

OPERATORS MANUAL

Starke EcoMaxx Series

ECO-FG/FD 10-35

Rev 02/2017



STARKE MATERIAL HANDLING GROUP

402 Allanburg Road • Thorold, ON L2V 1A4 • Canada

TOLL FREE 877-435-4352

www.starkeforklift.com • info@starkeforklift.com

STARKE
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INTRODUCTION

The purpose of this manual is to offer owners, operators, and service technicians a complete understanding of the safe operation and maintenance of Starke EcoMaxx Series diesel and gasoline model forklifts. And additionally to help avoid, and provide solutions to, potential issues that may occur during operation.

The safe and efficient operation of a lift truck requires skill and alertness on the part of any operator. To develop the skills required the operator must:

- Acquire the proper training and certifications required for the operation of the forklift.
- Understand the capabilities, limitations, specifications and rules of the forklift prior to operation.
- Become familiar with the structure and layout of the forklift.
- Read and understand the warnings and operating procedures in this manual.

Starke Material Handling Group strongly suggests that you read this manual in its entirety:

Optimized efficiency begins EcoMaxx forklift. In addition, a qualified person experienced in lift truck operation, must guide every new operator through operation lessons before they operate the lift truck independently.

Starke Material Handling Group puts operator safety at the core of model designs and operations, observation of the safety rules and recommendations contained in this manual can prevent potentially fatal accidents. Keep a copy of this manual with the forklift at all times and ensure that all operators review the contents of this manual on a regular basis. If a replacement manual is required, contact Starke Material Handling Group or your local Starke dealer immediately to request a replacement.

NOTE: Starke forklifts are designed for single person operation only.

NOTE: Starke forklifts are not intended for use on public roads. It is an on-site machine and inappropriate for long-distance road travel.

NOTE: Incorrect operation and maintenance of the forklift can be dangerous and lead to injury.

The safety practices and preventative measures outlined in this manual apply only if the forklift is used for its intended purpose inside of the outlined capacity and limitations. Should the forklift be used for any other purpose than the intended function the operator is responsible for their own safety and the safety of others and property.

Additional information that describes the safe operation and use of forklifts is available from the following sources:

- Employment safety and health standards or regulations.
- Safety laws, codes, and standards.
- Publications from government safety agencies, government insurers, private insurers and private organizations.

TABLE OF CONTENTS

<i>CORRECT OPERATING PROCEDURE.....1</i>	Information on Operating the Forklift.....9
Load and Vehicle Stability.....1	Qualifications and Training.....9
Load Capacity Chart.....2	Fundamental Safety Guidelines.....9
Handling a New Forklift.....3	Fuel.....10
Engine Starting and Post-Starting Procedures.....3	Fuel Types.....10
After Starting.....3	Handling of Fuel.....10
Lift Cylinder Warm-Up.....3	Refuelling.....10
Vehicle operation.....4	Shipping, Loading and Unloading the Forklift.....11
Take-Off.....4	Lifting the Forklift.....11
Gear Shifting.....4	Assembling the Forklift and Mounting Attachments.....11
Steering.....4	Towing the Forklift and Moving Incomplete Forklifts.....11
Picking-Up Loads.....4	Leaving the Forklift Idle and Long term Storage.....12
Unloading.....4	Care of the Engine Compartment.....12
Stopping and Parking.....4	Maintenance of the Brake System.....12
Road or Surface Conditions.....5	Maintenance of the Hydraulic System.....12
Snowy or Frozen Surfaces.....5	Battery Care.....12
Handling in Hot Weather.....5	Drive System Maintenance.....12
Cold Weather Vehicle Handling.....5	Inspection of Industrial Trucks While In Storage.....13
<i>SAFETY, TRANSPORTATION & MAINTENANCE.6</i>	Service Requirements.....18
Conditions for Normal Vehicle Use.....7	Genuine Starke Replacement Parts.....18
Work Environment.....7	Safe Work Practices.....18
For Engine-Powered Forklifts.....7	Safety Equipment and Warning Labels.....19
For Electric-Powered Forklifts.....7	Handling the Battery Safely.....19
Work Environment Hazards.....8	Notes on Other Hazards.....20
Slippery Road Surfaces.....8	<i>OPERATION SAFETY TIPS.....21</i>
Rough Ground.....8	
Lighting.....8	
Noise.....8	
Conditions That Apply When Attachments Are Used.....8	

CORRECT OPERATING PROCEDURE

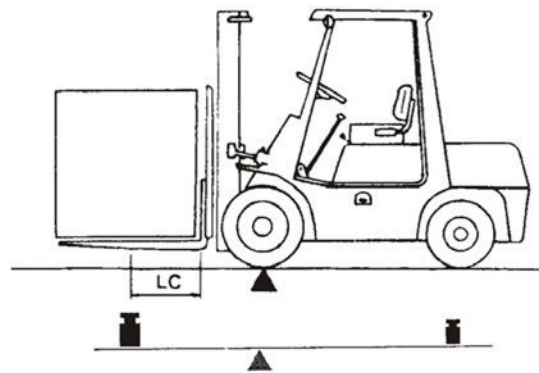
LOAD CAPACITY

Let us compare the way we lift a load with the way a forklift does. A light object can be picked up from just about any position, but to pick up a heavy one you must bend down, lowering your hips and arms. The heavier the object, the more bending you must do. The same is true of a forklift.

As seen from the diagram, the forklift front wheels act as a fulcrum upon which the load on the rear wheels (counterweight) is counterbalanced by the load on the forks. Thus, care should be taken not to disturb the balance in relation to the load center.

Even if a load less than the maximum is set far forward on the forks, or if a load exceeds the specified allowable limit, the rear wheels will tend to float and the steering wheel will be hard to turn. This is the most dangerous condition for a forklift.

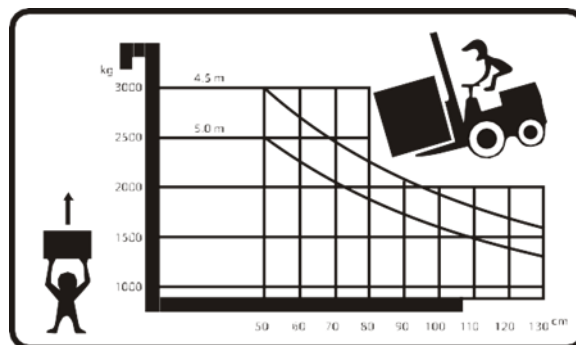
Because of this principle of leverage, a forklift's capacity is always specified by giving not only the maximum weight it can lift, but also the maximum distance between the center of the weight and the back of the forks. This is called the load center distance.



LOAD CAPACITY CHART

Load capacity chart shows exactly how the truck's load capacity is reduced if the load center distance is greater than normal.

The curves are given for several different maximum lift heights. The higher the lift, the lower the allowable load.



LOAD CAPACITY

Load capacity is the maximum weight of material that can be handled on the forks at a specific load center.

LOAD CENTER

Load center is the distance between the center of weight of load and the back of the forks.

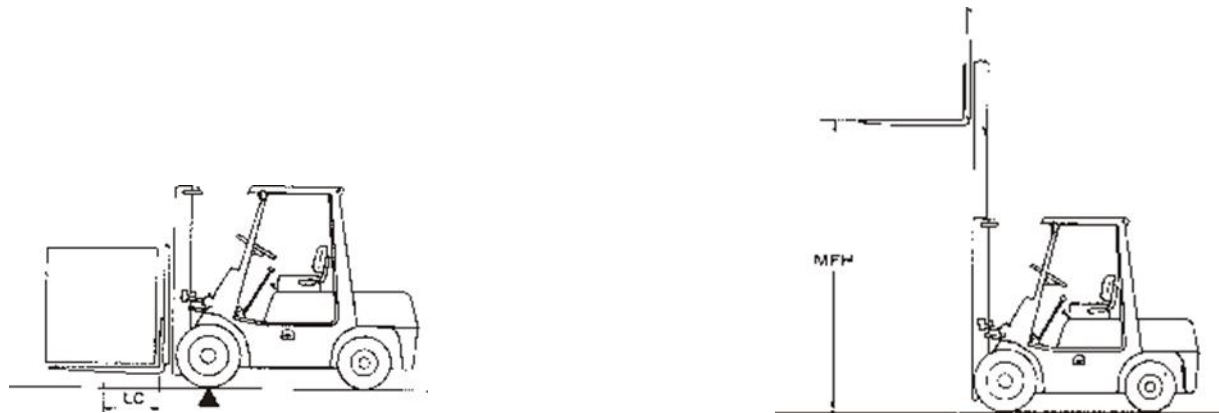
MAXIMUM FORK HEIGHT

Maximum fork height (MFH) is the highest position of the forks with the mast in a vertical position.

HOW TO READ THE LOAD CAPACITY CHART

The load weights 2500 kg well below the normal capacity of a truck with 4.5m mast. However, the load center is 100cm from the back of the forks. On the chart, trace up from the 100cm load center to the upper load curve and then across to the capacity scale.

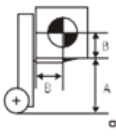
According to the chart, the maximum weight that can be lifted at a 100cm load center is approximately 1800kg, and so our assumed load of 2500kg is too heavy. It must be broken down.



HOW TO READ THE SPEC PLATE

The load capacity is engraved on the spec plate. Make sure of the load center and capacity before starting the operation.

- | | |
|--|------------------------|
| 1. Vehicle Type | 7. Tire Size |
| 2. Special Vehicle Type, Attachment Type | 8. Air Pressure |
| 3. Frame No. | 9. Year of Manufacture |
| 4. Vehicle Weight | 10. UL Specification |
| 5. Mast Lifting Height | 11. Load Capacity |
| 6. Front Tread | 12. Load Center |

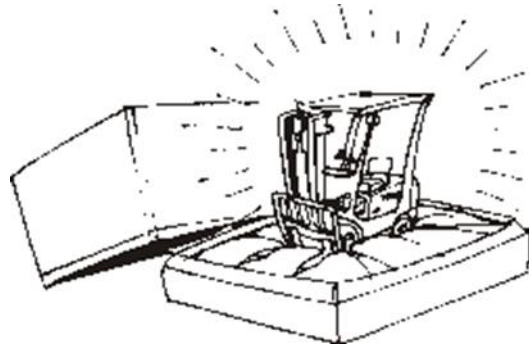
STÄRKE ECOMAXX FORKLIFT TRUCK			
MODEL	①	FRONT TREAD	⑥
CODE NO. OF SPECIAL MODEL MODEL OF ATTACHMENT		TIRE SIZE FR	⑦
②		TIRE PRESS FR	⑧
FRAME NO.	③	TIRE SIZE RR	⑦
TRUCK WEIGHT	④	TIRE PRESS RR	⑧
MAX LIFTING HEIGHT "A"	⑤	PROD YEAR	⑨
		TYPE	⑩
			
CAPACITY WITH VERTICAL UPRIGHT EQUIPPED AS SHOWN			
CAPACITY	⑪	⑪	⑪
LOAD CENTER "B"	⑫	⑫	⑫

HANDLING A NEW FORKLIFT

the performance and service life of your Starke EcoMaxx forklift depends heavily upon the way you handle it during the break-in period.

During the first 100 hours, pay special attention to the following:

- Do not race the engine unnecessarily.
- After starting the engine, allow it to warm up fully before starting work.
- Avoid rough handling and driving. Do not overwork the forklift.
- Be sure that the new vehicle receives inspection service and periodic maintenance as noted in the Service Booklet.



ENGINE STARTING AND POST-STARTING PROCEDURES

1. Set the shift lever to neutral
2. Put on the parking brake.
3. Set the engine switch to GLOW and wait for the glow plug controller to indicate the red hot condition. (Diesel only)
4. Turn the engine switch to ON, see that the oil warning lamp is lit, then pump the accelerator pedal lightly.
5. Now pull the switch on START and the engine will start.



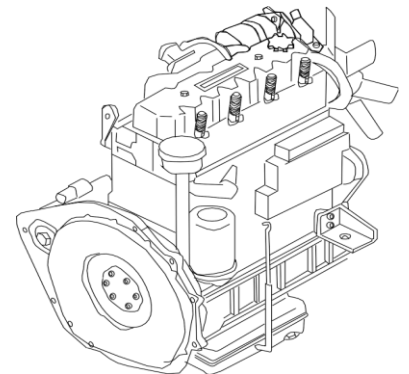
NOTE: Do not crank the starter motor for more than five seconds at a time.

AFTER STARTING

Once the engine is started, do not begin work immediately; let the engine warm up fully.

LIFT CYLINDER WARM-UP

Every day, before beginning work with the forklift, always operate the forks with the full piston cylinder stroke several times. This will give the cylinders an even coat of oil and prevent rusting from the air drawn into them.



VEHICLE OPERATION

TAKE-OFF

Raise the forks 15 to 20cm off the ground, work the torque converter shift lever, release the parking brake, and gently ease into takeoff.

1. NOTE: Do not 'ride' the brake pedal. Applying your foot to the pedal more than needed can damage the torque converter and cause rapid brake wear.

GEAR SHIFTING

1. Bring the vehicle to a full stop before reverting gears.
2. In the unloaded condition, 2nd gear may be used for takeoff and travel, but in the loaded condition, 1st gear should always be used for takeoff.

STEERING

1. The left hand is used to turn the steering wheel by the knob. The right hand This forklift is steered by the rear wheels. The steering wheel turns easily I so watch out for exaggerated tail swing.

PICKING-UP LOADS

Approach an object to be loaded carefully, keeping the fork undersides level with the ground. Slip the forks under the load as far as the carriage, raise forks 15 to 20 centimeters, tilt mast fully backward and then transport it to the unloading point.

UNLOADING

Tilt the mast forward to either a vertical or forward tilt position then lower the forks to the desired spot for unloading. Back away with the mast in one of the above conditions, smoothly withdrawing the forks from beneath the load. Raise the forks 15 to 20 cm and proceed to the next operation.

1. If the mast is tilted backward at first when loading, the fork tips will strike the object for loading and the forks cannot be slipped underneath as far as the front of the carriage.
2. Do not approach the load fast and strike it.
3. When travelling with a load on the forks, keep the mast titled backward and the forks 15 to 20 cm off the ground.
4. Never travel with the mast titled forward with the load raised. The load center of balance can shift and cause the load to fall off.
5. Back down a slope slowly when carrying a load.

STOPPING AND PARKING

To come to a stop, release your foot from the accelerator pedal, reduce speed and apply the brake with the foot pedal.

When parking the vehicle, stop in a place where the vehicle will not be in the way of other vehicles. Set the parking brake and lower the forks onto the floor or ground.



NOTE: Do not attempt to stop on a slope or incline by working the accelerator pedal with the unit in gear. This will cause the oil temperature to rise in the torque converter. This is called the stall speed of the engine.

ROAD OR SURFACE CONDITIONS

Needless to say, forklift construction is such that travelling speed is limited by the road or surface conditions. Be particularly careful when operating the forklift over other than flat surfaces.

SNOWY OR FROZEN SURFACES

Use tire chains on snowy or frozen surfaces. Since it is dangerous to go into a forward slide or side slip on such surfaces, avoid sudden braking, acceleration or sharp turning. Speed should be controlled only by means of the accelerator pedal.

 NOTE: Tire chains grip the surface very well, but they are not insurance against side slippage.

HANDLING IN HOT WEATHER

Keep the following points in mind when you handle the forklift in hot weather:

COOLING SYSTEM

1. Clogged radiator can cause overheating. Clean them out regularly with a blast of compressed air. Also check for water leakage at the same time.
2. Check the fan belt tension and adjust to the specified tension.
3. If the engine overheats and coolant boils over, let the engine run idle until the temperature falls before shutting the engine off. Long life coolant is mixed in with the coolant; do not run tap water into it right away. Raise the engine hood and allow it to cool down by itself.

COLD WEATHER VEHICLE HANDLING

In the severe cold of certain climates, lubricating oils and coolant are used in much tougher conditions than in milder weather areas. Thus, the following precautions should be taken:

1. When Fuelling Up: Always fill the tank up to the top. This minimizes the air within the tank and thus reduces possible freezing from moisture condensation, rust in the fuel system and hard starting.
2. Battery Precautions: The higher the specific gravity and the greater the charge level, the more difficult it is for a battery to freeze up. By the same token, battery effectiveness is at its peak.

NOTE: Make sure the cap on the fuel tank is closed tightly so that no rain or snow can enter.

USE OF ANTIFREEZE

Before freezing weather sets in, the coolant (100% water) should be replaced by an antifreeze coolant – a mixture of water and the antifreeze compound, the mixing ratio depends on the lowest temperature expected.

MIXING RATIO FOR ANTIFREEZE

Lowest Temperature Expected (°c)	-15°c/5°f	-35°c/-31°f
Antifreeze (%)	30	50

SAFETY, TRANSPORTATION & MAINTENANCE

CONDITIONS FOR NORMAL VEHICLE USE

WORK ENVIRONMENT

In special work environments, it may be possible to use this forklift under its standard specifications. Consult with your Starke EcoMaxx dealer if this forklift will be used in any of the following environments:

- In harbours or waterfronts where there is the risk of salt corrosion
- In chemical plants where the forklift may be affected by acids or other chemicals
- In environments where there is a risk of explosions due to suspended particulate matter or explosive gases, etc.
- In cold regions, hot regions, or at high altitudes
- In environments with exhaust emissions exceed standards.

FOR ENGINE-POWERED FORKLIFTS

Do not use the forklift in bad weather conditions such as thunderstorms or high winds. Similarly, when dense fog arises, wait until visibility is good before using the forklift. Engine exhaust gas can be hazardous to your health as it contains carbon monoxide. Where work must be done indoors, ensure that windows or doors are open to allow adequate ventilation.

FOR ELECTRIC-POWERED FORKLIFTS

Never use the (optional) Cold Storage Model continuously in a cold storage area for more than 30 minutes. In addition, ensure that the time spent working outside the cold storage area is at least equal to that.

 NOTE: Do Not Use the Forklift Outdoors

WORK ENVIRONMENT HAZARDS

SLIPPERY ROAD SURFACES

Ensure that any water, oil, sand, ice or snow is removed from the road surface before work begins as these may cause the operator to lose control of the forklift.

ROUGH GROUND

Never operate on rough roads, including roads with potholes or sharp objects on them. These could damage the forklift, or cause it to tip over. Always ensure that the forklift will travel on a smooth surface free of hazards.

LIGHTING

Never work in areas with insufficient light. Provide adequate lighting for the work environment or consult with your Starke EcoMaxx dealer about installing work lights on the forklift.

NOISE

Excessive peripheral noise can distract the operator and cause fatigue. There is also the risk that warnings to pedestrians and will go unnoticed. Operators must take particular care when using the forklift in noisy environments.

CONDITIONS THAT APPLY WHEN ATTACHMENTS ARE USED

When attachments are installed on the forklift, the rated capacity is lessened than that of a standard model. Prior to using the attachment, contact your Starke EcoMaxx dealer for the rated capacity for the specific attachment.

INFORMATION ON OPERATING THE FORKLIFT

QUALIFICATIONS AND TRAINING

Only those persons who have the appropriate qualifications under the legislation of their country are permitted to operate this forklift. Where such laws have not been enacted, the employer should ensure that the selected operator is trained in safety measures and forklift operation before authorizing the operator to use the forklift. If more than one forklift is used, the characteristics of features such as the brakes, accelerator and load handling equipment will differ, even on forklifts with the same specifications. Ensure that operators who temporarily switch to other forklifts are trained to familiarize themselves with the characteristics of each forklift before beginning work.

FUNDAMENTAL SAFETY GUIDELINES

WORKERS

- Where a seat belt is fitted, operators must wear the seat belt while operating the forklift.
- Always use the proper personal protective equipment, such as hard hats, protective shoes, gloves, eye protection or other equipment as appropriate.
- Before operating the forklift, always visually inspect for any oil leakages or other abnormalities. Do not touch any metal surfaces with the bare hands. If any abnormalities are found contact the supervisor and do not use the forklift until repairs are completed. Unless qualified, you must not attempt to make repairs or adjustments yourself.
- Always use the assist grips and steps when climbing in and out of the forklift.

PEDESTRIANS

The operator has a primary responsibility to protect the safety of themselves, other workers, and pedestrians. Priority must always be given to pedestrians. Take particular care when turning. Never deliberately frighten pedestrians into moving aside by flashing the lights or sounding the horn. Ensure that pedestrians are aware when the forklift is approaching, and use a warning device if necessary.

 **NOTE:** It is recommended that products such as a strobe light and a back-up alarm be installed to give pedestrians better warning of forklift operations.

HAZARDS ARISING WHEN ATTACHMENTS ARE USED ON THE FORKLIFT

When attachments are installed on the forklift, the rated capacity is lessened than that of a standard model. Check with your Starke EcoMaxx dealer for the rated capacity of the specific attachment used.

An example of the particular considerations that apply when attachments are used is given below:

When the forklift operated is equipped with the side shift attachment, ensure that the load is centered with respect to the forklift during lifting and moving. Unbalanced loading can result in the forklift tipping over. Whether or not the forklift is equipped with an attachment, loads should never be left in a raised position. This applies particularly to forklifts equipped with the clamp attachment; leaving a load clamped can cause it to slip out.

FUEL

FUEL TYPES

The following fuels are recommended:

- Unleaded gasoline should have a Research Octane Number (RON) of 91 or greater;
- Diesel fuel should be No.2 or greater;
- And LPG should include 90% or more of propane and propylene by volume.

Use the correct fuel type for your forklift. The use of the wrong fuel will impair forklift performance and may lead to unpredictable faults or damage.

HANDLING OF FUEL

Always refuel in the designated area. For LPG, check that the supplier is equipped with proper connections to ensure a secure supply. Ensure that the refuelling area is well ventilated, is away from sparks and flames, and is equipped with appropriate fire extinguishing equipment.

 Fuel is flammable and can ignite and explode. Any flame is strictly forbidden when handling fuel. Mistakes in fuel handling can invariably cause serious accidents. Always clean up any fuel spills.

 LPG is heavier than air, and can accumulate in low areas and even on clothing. Any flame or spark can cause a fire and lead to a serious accident.

REFUELLING

Any exposed flame is strictly forbidden at refuelling stations. Remove the ignition key and turn off the headlamps when refuelling. Always retighten the fuel cap after refuelling.

Always exchange tanks when refuelling with LPG. When exchanged LPG tanks, the operator should always visually check the connections for damage or other abnormalities.

If a gas leak occurs, do not start the engine and request repairs immediately. When the LPG tank needs refilling, ask the LPG station attendant to fill the tank. Never attempt to fill the tank yourself, unless properly trained. This is extremely dangerous.

SHIPPING, LOADING AND UNLOADING THE FORKLIFT

- Observe the following cautions when shipping the forklift by trailer or freight car:
- Appoint a supervisor.
- Ensure that the bed of the freight car or trailer is strong enough to hold the weight of the forklift.
- Securely apply the parking brake of the trailer and chock the wheels so that the trailer cannot move.
- Use jacks to prevent the trailer from sinking when the forklift is loaded onto it.
- Use ramps that can bear the weight of the forklift and can be firmly secured to the bed of the freight car or trailer.
- Drive onto and off the trailer or freight car at low speed and check the strength and stability of the ramps throughout the loading process.
- Never attempt to change direction while on the ramps, and proceed in accordance with the supervisor's directions.
- Park the forklift in the middle of the bed of the trailer or freight car, lower the forks or attachment to the bed and apply the parking brake.
- To ensure that the forklift does not move during shipment, chock the tires and secure the forklift with steel cables.
- To avoid damage to the forklift's paintwork or operator's seat when securing the forklift with cables, etc, protect those areas with strong timber or heavy cardboard, etc.
- Drive the freight car or trailer smoothly, and stop periodically to check the cables and shackles for looseness.

LIFTING THE FORKLIFT

Do not lift the forklift with a cable attached to the counterweight or drawbar. Lift the forklift by the hooking points indicated on the caution plate affixed to the forklift.

Use a cable with ample strength to support the lift. Never use a cable that has kinks, distortions, fraying or friction damage. Never walk under a suspended forklift.

ASSEMBLING THE FORKLIFT AND MOUNTING ATTACHMENTS

Ask your Starke EcoMaxx dealer to assemble a forklift that has been delivered disassembled.

If the mast and/or counterweight must be removed for shipping or other reasons remove the mast first and then remove the counterweight. To reattach the mast and counterweight, use the reverse order, attaching the counterweight first and then the mast.

When installing a battery in a battery-less forklift, use batteries that match the weight and capacity of the forklift (electric-powered forklifts). When an attachment has been replaced, operate it without a load and (visually) inspect for oil leaks or other

TOWING THE FORKLIFT AND MOVING INCOMPLETE FORKLIFTS

Use a trailer or freight car to move the forklift to another location. Do not tow the forklift or push it from behind.

The drawbar is located behind the counterweight. Use the drawbar to extricate the forklift when it has become stuck and cannot move, or when the forklift is being loaded or winched onto a trailer. Do not use the forklift as a towing tractor to tow other forklifts or other vehicles. Use moving equipment (a crane or forklift) to move incomplete forklifts.

LEAVING THE FORKLIFT IDLE AND LONG TERM STORAGE

When the forklift is left to be idle, store the forklift with the mast extended to its highest point. When performing periodic checks, raise and lower the mast three or four times to lubricate the inside of the cylinders.

CARE OF THE ENGINE COMPARTMENT

The engine and engine compartment can become rusted from moisture and the like. Therefore, you should inspect the engine compartment once a month to remove rust build up and touch up spots or apply rust repellent as required.

MAINTENANCE OF THE BRAKE SYSTEM

If storage conditions permit, the parking brake should be completely released. Check the brake fluid level and fluid quality in the reservoir tank once a month, keeping the brake system in normal operation condition at all times. Brake fluid must be changed when the truck is stored for more than 6 months.

MAINTENANCE OF THE HYDRAULIC SYSTEM

As far as possible unpack the truck and store it with the mast fully raised in the maximum backward tilt position. Once a month perform: the lifts, lowering, forward and backward tilt operations over three times. Inspect the hydraulic oil once a month, checking for leakage and viscosity.

BATTERY CARE

A battery check should be run once a month so as not to allow any loss of battery performance. The battery electrolyte level should be all the way up the specified level mark. Repeated charging is necessary when the specific gravity goes down below 1.230 (or 1.250 with an electric lift truck).

DRIVE SYSTEM MAINTENANCE

To prevent rust from developing it is necessary to operate the truck once a month in forward and reverse over a travel distance of 50 meters or more.

 NOTE: Careful performance of these inspections and maintenance will assure delivery of the Starke EcoMaxx forklift in the best possible condition.

INSPECTION OF INDUSTRIAL TRUCKS WHILE IN STORAGE

INSPECTION PERIOD SUMMARY

In order to maintain the quality of vehicles in storage and to deliver trucks in satisfactory condition, the following inspections must be performed periodically.

INSPECTION & SERVICE AREAS		INSPECTION & SERVICE INTERVALS		
		Receipt	Monthly	Semi-Annually
Vehicle Exterior	Paint Condition	○	○	○
	Rust Condition	○	○	○
	Damage (Each Part)	○	○	○
	Tires	○	○	○
	Cleanliness	○	○	○
Engine Compartment	Rust Condition	○	○	○
	Cleanliness	○	○	○
Functional Parts Operation		○	○	○
50m Travel		○	○	○

INSPECTION & SERVICE AREAS	INSPECTION & SERVICE INTERVALS		
	Receipt	Monthly	Semi-Annually
Engine Oil	○		●
Brake Fluid	○		●
Hydraulic Oil	○	○	○
Tire Pressure	○	○	○
Electroyte	○	○	○

○ Inspection / ● Replacement / Receipt: Inspection when the truck is received by the dealer. / Monthly: One month from the inspection performed upon reception, and every month thereafter. / Semi-Annually: Six month after reception by the dealer, and every 6 months thereafter.

INSPECTION ITEMS

AREAS	INSPECTION	DESCRIPTION	REMEDY
Vehicle Exterior	Paint Finish	Peeling Discoloration Damage	Touch Up Repaint
	Rust	Check Each Truck Part For Rusting	Remove Rust and Touch Up
		<i>Important Checkpoints:</i> Overhead Guard, Tilt Cylinder Rod, Shift Lever, Steering Post, Torque Converter Shift Rod, Back Rest, Mud Guard, Underside, All Esge and Protrusions or Indentations.	Repaint Rust Preventative

AREAS	INSPECTION	DESCRIPTION	REMEDY
		Check Underside For Rusting	Remove Rust And Touch Up.
		<i>Important Checkpoints:</i> Front Axle Housing, Steering Linkage, Power Steering Cylinder Rod.	Repaint Rust Preventative
	Damage	Damage During Transport Damage While In Stock	Touch Up Replace Parts Body Repair Repaint
	Tires	Dirty Damaged	Clean Replace
	Cleanliness	Exterior Extremely Dirty Foreign Matter Adhering	Clean & Wash Truck Repaint Be Sure To Wipe Completely Dry After Washing Clean an Electric Truck With Damp Cloth; Do Not Use Water
Engine Compartment	Cleanliness	Engine or Engine Compartment Extremely Dirty	Blow Off Dirt With Compressed Air, Clean, Wash

AREAS	INSPECTION	DESCRIPTION	REMEDY
	Rust	Engine Or Engine Compartment Rusting	Remove Rust, Blow Out With Compressed Air, Wash, And Touch Up Paint.
		<i>Important Checkpoints:</i> Engine Mounting Cylinder Head, Cylinder Head Bolts, Cylinder Block, Transmission, Machined Surfaces, All Joints and Connections, Counterweight	Rust Preventive.
Functional Parts	Hydraulic Systems	Raise, Lower, and Tilt Mast Both Forward and Backwards More Than 3 Times	Inspect, Adjust, and Repair.
	Gauges	With the Ignition Switch or All Switches ON, Check Operation With the Engine Running	Inspect, Adjust, Repair, Replace.
	50m Travel	Drive Both Forward and Reverse for More Than 50 Meters.	Inspect, Adjust, And Repair.
	Engine Oil	Inspect The Oil Level With The Level Gauge. Check Cleanliness, Viscosity And Possible Deterioration.	Replenish After Assuring Cleanliness. If Truck Has Been In Storage Over Six Months, Change Oil.
		Do Not Check Oil Immediately After Turning Off Engine.	
	Brake Fluid	Check The Amount Of Brake Fluid in the Master Cylinder Reservoir Tank. (Fluid Should Be Up to Stepped Position of Reservoir Tank)	Replenish After Assuring Cleanliness.
		Foreign Matter, Extreme Dirtiness Or Discoloration.	If Truck Has Been In Stock Over Six Months, Change Fluid Before Operating.
			Remove Foreign Matter And Change Fluid.

BATTERY MAINTENANCE

ITEM	GASOLINE, DIESEL TRUCK	ELECTRIC TRUCK
Electrolyte Level Check	Should Be Up To Specified Level	Should Be Up To Specified Level
Specific Gravity Check	Measure At The Second Cell For Battery Plus (+) Terminal. Specific Gravity: 1.260	1.250 (20°C). Remove Battery And Recharge If Below This Level.
Lower Limit Of Specific Gravity	1.230 (20°C). Remove Battery and Recharge if Below This Level.	1.250 (20°C). Remove Battery And Recharge If Below This Level.
Charging	Do Not Perform Quick Charge. Measure Specific Gravity 01 Each Cell After Charging	Measure Specific Gravity Of Each Cell After Charging.
Measure the Specific Gravity of Each Cell after Charging	Convert the Specific Gravity Of Electrolyte Into What It Would Be at a Fluid Temperature of 20°C. $S_{20} = S_t + 0.0007 (t - 20)$ S_{20} : Specific Gravity at 20°C S_t : Actual Specific Gravity Measured t : Temperature of Electrolyte When Measured	

RUST PROOFING

The engine compartment chassis and undersides should be cleaned, touched up and rust removed. A rust preventative should be applied to long-term storage trucks.

SERVICE REQUIREMENTS

GENUINE STARKE REPLACEMENT PARTS

There are genuine Starke EcoMaxx Parts available for all repairs and maintenance required on the forklift. Contact your Starke EcoMaxx dealer. Refer also to the User Parts Catalogue supplied with the forklift.

DISPOSING OF ENGINE OIL AND BATTERIES

To avoid damage to the environment, do not dispose of used engine oil, batteries, filters, etc. yourself. Dispose of such waste products in accordance with the legislation in your area, or use an authorized waste treatment agency.

SAFE WORK PRACTICES

Ask your Starke EcoMaxx dealer about inspections other than routine per-work and weekly inspections. Your dealer has qualified staffs that are fully trained in the equipment you use. Repair manuals are also available from your dealer for information on service requirements.

NOTES ON DAILY EQUIPMENT CHECKS

-  Always use safety equipment (safety helmet, safety shoes, safety goggles, gloves, etc.).
-  Always use the correct tool for the job.
-  Perform forklift maintenance on level ground with firm footing.
-  Remove the ignition key and disconnect the battery plug.
-  Lower the forks and other moving parts to the ground.
-  Wear goggles and a respirator when using compressed air.
-  Visually inspect for oil leaks. Never use your bare hands.
-  When performing maintenance checks with in the forks raised position, use measures to prevent the forks from falling.
-  Mop up oil or grease spills immediately.
-  Exposed flames are strictly forbidden when handling flammable materials such as oil-soaked cloths.

MAIN OPTIONS AND ATTACHMENTS

Back-Up Alarm	Side Shift Fork
Rear-View Mirror	Hinged Fork
Rear Combination Lamp	Roll Clamp
Beacon Light	Bale Clamp
LPG Vehicle (Engine-Powered Models)	
Upswept Exhaust (Engine-Powered Forklifts)	
High-Capacity Battery	
Charger (Electric-Powered Forklifts)	

SAFETY EQUIPMENT AND WARNING LABELS

Caution plates are installed on all Starke EcoMaxx industrial forklifts. Never operate the forklift improperly. Always properly inspect and maintain the forklift.

The information on the caution plates provides guidelines for safe operation. Make sure you fully understand and follow the information provided on them. Replace caution plates that are damaged or defaced and are no longer legible with new caution plates. Your Starke dealer can provide new caution plates.

-  **MOVING PARTS WARNING:** Never place hands or other body parts in this area.
-  **FORK MOVEMENT WARNING:** Never use the forks to lift people. Never enter the range of movement of the forks.
-  **ROTATING FAN WARNING:** Beware of rotating fan. Do not touch.
-  **LIFT POINTS:** Always use the lift points and follow the guidelines on the cautions.
-  **OPERATION CAUTIONS:** Always read these notes before operating the forklift.
-  **NOTE:** When parking LPG forklifts for the night, check that the LPG valve is closed, the fuel supply is cut, and the engine is stopped before turning off and removing the ignition key.

HANDLING THE BATTERY SAFELY

Never allow an open flame near the battery. The battery gives off hydrogen gas which can catch fire and/or explode.

Always use protective gear such as rubber gloves and/or rubber-soled shoes when handling the battery. The battery produces a high-voltage current which can cause electric shocks and/or burns if the battery comes into contact with a part of the body during installation, maintenance or inspection.

Never allow the electrolyte to come into contact with the skin, clothing or eyes. The electrolyte used in the battery is diluted sulphuric acid and can cause burns and/or blindness.

Never clean or dust the top of the battery and/or the connection terminals with a dry cloth, and do not cover the battery with a plastic sheet. This can result in a build-up of static electricity and cause an explosion.

Do not place flat pieces of metal on top of the battery as this can short circuit the battery and cause a fire or ignite an explosion.

Do not store the battery close to equipment that emits heat, such as transformers, or that emits sparks, such as switches, fuses or welding equipment.

NOTES ON CHARGING

When charging the battery while it is in the forklift, keep the battery cover open. Ensure that a “No Exposed Flames” sign is prominently displayed when charging the battery.

To prevent the hydrogen gas from igniting during battery charging, observe the prohibition on open flames.

Do not stop charging by disconnecting the charging plug or battery plug. There is a risk that sparks will be generated that can cause accidents. Always use the controls on the switch panel to stop charging. Do not stop charging by disconnecting the switch breaker at the power source as this will cause the battery charger to assume that a power failure has occurred and result in abnormal operation.

NOTES ON OTHER HAZARDS

CHOCKING THE WHEELS TO PREVENT RUNAWAYS

The edges of docs and platforms are dangerous! Chock the wheels to prevent the forklift from rolling off the edge.

TAKE APPROPRIATE SAFETY MEASURES IN HAZARDOUS LOCATIONS

Employ the safety measure necessary to ensure safety when working on road shoulders and edges of cliffs or where landslides may occur. Do not work close to the road shoulders or the edges of cliffs as the ground is soft.

CHECK THE LOAD-BEARING STRENGTH OF RAMPS AND OTHER STRUCTURES

The weight of a laden forklift is the weight of the forklift itself plus the weight of the load being carried. Check the strength of the floor when working on ramps and other structures. Also check the strength of the ramp girders before crossing the ramp, and drive in the middle of the ramp. When using an elevator to lift the forklift, ensure that the elevator is designed for lifting forklifts and only use the elevator when the forklift is unladen.

DO NOT TURN ON INCLINED SURFACES

When carrying loads up or down a slope, go forwards up the slope and backwards down the slope. Do not turn on a slope as this may cause the forklift to tip over.

DO NOT USE THE CHARGER TO OPERATE THE FORKLIFT OR TO LIFT LOADS (ELECTRIC-POWERED MODELS)

Do not use any power source other than the battery.

OPERATION SAFETY TIPS

- 1. Only Properly Trained and Authorized Drivers Should Operate Forklift Trucks Are you qualified to be a forklift truck driver?**
Are you qualified to be a forklift truck driver?
Are you familiar with the forklift truck you operate?
Do you wear a safety helmet and proper clothing on the job?
- 2. Before Starting Work Check the Condition of the Forklift Truck**
Stop and think safety before starting the day's work. No truck should be operated unless it is in good working condition. Refuse to operate a forklift truck which in your opinion is unsafe.
- 3. Immediately Report To Your Supervisor Any Obvious Defects or Required Repairs**
A defective forklift truck or one requiring repairs should be taken out of service until it has been restored to safe operating condition. Remember, safe handling begins with a safe forklift truck.
- 4. Don't Overload the Forklift**
Check load weights and handle only within the rated capacity of your forklift truck. Before picking up a load, be sure of how much it weights and where its load center is located. Safe operation requires understanding and observing the forklift truck's rated load capacity.
- 5. Always Use the Proper Size Pallet**
Check the condition and safe loading capacity of the pallet. The sudden collapse of block stacking often results from a faulty pallet.
- 6. Set the Forks to the Maximum Possible Width**
Before picking up a load make sure that the forks are as wide apart as the pallet or load will allow. Wide fork spacing keeps the load stable.
- 7. Watch For Loose Loads**
Handle only stable, safely arranged loads.
- 8. Position Loads Evenly On the Forks for Proper Balance**
When handling wide loads or off-center loads that cannot be centered I operate with caution to prevent tipping over the forklift truck. Also use caution when handling long lengths of bar stock, lumber, etc.
- 9. Never Elevate a Load with the Forklift Truck on an Incline**
When on an incline always watch the condition of the surface. When operating on an incline with the load lifted high, just a slight bump or hole in the floor would be enough to tip the truck.
- 10. Do Not Permit Anyone to Stand between Elevated Forks**
Never stand or pass, or permit anyone else to stand or pass under the elevated forks whether empty or loaded.
- 11. Keep Hands and Feet Out Of the Mast Assembly**
Never reach through the mast assembly for ANY reason. Just one small mistake could result in serious injury.
- 12. Always Use the Loads Backrest Extension and Overhead Guard for High Stacking**
Be especially alert for falling objects when high stacking. Make sure no loose articles are lying on top of the load.
- 13. Do Not Elevate the Load with the Mast Tilted Forward**
The mast should always be vertical or tilted backward when lifting a load, never tilt forward beyond the vertical, and an elevated load may be tilted forward only when putting it on the stack or directly over the unloading area.
- 14. Carry Loads as Close to the Floor As Possible**
Keep the forks low, 100 to 150 mm (4 to 6 inches) off the floor in most cases. Never travel with the load lifted higher than necessary for adequate clearance

- 15. Keep the Load against the Backrest, With the Mast Tilted Backward**
Never lift or lower loads with the forklift truck in motion. And be sure that the full length of the forks is under the load, with the load against the load backrest.
- 16. Always Look Before Starting Operation**
Before starting, first make sure that the direction lever is in position for the desired direction of travel and then make sure that the road is clear.
- 17. Start and Stop G-R-A-D-U-A-L-L-Y and S-L-O-W-L-Y**
Avoid Quick or jerky starts and stops, particularly when loaded or when stacking. Never turn sharply at high speed. Bring the forklift truck to a gradual full stop before reversing.
- 18. Keep Your Forklift Truck under Control at All Times**
Always drive at a safe speed considering all conditions. Be sure you understand your limitations.
- 19. Always Keep a Safe Distance from Other Vehicles**
Keep a safe distance behind other moving vehicles to allow sufficient space for safe stopping under any condition.
- 20. Never Overtake Other Vehicles**
Never pass other vehicles moving in the same direction at intersection blind spots and other dangerous places. Always expect the unexpected!
- 21. Avoid Stunt Driving and Horseplay**
Safety is the matter of your own attitude. This is difficult to measure but quickly becomes evident once you are behind the wheel. It's not your forklift truck. It's you who invites trouble!
- 22. Don't Daydream! Stay Alert!**
Keep your eyes open while driving. Always watch where you are going.
- 23. Slow Down For Wet, Slippery Areas**
You know how easy it is to lose control of your forklift truck on wet, slippery places. A forklift truck is not built for winning a Safari Rally in spite of similar road conditions.
- 24. Go Slow and Sound the Horn at Corners**
Go slow wherever vision is limited or obstructed. If your plant has traffic mirrors, use them. Observe stop signs, stop your forklift truck completely, sound the horn if necessary, and then proceed with extreme caution.
- 25. Cross Railroad Tracks Slowly and Diagonally Whenever Possible**
A railroad crossing can give a loaded forklift truck a real jolt. For a smoother railroad crossing, approach the tracks at an angle
- 26. Avoid Running over Loose Objects**
Remove hazardous loose objects rather than driving over or around them. Avoid holes and bumps that might disturb your load.
- 27. Always Watch Load and Mast Overhead Clearance**
Be sure of sufficient headroom under overhead installations such as lights, wiring, pipe work, sprinkler systems, doorway lintels, conveyors. Keep the mast as low as possible in all areas where overhead clearances are limited.
- 28. Watch Side Clearance**
Watch your side clearance, especially with wide loads. Where possible, drive in the center of the aisle to avoid endangering personnel or equipment.
- 29. Keep Hands and Feet inside the Truck**
While driving, do not put your arms or legs outside the forklift truck, you only have one set of each. Take care of them.

- 30. Watch Rear End Swing**
Because the rear wheels steer your truck the rear end swings wide when you turn. Use care in aisles and other tight places.
- 31. Do Not Allow the Fork Tips to Strike Objects**
Extreme care should be exercised when driving near anyone in front of any fixed object. Always keep the forks down when traveling.
- 32. For Better Vision with Bulky Loads, Drive Backward**
If your front view is obstructed by an extra wide load, drive in reverse so you can see where you are going. Better still, have a co-worker guide you.
- 33. Observe Floor Loading Limits**
Never assume that any surface over which your forklift truck is to operate is strong enough to support the weight with or without a load. Make sure the dock boards are securely fastened and are strong enough to take this moving load safely.
- 34. Have Brakes Set And Wheel Blocks In Place While Loading And Unloading**
When working on a loading dock. Make sure that the brakes of the trucks or trailers are set to prevent movement when you drive on. If a truck should roll forward, a serious accident could happen.
- 35. Always Drive With the Load Uphill On a Ramp**
Travel forward going up and in reverse coming down to keep the load from falling off. Don't descend with the load in front. Always go up and down grades slowly.
- 36. Use an Assistant When Going Up or Down a Ramp with a Bulky Load**
When driving forward up a ramp with a load so big you can't see ahead I get someone to guide you and make sure the way is clear.
- 37. Don't Use Your Forklift Truck to Lift Personnel**
This is extremely dangerous. Your forklift truck was designed for smooth, safe handling of things - not for elevating people.
- 38. Don't Carry Passengers**
Again, don't use your forklift truck for moving loads for which it was not designed. There is NO safe place on a forklift truck for a passenger to ride.
- 39. Shut Off Your Forklift Truck When Leaving It Unattended**
Always park on level ground with the forks flat on the floor, this ensures no one will run into them. Make sure that the brakes are set, the controls in neutral and the starter key or battery plug is removed.
- 40. No Smoking While Refuelling**
Turn off the engine when refuelling the forklift truck or when checking the battery - and don't smoke! Remember, the driver's seat is not a smoking seat.
- 41. Check the Condition of Your Forklift Truck after the Day's Work**
Keep your forklift truck in the best of health. Your personal care will not only prevent costly repairs and reduce downtime but will also make you safer, as well as the people and equipment around you. Report any faulty performance without delay.
- 42. Know Your Forklift Truck and Think Safety**
Make safety a matter of attitude. Expect the unexpected and use sound judgement whenever you are behind the wheel. Enjoy operating your Starke EcoMaxx Forklift!



STARKE MATERIAL HANDLING GROUP
402 Allanburg Road • Thorold, ON L2V 1A4 • Canada
TOLL FREE 877-435-4352
www.starkeforklift.com • info@starkeforklift.com

