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**TMT55 HT/XT - 4W  
T3**

**OPERATOR MANUAL**

**Catalog No. 51900008  
In. Rel. 10-2011**

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



**TMT 55 FL XT -4W** (SHOWN WITH OPTIONS)





## **- INTRODUCTION TO SAFETY -**

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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:**

ASME 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 from the American Society of Mechanical Engineers (ASME), 345 East 47th St., United Engineering Center, New York, NY 10017. 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 upgrade.
  - b.) Unloaded rough terrain forklift trucks should be operated on all grades with the load-engaging means downgrade.
  - 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.

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!

#### **5.) 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 Americas, 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!** Observe the safety messages placed throughout this manual; providing special instructions, telling you when to take precautions and identify potential hazards. The safety messages are highlighted and outlined in a box similar to those shown in the examples below.

### SAFETY ALERT SYMBOL



#### NOTE or NOTICE

Provides information, special instructions or references about the lift truck.

#### IMPORTANT

Precautions which must be taken to avoid damage to the lift truck.



#### CAUTION

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



#### WARNING

Indicates a potentially hazardous situation which, if not avoided, *may result in death or serious injury!*

#### DANGER

Indicates an imminently hazardous situation which, if not avoided, *will result in death or serious injury.*

### **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 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

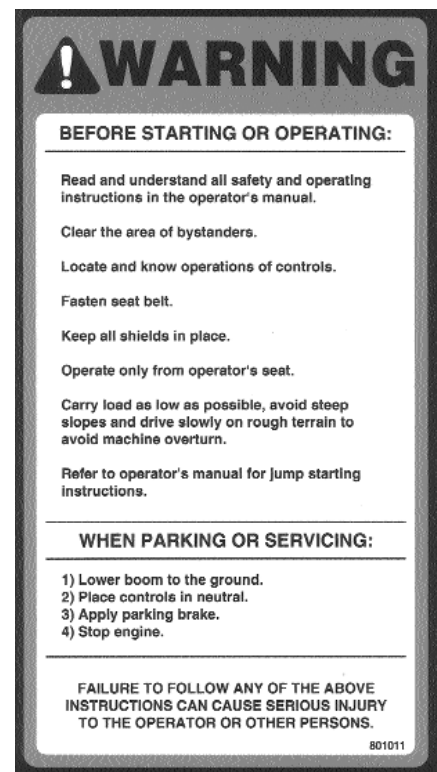
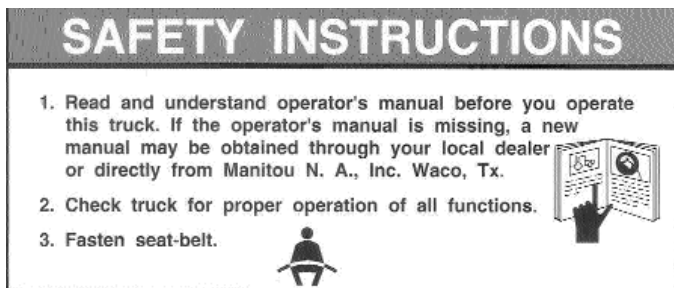
#### Before Starting - 801011

(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.

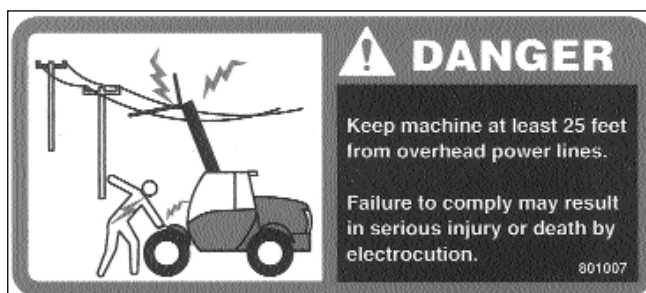
Keep away from unsupported boom.



### Clear of Power Lines - 801007

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

Keep away from power lines.

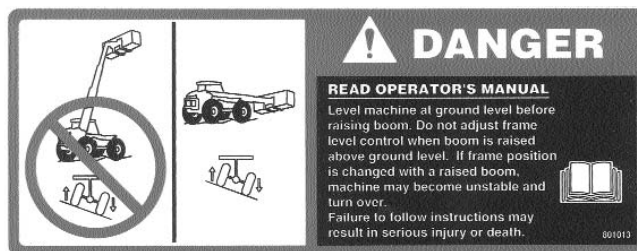


## SAFETY DECALS

### Use of Frame Leveling - 801013

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

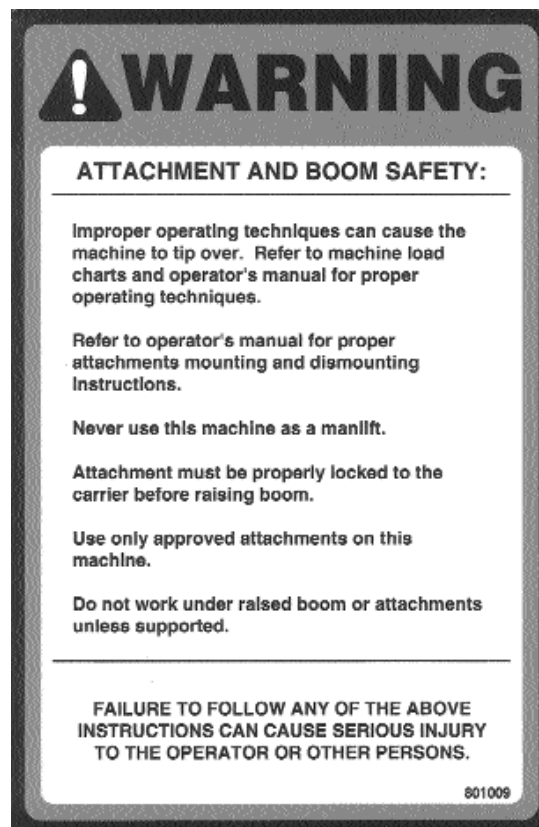
Frame leveling notice; load must be lowered.



### Attachment and Boom Safety - 801009

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

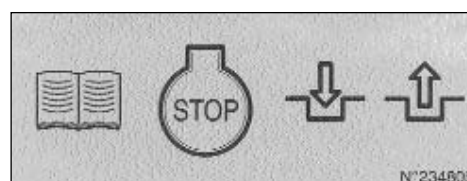
Important reminders of attachment and boom safety.



### 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.

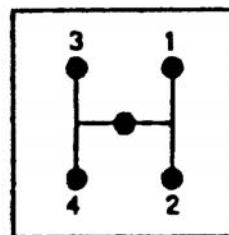


## SAFETY DECALS

### Gear Shift Pattern - 33460

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

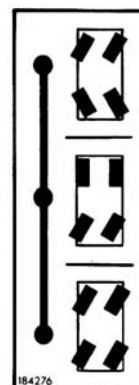
Identifies the gear shift pattern of the forklift transmission.



### 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

**ATTENTION CUIDADO**  
**ACHTUNG ATTENZIONE**

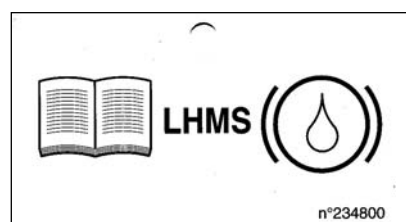
**LIQUIDE DE FREIN**  
**BRAKE LIQUID**  
**BREMSFLUESSIGKEIT**  
**LIQUIDO DE FRENO**  
**LIQUIDO FRENI**

Utiliser IMPERATIVEMENT de l'huile minérale  
IMPERATIVE to use mineral oil  
Verwenden Sie UNBEDINGT Mineralöl  
Usar IMPERATIVAMENTE de aceite mineral  
Utilizzare IMPERATIVAMENTE olio minerale

**LHMS**

221322 A

234800

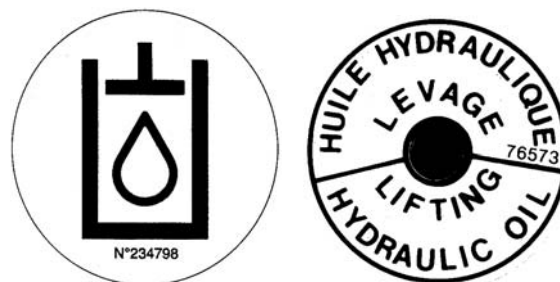


## SAFETY DECALS

### 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.

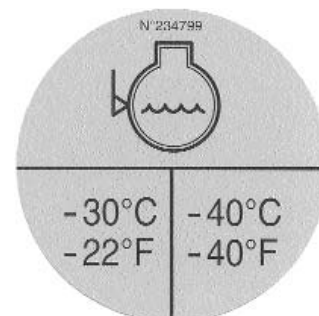
Identifies the hydraulic reservoir (tank).



### 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.

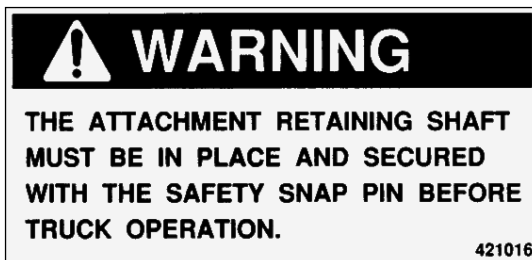


## **SAFETY DECALS**

### **Attachment Warning - 421016**

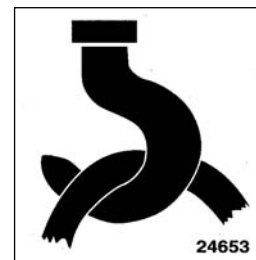
(Boom equipped models). Location: on the boom coupler, near where the retaining shaft is installed.

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.

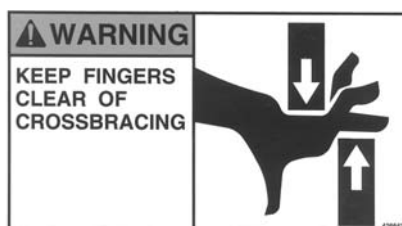


### **Pinch Point, Large, 2.5 x 4.5 in. - 426643**

### **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.

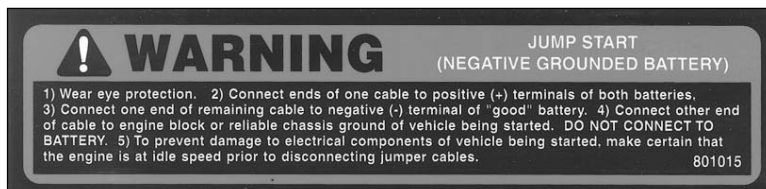
Addresses battery hazards.



### 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.

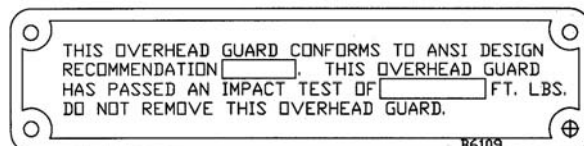
Important manufacturer information about the attachment. Record this information for use when contacting the manufacturer for parts and service.

<b>MANITOU</b>	
MANITOU NORTH AMERICA, INC. 6401 IMPERIAL DR. WACO, TX. 76712 800-433-3304 www.manitou-na.com	
MODEL NUMBER:	
SERIAL NUMBER:	
YEAR OF MANUFACTURE:	
COUNTRY OF MANUFACTURE:	
UNLADEN WEIGHT (LBS.)	
CAPACITY (LBS.)	
HORIZONTAL CENTER OF GRAVITY (IN.)	
OPERATING PRESSURE (PSI)	
<b>WARNING</b>	
This attachment affects the capacity of the lift truck.	
Check the operator service manual or load chart for net capacity with this attachment.	
If the load chart is not available, contact the factory.	
425995	

### Overhead Guard Data Plate - B6109

Location: attached to the overhead guard.

Overhead guard conformity.



### Forklift Data Plate - 496550

(Boom equipped models)

### Forklift Data Plate - 496538

(Mast equipped models)

Location: within the operator's compartment.

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

496550

496538

<b>MANITOU</b>	
MANITOU NORTH AMERICA, INC. 6401 IMPERIAL DR. WACO, TX. 76712 800-433-3304 www.manitou-na.com	
TRUCK MODEL	
SERIAL NUMBER	
UNLADEN WEIGHT	LBS.
YEAR OF MFG.	
TIRE PRESSURE: FRONT	PSI
TIRE PRESSURE: REAR	PSI
FOR CAPACITIES, REFER TO THE APPROPRIATE LIFT CHART OR CONTACT THE FACTORY. AS RELEASED FROM THE FACTORY, THIS TRUCK CONFORMS TO DESIGN STANDARDS ANSI/ASME B56.6	
MANUFACTURED IN	
496550	

<b>MANITOU</b>	
MANITOU NORTH AMERICA, INC. 6401 IMPERIAL DR. WACO, TX. 76712 800-433-3304	
TRUCK MODEL	S.N.
MAST MODEL	
MAST S.N.	
ATTACHMENTS	S.N.
UNLADEN WEIGHT	LBS.
YEAR OF MFG.	
A	INCHES
C	INCHES
MAX CAPACITY	LBS.
UP TO (B)	INCHES
MAX CAPACITY	LBS.
AT MPH (B)	INCHES
TIRE PRESSURE: FRONT	PSI
TIRE PRESSURE: REAR	PSI
CAPACITY WITH ATTACHMENTS LISTED ABOVE ARE WITH FORK UPRIGHTS VERTICAL. FOR OTHER CAPACITIES CONTACT THE FACTORY. AS RELEASED FROM THE FACTORY, THIS TRUCK CONFORMS TO DESIGN STANDARDS ANSI/ASME	
MANUFACTURED IN	
496538	



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





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# INSTRUCTIONS TO THE COMPANY MANAGER

## 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.



### WARNING

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

- *The foreseeable abnormal behavior of neglect, but not intending 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.*
  - *Behavior resulting from application of the "principle of least action" when performing a task.*
  - *For certain machines, the foreseeable behavior of such persons as unauthorized: apprentices, teenagers, handicapped persons and trainees tempted to drive a lift truck. Truck drivers 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 LIFT 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 boom head, etc.
- 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 utilization.
  - . 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).

### IMPORTANT

*For operation under average climatic conditions, i.e. between -15 °C and + 35 °C (5° to 95°F), correct levels of lubricants in all the circuits are provided in production. For operation under more severe climatic conditions, before starting up, it is necessary to drain all the circuits, then add the correct levels of lubricants properly suited to the relevant ambient temperatures. It is the same for the cooling fluid (Contact your dealer for information, if necessary).*

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



### WARNING

*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 (i.e. refineries, fuel or gas depots, stores of inflammable products...). For use in these areas, specific equipment is available (ask your dealer for information).*

### 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.

## THE INSTRUCTIONS

- 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.




#### **WARNING**

*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

## PREAMBULE

 <b>DANGER</b>	<i>The risk of accident while operating, servicing or repairing your lift truck can be reduced if you follow the safety instructions and safety measures detailed in this manual. Failure to respect the safety and operating instructions, or the instructions for repairing or servicing your lift truck can lead to serious injury or fatal accident.</i>
---	--

- Only the operations and maneuvers 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.

## 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 - AUTHORIZATION FOR USE

- Only qualified, authorized personnel may use the lift truck. This authorization is given in writing by the appropriate person in the company, in charge of using the lift truck, and must be permanently carried by the operator.
- The operator is not competent to authorize 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 tires are adapted to the nature of the ground (see area of the contact surface of the tires in the chapter : 2 - DESCRIPTION : CHARACTERISTICS). There are optional solutions, consult your dealer.
  - . SAND tires.
  - . LAND tires.
  - . Snow chains.

 <b>DANGER</b>	<i>Do not operate the lift truck if the tires are incorrectly inflated, damaged or excessively worn. Bad tires can put your safety or that of others at risk, or cause damage to the lift truck. The installation of foam inflated tires is prohibited and is not guaranteed by the manufacturer (prior authorization is required).</i>
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### 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 strictly forbidden.

#### **F - SYTEMS FOR HOOKING**

- Optional solutions exist, consult your dealer.



#### **WARNING**

*Manitou's consent is required before using any system for hooking a forklift truck to or on the back of a trailer or any other equipment.*

#### **G - CLIMBING ONTO THE TRUCK**

- Optional solutions exist, consult your dealer.



#### **DANGER**

*To climb onto the truck, it is strictly prohibited to use the lift truck hydraulic system if it is not equipped with a suitable hydraulic safety device kit.*


**IF NECESSARY, CONSULT YOUR DEALER.**

### 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 and backup alarm work.

### B - DRIVER'S OPERATING INSTRUCTIONS

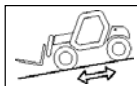
- Whatever his experience, the operator is advised to familiarize himself with the position and operation of all the controls and instruments before operating the lift truck.
- Wear clothes suited for driving the lift truck, avoid loose clothes.
- Make sure you have the appropriate protective equipment 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 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.

 <b>CAUTION</b>	<i>Under no circumstances should the seat be adjusted while the lift truck is moving.</i>
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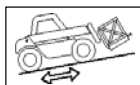
- The operator must always be in his normal position in the driver's cab. It is prohibited to have arms or legs, or generally any part of the body, protruding from the driver's cab of the lift truck.
- The safety belt must be worn and adjusted to the operator's size.
- The control units must never in any event be used for any other than their intended purposes (e.g. climbing onto or down from the lift truck, 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 boom, 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, truck, 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.

 <b>WARNING</b>	<p><i>If the load or the attachment must remain above a structure for a period of time, there is the risk that it will settle upon the structure as the hydraulic oil in the cylinders cools.</i></p> <p><i>To eliminate this risk :</i></p> <ul style="list-style-type: none"><li>- <i>Regularly check the distance between the load or the attachment and the structure and readjust as necessary.</i></li><li>- <i>If possible use the lift truck at an oil temperature as close as possible to ambient temperature.</i></li></ul>
--	---

- 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.


 <b>DANGER</b>	<i>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 lines.</i>
 <b>DANGER</b>	<i>During high winds do not attempt moving loads that may catch the wind or cause the fork lift to be unstable.</i>

#### **D - VISIBILITY**


- The safety of personnel within the lift truck's radius of operation as well as that of the lift truck and its operator, depends on the operator having good visibility of the environment immediately around the lift truck, under all circumstances at all times.
- This lift truck was designed to provide the operator with good visibility (direct or indirect via rear-view mirrors) of the immediate environment during movement with the lift truck empty and boom in transport position.
- If the volume of the load limits visibility ahead, particular precautions must be taken :
  - move in reverse ;
  - adjust the site layout ;
  - be assisted by someone (outside the area of operations of the lift truck) who can direct movements, making sure that this person is always in view.
  - always avoid maneuvering too far in reverse.
- With certain specific attachments, lift truck moving operations may need the boom to be in high position. In this case, visibility on the right is limited and particular precautions must be taken :
  - adjust the site layout ;
  - be assisted by someone (outside the area of operations of the lift truck) who can direct movements.
- In any situation where visibility of the route is inadequate, obtain the help of someone (outside the area of operations of the lift truck) to direct movements, making sure that this person is always in view.
- Maintain all components used for visibility clean, well-adjusted, and in good working order : windscreen and windows, windscreen wipers and washers, road and work lights, rear-view mirrors.

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

##### **SAFETY NOTICE**

 <b>WARNING</b>	<i>The lift truck must be started or maneuvered only when the operator is sitting in the driver's cab, his seat belt fastened and properly adjusted.</i>
--	--

- 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.

 <b>WARNING</b>	<i>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.</i>
--	--


#### **INSTRUCTIONS**

- Check the closing and locking of the hood(s).
- Make sure that the forward/reverse lever is in neutral.
- Turn the ignition key to the position I to activate the electrical system.
- Make sure the signal lights on the instrument control panel and fuel level indicators are working properly (see : 2 - DESCRIPTION : INSTRUMENTS AND CONTROLS).
- Turn the ignition key to position II to preheat for 5 seconds and 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 for 5 seconds 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.

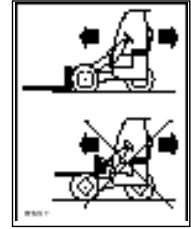


## F - DRIVING THE LIFT TRUCK

### SAFETY NOTICE

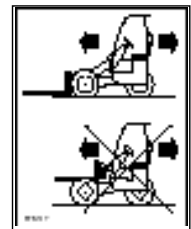
 <b>DANGER</b>	<p><i>Operators' attention is drawn to the risks involved in using the lift truck, in particular :</i></p> <ul style="list-style-type: none"><li>- Risk of losing control.</li><li>- Risk of losing lateral and frontal stability of the lift truck.</li></ul> <p><i>The operator must remain in control of the lift truck. In the event of the lift truck overturning, do not try to leave the cab during the incident. YOUR BEST PROTECTION IS TO STAY FASTENED IN THE CAB.</i></p>
---	---

- 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 loaded lift truck with the forks or attachment at the transport position, i.e. at 12 in. from the ground, the boom retracted and the carriage sloping backwards.
- When unloaded, travel with the boom extended as shown and the forks 12 in. from the ground (transport position).
- 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 7 mph.
- Drive smoothly at an appropriate speed for the operating conditions (land configuration, load on the lift truck).
- Do not use the hydraulic boom controls when the lift truck is moving.
- Do not manoeuvre the lift truck with the boom 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 lever from a stationary position and never do so abruptly.
- Do not drive with your foot on the brake pedal or with the parking brake on.
- 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 around 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.



### INSTRUCTIONS

- Always drive the loaded lift truck with the forks or attachment at the transport position, i.e. 12 in. from the ground, the boom retracted and the carriage sloping backwards.
- When unloaded, travel with the boom extended as shown and the forks 12 in. from the ground (transport position).
- Release the parking brake.
- Shift the forward/reverse lever to the selected direction of travel and accelerate gradually until the lift truck moves off.



## G - STOPPING THE LIFT TRUCK

### SAFETY NOTICE

- 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, place the gear lever in neutral, apply the parking brake and put the forward/reverse lever in neutral.
- Make sure that the lift truck is not stopped in any position that will interfere with the traffic flow and is at least 6 ft 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 (door, window, engine cover...).

### INSTRUCTIONS

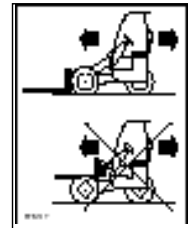
- Park the lift truck on flat ground or on an incline lower than 15 %.
- Place the forward/reverse lever in neutral.
- Apply the parking brake.
- Lower the forks or attachment to rest on the ground.
- When using an attachment with a grab or jaws, or a bucket with hydraulic opening, close the attachment 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.
- Make sure all means of access to the lift truck are closed and locked (door, window, engine cover...).

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


### 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.
- Check the good working order and cleanness of lights, indicators and windscreen wiper.
- Switch off the working headlights if the lift truck is fitted with them.
- Always drive the loaded lift truck with the forks or attachment at the transport position, i.e. at 12 in. from the ground, the boom retracted and the carriage sloping backwards.
- When unloaded, travel with the boom extended as shown and the forks 12 in. from the ground (transport position).
- Lift up the stabilizers to the maximum.

 <b>DANGER</b>	<p><i>Do not allow the lift truck to coast in neutral (using either the forward/reverse lever, gear shift lever or transmission cut-off button). Coasting on a slope will lead to excessive speed which may make the lift truck uncontrollable (steering, brakes) and may cause serious mechanical damage.</i></p>
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### 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.
  - 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 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 maximum vertical pull on the trailer hook must not exceed 3372 ft/lbs.
- The authorized maximum train weight must not exceed the maximum weight authorized by the manufacturer (consult the manufacturer's plate on your lift truck).

**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).
- 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. There are optional solutions ; contact your dealer.

### **B - MASS OF LOAD AND CENTER OF GRAVITY**

- Before taking up a load, you must know its mass and its center of gravity.
- The load chart for your lift truck is valid for a load in which the longitudinal position of the center of gravity is 24 in. from the base of the forks (fig. B1). For a higher center of gravity, contact your dealer.
- For irregular loads, determine the transverse center of gravity before any movement (fig. B2) and set it in the longitudinal axis of the lift truck.



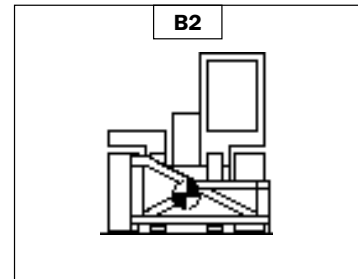
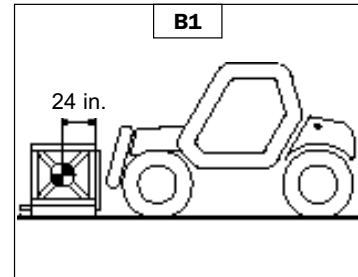
#### **CAUTION**

*Do not attempt to move a load heavier than the effective capacity defined on the lift truck load chart.*



#### **CAUTION**

*For loads with a moving center of gravity (i.e., liquids), take into account the variations of the center of gravity in order to determine the load to be handled (Consult your agent or dealer). Be vigilant and take extra care to limit these variations as much as possible.*



## C - TRANSVERSE (LEVEL) ATTITUDE OF THE LIFT TRUCK

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

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

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

- 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 USED ON STABILIZERS

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

## D - TAKING UP A LOAD ON THE GROUND

- Direct the lift truck perpendicular to the load, with the boom 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.



### CAUTION

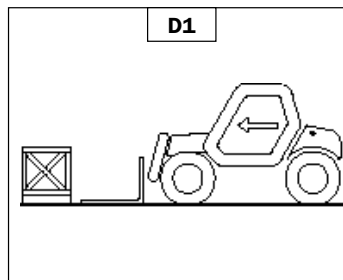
*Beware of the risks of pinching or crushing fingers when manually adjusting the forks.*

- Move the lift truck forward slowly (1) and bring the forks in front of the load (fig. E3), if necessary, slightly lift the boom (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).

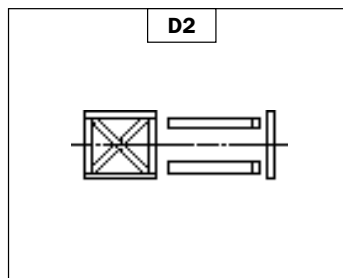
### FOR A NON-PALLETIZED LOAD

- 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.

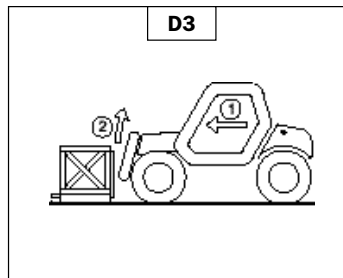
D1



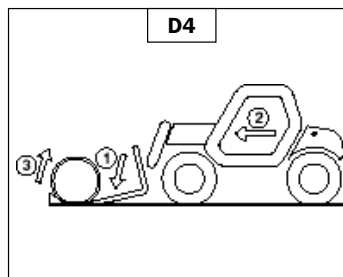
D2



D3



D4



## D - TAKING UP AND LAYING A HIGH LOAD ON TIRES

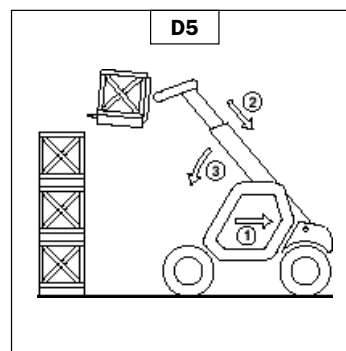
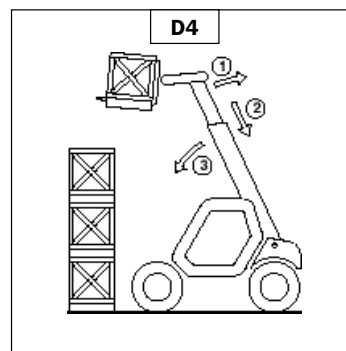
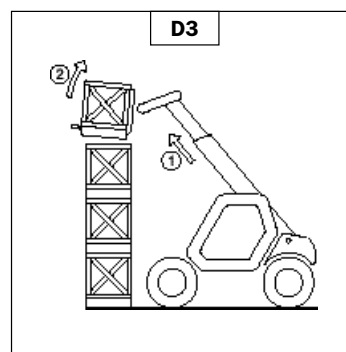
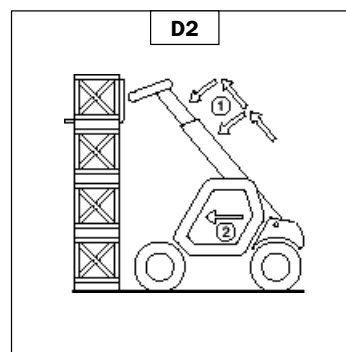
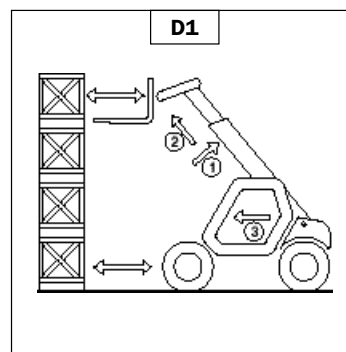
### **WARNING**

*Do not raise the boom until you have first checked the level 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).

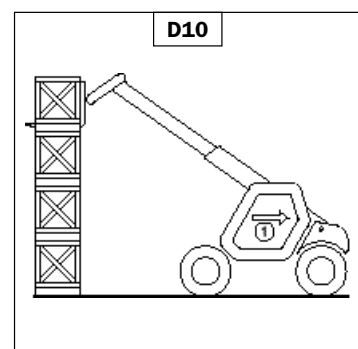
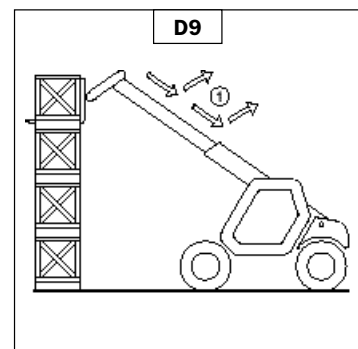
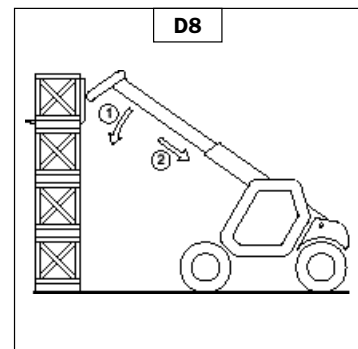
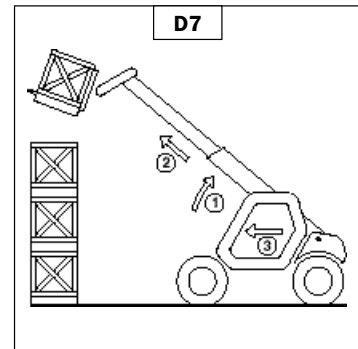
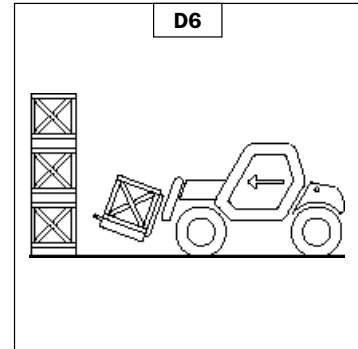
#### TAKING UP A HIGH LOAD ON TIRES

- Ensure that the forks will easily pass under the load.
- Lift and extend the boom (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 boom.
- Place the forks in front of the load by alternately extending and raising the boom (1) or, if necessary, moving the lift truck forward (2) (fig. F2). Put the handbrake on and set the reverse gear to neutral.
- Slightly lift the load (1) and incline the carriage (2) backwards to stabilize the load (fig. F3). Watch the load, if it is unstable, lower the load in the place from which it was taken.
- If possible lower the load without shifting the lift truck. Lift the boom (1) to raise the load, retract (2) and lower the boom (3) to bring the load into the transport position (fig. F4).
- If this is not possible, back up the lift truck (1), maneuvering very gently and carefully to remove the load. Retract (2) and lower the boom (3) to bring the load into the transport position (fig. F5).



#### LAYING A HIGH LOAD ON TIRES

- Approach the load in the transport position in front of the pile (fig. F6).
- Put the handbrake on and set the reversing lever to neutral.
- Lift and extend the boom (1) (2) until the load is above the pile, 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 boom (1) (2) in order to position the load correctly (fig. F8).
- If possible, release the fork by alternately retracting and raising the boom (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.



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



### CAUTION

*You must not raise the boom if you have not checked the transverse (level) 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 optimize 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 boom to be raised.
- Put on the parking brake and set the gear reverser lever to neutral.
- Lower both stabilizers fully (fig. G1), while maintaining its transverse stability.

#### Raise the stabilizers with the forks in transport position (unladen and laden)

- Raise both stabilizers fully.

#### Setting the stabilizers with the boom up (unladen and laden)



### CAUTION

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

- Raise the boom and retract the telescope completely.
- Set the lift truck in position in front of the elevation (fig. G2) moving very slowly and carefully.
- Put on the parking brake and set the gear reverser lever to neutral.
- Move the stabilizers very slowly and gradually as soon as they are close to the ground or in contact with it.
- Lower both stabilizers fully (fig. G3). During this operation, transverse attitude must be permanently maintained : the bubble in the level must be kept between the two lines.

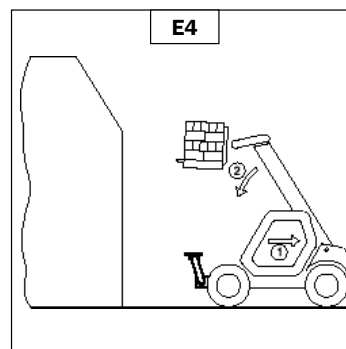
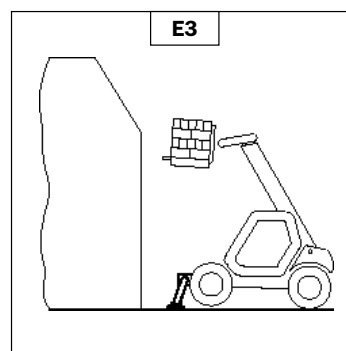
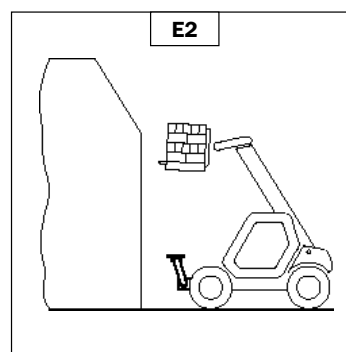
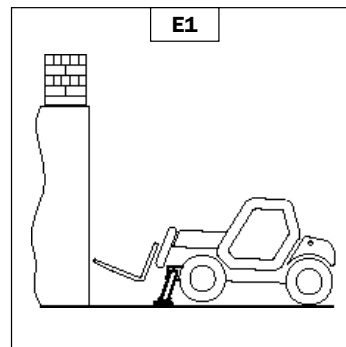
#### Raising the stabilizers with the boom up (unladen and laden)



### CAUTION

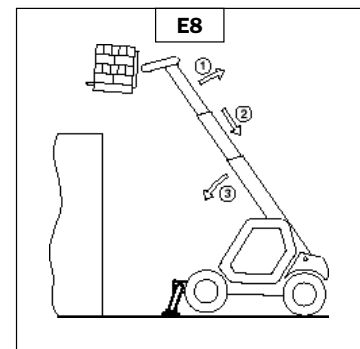
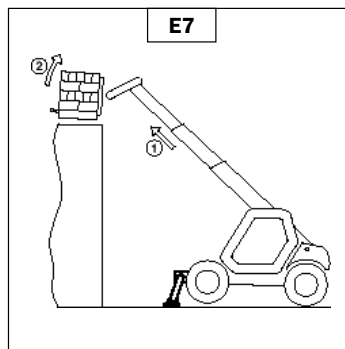
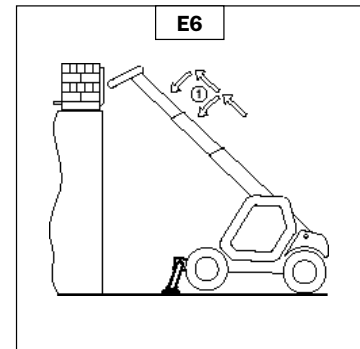
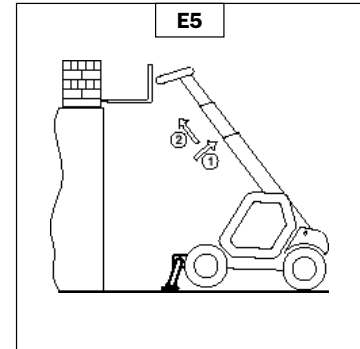
*This operation must be exceptional and performed with great care.*

- Keep the boom up and retract the boom 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).



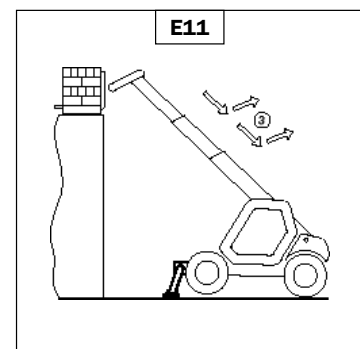
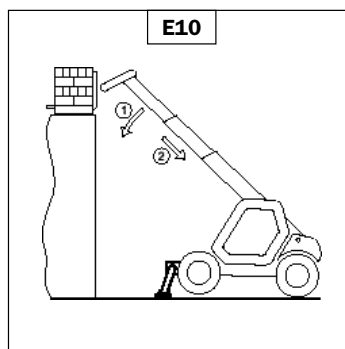
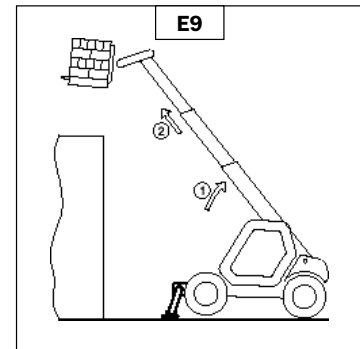
#### TAKING UP A HIGH LOAD ON STABILIZERS

- 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 boom (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 boom (1) (fig. G6).
- Lift the load slightly (1) and tilt the carriage (2) backwards to stabilize the load (fig. G7). 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 boom (1) to release the load, retract (2) and lower the boom (3) to set the load into transport position (fig. G8).



#### LAYING A HIGH LOAD ON STABILIZERS

- Raise and extend the boom (1) (2) until the load is above the elevation (fig. G9).
- Position the load horizontally and release it by lowering and retracting the boom (1) (2) (fig. G10).
- Release the forks by alternating retracting and raising the boom (3) (fig. G11).
- If possible, set the boom in transport position without moving the lift truck.





# 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 jewelry 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.

## 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

- Do not attempt to loosen unions, hoses or any hydraulic component with the circuit under pressure.

 <b>WARNING</b>	<i>BALANCING VALVE : For inspection, see : 3 – MAINTENANCE : D - EVERY 500 HOURS SERVICE. It is dangerous to change the setting or 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).</i>
 <b>WARNING</b>	<i>The HYDRAULIC ACCUMULATORS which may be fitted on your lift truck, are under high pressure, it is dangerous to dismantle them. This operation must only be performed by approved personnel (consult your dealer).</i>
 <b>WARNING</b>	<i>STEERING SLOW SPEED SYSTEM: controlling the overall condition. The slow speed system is triggered when the rear wheel is turned to the left or the right. If the operator notices any operating anomaly, make the necessary repairs immediately. Any modification or dismantlement to the slow speed system is forbidden. These operations must be performed by approved personnel only (consult your dealer).</i>

## ELECTRICITY

- Do not short-circuit the starter relay to start the lift truck. If the reverse gear is not in neutral, the lift truck will start to move immediately.
- 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 tire. The heat would increase the pressure which could cause the tire 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***

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- Clean the lift truck or at least the area concerned before any intervention.
- Remember to close and lock all accesses to the lift truck (door, window, engine cover...).
- 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 protective products.

Instructions for using the product are given on the packaging.

#### **IMPORTANT**

*It is recommended that your dealer perform the following procedures for lift truck storage and returning it to service.*

### **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 boom 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 a 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 a protective product into each cylinder for two seconds with the piston in low neutral position.
  - Turn the crankshaft once slowly and install the injectors (see I.C. engine REPAIR MANUAL).
  - Remove the intake hose from the manifold or turbocharger and spray a protective product into the manifold or turbocharger.
  - Cap the intake manifold or turbocharger hole with waterproof adhesive tape.
  - Remove the exhaust pipe and spray a protective product into the exhaust manifold or turbocharger.
  - Install 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 a protective product around the rocker arm shaft and install 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 tires are not in contact with the ground and release the handbrake.
- Protect cylinder rods which will not be retracted, from corrosion.
- Wrap the tires.

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.
- Install the intake hose.
- Install 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: 3 - MAINTENANCE : E - EVERY 1000 HOURS SERVICE).
- Install and set the tension in the drive belts (see : 3 - MAINTENANCE : E - EVERY 1000 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).



### **WARNING**

*Insure the area is adequately ventilated before starting the lift truck.*

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



## ***2 - DESCRIPTION***



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<b><i>DIMENSIONS AND LOAD CHART</i></b>	<b><i>2 - 10</i></b>
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<b><i>INSTRUMENTS AND CONTROLS</i></b>	<b><i>2 - 14</i></b>
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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 prior notice.

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.

### PLATE MANUFACTURER OF THE LIFT TRUCK (FIG. A)

- Model \_\_\_\_\_
- Series \_\_\_\_\_
- Serial No \_\_\_\_\_
- Chassis No \_\_\_\_\_
- Year of manufacture \_\_\_\_\_

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

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

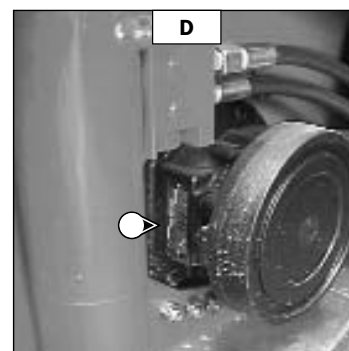
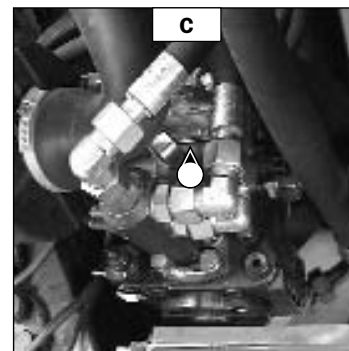
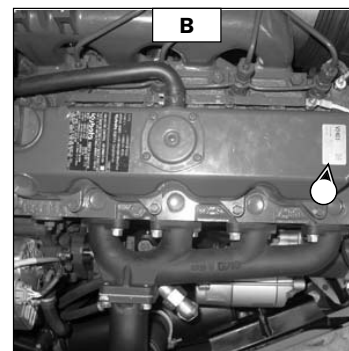
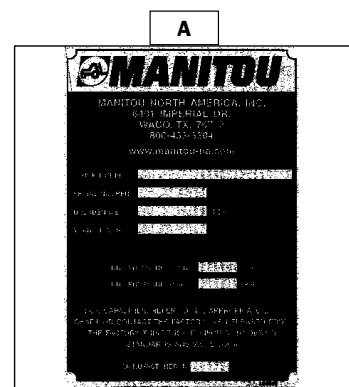
- I.C. engine No \_\_\_\_\_

### TRANSMISSION (FIG. C)

- Type \_\_\_\_\_
- MANITOU reference \_\_\_\_\_
- Serial No \_\_\_\_\_

### FRONT WHEEL REDUCER (FIG. D)

- Type \_\_\_\_\_
- MANITOU reference \_\_\_\_\_
- Serial No \_\_\_\_\_



***REAR WHEEL REDUCER (Fig. E)***

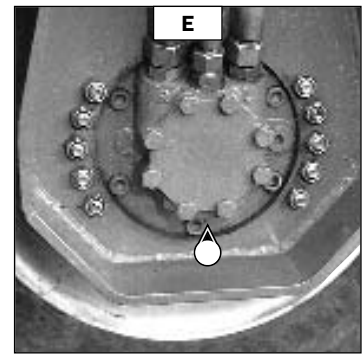
---

- Type
- MANITOU reference
- Serial No

---

---

---



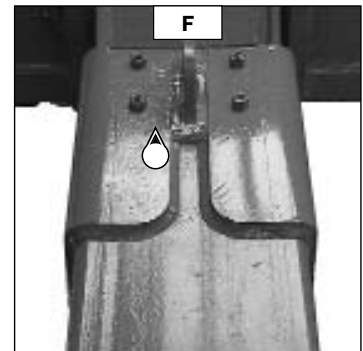
***Boom (Fig. F)***

---

- Boom No
- Date of manufacture

---

---



**I.C. ENGINE**

---

- Type	<b>KUBOTA V2403-M</b>
- Fuel	Diesel
- Number of cylinders	4 in line
- Number of strokes	4
- Inlet system	Natural aspiration
- Injection system	Mechanical
- Ignition sequence	1.3.4.2.
- Clearance of rocker valve (cold)	
. Inlet	0,20 mm (0.787in)
. Exhaust	0,20 mm (0.787in)
- Capacity	2434 cm3 (134.3 cu.in.)
- Bore	87 mm (3.4 in)
- Stroke	102.4 mm (4.03 in)
- Compression ratio	23/1
- Nominal rating loaded	2700 rpm
- Rating slow unladen	900 ± 20 rpm
- Max. rating unladen	2920 rpm
- Power ISO 3046	50 cv/36.5 kw
- Maximum torque ISO 3046	159 Nm @ 105.5 ft/lbs at 1800 rpm
- Air cleaner	Dry 3 µm

**COOLING CIRCUIT**

---

- Type	By water
- Fan	Puller
. Number of blades	8
. Diameter	410 mm (15.2 in)
- Thermostat	
. Start opening	71 °C (171°F)
. Full opening	85 °C (180°F)

**ELECTRIC CIRCUIT**

---

- Earth	Negative
- Battery	12 V - 74 Ah - 680 A EN
- Alternator	12 V - 70 A
- Tension regulator	Incorporated into the alternator
- Starter	12 V

## **HYDROSTATIC TRANSMISSION**

---

### **HYDROSTATIC PUMP STANDARD AND HT MODELS**

- Type

### **MANNESMANN REXROTH**

**A4 VG 40 DA** variable displacement pump with automatic power governor

### **HYDROSTATIC PUMP FOR XT MODELS**

- Type

### **MANNESMANN REXROTH**

**A4 VG 56 DA** variable displacement pump with automatic power governor

- Gear reverser

Electro-hydraulic

- Inching starter

Hydraulic via external inching valve

### **MAIN PUMP STANDARD AND HT MODELS**

- Max./Mini displacement

0 to 40 cm<sup>3</sup> (2.44 cu.in.)

- Max./Mini flow rate at 2990 rpm

0 to 120 l/mn (31.7 gal/min)

### **MAIN PUMP XT MODELS**

- Max./Mini displacement

0 to 56 cm<sup>3</sup> (3.4 cu.in.)

- Max./Mini flow rate at 2990 rpm

0 to 168 l/mn (44.4 gal/min)

- Working pressure

420 bar (6090 psi)

### **BOOST PUMP STANDARD AND HT MODELS**

- Capacity

8,6 cm<sup>3</sup> (0.5 cu.in.)

- Max./Mini flow rate at 2990 rpm

0 to 25,7 l/mn (6.8 gal/min)

- Boost pressure Max. R.P.M.

24 bar (348 psi)

### **BOOST PUMP XT MODELS**

- Capacity

11,6 cm<sup>3</sup> (0.7 cu.in.)

- Max./Mini flow rate at 2990 rpm

0 to 34,7 l/mn (9.2 gal/min)

- Boost pressure Max. R.P.M.

30 bar (435 psi)

## **FRONT WHEEL REDUCER - STD & HT MODELS**

---

- Type

**MSE02 POCLAIN** Motor wheel with brakes fixed displacement

- Capacity

398 cm<sup>3</sup> (24.3 cu.in.)

- Working pressure

420 bar (6090psi)

## **FRONT WHEEL REDUCER - XT MODELS**

---

- Type

**MSE05 POCLAIN** Motor wheel with brakes fixed displacement

- Capacity

750 cm<sup>3</sup> (45.8 cu.in.)

- Working pressure

420 bar (6090 psi)

## **REAR WHEEL REDUCER - STD MODELS**

---

- Type

**MSE02 POCLAIN** Motor wheel fixed displacement

- Capacity

398 cm<sup>3</sup> (24.3 cu.in.)

- Working pressure

420 bar (6090 psi)

## **REAR WHEEL REDUCER - HT & XT MODELS**

---

- Type

**MSE05 POCLAIN** Motor wheel fixed displacement

- Capacity

750 cm<sup>3</sup> (45.8 cu.in.)

- Working pressure

420 bar (6090 psi)

## **BRAKE**

---

- Type

Multidisc brake immersed in oil.

- Service brake

Foot pedal. Hydraulic brake, applied on the front wheels through hydraulic pressure break.

- Parking brake

Electrically controlled on dashboard on the front wheels through hydraulic pressure break.

## ***TIRES (STANDARD MODELS)***

---

- OTR / SOLIDEAL 31x10-16.5 (Front and Rear)	55psi	
Front tire load	unladen -	laden -
Rear tire load	unladen -	laden -

## ***TIRES (HT & XT MODELS ONLY)***

---

- OTR / SOLIDEAL 31x10-16.5 (Front Only)	55psi	
Front tire load	unladen -	laden -
Rear tire load	unladen -	laden -
- OTR / SOLIDEAL 31x15.5-15 (Rear) (Optional Front)	55psi	
Front tire load	unladen -	laden -
Rear tire load	unladen -	laden -

### **IMPORTANT**

*When changing or replacing the tires and wheels; use only the manufacturer's approved components as installed at the factory. Any substitutes or modifications must first be approved by the manufacturer.*

## ***HYDRAULIC CIRCUIT***

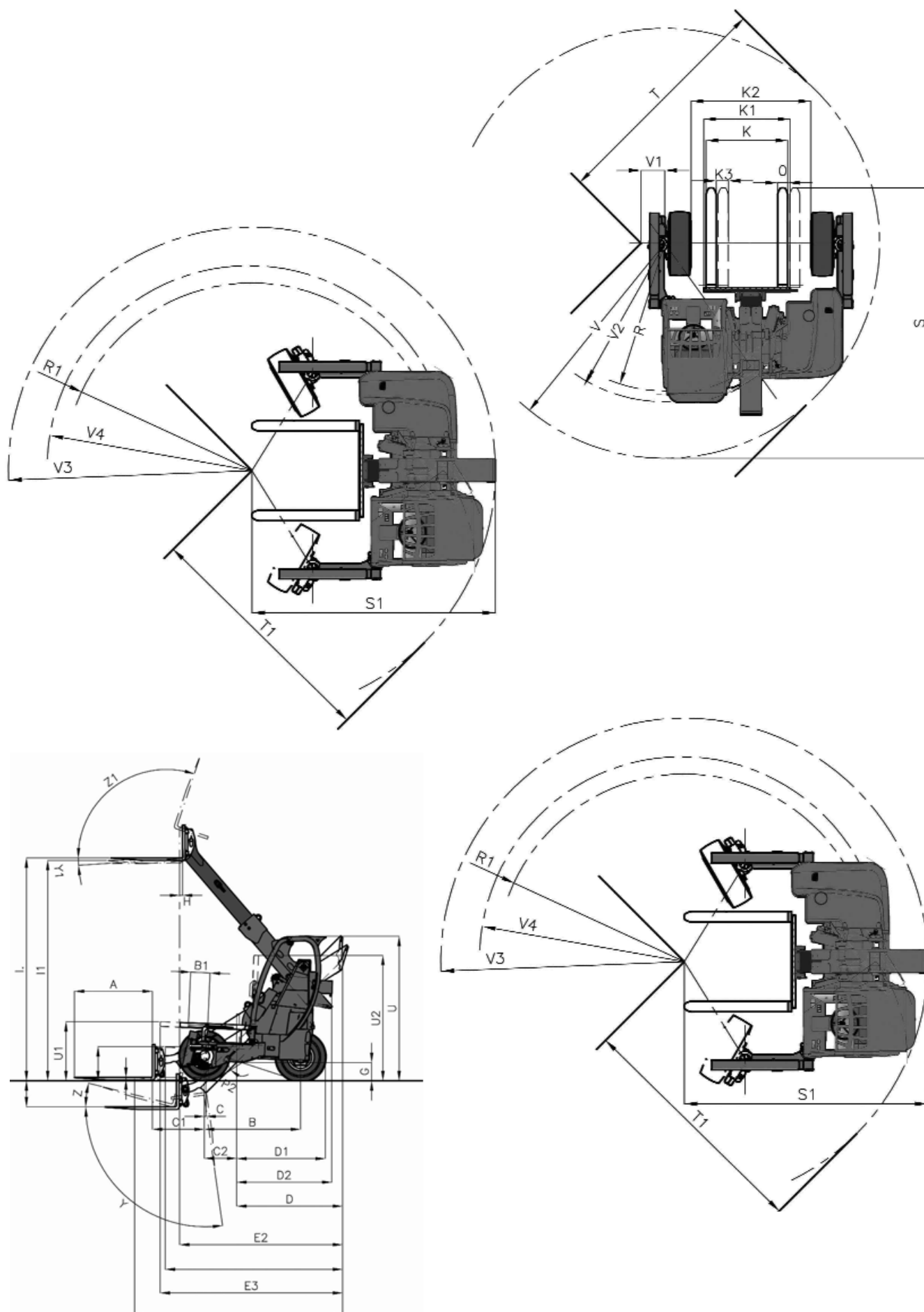
---

- Lifting, tilting, telescoping, travel circuit, stabilizer.	
. Type of pump	Gear
. Flow rate at full speed	32 L/min (8.4 gal/min)
. Pressure	220 Bar (3190 psi)
. Capacity	11,1 cm <sup>3</sup> /r (0.7 in <sup>3</sup> )
- Steering direction	
. Provided by flow distributor (Loadsensing)	
. Pressure	140 Bar (2031 psi)
- Filtration	
. Suction	15 μ
. Return	15 μ
. Air contained in the tank	5 μ

## ***SPECIFICATIONS***

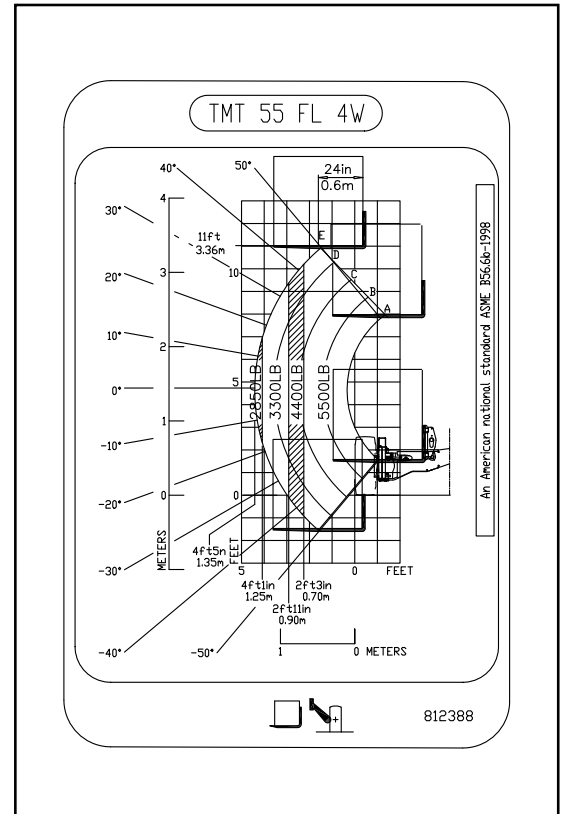
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- Level of sound pressure in the driver's cab LpA (according to standard prEN 12053 : 1995)	dB
- Level of sound power in the LwA environment (according to directive 2000/14 CE guaranteed)	dB
- Speed of movement of lift truck in standard configuration on horizontal ground	
. Forward unladen	12.4 km/h (7.7 mph)
. Reverse unladen	12.4 km/h (7.7 mph)
- Standard lift height	3000 mm (118 in)
- Rated capacity with standard attachment	2000 kg (4500 lb)
- Load center	24 in
- Weight of forks (each)	55 kg (121 lb)
- Lifting motions (Telescopes retracted)	
. Unladen lifting	6 s      24.7 m/min (81 ft/min)
. Rated load lifting	6.5 s     22.8 m/min (74.8 ft/min)
. Unladen lowering	4.5 s     32.9 m/min (107.9 ft/min)
. Rated load lowering	5.4 s     27.4 m/min (89.9 ft/min)
- Telescoping motions (Lifting boom)	
. Extending of telescope unladen	4.2 s     18.7 m/min (61.3 ft/min)
. Extending of telescope laden	4.6 s     17.1 m/min (56 ft/min)
. Retracting of telescope unladen	6.3 s     12.5 m/min (41 ft/min)
. Retracting of telescope laden	5.9 s     13.3 m/min (43.6 ft/min)
- Reverse tilt time unladen	8.1 s     13.8 °/s
- Forward tilt time unladen	3 s       37.3 °/s
- Lift truck weight with standard attachment	
. Unladen	2812 kg (6200 lb)
. Rated load	5307 kg (11700 lb)
- Axle weight with standard attachment (Transport position)	
. Front unladen	1192 kg (2630 lb)
rated load	
. Rear unladen	1619 kg (3570 lb)
rated load	
- Drawbar pull	
. Rated load	

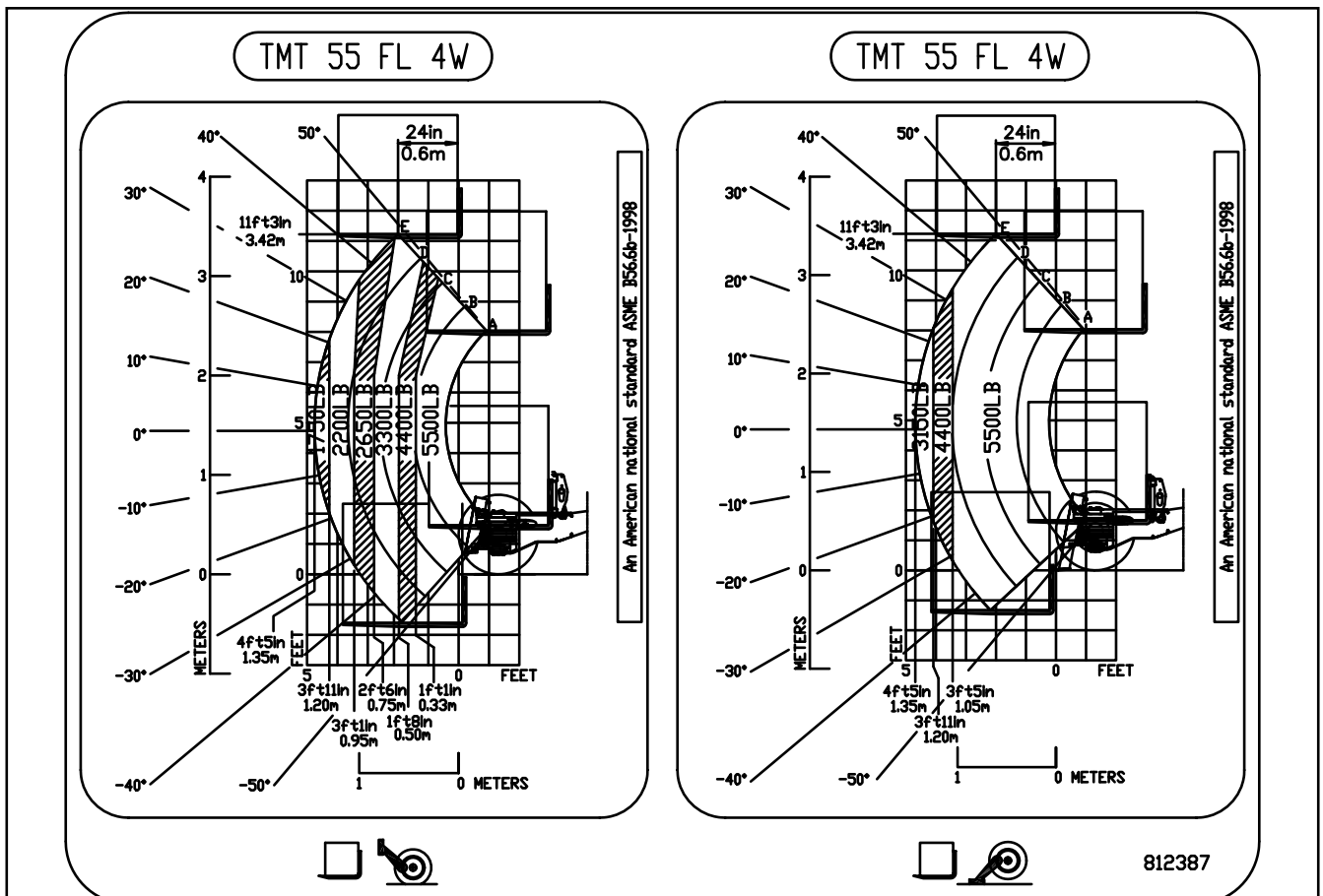


TMT 55/XT-4W			
<b>A</b>	1220 mm (48 in)	<b>M1</b>	530.86 mm (20.9 in)
<b>B</b>	1651 mm (65 in)	<b>N</b>	1879.6 mm (74 in)
<b>B1</b>	300 mm (11.8 in)	<b>O</b>	101.6 mm (4 in)
<b>C</b>	45.72 mm (1.8 in)	<b>P2</b>	132.08mm(5.2 in)
<b>C1</b>	840.74 mm (33.1 in)	<b>R</b>	1983.74 mm (78.1 in)
<b>C2</b>	441.96 mm (17.4 in)	<b>R1</b>	2313.94 mm (91.1 in)
<b>D</b>	1661.16 mm (65.4 in)	<b>S</b>	3477.26 mm (136.9 in)
<b>D1</b>	1600 mm(63 in)	<b>S1</b>	2760.98 mm (108.7 in)
<b>D2</b>	1490.98 mm (58.7 in)	<b>T</b>	2989.58 mm (117.7 in)
<b>E</b>	3345.18 mm(131.7 in)	<b>T1</b>	2763.52mm(108.8 in)
<b>E1</b>	2860.04 mm(112.6 in)	<b>U</b>	2413 mm (95 in)
<b>E2</b>	2494.28 mm (98.2 in)	<b>U1</b>	906.78 mm (35.7 in)
<b>E3</b>	2791.46 mm(109.9 in)	<b>U2</b>	1955.8mm (77 in)
<b>F</b>	1882.14 mm (74.1 in)	<b>V</b>	2715.26 mm (106.9 in)
<b>G</b>	309.88 mm (12.2 in)	<b>V1</b>	406.4 mm (16 in)
<b>H</b>	12.7 mm (0.5 in)	<b>V2</b>	2141.22 mm (84.3 in)
<b>I</b>	3507.74 mm(138.1 in)	<b>V3</b>	2763.52 mm (108.8 in)
<b>J</b>	633.12 mm (32.8 in)	<b>V4</b>	2466.34mm(97.1 in)
<b>K</b>	1270 mm (50 in)	<b>W</b>	2560.32 mm (100.8 in)
<b>K2</b>	1607.82mm (63.3 in)	<b>Y</b>	98 °
<b>K3</b>	152.4 mm (6 in)	<b>Y1</b>	3.7 °
<b>L</b>	40.64 mm (1.6 in)	<b>Z</b>	14 °
<b>M</b>	400 mm (15.7 in)	<b>Z1</b>	108.3 °

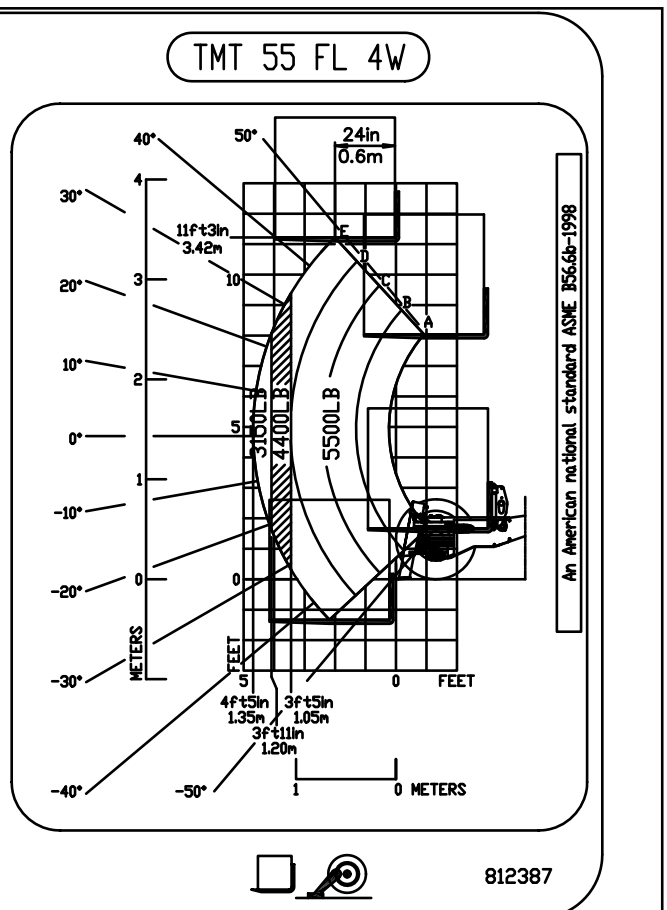
CAPACITY WITH  
STANDARD FRONT TIRES IN LATERAL POSITION  
10 x 16.5 TIRES



CAPACITY WITH STABILIZERS RAISED

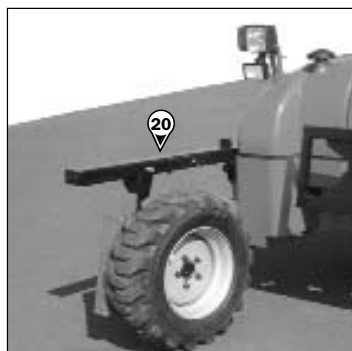
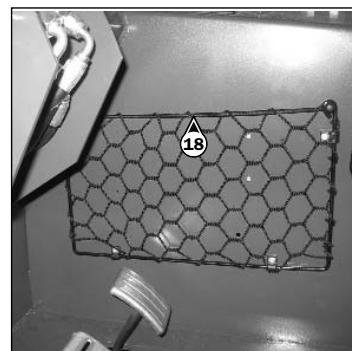
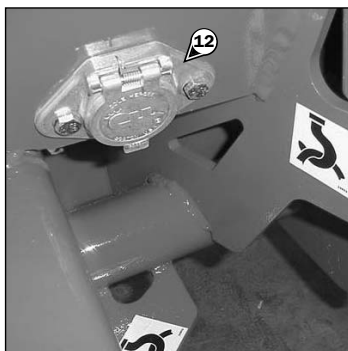


CAPACITY WITH STABILIZERS LOWERED





## INSTRUMENTS AND CONTROLS

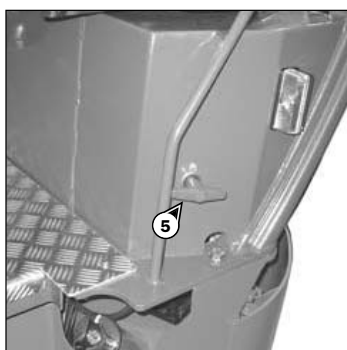
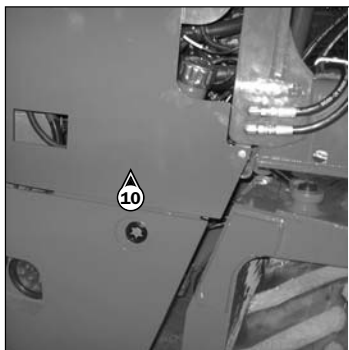


## ***DESCRIPTION***

---

- 1 - DRIVER'S SEAT**
- 2 - SAFETY BELT**
- 3 - SIGNAL LIGHTS PANEL**
- 4 - FUEL LEVEL AND HOURMETER**
- 5 - BATTERY CUT-OFF**
- 6 - SWITCH PANEL**
- 7 - DIFFERENTIAL LOCK PEDAL**
- 8 - IGNITION SWITCH**
- 9 - SOUND ALARM SWITCH (HORN)**
- 10 - PLATE: ACCESS TO TANKS**
- 11 - FUSE AND RELAY**
- 12 - SOCKET FOR TRUCK TRAILER LIGHTING**
- 13 - ACCELERATOR PEDAL**
- 14 - SERVICE BRAKE PEDAL AND TRANSMISSION CUT-OFF**
- 15 - FORWARD/REVERSE SWITCH**
- 16 - HYDRAULIC CONTROL DISTRIBUTOR LEVERS**
- 17 - REAR LIGHTS**
- 18 - DOCUMENT HOLDER**
- 19 - LOAD CHARTS FILE**
- 20 - REMOVABLE LOAD CARRIER**

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.

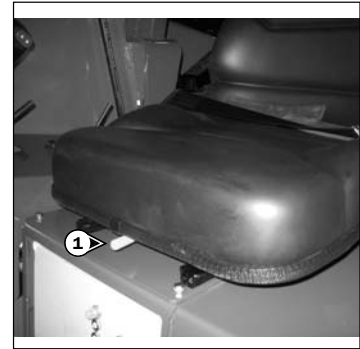


## 1 - DRIVER'S SEAT

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

### LONGITUDINAL ADJUSTMENT

- Pull locking lever 1 towards the right.
- Slide the seat to the required position.
- Release the lever and be sure it returns to the lock position.



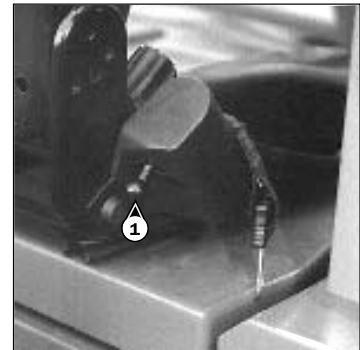
## 2 - SAFETY BELT

- Sit correctly on the seat.
- Operate the lever 1 to wind or unwind the safety belt.
- 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.



### WARNING

*Do not operate the lift truck with a defective seat belt (fixing, locking, cuts, tears, etc.). Repair or replace the seat belt immediately.*



## 3 - SIGNAL LAMP PANEL

- When activating the ignition on the lift truck, all the panel lamps must light to indicate their good working order. If one of the panel lamps is not working, carry out the necessary repairs.

### A - RED ENGINE OIL PRESSURE LAMP

If the lamp comes on when the lift truck is running, stop the engine immediately and look for the cause (See oil level in engine crankcase).

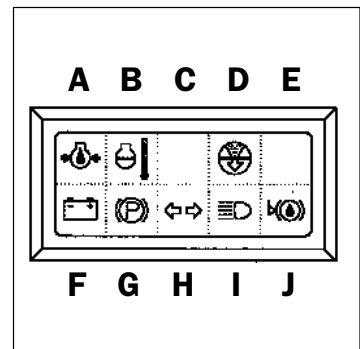
### B - RED WATER TEMPERATURE LAMP

If the warning lamp lights while operating the lift truck, immediately stop the engine and look for the origin of the failure in the cooling circuit.

### C - RED HYDROSTATIC TRANSMISSION OIL FILTER CLOG LAMP

The warning lamp lights when the oil filter cartridge is clogged or damaged. Park the lift truck and carry out the necessary repairs (See cleaning and changing schedules in the chapter : FILTERS CARTRIDGES AND BELTS).

Note : This lamp may light in cold weather when starting the truck ; it should go out when the hydraulic oil reaches its working temperature.



#### **D - RED AIR FILTER CLOG LAMP**

The warning lamp lights when the air filter cartridge is clogged. Stop the lift truck and carry out the necessary repairs (See cleaning and changing schedules in the chapter: 3 - MAINTENANCE: FILTERS CARTRIDGES AND BELTS).

#### **E - NOT USED**

#### **F - RED ALTERNATOR CHARGE LAMP**

If the warning lamp lights while operating the lift truck, immediately stop the engine and check the electrical circuit as well as the alternator belt.

#### **G - RED PARKING BRAKE LAMP**

This lamp comes on when the parking brake is applied.

#### **H - GREEN INDICATOR LAMP (OPTIONAL ROAD LIGHTS)**

#### **I - BLUE MAIN BEAM LAMP (OPTIONAL ROAD LIGHTS)**

#### **J - RED PREHEATING LAMP**

The warning lamp lights when the operator turns the ignition key in preheating position and goes out when the operator turns the key in engine starting position.

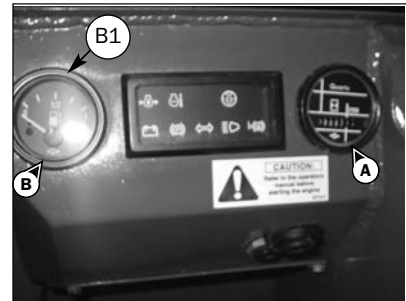
### **4 - FUEL LEVEL GAUGE AND HOURMETER**

#### **A - HOURMETER**

It shows the number of hours the lift truck has run.

#### **B - FUEL LEVEL GAUGE**

Red zone B1 indicates that you are using the reserve supply and that time of use is limited.

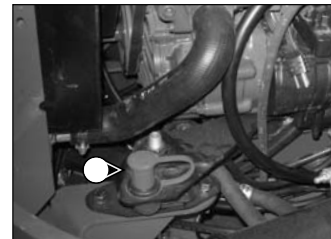
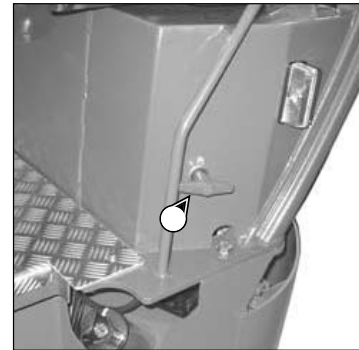


### **5 - BATTERY CUT-OFF**

Enables the battery to be rapidly cut off from the electric circuit in the event of a short circuit or a fire.

#### **BATTERY JUMPER CONNECTION**

Located in the motor compartment.



### **6 - SWITCH PANEL**

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

#### **A - PARKING BRAKE SWITCH**

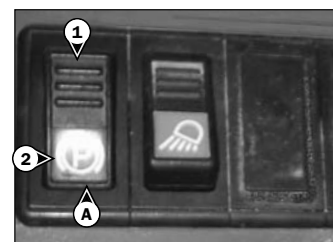
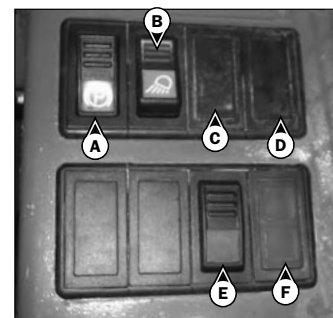
To engage the parking brake, push the switch lock (1) down while pressing the bottom of the brake switch (2). A signal light indicates its usage. To disconnect the parking brake, press the top of the switch.

#### **B - FRONT WHITE WORKING LIGHT (OPTION)**

#### **C - FLASHING LIGHT (OPTION)**

#### **D - WARNING LIGHTS (OPTION)**

This switch enables the L.H. and R.H. Indicators to be switched on simultaneously, with the ignition off. The signal light indicates that the switch is being used.



## E - STEERING MODE

The three-position switch E selects the desired steering mode.

### \* SIDEWAYS STEERING MODE

- Hold down E1: Sideways steering mode is achieved in a few seconds. Continue to hold the switch in position E1 until indicator light F1 illuminates. The operator can then release the switch. The switch returns to its initial position (E3).

### \* FORWARDS STEERING MODE

- Hold down E2: Forwards steering mode is achieved in a few seconds. Continue to hold the switch in position E2 until indicator light F2 illuminates. The operator can then release the switch. The switch returns to its initial position (E3).

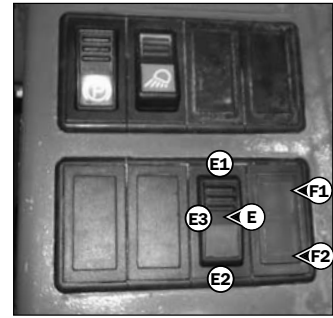
NOTE: When switching to sideways steering mode, you need not align the front wheels; instead, perform the procedure described (until indicator light F2 illuminates).

The steering mode can only be changed if the Forward/Reverse Lever is in Neutral and the stabilizers are fully retracted.

If the mode changing cycle is not performed correctly, the steering system's operation becomes inconsistent. You must return to the initial steering mode and repeat the procedure (the wheel movements must have been fully completed).

## F - STEERING MODE GREEN INDICATORS LIGHTS

These green lights illuminate to indicate the steering mode selected via switch E. F1 is the indicator for the sideways steering mode and F2 for the forwards steering mode.



## 7 - DIFFERENTIAL LOCK PEDAL

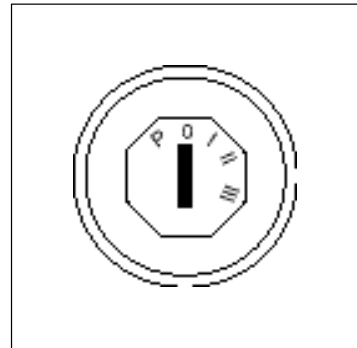
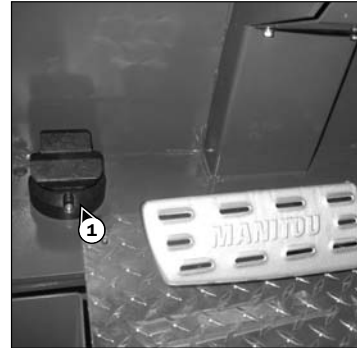
The differential lock allows the main wheels to turn at the same speed whatever the ground condition. In order to engage it, fully press the pedal.

- Maintain this position during the time required for locking. To interrupt its use, simply remove the foot from the top of the pedal which returns to its initial position automatically.



### WARNING

While the differential lock is engaged, steer the lift truck in a straight line, driving slowly.



## 8 - IGNITION SWITCH

The key switch has five positions :

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

## 9 - SOUND ALARM SWITCH (HORN)

Pressing the switch sounds the horn.



## 10 - PLATE : ACCESS TO TANKS



## 11 - FUSE AND RELAY

Unscrew the four plastic screws 1 and remove the protective cover on the fuses 2.  
Remove the plastic cover to access the fuses F1 to F11.

### FUSES

NOTE: Replace a used fuse with a new fuse of the same quality and capacity. Never reuse a repaired fuse.

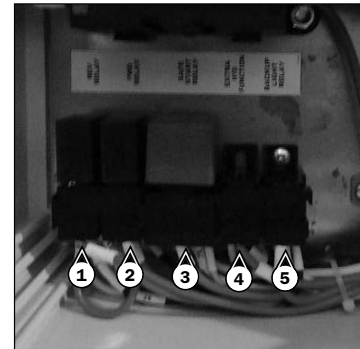
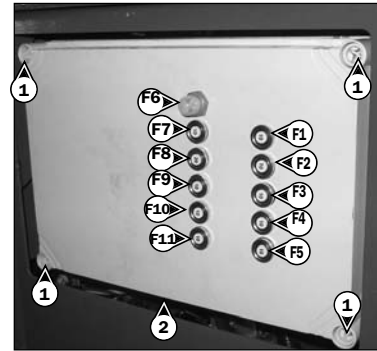
- F1 - (10A MAXI) - Gauges.
- F2 - (10A MAXI) - Park Brake Switch
- F3 - (10A MAXI) - Brake Switch
- F4 - (10A MAXI) - Forward/Reverse Switch
- F5 - (10A MAXI) - Fuel Pump Switch
- F6 - (10A MAXI) - Fuel Sender Switch
- F7 - (10A MAXI) - OPTIONAL Backup Light
- F8 - (30A MAXI) - Preheat Relay
- F9 - (10A MAXI) - Rotating Beacon
- F10 - (10A MAXI) - Extra Hydraulic Function
- F11 - (10A MAXI) - Extra Hydraulic Function 4 way Option

### RELAYS

- 1 - W - Reverse gear relay.
- 2 - W - Forward gear relay.
- 3 - V1 - Safe Start relay
- 4 - U - Extra Hydraulic Function
- 5 - U1 - Backup Light relay

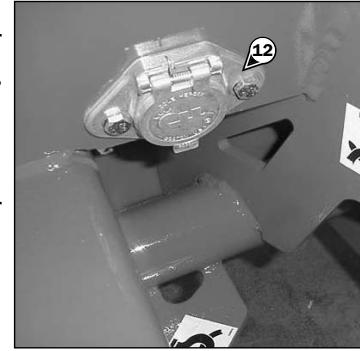
### OPTIONAL RELAYS

- 6 - S - Preheat relay
- 7 - S1 - Backup Alarm Cutout
- 8 - S2 - Work Lights in Lateral Mode



## **12 - SOCKET FOR TRUCK TRAILER LIGHTING**

This socket to be connected while transporting the lift truck on the back of the trailer, providing trailer lights.



## **13 - ACCELERATOR PEDAL**

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

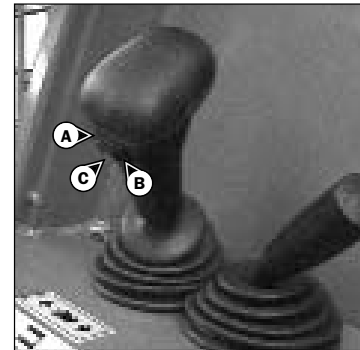
The pedal acts on the front and rear wheels by means of a hydraulic brake system enabling the slowing down or stopping the forklift truck. During clearance travel it enables the transmission to be cut off progressively thus allowing a gradual approach (delicate handling), and full I.C. engine power. By pushing down harder on the fully depressed pedal, the braking system is activated to bring the lift truck to a complete stop.

## **15 - FORWARD/REVERSE SWITCH**

FORWARD: Push the switch forward (position A).  
REVERSE: Push the switch backwards (position B).  
NEUTRAL: The switch must be in the neutral 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: OPTION: The reverse lights and the backup alarm in reverse motion indicate that the lift truck is running in reverse gear.



### **SAFETY FOR MOVING THE LIFT TRUCK**

Authorization 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 park the lift truck, he must observe the following sequence:

- 1 - set the reversing gear in neutral,
- 2 - engage the parking brake,
- 3 - get out of the lift truck.

If these sequences are not observed (e.g.: leaving the driver's seat without setting the parking brake), a buzzer sounds. You must then return the reversing gear to the neutral position and repeat the sequence.

### **IN SIDEWAYS STEERING MODE**

MOVEMENT TO THE RIGHT: Push the switch forward (position A).  
MOVEMENT TO THE LEFT: Push the switch backwards (position B).  
NEUTRAL: The switch must be in the neutral position to start the lift truck (position C).

## 16 - HYDRAULIC CONTROL DISTRIBUTOR LEVERS



### WARNING

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 VOID THE WARRANTY.



### WARNING

Use the hydraulic controls carefully without sudden movements, to avoid accidents caused by shaking the lift truck.

### LIFTING OF THE LOAD

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

### TELESCOPING

- The lever A to the left for retracting.
- The lever A to the right for extending.

### TILTING

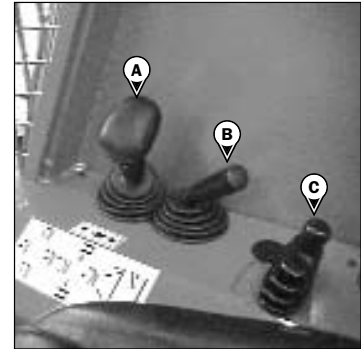
- The lever B backwards when reverse tilt.
- The lever B forwards when forward tilt.

### SIDESHIFT

- The lever B to the left for lateral shifting to the left.
- The lever B to the right for lateral shifting to the right.

### STABILIZERS

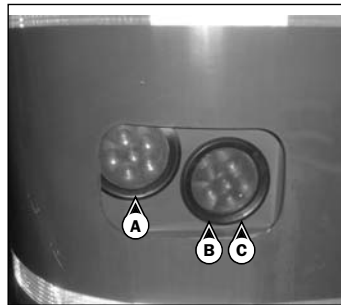
- The lever C backwards when lifting.
- The lever C forwards when lowering.



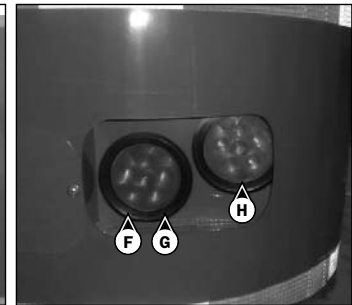
## 17 - REAR LIGHTS MOUNTED ON TRUCK OR TRAILER

Operates only in transport position at the back of the truck or trailer.

- A - Left rear indicator.
- B - Left rear stoplight.
- C - Left tail light.

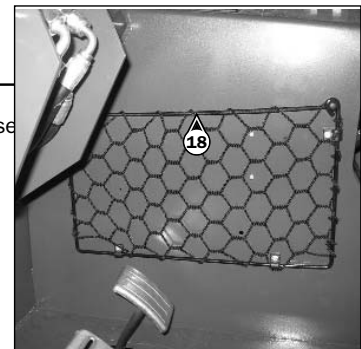


- F - Right tail light.
- G - Right rear stoplight.
- H - Right rear indicator.



## 18 - DOCUMENT HOLDER

Ensure that the operator's manual is in its place in the document holder, under the driver's seat.



## 19 - LOAD CHART FILE

The load chart shows the capabilities of the lift truck.





## 20 - LOAD CARRIERS

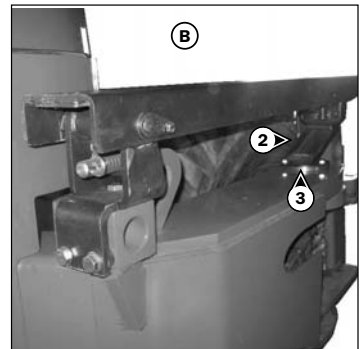
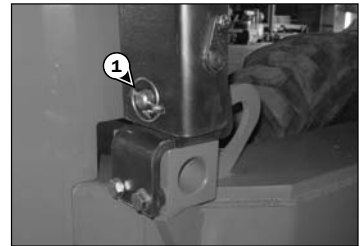
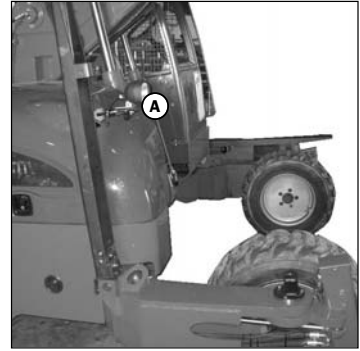
The load carriers help secure capacity loads and help increase stability while the forklift truck is being operated.



### WARNING

*To load the forklift truck onto the rear of the truck or the trailer, the load carriers must be locked in vertical position (position A).*

To set the load carriers horizontal (position B), remove the lock pin 1 to lower the load carrier, let it sit on the support 2 in front of the stop 3 on the wheel arm.





# ***3 - MAINTENANCE***



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<b>F - EVERY 2000 HOURS SERVICE</b>	<b>3 - 24</b>
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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,***

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#### **YOU BENEFIT EXPERTISE**

#### **THROUGH ITS NETWORK, MANITOU PROVIDES THE USER WITH**

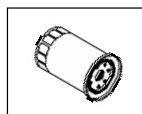
- Know-how and competence.
- The guarantee of high-quality work.
- Original replacement components.
- Help with preventive maintenance.
- Efficient help with diagnosis.
- Improvements due to experience feedback.
- Operator training.
- Only the MANITOU network has detailed knowledge of the design of the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

**ORIGINAL REPLACEMENT PARTS ARE DISTRIBUTED EXCLUSIVELY BY MANITOU AND ITS DEALER NETWORK.**

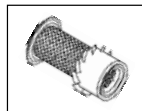
The dealer network list is available on MANITOU web site [www.manitou.com](http://www.manitou.com)

## ***FILTERS CARTRIDGES AND BELTS***

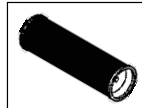
### **I.C. ENGINE**



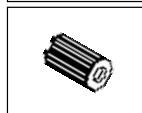
I.C. ENGINE OIL FILTER  
Part number : 749613  
Change : 500 H



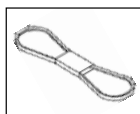
DRY AIR FILTER CARTRIDGE  
Part number: 227959  
Clean: 50 H\*  
Change: 500 H\*



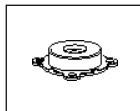
SAFETY DRY AIR FILTER CARTRIDGE  
Part number : 227960  
Change : 1000 H\*



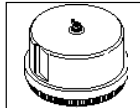
FUEL FILTER CARTRIDGE  
Part number: 748087  
Change: 500 H



ALTERNATOR BELT  
Part number : 749605  
Change : 1000 H



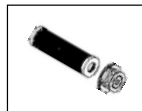
INTERNAL COMBUSTION ENGINE'S SNIFFLER  
Part number: 703289  
Change: 2000 H



AUTOMATIC VACUUM-CLEANING PRE-FILTER  
(OPTION)  
Part number : 240334

\* : This schedule for reference only, see : 3 - MAINTENANCE : SERVICING SCHEDULE for cleaning and changing.

### **HYDRAULICS**



SUCTION OIL AND HYDRAULIC RETURN FILTER  
CARTRIDGE  
Part number : 686237  
Change : 500 H



SUCTION STRAINER FOR HYDRAULIC OIL TANK  
Part number : 721939  
Clean : 1000 H



FILTER CAP FOR HYDRAULIC OIL TANK  
Part number : 62415  
Change : 1000 H



## LUBRICANTS AND FUEL

**IMPORTANT** USE ONLY THE RECOMMENDED LUBRICANTS AND FUEL : - For topping up, lubricants may not be mixed.

### DIAGNOSTIC ANALYSIS OF OILS

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

### (\*) FUEL CHARACTERISTICS

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

#### CHARACTERISTICS OF RECOMMENDED FUEL :

- ASTM D975 (SAE J313 JUN87)
- CETANE NUMBER : 45 minimum.
- VISCOSITY : 1,9 - 4,1 Centistokes at 40°C
- Sulphur : 0,5% of weight, maximum

### I.C. ENGINE

COMPONENT	CAPACITY	RECOMMENDATION		
I.C. ENGINE	10.9 Liters (2.8 gal)	Shell: Rotella 15w40 Citgo: C-600 15w40		
COOLING CIRCUIT	8 Liters (2.1 gal)	Tulco 50/50 pre-mix		
FUEL TANK	31 Liters	(8.2 gal) Diesel fuel (*)		

### BOOM

COMPONENT	RECOMMENDATION		
BOOM PADS	Shell: Rentinax Am Citgo: Lithoplex CM-2		
GREASING OF THE BOOM	Shell: Rentinax Am Citgo: Lithoplex CM-2		

### HYDRAULICS

COMPONENT	CAPACITY	RECOMMENDATION		
HYDRAULIC OIL TANK	45 Liters (11.9 gal)	Shell: Tellus T46 Citgo: Transguard THF Lo-temp Shell: Tellus T32 (-2°F to +124°F)		

### REAR AXLES

COMPONENT	RECOMMENDATION		
STEERING PIVOT	Shell: Rentinax Am Citgo: Lithoplex CM-2		
STEERING CYLINDER	Shell: Rentinax Am Citgo: Lithoplex CM-2		

### FRONT STEERING

COMPONENT	RECOMMENDATION		
STEERING PIVOT	Shell: Rentinax Am Citgo: Lithoplex CM-2		
STEERING CYLINDER	Shell: Rentinax Am Citgo: Lithoplex CM-2		

# SERVICING SCHEDULE

<b>A = ADJUST</b>	<b>N = CLEAN</b>
<b>C = CHECK</b>	<b>R = CHANGE</b>
<b>D = DESCALE</b>	<b>V = DRAIN/CHANGE</b>
<b>G = GREASE</b>	

After the first 50 hours	Day or 10 hours	50 hours	6 month or 250 hours	1 year or 500 hours	1 year or 1000 hours	2000 hours	4000 hours
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## I.C. ENGINE

I.C. engine oil level	C	<<	<<	<<	<<	<<	<<
Cooling liquid level	C	<<	<<	<<	<<	<<	<<
Fuel level	C	<<	<<	<<	<<	<<	<<
Dry air filter cartridge		N	<<	R	<<	<<	<<
Dry air filter valve	N	<<	<<	<<	<<	<<	<<
Radiator core		N	<<	<<	<<	<<	<<
Alternator/crankshaft belt tension			C/A	<<	<<	<<	<<
I.C. engine oil				V	<<	<<	<<
I.C. engine oil filter				R	<<	<<	<<
Fuel filter cartridge				R	<<	<<	<<
Fuel tank					N	<<	<<
Safety dry air filter cartridge					R	<<	<<
Alternator belt					R	<<	<<
I.C. engine silent blocks					C**	<<	<<
I.C. engine rates					C**	<<	<<
Valves clearances					C**	<<	<<
Cooling liquid						V	<<
Coolant concentration			C	<<	<<	<<	<<
Internal combustion engine's sniffer						R	<<
Radiator						N/D**	<<
Water pump and the thermostat						C**	<<
Alternator and the starter motor						C**	<<
Bleed the fuel supply circuit							

## TRANSMISSION

Hydrostatic transmission circuit pressures						C**	<<
Governing start of the hydrostatic transmission						C**	<<
Working order of the transmission cut-off hydraulic valve						C**	<<

## TIRES

Tires pressure	C	<<	<<	<<	<<	<<	<<
Wheel nuts torque	C	<<	<<	<<	<<	<<	<<
Condition of wheels and tires					C**	<<	<<
Change a wheel							

## JIB

Jib pads		G*					
Jib		G	<<	<<	<<	<<	<<
Jib pads wear					C**	<<	<<
Condition of jib unit						C**	<<
Bearings and articulation rings						C**	<<

## HYDRAULICS

Hydraulic oil level		C	<<	<<	<<	<<	<<
Suction oil and hydraulic return filter cartridge	R			R	<<	<<	<<
Balancing valve	C			C	<<	<<	<<
Hydraulic oil					V	<<	<<
Suction strainer for hydraulic oil tank					N	<<	<<
Filter cap for hydraulic oil tank					R	<<	<<
Speeds of hydraulic movements					C**	<<	<<
Condition of hoses and flexibles pipes					C**	<<	<<
Condition of cylinders (leakage, shafts)					C**	<<	<<
Hydraulic circuit pressures						C**	<<
Hydraulic circuit outputs						C**	<<
Hydraulic oil tank						N**	<<

## BRAKE

Wear on the disc brakes on the front or rear wheel motors			C/A	<<	<<	<<	<<
---	--	--	-----	----	----	----	----

<b>A = AJUST</b>	<b>N = CLEAN</b>
<b>C = CHECK</b>	<b>R = CHANGE</b>
<b>D = DESCALE</b>	<b>V = DRAIN/CHANGE</b>
<b>G = GREASE</b>	

After the first 50 hours	Day or 10 hours	50 hours	6 month or 250 hours	1 year or 500 hours	1 year or 1000 hours	2000 hours	4000 hours
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#### CAB

Seat belt .....					<b>C</b>	◀◀	◀◀
Condition of the rear view mirrors .....					<b>C**</b>	◀◀	◀◀

#### ELECTRICITY

Battery electrolyte level .....		<b>C</b>	◀◀	◀◀	◀◀	◀◀	◀◀
Battery electrolyte density .....				<b>C</b>	◀◀	◀◀	◀◀
Condition of wiring harness and cables .....					<b>C**</b>	◀◀	◀◀
Lights and signals .....					<b>C**</b>	◀◀	◀◀
Warning indicators .....					<b>C**</b>	◀◀	◀◀
Adjust the front headlamps .....							

#### FRONT AXLE ASSEMBLY

Rear wheel steering pivot .....		<b>G</b>	◀◀	◀◀	◀◀	◀◀	<b>C**</b>
Rear wheel steering cylinder .....		<b>G</b>	◀◀	◀◀	◀◀	◀◀	<b>C**</b>
Steering .....						<b>C**</b>	◀◀
Steering speed restrictor .....				<b>C**</b>	◀◀	◀◀	◀◀

#### FRONT STEERING

Front wheel steering pivot .....		<b>G</b>	◀◀	◀◀	◀◀	◀◀	<b>C**</b>
Front wheel steering cylinder .....		<b>G</b>	◀◀	◀◀	◀◀	◀◀	<b>C**</b>

#### CHASSIS

Structure .....					<b>C**</b>	◀◀	◀◀
Bearings and articulation rings .....						<b>C**</b>	◀◀

#### ATTACHMENTS

Forks wear .....				<b>C**</b>	◀◀	◀◀	◀◀
Attachment carriage .....					<b>C**</b>	◀◀	◀◀
Condition of attachments .....					<b>C**</b>	◀◀	◀◀

#### LIFT TRUCK

Tow the lift truck .....							
Sling the lift truck .....							
Transport the lift truck on a platform .....							

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

(\*\*): Consult your dealer.

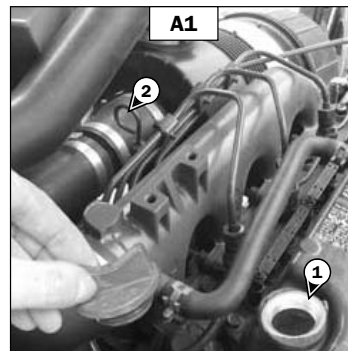
## A - DAILY OR EVERY 10 HOURS SERVICE

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

CHECK

Park the lift truck on level ground with the I.C. engine stopped, and allow the oil to settle.

- Open the I.C. engine cover.
- Remove the dipstick 1 (Fig. A1/1).
- Check that the oil level is between the two upper notches on dipstick.
- If necessary, add oil (see : 3 - MAINTENANCE : LUBRICANTS AND FUEL) by the filler port 2 (Fig. A1/2).

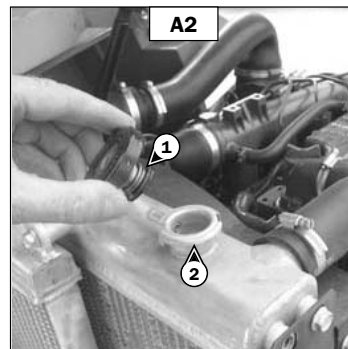


### A2 - COOLING LIQUID LEVEL

CHECK

Park 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 cover.
- Slowly turn the cap 1 of the radiator up to safety stop (fig. A2).
- allow the pressure and steam to escape
- Press down and turn the cap so as to release it
- If necessary, add coolant via the filling hole 2 (fig. A2) (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL).
- Lubricate slightly the filler neck in order to facilitate the setting & removal of the cap,
- Check visually that there is no leakage in the radiator and hoses.



#### WARNING

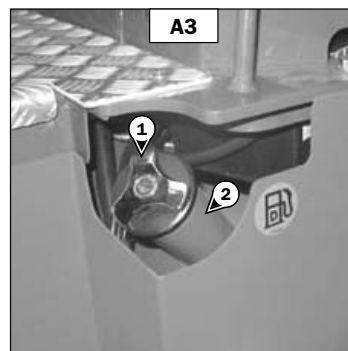
To avoid risk of boiling water or steam, wait until the I.C. engine has cooled before removing the filler plug. If the cooling liquid is hot, add only hot cooling liquid. In an emergency, you can use water as a cooling liquid, then change the cooling circuit liquid as soon as possible (see : 3 - MAINTENANCE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

### A3 - FUEL LEVEL

CHECK

Keep the fuel tank near full, to reduce condensation forming in the tank.

- 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.
- Check visually that there is no leakage from the tank and hoses.



#### WARNING

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

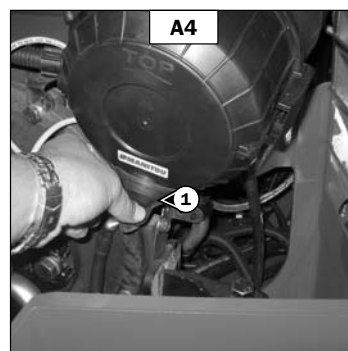
#### IMPORTANT

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

### A4 - DRY AIR FILTER VALVE

CLEAN

Pinch the valve 1 as shown in fig. A4 to empty any residue from inside the air filter.



## A5 - TIRE PRESSURE AND WHEEL NUT TORQUE

**CHECK**

- Check the condition of the tires, to detect cuts, wear, etc.
- Check the torque on the wheel nuts. Loose wheel nuts can damage and rupture the wheel bolts and distort the wheels.
  - Wheel nuts tightening torque
    - Front tires : 125 ft/lbs (170 Nm)
    - Rear tires : 125 ft/lbs (170 Nm)
- Check and adjust the tire pressures if necessary (see : 2 - DESCRIPTION : CHARACTERISTICS).



### **WARNING**

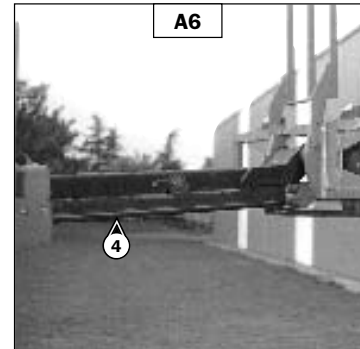
*Check that the air hose is correctly connected to the tire valve before inflating and keep all persons at a distance during inflation. Respect the recommended tire pressures given.*

## A6 - 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. A6).
- Telescope the boom several times in order to spread the coat of grease evenly.
- Remove the surplus grease.



### **IMPORTANT**

*If the lift truck is used in an abrasive environment (dust, sand, coal...) Use lubricating varnish, 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 schedule for inspecting and cleaning the cartridge must be increased.

#### IMPORTANT

*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 replaced.*

- For the disassembly and reassembly of the cartridge, see: 3 - MAINTENANCE: D1 - DRY AIR FILTER CARTRIDGE.
- Clean the filter cartridge using a compressed air jet (max. 30 psi) directed from the top to the bottom from the inside out at a minimum distance of 1.5 in. from the cartridge wall.
- Cleaning is completed when there is no more dust on the cartridge.

#### IMPORTANT

*Respect the safety distance of 1.5 in. 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.
- Check the outer condition of the air filter and its mounts. Inspect the condition of the intake hoses and clamps.

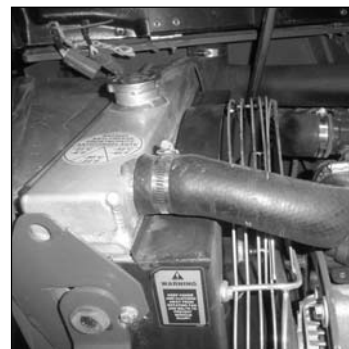
#### IMPORTANT

*Do not clean the dry air filter cartridge by washing it in liquid. Do not clean the safety cartridge located inside the filter cartridge, change it for a new one if it is dirty or damaged.*

### B2 - RADIATOR CORE

#### CLEAN

- Open the I.C. engine compartment.
- In order to prevent the radiator becoming clogged, clean the radiator with a compressed air jet directed from outside to inside. This is the only way to clean the core of debris.
- If necessary, clean the intake grill on the engine cover.



#### IMPORTANT

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

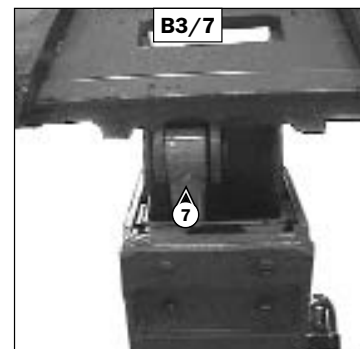
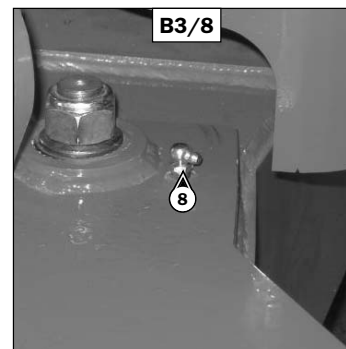
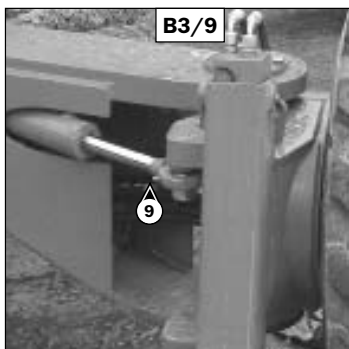
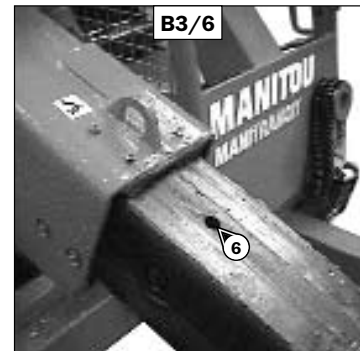
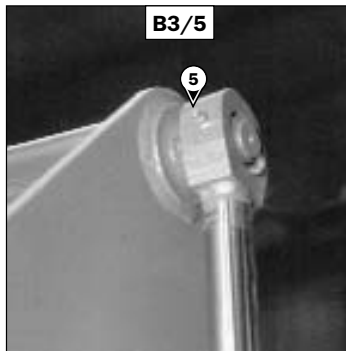
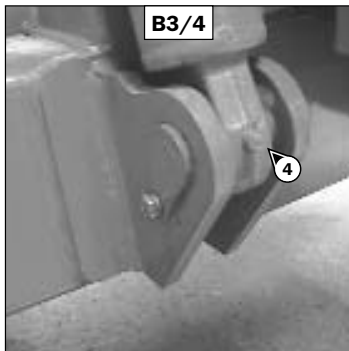
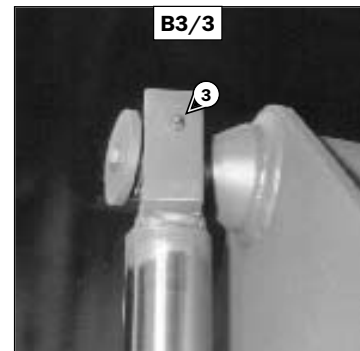
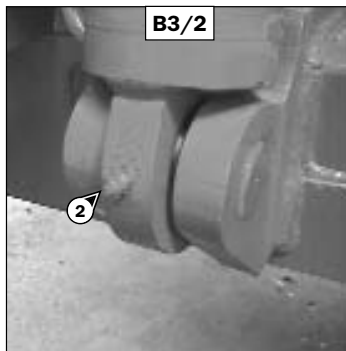
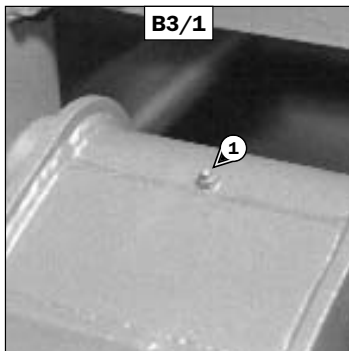
To be carried out weekly, if the lift truck has been operated for less than 50 hours during the week.

**IMPORTANT**

*In the event of prolonged use in an extremely dusty or oxidizing 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), remove the excess grease.

- 1 - Lubricator of the carriage axle (1 lubricator) (Fig. B3/1).
- 2 - Lubricator of the lifting cylinder foot axle (1 lubricator) (Fig. B3/2).
- 3 - Lubricator of the lifting cylinder head axle (1 lubricator) (Fig. B3/3).
- 4 - Lubricator of the compensation cylinder foot axle (1 lubricator) (Fig. B3/4).
- 5 - Lubricator of the compensation cylinder head axle (1 lubricator) (Fig. B3/5).
- 6 - Lubricator of the tilt cylinder foot axle (1 lubricator) (Fig. B3/6).
- 7 - Lubricator of the tilt cylinder head axle (1 lubricator) (Fig. B3/7).
- 8 - Lubricator of the steering cylinder head axle (1 lubricator) (Fig. B3/8).
- 9 - Lubricator of the steering cylinder foot axle (1 lubricator) (Fig. B3/9).

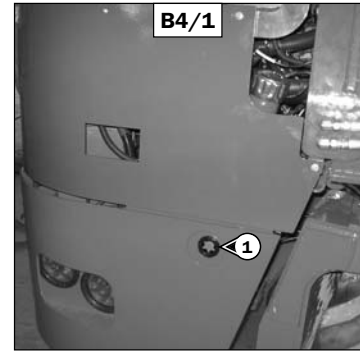


## **B4 - HYDRAULIC OIL LEVEL**

### **CHECK**

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

- Refer to oil level gauge 1 (fig. B4/1).
- 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. B4/2).
- Add oil by filler port 3 (fig. B4/2).

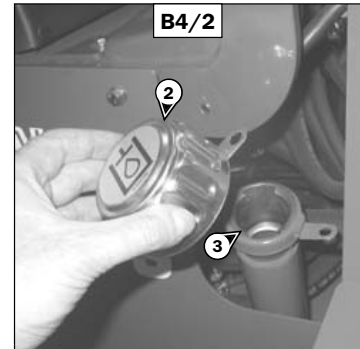


### **IMPORTANT**

*Use a clean funnel and clean the oil nozzle before filling.*

- Put the cap back.
- Check that there is no leakage from the tank or hoses.

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

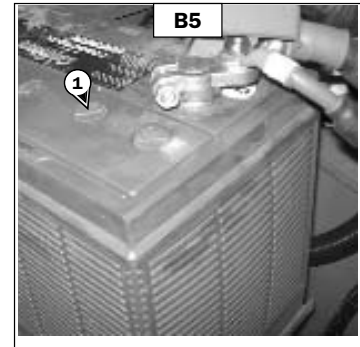


## **B5 - BATTERY ELECTROLYTE LEVEL**

### **CHECK**

Check the electrolyte level in each cell of the battery.  
If the lift truck is working in a high temperature environment, check the level more frequently.

- Open the I.C. engine cover.
- Remove caps 1 (Fig. B5) from each cell of the battery.
- The level is correct when it is 3/8 in. above the top of the plates in the battery.
- If necessary, top up the cells with clean distilled water that has been stored in a glass container. Clean and dry the caps 1 (Fig. B5) and re-install them.
- Check the terminal connections and lightly smear them with petroleum jelly to prevent the formation of corrosion.



**WARNING**

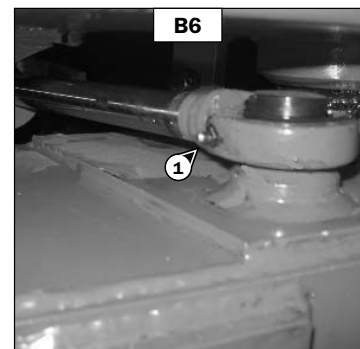
*Handling and servicing a battery can be dangerous, take the following precautions :*

- Wear protective goggles.
- Keep the battery horizontal.
- Never smoke or work near an open flame.
- Work in a well-ventilated area.
- In the event of electrolyte being spilled onto the skin or splashed in the eyes, rinse thoroughly with cold water for 15 minutes and call a doctor.

## **B6 - REAR WHEEL STEERING CYLINDER**

### **GREASE**

Clean and lubricate the point 1 (fig. B6) with grease (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL), remove any excess.

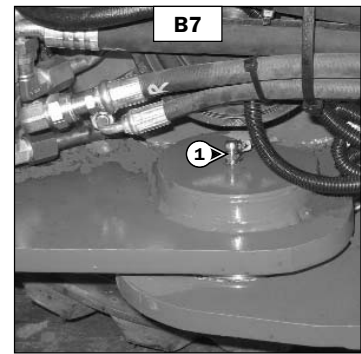




### ***B7 - FRONT WHEEL STEERING PIVOT***

#### ***GREASE***

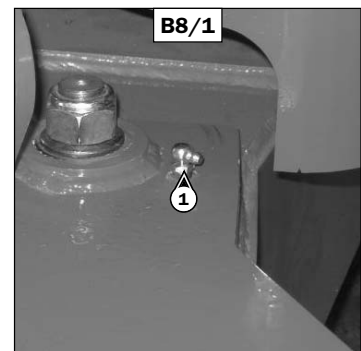
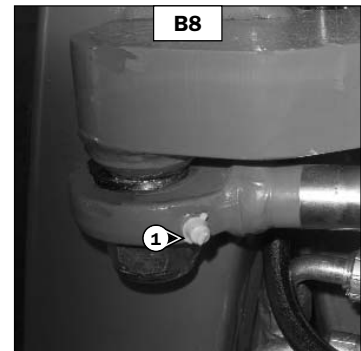
Clean and lubricate the points 1 (4 lubricators) (fig. B7) with grease (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL), remove any excess.



### ***B8 - FRONT WHEEL STEERING CYLINDER***

#### ***GREASE***

Clean and lubricate the points 1 (2 lubricators) (fig. B8 & B8/1) with grease (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL), remove any excess.



## C - EVERY 250 HOURS SERVICE

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

### C1 - ALTERNATOR/CRANKSHAFT BELT TENSION

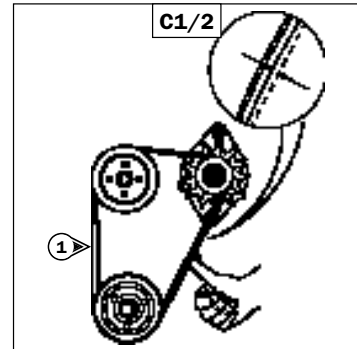
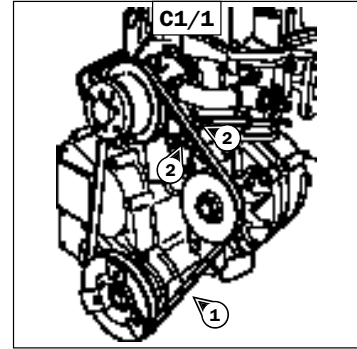
CHECK - ADJUST

Park 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 cover.
- Remove the protective guard.
- Check the belt 1 (fig. C1/1), 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 (fig. C1/2).
- Under a normal pressure exerted with the thumb (10 ft.lbs), the tension should be approximately 5/16 in. (fig. C1/2).
- Carry out adjustments if necessary.
- Loosen screws 2 (fig. C1/1) by two to three thread turns.
- Swivel the alternator assembly so as to obtain the belt tension required.
- Retighten screws 2 (fig. C1/1) (tightening torque 19ft/lbs).
- Install the protective guard.

#### IMPORTANT

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





## D - EVERY 500 HOURS SERVICE

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

### D1 - DRY AIR FILTER CARTRIDGE

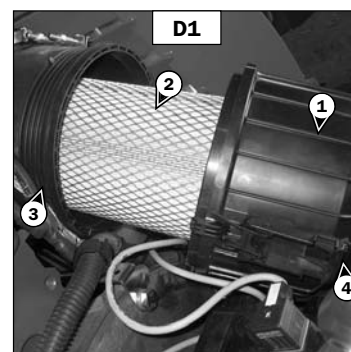
CHANGE

In a heavily dust laden atmosphere, use a pre-filtration cartridge, see: 3 - MAINTENANCE: FILTERS CARTRIDGES AND BELTS. Also, checking and cleaning the cartridge must be increased (to every 250 hours in a heavily laden dust atmosphere and with pre-filtration).

#### IMPORTANT

Change the cartridge in a clean location, with the I.C. engine stopped.  
Never run the I.C. engine with the air filter removed or damaged.

- Open the I.C. engine cover.
  - Loosen the bolts and remove cover 1 (fig. D1).
  - Gently remove the cartridge 2 (fig. D1), 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 hoses and connections between the air filter and the I.C. engine and the connection and state of the clogging indicator 3 (fig. D1) on the filter.
  - Before installing 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 place, pressing the edges and not the middle.
  - Reassemble the cover, keep the valve 4 (fig. D1) pointed down.



### D2 - I.C. ENGINE OIL

DRAIN

### D3 - I.C. ENGINE OIL FILTER

CHANGE

Park 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 cover.
- Place a receptacle under the drain hole 1 (fig. D2) and the filter 2 (fig. D3).
- Unscrew the drain plug 1 (fig D2).
- Remove filler cap 3 (fig. D2/1) to ensure that the oil is drained properly.

#### IMPORTANT

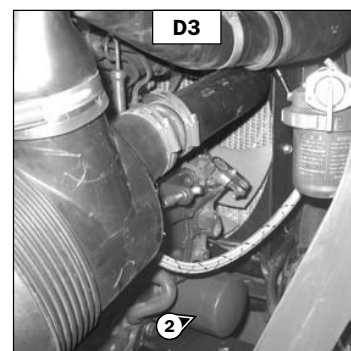
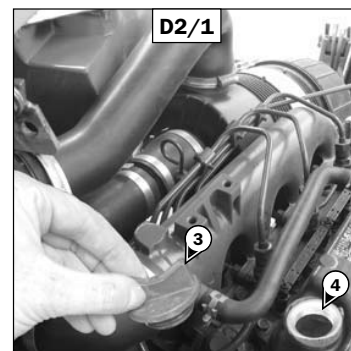
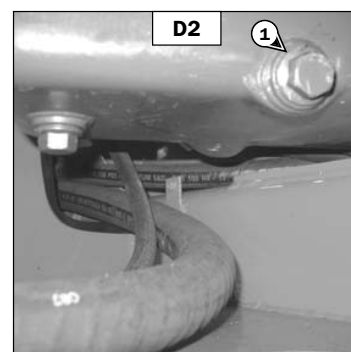
Dispose of the drain oil in an ecological manner.

#### REPLACEMENT OF THE FILTER

- Remove I.C. engine oil filter 2 (fig. D3) ; discard the filter and the filter seal.
- Clean the filter bracket with a clean, lint-free cloth.
- Fill the new oil filter (see: 3 - MAINTENANCE: FILTERS CARTRIDGES AND BELTS) with I.C. and lightly grease the seal.
- Install the oil filter on the filter bracket.

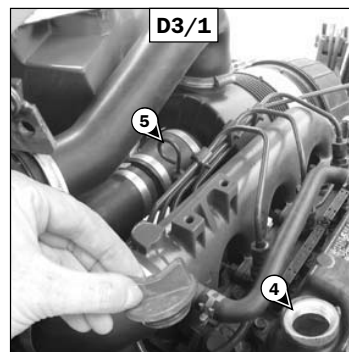
#### IMPORTANT

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



### FILLING UP THE OIL

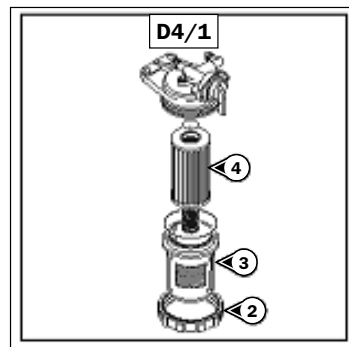
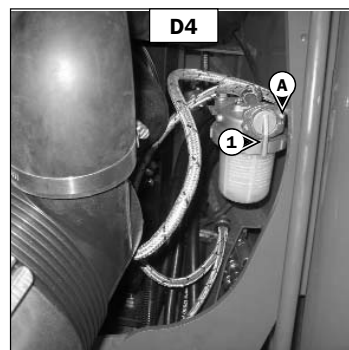
- Install and tighten drain plug 1 (fig. D2) (tightening torque 25 ft.lb.).
- Fill up with oil (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL) by filler port 4 (fig. D3/1).
- Wait a few minutes to allow the oil to settle.
- Start the I.C. engine and let it idle for a few minutes.
- Check for possible leaks at the drain plug and oil filter.
- Stop the I.C. engine, wait a few minutes and check the level between the two notches on the dipstick 5 (fig. D3/1).
- Top up the level if necessary.



### D4 - FUEL FILTER CARTRIDGE

CHANGE

- Open the I.C. engine cover.
- Carefully clean the outside of the filter and bracket. Prevent dirt from entering the system.
- Close valve 1 (fig. D4) by setting to position A.
- Unscrew the retaining ring 2, remove housing 3 and clean inside using a brush immerse in clean diesel oil.(fig. D4/1).
- Remove the filter cartridge 4 (fig. D4/1).
- Install a set of new seals and a new cartridge (see: 3 - MAINTENANCE: FILTERS CARTRIDGES AND BELTS).
- Start up the I.C. engine and check for leaks.
- If necessary, bleed the fuel circuit (see: 3 - MAINTENANCE: G1 - OCCASIONAL MAINTENANCE).



### D5 - SUCTION OIL AND HYDRAULIC RETURN FILTER CARTRIDGE

CHANGE

Place the lift truck on horizontal ground, Stop the I.C. engine and remove the pressure from the circuits by acting on the hydraulic controls.

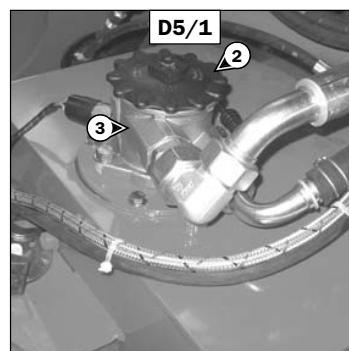
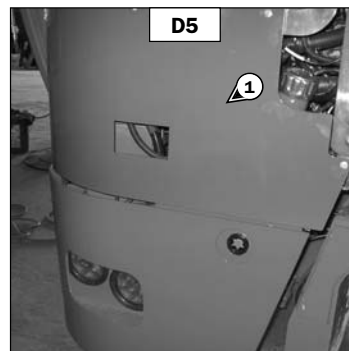
#### IMPORTANT

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

- Remove the rear plate 1 (fig D5).
- Remove the filter head cap 2 (fig. D5/1) with a wrench.
- Remove the hydraulic return oil filter cartridge 3 (fig. D5/1) and replace it with a new one (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL).
- Make sure that the cartridge is installed correctly.
- Refit the filter head cap 2 (fig. D5/1) and lock it in place with a wrench.

#### IMPORTANT

*Do not operate the lift truck without the oil filter cartridge, doing so would immediately damage the transmission hydraulic circuit, the hydrostatic wheel motors and pump.*




## D6 - BALANCING VALVE

CHECK

To be performed after the first 50 hours of operation and then every 400 hours.  
Park the truck on level ground, engage the parking brake and shift the truck into neutral.

### ROLE OF BALANCING VALVES

- The balancing valves protect the user from any risk due to a fall in hydraulic pressure or an exploding hose during hydraulic operations.

	<b>WARNING</b>	<i>Keep everyone well away during these inspections. In all cases, the balancing valve(s) concerned must be repaired or replaced if hydraulic movement continues after the I.C. engine has been switched off. Never use the lift truck with a defective balancing valve.</i>
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### TESTING EACH HYDRAULIC MOVEMENT

#### LIFTING CIRCUIT:

- Start up the lift truck and raise the boom by about 45°.
- With the I.C. engine running at mid- speed, lower the boom. While the boom is being lowered, switch off the I.C. engine; movement should slow down as the I.C. engine speed falls and stop when the I.C. engine stops.

#### TELESCOPING CIRCUIT:

- Start up the lift truck and raise the boom as far as it will go, extending the telescope(s) completely.
- With the I.C. engine running at mid- speed, retract the telescope(s). When retracting the boom, switch off the I.C. engine; movement should slow down as the I.C. engine speed falls and stop when the I.C. engine stops.

#### TILT CIRCUIT:

- Place the nominal load on the forks, anchor it correctly to prevent it from falling off during the test.
- Start up the lift truck and tilt the carriage backwards, lifting the boom sufficiently to allow the carriage to tilt.
- With the I.C. engine running at mid-speed, tilt the carriage forwards. While it is tilting, switch off the I.C. engine; movement should slow down as the I.C. engine speed falls and stop when the I.C. engine stops.

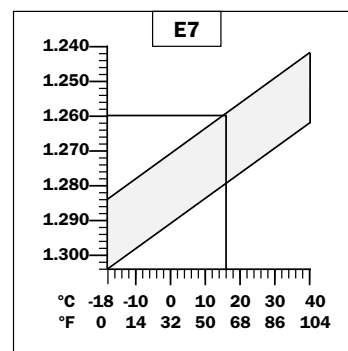
## D7 - BATTERY ELECTROLYTE DENSITY


CHECK

The electrolyte density varies depending on the temperature concerned, but a minimum of 1.260 at 60°F must be maintained. In the shaded area (fig. D9), the battery is in a normal charge condition. Readings above this zone indicate that the battery needs to be recharged.

The density should not vary more than 0.025 units between cells.

- Check the electrolyte density in each battery cell using a hydrometer.
- Do not carry out this check immediately after topping up with distilled water. Recharge the battery for at least an hour before checking the battery electrolyte density.



	<b>WARNING</b>	<i>Handling and servicing a battery can be dangerous, take the following precautions :</i> <ul style="list-style-type: none"><li>- Wear protective goggles.</li><li>- Keep the battery horizontal.</li><li>- Never smoke or work near an open flame.</li><li>- Work in a well-ventilated area.</li><li>- In the event of electrolyte being spilled onto the skin or splashed in the eyes, rinse thoroughly with cold water for 15 minutes and call a doctor.</li></ul>
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## E - EVERY 1000 HOURS SERVICE

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

### E1 - FUEL TANK

**CLEAN**



#### WARNING

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

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

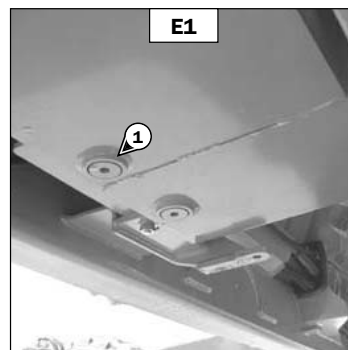
- Inspect the parts susceptible to leaks in the fuel circuit and tank.
- In the event of a leak, contact your dealer.



#### WARNING

Never perform welding on the fuel system, this could cause an explosion or a fire.

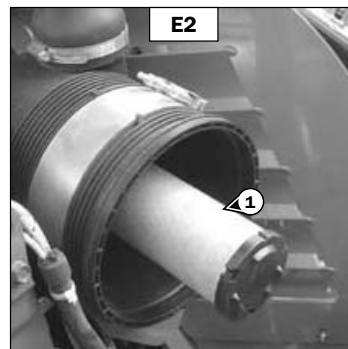
- Place a container under drain plug 1 (fig. E1) and unscrew the plug.
- Remove cap 2 (fig. E1/1) to ensure that the oil is drained properly.
- Rinse out with 2.7 gal (10 liter) of clean diesel through filler port 3 (E1)
- Install and tighten drain plug 1 (tightening torque 26 ft/lb).
- Fill the fuel tank with clean fuel (see : 3 - MAINTENANCE : LUBRICANTS AND FUEL) filtered through a strainer or a clean, lint-free cloth and install the filler plug 2 (fig. E1/1).
- If necessary, bleed the system (see : 3 - MAINTENANCE : G1 - BLEED THE FUEL SYSTEM).



### E2 - SAFETY DRY AIR FILTER CARTRIDGE

**CHANGE**

- For the disassembly and reassembly of the cartridge, see : 3 - MAINTENANCE : D1 - DRY AIR FILTER CARTRIDGE.
- Unscrew the nut (Fig. E2), if equipped.
- Gently remove the dry air filter safety cartridge 1 (Fig. F2), avoid spilling the dust.
- Clean the gasket surface on the new filter with a damp, clean lint-free cloth.
- Before installing check the condition of the new safety cartridge (see : 3 - MAINTENANCE : FILTERS CARTRIDGES AND BELTS).
- Introduce the cartridge into the filter canister and push it in, pressing the edges and not the middle.
- Install the washer and the nut 1, if equipped.



NOTE: The period for changing the safety cartridge is given for ref. only. The safety cartridge must be changed for every two changes of the air filter cartridge.

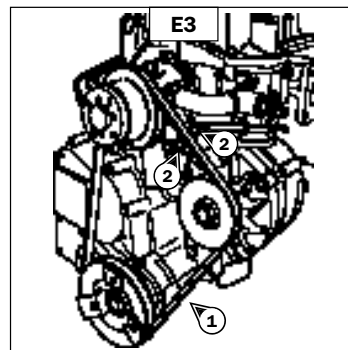
### E3 - ALTERNATOR BELT

**CHANGE**

- Open the I.C. engine cover.
- Loosen screws 2 (Fig. E2) by two to three turns.
- Swivel the alternator assembly to release the belt 1 (Fig. E2).
- Replace it with a new belt (see : 3 - MAINTENANCE : FILTERS CARTRIDGES AND BELTS).
- Adjust the alternator to obtain the belt tension required.
- Check the belt 1 tension A between the pulley of the crankshaft and alternator (Fig. E3) (see: 3 - MAINTENANCE : C1 - ALTERNATOR / FAN / CRANKSHAFT BELT).

#### IMPORTANT

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





## **E4 - HYDRAULIC OIL**

**DRAIN**

## **E5 - SUCTION STRAINER FOR HYDRAULIC OIL TANK**

**CLEAN**

## **E6 - FILTER CAP FOR HYDRAULIC OIL TANK**

**CHANGE**

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

### **IMPORTANT**

*Thoroughly clean the area surrounding the drain plug and the suction cover on the hydraulic tank.*

### **DRAINING THE OIL**

- Place a container under drain plug 1 (Fig. E4/1).
- Unscrew the tank's drain plug.
- Remove filler cap 2 (Fig. E4/4) in order to ensure that the oil is drained properly.

### **IMPORTANT**

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

### **CLEANING THE STRAINER**

- Disconnect the clogging indicator 3 (fig. E4/2) and disconnect the hoses at the filter.
- Unscrew the four screws 4 of plate 5 and remove the complete filter 6.
- Remove and clean the strainer using a compressed air jet, check its condition and replace if necessary (see : 3 - MAINTENANCE : FILTERS CARTRIDGES AND BELTS).
- Install the strainer, the plate and filter making sure that the seal is properly in place, reconnect the hoses and the clogging indicator.

### **IMPORTANT**

*Use a clean container and funnel, and clean the underside of the oil nozzle before filling.*

### **FILLING UP THE OIL**

- Install and tighten drain plug 1 (Fig. E4/1) (tightening torque 26 ft/lbs).
- Fill up with oil (see : 3 - MAINTENANCE : LUBRICANTS AND FUEL) by filler port 7 (Fig. E4/4).

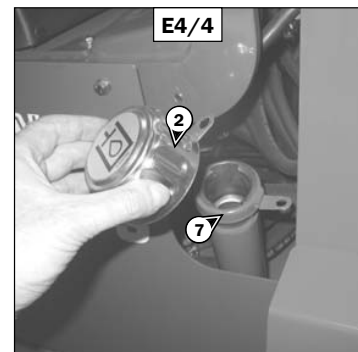
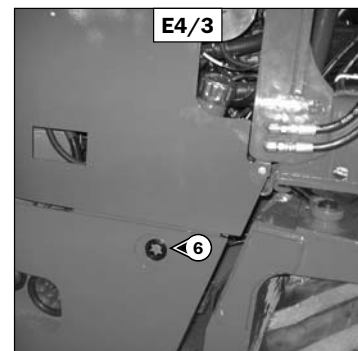
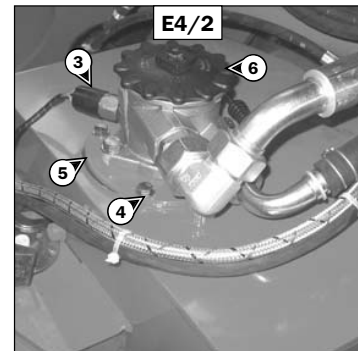
- Observe the oil level 6 (Fig. E4/3); the oil level should be at the level of the red dot.
- Check for any possible leaks at the drain plug.
- Replace filler cap 2 (Fig. E4/4) with a new one (see : 3 - MAINTENANCE : FILTERS CARTRIDGES AND BELTS).

### **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.


### **IMPORTANT**

*It may be necessary to bleed the system at the inlet of the pumps, if any air bubbles have formed during the draining ; if so, consult your dealer.*



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

 <b>WARNING</b>	<i>Under no circumstances should you use the lift truck if the seat belt is damaged! Replace the seat belt immediately!</i>
--	---

## F - EVERY 2000 HOURS SERVICE

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

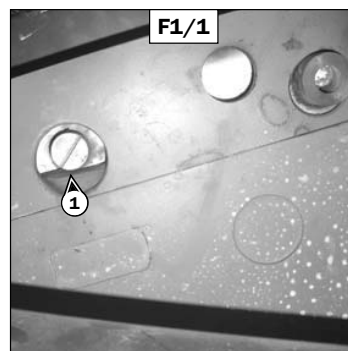
### F1 - COOLING LIQUID

#### DRAIN

These operations are to be carried out as necessary or every two years at the beginning of winter. Park the lift truck on level ground with the I.C. engine stopped and cold.

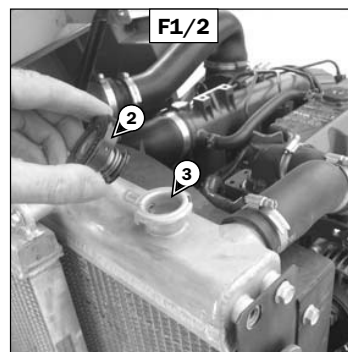
#### DRAINING THE LIQUID

- Open the I.C. engine cover.
- Place a receptacle under the drain hole 1 (fig. F1/1) and remove it.
- Remove filler cap 2 (fig. F1/2) from the radiator.
- Drain the cooling circuit completely while ensuring that the ports do not become blocked.
- Check the condition of the hoses and clamps, replace if necessary.
- Rinse the circuit with clean water, use a cleaning agent if necessary.



#### FILLING THE LIQUID

- Tighten the drain plug 1 (fig. F1/1).
- Slowly fill the circuit with coolant via the filling hole 3 (fig. F1/2) (see: 3 - MAINTENANCE: LUBRICANTS AND FUEL).
- Install the radiator cap 2 (fig. F1/2).
- Let the engine run at idle a few minutes.
- Check for any possible leaks.
- Check the fluid level again and refill if necessary.



### F2 - INTERNAL COMBUSTION ENGINE'S SNIFFLER

#### CHANGE

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

- Open the I.C. engine compartment.
- Loosen the 4 locking screws 2 (fig. F2) and remove the sniffer's cover 1 (fig. F2), the spring 6 (fig. F2) and the diaphragm assembly 4 (fig. F2).

#### IMPORTANT

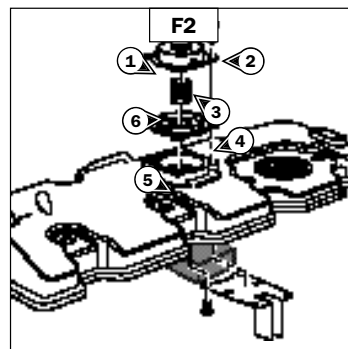
*It is important for the area around the sniffer hole 3 (fig. F2) to be clean.*

- Clean the sniffer cavity 5 (fig. F2) in the rocker arm cover.
- Install the new sniffer assembly (see: 3 - MAINTENANCE: FILTERS CARTRIDGES AND BELTS) in the rocker arm cover, ensuring that the sniffer's cover, the membrane and the spring are correctly installed.

#### IMPORTANT

*Ensure that the sniffer assembly's components are all fitted in the correct position. If they are not, it could damage the engine.*

- Tighten the 4 locking screws.





## G - OCCASIONAL MAINTENANCE

### G1 - BLEED THE FUEL SYSTEM

#### BLEED

These operations may be necessary for the following reasons:

- A changed or drained component on the fuel system.
- A drained tank.
- Running out of fuel.

Make sure that the fuel level is sufficient in the tank and bleed in the following order:

#### BLEEDING THE FUEL FILTER

- Open the engine compartment.
- Loosen the bleed screw 1 (Fig. G1/1).
- Switch on the lift truck ignition until the diesel oil flows from the bleeder screw free of any air.
- Tighten the bleed screw 1 (Fig. G1/1) while the fuel flows from it.

#### BLEEDING THE INJECTION NOZZLES

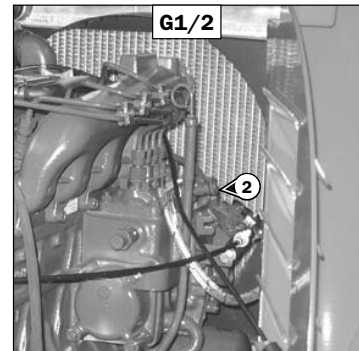
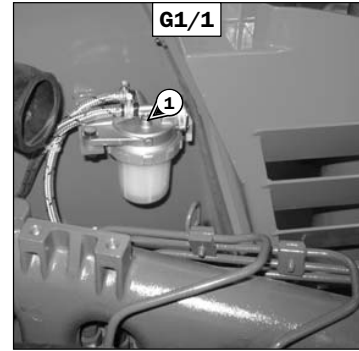
- Open the bleed valve 2 (Fig. G1/2).
- Switch on the lift truck ignition until the diesel oil flows from the bleeder screw free of any air.
- Tighten the bleed screw while the fuel is flowing out.
- The engine is thus ready to start.



#### WARNING

Idle the engine for 5 minutes immediately after bleeding the fuel circuit to ensure the injection pump has been bled thoroughly.

NOTE: If the I.C. engine functions correctly for a short time then stops or runs irregularly, check for possible leaks in the low pressure circuit. If in doubt, contact your dealer.



### G2 - WHEEL

#### CHANGE



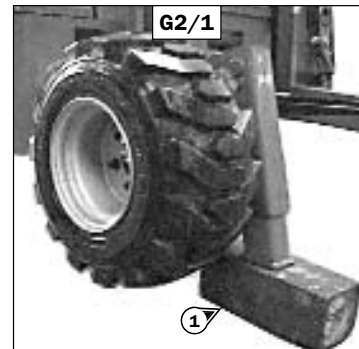
#### WARNING

In the event of a wheel being changed on the public highway, make sure of the following points :

- Park the lift truck, if possible on even and hard ground.
- Put the warning lights on.

#### FRONT WHEEL

- Immobilize the lift truck in both directions on the wheel opposite to the wheel to be changed.
- Loosen the nuts of the wheel to be changed.
- Put a block under the stabilizer 1 (Fig. G2/1) of the wheel to be changed.
- Lower the stabilizers.
- Completely unscrew the wheel nuts and remove them.
- Release the wheel through rocking movements and roll it aside.
- Slide the new wheel onto the wheel hub.
- Screw the nuts by hand, if necessary, lubricate them.
- Lift the stabilizers and remove the block.
- Tighten the wheel nuts with a torque wrench. (See chapter : A - DAILY OR EVERY 10 HOURS SERVICE for tightening torque).



## REAR WHEEL

For this operation use an approved hydraulic jack and safety support.

- Immobilize the lift truck in both directions on the front wheels.
- Loosen the wheel nuts.
- Place the jack under the rear pivot.
- Lift the wheel until it lifts off the ground and install a security block (Fig. G2/2).
- Loosen the wheel nuts and remove them.
- Release the wheel through rocking movements and roll it aside.
- Slide the new wheel onto the wheel hub.
- Install the nuts to hand tight, if necessary, lubricate them.
- Remove the security block and lower the lift truck with the jack.
- Tighten the wheel nuts with a torque wrench (See chapter : A - DAILY OR EVERY 10 HOURS SERVICE for tightening torque).



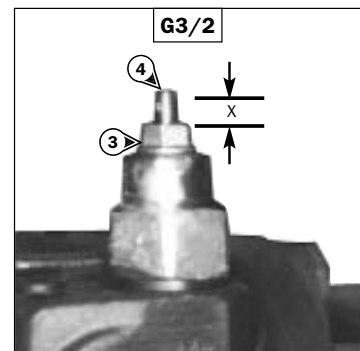
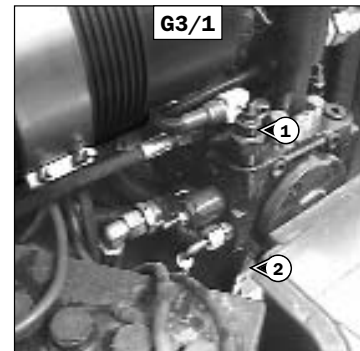
## G3 - TOWING THE LIFT TRUCK

**TOW**

### IMPORTANT

*The lift truck must be towed at very slow speed (less than 3mph) over the shortest possible distance (less than 325 ft.).*

- Open the engine compartment.
- Unlock the high pressure relief valves 1 and 2 (fig. G3/1).
- Note the position of reading X (fig. G3/2) on both high pressure relief valves 1 and 2.
- Unlock the counter-nut 3 (fig. G3/2).
- Tighten the screw 4 (fig. G3/2) until flush with the counter-nut 3 (fig. G3/2).
- After towing proceed in reverse order to reposition the HP valves to the X position.



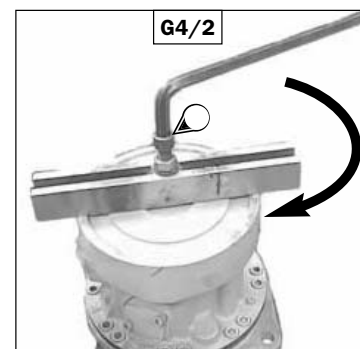
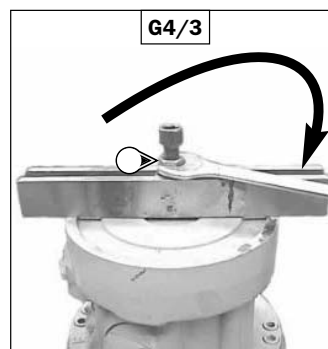
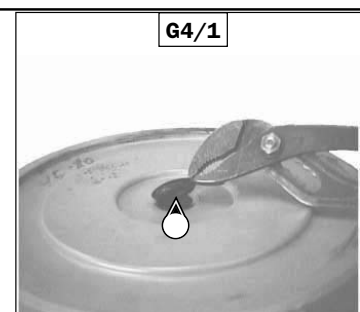
## G4 - MECHANICAL BRAKE RELEASE

**RELEASE**

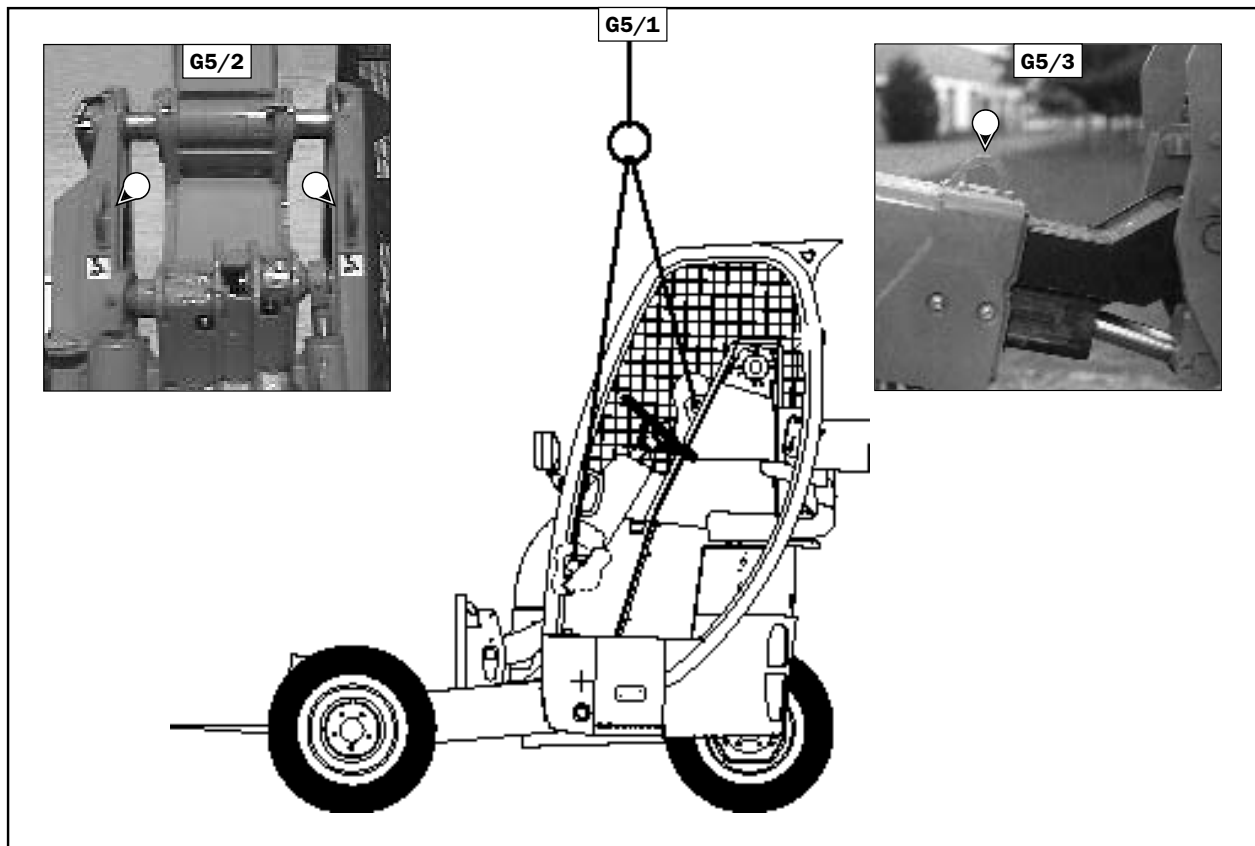
- Extract and release the plug from the brake cover. fig. G4/1
- Tighten the screw in the piston. fig. G4/2
- Tighten the nut until the motor shaft turns freely. fig. G4/3

### IMPORTANT

*AFTER BREAK RELEASE, MOUNT A NEW PLUG.*



- Take into account the lift truck's center of gravity before lifting (Fig. G5/1).
- Place the hooks in the fastening points provided (Fig. G5/2 and G5/3).



## G6 - LIFT TRUCK ON A PLATFORM

### TRANSPORT



#### CAUTION

Ensure that the safety instructions concerning the platform are followed before loading the lift truck, and that the truck driver has been informed about the dimensions and the weight of the lift truck (See 2 - DESCRIPTION : CHARACTERISTICS).  
Ensure that the platform has 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.

#### LOAD THE LIFT TRUCK

- Block the wheels of the trailer (Fig. G6/1).
- 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.
- Park the lift truck (see : 1 - OPERATING AND SAFETY INSTRUCTIONS : DRIVING INSTRUCTIONS UNLADEN AND LADEN).

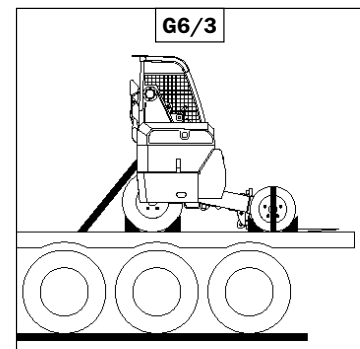
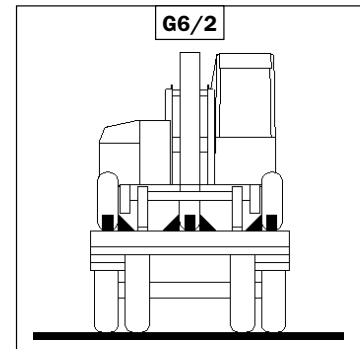
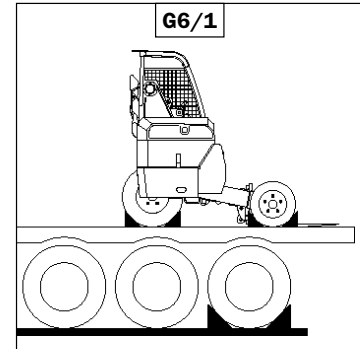


#### WARNING

The lift truck must be loaded on the transport semitrailer in reverse motion and unloaded in forward motion.

#### STOW THE LIFT TRUCK

- Fix the chocks to the platform at the front and at the back of each tire (Fig. G6/1).
- Also fix the blocks to the trailer in the inside of the front wheels and on each side of the rear wheel (Fig. G6/2).
- Secure the lift truck on the trailer with straps or chains. At the front of the lift truck and at the rear (Fig. G6/3).
- Tighten the straps/chains correctly (Fig. G6/3).



## G7 - FRONT HEADLAMPS

### ADJUST

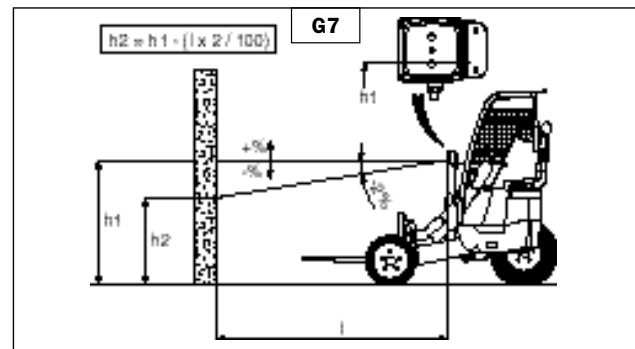
#### RECOMMENDED SETTING

(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

- Park the lift truck unloaded and in the transport position and perpendicular to a white wall on flat, level ground (fig. G7).
- Check the tire pressures (see : 2 - DESCRIPTION : CHARACTERISTICS).
- Put the lift truck 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.





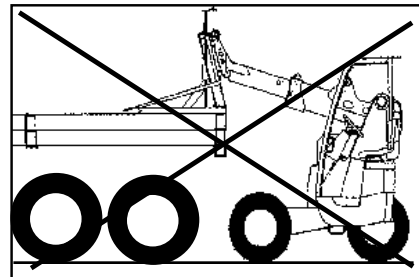
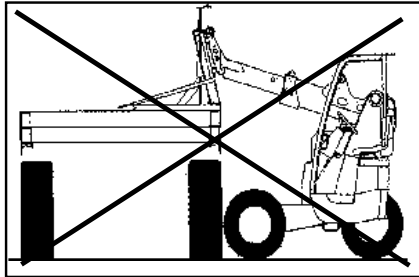
# ***4 - MOUNTING THE LIFT TRUCK***



## **MOUNTING THE LIFT TRUCK ONTO THE TRAILER OR CARRIER**

### **DANGER**

*Never mount the TMT Lift Truck to the trailer as shown below! Use only the Mounting Kit as approved by Manitou Americas Inc.. The approved kit mounts the lift truck below the trailer bed at the rear of the trailer. Mounting the forklift higher than recommended may result in damage to the lift truck, serious injury or death!*



### **WARNING**

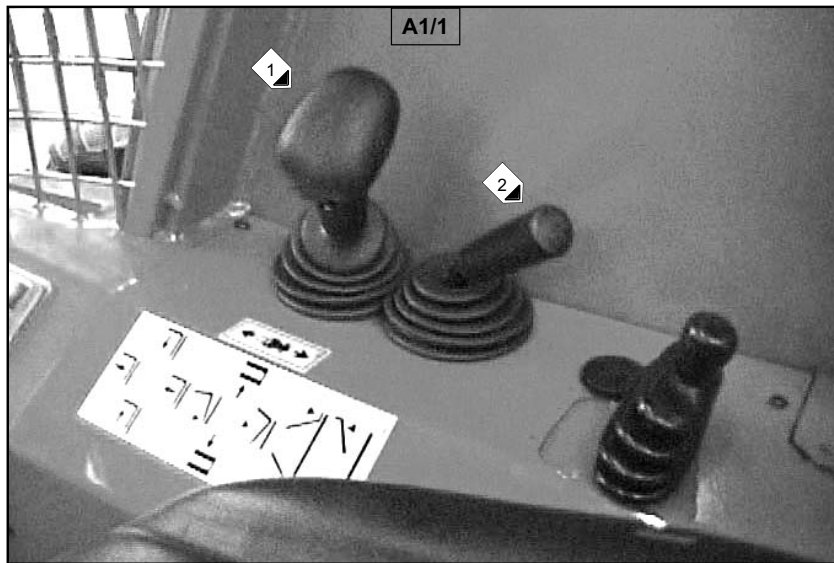
*The mounting kit for the TMT must be supplied or approved in writing by Manitou Americas Inc.*

### **WARNING**

*Ensure the tractor/trailer is properly parked and secured, utilizing wheel chocks as required.*

### **WARNING**

*The Retractable Load Carriers must be retracted and secured in the raised position before mounting the forklift to the trailer. See CHAPTER 2: INSTRUMENTS AND CONTROLS: 22 - RETRACTABLE LOAD CARRIERS.*



The joystick operations may be viewed as clock positions:

Lever forward - 12 o'clock	Lever back - 6 o'clock
Lever right - 3 o'clock	Lever left - 9 o'clock

**- Lever 1**

- Controls Lifting the boom: Move Lever back - 6 o'clock
- Controls Lowering the boom:- Move Lever forward - 12 o'clock
- Controls Extending the boom: Move Lever right - 3 o'clock
- Controls Retracting the boom: Move Lever left - 9 o'clock

**- Lever 2**

- Controls Tilting the carriage forward: Move Lever forward - 12 o'clock
- Controls Tilting the carriage backward: Move Lever back - 6 o'clock
- Controls Side Shifting the boom to the right: Move Lever right - 3 o'clock
- Controls Side Shifting the boom to the left: Move Lever left - 9 o'clock



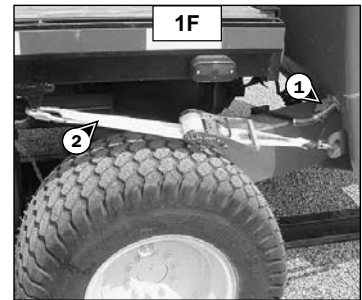
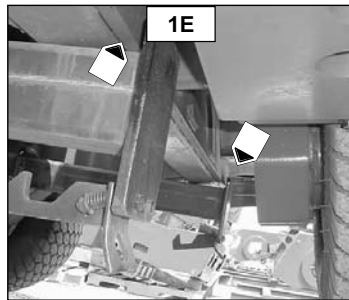
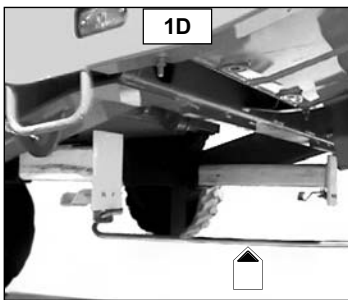
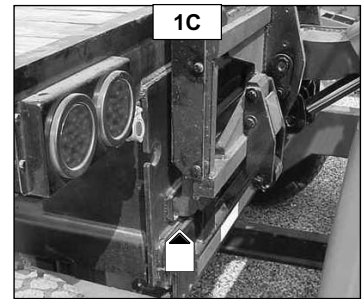
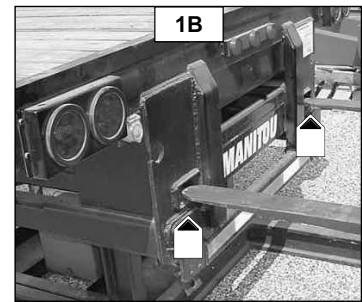
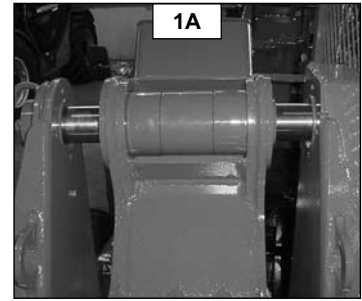
**WARNING**

*Ensure the tractor/trailer is properly parked and secured, utilizing wheel chocks as required.*

## 1 - MOUNTING THE LIFT TRUCK ONTO THE TRAILER

### - MANITOU SYSTEM MOUNTING-

- 1.) Learn the controls. Execute all movements slowly. All forklift movements are to be made by the operator positioned in the operator's seat, with the seat belt fastened. Take extra precaution when entering and exiting the cab while it is in the raised position.
- 2.) Fully retract the boom, Lever 1 left.
- 3.) Side shift the boom until it is centered, move Lever 2 to the right or left as needed (fig. 1A shows the boom centered on the side shift cylinder).
- 4.) Align the forks to the trailer sleeves (fig. 1B), insure the forks are equally spaced from the center of the carriage.
- 5.) Maneuver the forks into the sleeves, make adjustments as required, insure both forks are fully inserted and flush with the trailer bed (fig. 1C).
- 6.) Tilt the carriage back slightly, until the forks are tight in the sleeves, Lever 2 back.
- 7.) Raise the forklift off the ground, Lever 1 forward, the full distance of travel.
- 8.) Tilt the lift truck fully forward, Lever 2 back.
- 9.) Extend the boom - 5" max., Lever 1 to the right. Carefully exit the cab.
- 10.) With the hook tool, fully extend both support arms (fig. 1D).
- 11.) Carefully enter the cab. Retract the boom, Lever 1 to the left.
- 12.) To set the forklift on the support arms, tilt the lift truck back, Lever 2 forward.
- 13.) Make sure the support arms are locked in place (fig. 1E).
- 14.) Stop the engine and remove the key.
- 15.) Connect the trailer lights electrical cable (1) and straps (2) (fig. 1F).



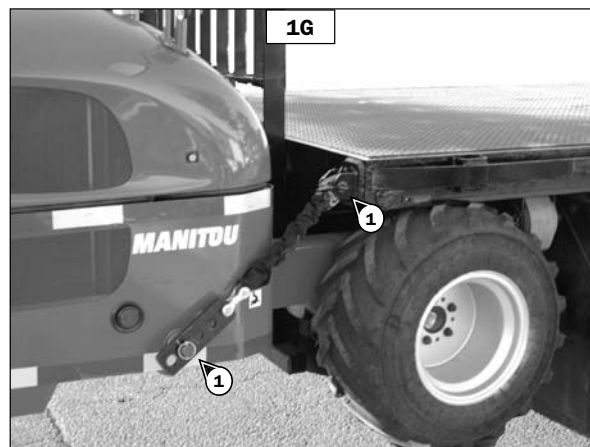
#### MANITOU SYSTEM MOUNTING

- |             |   |                             |
|-------------|---|-----------------------------|
| 1.) Lever 2 | 6 o'clock                                 | Locks Forks in place        |
| 2.) Lever 1 | 12 o'clock                                | Fully raise Forklift        |
| 3.) Lever 2 | 6 o'clock                                 | Tilt Forklift fully forward |
| 4.) Lever 1 | 3 o'clock                                 | Extend Boom 5 inches        |
| 5.)         | Extend Support Arms fully                 |                             |
| 6.) Lever 1 | 9 o'clock                                 | Fully retract the Boom      |
| 7.) Lever 2 | 12 o'clock                                | Levels TMT on Support Arms  |
| 8.)         | Connect Trailer Lights and Locking Straps |                             |

## ***1 - MOUNTING THE LIFT TRUCK ONTO THE TRAILER (CONTINUED)***

### **- CHAIN SYSTEM MOUNTING-**

- 1) Learn the controls. Execute all movements slowly. All forklift movements are to be made by the operator positioned in the operator's seat, with the seat belt fastened. Take extra precaution when entering and exiting the cab while it is in the raised position.
- 2) Fully retract the boom, Lever 1 left.
- 3) Side shift the boom fully left, Lever 2 to the left as needed.
- 4) Align the forks to the trailer sleeves, insure the forks are equally spaced from the center of the carriage.
- 5) Maneuver the forks into the sleeves, moving the forklift forward until the front tires contact the trailer wheel pads. Extend the boom, Lever 1 to the right, to insure both forks are fully inserted.
- 6) Tilt the carriage back slightly, until the forks are tight in the sleeves, Lever 2 back.
- 7) Raise the forklift off the ground, Lever 1 forward, and retract the boom, Lever 1 left, until the front tires rest against the wheel pads.
- 8) Carefully exit the cab. Attach and adjust both support chains on the trailer brackets (Item 1, fig. 1G). Use the chain pin w/handle and lynch pin to attach the chains to the trailer brackets. Secure the lift truck end of the chain with a lynch pin.
- 9) Carefully enter the cab. Tilt the cab backward, Lever 2 forward, until the forklift rests fully on the chains.
- 10) Stop the engine and remove the key.
- 11) Connect the trailer lights electrical cable.



#### **CHAIN SYSTEM MOUNTING**

- |                            |            |                              |
|----------------------------|------------|------------------------------|
| 1.) Lever 2                | 9 o'clock  | Side shift Boom fully left   |
| 2.) Lever 2                | 3 o'clock  | Extend Boom as required      |
| 3.) Lever 2                | 6 o'clock  | Lock Forks in place          |
| 4.) Lever 1                | 12 o'clock | Raise Forklift as required   |
| 5.) Lever 1                | 9 o'clock  | Retract the Boom as required |
| 6.) Attach the Chains      |            |                              |
| 7.) Lever 2                | 12 o'clock | Tilt Forklift fully backward |
| 8.) Connect Trailer Lights |            |                              |

## **2 - DISMOUNTING THE LIFT TRUCK FROM THE TRAILER**

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### **- MANITOU SYSTEM DISMOUNTING -**

- 1) Execute all movements slowly. All forklift movements are to be made by the operator positioned in the operator's seat, with the seat belt fastened. Take extra precaution when entering and exiting the cab while it is in the raised position.
- 2.) Disconnect the electrical cable and straps.
- 3.) Tilt the lift truck fully forward, Lever 2 back.
- 4.) Extend the boom 5" max., Lever 1 right.
- 5.) Carefully exit the cab. With the support hook, push the support bars in, insure they are locked in place.
- 6.) Fully retract the boom, Lever 1 left.
- 7.) Lower the forklift, Lever 1 back, until the front wheels touch the ground.
- 8.) Tilt the forklift back, Lever 2 forward, until the rear wheel is on the ground.
- 9.) Slowly back the forklift away from the trailer, adjust fork angle as needed for smooth exit.

#### **MANITOU SYSTEM DISMOUNTING**

- |                              |            |                             |
|------------------------------|------------|-----------------------------|
| 1.) Lever 2                  | 6 o'clock  | Tilt Forklift fully forward |
| 2.) Lever 1                  | 3 o'clock  | Extend Boom 5 inches        |
| 3.) Push Support Bars in     |            |                             |
| 4.) Lever 1                  | 9 o'clock  | Retracts Boom               |
| 5.) Lever 1                  | 6 o'clock  | Lowers the Forklift         |
| 6.) Lever 2                  | 12 o'clock | Tilts the Forklift back     |
| 7.) Back out of fork sleeves |            |                             |

---

### **- CHAIN SYSTEM DISMOUNTING -**

- 1) Execute all movements slowly. All forklift movements are to be made by the operator positioned in the operator's seat, with the seat belt fastened. Take extra precaution when entering and exiting the cab while it is in the raised position.
- 2) Disconnect the electrical cable.
- 3.) Tilt the lift truck up fully, pull Lever 2 back.
- 4.) Disconnect and remove the chains.
- 5.) Alternate extending the boom, Lever 1 right, and lowering the forklift, Lever 1 back, until the wheels clear the bottom pads and touch the ground.
- 7.) Tilt the Forklift back, Lever 2 forward, until the Forklift settles on the ground.
- 8.) Slowly back the forklift away from the trailer, adjust fork angle as needed for smooth exit.

#### **CHAIN SYSTEM DISMOUNTING**

- |   |            |                                   |
|---|------------|-----------------------------------|
| 1.) Disconnect the electrical cable         |            |                                   |
| 2.) Lever 2                                 | 6 o'clock  | Tilt Forklift fully forward       |
| 3.) Disconnect and remove the chains        |            |                                   |
| 4.) Alternate until tires touch the ground: |            |                                   |
| Lever 1                                     | 3 o'clock  | Extend Boom as required           |
| Lever 1                                     | 6 o'clock  | Lowering the forklift as required |
| 6.) Lever 2                                 | 12 o'clock | Tilts the Forklift back           |
| 7.) Back out of fork sleeves                |            |                                   |



