NISSAN
FORKLIFT

SERVICE MANUAL & TECHNICAL BULLETIN

MODEL 1D1/1D2 SERIES

(VEHICLE)

SERVICE

INTRODUCTION

This service manual has been prepared to provide necessary information concerning the maintenance and repair procedures for the NISSAN FORKLIFT 1D1 and 1D2 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 Sixteen 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)
ENGINE REMOVAL	(ER)
AUTOMATIC TRANSMISSION	(AT)
DIFFERENTIAL CARRIER	(DF)
DRIVE AXLE	(DA)
STEERING AXLE	(SA)
ROAD WHEEL & TIRE	(RT)
BRAKE SYSTEM	(BR)
STEERING SYSTEM	(ST)
HYDRAULIC SYSTEM	(HD)
LOADING MECHANISM	(LM)
FUEL & EXHAUST SYSTEMS	(FE)
VEHICLE CONTROL SYSTEMS	(VC)
BODY & FRAME	(BF)
BODY ELECTRICAL SYSTEM	(BE)

Edition: April 2008
Printing: April 2008
Publication: SM08E-1D12EU

Printed in EU

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.

 Printed in The Netherlands

GENERAL INFORMATION

SECTION GI

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Outline Of This Manual

Symbol	Section title	Topics
GI	GENERAL INFORMATION	Outline of This Manual, Description, Technical Term Definitions, Manual Illustrations, Prefix and Suffix Designations, Identification Numbers, General Precautions, Basic Operations, Tightening Torque
MA	MAINTENANCE	Lubrication Chart, Maintenance Schedule, Engine Maintenance, Chassis and Body Maintenance
ER	ENGINE REMOVAL	Removal and Installation
AT	AUTOMATIC TRANSMISSION	Construction, Removal and Installation, Disassembly and Assembly, Control Valve, Input Shaft Assembly, Pump Assembly, Inspection and Adjustment
DF	DIFFERENTIAL CARRIER	Differential Carrier, Adjustment
DA	DRIVE AXLE	Construction, Removal and Installation, Disassembly and Assembly
SA	STEERING AXLE	Description, Specification, Trouble Diagnosis and Corrections, Removal and Installation, Disassembly and Assembly, Hub, Kingpin, Steering Axle Component Parts Location, Spindle Details, Service Data and Specifications (SDS)
RT	ROAD WHEELS & TIRES	Specification, Type of Tire, Application of Hub, Inspection, Installation
BR	BRAKE SYSTEM	Construction, Disassembly and Assembly, Inspection and Adjustment, Troubleshooting, Service Data and Specifications (SDS), Parking Brake
ST	STEERING SYSTEM	Description, Specification, Trouble Diagnosis and Corrections, Steering Wheel, Steering Column, PS Valve, PS Cylinder, Piping
HD	HYDRAULIC SYSTEM	Specification, Service Data and Specifications (SDS), Trouble Diagnosis, Precautions, Hydraulic Piping, Oil Pump, Control Valve, Lift (Mast) Cylinder, Tilt Cylinder, Replacement of Hydraulic Fluid, Hydraulic Piping
LM	LOADING MECHANISM	Service Data and Specifications (SDS), Trouble Diagnosis, Precautions, Fork, Lift Chain, Carriage Assembly, Mast Assembly, 3.5-ton Model Mast
FE	FUEL & EXHAUST SYSTEMS	Accelerator Wire, Accelerator Pedal, Fuel System, Exhaust System, LP Tank Swing Bracket
VC	VEHICLE CONTROL SYSTEM	Vehicle Control System, VCM Setting, Selection of Vehicle Specification, Storage of Settings, Functional Check, Trouble Diagnosis, VCM-1 Active Test, ECM Active Test, Diagnosis History, Table of Alarm Code, Inspection
BF	BODY & FRAME	Service Data and Specifications (SDS), Counterweight, Frame, Instrument Frame, Undercover, Overhead Guard, Top Panel, Floor Board, Plastic Cover, Seat
BE	BODY ELECTRICAL	Wire harness, Relay Box, Fuse Box, Combination Meter, Speedometer (Option), Switches, Headlights, Others

Description

This manual contains the information on methods required to perform appropriate maintenance. This main text describes removal, disassembly, inspection, assembly, installation, and adjustment procedures of units. Step-by-step descriptions or service points are provided for these procedures. Illustrations, values, tightening torques and SSTs are also provided as required.

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.

LOCATING DIRECTIONS

The direction (front, rear, left, right, upper, lower) shown in this manual shows the direction when sitting in the driver seat facing frontward.

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:

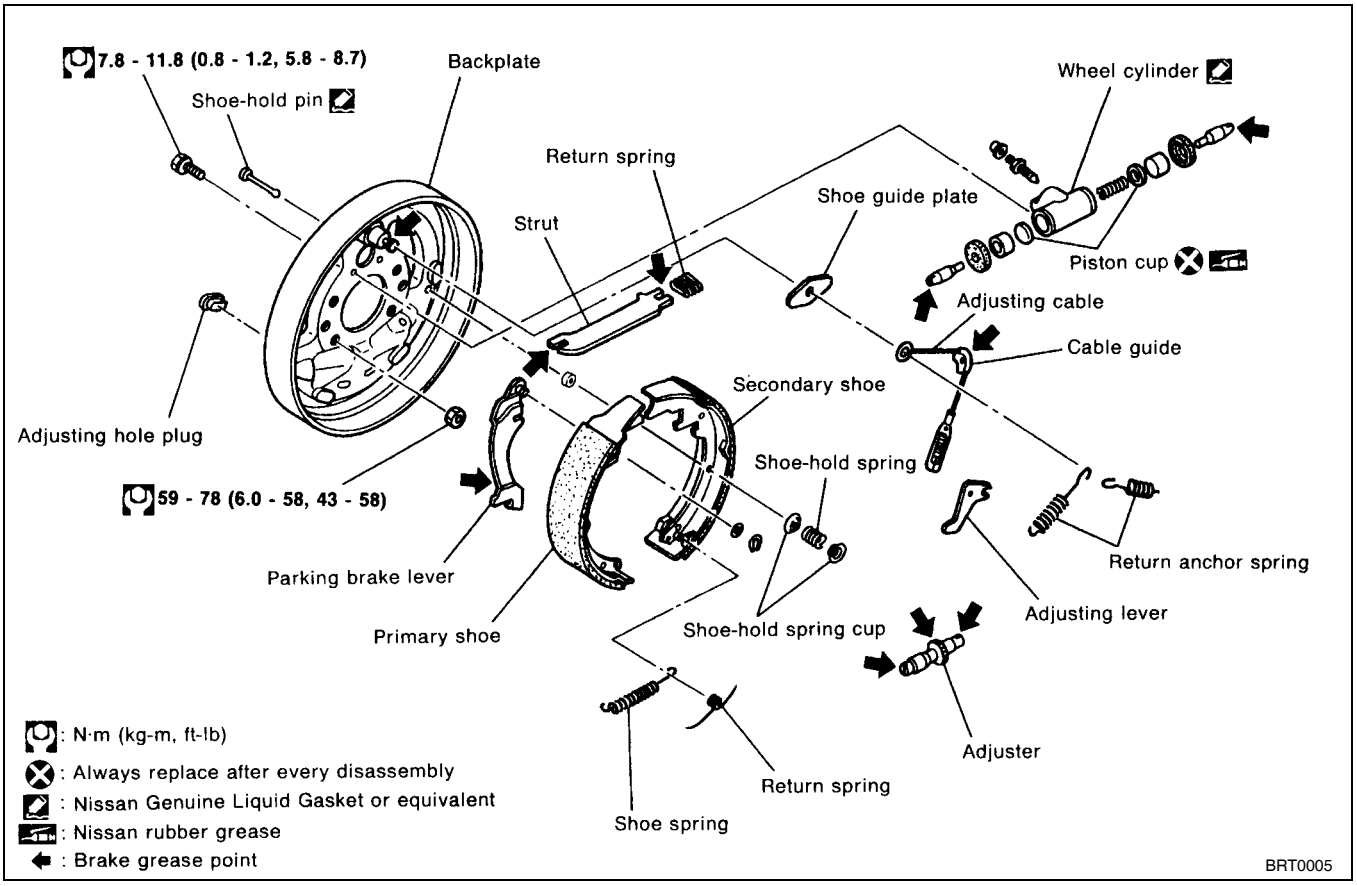
	SI unit	Metric system	Yard/pound system	Conversion factor to SI unit
Torque and moment	N•m	kg-m	–	9.807
		–	ft-lb	1.356
Force	N	kg	–	9.807
		–	lb	4.448
Pressure	kPa	kg/cm^2	–	98.07
		–	psi	6.895
	MPa	kg/cm^2	–	0.0981
		–	psi	0.0069

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

Manual Illustrations

EXPLODED VIEWS

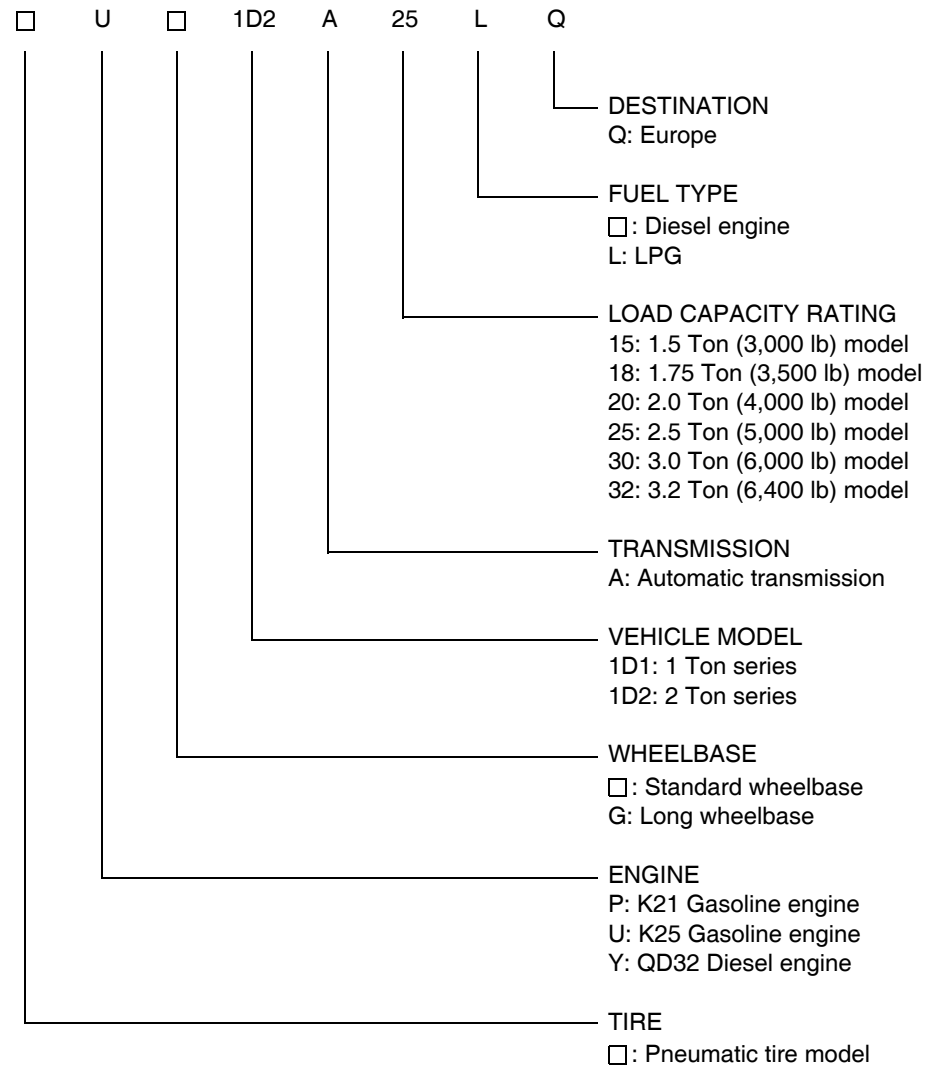
These contain part names, tightening torques, lubrication points and other information necessary to perform removal, disassembly, repair, reassembly and installation procedures. (See example below.)



Symbols used in exploded views

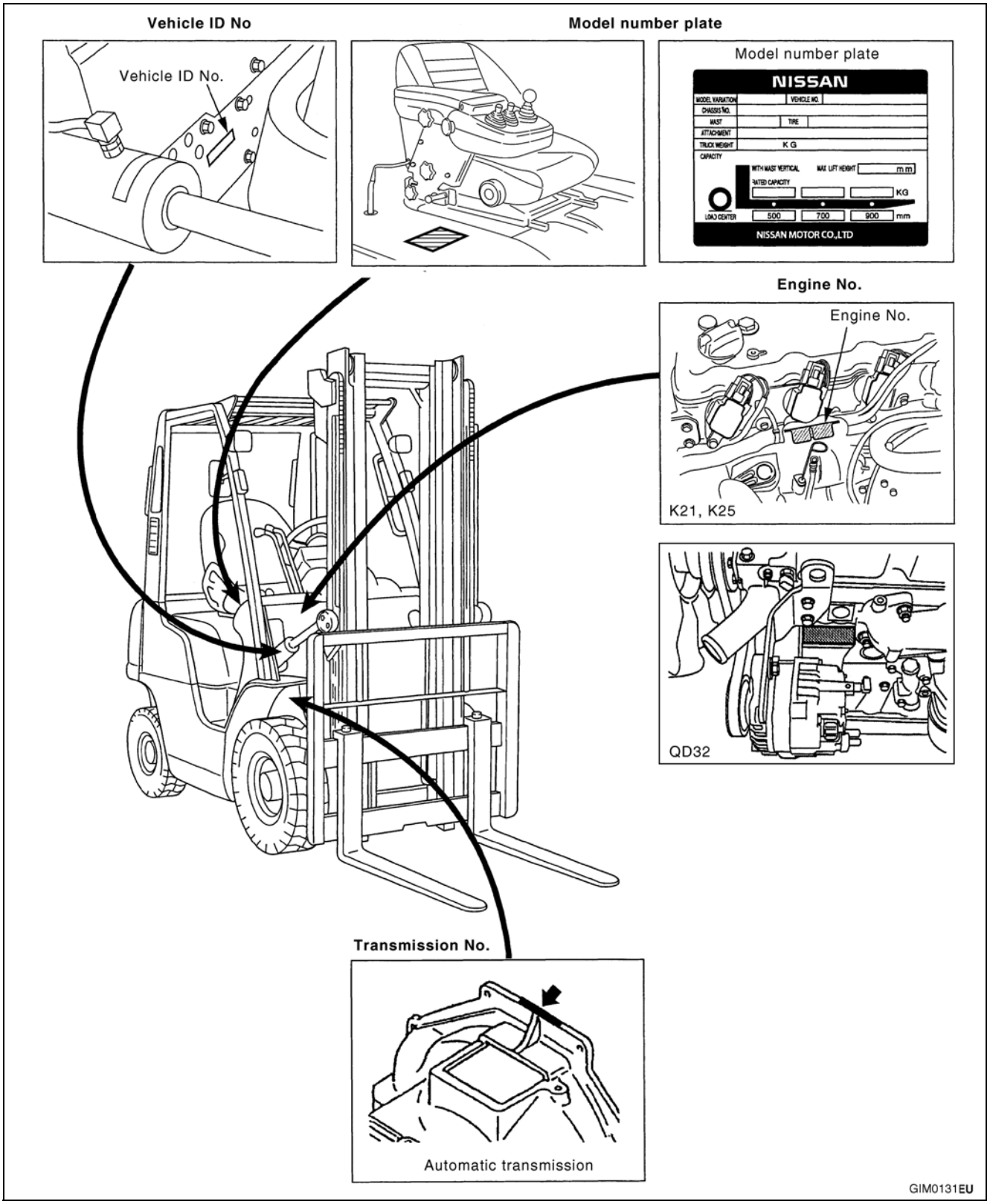
Symbol	Meaning	Symbol	Meaning
	Specified tightening torque is required for part installation. When a torque range is given, use the average figure as the standard.		Always replace after every disassembly.
	Should be lubricated with specified grease.	★	Select parts of proper thickness.
	Should be lubricated with oil.	☆	Adjustment is required.
	Sealing point		

Vehicle Model Classification Number



NOTE: □ Means no indication.

Identification numbers



General precautions

Please read and thoroughly understand this section as well as the reference "Precautions".

- Lifting and hoisting work should be performed by persons who have completed slinging skills training or hoisting skills training.
- Make sure that the work area is well ventilated and free of flammable materials.
- If work must be performed in an area having poor ventilation, sufficiently ventilate the area ahead of time.
- When handling flammable or hazardous materials, take sufficient steps to prevent the occurrence of a fire or disaster.
- Do not smoke when working.
- When working with hot parts, rotating parts, and sliding parts, be careful not to get burned or injured.
- When working near a running engine, be careful not to touch rotating or sliding parts.
- Each unit is heavy, so watch your footing when working.
- When performing maintenance, set the parking brake and turn the ignition switch OFF.
- Electrical circuits can short, therefore, before disassembling and inspecting, remove rings and other metal items from your body.
- Make an efficient repair by performing the diagnosis after sufficiently understanding the symptoms of the malfunction. Then after the work is completed, make sure that everything is working properly.
- Before performing removal or disassembly work, be thoroughly familiar with the properly assembled condition.
- When necessary, affix matching marks to parts that will not affect performance.
- Before removing wiring, memorize the wire colors and wiring conditions.
- When performing disassembly and inspection work, use the specified tools or tools that are appropriate for the task.
- When performing disassembly and inspection work, use clean tools. When a part has been removed, place it in a clean location.
- Organize removed parts in proper order so that they do not get mixed up.
- Before removing piping and hoses that are under pressure, release the pressure.
- Before removing the engine and counterweight, block the tires. Do not jack up the vehicle.
- Before inspecting or assembling parts that have been disassembled, clean and wash them.
- Use the specified nuts and bolts, and tighten them to the specified torque when assembling.
- After removing oil seals, gaskets, packing, O-rings, lock washers, cotter pins, and self-locking nuts, replace them with new ones as indicated in the relevant provisions (non-reusable parts). When replacing a part, refer to the parts catalog issued by Nissan Motor Co. and use the part that has the same part number (genuine NISSAN part).
- Replace inner and outer races of tapered or needle roller bearings as a set.
- Use the specified lubricant and sealing agent.
- Do not allow brake fluid to adhere to the body and other painted surfaces. If such fluid gets on a painted surface, quickly wipe it off and wash with water.

- Do not reuse brake fluid that has been removed.
- After repairing the hydraulic or brake system, closely inspect for leakage.
- Do not recklessly release waste oil following an oil change, or treated oil used for parts. Dispose according to the method established by law.
- Before performing maintenance, disconnect the battery ground cable and battery positive (+) cable.
- If, with electronic control specifications, a part is to be welded to a unit later on, disconnect both of the battery cables (+ and −) before welding. (This action prevents current from circling into the ECM.)

PRECAUTIONS RELATED TO ELECTRICAL SYSTEM INSPECTIONS

- Do not pry connectors when inserting or withdrawing them. Such actions can cause poor contact.
- When withdrawing a connector, do not pull on the wire (cable) itself.
- When conducting an inspection with a circuit tester, use the correct range (A, V, Ω) and polarity (+, −).
- When the task is completed, reconfirm that the wiring is connected in its original location.

PRECAUTIONS RELATED TO BATTERY HANDLING

WARNING:

- **Keep sources of fire away from batteries.**
- **To keep from getting burned, do not allow battery fluid to get on your skin or clothing.**
- **If a large amount of battery fluid spills or leaks out, immediately neutralize it with a neutralizing agent (such as baking soda, calcium hydroxide, or sodium carbonate) and wash it away with a large amount of water.**
- **Do not leave tools or other metal objects on the battery, because contact with a terminal can cause a short, burning anyone nearby, or hydrogen gas emitted from the battery can ignite and explode.**
- **If static electricity is produced, a battery can explode. Therefore, do not wipe or dust off the battery's top surface or terminal areas with a dry cloth or duster, and do not cover with a vinyl cover. Use a damp cloth to clean the battery.**

CAUTION:

- **Leaking battery fluid can cause corrosion, therefore, securely close the battery fluid cap.**
- **Do not allow a person to inspect a battery if that person does not understand how to properly handle batteries.**

Precaution

CAUTION:

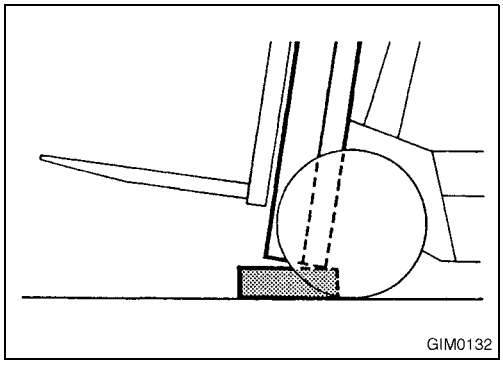
- **Do not go under forks or a forklift when cargo handling gear or travel gear is being operated during maintenance and inspection work.**
- **Work on flat, level, hard surfaces.**
- **Be properly seated in the driver's seat when operating ignition switches and levers.**
- **Engage the parking brake when working.**
- **Do not use square timbers that have been piled on each other.**
- **Use square timbers that have sufficient strength to support the vehicle's weight.**
- **Do not use square timbers that are cracked or chipped. This can be dangerous, because the vehicle may tip.**
- **Do not place square timbers of different heights under the left and right sides of the mast or vehicle body. The vehicle will tilt.**

Jacking

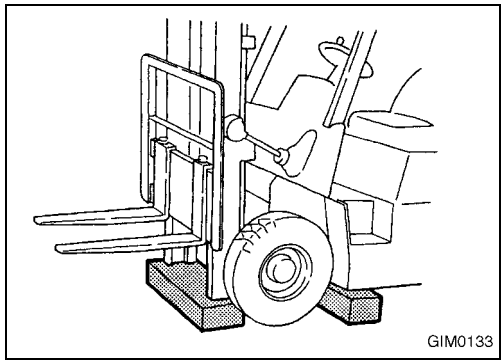
CAUTION:

- **If the front wheels are lifted off the ground with the mast and left for a long period of time, the mast may gradually tilt back. Therefore, place a square timber under the front of the frame on the left and right sides, leaving no gaps.**
- **Use square timbers having the following dimensions: a height that barely enables them to be inserted between the ground and mast when tilted back, longitudinal (front-to-back) dimension that is 50 to 100 mm (1.97 to 3.94 in) larger than the longitudinal dimension of the mast rail of the outside mast, and lateral (left-to-right) dimension that is 20 to 40 mm (0.79 to 1.57 in) larger than the outside dimension of the outer mast.**
- **When jacking a vehicle, stop when the tire is slightly raised from the ground.**

JACKING FRONT

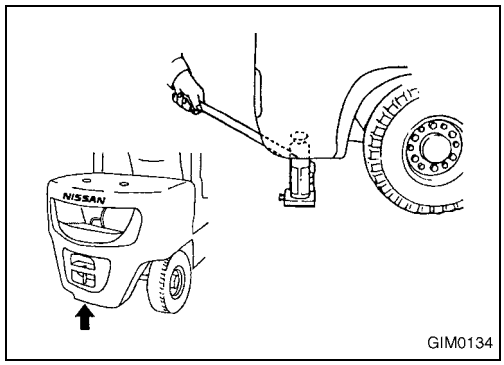


1. Raise the forks 200 to 300 mm (78.7 to 11.81 in) from the ground, and tilt the mast completely back.
2. Place a square timber under the mast.


GIM0133

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.

JACKING REAR



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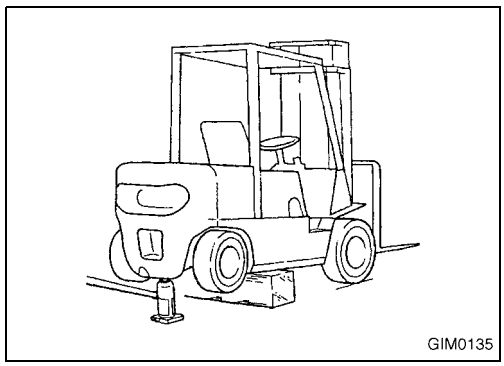
1. Raise the forks about 100 mm (3.94 in) from the ground, and tilt them slightly back.
2. Block the front wheels.
3. Place a garage jack under the counterweight center, and then jack it up.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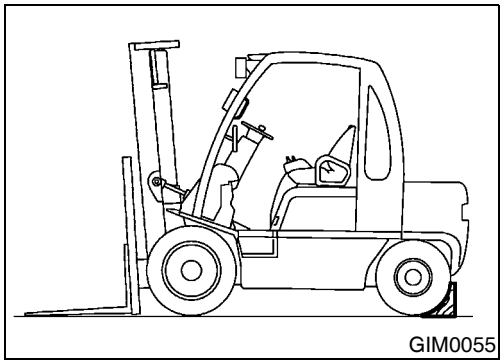
4. Jack up until the tires are slightly raised from the ground, place a square timber under the left and right frame, and then slowly lower the jack.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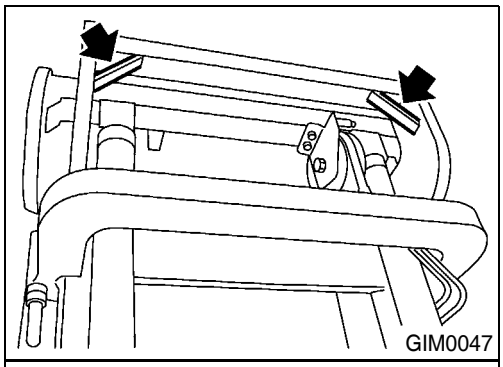
Lifting Points

FRONT SIDE

1. Place chocks behind rear wheels.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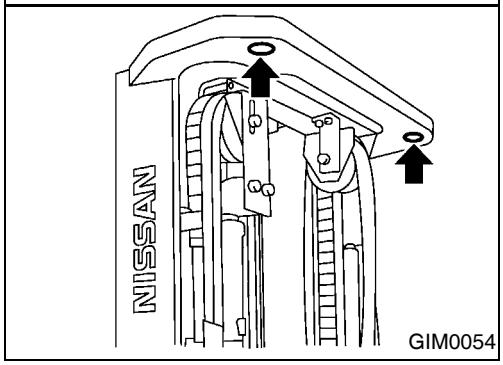
2. Lift outer mast with a hoist.



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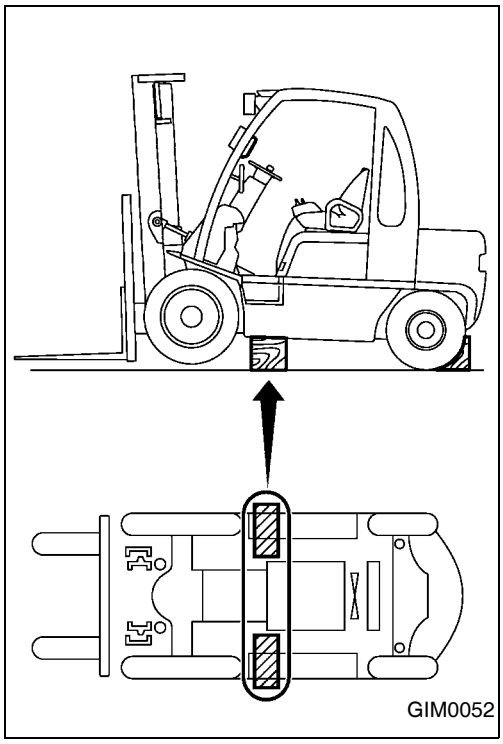
3. Place wooden blocks under both side frames. Gradually lower front end to ground. Be careful not to dislocate blocks while lowering.

WARNING:

- **Use the same size wooden blocks on both sides of the lift truck. Wooden blocks should be one-piece and strong enough to support the weight of the lift truck.**
- **Do not use a supporting block higher than 300 mm (11.81 in).**
- **Raise the lift truck just high enough to place the supporting block under the lift truck.**
- **Never put your feet or hands under the lift truck while lifting or lowering it.**
- **After supporting lift truck with blocks, swing it back and forth and left and right to see if it is safe.**



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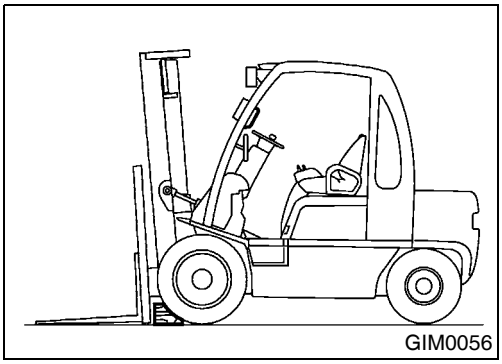
Lifting Points (Cont'd)

REAR SIDE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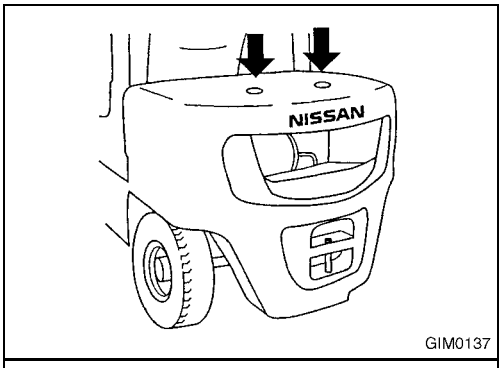
1. Place chocks in front of front wheels.



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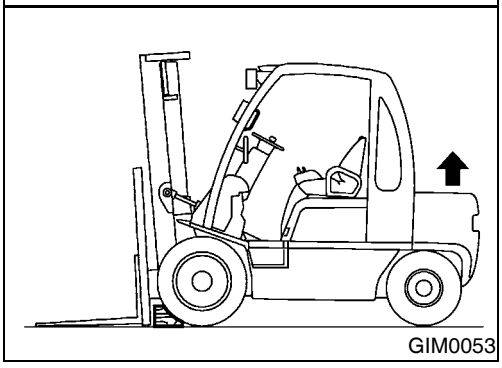
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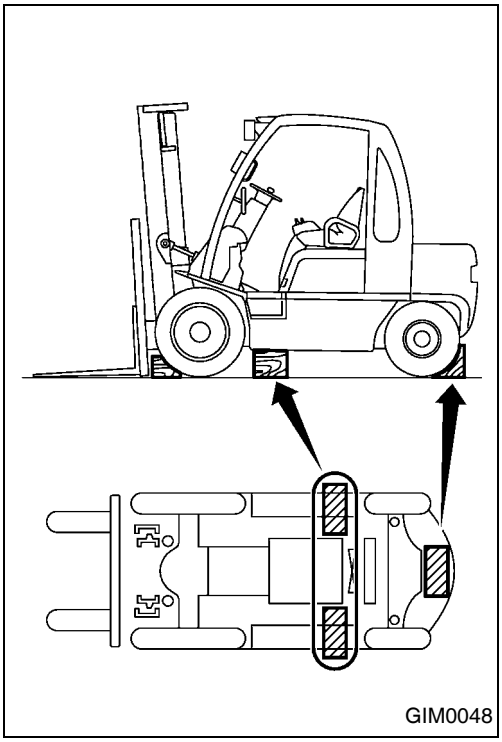
2. Lift counterweight with a hoist.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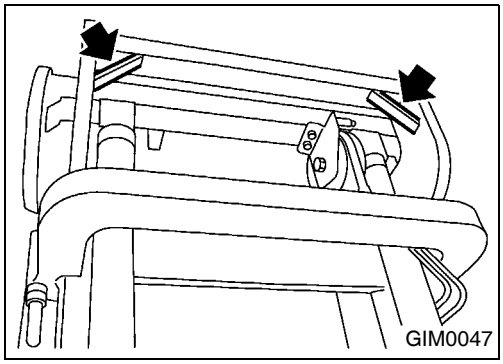
3. Place wooden block under counterweight. Gradually lower rear end to ground. Be careful not to dislocate blocks while lowering.

WARNING:

- **Wooden blocks should be one-piece and strong enough to support the weight of the lift truck.**
- **Do not use a supporting block higher than 300 mm (11.81 in).**
- **Raise the lift truck just high enough to place the supporting block under the truck.**
- **Place the same size wooden blocks under the left and right sides of the frame, as shown in the figure below.**
- **After supporting lift truck with blocks, swing it back and forth and from side to side to see if it is safe.**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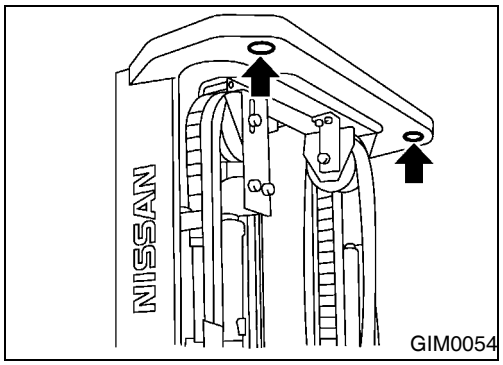

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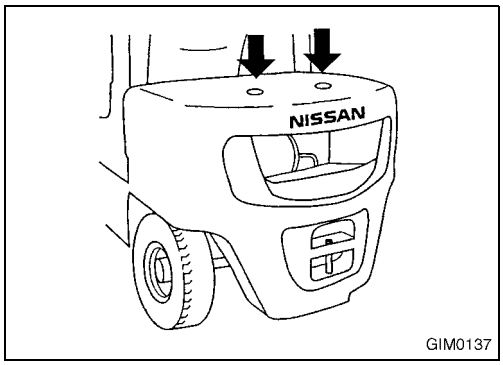

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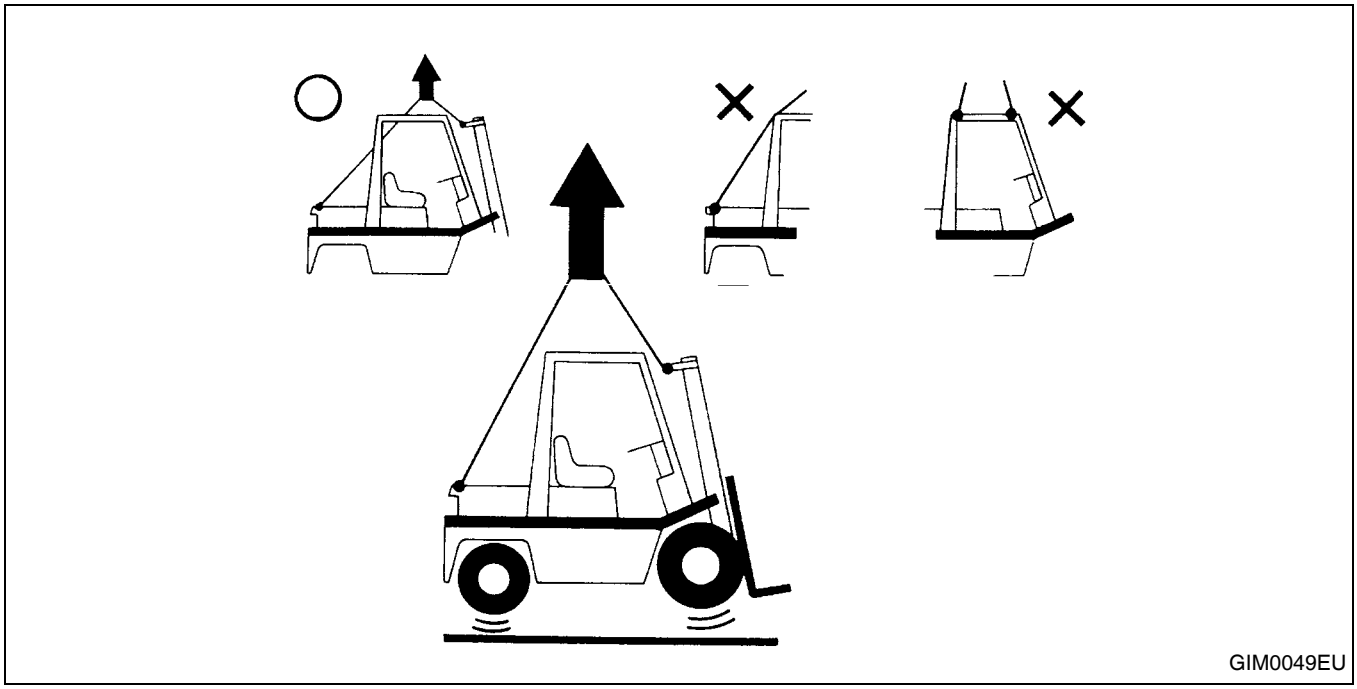
Lifting Up Forklift Truck

When lifting the entire forklift truck, secure wire ropes to hook points (2W MAST) or holes (2F/3F MAST) on both sides of the outer mast cross beam and to the holes on the counterweight, and then utilize a lifting device.

WARNING:

- **Make sure that the wire ropes do not interfere with the overhead guard while lifting the truck.**
- **Ensure that the wire ropes and lifting device are strong enough to support the lift truck safely, as the lift truck is extremely heavy.**
- **Do not use the cab frame (overhead guard) to lift up the truck.**
- **Never get under the lift truck while lifting the truck.**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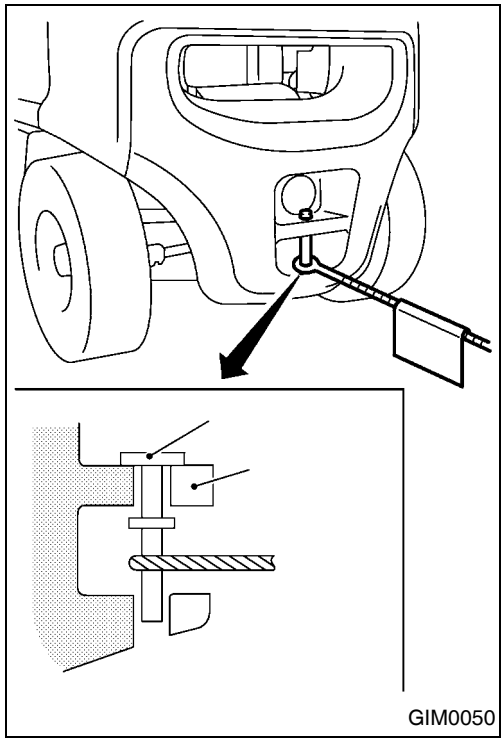

Towing

Before towing a lift truck, secure a wire rope to traction pin. Make sure parking brake is released.

WARNING:

- **Do not attach towing rope to any points other than those designated.**
- **To prevent accidents, do not apply load to wire rope abruptly.**

Tightening Torque

Grade	Nominal diameter (mm)	Pitch (mm)	Specified tightening torque		
			(N•m)	(kg-m)	(ft-lb)
4T	M6	1.00	3 - 4	0.3 - 0.4	2.2 - 2.9
	M8	1.25	8 - 11	0.8 - 1.1	5.8 - 8.0
		1.00	8 - 11	0.8 - 1.1	5.8 - 8.0
	M10	1.50	16 - 22	1.6 - 2.2	12 - 16
		1.25	16 - 22	1.6 - 2.2	12 - 16
	M12	1.75	26 - 36	2.7 - 3.7	20 - 27
		1.25	30 - 40	3.1 - 4.1	22 - 30
	M14	1.50	46 - 62	4.7 - 6.3	34 - 46
7T	M6	1.00	6 - 7	0.6 - 0.7	4.3 - 5.1
	M8	1.25	14 - 18	1.4 - 1.8	10 - 13
		1.00	14 - 18	1.4 - 1.8	10 - 13
	M10	1.50	25 - 35	2.6 - 3.6	19 - 26
		1.25	26 - 36	2.7 - 3.7	20 - 27
	M12	1.75	45 - 61	4.6 - 6.2	33 - 45
		1.25	50 - 68	5.1 - 6.9	37 - 50
	M14	1.50	76 - 103	7.7 - 10.5	56 - 76
	M16	1.50	118 - 157	12.0 - 16.0	87 - 116
	M18	1.50	177 - 235	18.0 - 24.0	130 - 174
	M20	1.50	245 - 324	25.0 - 33.0	181 - 239
	M22	1.50	324 - 441	33.0 - 45.0	239 - 325
9T	M6	1.00	8 - 11	0.8 - 1.1	5.8 - 8.0
	M8	1.25	19 - 25	1.9 - 2.5	14 - 18
		1.00	20 - 27	2.0 - 2.8	14 - 20
	M10	1.50	36 - 50	3.7 - 5.1	27 - 37
		1.25	39 - 51	4.0 - 5.2	29 - 38
	M12	1.75	65 - 88	6.6 - 9.0	48 - 65
		1.25	72 - 97	7.3 - 9.9	53 - 72
	M14	1.50	108 - 147	11.0 - 15.0	80 - 108
	M16	1.50	167 - 226	17.0 - 23.0	123 - 166
	M18	1.50	255 - 343	26.0 - 35.0	188 - 253
	M20	1.50	343 - 461	35.0 - 47.0	253 - 340
	M22	1.50	471 - 632	48.0 - 64.4	347 - 466

CAUTION:

- **Special parts are excluded.**
- **This standard is applicable to bolts having the following marks embossed on the bolt head.**

Grade..... Mark
4T ..... 4 or no mark
7T 7
9T 9

ABBREVIATION LIST

Abbreviation	Description
ABDC	After Bottom Dead Center
A/C	Air Conditioner
AFM	Air Fuel Management
ALT	Alternator
APPS	Accelerator Pedal Position Sensor
Assy	Assembly
ATDC	After Top Dead Center
ATM	Automatic Transmission
BAT	Battery
BBDC	Before Bottom Dead Center
BDC	Bottom Dead Center
BTDC	Before Top Dead Center
C/P	Crankshaft Pulley
C/U	Control Unit
CAN	Can Area Network
Cyl	Cylinder
DCM	Diesel Control Module
DTC	Diagnostic Trouble Code
ECM	Engine Control Module
ECO	Economy Mode
EGI	Electronic General Ignintion (Relay/Fuse)
ELEG	Electronically Controlled Gasoline
ELEG.L	Electronically Controlled Gasoline/LPG
ELEL	Electronically Controlled LPG
ENG	Engine
ETC	Electronic Throtthle Control
EXH	Exhaust
F/L	Fusible Link
FC1	Fingertip Controlled (1 Auxiliaries)
FC2	Fingertip Controlled (2 Auxiliaries)
FET	Mosfet
FR	Front
GOM	General Overseas Market
H02	Heated Oxygen Sensor
I/P	Idler Pulley
IAT	Intake Air Temperature
IGN	Ignition
INT	Intake
LCD	Liquid Crystal Display
LED	Light Emmitting Diode
LH	Left Hand
LLC	Long Lige Coolant
LPG	Liquefied Petroleum Gas