# T 204 H
# T 235 H

# OPERATOR'S MANUAL

**ENGLISH / USA**
**ORIGINAL MANUAL**

# Compact rough terrain reach truck
# AUSA T204H -T235H

**Above chassis number 32061018**

**ORIGINAL MANUAL**

# Foreword

Thank you for choosing this AUSA Compact rough terrain reach truck (hereafter “forklift”), which offers the best levels of performance, safety and working comfort. Remember that you are the key to maintaining these characteristics. Correct use of the forklift will enable you to take full advantage of the features it has to offer.

**You should read and understand this Manual before operating the forklift. Its purpose is to provide instructions for those persons in contact with the machine and especially for the machine’s operator. Its content will help you to better understand the AUSA forklift, and teach all you need to know about starting it, driving techniques, maintenance and care, designed uses of the dumper and safety instructions to be followed.**

AUSA cannot be held responsible for any damages caused by the improper use of the forklift.
For any queries, complaints or spare parts orders, contact your Official AUSA Representative or Dealer.

For further information you may call, write, FAX or email to:

**AUSA Center, S. L. U.**
P.O.B. 194
08243 MANRESA (Barcelona), SPAIN
Tel. 34-938 747 552 / 938 747 311
Fax: 34-938 736 139 / 938 741 211 / 938 741 255
E-mail: ausa@ausa.com
Web: http://www.ausa.com

AUSA is continually improving its products and reserves the right to make such improvements without incurring any obligation to make changes to forklifts previously sold. Therefore, claims cannot be made based on the data, illustrations and descriptions set forth in this manual.
Use only original AUSA spare parts. Only thus can you guarantee that the forklift will continue to give the same level of technical performance as when purchased.
No changes should be made to the forklift without prior authorization from the manufacturer.
Keep this manual in the document holder situated behind the operator’s seat **(Fig.1).**

**Store the manual with care, including after having fully read the document, to ensure that you can refer to it in the future and clarify any doubts. Should you have any difficulty understanding this manual, or any paragraph in the manual, contact your Official AUSA Representative or Dealer.**

(fig. 1)

# Introduction

The manual consists of five sections:

| | |
|---|---|
| **Section 1** | GENERAL INFORMATION |
| **Section 2** | SPECIAL SAFETY INFORMATION |
| **Section 3** | OPERATING INSTRUCTIONS |
| **Section 4** | PERIODIC MAINTENANCE OPERATIONS |
| **Section 5** | DIAGRAMS AND CHARTS |

**Section 1**, “GENERAL INFORMATION”, includes general information on the main parts of the machine. This section also lists details of part references and technical characteristics, etc.
**Section 2**, “SPECIAL SAFETY INFORMATION”, is aimed at personnel in charge of the correct operation of the machine, repairs and maintenance, and, for companies with a large number of machines, the safety manager.
This section also includes the requirements which managers must satisfy and key items of indispensable safety information.
**Section 3**, “OPERATING INSTRUCTIONS” mainly targets operators. This section illustrates all control devices and instruments and includes instructions on how to use the forklift: from starting the engine, to parking and leaving the forklift.
**Section 4**, “PERIODIC MAINTENANCE OPERATIONS”, mainly targets operators, and specifically the maintenance manager and personnel. This section includes information on the planned maintenance program, the regularity of operations, which liquids and lubricants to use, greasing points, etc.
**Section 5**, “DIAGRAMS AND CHARTS” includes tables and related documents: load charts, wiring and hydraulic diagrams, etc.

All sections are divided into chapters and paragraphs.
Checking the “INDEX” is the quickest and easiest means of finding information.

## WARNING

Should conflict be identified between the content of this manual and the actual operation of the machine, this may be due to the manual relating to a more recent version of the machine or to the manual not having been updated since modifications to the machine.
In this case, contact your Official AUSA Representative or Dealer to clarify any doubts or obtain another version of this manual.

Optional equipment
Optional equipment is indicated as follows: (if applicable). Optional equipment will only be supplied at the express request of the customer, for specific versions or countries.

## Symbols

When using the machine, you may find yourself in situations in which specific considerations or explicit explanations are required.
Should a situation imply a risk for your safety or that of others, or the operating order or correct use of the machine, this manual uses SPECIAL SYMBOLS and includes specific instructions.
Although simply reading this information will not remove the risk, the understanding and application of the indications will assist in the correct use of the machine.
Seven special (safety) symbols are used in the manual. These symbols are displayed next to key words classifying the degree of danger involved. Each symbol will assist in identifying the corresponding risk and indicates the action to be taken to avoid the risk. The text may be accompanied with illustrations in some cases.
The following is a list of the special (safety) symbols in order of importance:

**DANGER**

Indicates situations which, if the appropriate safety precautions are not taken for yourself and others, imply serious risks for the physical integrity of the people involved, and may even include a risk of death.

**ELECTRIC HAZARDS**

Indicates situations which, if the appropriate safety precautions are not taken for yourself and others, imply serious risks for the physical integrity of the people involved, and may even include a risk of death.

**WARNING**

Indicates situations relating to your safety and that of others, which imply low risks of accidents or injury, or the ineffective operation of the machine.

**CAUTION**

Indicates situations relating to the operation of the machine.

**ENVIRONMENT PROTECTION**

The text following this symbol includes information on recycling and environmental information.

**NOTE**

Indicates any additional information required to complete instructions.

## WARNING

When reading this manual, pay close attention to the special symbols and explanations next to these symbols.

# Index

# General Information

**Section 1**

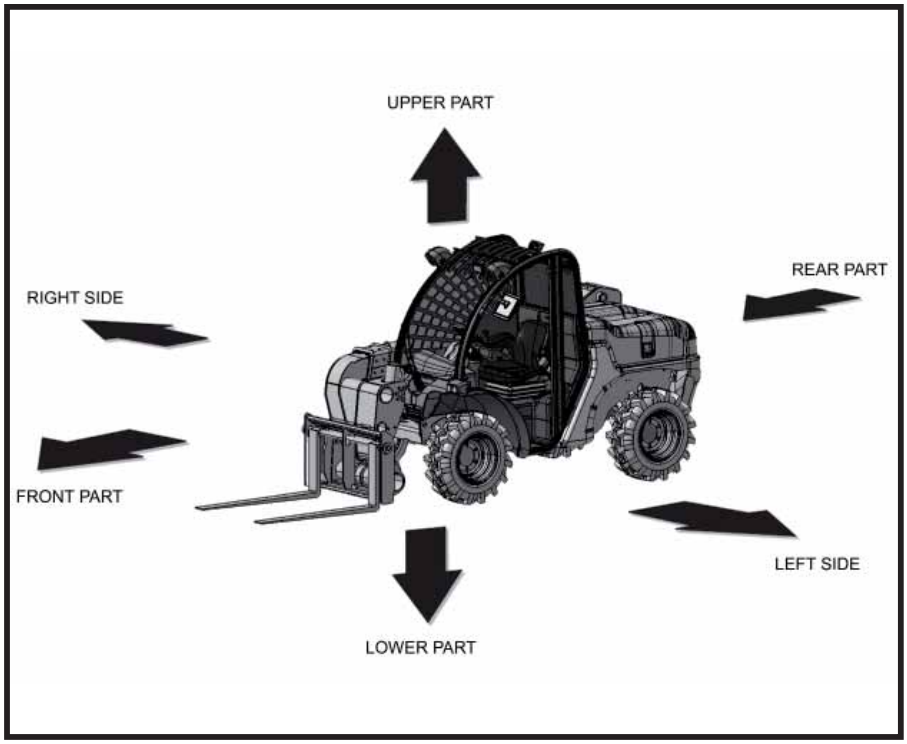
**INDEX**

# 1.1 How to identify your machine

### 1.1.1 MACHINE DIRECTIONS

The terms right, left, forward and back, when used in this manual, refer to these positions from the operator's seat looking forwards. These references will be particularly useful to identify the different machine parts (front, rear, etc.) mentioned in this manual.

(fig. 1)

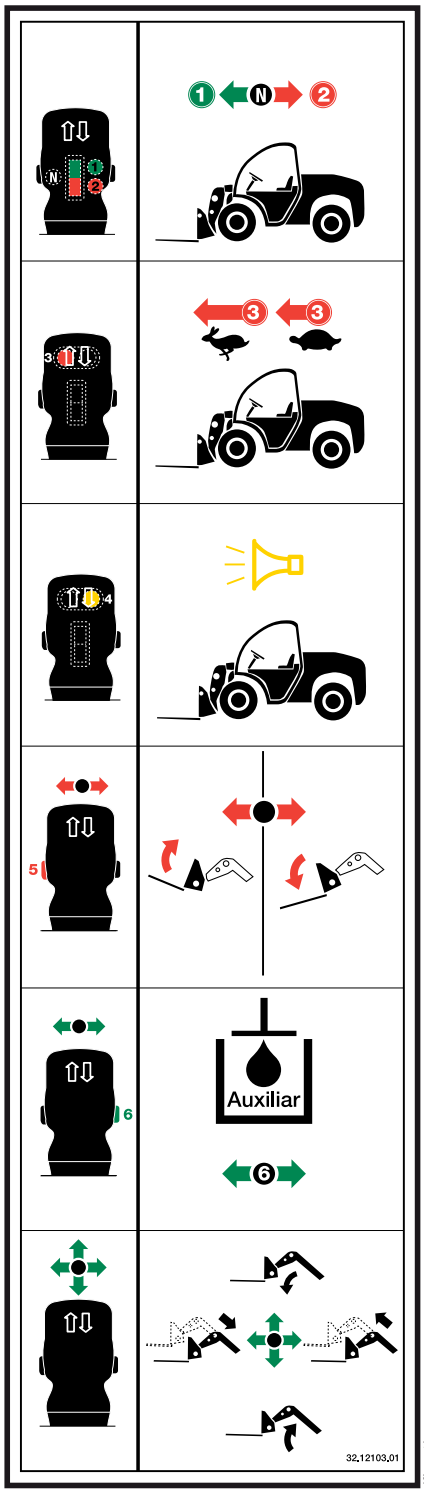


### 1.1.2 WARNING PLATES AND LABELS ON THE MACHINE

This paragraph and paragraph 1.2.3. of this manual show the warning plates and labels placed on standard machines and those equipped with options.

**IMPORTANT**

Take time to learn these plates and labels. Check that they are readable. Clean and replace damaged or unreadable (text or graphics) items.
Use a clean cloth, water and soap to clean plates and labels. Do not use solvents, gasoline, etc. Should a plate or label be placed on a component to be replaced, check that the plate or label is transferred to the new component.




(fig. 1)

**Description**
Quick guide to the main functions of the forklift (printed on PVC).

**Meaning**
Extracted from the instructions and maintenance manual on:
- the functioning of joystick movements.

**Location**
Inside the cab, to the right of the driver, fitted crosswise, on the relay box.


(fig. 1)

**Description**
Label with white background and black text indicating “Guaranteed acoustic level”.

**Meaning**
Indicates the guaranteed acoustic level measured as per the provisions of the Directive 2001/14/EC

**Location**
In the cab, fitted under the parking brake handle.


(fig. 2)

**Description**
White/red/orange label indicating “Do not enter or remain within radius of action”.

**Meaning**
Dictates that no person may enter or remain within the radius of action of the machine when operating.

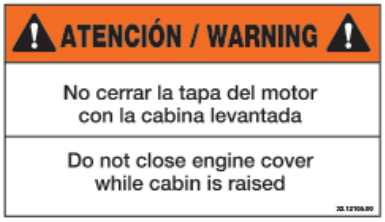
**Location**
In the cab, fitted on the front left mud guard.


(fig. 3)

**Description**
Label with yellow background and black drawing. “Do not use this machine without authorization and full knowledge of how to operate”.

**Meaning**
Indicates the risks incurred by operators if they use the machine without authorization or appropriate knowledge.

**Location**
In the cab, fitted under the armrest to the right of the driver.




(fig. 4)

**Description**
Label with white/orange background. “Do not close the engine cover with the cab in the up position”.

**Meaning**
Indicates the risk incurred in closing the engine cover with the cab in the up position.

**Location**
In the engine compartment, fitted on the rear left mud guard.


(fig. 5)

**Description**
Label with white background and black text indicating “Inflation pressure for standard tyres”.

**Meaning**
Indicates the inflation pressure for standard tyres.

**Location**
On the front and rear mud guards, fitted over the tyre aperture.


(fig. 1)

**Description**
Label with white background and black text indicating “Inflation pressure for optional tyres”.

**Meaning**
Indicates the inflation pressure for optional tyres.

**Location**
On the front and rear mud guards, fitted over the tyre aperture.

(fig. 2)

**Description**
Label with white/orange background. “Do not operate the machine without wearing the seatbelt”.

**Meaning**
Indicates the risks incurred by operators if they use the machine without wearing the seatbelt.

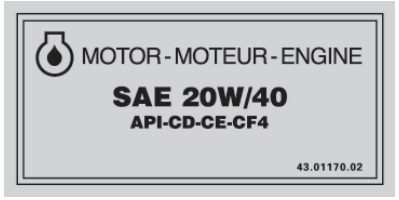
**Location**
In the cab, fitted under the armrest to the right of the driver.


(fig. 3)

**Description**
Label with white/orange background. “Precautions to be taken prior to lifting the cab”.

**Meaning**
Indicates the action to be taken to lift the cab, to ensure that the extending arm of the machine is in the down position and extended by approximately 20 cm. (7.8 in) and that the fork is resting on the ground before lifting the cab.

**Location**
In the cab, fitted in the rear section, to the left of the opening latch.




(fig. 4)

**Description**
Label with white background and black text indicating “Engine oil: SAE 20W/40”.

**Meaning**
Indicates the specifications for the type of oil to be used with the machine’s heat engine.

**Location**
In the engine compartment, fitted on the rear left mud guard.


(fig. 5)

**Description**
Plate with orange background and grey and white text.

**Meaning**
Logo of the manufacturer.

**Location**
In the centre of the front spoiler of the cab.

(fig. 1)

**Description**
Label with silver background and black drawing.

**Meaning**
Indicates anchor points for the hoisting of the machine.

**Location**
On the front left mud guard.


(fig. 2)

**Description**
Label with grey background and black text indicating “Use SAE 10W oil, or ATF type A - A for the brake circuit”.

**Meaning**
Indicates the specifications for the type of oil or fluid to be used for the machine’s brake circuit.

**Location**
Under the cab, fitted in the chassis to the right of the brake fluid tank.


(fig. 3)

**Description**
Label with white background and black text indicating “Use headphones or ear plugs”.

**Meaning**
Indicates that headphones or ear plugs should be used as a precaution due to high acoustic levels.

**Location**
In the cab, fitted under the armrest to the right of the driver.


(fig. 4)

**Description**
Label with white background and black text indicating “European authorization”.

**Meaning**
Indicates that the machines comply with applicable European standards.

**Location**
In the cab, fitted on the front left mud guard.


(fig. 5)

**Description**
Label with black & orange background and silver text indicating the machine model.

**Meaning**
T204H Machine model.

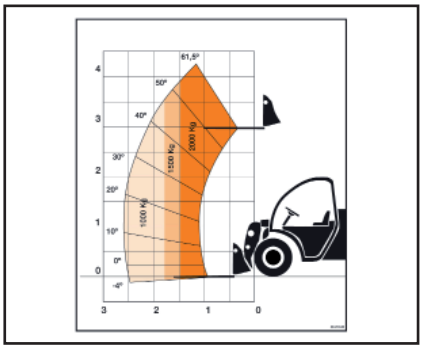
**Location**
One on each side of the machine (engine cover and tank protection)


(fig. 5)

**Description**
Label with black & orange background and silver text indicating the machine model.

**Meaning**
T204H Machine model.

**Location**
One on each side of the machine (engine cover and tank protection)

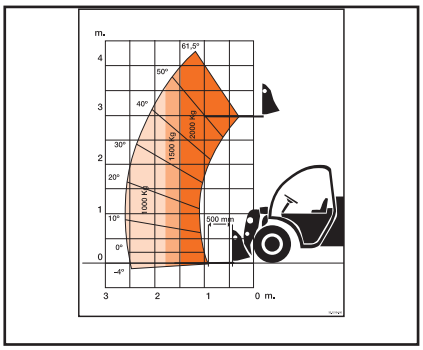



(fig. 1)

**Description**
Label with white background showing the load chart.

**Meaning**
Indicates the service limits of the machine T204H, when loaded, or in relation to the limits which operators must comply with when using the machine.

**Location**
Inside the cab, to the right of the driver.




(fig. 1)

**Description**
Label with white background showing the load chart.

**Meaning**
Indicates the service limits of the machine T235H, when loaded, or in relation to the limits which operators must comply with when using the machine.

**Location**
Inside the cab, to the right of the driver.

### 1.1.3 SYMBOLS USED ON THE MACHINE

This paragraph shows the symbols placed on the controls and instruments of standard machines, or those fitted with optional equipment. These symbols comply with standards (ISO).

**IMPORTANT**

Take time to learn these symbols and their meanings.

| SYMBOL | DESCRIPTION | SYMBOL | DESCRIPTION | SYMBOL | DESCRIPTION |
|---|---|---|---|---|---|
|  | Hazard warning lights |  | Steering mode switch |  | Hydraulic oil filter clogged |
|  | Windsreen wiper |  | Engine oil pressure |  | Forward driving |
|  | Windscreen washer |  | Extending arm up |  | Reverse driving |
|  | Cab ventilation fan |  | Extending arm down |   | Auxiliary hydraulic circuit |
|  | Fuel gauge |  | Extending arm out |  | Hydraulic quick fit locked |
|  | Coolant temperature |  | Extending arm in |  | Hydraulic quick fit unlocked |
|  | Working light (if fitted) |  | Fork carriage forward | | |
|  | Lightning |  | Fork carriage back | | |
|  | Turn signals |  | Air filter clogged | | |
|  | Parking brake |  | Preheating glow plugs | | |
|  | Battery charge |  | Rotating beacon | | |
|  | Fast speed |  | Hydraulic oil level | | |

# 1.2 How to identify the machine

## IMPORTANT

Check that the instructions manual is the right version for the machine in question.
Please indicate model number, date of purchase and frame and serial number when consulting AUSA or your dealer for any matter. This information can be found on the identification plate. We recommend you make a record of these numbers in the spaces provided below for handy reference and keep it in your files.

Date of purchase: .....
Frame number: .....
Engine number: .....

### 1.2.1 MODEL AND TYPE

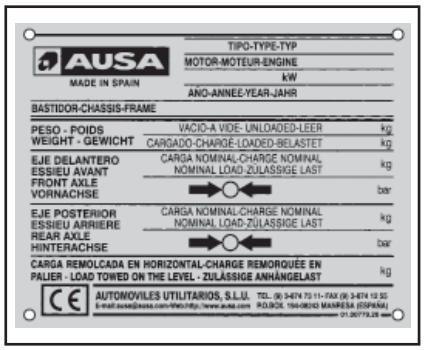
AUSA T204H compact off-road forklift with extending arm

### 1.2.2 MANUFACTURER

**AUSA Center, S. L. U.**
P.O.B. 194
08243 MANRESA (Barcelona), SPAIN
Tel. 34-938 747 552 / 938 747 311
Fax: 34-938 736 139 / 938 741 211 / 938 741 255
E-mail: ausa@ausa.com
Web: http: //www.ausa.com

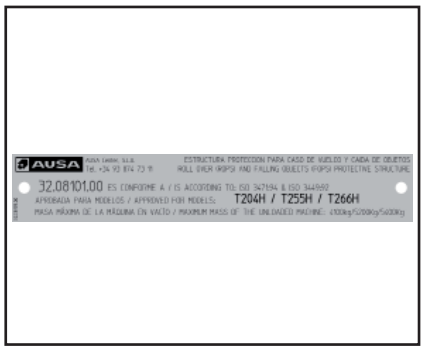
### 1.2.3 IDENTIFICATION PLATES

2 identification plates are attached to the machine:




(fig. 1)

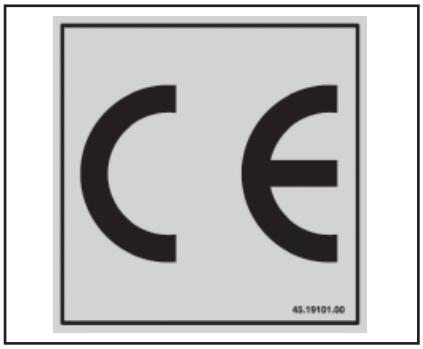
**Machine identification plate.**
This plate is located to the left of the operator's seat.
This plate mentions information such as the machine model, frame number, engine number, year of manufacture, etc.




(fig. 2)

**ROPS-FOPS cab authorization plate.**
This plate is located at the rear left of the cab.

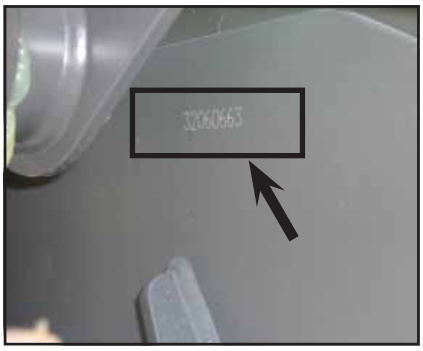
Identification plates of the main components.
Plates for all components which are not directly manufactured by AUSA, (e.g.: engines, pumps, etc.) will be directly attached to these components at the points where the respective manufacturers had originally located the plates.



(fig. 1)

### 1.2.4 EC MARKING

This machine complies with the safety requirements inherent to the EC Directive on machines. The EC marking therefore appears on the machine identification plate.



(fig. 2)

### 1.2.5 FRAME NUMBER

The frame number is marked on the front part of the right side of the chassis.


(fig. 3)

### 1.2.6 ENGINE SERIAL NUMBER

The engine number is marked on the left hand block behind the fuel filter and on a label on the upper part of the valve cover.


(fig. 4)

# 1.3 Acceptable use

### 1.3.1 ACCEPTABLE USE

The Compact off-road forklifts with extending arms have been designed and manufactured to lift, handle and transport agricultural and industrial products via accessories and equipment manufactured or authorized by AUSA. This does not include the following:

- Carrying suspended loads. Should the forklift be used to carry suspended loads, take the appropriate precautions or consult an authorized AUSA dealer.
- Lifting people. Should the forklift be used to lift people, obtain information on applicable legislation as per each country and take the appropriate precautions or consult an authorized AUSA dealer.

Any other use should be considered outside of the intended use and therefore improper. Close adherence to the operation, maintenance and repair conditions specified by the manufacturer is essential for good use of this vehicle.
Driving, maintenance and repair of the forklift must only be entrusted to duly trained personnel, who have the required tools and know the intervention and safety procedures relating to the forklift.
Health and safety at work and risk prevention standards should be respected during all transport, maintenance or repair operations. When driving on public roads current legislation must be adhered to (Highway Code).

**CAUTION**

No modifications or other interventions of any type may be carried out on the machine, with the exception of repairs and maintenance. Should the machine be modified in any way without the authorization of AUSA or an Official AUSA Representative or Dealer, this will automatically nullify compliance of the machine with Directive 2006/42/EC.

### 1.3.2 UNACCEPTABLE USE

Improper use is understood to be the use of the forklift in such a way that it does not meet with the criteria and instructions of this manual and in such a way that said use may cause harm to persons or equipment.

**DANGER**

The following are some of the most frequent and dangerous instances of improper use:

- Carrying people on the forklift or an accessory or item of equipment.
- Failing to comply scrupulously with the instructions for use and maintenance set out in this manual.
- Overloading the forklift.
- Working on unstable, unconsolidated ground or on the edge of ditches and trenches.
- Operating crosswise on slopes.
- Working during storms.
- Operating on slopes steeper than recommended.
- Using accessories or equipment for purposes other than those intended.
- Using accessories or equipment not authorized or manufactured by AUSA.
- Operating in locations with a risk of fire or explosions.
- Operating in confined or unventilated locations.

### 1.3.3 OPERATOR RISKS

Certain risks could be caused by operators during their work. For example:

- Risks caused by working excessively fast or carrying loads at excessive heights in view of the load or working environment.
- Risks caused by applying methods incorrectly when controlling or replacing a hydraulic valve (residual pressure - uncontrolled movements).
- Risks caused by applying methods incorrectly when dismantling parts such as e.g. cylinders without having attached all mobile parts appropriately (risk of mobile parts accidentally falling).
- Risk caused by the machine accidentally tipping over without use of the seatbelt.

### 1.3.4 APPLICABLE STANDARDS

The following standards have been adopted to ensure operator safety during the analysis of risks for the forklift:

| **Directive** | **Title** |
|---|---|
| 2006/42/CE | Directive on safety for machinery. |
| 2004/108/EC | Directive on Electromagnetic compatibility. |
| 2006/95/CE | Directive on low voltage. |
| 2000/14/CE*2005/88 | Directive on noise emission in the environment by equipment for use outdoors. |

| Directive | Title |
|---|---|
| EN 1459 | Safety of industrial forklifts |
| EN 1726 | Self-propelled variable reach forklifts. |
| EN ISO 21281 | Self-propelled industrial forklifts. Rules for the construction and layout of pedals. |
| EN ISO 12100-1 | Safety of machinery. Basic concepts, general principles for design. Part 1: Basic terminology, methodology. |
| EN ISO 12100-2 | Safety of machinery. Basic concepts, general principles for design. Part 2: Technical principles and specifications. |
| EN 1175-2 | Safety of industrial forklifts Electrical requirements. Part 2: General requirements of internal combustion engine powered forklifts. |
| EN ISO 13564 | Safety of industrial forklifts Self-powered industrial forklifts - Visibility test methods and verification. |
| ISO 2330:1995 | Industrial forklifts. |
| ISO 3287 | Self-propelled industrial forklifts. Control systems. |
| EN ISO 3449 | Earth Moving machinery – Falling object protective structures. Laboratory tests and performance requirements. |

| | |
|---|---|
| ISO 3471 | Earth Moving machinery – Roll-over protective structures. Laboratory tests and performance requirements. |
| ISO 3776 | Tractors for agriculture - Seat belt anchorages. |
| ISO 3795 | Road vehicles, tractors and machinery for agriculture and forestry. Determination of the burning behaviour of internal materials. |
| ISO 5053 | Industrial forklifts. Terminology. |
| ISO 6055 | High-lift rider forklifts. Overhead guards. Specification and testing. |
| ISO 6292 | Powered industrial forklifts and tractors. Brake performance and component strength. |
| ISO 9533 | Earth Moving Machinery. Sound test method for machine-mounted forward and reverse warning alarm. Sound test method. |
| EN 13059 | Safety of industrial forklifts Test methods for measuring vibration. |
| EN 61000-6-3 | Electromagnetic compatibility - Generic emission standard Part 1. |
| EN 61000-6-1 | Electromagnetic compatibility - Generic immunity standard Part 1. |
| EN 60204-1 | Safety of machinery - Electrical equipment of machines - Part 1. |
| AS 1418.19-2007 | Specifies requirements for self-propelled non-slewing and slewing reach truck not greater than 5 either side of the longitudinal axis of seated rider-operated reach truck. |

### 1.3.5 SAFETY DEVICES

(fig. 1)

**Overload system.**
A load unit is applied to the rear axle. A screen in the driver's cab displays the modification to stability on the basis of a scale with 8 LED indicators (4 green, 2 yellow and 2 red lights).

**Operator present switch on the driver's seat**
This switch is on the inner padding of the seat and controls:

- machine start-up, which is only enabled if the operator is correctly seated in the driver's seat and the forward-reverse switch is set to "NEUTRAL".
- the movements of the extending arm, which are only enabled if the operator is correctly seated in the driver's seat.

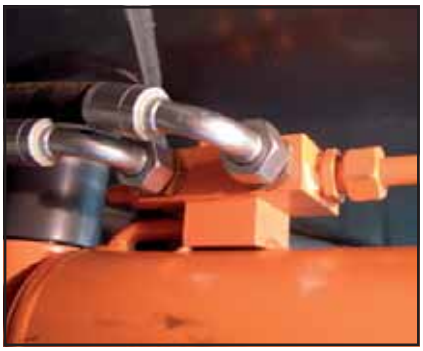

(fig. 1)

**Emergency stop button which, when pressed, immediately cuts the engine.**
Before restarting the machine, the reason for the emergency stop must be identified. Subsequently reset the button by pressing and turning clockwise.

## NOTE

The parking brake indicator on the multifunctional gauge will light up when the emergency stop button is activated, even if the parking brake is set to release.

**Check valves in all cylinders:**


(fig. 2)

A) Check valve in the extending arm lifting actuator.


(fig. 3)

B) Check valve in the extending arm extension actuator.

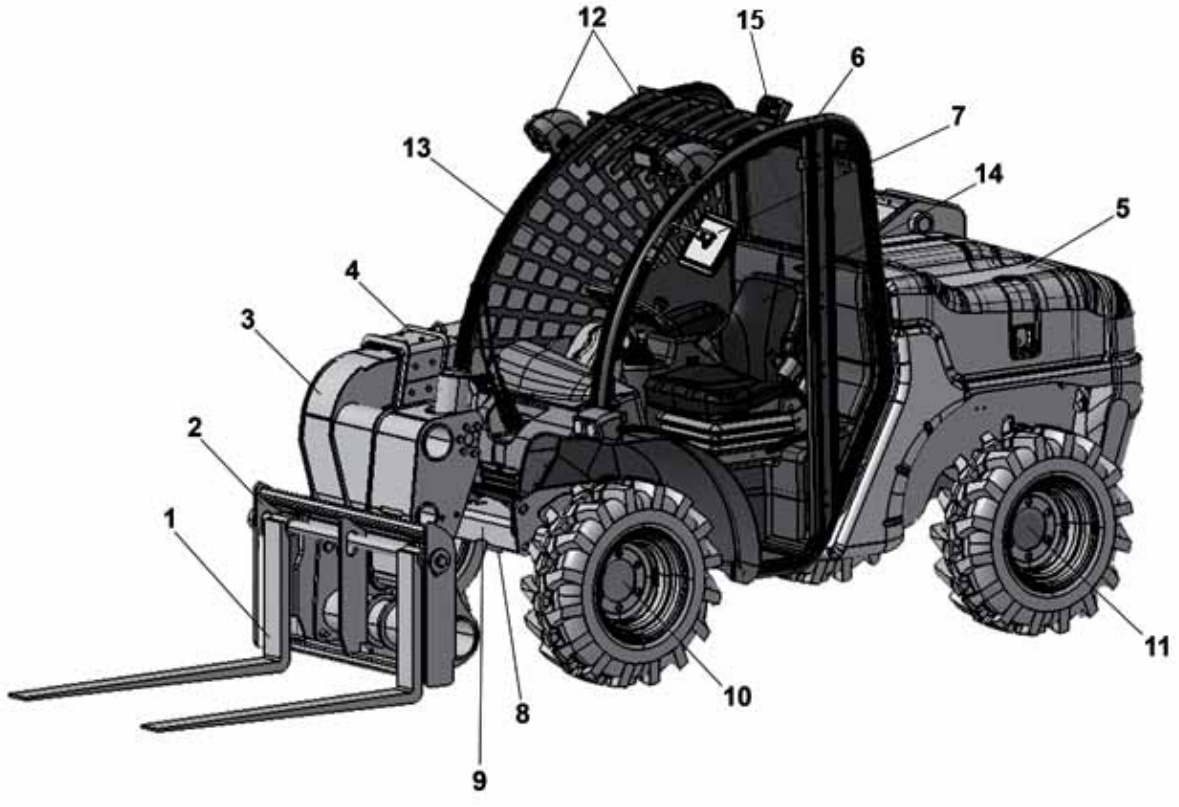

(fig. 4)

C) Check valve in the tilt actuator of the fork carriage.

# 1.4 General description

### 1.4.1 MAIN PARTS

1 - Fork
2 - Fork carriage for accessories and tools
3 - 2nd section of the extending arm
4 - 1st section of the extending arm
5 - Engine lock cover
6 - Driver's cab as per ROPS -FOPS standards
7 - Left hand rear view mirror
8 - Front axle
9 - Chassis
10 - Front left reduction gear
11 - Rear left reduction gear
12 - Headlights and signal lights (if fitted)
13.- Steering wheel
14 - Driver's seat with seatbelt
15 - Work light (if fitted)




(fig. 1)

### 1.4.2 DESCRIPTION OF THE MAIN PARTS

**Hydrostatic transmission**
This is an assembly of components enabling the movement of the machine. The assembly mainly consists of:

- a variable-flow pump connected to the combustion engine via an elastic coupling.
- a single speed motor fitted in the transfer box. The transfer box is fitted directly to the rear axle.
- 2-speed motor selectable via a switch on the joystick in the T204H model. Optionally you can mount a 1-speed motor.
- 1-speed motor in the model T235H.
- a hydraulic fluid filter in the tank suction line.
- a cooler for the hydraulic fluid circuit.

Movement is transmitted from the transfer box to the front axle via a universal shaft.

**Engine**
Diesel. 4 cylinders, 4 strokes. Water cooled.

**Axles/ differential (front and rear)**
The axles transmit the movement to the wheels.

**Tyres**
The machine is equipped with tyres with the appropriate dimensions for the maximum load accepted on the forklift.
Should tyres be changed, systematically replace them with tyres with the same dimensions and load carrying properties.

**Roll-over protection system**
The anti-roll-over system is fitted as standard on the vehicle, and enables the operator to constantly control the maximum load limit. A screen with six LED indicators shows the modification to stability. When the last red LED lights up, this indicates that the forklift has reached its maximum load limit.

**Extending arm hydraulic circuit**
This assembly consists of a gear pump connected to the hydrostatic pump which distributes oil to the steering system or to the actuators for the following functions when required, via a selector valve:

- lifting/lowering of the extending arm
- extension/ retraction of the sections of the extending arm
- tilting of the fork carriage

**Brake circuit**
This assembly consists of two independent circuits:

- the effect of the initial part of pedal travel will be Inching or “inching”.
- during the final part of pedal travel, the brake pump will be directly actuated, applying pressure to the oil in the disk brake assembly fitted on the front axle.

The disk parking brake is a mechanical system and actuates the brake assembly of the service brake (cable actuation). The assembly is actuated using the parking brake lever located to the left of the operator’s seat.

**Variable-reach arm.**
The machine is equipped with a hydraulic extending arm. Extending sections slide over resistant interchangeable guides.

**Driver's cab**
Authorized driver's cab satisfying the provisions of ISO 3449 & ISO 3471 (ROPS & FOPS).

**Towing hook (if fitted)**
The machine may be fitted with a rear connection and pull authorized trailers.

### 1.4.3 OPTIONAL ACCESSORIES

The machine may be fitted with a range of optional accessories: contact your Official AUSA Representative or Dealer.

| IMPORTANT |
| --- |
| Check if your machine is equipped with optional accessories. |

# 1.5 Technical data

### 1.5.1 DIESEL ENGINE

Kubota V2403-M-E3B brand: water cooled, four cylinder, four stroke with electric starter.

Inner diameter x stroke: 87 x 102.4 mm (3.4 x 39.9 in).
Total surface: 2 434cc (262 sq.ft)

**Power:**
36.5 Kw / 49.6 HP at 2600 rpm according SAE J 1995 Standard

### 1.5.2 TRANSMISSION

Wheel hubs reduction gears fitted to front and rear axles.
permanent 4x4 via the transfer box.
Hydrostatic system with variable flow pump and motor or 2-speed in T204H model and single speed motor in T235H model. T204H model can optionally mount the 1-speed motor.
Maximum service pressure: 410 bar (5942 psi).

**2-speed motor**
- Slow: 6 Km/h (3.72 mph)
- Rapid: 24 Km/h (14.9 mph)

**Single speed motor**
- 24 Km/h (14.9 mph)

Gear direction (forward / reverse) can be changed using an electric switch on the lower part of the joystick handle to the right of the driver's seat.

When the direction is selected, the indicator in the form of an arrow pointing in the corresponding direction will light up.

### 1.5.3 STEERING

"ORBITROL" hydraulic system. Actuates the two axles (front and rear) via two-ways cylinder on each axle.
Electric solenoid selector.
Maximum service pressure: 160 bar (2318.8 psi).

### 1.5.4 BRAKES

Service Brake: disk brake on the front axle. Hydraulically powered.
Parking brake: cable actuated, via the rear axle disk.

### 1.5.5 STANDARD TYRES

**T204H**
4 identical tyres
Tyre sizes: 10/75-15.3 (14PR)
Inflation pressure for the front and rear tyres: 6 bar.

**T235H**
4 identical tyres
Tyre sizes: 12-16.5
Inflation pressure for the front and rear tyres: 5.5 bar.

### 1.5.6 SERVICE TEMPERATURE

From -15ºC to 40ºC (5 to 104°F).

### 1.5.7 HYDRAULIC CIRCUIT

A 24dc gear pump coupled to the hydrostatic pump.
Two spool distributor and 1 electric selector for moving the extending arm.
Maximum service pressure: 240 bar (3478,8 psi).
60 l (15.85 US gal.) hydraulic fluid tank

### 1.5.8 CAPACITY/DIMENSIONS

Unloaded weight (with full tanks). See machine identification plate:
- **T204H:** 4050 Kg. (8928,72 lbs)
- **T235H:** 4700 Kg. (10361,72 lbs)

Nominal load:
- **T204H:** 2000 Kg. (4409,25 lbs)
- **T204H:** 2300 Kg. (5070,63 lbs)

Maximum height for lifting:
- **T204H:** 4200 mm (13ft 9in)
- **T235H:** 5000 mm (16ft 4in)

Maximum front-reach of the extending arm:
- **T204H:** 2598 mm (8ft 6in)
- **T235H:** 2732 mm (8ft 11in)

Rotation of the fork carriage (with the arm horizontal):
- **T204H / T235H:** de $+20^{o}$ a $-120^{o}$

Load capacity at maximum height:
- **T204H:** 2000 Kg (4409,25 lbs)
- **T235H:** 1800 Kg. (3968,32 lbs) at 5000 mm (16ft 4in) or
  2300 Kg. (5070,63 lbs) at 4500 mm (14ft 9in)

Load capacity at maximum reach:
- **T204H:** 1000 Kg. (2204,62 lbs)
- **T235H:** 800 Kg. (1763,70 lbs)

Maximum Weight: See machine identification plate:
- **T204H:** 6050 Kg. (13337,96 lbs)
- **T235H:** 7000 Kg. (15432,35 lbs)

Total length
- **T204H:** 4664 Kg. 10282,35 lbs)
- **T235H:** 4860 Kg. (10714,46 lbs)

Total height
- **T204H:** 1995 Kg. (4398,22 lbs)
- **T235H:** 2070 Kg. (4563,56 lbs)

Total width:
- **T204H:** 1595 mm. (5ft 2in)
- **T235H:** 1705 mm. (5ft 7in)

Maximum gradient (fully loaded)
- **T204H:** 50%
- **T235H:** 44%

Outer turning radius
- **T204H:** 2900 mm. (9ft 6in)
- **T235H:** 3490 mm. (11ft 5in)

### 1.5.9 Forks

Floating
Dimensions: 1200 x 100 x 40 mm (47.24 x 3.94 x 1.57 in)

### 1.5.10 ELECTRICAL EQUIPMENT

2.0 Kw electrical starter motor.

- 12V /70Ah battery.
- 12V / 480W alternator.
- 12V / 720W (60A) alternator.
  (on machines with closed cabin, from frame 32062925)
- Diesel pre-heating spark plugs.
- Rotating beacon
- Horn
- Acoustic warning for reverse direction.

### 1.5.11 VIBRATION AND NOISE LEVELS

**Sound power level:**
Warrantee sound power (according to 2000/14/EC sound emissions in the environment by machinery for outdoor use):
Lwa = 104 dB (A)

**Sound pressure level on the operator's site:**
A weighted sound pressure in the operator's ear measured (following norms EN 12053 and ISO 4871):
Lpa = 84 dB (A)

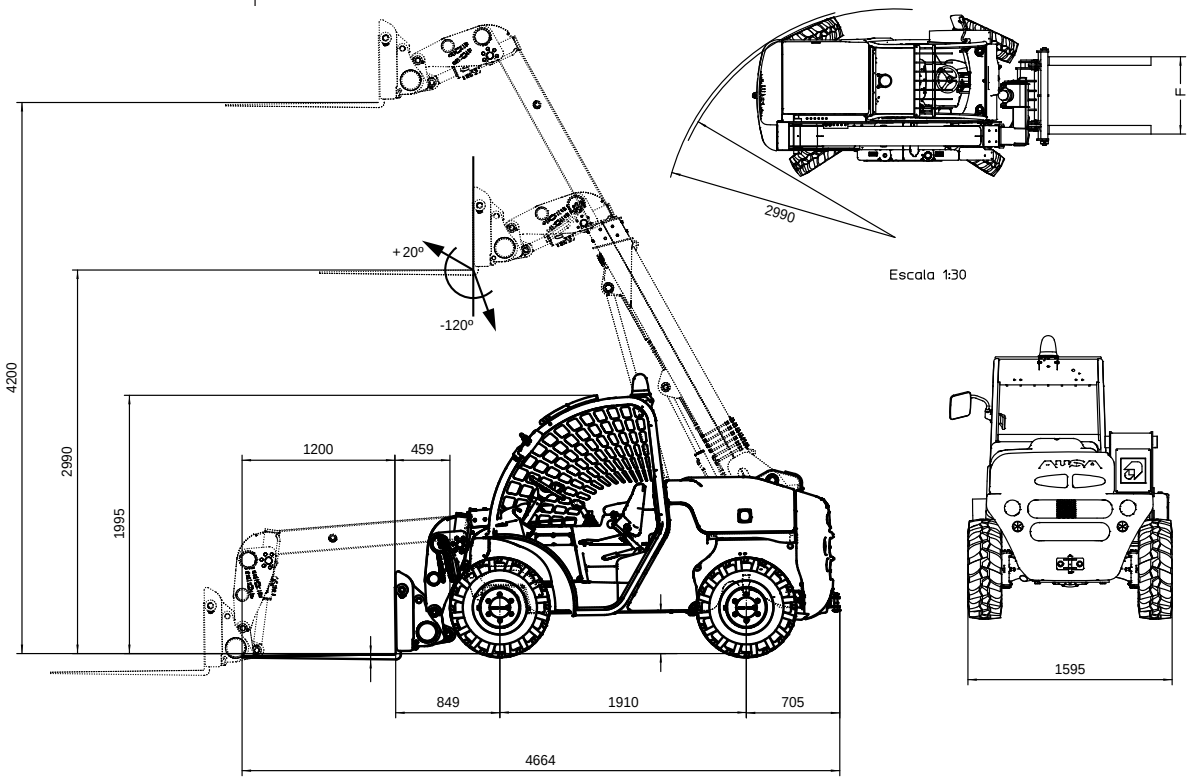
Measurement uncertainty: 2,5 dB (A)

**Vibration level produced by the machine:**
Root-mean-square frequency-weighted, hand-arm vibration acceleration value:
$< 2{,}5$ m//s$^2$

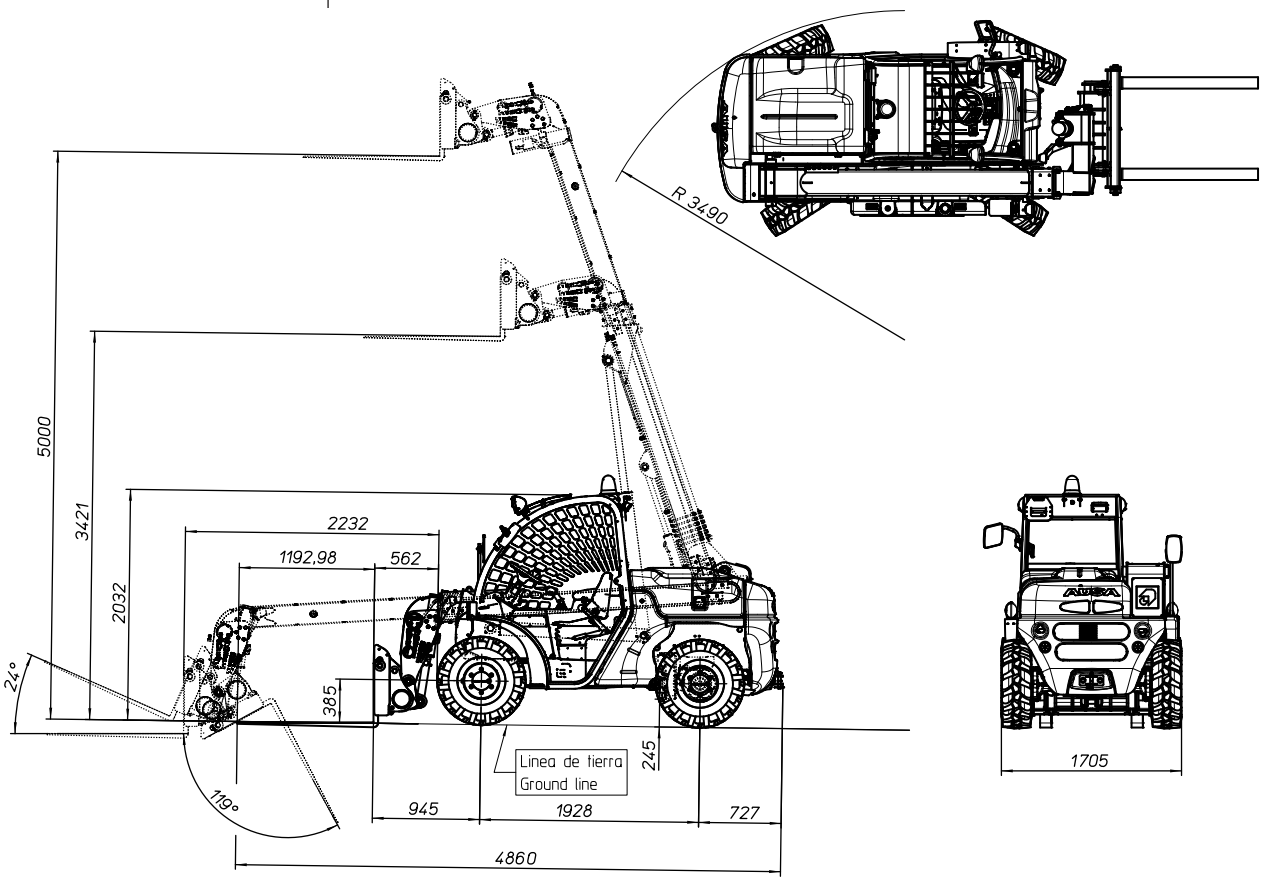
Root-mean-square frequency-weighted, whole body vibration acceleration value:
$< 0{,}5$ m/s$^2$.

## 1.5.12 FORKLIFT MEASUREMENTS

### T204H




### T235H



## 1.6 Duration of use

The effective life cycle of the machine is 8000 hours providing that all checks, periodic maintenance operations and overhauls defined in the manual are carried out.

**DANGER**

The forklift may not be used beyond this period without an overhaul and testing by an Official/authorized AUSA Representative or Dealer.

## 1.7 Accessories included

The following equipment is supplied with the machine as standard:

Wheel brace

### 1.7.1 DOCUMENTATION PROVIDED

The following are provided with the machine:

- Instructions and maintenance manual for the forklift
- Instructions and maintenance manual for the KUBOTA engine
- Maintenance book for AUSA machines

# Special safety messages

**Section 2**

**INDEX**

## 2.1 General information

AUSA manufactures its forklifts in accordance with the relevant protection requirements defined in current legislation for countries in the European Economic Community, with regard dangers of any kind, which may present a risk to health or life, providing the machine is used and maintained in accordance with these directives. Any hazard caused by improper use, not complying with these instructions or others specifically provided with the forklift, will be the responsibility of the user and not AUSA.

This section gives instructions on how the forklift must be used as per the provisions of the 2006/42/EEC Directive on the Safety of machinery.

**WARNING**

The instructions mentioned in this manual are those recommended by AUSA. More appropriate methods with equivalent safety levels for the start-up, use and repair of the machine may exist, in view of the area of operation, available resources at all times and the assessment of the risks inherent to the work station in question.
Most accidents occurring with machines, during operation, maintenance or repairs, are due to a lack of attention to basic safety precautions. Therefore, it is necessary to pay constant attention to the reactions which may occur at each interaction with the machine.
This manual uses safety symbols to indicate the potentially most dangerous situations.

**IMPORTANT**

Identifying potentially dangerous situations before they happen can help to avoid accidents.
Under all circumstances, should it be necessary to proceed in a manner differing from that described in the manual, ensure that:
- the procedures to be applied are not explicitly prohibited;
- the methods are safe, i.e. they satisfy the standards and descriptions mentioned in this section of the manual.
- these methods do not cause direct or indirect damage to the machine, making it unsafe.

**IMPORTANT**

If in doubt, always ask!. Contact your Official AUSA Representative or Dealer should you have any questions.

# 2.2 Prerequisites for personnel

**You are the vehicle operator, think...**

- Before you begin using a forklift that you are not familiar with, you should read this operator manual carefully and consult your superior if you have any doubts. The forklift should only be used by authorized and duly trained personnel.

### 2.2.1 PREREQUISITES FOR OPERATORS

Operators which use the machine occasionally or regularly (e.g. for transport) must satisfy the following requirements:

**Medical requirements**
Operators must not consume alcohol, drugs or other substances which may alter the physical or mental state of the person, and consequently their ability to operate the machine, prior to and during work.

**Physical requirements**
Operators must have normal hearing and visual abilities, satisfactory coordination and the ability to execute the functions required to operate the machine in a safe manner, as specified in this manual.

**Intellectual requirements and attitude**
Operators must be able to understand and apply current standards and safety instructions, and able to pay attention and take the necessary decisions to ensure their safety and that of others: they must make every effort to execute tasks correctly and in a responsible manner.

**Prior learning**
Operators must have carefully read and understood this manual and all graphics and diagrams therein, as well as all informative and warning plates and labels displayed both in this manual and on machines. Operators must receive specialist training on all elements of the operation and use of the machine.

### 2.2.2 PREREQUISITES FOR PERSONNEL IN CHARGE OF MAINTENANCE

Personnel in charge of the maintenance of the machine must be qualified, and have received mechanical training in the maintenance of earth moving machines in general, and must necessarily satisfy the following prerequisites:

**Physical requirements**
Operators must have normal hearing and visual abilities, satisfactory coordination and the ability to execute the functions required to maintain the machine in a safe manner, as specified in this manual.

**Intellectual requirements and attitude**
Operators must be able to understand and apply current standards for preventive maintenance and safety instructions, and able to pay attention and take the necessary decisions to ensure their safety and that of others: they must make every effort to execute tasks correctly and in a responsible manner.

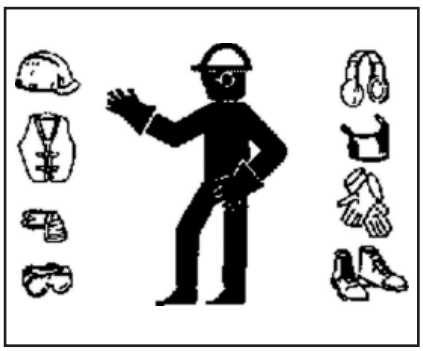
**Prior learning**
Operators must have carefully read and understood this manual and all graphics and diagrams therein, as well as all informative and warning plates and labels displayed both in this manual and on machines. Operators must receive specialist training on all elements of the operation, maintenance and use of the machine.

## IMPORTANT

According to the applicable national legislation, operators may be required to validate prior training or aptitude to operate the machine in the form of a permit (or log) issued either by the employer or a government or private body. Operators should obtain information locally.

## IMPORTANT

Routine machine maintenance will not involve the execution of complex technical operations. Therefore, most of these operations may be carried out by the operator simply by following the instructions provided in this manual.



(fig. 1)

### 2.2.3 WORK AND MAINTENANCE CLOTHING

The appropriate equipment and material for the function in question and the prevention of accidents must be used when operating the machine or carrying out maintenance or repair operations. The final equipment will be selected on the basis of the assessment of risk for each work station, however, generally speaking, the following recommendations apply:

- Wear a comfortable close fitting work suit or other clothing which cannot be caught in moving components. Wear reflective clothing if appropriate.
- Protective hard hat.
- Protective gloves.
- Safety boots.
- Ear protection
- Safety goggles, if applicable.

### 2.2.4 PERSONAL PROTECTION EQUIPMENT

You are the vehicle operator, think...
Make sure that you are issued with all the necessary personal protection equipment (PPE) to carry out your work safely, for instance: hard hat, ear protection, warm clothes, reflective equipment, safety goggles, masks, etc.
The operation of the forklift whilst wearing bracelets, chains, loose clothing, with long hair which is not tied back, etc. is not recommended due to the risk of catching in controls, rotating parts, cracks, etc.

## IMPORTANT

Only use approved accident prevention equipment in good condition.

# 2.3 Safety standards

### 2.3.1 WORKING AREA

**Depending on the work area, remember....**

- If there is a risk of fire or explosion in the working area, either because of goods stored or because of possible fluid or gas leaks, check that the forklift is fitted with a sufficient degree of fire protection.
- If you have to work in closed spaces, make sure that the area is well ventilated in order to prevent the excessive build-up of exhaust fumes. Always turn the engine off when it is not needed.
- To drive the forklift on public roads, all necessary approvals and licenses must be obtained in accordance with the current legislation in the country of use, and all signs and safety elements required by legislation must be satisfied.
- In Spain, the forklift may be used without lighting in full daylight or in areas which are sufficiently lit.

Always account for the characteristics of the planned working area. Carefully study the working area: consider the area in view of the dimensions and movements of the machine.

### ELECTROMAGNETIC COMPATIBILITY

This machine complies with current legislation on electromagnetic compatibility, however, should the machine be used in areas with devices that are highly sensitive to electromagnetic interference, make sure that they will not be affected.

**ELECTRIC HAZARDS**

Pay special attention to nearby airborne electric lines. Always maintain the extending arm at a safe distance from these lines to reduce the risk of electric discharges.

**MINIMUM DISTANCE TO BE MAINTAINED, DEPENDING ON THE VOLTAGE OF THE ELECTRIC LINE**
9m from wood pylons, 15m from metal pylons.

CONTACT WITH LOW VOLTAGE ELECTRIC LINES OR ACCIDENTAL DISCHARGES FROM THE LATTER IMPLY A RISK OF DEATH OR SERIOUS INJURY.
BEFORE STARTING WORK IN AREAS WHICH ARE POTENTIALLY DANGEROUS DUE TO ELECTRIC HAZARDS, CONTACT THE OWNER OF THE ELECTRIC LINE TO CHECK IF DISCONNECTION IS NOT REQUIRED PRIOR TO WORKING NEAR TO THE LINE.

**DANGER**

It is prohibited to use the machine with electric devices during storms.

**WARNING**

Check that the ground to be covered by the machine is sufficiently solid to avoid compromising the stability of the machine.
- Assess the best route to reach the working area.
- Do not allow anybody to enter within the radius of action of the machine during operation.
- Keep the working area tidy when operating the machine: do not leave stray objects within the working area as they may imply a risk for machine movements. Keep the driving area clear of all objects or tools that could move about and might obstruct a control, preventing you from using the control when required.

### 2.3.2 PRIOR PREPARATION

**When starting up the forklift**

**WARNING**

Place the machine in the working position and check that the machine is level using the spirit level fitted in the right side of the driver's cab.

Before starting operations:

- Check that maintenance operations are carried out carefully, and that the specified time intervals are applied (see section 4 on "MAINTENANCE").

- Check that enough fuel exists in view of autonomy, to avoid the risk of the engine stopping suddenly during a critical manoeuvre. Always stop the engine before refueling and never smoke during the process. Do not mix gasoline or alcohol with the fuel.

- Carefully clean the instruments, plates and labels, lights, rear view mirrors and wing mirrors (if fitted).

- Check that all safety devices fitted on the machine operate correctly and in the working area.

- Should any difficulties or problems of any type arise, immediately notify your superior. Do not start any job without complying with safety requirements. If you notice any anomaly while using the forklift, inform the maintenance service immediately.

- It is prohibited to make tide over repairs simply to be able to start work.

Before starting work with the forklift, clean up any possible oil or fuel which may have leaked, clean and remove any grease from your hands and the soles of your shoes and remember to check the following items:

- Tyre pressure and tread condition.

- Brake operation.

- Leaks in the hydraulics, fuel and cooling systems, etc.

- All protective devices, covers and safety stops are correctly positioned and properly attached.

- No cracks or other structural defects are visible to the naked eye.

- The correct operation of all controls.

- The levels of fluids and lubricants:
  • fuel.
  • brake fluid.
  • hydraulic fluid.
  • coolant.
  • engine oil

- Seat belts and their mountings: good condition and properly fixed. Carefully inspect the condition of this device paying special attention to:
  • cuts or loose threads on the belt.
  • wear or damage to fittings, including anchor points.
  • incorrect functioning of the seat belt buckle or retracting roller.
  • loose seams or stitching.

- Check that all covers, locks and other safety elements are correctly positioned. The removal of safety devices such as the engine cover is prohibited with the exception of for maintenance purposes. Should it be necessary to remove these devices, stop the engine, and pay close attention during the operation. Replace the devices before starting the engine and operating the machine.

- Check the correct functioning of alarms and signalling devices (for example: acoustic warning, obstruction indicator for the air admission filter, etc.)

- Check that all the information and safety plates on the forklift are clean and in good condition. Danger warning signals must not be removed, covered or unreadable.

- Check that the lighting and signalling system is clean and working properly (if fitted).

- Check the electric battery connections and the level of electrolyte.

- Adjust the seat position so that you are comfortable and can easily reach the controls.

- Do not start the forklift or operate the controls unless you are in the operator's seat.

- For your safety should the machine roll over, do not forget to correctly adjust and fasten the seat belt.

### 2.3.3 DURING WORK AND MAINTENANCE

**When operating the forklift, do not forget to...**

- Keep hands, feet and the whole body in general inside the area provided for the operator.
- Pay special attention to work on slopes, move slowly, avoid being situated crosswise and do not operate on slopes which exceed the recommended gradient. A slope within the recommended gradient does not mean that this slope can be manoeuvred on with absolute safety under any load, terrain or handling conditions. Descend slopes in reverse gear, i.e. with the load in the most stable direction.
- It is not recommended to operate on slopes greater than 15% under any circumstances.
- Give way to any pedestrians you might come across while driving.
- The forklift must not be used to carry people, other than the driver, or to lift people if approved and authorized systems are not fitted for this purpose.
- Do not overload the forklift or handle loads which displace the centre of gravity of the forklift outside of limits. Carry out manoeuvres gently, especially when changing direction on slippery ground.
- Do not carry unstable, unfastened or overlarge loads. If very large or wide loads must be handled, take all possible precautions to avoid hitting items in the surrounding area and other potential accidents.
- Before handling loads from a lorry or trailer, ensure that the latter is appropriately positioned and that the brakes are set.
- When using an accessory, check acceptable loads for the forklift + accessory configuration (which will differ from figures for the standard configuration) prior to use.
- Ensure that you have good visibility of the track, if the load obstructs visibility, drive in reverse gear and increase precautions.
- When approaching a crossroads with poor visibility, slow down, sound your horn and move forwards slowly in accordance with the amount of visibility available.
- The speed of the forklift should be adjusted to the working conditions and area at all times. Systematically driving the machine at maximum speed may represent a danger to the operator and the surrounding area.
- Check that the resistance of the ground on which you are driving is sufficient for the loaded forklift, in particular when accessing bridges, embankments, slabbed areas, loading areas, etc.
- Before reversing the forklift, the operator should check that doing so will not put at risk either the machine itself or nearby people or objects.
- Do not drive with the extended arm lifted.
- Do not activate two extending arm movements simultaneously.
- Keep your mind completely on the job in hand. The safety of both the driver and others depends on the care taken when driving.
- Depending on the ground, try to raise as little dust as possible while moving.
- The forklift is not designed to tow other machines. If, for any reason, this operation is indispensable, check that the machine has sufficient pulling power.
- Drive carefully and slowly. If the trailer is not fitted with an inertia brake, make sure that the brakes are strong enough for both the forklift mass and that of the trailer.

- Should the machine roll-over, it is important that the driver avoids being trapped between the machine and the ground. To prevent this we recommend the following:
- Try to remain within the operator cab.
- Grasp the steering wheel firmly.
- Push your feet firmly against the floor plate of the cab.
- Try to keep as far away from the point of impact as possible.

**Take care when loading and unloading the forklift...**

- If concrete spills onto the road surface, remove it before it hardens.

**While working, carrying out maintenance or repairs, extreme precaution must be taken. Your safety depends on it...**

- Never stop carrying out forklift maintenance. Specialized personnel should be assigned to this job, equipped with the necessary tools and appropriate instructions. Only authorized personnel should carry out maintenance and repair work.
- Assess the best route to reach the working area.
- It is prohibited to transit or remain under suspended weights or machine parts which are only supported by hydraulic pistons, chains or cables.
- Keep the handles and footholds used to enter and operate the machine clean and free of oil and grease to avoid slipping or falling.
- Face the machine when entering or exiting the cab or other raised parts. Never face away from the machine.
- It is prohibited to enter or exit the machine during operation.
- It is prohibited to leave the control panel when the machine is operating.
- Unless unavoidable, all interventions on the forklift should be carried out with the engine switched off, without any load and with all blocking and locking devices engaged.
- It is prohibited to stop or undertake any kind of intervention in the area between the wheels of the machine while the engine is running. The engine must be stopped.
- Some operations are easier to carry out with the extending arm lifted. Before doing so, precautions must be taken to prevent the arm from accidentally lowering using the devices designed for this purpose for each specific forklift model.
- Maintenance or repairs may not be carried out without the appropriate lighting.
- Direct the spot light beams to ensure that personnel are not blinded.
- Before handling cables or electric devices, check that connections are correct and that the devices are operational.
- It is prohibited to connect wet plugs.
- When carrying out any repair work, make especially sure that the battery terminals are protected, so that they cannot accidentally be shorted out by a tool, part, etc.
- Before carrying out any electrical welding on the forklift, disconnect the battery to avoid possible damage to electric and electronic equipment.
- It is prohibited to lubricate, clean or adjust mechanical components while moving.
- Operations which require the use of specific tools may not be carried out without these tools.
- Do not use tools in an unsatisfactory condition or in an improper manner (e.g. use a clip instead of a fixed clamp).
- Regular checks should also be carried out on all those elements whose excessive wear or ageing could lead to a risk of accident, for example: hydraulic pipes, brake lining, tyre tread, etc.
- Should the operator protection suffer an impact that induces a crack or permanent deformity, as this is a safety element, it must be replaced with a new item.
- Any modification which affects the capacity and safety of the forklift must be authorized by the manufacturer or by an official industrial actor, with an update to instruction manuals and plates if necessary.
- The manufacturer will not be held liable for any incident or accident caused by the use of non-original spare parts or by repairs carried out by unauthorized workshops.

- When replacing tyres, ensure that they are the correct replacements and follow the tyre manufacturer's safety instructions. For safety reasons, split rim wheels must not be used (wheels consisting of two rims bolted together).
- The forklift should be lifted for handling or inspection purposes using the points on the machine designed for this purpose, as indicated in this manual, and using devices with an adequate capacity.
- If the forklift needs to be towed, use a tow bar whenever possible, or if none is available, a cable that is strong enough for the job. In either case, it should be fixed onto the point indicated by the manufacturer and the manoeuvre should be carried out at a speed of no more than 10 Km/h (6,2 MPH). When driving a towed forklift, pay attention to the position of your hands on the steering wheel, to ensure that an unexpected turn of the wheel does not cause you injury.
- Make sure that the towing forklift has adequate towing and braking capacities to be able to perform this operation.
- If the forklift needs to be transported on a lorry platform:

• Ensure that only a minimum amount of fuel remains in the tank.
• Apply the forklift brakes.
• Apply chocks to the wheels and fix them to the platform.
• Fasten the machine firmly to the platform using slings or other methods to prevent any kind of movement.

- This forklift is hydrostatically controlled, should it be necessary to tow the machine, before doing so, follow the instructions indicated in this manual for the disconnection of the hydrostatic unit, therefore facilitating towing and eliminating any risk for the hydrostatic unit.
- When changing a tyre, make sure that it is fitted with the tread pattern facing the right way.
- Before carrying out any work on the engine cooling system, wait for the temperature of the coolant to drop enough for the coolant reservoir cap to be removed safely.
- In order to avoid allergic reactions and other hazards affecting the skin, replenishing of fuel or other fluids should be carried out wearing protective gloves.
- Before disconnecting fluid systems, make sure there is no pressure in them, that they no longer contain hot fluid, and take steps to avoid unexpected spills.
- Regular checks should be carried out on the hydraulic system to detect any possible leaks or misalignment on the safety valves which could lead to a risk situation.

**DANGER**

Only authorized personnel may carry out interventions on the hydraulic system.

- It is prohibited to smoke or use flames in locations with a risk of fire or in the presence of fuel, oil or batteries.
- Avoid leaving containers or tanks containing fuel in areas which are not designed for the storage of fuel.
- Handle inflammable or dangerous substances with care.
- After maintenance or repair operations, before starting up the machine, check that no tools, gates or other materials remain between moving parts, in the suction air ducts or in the cooling air circuit.

- When executing manoeuvres with guidance from a person outside the forklift, only one person must transmit signals and indications.
- All orders issued by managers must be complied with.
- Avoid interference during complex operations or manoeuvres,
- Avoid distracting or frightening operators without reason.
- After completing an operation, do not leave the machine in a potentially dangerous configuration.
- Protect the environment. Be environmentally friendly. When changing oil, fluids, tyres, batteries, etc., take the used materials to the corresponding recycling centres. If you handle or scrap silencers or catalytic silencers which contain mineral fibber-based absorbent materials, protect your skin with the appropriate gloves and clothing and take the materials to approved disposal sites for this class of materials.
- Similarly, transmit this vehicle to an authorized scrap centre at the end of its useful life.

### 2.3.4 PARKING THE FORKLIFT AND STOPPING THE ENGINE

**When leaving the forklift...**

- Turn the engine off and switch off the ignition. Set the extending arm to horizontal and fully retracted.
- Place all controls in the neutral standby position.
- Put the parking brake on.
- Lock all mechanisms which impede use of the forklift by unauthorized persons; the starter circuit in particular, by removing the ignition key.
  If you must leave the forklift on a slope, block the wheels with suitable chocks in addition to putting the parking brake on.
- Leave the forklift parked in areas specifically designated for this purpose, and not in locations where it prevents people from passing or blocks exits or access to stairways or emergency equipment.

## 2.4 Safety devices

**DANGER**

Various safety devices are fitted on the machine and must never be modified or removed (see chap. 4.3.15).
Regularly check the effectiveness of these devices. Should these devices not be in perfect operating order, stop work immediately and repair or replace.
For information on how to check safety devices (see chap. 4.3.16)

## 2.5 Overload system

The overload system assists operators in using the machine safely via the use of visual and back-up alarm if the machine is reaching roll-over limits and the situation is therefore dangerous.
This device only indicates the forwards roll-over point; other factors play a role in the stability and safety of the machine, therefore, under no circumstances should the overload system be used as a guide when assessing the load to be handled. Acceptable loads are indicated on the load charts shown on the machine and in this manual.
Under no circumstances may this device replace the operator's judgment. Operators are responsible for working in safe conditions and complying with the safety standards defined.

# Operating instructions

**Section 3**

**INDEX**

# Preamble

This section aims to supply the operator with a basis to gradually learn how to operate the forklift.
Once seated in the driver's cab and having made preliminary adjustments, the operator must identify and learn the position of the different controls and instruments.
This process is essential in ensuring that the operator is able to work effectively or carry out rapid punctual operations if suddenly required to guarantee the safety of the operator and the machine.
Learn to use and predict the reactions of the forklift.
Learn to use controls in an open area, free of obstacles, in a safe manner without people nearby. Never use controls suddenly, apply caution until certain of the effect of the controls on the machine.

## 3.1 Before entering the machine

**Check and clean**

- Clean all windows, lights, rear view mirrors (if fitted).
- Check that bolts, joints and screws are tightened and positioned as appropriate.
- Check that no oil, fuel or coolant leaks exist.

**Check tyres**

- Check tyre pressure.
  Refer to the “Tyre pressure” chapter in the “MAINTENANCE” section.
- Check that tyres have no cuts and that the tyre fabric has no visible breakages with deformation.

**DANGER**

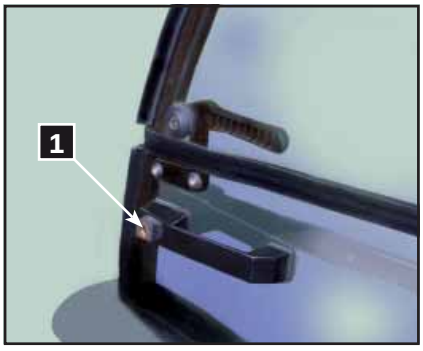
The explosion of a tyre can cause serious injury. Do not use the machine with damaged or low-pressure tyres or tyres with excessive wear.

## 3.2 Accessing the machine

### 3.2.1 ACCESSING THE CAB

**WARNING**

Always check that your hands and boots are dry and clean before entering the driver’s cab. Do not hold on to or pull on the steering wheel to access the operator’s cab. Hold the handles provided for this purpose and always place your foot on the step to avoid slipping both when entering and exiting the cab.



(fig. 1)

The left hand side of the forklift’s cab is fitted with an access door.

To open this door from the outside:

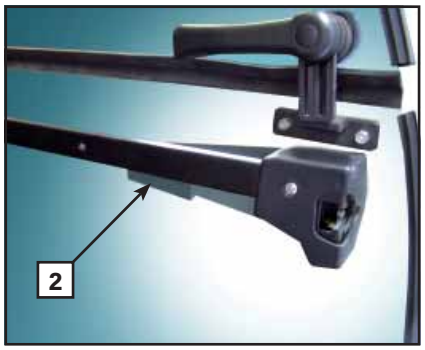
- Enter the key and turn to open the lock **(1)**.
- Press the button and open the door.

To close this door from the inside:

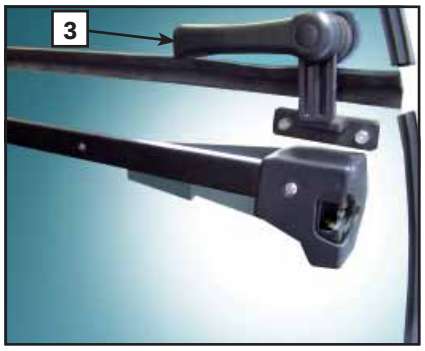
- Pull on the door firmly: it will shut on its own.

To open this door from the inside:

- Press on the bar **(2)** and release the lock to open the door completely.




(fig. 1)




(fig. 2)

- Rotate the lever **(3)** to only open the upper section of the door completely, and block in place in the rear section of the cab.

To release the door from its open position:

- Turn the knob **(4)** to release the door, close and fix to the lower section using the lever **(3)**.


(fig. 3)

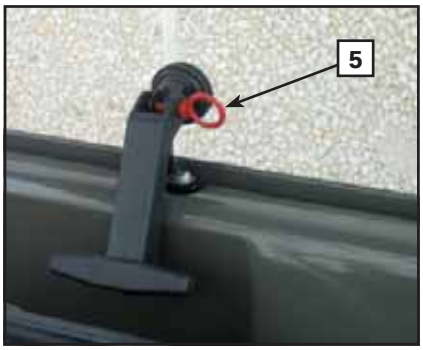
**WARNING**

If the upper section of the door is not blocked in the rear section of the cab, it must be fastened to the lower section of the door.

**WARNING**

Do not operate with the lower section of the door open.

### 3.2.1.1 Exiting the cab in an emergency situation (if fitted)

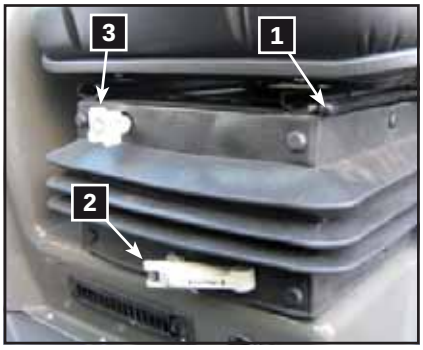


(fig. 1)


(fig. 2)

In case of emergency, the cab is fitted with an emergency exit, i.e. the rear window of the cab.
This window is fitted with an opening lever for partial opening, fastened with a safety pin **(5)** which, when removed, enables the window to be completely opened.

### 3.2.2 ADJUSTING THE SEAT



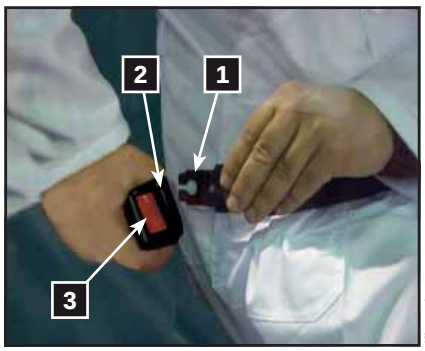
(fig. 3)

(fig. 4)

The seat must be carefully adjusted to provide a safe and comfortable driving position for the operator. The forklift's seat is fitted with devices enabling the adjustment of the suspension, height and distance from the pedals.

- Adjustment of the distance of the seat from the pedals
  A device is fitted enabling the seat to be moved forward or back to adjust the distance from the pedals. To adjust the seat, press on the lever **(1)** and push the seat in the desired direction. Once in position, leave the lever and ensure that the seat remains blocked in the selected position.
- Adjustment of suspension
  Rotate the lever **(2)** clockwise or anti-clockwise to the desired suspension. Rotate the lever clockwise to increase resistance, and anti-clockwise to reduce resistance.
- Adjustment of height
  Rotate the knob **(3)** clockwise to raise the seat and anti-clockwise to lower.
- Tilt the seat back
  The angle of the back can be adjusted as desired. Lift the lever **(4)**, and set the back to the desired position.

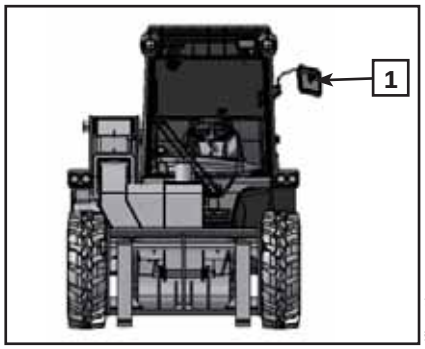
### 3.2.3 ADJUSTING THE SEAT BELT




(fig. 1)

To fasten the seatbelt, insert the anchor point **(1)** into the buckle **(2)** until you hear the locking “click”. To unfasten the seat belts, press button **(3)**. The seat belt adapts to the body of the passenger using it, giving them freedom of movement but adjusting the belt to the physical constitution of the road. If the machine is parked on a steep slope, the reel retracting roller could become locked; this is normal. Additionally the reel retracting roller blocks the strap belt every time the strap belt is suddenly pulled or in case of sharp braking, collisions or turning operations at high speed.

### 3.2.4 ADJUSTING THE REAR VIEW MIRRORS

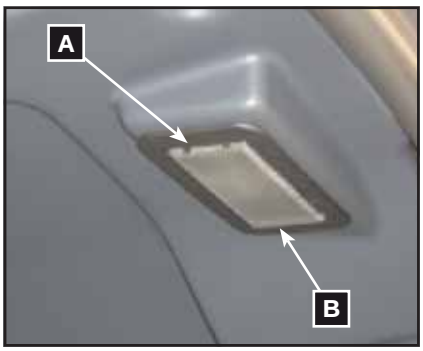



(fig. 2)

The machine is equipped with an external rear view mirror:

- The left hand mirror **(1)** is fitted on the upper left hand upright of the windscreen and provides a view of the area behind and to the left of the machine. Adjust the position by manually turning the mirror.

### 3.2.5 USE OF THE COURTESY LIGHT (if fitted)



(fig. 1)

An inside light is fitted on the cab ceiling.

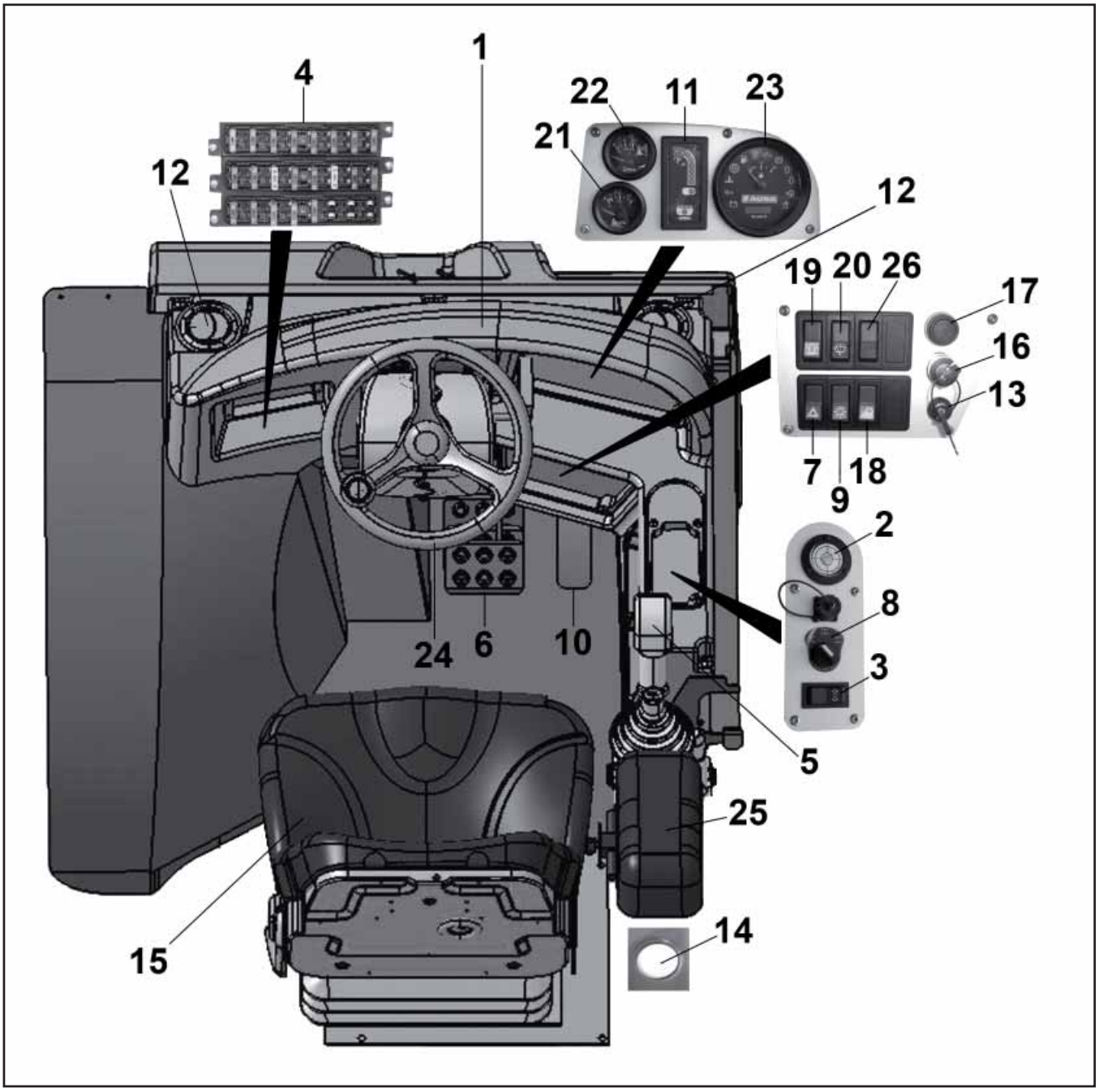
The light is off when in the neutral position.

To turn the light on, press the front section **“A”** or rear section **“B”** of the ceiling light.

# 3.3 Control panel

### 3.3.1 CONTROLS

1- Splash guard
2- Machine level gauge
3- Turning light switch
4- Fuse box
5- Joystick
6- Inching pedal and service brake
7- Emergency light switch
8- Turning system selector
9- Road light switch
10- Throttle pedal
11- Overload system indicator
12- Adjustable vent
13- Road - job selector
14- Windscreen washer water tank
15- Seat
16- Overload system deactivation key
17- Starter
18- Job light switch
19- Rotating beacon switch
20- Windscreen washer switch
21- Engine cooling temperature gauge
22- Hydraulic fluid temperature gauge
23- Multi-functional gauge
24- Steering wheel
25- Arm rest
26- Overload system disable button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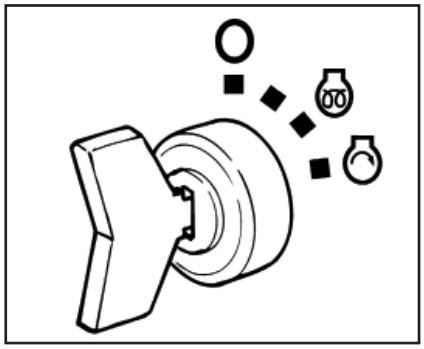
### 3.3.2 ENGINE CONTROLS

#### 3.3.2.1 Starter switch



(fig. 1)

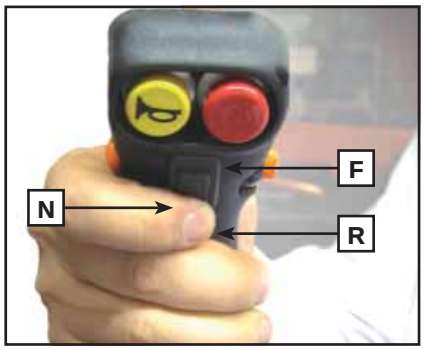
4 positions:

Neither circuit is supplied. You may remove the key and the engine is stopped.

Circuits are supplied, ready to start the engine. Engine oil pressure, battery charge and pre-heating lamps all light up. If the pre-heating lamp is lit, this indicates that the pre-heating resistances are operational and heating the combustion chamber to a temperature which will enable the firing of the vaporized diesel fuel.
Wait until this light goes out before starting the engine.

Start the engine. When the key is released, it will automatically return to its initial position.

#### 3.3.2.2 Forward/reverse selector




(fig. 2)

3 positions:

**(N)** Neutral position, no direction is selected.
**(F)** Push the switch to its upper position **(F)** to operate forwards. The green arrow will light up on the upper section of the joystick. Refer to section 3.3.3.2
**(R)** Push the switch to its lower position **(R)** to reverse. The red arrow will light up on the upper section of the joystick. Refer to section 3.3.3.2

#### 3.3.2.3 Back-up alarm and speed selector

(fig. 3)

**Back-up alarm function:**

Press the yellow button located on the forklift joystick to activate the back-up alarm.

**Speed selector function:**

Press the red button to select slow or fast speed. The fast speed indicator will light up on the multi-functional gauge when selected.
Refer to section 3.3.3.2

(fig. 4)

**Overload system disable switch (if fitted):**
Button located on the right side of the splash guard. This button needs to be handly pressed:

The fuction disable the overload system permiting to extend the arm over the limit.

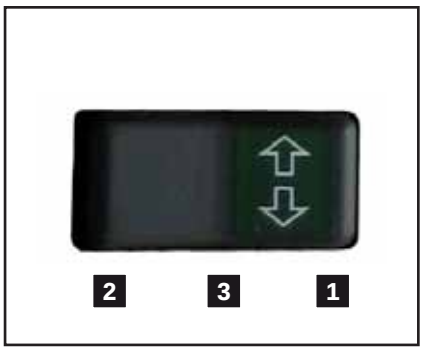
**WARNING**

Working with the overload system disabled can cause the forklift to roll-over and imply serious risks for the safety of the operator. Use this function with great care and re-activate the overload system after the emergency situation has been solved.

(fig. 1)

**Windscreen washer function (if fitted):**
Switch located on the right side of the splash guard. This switch has two positions:

**1.** Position: Activates the front windscreen washer
**2.** Position: Activates the water pump for the front windscreen washer



(fig. 2)

**Turn signals (if fitted):**
Switch located on the right side of the splash guard. This switch has three positions:

**1.** Position: Selects the right turning lights.
**2.** Position: Selects the left turning lights.
**3.** Position: Disconnects all turning lights.

The light will flash when turning lights are selected.

(fig. 3)

**Lights (if fitted):**
Switch located on the lower right side of the splash guard, next to the road - job selector. This switch has three positions:

Button set to position **(0)**: Lights out.
Button set to position **(1)**: Long beam.
Button set to position **(2)**: Short beam.

### 3.3.2.4 Brakes

(fig. 4)

**Inching pedal and service brake**
Press the pedal **(1)** to bring the machine gradually to a stop. You may accelerate the engine to move the extending arm more rapidly. Press the pedal to the floor to gradually activate the service brake.
Slowly release the pedal. The machine will start to move.

(fig. 1)

**Parking Brake**

The mechanical parking brake is activated by pulling the lever to the left of the seat. To release the parking brake, press the button located on this lever, and lower the lever to the resting position.

**WARNING**

Do not use the parking brake to slow the machine down, with the exception of emergencies, as this would reduce the effectiveness of the brake and could even damage certain components.

**3.3.2.5 Throttle**

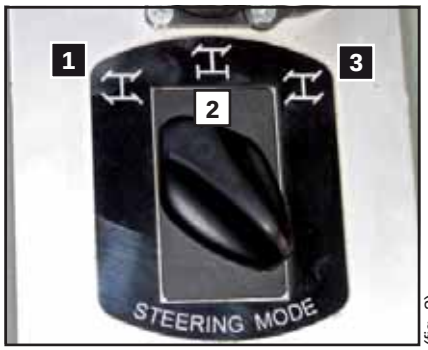
**Throttle pedal**


(fig. 2)

Apply pressure on the pedal **(1)** to control engine speed and consequently, the speed of the machine. The lower section of this plate is equipped with an adjustable stop.

**3.3.2.6 Turning system**

**Selector**




(fig. 3)

This switch has three positions enabling the selection of the type of turn:

**1.** Position: “Crab” translation
**2.** Position: Front-wheel steering
**3.** Position: Four-wheel steering

**WARNING**

This machine is capable of four-wheel steering. Check that you have enough room to allow the forklift to turn without hitting any obstacles.


(fig. 1)

### 3.3.2.7 Road - job site switch

**Selector**

Two-position selector.

1. Turn the selector to **(1)** to select road driving. You may use quick speed, as the extending arms are disabled, and only the front-wheel turning system is activated. The light on the switch will be activated when switched on.
2. Turn the selector to **(0)** to select job. This will enable the use of the extending arm and four-wheel turning. The light on the switch will not be activated.

**DANGER**

Before selecting road driving, you must align the rear wheels of the machine.

### 3.3.2.8 Auxiliary driving controls

(fig. 1)

**Rotating beacon**

This switch has two positions: ON/OFF.

(fig. 2)

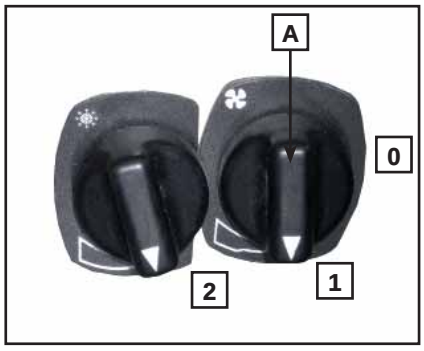
**Hazard warning lights (if fitted)**

This switch has two positions: ON/OFF and activates the simultaneous and flashing illumination of the turning lights.

(fig. 3)

**Job lights (if fitted)**

Switch located on the lower right side of the splash guard, next to the road - job selector. This switch has two positions: ON/OFF, which activate the job lights.

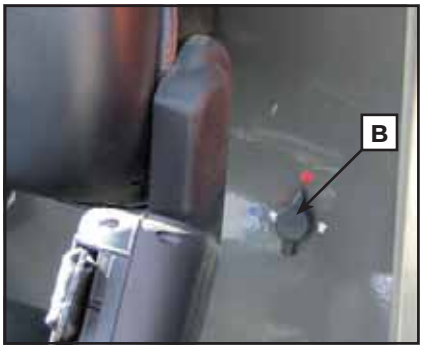



(fig. 4)

**Fan speed regulator (if fitted)**

The fan speed regulator **(A)** has three positions:

**0.** OFF
**1.** Selects low speed
**2.** Selects high speed

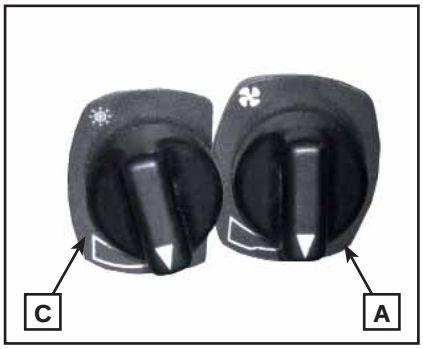


(fig. 1)

**Hot air temperature regulator (if fitted)**

The hot air temperature regulator **(B)** is located to the left of the driver's seat.

- Rotate anti-clockwise to reduce the air temperature.
- Rotate clockwise to increase the temperature of the air entering the driver's cab.
- The amount of hot air can be regulated using the fan speed regulator **(A)** under the seat.



(fig. 2)

**Air conditioning temperature regulator (if fitted)**

- Rotate the air temperature regulator **(B)** anti-clockwise until reaching the minimum temperature.
- Rotate the air conditioning temperature regulator **(C)** clockwise to reduce the temperature of the air conditioning or anti-clockwise to increase it.

(fig. 3)

### 3.3.3 GAUGES AND INDICATORS

#### 3.3.3.1 Gauges

**Engine coolant temperature indicator**

Indicates the temperature of the engine coolant.

(fig. 4)

**Hydraulic fluid temperature gauge**

Indicates the temperature of the hydraulic fluid in the tank.

(fig. 5)

**Fuel level (1)**

Indicates the level of fuel in the tank.


(fig. 1)

**Hour meter (1)**

The hour meter indicates the operating time for the machine.

### 3.3.3.2 Indicators

Parking brake engaged indicator. This indicator lights up to show that the parking brake lever is not set to release or that the emergency stop button has been activated.

This indicator lights up to show that the forklift is set to forward operation.

This indicator lights up to show that the forklift is set to reverse.

Fuel tank reserve warning. Indicates a minimum level in the fuel tank.

Low battery warning light. Indicates that the alternator is not charging adequately.

Low engine oil pressure warning light. Indicates that the engine oil pressure is not adequate.

Low hydraulic fluid level warning light. Indicates a low level of hydraulic fluid in the forklift tank.

Hydraulic filter clogged warning light. Indicates that the forklift's hydraulic fluid filter is clogged.

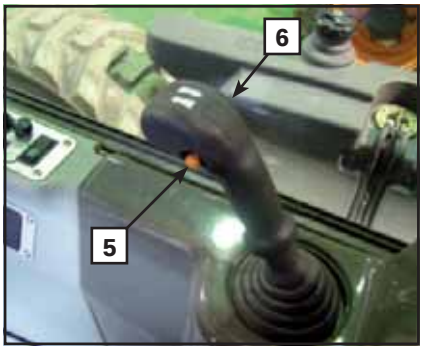
Fast speed warning light. This indicator lights up to show that the forklift is set to fast speed.

Pre-heating resistances warning light. Indicates the pre-heating phase for engine resistances. Wait until this light goes out before starting the engine.

Air filter clogged warning light. Indicates that the engine's air suction filter is clogged. Clean or replace the filter cartridge immediately.

Excessive increase in engine coolant temperature warning light. Indicates an excessive rise in temperature of the forklift's engine coolant.

### 3.3.4 JOYSTICK



(fig. 1)

The forklift is equipped with a joystick to control the movements of the extending arm using the hydraulic distributor.
The joystick is equipped with two buttons **(5)** to tilt the fork carriage forward or back and **(6)** to operate the auxiliary hydraulic circuit (Hydraulic Quick Fit).
If the joystick can move in all four directions (right/left, forward/reverse), the extending arm may be extended/retracted and the fork carriage may be tilted forward/back.

**IMPORTANT**

Refer to 3.3.4.1.1. for more information on joystick functions

(fig. 1)

## IMPORTANT

Hold the joystick correctly and move with caution. The speed of the movement of the actuators depends on the position towards which the lever is moving: a small displacement will lead to a small movement by actuators and vice versa; moving the lever to maximum will lead to the actuator moving at maximum speed.

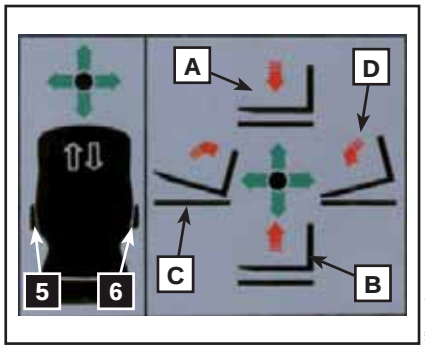
## WARNING

The joystick must only be actuated when the operator is seated correctly in the driver's seat.

## WARNING

Before operating the joystick, check that nobody is present in the radius of action of the machine.

### 3.3.4.1 Selection of movements




(fig. 2)

The joystick can be used to execute the following movements, when the operator is in the driver's seat:

- lift/lower the fork carriage:
  move the joystick as shown in **(A)** - **(B)**.
- extend/retract the extending arm:
  move the joystick as shown in **(C)** - **(D)**.
- forward/back tilt of the fork carriage:
  press the button **(5)** and move the joystick as shown in **(C)** - **(D)**.
- auxiliary hydraulic circuit. Hydraulic quick fit lock/unlock (if fitted):
  press the button **(6)** and move the joystick as shown in **(C)** - **(D)**.

## DANGER

Before operating the joystick, check that nobody is present in the radius of action of the machine. Should anybody be present, clear the area before operating the forklift.

### 3.3.4.2 Emergency stop

(fig. 1)

Any of the functions of the forklift may be stopped at any time by pressing the emergency stop button **(4)**.
Activating this button will stop the engine.
Reset the button by releasing and turning clockwise before restarting the machine.

**NOTE**

The parking brake indicator on the multifunctional gauge will light up when the emergency stop button is activated, even if the parking brake is set to release.

**WARNING**

Remove the cause of the emergency stop before starting the machine.

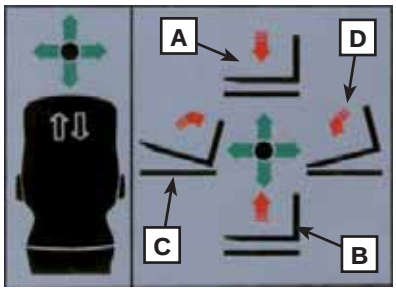
### 3.3.4.2.1 Deactivation of the overload system

(fig. 2)

The action of the overload system can be disabled using the key switch **(1)**

**WARNING**

Working with the overload system disabled can cause the forklift to roll-over and imply serious risks for the safety of the operator. Use this function with great care and re-activate the overload system after the emergency situation has been solved.




(fig. 1)

### 3.3.4.3 lifting/lowering of the extending arm

Stop the movement of the extending arm:

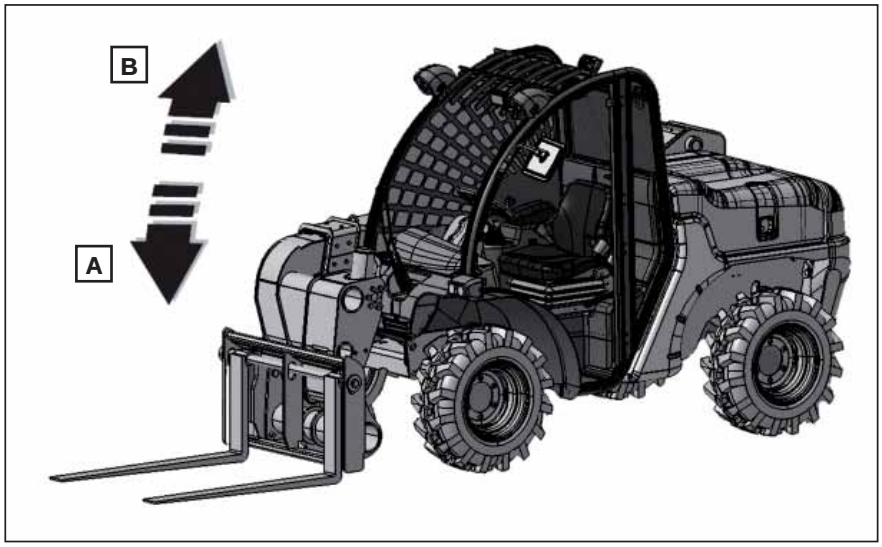
**WARNING**

Before moving the extending arm, check that nobody is present in the radius of action of the machine.

- Place the joystick in its central position.
- Move the joystick carefully as shown in **(B)** to lift the arm or as shown in **(A)** to lower the arm.

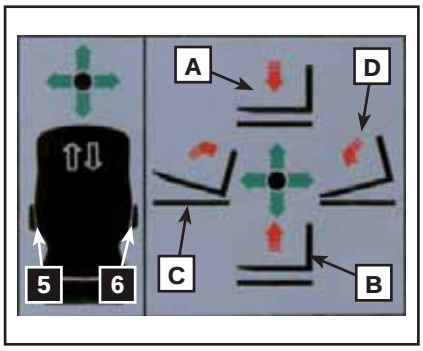
**IMPORTANT**

Refer to 3.3.4.1.1. for more information on joystick functions




(fig. 2)

### 3.3.4.4 Forward/back tilt of the fork carriage

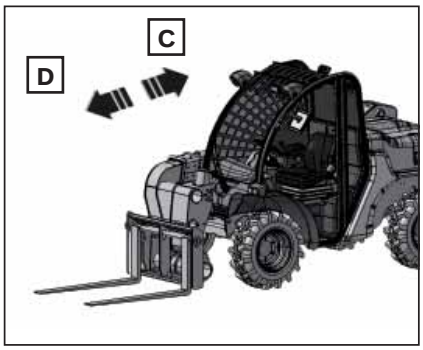


(fig. 1)

To tilt the fork carriage forward or back:

- Place the joystick in its central position and press **(5)**.
- While holding **(5)** in, move the joystick carefully as shown in **(C)** to tilt the fork carriage forwards, or as shown in **(D)**, to tilt the plate backwards.

### 3.3.4.5 Extension/retraction of the extending arm



(fig. 2)

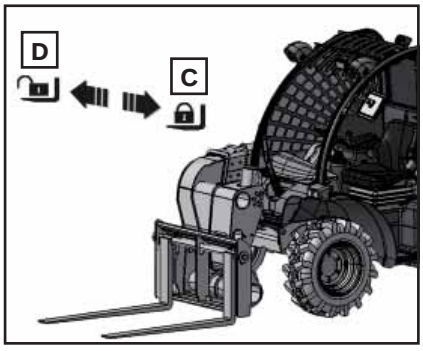
To extend or retract the extending arm:

**WARNING**

Before moving the extending arm, check that nobody is present in the radius of action of the machine.

- Place the joystick in its central position.
- Move the joystick as shown in **(D)** to extend the arm or as shown in **(C)** to retract.

### 3.3.4.6 Auxiliary hydraulic circuit. Hydraulic quick fit Lock / Unlock (if fitted)



(fig. 3)

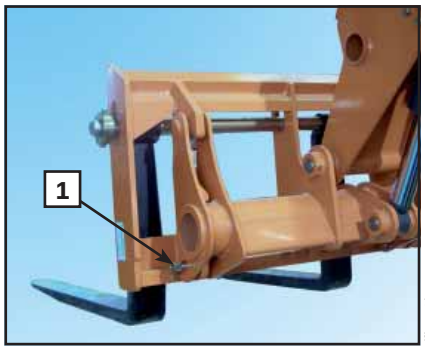
Proceed as follow to lock /unlock the hydraulic quick fit:

**WARNING**

Before moving the extending arm, check that nobody is present in the radius of action of the machine.

- Place the joystick in its central position and press **(6)**.
- While holding **(6)**, move the joystick as shown in **(D)** to disengage hydraulic ram lock and as shown in **(C)** to engage hydraulic ram locks.

(fig. 1)




(fig. 2)

### 3.3.4.7 Attachment of tools

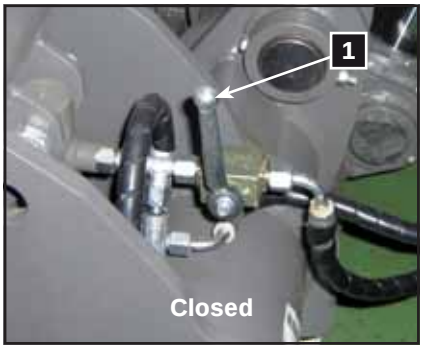
**WARNING**

Before moving the extending arm, check that nobody is present in the radius of action of the machine.

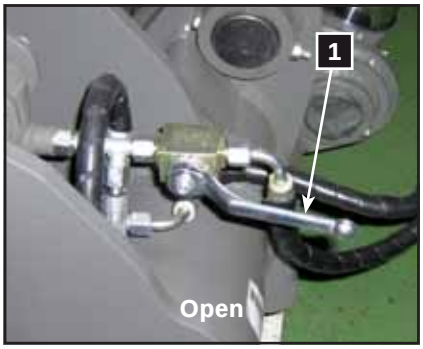
**To block/release tools manually:**

- Lift the tool to a distance of between 10 & 15 cm (3.94 & 5.91 in). from the ground, with the extending arm retracted.
- Extract the safety pins from the tool.
- Lower the tool to a stable horizontal surface and its resting position.
- Extract the safety pins **(1)** from the tool.
- Tilt the fork carriage forwards while moving the forklift backwards.

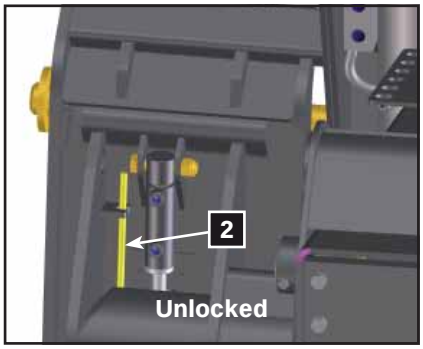
Following the release of the forklift tool, repeat the operation in reverse order to fix the tool.



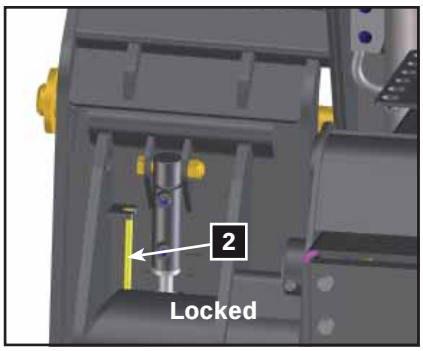
(fig. 1)



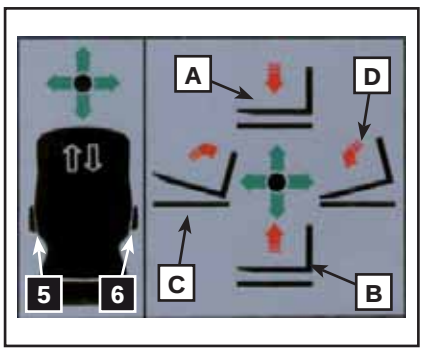
(fig. 2)



(fig. 3)



(fig. 4)



(fig. 5)

**Replacement of tools (Hydraulic quick hitch) (if fitted)**

Proceed as follows to replace tool:

- Approach the location where you intend to place the fitted tool.
- Lower the tool to the ground.
- Move the valve **(1)** fitted on the left side of the hitch to its position “open”.
- Move the joystick to disengage the attachment (see chapter 3.3.4.6 on this manual.
  Once unlocked, the quick hitch position indicator **(2)** should be in “unlocked” position.
- Lower the attachment and sustain it on an horizontal and stable surface on its rest position
- Tilt the fork carriage forward and lower boom while driving backwards at the same time with the forklift to disengage tool.

Proceed as follows to fit a new tool:

- Apply the above procedure in reverse but push the button **(6)** on the joystick (see chapter 3.3.4.6 on this manual) and move joystick to the left to engage hydraulic ram locks. Be sure that the quick hitch position indicator **(2)** is in “locked” position.
- Move the valve **(1)** fitted on the left side of the hitch to its “close” position.
- Tilt carriage forward to double check tool is securely locked on.

**WARNING**

Before start working with the forklift, be sure that quick hitch position indicator is in “locked” position and the safety valve is in “close” position.

# 3.4 Start-up

### 3.4.1 BEFORE STARTING THE ENGINE

- Check tyre pressure and condition.
- Familiarize yourself with the controls and ensure that they function correctly.
- Check that the steering operates freely.
- Activate the throttle pedal various times to ensure it operates freely. It must return to the original position when released.
- Activate the brake pedal to ensure that the brakes function correctly. The pedal must return to the original position when released.
- Check that the joystick operates freely.
- Check fuel, engine oil, hydraulic fluid, coolant and brake fluid levels.
- Check for oil leaks in the engine, the transmission components or the hydraulic circuit.
- Clean the lights and the lamps (if fitted).
- Ensure that the engine cover is correctly closed.
- Ensure that the seat belts are correctly fastened.

Before starting the day, carefully inspect this device with special attention to:

- Cuts or threading of the belt.
- . Wear or damage to anchor points
- . Poor functioning of the seat belt buckle or the retracting roller.
- Loose threads or poor stitching

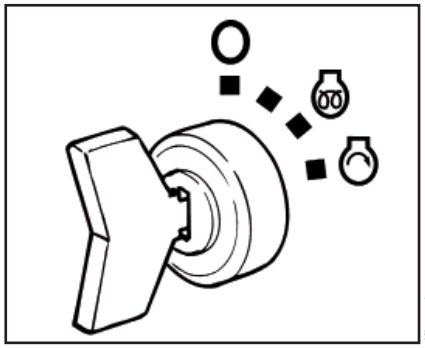
- If transporting a load, respect the load limits. Ensure that the cargo is properly distributed.
- Review engine parts while stopped. Check fixings.
- Check that the starter switch, headlights, turning lights, lamps and back-up alarm are functioning correctly.
- Start the engine and drive forward slowly a short distance, press the brake pedal to check the brakes.

**Correct any problem you may have found before operating the vehicle. Consult an authorized AUSA dealer if necessary.**

#### 3.4.1.1 Machine start-up check list

The overload system will start automatically once the electric contact is made. Satisfactory power supply is indicated by the green warning light (Power). Refer to chapter 3.5.2. for more details. Check the correct operation of safety devices as per chapter 4.3.15 on:

- Roll-over protection system
- Forward/reverse selector.
- Operator present switch on the seat.
- Parking brake travel stop.
- Emergency stop button.
- Starter switch.



(fig. 1)

### 3.4.2 START-UP

For safety reasons when starting the forklift, the operator must be seated with the seat belt fastened, the hand brake must be applied, and the operator must check that the joystick and the forward/reverse selector are in the neutral position.
Insert the key into the starter switch and turn it to position **(B)** until the pre-heat indicator turns off, press the throttle pedal a 1/4 of the way and turn the key to position **(C)** until the engine starts. Do not hold this position for more than 15 seconds. If the engine does not start repeat the previous operations. Wait for 30 seconds between each try.

## CAUTION

If the indicators do not go out when the engine starts to run, stop the engine immediately and identify the causes of the incorrect operation.

## IMPORTANT

It is not possible to start the engine if the forward/reverse selector is not in the neutral position or if the operator is not correctly seated in the driver's seat.

## DANGER

After starting the engine, the engine will continue to run if the operator leaves the driver's cab. Do not go far from the driver's cab without stopping the engine, lowering the extending arm to the ground, and applying the parking brake.

### 3.4.3 START THE ENGINE USING AN EXTERNAL SOURCE

## DANGER

When starting the engine using an external source of energy, by connecting to the battery of another machine, check that the two resources do not enter into contact to avoid the possible protection of sparks. The batteries emit a flammable gas which sparks could ignite, leading to the battery exploding.
Do not smoke when checking the level of electrolyte.
Keep metal items such as buckles, watch straps, etc. at a distance from the positive cable (+) of the battery, as they may cause a short circuit between this pole and nearby metal components, and consequently the operator may be burnt. The external or emergency battery must have the same nominal voltage and capacity as the forklift battery.

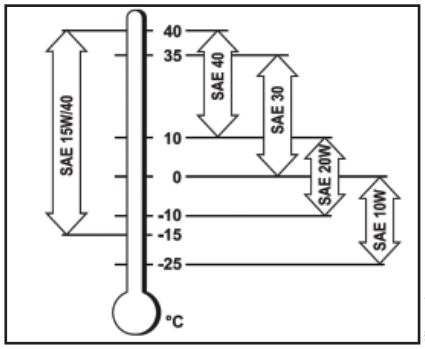
(fig. 1)

If the engine cannot start due to a flat battery, another 12V booster battery can be used together with the corresponding jump leads to connect the two batteries. If you use the battery of another machine or forklift, avoid the two machines touching.

1- Apply the forklift's parking brake.
2- Lift the engine cover of the forklift.
3- Connect the positive (+) terminal of the battery with the positive (+) terminal of the battery's disconnector and the negative (-) terminal with the negative (-) ground of the forklift's engine (fig. 1).
4- Start the forklift in the normal way.
5- Disconnect the cables from the terminals and the connections, starting with the positive (+) terminals.

**DANGER**

Only use a 12V battery, as all other devices (battery chargers, etc.) could lead to the battery exploding or damage to the battery unit.



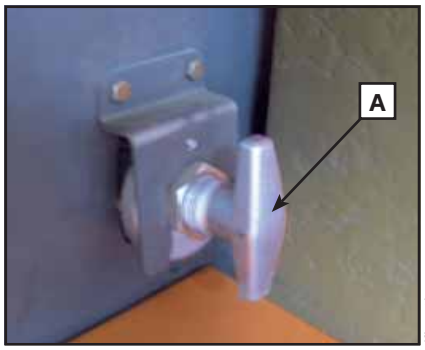

(fig. 1)

### 3.4.4 START UP AT LOW TEMPERATURES

The use of oils with suitable SAE viscosity in view of ambient temperatures is recommended for cold starts.
Consult the instructions and maintenance manual for the KUBOTA engine for this purpose.

Strop the cold start of the engine:

- Set the forward/reverse selector to neutral.
- Rotate the starter switch to contact and wait until the resistance pre-heating indicator goes out. Press the throttle pedal to the floor and start the engine by turning the starter switch to the ignition position. Once the engine has started, release the switch and reduce engine speed to idle. Wait for a few minutes before starting operation, to allow the engine oil to heat gradually and optimize lubrication.
- If the engine has been started using an external source of power, remove the connectors (refer to chapter 3.4.3).




(fig. 1)

### 3.4.5 DISCONNECTING THE BATTERY

Before carrying out any repair or maintenance operation, and, in particular, before welding the machine, switch the general battery switch **(A)**, located under the forklift engine cover, to “OFF” to cut the power supply to the electric circuit.

### 3.4.6 START-UP OF THE MACHINE

Once the engine has reached service temperature, check that all controls are set to their resting positions and that the forwards/reverse selector is set to neutral. Proceed as follows:

- Select the turning system desired.
- Select forward/reverse as required.
- Release the parking brake.
- Gradually apply pressure to the throttle pedal to start movement.

**WARNING**

Do not activate the forwards/reverse selector while the machine is moving. The machine would suddenly change direction, putting the operator in real danger.

### 3.4.7 PARKING THE FORKLIFT AND CUTTING THE ENGINE

Always park the forklift on level ground, either at the end of the day or in order to carry out any maintenance work, as follows:

- Gradually release the throttle pedal and apply light pressure on the service brake pedal.
- Set the forward/reverse selector to neutral.
- Put the parking brake on.
- Release the service brake pedal.
- Lower the tool fitted on the extending arm to the ground.
- Run the engine at idle for 1 minute, if the forklift has been working at full load. Turn the starter key to position “0”, remove the key and take the key with you. Never leave the key in the parked forklift.
- Exit the driver’s cab and lock using the cab door key.
- Activate the general switch **(A)** to disconnect the battery.
- Chocking the wheels with suitable blocks is also recommended.

**DANGER**

Always exit the driver’s cab backwards. Make sure that your boots and hands are clean and dry. Hold on to the supports and handles to avoid falling or tripping.

**DANGER**

Set the parking brake whenever the forklift stops, to prevent any undesired movements.

This chapter defines a few techniques and procedures for the use of the machine equipped with a standard fork in safe conditions. Apply the indications of the “OPTIONAL EQUIPMENT” chapter when using different equipment.

**WARNING**

Examine the working area and check the possible presence of dangerous situations before using the forklift. Check that no holes, embankments, or border areas exist which could sink in, and check for other factors which could compromise the control of the forklift.

**ELECTRIC HAZARDS**

Pay special attention to electric lines. Check the position, ensuring that no part of the forklift moves less than 6 meters from any electric line.

**WARNING**

To ensure maximum safety when using the forklift, always weigh the loads to be handled.
Consult the load chart displayed in the inner window of the cab or the quick guide with the fork capacity diagrams.

# 3.5 Use of the forklift

### 3.5.1 USE OF THE LOAD CHART

The chart showing the loads which can be carried per arm extension is displayed in the cab window and/or in the quick guide.
The chart indicates load limits for the machine.
Always consult these charts to ensure safe operations.

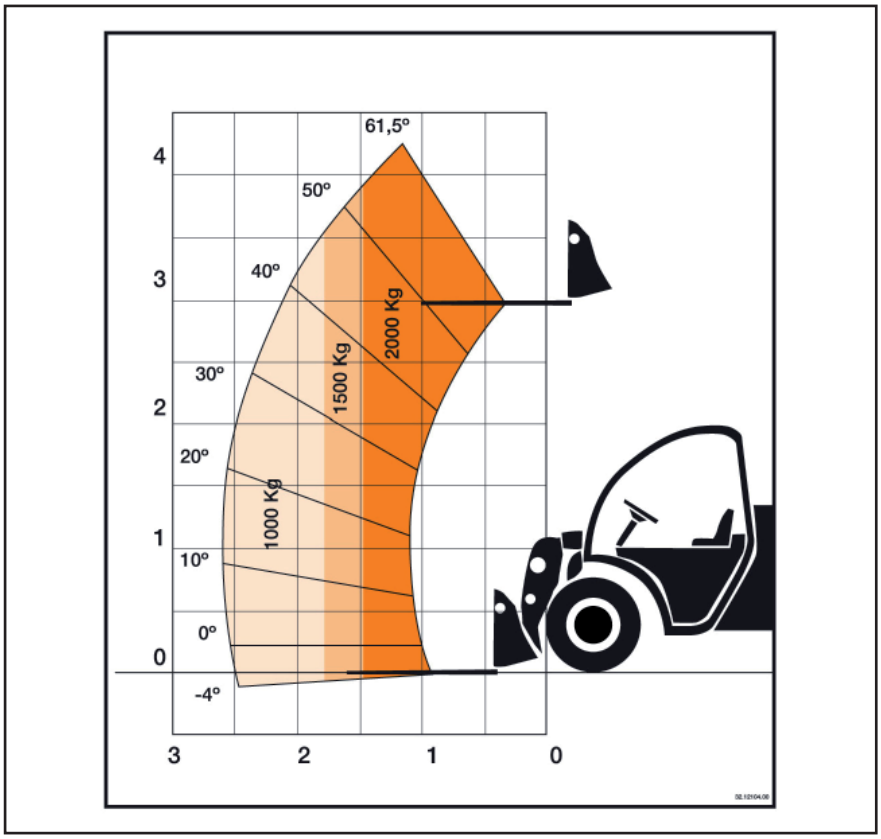
**WARNING**

The charts shown here are for information only. Only use the charts in the forklift to determine load limits.

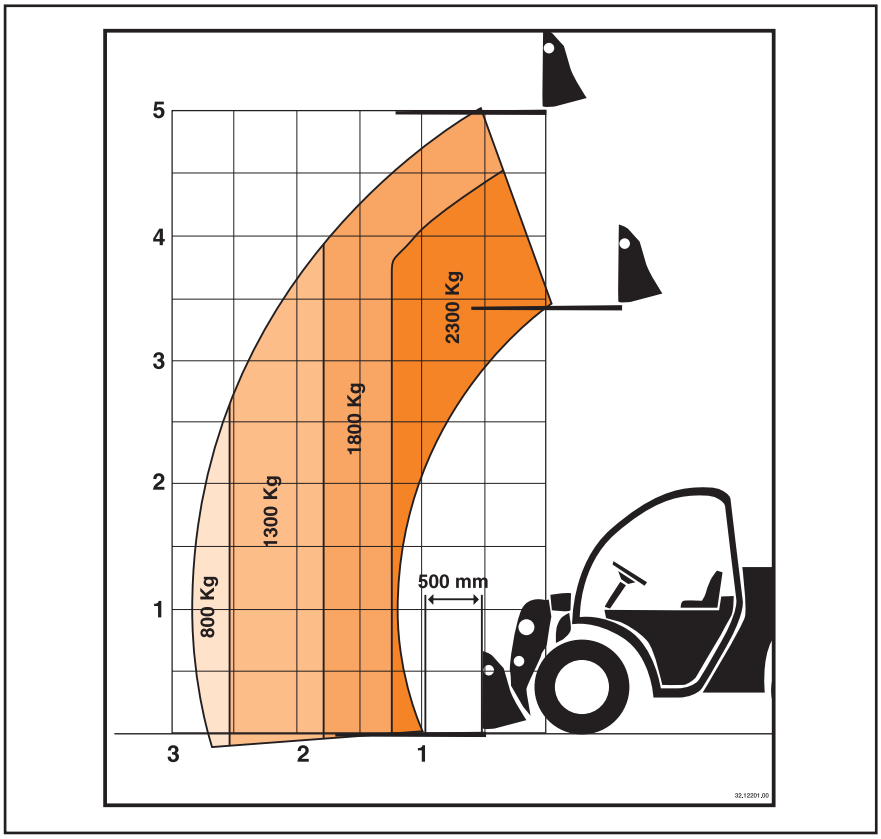
**WARNING**

The charts displayed in the forklift apply when the machine is stopped on solid level ground.
Lift loads a few centimetres and check stability before lifting entirely.

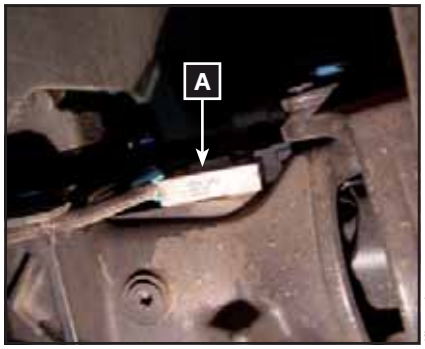
**T204H**




**T235H**




(fig. 1)



(fig. 1)

(fig. 2)

(fig. 3)

### 3.5.2 Overload system

The overload system is fitted on the rear axle **(A)** and indicates the gradual change in stability of the machine. This device will warn the operator before critical conditions are achieved.

### 3.5.2.1 Overload system calibration procedure (standard machines)

The calibration procedure is as follows:
The calibration sequence is defined on the basis of two calibration points:

1º Calibration position with minimum instability.
2º Calibration position with maximum instability.

The minimum load placed on the forks of the forklift in the maximum instability position must represent 1000 Kg (2204.6 lbs).

**WARNING**

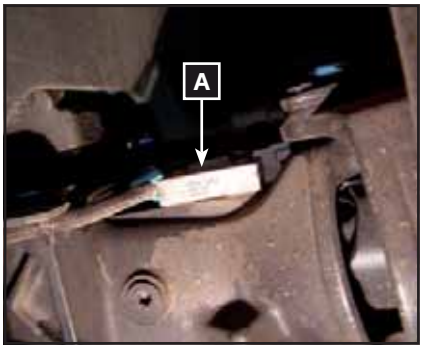
The forklift engine must be kept running during the entire calibration procedure and the load remains at 20 cm (8 in) from the floor.

When calibrating the minimum instability position, with the extending arm completely retracted and with zero load on the forks, apply the following sequence for the specific calibration tool connected **(A)**, with the connector intended for this purpose **(B)**:

1. Hold buttons P1+P2 in simultaneously (during approx. 5 sec.) until you hear an audio signal, indicating the receipt of the order. Subsequently, enter the following sequence of orders rapidly.
2. Press P2 twice consecutively.
3. Press P1 three times consecutively.
4. Press P2 three times consecutively.
5. Press P1 twice consecutively. (An audio signal and the flashing of the LEDS indicates that the sequence has been entered correctly).
6. To complete the calibration of the minimum instability position, press P1 and hold in until the audio signal is heard to quit calibration mode.

When calibrating the maximum instability position, with the extending arm completely extended and with a load of 1000kg (2204.6 lbs) on the forks, apply the following sequence for the specific calibration tool connected **(A)**, with the connector intended for this purpose **(B)**:

1. Hold P1+P2 in simultaneously for approximately 5 seconds until you hear an audio signal, indicating the receipt of the order. Subsequently, enter the following sequence of orders rapidly.
2. Press P2 twice consecutively.
3. Press P1 three times consecutively.
4. Press P2 three times consecutively.
5. Press P1 twice consecutively. (An audio signal and the flashing of the LEDS indicates that the sequence has been entered correctly).
6. To complete the calibration of the maximum instability position, press P2 and hold in until the audio signal is heard to quit calibration mode.



(fig. 1)

(fig. 2)

(fig. 3)

(fig. 3)

### 3.5.2.2 Overload system calibration procedure (optional / standard for Australian market)

The calibration procedure is as follows:
The calibration sequence is defined on the basis of two calibration points:

1º Calibration position with minimum instability.
2º Calibration position with maximum instability.

The minimum load placed on the forks of the forklift in the maximum instability position must represent 1400 Kg (3086.47 lbs).

**WARNING**

The forklift engine must be kept running during the entire calibration procedure and the load remains at 20 cm (8 in) from the floor.

When calibrating the minimum instability position, with the extending arm completely retracted and with zero load on the forks, apply the following sequence for the specific calibration tool connected **(A)**, with the connector intended for this purpose **(B)**:

1. Hold buttons P1+P2 in simultaneously (during approx. 5 sec.) until you hear an audio signal, indicating the receipt of the order. Subsequently, enter the following sequence of orders rapidly.
2. Press P2 twice consecutively.
3. Press P1 three times consecutively.
4. Press P2 three times consecutively.
5. Press P1 twice consecutively. (An audio signal and the flashing of the LEDS indicates that the sequence has been entered correctly).
6. To complete the calibration of the minimum instability position, press P1 and hold in until the audio signal is heard to quit calibration mode.

When calibrating the maximum instability position, with the extending arm completely extended and with a load of 1400kg (3086.47 lbs) on the forks (to extend completely the arm, invalidate the blocking system by using the botton located on the instrument panel), apply the following sequence for the specific calibration tool connected **(A)**, with the connector intended for this purpose **(B)**:

1. Hold P1+P2 in simultaneously for approximately 5 seconds until you hear an audio signal, indicating the receipt of the order. Subsequently, enter the following sequence of orders rapidly.
2. Press P2 twice consecutively.
3. Press P1 three times consecutively.
4. Press P2 three times consecutively.
5. Press P1 twice consecutively. (An audio signal and the flashing of the LEDS indicates that the sequence has been entered correctly).
6. To complete the calibration of the maximum instability position, press P2 and hold in until the audio signal is heard to quit calibration mode.


(fig. 1)

### 3.5.2.3 Usage (standard machines)

The green power indicator **(1)** will come on once the electric contact is made. When using the machine, the LEDS bar will gradually light up to indicate stability conditions.

**Green LEDS:** LEDS will indicate normal working conditions if the percentage of rollover moment varies between 0 & 89 of the tolerance, i.e. the machine is stable.
**Yellow LEDS:** indicating that the machine is nearing instability: the percentage of the rollover moment varies between 90 & 100 of the tolerance.
The system is set to pre-alarm: the warning light **(2)** comes on and the audio alarm sounds at intervals.

**WARNING**

The overload system blocks the extension and lower movements of the arm.

**Red LEDS:** danger of roll-over: the percentage of the rollover moment varies exceeds 100 of tolerance. The warning light **(2)** is on and the audio alarm sounds constantly. At this point, it is recommended to only lift or retract the extended arm.

**WARNING**

The overload system blocks the extension and lower movements of the arm.

**DANGER**

The stability indicator must not be used to check the load to be lifted: this indicator is only designed to indicate possible unbalance on the machine along the longitudinal axis. This unbalance may also be caused by sudden use of the joystick during the handling of loads. Should more lights come on during the operation, use joystick force with care and handle more delicately.

### 3.5.2.4 Usage (optional / standard for Australian market)

The green power indicator **(1)** will come on once the electric contact is made. When using the machine, the LEDS bar will gradually light up to indicate stability conditions.

**Green LEDS:** LEDS will indicate normal working conditions if the percentage of rollover moment varies between 0 & 89 of the tolerance, i.e. the machine is stable.
**Yellow LEDS:** indicating that the machine is nearing instability: the percentage of the rollover moment varies between 90 & 100 of the tolerance. The system is set to pre-alarm: the warning light **(2)** comes on and the audio alarm sounds at intervals. The overload system blocks the extension movement.

**WARNING**

The overload system blocks the extension and lower movements of the arm.

**Red LEDS:** danger of roll-over: the percentage of the rollover moment varies exceeds 100 of tolerance. The warning light **(2)** is on and the audio alarm sounds constantly. The overload system blocks the extension movement.

**WARNING**

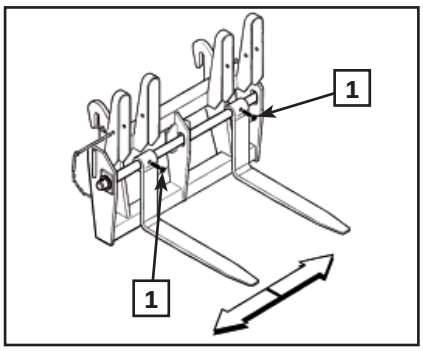
The overload system blocks the extension and lower movements of the arm.

**DANGER**

The stability indicator must not be used to check the load to be lifted: this indicator is only designed to indicate possible unbalance on the machine along the longitudinal axis. This unbalance may also be caused by sudden use of the joystick during the handling of loads. Should more lights come on during the operation, use joystick force with care and handle more delicately.

### 3.5.3 HANDLING LOADS

#### 3.5.3.1 Adjustment of forks



(fig. 2)

The forks must be adjusted in terms of width depending on the load to be handled. Proceed as follows:

Floating forks (standard configuration):

- Loosen the attachment screws **(1)**.
- Lift the forks and slide over the bolts until the desired distance is reached.
- Re-tighten the attachment screws **(1)**.

**DANGER**

- The centre of the load must always be between the two forks.
- Make sure that you know the weight of the load before starting handling.
- Do not exceed the acceptable load limit for the arm extension.
- Consult and apply the load limits indicated in the load chart displayed in the window inside the cab.
- Separate the forks as far as the load to be handled allows.

### 3.5.3.2 Working phases

Once the width of the forks has been adjusted correctly, the forklift is prepared for use. This process involves three phases: loading, transport and unloading.

**Loading phase.**

- Approach the load to be moved perpendicularly, controlling the correct levelling of the forklift using the indicator in the cab.
- Introduce the full length of the forks under the load and lift a few centimetres from the ground.
- Tilt the forks backwards while checking that the stability indicator confirms the correct loading of the forklift.

**Unbalanced loads**

- Identify the centre of gravity of the load. When handling packaged loads, this may be actually marked on the box.
- Place the forklift to move the centre of gravity of the load to the centre of the forks.
- Grip/release the load. This will depend on the type of load handled. It the load is on a pallet, apply the procedure for palletized loads. Should no pallet be used, it may be necessary to secure the load on the forks using the appropriate fastening devices. Stop the engine before allowing anybody to come near to the forks.

**WARNING**

If it is not possible to identify the centre of gravity of the load, do the following: attempt to lift the load from various different positions until the load remains securely stable on the forks. Do not lift the load more than a few centimetres from the ground, when considering how to lift the load.
Pay close attention when using the extending arm and the fork carriage with an unbalanced load.

**Transport phase.**

- Avoid starting to transfer or braking in a sudden manner.
- Transfer up to the unloading point while paying maximum attention and maintaining the load a maximum of 20-30 cm (7.87-11.87 in) from the ground.
- Select the appropriate speed for the type of ground over which the machine moves to avoid jumps or skids and losing the load.
- Pay special attention to work on slopes, move slowly, avoid being situated crosswise and do not operate on slopes which exceed the recommended gradient. A slope within the recommended gradient does not mean that this slope can be manoeuvred on with absolute safety under any load, terrain or handling conditions. Descend slopes in reverse gear, i.e. with the load in the most stable direction.

**WARNING**

You may not move transversely on a slope. This maneuver is the leading cause overturning of the truck.

**Unloading phase.**

- Approach the unloading area with the wheels straight and reduce speed gradually, leaving enough space to handle the extending arm.
- Set the parking brake and set the forward/reverse selector to neutral.
- Hold the load a few centimetres over the unloading point, with the forks horizontal.
- Lower the load until the forks are free of weight.
- Remove the forks carefully by retracting the extending arm and, if necessary, modifying the height of the arm while the forks withdraw from under the load.
- After having completely released the forks from the load, switch to translation position.
- Release the parking brake and prepare for a new job cycle.

**WARNING**

Never displace the machine in any direction with a load lifted more than 20-30 cm (7.87-11.87 in) from the ground.
This implies a risk of roll-over or losing the load.

### 3.5.4 REPLACEMENT OF TOOLS

**Proceed as follows to replace mechanically the tool:**

(fig. 1)

- Approach the location where you intend to place the fitted tool.
- Lower the tool to the ground.
- Extract the safety pins from the attachment bolts.
- Remove the attachment bolts.
- Lift the arm (approximately 10-15 cm (3.94-5.91 in))
- Tilt the optional equipment forwards.
- Carefully lower the extending arm and lower the tool to the ground again.
- Slowly retract to release the tool from the forklift's extending arm.

(fig. 1)

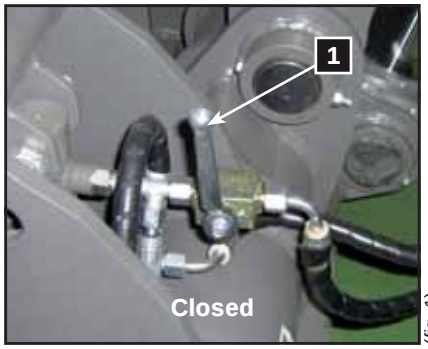
To fit a new tool, apply the above procedure in reverse order.

**DANGER**

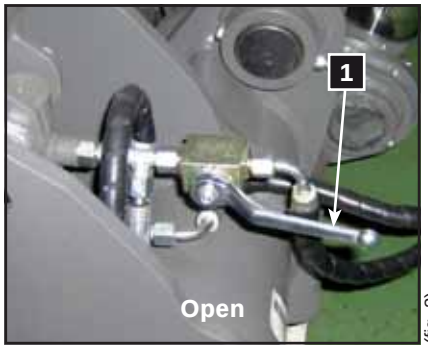
After each replacement of a tool, and after any operation fitting an item of equipment, visually check the attachments, as an incorrectly fitted tool could cause serious accidents.

**CAUTION**

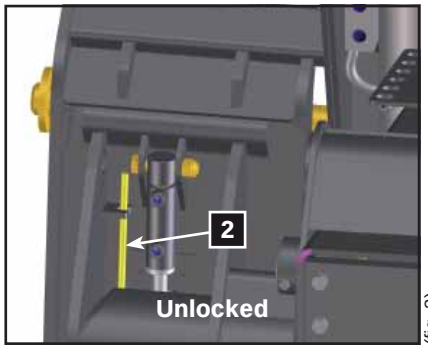
Only use equipment authorized and designated by AUSA for this type of forklift.



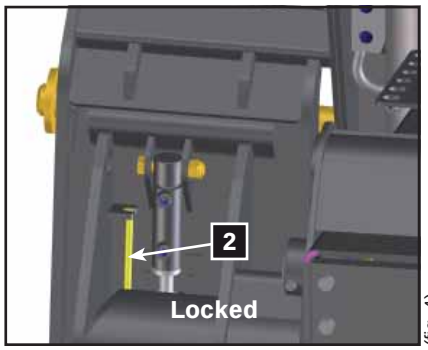

(fig. 1)



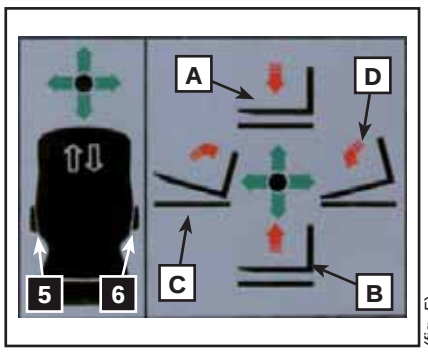

(fig. 2)




(fig. 3)




(fig. 4)




(fig. 5)

**Replacement of tools (Hydraulic quick hitch) (if fitted)**

Proceed as follows to replace tool:

- Approach the location where you intend to place the fitted tool.
- Lower the tool to the ground.
- Move the valve **(1)** fitted on the left side of the hitch to its position “open”.
- Move the joystick to disengage the attachment (see chapter 3.3.4.6 on this manual.

Once unlocked, the quick hitch position indicator **(2)** should be in “unlocked” position.

- Lower the attachment and sustain it on an horizontal and stable surface on its rest position
- Tilt the fork carriage forward and lower boom while driving backwards at the same time with the forklift to disengage tool.

Proceed as follows to fit a new tool:

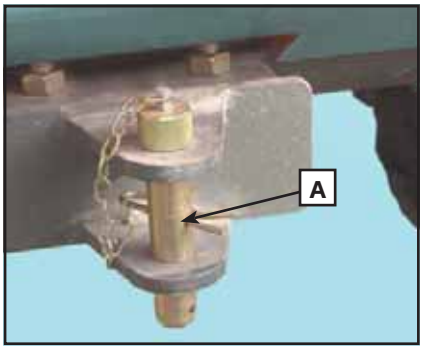
- Apply the above procedure in reverse but push the button **(6)** on the joystick (see chapter 3.3.4.6 on this manual) and move joystick to the left to engage hydraulic ram locks. Be sure that the quick hitch position indicator **(2)** is in “locked” position.
- Move the valve **(1)** fitted on the left side of the hitch to its “close” position.
- Tilt carriage forward to double check tool is securely locked on.

**WARNING**

Before start working with the forklift, be sure that quick hitch position indicator is in “locked” position “locked” and the safety valve is in “close” position.

**CAUTION**

Only use equipment authorized and designates by AUSA for this type of forklift.



(fig. 1)

### 3.5.5 TRANSPORTING TOWED LOADS

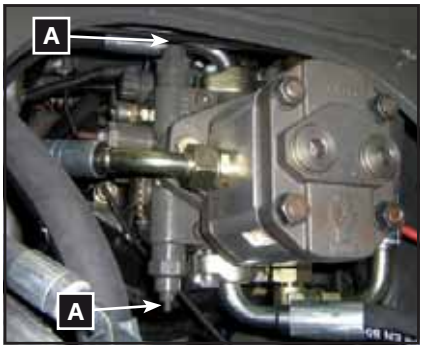
**WARNING**

Towed masses on flat ground must not exceed:
Trailer without brakes: 750 Kg (1653.4 lbs).
Trailer with brakes: 2100 Kg (4629.63 lbs).

**WARNING**

- Avoid attaching excessively heavy trailers.
- The load on the towing hook must never exceed 100 kg (220.46 lbs).
- Do not apply sudden translation movements due to the high risk of accidents.
- For safety reasons, do not tow trailers without an independent braking system.
- Before reversing to secure a trailer, check that nobody is present between the machine and the trailer. Those in charge of signalling must be located at the safety distance and clearly visible for the operator.

## 3.6 Transporting the machine



(fig. 2)

### 3.6.1 TOWING A DAMAGED MACHINE

Towing the forklift is only advisable in cases of breakdown when there is no other alternative, as this may seriously damage the hydrostatic transmission. Whenever possible, it is recommended to repair the vehicle where it is halted.
It towing is obligatory, apply the following procedure:

- Release the parking brake.
- Only tow for short distances and at slow speeds.
- Use a rigid towing bar.
- Select the front-wheel steering system.
- Set the forward/reverse selector to neutral.
- If possible, start the engine to assist with steering and braking.
- The central screws of the hydrostatic pump's maximum **(A)** pressure valves must be fully tightened (but not excessively). Loosen the counter-nuts for this purpose.

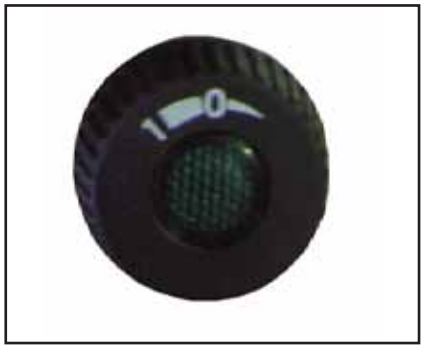
Once the forklift is repaired, loosen the screws **(A)** on the maximum pressure valves of the hydrostatic pump again and re-tighten the counter-nuts.

**CAUTION**

The forklift may be fitted with a hook for future towing should the machine be damaged.

### 3.6.2 TRANSFER BY ROAD AND JOBS

When driving the machine down public roads, ensure strict compliance with applicable traffic standards in the country of work.
Always apply the following standards in all events:




(fig. 1)

- Align the rear wheels, so they are straight.
- Select the front-wheel steering position.
- Position the extending arm in its translation position.
  Select the ROAD-JOB selector to position **"1"** so the light comes on and it will only be possible to drive with front-wheel steering and extending arm movements will be blocked.

(fig. 2)

- Use the protection device on the fork ends (if fitted) or, with floating forks, place the forks in the translation position.

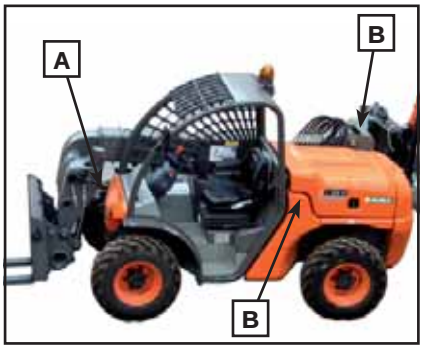
- Check that the lights, the back-up alarm and the turning lights are fully operational (if fitted)
- Start the forklift and connect the rotating beacon.
- Select forward operation.

The machine velocity will depend on the engine speed.

**WARNING**

The use of public roads may be authorized depending on applicable legislation per country.

(fig. 1)



(fig. 2)


(fig. 3)

(fig. 4)

### 3.6.3 LOADING THE MACHINE WITH A CRANE

When the forklift is loaded onto a using a crane and a cable or sling:

- Hook the cable or sling on the points provided for this purpose on the machine.
  - FRONT PART: using the designated towing hole **(A),** taking into account that the sling must pass through the external part of the extending arm.
  - REAR AND MIDDLE PART: screw in eyebolts **(B)** using the threads placed in the rear and left side counterweight. These eyebolts are stored in the machine's toolbox.
- Always carry out this operation with the machine unloaded.
- Before hoisting check that the cable or sling is firmly hooked and that both the crane and the cables or slings have sufficient capacity to lift the load.
- During hoisting do not allow any person to be on the forklift or any spectators within a 5 m (197 in) radius.
- Always undertake this operation on flat and horizontal ground.
- Use guide ropes or other systems to avoid the machine pivoting or turning.

Also take into account the following recommendations.

- The slings must be long enough to form an angle wider than 45° with the horizontal.
- Always elevate the machine in the most horizontal position possible.

To lift the machine, use resources with adequate loading characteristics for the weight of the forklift. Technical data is indicated in the section on "TECHNICAL DATA" in this manual and printed on the identification plate of the machine.

### 3.6.4 TRANSPORT ON ANOTHER VEHICLE

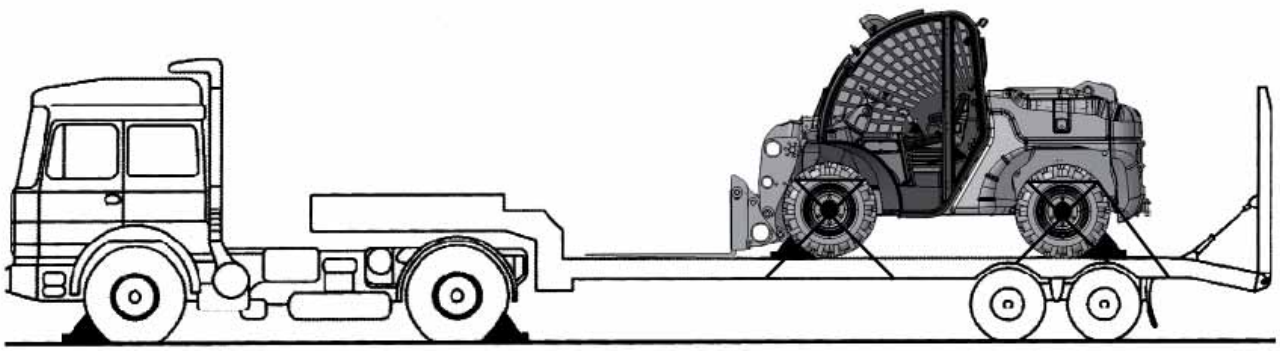
When transporting the forklift on a truck bed or low loader, carefully follow the advice given in the following chart:

**WARNING**

Before raising the forklift onto a trailer or bed, make certain that the ramp is strong enough to support the weight of the forklift and that the truck bed surface is free from debris, oil, grease or ice.

- Do not transport the forklift with the fuel tank full.
- Make certain your seat belt is properly fastened.
- Move the forklift slowly and carefully up or down the loading ramps.
- Set the forward/reverse selector to neutral.
- Apply the forklift's parking brake.
- Lower the forks as far as possible, or, should no forks be fitted, any optional equipment fitted, until it reaches the trailer.
- Stop the engine and remove the key from the ignition.
- Close the driver's cab.
- Chocking all four wheels is also recommended.
- Secure the forklift to the platform using the appropriate attachment systems (chains, straps or slings), which must be sufficiently resistant and appropriate for this purpose.

Once the machine is loaded on the truck/trailer, add chocks for the front and rear wheels. Subsequently, firmly secure the forklift to the platform to prevent any movement by attaching the systems shown in figure **(1)**.



(fig. 1)

### 3.6.5 PARKING AND NON-OPERATIONAL MACHINES

#### 3.6.5.1 Short stops

Whenever the forklift is parked, either at the end of the day or in order to carry out any maintenance work, it should be parked on level ground.
Apply the forklift's parking brake. Run the engine at idle for 1 minute, if the forklift has been working at full load. Then turn the ignition key to position "A" to stop the engine. Chocking the wheels with suitable blocks is also recommended in case the parking brake fails.
Remove the key from the ignition, close the cab, and take it with you. Never leave the key in the parked forklift.

#### 3.6.5.2 Extended stops

Should it be necessary to park the forklift for an extended period of inactivity, the following is recommended in addition to the guidance mentioned for short stops:

- Wash the forklift carefully.
- After washing, carefully dry all parts using a pressurized air jet.
- Completely lubricate the forklift.
- Carry out a general inspection and replace any damaged parts.
- Paint damaged areas.
- Dismantle the battery and place in a dry location after having lubricated the terminals with Vaseline. If the battery is temporarily used for other purposes, regularly check the charge level.
- Fill the fuel tank to avoid inner parts rusting.
- Park the forklift in a dry, covered and ventilated location.
- Start the engine at least once monthly, and run at idle for approximately 10 minutes.

In extreme climates, empty the coolant from the radiator.

**IMPORTANT**

During extended periods of inactivity, also remember that periodic maintenance must be carried out and close attention must be paid to all liquids and elements which may age.
In all events, before starting the forklift, carry out a complete overhaul checking all mechanical, hydraulic and electric parts.

### 3.6.6 CLEANING AND WASHING THE MACHINE

#### 3.6.6.1 Cleaning instructions

Comply with the following instructions to clean the machine in a satisfactory manner:

- Clean parts of oil or grease using solvents or volatile mineral alcohol.
- Remove all protective substances (rust inhibitor, grease, wax, etc.)
- Should signs of rust appear on metal parts of the forklift, clean using an emery board and cover with an appropriate protection substance (rust inhibitor, varnish, oil, etc.).
- When the forklift is used in salt water areas (beach areas, etc.), rinse with clean water to preserve the forklift and its components.
- When the forklift is operated in muddy conditions, rinsing the dumper is recommended to preserve the forklift and its components.

Lubrication of metallic parts is highly recommended.
This must be performed at the end of each operation day.

#### 3.6.6.2 Washing the machine

**External washing**
During the washing process, care must be taken to avoid aiming the pressurized water jet at the air intake (air filter), battery, instrument panel, alternator and other electrical equipment since this can damage the components.

**Interior washing**
Wash the inside of the machine using, water, a bucket and a sponge. Do not use low-pressure water jets. Finish by wiping with a clean cloth.

**Washing the engine**
Wash the engine after having covered the air suction filter to protect against water.

### 3.6.7 ELIMINATION

#### 3.6.7.1 Elimination of batteries

**ELECTRIC HAZARDS**

Dispatch all used batteries to the appropriate recycling centres. Should leaks of substances such as acid or lead occur, which may be dangerous for individuals or the environment, take the emergency action required to reduce impact.

# Periodic maintenance operations

**Section 4**

**INDEX**

# Preamble

Careful and regular maintenance is necessary to ensure a safe and operational machine for the operator. Therefore, after work in extreme conditions (muddy ground, dusty area, heavy work, etc.) the washing, greasing and maintenance of the vehicle is recommended.
Always check that all parts are in correct working order, that oil has not leaked, that protective and safety devices are effective. Should this not be the case, identify and eliminate the causes of the incident. Scheduled maintenance operations are carried out on the basis of the hours of operation carried out by the machine. Check and ensure that the hour counter remains operational to ensure the correct definition of maintenance intervals. Should the scheduled maintenance standards indicated in this manual not be complied with, the AUSA warranty will automatically be cancelled.

**IMPORTANT**

Carefully comply with the specific instructions and maintenance manual supplied with the forklift for engine maintenance standards.

# 4.1 Lubricants, Safety and Hygiene Standards

**Hygiene**
Should oils come into extended contact with the skin, this may cause irritation. Therefore, it is recommended to use protective goggles and rubber gloves.
After having handled oils it is recommended that you wash your hands carefully using water and soap.

**Storage**
Always store oils in a closed location out of the reach of children. Never leave lubricants in open containers, and without a label indicating content.

**Elimination**
Oil left in the environment, whether new or used, is serious pollution.
Carefully store new oil, and store waste oil in special containers for future elimination by specialist collection centres.

**Spillage**
In case of the accidental loss of oil, intervene to enable absorption with sand or aggregates of an appropriate type. Collect the compound created and ensure it is eliminated as chemical waste.

**Emergencies**

Eyes: In case of contact with the eyes, rinse abundantly with running water. Should the irritation continue, contact the nearest Emergency centre.

Ingestion: Should oil be ingested, do not force the person to vomit. Call a doctor.

Skin: Should the skin come into excessive and extended contact with oil, wash with soap and water.

Fire: Should a fire start, use carbon dioxide, dry powder or foam extinguishers. Do not use water.

# 4.2 Scheduled maintenance

- **In maintenance operations only use original AUSA spare parts. This is the only way to guarantee that your forklift will remain as technically efficient as when it was purchased.**

- In this forklift as with any other, there are parts and systems which are subject to wear and misalignment, which may affect reliability and operator safety, the environment and the area, e.g. exhaust fume emissions, etc.
  Necessary maintenance must be carried out periodically to ensure that the machine is kept in a condition similar to when it left the factory.
  In accordance with Work Group Directives, inspections of these systems must be carried out periodically and the results recorded on the forms provided by the Work Authorities of each country. (89/655/CEE and RD1215/97).
  Even if repairs must be carried out with the engine running, perform all repairs and maintenance operations on the forklift while unloaded, with the forward/reverse selection set to neutral and the wheels blocked to prevent the forklift from moving.
  Unless otherwise specified, do not start the engine during maintenance operations.
  Never use a flame to check fluid levels.

- Protect the environment.
  When changing oils or other fluids, use an appropriate container to collect the fluid and ensure that you are not harming the environment during the operations and take all replaced materials (batteries, coolant, tyres, etc.) to the appropriate recycling centres.
  In cases of leaks of substances which could be harmful to people or the environment, urgently take the necessary actions to reduce the impact, e.g. in oil leaks, plug the leak, place a container to collect the oil, spread absorbent material or pick up and remove the contaminated ground if necessary.

- Roadside breakdown
  In the case of a breakdown when driving on a road, you must use the warning triangles (if fitted).

# 4.2.1 Lubrication and maintenance chart

| **I:** Inspect, verify, clean, lubricate, replace if necessary<br>**C:** Clean<br>**L:** Lubricate<br>**R:** Replace | EVERY | | | | | | | | | | | | | To be performed by |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Initial inspection (50 h) | 150 h. | 300 h. | 450 h. | 750 h. | 900 h. | 1500 h. | 3000 h. | DAILY | Weekly | 1 or 2 months | Annually | 2 years | |
| **ENGINE** | | | | | | | | | | | | | | |
| Oil (1) | R | R | | | | | | | I | | | R | | USER |
| Oil filter (1) | R | | R | | | | | | | | | R | | USER |
| Alternator belt | | I | | R | | | | | | | | | R | DEALER |
| Valve clearance | | | | | I | | | | | | | | | DEALER |
| Engine frame | | I | | | | | | | | | | | | USER |
| Visual check of exhaust fumes | | | | I | | | | | | | | | | USER |
| **SUPPLY CIRCUIT** | | | | | | | | | | | | | | |
| Air filter | | C(3) | | | | R(4) | | | I | | | R | | USER |
| Inlet air tube. | | I | | | | | | | | | | | R(2) | USER |
| Fuel tubes and fittings | | | | | | | | | | I | | | R(2) | DEALER |
| Fuel filter cartridge. | | | R | | | | | | | | | | | USER |
| Fuel pre-filter | | R | | | | | | | | | | | | USER |
| Fuel tank | | | | C | | | | | I | | | | | USER |
| Injection pressure at the fuel injection nozzle (2) | | | | | | | I | | | | | | | DEALER |
| Injection pump (2) | | | | | | | | I | | | | | | DEALER |
| **COOLING CIRCUIT** | | | | | | | | | | | | | | |
| Radiator hoses and clamp bands | | I | | | | | | | | | | | R(2) | USER |
| Radiator (interior) | | | | C | | | | | | | | | | DEALER |
| Radiator (exterior) | | | | | | | | | I | C | | | | USER |
| Coolant | | | | | | | | | I | | | | R | USER |
| **ELECTRICAL SYSTEM** | | | | | | | | | | | | | | |
| Battery electrolyte | | I | | | | | | | | | | | | USER |
| Battery connections | | | | | | | | | | | I | | | USER |
| Battery | | | | | | | | | | I | | | R | USER |
| Damage to harness and loose connections | | | | | | | | | | | I | | | USER |
| Instrument panel indicators | | | | | | | | | I | | | | | USER |
| Lighting and signalling (if fitted) | | | | | | | | | I | | | | | USER |
| **HYDRAULIC CIRCUIT** | | | | | | | | | | | | | | |
| Hydraulic fluid | R | | | | | R | | | I | | | | | USER |
| Admission filter and drainage cap magnet | C | | | | | C | | | | | | | | USER |
| Hydraulic filter cartridge (1) | R | | | | | R | | | | | | | | USER |
| Fork compensation system | | | | | | | | | I | | | | | USER |
| Hydraulic connections | | | | I | | | | | | | | | | USER |
| Hydraulic cylinder check valves | | | | | | | | | | | I | | | USER |
| Condition of the rods and seals of the hydraulic cylinders | | | | | | | | | | | I | | | USER |
| Condition of hydraulic hoses | CHECK ON A MONTHLY BASIS. REPLACE AT LEAST ONCE EVERY 6 YEARS | | | | | | | | | | | | | DEALER |
| **TRANSFER BOX** | | | | | | | | | | | | | | |
| Oil (1) | R | | | | R | | | | | | I | R | | USER |
| Oil leaks | | | | | | | | | | I | | | | USER |
| Tightness of all nuts and bolts | | | | | | | | | | | I | | | DEALER |

(1) Initial inspection. Initial maintenance is crucial and must not be neglected.
(2) Contact an authorized AUSA dealer for this service.
(3) More often in severe operating conditions such as sandy or dusty areas, areas with snow, or wet or muddy areas.
(4) ...or after cleaning 5 times.

| **I:** Inspect, verify, clean, lubricate, replace if necessary<br>**C:** Clean<br>**L:** Lubricate<br>**R:** Replace | EVERY | | | | | | | | | | | | | To be performed by |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Initial inspection (50 h) | 150 h. | 300 h. | 450 h. | 750 h. | 900 h. | 1500 h. | 3000 h. | DAILY | Weekly | 1 or 2 months | Annually | 2 years | |
| **AXLES (FRONT AND REAR)** | | | | | | | | | | | | | | |
| Differential and reduction gear oil (1) | R | | | | R | | | | | | I | R | | USER |
| Oil leaks | | | | | | | | | | I | | | | USER |
| Tightness of wheel nuts | | | | | | | | | | I | | | | USER |
| Tightness of chassis fixing screws | | | | | | | | | | | I | | | DEALER |
| Wheel hub bearing adjustment | | | | | | I | | | | | | | | DEALER |
| Tightness of raceway fixing screws | | | | | | | | | | | I | | | DEALER |
| Tighten coupling fixture nuts and universal drive shaft joint | | | | | | | | | | | I | | | DEALER |
| Tyre condition and pressure | | | | | | | | | | I | | | | USER |
| **BRAKES** | | | | | | | | | | | | | | |
| Brake fluid | | | | | | R | | | | I | | | | DEALER |
| Parking brake tension | | | | | | | | | | I | | | | USER |
| **STEERING** | | | | | | | | | | | | | | |
| Turning selection system | | | | | | | | | I | | | | | USER |
| Steering cylinder | | | | | | | | | | I | | | | USER |
| Steering alignment | | | | | | | | | | | I | | | DEALER |
| **BODYWORK / CHASSIS** | | | | | | | | | | | | | | |
| Cab | | | | I | | | | | C | | | | | USER |
| Cab lock | | | | | | | | | | I | | | | USER |
| Bolt and joint clearance | | | | I | | | | | | | | | | USER |
| Seat belts | | | | | | | | | | I | | | | USER |
| Floor panel and access step | | | | | | | | | | I/C | | | | USER |
| Decks and protection | | | | | | | | | | I | | | | USER |
| Identification plates and labels decals | | | | | | | | | | I | | | | USER |
| Engine compartment cover lock | | | | | | | | | | I | | | | USER |
| **EXTENDING ARM** | | | | | | | | | | | | | | |
| Extending arm sections | | | | | | | | | C | L | | | | USER |
| Fork carriage | | | | | | | | | | L | | | | USER |
| Guides | | | | | | | | | | C/L | I | | | USER |
| **GREASING POINTS** | | | | | | | | | | | | | | |
| Nipples (see paragraph on “GREASING POINTS”) | | | | | | | | | | L | | | | USER |
| Control articulations (throttle, lifting cylinders, etc.) | | | | | | | | | | L | | | | USER |
| Cables | | | | | | | | | | I | L | | | USER |
| **SAFETY DEVICES** | | | | | | | | | | | | | | |
| Seat switch | | | | | | | | | I | | | | | USER |
| Distributor spool block (joystick block) | | | | | | | | | I | | | | | USER |
| Safety systems/ extending arm check valve | | | | | | | | | I | | | | | USER |
| Emergency stop button | | | | | | | | | I | | | | | USER |
| Overload system | | | | | | | | | I | | | | | USER |

(1) Initial inspection. Initial maintenance is crucial and must not be neglected.
(2) Contact an authorized AUSA dealer for this service.
(3) More often in severe operating conditions such as sandy or dusty areas, areas with snow, or wet or muddy areas.
(4) ...or after cleaning 5 times.

## 4.3 Maintenance operations

**DANGER**

All maintenance interventions must be carried out with the engine stopped, the parking brake set, the tools on the ground and the forward/reverse selector in the neutral position.

**WARNING**

Before carrying out any maintenance operation requiring the hoisting of a component, e.g. the extending arm or the cab, attach the hoisted component in a stable and secure manner, before carrying out any action.

**WARNING**

Interventions on the hydraulic circuit must be carried out by personnel with basic knowledge of hydraulics and with the appropriate tools. Pressure should never exceed the figures indicated in the “TECHNICAL DATA” section of this Manual.

**WARNING**

Before carrying out operations on hoses or on hydraulic components, check that there is no pressure in the system. Proceed as follows:
- Stop the machine engine. Leaving the driver’s seat is not recommended.
- Re-energize the ignition.
- Release the parking brake and move the joystick towards the possible positions to discharge the pressure from the hydraulic circuit.

**CAUTION**

The high pressure conducts in the hydrostatic unit may only be replaced by qualified personnel. Any impurity in the closed circuit may cause the rapid deterioration of the transmission.

## CAUTION

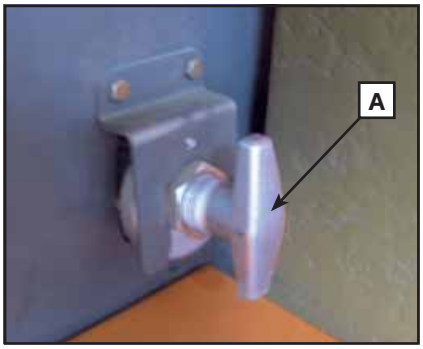
Before intervening on any component in the hydraulic circuit, carefully clean the surrounding area.

## ENVIRONMENT PROTECTION

The handling and elimination of used oil is regulated by applicable standards. Dispatch all used oil to the appropriate recycling centres.

### 4.3.1 DISCONNECTING THE BATTERY

If any repair or maintenance operation must be carried out, and, in particular, if the machine must be welded, disconnect the battery **(A)**, using the switch located under the forklift engine cover.



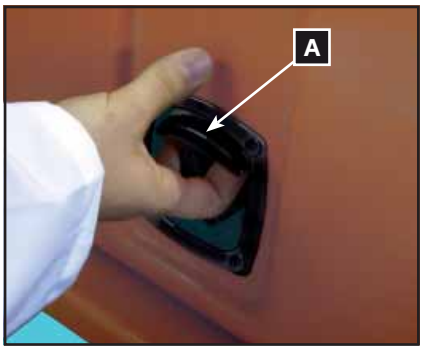
(fig. 1)

### 4.3.2 ACCESS TO ENGINE, CAB AND TANK COMPARTMENTS

**Engine compartment**

You must open the engine protective cover to carry out any intervention inside the engine compartment.
The cover is equipped with a lock and key and hydraulic suspension, holding it in the up position.
The following may be accessed from the engine compartment:

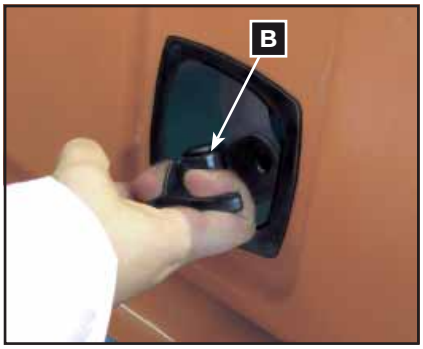
- Combustion engine.
- Engine air filter.
- Engine oil fill plug
- Coolant circuit tank.



(fig. 2)

To access the engine compartment:

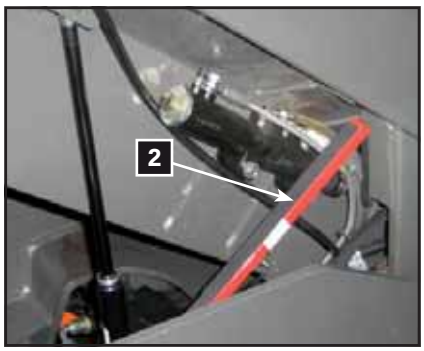
- Stop the engine and set the parking brake.
- Open the lock, pull the cover handle and turn anti-clockwise **(A)**. This special handle is equipped with a tamper-proof lock **(B)**.
- Lift the cover by gripping the special handle **(A)** until the hydraulic suspension is activated. The cover will then lift automatically.
- To close the cover: lower the cover and close. This special handle is equipped with a tamper-proof lock **(B)**.



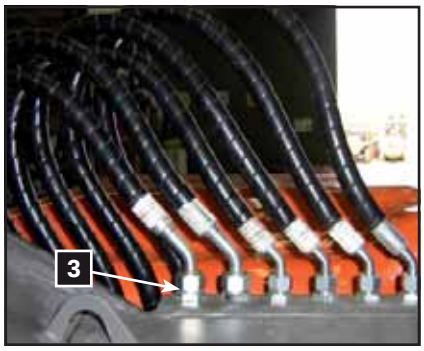
(fig. 3)


(fig.1)

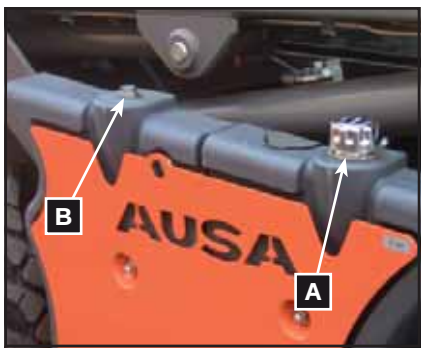

(fig. 2)




(fig. 3)




(fig. 4)




(fig. 5)

**DANGER**

Approach with care. Some engine parts could be very hot. Use protective gloves.

The operator's cab may be folded towards the front section of the forklift to simplify maintenance operations.

To access components located under the cab:

- Sit in the operator's seat, start the forklift, release the parking brake, and move the extending arm until the forks or the tools are on the ground. Then, extend approximately 35-40 cm (14-16 in). This will avoid the cab or the front windscreen colliding with extending arm rubber abutment stop.
- Stop the engine and remove the key from the ignition.
- Leave the operator's cab.
- Pull on the control **(1)** located in the rear section of the cab to detach the cab.
- Accompany the cab until it reaches its maximum opening.
- Once the cab is folded, secure using the safety block **(2)** under the cab on the right. This block prevents the cab from lowering and causing an accident.

**DANGER**

This safety block must not be removed while the cab is lifted.
This will prevent the cab causing an accident by accidently lowering.

**NOTE:** should the battery be operational, but the engine not be running, it is possible to rotate the hydraulic pump using the machine starter while activating the joystick to extend the arm.
If the engine is damaged, and the battery is flat, proceed as follows:

Remove the hose **(3)** supplying the arm extension cylinder.
Apply pressure (more than 20 bars (289.85 psi)) using an external hydraulic unit until the arm has extended enough to lift the cab.

**Hydraulic fluid and fuel tank**

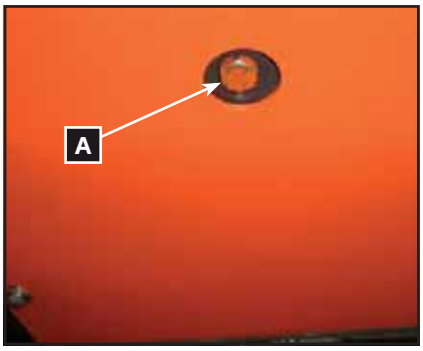
The fuel and hydraulic fluid tanks are located on the right side of the forklift.

- Fuel tank **(A)**.
- Hydraulic fluid tank **(B)**.

### 4.3.3 SUPPLY CIRCUIT

**WARNING**

Never mix oil with the fuel. The forklift has a 4-stroke engine. Oil must be added in the engine only.



(fig. 1)

**Draining the fuel tank.**

**(A) Tank drainage plug.**

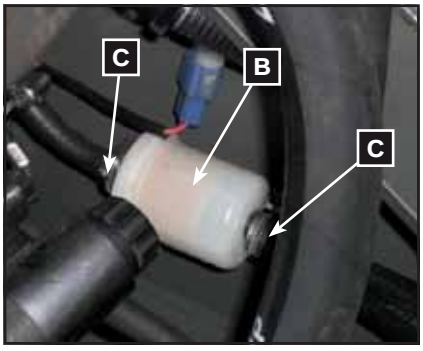
Fuel can be drained via the plug situated on the lower part of the tank.

- Clean the area around the fuel drain plug.
- Place a container underneath the fuel drain plug.
- Unscrew the plug.
- Change the seal in the tank drain plug. Clean the tank seal area and the oil drainage plug and replace the plug.

Ensure that there are no leaks from the fuel drain plug.

**WARNING**

Clean any fuel spillage.



(fig. 2)

**Changing the fuel pre-filter.**

Lift the cab and access the left side of the engine compartment. Locate the fuel pre-filter.

**(B) Pre-filter**
**(C) Flanges**

Remove the fixing flanges brackets and the filter. Ensure that the new filter is located in the correct direction as indicated by the arrow marked on the filter housing.

**WARNING**

Always replace this component. Under no circumstances should you attempt to clean it.

(fig. 3)

**Changing the fuel filter.**

Unscrew the fuel filter cartridge located on the left part of the engine and remove it from its support.

**(D) Fuel filter**

Clean the base and cover the joint of the new filter with clean oil. Screw in the filter element once again and tighten, do not use mechanical tools.

**Fuel system bleed.**

If the fuel system has taken in air, purging is not necessary as it has a system for expelling air from the circuit.

### 4.3.4 GREASE

**CAUTION**

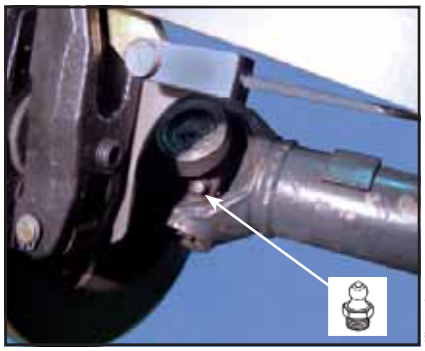
Before injecting lubricating grease in the grease nipples, clean carefully to prevent, mud, dust or other foreign bodies mixing in the grease thereby reducing or even cancelling out lubrication properties.

**CAUTION**

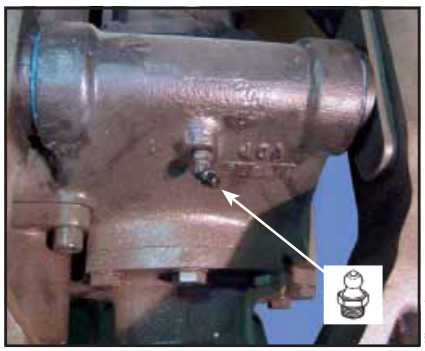
Before applying grease on the guides, carefully clean the surface in contact with the guides.

Regularly grease the forklift to ensure it is effective and extend its life.
Inject lubricating grease via the grease nipples using a pump.
Stop greasing as soon as fresh grease appears in the filling holes.
Greasing points are indicated in the following figures:

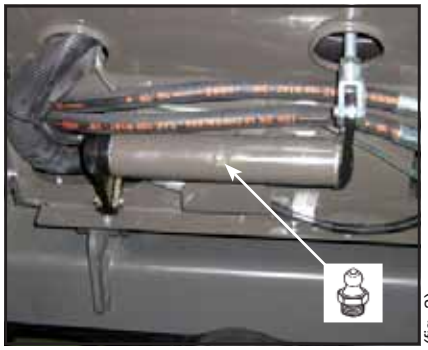
- This symbol indicates greasing points with pump (nipples).
- This symbol indicates greasing points with brush.



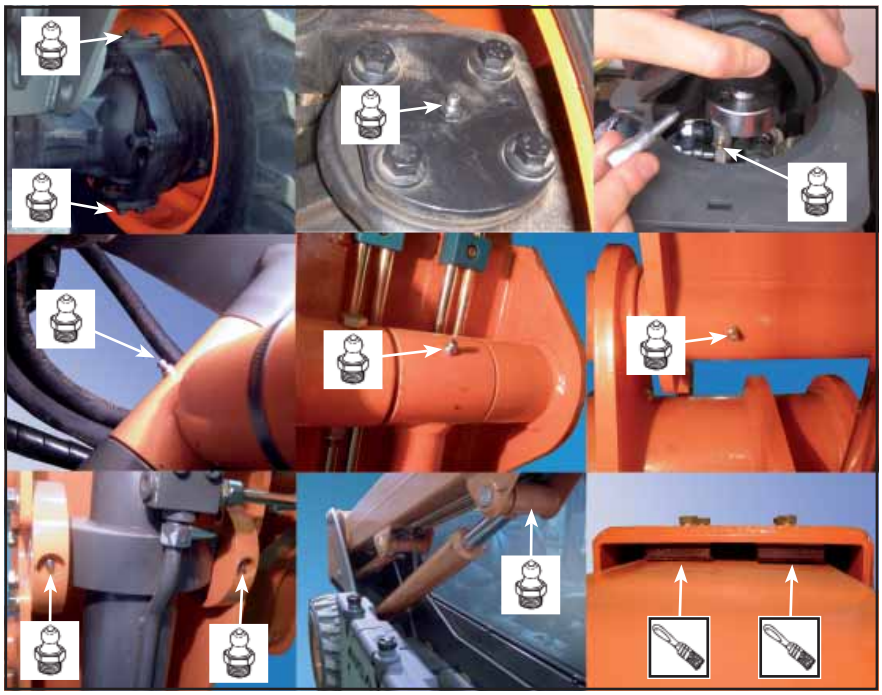
(fig. 1)



(fig. 2)



(fig. 3)



(fig. 4)

### 4.3.5 TYRES AND WHEELS

Unless it is essential for the type of work to be carried out, the use of solid tyres is not recommended, as this increase the effects of impacts on the transmission and the operator.
Occasionally, the wheel nuts must be removed in order to apply lubricant. This operation is very important when the forklift is used in salt water or muddy environments. Remove the wheel nuts one by one, lubricate each one and screw them on again.

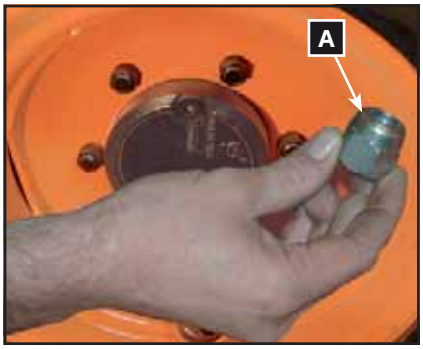
**Re-tighten the wheels**
Wheel nuts should be re-tightened every week or every 50 hours of operation.
**Wheel nut torque loading: 350 ± 50 Nm (258.3 ± 36.9 lb/ft.**

**Tyre pressure**
We recommend that the following instructions are applied:

- Park the forklift on flat ground with the engine off.
- Always inflate the tyres when they are cold, to the pressure indicated in the "TECHNICAL DATA" section of this manual before beginning work with the forklift.
- Tyre pressure changes according to temperature and altitude. Recheck the pressure if one of these conditions changes.
- Checking the pressure and inflating the tyre must be carried out with a pressure meter in good operational condition and equipped with a nozzle which has a safety clamp, to avoid it slipping from the tyre valve during inflation.
- Use gloves to avoid any injury to the hands by any incorrect function of the air nozzle.
- If the tyre is being inflated away from the forklift, first protect it with a special protection cage designed for this purpose.
- Carrying an anti-puncture repair kit is recommended.

**Tyre/Wheel condition.**
Check the tyres for possible damage or wear. Replace if necessary. Do not rotate the tyres if they are directional.
For correct operation their rotation must maintain a specific direction.

**Removing the wheel. (fig. 1)**
Loosen the nuts and raise the forklift. Place a support beneath it. Remove the nuts and then remove the wheel.
When assembling, apply lubricant to the threads. Slowly tighten the nuts in a criss-cross sequence, applying a final torque of 350 ±50 Nm.

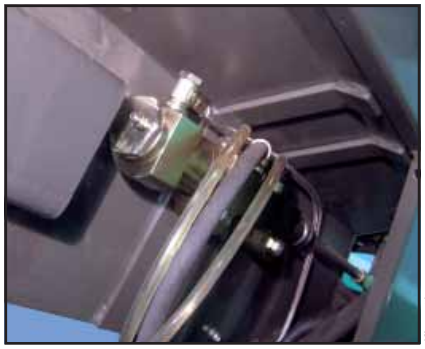


(fig. 1)

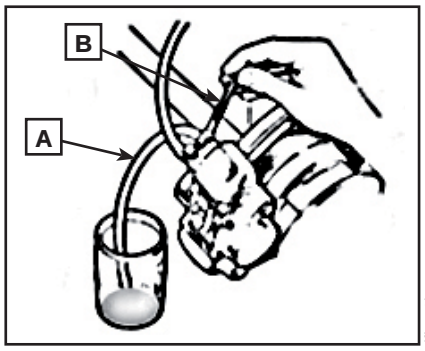
**(A) Coned part of the wheel nut**

**WARNING**

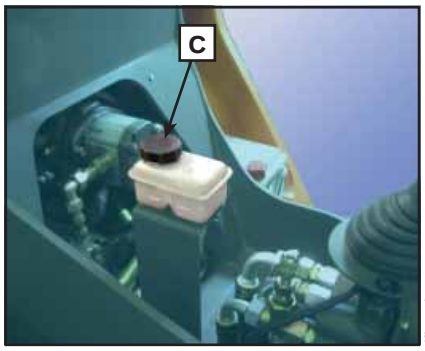
Tyre pressure largely affects the steering and stability of the forklift. Low tyre pressure can lead to deflation and spin out. High tyre pressure can lead to a blow out. Always apply the recommended pressure. As the tyre pressure is high, do not use a manual pump. Inflating the wheels could be dangerous if the operation is not carried out with caution. If possible, it is recommended that this operation be carried out by specialists in the field.



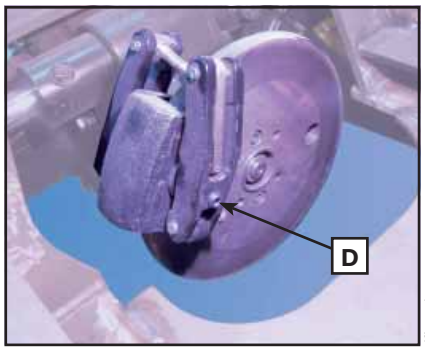
(fig. 1)



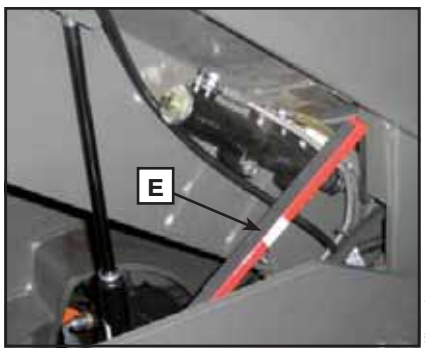

(fig. 2)




(fig. 3)




(fig. 4)




(fig. 5)

### 4.3.6 BRAKES

- Contact an authorized AUSA dealer for any anomaly on the brake system (adjustment and/or replacement of the brake disk).

The incorrect operation of the brake system may be due to the presence of air in the circuit.

**To bleed the service brake circuit:**

- Fill the brake tank **(C)** to maximum and check that the tank does not empty during the bleed operation (re-fill should the tank empty). Leave the tank cover open.
- Bleeding must take place via the clip placed on the front axle of the forklift for braking.
- Bleeding the brakes is a two-person job.
- While bleeding the brakes, the brake pedal will be activated rapidly when applying pressure, and slowly when releasing, to avoid damaging the o ring in the brake pump **(fig. 1)** which would cause substantial damage.

Procedure:

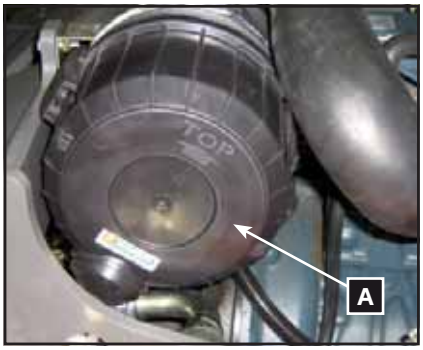
- Firstly, remove the rubber protection covering the brake clip bleed screw. Insert a transparent tube **(A)** in the bleed screw. Immerse the other end of the tube in a container filled with brake fluid **(fig. 2)**.
- Loosen the bleed screw using a spanner **(B)**. Then press the pedal (2nd person) to ensure rapid lowering and slow rising. Repeat this operation several times until the fluid flows down the transparent tube **(A)** without bubbles, then press the bleeder with the pedal to the floor.
- Repeat the operation as often as necessary, checking that the tank is always full to prevent any air entering piping. After the operation, fill the tank **(C)** until the indicated level (MAX.).
- If the brake fluid needs changing, empty the circuit starting with the tank **(C)**, aspiring the fluid using a syringe or similar. Fill the tank **(C)** with new fluid and open the purging screws to let the used fluid evacuate until new fluid starts to appear. Then close the purging screws with the pedal to the floor and bleed the brakes again, as explained previously.

**Adjustment of the parking brake:**
Handbrake may be tight by the end of the cable cover **(D)**.
Always maintain the cables free from excessive bends and the links greased.

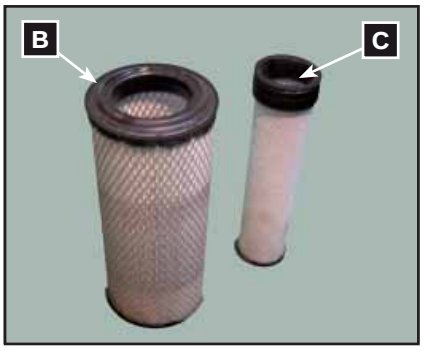
#### 4.3.6.1 Brake oil level

The level of oil in the brake circuit must be maintained at tank mark (MAX.) **(C)** which is on a support under the driver's cab. To lift the cab, pull on the handle behind the cab and, when lifting, attach the safety device **(E)**, located under the cab, to the right of the chassis, to avoid the accidental lowering of the cab.

### 4.3.7 ENGINE AIR FILTER



(fig. 1)



(fig. 2)

Clean the engine air filter on a daily basis and replace the cartridges if necessary.

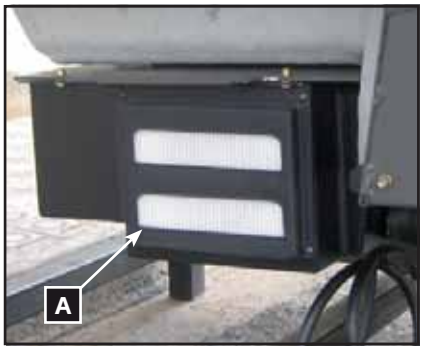
Clean or replace the external cartridge

- Stop the engine and set the parking brake.
- Open the cover **(A)**.
- Remove the external cartridge **(B)**, and then the internal cartridge **(C)**.
- Clean the inside of the filter housing **(B)** & **(C)**.
- Clean both cartridges using a compressed air jet (pressure must not exceed 6 bars) directed towards the outside of the cartridge.
- Check that there are no cracks on the filter by shining a light inside.
- Re-fit the cartridge **(C)** inside the cartridge **(B)**, apply a bit of grease on the cartridge seal **(B)**, checking that it is mounted correctly.
- Close the cover **(A)** by pressing the fastener clips.

| CAUTION |
| --- |
| The filter must be replaced immediately should the indicator in the driver's cab light up. |

### 4.3.8 CAB AIR FILTER

Clean the cab air filter every six months, and, should the filter fabric be damaged or broken, immediately replace the element.



(fig. 3)

**Clean or replace the filter:**

- Stop the engine and set the parking brake.
- Remove the filter **(A)** located to the left of the driver's seat, under the cab.
- Clean the inside of the filter housing
- Clean the filter without using compressed air jets.

| CAUTION |
| --- |
| Avoid blowing on the filters with compressed air. |

### 4.3.9 ENGINE COOLANT CIRCUIT

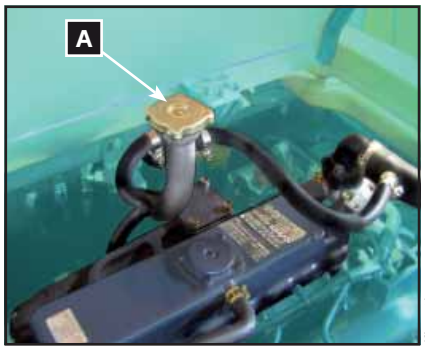
Consult the “LIQUIDS AND LUBRICANTS“ section of this Manual for the specifications of the coolant liquid to be used.

**WARNING**

Never remove the tank plug if the engine is hot. Wait until the engine is cold. Wait for approximately 20 minutes.

**Coolant level.**

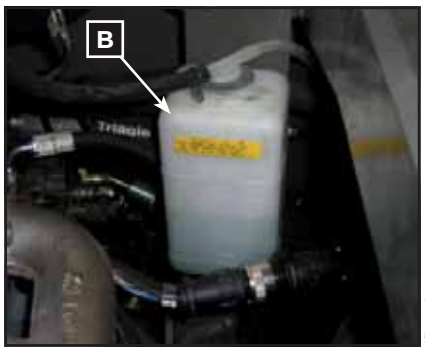
**(A).- Upper radiator plug**




(fig. 1)

Check via the tank.

**(B).- Tank**




(fig. 2)

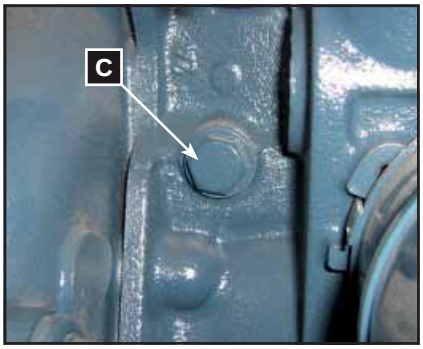
Lift the engine cover.
With the forklift on a level surface, the liquid must be between the MIN. and MAX. levels marked on the tank.

**CAUTION**

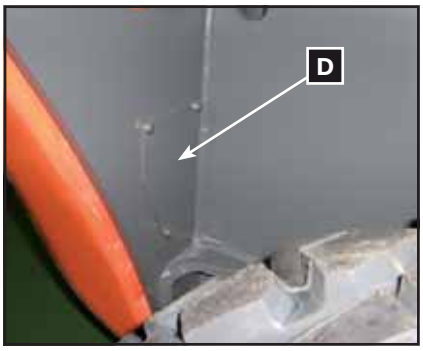
When checking the level at a temperature lower than 20°C (68°F), the level may be below the MIN mark.
Add coolant up to MAX. mark if required. Never exceed the maximum level.
Use a funnel to avoid spills.
Place and tighten the filling cap correctly and close the cover.

**CAUTION**

A cooling system which requires coolant frequently indicates that there are leaks or engine problems. See an authorized AUSA dealer.

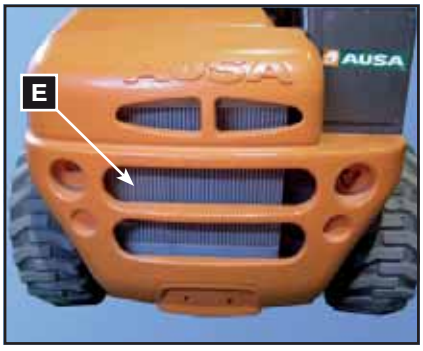


(fig. 1)



(fig. 2)


(fig. 3)



(fig. 4)

**Changing the coolant.**

**(C). - Cylinder block drainage plug.**
**(D).- Radiator drainage tap access cover.**

This change should be carried out every 2 years or when the circuit is emptied for repair. To do so the following operations are carried out:

- Loosen the cylinder block drainage plug, located on the left side of the engine, to drain it.
- Remove the cover (D) located in the rear right wheel housing. The drainage tap is behind the cover. Open the tap to drain the water from inside the radiator via this point.
- Before filling the circuit the engine drainage cap must be tightened and the tap must be closed again.
- Filling is carried out via the upper radiator cap and the tank.
- Start the engine and wait until the thermostat is open.
- Then with the engine cold, check the level in the tank.

Check the replacement schedule in the LUBRICATION AND MAINTENANCE CHART or replace when the circuit is emptied for repairs.

**Radiator**

**(E).- Radiator fins**

Periodically check the radiator area for its cleanliness.
Inspect the radiator fins. They must be clean, free of mud, dirt, leaves or any other deposit that would prevent the radiators cooling properly. Never clean the radiators when hot with your bare hands. Use gloves to remove external dirt. Allow the radiators to cool down before cleaning.
If water is available in the working area, rinse the radiator fins with a hose and low pressure water.

**WARNING**

Do not use high pressure water, only use low pressure water.

Be careful not to damage the radiators when cleaning the fins. Do not use any sharp object or tool that could damage the fins. The fins are purposely thin parts to allow efficient cooling.

See an authorized AUSA dealer to check the correct performance of the cooling system.

### 4.3.10 TANK OIL LEVEL

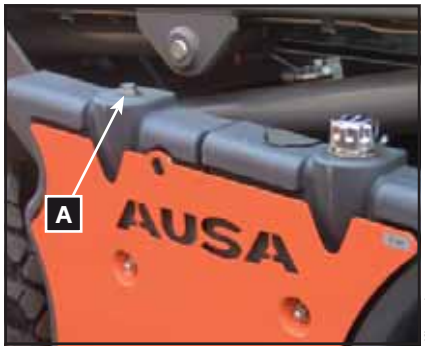
**DANGER**

Fine jets of pressurized hydraulic fluid can penetrate the skin. Never use your hands to check losses of any type. Use a bit of board or similar.

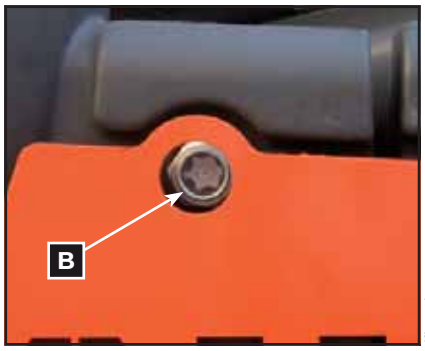
Check the level of hydraulic fluid on a daily basis via the optical level **(B)**. If necessary, add oil through the filling cap **(A)**.

**DANGER**

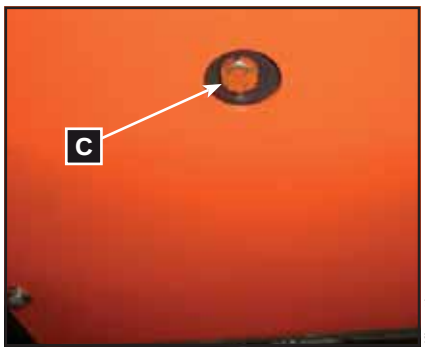
Check the level of oil with the forklift in road translation configuration (extending arm lowered and retracted).



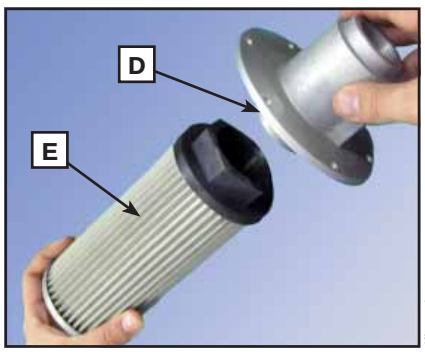
(fig. 1)



(fig. 2)



(fig. 3)



(fig. 4)

#### 4.3.10.1 Replacing hydraulic fluid

Proceed as follows to replace hydraulic fluid:

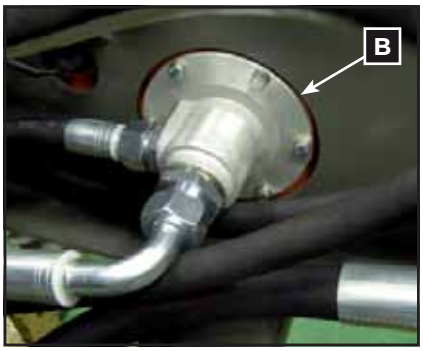
1. Stop the machine on flat ground and check that the parking brake is activated.
2. Place an appropriate container in the lower section of the tank to collect the fluid.
3. Loosen the oil outlet plug (C) and leave the fluid to collect in the container.
4. Remove the support from the suction hydraulic fluid filter (D), and loosen the screws.
5. Remove the tank filter (E), and unscrew from its support (D).
6. Wash the tank carefully with diesel and dry with a compressed air jet.
7. Then clean the hydraulic fluid filter (E) in the tank.
8. Re-screw the filter onto the support by hand.
9. Place this support in the tank, with its seal, and secure using the appropriate screws.
10. Tighten the hydraulic fluid outlet plug in the tank.
11. Add new fluid up to the mark, after having checked that the fluid type corresponds to the specifications of paragraph 4.5.2.2.

**IMPORTANT**

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

**ENVIRONMENTAL PROTECTION**

The handling and elimination of used oil is regulated by applicable standards. Dispatch all used oil to the appropriate recycling centres.



(fig. 1)

#### 4.3.10.2 Suction oil filter

Proceed as follows to replace the suction hydraulic fluid filter cartridge:

1. Stop the machine on flat ground and check that the parking brake is activated.
2. Dismantle the support (B), with the corresponding screws and unscrew the oil filter.
3. Check that the tank is clean before re-fitting the filter and support (B).
4. Add new oil.

### 4.3.11 REPLACEMENT OF THE HYDROSTATIC TRANSMISSION FILTER CARTRIDGE

#### 4.3.11.1 Hydrostatic transmission filter

(fig. 2)

The hydrostatic transmission circuit is equipped with a filter cartridge. The filter should be changed at the intervals indicated in the “LUBRICATION AND MAINTENANCE CHART”.

**A.- Cartridge filter**

To replace the cartridge filter:

1. Unscrew the cartridge filter and remove from the support.
2. Clean the base and cover the joint of the new filter element with clean oil.
3. Fill the new filter cartridge with clean hydraulic fluid.
4- Screw in the filter element once again and tighten by hand, do not use mechanical tools.

**WARNING**

Take particular care when tightening the filter cartridge in its support because if it is incorrectly tightened, it could cause the suction circuit to take in external air causing transmission failure.
Clean any oil spillage.
Start the engine and leave running idle for a few minutes.
Stop the engine.
Wait for a few seconds and then check the level of hydraulic fluid. Refill if necessary.
Dispose of the fluid and filter cartridge in authorized centres.

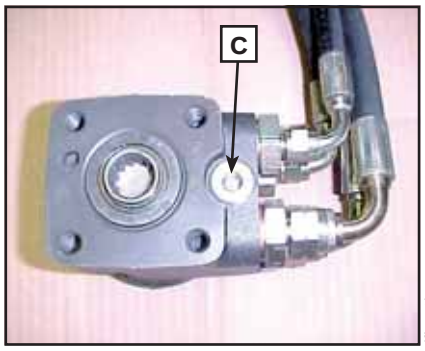
## IMPORTANT

Hydraulic fluid filter cartridges cannot be re-used after washing under any circumstances.
They must be replaced by new cartridges of the type recommended by the manufacturer (see paragraph 4.5.2.2).

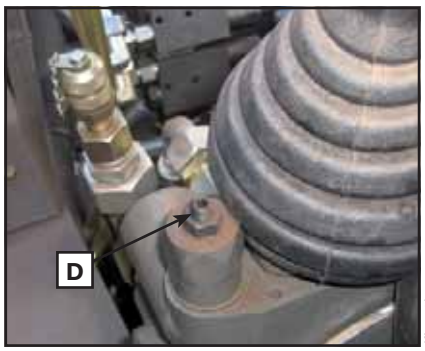
## IMPORTANT

Drain oil while hot and contamination is in suspension.

### 4.3.11.2 Regulation of the pressure regulation valves in the hydraulic circuit (fig. 1, 2)




(fig. 1)




(fig. 2)

There are two safety valves to avoid over-pressure in the steering circuit and the arm movement circuits.

**(C) Steering block safety valve.**
**(D) Arm movement system safety valve.**

The first is located on the hydraulic steering circuit and the second on the distributor. These valves are set at the correct working pressure in the factory, but the settings need to be checked periodically and adjusted if necessary. This work must only be done by trained mechanics with knowledge of hydraulics and with the appropriate tools. Pressure should never exceed the figures indicated in the “TECHNICAL DATA” section of this Manual.

- Hydraulic steering valve: Remove the cap by unscrewing it and turn the internal screw with a screwdriver in a clockwise direction to increase the hydraulic pressure and anti-clockwise to reduce it.

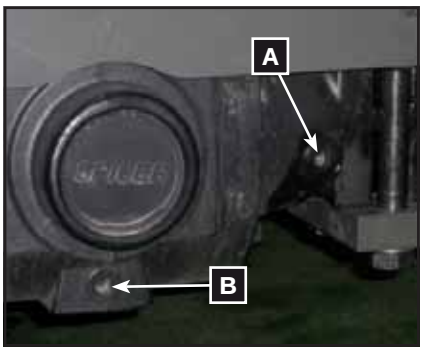
- Circuit pressure regulation valve: Remove the plastic cap, loosen the locknut and turn the screw in a clockwise direction to increase the hydraulic pressure and anti-clockwise to reduce it.

### 4.3.11.3 Hydraulic hoses

All hydraulic hoses must be changed at least every 6 years.

## 4.3.12 TRANSFER BOX AND DIFFERENTIAL OIL LEVEL

### 4.3.12.1 Front and rear differential



(fig. 1)

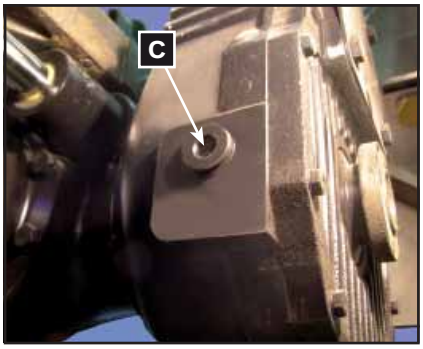
To check differential oil level:

- Stop the machine on flat ground and check that the parking brake is activated.
- Unscrew the level plug **(A)** and check that the oil is level with the filling hole.
- If necessary, add oil through the same filling hole until oil appears.
- Screw the cap again **(A)**.

To replace the oil:

- Place a container of the appropriate size under the drain plug **(B)**.
- Unscrew the drain plug **(B)** and the filling and level plug **(A)** and allow the differential oil to completely drain.
- Replace and tighten oil drainage plug **(B)**.
- Replenish the oil level using filling hole **(A)** until the level is reached.
- Replace and tighten the filling and level plug **(A)**.

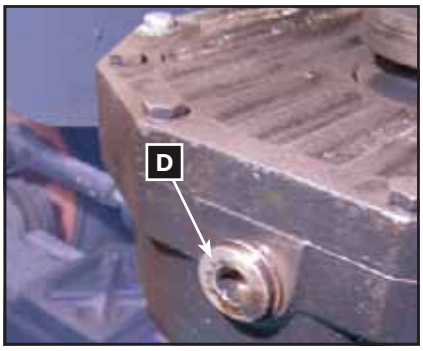
### 4.3.12.2 Transfer box



(fig. 2)

To check transfer box oil level:

- Stop the machine on flat ground and check that the parking brake is activated.
- Unscrew the filling and level plug **(C)** and check that the oil is level with the filling hole.
- If necessary, add oil through the same filling hole until oil appears.
- Screw the plug again **(C)**.

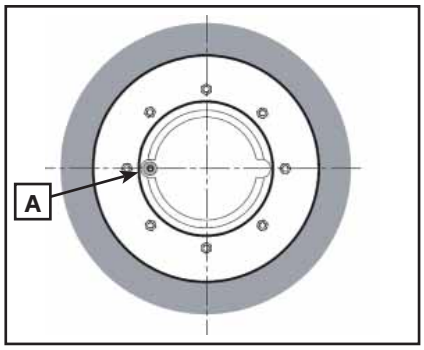


(fig. 3)

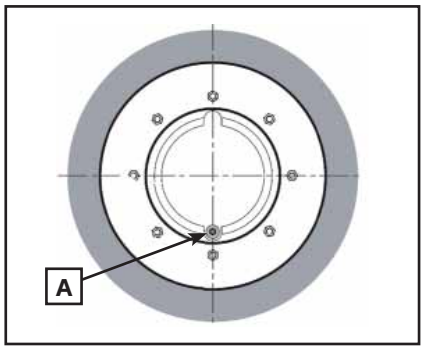
To replace the oil:

- Place a container of the appropriate size under the drain plug **(D)**.
- Unscrew the drain plug **(D)** and the filling and level plug **(C)** and allow the reduction gear oil to completely drain.
- Replace and tighten oil drainage plug **(D)**.
- Replenish the oil level using filling hole **(C)** until the level is reached.
- Replace and tighten the filling and level plug **(C)**.


(fig. 1)




(fig. 2)




(fig. 3)

### 4.3.13 REDUCTION GEAR OIL LEVEL (front and rear)

To fill and check the level of the reducer oil, use the plug (A) located on the wheel hub.
Turn until the horizontal “Oil level” signal appears, as indicated in (fig. 1).
Remove the level plug (A) and check that the oil is level with the filling hole.
To drain the oil, simply remove the plug (A) and position the hole in the lower part of the wheel hub, as shown in (fig. 2).

**WARNING**

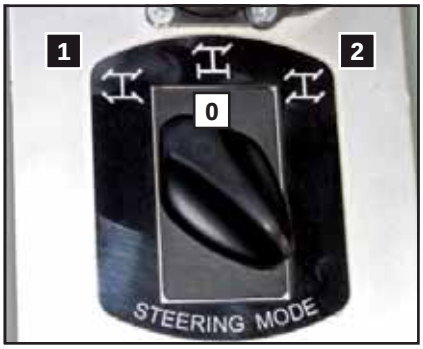
Never remove the plug from hot reduction gear directly from the lower section of the wheel hub, as the gases created may cause injury. Always position the plug in the upper section of the wheel hub and, after removal of the plug, rotate to the desired position.

**ENVIRONMENT PREOTECTION**

The handling and elimination of used oil is regulated by applicable standards. Dispatch all used oil to the appropriate recycling centres.

**IMPORTANT**

Drain oil while hot and contamination is in suspension.



(fig. 1)

### 4.3.14 RE-ADJUSTMENT OF THE LONGITUDINAL AXIS OF THE WHEELS

While using the machine, alignment between the front and rear axles may vary. This may occur due to oil loss in the turning control circuits, or should, for example, the operator select front-wheel steering when the front wheels are not exactly aligned with the rear wheels. To avoid this inconvenience, check alignment visually and apply the following process if possible:

1. Take the machine to flat even ground.
2. Set the turning selector to “four-wheel” steering (pos. 1).
3. Rotate steering to the end of travel (either to the left or right).
4. Set the turning selector to “front-wheel” steering (pos. 0).
5. Rotate steering to the end of travel in the same direction as the previous manoeuvre.
6. Set the turning selector to “four-wheel” steering again (pos. 1).
7. Rotate steering (in the opposite direction to action 3) until the rear axle reaches the end of travel.
8. Set the turning selector to “front-wheel” steering again (pos.
9. Rotate steering (in the same direction as action 7) until the front axle reaches the end of travel, just like the rear axle.
10. Set the turning selector to “four-wheel” steering again (pos. 1).

This will enable the full alignment of the wheels.

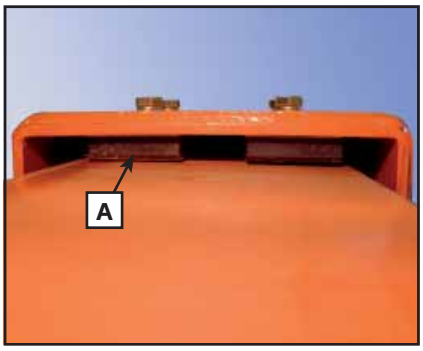
### 4.3.15 REGULATION OF CLEARANCE FOR THE ARM SECTION GUIDES

Each section is equipped with guides on the four sides of the profile. The guides are attached to both the fixed and moving components of each section.
All guides can be adjusted by introducing the adequate adjustment spacers supplied by AUSA.

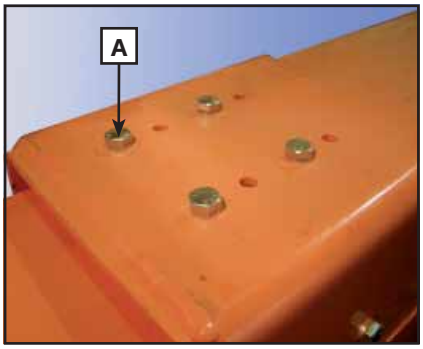
Adjusting the guides:

- Loosen the screws (B) attaching the guides (A).
- Introduce the necessary amount of adjustment spacers.
- If the thickness of the guide is not adequate, or, in all events, is near to the maximum thickness allowed, the guide must be replaced (A).
- Tighten the attachment screws (B) on the guides, checking that the corresponding washers are fitted, using a torque wrench and applying the torque indicated below.

  M10 screws ..... 30 Nm (22 lb/ft)



(fig. 2)



(fig. 3)


(fig. 1)

Applying torque higher than that indicated may break the guide or the nut.

**CAUTION**

Guides must be replaced when the thickness in the guide chamfer area has been worn through.

#### 4.3.16 CHECKING SAFETY DEVICES

(fig. 2)

**Checking the load regulation system (systematically before use)**

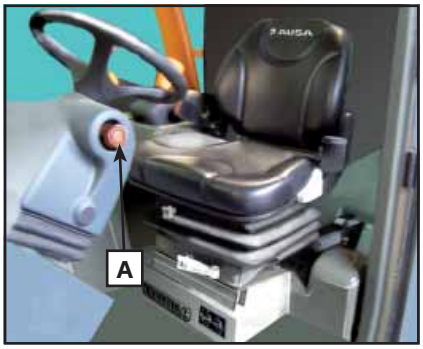
The green power indicator **(1)** will come on once the electric contact is made. When using the machine, the LEDS bar will gradually light up to indicate stability conditions.
For manual checks, simply load a weight which exceeds tolerance with the arm extended to maximum and attempt to lift the weight from the ground. If the machine is liable to roll-over, the alarm will trigger: the warning light **(2)** will come on and the audio alarm will sound constantly in these conditions and the hydraulics will be blocked. It is only possible to return loads within the safety limits.

**Starter switch control (systematically before use)**

Attempt to start the engine with forward or reverse operation selected.
The engine should not start. Should the engine start, contact your authorized AUSA dealer. Carry out the operation by selecting one direction and then the other.

**Checking the operator presence system for the seat (systematically before use)**

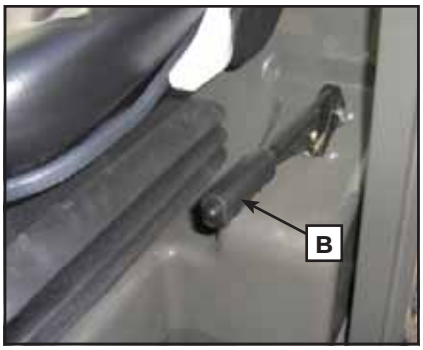
To check that the system is operational, simply attempt to move the arm without sitting in the seat. The arm should not move. Should the arm move, contact your authorized AUSA dealer.



(fig. 1)

### Checking the emergency stop button (systematically before use)

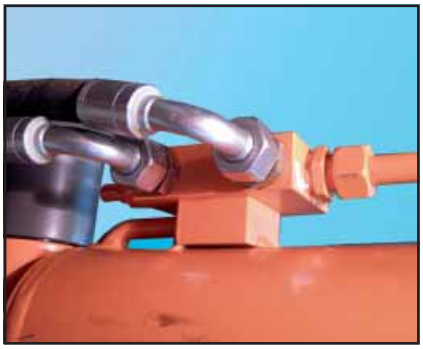
To check the effectiveness of the button, simply press while executing a movement. The movement and the engine should stop when the button is pressed **(A)**. Should this not be the case, contact your authorized AUSA dealer.



(fig. 2)

### Checking the parking brake switch (systematically before use)

To check that the switch is operational, simply attempt to start the engine without releasing the parking brake, by lowering the lever **(B)**. The machine should not start. Should the machine start, contact your authorized AUSA dealer.


(fig. 3)


(fig. 4)

### Checking check valves (at 1 or 2 monthly intervals)

Controlled check valves enable the position of the load to be maintained, including if a hydraulic connection or hose breaks.

To check the correct operation of a valve, proceed as indicated below:

- Load a weight equivalent to maximum load capacity on the extending arm (approx. 2000 Kg (4409.2 lbs)).
- Lift the load a few centimetres above the ground (max. 10 cm (3.94 in)). To check the check valve fitted on the extension cylinder of the extending arm, lift to maximum height and leave for a few centimetres.
- Loosen the oil tubes on the cylinder for which the check valve must be examined carefully.

During testing, the load must remain in its blocked position, even if oil is leaked from the circuit. If the load moves, replace the valve. Contact your authorized AUSA dealer for this purpose.

(fig. 1)

## DANGER

Before carrying out operations on hydraulic components or lines, check that there is no pressure in the system. To this end, after having cut the engine with the ignition on, move the joystick (in both directions) to discharge the pressure in the hydraulic circuit.

## DANGER

When handling the hydraulic system, the following is recommended:

- Wear protective goggles.
- Wear protective gloves.
- Wear safety boots.
- Wear clothing which is suitable for the job.
- Use a protective shield to protect from pressurized oil leaks.
- Carry out testing in an open and restricted area, to prevent unauthorized individuals nearing the radius of action of the machine.
- Place the component to be tested in safe conditions and ensure that the action taken does not induce uncontrolled movement by the machine.

**DANGER**

All maintenance interventions must be carried out with the engine stopped, the parking brake set, the tools or forks on the ground and the forward/reverse selector in the neutral position.

**DANGER**

Before carrying out any maintenance operation requiring the hoisting of a component, attach the hoisted component in a stable and secure manner, before carrying out the action.

# 4.4 Electric installation

### 4.4.1 BATTERY

- Check the level of electrolyte in the battery every 150 hours of operation; if necessary, top up with distilled water.
- Check that the fluid covers the elements by 5-6 mm (.2-.24 in) and that all cells have the necessary level.
- Check that all cables are firmly secured to the battery terminals. Always use a fixed clamp to tighten connectors rather than alligator clips.
- Protect the terminals by covering with pure Vaseline.
- If the machine is liable to not be used for a lengthy period, it is recommended to dismantle the battery and place in a dry location.

**DANGER**

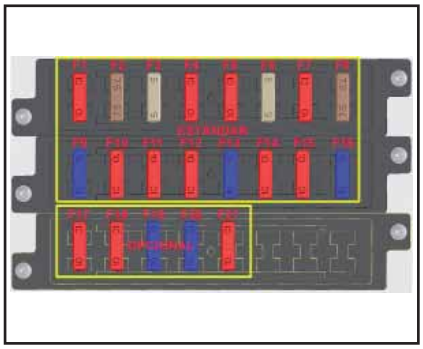
- The electrolyte in the battery contains sulphuric acid which may cause burns if it comes into contact with the skin or eyes. Wear protective goggles and gloves and move the battery carefully to avoid electrolyte leakage. Keep all metal objects (watches, rings, chains) at a distance from the battery, as they may cause a short circuit and burns.
- Before connecting or disconnecting the battery, turn off all of the switches in the cab.
- To disconnect the battery, remove the negative terminal (-) from the ground.
- Connect the positive terminal (+) first.
- Charge the battery at a distance from the machine in a well ventilated area.
- Never approach the battery with objects which may produce sparks, bare flames or with cigarettes.
- Avoid placing metal objects on the battery. This could cause dangerous short circuits, especially during recharging.
- Given that electrolyte is highly corrosive, avoid any contact with the forklift chassis or with electric or electronic components. Should contact occur, contact your authorized AUSA dealer.

**DANGER**

Danger of explosion or short circuit. An explosive mixture of hydrogen gas will form during the recharging of the battery.

**DANGER**

Never add sulphuric acid, only use distilled water.



(fig. 1)

(fig. 2)

### 4.4.2 FUSES - RELAYS

The electric installation is protected by fuses placed on the left hand side in the cab **(fig. 1)**. The relays are located under the plate under the turning selector, on the right hand side of the cab **(fig. 2)**. Before replacing a melted fuse with another fuse of the same rating, identify and eliminate the causes of the incident.

| FUSES - RELAYS | | |
|---|---|---|
| **Reference** | **Circuit** | **Amps** |
| F1 | Windscreen wiper / heater fuse | 10 |
| F2 | Lighting / dashboard indicators / lighter fuse | 7.5 |
| F3 | Load limiting selector fuse | 5 |
| F4 | Working lights switch fuse | 10 |
| F5 | Optional switch I5 fuse | 10 |
| F6 | Optional switch I4 fuse | 5 |
| F7 | Rotating beacon fuse | 10 |
| F8 | Seat switch fuse | 7.5 |
| F9 | Boom solenoids / reverse fuse | 15 |
| F10 | Horn / fast speed fuse | 10 |
| F11 | Joystick S5 / S6 / engine control fuse | 10 |
| F12 | Control valve locking solenoids fuse | 15 |
| F13 | Boom locking fuse | 15 |
| F14 | Road - Jobsite switch / boom locking fuse | 5 |
| F15 | Fuel pump / optional fuse | 10 |
| F16 | S21 / radio fuse | 15 |
| F17 | Heater fuse | 10 |
| F18 | Left / right sidelights fuse | 10 |
| F19 | Left / right low beam fuse | 15 |
| F20 | Switches (I10 - I13), stop lights, radio and courtesy light fuse | 15 |
| F21 | Hazard lights / radio memory | 10 |
| F22 | Options fuse | - |
| F23 | Options fuse | - |
| F24 | Options fuse | - |

| FUSES - RELAYS | | |
|---|---|---|
| **Reference** | **Circuit** | **Amps** |
| K1 | Main system supply relay (emergency stop button) | - |
| K6 | Transmission supply relay | - |
| K7 | Engine starting relay | - |
| K11 | Control valve spools locking relay | - |
| K12 | Side-shift solenoid relay | - |
| K13 | Reverse / reverse alarm relay | - |
| K14 | Handbrake relay | - |
| K15 | Boom extension relay | - |
| K100 | Seat switch timer relay | - |
| K101 | Indicators relay | - |
| FG1 | Ignition barrel maxi fuse | 40A |
| FG2 | Lighter maxi fuse | 50A |
| FG3 | Pre-heat plugs maxi fuse | 50A |

# CAUTION

- Do not use fuses with a higher rating than the indicated rating: they may cause damage to the electrical installation.
- If the fuse melts again within a short interval, identify the origin of the problem and inspect the electrical installation.
- Always have a few spare fuses ready for emergencies.
- Never attempt to repair or short circuit melted fuses.
- Check that fuse contacts and fuse holders ensure a satisfactory electrical connection and are not rusted.

### 4.3 12 V SUPPLY LAMPS

| 12V LAMPS | | | | | |
|---|---|---|---|---|---|
| **Use** | **Voltage** | **Type** | **Standard** | **Mount type** | **Power** |
| Low beam front lights | 12V | HB3 | ECE-R 37 | P 20 d | 60W |
| Front sidelights | 12V | R5W | ECE-R 37 | BA 15 s | 5W |
| Front indicators | 12V | R5W | ECE-R 37 | BA 15 s | 5W |
| Rear indicators | 12V | PY21W | ECE-R 37 | BAU 15 s | 21W |
| Side / stop tail lights | 12V | P21/5W | ECE-R 37 | BAY 15 d | 21/5W |
| Rotating beacon | 12V | H1 | ECE-R 37 | P 14,5 S | 55W |
| Dashboard warning lights | 12V | - | - | B 8,5 d | 1,5W |
| Dashboard indicators lights | 12V | W2,3W | ECE-R 37 | W 2 x 4,6 d | 1,2W |
| Interior lamp | 12V | C5W | ECE-R 37 | SV 8,5 | 5W |
| Plate number light | 12V | C5W | ECE-R 37 | SV 8,5 | 5W |
| Working light / reverse light | 12V | H3 | ECE-R 37 | PK 22 s | 35W |

**WARNING**

The lamps have a high operating temperature. Before touching a lamp with your fingers, check that it has cooled down enough.

**IMPORTANT**

Do not touch the halogen lamp bulb with your fingers (H3 type socket) as this could cause unfixable damage (use a clean cloth or paper tissue). If necessary, clean the bulb using a paper tissue imbibed with ethyl alcohol.

# 4.5 Liquids and lubricants

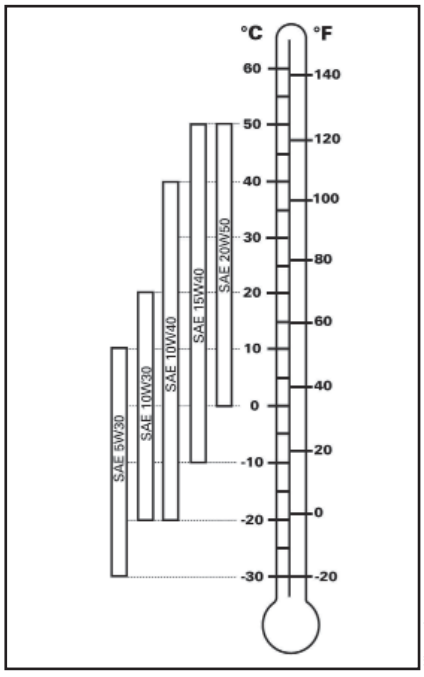
## 4.5.1 REFUELLING

| Component | Product | Capacity (liters/US gal) | Details of the product in the paragraph |
|---|---|---|---|
| Diesel engine | Engine oil | 9.5 /2.51 | 4.5.2.1 |
| Fuel tank | Diesel | 65/17.17 | 4.5.2.3 |
| Hydraulic system tank | Hydraulic fluid | 60/15.85 | 4.5.2.2 |
| Front differential | Transmission oil | 4/1.05 | 4.5.2.2 |
| Rear differential | Transmission oil | 3.5/.92 | 4.5.2.2 |
| Front wheel reduction gear | Transmission oil | 0.4/.10 | 4.5.2.2 |
| Rear wheel reduction gear | Transmission oil | 0.4/.10 | 4.5.2.2 |
| Inching and brake fluid tank | Hydraulic fluid | 1/.26 | 4.5.2.5 |
| Transfer box | Transmission oil | 1/.26 | 4.5.2.2 |
| Arm movement guides | Special grease | 0.2/.05 | 4.5.2.4 |

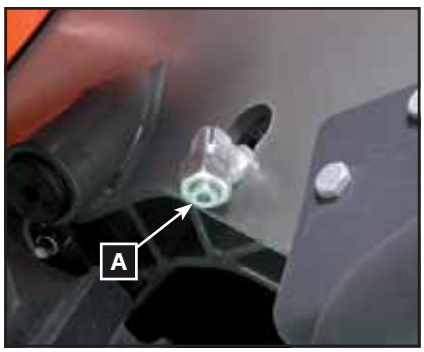
## 4.5.2 PRODUCT DETAILS

### 4.5.2.1 Engine oil

Use the oil defined by the manufacturer of the diesel engine (consult the instructions handbook with machine documentation).
Use oil for four stroke engines which meets requirements MIL-L-2104C / API CD or above. Always check the API quality on the oil container label to ensure that it is the required quality. Your forklift leaves the factory with SAE 20W40 oil viscosity. However, depending on the climate, consult the chart to select the most appropriate viscosity (Fig.1). If oils of different brand names are used, ensure that you completely empty the crankcase through drain plug **(A)** before adding the new oil.




(fig. 1)




(fig. 2)

#### 4.5.2.2 Lubricants, oils and filter cartridges

The machine is refuelled with the following lubricant oils:

| Component | Specifications |
|---|---|
| Transfer box<br>Differentials<br>Wheel hubs | Oil for transmissions SAE 80W90 or SAE 90 following API GL5 / MIL L-2105B |
| Hydraulic system | Hydraulic oil ISO Grade VG-46 following ISO 67'43/4-HV DIN-51524 Part 3HVLP (standard) |
| | VG32 for environmental temperatures normally below 10°C (50° F) |
| | VG46 for environmental temperatures between 10°C and 40°C (50°F and 104° F) |
| | VG68 for environmental temperatures normally above 40°C (104° F) |

**CAUTION**

Avoid mixing oils of different types and characteristics: risk of anomalies and components breaking.

**Filter cartridges:**

| Filter | Flow l/1' | Filtering | P/# |
|---|---|---|---|
| Transmission oil filter | 90 | 10 $\mu$ | 70.10051.00 |
| Oil strainer filter (inside the tank) | 130 | 125 $\mu$ | 58.01810.00 |

#### 4.5.2.3 Fuel

Use automotive clean diesel (class A), which preferably meets 98/70/CEE standard amended by standard 2003/17 or the equivalent EN 590 standard. In Spain RD 1728/1999 applies. For the USA market, it must meet Grades 1D and 2D of the ASTM D975 standard, in supplies which do not meet these standards, the sulphur content should never exceed 0.5 in terms of mass. In principal, the use of REM type bio diesel or similar is not recommended. In case of use, the proportion used should not exceed 5% of the fuel mix.
Consult the details included in the instructions for the diesel engine.

#### 4.5.2.4 Greases

When greasing the machine, use:

| | |
|---|---|
| Lithium - based grease type EP2 | When greasing with pump (nipples) |
| MOLIKOTE molybdenum sulphide grease | Ball joints on hub articulation on front and rear axle |
| Grease for AUSA extending arm or EUROLUBE Z 4 AZ R4 following ISO 6743-9-L-X-BGEB 1. | On extending arm sliding pads |

**CAUTION**

Avoid mixing greases of different types and characteristics, and do not use greases with lower characteristics.

#### 4.5.2.5 Brakes & Inching

| Component | Specifications |
|---|---|
| Brakes & inching | Hydraulic oil SAE 10W or ATF fluid following CAT TO-4 / TO-2 o ALLISON C-4 / C-3 |

**WARNING**

To avoid serious damage to the brake system, do not use fluids other than the recommended one, or mix different fluids for topping up.

# Diagrams and charts

**Section 5**

**INDEX**

# Section 5.1
# Screw torques

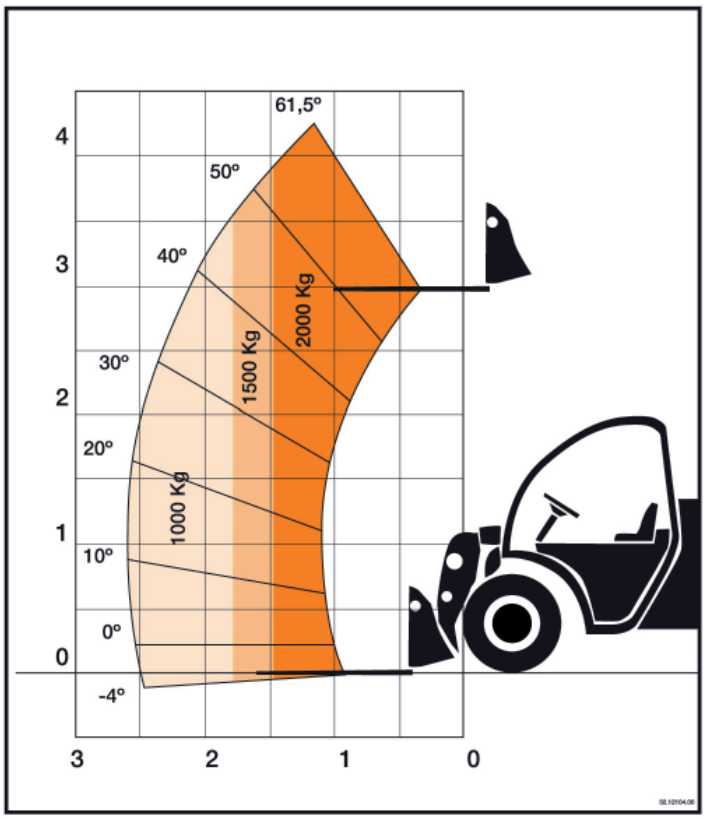
Specify torques for screws junctions using new screws with a friction coefficient of $\mu_{ges} = 0.12$.
Screw junctions with normal metric thread screws and fin metric thread screws (DIN 13), without grease, for which no actual specification exists.
NORMAL PITCH SCREWS (as per DIN 13)

| Metric standard thread | Bolt quality | | | | | |
|---|---|---|---|---|---|---|
| | 8,8 | | 10,9 | | 12,9 | |
| | Nm | kpm | Nm | kpm | Nm | kpm |
| M4 | 2,8 | 0,3 | 4,1 | 0,4 | 4,8 | 0,5 |
| M5 | 5,5 | 0,6 | 8.1 | 0,8 | 9,5 | 1 |
| M6 | 9,5 | 1,0 | 14 | 1,4 | 16,5 | 1,7 |
| M7 | 15,5 | 1,6 | 23 | 2,3 | 27 | 2,8 |
| M8 | 23 | 2,3 | 34 | 3,5 | 40 | 4,1 |
| M10 | 46 | 4,7 | 68 | 6,9 | 79 | 8 |
| M12 | 79 | 8 | 117 | 12 | 135 | 14 |
| M14 | 125 | 13 | 185 | 19 | 215 | 22 |
| M16 | 195 | 20 | 280 | 29 | 330 | 34 |
| M18 | 280 | 29 | 390 | 40 | 460 | 47 |
| M20 | 390 | 40 | 560 | 57 | 650 | 66 |
| M22 | 530 | 54 | 750 | 76 | 880 | 90 |
| M24 | 670 | 68 | 960 | 98 | 1120 | 114 |
| M27 | 1000 | 102 | 1400 | 143 | 1650 | 168 |
| M30 | 1350 | 138 | 1900 | 194 | 2250 | 229 |

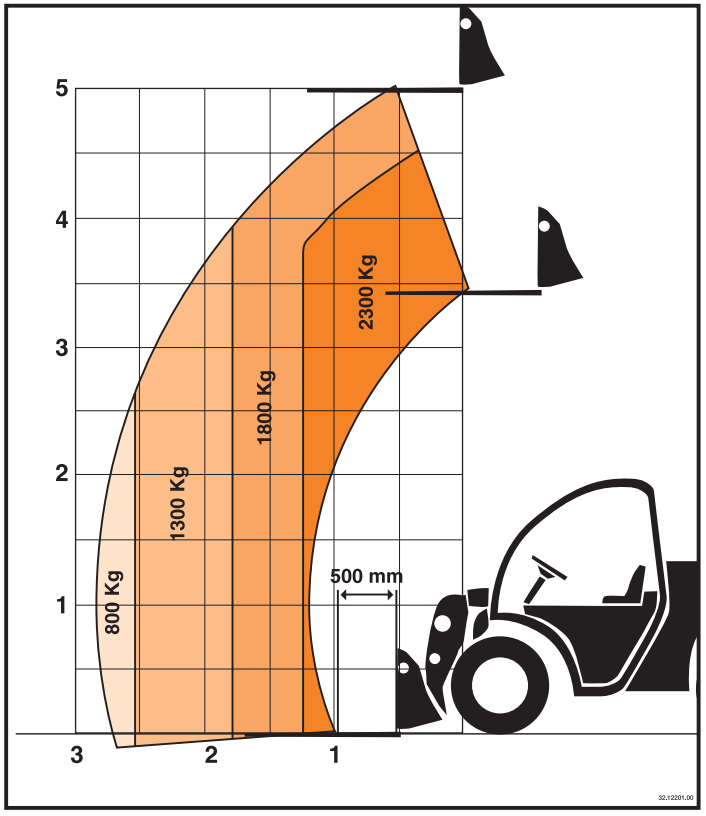
| Metric fine thread | Bolt quality | | | | | |
|---|---|---|---|---|---|---|
| | 8,8 | | 10,9 | | 12,9 | |
| | Nm | kpm | Nm | kpm | Nm | kpm |
| M 8 x 1 | 24,5 | 2,5 | 36 | 3,7 | 43 | 4,4 |
| M 9 x 1 | 36 | 3,7 | 53 | 5,4 | 62 | 6,3 |
| M 10 x 1 | 52 | 5,3 | 76 | 7,7 | 89 | 9 |
| M 10 x 1,25 | 49 | 5 | 72 | 7,3 | 84 | 8,6 |
| M 12 x 1,25 | 87 | 8,9 | 125 | 12,7 | 150 | 15,3 |
| M 12 x 1,5 | 83 | 8,5 | 122 | 12,4 | 145 | 14,8 |
| M 14 x 1,5 | 135 | 13,8 | 200 | 20 | 235 | 24 |
| M 16 x 1,5 | 205 | 21 | 300 | 31 | 360 | 37 |
| M 18 x 1,5 | 310 | 32 | 440 | 45 | 520 | 53 |
| M 18 x 2 | 290 | 30 | 420 | 43 | 490 | 50 |
| M 20 x 1,5 | 430 | 44 | 620 | 63 | 720 | 73 |
| M 22 x 1,5 | 580 | 59 | 820 | 84 | 960 | 98 |
| M 24 x 1,5 | 760 | 77 | 1090 | 111 | 1270 | 129 |
| M 24 x 2 | 730 | 74 | 1040 | 106 | 1220 | 124 |
| M 27 x 1,5 | 1110 | 113 | 1580 | 161 | 1850 | 189 |
| M 27 x 2 | 1070 | 109 | 1500 | 153 | 1800 | 183 |
| M 30 x 1,5 | 1540 | 157 | 2190 | 223 | 2560 | 261 |
| M 30 x 2 | 1490 | 152 | 2120 | 216 | 2480 | 253 |

## 5.2 FORK LOAD CHART

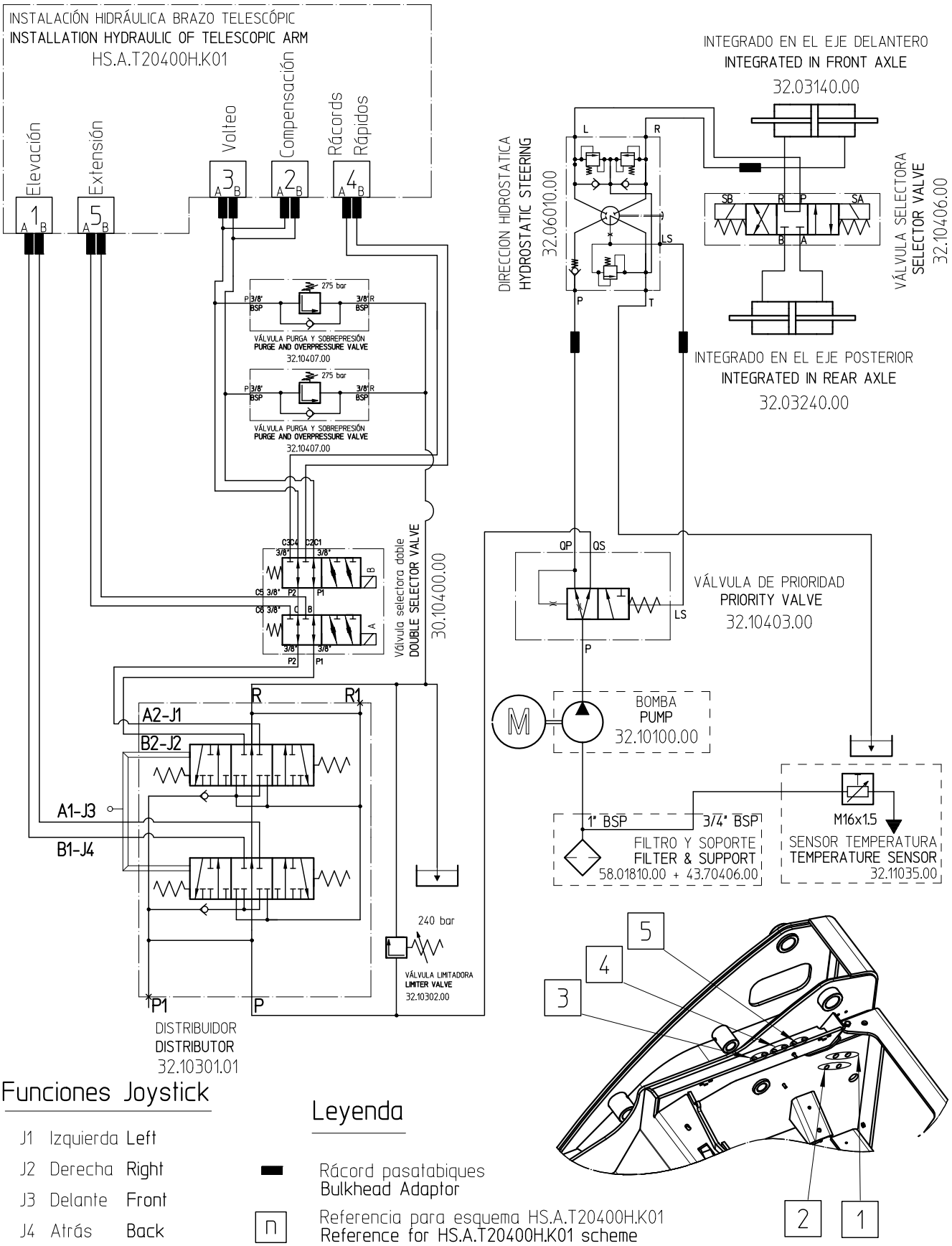
### T204H




### T235H



# 5.3 FORKLIFT ACTUATION HYDRAULIC DIAGRAM




## Funciones Joystick

J1 Izquierda Left

J2 Derecha Right

J3 Delante Front

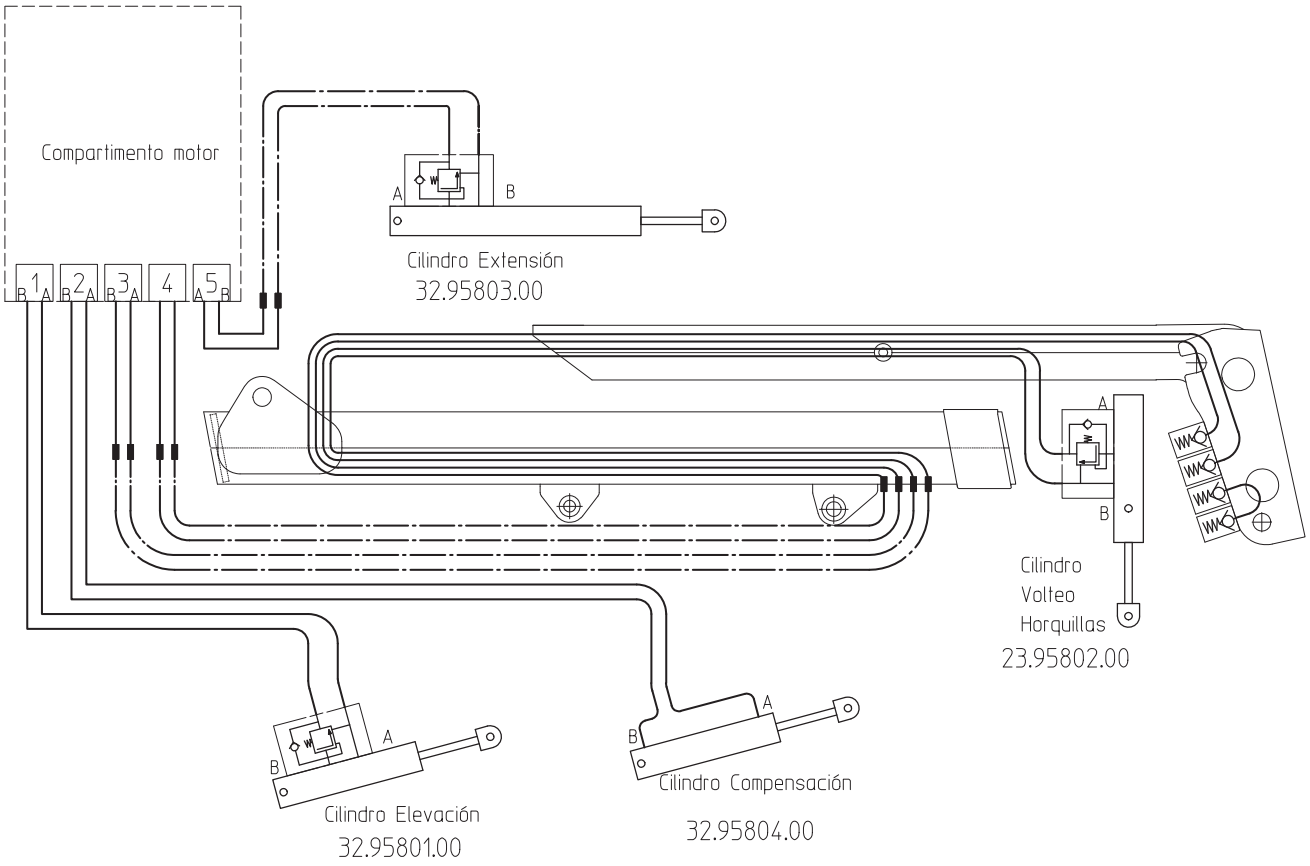
J4 Atrás Back

## Leyenda

Rácord pasatabiques
Bulkhead Adaptor

n Referencia para esquema HS.A.T20400H.K01
Reference for HS.A.T20400H.K01 scheme

# 5.4 EXTENDING ARM HYDRAULIC DIAGRAM




## Leyenda

Tubería flexible
Flexible pipe

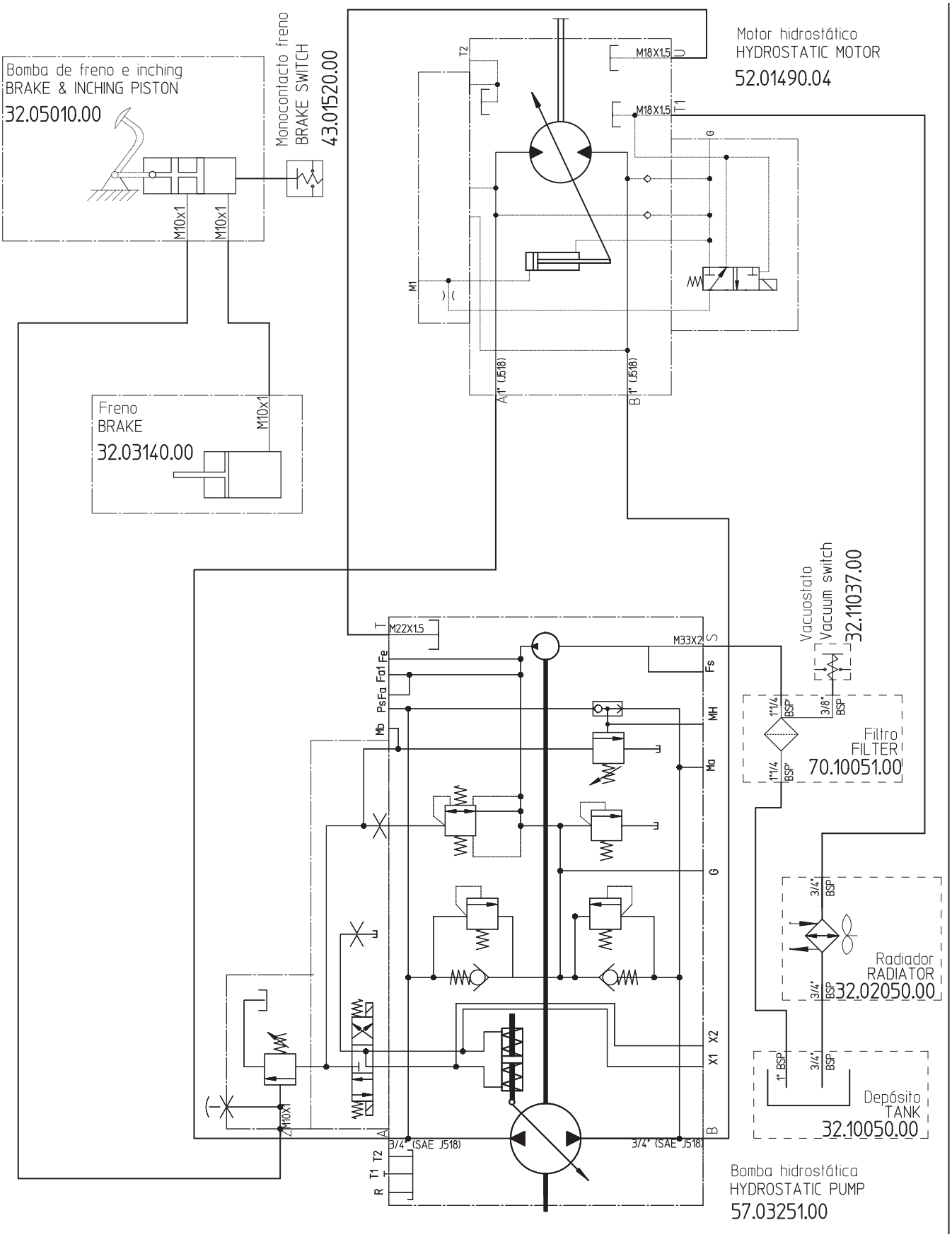
Tubería rígida
Rigid pipe

Rácord para cambio de tubería rígida a flexible
Racord for rigid to flexible pipe change

Rácord de conexión rápida
Quick touch racord

Válvula de frenado simple 32.10401.00
Simple overcenter valve 32.10401.00

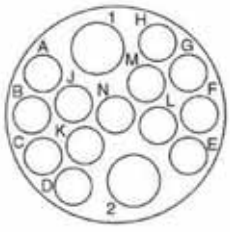
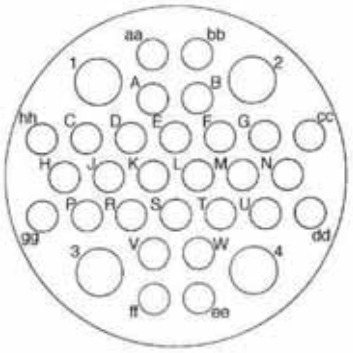
# 5.5 TRANSMISSION HYDRAULIC DIAGRAM



# 5.6 WIRING DIAGRAM

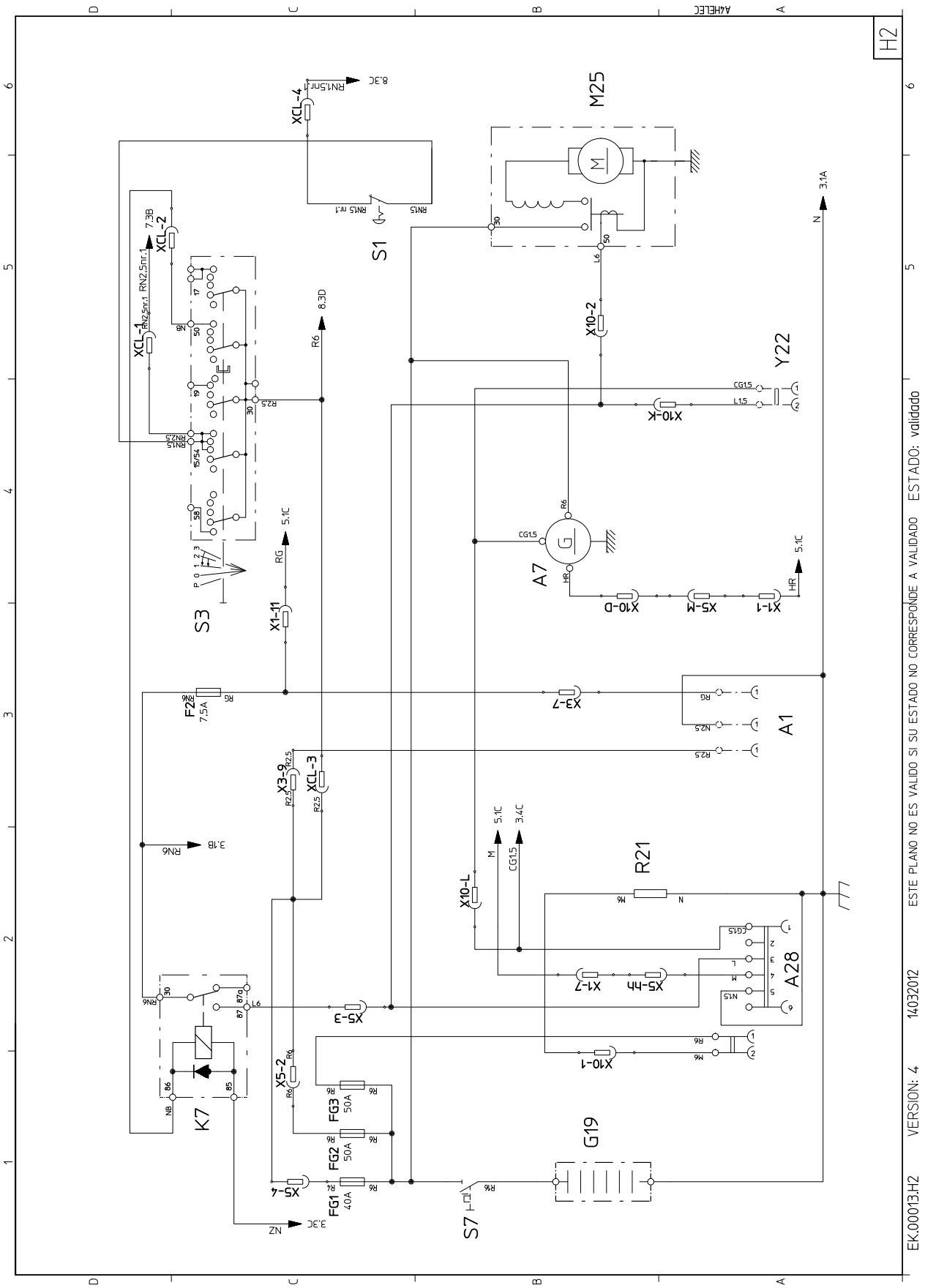
| WIRES COLOURS | |
|---|---|
| **A** | Light Blue |
| **B** | White |
| **C** | Orange |
| **G** | Yellow |
| **H** | Grey |
| **L** | Blue |
| **M** | Brown |
| **N** | Black |
| **R** | Red |
| **S** | Pink |
| **V** | Green |
| **Z** | Violet |

**Description: 1,5mm. section red wire leading to PG. 2 column 6C**

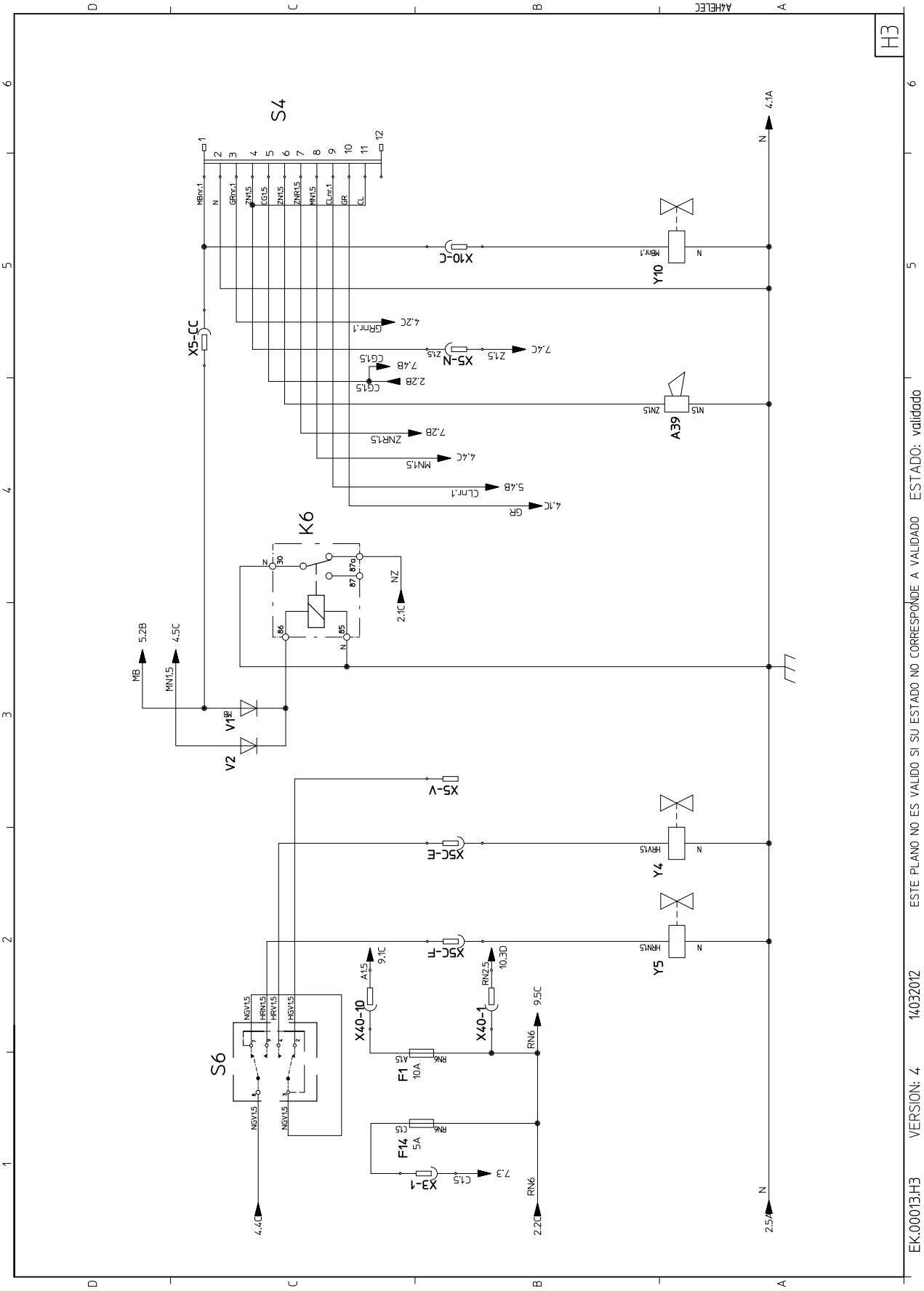
| | | |
|---|---|---|
| R1.5 ► 2.5A | Red cable 1,5mm leading to PG. 2 column 5A. |  **2-13 Shell Size 16 13 Signal 2 Power**  **4-28 Shell Size 24 28 Signal 4 Power** |
| 1.6C ► R1.5 | Red cable 1,5mm coming from PG. 1 column 6C. | |
|  | Connector identification and pin number | |

# 5.6 WIRING DIAGRAM

2

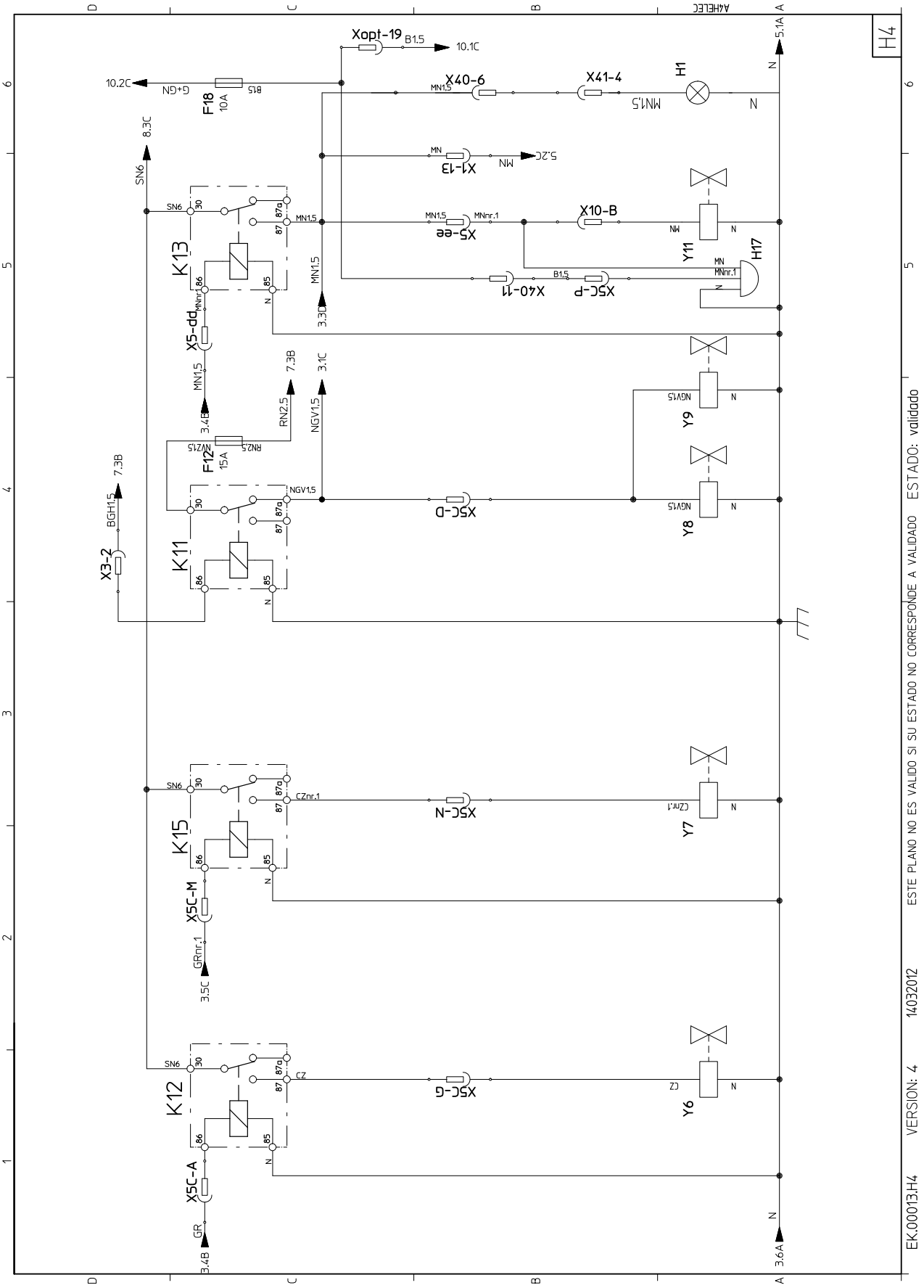


# 5.6 WIRING DIAGRAM 3



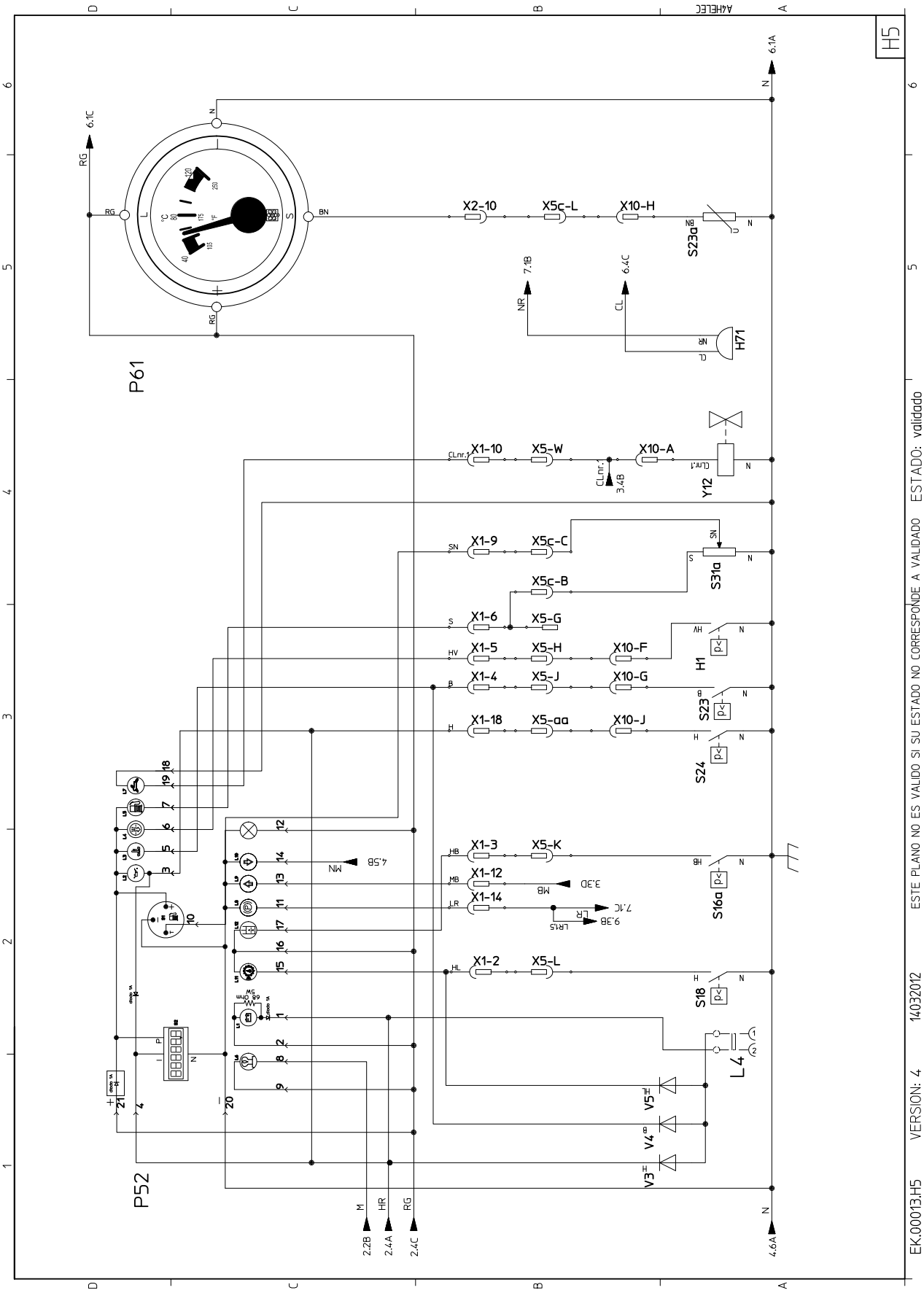
# 5.6 WIRING DIAGRAM

4



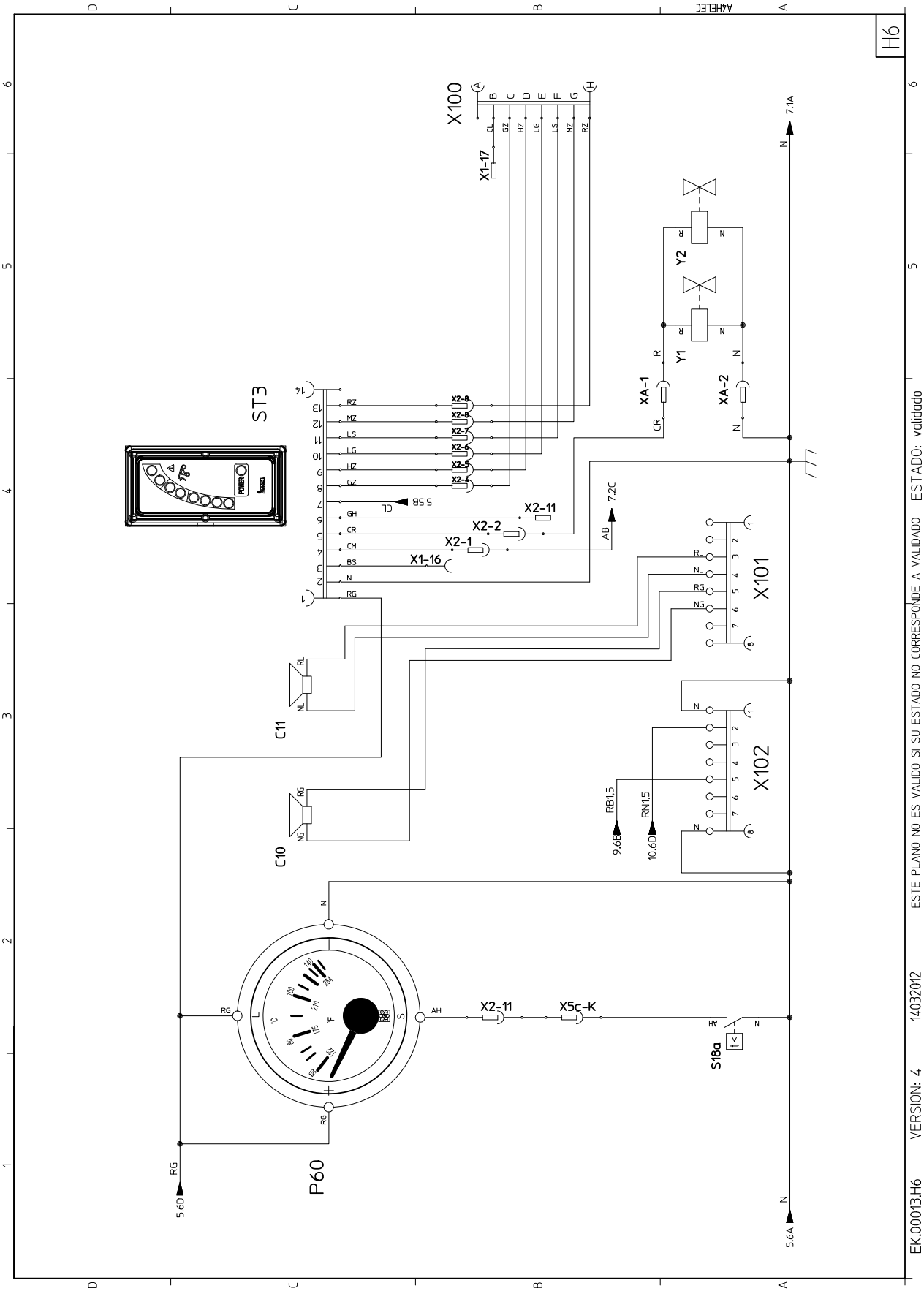
# 5.6 WIRING DIAGRAM

5

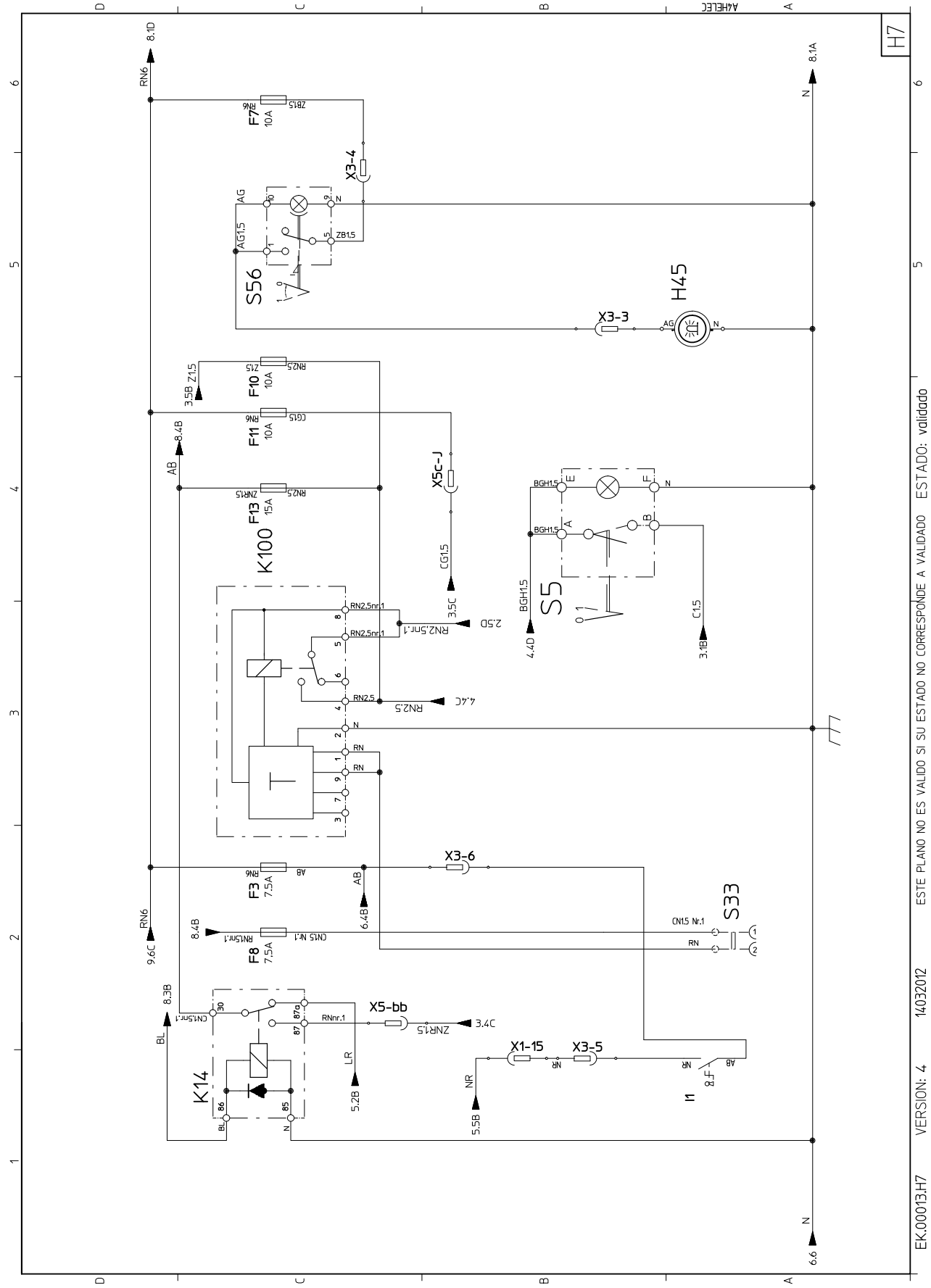


# 5.6 WIRING DIAGRAM

6

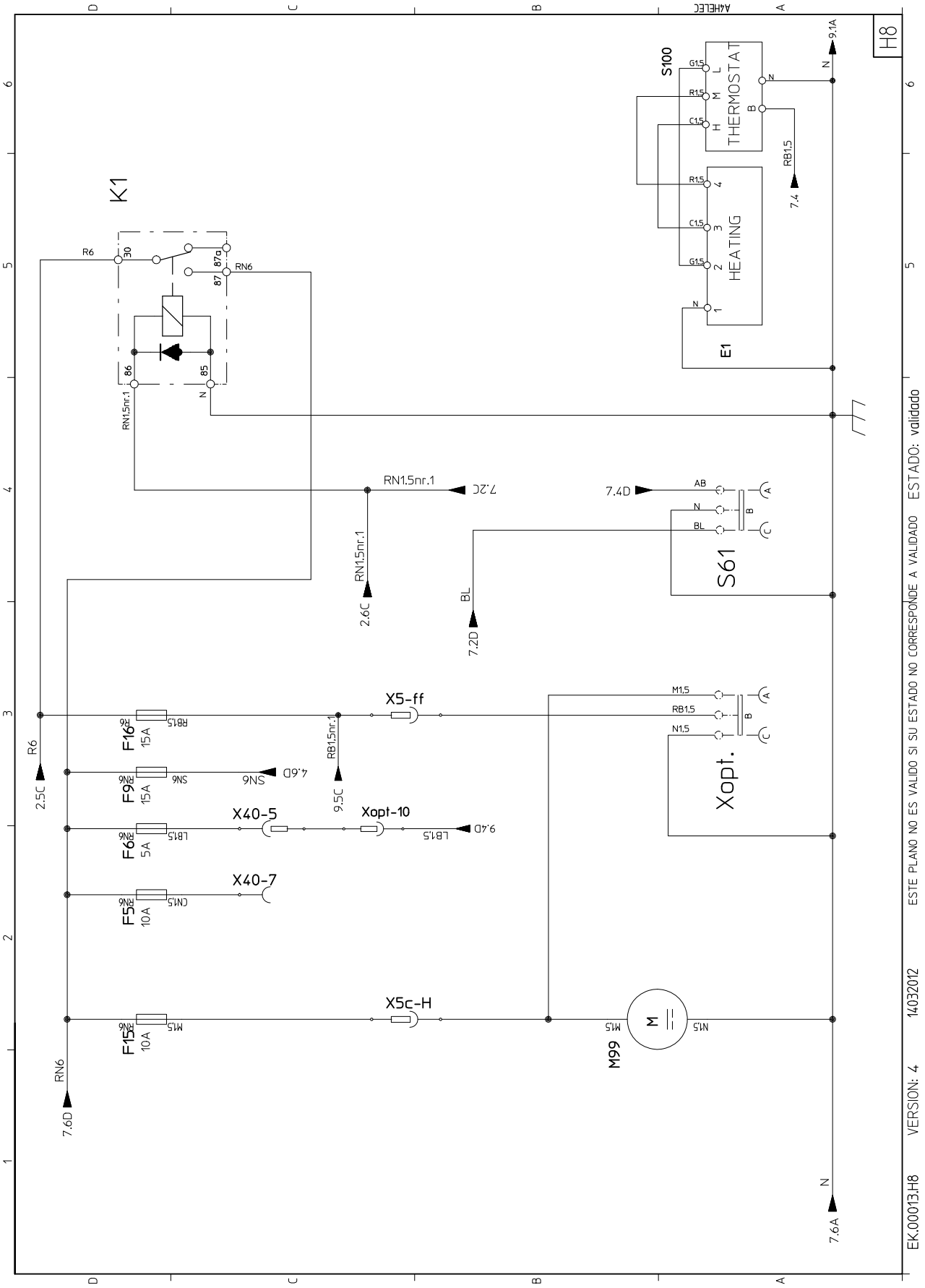


# 5.6 WIRING DIAGRAM 7



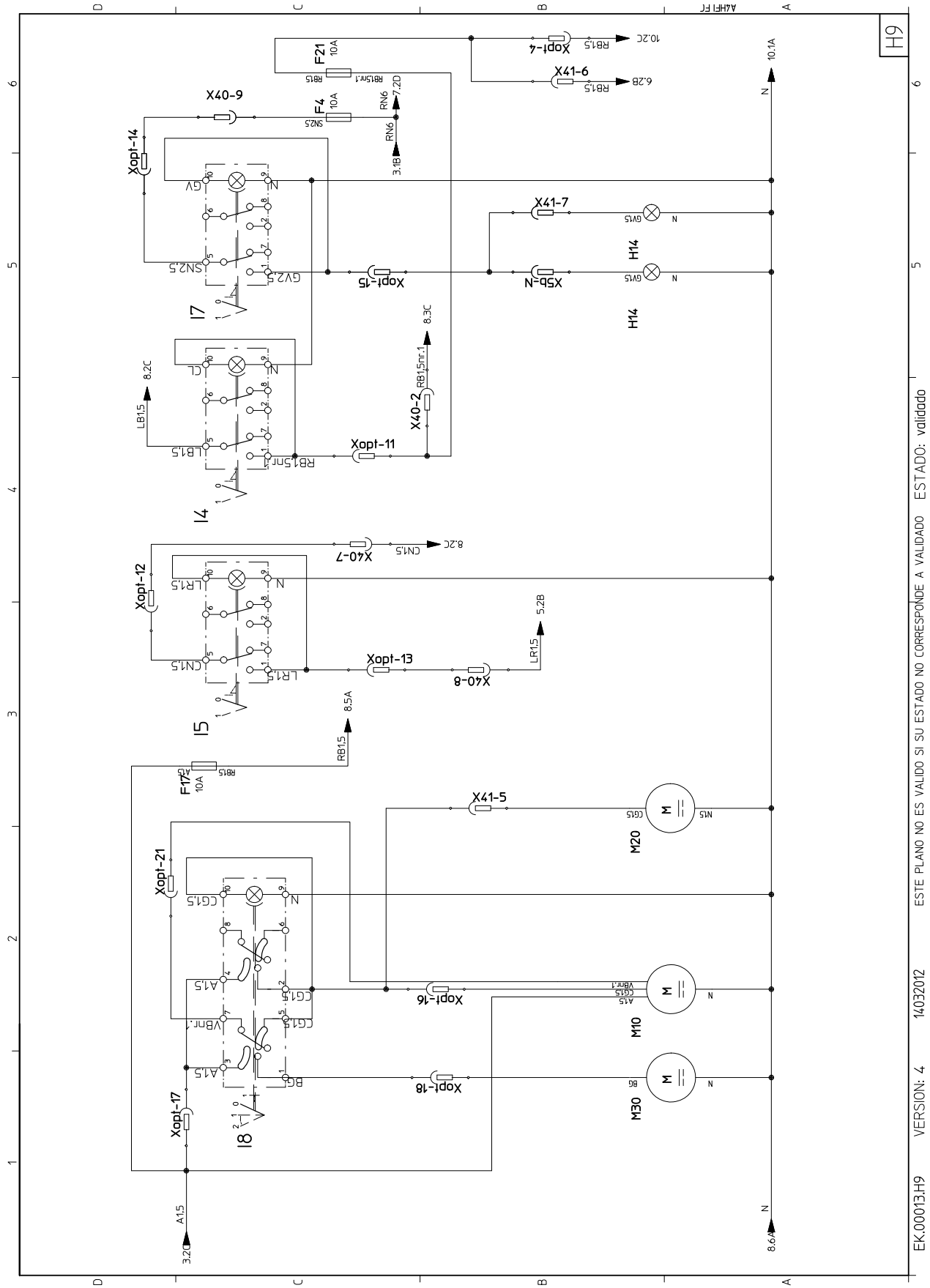
# 5.6 WIRING DIAGRAM

8



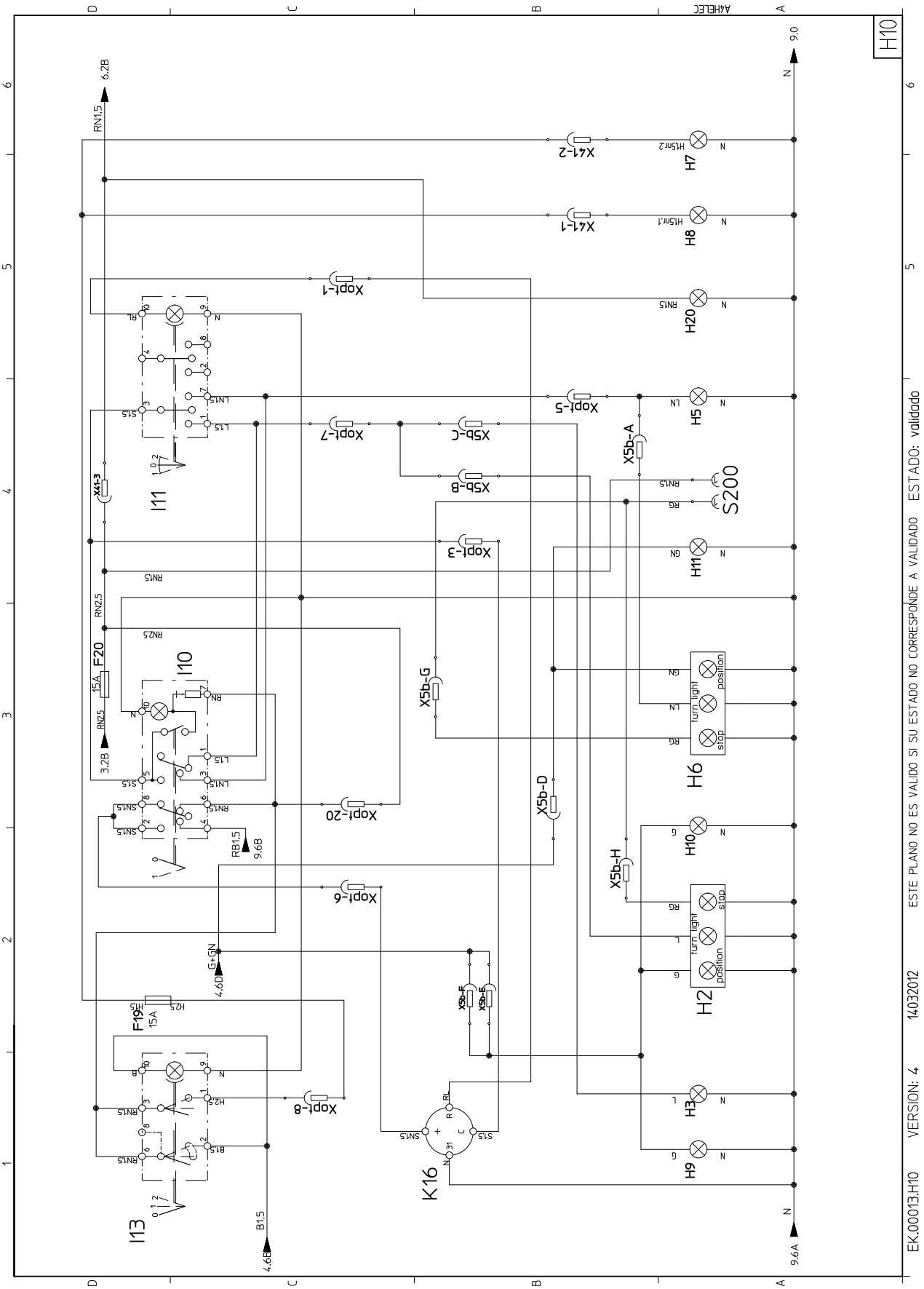
# 5.6 WIRING DIAGRAM

9



# 5.6 WIRING DIAGRAM

10



# 5.6 WIRING DIAGRAM

| Item | Label in harness | Description | Sh. |
|---|---|---|---|
| A39 | A1 | Horn | 3 |
| H17 | A2 | Reverse alarm | 4 |
| A1 | ACC. | Lighter | 2 |
| A7 | ALT. | Alternator | 2 |
| M25 | AVV. | Starter motor | 2 |
| G19 | B | Battery | 2 |
| H4 | B1 | Battery charge warning light | 5 |
| H71 | B2 | Dash panel buzzer | 5 |
| R21 | CAND. | Pre-heater Plugs | 2 |
| V1 | D1 | 3A Diode | 3 |
| V2 | D2 | 3A Diode | 3 |
| V3 | D3 | Diode | 5 |
| V4 | D4 | Diode | 5 |
| V5 | D5 | Diode | 5 |
| Y4 | EV.4 | Crab steering solenoid | 3 |
| Y5 | EV.5 | Four wheel steering solenoid | 3 |
| Y6 | EV.6 | Side-shift solenoid | 4 |
| Y7 | EV.7 | Boom extension solenoid | 4 |
| Y8 | EV.8 | Control valve locking solenoid | 4 |
| Y9 | EV.9 | Control valve locking solenoid | 4 |
| Y10 | EV.10 | Forward solenoid | 3 |
| Y11 | EV.11 | Reverse solenoid | 4 |
| Y12 | EV.12 | Fast speed solenoid | 5 |
| F1 | F1 | Windscreen wiper / heater fuse (10A) | 3 |
| F2 | F2 | Lighting / dashboard indicators / lighter fuse (7,5A) | 2 |
| F3 | F3 | Load limiting selector fuse (5A) | 7 |
| F4 | F4 | Working lights switch fuse (10A) | 8 |
| F5 | F5 | Optional switch I5 fuse (10A) | 8 |
| F6 | F6 | Optional switch I4 fuse (5A) | 8 |
| F7 | F7 | Rotating beacon fuse (10A) | 7 |
| F8 | F8 | Seat switch fuse (7,5A) | 7 |
| F9 | F9 | Boom solenoids / reverse fuse (15A) | 8 |
| F10 | F10 | Horn / fast speed fuse (10A) | 7 |
| F11 | F11 | Joystick S5 / S6 / engine control fuse (10A) | 7 |
| F12 | F12 | Control valve locking solenoids fuse (15A) | 4 |
| F13 | F13 | Boom locking fuse (15A) | 7 |
| F14 | F14 | Road - Jobsite switch / boom locking fuse (10A) | 3 |
| F15 | F15 | Fuel pump / optional fuse (10A) | 8 |

# 5.6 WIRING DIAGRAM

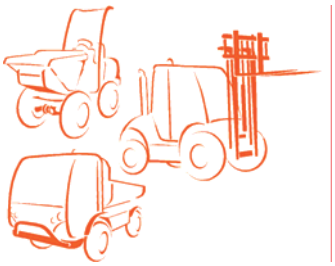
| Item | Label in harness | Description | Sh. |
|---|---|---|---|
| F16 | F16 | S21 / radio fuse (15A) | 8 |
| B23 | F. Aria | Air filter clogged indicator switch | 5 |
| S1 | FE | Emergency stop button | 2 |
| FG1 | FG1 | Ingition barrel maxifuse (40A) | 2 |
| FG2 | FG2 | Lighter maxifuse (50A) | 2 |
| FG3 | FG3 | Pre-heat plugs maxifuse (50A) | 2 |
| S2 | I1 | Load limiter disabling key | 7 |
| S4 | JOYS | Joystick | 3 |
| S3 | KEY | Ignition barrel | 2 |
| H45 | LROT | Rotating beacon | 7 |
| S33 | M1 | Seat switch | 7 |
| S61 | M3 | Handbrake proximity switch | 8 |
| Xopt | OPT. | Optional connector | 8 |
| S24 | P.OLIO | Engine oil pressure switch | 5 |
| A28 | PRERIS. | Pre-heater Plugs control unit | 2 |
| X100 | PRG | Load limiter setting connector | 6 |
| K1 | R1 | Main system supply relay (emergency stop button) | 8 |
| K6 | R6 | Transmission supply relay | 3 |
| K7 | R7 | Engine starting relay | 2 |
| K11 | R11 | Control valve spools locking relay | 4 |
| K12 | R12 | Side-shift solenoid relay | 4 |
| K13 | R13 | Reverse / reverse alarm relay | 4 |
| K14 | R14 | Handbrake relay | 7 |
| K15 | R15 | Boom extension relay | 4 |
| S5 | S.B | Road - Jobsite switch relay | 7 |
| S6 | S.S. | Crab steering relay | 3 |
| S7 | SB | Battery main switch | 2 |
| P60 | ST1 | Hydraulic oil temperature gauge | 6 |
| P61 | ST2 | Engine coolant temperature gauge | 5 |
| P70 | ST3 | Load limiting display | 6 |
| P52 | ST4 | Multifunction instrument | 5 |
| M99 | T1 | Fuel pump | 8 |
| K100 | T1 | Seat switch timer relay | 7 |
| S16a | T2 | Oil filter clogged indicator | 5 |
| S23 | T3 | Coolant temperature switch | 5 |
| S23a | T.H20 | Coolant temperature sensor | 5 |
| S18a | T.OLIO | Hydraulic oil temperature sensor | 6 |
| S31a | X7 | Fuel level sensor | 5 |

# 5.6 WIRING DIAGRAM

| Item | Label in harness | Description | Sh. |
|---|---|---|---|
| S18 | X8 | Hydraulic oil low level switch | 5 |
| Y22 | X11 | Engine stop solenoid | 4 |
| X101 | C5 | Speakers connector | 6 |
| X102 | C6 | Radio supply connector | 6 |
| B2 | C10 | Speaker 2 | 10 |
| B2 | C11 | Speaker 1 | 10 |
| F17 | F17 | Heater fuse (10A) | 9 |
| F18 | F18 | Right / Left side lights fuse (10A) | 4 |
| F19 | F19 | Right / Left low beam fuse (15A) | 10 |
| F20 | F20 | Switches (I10 - I13), stop lights, radio and courtesy light fuse (15A) | 10 |
| F21 | F21 | Hazard lights and radio memory fuse (10A) | 9 |
| H2 | FPDX | Right tail lights | 10 |
| H3 | FDX | Front right turning indicator | 10 |
| H5 | FSX | Front left turning indicator | 10 |
| H6 | FPSX | Left tail lights | 10 |
| H7 | FADX | Front right headlamp | 10 |
| H8 | FASX | Front left headlamp | 10 |
| H14 | F.LAV | Working light | 9 |
| S5 | I4 | Optional switch | 9 |
| S6 | I5 | Optional electric parking brake switch | 9 |
| S7 | I7 | Working lights switch | 9 |
| S8 | I8 | Windscreen wiper switch | 9 |
| S9 | I10 | Hazard lights switch | 10 |
| S10 | I11 | Turning indicators switch | 10 |
| S11 | I13 | Lights switch | 10 |
| K16 | INT. | Turning indicators relay | 10 |
| S100 | INT.VEL | Heater fan switch | 8 |
| H1 | L.RETRO | Right reverse light | 4 |
| H9 | L.T | Plate number light | 10 |
| H10 | LPDX | Rear right side light | 10 |
| H11 | LPSX | Rear left side light | 10 |
| H20 | PLAF | Courtesy light | 10 |
| E1 | RIS | Heater | 8 |
| S200 | STOP | Stop lights switch | 10 |
| M100 | T.A. | Front windscreen wiper motor | 9 |
| M101 | T.P. | Rear winscreen wiper motor | 9 |
| M102 | L.V. | Front windscreen washer motor | 9 |
| | | | |

# 5.7 IDENTIFICATION OF FAILURES IN HYDROSTATIC TRANSMISSIONS

| INSTRUCTIONS FOR THE IDENTIFICATION OF FAILURES IN HYDROSTATIC TRANSMISSIONS | | | | |
|---|---|---|---|---|
| **FAILURES** | **POSSIBLE CAUSE** | **CHECK** | **LOCATION** | **CORRECT VALUES** |
| **The machine does not move neither forward nor reserve** | Oil Level is low | Oil level | Oil tank | |
| | Suction hose is bent or squashed | | Suction hose | |
| | Hydraulic oil cartridge is clogged | Depressor marked in vacuum gauge | Suction filter | < 0,3 bar |
| | Faulty coupling | | Motor or pump coupling | |
| | Pre-load pump turns counter wise to engine | Load pressure | Pressure intake with a gauge on pump sport M3 (SAUER GROUP) or S (BOSCH REXROTH GROUP) | 20 ÷ 24 bar |
| | Faulty pre-load pump | | | |
| | Faulty oil motor | | | |
| | Directional solenoid does not work | Resistance and voltage Control box (SAUER) | Directional solenoids in pump | |
| | Inching is seized, disconnected or badly set (SAUER) | Throw and connections | Pedal and electric connections | |
| | Faulty oil strainer | Faulty oil suction Seadling of tubes connectors and suction | Oil connections | |
| **Non instant motion response, abnormal** | Oil is air emulsified or Oil level is low | Oil level seating of pipes / hoses, fittings | Oil tank, fittings | |
| | Vacuum filter is clogged | Depressor marked in vacuum gauge | Vacuum filter | < 0,3 bar |
| | Inching is seized, disco meeted or badly connected (SAUER) | Potentiometer, linkage and connections | Pedal and electric connections | |
| **Engine is overloaded** | Low engine power or faulty engine | Engine does not accelerate at max. Load | Engine | 85 ÷ 95 % max rpm. of engine |
| | High pressure limit is set too low | Working pressure | Working pressure ports in pump | Recommended max. Pressure 345 or 410 bar. |
| | Inching is seized (SAUER) | Potentiometer / linkage | Pedal | < 0,3 bar |
| **Low traction power** | Engine does not work at nominal level or it's over | Haul of accelerator lever | Engine | 85 ÷ 95 % max rpm. of engine |
| | Low load pressure | Load pressure | Pressure intake with a gauge on pump sport M3 (SAUER GROUP) or S (BOSCH REXROTH GROUP) | 20 ÷ 24 bar. |
| | Inching is seized (SAUER) | Potentiometer / linkage | Pedal | |
| | M4, M5 (SAUER) or Xa, Xb (BOSCH REXROTH) Piloting hoses of hydrostatic motor are reversed. | Hydraulic chart | Connections | |
| | Hydraulic Oil overheating | Dirt in radiator | Radiator oil | |
| **Hydraulic oil overheating** | Low oil level | Oil level | Oil tank | |
| | Faulty oil | Oil degradation an pollution | | |
| | Suction line is not sealed | Sealing for hoses, fittings and cartridge | Oil connections | |
| | Faulty high pressure relief valves | Working pressure | Working pressure ports in pump | Recommended max. Pressures 345 or 410 bar. |
| | Radiator is dogged | Dirt in radiator | | |
| **Transmission over speed** | Max. Engine RPM is higher than recommended | Max. RPM on the engine | Engine | |
| | Faulty hydrostatic motor. Does not move to max. flow. | | | |
| **Irregular running** | M4, M5 (SAUER) or Xa, Xb (BOSCH REXROTH) Piloting hoses of hydrostatic motor are reversed. | Hydraulic Chart | Oil connections | |
| **Insufficient acceleration** | Low engine power | Haul of accelerator lever | Engine | |
| | M4, M5 (SAUER) or Xa, Xb (BOSCH REXROTH) Piloting hoses of hydrostatic motor are reversed. | Hydraulic Chart | Oil connections | |



## EC DECLARATION OF CONFORMITY

The manufacturer **AUSA Center, S.L.U.,** established on Ctra. De Vic, km 2.8, 08243 – Manresa – Barcelona – Spain, declares that the machine assigned below:

Generic denomination: **SELF – PROPELLED VARIABLE REACH TRUCK**

Model/Type : **T XXX X**

Serial number: **XXXXXXXX**

fulfils all relevant provisions of the machinery Directive 2006/42/EC

and it conforms with the next European Directives:

Electromagnetic Compatibility Directive 2004/108/EC

Sound level Directives of machinery used outdoors, 2000/14/EC and 2005/88/EC

Exhaust emissions Directives, 97/68 and 2004/26

and also it conforms with the following harmonized European Standards:

EN 1459 - Safety of industrial trucks. Self-propelled variable reach trucks.

The certification procedure has been carried out in accordance with the provisions relating to non-dangerous machinery in the above mentioned Directives.

Name and address of the person authorized to compile the technical file:

Mr Antoni Tachó Figuerola

Ctra. De Vic, km 2.8, 08243, Manresa, Barcelona, Spain

Signed by Mr Antoni Tachó Figuerola

Given at Manresa on

**AUSA Center, S.L.U.**
Cra. de Vic, Km. 2,8 - P.O.B. 194
08243 MANRESA (Barcelona) España

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