CONTENTS

2.2.6 CLEANING

After operating, use an air blower or similar device to clean off any dirt, tree waste, and paper that has accumulated on the lift truck.

- Around the engine
  Carefully clean the circumference of the exhaust manifold.

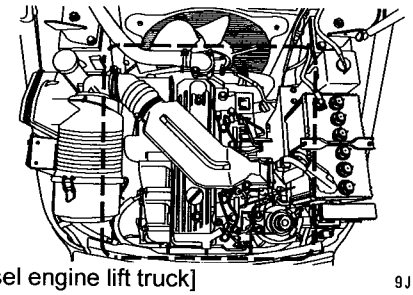
REMARK

These instructions apply to the following diesel engine lift trucks (see illustrations at right).

A : FD20/FD20H/FD25/FD25H/FD30/FD30H/FD35A-17

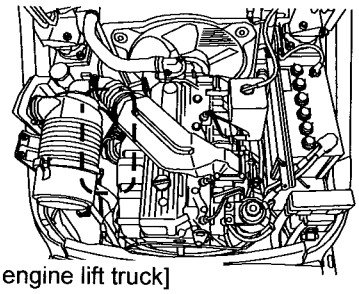
B : FD10/FD15/18-21

A

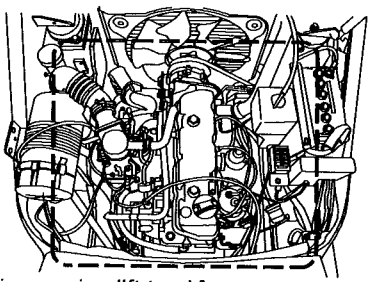


[Diesel engine lift truck] 9JM08048

B

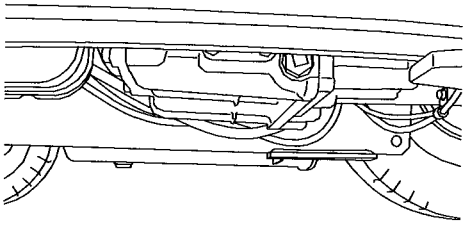


[Diesel engine lift truck] 9JM08031



[Gasoline engine lift truck] 9JZ01680

- Under the frame
  In particular, dirt or paper may accumulate easily on a lift truck with an undercover. Carefully clean such accumulation.

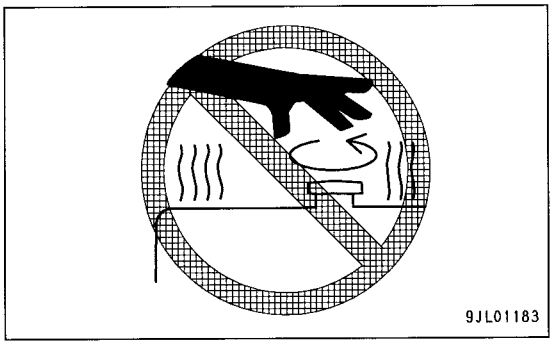


9JM08030

2.3.10 TO AVOID BURN INJURY

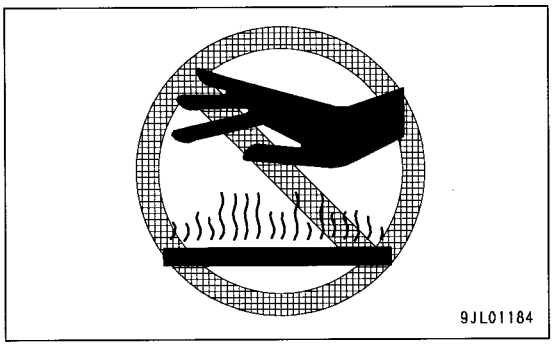
HIGH TEMPERATURE COOLANT

- Immediately after the operation, the cooling water is at a high temperature, so there is always the danger of burns if you open the radiator cap as steam or boiling water may spurt out. Turn the radiator cap slowly, after the coolant temperature has gone down sufficiently.



HIGH TEMPERATURE PARTS AND OIL

- To prevent burns with the high temperature parts or by the spurt of oil, wait for the lift truck temperature to go down enough before the inspection and maintenance work.



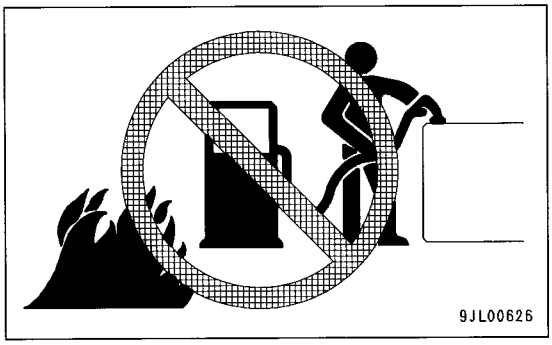
2.3.11 FIRE PREVENTION

FIRE WITH FUEL AND OIL

Fuel, oil, coolant and window washer fluid are flammable, so keep them away from open flame.
Strictly follow the instructions shown below.

- Do not smoke or allow any flame near fuel, oil, coolant or window washer fluid, or clothes soaked in them.
- Stop the engine before refilling fuel.
- Do not leave the area while refilling fuel or oil.
- Tighten the fuel cap and oil cap securely.
- Do not spill fuel on the overheated surface or electrical system components.
- Store fuel and oil in a well-ventilated dark cold place.
- Store fuel and oil in a designated place away from unauthorized people.
- Wipe off the spilled fuel, oil, and grease after refilling.
- Put clothes soaked in oil and other flammable objects in a secure container and store them in a safe place.
- Also, be cautious and take measures for fires ignited with a spark or flame, when inspecting or servicing the lift truck using devices and equipment.

Failure to comply with these safety policies may result in serious injury or death.



- The following symbols indicate the types of attachment if any.

Attachment	Symbol						Attachment	Symbol					
	Type		Capacity					Type		Capacity			
Side shifter	F	S	*	*	*	*	Clamp	C	*	*	*	*	*
Fork positioner	F	M	*	*	*	*	Roll clamp	R	S	*	*	*	*
Load stabilizer	F	T	*	*	*	*	Rotating fork	R	F	*	*	*	*
3-way stacker	F	W	*	*	*	*	Ram	L	*	*	*	*	*
Hinged fork	H	F	*	*	*	*	Spreader	N	*	*	*	*	*
Push-pull	P	P	*	*	*	*	Hook	K	*	*	*	*	*
Pusher	P	A	*	*	*	*							

* marks in the chart will be replaced with alphabets and numbers which stand for types and capacities of the attachment.
Numbers are not necessarily in 6 digits.

LOAD CAPACITY WHEN EQUIPPED WITH ATTACHMENT AND / OR HIGH MAST

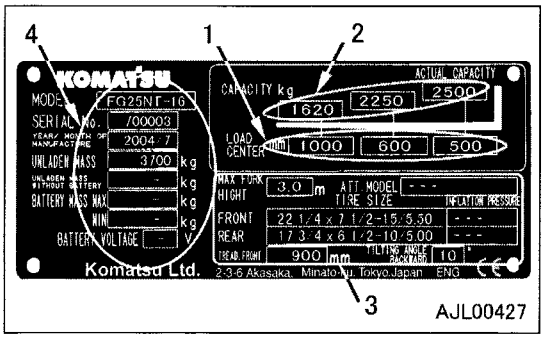
- Please note that the lift truck equipped with attachments and/or high mast has a smaller maximum capacity and actual capacity than the standard truck.
- Follow the load limit as indicated in the load table of the serial No. plate.

LOAD TABLE AND LOAD CAPACITY FOR DETACHABLE AND INSERT-TYPE ATTACHMENTS

- For some detachable attachments, additional load table is provided at a certain place of the lift truck. In this case, follow the instructions in the table when installing such an attachment.
- For insert-type bucket and fork extension sleeve, calculate the capacity as follows: Subtract the weight of insert-type bucket or fork extension sleeve from the capacity on the chart.
- To check if weight of the insert-type bucket or fork extension sleeve must be considered, see the label attached on the right side of the operator's seat.

OTHER INFORMATION ON THE SERIAL NO. PLATE

- The area (4) shows other basic information of the lift truck.
  Model
  Serial No.
  Date of manufacture
  Unladen mass
- [-] means that no information is required.
- Logo and the company name are shown on the top and bottom of the serial No. plate.

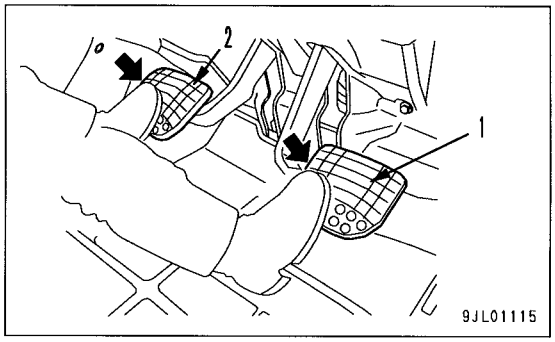


3.3.8 TEMPORARY STOPPING AND PARKING

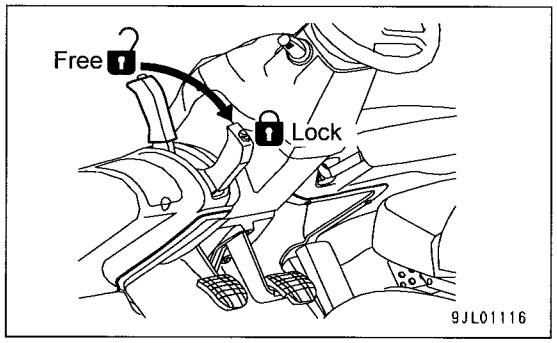
⚠ CAUTION

Select a parking area well away from the traffic areas.

1. Carry out the following operations for each clutch type and TORQFLOW transmission lift truck.
   - Clutch type lift truck: Release the accelerator pedal, depress brake pedal (1), then depress clutch pedal (2) immediately before the lift truck stops.
   - TORQFLOW transmission lift truck
     : Release the accelerator pedal, then depress brake pedal (1).



2. After the lift truck comes to a stop, apply the parking brake by pulling the parking brake lever in the direction to the rear of the lift truck. (Parking brake activated)
   After it stops completely, move the forward/reverse lever and high/low speed lever (clutch type lift truck) to the N (neutral) positions.



REMARK

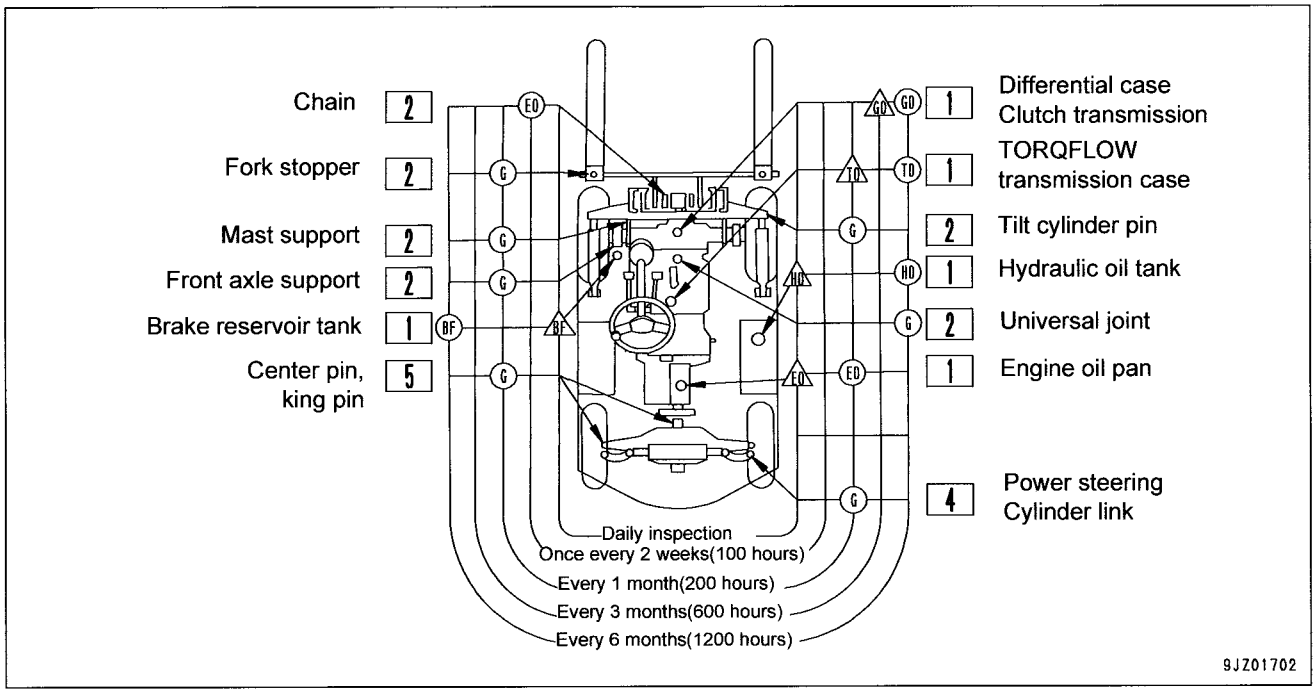
When the parking brake lever is in the Free position, and if you take a posture that your weight is not fully applied to the seat, e.g. leaving the operator's seat or leaning forward or sideways, the parking brake alarm buzzer begins to sound. When it does, take the following actions.

When leaving the lift truck: Pull the parking brake lever in the rear direction of the lift truck to the Lock position.

When continuing to operate the lift truck
: Seat yourself properly.

4.4.1.2 LUBRICANT LIST

OIL AND GREASING CHART (OIL, GREASE LOCATIONS AND INSPECTION AND MAINTENANCE INTERVALS)



△ : Check and add fluid if necessary
○ : Total oil change or greasing and application
□ : Figure inside the box shows the number of places to apply oil or grease to.

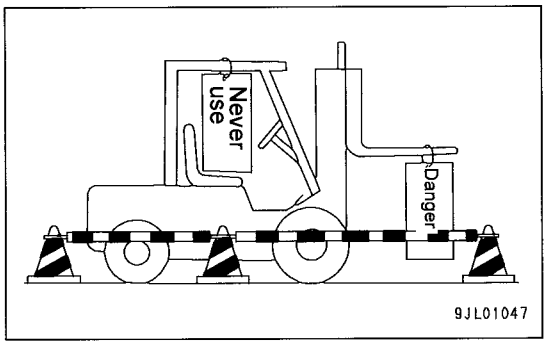
Symbol	Type of fluid
EO	Engine oil
TO	Power train oil
GO	Gear oil
HO	Hydraulic oil
BF	Brake fluid
G	Lithium grease

4.9 ACTION TO TAKE IF THE FORK FAILS TO LOWER

⚠ CAUTION

- **If the fork stops lowering during operation, stop the work immediately. Never use this lift truck until repaired.**
- **Put up "No Entry" and "Never use" signs to keep other persons from entering under or in front of the raised fork.**
- **The lift truck may suddenly start moving leading to a critical accident. Do not touch the mast, fork, chain and other load handling devices. (Do not shake, touch or pry with a stick or tool)**
- **Immediately contact with the administrator or your KOMATSU FORKLIFT distributor for repair service.**

1. If the fork stops lowering during operation, stop the work immediately.
2. Move the lift truck in question to a flat place and park it by avoiding emergency exit or fire fighting equipment. For details on parking, see "2.5.3 STOPPING AND PARKING (PAGE 2-32)" and "3.3.8 TEMPORARY STOPPING AND PARKING (PAGE 3-30)".
3. If the loaded fork should stop operating in raised condition, secure wide "No Entry" area around the lift truck or park the lift truck directly facing a stout wall surface in checking a risk of falling load to the ground.



Component		Inspection item		Unit	FG30-17	FG30N-17	FG35A-17
Engine	Engine proper	Engine model		–	NISSAN K25	NISSAN K25	NISSAN K25
		Idling speed		rpm	750 - 900	750 - 900	750 - 900
		Max. speed		rpm	2720 - 2920	2720 - 2920	2720 - 2920
		Compression		MPa (PSI) {kgf/cm²}/rpm	1.27 (185) {13.0} / 250	1.27 (185) {13.0} / 250	1.27 (185) {13.0} / 250
	Lubricating oil cooling system	Fan belt deflection mm (98N{10kgf}by finger force)		mm (in)	11 - 13 (0.43 - 0.51)	11 - 13 (0.43 - 0.51)	11 - 13 (0.43 - 0.51)
	Fuel system	Injection timing		deg-BTDC	–	–	–
		Injection order		–	–	–	–
		Injection pressure		MPa (PSI) {kgf/cm²}	–	–	–
	Intake, exhaust system	Valve clearance	Intake	mm (in)	0.38 (0.015) [Warm]	0.38 (0.015) [Warm]	0.38 (0.015) [Warm]
			Exhaust	mm (in)	0.38 (0.015) [Warm]	0.38 (0.015) [Warm]	0.38 (0.015) [Warm]
	Electric system	Distributor point gap		–	–	–	–
		Spark plug gap		mm (in)	0.8 - 0.9 (0.031 - 0.035)	0.8 - 0.9 (0.031 - 0.035)	0.8 - 0.9 (0.031 - 0.035)
		Spark plug type		–	FR2A - D(*1)	FR2A - D(*1)	FR2A - D(*1)
		Ignition timing		deg-BTDC/rpm	0 / 850	0 / 850	0 / 850
		Firing order		–	1 - 3 - 4 - 2	1 - 3 - 4 - 2	1 - 3 - 4 - 2
Travel System	Tires	Tire inflation pressure	Front wheels	kPa (PSI) {kgf/cm²}	700 (101) {7.1}	–	850 (121) {8.5}
			Rear wheels	kPa (PSI) {kgf/cm²}	700 (101) {7.1}	–	900 (130) {9.2}
	Hub nut	Tightening torque	Front wheels	Nm {kgfm}	294 - 490 {30 - 50}	294 - 490 {30 - 50}	294 - 490 {30 - 50}
			Rear wheels	Nm {kgfm}	157 - 245 {16 - 25}	157 - 245 {16 - 25}	157 - 245 {16 - 25}
	Rim bolt	Tightening torque	Front wheels	Nm {kgfm}	–	–	–
			Rear wheels	Nm {kgfm}	–	–	–
Steering, braking system	Steering wheel	Play		mm (in)	10 - 30 (0.4 - 1.2)	10 - 30 (0.4 - 1.2)	10 - 30 (0.4 - 1.2)
	Clutch pedal	Play		mm (in)	–	–	–
	Inching pedal	Play		mm (in)	0 - 4 (0 - 0.158)	0 - 4 (0 - 0.158)	0 - 4 (0 - 0.158)
		Interconnected stroke		mm (in)	35 - 41 (1.38 - 1.61)	35 - 41 (1.38 - 1.61)	40 - 46 (1.58 - 1.81)
	Brake pedal	Play		mm (in)	0 - 4 (0 - 0.158)	0 - 4 (0 - 0.158)	0 - 4 (0 - 0.158)
		Pedal height when pedal is depressed		mm (in)	62 - 82 (2.4 - 3.2)	62 - 82 (2.4 - 3.2)	62 - 82 (2.4 - 3.2)
	BRAKE	Parking brake operating force		N {kgf}	147 - 196 {15 - 20}(*2)	147 - 196 {15 - 20}(*2)	147 - 196 {15 - 20}(*2)
		Back plate mounting bolt tightening torque		Nm {kgfm}	176 - 196 {18 - 20}	176 - 196 {18 - 20}	245 - 294 {25 - 30}
Loading equipment	Fork	Fork thickness at base		mm (in)	3 ton lift truck : Min. 39.5 (1.60) 3.5 ton lift truck: Min. 45 (1.80)		
	Chain	Length over 17 links		mm (in)	3 ton lift truck : Max. 550 (21.7) 3.5 ton lift truck: Max. 440 (17.3)		
	Hydraulic system	Relief pressure		MPa (PSI) {kgf/cm²}	18 (2630) {185}	18 (2630) {185}	18 (2630) {185}

*1: Use BP4ES for lift trucks of LPG specifications to prevent engine knocking and run-on.

*2: Power brake-installed lift truck: 245 - 294N (25 - 30kgf).

BX50 (3.5 ton) Series

Characteristics	1.2	Model	Manufacturer's Designation			FG35A-17	FD35A-17
	1.3	Power Type	Electric, Diesel, Gasoline, LPG			Gasoline	Diesel
	1.4	Operation Type				Sitting	Sitting
	1.5	Rated Capacity	Rated Capacity		kg	3500	3500
	1.6	Load Center	Rated Load Center		mm	500	500
	1.6.1	Alternative Capacity	Capacity@600mm Load Center		kg	3180	3180
	1.8	Load Distance	x	Front Axle Center to Fork Face	mm	505	505
	1.9	Wheelbase	y		mm	1700	1700
Weight	2.1	Service Weight			kg	4910	4950
	2.2	Axle Loading	Loaded	Front	kg	7440	7430
	2.2.1			Rear	kg	970	1020
	2.3		Unloaded	Front	kg	1820	1810
	2.3.1			Rear	kg	3090	3140
Tires	3.1	Tire Type				Pneumatic	Pneumatic
	3.2	Tire Size	Front			250-15-16PR(I)	250-15-16PR(I)
	3.3		Rear			6.50x10-12PR(I)	6.50-10-12PR(I)
	3.5	Number of Wheel	Front/Rear (x=driven)			2*/2	2*/2
	3.6	Tread, Front	b4		mm	1060	1060
	3.7	Tread, Rear	b3		mm	965	965
Dimensions	4.1	Tilting Angle	α/β	Forward/Backward	degree	6/12	6/12
	4.2	Mast Height, Lowered	h1	2-stage Mast	mm	2100	2100
	4.3	Std. Free Lift	h2	2-stage Std. Mast, from Ground	mm	145	145
	4.4	Std. Lift Height	h3	2-stage Std. Mast, from Ground	mm	3000	3000
	4.5	Mast Height, Extended	h4	2-stage Std. Mast	mm	4280	4280
	4.7	Height, Overhead Guard	h6		mm	2145	2145
	4.19	Length, with Std. Forks	L1		mm	3865	3865
	4.20	Length, to Fork Face	L2		mm	2795	2795
	4.21	Width, at Tire	b1	Single	mm	1290	1290
	4.22	Forks	Thickness x Width x Length		mm	50x150x1070	50x150x1070
	4.23	Fork Carriage Class	ISO 2328, Type A/B/no			Class 3	Class 3
	4.24	Width, Fork Carriage	b2		mm	1060	1060
	4.31	Ground Clearance	m1	Under Mast	mm	135	135
	4.32		m2	at Center of Wheelbase	mm	185	185
	4.33	Right Angle Stacking Aisle	with L1000 x W1200 pallet		mm	4055	4055
	4.34		with L1200 x W800 pallet		mm	4185	4185
	4.35	Turning Radius	Wa		mm	2480	2480
Performance	5.1	Travel Speed (FWD)	Loaded, 1st/2nd		km/h	18.0	18.0
			Unloaded, 1st/2nd		km/h	19.0	18.5
	5.2	Lifting Speed	Loaded		mm/s	410	450
			Unloaded		mm/s	450	490
	5.3	Lowering Speed	Loaded		mm/s	400	420
			Unloaded		mm/s	400	400
	5.6	Max. Drawbar Pull	Loaded		KN	16	17
	5.8	Max. Gradeability	Loaded		%	20	21
	5.10	Service Brake	Operation/Control			Foot/Hydraulic	Foot/Hydraulic
	5.11	Parking Brake	Operation/Control			Hand/Mechanical	Hand/Mechanical
	5.12	Steering	Type			FHPS	FHPS
	6.4	Battery	Voltage/ Capacity at 5-hour rating		V/ah	12/33	12/64
I.C Engine	7.1	Maker Model				NISSAN K25	Komatsu 4D98E
	7.2	Rated Output, SAE gross			KW	43@2400	44.2@2450
	7.3	Rated RPM			min-1	2400	2450
	7.3.1	Max. Torque, SAE gross			Nm@min-1	186@1600	185@1500
	7.4	No. of Cylinder/Displacement			cm^3	4-2488	4-3318
Others	7.6	Fuel Tank Capacity			Ltr	58	58
	8.2	Relief Pressure for Attachment			bar	181	181
	8.7	Transmission				TORQFLOW	TORQFLOW
Noise Level	L_{pAZ} as Measured in accordance with EN12053				dB(A)	80	87
	K_{PZ} The uncertainty of measurement in accordance with EN12053					2.5	2.5
	L_{WAd} Guaranteed sound power level accordance with 2000/14/EC				dB(A)	103	107
	The uncertainty of measurement					1.6	1.1
Vibration	VIBRATION in accordance with EN 13059				m/s^2	0.7	0.7
	The uncertainty of measurement					0.4	0.4

7. LPG FORK LIFT

7.1 CHAPTER CONTENTS

This chapter describes the procedures for proper operation, inspection, and maintenance of the LPG forklift, and the rules you must follow for your safety.Most accidents are caused by failing to follow basic safety precautions regarding operation, inspection, and maintenance of forklifts. Also, being aware of possible hazards will help to avoid accidents.

⚠ WARNING

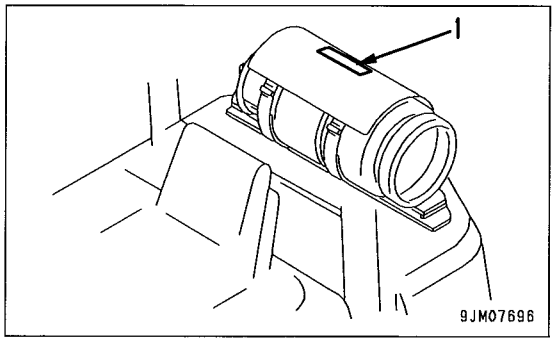
Operators and maintenance personnel must do the following before operating, or performing inspections and maintenance on the LPG forklift.

- **Read this chapter carefully and have a clear understanding of the material.**
- **Read and have a clear understanding of the precautions in this chapter.**
- **Clearly understand the descriptions for the standard forklift.**

7.2 SAFETY LABELS

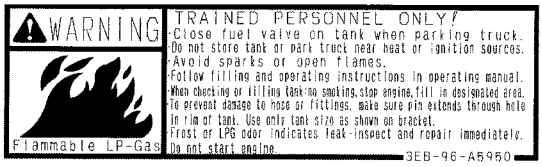
7.2.1 SAFETY LABEL LOCATIONS

No.	Safety label name	Places where safety labels are attached
1	LPG cylinder handling precautions	Cylinder bracket



7.2.2 SAFETY LABELS

(1) LPG cylinder handling precautions (3EB-96-A5950)



7.7 OPERATING

⚠ WARNING

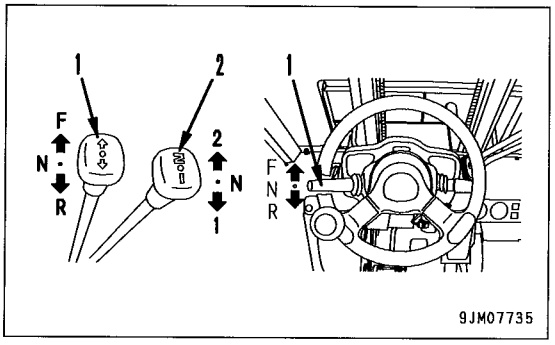
Do not attempt to start the engine by short-circuiting the engine starting circuit.Doing this poses a serious threat of bodily injury and risk of fire.

⚠ CAUTION

- **Only start the engine when sitting in the operator's seat.**
- **Prior to starting the engine, place the forward/reverse lever and 1st/2nd gear lever (clutch) in neutral (N), and pull the parking brake lever toward the rear of the forklift (Engage the parking brake)**
- **Exhaust is toxic. Therefore, when starting engine indoors or in a poorly-ventilated area, pay close attention to the ventilation setup within the area.**
- **If you are leaning forward or sideways i.e., are not seated properly while traveling on an incline in the forklift, it may hamper your ability to operate the forklift and could cause the forklift to slid backwards resulting in an accident. Maintain the correct posture while traveling on an incline.**

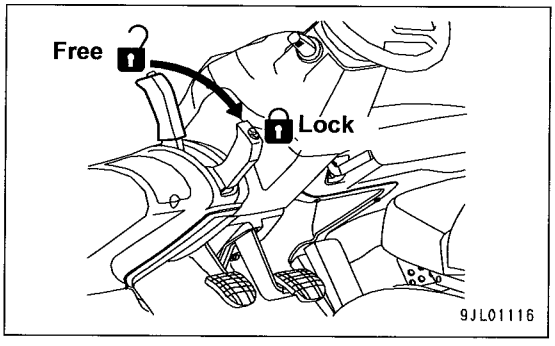
7.7.1 STARTING ENGINE W/ LP GAS

1. Place the forward/reverse lever (1) and 1st/2nd gear lever (clutch) (2) in neutral (N).

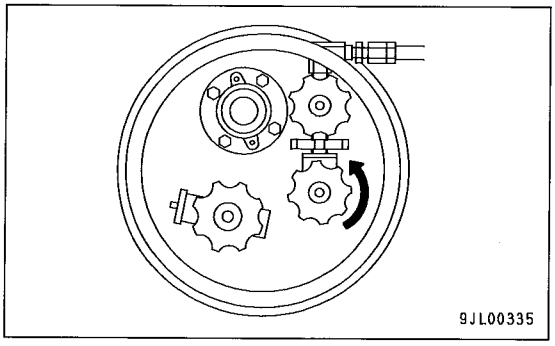


REMARK
The engine does not start unless the forward/reverse lever (1) is set in neutral (N).

2. Pull the parking brake lever to the lock position toward the rear of the forklift. (Engage the parking brake)



3. Fully open the red discharge valve (turn it to the left).



8. ATTACHMENT

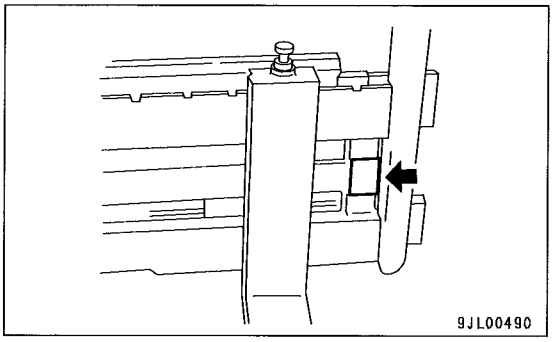
8.1 OPERATION OF SIDE SHIFT

8.1.1 ATTACHMENT MODEL PLATE LOCATION, SERIAL NO.

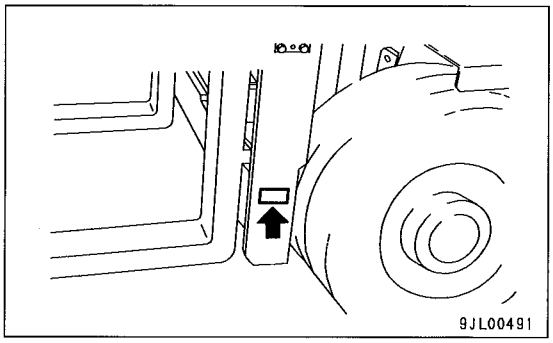
ATTACHMENT MODEL PLATE LOCATION

The attachment model is stamped on the nameplate stuck to a conspicuous place of each attachment.
The location of the name plate may differ according to the model of the machine. In cases where a combination of side shift and another attachment are used, the name plate is attached on the attachment installed in front of the side shift.

Side shift



Fork mover



MODEL and SERIAL NO. are stamped on the nameplate.