



**MANITOU AMERICAS, INC.**

One Gehl Way  
P. O. Box 179  
West Bend, WI 53095-0179 U.S.A

Website: [www.us.manitou.com](http://www.us.manitou.com)

For parts orders contact your Manitou dealer or call:  
Manitou Americas Parts Department. 262-334-6653  
Fax (254) 867--6504

**MLT735 120 LSU  
S6-E3**

**Operator Manual**  
Catalog No. 51900002  
In. Rel. 04-2011

***THIS OPERATOR'S MANUAL MUST BE KEPT IN THE LIFT TRUCK AND MUST BE READ AND UNDERSTOOD  
BY OPERATORS.***



## **0 - ROUGH TERRAIN FORKLIFT TRUCK GENERAL SAFETY STANDARDS**

### **1 - OPERATING & SAFETY INSTRUCTION**

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RELEASE: 04/11	Initial Release
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**ROUGH TERRAIN FORKLIFT TRUCK**  
**GENERAL SAFETY STANDARDS**

# **ROUGH TERRAIN FORKLIFT TRUCK GENERAL SAFETY STANDARDS**

## **STUDY THE OPERATOR/SERVICE MANUALS**

The information in this manual provides general instructions for the safe operation and maintenance of your forklift truck. This information is vital and must be clearly understood by the operator and serviceman. Study this manual and the Rough Terrain Forklift Safety Manual (part no. 422494) thoroughly and carefully before operating or servicing your forklift. Contact your dealer or Manitou North America, Inc. if you have any questions concerning your forklift, its operation, service or parts. Keep both manuals in the literature box on the forklift available for reference. If either manual becomes illegible or is missing, contact your dealer for replacements immediately. This manual cannot cover every situation that might result in an accident. It is the responsibility of the operator to always remain alert for potential hazards and be prepared to avoid them!

## **ADDITIONAL RECOMMENDED LITERATURE:**

ANSI / ITSDF B56.6 is the national consensus standard for rough terrain forklift trucks. It contains rules about forklift safety, maintenance, safe operation, training, and supervision. Forklift owners should learn this standard and make it available for their operators, service personnel, and supervisors. These standards can be obtained, free of charge, from the Industrial Truck Standards Development Foundation (ITSDF) on their website at [www.itsdf.org](http://www.itsdf.org). The following references are examples from the standard, addressing forklift operators:

### **A.) OPERATOR TRAINING QUALIFICATIONS**

- 1.) The user shall ensure that operators understand that safe operation is the operator's responsibility. The user shall ensure that operators are knowledgeable of, and observe, all safety rules and practices.
- 2.) Create an effective operator training program centered around user company's policies, operating conditions, and rough terrain forklift trucks. The program should be presented completely to all new operators and not be condensed for those claiming previous experience.
- 3.) Information on operator training is available from several sources, including rough terrain forklift truck manufacturers, users, government agencies, etc.
- 4.) An operator training program should consist of the following:
  - a.) careful selection of the operator, considering physical qualifications, job attitude, and aptitude;
  - b.) emphasis on safety of stock, equipment, operator, and other personnel;
  - c.) citing of rules and why they were formulated;
  - d.) basic fundamentals of rough terrain forklift truck and component design as related to safety, e.g., in.-lb (N-m) loading, mechanical limitations, center of gravity, stability, etc.;
  - e.) introduction to equipment, control locations, and functions. Explain how they work when used properly and problems when used improperly.
  - f.) supervise practice on operating course remote from normal activity and designed to simulate actual operations, e.g., lumber stacking, elevating shingles to the roof, etc.;
  - g.) oral, written, and operational performance tests and evaluations during and at completion of the course;
  - h.) refresher courses, which may be condensed versions of the primary course, and periodic "on job" operator evaluation;
  - i.) understanding of nameplate data and operator instructions and warning information appearing on the rough terrain forklift truck.

### **B.) GENERAL SAFETY PRACTICES**

- 1.) Rough terrain forklift trucks can cause injury if improperly used or maintained.
- 2.) Only authorized operators trained to adhere strictly to all operating instructions shall be permitted to operate rough terrain forklift trucks. Unusual operating conditions may require additional safety precautions, training, and special operating instructions.
- 3.) Modifications and additions which affect capacity or safe operation shall not be performed without the manufacturer's prior written approval. Where such authorization is granted, capacity, operation, and maintenance instruction plates, tags, or decals shall be changed accordingly.
- 4.) If the rough terrain forklift truck is equipped with front end attachment(s) or optional forks, the user shall see that the truck is marked to identify the forks or attachment(s), show the approximate weight of the truck and fork or attachment combination, and show the capacity of the truck with forks or attachment(s) at maximum elevation with load laterally centered.
- 5.) The user shall see that all nameplates and caution and instruction markings are in place and legible.
- 6.) The user shall consider that changes in load dimension may affect rough terrain forklift truck capacity.



## **ROUGH TERRAIN FORKLIFT TRUCK GENERAL SAFETY STANDARDS (cont.)**

### **B.) GENERAL SAFETY PRACTICES (cont.)**

- 7.) Where steering can be accomplished with either hand and the steering mechanism is of a type that prevents road reactions from causing the handwheel to spin (power steering or equivalent), steering knobs may be used. When used, steering knobs shall be of a type that can be engaged by the operator's hand from the top and shall be within the periphery of the steering handwheel.
- 8.) Experience has shown that rough terrain forklift trucks which comply with stability requirements are stable when properly operated. However, improper operation, faulty maintenance, or poor housekeeping may contribute to a condition of instability and defeat the purpose of the requirements.
- 9.) Users shall give consideration to special operating conditions. The amount of forward and rearward tilt to be used is governed by the application. Although the use of maximum rearward tilt is allowable under certain conditions, such as traveling with the load lowered, the stability of a rough terrain forklift truck as determined by standardized tests does not encompass consideration for excessive tilt at high elevations or the operation of trucks with excessive off-center loads.
- 10.) Some of the conditions which may affect stability are ground and floor conditions, grade, speed, loading (rough terrain forklift trucks equipped with attachments behave as partially loaded trucks even when operated without a load on the attachment), dynamic and static forces, improper tire inflation, and the judgement exercised by the operator.

### **C.) OPERATING SAFETY RULES AND PRACTICES**

- 1.) Safe operation is the responsibility of the operator.
- 2.) This equipment can be dangerous if not used properly. The operator shall develop safe working habits and also be aware of hazardous conditions in order to protect himself, other personnel, the rough terrain forklift truck, and other material.
- 3.) The operator shall be familiar with the operation and function of all controls and instruments before undertaking to operate the rough terrain forklift truck.
- 4.) Before operating any rough terrain forklift truck, truck operators shall have read and be familiar with the operator's manual for the particular truck being operated.
- 5.) Before starting to operate the rough terrain forklift truck:
  - a.) be in operating position and fasten seat belt;
  - b.) place directional controls in neutral;
  - c.) apply brakes;
  - d.) start engine.
- 6.) Do not start or operate the rough terrain forklift truck, any of its functions, or attachments from any place other than the designated operator's position.
- 7.) Keep hands and feet inside the operator's designated area or compartment. Do not put any part of the body outside the operator compartment of the rough terrain forklift truck.
- 8.) Never put any part of the body into the mast structure or between the mast and the rough terrain forklift truck.
- 9.) Never put any part of the body within the reach mechanism of the rough terrain forklift truck or other attachments.
- 10.) Understand rough terrain forklift limitations and operate the truck in a safe manner so as not to cause injury to personnel.
- 11.) Do not allow anyone to stand or pass under the elevated portion of any rough terrain forklift truck, whether empty or loaded.
- 12.) Do not permit passengers to ride on rough terrain forklift trucks.
- 13.) Check clearance carefully before driving under electrical lines, bridges, etc.
- 14.) A rough terrain forklift truck is attended when the operator is less than 25 ft (7.6m) from the truck, which remains in his view.
- 15.) A rough terrain forklift truck is unattended when the operator is 25ft (7.6m) or more from the truck, which remains in his view, or whenever the operator leaves the truck and it is not in his view.
- 16.) Before leaving the operator's position:
  - a.) bring rough terrain forklift truck to a complete stop;
  - b.) place directional controls in neutral;
  - c.) apply the parking brake;
  - d.) lower load-engaging means fully, unless supporting an occupied elevated platform;
  - e.) stop the engine;
  - f.) if the rough terrain forklift truck must be left on an incline, block the wheels;
  - g.) fully lower the load-engaging means.
- 17.) Maintain a safe distance from the edge of ramps, platforms, and other similar working surfaces.
- 18.) Do not move railroad cars or trailer with a rough terrain forklift truck.

## **ROUGH TERRAIN FORKLIFT TRUCK GENERAL SAFETY STANDARDS (cont.)**

### **C.) OPERATING SAFETY RULES AND PRACTICES (cont.)**

- 19.) Do not use a rough terrain forklift truck for opening or closing railroad car doors.
- 20.) In areas classified as hazardous, use only rough terrain forklift trucks approved for use in those areas.
- 21.) Report all accidents involving personnel, building structures, and equipment to the supervisor or as directed.
- 22.) Do not add to, or modify, the rough terrain forklift truck.
- 23.) Do not block access to fire aisles, stairways, and fire equipment.
- 24.) For rough terrain forklift trucks equipped with a differential lock, the lock should not be engaged when driving on the road or at high speeds or when turning. If the lock is engaged when turning, there could be loss of steering control.
- 25.) Observe all traffic regulations including authorized speed limits. Under normal traffic conditions, keep to the right, maintain a safe distance, based on speed of travel, from the truck ahead; and keep the truck under control at all times.
- 26.) Yield the right-of-way to pedestrians and emergency vehicles such as ambulances and fire trucks.
- 27.) Do not pass another truck traveling in the same direction at intersections, blind spots, or at other dangerous locations.
- 28.) Slow down and sound the audible warning device(s) at cross-aisles and other locations where vision is obstructed.
- 29.) Cross railroad tracks at an angle wherever possible. Do not park closer than 6 ft (1.8m) to the nearest rail of a railroad track.
- 30.) Keep a clear view of the path of travel and observe other traffic, personnel, and safe clearances.
- 31.) If the load being carried obstructs forward view, travel with the load trailing.
- 32.) Ascend or descend grades slowly and with caution.
  - a.) When ascending or descending grades in excess of 5%, loaded rough terrain forklift trucks should be driven with the load up grade.
  - b.) Unloaded rough terrain forklift trucks should be operated on all grades with the load-engaging means down grade.
  - c.) On all grades, the load and load-engaging means shall be tilted back, if applicable, and raised only as far as necessary to clear the road surface.
  - d.) Avoid turning, if possible, and use extreme caution on grades, ramps, or inclines; normally travel straight up or down.
- 33.) Under all travel conditions, operate the rough terrain forklift truck at a speed that will permit it to be brought to a stop in a safe manner.
- 34.) Travel with load-engaging means or load low and, where possible, tilted back. Do not elevate the load except during stacking.
- 35.) Make starts, stops, turns, or direction reversals in a smooth manner so as not to shift load and/or overturn the rough terrain forklift truck.
- 36.) Do not indulge in stunt driving or horseplay.
- 37.) Slow down for wet and slippery surfaces.
- 38.) Before driving over a dockboard or bridge plate, be sure that it is properly secured. Drive carefully and slowly across the dockboard or bridge plate, and never exceed its rated capacity.
- 39.) Do not drive rough terrain forklift trucks onto any elevator unless specifically authorized to do so. Approach elevators slowly, and then enter squarely after the elevator car is properly leveled. Once on the elevator, neutralize the controls, shut off engine, and set brakes. It is advisable that all other personnel leave the elevator before truck is allowed to enter or leave.
- 40.) Avoid running over loose objects on the roadway surface.
- 41.) When negotiating turns, reduce speed to a safe level, and turn steering handwheel in a smooth sweeping motion. Except when maneuvering at a very low speed, turn the steering handwheel at a moderate, even rate.
- 42.) Use special care when traveling without load, as the risk of lateral overturning is greater.
- 43.) Improper use of stabilizer controls (if so equipped) could cause rough terrain forklift truck upset. Always lower the carriage before operating stabilizer controls.
- 44.) For rough terrain forklift trucks equipped with lateral leveling:
  - a.) Always level the frame before raising the boom or mast, with or without a load.
  - b.) Lateral leveling should not be used to position an elevated load; instead, lower the load and reposition the rough terrain forklift truck.
- 45.) Handle only stable or safely arranged loads.
  - a.) When handling off-center loads which cannot be centered, operate with extra caution.
  - b.) Handle only loads within the capacity of the rough terrain forklift truck.
  - c.) Handle loads exceeding the dimensions used to establish rough terrain forklift truck capacity with extra caution. Stability and maneuverability may be adversely affected.

## **ROUGH TERRAIN FORKLIFT TRUCK GENERAL SAFETY STANDARDS (cont.)**

### **C.) OPERATING SAFETY RULES AND PRACTICES (cont.)**

- 46.) When attachments are used, extra care shall be taken in securing, manipulating, positioning, and transporting the load. Operate rough terrain forklift trucks equipped with attachments as partially loaded trucks when not handling a load.
- 47.) Completely engage the load with the load-engaging means. Fork length should be at least two-thirds of load length. Where tilt is provided, carefully tilt the load backward to stabilize the load. Caution should be used in tilting backward with high or segmented loads.
- 48.) Use extreme care when tilting load forward or backward, particularly when high tiering. Do not tilt forward with load-engaging means elevated except to pick up or deposit a load over a rack or stack. When stacking or tiering, use only enough backward tilt to stabilize the load.
- 49.) The handling of suspended loads by means of a crane arm (boom) or other device can introduce dynamic forces affecting the stability of a rough terrain forklift truck. Grades and sudden starts, stops, and turns can cause the load to swing and create a hazard if not externally stabilized. When handling suspended loads:
- a.) do not exceed the truck manufacturer's capacity of the rough terrain forklift truck as equipped for handling suspended loads.
  - b.) only lift the load vertically and never drag it horizontally;
  - c.) transport the load with the bottom of the load and the mast as low as possible;
  - d.) with load elevated, maneuver the rough terrain forklift truck slowly and cautiously, and only to the extent necessary to permit lowering to the transport position;
  - e.) use tag lines to restrain load swing whenever possible.
- 50.) At the beginning of each shift and before operating the rough terrain forklift truck, check its condition, giving special attention to:
- a.) tires and their inflation pressure
  - b.) warning devices
  - c.) lights
  - d.) lift and tilt systems, load-engaging means, chains, cables, and limit switches
  - e.) brakes
  - f.) steering mechanism
  - g.) fuel system(s)
- 51.) If the rough terrain forklift truck is found to be in need of repair or in any way unsafe, or if it contributes to an unsafe condition, the matter shall be reported immediately to the user's designated authority, and the truck shall not be operated until it has been restored to safe operating condition.
- 52.) If during operation the rough terrain forklift truck becomes unsafe in any way, the matter shall be reported immediately to the user's designated authority, and the truck shall not be operated until it has been restored to safe operating condition.
- 53.) Do not make repairs or adjustments unless specifically authorized to do so.
- 54.) When refueling, smoking in the area shall not be permitted, the engine shall be stopped, and the operator shall not be on the rough terrain forklift truck.
- 55.) Spillage of oil or fuel shall be carefully and completely absorbed or evaporated and fuel tank cap replaced before restarting engine.
- 56.) Do not use open flames when checking electrolyte level in storage batteries, liquid level in fuel tanks, or the condition of LPG fuel lines and connectors.
- 57.) Do not lift personnel with the forklift. If the forklift must be used to lift people, precautions for the protection of the personnel must be taken (see ITSDF B56.6, chapter 5.15 Elevating Personnel).

## **ROUGH TERRAIN FORKLIFT TRUCK GENERAL SAFETY STANDARDS (cont.)**

### **D.) SUSPENDED LOADS**

A jib or truss boom should ONLY be used to lift and place loads when the machine is stationary and the frame is level. Transporting suspended loads must ALWAYS be done slowly and cautiously, with the boom and load as low as possible. Use taglines to restrict loads from swinging, to avoid overturn.

The handling of suspended loads by means of a truss boom or other similar device can introduce dynamic forces affecting the stability of the machine that are not considered in the stability criteria of industry test standards. Grades and sudden starts, stops and turns can cause the load to swing and create a hazard.

#### **Guidelines for “Free Rigging / Suspended Loads”**

1. DO NOT exceed the rated capacity of the telescopic handler as equipped for handling suspended loads. The weight of the rigging must be included as part of the load.
2. During transport, DO NOT raise the load more than 12 inches (305 mm) above the ground, or raise the boom more than 45 degrees.
3. Only lift the load vertically – NEVER drag it horizontally.
4. Use multiple pickup points on the load when possible. Use taglines to restrain the load from swinging and rotating.
5. Start, travel, turn and stop SLOWLY to prevent the load from swinging. DO NOT exceed walking speed.
6. Inspect rigging before use. Rigging must be in good condition and in the U.S. comply with OSHA regulation §1910.184, “Slings,” or §1926.251, “Rigging equipment for material handling.”
7. Rigging equipment attached to the forks must be secured such that it cannot move either sideways or fore and aft. The load center must not exceed 24 inches (610 mm).
8. DO NOT lift the load with anyone on the load, rigging or lift equipment, and NEVER lift the load over personnel.
9. Beware of the wind, which can cause suspended loads to swing, even with taglines.
10. DO NOT attempt to use frame-leveling to compensate for load swing.



#### **WARNING**

**U.S. OSHA regulations effective November 8, 2010 (29 CFR Part 1926, Subpart CC - Cranes and Derricks in Construction) include requirements for employers that use powered industrial trucks (“forklifts”) configured to hoist (by means of a winch or hook) and move suspended loads horizontally. In particular, this regulation applies to any rough-terrain forklift (e.g., “telescopic handler”) equipped with a jib or truss boom with a hook (with or without a winch), or a hook assembly attached to the forks. [Note: This regulation is in addition to the OSHA regulation that requires specific forklift operator training: §1910.178(l).]**

**When a forklift / telescopic handler is configured and used for hoisting, the employer must ensure that:**

1. **Forklift, lift equipment and rigging have been inspected (each shift, month and year) and are in good, safe condition and properly installed.**
2. **An operator’s manual and applicable load charts are on the forklift.**
3. **Work zone ground conditions can support the equipment and load. Any hazardous conditions in the work area have been identified, and the operator notified.**
4. **Equipment is being used within its rated capacity and in accordance with the manufacturer’s instructions.**

5. **Operator and crew members have been trained in the safe use and operation of the equipment, including how to avoid electrocution.**
6. **During use, no part of the equipment, load line or load will be within the minimum clearance distance specified by OSHA [10 feet (3.0 m), and more for lines rated over 50 kV] of any energized power line, and any taglines used are non-conductive.**
7. **In addition, for lift equipment with a rated capacity greater than 2000 lbs. (907 kg), the employer must ensure that:**
  - a.) **An accessible fire extinguisher is on the forklift;**
  - b.) **Monthly and annual inspections are performed and documented, and records retained (three months for monthly, one year for annual);**
  - c.) **Before November 10, 2014, operators must have had the additional training and qualification / certification required by OSHA regulations §1926.1427 and §1926.1430.**

**Note: Refer to the full text of the OSHA crane regulation (29 CFR Part 1926, Subpart CC) for a detailed description**

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## **ROUGH TERRAIN FORKLIFT TRUCK GENERAL SAFETY STANDARDS (cont.)**

### **CONCLUSION:**

#### **1.) ATTEND OPERATOR TRAINING CLASSES**

The forklift operator must clearly understand all instructions concerning the safe operation of the forklift and all safety rules and regulations of the work site. They must have successfully completed a training course in accordance with the Powered Industrial Truck Standard (29 CFR 1910.178) as described by the Occupational Safety and Health Administration (OSHA). They must be qualified as to their visual, hearing, physical, and mental ability to operate the equipment safely. NEVER use drugs or alcohol while operating a forklift! NEVER operate or allow anyone to operate a forklift when mental alertness or coordination is impaired! An operator on prescription or over-the-counter drugs must consult a medical professional regarding any side effects of the medication that may impair their ability to safely operate the forklift.

#### **2.) CREATE A MAINTENANCE PROGRAM**

OSHA recommends a maintenance log, listing repairs requested and completed, for each forklift. Also, "lock out tag procedures" should be utilized. If the forklift malfunctions; park it safely, remove the key, tag "Do Not Use", and report the problem to the proper authority or authorized service personnel immediately.

## **ROUGH TERRAIN FORKLIFT TRUCK GENERAL SAFETY STANDARDS (cont.)**

#### **2.) CREATE A MAINTENANCE PROGRAM (cont.)**

For the best forklift performance and operation, a maintenance program is required. Use the hour meter on the instrument panel to keep maintenance properly scheduled (see SECTION TWO - "Servicing Schedule"). For repairs on major components (engine, transmission, etc.), contact your nearest dealer for a Repair Manual. Do not operate a forklift that is damaged or does not function properly. Only authorized personnel may make repairs or adjustments to the lift truck. After repairs, the lift truck must be tested for safe operation before returning to service.

#### **3.) FORKLIFT KNOWLEDGE**

Forklift trucks can cause serious injury if improperly used or maintained. Study all of the manuals provided for your forklift model. Learn the locations and meanings of all safety decals. If any decals are illegible or missing, have them replaced immediately. Make sure all safety features provided by the original manufacturer are in place and function properly. Do not operate a forklift with damaged, missing or unsafe components. Have it repaired by authorized service personnel. Learn the functions of all controls, gauges, indicator lights, etc. on the forklift. Know the speed/gear ranges, braking and steering capabilities, load ratings and clearances. When referring to the location of forklift components, the terms "left", "right", "front", and "rear" are related to the operator seated normally, facing forward in the operator's seat. If you have any questions about the forklift, consult your supervisor. Failure to fully understand or obey safety warnings can result in serious injury or death!

#### **4.) WORK SITE KNOWLEDGE**

Before operating on a work site, learn the rules for movement of people, forklifts and all other traffic. Check the size, weight, and condition of the loads you will be expected to handle. Verify that they are properly secured and safe to transport. Learn where the loads are to be placed, planning your route for a safe approach, watching for hazardous conditions. Will a signal man be required to help place the load? Remove any debris which may cause tire damage or rupture. Plan your route around problem areas or have them corrected. Inform the supervisor of any unsafe conditions observed at the site. Examples of hazards: power lines, cables, low clearance structures, garage doors, telephone pole guide lines, fencing, loose lumber, building materials, drop-offs, trenches, rough/soft spots, oil spills, deep mud, steep inclines, railroad tracks, curbs, etc.. NEVER approach power lines, gas lines or other utilities with the forklift! Always verify that local, state/provincial and federal regulations have been met. Report any accidents involving personnel, building structures, and equipment to the supervisor immediately. Always remain alert - conditions are constantly changing at the work site!

### **TECHNICAL SUPPORT**

All data provided in this manual is subject to production changes, addition of new models, and improved product designs. If a question arises regarding your forklift, please consult your dealer or Manitou-NA, Inc. for the latest information. When ordering service parts or requesting technical information, be prepared to quote the applicable Model/Serial Numbers.

## **SAFETY MESSAGES**

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**NOTE THE SAFETY ALERT SYMBOL (SHOWN BELOW). IT IDENTIFIES POTENTIAL HAZARDS WHICH, IF NOT AVOIDED MAY RESULT IN INJURY OR DEATH!** Also, observe the safety messages places throughout this manual; providing special instructions, telling you when to take precautions and to identify potential hazards. The safety messages are highlighted and outlined in a box similar to those shown in the examples below.

### **SAFETY ALERT SYMBOL**



<b>NOTE or NOTICE</b>
Provides information, special instructions or references about the lift truck.

<b>IMPORTANT</b>
Precautions which must be taken to avoid damage to the lift truck.



<b>CAUTION</b>
Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. May also alert unsafe practices.



<b>WARNING</b>
Indicates a potentially hazardous situation which, if not avoided, <i>may result in death or serious injury!</i>



<b>DANGER</b>
Indicates an imminently hazardous situation which, if not avoided, <i>will result in death or serious injury.</i>

### **CALIFORNIA PROPOSITION 65 WARNING**

Diesel Engine Exhaust and some of its constituents are known to the State of California to cause cancer, birth defects or other reproductive harm.

**WARNING:** Battery posts, terminals and related accessories and related accessories contain lead and lead compounds. **Wash hands after handling.**

## SAFETY DECALS

The purpose of this chapter is to introduce you to the safety messages, decals, and nameplates found on your forklift truck. The decals are identified by name, part number, location, and a brief description. (The forklift model logos, and other misc. decals not shown, can be found in your forklift parts manual.) The decals illustrated may not be exactly the same as those installed on your forklift; installation of the decals varies depending on the forklift model, series, decal updates, etc.. The size and location of some decals limit the amount of information that can be placed upon it. For this reason, additional detailed information not found on the decals is provided through-out this manual.

Every decal placed on the lift truck is important; they are constant reminders of safety and instructions that should never be taken for granted. Even experienced operators can be seriously injured or killed by ignoring, refusing to enforce, or forgetting to follow safe operating procedures! Do not assume you know all safety issues concerning the decals. Before operating the lift truck; learn the meaning(s) of the decals as described in this manual. If any decal becomes illegible or missing, have it replaced immediately! Always replace decals using the same decal part no., unless otherwise specified by the manufacturer. For replacement decals not found in your parts manual, contact your nearest dealer. If you have any questions, contact your supervisor or nearest dealer for advice before operating your forklift!

### 801011

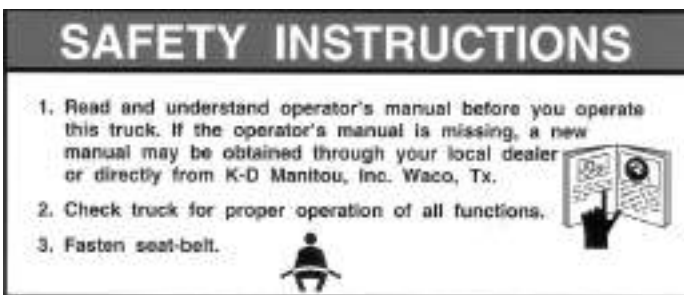
#### Before Starting - 801011

(Boom equipped models). Location: on the brake fluid cover panel (to the left and below the dash panel).

#### Safety Instructions - 420792

(Mast equipped models). Location: on or near the operator manual storage case, and/or on the dash panel.

Instructions for the forklift operator; before operating the forklift.



#### Use of Seat Belt - 801012

(Boom equipped models). Location: to the right of the operator, near the hydraulic control lever.

Instructs the operator to always wear the seat belt during operations, and never jump from an over-turning forklift.





## SAFETY DECALS

### Emergency and Parking Brake - 801010

Location: near the park brake lever.

Identifies the Emergency/Parking Brake Lever.



### Alarm Must Sound - 496162

Location: on the dash, in direct view of the operator.

The backup alarm must sound when the forklift is placed in reverse gear.



### No Riders - 420732

Location: on the cab entrance(s), and on or near wheel fenders and engine cover.

Informs: riders are not allowed on the forklift.



### Clear of Raised Boom - 801006

(Boom equipped models). Location: on both sides of the boom nose.

Keep away from unsupported boom.



### Clear of Power Lines - 801007

(Boom equipped models). Location: on both sides of the boom nose.

Keep away from power lines.



## SAFETY DECALS

### Use of Frame Leveling - 801013

(Boom equipped models). Location: to the right of the operator near the hydraulic control lever.

Frame leveling notice; load must be lowered.



### Attachment and Boom Safety - 801009

(Boom equipped models). Location: on both sides of the boom nose.

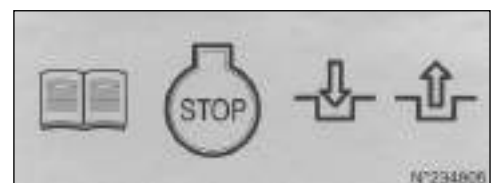
Important reminders of attachment and boom safety.



### Hydraulic Coupling - 234805

Location: near the quick-disconnect adapters.

Stop the engine and release hydraulic pressure before changing attachments.



### Rotating Fan and Belt(s) - 801008

Location: on the radiator near the fan, and on any fan belt/pulley cover(s).

Keep hands and clothing away from rotating fan and belts.

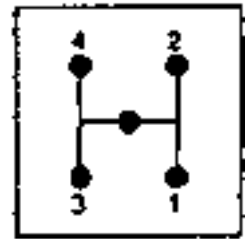


**SAFETY DECALS**

**Gear Shift Pattern - 33460**

(4-speed transmission models). Location: near the gear shift lever.

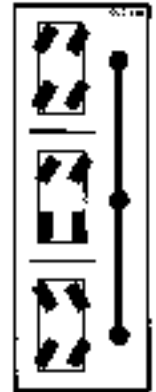
Identifies the gear shift pattern of the forklift transmission.



**Steering Mode - 184276**

(4 wheel steer equipped models). Location: near the steering mode selection lever.

Identifies the steering mode selection.



**Mineral Oil (Brake Reservoir) - 221322 or 234800 has been replaced by 164091.**

Location: near the brake fluid reservoir where applicable.

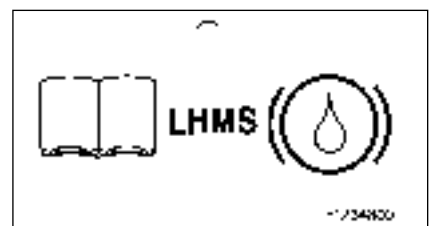
Refer to the Operator/Service Manual for the correct brake fluid (mineral oil) to be used in the brake system.



221322



234800

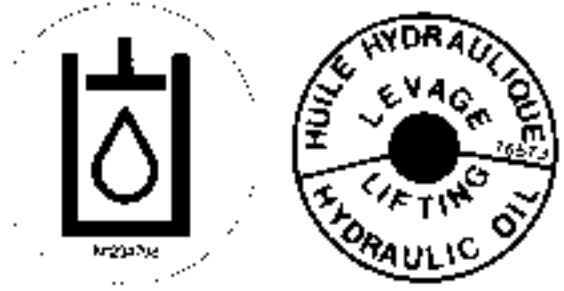


## SAFETY DECALS

### Hydraulic Oil - 234798 or 76573

Location: on the hydraulic tank or filler cap.

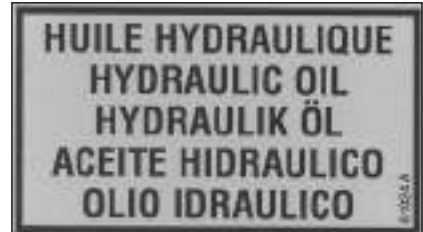
Identifies the hydraulic reservoir (tank) or filler cap.



### Hydraulic Oil - 61024

Location: on the hydraulic tank.

Identifies the hydraulic reservoir (tank).



### Anti-Freeze - 234799

Location: on the radiator, near the radiator filler cap.

Indicates required minimum to maximum anti-freeze protection (-22°F to -40°F).



### Diesel Fuel - 161101

Location: on the fuel tank, near the filler cap.

Identifies the fuel tank, and use of diesel fuel.



### No Step - 496735

Location: varies, depending on the forklift model.

Instructs personnel not to use the designated area as a step.



### Do Not Tow - 494918

(Hydrostatic equipped models). Location: on the dash, in view of the operator.

Towing the forklift will damage the transmission; refer to the operator's manual.



## SAFETY DECALS

### Attachment Warning - 421016

(Boom equipped models). Location: on the boom coupler, near where the retaining shaft is installed.

Reminder to operator; install attachment retaining shaft and safety pin before operations.



### Hook Here - 24653

Location: at points provided on the forklift, where straps or chains may be attached to secure the forklift to a trailer during transport.



### Fork Safety - 426641

(Mast equipped models). Location: on the front and back side of the mast's outer rails, at eye level (4 required).

Instructs personnel not to travel beneath or upon the lift truck forks.



### Pinch Point, Large, 2.5 x 4.5 in. - 426643

### Pinch Point, Small, 1.5 x 2.75 in. - 426642

(Mast equipped models). Location: on the front and rear sides of the mast cross bracing.

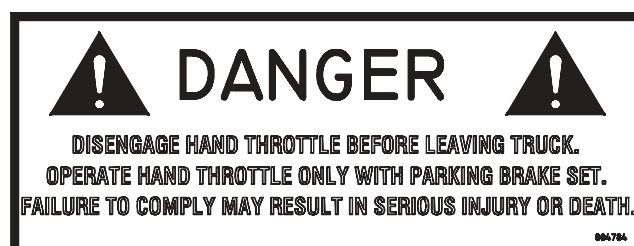
Keep fingers away from the mast crossbracing.



### HAND THROTTLE DANGER - 804784

(Boom equipped models, option). Location: Near the hand throttle mechanism.

Reminder to operator; set parking brake before operating hand throttle. Disengage hand throttle before leaving the forklift.



## SAFETY DECALS

### Acid in Battery - 801014

Location: in or near the battery storage compartment.

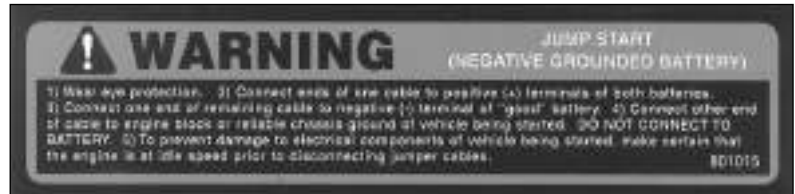
Addresses battery hazards.



### Jump Start Battery - 801015

Location: in or near the battery storage compartment.

Jump start instructions.



### Attachment Plate - 425995

Location: on the optional removeable forklift attachment.

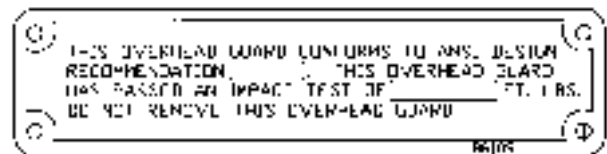
Important manufacturer information about the attachment. Record this information for use when contacting the manufacturer for parts and service.



### Overhead Guard Data Plate - B6109

Location: attached to the overhead guard.

Overhead guard conformity.



### Forklift Data Plate - 496550

(Boom equipped models)

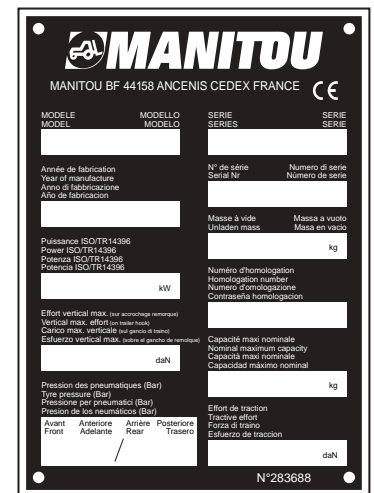
### Forklift Data Plate - 283688

Location: within the operator's compartment.

Important forklift truck identification. Record this information for use when contacting the manufacturer for parts and service.

496550

283688





# ***1 - OPERATING AND SAFETY INSTRUCTIONS***





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# INSTRUCTIONS TO THE COMPANY MANAGER

## THE SITE

- Proper management of lift truck's area of travel will reduce the risk of accidents:
  - . ground not unnecessarily uneven or obstructed,
  - . no excessive slopes,
  - . pedestrian traffic controlled, etc.

## THE OPERATOR

- Only qualified, authorized personnel can use the lift truck. This authorization is given in writing by the appropriate person in the establishment with respect to the use of lift trucks and must be carried permanently by the operator.



**On the basis of experience, there are a number of possible situations in which operating the lift truck is contra-indicated. Such foreseeable abnormal uses, the main ones being listed below, are strictly forbidden.**

- **The foreseeable abnormal behaviour resulting from ordinary neglect, but does not result from any wish to put the machinery to any improper use.**
  - **The reflex reactions of a person in the event of a malfunction, incident, fault, etc. during operation of the lift truck.**
  - **Behaviour resulting from application of the «principle of least action» when performing a task.**
  - **For certain machines, the foreseeable behaviour of such persons as: apprentices, teenagers, handicapped persons, trainees tempted to drive a lift truck, operator tempted to operate a truck to win a bet, in competition or for their own personal experience.**
- The person in charge of the equipment must take these criteria into account when assessing whether or not a person will make a suitable driver.**

## THE LIFT TRUCK

### A - THE TRUCK'S SUITABILITY FOR THE JOB

- MANITOU has ensured that this lift truck is suitable for use under the standard operating conditions defined in this operator's manual, in accordance to ASME B56.6 - 2002
- Before commissioning, the company manager must make sure that the lift truck is appropriate for the work to be done, and perform certain tests (in accordance with current legislation).

### B - ADAPTATION OF THE LIFT TRUCK TO STANDARD ENVIRONMENTAL CONDITIONS

- In addition to series equipment mounted on your lift truck, many options are available, such as: road lighting, stop lights, flashing light, reverse lights, reverse buzzer alarm, front light, rear light, light at the jib head, etc... (as model of lift truck).
- The operator must take into account the operating conditions to define the lift truck's signalling and lighting equipment. Contact your dealer.
- Take into account climatic and atmospheric conditions of the site of utilisation.
  - . Protection against frost (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL).
  - . Adaptation of lubricants (ask your dealer for information).
  - . I.C. engine filtration (see: 3 - MAINTENANCE: FILTERS CARTRIDGES AND BELTS).



**For operation under average climatic conditions, i.e.: between - 15 °C and + 35 °C, correct levels of lubricants in all the circuits are checked in production. For operation under more severe climatic conditions, before starting up, it is necessary to drain all the circuits, then ensure correct levels of lubricants using lubricants properly suited to the relevant ambient temperatures. It is the same for the cooling liquid.**

- A lift truck operating in an area without fire extinguishing equipment must be equipped with an individual extinguisher. There are solutions, consult your dealer.



**Your lift truck is designed for outdoor use under normal atmospheric conditions and indoor use in suitably aerated and ventilated premises. It is prohibited to use the lift truck in areas where there is a risk of fire or which are potentially explosive (e.g. Refineries, fuel or gas depots, stores of inflammable products...). For use in these areas, specific equipment is available (ask your dealer for information).**

- Our trucks comply with Directive 2004/108/EC concerning electromagnetic compatibility (EMC), and with the corresponding harmonized norm EN 12895. Their proper operation is no longer guaranteed if they are used within areas in which the electromagnetic fields exceed the limit specified by that norm (10 V/m).
- Directive 2002/44/EC requires company managers to not expose their employees to excessive vibration doses. There is no recognized code of measurement for comparing the machines of different manufacturers. The actual doses received can therefore be measured only under actual operating conditions at the user's premises.
- The following are some tips for minimizing these vibration doses:
  - Select the most suitable lift truck and attachment for the intended use.
  - Adapt the seat adjustment to the operator's weight (according to lift truck model) and maintain it in good condition, as well as the cab suspension. Inflate the tires in accordance with recommendations.
  - Ensure that the operators adapt their operating speed to suit the conditions on site.
  - As far as possible, arrange the site in such a way as to provide a flat running surface and remove obstacles and harmful potholes.

### **C - MODIFICATION OF THE LIFT TRUCK**

- For your safety and that of others, you must not change the structure and settings of the various components used in your lift truck (hydraulic pressure, calibrating limiters, I.C. engine speed, addition of extra equipment, addition of counterweight, unapproved attachments, alarm systems, etc.) yourself. In this event, the manufacturer cannot be held responsible.

### **D - FRENCH ROAD TRAFFIC RULES**

(or see current legislation in other countries)

- Only one certificate of conformity is issued. It must be kept in a safe place.

## ***THE INSTRUCTIONS***

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- The operator's manual must always be in good condition and kept in the place provided on the lift truck and in the language used by the operator.
- The operator's manual and any plates or stickers which are no longer legible or are damaged, must be replaced immediately.

## ***THE MAINTENANCE***

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- Maintenance or repairs other than those detailed in part: 3 - MAINTENANCE must be carried out by qualified personnel (consult your dealer) and under the necessary safety conditions to maintain the health of the operator and any third party.



***Your lift truck must be inspected periodically to ensure that it remains in compliance. The frequency of this inspection is defined by current legislation in the country in which the lift truck is used.***

# INSTRUCTIONS FOR THE OPERATOR

## PREAMBLE

WHENEVER YOU SEE THIS SYMBOL IT MEANS:



**WARNING ! BE CAREFUL ! YOUR SAFETY OR THE SAFETY OF THE LIFT TRUCK IS AT RISK.**

**!** *The risk of accident while using, servicing or repairing your lift truck can be restricted if you follow the safety instructions and safety measures detailed in these instruction.*

- Only the operations and manœuvres described in these operator's manual must be performed. The manufacturer cannot predict all possible risky situations. Consequently, the safety instructions given in the operator's manual and on the lift truck itself are not exhaustive.
- At any time, as an operator, you must envisage, within reason, the possible risk to yourself, to others or to the lift truck itself when you use it.

**!** *Failure to respect the safety and operating instructions, or the instructions for repairing or servicing your lift truck may lead to serious, even fatal accident.*

## GENERAL INSTRUCTIONS

### A - OPERATOR'S MANUAL

- Read the operator's manual carefully.
- The operator's manual must always be in good condition and in the place provided for it on the lift truck.
- You must report any plates and stickers which are no longer legible or which are damaged.

### B - AUTHORISATION FOR USE IN FRANCE

(or see current legislation in other countries)

- Only qualified, authorized personnel can use the lift truck. This authorization is given in writing by the appropriate person in the establishment with respect to the use of lift trucks and must be carried permanently by the operator.
- The operator is not competent to authorise the driving of the lift truck by another person.

### C - MAINTENANCE

- The operator must immediately advise his superior if his lift truck is not in good working order or does not comply with the safety notice.
- The operator is prohibited from carrying out any repairs or adjustments himself, unless he has been trained for this purpose. He must keep the lift truck properly cleaned if this is among his responsibilities.
- The operator must carry out daily maintenance (see: 3 - MAINTENANCE: A - DAILY OR EVERY 10 HOURS SERVICE).
- The operator must ensure tyres are adapted to the nature of the ground (see area of the contact surface of the tyres in the chapter: 2 - DESCRIPTION: FRONT AND REAR TYRES). There are optional solutions, consult your dealer.
  - . SAND tyres.
  - . LAND tyres.
  - . Snow chains.

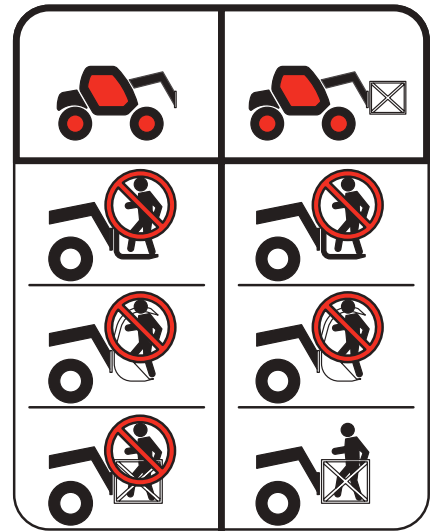
**!** *Do not use the lift truck if the tyres are incorrectly inflated, damaged or excessively worn, because this could put your own safety or that of others at risk, or cause damage to the lift truck itself. The fitting of foam inflated tyres is prohibited and is not guaranteed by the manufacturer, excepting prior authorisation.*

### D - MODIFICATION OF THE LIFT TRUCK

- For your safety and that of others, you must not change the structure and settings of the various components used in your lift truck (hydraulic pressure, calibrating limiters, I.C. engine speed, addition of extra equipment, addition of counterweight, unapproved attachments, alarm systems, etc.) yourself. In this event, the manufacturer cannot be held responsible.

## E - LIFTING PEOPLE

- The use of working equipment and load lifting attachments to lift people is:
  - either forbidden
  - or authorized exceptionally and under certain conditions (see current regulations in the country in which the lift truck is used).
- The pictogram posted at the operator station reminds you that:
  - Left-hand column
    - It is forbidden to lift people, with any kind of attachment, using a non PLATFORM-fitted lift truck.
  - Right-hand column
    - With a PLATFORM-fitted lift truck, people can only be lifted using platforms designed by MANITOU for the purpose.
- MANITOU sells equipment specifically designed for lifting people (OPTION PLATFORM lift truck, contact your dealer).



## **OPERATING INSTRUCTIONS UNLADEN AND LADEN**

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### **A - BEFORE STARTING THE LIFT TRUCK**

- Carry out daily maintenance (see: 3 - MAINTENANCE: A - DAILY OR EVERY 10 HOURS SERVICE).
- Make sure the lights, indicators and windscreen wipers are working properly.
- Make sure the rear view mirrors are in good condition, clean and properly adjusted.
- Make sure the horn works.

### **B - DRIVER'S OPERATING INSTRUCTIONS**

- Whatever his experience, the operator is advised to familiarize himself with the position and operation of all the controls and instruments before operating the lift truck.
- Wear clothes suited for driving the lift truck, avoid loose clothes.
- Make sure you have the appropriate protective equipment for the job to be done.
- Prolonged exposure to high noise levels may cause hearing problems. It is recommended to wear ear muffs to protect against excessive noise.
- Always face the lift truck when getting into and leaving the driving seat and use the handle(s) provided for this purpose. Do not jump out of the seat to get down.
- Always pay attention when using the lift truck. Do not listen to the radio or music using headphones or earphones.
- Never operate the lift truck when hands or feet are wet or soiled with greasy substances.
- For increased comfort, adjust the seat to your requirements and adopt the correct position in the driver's cab.

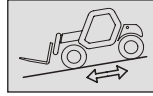


***Under no circumstances must the seat be adjusted while the lift truck is moving.***

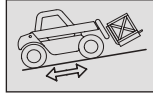
- The operator must always be in his normal position in the driver's cab. It is prohibited to have arms or legs, or generally any part of the body, protruding from the driver's cab of the lift truck.
- The safety belt must be worn and adjusted to the operator's size.
- The control units must never in any event be used for any other than their intended purposes (e.g. climbing onto or down from the lift truck, portmanteau, etc.).
- If the control components are fitted with a forced operation (lever lock) device, it is forbidden to leave the cab without first putting these controls in neutral.
- It is prohibited to carry passengers either on the lift truck or in the cab.

## C - ENVIRONMENT

- Comply with site safety regulations.
- If you have to use the lift truck in a dark area or at night, make sure it is equipped with working lights.
- During handling operations, make sure that no one is in the way of the lift truck and its load.
- Do not allow anybody to come near the working area of the lift truck or pass beneath an elevated load.
- When using the lift truck on a transverse slope, before lifting the jib, follow the instructions given in the paragraph: INSTRUCTIONS FOR HANDLING A LOAD: D - TRANSVERSE ATTITUDE OF THE LIFT TRUCK.
- Travelling on a longitudinal slope:
  - Drive and brake gently.



- Moving without load: Forks or attachment facing downhill.



- Moving with load: Forks or attachment facing uphill.

- Take into account the lift truck's dimensions and its load before trying to negotiate a narrow or low passageway.
- Never move onto a loading platform without having first checked:
  - That it is suitably positioned and made fast.
  - That the unit to which it is connected (wagon, lorry, etc.) will not shift.
  - That this platform is prescribed for the total weight of the lift truck to be loaded.
  - That this platform is prescribed for the size of the lift truck.
- Never move onto a foot bridge, floor or freight lift, without being certain that they are prescribed for the weight and size of the lift truck to be loaded and without having checked that they are in sound working order.
- Be careful in the area of loading bays, trenches, scaffolding, soft land and manholes.
- Make sure the ground is stable and firm under the wheels and/or stabilizers before lifting or removing the load. If necessary, add sufficient wedging under the stabilizers.
- Make sure that the scaffolding, loading platform, pilings or ground is capable of bearing the load.
- Never stack loads on uneven ground, they may tip over.

**!** *If the load or the attachment must remain above a structure for a long time, there is the risk that it will rest on the structure because of the jib descending owing to the oil in the cylinders cooling down.*

*To eliminate this risk:*

- *Regularly check the distance between the load or the attachment and the structure and readjust this if necessary.*
- *If possible use the lift truck at an oil temperature as close as possible to ambient temperature.*

- In the case of work near aerial lines, ensure that the safety distance is sufficient between the working area of the lift truck and the aerial line.

**!** *You must consult your local electrical agency. You could be electrocuted or seriously injured if you operate or park the lift truck too close to power cables.*

**!** *In the event of high winds, do not carry out handling work that jeopardizes the stability of the lift truck and its load, particularly if the load catches the wind badly.*

## D - VISIBILITY

- The safety of people within the lift truck's working area, as well as that of the lift truck itself and the operator are depend on good operator visibility of the lift truck's immediate vicinity in all situations and at all times.
- This lift truck has been designed to allow good operator visibility (direct or indirect by means of rear-view mirrors) of the immediate vicinity of the lift truck while traveling with no load and with the jib in the transport position.
- Special precautions must be taken if the size of the load restricts visibility towards the front:
  - moving in reverse,
  - site layout,
  - assisted by a person directing the maneuver (while standing outside the truck's area of travel), making sure to keep this person clearly in view at all times.
  - in any case, avoid reversing over long distances.
- Certain special accessories may require the truck to travel with the jib in the raised position. In such cases, visibility on the right hand side is restricted, and special precautions must be taken:
  - site layout,
  - assisted by a person directing the maneuver (while standing outside the truck's area of travel).
- If visibility of your road is inadequate, ask someone to assist by directing the maneuver (while standing outside the truck's area of travel), making sure to keep this person clearly in view at all times.
- Keep all components affecting visibility in a clean, properly adjusted state and in good working order (e.g. windscreens, windows, windscreen wipers, windscreen washers, driving and work lights, rear-view mirrors).



## **E - STARTING THE LIFT TRUCK**

### **SAFETY INSTRUCTIONS**



***The lift truck must only be started up or maneuvered when the operator is sitting in the driver's cab, with his seat belt adjusted and fastened.***

- Never try to start the lift truck by pushing or towing it. Such operation may cause severe damage to the transmission. If necessary, to tow the lift truck in an emergency, the transmission must be placed in the neutral position (see: 3 - MAINTENANCE: G - OCCASIONAL MAINTENANCE).
- If using an emergency battery for start-up, use a battery with the same characteristics and respect battery polarity when connecting it. Connect at first the positive terminals before the negative terminals.



***Failure to respect polarity between batteries can cause serious damage to the electrical circuit. The electrolyte in the battery may produce an explosive gas. Avoid flames and generation of sparks close to the batteries. Never disconnect a battery while it is charging.***

### **INSTRUCTIONS**

- Check the closing and locking of the hood(s).
- Check that the cab door is closed.
- Check that the forward/reverse selector is in neutral.
- Turn the ignition key to the position I to activate the electrical system and the preheat.
- Whenever you switch on the lift truck, perform the automatic check on the longitudinal stability limiter and warning device system (see: 2 - DESCRIPTION: INSTRUMENTS AND CONTROLS). Do not use the lift truck if it does not conform to the regulations.
- Check the fuel level on the indicator.
- Turn the ignition key fully: the I.C. engine should then start. Release the ignition key and let the I.C. engine run at idle.
- Do not engage the starter motor for more than 15 seconds and carry out the preheating between unsuccessful attempts.
- Make sure all the signal lights on the control instrument panel are off.
- Check all control instruments when the I.C. engine is warm and at regular intervals during use, so as to quickly detect any faults and to be able to correct them without any delay.
- If an instrument does not show the correct display, stop the I.C. engine and immediately carry out the necessary operations.

## **F - DRIVING THE LIFT TRUCK**

### **SAFETY INSTRUCTIONS**



***Operators' attention is drawn to the risks involved in using the lift truck, in particular:***

- ***Risk of losing control.***
- ***Risk of losing lateral and frontal stability of the lift truck.***

***The operator must remain in control of the lift truck.***

***In the event of the lift truck overturning, do not try to leave the cabin during the incident. YOUR BEST PROTECTION IS TO STAY FASTENED IN THE CABIN.***

- Observe the company's traffic regulations or, by default, the public highway code.
- Do not carry out operations which exceed the capacities of your lift truck or attachments.
- Always drive the lift truck with the forks or attachment to the transport position, i.e. at 300 mm from the ground, the jib retracted and the carriage sloping backwards.
- Only carry loads which are balanced and properly anchored to avoid any risk of a load falling off.
- Ensure that pallets, cases, etc, are in good order and suitable for the load to be lifted.
- Familiarise yourself with the lift truck on the terrain where it will be used.
- Ensure that the service brakes are working properly.
- The loaded lift truck must not travel at speeds in excess of 12 km/h.
- Drive smoothly at an appropriate speed for the operating conditions (land configuration, load on the lift truck).
- Do not use the hydraulic jib controls when the lift truck is moving.
- Never change the steering mode whilst driving.
- Do not manoeuvre the lift truck with the jib in the raised position unless under exceptional circumstances and then with extreme caution, at very low speed and using gentle braking. Ensure that visibility is adequate.
- Take bends slowly.
- In all circumstances make sure you are in control of your speed.
- On damp, slippery or uneven terrain, drive slowly.
- Brake gently, never abruptly.
- Only use the lift truck's forward/reverse selector from a stationary position and never do so abruptly.
- Do not drive with your foot on the brake pedal.
- Always remember that hydrostatic type steering is extremely sensitive to movement of the steering wheel, so turn it gently and not jerkily.
- Never leave the I.C. engine on when the lift truck is unattended.
- Do not leave the cab when the lift truck has a raised load.
- Look where you are going and always make sure you have good visibility along the route.

- Use the rear-view mirrors frequently.
- Drive round obstacles.
- Never drive on the edge of a ditch or steep slope.
- It is dangerous to use two lift trucks simultaneously to handle heavy or voluminous loads, since this operation requires particular precautions to be taken. It must only be used exceptionally and after risk analysis.
- The ignition switch has an emergency stop mechanism in case of an operating anomaly occurring in the case of lift trucks not fitted with a punch-operated cut-out.

#### INSTRUCTIONS

- Always drive the lift truck with the forks or attachment to the transport position, i.e. at 300 mm from the ground, the jib retracted and the carriage sloping backwards.
- For lift trucks with gearboxes, use the recommended gear (see: 2 - DESCRIPTION: INSTRUMENTS AND CONTROLS).
- Select the steering mode appropriate for its use and/or working conditions (see: 2 - DESCRIPTION: INSTRUMENTS AND CONTROLS) (as model of lift truck).
- Release the parking brake.
- Shift the forward/reverse selector to the selected direction of travel and accelerate gradually until the lift truck moves off.

### **G - STOPPING THE LIFT TRUCK**

#### SAFETY INSTRUCTIONS

- Never leave the ignition key in the lift truck during the operator's absence.
- When the lift truck is stationary, or if the operator has to leave his cab (even for a moment), place the forks or attachment on the ground, apply the parking brake and place the forward/reverse selector in neutral.
- Make sure that the lift truck is not stopped in any position that will interfere with the traffic flow and at less than one meter from the track of a railway.
- In the event of prolonged parking on a site, protect the lift truck from bad weather, particularly from frost (check the level of antifreeze), close and lock all the lift truck accesses (doors, windows, cowls...).

#### INSTRUCTIONS

- Park the lift truck on flat ground or on an incline lower than 15 %.
- Set the forward/reverse selector to neutral.
- Apply the parking brake.
- For lift trucks with gearboxes, place the gear lever in neutral.
- Retract entirely the jib.
- Lower the forks or attachment to rest on the ground.
- When using an attachment with a grab or jaws, or a bucket with hydraulic opening, close the attachment fully.
- Before stopping the lift truck after a long working period, leave the I.C. engine idling for a few moments, to allow the coolant liquid and oil to lower the temperature of the I.C. engine and transmission. Do not forget this precaution, in the event of frequent stops or warm stalling of the I.C. engine, or else the temperature of certain parts will rise significantly due to the stopping of the cooling system, with the risk of badly damaging such parts.
- Stop the I.C. engine with the ignition switch.
- Remove the ignition key.
- Lock all the accesses to the lift truck (doors, windows, cowls...).

## H - DRIVING THE LIFT TRUCK ON THE PUBLIC HIGHWAY

(or see current legislation in other countries)

### SAFETY INSTRUCTIONS

- Operators driving on the public highway must comply with current highway code legislation.
- The lift truck must comply with current road legislation. If necessary, there are optional solutions. Contact your dealer.

### INSTRUCTIONS

- Make sure the revolving light is in place, switch it on and verify its operation.
- Make sure the lights, indicators and windscreen wipers are working properly.
- Switch off the working headlights if the lift truck is fitted with them.
- Select the steering mode "HIGHWAY TRAFFIC" (as model of lift truck) (see: 2 - DESCRIPTION: INSTRUMENTS AND CONTROLS).
- Retract entirely the jib and put the attachment at 300 mm from the ground.
- Place the slope correctors in the central position, i.e. the transverse shaft of the axles parallel to the chassis (as model of lift truck).
- Lift up the stabilizers to the maximum and turn the blocks inwards (as model of lift truck).



***Never move in neutral (forward/reverse selector or gear lever in neutral or transmission cut-off button pressed) to preserve the lift truck engine brake. Failure to respect this instruction on a slope will lead to excessive speed which may make the lift truck uncontrollable (steering, brakes) and cause serious mechanical damage.***

#### DRIVING THE LIFT TRUCK WITH A FRONT-MOUNTED ATTACHMENT

- You must comply with current regulations in your country, covering the possibility of driving on the public highway with a front-mounted attachment on your lift truck.
- If road legislation in your country authorizes circulation with a front-mounted attachment, you must at least:
  - Protect and report any sharp and/or dangerous edges on the attachment (see: 4 - ADAPTABLE ATTACHMENTS IN OPTION ON THE RANGE: ATTACHMENT SHIELDS).
  - The attachment must not be loaded.
  - Make sure that the attachment does not mask the lighting range of the forward lights.
  - Make sure that current legislation in your country does not require other obligations.

#### OPERATING THE LIFT TRUCK WITH A TRAILER

- For using a trailer, observe the regulations in force in your country (maximum travel speed, braking, maximum weight of trailer, etc.).
- Do not forget to connect the trailer's electrical equipment to that of the lift truck.
- The trailer's braking system must comply with current legislation.
- If pulling a trailer with assisted braking, the tractor lift truck must be equipped with a trailer braking mechanism. In this case, do not forget to connect the trailer braking equipment to the lift truck.
- The vertical force on the towing hook must not exceed the maximum authorised by the manufacturer (consult the manufacturer's plate on your lift truck).
- The authorised gross vehicle weight must not exceed the maximum weight authorised by the manufacturer (see: 2 - DESCRIPTION: CHARACTERISTICS).

**IF NECESSARY, CONSULT YOUR DEALER.**

## INSTRUCTIONS FOR HANDLING A LOAD

### A - CHOICE OF ATTACHMENTS

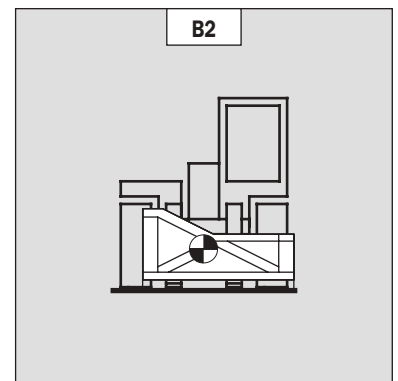
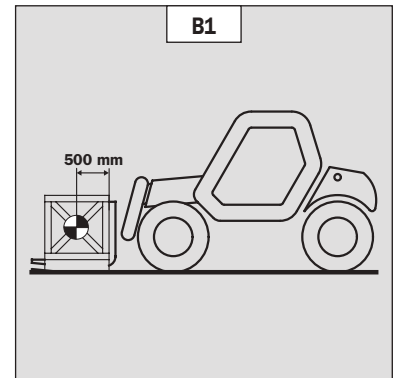
- Only attachments approved by MANITOU can be used on its lift trucks.
- Make sure the attachment is appropriate for the work to be done (see: 4 - ADAPTABLE ATTACHMENTS IN OPTION ON THE RANGE).
- If the lift truck is equipped with the Single side-shift carriage OPTION (TSDL), use only the authorised attachments (see: 4 - ADAPTABLE ATTACHMENTS IN OPTION ON THE RANGE).
- Make sure the attachment is correctly installed and locked onto the lift truck carriage.
- Make sure that your lift truck attachments work properly.
- Comply with the load chart limits for the lift truck for the attachment used.
- Do not exceed the rated capacity of the attachment.
- Never lift a load in a sling without the attachment provided for the purpose, as the sling risks to slip (see: INSTRUCTIONS FOR HANDLING A LOAD: H - TAKING UP AND LAYING DOWN A SUSPENDED LOAD).

### B - MASS OF LOAD AND CENTRE OF GRAVITY

- Before taking up a load, you must know its mass and its centre of gravity.
- The load chart for your lift truck is valid for a load in which the longitudinal position of the centre of gravity is 500 mm from the base of the forks (fig. B1). For a higher centre of gravity, contact your dealer.
- For irregular loads, determine the transverse centre of gravity before any movement (fig. B2) and set it in the longitudinal axis of the lift truck.

**!** *It is forbidden to move a load heavier than the effective capacity defined on the lift truck load chart.*

**!** *For loads with a moving centre of gravity (e.g. liquids), take account of the variations in the centre of gravity in order to determine the load to be handled and be vigilant and take extra care to limit these variations as far as possible.*

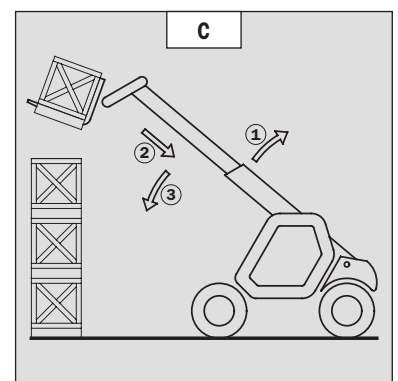


### C - LONGITUDINAL STABILITY LIMITER AND WARNING DEVICE

This device gives an indication of the longitudinal stability of the lift truck, and limits hydraulic movements in order to ensure this stability, at least under the following operating conditions:

- when the lift truck is at a standstill,
  - when the lift truck is on firm, stable and consolidated ground,
  - when the lift truck is performing handling and placing operations.
- Move the jib very carefully when approaching the authorized load limit (see: 2 - DESCRIPTION: INSTRUMENTS AND CONTROLS).
  - Always watch this device during handling operations.
  - In the event that "AGGRAVATING" hydraulic movements are cut-off, only perform de-aggravating hydraulic movements in the following order (fig. C): if necessary, raise the jib (1), retract the jib as far as possible (2) and lower the jib (3) to set down the load.

**!** *The instrument reading may be erroneous when the steering is at its maximum limit or the rear axle oscillated to its limit. Before lifting a load, make sure that the lift truck is not in either of these situations.*



## D - TRANSVERSE ATTITUDE OF THE LIFT TRUCK

Depending on the model of lift truck

The transverse attitude is the transverse slope of the chassis with respect to the horizontal.

Raising the jib reduces the lift truck's lateral stability. The transverse attitude must be set with the jib in down position as follows:

### 1 - LIFT TRUCK WITHOUT SLOPE CORRECTOR USED ON TYRES

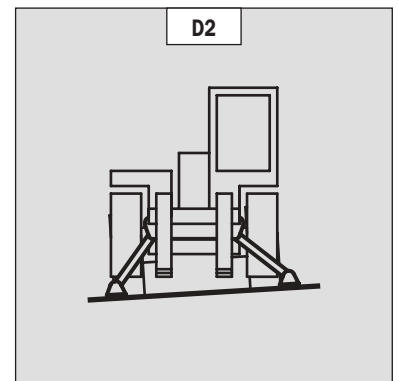
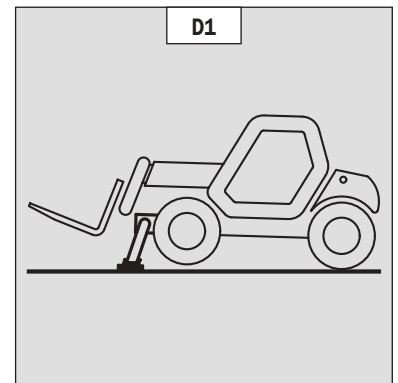
- Position the lift truck so that the bubble in the level is between the two lines (see: 2 - DESCRIPTION: INSTRUMENTS AND CONTROLS).

### 2 - LIFT TRUCK WITH SLOPE CORRECTOR USED ON TYRES

- Correct the slope using the hydraulic control and verify the horizontality via the level. The bubble in the level must be between the two lines (see: 2 - DESCRIPTION: INSTRUMENTS AND CONTROLS).

### 3 - LIFT TRUCK USED ON STABILIZERS

- Set the two stabilizers on the ground and raise the two front wheels of the lift truck (fig. D1).
- Correct the slope using the stabilizers (fig. D2) and make sure the truck is horizontal by checking the level. The bubble of the level must be between the two lines (see: 2 - DESCRIPTION: INSTRUMENTS AND CONTROLS). In this position, the two front wheels must be off the ground.



## E - TAKING UP A LOAD ON THE GROUND

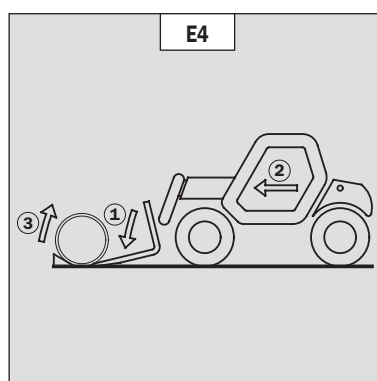
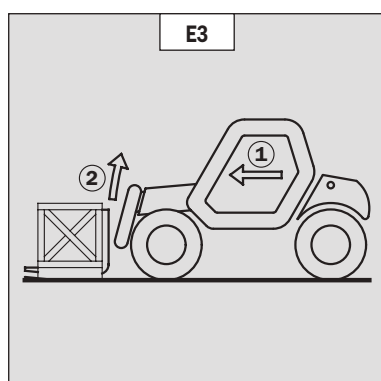
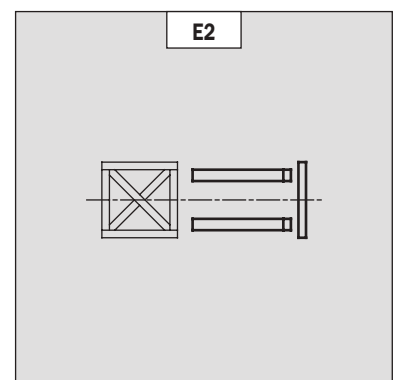
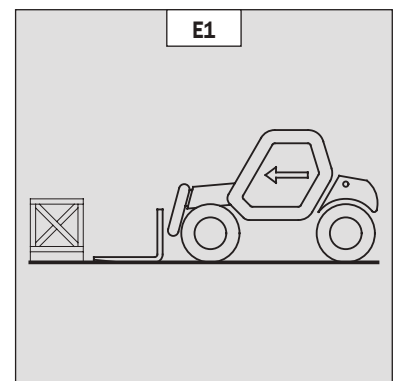
- Approach the lift truck perpendicular to the load, with the jib retracted and the forks in a horizontal position (fig. E1).
- Adjust the fork spread and centering in connection with the load (fig. E2) (optional solutions exist, consult your dealer).
- Never lift a load with a single fork.

**!** Beware of the risks of trapping or squashing limbs when manually adjusting the forks.

- Move the lift truck forward slowly (1) and bring the forks to stop in front of the load (fig. E3), if necessary, slightly lift the jib (2) while taking up the load.
- Bring the load into the transport position.
- Tilt the load far enough backwards to ensure stability (loss of load on braking or going downhill).

### FOR A NON-PALLETIZED LOAD

- Tilt the carriage (1) forwards and move the lift truck slowly forwards (2), to insert the fork under the load (fig. E4) (block the load if necessary).
- Continue to move the lift truck forwards (2) tilting the carriage (3) (fig. E4) backwards to position the load on the forks and check the load's longitudinal and lateral stability.



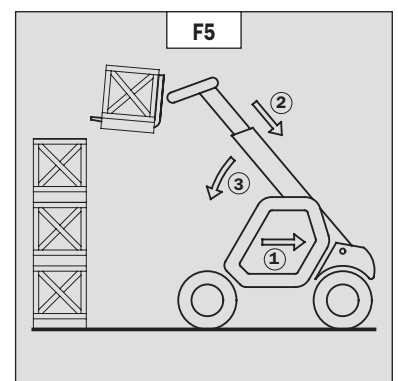
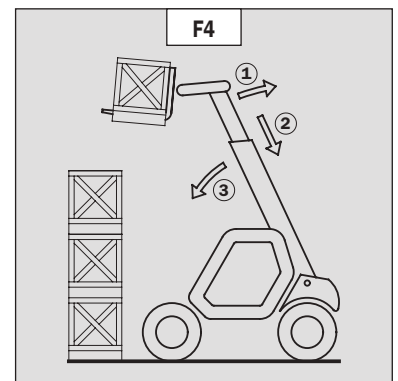
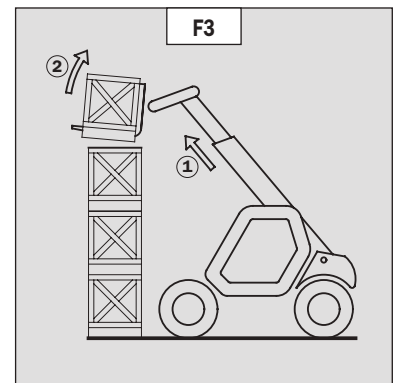
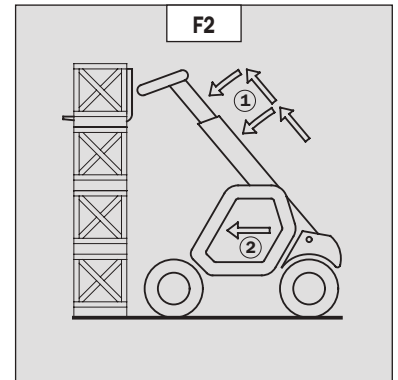
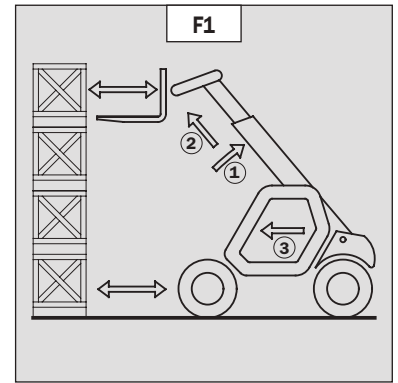
## F - TAKING UP AND LAYING A HIGH LOAD ON TYRES

**⚠ You must not raise the jib if you have not checked the transverse attitude of the lift truck (see: INSTRUCTIONS FOR HANDLING A LOAD: D - TRANSVERSE ATTITUDE OF THE LIFT TRUCK).**

REMINDER: Make sure that the following operations can be performed with good visibility (see: OPERATIONS INSTRUCTIONS UNLADEN AND LADEN: D - VISIBILITY).

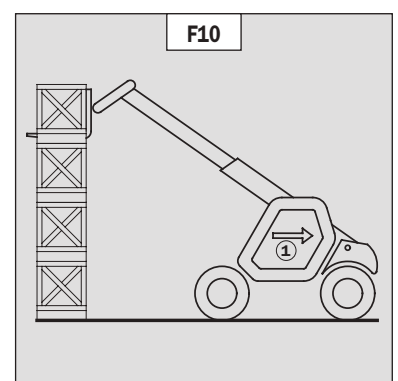
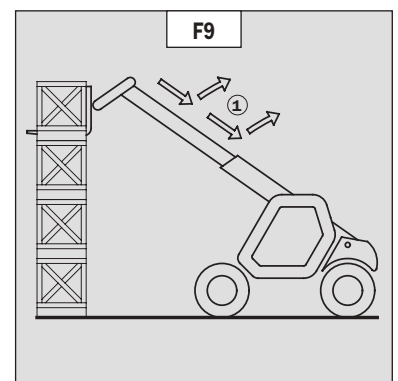
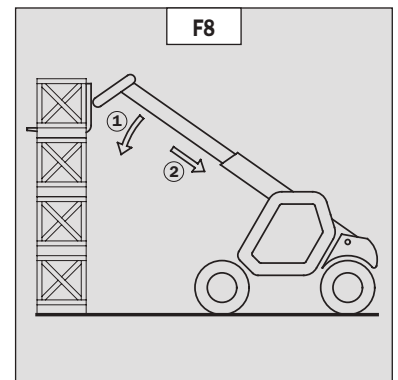
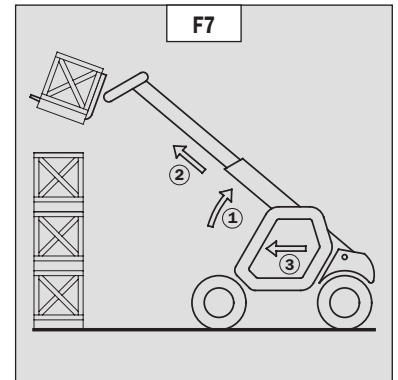
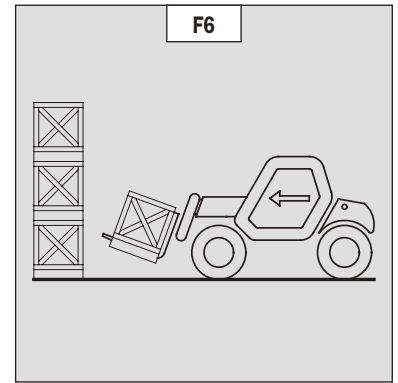
### TAKING UP A HIGH LOAD ON TYRES

- Ensure that the forks will easily pass under the load.
- Lift and extend the jib (1) (2) until the forks are level with the load, moving the lift truck (3) forward if necessary (fig. F1), moving very slowly and carefully.
- Always think about keeping the distance necessary to fit the forks under the load, between the pile and the lift truck (fig. F1) and use the shortest possible length of jib.
- Stop the forks in front of the load by alternately extending and retracting the jib (1) or, if necessary, moving the lift truck forward (2) (fig. F2). Put the handbrake on and set the forward/reverse selector to neutral.
- Slightly lift the load (1) and incline the carriage (2) backwards to stabilize the load (fig. F3).
- Tilt the load sufficiently backwards to ensure its stability.
- Watch the longitudinal stability limiter and warning device (see: INSTRUCTIONS FOR HANDLING A LOAD: C - LONGITUDINAL STABILITY LIMITER AND WARNING DEVICE). If it is overloaded, replace the load in the place from which it was taken.
- If possible lower the load without shifting the lift truck. Lift the jib (1) to release the load, retract (2) and lower the jib (3) to bring the load into the transport position (fig. F4).
- If this is not possible, back up the lift truck (1), manoeuvring very gently and carefully to release the load. Retract (2) and lower the jib (3) to bring the load into the transport position (fig. F5).



## LAYING A HIGH LOAD ON TYRES

- Approach the load in the transport position in front of the pile (fig. F6).
- Put the handbrake on and set the forward/reverse selector to neutral.
- Lift and extend the jib (1) (2) until the load is above the pile, while keeping an eye on the longitudinal stability limiter and warning device (see: INSTRUCTIONS FOR HANDLING A LOAD: C - LONGITUDINAL STABILITY LIMITER AND WARNING DEVICE). If necessary, move the lift truck (3) forward (fig. F7), driving very slowly and carefully.
- Place the load in a horizontal position and lay it down on the pile by lowering and retracting the jib (1) (2) in order to position the load correctly (fig. F8).
- If possible, release the fork by alternately retracting and raising the jib (1) (fig. F9). Then set the forks into transport position.
- If this is not possible, reverse the lift truck (1) very slowly and carefully to release the forks (fig. F10). Then set them into transport position.





## G - TAKING UP AND LAYING A HIGH LOAD ON STABILIZERS

Depending on the model of lift truck

**!** *You must not raise the jib if you have not checked the transverse attitude of the lift truck (see: INSTRUCTIONS FOR HANDLING A LOAD: D - TRANSVERSE ATTITUDE OF THE LIFT TRUCK).*

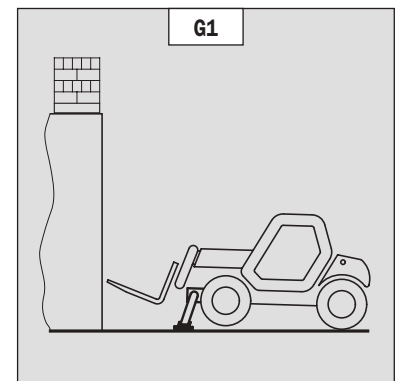
REMINDER: Make sure that the following operations can be performed with good visibility (see: OPERATIONS INSTRUCTIONS UNLADEN AND LADEN: D - VISIBILITY).

### USING THE STABILIZERS

The stabilizers are used to optimise the lift truck's lifting performances (see: 2 - DESCRIPTION: INSTRUMENTS AND CONTROLS).

#### POSITION THE STABILIZERS WITH THE FORKS IN TRANSPORT POSITION (UNLADEN AND LADEN)

- Set the forks in transport position in front of the elevation.
- Stay far enough away to have room for the jib to be raised.
- Put the handbrake on and put the gearshift lever into neutral.
- Set the two stabilizers on the ground and lift the two front wheels of the lift truck (fig. G1), while maintaining its transverse stability.



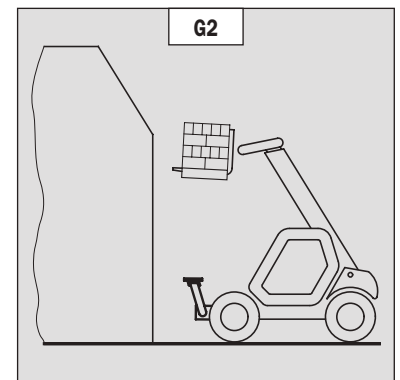
#### RAISE THE STABILIZERS WITH THE FORKS IN TRANSPORT POSITION (UNLADEN AND LADEN)

- Raise both stabilizers fully and at the same time.

#### SETTING THE STABILIZERS WITH THE JIB UP (UNLADEN AND LADEN)

**!** *This operation must be exceptional and performed with great care.*

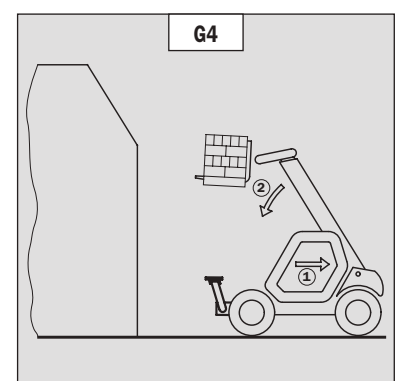
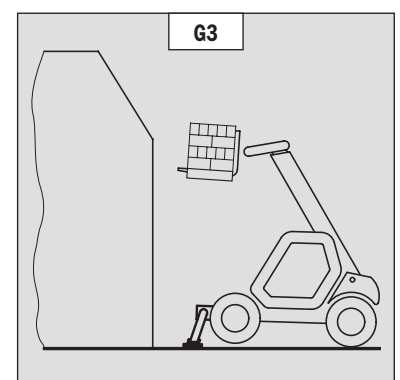
- Raise the jib and retract the telescopes completely.
- Set the lift truck in position in front of the elevation (fig. G2) moving very slowly and carefully.
- Put the handbrake on and put the gearshift lever into neutral.
- Move the stabilizers very slowly and gradually as soon as they are close to the ground or in contact with it.
- Lower the two stabilizers and lift the two front wheels of the lift truck (fig. G3). During this operation, transverse attitude must be permanently maintained: the bubble in the level must be kept between the two lines.



#### SETTING THE STABILIZERS WITH THE JIB UP (UNLADEN AND LADEN)

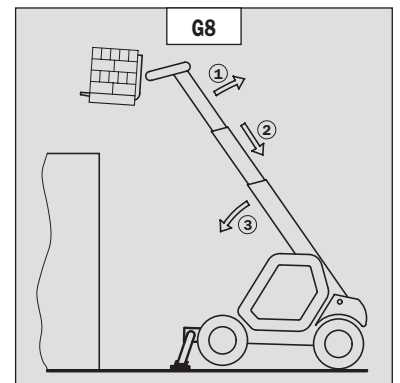
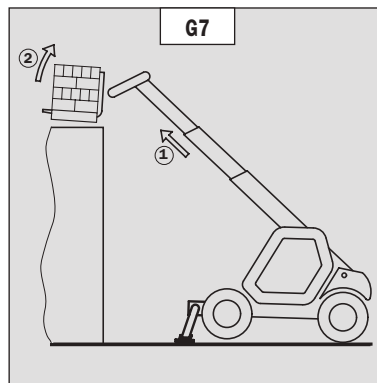
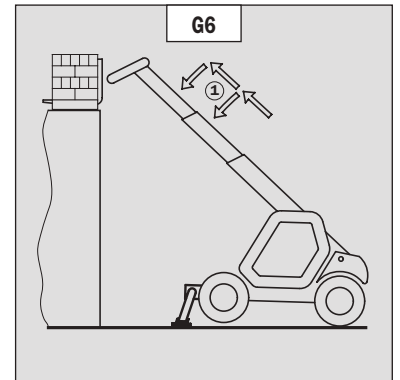
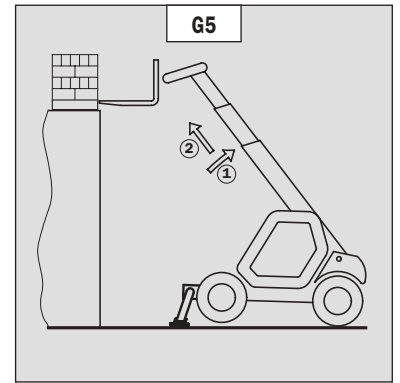
**!** *This operation must be exceptional and performed with great care.*

- Keep the jib up and retract the telescopes completely (fig. G3).
- Move the stabilizers very slowly and gradually as soon as they are in contact with the ground and when they leave the ground. During this operation, the transverse attitude must be permanently maintained: the bubble in the level must be kept between the two lines.
- Raise both stabilizers completely.
- Release the parking brake and reverse the lift truck (1) very slowly and carefully, to release it and lower the forks (2) into transport position (fig. G4).



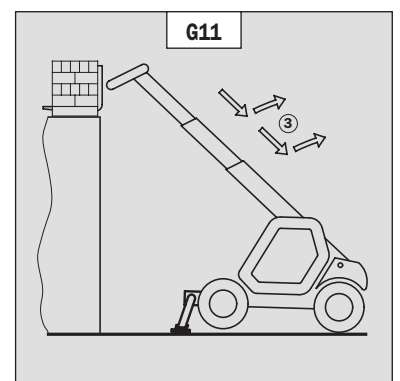
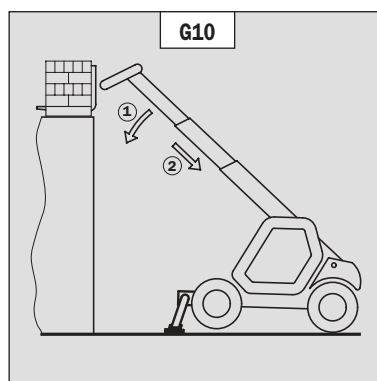
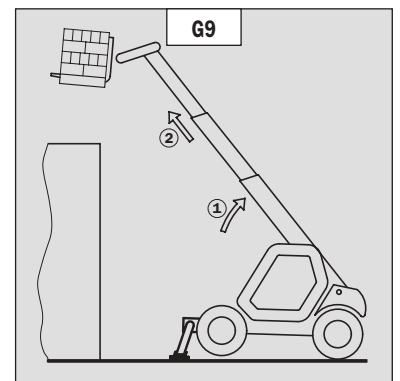
### TAKING UP A HIGH LOAD ON STABILIZERS

- Make sure the forks will fit easily under the load.
- Check the position of the lift truck with respect to the load and make a test run, if necessary, without taking the load.
- Raise and extend the jib (1) (2) until the forks are at the level of the load (fig. G5).
- Block the forks in front of the load by alternately using the controls to extend and lower the jib (1) (fig. G6).
- Lift the load slightly (1) and tilt the carriage (2) backwards to stabilise the load (fig. G7).
- Monitor the longitudinal stability limiter and warning device (see: INSTRUCTIONS FOR HANDLING A LOAD: C - LONGITUDINAL STABILITY LIMITER AND WARNING DEVICE). If it is overloaded, set the load down in the place from where it was taken.
- If possible lower the load without moving the lift truck. Raise the jib (1) to release the load, retract (2) and lower the jib (3) to set the load into transport position (fig. G8).



### LAYING A HIGH LOAD ON STABILIZERS

- Raise and extend the jib (1) (2) until the load is above the elevation (fig. G9), while monitoring the longitudinal stability limiter and warning device (see: INSTRUCTIONS FOR HANDLING A LOAD: C - LONGITUDINAL STABILITY LIMITER AND WARNING DEVICE).
- Position the load horizontally and release it by lowering and retracting the jib (1) (2) to position the load correctly (fig. G10).
- Release the forks by alternating retracting and raising the jib (3) (fig. G11).
- If possible, set the jib in transport position without moving the lift truck.



## H - TAKING UP AND LAYING DOWN A SUSPENDED LOAD



**WARNING:** Failure to follow the above instructions may lead the lift truck to loose stability and overturn.



**MUST** be used with a lift truck equipped with an operational hydraulic movement cut-out device.

### CONDITIONS OF USE

- The length of the sling or the chain shall be as short as possible to limit swinging of the load.
- Lift the load vertically along its axis, never by pulling sideways or lengthways.

### HANDLING WITHOUT MOVING THE LIFT TRUCK

- Whether on stabilisers or on tyres, the lateral attitude must not exceed 1 % and the longitudinal attitude must not exceed 5%, the bubble of the level must be held at "0".
- Ensure that the wind speed is not higher than 10 m/s.
- Ensure that there is no one between the load and the lift truck.

## I - TRAVELLING WITH A SUSPENDED LOAD

- Before moving, inspect the terrain in order to avoid excessive slopes and cross-falls, bumps and potholes, or soft ground.
- Ensure that the wind speed is not higher than 10 m/s.
- The lift truck must not travel at more than 0.4 m/s (1.5 km/h, i.e., one quarter walking speed).
- Drive and stop the lift truck gently and smoothly to minimise swinging of the load.
- Carry the load a few centimetres above the ground (max. 30 cm) the shortest possible jib length. Do not exceed the offset indicated on the load chart. If the load begins to swing excessively, do not hesitate to stop and lower the jib to set down the load.
- Before moving the lift truck, check the longitudinal stability limiter and warning device (see: 2 - DESCRIPTION: INSTRUMENTS AND CONTROLS), only the green LEDs and possibly the yellow LEDs should be lit.
- During transport, the lift truck operator must be assisted by a person on the ground (standing a minimum of 3 m from the load), who will limit swinging of the load using a bar or a rope. Ensure that this person is always clearly in view.
- The lateral attitude must not exceed 5%, the bubble in the level must be kept between the two "MAX." marks
- The longitudinal attitude must not exceed 15%, with the load facing uphill, and 10%, with the load facing downhill.
- The jib angle must not exceed 45°.
- If the first red LED of the longitudinal stability limiter and warning device (see: 2 - DESCRIPTION: INSTRUMENTS AND CONTROLS) comes on while travelling, gently bring the lift truck to a stop and stabilise the load. Retract the telescope to reduce the offset of the load.

# PLATFORM OPERATING INSTRUCTIONS

For PLATFORM-fitted lift trucks

 **Installation of the platform on the lift truck is only possible if the shields “operating the platform” of the lift truck and the platform are identical (see: 2 - DESCRIPTION: OPERATING THE PLATFORM).**

## A - AUTHORISATION FOR USE

- Operation of the platform requires further authorisation in addition to that of the lift truck.

## B - SUITABILITY OF THE TRUCK FOR USE

- MANITOU has ensured that this lift truck is suitable for use under the standard operating conditions defined in this operator’s manual, with a **STATIC test coefficient of 1.25** and a **DYNAMIC test coefficient of 1.1**, as specified in harmonised standard **EN 280** for “mobile elevating work platforms”.
- Before commissioning, the company manager must make sure that the platform is appropriate for the work to be done, and perform certain tests (in accordance with current legislation).

## C - PRECAUTIONS WHEN USING THE PLATFORM

- Wear clothes suited for operating the platform, avoid loose clothes.
- Never operate the platform when hands or feet are wet or soiled with greasy substances.
- Always pay attention when using the platform. Do not listen to the radio or music using headphones or earphones.
- For increased comfort, adopt the correct position at the platform’s operator station.
- The platform’s guard rail exempts the operator from wearing a safety harness under normal operating conditions. As a result, you are responsible deciding whether to wear a safety harness.
- The controls must not be used for any other than their intended purpose (e.g. getting in and out of the lift truck, coat hanger etc.).
- Safety helmets must be worn.
- The operator must always be in the normal operator’s position. It is prohibited to have arms or legs, or generally any part of the body, protruding from the basket.
- Ensure that any materials loaded onto the platform (pipes, cables, containers, etc.) cannot fall out. Do not pile these materials to the point where it is necessary to step over them.

## D - USING THE PLATFORM

- However experienced they may be, operators must acquaint themselves with the emplacement and operation of all control instruments prior to operating the platform.
- Check before operating that the platform has been correctly assembled and locked onto the lift truck.
- Check before operating the platform that the access gate has been properly locked.
- The platform should be operated in an area free of any obstructions or danger when it is lowered to the ground.
- The operator using the platform must be aided on the ground by a person with adequate training.
- You should stay within the limits set out in the platform load chart.
- The lateral stresses are limited pressure (see: 2 - DESCRIPTION: CHARACTERISTICS).
- It is strictly forbidden to hand a load from the platform or the lift truck jib without a specially designed attachment (see: INSTRUCTIONS FOR HANDLING A LOAD: H - TAKING UP AND LAYING DOWN A SUSPENDED LOAD).
- The platform cannot be used as a crane or a lift for permanently transporting people or materials, nor as jacks or supports.
- The lift truck must not be moved with one (or more) person(s) in the platform.
- It is forbidden to transport people on the platform using the hydraulic controls in the lift truck’s driver’s cab (except in case of rescue).
- The operator must not get in or out of the platform when it is not on ground level (jib retracted and in the down position).
- The platform must not be fitted with attachments that increase the unit’s wind load.
- Do not use ladders or improvised structures in the platform to gain extra height.
- Do not climb onto the sides of the platform to gain extra height.

## E - ENVIRONMENT

 **Operating the platform close to electricity cables is forbidden. Maintain the specified safe distances.**

NOMINAL VOLTAGE	DISTANCE ABOVE THE GROUND OR THE FLOOR IN METRES
50 < U < 1000	2,30 M
1000 < U < 30000	2,50 M
30000 < U < 45000	2,60 M
45000 < U < 63000	2,80 M
63000 < U < 90000	3,00 M
90000 < U < 150000	3,40 M
150000 < U < 225000	4,00 M
225000 < U < 400000	5,30 M
400000 < U < 750000	7,90 M



**Operation of the platform is strictly forbidden in the event of wind speeds of over 45 km/h.**

- The following scale is given for an empiric evaluation of the wind speed:

BEAUFORT scale (wind speed at a height of 10 m from flat ground)						
Force	Type of wind	Speed (knots)	Speed (kph)	Speed (m/s)	Effects on Land	Sea condition
0	Calm	0 - 1	0 - 1	< 0,3	Smoke rises vertically.	Sea like a mirror.
1	Light air	1 - 3	1 - 5	0,3 - 1,5	The wind bends the smoke.	Ripples but without foam crests.
2	Light breeze	4 - 6	6 - 11	1,6 - 3,3	The wind can be felt on the face, shakes the leaves.	Small but evident wavelets.
3	Gentle breeze	7 - 10	12 - 19	3,4 - 5,4	The wind continuously shakes the leaves and twigs.	Large wavelets Perhaps scattered white horses.
4	Moderate breeze	11 - 16	20 - 28	5,5 - 7,9	The wind raises dust and scraps of paper, shakes the twigs.	Small waves. Fairly frequent white horses.
5	Fresh breeze	17 - 21	29 - 38	8 - 10,7	Leafy shrubs sway.	Small waves form on inland waters. Moderate waves, many white horses.
6	Strong breeze	22 - 27	39 - 49	10,8 - 13,8	Shakes thick branches, metal wires hum, it becomes difficult to keep an umbrella open.	Large waves begin to form, white foam crests, probably spray.
7	Near gale	28 - 33	50 - 61	13,9 - 17,1	Whole trees sway, it is difficult to walk against the wind.	Sea heaps up and white foam blown in streaks along the direction of the wind.
8	Gale	34 - 40	62 - 74	17,2 - 20,7	Breaks the branches of trees, it is almost impossible to walk against the wind.	Moderately high waves, crests begin to break into spindrift.
9	Strong gale	41 - 47	75 - 88	20,8 - 24,4	Causes slight damage to buildings (stacks, tiles, etc..).	High waves. Dense foam along the direction of the wind. Crests of waves begin to roll over. Spray may affect visibility.
10	Storm	48 - 55	89 - 102	24,5 - 28,4	Rare inland, uproots trees, causes considerable damage to buildings.	Very high waves with long overhanging crests. Visibility affected.
11	Violent storm	56 - 63	103 - 117	28,5 - 32,6	Very rare, causes extensive devastation.	Exceptionally high waves that may hide medium sized ships. Visibility affected.
12	Hurricane	64 +	118 +	32,7 +	Causes very serious catastrophes.	The air is filled with foam and spray. Sea completely white with driving spray. Visibility very seriously affected.

## F - MAINTENANCE



**Your platform must be periodically inspected to ensure its continued compliance. The inspection frequency is defined by the current legislation in the country in which the platform is used.**


## **INSTRUCTIONS FOR USING THE RADIO-CONTROL**

For lift trucks with RC radio control

### **HOW TO USE THE RADIO-CONTROL**

#### **SAFETY INSTRUCTIONS**

- This radio-control consists of electronic and mechanical safety elements. It cannot receive commands from another transmitter because the internal encoding is unique to each radio-control.

 ***If it is used improperly or incorrectly, there is a risk of danger to:***  
- ***The physical and mental health of the user or others.***  
- ***The lift truck and other neighbouring items.***

 ***Everyone working with this radio-control:***  
- ***Must be qualified in line with current regulations and therefore appropriately trained.***  
- ***Must follow this instruction manual as closely as possible.***

- The system is used to control the lift truck remotely via radio waves. Commands are also transmitted if the lift truck is out of sight (behind an obstacle or a building for example), this is why:

- After stopping the truck and removing the key button (only possible when it is stationary), always place the transmitter in a safe, dry place.
- Before performing any installation, servicing or repair work, always switch off power sources (in particular, electric welding devices and electric head units on hydraulic distributors must be disconnected at each section).
- Never remove or alter the safety devices (such as the hand-guard frame, key, emergency stop button, etc.).

 ***Never drive the lift truck if it is not continuously and perfectly within view of the operator!***

- Before leaving the transmitter, the operator must make sure that it cannot be used by an unauthorized third person: either by removing the key button from the transmitter or locking it in an inaccessible place.

- The user must ensure that the instruction manual is accessible at all times and that operators have read and understood it.

#### **INSTRUCTIONS**

- Take up position in a stable place with no risk of slipping.

- Before using the transmitter, make sure there is nobody within the working area.

- Only use the transmitter with its carrying device or installed correctly on the platform.

 ***When you remove the transmitter, remove the accumulator and key button so that it cannot be used accidentally or deliberately by anyone else.***

#### **PROTECTIVE DEVICES**

- The lift truck will be immobilised within 450 milliseconds (approx. 0.5 second) at most:

- If the transmitter emergency stop button (50 milliseconds), or the one on the lift is pressed.
- If the transmission distance of the radio waves is exceeded.
- If the transmitter is faulty.
- If an interfering radio signal is received from elsewhere.
- If the accumulator is removed from its housing in the transmitter.
- If the accumulator reaches the end of its autonomy.
- If the transmitter is switched off by turning the key button to stop.

- These protective devices are provided for the safety of personnel and property and must never be altered, removed or bypassed in any way whatsoever!

- The hand-guard frame prevents external action on a manipulator (if the transmitter falls, for example, or if the operator leans on a guard-rail).

- An electronic safety device prevents radio transmission from being initiated if the manipulators are not mechanically and electrically at rest and if the internal combustion engine speed selector is not set to idle.

 ***In an emergency, press the transmitter emergency stop button immediately ; then follow the manual's instructions (see: 2 - DESCRIPTION: INSTRUMENTS AND CONTROLS).***

# MAINTENANCE INSTRUCTIONS OF THE LIFT TRUCK

## GENERAL INSTRUCTIONS

---

- Ensure the area is sufficiently ventilated before starting the lift truck.
- Wear clothes suitable for the maintenance of the lift truck, avoid wearing jewellery and loose clothes. Tie and protect your hair, if necessary.
- Stop the I.C. engine and remove the ignition key, when an intervention is necessary.
- Read the operator's manual carefully.
- Carry out all repairs immediately, even if the repairs concerned are minor.
- Repair all leaks immediately, even if the leak concerned is minor.
- Make sure that the disposal of process materials and of spare parts is carried out in total safety and in a ecological way.
- Be careful of the risk of burning and splashing (exhaust, radiator, I.C. engine, etc.).

## MAINTENANCE

---

- Perform the periodic service (see: 3 - MAINTENANCE) to keep your lift truck in good working conditions. Failure to perform the periodic service may cancel the contractual guarantee.

### MAINTENANCE LOGBOOK

- The maintenance operations carried out in accordance with the recommendations given in part: 3 - MAINTENANCE and the other inspection, servicing or repair operations or modifications performed on the lift truck or its attachments shall be recorded in a maintenance logbook. The entry for each operation shall include details of the date of the works, the names of the individuals or companies having performed them, the type of operation and its frequency, if applicable. The part numbers of any lift truck items replaced shall also be indicated.

## LUBRICANT AND FUEL LEVELS

---


- Use the recommended lubricants (never use contaminated lubricants).
- Do not fill the fuel tank when the I.C. engine is running.
- Only fill up the fuel tank in areas specified for this purpose.
- Do not fill the fuel tank to the maximum level.
- Do not smoke or approach the lift truck with a flame, when the fuel tank is open or is being filled.

## HYDRAULIC

---

- Any work on the load handling hydraulic circuit is forbidden except for the operations described in part: 3 - MAINTENANCE.
- Do not attempt to loosen unions, hoses or any hydraulic component with the circuit under pressure.

 **BALANCING VALVE: It is dangerous to change the setting and remove the balancing valves or safety valves which may be fitted to your lift truck cylinders. These operations must only be performed by approved personnel (consult your dealer).**

 **The HYDRAULIC ACCUMULATORS that may be fitted on your lift truck are pressurized units. Removing these accumulators and their pipework is a dangerous operation and must only be performed by approved personnel (consult your dealer).**

## ELECTRICITY

---

- Do not short-circuit the starter relay to start the IC engine. If the forward/reverse selector is not in neutral and the parking brake is not engaged, the lift truck may suddenly start to move.
- Do not drop metallic items on the battery.
- Disconnect the battery before working on the electrical circuit.

## **WELDING**

---

- Disconnect the battery before any welding operations on the lift truck.
- When carrying out electric welding work on the lift truck, connect the negative cable from the equipment directly to the part being welded, so as to avoid high tension current passing through the alternator.
- Never carry out welding or work which gives off heat on an assembled tyre. The heat would increase the pressure which could cause the tyre to explode.
- If the lift truck is equipped with an electronic control unit, disconnect this before starting to weld, to avoid the risk of causing irreparable damage to electronic components.

## **WASHING THE LIFT TRUCK**

---

- Clean the lift truck or at least the area concerned before any intervention.
- Remember to close and lock all accesses to the lift truck (doors, windows, cowls...).
- During washing, avoid the articulations and electrical components and connections.
- If necessary, protect against penetration of water, steam or cleaning agents, components susceptible of being damaged, particularly electrical components and connections and the injection pump.
- Clean the lift truck of any fuel, oil or grease trace.

**FOR ANY INTERVENTION OTHER THAN REGULAR MAINTENANCE, CONSULT YOUR DEALER.**



# **IF THE LIFT TRUCK IS NOT TO BE USED FOR A LONG TIME**

## **INTRODUCTION**

---

The following recommendations are intended to prevent the lift truck from being damaged when it is withdrawn from service for an extended period.

For these operations, we recommend the use of a MANITOU protective product, reference 603726. Instructions for using the product are given on the packaging.



**Procedures to follow if the lift truck is not to be used for a long time and for starting it up again afterwards must be performed by your dealership.**

## **PREPARING THE LIFT TRUCK**

---

- Clean the lift truck thoroughly.
- Check and repair any leakage of fuel, oil, water or air.
- Replace or repair any worn or damaged parts.
- Wash the painted surfaces of the lift truck in clear and cold water and wipe them.
- Touch up the paintwork if necessary.
- Shut down the lift truck (see: OPERATING INSTRUCTIONS UNLADEN AND LADEN).
- Make sure the jib cylinder rods are all in retracted position.
- Release the pressure in the hydraulic circuits.

## **PROTECTING THE I.C. ENGINE**

---

- Fill the tank with fuel (see: 3 - MAINTENANCE: A - DAILY OR EVERY 10 HOURS SERVICE).
  - Empty and replace the cooling liquid (see: 3 - MAINTENANCE: F - EVERY 2000 HOURS SERVICE).
  - Leave the I.C. engine running at idling speed for a few minutes, then switch off.
  - Replace the I.C. engine oil and oil filter (see: 3 - MAINTENANCE: D - EVERY 500 HOURS SERVICE).
  - Add the protective product to the engine oil.
  - Run the I.C. engine for a short time so that the oil and cooling liquid circulate inside.
  - Disconnect the battery and store it in a safe place away from the cold, after charging it to a maximum.
  - Remove the injectors and spray the protective product into each cylinder for two seconds with the piston in low neutral position.
  - Turn the crankshaft once slowly and refit the injectors (see I.C. engine REPAIR MANUAL).
  - Remove the intake hose from the manifold or turbocharger and spray the protective product into the manifold or turbocharger.
  - Cap the intake manifold or turbocharger hole with waterproof adhesive tape.
  - Remove the exhaust pipe and spray the protective product into the exhaust manifold or turbocharger.
  - Refit the exhaust pipe and block the outlet with waterproof adhesive tape.
- NOTE: The spray time is noted on the product packaging and must be increased by 50 % for turbo engines.
- Open the filler plug, spray the protective product around the rocker arm shaft and refit the filler plug.
  - Cap the fuel tank using waterproof adhesive tape.
  - Remove the drive belts and store them in a safe place.
  - Disconnect the engine cut-off solenoid on the injection pump and carefully insulate the connection.

## **PROTECTING THE LIFT TRUCK**

---

- Set the lift truck on axle stands so that the tyres are not in contact with the ground and release the handbrake.
- Protect cylinder rods which will not be retracted, from corrosion.
- Wrap the tyres.

NOTE: If the lift truck is to be stored outdoors, cover it with a waterproof tarpaulin.

## ***BRINGING THE LIFT TRUCK BACK INTO SERVICE***

---

- Remove the waterproof adhesive tape from all the holes.
- Refit the intake hose.
- Refit and reconnect the battery.
- Remove the protection from the cylinder rods.
- Perform the daily service (see: 3 - MAINTENANCE: A - DAILY OR EVERY 10 HOURS SERVICE).
- Put the handbrake on and remove the axle stands.
- Empty and replace the fuel and replace the fuel filter (see: 3 - MAINTENANCE: D - EVERY 500 HOURS SERVICE).
- Refit and set the tension in the drive belts (see: 3 - MAINTENANCE: C - EVERY 250 HOURS SERVICE).
- Turn the I.C. engine using the starter, to allow the oil pressure to rise.
- Reconnect the engine cut-off solenoid.
- Lubricate the lift truck completely (see: 3 - MAINTENANCE: SERVICING SCHEDULE).



***Make sure the area is adequately ventilated before starting up the lift truck.***

- Start up the lift truck, following the safety instructions and regulations (see: OPERATING INSTRUCTIONS UNLADEN AND LADEN).
- Run all the jib's hydraulic movements, concentrating on the ends of travel for each cylinder.



## ***2 - DESCRIPTION***



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# IDENTIFICATION OF THE LIFT TRUCK

As our policy is to promote a constant improvement of our products, our range of telescopic lift trucks may undergo certain modifications, without obligation for us to advise our customers.

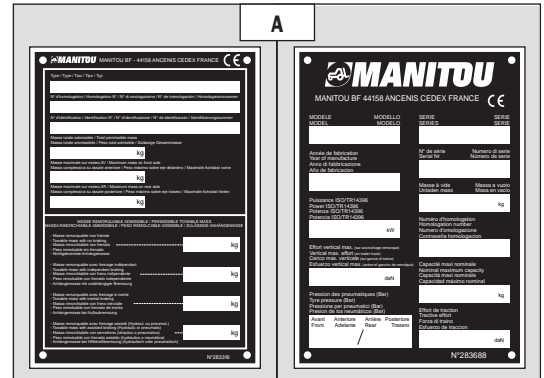
When you order parts, or when you require any technical information, always specify:

NOTE: For the owner's convenience, it is recommended that a note of these numbers is made in the spaces provided, at the time of the delivery of the lift truck.

## LIFT TRUCK MANUFACTURER'S PLATE (FIG. A)

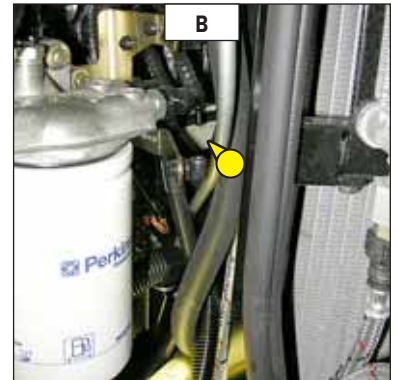
- Model .....
- Series .....
- Serial Nr .....
- Year of manufacture .....

For any further technical information regarding your lift truck refer to chapter:  
2 - DESCRIPTION: CHARACTERISTICS.



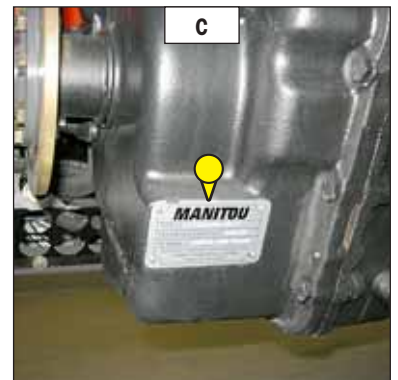
## I.C. ENGINE (FIG. B)

- I.C. engine Nr .....



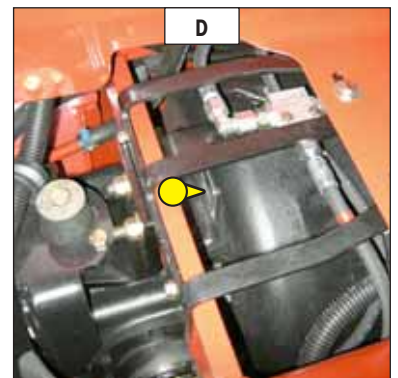
## GEAR BOX (FIG. C)

- Type .....
- MANITOU reference .....
- Serial Nr .....



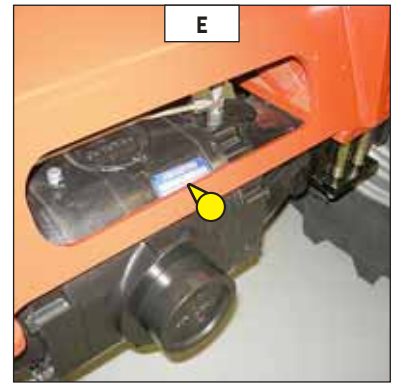
## ANGLE GEARBOX (FIG. D)

- Type .....
- MANITOU reference .....
- Serial Nr .....



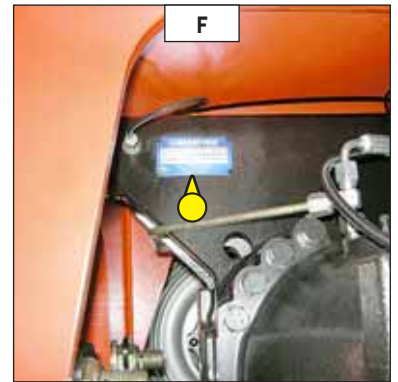
**FRONT AXLE (FIG. E)**

- Type .....
- Serial Nr .....
- MANITOU reference .....



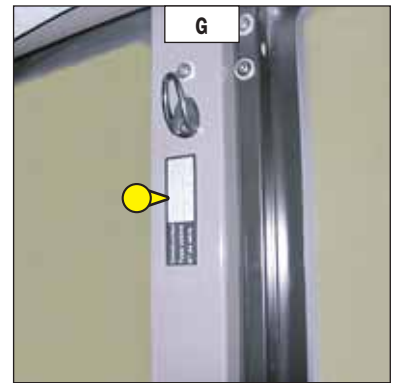
**REAR AXLE (FIG. F)**

- Type .....
- Serial Nr .....
- MANITOU reference .....



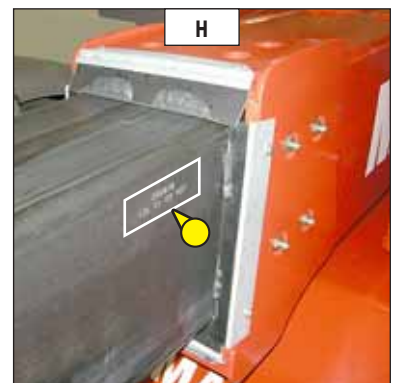
**CAB (FIG. G)**

- Type .....
- Serial Nr .....



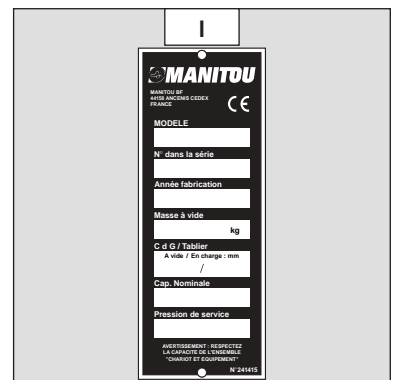
**BOOM (FIG. H)**

- MANITOU reference .....
- Date of manufacture .....



**PLATE MANUFACTURER OF THE ATTACHMENT (FIG. I)**

- Model .....
- Serial Nr .....
- Year of manufacture .....





# CHARACTERISTICS

MLT 735 -120 LSU Série 6-E3

I.C. ENGINE		
Type		PERKINS 1104D-E44TA NJ38698
Fuel		Diesel
Number of cylinders		4 in line
Suction		Supercharged
Injection system		Direct
Ignition sequence		1,3,4,2
Capacity	cm <sup>3</sup> (cu/in)	4400(268.5)
Bore and stroke	mm(in)	105 x 127(4 x 5)
Compression ratio		16,2:1
Nominal rating loaded	rpm	2200
Rating slow unladen	rpm	930
Max. rating unladen	rpm	2360
Power ISO/TR 14396	cv- kW	124 - 91
Power SAE J 1995	cv- kW	124 - 91
Maximum torque ISO/TR 14396	Nm	490 to 1400 rpm
Air cleaner	µm	3
Type of cooling		By water
Fan		Puller

TRANSMISSION		
Gear box		TURNER
Type		Mechanical
Forward/reverse selector		Electro-hydraulic
Torque converter		SACHS
Number of forward speeds		4
Number of reverse speeds		4
Angle gear box		TURNER
Front axle		DANA
Differential		Limited slip
Rear axle		DANA
Differential		Without locking
Drive wheels		4RM Permanent
Switch for 2/4 drive wheels		No
Front tyres		MICHELIN
Size		460-70 R24 159A8 TL
Pressure	bar(psi)	3,4(49)
Rear tyres		MICHELIN
Size		460-70 R24 159A8 TL
Pressure	bar(psi)	3,4(49)

ELECTRIC CIRCUIT		
Battery	Standard Option	12 V - 2 x 74 Ah - 2 x 680 A EN
Alternator		12 V - 85 A
Type		Denso Ai115
Starter		12 V - 4,2 kW
Type		AZF

BRAKE CIRCUIT		
Service brake		Hydraulic power brake
Type of brake		Multidisk brake immersed in oil
Type of control		Foot-operated for the front and rear axles
Parking brake		Mechanical
Type of brake		Discon gear-box output
Type of control		Manual

SOUND AND VIBRATION		
Level of sound pressure in the driver's cab LpA (according to standard NF EN 12053)	dB	79
Level of sound power ensured in the LwA environment (according to directive 2000/14/EC modified by directive 2005/88/EC)	dB	106 (measured) 107 (ensured)
Average weighted acceleration on driver's body (according to standard NF EN 13059)	m/s <sup>2</sup>	
The average weighted acceleration transmitted to the driver's hand/arm system (according to standard ISO 5349-2)	m/s <sup>2</sup> (ft/s <sup>2</sup> )	< 2,5(<8.2)

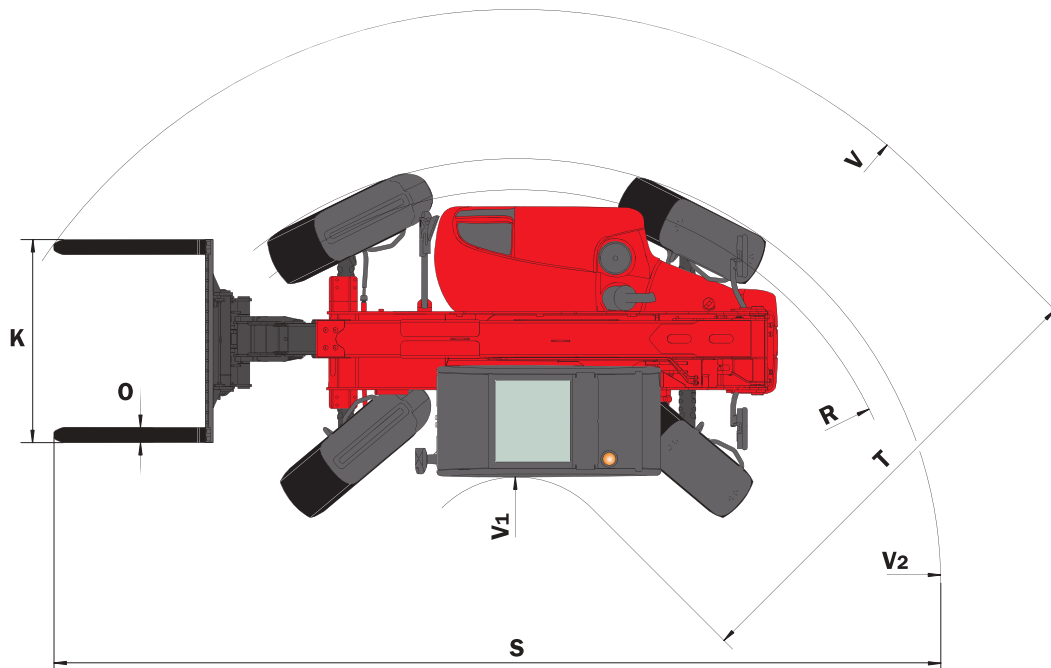
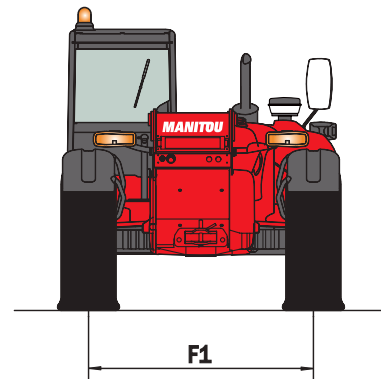
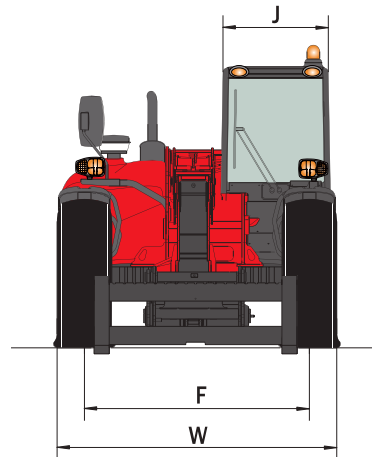
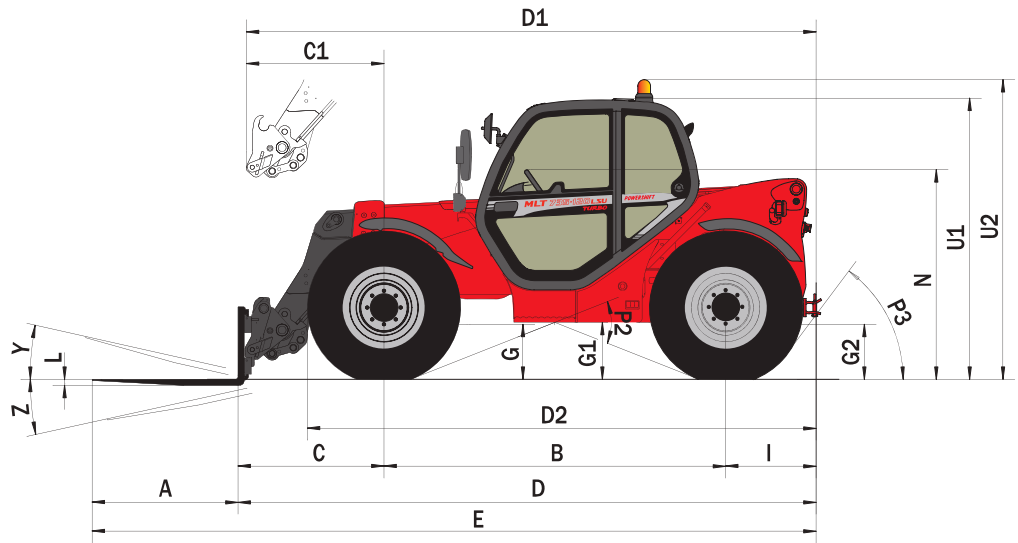
HYDRAULIC CIRCUIT		
Hydraulic pump		
Type		Variable volume pistons
		1st casing
Capacity	cm <sup>3</sup> (cu/in)	63(3.8)
Max. rating capacity unladen	l/mn(gl/min)	149(39.4)
Flow rate at 1600 rpm	l/mn(gl/min)	101(26.7)
Filtration		
Return	µm	15
Suction	µm	125
Maximum service pressure	bar (psi)	270 (3915)
Telescoping circuit	bar (psi)	200/270 (2900/3316)
Lifting circuit	bar (psi)	270/270 (3316)
Tilt circuit	bar (psi)	190/270 (2756/3316)
Attachment circuit	bar (psi)	270 (3316)
Steering circuit	bar (psi)	140 (2030)

HYDRAULIC MOVEMENTS		
Longitudinal stability limiter and warning device		Electronic
Lifting motions (boom retracted)		
Unladen lifting	s - m/mn (ft/mn)	6,7 - 40,2 (41-132)
Laden lifting	s - m/mn (ft/mn)	7,3 - 36,9 (24-121)
Unladen lowering	s - m/mn (ft/mn)	4,8 - 56,1 (16-184)
Laden lowering	s - m/mn (ft/mn)	4,6 - 58,5 (15-192)
Telescoping motions (boom raised)		
Unladen extending	s - m/mn (ft/mn)	7,1 - 22,2 (23-73)
Laden extending	s - m/mn (ft/mn)	7,3 - 22,8 (24-75)
Unladen retracting	s - m/mn (ft/mn)	5,7 - 28,4 (19-93)
Laden retracting	s - m/mn (ft/mn)	5,5 - 29,5 (18-97)
Tilting movements		
Unladen digging	s - °/s	3,0 - 48,8
Forward tilting unladen	s - °/s	2,35 - 62,3

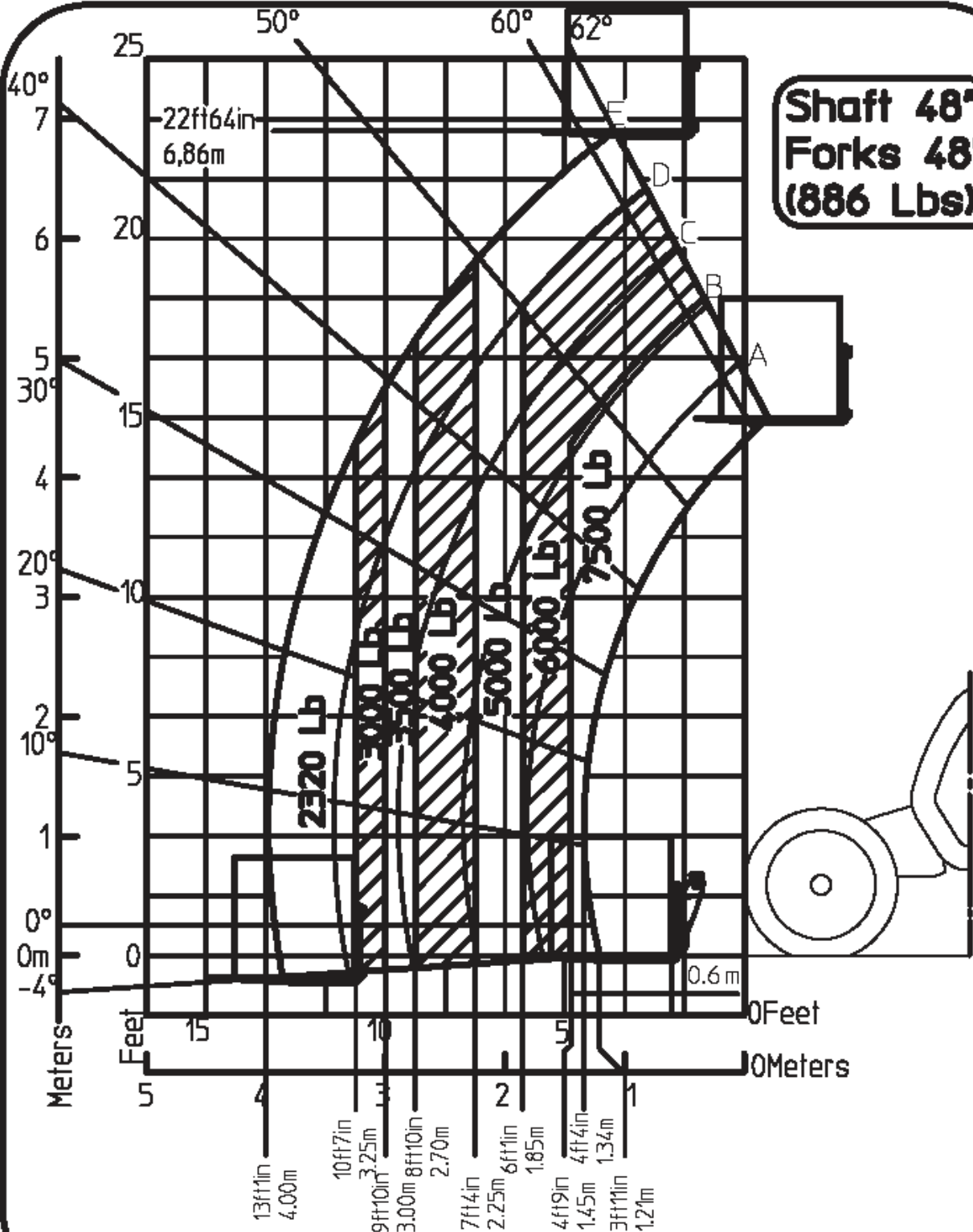
SPECIFICATIONS AND WEIGHTS		
Speed of movement for lift truck in standard configuration on flat ground (except particular conditions)		
Front unladen	1	km/h (mph)
	2	km/h (mph)
	3	km/h (mph)
	4	km/h (mph)
Rear unladen	1	km/h (mph)
	2	km/h (mph)
	3	km/h (mph)
	4	km/h (mph)
Standard attachment		PFB
Weight of attachment (without fork)	kg (lbs)	95 (209)
Weight of forks (each one)	kg (lbs)	72,5 (160)
Rated capacity with standard attachment	kg (lbs)	3500 (7716)
Tipping load at maximum reach on tyres	kg (lbs)	1490 (3284)
Distance from the centre of gravity from the load to the lug of the forks	mm (in)	500 (20)
Standard lifting height	mm (in)	6860 (270)
Lift truck weight without attachment	kg (lbs)	6860 (15124)
Lift truck weight with standard attachment		
Unladen	kg (lbs)	7100 (15653)
At rated load	kg (lbs)	10600 (23369)
Weight per axle with standard attachment (transport position)		
Front unladen	kg (lbs)	3445 (7595)
Rear unladen	kg (lbs)	3655 (8058)
Front rated load	kg (lbs)	9370 (20657)
Rear rated load	kg (lbs)	1230 (2712)
Weight per axle with standard attachment (boom extended)		
Front rated load	kg (lbs)	7630 (16821)
Rear rated load	kg (lbs)	620 (1367)
Contact pressure on the ground for the whole surface of each stabilizer at maximum load when tilting	kg/cm <sup>2</sup>	-
Drag strain on the coupling hook		
Unladen (sliding)	daN (lbf)	5465 (12286)
At rated load (transmission setting)	daN (lbf)	7820 (17580)
Pull strain with open carrier (according to standard ISO 8313)	daN (lbf)	3700 (8318)

# DIMENSIONS AND LOAD CHART

<b>A</b>	mm (in.)	1200 (47.2)
<b>B</b>	mm (in.)	2810 (110.6)
<b>C</b>	mm (in.)	1192 (46.9)
<b>C1</b>	mm (in.)	1287 (50.7)
<b>D</b>	mm (in.)	4791 (188.6)
<b>D1</b>	mm (in.)	4886 (192.4)
<b>D2</b>	mm (in.)	4165 (164.0)
<b>E</b>	mm (in.)	5991 (235.8)
<b>F</b>	mm (in.)	1935 (73.6)
<b>F1</b>	mm (in.)	1935 (73.6)
<b>G</b>	mm (in.)	450 (17.7)
<b>G1</b>	mm (in.)	435 (17.1)
<b>G2</b>	mm (in.)	435 (17.1)
<b>I</b>	mm (in.)	789 (31.1)
<b>J</b>	mm (in.)	980 (34.1)
<b>K</b>	mm (in.)	1260 (49.6)
<b>L</b>	mm (in.)	45 (1.8)
<b>N</b>	mm (in.)	1715 (67.5)
<b>O</b>	mm (in.)	125 (4.9)
<b>P2</b>	(°)	38
<b>P3</b>	(°)	53
<b>R</b>	mm (in.)	3685 (145)
<b>S</b>	mm (in.)	7712 (303.6)
<b>T</b>	mm (in.)	3575 (140.7)
<b>U1</b>	mm (in.)	2295 (90.4)
<b>U2</b>	mm (in.)	2545 (100.2)
<b>V</b>	mm (in.)	4885 (192.3)
<b>V1</b>	mm (in.)	1310 (51.8)
<b>V2</b>	mm (in.)	3919 (154.3)
<b>W</b>	mm (in.)	2402 (94.6)
<b>Y</b>	(°)	12
<b>Z</b>	(°)	133,7



# MLT735 -USA-



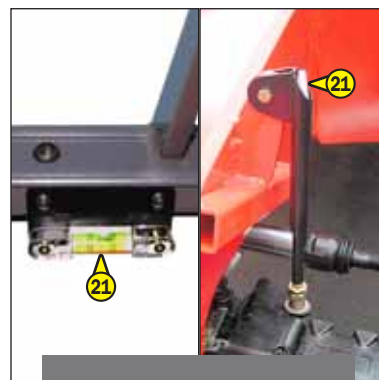
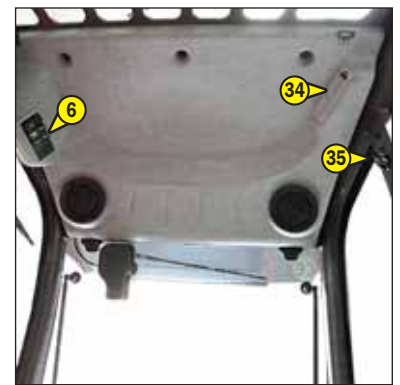
**Shaft 48"  
Forks 48"  
(886 Lbs)**

**N°260353**

An American national standard ASME B56-6b-1998



# INSTRUMENTS AND CONTROLS



## **DESCRIPTION**

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- 1 - DRIVER'S SEAT
- 2 - SAFETY BELT
- 3 - CONTROL AND SIGNAL LIGHTS PANEL
- 4 - EMERGENCY STOP BUTTON
- 5 - EMERGENCY EXIT
- 6 - SWITCHES
- 7 - LIGHT SWITCH, HORN AND INDICATOR SWITCH
- 8 - FRONT AND REAR WINDSCREEN WIPER SWITCH
- 9 - IGNITION SWITCH
- 10 - FUSES AND RELAYS IN THE CAB
- 11 - FUSES AND RELAYS UNDER THE ENGINE HOOD (NOT ILLUSTRATED)
- 12 - DIAGNOSTIC SOCKET only for MLT ... -120 ...
- 13 - ACCELERATOR PEDAL
- 14 - SERVICE BRAKE PEDAL AND TRANSMISSION CUT-OFF
- 15 - GEAR LEVER AND TRANSMISSION CUT-OFF
- 16 - PARKING BRAKE LEVER
- 17 - FORWARD/NEUTRAL/REVERSE GEAR SELECTION
- 18 - STEERING SELECTION
- 19 - HYDRAULIC CONTROLS AND TRANSMISSION CUT-OFF
- 20 - FUNCTION FILES
- 21 - LEVEL INDICATORS
- 22 - HEATER CONTROL
- 22 - AIR CONDITIONING CONTROLS (OPTION AIR CONDITIONING)
- 23 - CAB FILTER VENTILATORS
- 24 - WINDSCREEN DEMISTER VENTS
- 25 - HEATING VENTS
- 26 - BRAKE FLUID RESERVOIR AND WINDSCREEN WASHER ACCESS PANEL
- 27 - STEERING WHEEL REGULATING HANDLE
- 28 - DOOR LOCK
- 29 - LOCKING HANDLE FOR UPPER HALF-DOOR
- 30 - UNLOCKING BUTTON FOR UPPER HALF DOOR
- 31 - HANDLE FOR REAR WINDOW OPENING
- 32 - DOCUMENT HOLDER
- 33 - SUN VISOR
- 34 - OVERHEAD LIGHT
- 35 - HOOK
- 36 - CIGAR LIGHTER
- 37 - ARMREST AND STORAGE
- 38 - CAR RADIO (OPTION)
- 39 - INSIDE REAR-VIEW MIRROR (OPTION) (NOT ILLUSTRATED)
- 40 - TOOL BOX (NOT ILLUSTRATED) except for MLT 1035 L Turbo LSU Série 6-E3
- 41 - NUMBER PLATE (NOT ILLUSTRATED)
- 42 - NUMBER PLATE LIGHTING (NOT ILLUSTRATED)
- 43 - REAR REFLECTORS (NOT ILLUSTRATED)
- 44 - FRONT LIGHTS (NOT ILLUSTRATED)
- 45 - REAR LIGHTS (NOT ILLUSTRATED)
- 46 - FLASHING LIGHT (NOT ILLUSTRATED)

NOTE: All the terms such as: RIGHT, LEFT, FRONT, REAR are meant for an observer seated on driver's seat and looking in front of him.



## 1 - DRIVER'S SEAT

DESIGNED FOR MAXIMUM COMFORT, THIS SEAT CAN BE ADJUSTED AS FOLLOWS.

### WEIGHT ADJUSTMENT (FIG. A)

It is advised that the weight be adjusted when the driver is not sitting in the cab.

- Refer to graduation 1 of the seat.
- Turn handle 2 depending on the driver's weight.

NOTE: To avoid any health problems, it is recommended that the weight should be checked and adjusted before starting up the lift truck.

### SEAT HEIGHT ADJUSTMENT (FIG. B)

- Raise the seat to the desired position, until you hear the ratchet click. If you raise the seat above the last notch (stop), the seat drops down to the lowest position.

### SEAT BACK-REST ANGLE ADJUSTMENT (FIG. C)

The back-rest angle of the seat may be adjusted to suit the individual.

- Press the left-hand button while pushing on the seat or relaxing pressure on the seat to find a comfortable position.

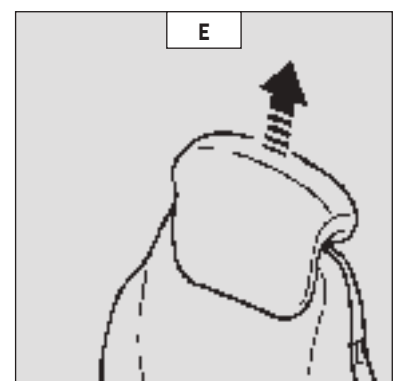
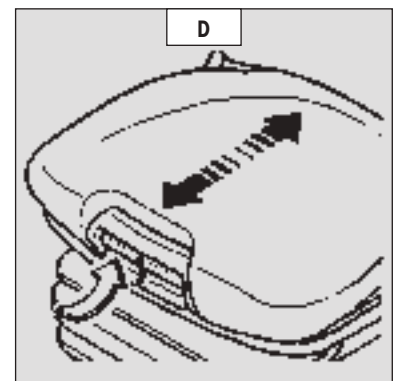
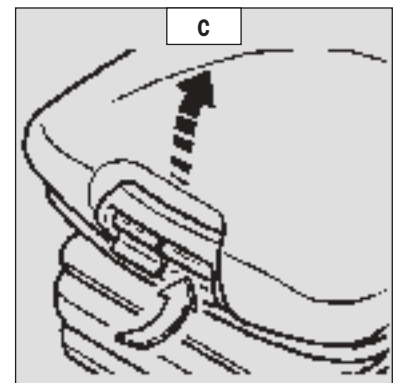
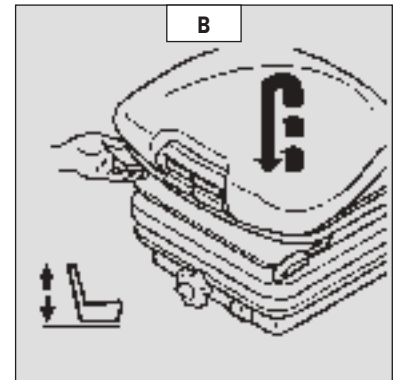
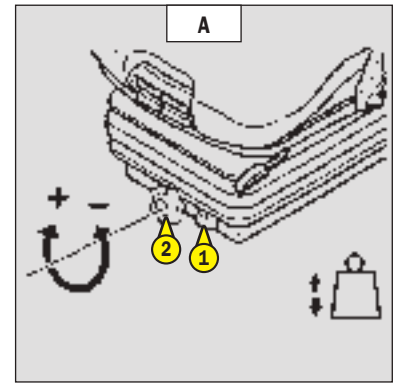
### SEAT DEPTH ADJUSTMENT (FIG. D)

The depth of the seat may be adjusted to suit the individual.

- Press the right-hand button while raising or lowering the seat to find the desired position.

### EXTENDING THE HEAD-REST (FIG. E)

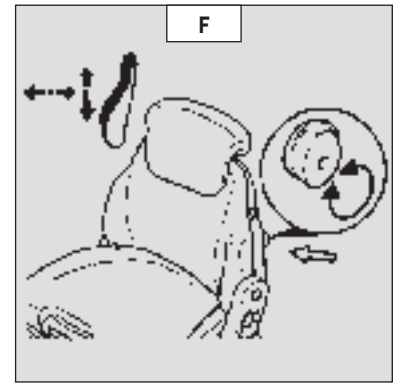
- The height of the back-rest can be adjusted by pulling it upwards (the notches will click) up to the stop.
- The head-rest can be removed by applying sufficient pressure to pull it off the stop.



### LUMBAR ADJUSTMENT (FIG. F)

This increases the comfort of the seat and the driver's freedom of movement.

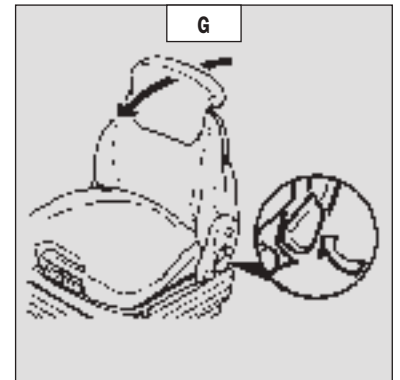
- Turn the handle either left or right to adjust the height or depth of the lumbar support.



### ADJUSTMENT OF THE ANGLE OF THE BACK-REST (FIG. G)

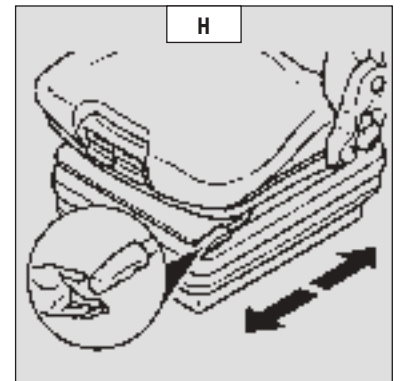
- Support the back-rest, pull the lever and position the back-rest to find the desired position.

**!** *If you do not support the back-rest when making adjustments, it swings completely forwards.*



### LONGITUDINAL ADJUSTMENT (FIG. H)

- Adjust the locking lever until you reach the position required. This then locks and the seat will not shift into another position.



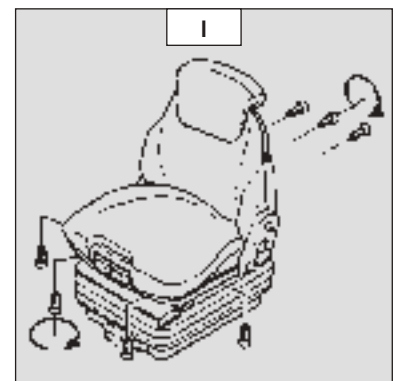
### MAINTENANCE (FIG. I)

Dirt may adversely affect the correct functioning of the seat. For this reason, make sure your seat is always clean.

- To clean or change the cushions, simply remove them from the seat frame.

**!** *A rocking head-rest increases the risk of an accident !*

Avoid wetting the cushion fabric when cleaning. Check the resistance of the fabric on a small hidden area before using any fabric or plastic cleaner.





## 1 - BASIC PNEUMATIC DRIVER'S SEAT (OPTION)

DESIGNED FOR MAXIMUM COMFORT, THIS SEAT CAN BE ADJUSTED AS FOLLOWS.

### **WEIGHT ADJUSTMENT (FIG. A)**

It is advised that you adjust the seat according to your weight when sitting.

- Switch on lift truck ignition.
- Push or pull lever 1 until green appears in display 2 indicating correct adjustment according to your weight.

NOTE: To avoid any health problems, it is recommended that the weight should be checked and adjusted before starting up the lift truck.

### **SEAT HEIGHT ADJUSTMENT (FIG. B)**

When weight adjustment has been carried out, you can then modify seat height.

- Keep the ignition on in the lift truck.
- Push or pull lever 1 until green appears and adjust the height of the seat while checking that the green in display 2 remains visible.

**!** *To avoid causing any damage, do not activate the compressor for over 1 minute.*

### **SEAT BACK-REST ANGLE ADJUSTMENT (FIG. C)**

The back-rest angle of the seat may be adjusted to suit the individual.

- Press the left-hand button while pushing on the seat or relaxing pressure on the seat to find a comfortable position.

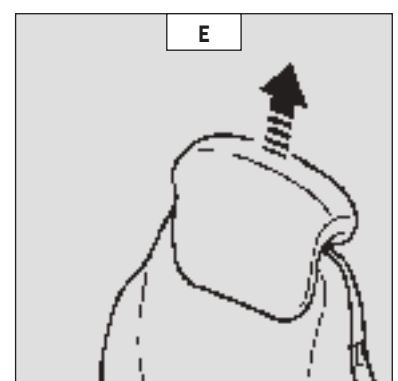
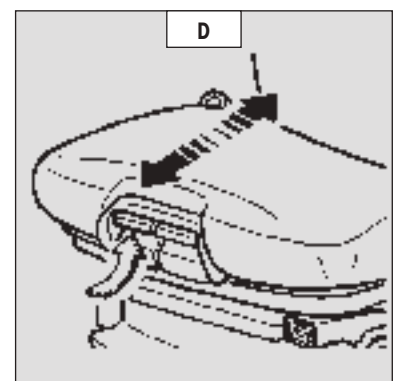
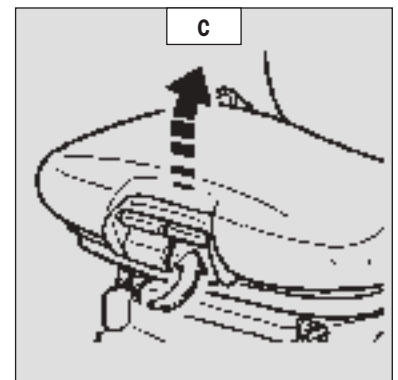
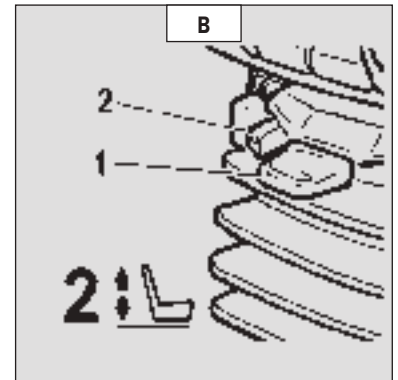
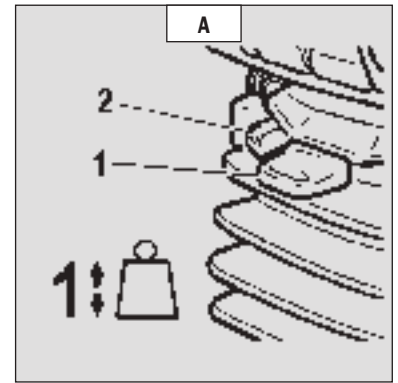
### **SEAT DEPTH ADJUSTMENT (FIG. D)**

The depth of the seat may be adjusted to suit the individual.

- Press the right-hand button while raising or lowering the seat to find the desired position.

### **EXTENDING THE HEAD-REST (FIG. E)**

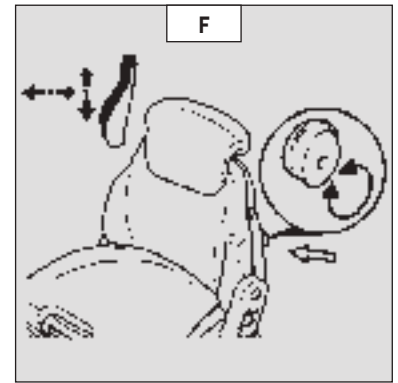
- The height of the back-rest can be adjusted by pulling it upwards (the notches will click) up to the stop.
- The head-rest can be removed by applying sufficient pressure to pull it off the stop.



### LUMBAR ADJUSTMENT (FIG. F)

This increases the comfort of the seat and the driver's freedom of movement.

- Turn the handle either left or right to adjust the height or depth of the lumbar support.



### ADJUSTMENT OF THE ANGLE OF THE BACK-REST (FIG. G)

- Support the back-rest, pull the lever and position the back-rest to find the desired position.

**⚠** *If you do not support the back-rest when making adjustments, it swings completely forwards.*

### HORIZONTAL SHOCK ABSORBER (FIG. H)

In certain conditions (e.g. driving with a trailer) it is advised that a horizontal shock absorber be used. The driver's seat is thus better able to absorb jerks in the direction of travel.

- Position 1: Horizontal shock absorber fitted.
- Position 2: Horizontal shock absorber removed.

### LONGITUDINAL ADJUSTMENT (FIG. I)

- Adjust the locking lever until you reach the position required. This then locks and the seat will not shift into another position.

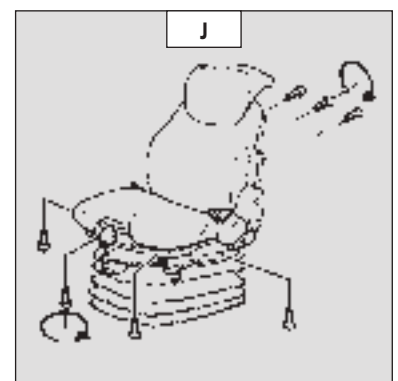
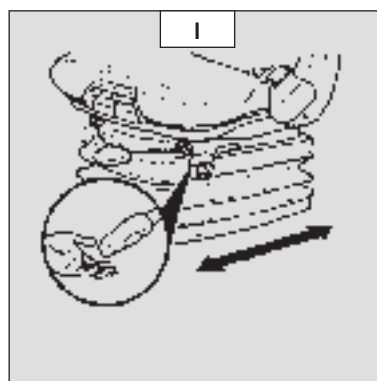
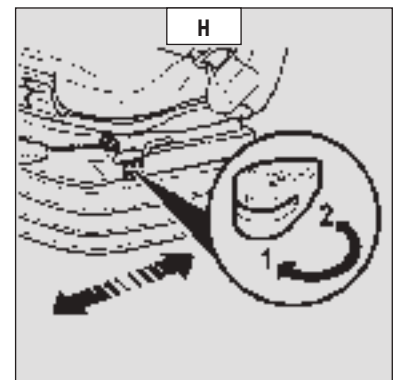
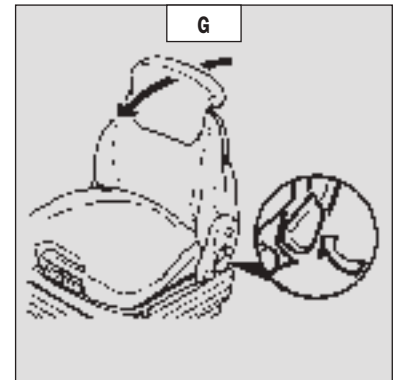
### SERVICING (FIG. J)

Dirt may adversely affect the correct functioning of the seat. For this reason, make sure your seat is always clean.

- To clean or change the cushions, simply remove them from the seat frame.

**⚠** *A rocking head-rest increases the risk of an accident !*

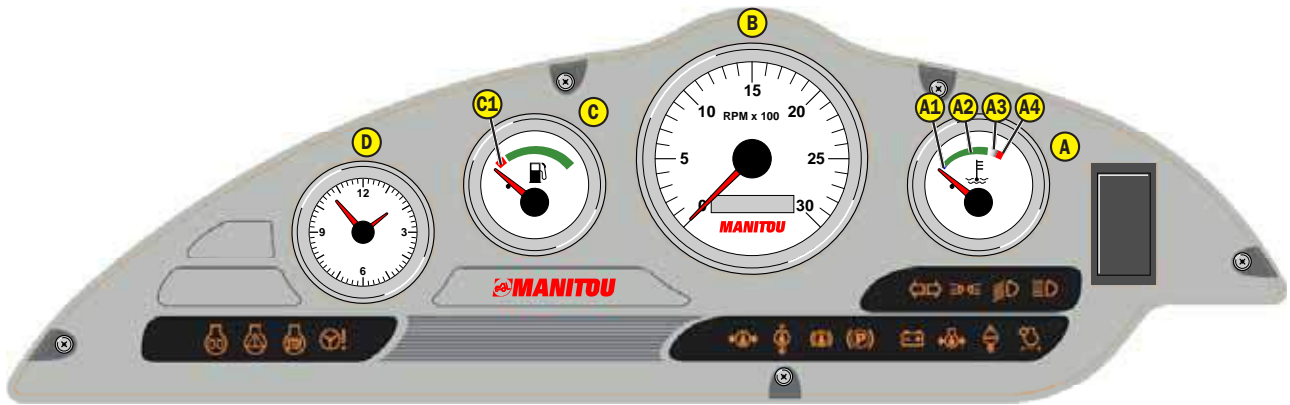
Avoid wetting the cushion fabric when cleaning. Check the resistance of the fabric on a small hidden area before using any fabric or plastic cleaner.



## 2 - SAFETY BELT

- Sit correctly on the seat.
- Check that seat belt is not twisted.
- Place the seat belt at hip level.
- Attach the seat belt and check that it locks.
- Adjust the seat belt to your body shape without squeezing your hip and without over-slack.

**⚠** *In no event should the lift truck be used if the seat belt is defective (fixing, locking, cuts, tears, etc.). Repair or replace the seat belt immediately.*




**CONTROL INSTRUMENTS**

**A - I.C. ENGINE WATER TEMPERATURE**

Temperature zone:

- A1 - Blue zone (0° - 50°) 122 °F Use the lift truck with moderation, wait for temperature to increase before normal operation.
- A2 - Green zone (50° - 100°) 122 °F - 212 °F Use lift truck normally
- A3 - White/red zone (100° - 105°) 212 °F - 221 °F Use lift truck with moderation, monitor the temperature.
- A4 - Red zone (105° - 120°) 221 °F - 248 °F Stop the lift truck, look for the cause of overheating.

NOTE: Red indicator  light comes on between zone A3 and A4.

**B - HOUR METER AND REV COUNTER**

**C - FUEL LEVEL**

Red zone C1 indicates that you are using the reserve supply and that time of use is limited.


**D - CLOCK**


**SIGNAL LIGHTS**


**!** *A permanently lit or flashing warning lamp, with the engine running, is the sign of an operating fault. The lighting of some lamps may be accompanied by an audible signal. Do not ignore this warning, consult your dealer without delay.*  
*If one of the warning lamps comes on while the lift truck is in motion, stop the lift truck under the safest possible conditions.*


When activating the electrical system of the lift truck, all the red and orange lamps and the panel’s buzzer must light to indicate their good working order. If one of the red lamps or the buzzer does not function, carry out the necessary repairs.

NOTE:  only for: MLT ... -120 ...

 **ORANGE I.C. ENGINE PREHEATING INDICATOR LIGHT**  
 Preheating is necessary. When the lift truck is switched on, the lamp comes on for 2 seconds and off as soon as preheating is ended. Start the lift truck’s I.C. engine.

 **ORANGE I.C. ENGINE WARNING INDICATOR LIGHT**  
 If the lamp comes on or flashes while the lift truck is in operation, a diagnostic fault has been detected. The lift truck will operate in reduced mode. Consult your dealer without delay.

 **RED I.C. ENGINE STOPPED INDICATOR LIGHT**  
 If the lamp comes on or flashes, when the lift truck is running, stop the I.C. engine immediately and consult your dealer.

 **RED STEERING SYSTEM OIL PRESSURE WARNING INDICATOR LIGHT**  
 If the lamp comes on when the lift truck is running, stop the I.C. engine immediately and look for the cause (possible leak, etc.).

NOTE: The indicator lights  go off after engine preheating.



#### **RED GEAR BOX OIL PRESSURE WARNING INDICATOR LIGHT**

The lamp and buzzer come on when there is an abnormal drop in gear box pressure, in forward gear. Stop the I.C engine and look for the cause (gear box oil level, possible leak, radiator, etc.).

NOTE: The signal light operates in forward travel conditions only, the signal should not be taken into account when the I.C. engine is running at idle or is stopped.



#### **RED CLUTCH PRESSURE WARNING INDICATOR LIGHT**

The lamp and buzzer come on when there is an abnormal drop in pressure in the gear box. Stop the I.C engine and look for the cause (gear box oil level, possible leak, radiator, etc.).

NOTE: Since this light only operates while driving, do not take the information into consideration when the lift truck has stopped or is idling.



#### **RED TRANSMISSION OIL TEMPERATURE FAULT INDICATOR LIGHT**

The lamp and buzzer come on when the gearbox oil temperature is abnormally high. Stop the I.C engine and look for the cause (gear box oil level, possible leak, radiator, etc.).



#### **RED BRAKING OIL LEVEL WARNING INDICATOR LIGHT**

If the lamp and the buzzer come on, when the lift truck is running, stop the I.C. engine immediately and look for the cause (braking oil level, possible leak, etc.). In the event of an abnormal dropping of the level, consult your dealer.



#### **RED PARKING BRAKE LAMP**

This lamp comes on when the parking brake is applied.



#### **BATTERY CHARGE WARNING INDICATOR LIGHT**

If the lamp and the buzzer come on when the lift truck is running, stop the I.C. engine immediately and look for the cause (electric circuit, alternator belt, alternator, etc.).



#### **RED I.C. ENGINE OIL PRESSURE WARNING INDICATOR LIGHT**

If the lamp and the buzzer come on when the lift truck is running, stop the I.C. engine immediately and look for the cause (engine oil level, possible leak, etc.).



#### **RED I.C. ENGINE WATER TEMPERATURE WARNING INDICATOR LIGHT**

If the lamp and the buzzer come on when the lift truck is running, stop the I.C. engine immediately and look for the cause (coolant level, possible leak, radiator, etc.).



#### **RED AIR FILTER OR HYDRAULIC RETURN FILTER CLOGGED INDICATOR LIGHT**

The lamp and buzzer come on when the air filter cartridge or the hydraulic return oil filter cartridge is clogged up. Stop the I.C. engine and carry out the necessary repairs (see cleaning and replacement requirements in chapter: 3 - MAINTENANCE: FILTERS CARTRIDGES AND BELTS).



#### **GREEN DIRECTION INDICATOR LAMP**



#### **GREEN SIDELIGHTS LAMP**



#### **GREEN LOW BEAM LAMP**



#### **BLUE MAIN BEAM LAMP**

## 4- EMERGENCY STOP BUTTON

- In the event of danger, it lets you stop the I.C. Engine and thereby cut out all hydraulic movements.
- Pull the button to disable it before restarting the lift truck.

 **Be ready for hydraulic movements suddenly stopping when you press this button.**



## 5 - EMERGENCY EXIT

### EMERGENCY HAMMER

Use the emergency hammer to break one of the windows in the event that it is impossible to exit the cab by the door or by opening the rear window.



## 6 - SWITCHES

NOTE: The location of the switches may vary depending on the options.

### A - OPTION ELECTRICAL JIB PROVISION ELECTROVALVE AT JIB HEAD

See: 2 - DESCRIPTION: DESCRIPTION AND USE OF THE OPTIONS.

### B - OPTIONAL BLUE FRONT AND REAR WORKING LIGHTS

### C - WHEEL ALIGNMENT LAMPS

### D - WARNING LIGHTS

### E - REAR FOG LIGHTS

### F - SELF-CLEANING FAN OPTION

See: 2 - DESCRIPTION: DESCRIPTION AND USE OF THE OPTIONS.

### G - STEERING SELECTION

### H - TRANSMISSION CUT-OFF

The switch selects transmission cut-off to the service brake pedal or the hydraulic controls lever.

NOTE: In all cases transmission cut-off can be activated using the GEAR lever. (except for MLT... POWERSHIFT ...)

- Position 1: With the indicator light on, transmission cut-off is by means of the service brake pedal and the forward/neutral/reverse gear lever.
- Position 2: Indicator light off, transmission is cut-off from forward/neutral/reverse gear selector.

### USE OF TRANSMISSION CUT-OFF

Transmission cut-off to brake pedal (position 1).

- When loading.

Transmission cut-off to hydraulic controls lever (position 2).

- When driving.
- For inching and continuous stopping and starting (delicate handling). In order to optimise hydraulic movements, cut off transmission to the hydraulic controls lever.
- Starting on a slope.



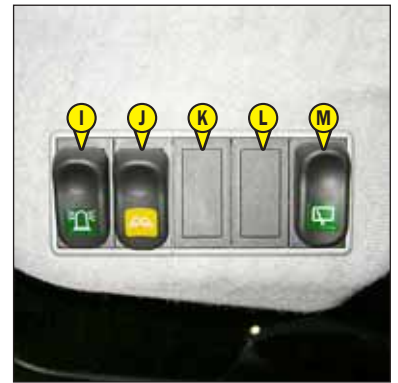
**I - REVOLVING LIGHT**

**J - FRONT AND REAR WORKING LIGHTS**

**K - JIB HEAD LIGHT OPTION**

**L - OPTION**

**M - SIDE WINDSCREEN WIPER + ROOF WINDSCREEN WIPER OPTION**



**N/O - OPTION HYDRAULIC TOWING HOOK WITH SINGLE OR DUAL EFFECT REAR HYDRAULIC PREDISPOSITION**

See: 2 - DESCRIPTION: DESCRIPTION AND USE OF THE OPTIONS.

**P - ATTACHMENT HYDRAULIC LOCKING DEVICE OPTION**

See: 2 - DESCRIPTION: DESCRIPTION AND USE OF THE OPTIONS.

**Q - OPTION JIB SUSPENSION**

See: 2 - DESCRIPTION: DESCRIPTION AND USE OF THE OPTIONS.

**R - NEUTRALIZATION OF HYDRAULIC MOVEMENTS**

When driving on the road, it is highly recommended (mandatory in Germany) that you cut-off all the hydraulic movements. The lamp shows when it is in use.



**S - TILTING CORRECTOR**

MLT 1035 L Turbo LSU Série 6-E3

See: 2 - DESCRIPTION: 20 - HYDRAULIC CONTROLS AND TRANSMISSION CUT-OFF.



**T - DISABLING 6TH GEAR**

See: 2 - DESCRIPTION: 16 - GEAR SELECTOR.

**U - GEAR INDICATOR**

See: 2 - DESCRIPTION: 16 - GEAR SELECTOR.



**V - ATTACHMENT EASY HYDRAULIC CONNECTION OPTION**

See: 2 - DESCRIPTION: DESCRIPTION AND USE OF THE OPTIONS.

**W - OPTION**





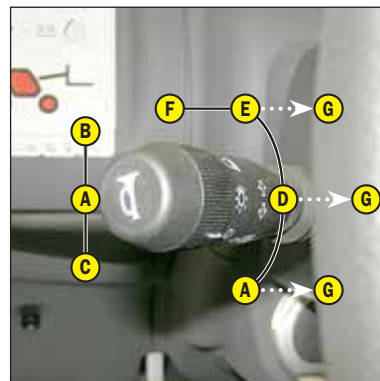
## 7 - LIGHT SWITCH, HORN AND INDICATOR SWITCH

The switch controls the visual and sound alarms.

- A - All lights are off, the direction indicators do not flash.
- B - The right hand direction indicators flash.
- C - The left hand direction indicators flash.
- D - The sidelights and the rear lights are on.
- E - The dipped headlights and the rear lights are on.
- F - The main beam headlights and the rear lights are on.
- G - Headlight signal.

Pressing the switch sounds the horn.

NOTE: The positions D - E - F - G can be carried out without the ignition being on.



## 8 - FRONT AND REAR WINDSCREEN WIPER SWITCH

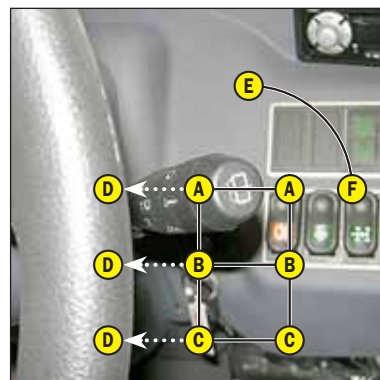
FRONT WINDSCREEN WIPER

- A - Front windscreen wiper off.
- B - Front windscreen wiper low speed setting.
- C - Front windscreen wiper high speed setting.
- D - Front windscreen wiper intermittent setting.

REAR WINDSCREEN WIPER

- E - Rear windscreen wiper off.
- F - Rear windscreen wiper on.

NOTE: These functions will only work when the ignition is switched on.



## 9 - IGNITION SWITCH

MLT ... -120 ...

The key switch has five positions:

- P - Ignition off, parking position.
- O - Ignition switched off and I.C. engine stopped.
- I - Ignition and pre-heating.
- II - Not used.
- III - The I.C. engine starts, return to position I as soon as the key is released.

MLT ... Turbo ...

The key switch has five positions:

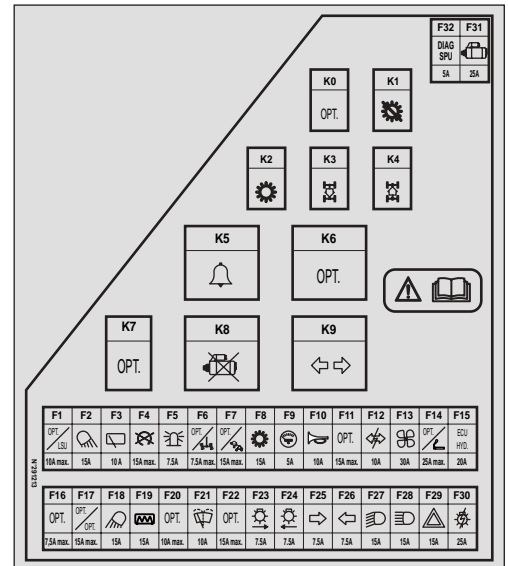
- P - Ignition off, parking position.
- O - Ignition switched off and I.C. engine stopped.
- I - Ignition on.
- II - Heating.
- III - The I.C. engine starts, return to position I as soon as the key is released.

## 10 - FUSES AND RELAYS IN THE CAB

- Lift up the fuse and relay access panel 1.

NOTE: A sticker on the inside of the access panel gives a clear display of the use of the components described below.

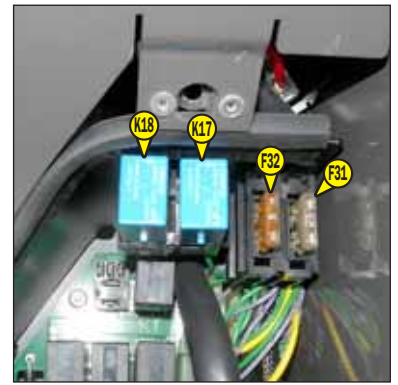
**⚠ Always replace a faulty fuse with another of equivalent rating. Never use a fuse that has been repaired.**



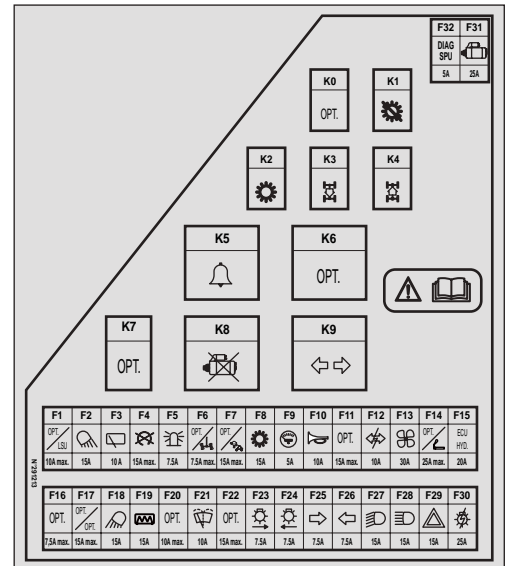
- F1 - Hydraulic control unit (7,5A). MLT ... LSU
  - OPTION.
- F2 - Working tail light (15A).
- F3 - Rear windscreen wiper (10A).
  - Roof windscreen wiper (10A).
  - Side windscreen wiper (10A).
- F4 - Engine stop electrovalve (10A). MLT ... Turbo LSU
  - Engine stop electrovalve (15A). MLT 731 Turbo
  - Engine control unit (10A). MLT ... -120 LSU
- F5 - Revolving light (7,5A).
- F6 - Wheel alignment (5A).
  - OPTION.
- F7 - Longitudinal stability limiter and warning device (7,5A).
  - "Aggravating" hydraulic movement cut-off deactivation (7,5A).
  - OPTIONAL Blue front and rear working lights (15A).
- F8 - Forward/neutral/reverse selector (15A).
  - Transmission cut-off (15A).
  - Reversing lights (15A).
  - OPTION Reverse buzzer alarm (15A).
- F9 - Control panel (5A).
- F10 - Sound alarm (10A).
  - Stop switch (10A).
- F11 - OPTION Working lights on jib head (15A).
- F12 - Flashing unit (10A).
- F13 - Ventilation/heating (30A).
- F14 - Cigar lighter (10A).
  - OPTION.
- F15 - Hydraulic movement control unit (20A).
- F16 - Diagnostic socket (5A).
  - OPTION.
- F17 - OPTION CLEANFIX self-cleaning fan (10A).
  - OPTION FINTRONIC anti-start system (10A).
  - OPTION MODCOD / MODCLÉ Anti-theft system (10A).
  - OPTION Rear hydraulic predisposition (10A).
  - OPTION Two rear hydraulic predispositions (15A).
- F18 - Front working lights (15A).
- F19 - OPTION.
- F20 - OPTION Pneumatic seat (10A).
  - OPTION.
- F21 - Front windscreen wiper and front windscreen washer (10A).
- F22 - OPTION Jib suspension (10A).
  - OPTION Electrical jib provision (5A).
  - OPTION Head jib electrovalve (7,5A)
- F23 - Right sidelight (7,5A).
  - Dashboard lighting (7,5A).
- F24 - Left sidelights (7,5A)
  - Number plate lighting (7,5A).
- F25 - Right indicators (7,5A).
- F26 - Left indicators (7,5A).
- F27 - Low beam (15A).
  - Low beam indicator light (15A).
  - Rear fog light (15A).
- F28 - Main beam (15A).
  - Main beam headlamp (15A).
- F29 - Warning lights (15A).
  - Roof light (15A).
  - Anti-theft device provision (15A).
  - Clock (15A).
  - Rev counter (15A).
- F30 - Lights, horn and indicator switch (25A).



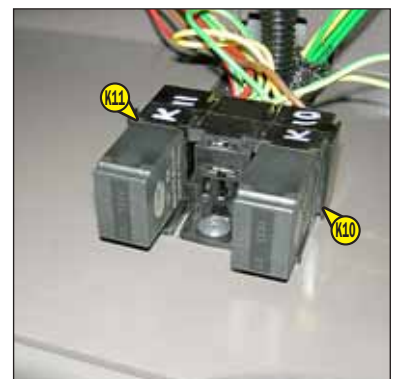
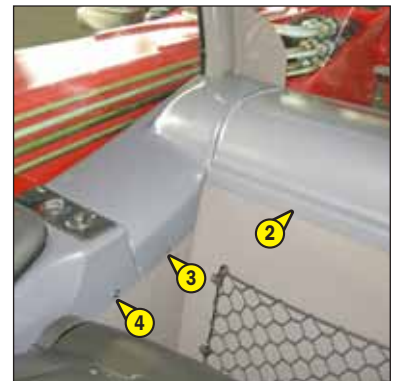
- F31 - Starter (25A).
- F32 - Diagnostic socket (5A).
  - Hydraulic movement control unit (5A).



- K0 - OPTION.
- K1 - Transmission cut-off relay.
- K2 - Transmission cut-off relay. *except MLT ... POWERSHIFT ...*
- K3 - Reverse gear relay.
- K4 - Forward gear relay. *except MLT ... POWERSHIFT ...*
- K5 - Buzzer.
- K6 - OPTION.
- K7 - OPTION.
- K8 - Safety system starting switch relay.
- K9 - Flashing unit.
- K17 - Indicator module relay.
- K18 - Neutral security system switch relay.



- Lift the lid 2 of the tool box for access to fuse.
  - F33 - Hydraulic control unit (1A). *MLT ... LSU*
- Remove the les casings 3 and 4 of the hydraulic control for access to relays.
  - K10 - OPTION Jib suspension cut-off.
  - K11 - OPTION Jib suspension supply.

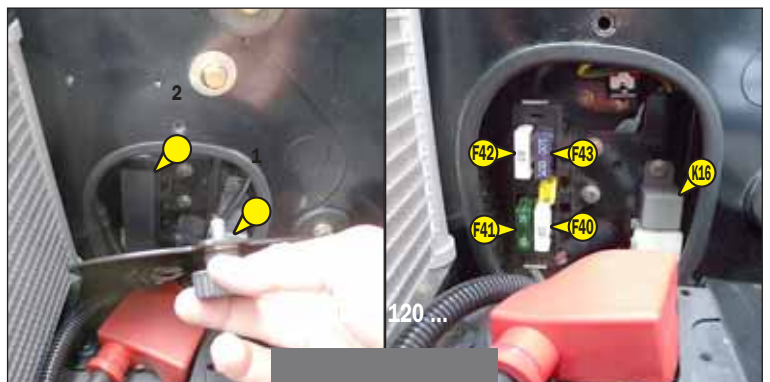
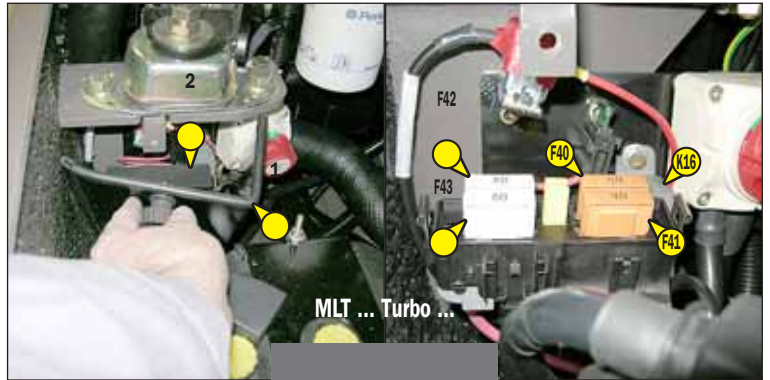


## 11 - FUSES AND RELAYS UNDER THE ENGINE HOOD

Remove casing 1 and cover 2 for access to fuses and relays.

**!** Always replace a faulty fuse with another of equivalent rating. Never use a fuse that has been repaired.

- F40 - Key switch (40A). MLT ... Turbo
    - Key switch (80A). MLT ... -120
  - F41 - Key switch (40A). MLT ... Turbo
    - Engine control unit (30A). MLT ... -120
  - F42 - Preheating I.C. engine (80A).
  - F43 - Alternator (80A). MLT ... Turbo
    - Alternator (100A). MLT ... -120
  - F47 - OPTION Fuel decongealant (15A). MLT ... Turbo
- 
- K15 - OPTION Diesel decongealant. MLT ... Turbo
  - K16 - Engine preheating relay.



## 12 - DIAGNOSTIC CONNECTOR

MLT 735 -120 LSU Série 6-E3

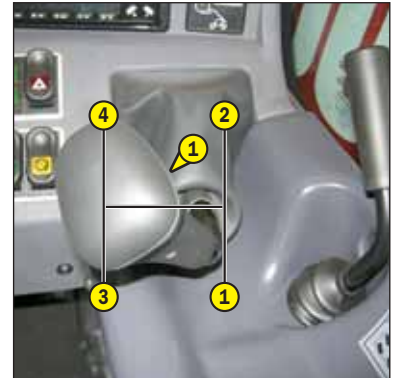


## 13 - ACCELERATOR PEDAL

## 14 - SERVICE BRAKE PEDAL AND TRANSMISSION CUT-OFF

The pedal applies on the front and rear wheels by an hydraulic brake system, and allows the lift truck to be slowed down and stopped. Depending on the position of the transmission cut-off switch, it enables the free travel to cut off transmission (see: 2 - DESCRIPTION: 5 - SWITCHES).

## 15 - GEAR LEVER AND TRANSMISSION CUT-OFF



In order to change speeds, it is necessary to cut the transmission by pressing the button 1 on the lever.

- 1st gear: to the right, backwards.
- 2nd gear: to the right, forwards.
- 3rd gear: to the left, backwards.
- 4th gear: to the left, forwards.

### USING THE GEARS ON THE GEAR BOX

- On these lift trucks with a torque converter, it is not necessary to automatically start up in 1st speed and progress up the gears.

**⚠** *The choice of transmission gear ratio should be made carefully according to the nature of the work being carried out. A poor choice may result in the extremely rapid rise of the transmission oil temperature through excessive slipping of the converter, which could lead to serious damage to the transmission (it is essential to stop and change the working conditions if the transmission oil temperature indicator light comes on). This poor choice may also result in a reduction in the lift truck's performance in forward gear. When the forward force increases, the forward speed in the r gear (for example, in 3rd gear) may be lower than the forward speed that could be obtained with the r-1 gear (in 2nd instead of 3rd).*

In general, we would advise you to use the following gears according to the nature of the work being carried out.

- ON THE ROAD:
  - Set off in 3rd gear and go up to 4th if the conditions and state of the road permit it.
  - In hilly areas, set off in 2nd gear and go up to 3rd if the conditions and state of the road permit it.
- WITH A TRAILER ON THE ROAD:
  - Set off in 2nd gear and go up to 3rd if the conditions and state of the road permit it.
- HANDLING:
  - 3rd gear.
  - 2nd gear in restricted spaces.
- LOADING (reclaiming with bucket, manure fork, etc.):
  - 2nd gear.
- EARTH MOVING:
  - 1st gear.

## 15 - GEAR SELECTOR

The gear is selected by means of buttons 1 and 2. The selected gear is indicated on the dial 3.

There are 6 forward and 3 reverse gears available.

NOTE: When reversing, the selected gear remains the same, except for the 4th, 5th and 6th gears in forward motion which become 3rd gear in reverse motion.

### USING THE GEARS ON THE GEAR BOX

- On these lift trucks with a torque converter, it is not necessary to automatically start up in 1st speed and progress up the gears.

**!** *The choice of transmission gear ratio should be made carefully according to the nature of the work being carried out. A poor choice may result in the extremely rapid rise of the transmission oil temperature through excessive slipping of the converter, which could lead to serious damage to the transmission (it is essential to stop and change the working conditions if the transmission oil temperature indicator light comes on). This poor choice may also result in a reduction in the lift truck's performance in forward gear. When the forward force increases, the forward speed in the r gear (for example, in 3rd gear) may be lower than the forward speed that could be obtained with the r-1 gear (in 2nd instead of 3rd).*

In general, we would advise you to use the following gears according to the nature of the work being carried out.

#### • ON THE ROAD:

Set off in 4th gear and go up to 5th and 6th if the conditions and state of the road permit it.

In hilly areas, set off in 3rd gear and go up to 4th and 5th (the use of 6th gear is prohibited) if the conditions and state of the road permit it.

#### • WITH A TRAILER ON THE ROAD:

Set off in 2nd gear and go up through the gears to 5th if the conditions and state of the road permit it.

#### • HANDLING:

3rd, 4th or 5th gear (the use of the 6th gear is prohibited).

2nd gear in restricted spaces.

#### • LOADING (reclaiming with bucket, manure fork, etc.):

2nd gear.

#### • EARTH MOVING:

1st gear.

### SWITCH FOR DISABLING 6TH GEAR

Switch 4 serves to enable or disable 6th gear and must be used when required for the task to be performed. When the lamp is lit, 6th gear is disabled.

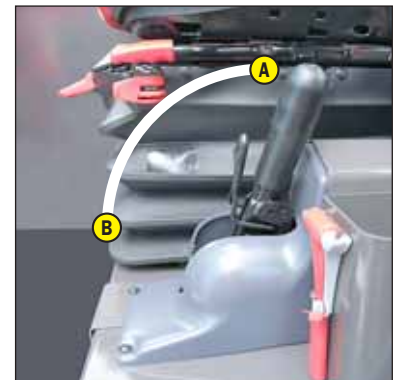
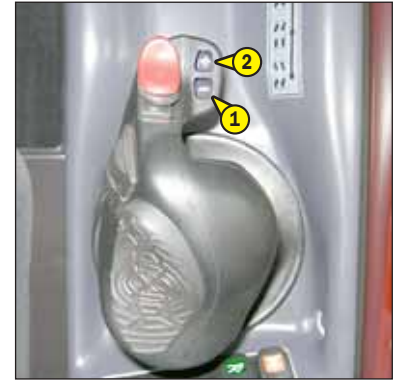
**!** *This device must be used during handling, when towing a trailer and in hilly areas, to reduce the risk of the gear box overheating. Disabling 6th gear also guarantees that the speed limit will not be exceeded when towing a trailer.*

## 16 - PARKING BRAKE LEVER

To prevent accidental loosening or release, the lever is fitted with safety locking.

- To apply the parking brake, pull the lever backwards (position A).

- To loosen the parking brake, release and push the lever forwards (position B).



## 17 - FORWARD/NEUTRAL/REVERSE GEAR SELECTION

FORWARD: Push the knob forward (position A).

REVERSE: Pull the knob backwards (position B).

NEUTRAL: The knob must be in the intermediate position to start the lift truck (position C).

When operating this control, the lift truck should be travelling at slow speed and not accelerating.

NOTE: The reverse lights indicate that the lift truck is running in reverse motion. An OPTIONAL audible reversing alarm can also be fitted.

### SAFETY FOR MOVING THE LIFT TRUCK

Authorisation to move the lift truck is controlled by an electronic unit. The operator must observe the following sequence to move the truck forwards or backwards:

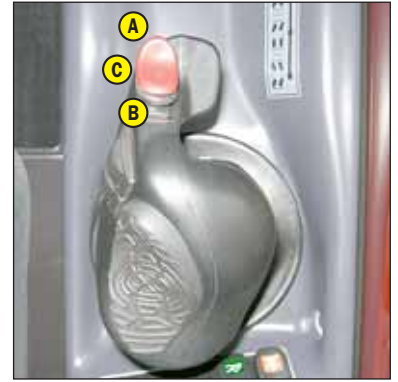
- 1 - sit down correctly in the driver's seat,
- 2 - release the parking brake,
- 3 - engage forward or reverse movement.

To stop the lift truck, he must observe the following sequence:

- 1 - Set the forward/reverse selector to neutral,
- 2 - engage the parking brake,
- 3 - get out of the lift truck.

NOTE: If the operator leaves the driving cab with forward or reverse engaged, a continuous alarm will sound. While this alarm sounds, the operator can simply sit back in the seat and continue advancing or reversing.

If the alarm becomes discontinuous, the operator must sit back in the seat, put the forward/reverse selector back in neutral and select forward or reverse if he wishes to continue moving.




## 18 - STEERING SELECTION


### A - GREEN WHEEL ALIGNMENT LAMPS


These lamps come on to indicate the alignment of the wheels in relation to the lift truck. Lamp A1 for the front wheels and lamp A2 for the rear wheels.

**⚠ Before selecting one of the three possible steering positions, bring all 4 wheels into alignment with regards to the lift truck axle. Never change the steering mode whilst driving.**

### B - STEERING SELECTION LEVER

B1 - Front drive wheels (highway traffic). 

B2 - Front and rear drive wheels in opposite direction (short steering lock). 

B3 - Front and rear drive wheels in the same direction (crab steering). 

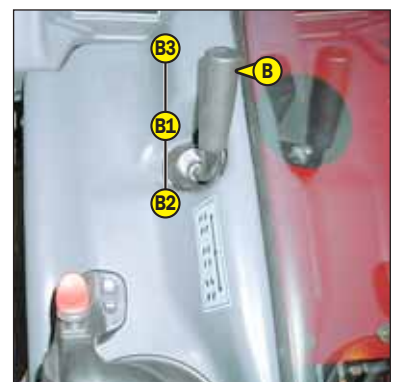
### C - SWITCH FOR ALIGNMENT OF THE WHEELS

This switch enables the use or not of the device for alignment of the wheels. The indicator light indicates its use.

#### CONTROL FOR ALIGNMENT OF THE WHEELS

- Connect the switch (signal light ON).
- Shift the steering selection lever B into position B2 (short steering lock).
- Turn the steering wheel and bring the rear wheels into alignment until lamp A2 lights up.
- Shift the steering selection lever B into position B1 (highway traffic).
- Turn the steering wheel and bring the front wheels into alignment until lamp A1 lights up.

**⚠ Before driving on roads, it is necessary to check the alignment of the rear wheels and to drive in front wheel steer. The control of the alignment of the rear wheels must be regularly done with the help of the green lamps, while driving the lift truck. In case of anomalies, consult your dealer.**





## 19 - HYDRAULIC CONTROLS AND TRANSMISSION CUT-OFF

**!** Do not attempt to alter the hydraulic system pressure by interfering with the pressure regulating valve. In the event of suspected malfunction, contact your dealer. ANY ALTERATION MAY RENDER THE WARRANTY NULL AND VOID.

**!** Use the hydraulic controls carefully without jerking, to avoid accidents caused by shaking the lift truck.

NOTE: When driving on the road, it is highly recommended (mandatory in Germany) that you cut-off all the hydraulic movements (see: 2 - DESCRIPTION 7 - SWITCHES).

NOTE: If necessary use the steering to reset the hydraulic control steering accumulator.

- A - Lifting and tilting control lever.
- B - Telescoping control button.
- C - Attachment control button.
- D - Jib head electrovalve option control button.

### LIFTING THE LOAD

- The lever A backwards when lifting.
- The lever A forwards when lowering.

### TILT OF CARRIAGE

- The lever A to the left for reverse tilt.
- The lever A to the right for forward tilt.

### TELESCOPING

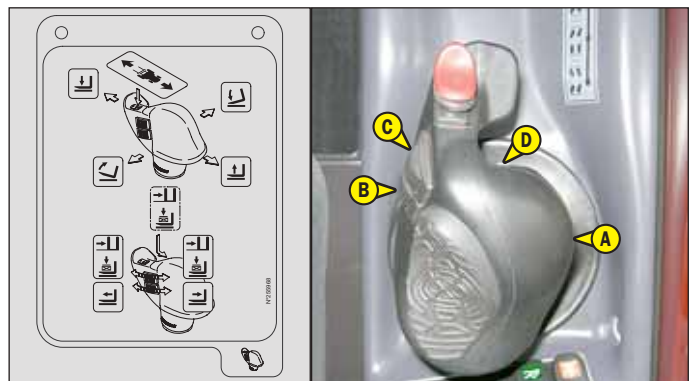
- Button B forwards for extending.
- Button B backwards for retracting.

### ATTACHMENT

- The button C forwards or backwards.

### OPTION ELECTRIC PREDISPOSITION ON ELECTROVALVE JIB AT HEAD JIB

- Button D (see: 2 - DESCRIPTION: DESCRIPTION AND USE OF ELECTRICAL AND HYDRAULIC OPTIONS).



### TILTING CORRECTOR

- Button E to the left to tilt the lift truck to the left.
- Button E to the right to tilt the lift truck to the right.

NOTE: Tilt can be corrected up to a carriage articulation axle height of 3m50 above the ground, with the jib retracted.



## 20 - FUNCTION FILES

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These files contain the description of the hydraulic controls and the load charts for the attachments used on the lift truck.

### 21 - LEVEL INDICATOR

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Except for MLT 1035 L Turbo LSU Série 6-E3

Enables the operator to check that the lift truck is in the horizontal position.



### 21 - LEVEL INDICATORS

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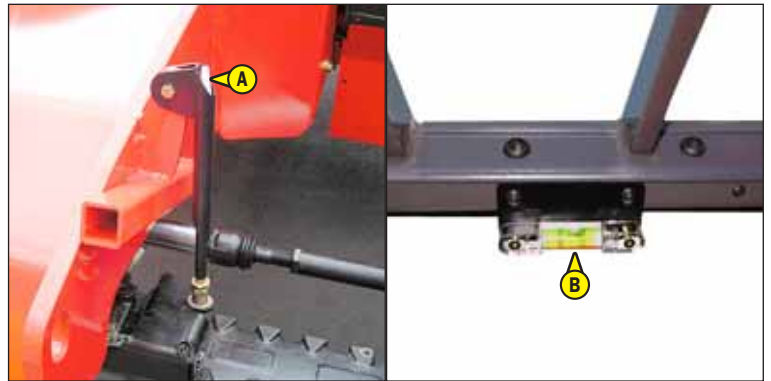
Only for MLT 1035 L Turbo LSU Série 6-E3

#### A - TILT INDICATOR

When the two marks are aligned, the chassis is parallel with the front axle.

#### B - SPIRIT LEVEL

Enables the operator to check that the lift truck is in the horizontal position.



### 22 - HEATER CONTROL

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#### A - HEATING FAN CONTROL

This 3-speed control regulates warm or cold air through the heating ventilators.

#### B - HEATING TEMPERATURE CONTROL

Allows the temperature inside the cab to be adjusted.

B1 - With the valve closed, the fan delivers fresh air.

B2 - With the valve opened completely, the fan delivers warm air.

The intermediate positions allow the temperature to be adjusted.



## 22 - AIR CONDITIONING CONTROLS (OPTION AIR CONDITIONING)

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**!** The air conditioning only comes on when the forklift truck has been started up. When using your air conditioning, you must work with the doors and windows closed.

*In winter: So as to ensure correct operation and complete efficiency of the air conditioning unit, start up the compressor once a week, if only for a short spell, so as to lubricate the internal seals.*

*In cold weather: Warm the I.C. engine before switching on the compressor, so as to allow the coolant that has collected in the liquid state at the lowest point of the compressor circuit to turn into gas under the effect of the heat given off by the I.C. engine, as the compressor is liable to be damaged by coolant in the liquid state.*

**!** If your air conditioning does not seem to be working properly, have it examined by your dealer (see: 3 - MAINTENANCE: F - EVERY 2000 HOURS OF SERVICE). Never try to repair any possible problems by yourself.

### DESCRIPTION OF THE AIR CONDITIONING CONTROLS

A - Air conditioning system ON/OFF control switch with indicator lamp. Only works when control switch "C" set to 1, 2 or 3.

B - Air temperature control.

C - Air flow and fan speed control. When this control is set to "0" the air conditioning system will not work.

NOTE: Possible losses of water under the lift truck are due to condensate discharges caused by the drying effect of the installation, especially with high outside temperatures and high relative humidity.

For the air conditioning to perform properly, the air intakes must not be blocked by frost, snow or leaves.

When the facility is running, at least one of the cab air grilles must be open so as to avoid any risk of freezing to the evaporator.

### HEATING MODE

The controls must be adjusted in the following way:

A - Control with signal light off.

B - At the required temperature.

C - To the desired position 1, 2 or 3.

### CONDITIONED AIR MODE

The controls must be adjusted in the following way:

A - Control with signal light on.

B - At the required temperature.

C - To the desired position 1, 2 or 3.

### DEMISTING MODE

The controls must be adjusted in the following way:

A - Control with signal light on.

B - At the required temperature.

C - To the desired position 1, 2 or 3.

NOTE: Direct the ventilators onto the cab's windows for increased efficiency.

## 23 - CAB FILTER VENTILATORS

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See: 3 - MAINTENANCE: D - EVERY 500 HOURS SERVICE.

## 24 - WINDSCREEN DEMISTER VENTS

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For optimum effectiveness, close the heating ventilators.

## 25 - HEATING VENTS

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These heating vents enable the air to be directed to the interior of the cabin and onto the side windows.



## **26 - BRAKING OIL AND WINDSCREEN WASHER TANK ACCESS PANEL**

- Loosen screw 1 and lift up the braking oil and windscreen washer tank access panel (see: 3 - MAINTENANCE: B - EVERY 50 HOURS OF SERVICE).



## **27 - STEERING WHEEL REGULATING HANDLE**

This handle enables the angle and height of the steering wheel to be adjusted.

- Pull handle 1 to adjust the steering wheel.
- Push in handle 1 to lock the steering wheel in the desired position.



## **28 - DOOR LOCK**

Two keys are provided with the lift truck to enable the cabin to be locked.

## **29 - LOCKING HANDLE FOR UPPER HALF-DOOR**

## **30 - UNLOCKING BUTTON FOR UPPER HALF DOOR**

## **31 - HANDLE FOR REAR WINDOW OPENING**

### **EMERGENCY EXIT**

Use the rear window as an emergency exit, in the event that it is impossible to leave the cab by the door or by opening the windscreen.

NOTE: There is an OPTIONAL rear window stay.



### **32 - DOCUMENT HOLDER**

Ensure that the operator's manual is in its place in the document holder.



### **33 - SUN VISOR**



### **34 - OVERHEAD LIGHT**



### **35 - HOOK**

### **36 - CIGAR LIGHTER**

For 12 V appliance and max. amperage 10A.



### **37 - ARMREST AND STORAGE**

- Lift the armrest 1 to access the storage.



### **38 - CAR RADIO (OPTION)**

### **39 - INSIDE REAR-VIEW MIRROR (OPTION)**

### **40 - TOOL BOX**

Except for MLT 1035 L Turbo LSU Série 6-E3



### **41 - NUMBER PLATE**

### **42 - NUMBER PLATE LIGHTING**

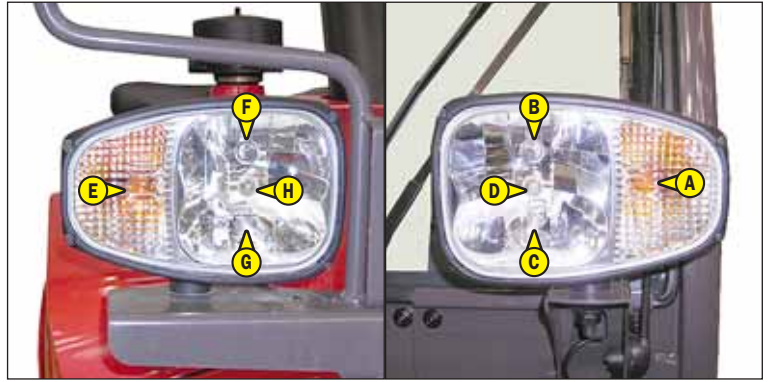


### **43 - REAR REFLECTORS**



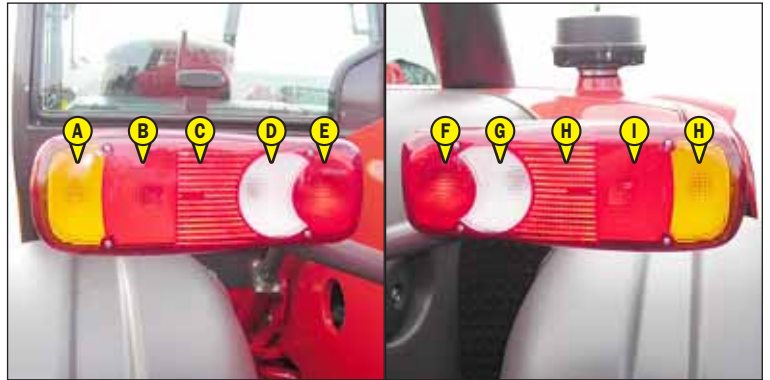
## 44 - FRONT HEADLIGHTS

- A - Left front indicator.
- B - Left front dipped headlight.
- C - Left front main beam.
- D - Left front sidelight.
- E - Right front indicator.
- F - Right front dipped headlight.
- G - Right front main beam.
- H - Right front sidelight.



## 45 - REAR LIGHTS

- A - Left rear indicator.
- B - Left rear stoplight.
- C - Left tail light.
- D - Left rear reverse light.
- E - Left rear fog light.
- F - Right rear fog light.
- G - Right rear reverse light.
- H - Right tail light.
- I - Right rear stoplight.
- J - Right rear indicator.



## 46 - REVOLVING LIGHT

### STANDARD

The revolving light pivots for space-saving on the lift truck and can be detached to prevent theft.

- Loosen nut 1 and remove the revolving light.
- Protect mounting 2 with cap 3.



### OPTIONAL AIR CONDITIONING

The magnetic revolving light must be clearly visible on the roof of the cab and plugged-in to socket 1.



## TOWING PIN AND HOOK

Located at the rear of the lift truck, this device is used to attach a trailer. Its capacity is limited for each lift truck by the Authorized Gross Vehicle Weight, tractive force and maximum vertical force on the coupling point.

- To use a trailer, see current regulations in your country (maximum running speed, braking, maximum weight of trailer, etc.).
- Verify the trailer's condition before using it (tyre condition and pressures, electrical connection, hydraulic hose, brake system...).

**!** *Do not tow a trailer or attachment which is not in perfect working order. Using a trailer in poor condition may affect the lift truck's steering and braking, and hence safety.*

**!** *If a third party helps in coupling or uncoupling the trailer, this person must be permanently visible to the driver and wait until the lift truck has stopped, the handbrake is on and the I.C. engine is switched off before performing the operation.*

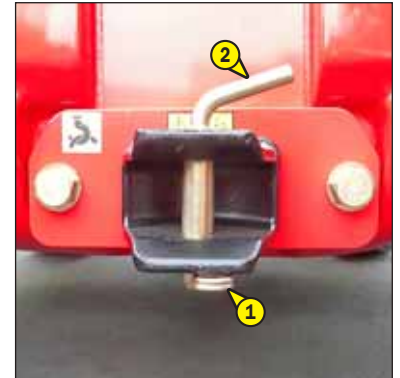
NOTE: A rear-view mirror allows the lift truck to approach more closely to the trailer ring.

### A - COUPLING FITTING

#### COUPLING AND UNCOUPLING THE TRAILER

- To couple the trailer, position the lift truck as close as possible to the trailer ring.
- Put the handbrake on and switch off the I.C. engine.
- Remove the clip 1, lift the trailer pin 2 and place or remove the trailer ring.

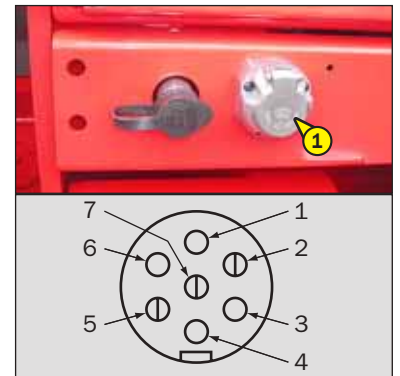
**!** *Be careful not to get your fingers caught or crushed during this operation.  
Do not forget to put clip 1 back in place.  
When uncoupling, make sure that the trailer is supported independently.*



### B - REAR ELECTRIC SOCKET

- Connect the male plug to the female socket 1 on the lift truck and make sure the lights of the trailer or the light bar are working properly.

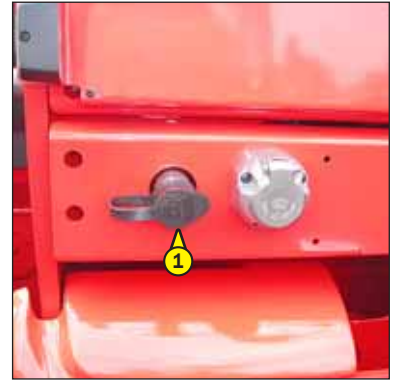
- 1 - Rear left-hand indicator light.
- 2 - Rear fog lights.
- 3 - Earth.
- 4 - Rear right hand indicator light.
- 5 - Right rear light.
- 6 - Rear stop lights.
- 7 - Left rear light and number plate.





## C - TRAILER BRAKE SYSTEM.

- Connect the brake hose to the provided brake unit 1 on the lift truck.
- Make sure the trailer brakes are working properly and test the effects of braking before taking the trailer onto the public highway.

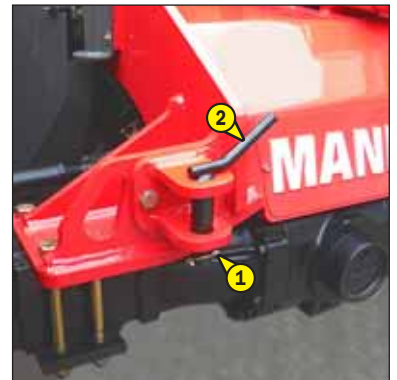


## D - CHASSIS-MOUNTED FRONT TOWING HOOK

### COUPLING AND UNCOUPLING THE TRAILER

- To couple the trailer, position the lift truck as close as possible to the trailer ring.
- Put the handbrake on and switch off the I.C. engine.
- Remove the clip 1, lift the trailer pin 2 and place or remove the trailer ring.

**⚠ Be careful not to get your fingers caught or crushed during this operation.**  
**Do not forget to put clip 1 back in place.**  
**When uncoupling, make sure that the trailer is supported independently.**



## E - COUPLING LADDER (OPTIONAL)

### COUPLING AND UNCOUPLING THE TRAILER

- To couple the trailer, position the lift truck as close as possible to the trailer ring.
- Put the handbrake on and switch off the I.C. engine.

#### ON THE FIXED PIN

- Remove pin 1, remove rod 2 and raise latch 3.
- Insert or remove the trailer ring, lower latch 3 and refit rod 2.

**⚠ Be careful not to get your fingers caught or crushed during this operation.**  
**Do not forget to put clip 1 back in place.**  
**When uncoupling, make sure that the trailer is supported independently.**

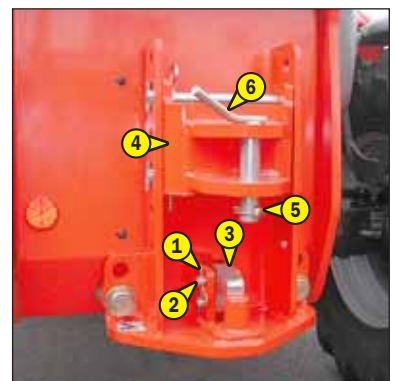
#### ON THE COUPLING LADDER

- Set the coupling fitting 4 according to the height of the trailer ring.

**⚠ Do not forget to put rods and clip back in place.**

- Remove the clip 5, lift the trailer pin 6 and place or remove the trailer ring.

**⚠ Be careful not to get your fingers caught or crushed during this operation.**  
**Do not forget to put clip 5 back in place.**  
**When uncoupling, make sure that the trailer is supported independently.**



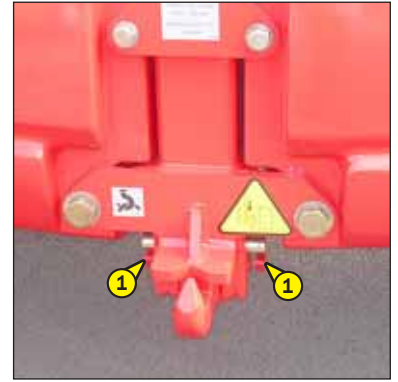
## F - HYDRAULIC TOWING HOOK (OPTION)

**!** *Never use the tow hook to raise the rear of the lift truck (when changing the rear wheel for example).*

- Raise the hydraulic tow hook to release the hook lock 1 by pressing the upper part of switch 2.
- Pull the knob 3, retain this position and press the lower part of switch 2 to lower the tow hook.
- Release knob 3.
- Couple or uncouple the trailer.

**!** *When uncoupling, make sure that the trailer is supported independently.*

- Raise the trailer hook by pressing the upper part of switch 2 and then lower the hook to verify that the lock pin is in proper contact with hook 1 lock.



## G - AUTOMATIC TRAILER HOOK (OPTION)

### COUPLING THE TRAILER

- Remove the automatic towing pin using lever 1.
  - Move the lift truck backwards so that the trailer ring slots into the automatic hook.
- NOTE: The pin closes automatically when the trailer ring touches the end of the fitting.  
The pin can be lowered by hand using lever 1.

### UNCOUPLING THE TRAILER

**!** *When uncoupling, make sure that the trailer is supported independently.*

- Remove the pin using lever 1 to uncouple the trailer.



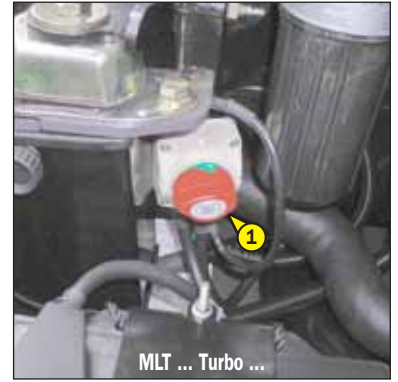




## **DESCRIPTION AND USE OF THE OPTIONS**

- 1 - BATTERY CUT-OFF**
- 2 - REVERSE BUZZER ALARM**
- 3 - PREHEATING ELEMENT**
- 4 - CLEANFIX SELF-CLEANING FAN**
- 5 - MODCOD ANTI-THEFT SYSTEM**
- 6 - FINTRONIC ANTI-START SYSTEM**
- 7 - MODCLÉ ANTI-START SYSTEM**
- 8 - ATTACHMENT HYDRAULIC CONTROL FORCED OPERATION**
- 9 - JIB SUSPENSION**
- 10 - ATTACHMENT EASY HYDRAULIC CONNECTION**
- 11 - PROVISION FOR ELECTRICAL JIB**
- 12 - JIB HEAD ELECTROVALVE**
- 13 - HYDRAULIC ATTACHMENT LOCKING**
- 14 - JIB HEAD ELECTROVALVE + HYDRAULIC ATTACHMENT LOCKING**
- 15 - MACH2 QUICK-RELEASE COUPLER ON ACCESSORY CIRCUIT**
- 16 - QUICK-RELEASE COUPLER MACH2 ON ATTACHMENT CIRCUIT + HYDRAULIC ATTACHMENT LOCKING**
- 17 - EXTERIOR DRAIN BACK**
- 18 - LIFTING RING ON SINGLE CARRIAGE**
- 19 - ANGULAR SECTOR ON JIB**
- 20 - SINGLE OR DUAL EFFECT REAR HYDRAULIC CONTROL PREDISPOSITION**
- 21 - DUAL EFFECT REAR HYDRAULIC CONTROL PREDISPOSITION + SINGLE OR DUAL EFFECT REAR HYDRAULIC CONTROL PREDISPOSITION**
- 22 - HYDRAULIC TOWING HOOK + SINGLE OR DUAL EFFECT REAR HYDRAULIC CONTROL PREDISPOSITION**

## 1 - BATTERY CUT-OFF



## 2 - REVERSE BUZZER ALARM

## 3 - PREHEATING ELEMENT

Enables the engine to be kept warm during prolonged periods of stoppage and thus improves engine starting.

### SUPPLY CHARACTERISTICS OF PREHEATING SYSTEM:

- Rated range of power: 220-240V; 50-60Hz
- Current consumed: 4,5A
- Equipment in class 1
- Equipment connectable only on feeder circuit TT or TN
- Category of insulation 2

### ENVIRONMENTAL CONDITIONS FOR USE:

- Maximum ambient temperature for using preheating: +25°C
- Pollution level 2



### CONDITIONS FOR CONNECTION AND USE OF PREHEATING:

- The preheating system should not be used for an external ambient temperature higher than + 25°C.
- It is essential that the power supply to the preheating system is:
  - Effected with a cable that conforms to the installation standards in force and contains a protective earth conductor.
  - Contains an appropriate sectioning system.
  - Incorporate an appropriate safety system against short circuits (fuses or circuit breaker) and a differential circuit breaker with 30 mA sensitivity.
- Only connect to and disconnect from the power supply while the unit is off and the I.C. engine is stopped.

## 4 - CLEANFIX SELF-CLEANING FAN

This system, operated by switch 1, cleans the radiator core and the grille of the engine cover by reversing the air flow.

**⚠ When in use, beware of the risk of projection into the eyes.**

Position A: The indicator light is on, the fan operates in self-cleaning mode for a few seconds once every 3 minutes.

Position B: The indicator light is off, the fan is in normal operating mode.



## 5 - MODCOD ANTI-THEFT SYSTEM

### OPERATION

- Switch on the lift truck: the red indicator 1 will flash.
- Enter your user code followed by "V" to validate: the green indicator 2 will come on.
- Start the lift truck within the next 60 seconds; otherwise the anti-theft system will be reactivated and the red indicator 1 will flash.

NOTE: If you make a mistake when entering the code, press key "A" to cancel and re-enter the code in full.

If you wait more than 5 seconds between key presses or do not complete entering the code, the anti-theft system will be reactivated and the red indicator will flash.



## 6 - FINTRONIC ANTI-START SYSTEM

### OPERATION

- Switch on the lift truck and set the black key A next to the antenna B (maximum 80 mm).
- Wait a few seconds for red led C to go out before starting the lift truck.

NOTE: You can restart the lift truck within 20 seconds of stopping it: after this time, the anti-start system reacts and led C flashes red.

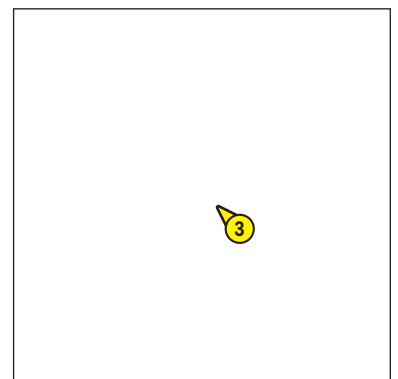
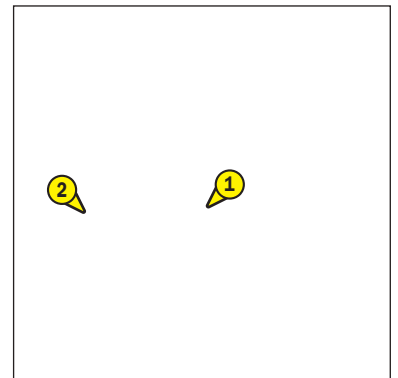


## 7 - MODCLÉ ANTI-START SYSTEM

### OPERATION

- Switch on lift truck ignition, red led 1 will flash.
- Apply key 2 to its base 3, and withdraw the moment the system emits a continuous beep, and led 1 turns green.
- Start the lift truck within the next 20 seconds; otherwise the anti-theft system will be reactivated and red led 1 will flash.

NOTE: You can restart the lift truck within 20 seconds of stopping it; after this time, the anti-start system reacts and red led 1 flashes.



## 8 - ATTACHMENT HYDRAULIC CONTROL FORCED OPERATION

**!** *This OPTION must only be used with an attachment requiring continuous hydraulic movement of type: brush, supply bucket, mixer, spray... It is strictly forbidden in handling operations and at all other events (winch, crane boom, crane boom with winch, hook, etc.).*

### CONTINUOUS HYDRAULIC MOVEMENT OF THE ATTACHMENT

- Make sure the potentiometer C is set to 0%.
- Switch button A to the front or the back (depending on the type of attachment), press button B and release button A. The red indicator 1, flashes to indicate that it is in operation.
- Set the required flowrate using potentiometer C.
- To stop continuous hydraulic movement of the attachment, move switch A forwards or backwards or press button B. Indicator 1 goes out.
- Set potentiometer C to 0%.

**!** *Never leave the driver's cab without resetting the potentiometer C to 0%. Before starting the lift truck, make sure the potentiometer is set to 0%.*

NOTE: If the operator leaves the driver's cab, the continuous hydraulic movement will automatically stop and must be restarted.



## 9 - BOOM SUSPENSION

The boom is suspended to reduce shaking of the lift truck on rough ground (e.g. moving straw in a field).

### OPERATION

- Set the forks or attachment on the ground and relieve the front wheels a few centimetres only.
- Press switch 1 set to position A, the visual indicator comes on indicating that boom suspension is activated.
- Press switch 1 set to position B, the visual indicator goes out indicating that boom suspension is deactivated.

**!** *Boom suspension is active to a lifting height of 3m00 from the axis of articulation of the carriage with respect to the ground with the boom retracted. When you move beyond this height or make another hydraulic movement (tilting, telescoping, attachment), boom suspension is momentarily deactivated and the visual indicator of switch 1 goes out.*

- When the I.C. engine is off, boom suspension is automatically deactivated.



## 10 - ATTACHMENT EASY HYDRAULIC CONNECTION

For easily connecting and disconnecting the attachment.

### OPERATION

- Press for two seconds on push-button 1 to release the attachment circuit hydraulic pressure.
- Connect or disconnect the rapid connectors of the hydraulic attachment (see: 4 - OPTIONAL ATTACHMENTS FOR USE WITH THE RANGE: PICKING UP THE ATTACHMENTS).



## 11 - PROVISION FOR ELECTRICAL JIB

Enables an electrical function to be used at the head of the jib foot.

### ELECTRIC JIB FUNCTION CONTROL

- Set switch 1 to position B (indicator light on).
- Hold button 2 down and button 3 forwards or backwards.

NOTE: Set switch 1 to position A (indicator light off) controls the hydraulic attachment line (see: 2 - DESCRIPTION: 20 - HYDRAULIC AND TRANSMISSION CUT-OFF CONTROLS).



## 12 - JIB HEAD ELECTROVALVE

Enables use of two hydraulic functions on the attachment circuit.

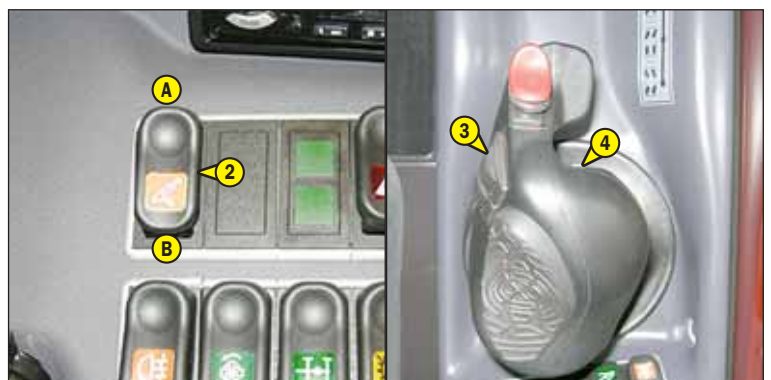
**⚠ To make connection of the rapid connectors easier, decompress the hydraulic circuit by pressing button 1 on the electrovalve.**

### ATTACHMENT LINE L1 CONTROL

- Set switch 2 to position A (indicator light off).
- Push button 3 forward or backward.

### ATTACHMENT LINE L2 CONTROL

- Set switch 2 to position B (indicator light on).
- Hold button 4 down and push button 3 forwards or backwards.





### 13 - HYDRAULIC ATTACHMENT LOCKING

Enables the attachment to be locked onto the carriage and a hydraulic attachment to be used by the same hydraulic circuit.

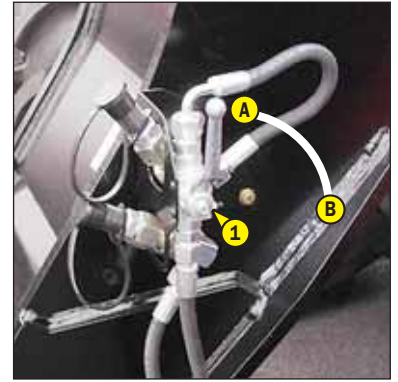
#### ATTACHMENT LOCKING CONTROL

- Set valve 1 to position A and place switch 2 in position B (indicator light on).
- Push button 3 forward to lock the attachment and backward to release it.

**⚠ After locking the attachment, return switch 2 to position A (indicator light off) to prevent accidental release of the attachment.**

#### HYDRAULIC ATTACHMENT CONTROL

- Set valve 1 to position B and press switch 2 in position B (indicator light on).
- Push button 3 forward or backward.



### 14 - JIB HEAD ELECTROVALVE + HYDRAULIC ATTACHMENT LOCKING

The addition of these two options on the attachment line allows two hydraulic functions to be used and locks the attachment onto the carriage.

**⚠ To make connection of the rapid connectors easier, decompress the hydraulic circuit by pressing button 1 on the electrovalve.**

#### ATTACHMENT LINE L1 CONTROL

- Set switch 2 to position A (indicator light off).
- Push button 3 forward or backward.

#### ATTACHMENT LINE L2 CONTROL + HYDRAULIC ATTACHMENT LOCKING

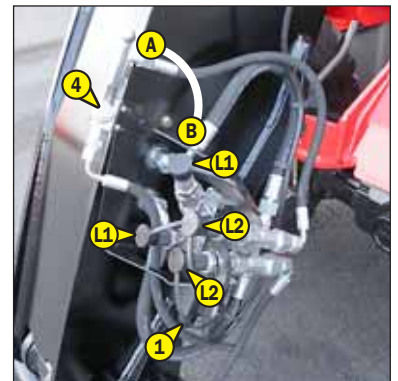
##### LOCKING AN ATTACHMENT

- Set valve 4 to position A.
- Set switch 2 to position B (indicator light on).
- Hold button 5 down and push button 3 forward to lock the attachment and backward to release it.

**⚠ Once the attachment is locked, return valve 4 to position B to prevent accidental release of the attachment.**

##### HYDRAULIC ATTACHMENT

- Set switch 2 to position B (indicator light on).
- Hold button 5 down and push button 3 forwards or backwards.



## **15 - MACH2 QUICK-RELEASE COUPLERS ON ACCESSORY CIRCUIT**

Enables the use of a hydraulic attachment fitted with MACH2 quick-release couplers.

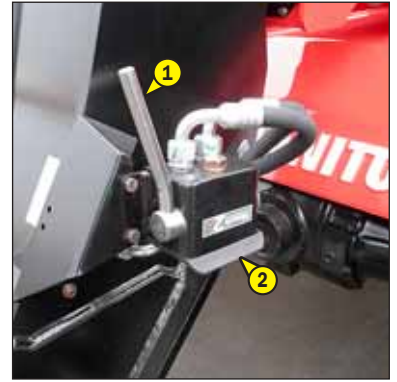
### **CONNECTING A HYDRAULIC ATTACHMENT**

- Lower lever 1 and valve 2 and connect the MACH2 quick-release couplers on the attachment.
- Lift up lever 1 to lock the connection.

NOTE: A foolproofing device prevents the connection inversion.

### **DISCONNECTING A HYDRAULIC ATTACHMENT**

- Lower lever 1 and disconnect the MACH2 quick-release couplers from the attachment.
- Lift up lever 1.



## **16 - MACH2 QUICK-RELEASE COUPLER MACH2 ON ATTACHMENT CIRCUIT + HYDRAULIC ATTACHMENT LOCKING**

Enables the locking of the attachment on the carriage to be controlled and a hydraulic attachment with MACH2 quick-release couplers to be used (see: 2 - DESCRIPTION: 14 - HYDRAULIC ATTACHMENT LOCKING and 15 - MACH2 QUICK-RELEASE COUPLERS ON ATTACHMENT CIRCUIT).



## **17 - EXTERIOR DRAIN BACK**

Enables connection of a hydraulic attachment for which drain-back is required.

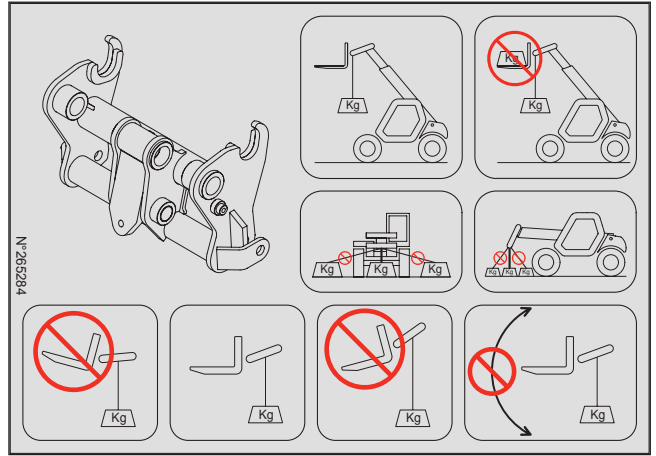


## 18 - LIFTING RING ON SINGLE CARRIAGE

### CONDITIONS OF USE

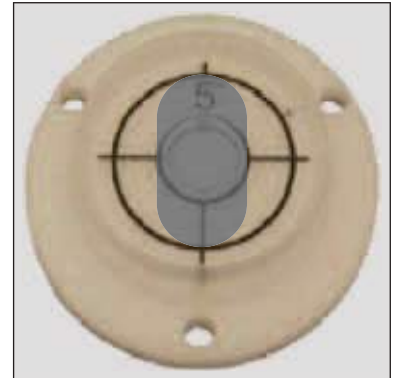
**⚠ Follow the instructions given in the instruction manual (see: 1 - OPERATING AND SAFETY INSTRUCTIONS: INSTRUCTIONS FOR HANDLING LOADS).**

- The lifting ring must be used WITHOUT FORKS AND ATTACHMENTS, but the angle of inclination of the carriage must be same as when the forks are used in the horizontal position.
- Do not change the angle of the carriage while using the lifting ring.
- The lifting hook, the chains and slings shall have a minimum capacity of 3000 kg with a factor of safety against breakage of 4.



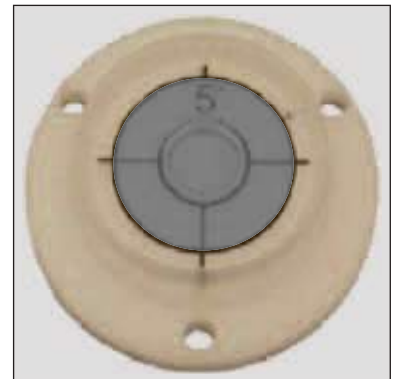
### HANDLING WITH NO MOVEMENT OF THE LIFT TRUCK

- Whether on stabilisers or on tyres, the lateral attitude must not exceed 1 % and the longitudinal attitude must not exceed 8,75 % (5°).
- The bubble of the level indicator must remain within the outer circle and be centred in the longitudinal direction.



### HANDLING WITH MOVEMENT OF THE LIFT TRUCK

- The lateral attitude must not exceed 8,75 % (5°). The bubble must remain within the outer circle.





## **19 - ANGULAR SECTOR ON JIB**

The angular sector displays the jib angle, and thus improves the reading of the load charts.



## **20 - SINGLE OR DUAL EFFECT REAR HYDRAULIC CONTROL PREDISPOSITION**

Enables the use of a hydraulic attachment at the rear of the lift truck (e.g. a trailer with hydraulic tipping).



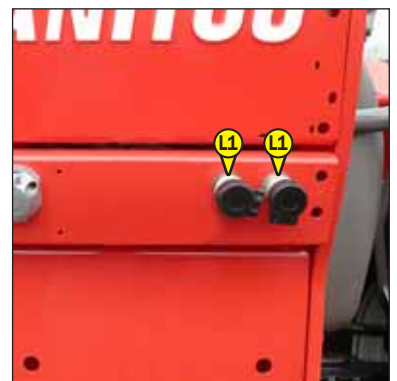
### **SINGLE EFFECT HYDRAULIC CONTROL L1**

- Press switch 1 downwards to supply the rear hydraulic attachment.



### **DUAL EFFECT HYDRAULIC CONTROL L1**

- Press switch 1 upwards or downwards to supply the rear hydraulic attachment.



## **21 - DUAL EFFECT REAR HYDRAULIC CONTROL PREDISPOSITION + SINGLE OR DUAL EFFECT REAR HYDRAULIC CONTROL PREDISPOSITION**

Enables the use of a hydraulic attachment at the rear of the lift truck or another hydraulic attachment at the rear of the lift truck.



### **DUAL EFFECT L1 AND SINGLE EFFECT L2 REAR HYDRAULIC CONTROL**

#### DUAL EFFECT ATTACHMENT L1

- Set switch 1 to position A (indicator light off).
- Press switch 2 upwards or downwards to supply the rear hydraulic attachment.

#### SINGLE EFFECT ATTACHMENT L2

- Set switch 1 to position B (indicator light on).
- Press switch 2 downwards to supply the rear hydraulic attachment.



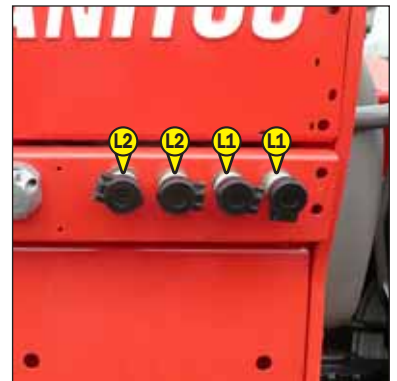
### **DUAL EFFECT L1 AND DUAL EFFECT L2 REAR HYDRAULIC CONTROL**

#### DUAL EFFECT ATTACHMENT L1

- Set switch 1 to position A (indicator light off).
- Press switch 2 upwards or downwards to supply the rear hydraulic attachment.

#### DUAL EFFECT ATTACHMENT L2

- Set switch 1 to position B (indicator light on).
- Press switch 2 upwards or downwards to supply the rear hydraulic attachment.



## 22 - HYDRAULIC TOWING HOOK + SINGLE OR DUAL EFFECT REAR HYDRAULIC CONTROL PREDISPOSITION

Enables the use of the trailer eye (see: 2 - DESCRIPTION: TRAILER PIN AND HOOK) or a hydraulic attachment at the rear of the lift truck.



### HYDRAULIC TRAILER HOOK + SINGLE EFFECT REAR HYDRAULIC CONTROL L1

#### HYDRAULIC TRAILER HOOK

- Set switch 1 to position A (indicator light off).
- Press switch 2 upwards or downwards to use the hydraulic trailer hook (see: 2 - DESCRIPTION: TRAILER PIN AND HOOK: F - HYDRAULIC TRAILER HOOK).

#### SINGLE EFFECT ATTACHMENT L2

- Set switch 1 to position B (indicator light on).
- Press switch 2 downwards to supply the rear hydraulic attachment.



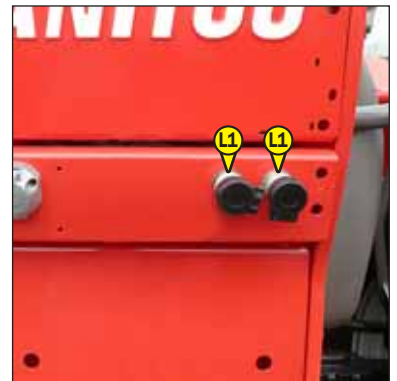
### HYDRAULIC TRAILER HOOK + DUAL EFFECT REAR HYDRAULIC CONTROL L1

#### HYDRAULIC TRAILER HOOK

- Set switch 1 to position A (indicator light off).
- Press switch 2 upwards or downwards to use the hydraulic trailer hook (see: 2 - DESCRIPTION: TRAILER PIN AND HOOK: F - HYDRAULIC TRAILER HOOK).

#### DUAL EFFECT ATTACHMENT L2

- Set switch 1 to position B (indicator light on).
- Press switch 2 upwards or downwards to supply the rear hydraulic attachment.





# ***3 - MAINTENANCE***



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## **MANITOU ORIGINAL SPARE PARTS AND EQUIPMENT**

**OUR LIFT TRUCKS MUST BE SERVICED USING ORIGINAL MANITOU PARTS.**

### ***IF YOU USE PARTS WHICH ARE NOT ORIGINAL MANITOU PARTS,***

---

***YOU RISK***

- Legally - to be held responsible in the event of an accident.
- Technically - to generate operating failure or shorten the life of the lift truck.

**THE USE OF COUNTERFEIT PARTS OR COMPONENTS NOT APPROVED BY THE MANUFACTURER,  
MEANS YOU LOSE THE BENEFIT OF THE CONTRACTUAL GUARANTEE.**

### ***BY USING ORIGINAL MANITOU PARTS FOR MAINTENANCE OPERATIONS,***

---

***YOU BENEFIT  
EXPERTISE***

- Through its network, MANITOU provides the user with
- Know-how and competence.
  - The guarantee of high-quality work.
  - Original replacement components.
  - Help with preventive maintenance.
  - Efficient help with diagnosis.
  - Improvements due to experience feedback.
  - Operator training.
  - Only the MANITOU network has detailed knowledge of the design of the lift truck and therefore the best technical ability to provide maintenance.

**ORIGINAL REPLACEMENT PARTS ARE DISTRIBUTED EXCLUSIVELY BY MANITOU AND ITS DEALER NETWORK.  
the dealer network list is available on manitou web site [www.manitou.com](http://www.manitou.com)**



# START-UP CHECKLIST

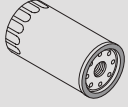
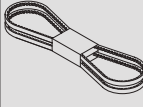
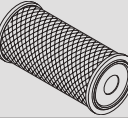
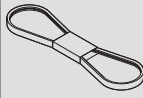
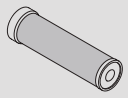
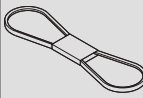

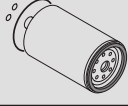
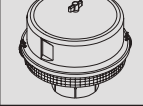


0 = OK    1 = Missing    2 = Incorrect

100	ENGINE	
01	Air filter	
02	Fuel tank	
03	Fuel lines - Filter	
04	Injection or carburetion system	
05	Radiator and cooling system	
06	Belts	
07	Hoses	
101	TRANSMISSION	
01	Direction reversal system	
02	Gear shift	
03	Cut-off pedal	
04	Clutch	
102	AXLES/TRANSFER GEAR BOX	
01	operation and seal	
02	Stop settings	
103	HYDRAULIC/HYDROSTATIC CIRCUIT	
01	Tank	
02	Pumps and couplings	
03	Tightening of connections	
04	Lift cylinder(s)	
05	Tilt cylinder(s)	
06	Attachment cylinder(s)	
07	Telescope cylinder(s)	
08	Compensation cylinder(s)	
09	Steering cylinder(s)	
10	Control Valve	
11	Balancing valve	
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107	MAST ASSEMBLY	
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05	Forks	

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01	Fitting on machine	
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109	CABIN/PROTECTOR/ELECTRIC CIRCUIT	
01	Seat	
02	Dashboard and radio	
03	Sound and visual alarm/safety system	
04	Heating/Air conditioning	
05	Windscreen wiper/windscreen washer	
06	Road horn	
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08	Road lights	
09	Additional lights	
10	Rotating beacon light	
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110	WHEEL	
01	Rims	
02	Tyre/Pressure	
111	SCREWS	
112	FRAME AND BODYWORK	
113	PAINTING	
114	GENERAL OPERATION	
115	OPERATOR'S MANUAL	
116	CUSTOMER INSTRUCTIONS	

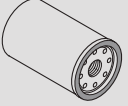
## FILTERS CARTRIDGES AND BELTS

### I.C. ENGINE

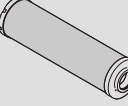
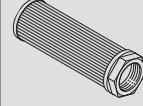

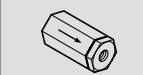
	I.C. ENGINE OIL FILTER Part number: 476954 Change: 500 H		ALTERNATOR BELT Part number: 269138
	DRY AIR FILTER CARTRIDGE Part number: 563416 Clean: 50 H* Change: 500 H*		FAN BELT Part number: 257524
	SAFETY DRY AIR FILTER CARTRIDGE Part number: 563415 Change: 1000 H*		COMPRESSOR BELT (OPTION AIR CONDITIONING) Part number: 244237
	FUEL FILTER Part number: 747351 Change: 500 H		CYCLONIC PRE-FILTER Part number: 224713 Clean: 10 H
	FUEL PRE-FILTER Part number: 747462 Change: 500 H		AUTOMATIC VACUUM-CLEANING PRE-FILTER (OPTION) Part number: 226611
	CLEANFIX COMPRESSOR FILTER (OPTION) Part number: 781443 Change: 500 H		AUTOMATIC VACUUM-CLEANING PRE-FILTER (OPTION) Part number: 223510

\*: This periodicity is given for information only (see: 3 - MAINTENANCE: SERVICING SCHEDULE) for cleaning and changing.

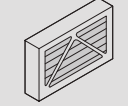
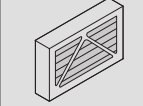
### TRANSMISSION

	GEAR BOX OIL FILTER Part number: 561749 Change: 500 H
-------------------------------------------------------------------------------------	-------------------------------------------------------------

### HYDRAULIC

	HYDRAULIC RETURN OIL FILTER CARTRIDGE Part number: 236094 Change: 500 H		SUCTION STRAINER FOR HYDRAULIC OIL TANK Part number: 224726 Clean: 1000 H
	FILTER CAP FOR HYDRAULIC OIL TANK Part number: 62415 Change: 1000 H		DISTRIBUTOR CONTROL HEAD FILTER Part number: 254780 Change: 1000 H

### CAB

	CAB VENTILATION FILTER (WITHOUT AIR CONDITIONING) Part number: 282619 Clean: 500 H		CAB VENTILATION FILTER (WITH AIR CONDITIONING) Part number: 282619 Clean: 50 H Change: 250 H
-------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------



## LUBRICANTS AND FUEL



### USE THE RECOMMENDED LUBRICANTS AND FUEL:

- For topping up, oils may not be miscible.
- For oil changes, MANITOU oils are perfectly appropriate.

### DIAGNOSTIC ANALYSIS OF OILS

If a service or maintenance contract has been organized with the dealer, a diagnostic analysis of engine, gear box and axle oils may be requested depending on the rate of use.

### (\*) RECOMMENDED FUEL SPECIFICATION

Use a high-quality fuel to obtain optimal performance of the I.C. engine.

- N590 diesel fuel type - Auto/C0/C1/C2/C3/C4
- BS2869 Class A2
- ASTM D975-91 Class 2-2DA, US DF1, US DF2, US DFA
- JIS K2204 (1992) Grades 1, 2, 3 and Special Grade 3.

I.C. ENGINE				
ORGANS TO BE LUBRICATED	CAPACITY	RECOMMENDATION		
I.C. ENGINE	11L(2.9 gl)	Shell: Rotella 15w40 Citgo: C-600 15w40		
COOLING CIRCUIT	18,5L(4.9 gl)	Tulco 50/50 Premix Anti-freeze		
FUEL TANK	120L(31.7 gl)	Diesel fuel (*)		

TRANSMISSION				
ORGANS TO BE LUBRICATED	CAPACITY	RECOMMENDATION		
GEAR BOX	16,6L(4.4 gl)	Shell: Donax TG Dexron III Citgo: Transgard ATF Dexron III		
ANGLE GEAR BOX	2,2L(2.3qts)	Shell: Spirax DH 80w90 Citgo: Premium Gear MP 80w90		
TRANSMISSION UNIVERSAL JOINT		Shell: Rentinax Am Citgo: Lithoplex CM-2		

BOOM				
ORGANS TO BE LUBRICATED		RECOMMENDATION		
BOOM PADS		Shell: Rentinax Am Citgo: Lithoplex CM-2		
GREASING OF THE BOOM		Shell: Rentinax Am Citgo: Lithoplex CM-2		

**HYDRAULIC**

ORGANS TO BE LUBRICATED	CAPACITY	RECOMMENDATION		
HYDRAULIC OIL TANK	135L(35.6 gl)	Shell: Tellus T46 Citgo: Transgard THF Lo-Temp		

**BRAKE**

ORGANS TO BE LUBRICATED	RECOMMENDATION		
BRAKE CIRCUIT	Shell: Donax TG Dexron III Citgo: Transgard ATF Dexron III		

**CAB**

ORGANS TO BE LUBRICATED	RECOMMENDATION		
CAB DOOR	Shell: Rentinax Am Citgo: Lithoplex CM-2		
WINDSCREEN WASHER TANK	Windscreen washer fluid		

**FRONT AXLE**

ORGANS TO BE LUBRICATED	CAPACITY	RECOMMENDATION		
FRONT AXLE DIFFERENTIAL	8,1L(2.1 gl)	Shell: Donax TD Citgo: Transgard (THF)		
FRONT WHEELS REDUCERS	0,8L(.8 qt)	Shell: Spirax DH 80w90 Citgo: Premium Gear MP 80w90		
FRONT WHEELS REDUCERS PIVOTS FRONT AXLE OSCILLATION		Shell: Rentinax Am Citgo: Lithoplex CM-2		

**REAR AXLE**

ORGANS TO BE LUBRICATED	CAPACITY	RECOMMENDATION		
REAR AXLE DIFFERENTIAL	8,1L(2.1 gl)	Shell: Donax TD Citgo: Transgard (THF)		
REAR WHEELS REDUCERS	0,8L(.8 qt)	Shell: Spirax DH 80w90 Citgo: Premium Gear MP 80w90		
REAR WHEELS REDUCERS PIVOTS REAR AXLE OSCILLATION		Shell: Rentinax Am Citgo: Lithoplex CM-2		

**CHASSIS**


ORGANS TO BE LUBRICATED	RECOMMENDATION		
TILTING CORRECTOR	Shell: Rentinax Am Citgo: Lithoplex CM-2		

# SERVICING SCHEDULE


## (1): MANDATORY 500 HOUR OR 6 MONTH SERVICE

This service must be carried out after approximately the first 500 hours of operation or within the 6 months following the start-up of the machine (whichever occurs first).

A = ADJUST, C = CHECK, G = GREASE, N = CLEAN,  
P = BLEED, R = REPLACE, V = DRAIN

	PAGE	 (1)	DAILY OR EVERY 10 HOURS SERVICE	EVERY 50 HOURS SERVICE	EVERY 250 HOURS SERVICE	EVERY 500 HOURS SERVICE OR 6 MONTHS	EVERY 1000 HOURS SERVICE OR 1 YEAR	EVERY 2000 HOURS SERVICE OR 2 YEARS	EVERY 4000 HOURS SERVICE	OCCASIONALLY
<b>I.C. ENGINE</b>										
I.C. engine oil level	3-14	C	C	<<<	<<<	<<<	<<<	<<<	<<<	
Cooling liquid level	3-14	C	C	<<<	<<<	<<<	<<<	<<<	<<<	
Fuel level	3-15	C	C	<<<	<<<	<<<	<<<	<<<	<<<	
Fuel pre-filter	3-15	C	C	<<<	<<<	<<<	<<<	<<<	<<<	
Cyclonic pre-filter	3-15	N	N	<<<	<<<	<<<	<<<	<<<	<<<	
Dry air filter cartridge	3-20/31	R		C/N	<<<	R	<<<	<<<	<<<	
Radiator cores	3-20	N		N	<<<	<<<	<<<	<<<	<<<	
Condenser core (OPTION Air conditioning)	3-21	C/N		C/N	<<<	<<<	<<<	<<<	<<<	
Fan belt tension	3-26	C/A			C/A	<<<	<<<	<<<	<<<	
Alternator/crankshaft belt tension	3-26	C/A			C/A	<<<	<<<	<<<	<<<	
Compressor belt tension (OPTION Air conditioning)	3-27	C/A			C/A	<<<	<<<	<<<	<<<	
I.C. engine oil	3-30	V				V	<<<	<<<	<<<	
I.C. engine oil filter	3-30	R				R	<<<	<<<	<<<	
Fuel pre-filter	3-31	R				R	<<<	<<<	<<<	
Fuel filter	3-32	R				R	<<<	<<<	<<<	
CLEANFIX compressor filter (OPTION)	3-33	R				R	<<<	<<<	<<<	
Fuel tank	3-36						N	<<<	<<<	
Safety dry air filter cartridge	3-36						R	<<<	<<<	
I.C. engine silent blocks							C**	<<<	<<<	
I.C. engine rates							C**	<<<	<<<	
Valves clearances		C**					C**	<<<	<<<	
Cooling liquid	3-42							V	<<<	
Radiator								C**	<<<	
Water pump and the thermostat								C**	<<<	
Alternator and the starter motor								C**	<<<	
Turbocompressor								C**	<<<	
Fuel system	3-44									P
<b>TRANSMISSION</b>										
Gear box oil level	3-16	C	C	<<<	<<<	<<<	<<<	<<<	<<<	
Transmission universal joint	3-21	G		G	<<<	<<<	<<<	<<<	G/C**	
Angle gear box oil level	3-28	C			C	<<<	<<<	<<<	<<<	
Gear box oil filter	3-33	R				R	<<<	<<<	<<<	
Gear box oil	3-37	V					V	<<<	<<<	
Gear box sump strainer	3-37	N					N	<<<	<<<	
Angle gear box oil	3-39	V					V	<<<	<<<	
Silentblocks in the gear box							C**	<<<	<<<	
Gear box controls							C**	<<<	<<<	
Gear box pressures							C**	<<<	<<<	
Converter pressure							C**	<<<	<<<	
<b>TYRES</b>										
Tyres pressure	3-16	C	C	<<<	<<<	<<<	<<<	<<<	<<<	
Wheel nuts torque	3-16	C	C	<<<	<<<	<<<	<<<	<<<	<<<	
Condition of wheels and tyres							C**	<<<	<<<	
Wheel	3-45									R
<b>Boom</b>										
Boom pads	3-16		G*	<<<	<<<	<<<	<<<	<<<	<<<	
Boom	3-22	G		G	<<<	<<<	<<<	<<<	<<<	
Boom pads wear							C**	<<<	<<<	
Condition of boom unit							C**	<<<	<<<	
Bearings and articulation rings							C**	<<<	<<<	
<b>HYDRAULIC</b>										
Hydraulic oil level	3-23	C		C	<<<	<<<	<<<	<<<	<<<	
Hydraulic return oil filter cartridge	3-34	R				R	<<<	<<<	<<<	
Hydraulic oil	3-39						V	<<<	<<<	
Suction strainer for hydraulic oil tank	3-39						N	<<<	<<<	
Filter cap for hydraulic oil tank	3-39						R	<<<	<<<	
Distributor control head filter	3-39						R	<<<	<<<	
Speeds of hydraulic movements							C**	<<<	<<<	
Hydraulic pump pipe filter (except ... LSU ...)							N**	<<<	<<<	
Condition of hoses and flexible pipes							C**	<<<	<<<	
Condition of cylinders (leakage, shafts)							C**	<<<	<<<	
Hydraulic circuit pressures							C**	<<<	<<<	
Hydraulic circuit outputs							C**	<<<	<<<	
Hydraulic oil tank							N**	<<<	<<<	

A = ADJUST, C = CHECK, G = GREASE, N = CLEAN,  
P = BLEED, R = REPLACE, V = DRAIN

	PAGE	 (1)	DAILY OR EVERY 10 HOURS SERVICE	EVERY 50 HOURS SERVICE	EVERY 250 HOURS SERVICE	EVERY 500 HOURS SERVICE OR 6 MONTHS	EVERY 1000 HOURS SERVICE OR 1 YEAR	EVERY 2000 HOURS SERVICE OR 2 YEARS	EVERY 4000 HOURS SERVICE	OCCASIONALLY
<b>BRAKE</b>										
Brake oil level	3-23	C		C	<<<	<<<	<<<	<<<	<<<	
Parking brake	3-28	C/A			C/A	<<<	<<<	<<<	<<<	
Parking brake lever mechanism	3-34	G				G	<<<	<<<	<<<	
Parking brake mechanism on the transmission		G**				G**	<<<	<<<	<<<	
Brake oil							V**	<<<	<<<	
Brake system							P**	<<<	<<<	
Brake system pressure							C**	<<<	<<<	
Brake							A**	<<<	<<<	
<b>STEERING</b>										
Steering								C**	<<<	
Steering swivel joints									C**	
<b>CAB</b>										
Windscreen washer liquid level	3-24	C		C	<<<	<<<	<<<	<<<	<<<	
Cab door	3-24	G		G	<<<	<<<	<<<	<<<	<<<	
Cab ventilation filter (OPTION Air conditioning)	3-24/28	R		N	R	<<<	<<<	<<<	<<<	
Heating block non-return valve	3-28	N			N	<<<	<<<	<<<	<<<	
Cab ventilation filters	3-34	N				N	<<<	<<<	<<<	
Seat belt	3-41						C	<<<	<<<	
Condition of the rear view mirrors							C**	<<<	<<<	
Structure							C**	<<<	<<<	
Air conditioning (OPTION)	3-43							C	<<<	
<b>ELECTRICITY</b>										
Longitudinal stability limiter and warning device	3-17/47		C	<<<	<<<	<<<	<<<	<<<	<<<	XXX
Condition of wiring harness and cables							C**	<<<	<<<	
Lights and signals							C**	<<<	<<<	
Warning indicators							C**	<<<	<<<	
Front headlights	3-45									A
<b>FRONT AXLE</b>										
Front wheels reducers pivots	3-25	G		G	<<<	<<<	<<<	<<<	G/C**	
Front axle oscillation	3-25	G		G	<<<	<<<	<<<	G/C**	<<<	
Front axle differential oil level	3-29	C			C	<<<	<<<	<<<	<<<	
Front wheels reducers oil level	3-29	C			C	<<<	<<<	<<<	<<<	
Front axle differential oil	3-35	V				V	<<<	<<<	<<<	
Front wheels reducers oil	3-41	V					V	<<<	<<<	
Wear of front axle brake discs									C**	
Front wheels reducers universal joint									C**	
Front wheels reducers clearance									C**	
<b>REAR AXLE</b>										
Rear wheels reducers pivots	3-25	G		G	<<<	<<<	<<<	<<<	G/C**	
Rear axle oscillation	3-25	G		G	<<<	<<<	<<<	G/C**	<<<	
Rear axle differential oil level	3-29	C			C	<<<	<<<	<<<	<<<	
Rear wheels reducers oil level	3-29	C			C	<<<	<<<	<<<	<<<	
Rear axle differential oil	3-35	V				V	<<<	<<<	<<<	
Rear wheels reducers oil	3-41	V					V	<<<	<<<	
Wearing of rear axle brake discs									C**	
Rear wheels reducers universal joint									C**	
Rear wheels reducers clearance									C**	
<b>CHASSIS</b>										
Tilting corrector	3-25	G		G	<<<	<<<	<<<	<<<	<<<	
Structure							C**	<<<	<<<	
Bearings and articulation rings								C**	<<<	
<b>ATTACHMENTS</b>										
Forks wear		C**				C**	<<<	<<<	<<<	
Attachment carriage							C**	<<<	<<<	
Condition of attachments							C**	<<<	<<<	
<b>LIFT TRUCK</b>										
Tow the lift truck	3-45									XXX
Sling the lift truck	3-46									XXX
Transport the lift truck on a platform	3-46									XXX

(\*): Every 10 hours during the first 50 hours, then once at 250 hours.

(\*\*): Consult your dealer.

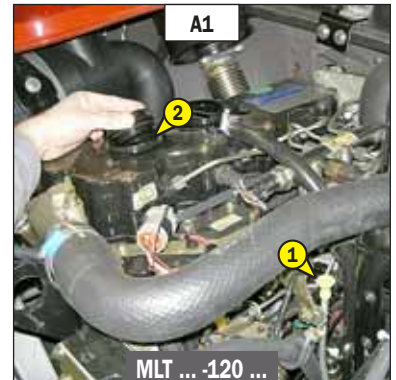
## A - DAILY OR EVERY 10 HOURS SERVICE

### A1 - I.C. ENGINE OIL LEVEL

CHECK

Place the lift truck on level ground with the I.C. engine stopped, and let the oil drain into the sump.

- Open the I.C. engine bonnet.
- Remove the dipstick 1 (fig. A1).
- Clean the dipstick and check the correct level between the two notches.
- If necessary, add oil (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL) by the filler port 2 (fig. A1).
- Check visually that there is no leakage or seepage of oil in the I.C. engine.

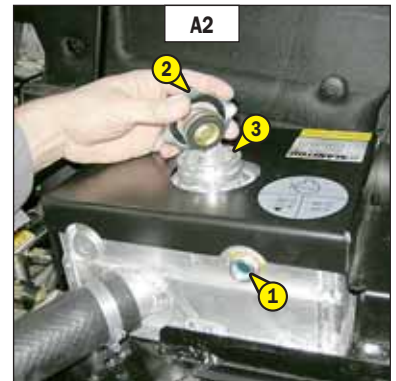


### A2 - COOLING LIQUID LEVEL

CHECK

Place the lift truck on level ground with the I.C. engine stopped, and allow the I.C. engine to cool.

- Open the I.C. engine bonnet.
- Check the correct level in the middle of gauge 1 (fig. A2).
- If necessary, add cooling liquid (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL).
- Slowly turn the cap of the radiator 2 (fig. A2) up to the safety stop.
- Allow the pressure and the steam to escape.
- Press down and turn the cap so as to release it.
- Add cooling liquid via filler port 3 (fig. A2) up to the middle of gauge 1 (fig. A2).
- Lubricate slightly the filler neck in order to facilitate the setting and the removal of the radiator cap.
- Check visually that there is no leakage in the radiator and pipes.



**⚠ To avoid any risk of spraying or burning, wait until the I.C. engine has cooled down before removing the cooling circuit filler plug. If the cooling liquid is very hot, add only hot cooling liquid (80°C). In an emergency, you can use water as a cooling liquid, then change the cooling circuit liquid as soon as possible (see: 3 - MAINTENANCE: F1 - COOLING LIQUID).**



### A3 - FUEL LEVEL

CHECK

Keep the fuel tank full, to reduce as much as possible any condensation due to the atmospheric conditions.

- Remove cap 1 (fig. A3).
- Fill the fuel tank with clean fuel (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL), filtered through a strainer or a clean, lint free cloth, through filler port 2 (fig. A3).
- Put the cap back 1 (fig. A3).
- Check visually that there is no leakage in the tank and pipes.

**!** *Never smoke or approach with a flame during filling operations or when the tank is open. Never refill while I.C. engine is running.*

**!** *The fuel tank is degassed via the filler plug. When changing it, always use an original part, with degassing hole.*

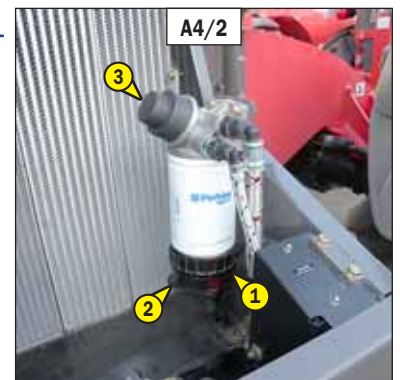
NOTE: A locking tank cap is available as an OPTION.



### A4 - FUEL PRE-FILTER

CHECK

- Open the I.C. engine bonnet.
- Check for the presence of water in the pre-filter bowl 1 (fig. A4/2) and empty it out if necessary.
- Place a receptacle under the drain plug 2 (fig. A4/2) and loosen it in two to three thread turns.
- Allow the diesel fuel to flow out until it is free from impurities and water.
- Tighten the drain plug.
- Pressurise the circuit with the hand pump 3 (fig. A4/2).



### A5 - CYCLONIC PREFILTER

CLEAN

The cleaning interval is given as a guide, however the pre-filter must be emptied as soon as impurities reach the MAX. level on the tank.

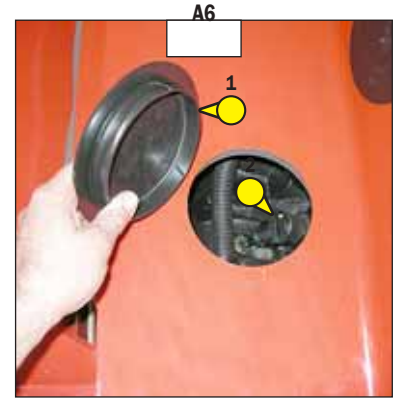
- Loosen nut 1 (fig. A5), remove cover 2 (fig. A5) and empty the tank.
- Clean the pre-filter unit with a clean dry cloth and reassemble the unit.

**!** *When cleaning, take care not to let impurities into the dry air filter.*



## A6 - GEAR BOX OIL LEVEL

CHECK



Park the lift truck on level ground with the boom raised, the I.C. engine cold and stopped. Carry out the control within 5 minutes of the I.C. engine being stopped.

- Remove the plastic cap 1 (fig. A6).
- Remove the dipstick 2 (fig. A6).
- Wipe the dipstick and check the correct level between the two MIN and MAX marks.
- If necessary, add oil (see: 3 - MAINTENANCE: E3 - GEAR BOX OIL).
- Check visually that there is no leakage or seepage of oil in the transmission.

## A7 - TIRES PRESSURE AND WHEEL NUTS TORQUE

CHECK

- Check the condition of the tyres, to detect cuts, protuberances, wear, etc.
- Check the torque load of the wheel nuts. Non compliance with this instruction can cause damage and rupture to the wheel bolts and distortion to the wheels.
  - Wheel nuts tightening torque
    - Front tyres: 630 N.m (465 ft/lb)  $\pm$  15%
    - Rear tyres: 630 N.m (465 ft/lb)  $\pm$  15%
- Check and adjust the tyre pressures if necessary (see: 2 - DESCRIPTION: FRONT AND REAR TYRES).

**⚠ Check that the air hose is correctly connected to the tyre valve before inflating and keep all persons at a distance during inflation. Respect the recommended tyre pressures given.**

NOTE: There is an OPTIONAL wheel toolkit and anti-puncture kit.

## A8 - BOOM PADS

CLEAN - GREASE

To be carried out every 10 hours during the first 50 hours service, then once at 250 hours.

- Extend the boom completely.
- With a brush, apply a coat of grease (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL) on the 4 sides of the telescope(s) (fig. A8).
- Telescope the boom several times in order to spread the coat of grease evenly.
- Remove the surplus of grease.

**⚠ If the lift truck is used in an abrasive environment (dust, sand, coal...) Use lubricating varnish (MANITOU reference: 483536). In this respect, consult your dealer.**





## B - EVERY 50 HOURS SERVICE

Carry out the operations described previously as well as the following operations.

### B1 - DRY AIR FILTER CARTRIDGE

CHECK - CLEAN

In case of use in a heavily dust laden atmosphere, there are pre-filtration cartridges (see: 3 - MAINTENANCE: FILTERS CARTRIDGES AND BELTS). Also, the checking and cleaning periodicity of the cartridge must be reduced.

**!** *If the clogging indicator light comes on, this operation must be carried out as quickly as possible (1 hour maximum). The cartridge must not be cleaned more than seven times, after which the cartridge must be changed. Never use the lift truck without an air filter or with a damaged air filter.*

- For the disassembly and reassembly of the cartridge, see: 3 - MAINTENANCE: D3 - DRY AIR FILTER CARTRIDGE.
- Clean the filter cartridge using a compressed air jet (max. pressure 3 bar) 45 psi directed from the top to the bottom and from the inside towards the outside at a minimum distance of 30 mm from the cartridge wall.
- Cleaning is completed when there is no more dust on the cartridge.

**!** *Respect the safety distance of 30 mm between the air jet and the cartridge to avoid tearing or making a hole in the cartridge. The cartridge must not be blown anywhere near the air filter box. Never clean the cartridge by tapping it against a hard surface. Your eyes must be protected during this intervention.*

- Clean the cartridge seal surfaces with a damp, clean lint-free cloth and grease with a silicone lubricant (MANITOU reference: 479292).
- Check visually the outer condition of the air filter and its mounts. Verify the condition of the hoses and their mounts also.

**!** *Never clean the dry air filter cartridge by washing it in liquid. Do not clean by any means the safety cartridge located inside the filter cartridge, change it for a new one if it is clogged or damaged.*

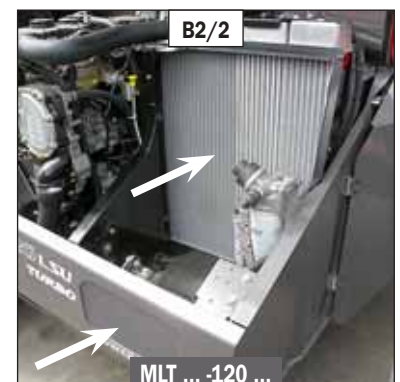
### B2 - RADIATOR CORES

CLEAN

**!** *In a polluting atmosphere, clean the radiator cores every day. Do not use a water jet or high-pressure steam as this could damage the radiator fins.*

- Open the I.C. engine bonnet.
- If necessary, clean the suction grid on the engine hood (fig. B2/1).
- Using a soft cloth, clean the radiator cores in order to remove as much dirt as possible.
- Clean the radiator cores using a compressed air jet aimed in the same direction as the cooling air flow (fig. B2/2).
- Clean with the fan running for best results.

NOTE: There is an OPTIONAL self-cleaning fan.



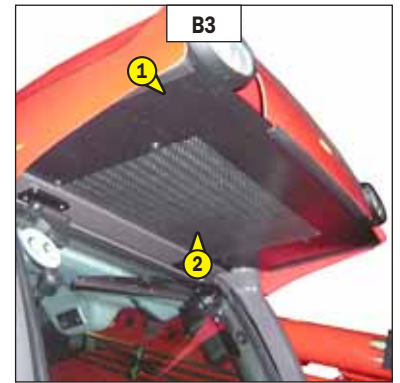
### **B3 - CONDENSER CORE (OPTION AIR CONDITIONING)**

**CHECK - CLEAN**

**⚠** *In a polluting atmosphere, clean the radiator core every day. Do not use a water jet or high-pressure steam as this could damage the condenser fins.*

- Remove the protective grid 1 (fig. B3) and clean it if necessary.
- Visually check whether the condenser 2 (fig. B3) is clean and clean it if necessary.
- Clean the condenser using a compressed air jet aimed in the same direction as the air flow (fig. B3).

NOTE: So as to enhance the cleaning, carry out this operation with the fans running.

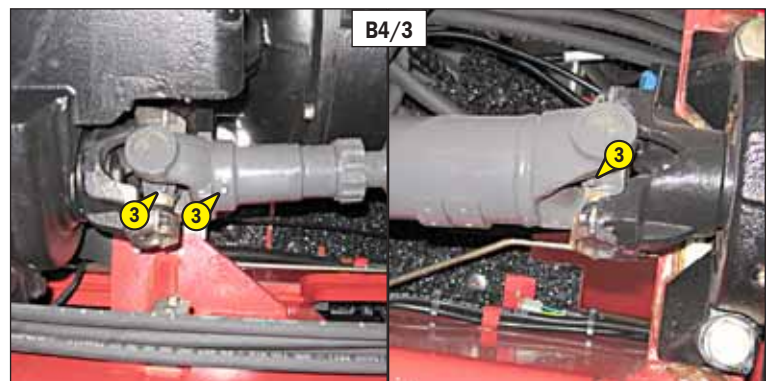
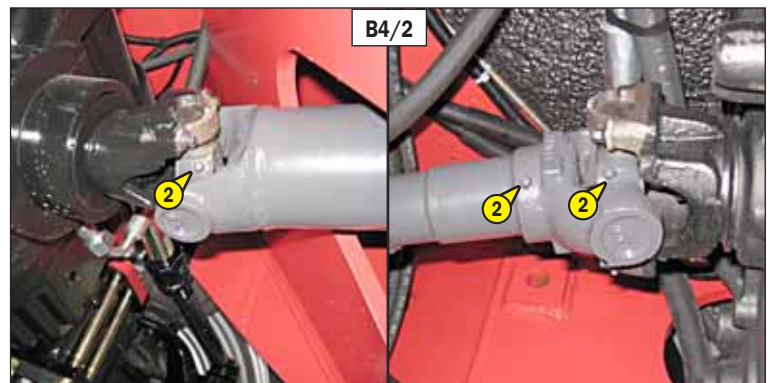
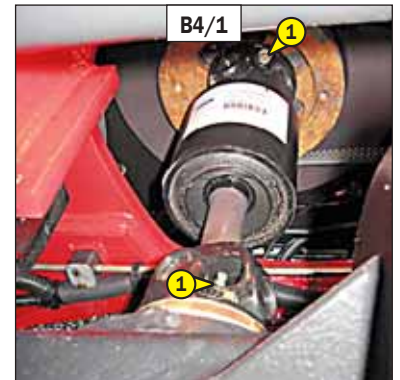


### **B4 - TRANSMISSION UNIVERSAL JOINT**

**GREASE**

- Clean and lubricate the following points with grease (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL) and remove the surplus of grease.

- 1 - Lubricators of the universal joint I.C. engine/Angle gear box (2 lubricators) (fig. B4/1).
- 2 - Lubricators of the universal joint Transmission/Front axle (3 lubricators) (fig. B4/2).
- 3 - Lubricators of the universal joint Transmission/Rear axle (3 lubricators) (fig. B4/3).



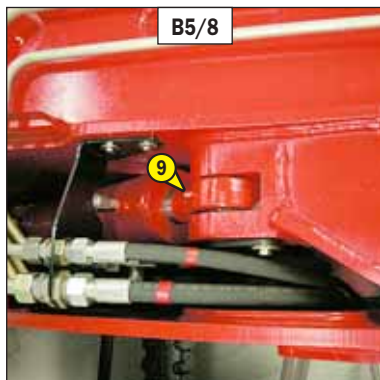
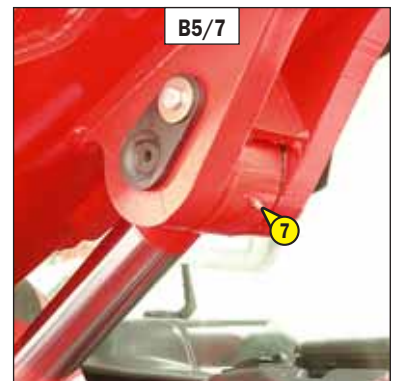
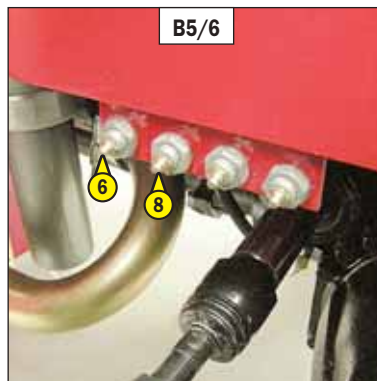
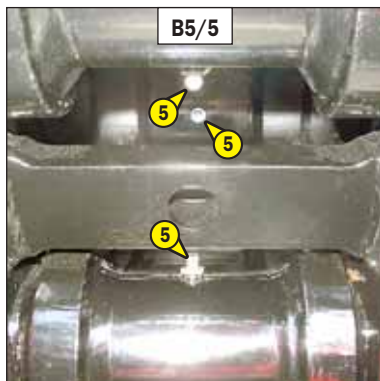
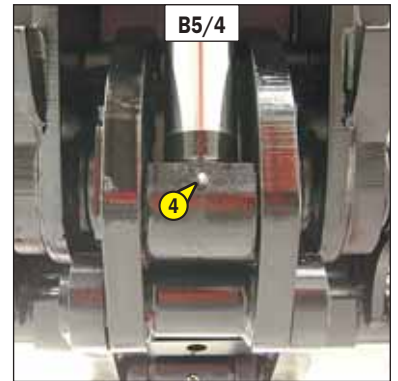
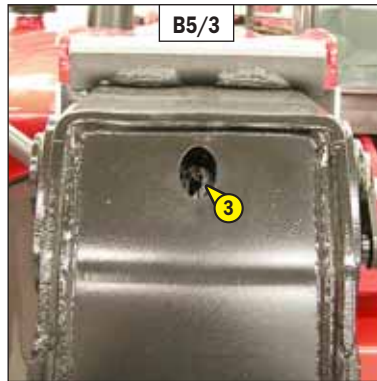
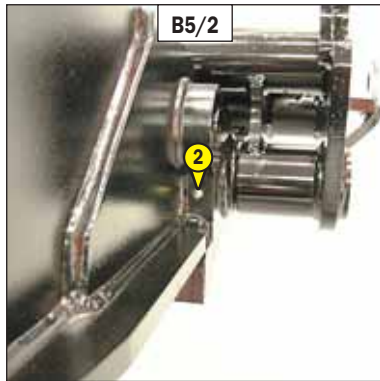
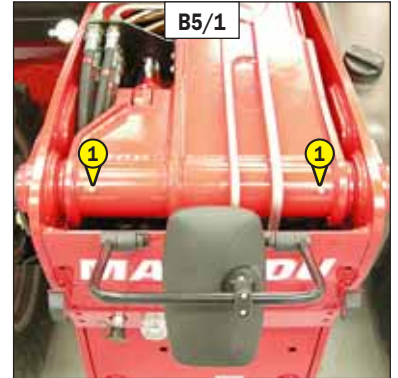


To be carried out weekly, if the lift truck has been operated for less than 50 hours during the week.

**!** *In the event of prolonged use in an extremely dusty or oxidising atmosphere, reduce this interval to 10 working hours or every day.*

- Clean and lubricate the following points with grease (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL) and remove the surplus of grease.

- 1 - Lubricators of the boom axle (2 lubricators) (fig. B5/1).
- 2 - Lubricators of the carriage axle (2 lubricators) (fig. B5/2).
- 3 - Lubricator of the tilt cylinder foot axle (1 lubricator) (fig. B5/3).
- 4 - Lubricator of the tilt cylinder head axle (1 lubricator) (fig. B5/4).
- 5 - Lubricators of the carriage connecting rod axle (3 lubricators) (fig. B5/5).
- 6 - Lubricator of the lifting cylinder foot axle (1 lubricator) (fig. B5/6).
- 7 - Lubricator of the lifting cylinder head axle (1 lubricator) (fig. B5/7).
- 8 - Lubricator of the compensation cylinder foot axle (1 lubricator) (fig. B5/6).
- 9 - Lubricator of the compensation cylinder head axle (1 lubricator) (fig. B5/8).



## B6 - HYDRAULIC OIL LEVEL

CHECK

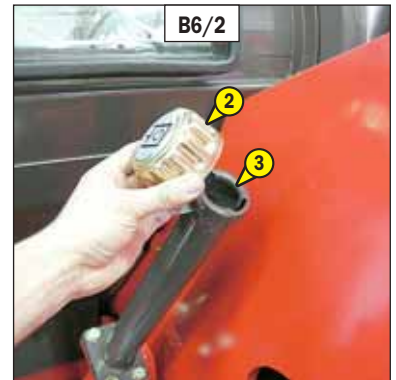
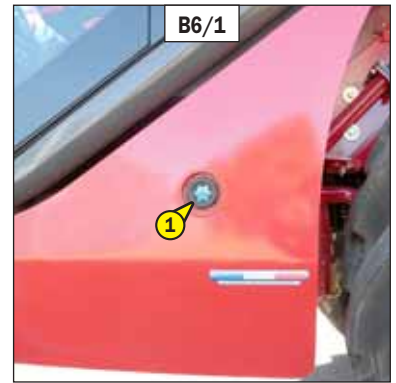
Place the lift truck on level ground with the I.C. engine stopped, and the boom retracted and lowered as far as possible.

- Refer to gauge 1 (fig. B6/1).
- The oil level is correct when it is at the level of the red point.
- If necessary, add oil (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL).
- Remove cap 2 (fig. B6/2).
- Add oil by filler port 3 (fig. B6/2).

**!** Use a clean funnel and clean the underside of the oil drum before filling.

- Put the cap back.
- Check visually that there is no leakage in the tank and pipes.

Always maintain the oil level at maximum as cooling depends on the oil flowing through the tank.



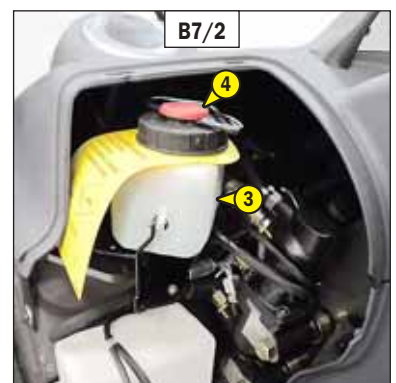
## B7 - BRAKE OIL LEVEL

CHECK

Place the lift truck on level ground.

- Loosen screw 1 (fig. B7/1) and remove the access panel for braking oil tank and windscreen washer tank 2 (fig. B7/1).
- The level is correct when it is at the MAX. level in tank 3 (fig. B7/2)
- If necessary, add oil (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL) by the filler port.
- Pivot the tank 3 (fig. B7/2) to access the filler cap 4 (fig. B7/2).
- Check visually that there is no leakage in the tank and pipes.

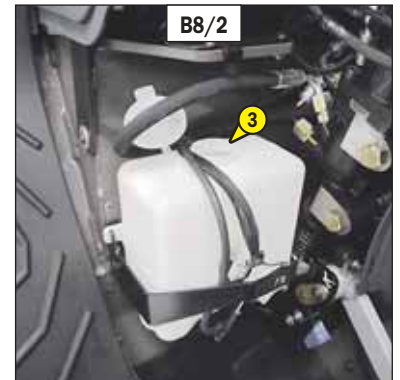
**!** If the braking oil level is abnormally low, consult your dealer.



## **B8 - WINDSCREEN WASHER LIQUID LEVEL**

**CHECK**

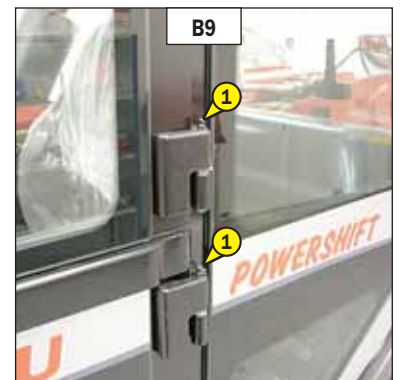
- Loosen screw 1 (fig. B8/1) and remove the access panel for braking oil tank and windscreen washer tank 2 (fig. B8/1).
- Visually check the level.
- If necessary add windscreen washer liquid (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL) by filler port 3 (fig. B8/2).



## **B9 - CAB DOOR**

**GREASE**

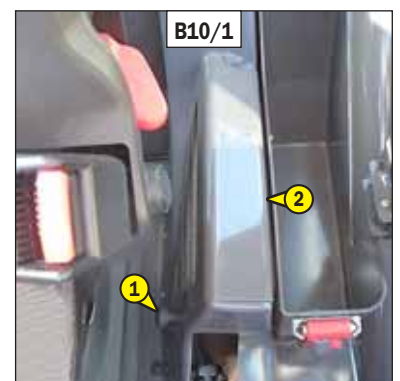
- Clean and lubricate the points 1 (4 lubricators) (fig. B9) with grease (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL) and remove the surplus of grease.



## **B10 - CAB VENTILATION FILTER (OPTION AIR CONDITIONING)**

**CLEAN**

- Unscrew the thumbscrew 1 (fig. B10/1) and remove protective guard back 2 (fig. B10/1).
- Lift out cabin ventilation filter 3 (fig. B10/2).
- Clean the filter using a compressed air jet.
- Check its condition and change if necessary (see: 3 - MAINTENANCE: FILTERS CARTRIDGES AND BELTS).
- Refit the filter and protective casing.





### **B11 - FRONT AND REAR WHEEL REDUCER PIVOTS**

**GREASE**

- Clean and lubricate the points 1 (8 lubricators) (fig. B11) with grease (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL) and remove the surplus of grease.



### **B12 - FRONT AXLE OSCILLATION**

**GREASE**

MLT 1035 L Turbo LSU Série 6-E3

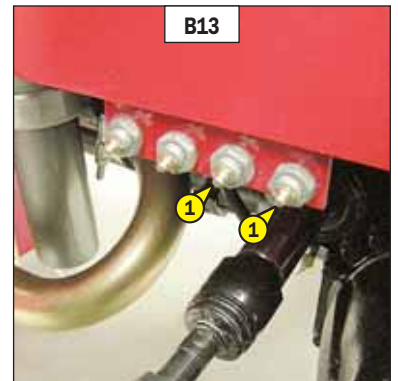
- Clean and lubricate the points 1 (2 lubricators) (fig. B12) with grease (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL) and remove the surplus of grease.



### **B13 - REAR AXLE OSCILLATION**

**GREASE**

- Clean and lubricate the points 1 (2 lubricators) (fig. B13) with grease (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL) and remove the surplus of grease.



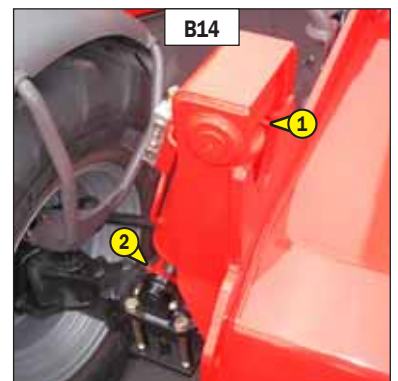
### **B14 - TILTING CORRECTOR**

**GREASE**

MLT 1035 L Turbo LSU Série 6-E3

- Clean and lubricate the following points with grease (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL) and remove the surplus of grease.

- 1 - Lubricator of the tilting corrector cylinder foot axle (1 lubricator) (fig. B14/1).
- 2 - Lubricator of the tilting corrector cylinder head axle (1 lubricator) (fig. B14/1).



## C - EVERY 250 HOURS SERVICE

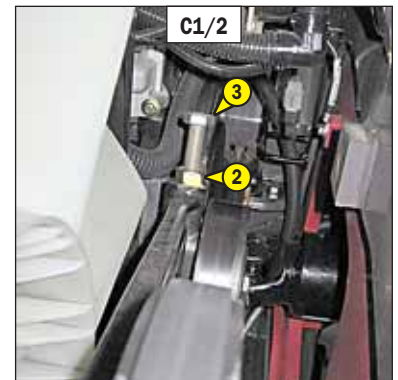
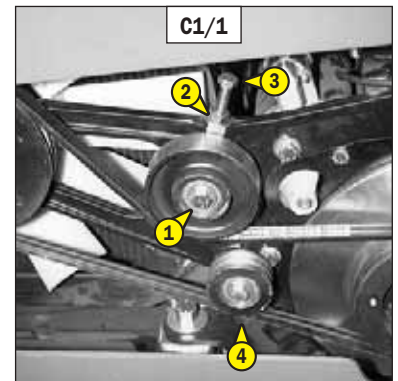
Carry out the operations described previously as well as the following operations.

### C1 - FAN BELT TENSION

CHECK - ADJUST

- Open the I.C. engine bonnet.
- Check the belt for signs of wear and cracks and change if necessary (see: 3 - MAINTENANCE: FILTERS CARTRIDGES AND BELTS).
- Loosen screw 1 (fig. C1/1) on the tension pulley.
- Loosen lock nut 2 (fig. C1/1 and C1/2) and screw 3 (fig. C1/1 and C1/2).
- Tighten the screw 2 (fig. C1/1 and C1/2) until the belt is as close as possible to the groove of the pulley 4 (fig. C1/1).
- Make a mark on the head of screw 3 (fig. C1/1 and C1/2) and tighten, turning it 5 times.
- Tighten the lock nut 2 (fig. C1/1 and C1/2).
- Retighten screw 1 (fig. C1/1) on the tension pulley.

**!** When changing the fanbelt, tighten screw 3 (fig. C1/1 and C1/2) by one and a half turns, having allowed the I.C. engine to idle for 30 minutes.



## C2 - ALTERNATOR/CRANKSHAFT BELT TENSION

### CHECK - ADJUST

For this operation, we advise you to use the MANITOU tension meter (fig. C2/1) reference 167418.

- Open the I.C. engine bonnet.
- Unscrew the fastening screws 1 (fig. C2/2).
- Lay down the protective guard 2 (fig. C2/2).
- Check the belt for signs of wear and cracks and change if necessary (see: 3 - MAINTENANCE: FILTERS CARTRIDGES AND BELTS).
- Check the belt tension between the pulleys of the crankshaft and of the alternator.

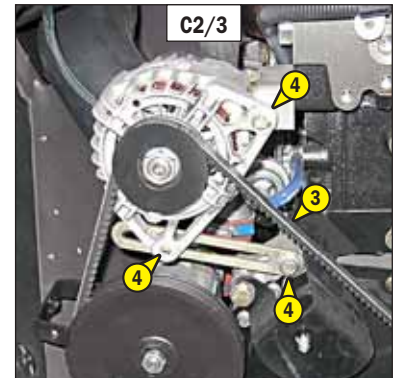
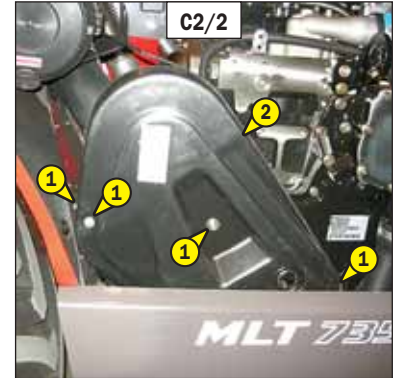
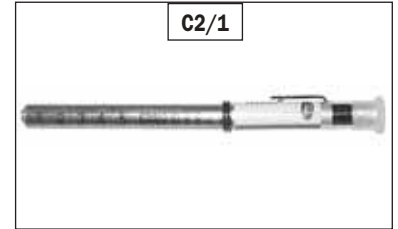
#### NEW BELT:

- At a pressure of  $15 \text{ N} \pm 0.4$  on strap 3 (fig. C2/3), the displacement must be about 3,7 mm.

#### BELT AFTER 20 HOURS OF OPERATION:

- At a pressure of  $13 \text{ N} \pm 0.4$  on strap 3 (fig. C2/3), the displacement must be about 3,7 mm.

- Carry out adjustments if necessary.
- Untighten screws 4 (fig. C2/3) by two to three thread turns.
- Swivel the alternator assembly so as to obtain the belt tension required.
- Retighten screws 4 (fig. C2/3) (tightening torque 22 N.m).
- Put the protective guard back 2 (fig. C2/2).



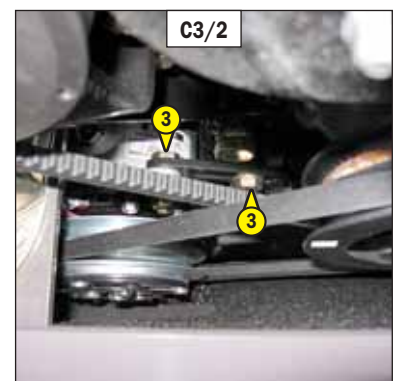
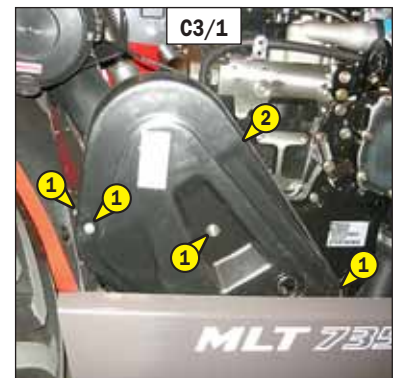
**!** *If the alternator belt has to be changed, check the tension again after the first 20 hours of operation.*

## C3 - COMPRESSOR BELT TENSION (OPTION AIR CONDITIONING)

### CHECK - ADJUST

- Open the I.C. engine bonnet.
- Unscrew the fastening screws 1 (fig. C3/1).
- Lay down the protective guard 2 (fig. C3/1).
- Check the belt for signs of wear and cracks and change if necessary (see: 3 - MAINTENANCE: FILTERS CARTRIDGES AND BELTS).
- Check the belt tension between the pulleys of the crankshaft and of the compressor.
- Under a normal pressure exerted with the thumb (45 N), the belt should move approximately 10 mm.
- Carry out adjustments if necessary.
- Untighten screws 3 (fig. C3/2) with two to three thread turns.
- Swivel the compressor assembly so as to obtain the belt tension required.
- Retighten screws 3 (fig. C3/2).
- Put the protective guard back 2 (fig. C3/1).

**!** *If the compressor belt has to be changed, check the tension again after the first 20 hours of operation.*

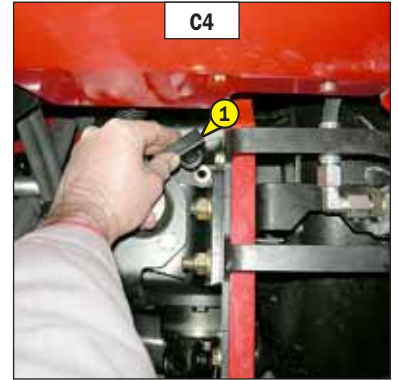


## C4 - ANGLE GEAR BOX LEVEL

CHECK

Park the lift truck on level ground with the jib raised and the I.C. engine stopped.

- Remove level plug 1 (fig. C4).
- Wipe the dipstick and check the correct level between the MIN and MAX marks.
- If necessary, add oil (see: 3 - MAINTENANCE: E5 - ANGLE GEAR BOX OIL).

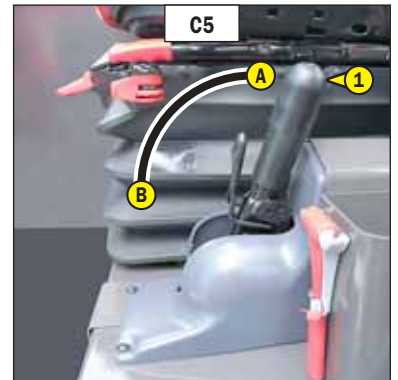


## C5 - PARKING BRAKE

CHECK - ADJUST

Place the lift truck on level ground with the rated load in the transport position.

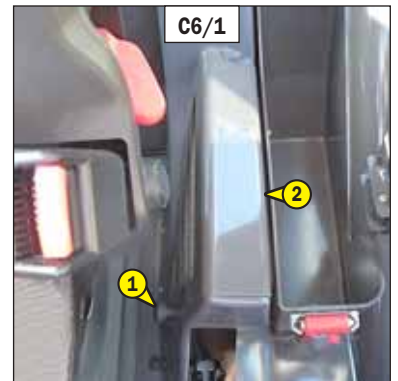
- Check braking by locking the parking brake in position A (fig. C5).
- Pull on the lift truck rear towing pin with a minimum force of 3500 daN. The wheels of the lift truck must not rotate.
- Carry out adjustments if necessary.
- Progressively tighten the end piece of the lever 1 (fig. C5) and recheck the braking.
- Repeat the operation until the correct braking adjustment is obtained.



## C6 - CAB VENTILATION FILTER (OPTION AIR CONDITIONING)

CHANGE

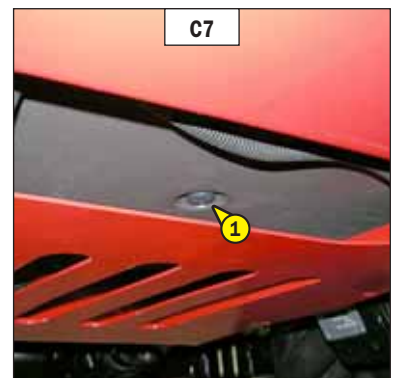
- Unscrew thumbscrew 1 (fig. C6/1) and remove protective guard back 2 (fig. C6/1).
- Lift out cabin ventilation filter 3 (fig. C6/2) and replace it with a new one (see: 3 - MAINTENANCE: FILTERS AND BELTS).
- Refit the protective casing.



## C7 - HEATING BLOCK NON-RETURN VALVE

CLEAN

- Since non-return valve 1 (fig. C7) is located under the cab, it is possible for it to become obstructed with spattered mud for example. Clean if necessary.

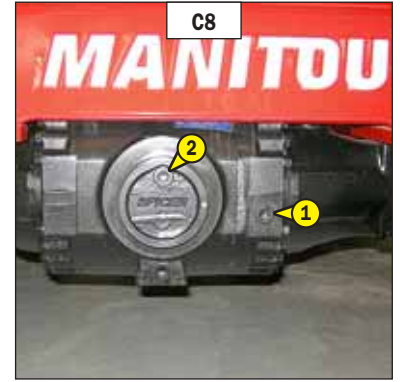


### **C8 - FRONT AND REAR DIFFERENTIAL OIL LEVEL**

**CHECK**

Place the lift truck on level ground with the I.C. engine stopped.

- Remove level plug 1 (fig. C8). The oil should be flush with the edge of the hole.
- If necessary, add oil (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL) by the filler port 2 (fig. C8).
- Replace and tighten the level plug 1 (fig. C8) (tightening torque 34 to 49 N.m).
- Repeat this operation for the rear axle differential.

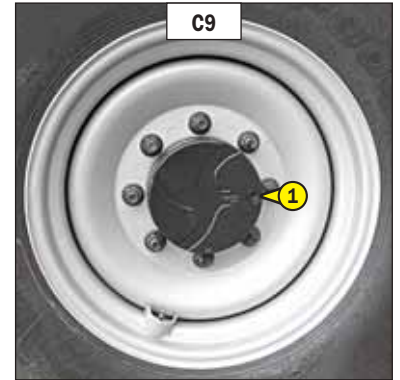


### **C9 - FRONT AND REAR WHEELS REDUCERS OIL LEVEL**

**CHECK**

Place the lift truck on level ground with the I.C. engine stopped.

- Check the level on each front wheel reducer.
- Place level plug 1 (fig. C9) in the horizontal position.
- Remove the level plug, the oil should be flush with the edge of the hole.
- If necessary, add oil (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL) by the same hole.
- Replace and tighten the level plug 1 (fig. C9) (tightening torque 34 to 49 N.m).
- Repeat this operation on each rear wheel reducer.





## D - EVERY 500 HOURS SERVICE

Carry out the operations described previously as well as the following operations.

### D1 - I.C. ENGINE OIL

DRAIN

### D2 - I.C. ENGINE OIL FILTER

CHANGE

Place the lift truck on level ground, let the I.C. engine run at idle for a few minutes, then stop the I.C. engine.

#### DRAINING THE OIL

- Open the I.C. engine bonnet.
- Remove access panel 1 (fig. D1/1).
- Place a container under drain plug 2 (fig. D1/1) and unscrew the plug 3 (fig. D1/2).
- Take drain hose 4 (fig. D1/3).
- Place the end of the drain hose in the container 2 (fig. D1/1) and screw fully the union on draining port 5 (fig. D1/4).
- Remove filler cap 6 (fig. D1/5) in order to ensure that the oil is drained properly.

**!** Dispose of the drain oil in an ecological manner.

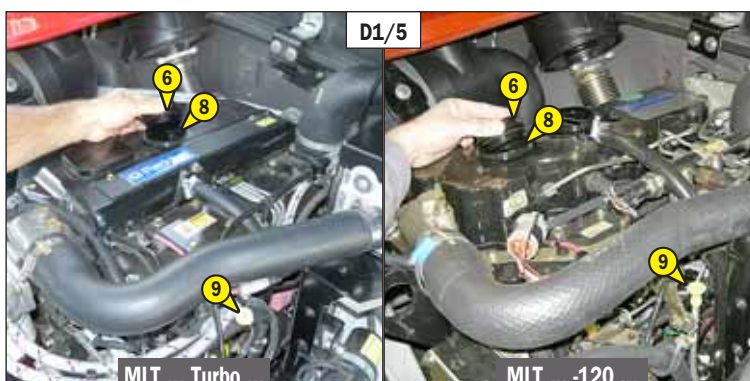
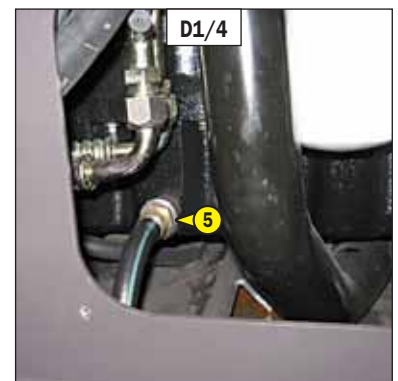
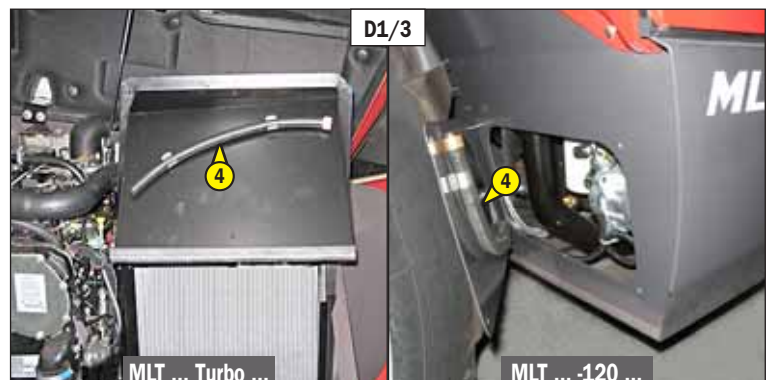
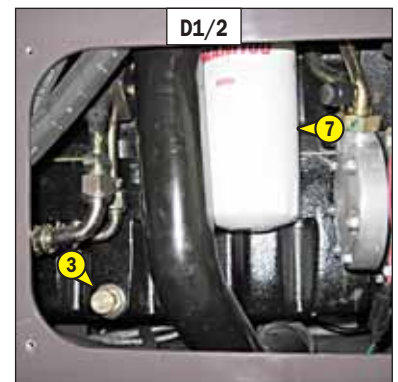
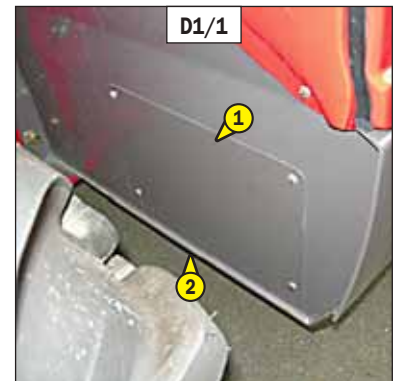
#### REPLACEMENT OF THE FILTER

- Remove I.C. engine oil filter 7 (fig. D1/2); discard the filter and the filter seal.
- Clean the filter bracket with a clean, lint-free cloth.
- Lightly grease the new oil filter seal and refit the oil filter (see: 3 - MAINTENANCE: FILTERS CARTRIDGES AND BELTS) on the filter bracket.

**!** Tighten the oil filter by hand pressure only and lock the filter in place by a quarter turn.

#### FILLING UP THE OIL

- Loosen, clean and put back in place the drain hose 4 (fig. D1/3).
- Refit and tighten drain plug 3 (fig. D1/2).
- Refit access panel 1 (fig. D1/1).
- Fill up with oil (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL) through filler port 8 (fig. D1/5).
- Wait a few minutes to allow the oil to flow into the sump.
- Start the I.C. engine and let it run for a few minutes.
- Check for possible leaks at the drain plug and the oil filter.
- Stop the I.C. engine, wait a few minutes and check the level between the two notches on dipstick 9 (fig. D1/5).
- Top up the level if necessary.



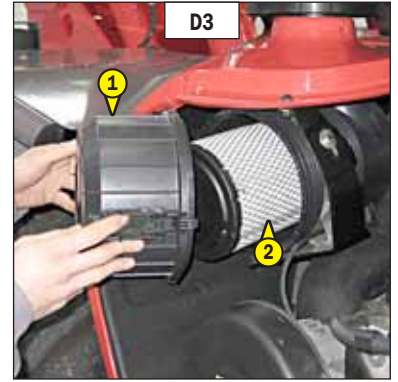
### D3 - DRY AIR FILTER CARTRIDGE

CHANGE

In case of use in a heavily dust laden atmosphere, there are pre-filtration cartridges, see: 3 - MAINTENANCE: FILTERS CARTRIDGES AND BELTS. Also, the checking and cleaning periodicity of the cartridge must be reduced (up to 250 hours in a heavily laden dust atmosphere and with pre-filtration).

**⚠ Change the cartridge in a clean location, with the I.C. engine stopped. Never operate the lift truck with the air filter removed or damaged.**

- Open the I.C. engine bonnet.
- Loosen the bolts and remove cover 1 (fig. D3).
- Gently remove the cartridge 2 (fig. D3), taking care to avoid spilling the dust.
- Leave the safety cartridge in place.
- The following parts must be cleaned with a damp, clean lint-free cloth.
  - The inside of the filter and cover.
  - The inside of the filter inlet hose.
  - The gasket surfaces in the filter and in the cover.
- Check pipes and connections between the air filter and the I.C. engine and the connection and state of the clogging indicator on the filter.
- Before mounting check the state of the new cartridge (see: 3 - MAINTENANCE: FILTERS CARTRIDGES AND BELTS).
- Introduce the cartridge into the filter axis and push it in, pressing the edges and not the middle.
- Reassemble the cover, guiding the valve downwards.

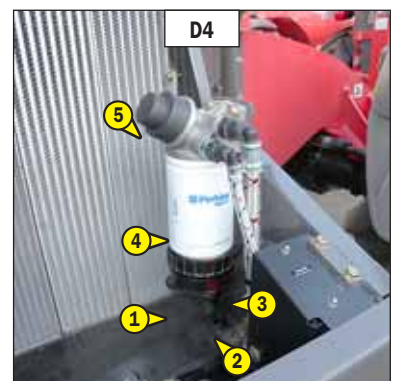


**⚠ Make sure the electrical contact on the lift truck is cut, otherwise fuel will be released if the lift pump is on.**

### D4 - FUEL PRE-FILTER

CHANGE

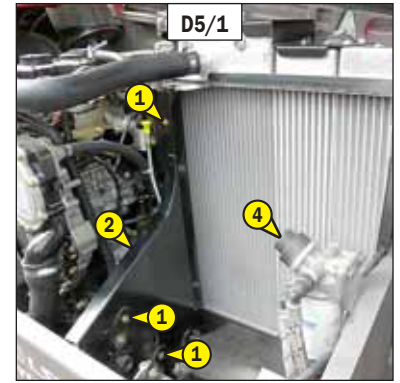
- Open the I.C. engine bonnet.
- Carefully clean the outside of the filter and its holder, to prevent dust from getting into the system.
- Place a container under the pre-filter and drain it using drain plug 1 (fig. D4).
- Disconnect the harness 2 (fig. D4).
- Unscrew locking screw 3 (fig. D4).
- Remove housing 4 (fig. D4) and discard cartridge 5 (fig. D4) as well as the seals of the cartridge.
- Clean the inside of the pre-filter head and the housing, using a brush immersed in clean diesel oil.
- Refit the assembly with a new pre-filter and new seals (see: 3 - MAINTENANCE: FILTERS CARTRIDGES AND BELTS).
- Connect the harness
- Pressurise the circuit by means of the hand pump 6 (fig. D4).
- If necessary, bleed the fuel circuit (see: 3 - MAINTENANCE: G1 - FUEL SYSTEM).



## D5 - FUEL FILTER

### CHANGE

- Open the I.C. engine bonnet.
- Unscrew the fastening screws 1 (fig. D5/1).
- Remove the protective housing 2 (fig. D5/1).
- Carefully clean the outside of the filter and its holder, to prevent dust from getting into the system.
- Place a container under the fuel filter 3 (fig. D5/2).
- Unscrew the filter and discard it
- Refit a new fuel filter (see: 3 - MAINTENANCE: FILTERS AND BELTS) on its bracket.



**▲ Tighten the fuel filter by hand pressure only and lock the filter in place by a quarter turn.**

- Bleed the fuel system: work the hand pump 4 (fig. D5/4) 100 times to remove air from the system.
- Remove the container from under the filter.
- Start up the I.C. engine and make sure there is no leakage.
- If necessary, bleed the fuel circuit (see: 3 - MAINTENANCE: G1 - FUEL SYSTEM).

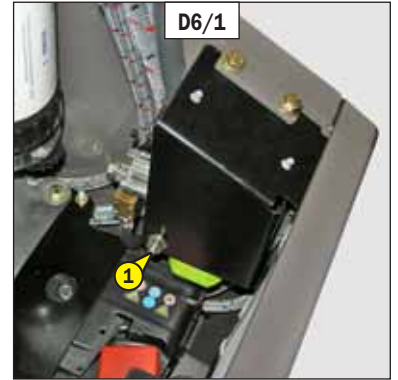




## D6 - CLEANFIX COMPRESSOR FILTER (OPTION)

CHANGE

- Open the I.C. engine bonnet.
- Remove compressor securing nut 1 (fig. D6/1). (MLT ... -120 ...)
- Remove clip 2 (fig. D6/2).
- Replace filter 3 (fig. D6/2) with a new one (see: 3 - MAINTENANCE: FILTERS CARTRIDGES AND BELTS) and correctly refit clip 2 (fig. D6/2).
- Refit the compressor securing nut. (MLT ... -120 ...)



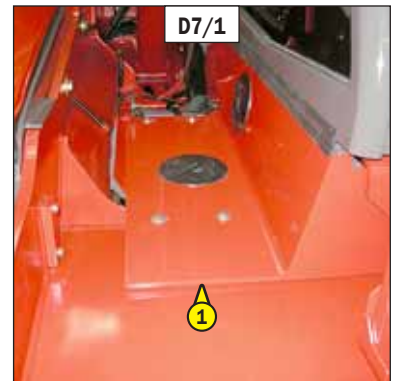
## D7 - GEAR BOX OIL FILTER

CHANGE

- Remove the cover plate 1 (fig. D7/1).
- Unscrew and discard gear box oil filter 2 (fig. D7/2).
- Carefully clean the filter head with a clean, lint-free cloth.
- Slightly lubricate the new seal and fit the seal on the filter.
- Fill up the new gear box oil filter (see: 3 - MAINTENANCE: FILTERS CARTRIDGES AND BELTS) with oil (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL).
- Refit the filter, making sure that the seal is correctly positioned and tightened.

**⚠ Tighten the gear box oil filter by hand pressure only and lock the filter in place by a quarter turn.**

- Put back the cover plate 1 (fig. D7/1).



## D8 - HYDRAULIC RETURN OIL FILTER CARTRIDGE

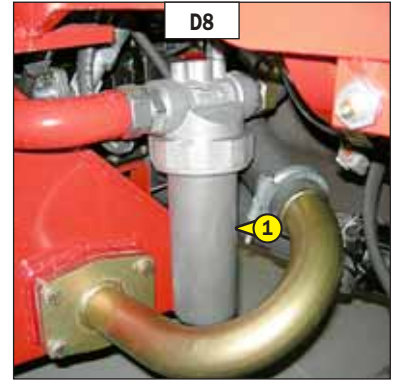
CHANGE

Stop the I.C. engine and remove the pressure from the circuits by acting on the hydraulic controls.

**⚠** *Thoroughly clean the outside of the filter and its surroundings before any intervention in order to prevent any risk of polluting the hydraulic circuit.*

- Place a container under hydraulic drain filter 1 (fig. D8).
- Unscrew the body of the filter.
- Remove the hydraulic return oil filter cartridge and fit new replacement cartridge (see: 3 - MAINTENANCE: FILTERS CARTRIDGES AND BELTS).
- Make sure that the cartridge is correctly positioned and refit the body of the filter.

**⚠** *Tighten the body of the filter by hand pressure only and lock the body of the filter in place by a quarter turn.*



## D9 - PARKING BRAKE LEVER MECHANISM

GREASE

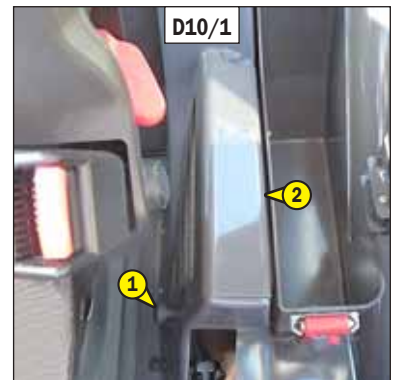
- Clean and grease articulation axles 1 (fig. D9) with grease (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL).



## D10 - CAB VENTILATION FILTER

CLEAN

- Unscrew thumbscrew 1 (fig. D10/1) remove protective guard back 2 (fig. D10/1).
- Lift out cabin ventilation filter 3 (fig. D10/2).
- Clean the filter using a compressed air jet.
- Check its condition and change if necessary (see: 3 - MAINTENANCE: FILTERS CARTRIDGES AND BELTS).
- Refit the filter and protective casing.



## D11 - FRONT AND REAR AXLE DIFFERENTIAL OIL

DRAIN

Place the lift truck on level ground with the I.C. engine stopped and the differential oil still warm.

 **Dispose of the drain oil in an ecological manner.**

- Place a container under drain plugs 1 (fig. D11) and unscrew the plugs.
- Remove level plug 2 (fig. D11) and filler plug 3 (fig. D11) in order to ensure proper emptying.
- Refit and tighten drain plugs 1 (fig. D11) (tightening torque 34 to 49 N.m).
- Fill up with oil (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL) through filler port 3 (fig. D11).
- The level is correct when the oil level is flush with the edge of port 2 (fig. D11).
- Check for any possible leaks at the drain plugs.
- Refit and tighten level cap 2 (fig. D11) (tightening torque 34 to 49 N.m) and filler port 3 (fig. D11) (tightening torque 34 to 49 N.m).
- Repeat this operation for the rear axle differential.



## E - EVERY 1000 HOURS SERVICE

Carry out the operations described previously as well as the following operations.

### E1 - FUEL TANK

CLEAN

**!** While carrying out these operations, do not smoke or work near a flame.

Place the lift truck on level ground with the I.C. engine stopped.

- Inspect the parts susceptible to leaks in the fuel circuit and in the tank.
- In the event of a leak, contact your dealer.

**!** Never try to carry out a weld or any other operation by yourself, this could provoke an explosion or a fire.

- Place a container under drain plug 1 (fig. E1/1) and unscrew the plug.
- Remove filling plug 2 (fig. E1/2) in order to ensure that the oil is drained properly.
- Rinse out with ten litres of clean diesel through filler port 3 (fig. E1/2).
- Refit and tighten the drain plug (tightening torque 29 to 39 N.m).
- Fill the fuel tank with clean diesel filtered through the filler port.
- Refit the filling cap.
- If necessary, bleed the fuel circuit (see: 3 - MAINTENANCE: G1 - FUEL SYSTEM).



### E2 - SAFETY DRY AIR FILTER CARTRIDGE

CHANGE

- For the disassembly and reassembly of the dry air filter cartridge, see: 3 - MAINTENANCE: D3 - AIR FILTER CARTRIDGE.
- Gently remove the dry air filter safety cartridge 1 (fig. E2), taking care to avoid spilling the dust.
- Clean the gasket surface on the filter with a damp, clean lint-free cloth.
- Before mounting, check the state of the new safety cartridge (see: 3 - MAINTENANCE: FILTERS AND BELTS).
- Introduce the cartridge into the filter axis and push it in, pressing the edges and not the middle.

NOTE: The periodicity for changing the safety cartridge is given for information only. It must be changed for every two changes of the dry air filter cartridge.



## E3 - GEAR BOX OIL

DRAIN

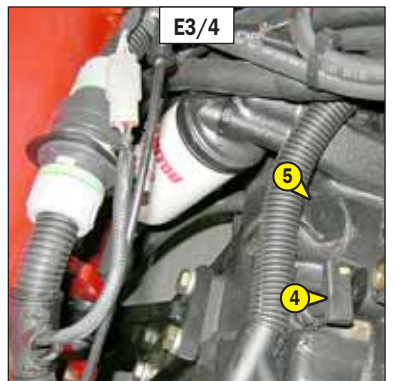
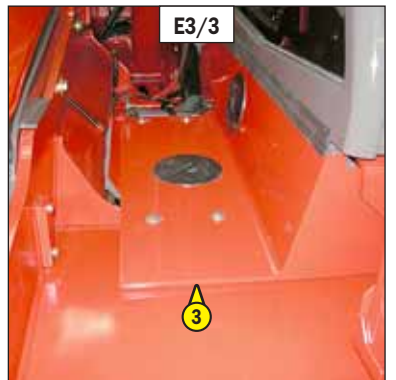
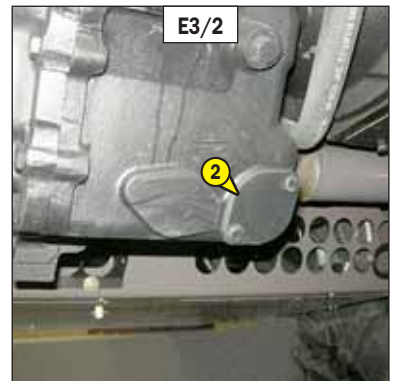
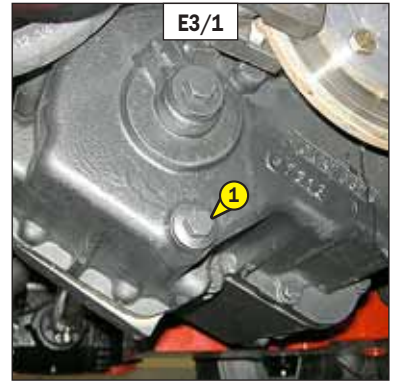
## E4 - GEAR BOX SUMP STRAINER

CLEAN

Place the lift truck on level ground with the I.C. engine stopped, the gear box oil still warm.

### DRAINING THE OIL

- Place a container under drain plug 1 (fig. E3/1) and under cover 2 (fig. E3/2) and unscrew the drain plug.
- Remove cover plate 3 (fig. E3/3).
- Remove dipstick 4 (fig. E3/4) and unscrew filling plug 5 (fig. E3/4) in order to ensure that the oil is drained properly.



*Dispose of the drain oil in an ecological manner.*

### CLEANING THE STRAINER

- Remove cover 2 (fig. E3/2) and set aside the O-ring joint and sealing washer.
- Allow the rest of the oil to drain away.
- Remove and clean the strainer using a compressed air jet.
- Clean the magnetic section on the plate.
- Refit the assembly and tighten up plate 2 (fig. E3/2) (tightening torque 18 to 31 N.m).

### FILLING UP THE OIL

- Refit and tighten drain plug 1 (fig. E3/1) (tightening torque 34 to 54 N.m).
- Fill up with oil (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL) by filler port 5 (fig. E3/4) and refit the filler cap.
- Start the I.C. engine and let it run for a few minutes.
- Check any possible leaks from the drain plug or cover.
- Stop the I.C. engine, and within 5 minutes of the I.C. engine being stopped, check on the dipstick 4 (fig. E3/4) the correct level between the two MIN and MAX. marks.
- Top up the level if necessary.
- Put back the cover plate 3 (fig. E3/3).



## E5 - ANGLE GEAR BOX OIL

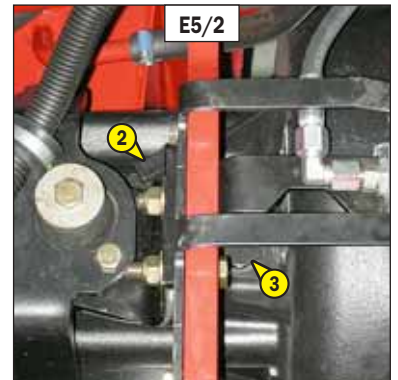
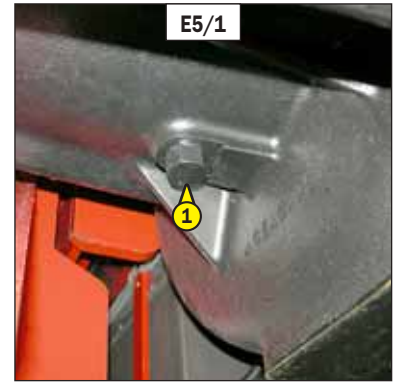
DRAIN

Place the lift truck on level ground with the I.C. engine stopped, the angle gear box oil still warm.

- Place a container under drain plug 1 (fig. E5/1) and unscrew the plug.
- Remove dipstick 2 (fig. E5/2) and unscrew filler cap 3 (fig. E5/2) in order to ensure that the oil is drained properly.

**!** *Dispose of the drain oil in an ecological manner.*

- Refit and tighten drain plug 1 (fig. E5/1) (tightening torque 20 to 29 N.m).
- Fill up with oil (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL) by filler port 3 (fig. E5/2) and refit the filler cap.
- Check the correct level between the MINI and MAX. marks on dipstick 2 (fig. E5/2).
- Check for any possible leaks at the drain plug.



## E6 - HYDRAULIC OIL

DRAIN

### E7 - SUCTION OIL STRAINER FOR HYDRAULIC OIL TANK

CLEAN

### E8 - FILTER CAP FOR HYDRAULIC OIL TANK

CHANGE

### E9 - DISTRIBUTOR CONTROL HEAD FILTER

CHANGE

Place the lift truck on level ground with the I.C. engine stopped and telescope boom retracted and lowered as far as possible.

**!** *Before any intervention, thoroughly clean the area surrounding the drain plugs and the suction cover on the hydraulic tank.*

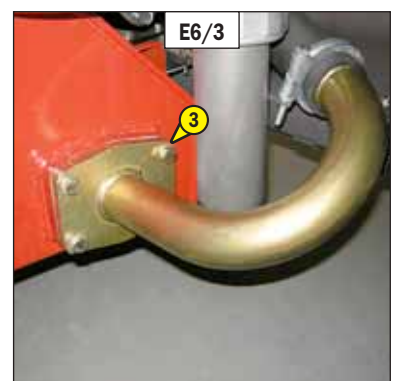
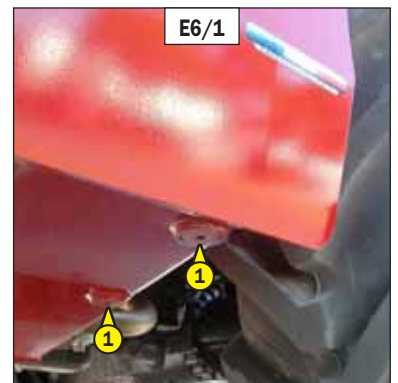
#### DRAINING THE OIL

- Place a container under drain plug 1 (fig. E6/1) and unscrew the plug.
- Remove filler cap 2 (fig. E6/2) in order to ensure that the oil is drained properly.

**!** *Dispose of the drain oil in an ecological manner.*

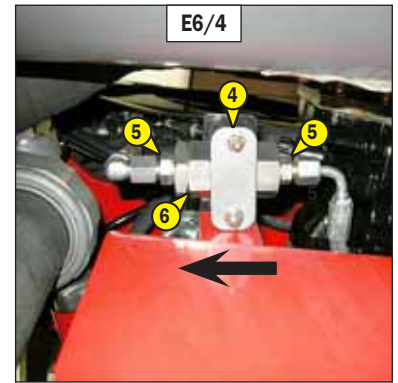
#### CLEANING THE STRAINER

- Remove suction cover 3 (fig. E6/3).
- Remove and clean the strainer using a compressed air jet, check its condition and replace if necessary (see: 3 - MAINTENANCE: FILTERS CARTRIDGES AND BELTS).
- Refit the strainer and tighten the suction cover 3 (fig. E6/3) (tightening torque 81 N.m) making sure the seal is in the correct position.



## REPLACING THE DISTRIBUTOR CONTROL HEAD FILTER

- Remove the half clamp 4 (fig. E6/4).
- Undo the two couplings 5 (fig.E6/4) and replace the filter 6 (fig. E6/4).



**!** *Be careful to mount the filter 6 (fig. D6/4) in the same direction as the arrow.*

- Refit the half clamp 4 (fig. E6/4).

### FILLING UP THE OIL

- Clean and refit drain plugs 1 (fig. E6/1) (tightening torque 29 to 39 N.m).
- Fill up with oil (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL) by filler port 7 (fig. E6/2).

**!** *Use a clean container and funnel and clean the underside of the oil drum before filling.*

- Observe the oil level on dipstick 8 (fig. E6/5), the oil level should be at the level of the red point.
- Check for any possible leaks at the drain plugs.
- Replace filler plug 2 (fig. E6/2) with a new filler plug (see: 3 - MAINTENANCE: FILTERS CARTRIDGES AND BELTS).



### HYDRAULIC CIRCUIT DECONTAMINATION

- Let the I.C. engine run (accelerator pedal at halfway travel) for 5 minutes without using anything on the lift truck, then for 5 more minutes while using completely the hydraulic movements (except the steering system and the service brakes).
- Accelerate the I.C. engine at full speed for 1 minute, then activate the steering system and the service brakes.
- This operation makes a pollution abatement of the circuit possible through the hydraulic return oil filter.

This should be carried out by your dealer after each oil change.

The hydraulic oil used in the circuit must be at least equal in quality to class 8 (according to NAS 1638). Your dealer will be able to clean the hydraulic circuit using an external unit and check the quality of the oil in order to ensure the long life of hydraulic components and particularly of the main pump.

**SEAT BELT WITH TWO ANCHORING POINTS**

- Check the following points:
  - Fixing of the anchoring points on the seat.
  - Cleanness of the strap and the locking mechanism.
  - Triggering of the locking mechanism.
  - Condition of the strap (cuts, curled edges).

**REELED BELT WITH TWO ANCHORING POINTS**

- Check the points listed above together with the following points:
  - The correct winding of the belt.
  - Condition of the reel guards.
  - Roller locking mechanism when the strap is given a sharp tug.

NOTE: After an accident, replace the seat belt.



**In no event should the lift truck be used if the seat belt is defective (fixing, locking, cuts, tears, etc.). Repair or replace the seat belt immediately.**

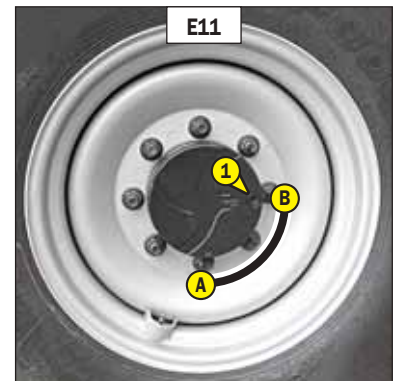
**E11 - FRONT AND REAR WHEELS REDUCERS OIL****DRAIN**

Place the lift truck on level ground with the I.C. engine stopped and the reducers oil still warm.



**Dispose of the drain oil in an ecological manner.**

- Drain and change each front wheel reducer.
- Place drain plug 1 (fig. E11) in position A.
- Place a container under the drain plug and unscrew the plug.
- Let the oil drain fully.
- Place the drain port in position B, i.e. in a level port.
- Fill up with oil (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL) by level port 1 (fig. E11).
- The level is correct when the oil level is flush with the edge of the hole.
- Refit and tighten the drain plug 1 (fig. E11) (tightening torque 34 to 49 N.m).
- Repeat this operation on each rear wheel reducer.





## F - EVERY 2000 HOURS OF SERVICE

Carry out the operations described previously as well as the following operations.

### F1 - COOLING LIQUID

#### DRAIN

These operations are to be carried out if necessary or every two years at the beginning of winter. Place the lift truck on level ground with the I.C. engine stopped and cold.

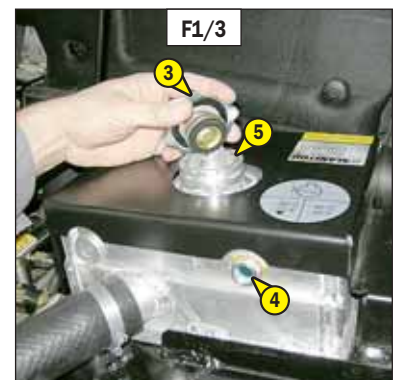
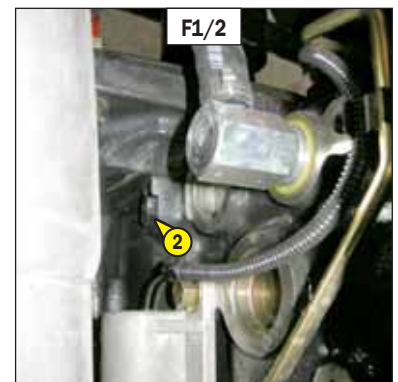
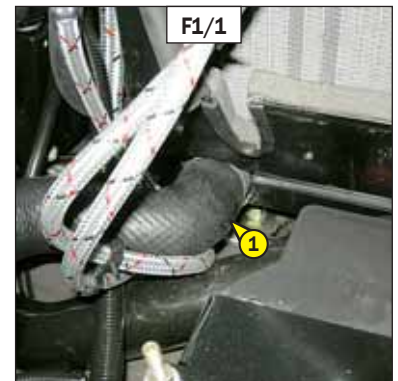
#### DRAINING THE LIQUID

- Open engine hood and lift the battery cover.
- Place a container under hose 1 (fig. F1/1) on the radiator and drain plug 2 (fig. F1/2) of the engine block. Remove the hose and loosen the drain plug.
- Remove filling plug 3 (fig. F1/3) of the radiator.
- Let the cooling circuit drain entirely while ensuring that the ports do not get clogged.
- Check the condition of the hoses as well as the fastening devices and change the hoses if necessary.
- Rinse the circuit with clean water and use a cleaning agent if necessary.

#### FILLING THE LIQUID

- Refit and tighten the hose 1 (fig. F1/1) and drain plug 2 (fig. F1/2) (tightening torque 40 N.m).
- Slowly fill up the circuit with cooling liquid (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL) to the middle of gauge 4 (fig. F1/3) through filler port 5 (fig. F1/3).
- Put back filling plug 3 (fig. F1/3).
- Run the I.C. engine at idle for a few minutes.
- Check for any possible leaks.
- Check the level and refill if necessary.

**⚠** The I.C. engine does not contain any corrosion resistor and must be filled during the whole year with a mixture containing 25% of ethylene glycol-based antifreeze.



**CLEANING CONDENSER AND EVAPORATOR COILS (\*)**  
**CLEANING CONDENSATE TRAY AND RELIEF VALVE (\*)**  
**COLLECTING COOLANT TO REPLACE FILTER-DRIER (\*)**  
**REFILLING WITH COOLANT AND CHECKING THE THERMOSTATIC CONTROL AND PRESSURE SWITCHES (\*)**

NOTE: When opening the evaporator unit, remember to replace the cover seal.

**(\*): (CONSULT YOUR DEALER).**

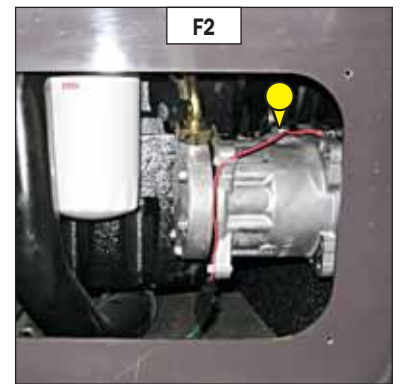
**⚠ CAUTION: DO NOT ATTEMPT TO REPAIR ANY PROBLEMS YOURSELF. ALWAYS REFER TO YOUR DEALER WHEN REFILLING CIRCUITS, AS THEY HOLD THE CORRECT SPARE PARTS, AS WELL AS HAVING THE NECESSARY TECHNICAL KNOWLEDGE AND TOOLS.**

- Do not open the circuit under any circumstances as this would cause the coolant to be lost.  
- The cooling circuit contains a gas which can be dangerous under certain conditions. This gas, coolant R 134a, is colourless, odourless and heavier than air.

**⚠**

- **If this gas is inhaled, take the victim into fresh air, give oxygen or artificial respiration if necessary and call a doctor.**
- **If the gas is in contact with the skin, wash it immediately under running water and remove any contaminated garments.**
- **If the gas is in contact with the eyes, rinse them in clear water for 15 minutes and call a doctor.**

- The compressor has an oil level gauge (fig. F2). Never unscrew this gauge because it would depressurizes the installation. The oil level is only checked when changing the oil in the circuit.



## G - OCCASIONAL MAINTENANCE

### G1 - FUEL SYSTEM

**BLEED**

These operations are to be carried out only in the following cases:

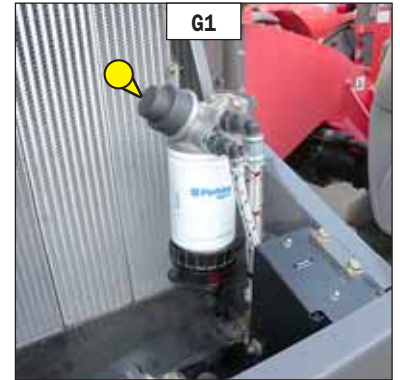
- A component of the fuel system replaced.
- A drained tank.
- Running out of fuel.



**Any contact with highly pressurized fuel risks presents a risk of percutaneous penetration or burns.**

**Spraying fuel under high pressure can cause a fire.**

**Failure to follow the inspection and maintenance instructions may result in serious injury.**



**Never work on the high pressure system. Failure to follow this instruction may result in serious damage to the engine.**

**The high pressure fuel system must be adjusted and repaired only by approved and suitably trained technicians.**

Ensure that the level of fuel in the tank is sufficient and bleed in the following order:

- Open the I.C. engine bonnet.
- Check the condition of the fuel system
- Operate the hand pump 1 (fig. G1) 50 times to remove air from the low pressure system.
  
- So the I.C. engine is ready to be started up.
- Turn the I.C. engine over slowly for 5 minutes immediately after bleeding the fuel feed circuit, in order to ensure that the injection pump has been bled thoroughly.

NOTE: If the I.C. engine functions correctly for a short time then stops or functions irregularly, check for possible leaks in the low pressure circuit. If in doubt, contact your dealer.

## G2 - WHEEL

CHANGE

**!** In the event of a wheel being changed on the public highway, make sure of the following points:

For this operation, we advise you to use the hydraulic jack MANITOU reference 505507 and the safety support MANITOU reference 554772.

- Stop the lift truck, if possible on even and hard ground.
- To pass on stop of lift truck (see: 1 - OPERATING AND SAFETY INSTRUCTIONS: DRIVING INSTRUCTIONS UNLADEN AND LADEN).
- Put the warning lights on.
- Immobilise the lift truck in both directions on the axle opposite to the wheel to be changed.
- Unlock the nuts of the wheel to be changed.
- Place the jack under the flared axle tube, as near as possible to the wheel and adjust the jack (fig. G2/1).
- Lift the wheel until it comes off the ground and put in place the safety support under the axle (fig. G2/2).
- Completely unscrew the wheel nuts and remove them.
- Free the wheel by reciprocating movements and roll it to the side.
- Slip the new wheel on the wheel hub.
- Refit the nuts by hand, if necessary grease them.
- Remove the safety support and lower the lift truck with the jack.
- Tighten the wheel nuts with a torque wrench (see: 3 - MAINTENANCE: A - DAILY OR EVERY 10 HOURS SERVICE for tightening torque).

NOTE: There is an OPTIONAL wheel toolkit and anti-puncture kit.



## G3 - FRONT HEADLAMPS

ADJUST

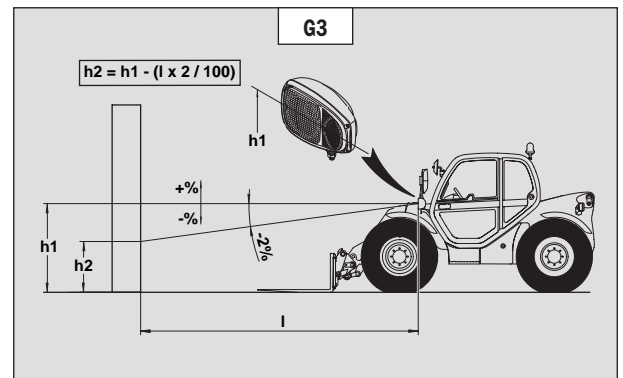
### RECOMMENDED SETTING

(as per standard ECE-76/756 76/761 ECE20)

Set to - 2% of the dipped beam in relation to the horizontal line of the headlamp.

### ADJUSTING PROCEDURE

- Place the lift truck unloaded and in the transport position and perpendicular to a white wall on flat, level ground (fig. G3).
- Check the tyre pressures (see: 2 - DESCRIPTION: CHARACTERISTICS).
- Place the forward/reverse selector in neutral and release the parking brake.



### CALCULATING THE HEIGHT OF THE DIPPED BEAM (H2)

- h1 = Height of the dipped beam in relation to the ground.
- h2 = Height of the adjusted beam.
- l = Distance between the dipped beam and the white wall.

## G4 - LIFT TRUCK

TOW

**!** Do not tow the lift truck at more than 25 km/h.

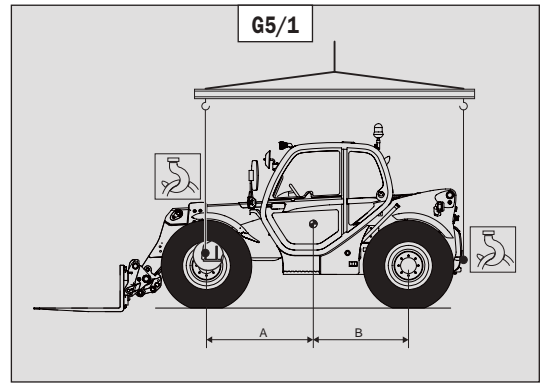
- Place the forward/reverse selector in neutral and the gear shift in neutral (according to model of lift truck).
- Release the parking brake.
- Put the warning lights on.
- If the I.C. engine is not running there will be no steering or braking assistance. Operate the steering and pedal slowly avoiding sudden jerky movements.

## G5 - LIFT TRUCK

SLING

- Take into account the position of the lift truck centre of gravity for lifting (fig. G5/1).

A = 1450 mm	B = 1110 mm	MLT 634 . . .
A = 1345 mm	B = 1215 mm	MLT 731 T
A = 1485 mm	B = 1325 mm	MLT 735 T LSU
A = 1445 mm	B = 1365 mm	MLT 735 -120 LSU
A = 1450 mm	B = 1360 mm	MLT 735 -120 LSU PS
A =     mm	B =     mm	MLT 741 T LSU
A = 1525 mm	B = 1295 mm	MLT 741 -120 LSU
A = 1535 mm	B = 1275 mm	MLT 741 -120 LSU PS
A = 1610 mm	B = 1200 mm	MLT 1035 LT LSU



- Place the hooks in the fastening points provided (fig. G5/2 and G5/3).



## G6 - LIFT TRUCK ON A PLATFORM

TRANSPORT

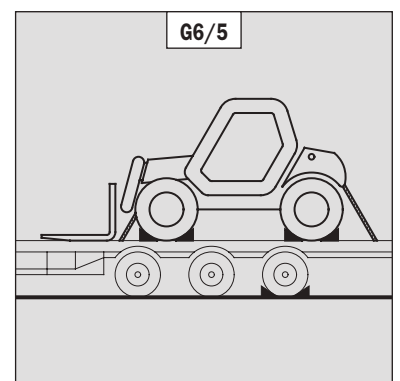
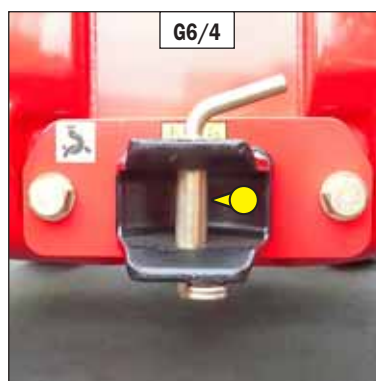
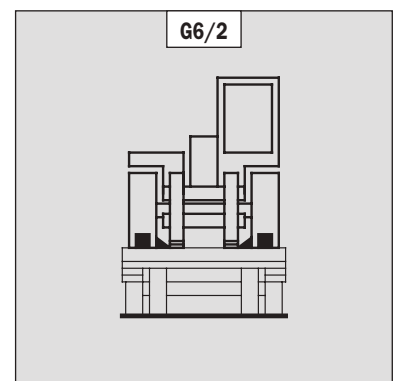
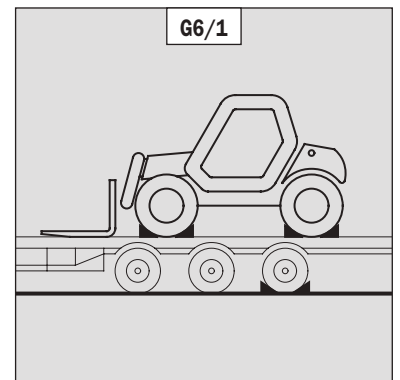
- !** Ensure that the safety instructions connected to the platform are respected before the loading of the lift truck and that the driver of the means of transport is informed about the dimensions and the weight of the lift truck (see: 2 - DESCRIPTION: CHARACTERISTICS).
- !** Ensure that the platform has got dimensions and a load capacity sufficient for transporting the lift truck. Check also the pressure on the contact surface allowable for the platform in connection with the lift truck.
- !** For lift trucks equipped with a turbo-charged I.C. engine, block off the exhaust outlet to avoid rotation of the turbo shaft without lubrication when transporting the vehicle.

### LOAD THE LIFT TRUCK

- Block the wheels of the platform.
- Fix the loading ramps so that you obtain an angle as little as possible to lift the lift truck.
- Load the lift truck parallel to the platform.
- Stop the lift truck (see: 1 - OPERATING AND SAFETY INSTRUCTIONS: DRIVING INSTRUCTIONS UNLADEN AND LADEN).

### STOW THE LIFT TRUCK

- Fix the chocks to the platform at the front and at the back of each tyre (fig. G6/1).
- Fix also the chocks to the platform in the inside of each tyre (fig. G6/2).
- Secure the lift truck to the platform with sufficiently strong ropes. At the front of the lift truck, attach the ropes to the fastening points 1 (fig. G6/3) and at the rear to the towing pin 2 (fig. G6/4).
- Tighten the ropes (fig. G6/5).





# **4 - *ENGAGING THE ATTACHMENTS***





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**PICKING UP THE ATTACHMENTS**


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## INTRODUCTION

- Your lift truck must be used with interchangeable equipment. These items are called: ATTACHMENTS.
- A wide range of attachments, specially designed and perfectly suitable for your lift truck is available and guaranteed by MANITOU.
- The attachments are delivered with a load chart concerning your lift truck. The operator's manual and the load chart should be kept in the places provided in the lift truck. For standard attachments, their use is governed by the instructions contained on this notice.
- Some particular uses require the adaptation of the attachment which is not provided in the price-listed options. Optional solutions exist, consult your dealer.

 **All attachments with a suspended load (winch, crane jib, crane jib with winch, hook, etc.) MUST be used with a lift truck equipped with a hydraulic movement cut-out device. In this case, the movement cut-out must be switched on and the transverse attitude perfectly horizontal.**

 **Only attachments approved by MANITOU are to be used on our lift trucks (see: 4 - ADAPTABLE ATTACHMENTS IN OPTION ON THE RANGE: TECHNICAL SPECIFICATIONS OF ATTACHMENTS). The manufacturer's liability will be denied in case of modification or of attachment adaptation carried out without his knowing it.**

 **Depending on their size, certain attachments may, when the boom is lowered and retracted, come into contact with the front tyres and cause damage to them, if reverse tilt is activated in the forward tilt direction. TO REMOVE THIS RISK, EXTEND THE TELESCOPE TO A SUFFICIENT EXTENT FOR THE PARTICULAR LIFT TRUCK AND ATTACHMENT SO THAT THIS CONTACT IS NOT POSSIBLE.**

 **Maximum loads are defined by the capacity of a lift truck taking account of the attachment's mass and centre of gravity. In the event of the attachment having less capacity than the lift truck, never exceed this limit.**

## PICKING UP THE ATTACHMENTS

### A - ATTACHMENT WITHOUT HYDRAULICS AND HAND LOCKING DEVICE

#### TAKING UP AN ATTACHMENT

- Ensure that the attachment is in a position facilitating the locking to the carriage. If it is not correctly oriented, take the necessary precautions in order to move it safely.
- Check that the locking pin and the clip are in position in the bracket (fig. A).
- Place the lift truck with the boom fully lowered in front of and parallel to the attachment, tilt the carriage forwards (fig. B).
- Bring the carriage under the locking tube of the attachment, slightly lift the boom, incline the carriage backwards in order to position the attachment (fig. C).
- Lift the attachment off the ground to facilitate locking.

#### HAND LOCKING

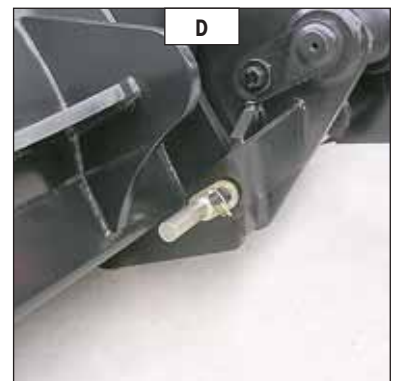
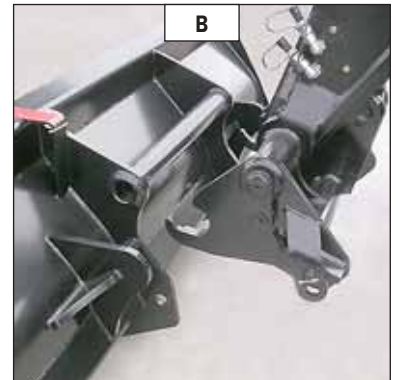
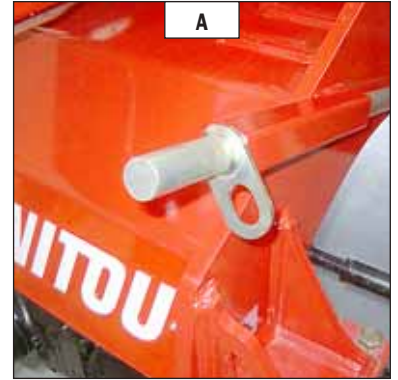
- Take the locking pin and the clip on the bracket (fig. A) and lock the attachment (fig. D). Do not forget to refit the clip.

#### HAND RELEASING

- Proceed in the reverse order of paragraph HAND LOCKING while making sure you put back the locking pin and the clip in the bracket (fig. A).

#### LAYING AN ATTACHMENT

- Proceed in the reverse order of paragraph TAKING UP AN ATTACHMENT while making sure you place the attachment flat on the ground and in closed position.



## **B - HYDRAULIC ATTACHMENT AND HAND LOCKING DEVICE**

### **TAKING UP AN ATTACHMENT**

- Ensure that the attachment is in a position facilitating the locking to the carriage. If it is not correctly oriented, take the necessary precautions in order to move it safely.
- Check that the locking pin and the clip are in position in the bracket (fig. A).
- Place the lift truck with the boom fully lowered in front of and parallel to the attachment, tilt the carriage forwards (fig. B).
- Bring the carriage under the locking tube of the attachment, slightly lift the boom, incline the carriage backwards in order to position the attachment (fig. C).
- Lift the attachment off the ground to facilitate locking.

### **MANUAL LOCKING AND CONNECTION OF THE ATTACHMENT**

- Take the locking pin and the clip on the bracket (fig. A) and lock the attachment (fig. D). Do not forget to refit the clip.
- Stop the I.C. engine and keep the ignition on the lift truck.
- Remove the pressure of the hydraulic circuit by operating switch 1 (fig. E) on the distributor lever backwards and forwards 4 or 5 times.
- Connect the rapid connectors according to the logic of the attachment's hydraulic movements.

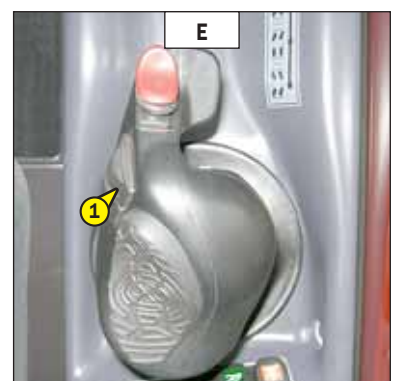
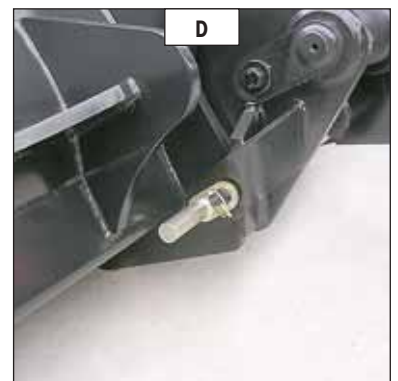
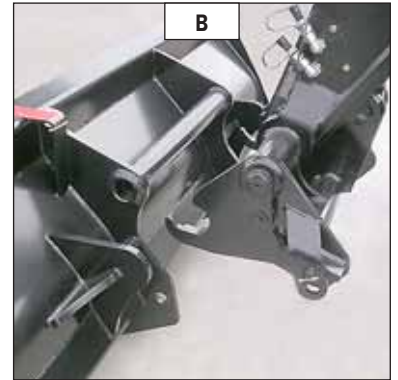
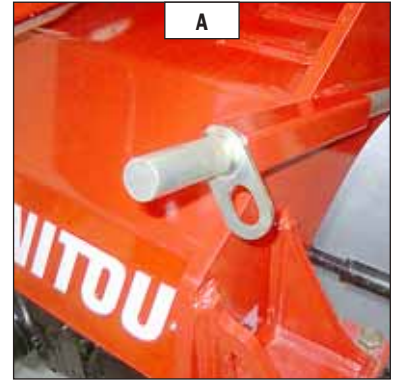
**!** *Make sure that the rapid connectors are clean and protect the holes which are not used, with the caps provided.*

### **HAND RELEASING AND DISCONNECTING THE ATTACHMENT**

- Proceed in the opposite order to that described in MANUAL LOCKING AND CONNECTION OF THE ATTACHMENT while making sure you put the locking pin back into the bracket (fig. A).

### **LAYING AN ATTACHMENT**

- Proceed in the reverse order of paragraph TAKING UP AN ATTACHMENT while making sure you place the attachment flat on the ground and in closed position.





	Pages
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## POSITION OF CONNECTORS ON DIAGRAMS

### Connectors

Wiring harness type	Item	Name component	Designation	Position on diagram				Hydraulic correspondence
				1	2	3	4	
MAIN	X01		TRANSMISSION CUT-OFF ON GEAR LEVER			26B		
MAIN	X02		SEAT SWITCH POWER SUPPLY			25D		
MAIN	X03		SEAT SWITCH INFORMATION			25D		
MAIN	X04		POWER SUPPLY TO OPTIONS				36C	
MAIN	X08		TRANSMISSION FLUID THERMOSTAT (PS: on PS gear box)		18E			
MAIN	X09		FORWARD SOLENOID		21B			
MAIN	X10		REVERSE MOTION SOLENOID		21B			
MAIN	X11		PNEUMATIC SEAT			27B		
MAIN	X12		HAND BRAKE CONNECTOR			27B		
MAIN	X13		FRONT RIGHT HEADLIGHT	13A				
MAIN	X14		HORN		18E			
MAIN	X15		FRONT WHEEL ALIGNMENT			34B		
MAIN	X16		RIGHT REAR LIGHT		15A			
MAIN	X17		LEFT REAR LIGHT		14A			
MAIN	X18		NUMBER PLATE LIGHT		17A			
MAIN	X19		REAR TRAILER CONNECTOR		16B			
MAIN	X20		REVERSING SOUND ALARM		16A			
MAIN	X21		REAR WHEEL ALIGNMENT				35B	
MAIN	X22		CLOGGING HYDRAULIC FILTER		18E			
CONTROL VALVE	X23		HYDRAULIC CUT-OFF EV / VS			32A		
MAIN / ENG	X24		MAIN HARNESS / ENGINE HARNESS INTERFACE	2D				
MAIN	X25		OPTION WORKING HEAD LIGHTS ON JIB				46B	
MAIN	X26		CAB UPPER HARNESS				42E	
MAIN	X27		CAB LOUDSPEAKER HARNESS				45B	
CONTROL VALVE	X28		TELESCOPE RETRACTION EV			31A		
CONTROL VALVE	X29		TELESCOPE EXTENSION EV			31A		
MAIN	X30		HEATING / VENTILATION		19B			
MAIN	X31		AIR CONDITIONING OPTION		19C			
MAIN	X32		CIGARETTE LIGHTER CONNECTOR		23C			
MAIN	X33		HYDR MVT NEUTRALISATION SWITCH			31C		
CONTROL VALVE	X34		ATTACHMENT MINUS DIRECTION EV			30A		
CONTROL VALVE	X35		ATTACHMENT PLUS DIRECTION EV			30A		
MAIN	X36		JSM			32G		
MAIN	X37		PLATE POWER CONNECTOR	11F				
MAIN	X38		PLATE FAULT INDICATOR LAMP CONNECTOR		18F			
MAIN	X39		LIGHTING HARNESS	12F				
MAIN	X40		IGNITION SAFETY / WHEEL ALIGNMENT / BRAKE FLUID JAR	9F				
MAIN	X41		OPTION AND CEILING LIGHT POWER SUPPLY	8F				
MAIN	X42		FUSE HOLDER PLATE		23F			

**Connectors**

Wiring harness type	Item	Name component	Designation	Position on diagram				Hydraulic correspondence
				1	2	3	4	
MAIN	X44		RELAYS / HYDR MVT CUT-OFF / TRANSMISSION CUT-OUT / EV		19F			
MAIN	X45		FUSE AND RELAY HOLDER PLATE POWER SUPPLY AND EARTH	7F				
MAIN	X46		HELLA K17 MINI RELAY HOLDER	11C				
MAIN	X47		STARTER ATOFUSE HOLDER	1E				
MAIN	X48		DIAG CONNECTOR ATOFUSE HOLDER	7C				
MAIN	X49		REAR FOG LIGHT SWITCH		18A			
MAIN	X50		FRONT WHEEL ALIGNMENT INDICATOR LAMP			34A		
MAIN	X51		REAR WHEEL ALIGNMENT INDICATOR LAMP			35A		
MAIN	X52		WHEEL ALIGNMENT SWITCH			35C		
MAIN	X53		CAR RADIO LOUDSPEAKER OUTPUT	5F				
MAIN	X54		4-WAY KEY SWITCH	2F				
MAIN	X55		6-WAY KEY SWITCH	3F				
MAIN	X56		SPU CN1-A			29F		
MAIN	X57		SPU CN1-B			32F		
MAIN	X58		LLMI SAFETY MODULE			33B		
MAIN	X59		CLOCK	7A				
MAIN	X60		CLOCK LIGHT	7A				
MAIN	X61		TRANSMISSION CUT-OFF SWITCH			25B		
MAIN	X68		HOUR METER REV COUNTER MODULE	9A				
MAIN	X70		FRONT WINDSCREEN WASHER PUMP				40F	
MAIN	X71		BRAKE PEDAL TRANSMISSION CUT-OFF SWITCH			26B		
MAIN	X72A		BRAKE FLUID LEVEL	12C				
MAIN	X72B		BRAKE FLUID LEVEL	12C				
MAIN	X73A		STOP SWITCH	11A				
MAIN	X73B		STOP SWITCH	11A				
MAIN	X74		FRONT LEFT-HAND LIGHT	12A				
MAIN	X75		TUV SIDELIGHT CONTROL BY WORKING LIGHT ON JIB	13G				
MAIN	X76A		CAB LEFT-HAND EARTH	1A				
MAIN	X76B		CAB LEFT-HAND EARTH	1A				
MAIN	X77		FRONT WINDSCREEN WIPER				41F	
MAIN	X79		WIPER STALK SWITCH				40G	
MAIN	X80		WIPER RESET				42G	
MAIN	X81		STEERING FAULT INDICATOR LAMP		14E			
MAIN	X82		STEERING FAULT PRESSURE SWITCH		13A			
MAIN	X83		DASHBOARD INDICATOR LAMPS (4 way)		14E			
MAIN	X87		CONTROL VALVE HARNESS INTERFACE			30D		
MAIN	X89		ENGINE WATER TEMPERATURE MODULE	10A				
MAIN	X90		FUEL LEVEL MODULE	7A				
MAIN	X91		CIGARETTE LIGHTER LIGHT		23C			

**Connectors**

Wiring harness type	Item	Name component	Designation	Position on diagram				Hydraulic correspondence
				1	2	3	4	
CONTROL VALVE	X92		PROPORTIONAL EV ON JIB LOWERING / VRD-VRP			31A		
MAIN / CONT VALVE	X93		TILTING CUT-OFF EV / VCI			32A		
OPT	X94		JIB HEAD ELECTROVALVE			34B		
MAIN	X95		HELLA K12-K18 MINI RELAY HOLDER		22B			
OPT (MT)	X96		REAR 7-PIN SOCKET ELECTRIC CONNECTOR		16A			
MAIN	X97		JIB HEAD ELECTRICAL PROVISION OR JIB HEAD EV			34B		
MAIN	X98		TRANSMISSION FLUID PRESSURE SWITCH (PS: ON PS GEAR BOX)		19E			
MAIN	X99		VISHAY GAUGE CONNECTOR			29B		
MAIN	X100		JIB ANGLE SENSOR EN15000			30G		
CABLE	X101		MID-CHASSIS EARTH / ENGINE	2A				
MAIN	X102A		FUSE HOLDER POWER SUPPLY BY 30 THK				36E	
MAIN	X102B		1A FUSE HOLDER FOR MICROPHONE RC2-20 POWER SUPPLY				37E	
MAIN	X103		JIB HEAD CONNECTOR OR JIB HEAD EV SWITCH			35C		
MAIN	X104		LSU PUMP				39E	
MAIN / CONT VALVE	X105		CONTROL VALVE HARNESS EARTH CONNECTION	1A				
MAIN	X106		REAR CHASSIS EARTH	1A				
MAIN	X107		CAB REAR EARTH	1A				
CABLE	X108		FRONT CHASSIS EARTH ON CAB BRACKET			26A		
MAIN	X109		LSU ECU / REXTROTH				35F	
MAIN	X112		FORCED OPERATION PUSH BUTTON			28G		
MAIN	X113		FORCED OPERATION POTENTIOMETER			29G		
MAIN	X114		EMERGENCY STOP			26F		
MAIN	X115		DIAGNOSTIC			34F		
MAIN	X116		EASY CONNECT SYSTEM SWITCH			28A		
MAIN	X117		ATTACHMENT LOCKING SWITCH			32C		
MAIN	X118		ANTI-THEFT MODULE PROVISION			24F		
MAIN	X119		OVERRIDE SWITCH			33C		
MAIN	X121		CANLINK MODULE	9C				
CABLE	X126		ENGINE EARTH (ALTERNATOR CABLE)	1A				
MAIN	X134		JIB RETRACTION SENSOR			31G		
OPT	X135		OPTION CAB RIGHT-HAND EARTH	1A				
CAB	X136		FRONT WORKING HEAD LIGHT INTERCONNECTION				43B	
CAB	X138A		LEFT LOUDSPEAKER				45B	
CAB	X138B		LEFT LOUDSPEAKER				45B	
CAB	X139A		RIGHT LOUDSPEAKER				45B	
CAB	X139B		RIGHT LOUDSPEAKER				45B	
CAB	X140		LEFT FRONT WORKING LIGHT				43B	
CAB	X141		RIGHT FRONT WORKING LIGHT				43B	

**Connectors**

Wiring harness type	Item	Name component	Designation	Position on diagram				Hydraulic correspondence
				1	2	3	4	
CAB	X142		REAR WINDSCREEN WIPER				41B	
CAB	X143		SIDE WINDSCREEN WIPER				40B	
CAB	X144		ROOF WINDSCREEN WIPER				41B	
CAB	X145A		ROTATING BEACON LIGHT				42B	
CAB	X145B		ROTATING BEACON LIGHT				42B	
CAB	X146		LEFT REAR WORKING LIGHT				44B	
CAB	X147		RIGHT REAR WORKING LIGHT				44B	
CAB	X148A		ROOF LIGHT				44B	
CAB	X148B		ROOF LIGHT				44B	
CAB	X148C		ROOF LIGHT				44B	
CAB	X149		ROOF / SIDE WINDSCREEN WIPER SWITCH				41C	
CAB	X150		REVOLVING LIGHT SWITCH				42C	
CAB	X151		WORKING LIGHT SWITCH				43C	
CAB	X152		JIB-MOUNTED WORKING LIGHT SWITCH				45C	
CAB	X153		DEFROSTING SWITCH				45C	
CAB	X154A		REAR DEFROST				44D	
CAB	X154B		REAR DEFROST				44C	
ENGINE ECM	X158		ENGINE ECM J2	6B				
ENGINE ECM	X159		ECM CONNECTOR DIAGNOSTIC CONNECTOR	6B				
ENGINE CABLE	X160		BATTERY FUSE BOX BF1	1C				
ENGINE	X161		STARTER SOLENOID	1B				
ENGINE	X165		FUEL GAUGE	2A				
ENGINE	X166A		AIR FILTER CLOGGING	3A				
ENGINE	X166B		AIR FILTER CLOGGING	3A				
ENGINE	X167		PREHEAT	2B				
ENGINE	X168		ENGINE EARTH	1A				
ENGINE	X171		PRE-HEATING RELAY	2C				
ENGINE	X172		PRE-HEATING / ALTERNATOR POWER FUSES	2C				
ENGINE	X173		EQUIPMENT POWER FUSES (MLT) - ECM FUSE (MT)	2D				
ENGINE	X174		CLOCK EARTH	1B				
CABLE	X176		ENGINE EARTH	2A				
ENGINE	X177		ENGINE ECM J1	4B				
ENGINE	X178		PRESENCE OF WATER IN DIESEL FUEL	3A				
ENGINE	X179		ACCELERATOR POTENTIOMETER	4A				
HOLDER PLATE	X180		INDICATOR LAMP HARNESS CONNECTOR E		15F			
HOLDER PLATE	X181		INDICATOR LAMP HARNESS CONNECTOR F		17F			
HOLDER PLATE	X182		DASHBOARD INDICATOR LAMPS (4 way)		14E			
HOLDER PLATE	X183		DASHBOARD INDICATOR LAMPS (16 way)		15E			
HOLDER PLATE	X184		BATTERY CHARGE INDICATOR LAMP		17E			

**Connectors**

Wiring harness type	Item	Name component	Designation	Position on diagram				Hydraulic correspondence
				1	2	3	4	
HOLDER PLATE	X185		STEERING FAULT INDICATOR LAMP		15E			
HOLDER PLATE	X187		WARNING SWITCH		17G			
HOLDER PLATE	X188		LIGHTING STALK SWITCH	11G				
HOLDER PLATE	X189		AWAITING STALK SWITCH-PLATE TUV DIODE	10G				
HOLDER PLATE	X190		AWAITING PLATE-STALK SWITCH TUV DIODE	10G				
HOLDER PLATE	X191		AWAITING PLATE-WORKING LIGHTS TUV DIODE	11G				
HOLDER PLATE	X192		CAR RADIO POWER SUPPLY	7F				
OPT	X200A		BATTERY CUT OFF	1B				
OPT	X200B		BATTERY CUT OFF	1A				
OPT	X202		BLUE HEADLIGHT SWITCH				38B	
OPT	X203		AGGRAVATING MVT CUT-OFF POWER SUPPLY ON NON EN15000 VERSION				36C	
OPT	X204		AIR-CONDITIONING HIGH PRESSURE SENSOR		19B			
OPT	X205		REMOTE AIR-CONDITIONING module		19B			
OPT	X206		REMOTE AIR-CONDITIONING module		20B			
OPT	X207		AIR-CONDITIONING COMPRESSOR		20A			
OPT	X208		AIR-CONDITIONING FAN MOTOR 1		20A			
OPT	X209		AIR-CONDITIONING FAN MOTOR 2		20A			
OPT	X210		LEFT-HAND JIB WORKING LIGHT				46B	
OPT	X211		RIGHT-HAND JIB WORKING LIGHT				46B	
OPT	X212		CLEANFIX SWITCH				39B	
OPT	X213		CLEANFIX				38A	
OPT	X216		REAR HYDRAULIC SELECTOR SWITCH				37B	
OPT	X217		REAR HYDRAULIC CONTROL SWITCH				36B	
OPT	X218		SELECTOR EV				37A	
OPT	X219		REAR HYDRAULIC EV 1				35A	
OPT	X220		REAR HYDRAULIC EV 2				36A	
OPT	X221		REAR HYDRAULIC PROVISION STANDBY CONNECTOR				36C	
OPT	X222		JIB SUSPENSION SWITCH				39E	
OPT	X223		JIB SUSPENSION EV 1				37C	
OPT	X224		JIB SUSPENSION EV 2				37C	
OPT	X225		JIB SUSPENSION VALVE PRESSURE SWITCH				38D	
OPT	X226		JIB POSITION SENSOR				38E	
OPT	X227		JIB SUSPENSION CUT-OFF RELAY				38C	
OPT	X228		JIB SUSPENSION POWER SUPPLY RELAY				38C	
OPT	X229		JIB SUSPENSION REVERSE TILT PRESSURE SWITCH				37D	
OPT	X230		NC T.S. REVERSE TILT MVT DETECTION PRESSURE SWITCH				37D	
OPT	X231		NC T.S. REVERSE TILT MVT DETECTION PRESSURE SWITCH				37D	

**Connectors**

<b>Wiring harness type</b>	<b>Item</b>	<b>Name component</b>	<b>Designation</b>	<b>Position on diagram</b>				<b>Hydraulic correspondence</b>
				<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	
OPT	X232		NC JIB LOWERING MVT DETECTION PRESSURE SWITCH				38D	
OPT	X233		NC JIB LOWERING MVT DETECTION PRESSURE SWITCH				38D	
OPT	X234		NC T.S. DUMPING MVT DETECTION PRESSURE SWITCH				38D	
OPT	X235		NC T.S. DUMPING MVT DETECTION PRESSURE SWITCH			25G		
OPT	X236		FINTRONIC ANTI-START UNIT			25G		
OPT	X238		PRE-HEATING ROD	1B				
OPT	X239		ANTI-THEFT UNIT			25G		
ENGINE	D+		ALTERNATOR D+	2C				
ENGINE	B+		ALTERNATOR B+	2C				

## POSITION OF COMPONENTS ON DIAGRAMS

### Components

Item	Designation	Position on diagram				Hydraulic correspondence
		1	2	3	4	
A1	ANTI-THEFT UNIT			26G		
A2	INSTRUMENT PANEL		17D			
A3	SPU MODULE			30F		
A4	LSU PROPORTIONAL PUMP ECU				35F	
A5	LONGITUDINAL SECURITY MODULE (LLMI)			33B		
A6	AIR CONDITIONING MODULE		20B			
A7	CAR RADIO	6G				
A8	HEATING / VENTILATION PANEL		19B			
A9	CLEANFIX MODULE				38A	
A10	FINTRONIC ANTI-START UNIT			24G		
A11	FINTRONIC ANTENNA			25G		
A12	JSM (JOYSTICK SWITCH AND MOVE)			32G		
A13	DIGICODE			26G		
A14	MODCLÉ			27G		
A15	HOLDER PLATE		23G			
A19	ENGINE ECM	4B				
A20	CANLINK MODULE	8C				
BF1	PRE-HEATER POWER FUSE AND RELAY BOX	1D				
B1	REVERSING SOUND ALARM		16A			
B2	HORN		18E			
B4	WATER IN DIESEL SENSOR	2A				
B6	ENGINE AIR FILTER CLOGGING PRESSURE SWITCH	3A				
B7	HYDRAULIC FILTER CLOGGING PRESSURE SWITCH		18E			
B8	STEERING FAULT PRESSURE SWITCH		13A			
B9	FRONT WHEEL ALIGNMENT SENSOR			34B		
B10	REAR WHEEL ALIGNMENT SENSOR			35B		
B11	STOP SWITCH PRESSURE SWITCH	11A				
B12	REVERSE TILT / JIB SUSPENSION MVT DETECTION PRESSURE SWITCH				37D	
B13	LOWERING / JIB SUSPENSION MVT DETECTION PRESSURE SWITCH				37D	
B14	DUMPING / JIB SUSPENSION MVT DETECTION PRESSURE SWITCH				38D	
B15	AIR INTAKE PRESSURE SENSOR	4C				
B16	FUEL PRESSURE SENSOR	5C				
B17	ENGINE OIL PRESSURE SENSOR	5C				
B18	COOLANT LIQUID TEMPERATURE SENSOR	4B				
B19	AIR INTAKE TEMPERATURE SENSOR	4A				
B20	STRAIN GAUGE			29A		
B21	FORCED OPERATION POTENTIOMETER			29G		
B23	JIB ANGLE POTENTIOMETER			30G		



## Components

Item	Designation	Position on diagram				Hydraulic correspondence
		1	2	3	4	
B24	ACCELERATOR TPS POTENTIOMETER	4A				
B25	JIB SUSPENSION CYLINDER VALVE PRESSURE SWITCH				38D	
B27	RIGHT LOUDSPEAKER				45A	
B28	LEFT LOUDSPEAKER				45A	
B29	PRIMARY SPEED SENSOR	5A				
B30	SECONDARY SPEED SENSOR	5A				
B46	AIR-CONDITIONING HIGH PRESSURE SENSOR		19B			
B69	TRANSMISSION FLUID PRESSURE SENSOR		19A			
B70	TRANSMISSION FLUID TEMPERATURE SENSOR		18A			
E1	LEFT FRONT LIGHT	12A				
E2	RIGHT FRONT LIGHT	12A				
E3	LEFT REAR LIGHT		14A			
E4	RIGHT REAR LIGHT		15A			
E5	LEFT-HAND TRAILER LIGHT		16A			
E6	RIGHT-HAND TRAILER LIGHT		16A			
E7	REAR NUMBER PLATE LIGHT		17A			
E8	WHEEL ALIGNMENT INDICATOR LAMPS			34A		
E12	RIGHT FRONT WORKING LIGHT				43A	
E13	LEFT FRONT WORKING LIGHT				43A	
E14	ROOF LIGHT				44A	
E15	ROTATING BEACON LIGHT				42A	
E16	LEFT REAR WORKING LIGHT				43A	
E17	RIGHT REAR WORKING LIGHT				44A	
E18	LEFT-HAND JIB WORKING LIGHT				45A	
E19	RIGHT-HAND JIB WORKING LIGHT				46A	
E20	FRONT LEFT-HAND BLUE LIGHT				37B	
E21	RIGHT FRONT BLUE LIGHT				38B	
E22	LEFT FRONT BLUE LIGHT				38B	
E23	RIGHT REAR BLUE LIGHT				38B	
F46	THERMAL CIRCUIT-BREAKER		20C			
G1	12V - 74AH - 680A BATTERY	1B				
G2	ALTERNATOR 12V / 85 A	2C				
H1	RIGHT AND LEFT REAR FOG LIGHT		14A 15A			
H2	RIGHT AND LEFT REAR POSITION LIGHT		14A 15A			
H3	RIGHT AND LEFT REAR STOP LIGHT		14A 15A			
H4	LEFT REAR DIRECTION INDICATOR LIGHT		14A			

**Components**

<b>Item</b>	<b>Designation</b>	<b>Position on diagram</b>				<b>Hydraulic correspondence</b>
		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	
H5	RIGHT AND LEFT REAR REVERSING LIGHT		14A 15A			
H6	RIGHT REAR DIRECTION INDICATOR LIGHT		15A			
H7	RIGHT AND LEFT FRONT POSITION LIGHTS	12A 13A				
H8	RIGHT AND LEFT DIPPED BEAM LIGHT	12A 13A				
H9	RIGHT AND LEFT MAIN BEAM LIGHT	12A 13A				
H10	RIGHT FRONT DIRECTION INDICATOR LIGHT	13A				
H11	LEFT FRONT DIRECTION INDICATOR LIGHT	12A				
H13	FRONT WHEEL ALIGNMENT LIGHT			35A		
H14	REAR WHEEL ALIGNMENT LIGHT			35A		
H15	CLOCK LIGHT	7A				
H20	PREHEATING		14E			
H21	ENGINE POLLUTION		14E			
H22	FAULT STOP ENGINE IMMEDIATELY		14E			
H23	STEERING FAULT		15E			
H24	TRANSMISSION OIL PRESSURE		15E			
H25	TRANSMISSION OIL TEMPERATURE		15E			
H26	BRAKE FLUID LEVEL		15E			
H27	PARKING BRAKE		16E			
H28	BATTERY CHARGE		16E			
H29	ENGINE OIL PRESSURE		16E			
H30	ENGINE COOLANT TEMPERATURE		16E			
H31	AIR FILTER CLOGGING		16E			
H32	DIRECTION INDICATORS		17E			
H33	SIDE LIGHTS		17E			
H34	DIPPED BEAM HEADLIGHTS		17E			
H35	MAIN BEAM HEADLIGHTS		17E			
H36	FINTRONIC INDICATOR LAMP			25G		
K0	FAST SPEED RELAY		19G			
K1	NC TRANSMISSION CUT-OFF RELAY		20G			
K2	NO TRANSMISSION CUT-OFF RELAY		20G			
K3	REVERSE GEAR RELAY		21G			
K4	FORWARD GEAR RELAY		21G			
K5	MACHINE FAULT ALARM		17G			
K6	SLOW SPEED RELAY		22G			
K7	FREE		22G			
K8	ANTI-START RELAY		23G			
K9	FLASHING / WARNING UNIT		16G			

## Components

Item	Designation	Position on diagram				Hydraulic correspondence
		1	2	3	4	
K10	JIB SUSPENSION CUT-OFF RELAY				38C	
K11	JIB SUSPENSION POWER SUPPLY RELAY				39C	
K16	PREHEATER RELAY	1C				
K17	MODULE RELAY LIGHTS	11C				
K18	NEUTRAL SAFETY RELAY		22A			
M1	STARTER	1B				
M3	FRONT WINDSCREEN WIPER MOTOR				41E	
M4	REAR WINDSCREEN WIPER MOTOR				41A	
M5	ROOF WINDSCREEN WIPER MOTOR				41A	
M6	SIDE WINDSCREEN WIPER MOTOR				40A	
M7	FRONT WINDSCREEN WASHER PUMP				40E	
M10	AIR-CONDITIONING COMPRESSOR		20A			
M11	CLEANFIX COMPRESSOR				38A	
M12	AIR-CONDITIONING FAN MOTOR 1		20A			
M13	AIR-CONDITIONING FAN MOTOR 2		20A			
M15	PNEUMATIC SEAT COMPRESSOR			28A		
M16	VENTILATION MOTOR-FAN		19A			
P1	HOUR METER / REV COUNTER	9A				
P2	FUEL LEVEL	8A				
P3	ENGINE COOLANT TEMPERATURE	10A				
P4	WATCH	7A				
R1	PREHEATING RESISTANCES	2B				
R2	FUEL LEVEL SENSOR	2A				
R3	REAR DEFROSTER				44D	
R4	RESISTANCE 120 OHM 1/2 W	4C				
R6	PREHEATING ELEMENT	1A				
S1	BATTERY CUT OFF	1A				
S2	KEY SWITCH	2F				
S4	WIPER SWITCH				43G	
S5	LIGHT SWITCH	10G				
S7	CIGARETTE LIGHTER		23B			
S10	JIB HEAD ELECTROVALVE REEL			34B		
S11	BRAKE LIQUID LEVEL CONTACT	11C				
S12	REVOLVING LIGHT SWITCH				42C	
S13	WARNING SWITCH		17G			
S14	EASY CONNECT SYSTEM SWITCH			27A		
S15	BLUE HEADLIGHT SWITCH				38B	
S16	REAR WINDOW DE-FROST SWITCH				45C	

**Components**

<b>Item</b>	<b>Designation</b>	<b>Position on diagram</b>				<b>Hydraulic correspondence</b>
		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	
S18	REAR HYDRAULIC CONTROL SWITCH				36B	
S19	HAND BRAKE SWITCH			27A		
S20	BRAKE PEDAL SWITCH			26A		
S21	GEAR LEVEL SWITCH			26A		
S22	REAR HYDRAULIC SELECTOR SWITCH				37B	
S23	JIB SUSPENSION SWITCH				39E	
S24	JIB POSITION SENSOR				37E	
S27	OVERRIDE SWITCH			33C		
S28	ATTACHMENT LOCKING SWITCH			32C		
S29	JIB ELECTRICAL CONNECTOR / JIB HEAD EV SWITCH			35C		
S30	TRANSMISSION CUT-OFF SWITCH			25B		
S31	WHEEL ALIGNMENT SWITCH			35C		
S32	REAR FOG LIGHT SWITCH		18B			
S33	MOVEMENT NEUTRALISATION SWITCH			31C		
S34	TELESCOPE RETRACTED POSITION SWITCH			31G		
S35	CLEANFIX SWITCH				39B	
S36	PUSH BUTTON + FORCED OPERATION INDICATOR LAMP			29G		
S44	PNEUMATIC SEAT SWITCH			28B		
S46	DRIVER PRESENCE SWITCH			25C		
S50	EMERGENCY STOP BUTTON			26F		
S54	JIB WORKING LIGHT SWITCH				46C	
S115	ROOF-SIDE WINDSCREEN WIPER SWITCH				41C	
S139	FRONT AND REAR WORKING LIGHT SWITCH				43C	
V1	DIODE P600 J - REVERSING LIGHTS		15C			
V2	6A 300V DIODE - TUV	12G 13G				
V3	1A 1000V DIODE - AIR FILTER CLOGGING	8D				
V4	1A 1000V DIODE - SAFETY RELAY / REVERSE GEAR		22B			
V5	1A 1000V DIODE - SAFETY RELAY / FORWARD GEAR		22B			
V6	DIODE P600J 6A / 600V - JIB SUSPENSION HARNESS				38D	
V7	DIODE P600J 6A / 600V - JIB SUSPENSION HARNESS				39D	
V9	DIODE	10D				
Y3	FORWARD ELECTROVALVE		21A			
Y4	REVERSE ELECTROVALVE		21A			
Y5	CLEANFIX ELECTROVALVE				39A	
Y6	LSU PUMP ELECTROVALVE				39E	
Y7	TILTING CUT-OFF ELECTROVALVE / VCI			32A		
Y10	JIB SUSPENSION SOLENOID VALVE 1				37C	
Y11	JIB SUSPENSION SOLENOID VALVE 2				37C	

**Components**

<b>Item</b>	<b>Designation</b>	<b>Position on diagram</b>				<b>Hydraulic correspondence</b>
		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	
Y12	HEAD JIB ELECTROVALVE			34A		
Y15	TELESCOPE EXTEND PROPORTIONAL SOLENOID VALVE			31A		
Y16	TELESCOPE RETRACT PROPORTIONAL SOLENOID VALVE			31A		
Y17	ATTACHMENT POS DIRECTION PROPORTIONAL ELECTROVALVE			30A		
Y18	ATTACHMENT NEG DIRECTION PROPORTIONAL ELECTROVALVE			30A		
Y19	JIB LOWERING PROPORTIONAL EV / VRD-VRP			31A		
Y20	HYDRAULIC CUT-OFF ELECTROVALVE / VS			32A		
Y21	SELECTION ELECTROVALVE				36A	
Y22	REAR HYDRAULIC ELECTROVALVE 1			35A		
Y23	REAR HYDRAULIC ELECTROVALVE 2				36A	
Y30	ELECTRONIC INJECTOR 1	5C				
Y31	ELECTRONIC INJECTOR 2	5C				
Y32	ELECTRONIC INJECTOR 3	6C				
Y33	ELECTRONIC INJECTOR 4	6C				
Y34	INJECTION PUMP SOLENOID	6C				
Y35	DISCHARGE ELECTRONIC VALVE	5A				

## POSITION OF FUSES AND RELAYS ON DIAGRAMS

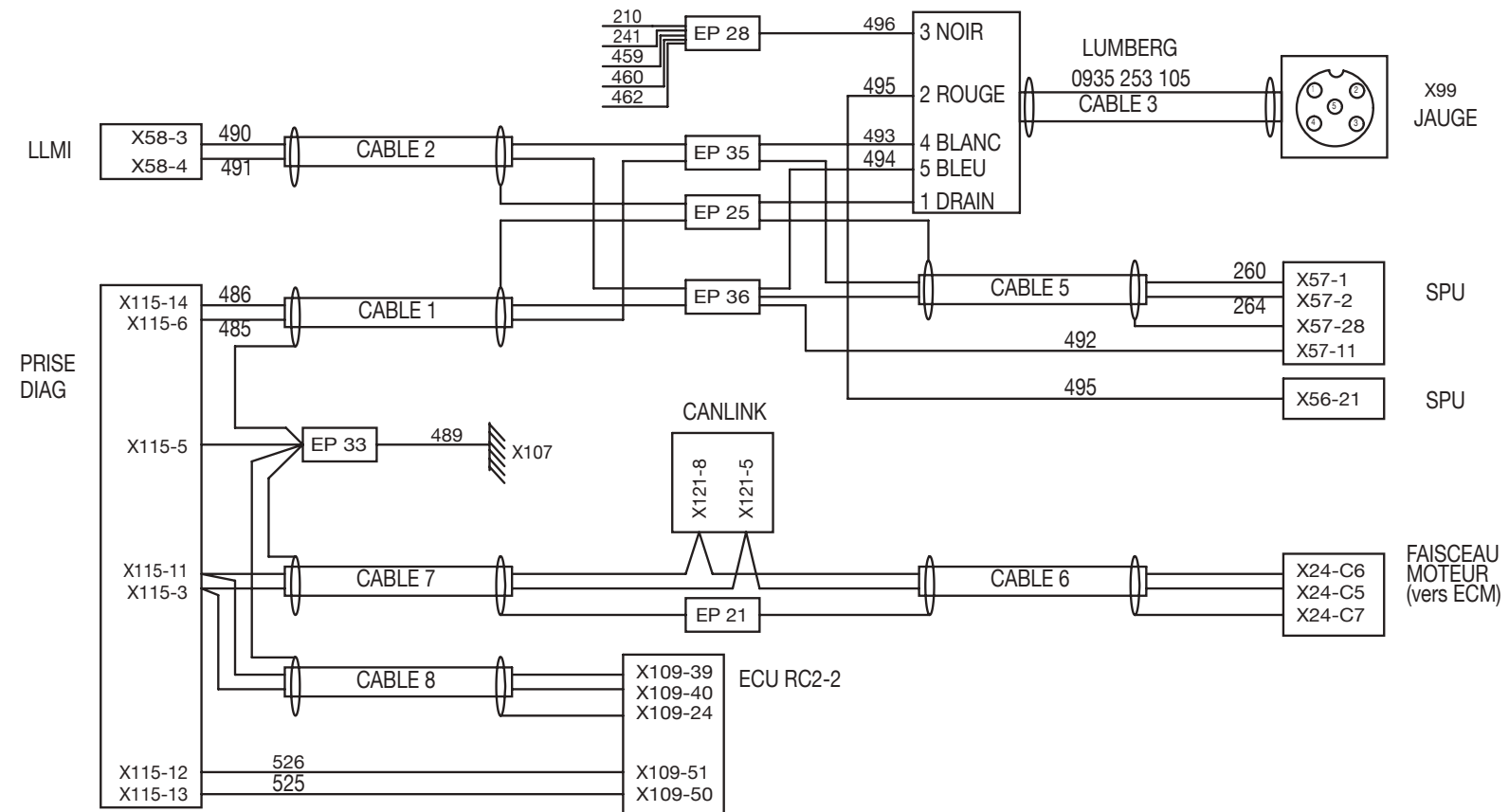
### Fuses and relays

Item	Current	Designation	Position on diagram			
			1	2	3	4
F1	7,5 A	LSU + AS OPTION	13G			
F2	15 A	REAR WORKING LIGHTS	8G			
F3	10 A	REAR WINDSCREEN WIPER + ROOF / SIDE WINDOW WIPER	9G			
F4	15 A Max	ENGINE STOP EV OR ENGINE ECM	9G			
F5	7,5 A	ROTATING BEACON LIGHT	8G			
F6	5 A	WHEEL ALIGNMENTS + AS OPTION	10G			
F7	7,5 A	LLMI + OVERRIDE SWITCH + SENSORS + BLUE LIGHT OPT (15A)	13G			
F8	15 A	RELAYS K2/K3/K4 + TRANSMISSION CUT-OFF + JSM / FNR	13G			
F9	5 A	DASHBOARD MODULE + INDICATOR LAMPS	10G			
F10	10 A	HORN + STOP SWITCH	10G			
F11	15 A	JIB WORKING LIGHTS	10G			
F12	10 A	DIRECTION INDICATORS	13G			
F13	30 A	VENTILATION	11G			
F14	10 A	CIGARETTE LIGHTER	11G			
F15	20 A	SPU	11G			
F16	5 A	DIAGNOSTIC CONNECTION	8G			
F17	15 A Max	CLEANFIX + REAR HYDRAULICS + ANTI-THEFT	8G			
F18	15 A	FRONT WORKING LIGHTS	8G			
F19	15 A	REAR WINDOW DEFROSTER	9G			
F20	10 A	PNEUMATIC SEAT + AS OPTION	8G			
F21	10 A	FRONT WINDSCREEN WIPER + WASHER	10G			
F22	10 A Max	JIB SUSPENSION + JIB ELECTRICAL PROVISION + JIB HEAD EV	10G			
F23	7,5 A	RIGHT SIDELIGHT + MODULE LIGHTING	12G			
F24	7,5 A	LEFT SIDELIGHT + REAR PLATE LIGHTING	12G			
F25	7,5 A	RIGHT INDICATOR LIGHTS	13G			
F26	7,5 A	LEFT INDICATOR LIGHTS	13G			
F27	15 A	DIPPED HEADLIGHT + FOG LIGHT	12G			
F28	15 A	HEADLIGHTS	12G			
F29	15 A	WARNING + CEILING LIGHT + ANTI-THEFT + CLOCK + REV COUNTER	8G			
F30	25 A	LIGHTING STALK SWITCH	11G			
F31	25 A	STARTER	1E			
F32	5 A	DIAGNOSTIC CONNECTOR + SPU	7C			
F33	1 A	LSU POTENTIOMETER				36E
F40	80 A	IGNITION SWITCH	1D			
F41	30 A	ENGINE ECM	1D			
F42	80 A	PREHEATING	1C			
F43	100 A	ALTERNATOR	1C			

## POSITION OF SPLICES ON DIAGRAMS

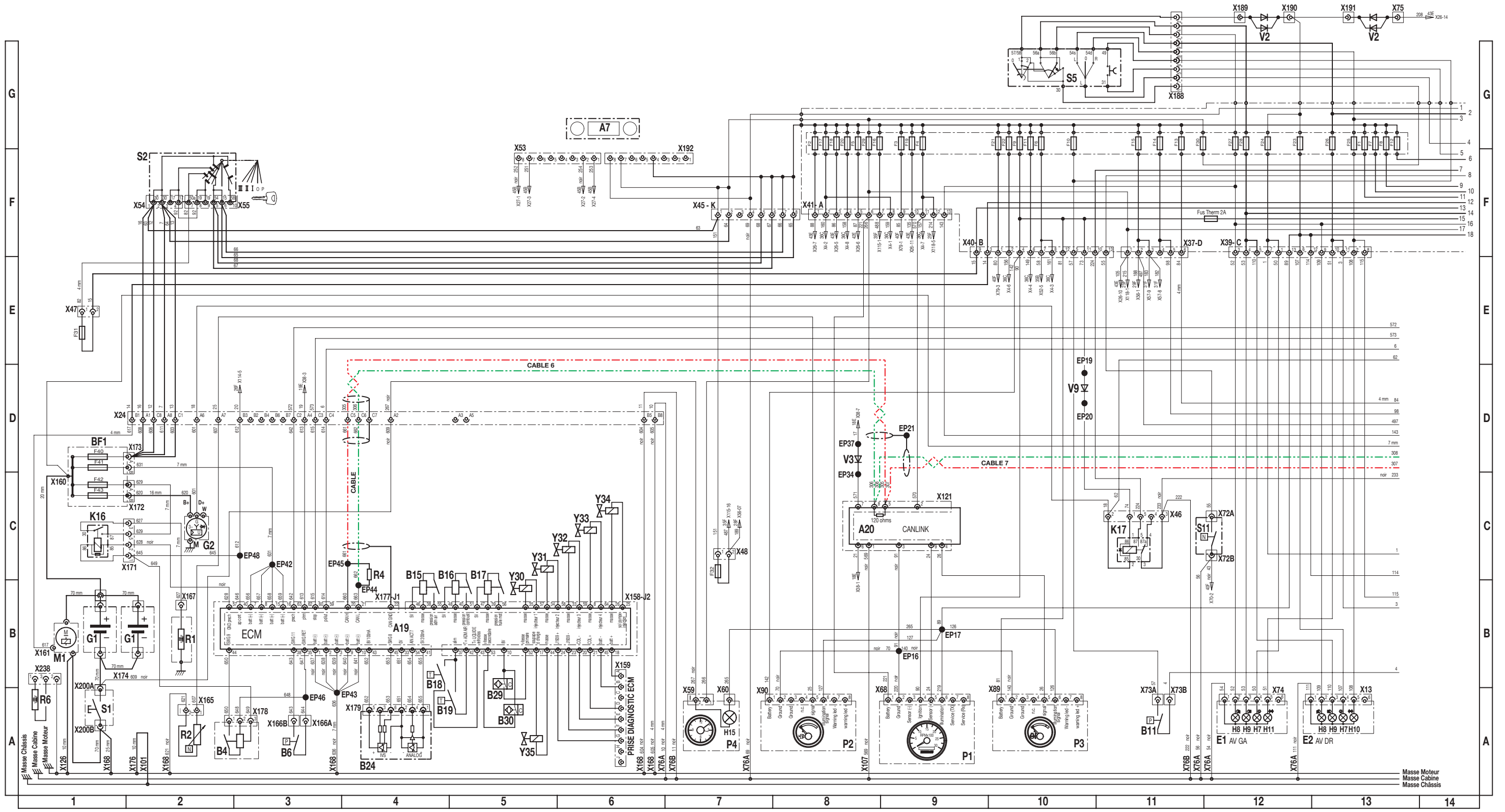
Item	Designation	Position on diagram			
		1	2	3	4
EP02	EARTH			27B	
EP03	RIGHT SIDELIGHT POWER SUPPLY		16C		
EP04	JSM / K1 POWER SUPPLY			25E	
EP06	FORWARD GEAR NEUTRAL CONTROL		22B		
EP07	REVERSE GEAR NEUTRAL CONTROL		22B		
EP08	FOG LIGHT POWER SUPPLY		16B		
EP09	LEFT REAR SIDELIGHT POWER SUPPLY		14C		
EP10	REVERSING LIGHT DIODE		15C		
EP11	RIGHT REAR DIRECTION INDICATOR POWER SUPPLY		15B		
EP12	NEUTRAL CONTROL		22B		
EP13	REVERSING LIGHT DIODE		15C		
EP14	LEFT REAR DIRECTION INDICATOR POWER SUPPLY		14B		
EP15	STOP LIGHT POWER SUPPLY		14B		
EP16	DASHBOARD MODULE EARTH	9B			
EP17	DASHBOARD MODULE INDICATOR LAMP	9B			
EP19		10D			
EP20		10D			
EP21	GROUND CAN B	9D			
EP23	FORWARD CONTROL			33G	
EP24	REVERSE CONTROL			33G	
EP25	CAN A EARTH			33E	
EP26	ROLLER 1			32G	
EP27	ROLLER 2			33G	
EP28	SPU ANA EARTH			29G	
EP29	ANA POWER SUPPLY			30G	
EP30	LSU POWER SUPPLY or LSU EARTH				36F
EP33	DIAG CAN EARTH			34F	
EP34	AIR FILTER CLOGGING DIODE	8C			
EP35	CAN H			33E	
EP36	CAN L			33E	
EP37	AIR FILTER CLOGGING DIODE	8D			
EP38	SPU POWER SUPPLY			29F	
EP42	ECM POWER SUPPLY	3C			
EP43	ECM POWER SUPPLY	3A			
EP44	CAN L	4B			
EP45	CAN H	4C			
EP46	B4 B6 POWER SUPPLY	3A			
EP48	CONT AP POWER SUPPLY	3C			
EP50	FRONT WORKING LIGHT POWER SUPPLY				43B
EP51	FRONT WORKING LIGHT EARTH				43B
EP52	CAB HARNESS EARTH				43C
EP53	LEFT-HAND LIGHT HP EARTH				44B
EP54	RIGHT REAR WORKING LIGHT POWER SUPPLY				44B
EP55	LEFT REAR WORKING LIGHT POWER SUPPLY				43B
EP56	REVOLVING LIGHT POWER SUPPLY				42B
EP57	WINDSCREEN WIPER POWER SUPPLY				41B

### DETAIL CAN A et B

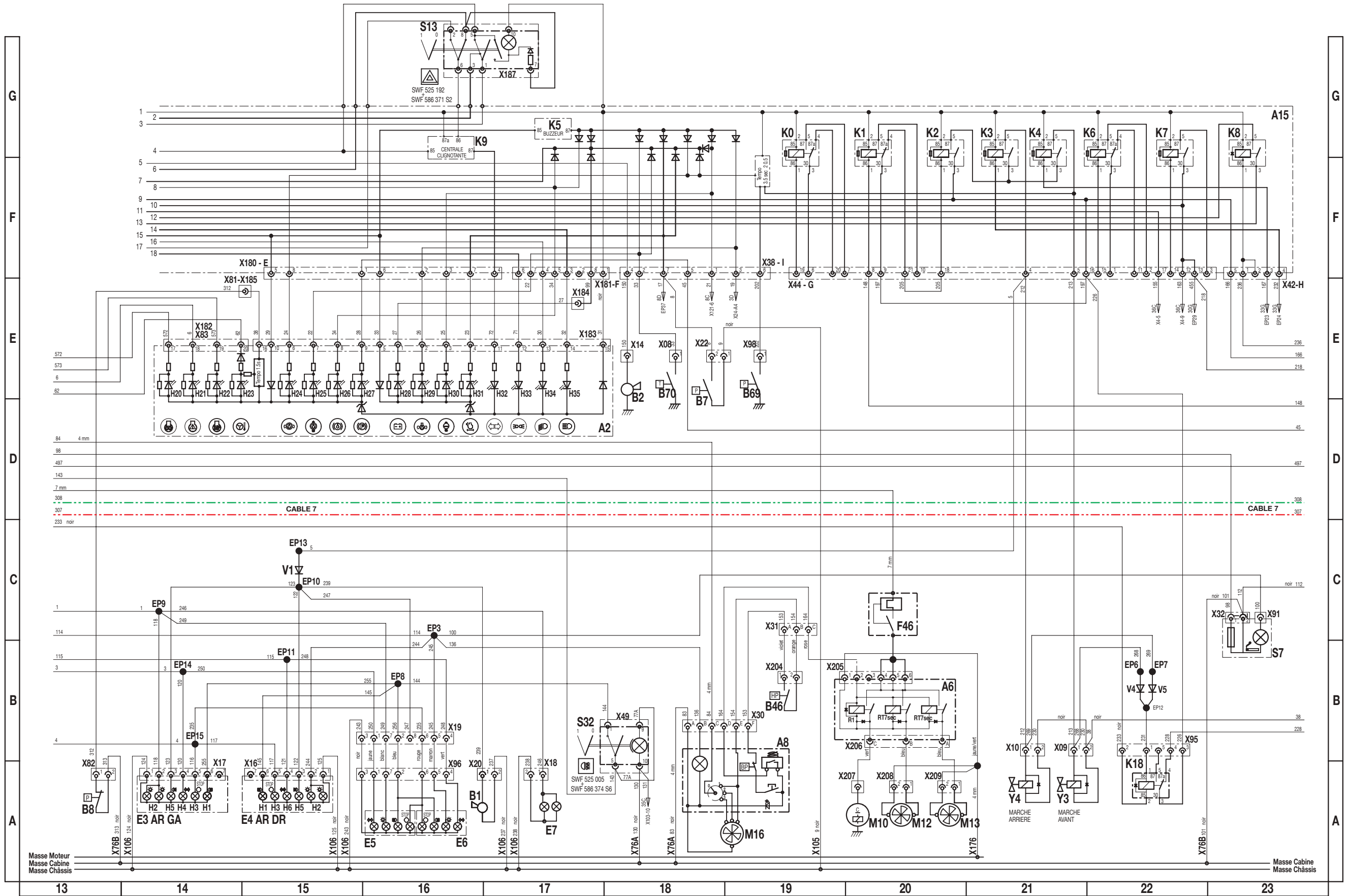


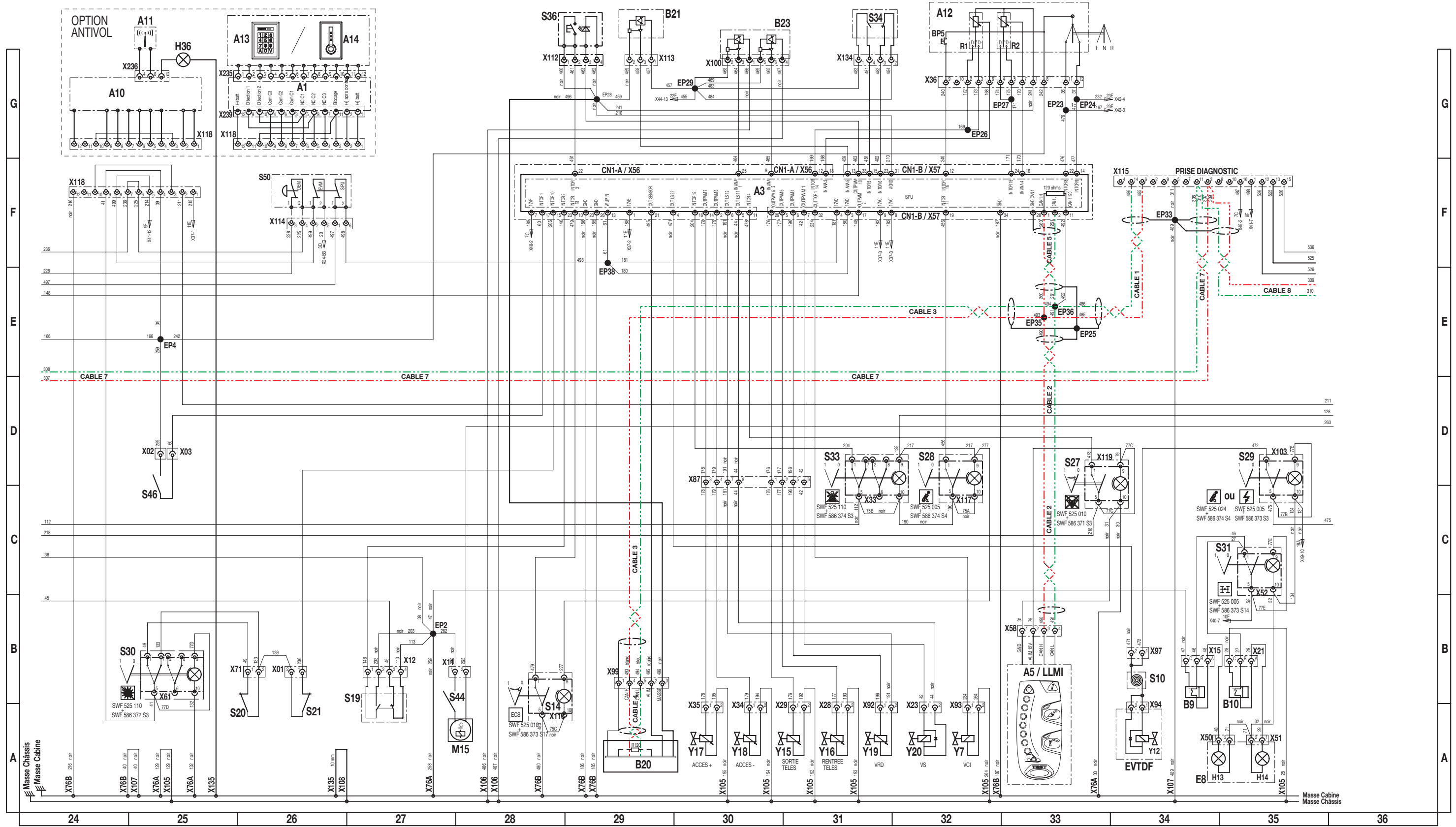
EP 36 CAN LOW  
 EP 35 CAN HIGH  
 EP 21 DRAIN  
 EP 25 DRAIN  
 EP 28 MASSE ANALOGIQUE  
 EP 33 MASSE CAN



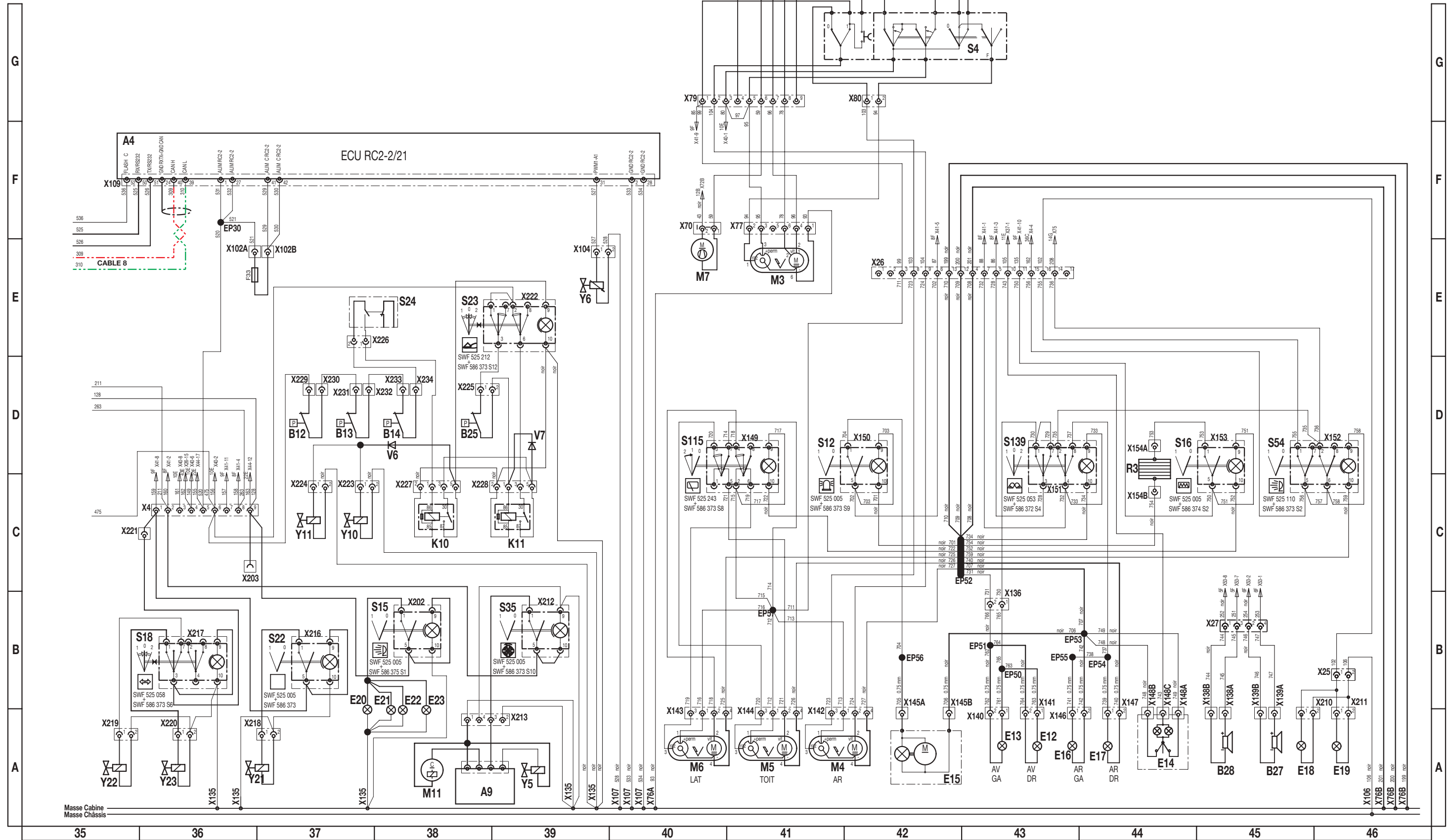


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	pages
- Key . . . . .	.G2
- Diagram . . . . .	.G5

<b>HYDRAULIC DIAGRAM KEY</b>			
<b>Item</b>	<b>Designation</b>	<b>Position on diagram</b>	<b>Characteristics (Options)</b>
AC	Accumulator	O27, G36	
CA	Suction strainer	S15	
CSP	Counterbalance valve	I29	
CR(O)	Trailer hook (option)	C16, C19, C25	
D	Control Valve	Q37	
EE	Inlet section	S25	
EA(O)	Attachment component (option)	S30	
EL	Lifting component	S36	
EI	Tilt component	S28	
EA	Attachment component	S34	
ET	Telescoping component	S32	
EF	Closing component	S38	
EVA(A)(O)	Rear attachment electrovalve (option)	C16, C18, C21, C23	
EVP(O)	Pilot electrovalve (option)	Q22	
EVTDF(O)	Jib head electrovalve (option)	C36, C38	
FDAV	Front disc brake	I3	
FDAR	Rear disc brake	I22	
FEMS	EMS head filter	M39	
FR	Return filter	Q17	
M	Engine	I18	
	Idle speed		930 rpm
	Nominal loaded speed		2200 rpm
	Full speed unladen		2360 rpm
MA	Manipulator	O40	
MC	Master cylinder	A3	
N	Level	S12	
P	Hydraulic pump	G18	
PAAV	Front attachment plug	C31	
PAAV (O) AV1	Front attachment plug (option) Hydraulic locking	C34	
PAAV (O) AV2	Front attachment plug (option) Jib head electrovalve	C36	
PAAV (O) AV3	Front attachment plug (option) Jib head electrovalve and hydraulic locking	C39	
PAAR(O) AR1	Rear attachment plug (option) single-effect	C28	
PAAR(O) AR2	Rear attachment plug (option) dual effect	C27	
PAAR(O) AR3	Rear attachment plug (option) hydraulic hook	C25	
PAAR(O) AR4	Rear attachment plug (option) dual + single rear provision	C23	
PAAR(O) AR5	Rear attachment plug (option) 2 dual rear provisions	C21	
PAAR(O) AR6	Rear attachment plug (option) towing hook + dual rear provision	C19	
PAAR(O) AR7	Rear attachment plug (option) towing hook + rear single provision	C16	
PCR	Cooling circuit pump	Q12	
PD	Steering pump	C11	
PFR	Trailer brake plug integrated in the VAFR	E4	
PP	Pressure port	O25	
PRES	Pressure sensitive switch	E12	

## MLT 735 -120 LSU Serie 6-E3

<b>HYDRAULIC DIAGRAM KEY</b>			
<b>Item</b>	<b>Designation</b>	<b>Position on diagram</b>	<b>Characteristics (Options)</b>
PRES(O)	Pressure sensitive switch (option)	G34	
PRF(O)	Leakage return plug (option)	K13	
R	Hydraulic tank	S12	
RH	Oil cooler	Q14	
RLF	Brake fluid tank	C3	
SC	Circuit selector	E8	
SCFR	Trailer brake circuit selector	E7	
SD	3 position steering selector	C9	
	Position 1 : short steering		
	Position 2 : front wheel steering		
	Position 3 : crab steering		
VC	Compensating cylinder (MLT 735)	I26	100x50 c310
	Compensating cylinder (MLT 741)		110x55 c310
VI	Tilting cylinder (MLT 735)	G26	130x65 c380
	Tilting cylinder (MLT 741)		140x70 c388
VDAV	Front steering cylinder	I4	
VDAR	Rear steering cylinder	I21	
VL	Lifting cylinder (MLT 735)	E35, G39	140x70 c720
	Lifting cylinder (MLT 741)		150x70 c716
VT	Telescoping cylinder (MLT 735)	G30	70x50 c2700
	Telescoping cylinder (MLT 741)		75x55 c2700
VAFR	Trailer brake valve	E3	
VVT(O)	Carriage locking cylinder (option)	C34, A39	60x45 c183
VAI(O)	Isolation valve (option)	C33, C38	
VS	Safety valve	Q25	
VRP	Pressure control valve	Q36	
VASF	Jib suspension valve	I35	
VCI	Inclination cut-off valve.	O35	

NOTE : 1- The calibration pressures of the main relief valves, on the inlet sections, are given for maximum engine speed.

2- The calibration pressures of the secondary relief valves are at an engine speed of 1000 rpm.

3- The pressure relief valves should be adjusted at an oil temperature of 50°C.





