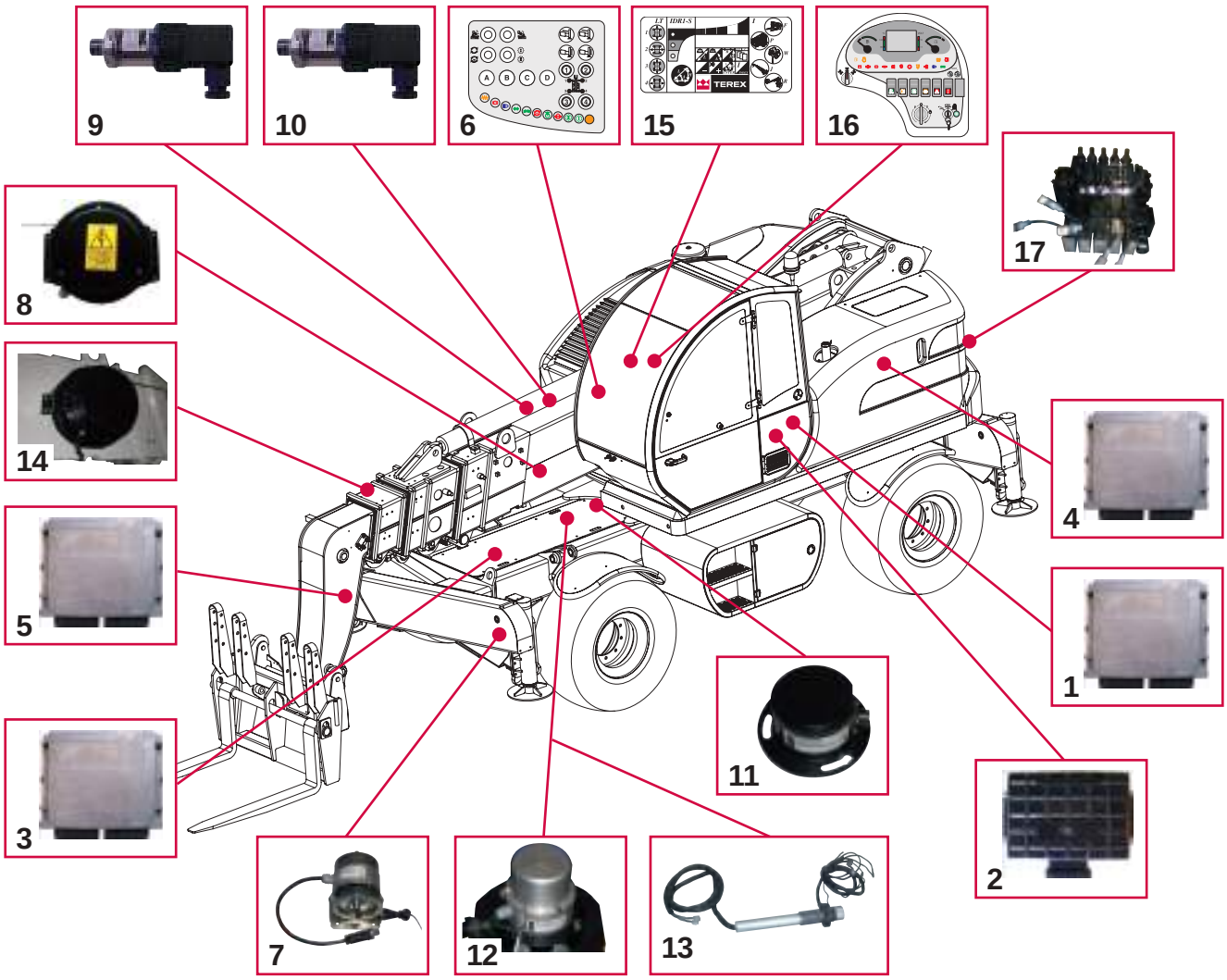
2.27 MIDAC SYSTEM

• General

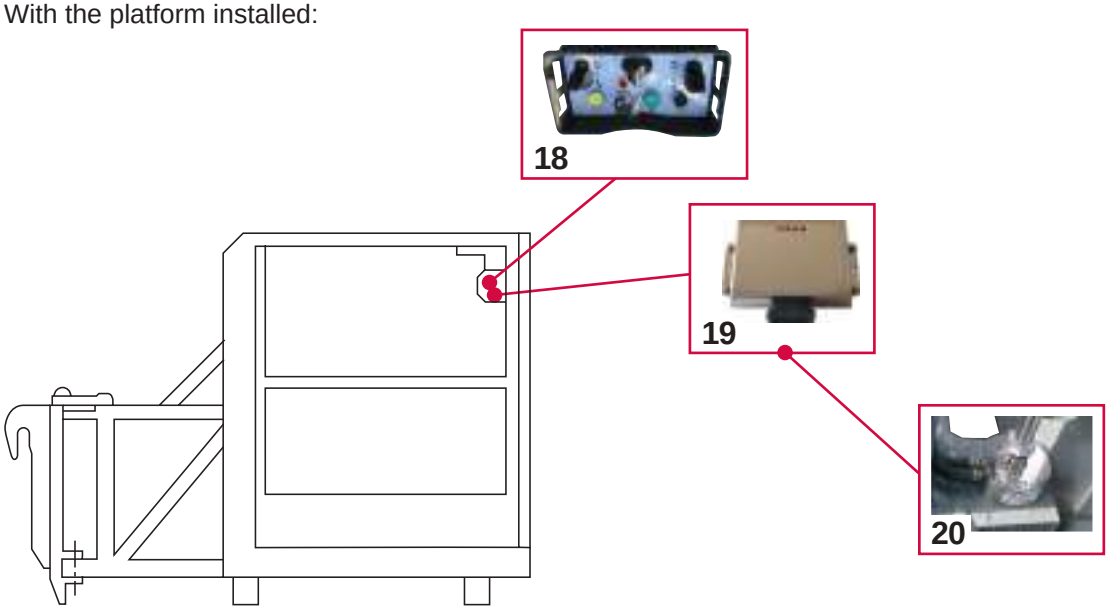
The HT04.x system, dealt with in this chapter, is used for the total control of the Gyro machines.
The main features are as follows:

1. Total management via CANBUS control units
2. Boom movement management from driving place
3. Boom movement management from platform
4. Boom movement management from remote control
5. Outriggers' safety devices management
6. Limiter management according to standard ISO13000 and EN280
7. Variable crossbars management
8. Black Box and alarms management with 500 events in memory.

- Layout



With the platform installed:



Ref.	Description	N.
1	Head type central unit	1
2	Limiter unit	1
3	Arm board - ARM C1 front carriage	1
4	Arm board - ARM C2 rear carriage	1
5	Arm board - ARM C3 platform and signals on boom	1
6	Cab Cluster panel	1
7	Servo-assisted reels for outriggers' extension	4
8	Angle/length servo-assisted reel with double transducers	1
9	Main cylinder pressure transducers	2
10	Compensation cylinder pressure transducers	2
11	Undercarriage levelling sensor	1
12	Turntable rotation Rotax sensor	1
13	8-passage rotary joint	1
14	Reel for 6-passage platform signals	1
15	Cab display	1
16	Right control panel (not 3B6) - Radio unit (not 3B6)	1
17	Boom control driver (not 3B6) - Diagnostic connector	1
18	Control console from platform	1
19	Platform weight control unit	1
20	2.5t redundant load cell	1

HEAD unit 1
It is equipped with a microprocessor for managing the movements, the ramps, etc.
It is positioned on a base and has a block programme (interpreter).

ARM units 3, 4, 5
They are the HEAD slave boards; they have no programmable logics but are equipped with micro-switches and manage the CAN I/O. Their outside aspect is similar to the one of the HEAD, but they have a resin coating as they are used outdoors. Protection degree IP67.

ROTAX unit 12
It is equipped with an electric joint for the passage of the digital signals. There are three potentiometers changed by 120 degrees in phase to guarantee redudancy (each potentiometer has a dead zone of some 40 degrees, therefore with the potentiometers changed in phase, we can read the turret position in redundancy).

CLUSTER panel unit 6
It is equipped with two connectors; the small on reads the CAN and the power supply, the other reads relays, right-hand panel pushbuttons and transfers them all around the machine.

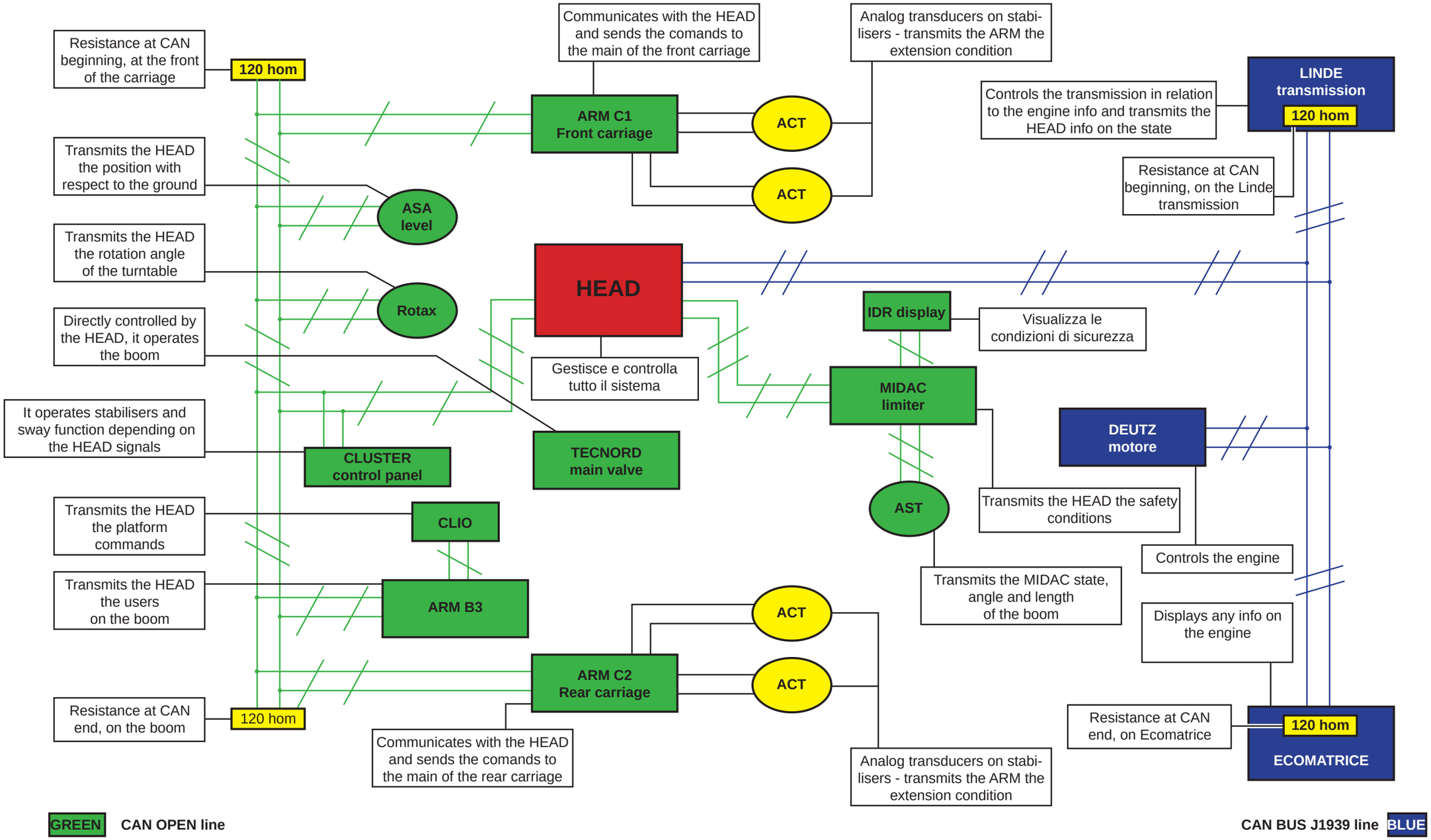
ECOMATRICE unit 16
It reads J1939 and CANOpen. ARM and MIDAC read J1939 and HEAD manages it (it can display the information on engine and transmission).

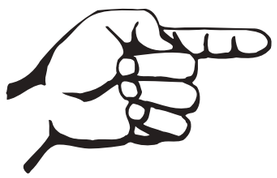
MIDAC unit 2
It has a flash-memory to save programme and charts in memory. It shall be re-programmed via sw with a PC.

ASA unit 11
It reads the two X and Y axes.

REEL unit 14
It is the CAN bus.

CLIO unit 19
It has two CPUs for the redundancy; it reads the two cell channels. It is connected to the CanBus and saves the settings in memory.

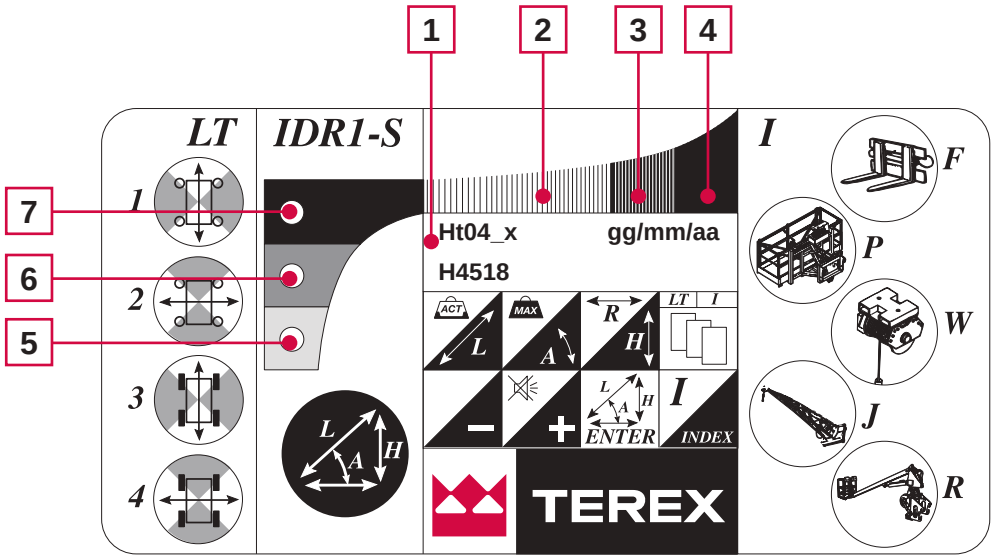

Resistance at CAN beginning, at the front of the carriage
120 hom
Communicates with the HEAD and sends the comands to the main of the front carriage
Analog transducers on stabi-lisers - transmits the ARM the extension condition
ARM C1 Front carriage
ACT
ACT
Controls the transmission in relation to the engine info and transmits the HEAD info on the state
LINDE transmission
120 hom
Resistance at CAN beginning, on the Linde transmission
Transmits the HEAD the position with respect to the ground
ASA level
Transmits the HEAD the rotation angle of the turntable
Rotax
HEAD
IDR display
Visualizza le condizioni di sicurezza
Directly controlled by the HEAD, it operates the boom
Gestisce e controlla tutto il sistema
MIDAC limiter
It operates stabilisers and sway function depending on the HEAD signals
CLUSTER control panel
TECNORD main valve
DEUTZ motore
AST
Transmits the HEAD the safety conditions
Transmits the HEAD the platform commands
CLIO
Controls the engine
Transmits the HEAD the users on the boom
ARM B3
ACT
Transmits the MIDAC state, angle and length of the boom
Displays any info on the engine
ARM C2 Rear carriage
ACT
Resistance at CAN end, on the boom
120 hom
Resistance at CAN end, on Ecomatrice
120 hom
ECOMATRICE
Communicates with the HEAD and sends the comands to the main of the rear carriage
Analog transducers on stabi-lisers - transmits the ARM the extension condition
GREEN
CAN OPEN line
CAN BUS J1939 line
BLUE



Intentionally blank page

- Operator panel

Load % condition and alarms



1. LCD bar on alphanumeric display showing the percentage of lifted load with respect to the max load that can be lifted under such working conditions.

2. White reference with vertical black stripes: Safety zone.

3. Black reference with vertical white stripes: Alarm zone (load lifted above 90% of the max admissible load).

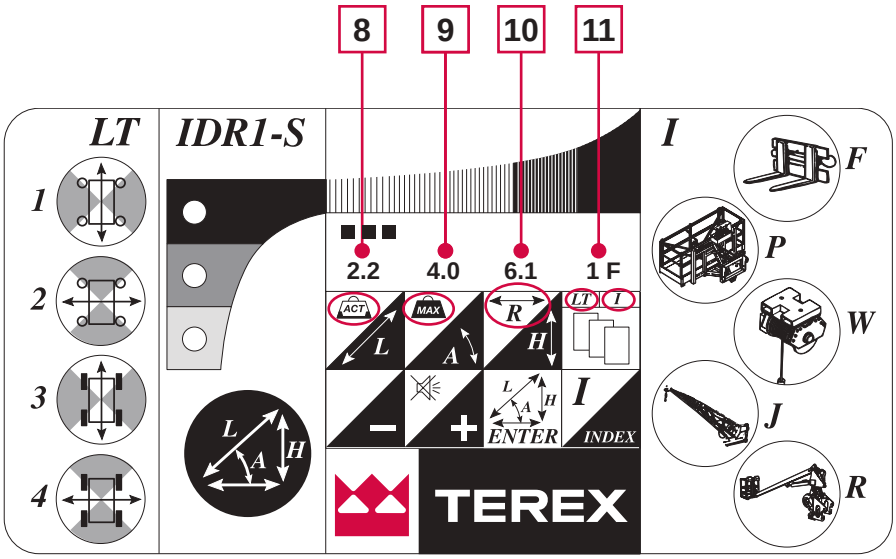
4. Black reference: Block zone (load lifted above 100% of the max admissible load).

5. Green light lit: Safety.

6. Yellow light lit: alarm (external audible alarm sounding).

7. Red light lit: Movements blocked (external audible alarm sounding).

Main work data



8. WEIGHT OF THE LIFTED LOAD, displayed only when you work with the forks with the boom fully retracted (as an option it is displayed when winch and platform are used in any extension condition).

Graphic symbol underneath: (**ACT**) Reading in "tons" with one decimal

9. MAX ADMISSIBLE LOAD in the current machine configuration.

Graphic symbol underneath: (**MAX**) Reading in "tons" with one decimal

10. WORK RADIUS (measures the distance from the slewring centre to the projection of the load application point).

Graphic symbol underneath: (**R**) Reading in "Metres" with one decimal

11. WORK CONFIGURATION

The first digit indicates the operating mode.

Graphic symbol underneath: (**LT**)

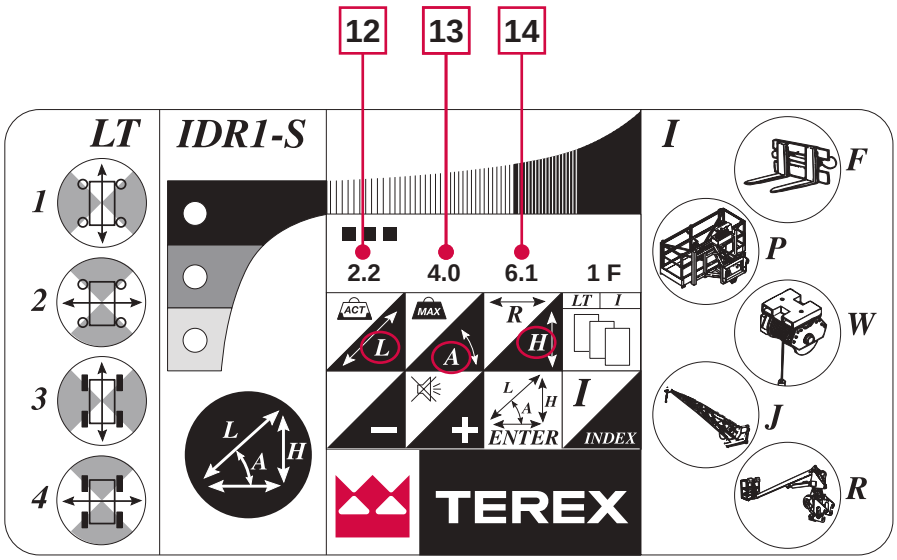
The second digit indicates the equipment used.

Graphic symbol underneath: (**I**)

CAUTION

If the imperial system is selected, loads are expressed in "pounds/1000" and geometrical data in "feet".

Reading of the complementary working data



For some seconds, the values relevant to the complementary readings **L**, **A**, **H** are displayed. Afterwards, the displays shows again the main readings **ACT**, **MAX**, **R**. Pressing the ENTER key displays the previous page once again.

12. BOOM LENGTH

Graphic symbol underneath: (**L**) Reading in "Metres" with one decimal

13. BOOM ANGLE

Graphic symbol underneath: (**A**) Reading in “degrees”.

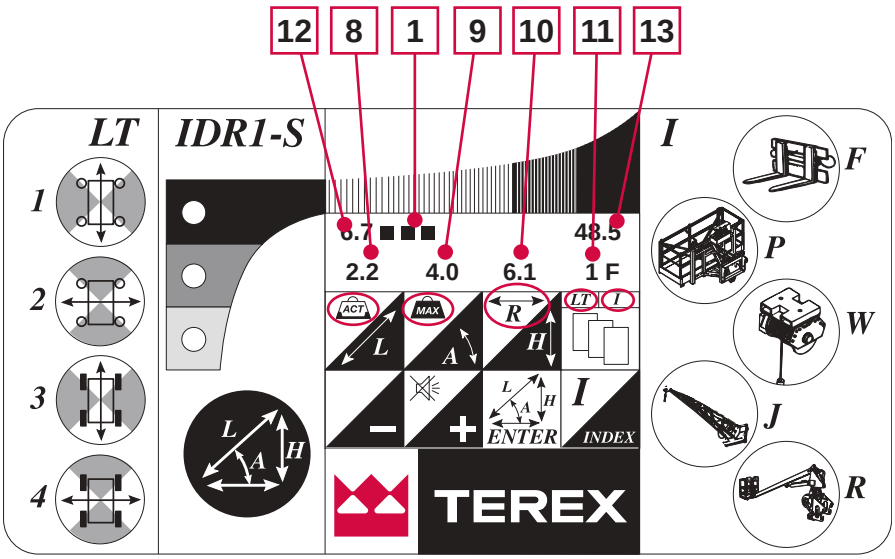
14. GROUND CLEARANCE

Graphic symbol underneath: (**H**) Reading in "Metres" with one decimal.

CAUTION

If the imperial system is selected, loads are expressed in "pounds/1000" and geometrical data in "feet".

Simultaneous reading of all the work data



1. Percent LCD bar

8. WEIGHT OF THE LIFTED LOAD **ACT**

9. MAX ADMISSIBLE LOAD **MAX**

10. WORK RADIUS **R**

11. WORK CONFIGURATION **LT, I**

12. BOOM LENGTH

13. BOOM ANGLE

For the reading of the HEIGHT above the ground **H**, press the ENTER key.

CAUTION

For the GRAPHIC SYMBOLS and the METRIC/ IMPERIAL UNITS OF MEASURE, see the previous notes.

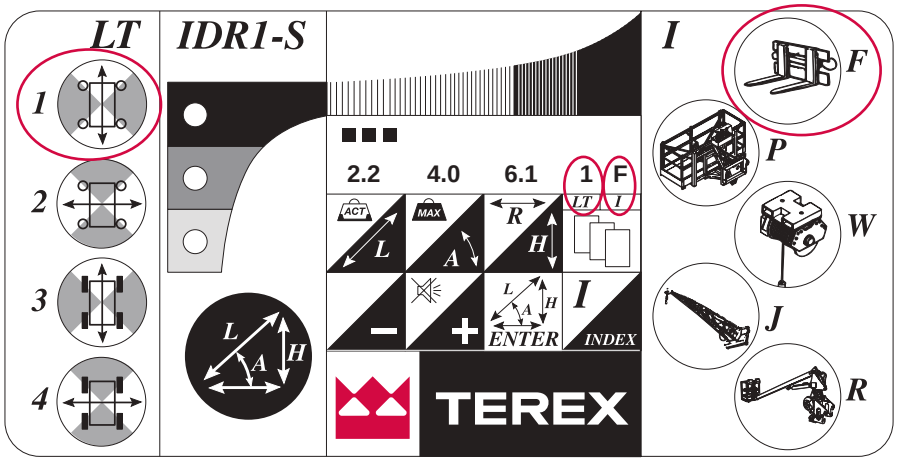
THE DISPLAY ALLOWS TO DISPLAY OTHER DATA ON THE SYSTEM OPERATION.

Display of equipment and operating mode

If the accessory is preset for automatic recognition (presence of the polarisation connector), the equipment change occurs automatically and the system self-recognises the accessory used.
If the accessory is not preset for automatic recognition, the selection is done by hand by selecting the correct Chart (**I**) from the panel.
The setting of the Operating Mode (**LT**) is automatic and selected by external micro-switches.
In the main page (the one usually displayed), the Chart of the selected equipment (**I**) and the Operating Mode (**LT**) of the machine are displayed in the highlighted zone under form of digits.
In the example in the picture, the displayed working condition is:

LT = 1
Front outriggers

I = F
Forks.



As for the symbols on the panel, the possible selections are as follows:

LT main selections (automatic):

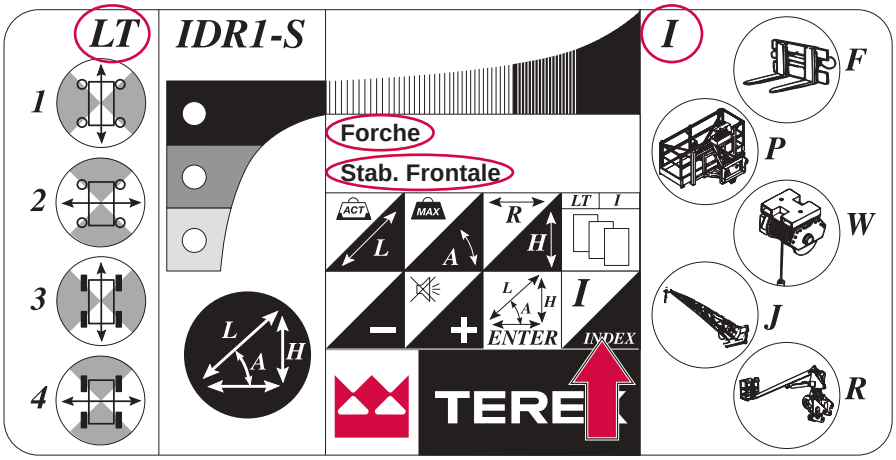
1 = Outriggers - front
2 = Outriggers - side
3 = Wheels - front
4 = Wheels - side

I selections from panel (manual):

F = Forks
P = Platform (basket)
W = Winch
J = Jib
R = Robot

Display of equipment and operating mode as a text

For ease of understanding, the working conditions - i.e. the Operating Mode (**LT**) and the Chart (**I**), can be displayed as a text.
By pressing the INDEX key, the displays shows the description of the set operating mode and the load chart of the selected equipment.
This screen remains for 3 seconds; afterwards the main work page is displayed.



Selecting equipment and operating mode

For accessories with automatic recognition:
If the accessory is preset for the automatic recognition, you have only to install the accessory and plug the connector in the relevant socket at the top of the boom.

For manual accessories:
Starting from the main page, press the INDEX key to open the page with the descriptions of the current Operating Mode (**LT**) and the Chart (**I**) relevant to the equipment being used.
Once the page has been opened, press the INDEX key several times until displaying the adequate chart: each pressure of the key corresponds to the selection of one available accessory.
During this phase, the system enters the block mode.
Once the correct Chart has been chosen, press the ENTER key **to confirm the selection** and activate the control.