

INTRODUCTION

This service manual has been prepared to provide necessary information concerning the maintenance and repair procedures for the 1Q2 series.

Any changes effected in the series after publication of this service manual will be announced in a technical bulletin. It is, therefore, recommended that each relevant technical bulletin be inserted in front of each section and be used together with the service manual as a reference.

If a new model requires different service method or has undergone a major change, revised sections will be issued to replace the applicable sections. Each revised section will include the description of how to service the parts for the former specifications. The publication of a revised section will be announced in the technical bulletin.

This service manual consists of fourteen sections as shown in the following table, which gives the updated symbols. When a revised service manual is issued, this “INTRODUCTION” sheet should be replaced with a revised one.

Section	Symbol
GENERAL INFORMATION	(GI)
MAINTENANCE	(MA)
CONTROL SYSTEM	(CS)
BATTERY AND CHARGER	(BC)
ELECTRICAL SYSTEM	(EL)
MOTOR MECHANISM	(MM)
DIFFERENTIAL CARRIER	(DF)
FRONT AXLE	(FA)
REAR AXLE	(RA)
BRAKE SYSTEM	(BR)
STEERING SYSTEM	(ST)
HYDRAULIC SYSTEM	(HD)
LOADING MECHANISM	(LM)
BODY AND FRAME	(BF)

FOREWORD

This manual contains maintenance and repair procedures.

In order to assure your safety and the efficient functioning of the lift truck, this manual should be read thoroughly. It is especially important that the PRECAUTIONS in the GI section be completely understood before starting any repair task.

All information in this manual is based on the latest product information at the time of publication. The right is reserved to make changes in specifications and methods at any time without notice.

IMPORTANT SAFETY NOTICE

The proper performance of service is essential for both the safety of the technician and the efficient functioning of the lift truck.

The service methods in this Service Manual are described in such a manner that the service may be performed safely and accurately.

Service varies with the procedures used, the skills of the technician and the tools and parts available.

Accordingly, anyone using service procedures, tools or parts which are not specifically recommended by NISSAN must first be completely satisfied that neither personal safety nor the lift truck's safety will be jeopardized by the service method selected.

No modifications or alterations to a powered industrial truck, which may affect, for example, capacity, stability or safety requirements of the truck shall be made without the prior written approval of NISSAN, its authorized representative, or a successor thereof. Contact an authorized NISSAN FORKLIFT dealer before making any modification or alteration to your industrial truck that may affect, for example braking, steering, visibility and the addition of removable attachments. After getting approval of NISSAN, its authorized representative, or a successor thereof, capacity plate, decals tags and operation and maintenance handbooks shall also be changed to the appropriate one.

Only in the event that NISSAN is no longer in business and there is no successor in the interest to the business, the user may arrange for a modification or alteration to a powered industrial truck, provided, however, that the user shall:

- A. Arrange for the modification or alteration to be designed, tested and implemented by an engineer(s) expert in industrial trucks and their safety;
- B. Maintain a permanent record of the design, test(s) and implementation of the modification or alteration;
- C. Approve and make appropriate changes to the capacity plate(s), decals, tags and Instruction Handbook;
- D. Affix a permanent and readily visible label to the truck stating the manner in which the truck has been modified or altered together with the date of the modification or alteration, and the name and address of the organization that accomplished the tasks.

GENERAL INFORMATION

SECTION **GI**

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HOW TO USE THIS MANUAL

Outline of This Manual

Section symbol	Section title	Topics
GI	General information	How to use this manual, identification information, general precautions, jacking, lifting, towing and tightening torque of standard bolts.
MA	Maintenance	Inspection, adjustment, part replacement and lubricant replenishment
CS	Control system	Precautions, controller unit inspection and adjustment, meter panel, LCD mode description, switches and sensors inspection, trouble diagnostic procedures, trouble diagnoses for controller.
BC	Battery and charger	Precautions, battery and battery charger.
EL	Electrical system	Precautions, electrical component parts, location of electrical units, harness layout, fuses, lighting system, switches, miscellaneous electrical parts, location of optional parts and wiring diagrams.
MM	Motor mechanism	Service data and specifications, trouble diagnoses and corrections, precautions and preparation, traction motor, hydraulic pump motor and motor inspection.
DF	Differential carrier	Service data and specifications, trouble diagnoses and corrections, precautions and preparation, construction, removal, installation, disassembly, assembly and inspection.
FA	Front axle	Service data and specifications, trouble diagnoses and corrections, precautions and preparation, construction, component parts, hub and axle housing.
RA	Rear axle	Service data and specifications, trouble diagnoses and corrections, precautions and preparation, construction, component parts, removal, inspection, installation and adjustment.
BR	Brake system	Service data and specifications, trouble diagnoses and corrections, precautions and preparation, construction, service brake, brake pedal, master cylinder, brake piping and parking brake.
ST	Steering system	Service data and specifications, trouble diagnoses and corrections, precautions and preparation, steering wheel, steering column assembly, power steering valve, power cylinder and steering piping.
HD	Hydraulic system	Service data and specifications, trouble diagnoses and corrections, precautions and preparation, hydraulic piping system, hydraulic pump (gear pump), control valve, control lever, tilt cylinder, lift (mast) cylinder and oil tank.
LM	Loading mechanism	Service data, trouble diagnoses and corrections, precautions and preparation, construction, fork, lift chain, carriage assembly and mast assembly.
BF	Body and frame	Service data, precautions, construction, removal, installation, body parts and accessories.

This Manual contains the essential information required to perform effective forklift maintenance procedures. All forklift units are included. Informational configuration in the CS (control system) section differs from that of other sections. The CS section introduces how to utilize information in the section.

Outline of This Manual (Cont'd)

MAIN TEXT ENTRIES

Main text entries describe unit removal, unit disassembly, inspection, unit reassembly, unit installation and adjustment procedures. Step-by-step descriptions are provided for all of these procedures.

Together with the step-by-step descriptions, other important information is provided. This information includes service points and tips, basic units and values, required specified tightening torques and required special service tools. Information pertaining to common tools generally found in all maintenance facilities is generally omitted. This information is included in the exploded part views and other drawings as required.

OTHER ENTRIES

The following information is included at the beginning of all sections as a supplement to the main text.

Service data and specifications

Adjustment values, part selection information and specified tightening torque values are shown for all procedures described in the main text.

Trouble diagnoses and corrections

Individual symptoms, probable causes and remedial measures indicated by these symptoms are described.

Precautions and preparation

- Precautionary and reference information related to the entire section is provided.
- Special service tools are required for some maintenance procedures. Special service tool name, tool number and tool application information as well as illustrations depicting tool shapes are included.

Technical Term Definitions

SPECIFIC TERMS

WARNING:

Warns you of instructions that must be followed to prevent severe personal injury and/or fatal accident.

CAUTION:

Warns you of instructions that must be followed to prevent personal injury and/or damage to some parts of the vehicle.

NOTE:

Provides helpful information to perform a smooth and effective service procedure.

Standard value or specifications:

The allowable range for a given measured value during inspection and adjustment.

Limit value:

The maximum or minimum acceptable measured value during inspection and adjustment.

HOW TO USE THIS MANUAL

Technical Term Definitions (Cont'd)

MEASURING UNITS AND VALUES

Specified torque, pressure, force and other values used in this Manual are primarily expressed as the SI unit (International System of Unit). The values following the SI unit and enclosed in parentheses () are expressed in the metric system and in the yard/pound system.

Example:

Tightening torque:

9 - 12 N•m (0.9 - 1.2 kg-m, 6.5 - 8.7 ft-lb)

SI unit

Metric system

Yard/pound system

Main unit conversions:

	SI unit	Metric system	Yard/pound system	Conversion factor to SI unit
Torque and moment	N•m	kg-m	–	9.807
		–	ft-lb	1.356
Force	N	kg	–	9.807
		–	lb	4.448
Pressure	kPa	kg/cm ²	–	98.07
		–	psi	6.895
	MPa	kg/cm ²	–	0.0981
		–	psi	0.0069

NOTE:

Converting the unit in metric system or yard/pound system to SI unit is shown below.

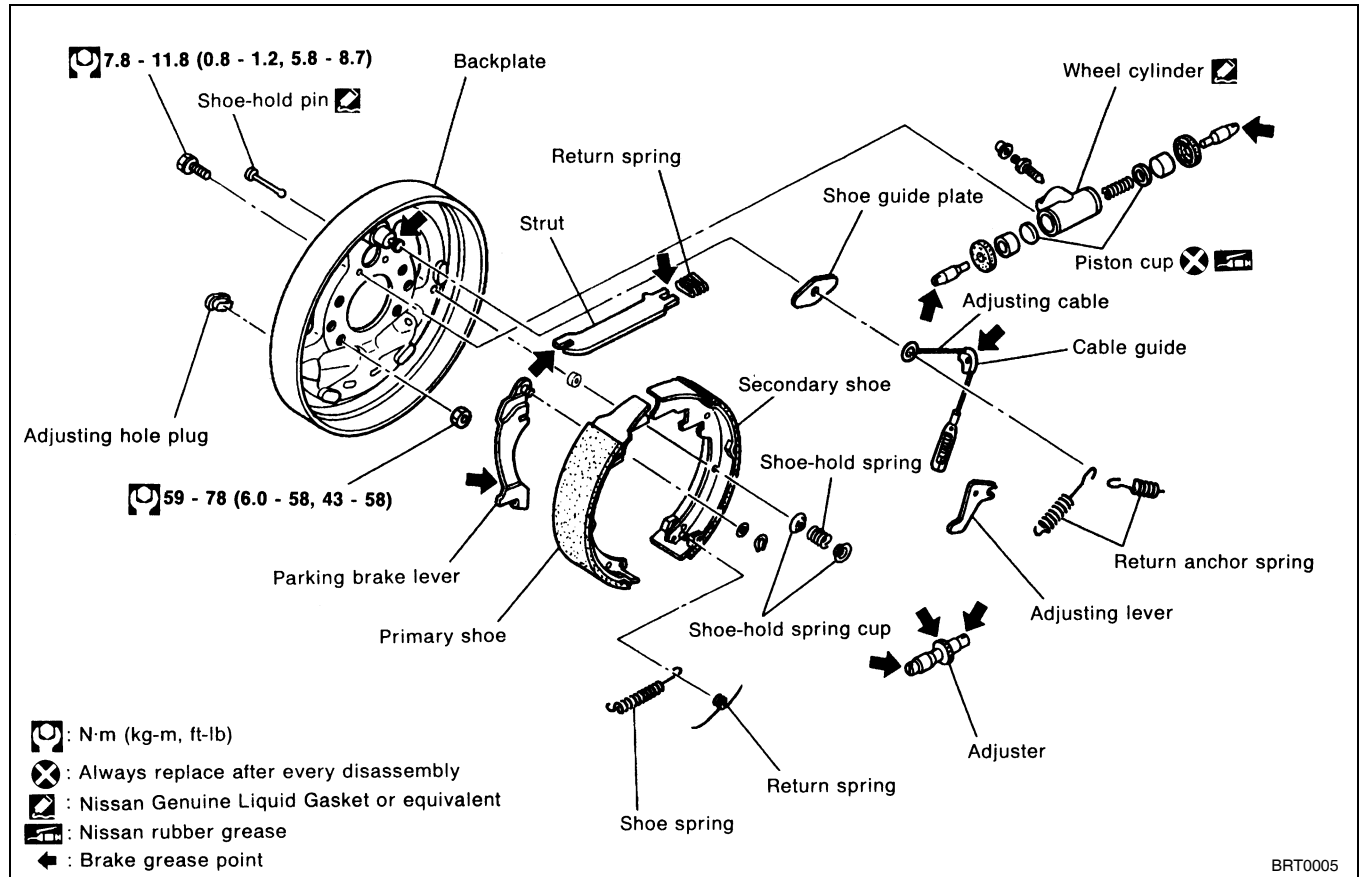
Unit in metric system or yard/pound system x conversion factor = SI unit

HOW TO USE THIS MANUAL

Manual Illustrations

EXPLODED VIEWS

These contain part names, tightening torques, lubrication points and other information necessary to perform removal, disassembly, repair, reassembly and installation procedures. (See example below.)



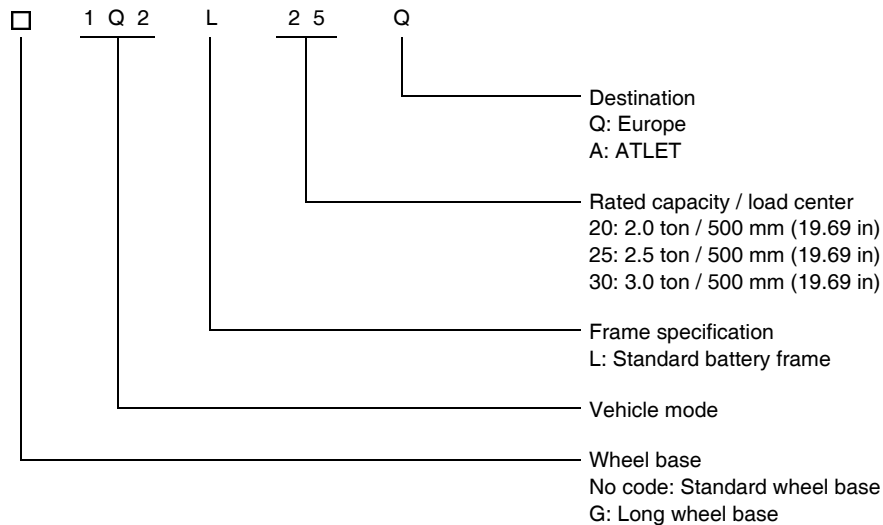
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SYMBOLS USED IN EXPLODED VIEWS

Symbol	Meaning	Symbol	Meaning
[Torque Symbol]	Specified tightening torque is required for part installation. When a torque range is given, use the average figure as the standard.	[X Symbol]	Always replace after every disassembly.
[Grease Symbol]	Should be lubricated with specified grease.	[Star Symbol]	Select parts of proper thickness.
[Lubrication Symbol]	Should be lubricated with oil.	[Star with Dot Symbol]	Adjustment is required.
[Sealing Symbol]	Sealing point.	—	—

IDENTIFICATION INFORMATION

Vehicle Model Classification Number



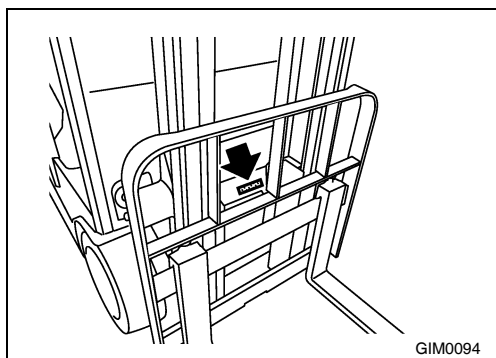
Vehicle Identification Number

GENERAL

The vehicle identification number is stamped on the front of the frame.

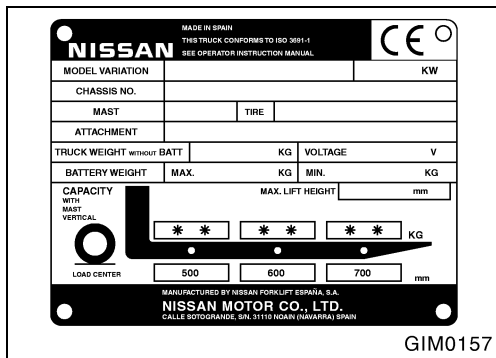
VEHICLE IDENTIFICATION NUMBER ARRANGEMENT

1Q2 - XXXXXX
G1Q2 - XXXXXX



Identification Plate

The identification plate shows the vehicle type, vehicle model classification number, vehicle identification number (chassis number), permissible load at load center, mast type, maximum mast elevation, battery voltage, available vehicle attachments and vehicle weight.



Description

- The vehicle may be hoisted and/or suspended only under the direct supervision of a person who has completed the required educational courses in forklift hoisting and suspension techniques.
- The forklift service area must be well ventilated and free of flammable objects and materials.
- If servicing the forklift in an area that has previously been closed off or poorly ventilated, open all windows and doors and thoroughly ventilate the area before starting the service procedure.
- Be extremely careful whenever handling flammable materials and other dangerous objects.
- Do not smoke during service operations.
- Exercise care when working around high-temperature, rotating or sliding area of the forklift. Avoid burns and other serious injuries.
- When removing a heavy unit or component from the forklift, be careful not to lose you balance and drop it.
- Before beginning disassembly and inspection, remove all rings, your watch and other metallic objects from your body to prevent an accidental short circuit.
- Carefully analyze all symptoms during troubleshooting. This will allow you to make repairs safely and efficiently. After completing a troubleshooting and repair procedure, carefully check to make sure that all existing problems have been rectified.
- Before beginning part removal and disassembly, carefully note the manner in which the unit or part is installed to the forklift and the way in which the part or unit is assembled. This will ensure smooth reassembly and installation.
- Make alignment marks on parts to be disassembled as required for easier and proper reassembly. Marks should be made in areas of the parts that will not affect function.
- When removing wires, note the color codes and remember the wiring configuration before removal.
- Use the proper tools for the disassembly and inspection procedures. Use the designated special service tools if required.
- Tools used for disassembly and inspection must be clean and completely free of foreign material. Place disassembled parts in a clean area after disassembly.
- Turn the key switch to the OFF position and disconnect the battery plugs before beginning the disassembly and inspection procedure.
- Do not mix up disassembled parts. Place them carefully to the side in their order of removal.
- Under no circumstances should electrical components (controllers, motors, battery charging units and wiring) be steam-cleaned.
- Clean internal areas of the controllers, motors with an air blower (never with steam). Following cleaning, check the insulation resistance.
- When disconnecting pressurized pipes or hoses, release the pressure from the line before removing.

Description (Cont'd)

- When removing the battery or the counterweight chock the wheels. Never remove the battery or the counterweight when the forklift is raised on jacks.
- Carefully clean all disassembled parts before inspection and reassembly.
- Use only the specified nuts and bolts to install parts. Tighten the nuts and bolts to the specified torque as required.
- Carefully check all removed oil seals, gaskets, packing materials, O-rings, lock washers, cotter pins and self-locking nuts against the instructions on each section to see whether or not they can be reused. If they cannot be reused, they must be replaced with new ones. If replacement parts are required, refer to the Parts Catalog distributed by Nissan Motors. Be sure that the replacement parts have the correct part number. Use only genuine Nissan parts.
- When replacing taper roller bearings or needle bearings, always replace their inner races and outer races as a set.
- Use only the specified lubricants and sealants.
- Be careful not to splash the brake fluid on the body or other painted areas; it may cause paint damage. If brake fluid is splashed on painted areas, immediately wipe it and wash the area with water.
- Never reuse drained brake fluid.
- Following repair of any system containing oil or brake fluid, carefully check the system for fluid leakage.
- Do not carelessly dispose of discarded oil from oil changes and part cleaning operations. Dispose of the oil following established procedures.

Precautions for Electrical System Inspection

- Turn the key switch to the OFF position and disconnect the battery plugs when disconnecting or connecting the print board connectors. Disconnecting and/or connecting the main print board or meter print board connectors with the key switch ON and the battery plugs in place can damage the print board. Exercise care.
- Avoid twisting and turning the print board connectors when connecting and/or disconnecting them. This can result in poor connector connections.
- When disconnecting connectors, do not pull on the wire attached to the connector. Always hold the connector body.
- When using a circuit tester, be very careful not to use the wrong range (A, V or Ω) and/or polarity.
- Static electricity can damage the main and meter print boards. Be sure to eliminate static electrical charges when handling the print boards.
- Following completion of the inspection procedure, once again check that all of the leads are connected to their original terminals.

Precautions for Handling Battery

⚠ WARNING:

- Do not permit open flames in close proximity to the battery when handling it.
- During battery maintenance, always wear safety goggles, rubber gloves and rubber boots.
- It is possible to burn yourself when working with a battery. Be careful not to allow your body and clothing to come in direct contact with the battery fluid.
- If large amounts of battery fluid have been spilled or leaked over an area, immediately neutralize the spill with some neutralizing agent (sodium bicarbonate, calcium hydroxide, carbon soda, etc.). Rinse the area with a large volume of water.
- Highly-explosive hydrogen gas leaks from the battery. If this gas is ignited by sparking from a short circuit in the battery terminal area, an explosion and serious damage can result. Avoid this danger by not placing tools and other metallic objects on top of the battery where they might short the battery terminals.
- Hydrogen gas escaping from the battery can also be ignited by static electricity in the area. Again, an explosion can result. Never wipe or dust the battery upper surface and terminal areas with a completely dry cloth as this will generate static electricity. Never cover the battery with a vinyl sheet or similar object to protect it. This can also generate static electricity. Clean the battery with a damp cloth.

⚠ CAUTION:

- Fluid leakage from a loosely closed battery electrolyte filler cap can cause many problems. Always be sure that the filler cap is tightly closed.
- Never entrust battery maintenance procedures to personnel who are not familiar with the techniques and safety precautions required for battery maintenance.

Special Service Tools

Special Service Tools play a very important role in the maintenance of the vehicle. These are essential to safe, accurate and speedy servicing.

The working times listed in the column under FLAT RATE TIME in FLAT RATE SCHEDULE are computed based on the use of Special Service Tools.

The identification code of maintenance tools is made up of 2 alphabetical letters and 8-digital figures.

Precautions

⚠ CAUTION:

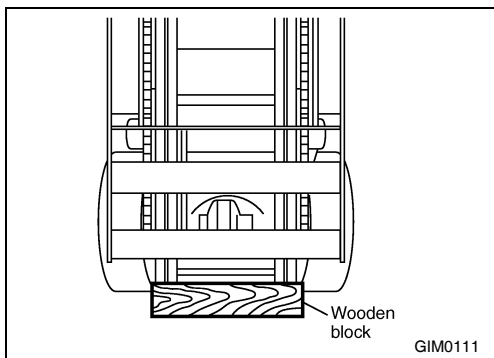
- Never get under the forklift or the fork while jacking or lifting the forklift.
- Always perform jacking or lifting operation on a flat and solid surface.
- Operate the key switch and individual operational levers only when sitting in the operator's seat. Never touch these controls when you are standing near the forklift.
- Be sure to apply the parking brake whenever jacking or lifting the forklift.
- Do not chock the forklift with multiple wooden blocks stacked one on top of the other. Only use one wooden block in place.
- Be sure to use wooden blocks of sufficient strength to support the weight of forklift.
- Never use cracked or broken wooden blocks. These may cause unstable support, putting you in danger.
- Never place wooden blocks of different heights side by side under the vehicle or the mast.

Jacking

PRECAUTIONS

⚠ CAUTION:

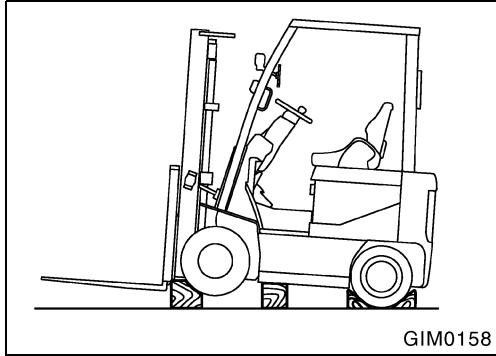
- Using the mast to raise the front wheels for an extended time period will eventually bend the mast. Place wooden blocks tightly under the front of the frame on both sides of the forklift to take the stress off the mast.
- Wooden block area and height should be such that the wooden blocks can just be inserted between the mast and the ground surface when the mast is tilted back. Front-to-back wooden block length should be 50 - 100 mm (1.97 - 3.94 in) larger than the mast rail front-to-back length. Side-to-side wooden block width should be 20 - 40 mm (0.79 - 1.57 in) greater than the outer mast outside width.
- When jacking up the forklift, raise it until the wheels are slightly clear of the ground. Stop jacking. Do not attempt to raise the forklift above this level.



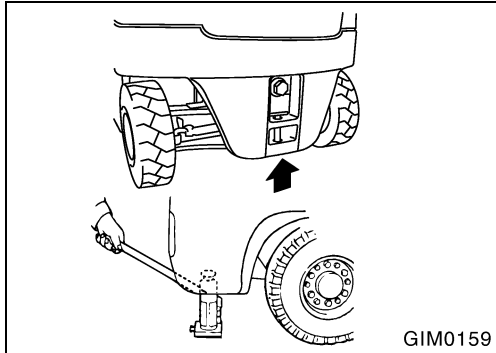
FRONT

1. Raise the forks 200 - 300 mm (78.7 - 11.81 in) from the ground, and tilt the mast completely back.
2. Place a square timber under the mast.

Jacking (Cont'd)

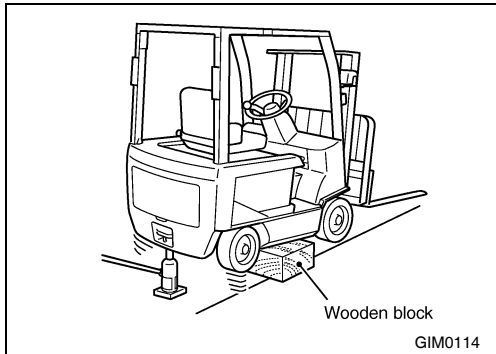


3. Tilt the mast forward until the front wheels lift up.
4. Place a square timber under the left and right frame.
5. Block the rear wheels.



REAR

1. Raise the forks about 100 mm (3.94 in) from the ground, and tilt them slightly back.
2. Block the front wheels.
3. Place a garage jack under the counterweight center, and then jack it up.



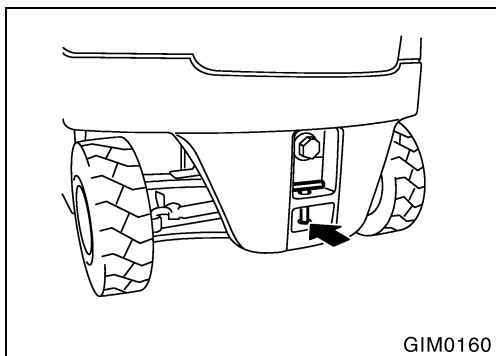
4. Jack up until the tires are slightly raised from the ground, place a square timber under the left and right frame, and then slowly lower the jack.

Towing (Freeing a stuck forklift)

If the forklift becomes stuck and cannot move under its own power, it may be recovered by a truck or similar vehicle. Attach the towing cable to the hook provided on the counterweight.

⚠ CAUTION:

- Do not use the hook for towing operation.
- Be sure that the towing cable is in perfect condition and that it has sufficient strength to pull the vehicle.



Lifting

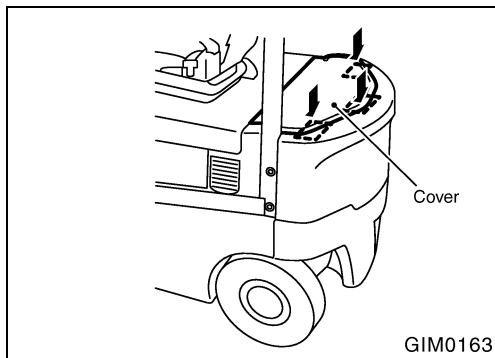
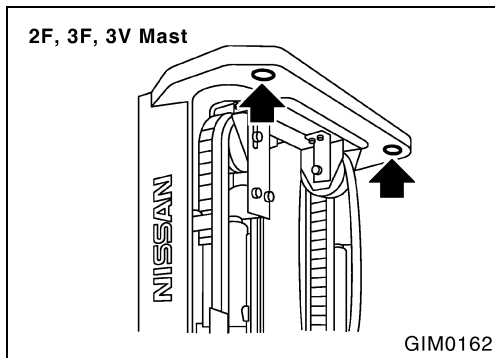
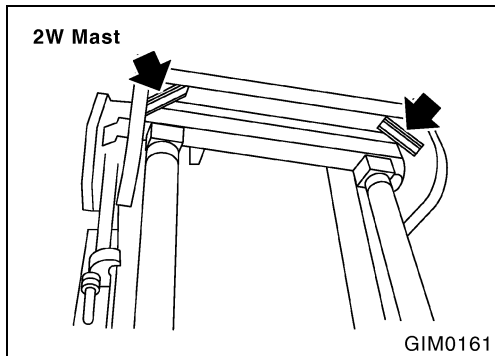
PRECAUTIONS

⚠ CAUTION:

- Do not use wooden blocks whose height exceeds 300 mm (11.81 in).
- Never hoist the vehicle unless it is absolutely necessary.
- Be sure that the hoist, nylon sling and lifting wire are in perfect condition. The hoist and wire must have sufficient strength to lift and support the forklift.
- Attach the lifting wire only to the specified points. Never attach the wire to any other part of the forklift.

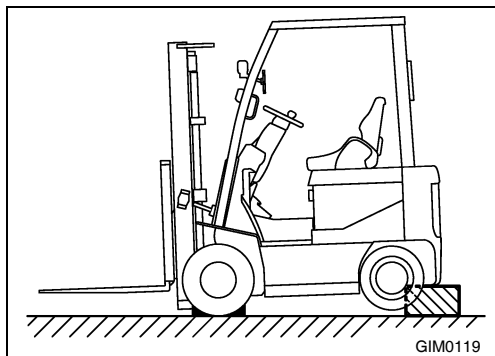
FRONT

1. Attach lifting wire to outer mast crossbeam. Use hoist to raise the front of vehicle.
2. Place wooden blocks under frame on both sides.
3. Slowly lower vehicle onto wooden blocks. Double-check to make sure that wooden blocks are positioned correctly.
4. Make sure that vehicle is settled firmly on wooden blocks by trying to shake the vehicle. It should be perfectly steady.
5. Chock rear wheels to hold vehicle stationary.



REAR

1. Utilizing the three hook points of the counterweight, lift using a hoist.
2. Place a square timber under the counterweight.
3. Gradually lower the forklift. Make sure that the square timber does not slip out of position at this time.
4. Rock the forklift to make sure that the body is securely supported.
5. Block the front wheels.



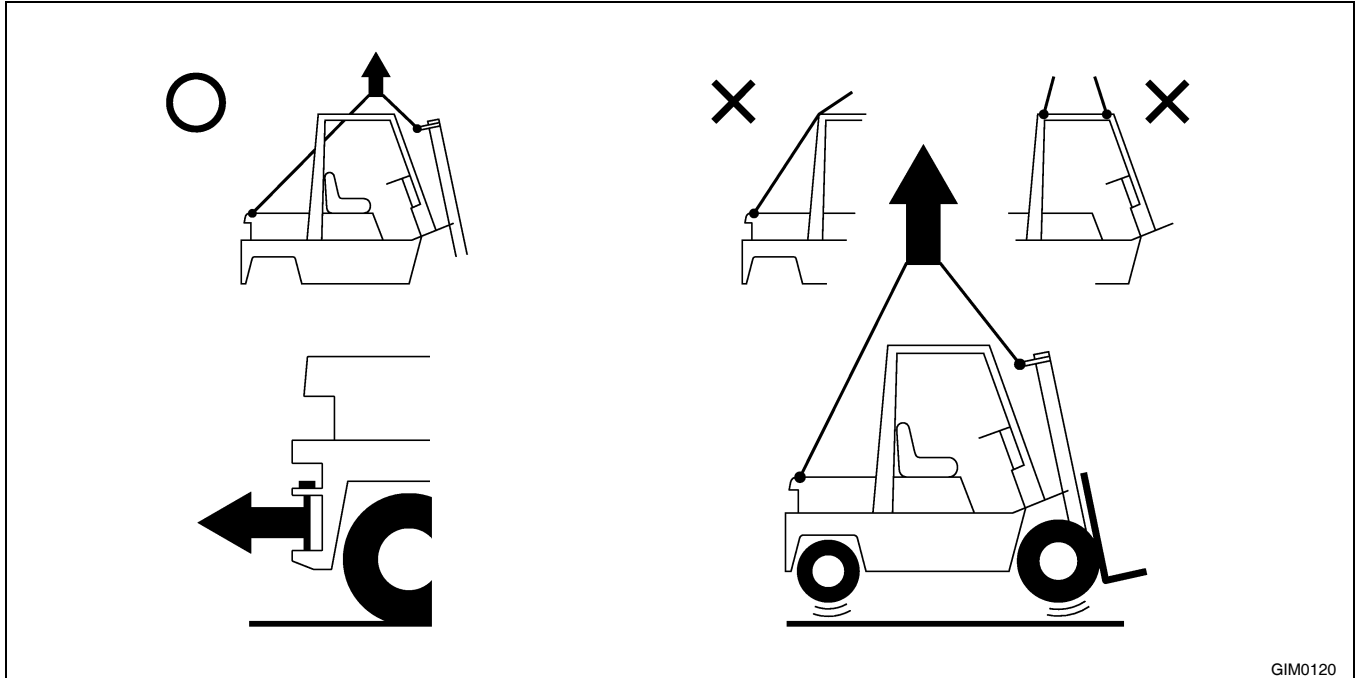
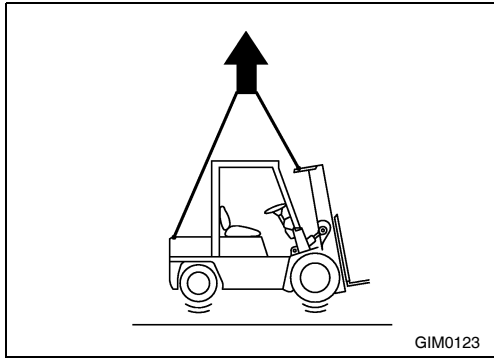
Lifting (Cont'd)

ENTIRE FORKLIFT

Utilizing the outer mast crossbeam and counterweight holes, attach a wire and then lift.

⚠ CAUTION:

Make sure that the wire does not interfere with the head guard.



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Thank you very much!**