

KOMATSU

Operation & Maintenance Manual

FORKLIFT TRUCK

FG35/40/45-7

FG35Z/40Z-7

FG50A-7

FD35/40/45-7

FD35/40/45-8

FD35Z/40Z-8

FD50A-8

FGD35/50A-7, FD35/50A-8

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⚠ WARNING

Unsafe use of this lift truck may cause serious injury or death. Operators and maintenance personnel must read this manual and be sure that they understand its contents before operating, inspecting or carrying out maintenance on this lift truck. This manual should be kept near the lift truck for reference and periodically reviewed by all operators and maintenance personnel who will come into contact with it.

KOMATSU FORKLIFT

1. FOREWORD

This manual provides rules and guidelines which will help you use this lift truck safely and effectively. Always be sure to read and understand this manual thoroughly before operating and performing maintenance.

Some actions involved in operation and maintenance of the lift truck can cause a serious accident if they are not done in the manner described in this manual.

WARNING

- Improper operation and maintenance of this lift truck can be hazardous and could result in serious injury or death.
- Operators and maintenance personnel should read this manual thoroughly before beginning operation or maintenance.
- Keep this manual handy and have all personnel read it periodically.
- Do not use this lift truck unless you are sure that you have understood the contents completely.
- If this manual has been lost or has become dirty or worn and cannot be read, request a replacement manual from your Komatsu Forklift distributor/dealer.
- Komatsu Forklift delivers lift trucks that comply with (to the best of our knowledge at the time of delivery) all applicable regulations and standards of the country to which they have been shipped. If this lift truck has been purchased in another country or purchased from someone in another country, it may lack certain safety devices and specifications that are necessary for use in your country. If there is any question about whether your product complies with the applicable standards and regulations of your country, consult your Komatsu Forklift distributor/dealer before operating the lift truck.
- Continuing improvements in the design of this lift truck may not be reflected in this manual. Consult Komatsu Forklift or your Komatsu Forklift distributor/dealer for the latest available information on your lift truck or for questions regarding information in this manual.
- Information on safety is given in the SAFETY INFORMATION section on page 0-2 and in chapter 1, the SAFETY section, starting on page 1-1.

2. SAFETY INFORMATION

Most accidents are caused by a failure to follow fundamental safety rules for the operation and maintenance of lift trucks.

To avoid accidents, read, understand and follow all precautions and warnings in this manual and on the lift truck before operating and performing maintenance.

Do not operate or carry out maintenance of this lift truck unless you are sure that you understand the explanations and procedures completely.

To identify safety messages in this manual and on lift truck labels, the following signal words are used.

⚠ DANGER — These safety messages or labels describe precautions that must be taken to avoid a hazard which carries a serious risk of serious injury or death.

⚠ WARNING — These safety messages or labels usually describe precautions that must be taken to avoid a hazard which may lead to serious injury or death.

⚠ CAUTION — This word is used on safety messages and safety labels for hazards which could result in injury or damage to the lift truck or surrounding property if the hazard is not avoided.

NOTICE — This word is used for precautions that may not lead to damage or failure, but which must be taken to avoid actions that could shorten the life of the lift truck.

Safety precautions are described in the SAFETY section starting on page 1-1.

Komatsu Forklift cannot predict every circumstance that might involve a potential hazard in operation and maintenance. Therefore the safety messages in this manual and on the lift truck may not include all possible safety precautions.

If any procedures or actions not specifically recommended or allowed in this manual are used, it is your responsibility to be sure that you and others can do such procedures and actions safely and without damaging the lift truck. If you are unsure about the safety of some procedures, contact your Komatsu Forklift distributor/dealer.

The procedures and precautions given in this manual apply only to intended uses of the lift truck. If you use your lift truck for any unintended use that is not specifically prohibited, you must be sure that it is safe for you and others. In no event should you or others engage in prohibited uses or actions as described in this manual.

3. RUNNING IN NEW LIFT TRUCK

3.1 RUNNING IN NEW LIFT TRUCK

Your Komatsu Forklift truck has been thoroughly adjusted and tested before shipment. However, operating the lift truck under severe conditions at the beginning can adversely affect performance and shorten the lift truck life. Be sure to run in the lift truck, taking special care concerning the following items.

- Idle the engine for 5 minutes after starting it up.
- Avoid operation with heavy loads or at high speeds.
- Avoid sudden starting or acceleration, unnecessarily abrupt braking and sharp turning, except in the case of emergency.

3.2 FIRST MONTH SERVICE (OR INITIAL 200 HOURS SERVICE) FOR NEW LIFT TRUCK

For new lift truck, carry out the following maintenance only after the first month or 200 hours.

Unit	Check items	Remarks
Engine	Change oil	
	Replace oil filter cartridge	
	Drain water from fuel filter	Diesel engine lift truck only
TORQFLOW transmission	Change oil	TORQFLOW transmission lift truck only
	Clean strainer	
Differential	Change oil	
Hydraulic tank	Change oil	
	Replace line filter	
	Clean strainer	
	Clean inside tank	
Other	Tighten all bolts and nuts	Particularly hub nuts, overhead guard mounting bolts, backrest mounting bolts, and operator's seat mounting bolts.

3.3 MODEL LINE UP

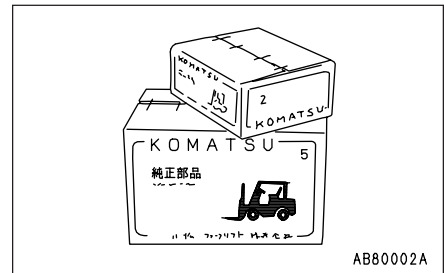
Model	Applicable lift truck No.	Model	Applicable lift truck No.
FG35/40/45-7	10001 and up	FD35/40/45-7	10001 and up
FG35Z/40Z-7	10001 and up	FD35/40/45-8	11001 and up
FG50A-7	10001 and up	FD35Z/40Z-8	11001 and up
		FD50A-7	10001 and up
		FD50A-8	11001 and up

4. WARRANTY AND SERVICE FOR NEW LIFT TRUCK

4.1 KOMATSU FORKLIFT GENUINE PARTS

Komatsu Forklift genuine parts are manufactured from the same materials and by the same method as the parts built in the new lift truck.

In the event that the customer uses imitation parts, Komatsu Forklift will not be held accountable for any faults which result from the use of such imitation parts, and the Komatsu Forklift warranty will not be applicable. Always use Komatsu forklift genuine parts when replacing parts.



5. LOCATION OF PLATES

5.1 LIFT TRUCK SERIAL NO. PLATE POSITION

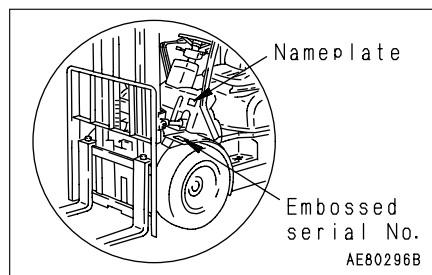
- **Nameplate location:** On front left of dashboard
- **Embossed serial No. location:**

It is stamped on top of the front fender on the left side of the lift truck.

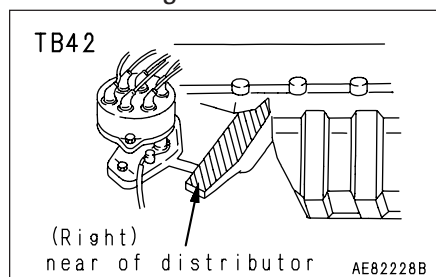
The engine serial number is stamped in the position shown below.

(Left) and (Right) in the diagram are as follows.

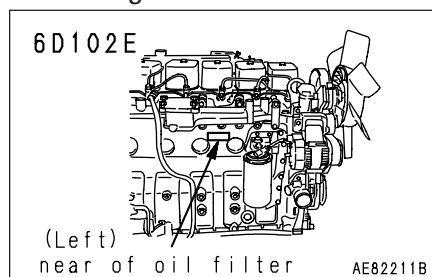
(Left): Left side of engine, (Right): Right side of engine



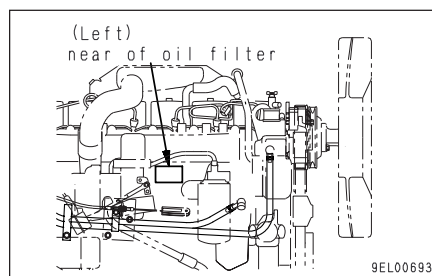
Gasoline engine



Diesel engine



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- **Contacting**

When contacting a Komatsu Forklift distributor for parts ordering or problem consulting, always give the lift truck serial No. embossed on the lift truck.

NOTICE

Take care not to damage the embossed serial No..

REMARK

The serial No. is located on the nameplate.

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SAFETY



WARNING

Read and follow all safety precautions. Failure to do so may result in serious injury or death.

7. SAFETY MANAGEMENT

7. SAFETY MANAGEMENT



WARNING OPERATION MANUAL AND SAFETY LABELS

- Read the instructions in this Manual and the safety labels attached to various parts of the lift truck, and make sure that you understand and follow them. If you do not understand or do not follow the instructions, this will lead to improper operation which may result in personal injury or damage.
- Be sure that you understand the proper method of using the lift truck and the procedure for carrying out an inspection, and ensure that they are carried out safely.
- Read this Manual and safety labels again from time to time. If the Operation and Maintenance Manual or safety labels have been lost or have become dirty and cannot be read, obtain replacements from your Komatsu forklift distributor/dealer and attach the safety labels in the specified positions.



WARNING OPERATING QUALIFICATIONS

- This lift truck should be operated only by qualified personnel. Be sure you have proper qualifications before operating the lift truck.
- When operating this lift truck, even if you have experience in operating other lift trucks, obtain instruction from an authorized person who has experience in operating this lift truck or the same type of lift truck.



WARNING CLOTHING AND PERSONAL PROTECTIVE ITEMS

- Avoid loose clothing, jewelry, and loose long hair. They can catch on controls or in moving parts and cause serious injury or death.
- Always wear a hard hat and safety boots.
- Depending on the working conditions, wear other safety equipment in addition to the hard hat and safety boots.



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WARNING OVERHEAD GUARD, LOAD BACKREST

- Do not use this lift truck unless it is equipped with the overhead guard and load backrest shipped with the lift truck from the factory by Komatsu Forklift.

⚠ WARNING UNAUTHORIZED MODIFICATION

- Any modification made without authorization from Komatsu Forklift can create hazards.
- Before making a modification, consult your Komatsu Forklift distributor/dealer. Komatsu Forklift will not be responsible for any injury or damage caused by any unauthorized modification.
- Do not install any equipment or parts which obstruct or limit the operator's view.

⚠ WARNING EXHAUST GAS

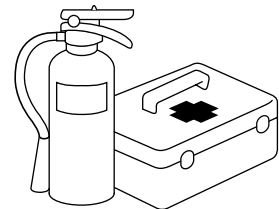
- Do not leave the engine running where there is poor ventilation. The engine exhaust gas contains carbon monoxide. There is danger that this will cause gas poisoning which may result in serious injury or death.



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⚠ WARNING FIRE EXTINGUISHER AND FIRST AID KIT

- If any abnormality in the lift truck occurs, stop operation immediately, park the lift truck in a safe place and safe condition, then contact the person in charge.
- Be sure that fire extinguishers have been provided and that you read the labels to ensure that you know how to use them.
- Know what to do in the event of a fire.
- Be sure that you know the phone numbers of persons you should contact in case of an emergency.
- Provide a first aid kit at the storage point.
- Do not use the lift truck if it is leaking fuel. Inform the person in charge of the nature of the abnormality, and repair the leakage before using the lift truck.
- Do not leave the lift truck with the engine running. Always apply the parking brake securely, lower the forks to the ground, stop the engine, and remove the key before leaving the lift truck.



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7. SAFETY MANAGEMENT



WARNING SAFETY RULES

- Do not operate the lift truck if you are fatigued, or when you have been drinking or have taken any medication which can make you sleepy.
- When carrying out operation, inspection, or maintenance of the lift truck, always follow all work shop rules, safety regulations, and precautions.
- During operation, always pay attention to safety and be careful of pedestrians and other surrounding conditions.



WARNING CHECK WHEN TRAVELING IN REVERSE

- When reversing, depending on the situation, optional alarm, reversing lamp or rotary lamp should be used. In all cases, be sure to face the rear and check around before traveling in reverse.



WARNING TRAFFIC REGULATIONS ON PUBLIC ROADS

- Always observe all traffic regulations when operating the lift truck.
- Do not drive on public roads with the lift truck loaded.
- Do not tow other machines on public roads. (Do not tow other machines even when not on public roads.)
- Always carry your driver's license when traveling on public roads if required.



WARNING SAFETY EQUIPMENT

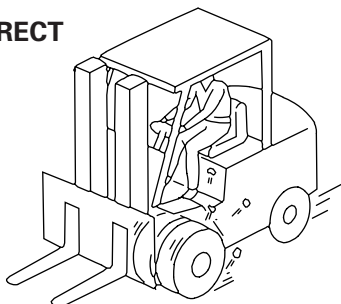
- The overhead guard is installed to protect the operator from falling objects. It is designed to withstand the force of light boxes or small packages. It is not designed to withstand every possible impact. Always be careful to prevent damage or injury from falling objects.



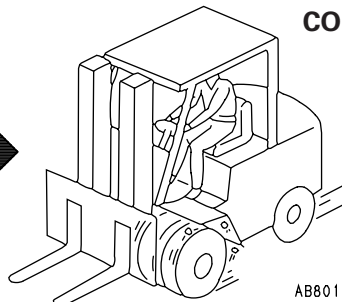
CAUTION TIRE FENDER

The tire fender prevents objects from being thrown up by the tires. When changing from a single tire to a double tire, always extend the tire fender. If the fender is not extended, small stones and other objects will be thrown up and may injure the operator or people in the surrounding area.

INCORRECT



CORRECT



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WARNING SAFE WORKING AREA

- Always work on level surfaces and wipe up all oil or grease from the ground.
- When working on quays, platforms, or docks, or other places where there is danger of falling, set up blocks to prevent the lift truck from going over the edge.
- Put warning signs up in dangerous places to warn the operator not to approach.
- Mark the travel areas clearly and maintain the road surface in good condition.
- Put up signs to prevent unauthorized machines from entering areas where trucks are being operated.
- Ensure that there is adequate lighting to enable safe operations to be carried out safely.



WARNING CLEAN OPERATOR'S COMPARTMENT

- Keep the operator's compartment clean and tidy. Be sure to clean up all oil or mud. If the operator's hand or foot slips, this may lead to a serious accident.
- Do not leave tools or spare parts lying around in the operator's compartment. They may damage or obstruct the control levers or pedals. Always keep them in the tool box when not being used.



WARNING SAFE OPERATING PLAN

- Before operation, establish an operating plan and hold a meeting to discuss operating safety.
- In confined areas, position a signaller and carry out operations in accordance with his/her instructions.
- When carrying out operations on roads, put up fences around the working area and carry out operations in accordance with instructions from the signaller.



WARNING REDUCE LOAD FOR LIFT TRUCKS WITH ATTACHMENT

- The permissible load for lift trucks equipped with any attachment is lower than the permissible load for the standard lift truck.
Reason:
 - 1) The permissible load must be reduced by an amount equivalent to the weight of the attachment itself.
 - 2) Because of the thickness of the attachment, the load center moves forward.
- Always observe the permissible load table strictly (this table is stuck to the lift truck or the attachment). Never exceed the permissible load.

7. SAFETY MANAGEMENT



WARNING FIRE PREVENTION FOR FUEL AND OIL

Fuel is extremely flammable and can cause fires and explosions.

- Carry out refueling away from flames or sparks.
- Stop the engine when refueling.
- After refueling, tighten the gas cap securely and wipe up any spilled fuel.
- The specific gravity of LPG is heavier than air, so it is easy for it to accumulate in low places (holes, road surface depressions, etc.). This can create a fire hazard or explosion. Be extremely careful !



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WARNING NO STARTING AIDS

Engine starting aids are highly flammable and may cause an explosion.

- Do not use starting aids to start the engine.

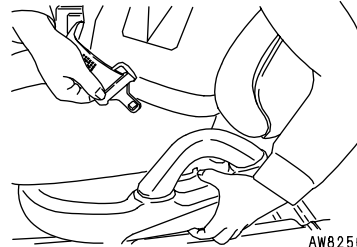
8. SAFE TRAVEL

8. SAFE TRAVEL



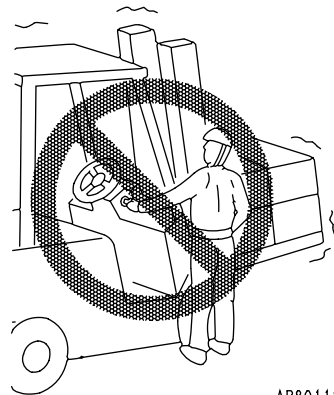
WARNING WEARING SEAT BELT

- Always wear your seat belt properly during operations.
If you wear your seat belt wrongly, there is danger that you will suffer serious injury if the lift truck tips over.



WARNING PRECAUTIONS WHEN STARTING ENGINE

- Before starting the engine, always check that the parking brake is applied and that the directional and speed levers are in neutral. Depress the clutch pedal (for clutch type lift trucks) or the brake pedal (for TORQFLOW transmission lift trucks) firmly, then start the engine.
- Adjust the operator's seat and the steering wheel before starting the engine. Always lock them in position after adjusting. Adjusting the seat or steering wheel during operation is dangerous as it may cause you to lose your balance or operate the lift truck wrongly.
- Before starting the engine, check that the surrounding area is safe. ALWAYS SIT IN THE OPERATOR'S SEAT when starting the engine.
- Do not attempt to start the engine by short-circuiting the engine starting circuit. Such an act may cause a serious bodily injury or fire.



WARNING PRECAUTIONS WHEN OPERATING DIRECTIONAL OR SPEED LEVERS

- When switching between FORWARD and REVERSE always stop the lift truck.(It is dangerous to change the direction of travel suddenly.)
- When operating the directional lever or speed lever, always depress the clutch pedal before moving the lever. (for clutch type lift trucks)
If the lever is moved without disengaging the clutch, the lift truck will move suddenly and may cause injury.

8. SAFE TRAVEL



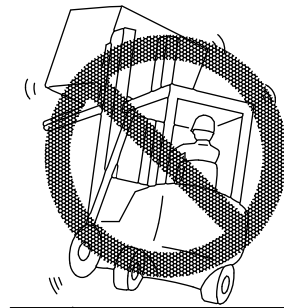
WARNING ESCAPING FROM RAILROAD CROSSING

- If engine trouble occurs on a railroad crossing and the lift truck does not move, it is impossible to use the starting motor as can be done on an automobile. (This is because a neutral safety switch is installed.)
- In such an emergency, light a flare or smoke candle to warn approaching trains and people in the area that there is a broken-down truck on the tracks. Before starting to drive in reverse, check that there is no one behind the lift truck.



WARNING TIPPING

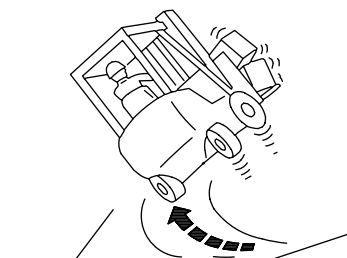
- If the load-engaging means or load is raised, the center of gravity of the lift truck will also rise and increase the danger of the lift truck tipping. Do not turn the lift truck when the forks are raised high.
- Do not suddenly raise the forks or tilt the mast to the front or rear when the forks are loaded. There is danger that the lift truck will tip.
- Reduce speed before turning the lift truck. In particular, when traveling unloaded, the rear of the lift truck is heavy. If the lift truck is turned at high speed, there is a greater chance of tipping than when traveling with the forks loaded.



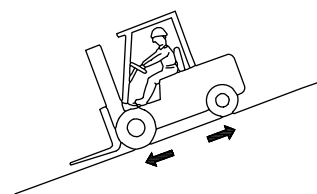
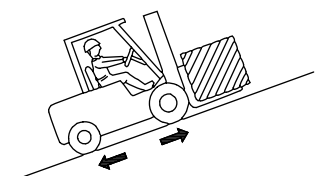
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WARNING TRAVEL ON SLOPES

- Do not turn, or travel across or at an angle on slopes. There is danger that the lift truck will tip.
- Before starting to drive up a slope, stop the lift truck and adjust the clearance between the ground surface and the bottom of the forks so that the bottom of the forks or pallet do not contact the ground surface or the tip of the fork does not stick into the ground when traveling.
- For safe travel on slopes.
When loaded: Travel forward up the slope and in reverse down the slope with the load upgrade.
When unloaded: Travel in reverse up the slope and forward down the slope with the load-engaging means down-grade.
- When traveling down slopes, use the braking force of the engine together with the foot brake, and travel slowly down the slope.



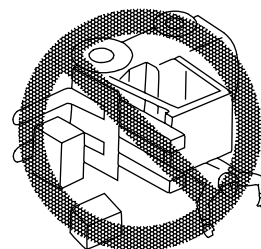
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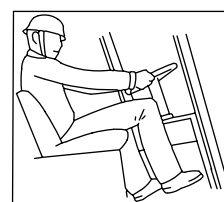
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WARNING DO NOT JUMP OFF LIFT TRUCK EVEN IF IT TIPS

- NEVER JUMP OFF the lift truck even if it seems that it will tip. Always do as follows.
- Hold the steering wheel securely.
- Stay in the operator's seat.
- Brace your legs.
- **If you jump off the lift truck when it turns over, there is danger that you will be fatally crushed under the lift truck.** Always stay in the operator's compartment if the lift truck turns over, then escape from the lift truck after it has stopped.
- Always wear the seat belt correctly (for lift trucks equipped with seat belt).



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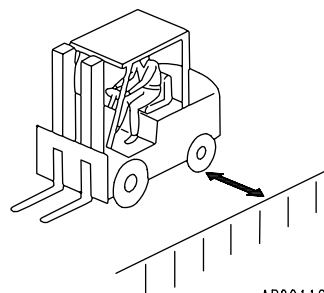
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8. SAFE TRAVEL



WARNING ROAD SHOULDER

- There is danger that soft road shoulders may collapse, so do not go near them.
- Always maintain a safe distance from the edge of road shoulders and platforms.

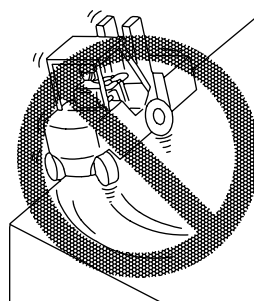


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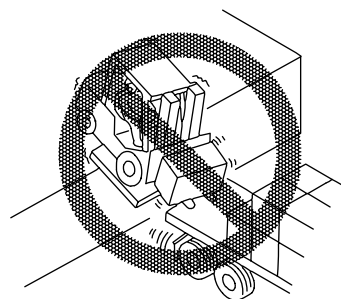


WARNING LOADING HIGHWAY TRUCKS OR RAILROAD CARS

- **Do not travel on the edge of docks. There is danger that the lift truck may fall, which may result in serious injury or death.**
- Before starting operations, check the load limit for the gangplanks, and do not use them if they do not have ample strength to take the weight of the lift truck when loaded.
- Apply the brakes on the truck and block the wheels.
- With trailers, use jacks and take steps to prevent the trailer from sinking when the forklift truck travels on it.
- When driving the forklift inside trucks, reduce speed when backing out and be sure to check that the gangplanks are safe.
- Be careful of pedestrians.
- Tell the truck driver not to move the truck until the operation is completed.
- If there is some system to secure the truck to the dock, always use this system. Secure the gangplanks so that they do not slip and fall.



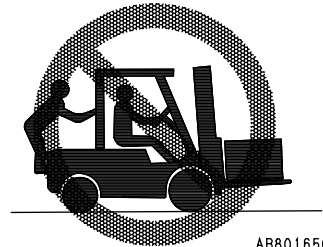
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WARNING NO RIDERS

Forklift trucks are one-person machines.
Do not allow any other person to ride on the truck
under any circumstances.
Never allow anyone to act as an extra counterweight.

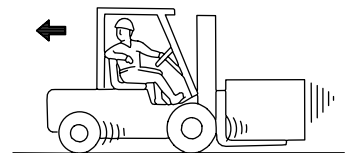


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WARNING DRIVING IN REVERSE

For lift trucks equipped with rear view mirror or back-up buzzer.

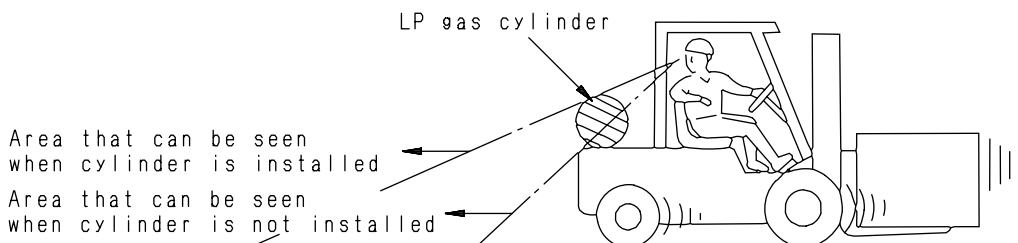
- The rear view mirror is simply an aid for checking the rear. When driving in reverse, do not use the rear view mirror. Turn to face the rear and check the area directly behind the lift truck.
- Even if you sound the back-up buzzer, the people behind the truck do not necessarily hear it. Always check that there is no one behind the truck before driving the truck.



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WARNING OBSTRUCTION OF REARVIEW WHEN USING LP GAS FUEL (GASOLINE ENGINE LIFT TRUCK)

- The LP gas cylinder partially blocks the view to the rear, so there is danger of hitting personnel or products or buildings in the surrounding area. Install backup warning devices (backup buzzer, rotating backup lamp, etc.) or backup confirmation devices (rearview mirror, etc.) to warn personnel in the surrounding area and to confirm that the area to the rear is safe. Please contact your Komatsu Forklift distributor for details of installing such optional warning equipment.



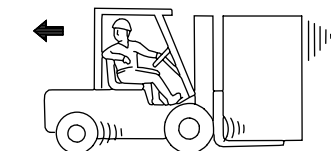
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8. SAFE TRAVEL



WARNING WHEN FRONT VIEW IS POOR

- If the view to the front is obstructed by the load, turn to the rear and drive the lift truck in reverse.
- When driving in reverse with a high load, use a signalperson to ensure the safety of the load and the safety in the surrounding area.



AB801220



WARNING CHECK BEFORE STARTING

- When checking the lift truck before starting, follow the procedure given in this Manual, and do not start the lift truck until all the checks have been completed.
- If anything abnormal is found, inform the person in charge and carry out the necessary repairs.



WARNING REARVIEW MIRROR, LAMPS

- When reversing, never depend on the rearview mirror; the operator must visually check behind him. Also, adjust the rearview mirror so that the operator can check from the operator's seat that the area behind the lift truck is safe. Always keep the surface of the mirror clean. If the mirror is broken, replace it with a new one (For lift trucks equipped with rearview mirror).
- Check that the lamps light up correctly. Replace any broken bulbs (for lift trucks equipped with lamps).

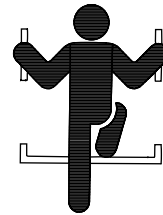


WARNING KEEP HANDS FREE FROM OIL OR WATER

- Do not drive the lift truck if your hands are wet or covered with oil. Your hands will slip on the work equipment control levers or directional lever, and this may cause a serious accident.

⚠ WARNING MOUNTING AND DISMOUNTING

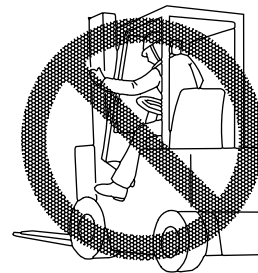
- Never jump on or off the lift truck.
- When getting on or off the lift truck, always stop the lift truck and use the handrails and steps to ensure that you support yourself.
- Never hold any control levers or the steering wheel when getting on or off the lift truck.
- If there is any oil, grease, or mud on the handrails or steps, wipe it off immediately. Always keep these parts clean. Repair any damage.



AL187320

⚠ WARNING ALWAYS SIT IN OPERATOR'S SEAT

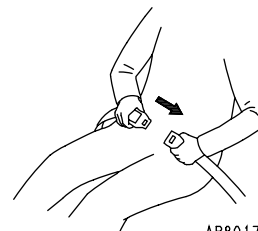
- Never operate the lift truck from outside the operator's compartment.
- Always keep your body under the overhead guard.
- Do not extend your arms or legs outside the operator's compartment.



AB801240

⚠ WARNING SEAT BELT (for lift trucks equipped with seat belt)

- Always wear your seat belt correctly when on the operator's seat. The seat belt will reduce the risk of injury.
- Always check the seat belt mounts and check for any damage to the seat belt. If any abnormality is found, repair or replace the seat belt immediately.



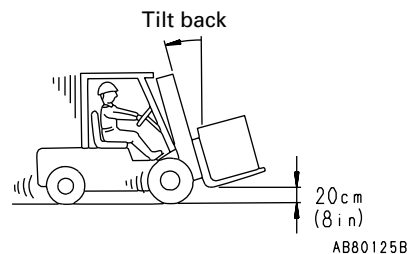
AB801700

8. SAFE TRAVEL



WARNING SAFETY WHEN STARTING

- Before starting the lift truck, check that the surrounding area is safe.
- Before starting the lift truck, raise the forks [approx. 20 cm (8 in) from the ground surface], and tilt the mast back.
- Before starting the lift truck, release the parking brake.



WARNING BRAKING WHEN TRAVELING

- Do not stop the engine when traveling.
If the engine is stopped, the power steering and power brake will not work.
- If the inching pedal is depressed, the braking effect of the engine will be lost.
- Do not use the brake excessively. Do not rest your foot on the brake pedal or inching pedal unless you are operating it.
If you do, the brake will overheat and the braking effect will be lost.
For TORQFLOW lift trucks, if you leave your foot on the inching pedal, the multiple disc clutch inside the transmission will overheat. In the worst case, the clutch discs will be deformed and the clutch will not function normally.

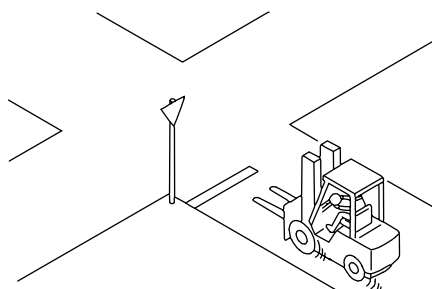


WARNING SAFETY DURING TRAVEL

- Keep a clear view of the path of travel and observe for other traffic, personnel, and safe clearances.
- When passing oncoming vehicles, reduce speed and keep a safe distance from the other vehicle.
- In places where there are speed limits, observe the speed limit and maintain a safe distance from other vehicles.

⚠ WARNING CONFIRMING SAFETY

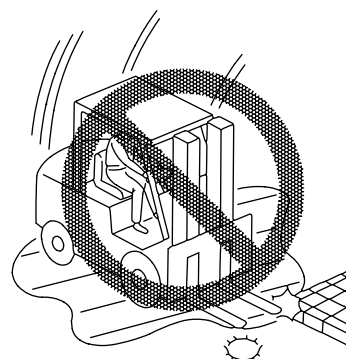
- When traveling, always pay careful attention to the area around your lift truck, particularly in the direction of travel or when turning.
- Do not pass other vehicles on narrow roads or at crossings or other places where the view is poor.
- When traveling through crossings or other places where the view is poor, or when entering or leaving narrow roads, stop and sound the horn to confirm safety before driving on.
- Even if you sound the horn, not everyone in the surrounding area will necessarily hear it. Always pay careful attention to the movements of people in the surrounding area.
- When crossing roads or turning corners, stop and confirm safety before continuing.
- Always pay careful attention to the movements of people in the surrounding area, and take steps to prevent people from entering the working area.



AB801260

⚠ WARNING SAFETY DURING TRAVEL

- Avoid traveling in places which are flooded or where there are holes.
- Do not try to drive the lift truck on soft ground.
- Avoid curbs, rails, ditches, or other obstacles, and do not travel directly over them.
- Do not travel on slippery road surfaces.
- When entering buildings, check the weight limit of the floor and be careful not to exceed the limit.



AB801270

⚠ WARNING GIVE PRIORITY TO LOADED LIFT TRUCKS

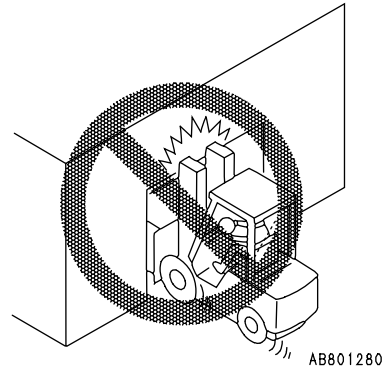
- When traveling on slopes or in confined areas, unloaded lift trucks should always give right of way to loaded trucks.

8. SAFE TRAVEL

⚠ WARNING HEIGHT OR WIDTH LIMITS

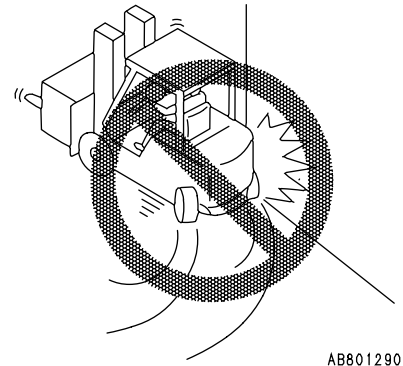
When going in or out of places with height or width limits:

- Ensure that there is ample height and width for the lift truck to pass.
- Do not extend your hands or legs outside the lift truck.
- Check that the surrounding area is safe.
- Be careful of electric wires and other obstacles inside and outside the building.



⚠ WARNING PRECAUTIONS WHEN TURNING

- When turning while traveling forward, the counterweight will swing far out. Keep an ample clearance from walls to ensure safety.
- When turning, travel slowly and be careful that the front or rear wheels do not come off the ground. When turning on soft road shoulders, there is danger that the rear wheels may come off the road shoulder and cause the lift truck to tip.



⚠ WARNING STOPPING DISTANCE

- When traveling downhill, it requires a longer distance for the lift truck to stop than when traveling on level ground. When traveling downhill, reduce the speed and make sure that you have ample room at the bottom of the slope to stop.
- When traveling on wet surfaces, it requires a longer distance to stop than when traveling on normal road surfaces. Always leave ample room to stop.

⚠ WARNING NO TOWING

If there is any problem with the brakes or steering system of your lift truck, do not use another lift truck to tow it.

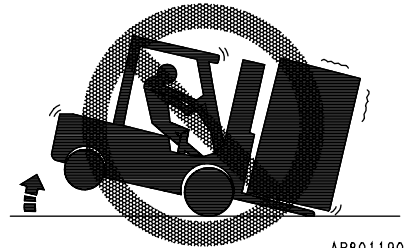
There is danger that the lift truck may run away.

9. LOADING OPERATIONS

9. LOADING OPERATIONS

WARNING NO OVERLOADING

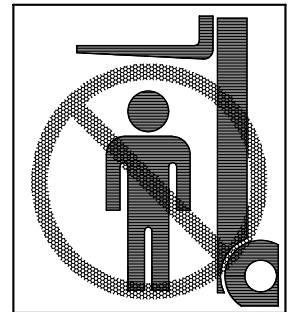
- Do not load the lift truck over the capacity set forth in the load capacity chart. If the rear wheels come off the ground because of overloading the lift truck cannot travel or turn. There is also danger that it may tip.
- Always check the load capacity chart to confirm the loading capacity.



AB801190

WARNING DON'T GO UNDER FORKS

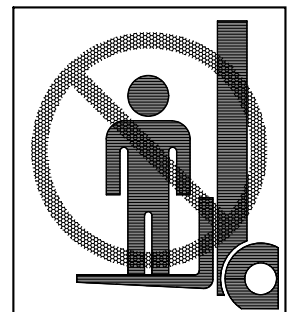
- Never allow anyone to go under the load-engaging means or load when it is raised.
The area under the forks is a danger area. If the forks come down, the person under the forks may be crushed, or seriously injured or killed.
- Never allow anyone to go under the load-engaging means or load even if it is elevated or stuck. It may fall down suddenly at any moment.



AA814800

WARNING DO NOT LIFT PEOPLE ON FORKS

- Do not use the forks to lift people. If the person falls from the forks he/she may be seriously injured.



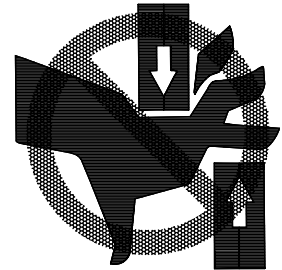
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9. LOADING OPERATIONS

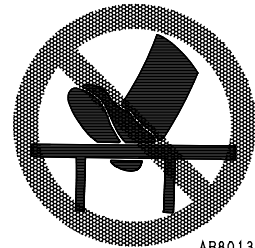


WARNING BE CAREFUL NOT TO GET CAUGHT OR FALL

- Never put your hands or feet into the mast structure. There is danger that you will get caught in moving parts and be seriously injured.
- Do not use the mast as a ladder. If you slip, there is danger that you will fall.



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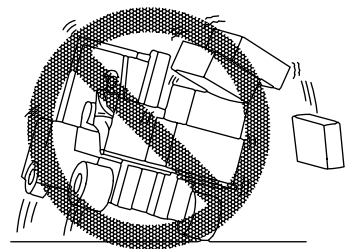
WARNING OPERATE FROM OPERATOR'S COMPARTMENT

- Always operate the mast and forks from the operator's compartment.



WARNING NO UNSTABLE LOADS

- Place the load so that its center of gravity will be on the center line of the lift truck. If the load is unbalanced, the truck may turn over.
- Place the load so that it contacts the load backrest.
- Do not handle unstable loads. If there is danger that the load may fall off, secure it in position and take steps to prevent the load from collapsing or falling.
- When carrying stacked loads, tie with rope to prevent the load from falling.



AB801340



WARNING DO NOT LOAD ABOVE HEIGHT OF LOAD BACKREST

- Keep the height of the load within the height of the load backrest. Do not carry any load that is higher than the load backrest. If the load is higher than the load backrest, there is danger that it will fall back on top of the operator. **This may lead to serious injury or death.**

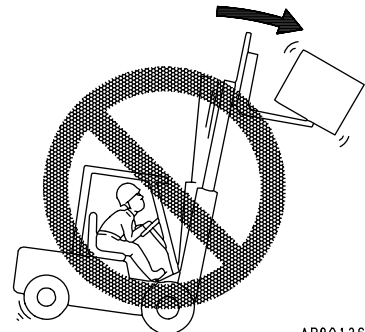


AB801350



WARNING DO NOT TILT MAST FORWARD WHEN LOADED

- Do not tilt the mast forward when the forks are loaded and raised. There is danger that the load may fall and that the lift truck may tip.
- Do not travel with the mast tilted forward.
- Do not load and unload on slopes.

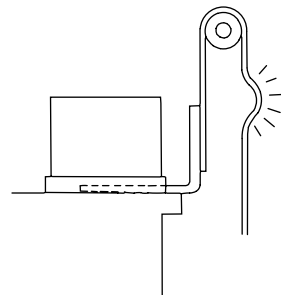


AB801360



WARNING KEEP CHAIN TENSE

- If there is any slack in the chain, the mast rail or forks may catch in the load or a shelf, and there is danger that the load may fall and the lift truck tip. Always be careful that there is no slack in the chain when pulling the forks out from pallet or shelf.

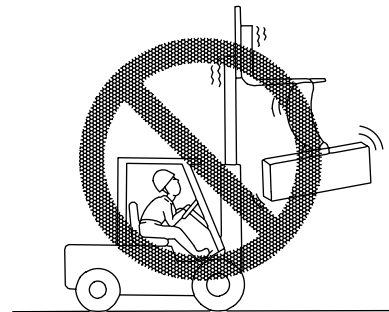


AB801370

9. LOADING OPERATIONS

⚠ WARNING USE ONLY FOR INTENDED PURPOSES

- Do not use the lift truck for anything other than the intended use (loading operations using the forks).
- Do not use the forks to open or close the doors of railroad cars or warehouses.
- Do not push any other vehicle.
- Do not hook ropes on the forks and use the forks to lift loads.
- Do not use the drawbar pin for towing operations.



AB801380

⚠ WARNING LEVER OPERATION

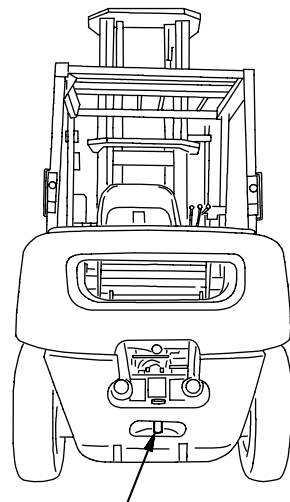
- Be careful not to operate the lever by mistake. There is danger that the forks or work equipment may cause serious injury.
- Do not operate the levers when getting off the lift truck.

⚠ WARNING USING DRAWBAR PIN

⚠ WARNING

Do not use the drawbar pin for towing other lift trucks, for being towed by other lift trucks, or for lifting operations.

- The drawbar pin installed to the rear of the counterweight is used only to free the lift truck when the tires have become stuck in mud or in a ditch and the lift truck cannot move, or when loading the lift truck on to a trailer or truck.



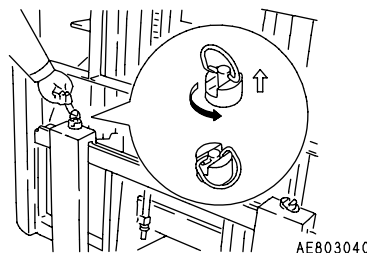
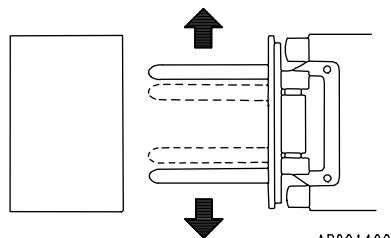
Drawbar pin

AE82212B



WARNING FIT FORKS SECURELY IN POSITION

- When adjusting the position (width) of the forks, be careful not to get your hands caught.
- After adjusting, check that the forks are held securely in position by the fork stopper. If the forks are not held in position, there is a danger that the forks may move when the lift truck is traveling and the load may fall off.



9. LOADING OPERATIONS



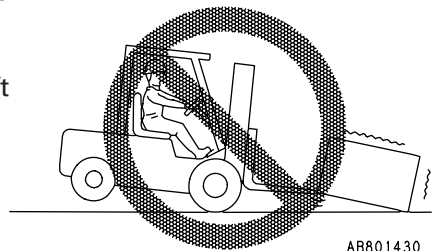
CAUTION ADJUST CHAIN

- Be sure the tension of the left and right chains are the same (See CHECK BEFORE OPERATION). If the tension is not the same, the load will be unbalanced even if it is loaded correctly in the center, and there is danger that the lift truck may tip. (For details of adjustment, see page 2-27.)



WARNING BE CAREFUL OF FORK TIPS

- Do not allow the tips of the forks to get close to people. The tips of the forks are pointed, so there is a risk that they may cause injury.
- Do not hook the tips of the forks under objects. If the forks slip out, there is danger that the lift truck or object may move unexpectedly.



AB801430



WARNING PEOPLE IN WORKING AREA

- Do not allow anyone except the signalperson in the working area.
- Do not let any person or other lift truck come close during operation.
- When working with a signalperson, always follow their instructions.



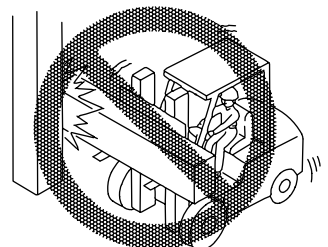
WARNING USE STRONG PALLETS AND SKIDS

- Always be sure that the pallets and skids have ample strength. If broken or damaged pallets or skids are used, there is a risk that the load may fall.



WARNING HANDLING LONG OR WIDE LOADS

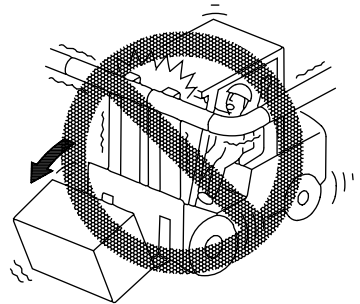
- Be extremely careful when carrying long or wide loads. Raise the load slowly and be careful not to touch anything in the surrounding area.
- Keep the load as low as possible and be sure to maintain the balance.
- When turning, operate slowly and be careful not to let the load move.



AB801440

⚠ WARNING OVERHEAD OBJECTS

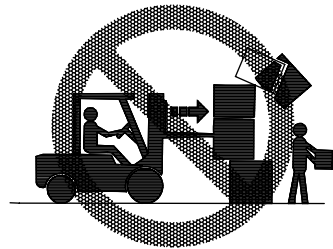
- Be careful not to let the mast, overhead guard or load contact electrical wiring, pipes, sprinklers, or roof beams. If the truck hits such objects, there is a risk that the load will fall or the lift truck will tip. When the forks are raised, the mast height increases, so be particularly careful when the forks are raised.



AB801450

⚠ WARNING NO PUSHING

- Do not use the forks to push or pull loads. There is a risk that the load will be damaged or fall.



AB801460

⚠ WARNING PRECAUTIONS WHEN LOADING/UNLOADING

- Do not let anyone place a load on the forks.
- Do not let anyone directly remove the load from the forks.
- Standing on the forks is dangerous because the forks are slippery and the load may move.
- Do not use anyone to keep the load stable.
The lift truck may move unexpectedly, causing the load to fall and crush the person.

10. STOPPING AND PARKING

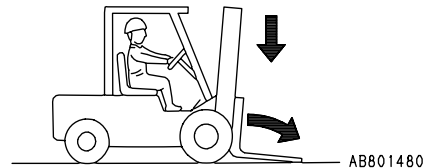
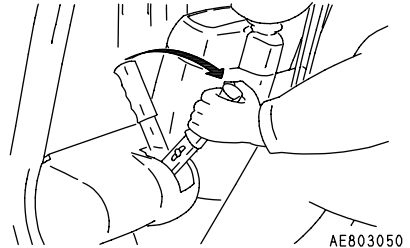
10. STOPPING AND PARKING



WARNING PRECAUTIONS WHEN STOPPING OR PARKING

Observe the following procedure when stopping or parking the lift truck.

- 1) Stop the lift truck on level ground.
- 2) Apply the parking brake securely to make sure that the lift truck cannot move.
- 3) Set the directional lever and speed lever to neutral.
- 4) Lower the forks to the ground.
- 5) Turn the key switch OFF to stop the engine.
- 6) Remove the key from the key switch, then get off the lift truck.



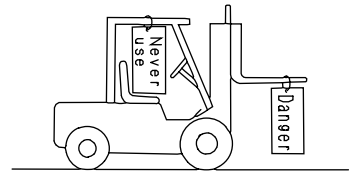
WARNING PARKING

- Park the lift truck in the specified place.
- Park the lift truck on a firm surface.
- Do not park near any emergency exit, stairway, fire extinguisher, or other safety equipment. Park the lift truck in a place where it will not obstruct pedestrians or other vehicles.
- Never park the lift truck near any flammable object.
- When parking the lift truck on a slope, park it in as mentioned in precautions when stopping or parking (above), then put blocks under the tires to prevent the lift truck from moving.
- Do not park near any holes for construction or elevator shafts. If LPG leaks, it can accumulate and cause fire or explosion.



WARNING PARKING MACHINE AFTER FAILURE

- If the lift truck has suffered a failure and the lift truck must be parked without lowering the forks, put markers on the tips of the forks and take steps to prevent pedestrians or other vehicles from hitting the forks.
- Select a parking place where people or vehicles do not pass, and stop the lift truck so that it is difficult for anyone to go under the forks. (The area under the forks is a danger zone.)
- Place a stand or something similar under the inner mast rail or forks to prevent unexpected drop of the forks.
- Remove the key from the faulty lift truck and hang signs in the operator's compartment to prevent its use.



AB80149B



WARNING ABRUPT LOWERING OF STUCK FORK

- Because a stuck fork may drop down unexpectedly, do not go under the fork when it is in this condition.
Be very careful when dealing with this problem to prevent damage or injury, and warn those in the work area.

11. INSPECTION AND MAINTENANCE

11. INSPECTION AND MAINTENANCE



WARNING USE QUALIFIED PERSONNEL FOR INSPECTION AND MAINTENANCE

- Only persons authorized by the owner or operator of the equipment and having proper certification (local or national) may carry out inspection, maintenance and repairs of the lift truck.
If inspection, maintenance, or repair work is carried out incorrectly, it is very dangerous.



WARNING MAINTENANCE LOCATION

- When carrying out inspection and maintenance, use a level, dry, dust-free area.
- If the work is carried out inside a building, make sure that there is ample ventilation.



WARNING PRECAUTIONS FOR INSPECTION AND MAINTENANCE

- To be prepared in the event of a fire, have a fire extinguisher nearby and make sure that you know how to use it.
- Before carrying out inspection, lower the forks to the ground and stop the machine.
- Do not run the engine unless it is necessary.
- Place the directional lever, speed lever, and work equipment control levers in neutral.



WARNING PRECAUTIONS WHEN CARRYING OUT INSPECTION AND MAINTENANCE

- Wipe off any oil or grease. Immediately wipe up any oil that has leaked.
If the lift truck is dirty, it becomes difficult or impossible to find cracks or other problems. Always clean the lift truck before starting inspection.
- Do not smoke or allow any flame to exist under any circumstances.
Do not use any cloth which is soaked in fuel, oil, or grease. There is danger that it may catch fire.
- Wear suitable clothes for the job.
- Use suitable safety and protective equipment (hard hat, safety boots, safety glasses, gloves) for the job.
- When working on top of the lift truck, be careful not to fall.
- Do not put your feet under the forks.
- When opening or closing the floor plate or engine hood, be careful not to get your hands or body caught.
- When carrying out inspection with the forks raised, insert a stand under the inner mast to prevent the forks and mast from dropping.
- When carrying out job with another worker, decide who is the leader and carry out the job in accordance with instructions from that person.
- After repairing, make sure that the trouble has been corrected by performing a trial run.
- During the trial run, start/operate the lift truck carefully because it is possible that the trouble has not been fully corrected or that defective parts have not been removed.

⚠ CAUTION USE SUITABLE TOOLS

- Always use tools that are suited for inspection and maintenance.
It is extremely dangerous to use broken tools or tools designed for another purpose.



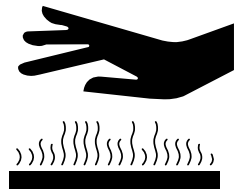
A0055120

⚠ WARNING REPLACE SAFETY CRITICAL PARTS PERIODICALLY

- Even if no abnormality is found, always replace safety critical parts periodically. As time passes, these parts deteriorate and may cause fire or failure in the work equipment system.
- However, if these parts show any abnormality before the replacement interval has passed, they should be repaired or replaced immediately.

⚠ WARNING PRECAUTIONS WITH HIGH TEMPERATURE COOLANT

- Immediately after using the lift truck, the engine coolant is at high temperature and high pressure. Do not remove the radiator cap under these conditions. Hot water may spurt out and cause burns.
- When removing the radiator cap, turn it slowly to release the internal pressure.
- When checking the coolant level, stop the engine and wait for the engine and radiator to cool down before checking. For lift trucks equipped with a subtank or reservoir, check the level in the subtank.
- When adding water on lift trucks equipped with a subtank, add the water to the subtank.



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11. INSPECTION AND MAINTENANCE

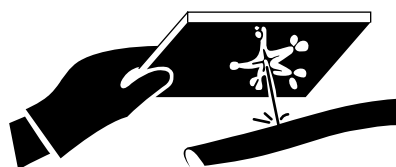


WARNING PRECAUTIONS WITH HIGH PRESSURE, HIGH TEMPERATURE OIL

- Immediately after using the lift truck, the oil is at high temperature. Do not drain the oil or replace the filter when the oil is hot. Hot oil may spurt out and cause burns.
- When carrying out inspection and maintenance, wait for the oil temperature to go down, and carry out the operation in the order given in this manual.
- Do not forget that the work equipment circuits are always under pressure. Do not add oil, drain oil, or carry out maintenance or inspection before completely releasing the internal pressure.
- If oil is leaking under high pressure from small holes, it is dangerous if the jet of high-pressure oil hits your skin or eyes. Always wear safety glasses and thick gloves, and use a piece of cardboard or a sheet of plywood to check for oil leakage.
- Release the internal pressure before checking the accumulator piping.
- If you are hit by a jet of high-pressure oil, consult a doctor immediately.



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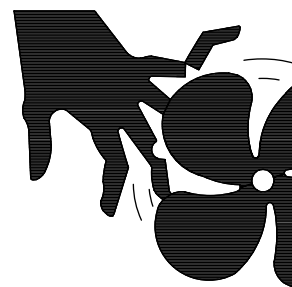


A0055190



WARNING ROTATING FAN AND BELT

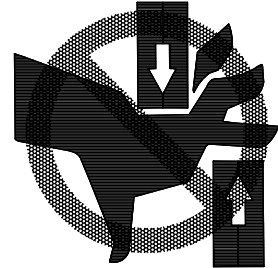
- It is extremely dangerous if you or any tool touches or gets caught in the fan or fan belt when the fan is rotating. Never touch the fan when it is rotating.
- Always stop the engine before inspecting rotating parts.
- When inspecting the areas around rotating parts, do not allow anything to come close which may get caught.



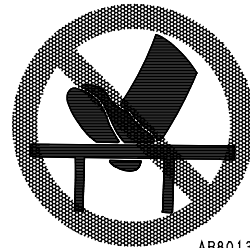
AB801500

⚠ WARNING BE CAREFUL NOT TO GET CAUGHT OR FALL

- Never put your hands or feet into the mast structure. There is danger that you will get caught in moving parts and be seriously injured.
- Do not use the mast as a ladder. If you slip, there is danger that you will fall.



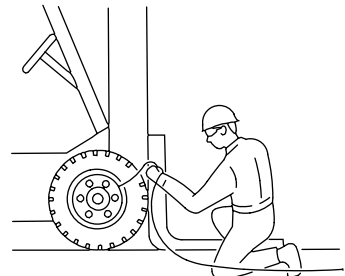
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AB801330

⚠ WARNING CHECKING AND INFLATING TIRES

- If the tire inflation pressure is low, it will affect truck stability. However, do not inflate the tires immediately. The inflation pressure may have gone down because of damage to the rim. If the rim is damaged or cracked and the tires are inflated, there is danger that the rim will break when the tire is under high pressure, and this may cause personal injury or death.
- For safety, when checking tire pressure, place your body in front of the tread face of the tire. Do not check from the side face of the tire.
- Suitable qualifications are needed for tire inflation work. Always have the work carried out by properly qualified personnel.
- The tire inflation pressure on a forklift truck is several times higher than the pressure on an automobile. When the tires are being inflated, there is danger that dirt or dust may be thrown up by the compressed air and enter your eyes, so always wear safety glasses.



AB801510

11. INSPECTION AND MAINTENANCE

WARNING HANDLING TIRES

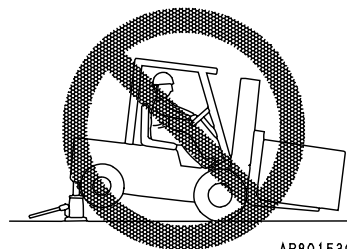
Disassembly and assembly of tires should be carried out by tire dealer.

The tire inflation pressure is extremely high, so caution is needed when handling tires.

- The wheel is fitted with mounting nuts. It also has rim nuts and bolts used to join the rim halves. When removing the tire from the lift truck, do not loosen the rim nuts and bolts. The tire is under high pressure, and there is a significant risk that the rim nuts and bolts may fly off. Relief tire inflation pressure before removing.
- When the tires have been replaced, carry out a test drive and check again for any loose mounting nuts. If the tightening torque is low, tighten to the specified torque.

WARNING JACKING UP LIFT TRUCK (when checking or replacing tires)

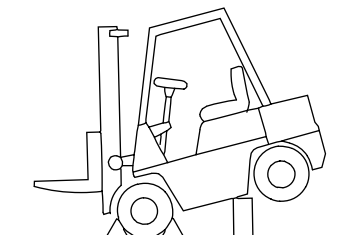
- Do not go under the forklift truck when it is jacked up.
- Check the following before jacking up the lift truck. (For details, see page 3-41.)
 - 1) Check that there is no one on the lift truck.
 - 2) Check that there is no load on the forks.
- When jacking up, stop when the tires come off the ground surface. Put blocks under both sides of the frame to prevent the lift truck from coming down.
- Put blocks under any tires contacting the ground to prevent the lift truck from moving.



AB801530

WARNING LIFTING LIFT TRUCK (when checking tires)

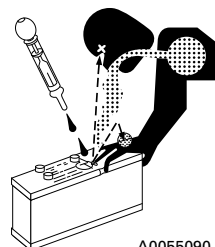
- Lift truck slinging work should be carried out by a qualified person who has completed a course in correct lifting methods.
- Fit wire ropes to the specified lifting points.
- When lifting the lift truck, check that the wire ropes have ample strength and are not damaged.
- Block the tires contacting the ground to prevent the lift truck from moving.
- Insert blocks to prevent the truck from coming down.
- Do not go under the lift truck during the lifting operation.
- If the specified lifting point is the counterweight, check that the counterweight mounting bolts are tightened to the specified torque before carrying out the lifting operation. Check also that there is no damage to the lifting portion on the counterweight.



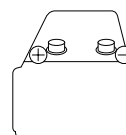
AB801540

⚠ WARNING BATTERY HAZARD PREVENTION

- Battery electrolyte contains sulfuric acid and can quickly burn the skin and eat holes in clothing. If you spill electrolyte on yourself, immediately flush the area with a large quantity of water.
- Battery electrolyte can cause blindness if splashed into the eyes. If electrolyte gets into your eyes, flush them immediately with large quantities of water and consult a doctor at once.
- If you accidentally drink electrolyte, drink a large quantity of water, or milk mixed with beaten eggwhite or vegetable oil. Call a doctor or poison prevention center immediately.
- When working with batteries, ALWAYS wear safety glasses or goggles.
- Batteries generate hydrogen gas. Hydrogen gas is highly EXPLOSIVE, and is easily ignited with a small spark or flame. Do not smoke or create any spark near the battery.
- Before working with batteries, stop the engine and turn the starting switch to the OFF position.
- When removing the battery, remove the cable from the negative ⊖ terminal first. When installing the battery, install the cable to the positive ⊕ terminal first.
- Avoid short-circuiting the battery terminals through accidental contact with tools or other metal objects across the terminals.
- Tighten the battery terminals securely. Loose terminals can generate sparks and lead to an explosion.
- When removing or installing the battery, confirm which is the positive ⊕ terminal and negative ⊖ terminal. Be careful not to connect the cables to the opposite terminals.
- Tighten the battery caps securely.
- When cleaning the battery, leave the battery caps tightened.



A0055090



A0055100

⚠ WARNING DO NOT PUT METAL OBJECTS ON TOP OF BATTERY

- Never place any metal objects on top of the battery. There is danger that they will cause a short circuit and start a fire.

11. INSPECTION AND MAINTENANCE



WARNING PRECAUTIONS WHEN CHARGING

When the battery is charged, hydrogen gas is generated and the battery is heated by the chemical change. To prevent the danger of gas explosion, always do as follows.

- Carry out the charging operation in a well-ventilated place.
- Do not smoke or allow any flame.
- Start the charging operation when the temperature of the battery electrolyte is below 35°C (95°F). (If the temperature goes above 50°C (122°F) during the charging operation, wait for it to go down below 35°C (95°F) before starting charging operation again.)
- When using a battery charger to charge the battery, take the battery caps off.



WARNING STARTING WITH BOOSTER CABLES

- ALWAYS wear safety glasses or goggles when starting the lift truck with booster cables.
- When starting using the battery of another lift truck, do not allow the two lift trucks to touch.

For details of the order of operations when using a booster cable.

- Stop the engine before connecting the cables.
- Be extremely careful not to let the cables get caught in the fan or fan belt.
- Connect the batteries in parallel: positive to positive and negative to negative. Never connect positive to negative.



WARNING DO NOT PUSH START

- Do not push the lift truck to start the engine. There is danger that the lift truck may suddenly start and operate unexpectedly.



WARNING HANDLING BRAKE FLUID

It is dangerous if the brakes do not work because in this condition, the lift truck cannot be stopped. Always do the following.

- Check the level of the brake fluid periodically.
- Always use the specified brake fluid.
- Check that the breather of the brake fluid reserve tank is not clogged.
- Be careful not to let dirt or dust get into the brake fluid reserve tank.



WARNING HANDLING ANTIFREEZE

- Antifreeze can be a flammable. Keep away from flame when handling.
- Antifreeze is poisonous, so do not drink it. If you drink it by mistake, drink large amounts of water, vomit it out, and get medical attention immediately. Follow safety precautions on container.



CAUTION WASTE MATERIALS

- Obey appropriate laws and regulations when disposing of harmful objects such as oil, fuel, solvent, filters, and batteries.



AB801560

12. STRUCTURE AND STABILITY OF THE LIFT TRUCK (to prevent lift truck from tipping!)

12. STRUCTURE AND STABILITY OF THE LIFT TRUCK (TO PREVENT LIFT TRUCK FROM TIPPING!)

To operate the lift truck safely, it is important to understand the structure and stability of the lift truck.

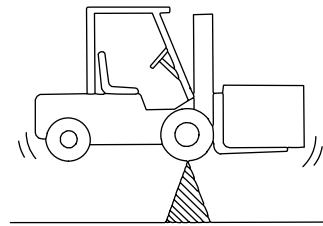


CAUTION STRUCTURE OF LIFT TRUCK

A forklift truck consists basically of the lifting mechanism (the forks and mast) at the front and the lift truck itself (with tires) at the rear.

The front wheels of the lift truck act as the fulcrum, and the center of gravity of the lift truck and center of gravity of the load are kept in balance.

The relationship between the position of the center of gravity of the lift truck and the center of gravity of the load is extremely important for maintaining the safety of the lift truck.

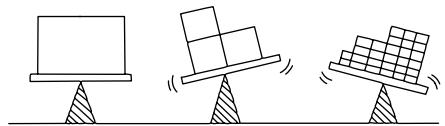


AB801570



CAUTION CENTER OF GRAVITY OF LOAD

The loads carried by forklift trucks come in various shapes from boxes to planks and long objects. To judge the stability of the lift truck, it is important to distinguish the position of the center of gravity for loads of various shapes.



AB801580

12. STRUCTURE AND STABILITY OF THE LIFT TRUCK (to prevent lift truck from tipping!)



CAUTION

CENTER OF GRAVITY AND STABILITY

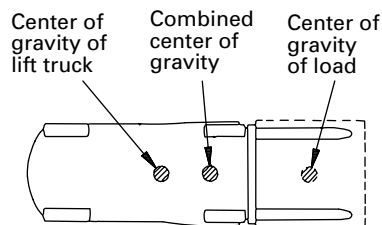
The stability of the lift truck is determined by the position of the combined center of gravity resulting from the combination of the centers of gravity of the lift truck and load.

When the lift truck is carrying no load, the center of gravity remains as it is, but when the lift truck is loaded, the combined center of gravity becomes the combination of the centers of gravity of both the lift truck and the load.

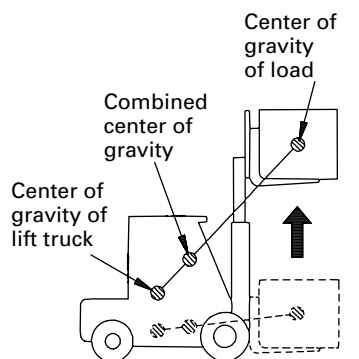
The position of the center of gravity of the load changes according to whether the mast is tilted forward or back or whether the mast is raised or lowered, so the position of the combined center of gravity also changes accordingly.

The position of the combined center of gravity of the lift truck is governed by the following factors:

- Size, weight, shape of load
- Lifting height
- Tilting angle of mast
- Inflation pressure of tires
- Acceleration, deceleration, turning radius
- Condition of road surface, angle of road
- Type of attachments



AB80159B



It is assumed that the lift truck body is constant. AB80160B

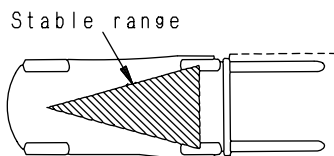


CAUTION

STABLE RANGE OF CENTER OF GRAVITY

For the lift truck to be stable, the position of the combined center of gravity must be inside the triangle (stable range of center of gravity) formed by the ground contact points of the left and right front tires and the center of the rear axle.

If the position of the overall center of gravity is in front of the front axle, the front tires will form the fulcrum and the lift truck will tip to the front. If the position of the combined center of gravity moves outside the triangle forming the stable area for the center of gravity, the lift truck will tip in the direction where the combined center of gravity moves outside the triangle.



AB80161B

12. STRUCTURE AND STABILITY OF THE LIFT TRUCK (to prevent lift truck from tipping!)

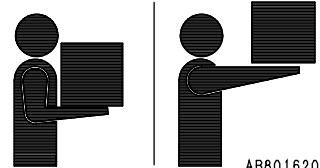


CAUTION

MAXIMUM LOAD (weight and center of gravity of load)

The horizontal distance between the center of gravity of the load on the forks and the load backrest of the forks or the front face of the forks (whichever is shorter) is called the load center.

The maximum load is the maximum weight of the load that can be loaded at the standard load center. The relationship between the maximum load and the load center is given in the load capacity chart on the plate on the lift truck. If the load center moves to the front of the forks, the overall center of gravity also moves to the front, so this means that the load must be reduced.



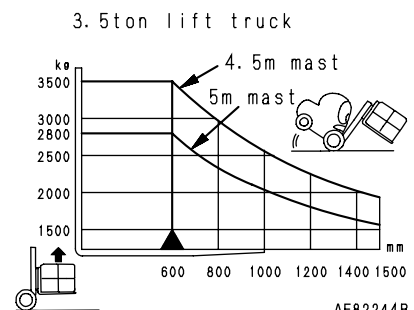
AB801620



CAUTION

LOAD CAPACITY CHART

This shows the relationship between the position of the load center and the maximum load. Before loading the forks, check that the load and load center are within the permitted range on the load capacity chart. If the shape of the load is complex, set so that the heaviest part of the load is at the center of the forks and set the load close to the load backrest.



12. STRUCTURE AND STABILITY OF THE LIFT TRUCK (to prevent lift truck from tipping!)



WARNING SPEED AND ACCELERATION

If a stationary object is not subjected to external force, it will remain stationary. In the same way, if a moving object is not subjected to external force, it will continue to move at the same speed. This is called inertia.

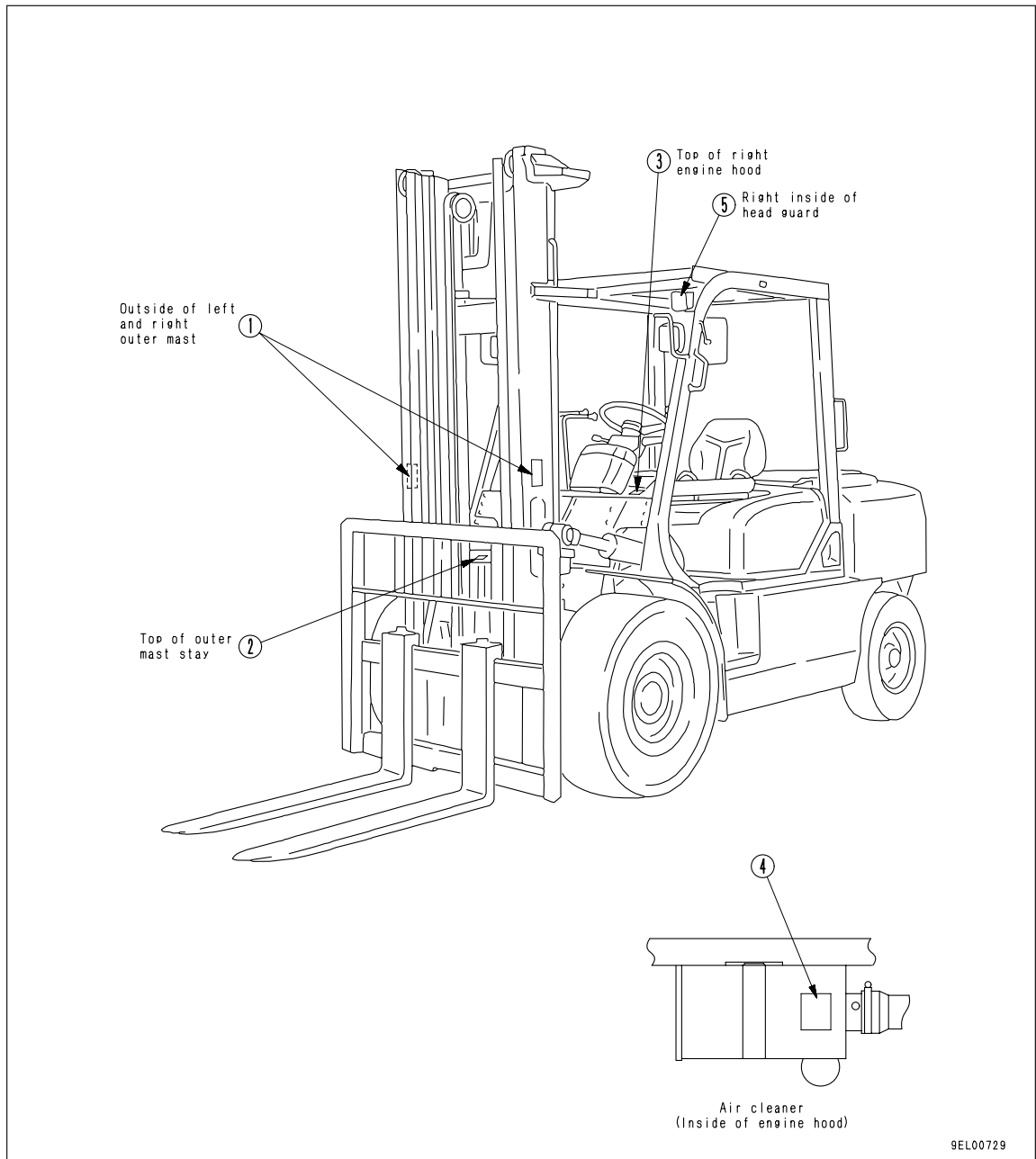
Because of inertia, a force is applied towards the rear when the lift truck starts to move, and is applied towards the front when the lift truck stops. If the brake are applied suddenly, there is danger of a large force being applied towards the front which may make the lift truck tip or the load to be expelled.

When the lift truck is turned, a centrifugal force is applied to the outside from the center of the turn. This force pushes the lift truck to the outside and makes it tip. The range of stability to the left and right is particularly small, so it is necessary to reduce speed when turning, in order to prevent the lift truck from tipping. If the lift truck is traveling with a raised load, the position of the overall center of gravity is high, so the danger of tipping to the front, left, or right becomes greater.

13. SAFETY LABEL STICKING POSITIONS

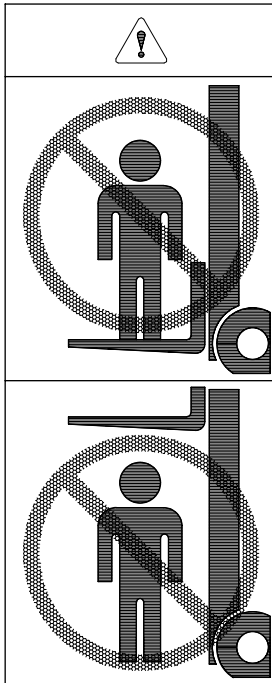
Keep these labels clean. If a label comes off, stick it on again or replace with a new one. Concerning labels other than the safety labels, use these in the same way.

13.1 SAFETY LABEL STICKING POSITIONS



13. SAFETY LABEL STICKING POSITIONS

1. Prohibit the operator from riding on the forks and lifting/lowering himself.
Never enter the area under the forks.

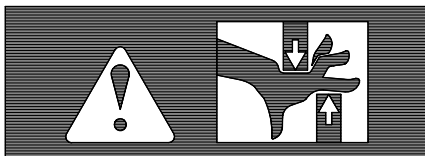


4. Never touch fan when rotating.



For safety label 1, order Part No. 3EB-96-25130
For safety label 2, order Part No. 3EB-96-25120
For safety label 3, order Part No. 3EB-96-15130
For safety label 4, order Part No. 3EB-96-25770
For safety label 5, order Part No. 3EB-96-32610

2. Caution to avoid getting hand caught.



3. Caution before operating machine.

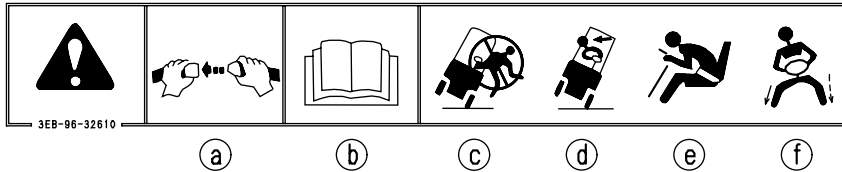
 WARNING	 CAUTION				
BEFORE LEAVING THE OPERATOR'S SEAT • BE SURE TO LOWER THE WORK ATTACHMENT TO THE GROUND. • APPLY THE PARKING BRAKE.	<table border="0"><tr><td>1. BEFORE STARTING ENGINE</td><td>2. BEFORE OPERATING, MACHINE, READ OPERATION MANUAL CAREFULLY.</td></tr><tr><td> • PUT GEARSHIFT LEVER IN NEUTRAL • APPLY BRAKE </td><td></td></tr></table>	1. BEFORE STARTING ENGINE	2. BEFORE OPERATING, MACHINE, READ OPERATION MANUAL CAREFULLY.	• PUT GEARSHIFT LEVER IN NEUTRAL • APPLY BRAKE	
1. BEFORE STARTING ENGINE	2. BEFORE OPERATING, MACHINE, READ OPERATION MANUAL CAREFULLY.				
• PUT GEARSHIFT LEVER IN NEUTRAL • APPLY BRAKE					

3EB-96-15130

13. SAFETY LABEL STICKING POSITIONS

5. Avoiding danger if lift truck overturns during operations

If the steering is operated suddenly during operations, there is danger that the lift truck may lose its balance and tip over. To avoid danger, always observe the following precautions strictly.



AW82592B

- (a) Always wear your seat belt during operations.
- (b) Make sure that you read and understand the Operation and Maintenance Manual before operating the lift truck.
- (c) Never jump off the lift truck.
- (d) Lean in the opposite direction from the direction in which the lift truck is tipping.
- (e) Grip the steering wheel tightly.
- (f) Brace yourself with both feet to support your body.

Items (c) to (f) are for when the lift truck tips over.

13.2 INTRODUCTION OF SAFETY DEVICES (OPTION)

Various safety devices are available as options. If the operating conditions demand, please install these devices. The devices listed below are only examples. Various other devices are also available.

For details, please contact your Komatsu Forklift distributor.

1. **Rear lamp**

Install this when carrying out operations at night which require the rear area to be lighted.

(The law demands that sufficient lighting be provided to ensure safety.)

2. **Speedometer**

This shows the travel speed (km/h) and distance traveled by the lift truck.

3. **Speed alarm**

When the lift truck exceeds the preset speed, a buzzer sounds to warn the operator.

4. **Safety checker**

Warning lamps are added to the meter panel.

- Battery electrolyte level warning lamp
- Radiator cooling water level warning lamp
- Air cleaner element warning lamp

5. **High backrest**

This improves the support for high loads and improves the stability of the load.

6. **Wide fork carriage**

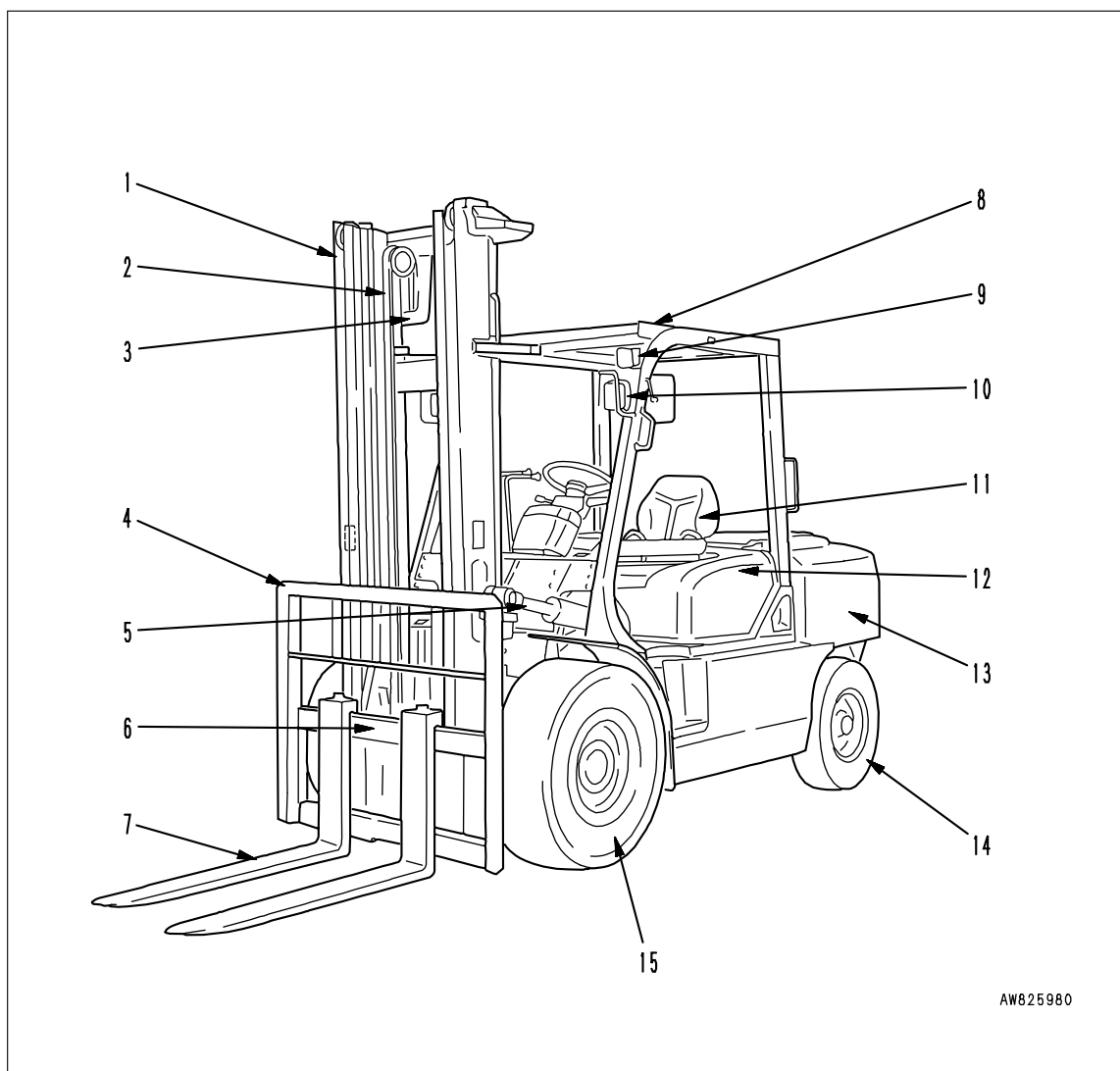
This improves the support for wide load and improves the stability.

MEMO

OPERATION

14. GENERAL VIEW

14.1 GENERAL VIEW OF LIFT TRUCK

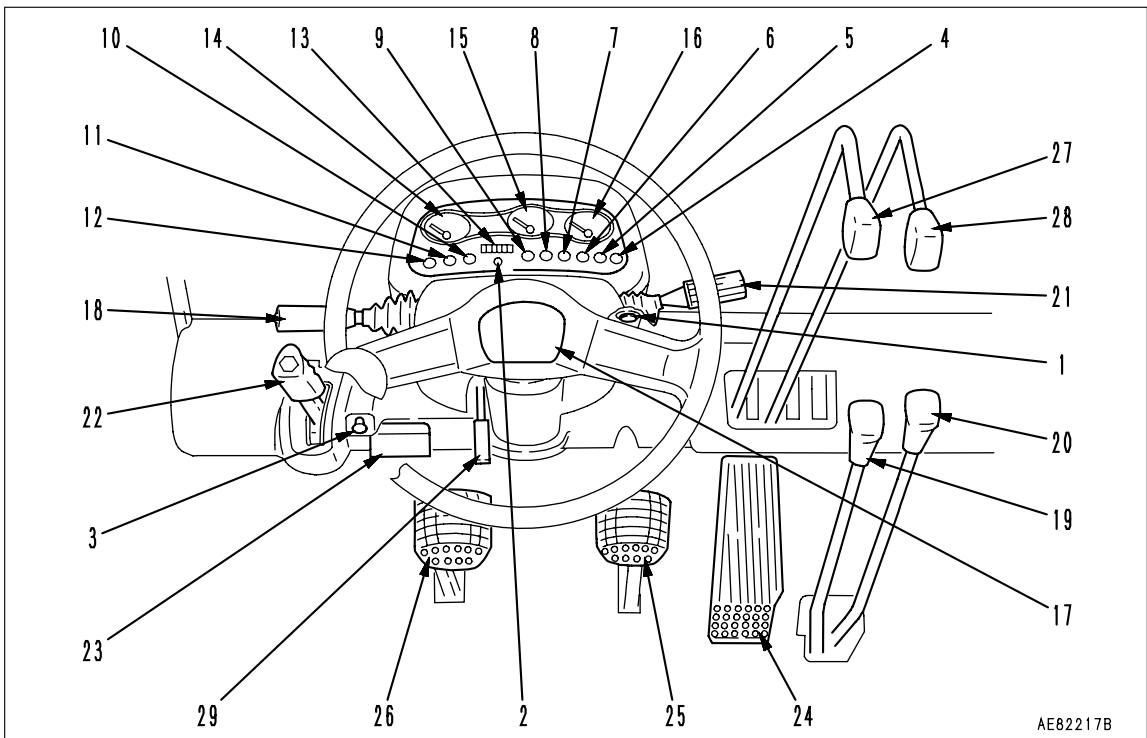


AW825980

1. Mast
2. Lift chain
3. Lift cylinder
4. Back rest
5. Tilt cylinder
6. Fork carriage
7. Fork
8. Overhead guard

9. Turn signal lamp
10. Head lamp
11. Operator's seat
12. Engine hood
13. Counterweight
14. Rear wheel
15. Front wheel

14.2 INSTRUMENTS AND CONTROLS



- | | | |
|---|--|---|
| 1. Starting switch | 9. Air cleaner element warning lamp (option) | 20. High/low speed lever (clutch type lift truck) |
| 2. Operation indicator (displays during operation) | 10. Charge warning lamp | 21. Combination switch (turn signal lamp and lamp switch) |
| 3. Choke button (gasoline engine lift truck) | 11. Engine oil pressure warning lamp | 22. Parking brake lever |
| 4. Glow indicator (diesel engine lift truck) | 12. Brake fluid level warning lamp | 23. Fuse box |
| 5. Sedimenter warning lamp (diesel engine lift truck) | 13. Hourmeter | 24. Accelerator pedal |
| 6. Battery electrolyte level warning lamp (option) | 14. Engine water temperature gauge | 25. Brake pedal |
| 7. Radiator cooling water level warning lamp (option) | 15. Torque converter oil temperature gauge | 26. Inching pedal |
| 8. Fuel level warning lamp (option) | 16. Fuel gauge | 27. Lift lever |
| | 17. Horn button | 28. Tilt lever |
| | 18. FORWARD/REVERSE lever (TORQFLOW transmission lift truck) | 29. Tiltable steering wheel lock lever |
| | 19. FORWARD/REVERSE lever (clutch type lift truck) | |

NOTICE

Method of checking for blown bulbs in warning lamps

1. Check that all warning lamps light up when the starting switch is turned ON.
2. If any warning lamp does not light up, the bulb for that lamp is blown.

15. EXPLANATION OF COMPONENTS

The following is an explanation of the devices employed to operate the lift truck. To carry out suitable operations correctly and safely, it is important to understand fully the method of operating the equipment and the meanings of the displays.

1. STARTING SWITCH

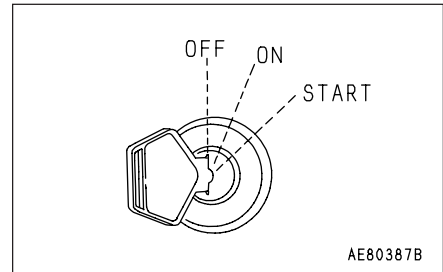
This is used to start and stop the engine.

- **Clutch type lift truck:**

When starting the engine, place the forward/reverse control lever and high/low speed control lever at the neutral position, pull the parking brake lever, and depress the clutch pedal fully, then turn the key.

- **TORQFLOW transmission lift truck:**

When starting the engine, place the forward/reverse control lever at the neutral position, pull the parking lever, and depress the inching pedal fully, then turn the key.



OFF: Engine stop position

The key can be inserted or removed. The lamps and horn are activated at this position.

ON: Engine running position

For diesel engine lift trucks, carry out preheating before starting the engine.

START: Position for starting engine

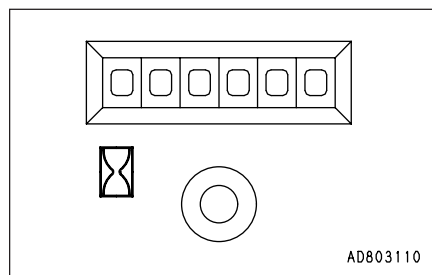
After the engine starts, release the key. It will automatically return to the ON position.

NOTICE

- When the engine is stopped, do not leave the key at the ON position. This will discharge the battery and make it difficult to start the engine.
- Do not run the starting motor continuously for longer than the times given below.
Gasoline engine lift truck: Max. 5 seconds
Diesel engine lift truck: Max. 20 seconds
- Do not turn the key to the START position when the engine is running.

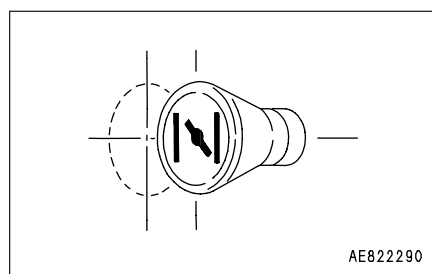
2. OPERATION INDICATOR

The lamp (green) flashes when the starting switch is turned ON. (It shows that the hourmeter is working. For details of the advance of the numbers on the hourmeter, see HOURMETER.)



3. CHOKE BUTTON (GASOLINE ENGINE LIFT TRUCK)

Use this for starting the engine when it is cold and for carrying out warming-up operations. Pull the button to make it easy to start the engine. When the engine has warmed up, return the button to its original position.



4. GLOW INDICATOR (DIESEL ENGINE LIFT TRUCK)

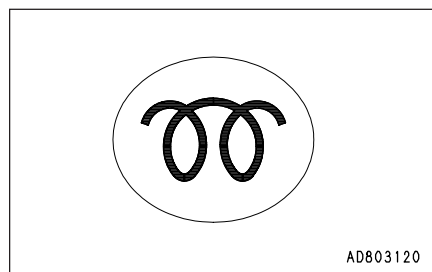
This lamp shows the preheating condition of the engine.

When the starting switch is turned ON it lights up, and when the preheating is completed, it goes out.

Lamp ON: Glow plug heating

Lamp OFF: Glow plug preheating completed

When the lamp goes out, start the engine.



5. SEDIMENTER WARNING LAMP (DIESEL ENGINE LIFT TRUCK)

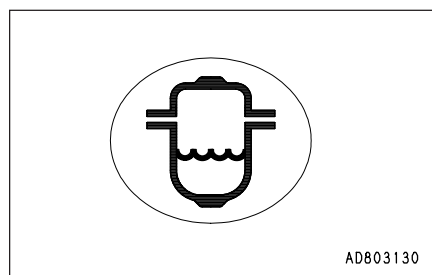
This lamp informs the operator that there is water collected in the fuel filter.

When the starting switch is turned ON, the check is carried out.

Lamp OFF: Normal

Lamp ON: Drain water from fuel filter.

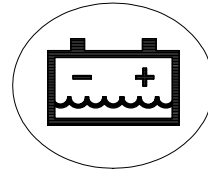
For details of the method of draining the water, see PERIODIC MAINTENANCE.



15. EXPLANATION OF COMPONENTS

6. BATTERY ELECTROLYTE LEVEL WARNING LAMP (OPTION)

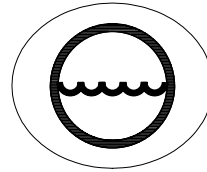
If this lamp lights up, add distilled water.



AD803140

7. RADIATOR COOLING WATER LEVEL WARNING LAMP (OPTION)

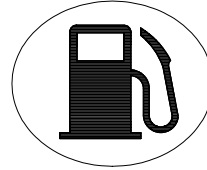
If this lamp lights up, check the cooling water level and add water.



AD803150

8. FUEL LEVEL WARNING LAMP (OPTION)

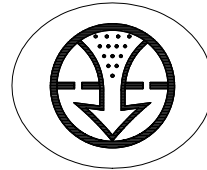
If this lamp lights up, check the fuel level and add fuel.



AD803160

9. AIR CLEANER ELEMENT WARNING LAMP (OPTION)

If this lamp lights up, clean or replace the element.



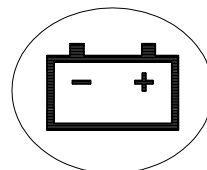
AD803170

10. CHARGE WARNING LAMP

This lamp informs the operator of the generating condition of the alternator.

When the starting switch is turned ON it lights up, and after the engine starts, it should go off.

If this lamp lights up during operations, check the electrical system.



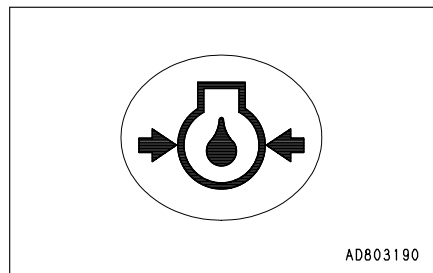
AD803180

11. ENGINE OIL PRESSURE WARNING LAMP

This lamp informs the operator of the engine lubricating oil pressure.

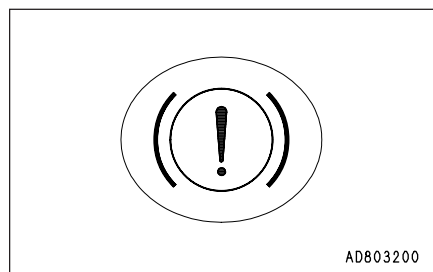
When the starting switch is turned ON it lights up, and after the engine starts, it should go off.

If this lamp lights up during operations, stop operations immediately and check the engine lubricating oil system.



12. BRAKE FLUID LEVEL WARNING LAMP

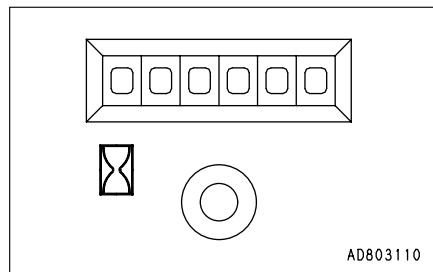
If this lamp lights up, check the brake fluid level and add fluid.



13. HOURMETER

When the starting switch is turned ON, the hourmeter starts moving and displays the total number of operating hours. (When the hourmeter is working, the operating indicator lamp flashes.)

The last digit advances by 1 every 6 minutes when the starting switch is at the ON or START position.



14. ENGINE WATER TEMPERATURE GAUGE

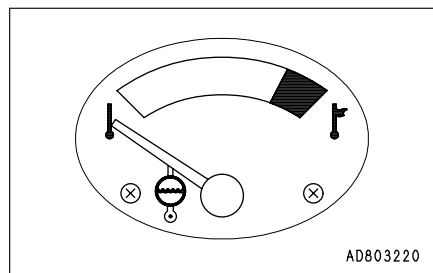
The indicator shows the engine water cooling temperature.

White range: Normal

Red range: Overheating

NOTICE

If the indicator enters the red range, stop the work immediately and park the truck in a safe place. Then take corrective actions against engine overheating. (See "Actions in Engine Overheating".)



15. EXPLANATION OF COMPONENTS

15. TORQUE CONVERTER OIL TEMPERATURE GAUGE

The indicator shows the torque converter oil temperature.

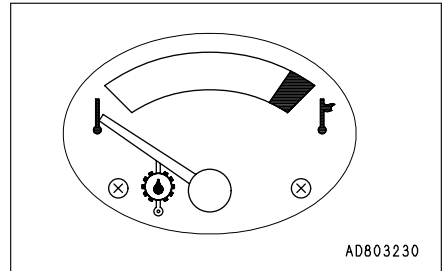
White range: Normal

Red range: Abnormal

NOTICE

Action to take if indicator enters red range

1. Stop operations, stop the lift truck, run the engine at idling, and wait for the temperature to go down.
2. Stop the engine and check the oil level in the TORQFLOW transmission.
3. If the oil level is correct and the indicator enters the red range, please contact your Komatsu Forklift distributor.



16. FUEL GAUGE

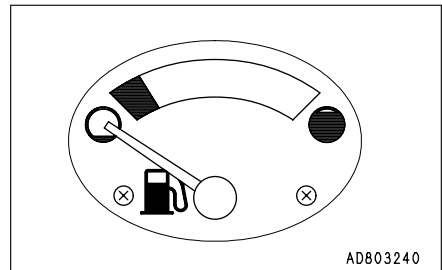
The indicator shows the remaining fuel level. When the starting switch is turned on, a check is carried out.

○ : Empty

● : Full

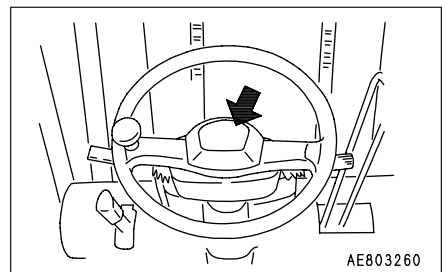
If the lift truck is on a slope, the correct fuel level will not be shown, so always check when the lift truck is on level ground.

Do not use up all the fuel. Fill the fuel tank before the fuel runs out.



17. HORN BUTTON

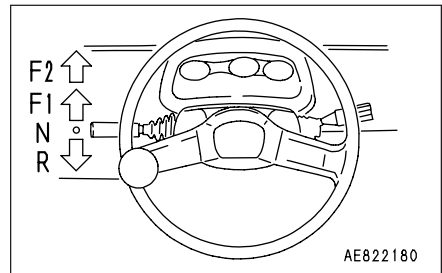
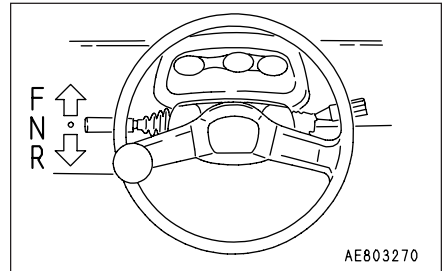
Press the button in the middle of the steering wheel to sound the horn.



18. FORWARD/REVERSE LEVER (TORQFLOW TRANSMISSION LIFT TRUCK)

This lever is used to change the direction of travel (FORWARD/REVERSE) of the lift truck.

- **1-speed TORQFLOW transmission lift truck**
F: FORWARD
N: Neutral
R: REVERSE
- **2-speed TORQFLOW transmission lift truck**
F2: FORWARD high speed
 To shift the lever to the F2 position, raise it and push it forward.
F1: FORWARD low speed
N: Neutral
R: REVERSE



NOTICE

- The control lever can be lightly operated with fingers.
- Always stop the lift truck completely before operating the lever to change the travel direction.

REMARK

The engine cannot be started if this lever is not at the N (neutral) position. (It is equipped with a neutral switch).

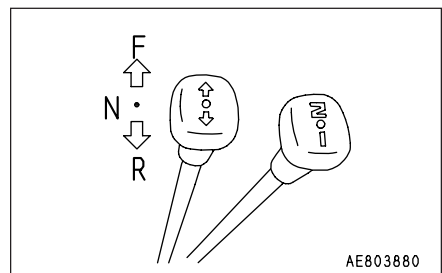
19. FORWARD/REVERSE LEVER (CLUTCH TYPE LIFT TRUCK)

⚠ WARNING

When starting the engine, return this lever to the neutral position. Always depress the clutch pedal when operating the lever.

This lever is used to change the direction of travel (forward/reverse) of the lift truck.

- F:** FORWARD
N: Neutral
R: REVERSE



NOTICE

Always stop the lift truck completely before operating the lever to change the travel direction.

REMARK

The engine cannot be started if this lever is not at the N (neutral) position. (It is equipped with a neutral switch.)

15. EXPLANATION OF COMPONENTS

20. HIGH/LOW SPEED LEVER (CLUTCH TYPE LIFT TRUCK)



WARNING

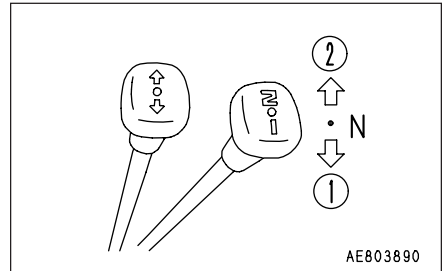
When starting the engine, return this lever to the neutral position. Always depress the clutch pedal when operating the lever.

This lever is used to change the travel speed range.

②: High speed

N: Neutral

①: Low speed



21. COMBINATION SWITCH

Light switch

Position 1 (OFF): Parking lamp (side clearance lamp) and front lamps are OFF

Position 2: Parking lamp (side clearance lamp) lights up

Position 3: Parking lamp (side clearance lamp) stays lighted up, and front lamp lights up

Hi, Lo selector type

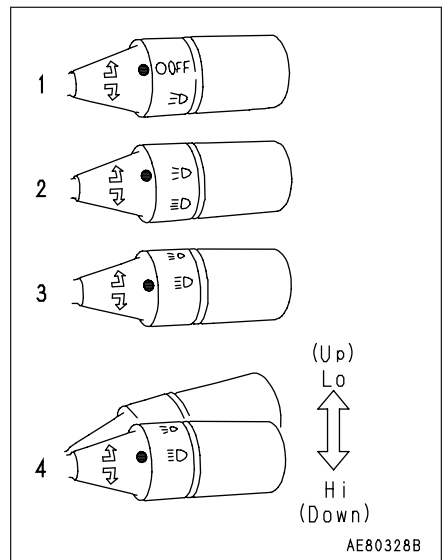
Light switch

Position 1 (OFF): Parking lamp (side clearance lamp) and front lamps are OFF

Position 2: Parking lamp (side clearance lamp) lights up

Position 3 (LO): Parking lamp (side clearance lamp) stays lighted up, and front lamp lights up at low beam

Position 4 (HI): Parking lamp (side clearance lamp) stays lighted up, and front lamp lights up at high beam



REMARK

The Hi, Lo selector type switch is installed as a standard part to 2-speed TORQFLOW transmission lift trucks.

Turn signal indicator switch

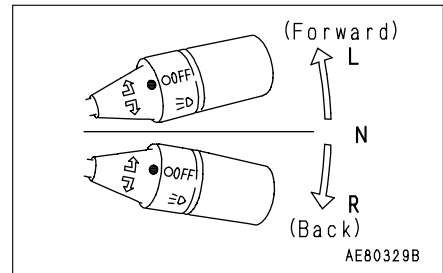
This makes the turn signal indicator lamp flash.

Left turn (L): Push lever forward

Right turn (R): Pull lever back

REMARK

This lever is equipped with an auto-return mechanism, so the lever will return automatically to the neutral position.



22. PARKING BRAKE LEVER

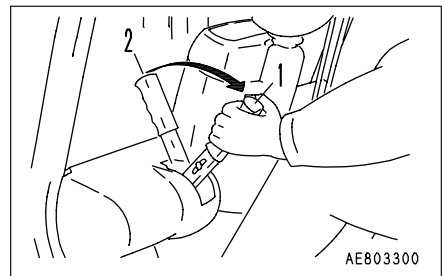
Position 1: Brake is applied.

When the lever is pulled back, the parking brake is applied and the front wheels are locked.

Use this when temporarily stopping or parking the lift truck.

Position 2: Brake is released.

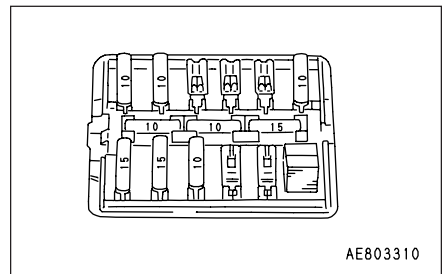
When the lever is pushed forward, the parking brake is released.



23. FUSE BOX

The fuses protect the electrical components and wiring from burning out.

For details of replacing the fuses, see "26.1 Replacing fuses".



15. EXPLANATION OF COMPONENTS

24, 25, 26 PEDALS

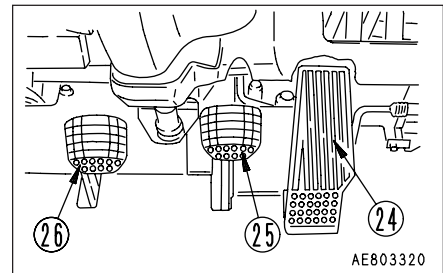
[TORQFLOW transmission lift truck]

②④: Accelerator pedal

②⑤: Brake pedal

②⑥: Inching pedal

- The inching pedal is used for fine control when driving the lift truck slowly forward or in reverse for loading or unloading.



NOTICE

Do not put your foot on the inching pedal or brake pedal unless necessary.

[Clutch type lift truck]

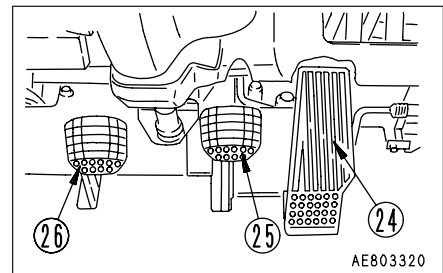
②④: Accelerator pedal

②⑤: Brake pedal

②⑥: Clutch pedal

NOTICE

Do not put your foot on the clutch pedal or brake pedal unless necessary.



27. LIFT LEVER

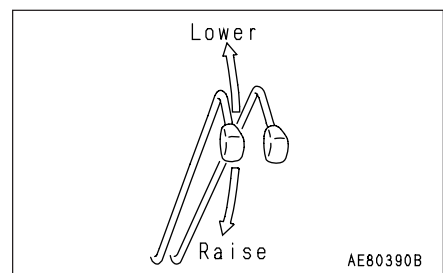
⚠ WARNING

Sit in the operator's seat and check that the surrounding area is safe before operating the lift lever.

This lever is used to raise and lower the forks.

LOWER (): Push the lever forward

RAISE (): Pull the lever back



REMARK

The speed when raising the forks can be controlled by the amount that the lever is operated and the amount that accelerator pedal is depressed.

The lowering speed can be controlled only by the amount that the lever is operated.

28. TILT LEVER

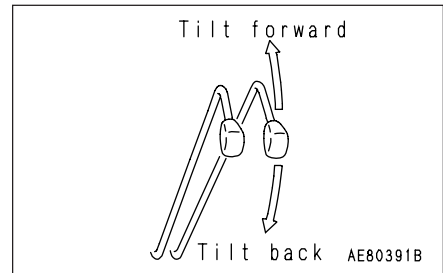
WARNING

Sit in the operator's seat and check that the surrounding area is safe before operating the tilt lever.

This lever is used to tilt the mast forward and back.

Tilt forward (): Push the lever forward

Tilt back (): Pull the lever back



REMARK

The speed when tilting the mast forward or back can be controlled by the amount that the lever is operated and the amount that accelerator pedal is depressed.

29. TILTABLE STEERING WHEEL LOCK LEVER

WARNING

Always stop the lift truck completely before adjusting the position of the steering wheel. After adjusting, move the steering wheel backward and forward to check that it is locked securely in position.

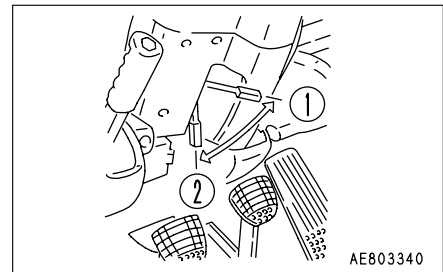
This lever is used to allow the position of the steering wheel to be adjusted and to lock it in position after adjustment.

Position ①: Lock is released

Position ②: Lock is applied

Method of adjustment

1. Pull the lock lever up (position ①).
2. Move the steering wheel forward and backward to adjust to the most suitable position.
3. Pull the lock lever down (position ②) to lock the steering wheel in position.



15. EXPLANATION OF COMPONENTS

● OPERATOR'S COMPARTMENT ADJUSTING SEAT

WARNING

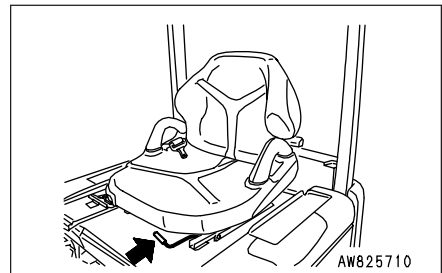
- Adjust the seat before starting operations or when changing operators at the beginning of a shift. (Always stop the lift truck before adjusting the seat.)
- Adjust the seat to a position where it is possible to depress the brake pedal fully with your back against the backrest of the operator's seat. (Always stop the lift truck before adjusting the seat.)
- Always wear your seat belt properly during operations.

It is possible to slide the seat forward or backward to set it to the optimum position.

Method of adjusting fore-and-aft position

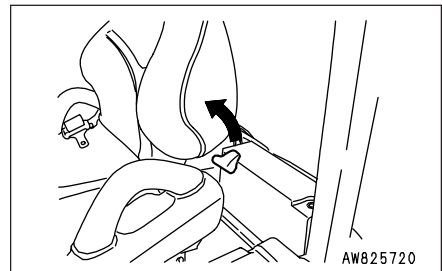
1. Raise the lever. (When the lever is raised, the seat can slide to the front or rear.)
2. Set the seat to a position where operation is easy, then release the lever. (The seat will be locked in position.)

Amount of fore-and-aft adjustment: 160 mm (6.3 in)



Method of adjusting reclining angle (suspension seat only)

1. Pull up the lever. (When the lever is raised, the angle of the seatback can be adjusted.)
2. Adjust the angle of the seat to a position where operation is easy, then release the lever. After adjusting, move the seat lightly to the front and rear to check that it is securely locked in position.

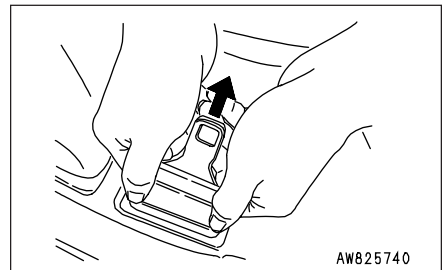
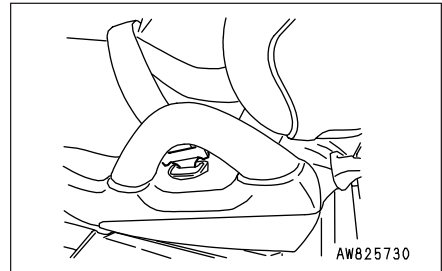


Method of fitting and releasing seat belt

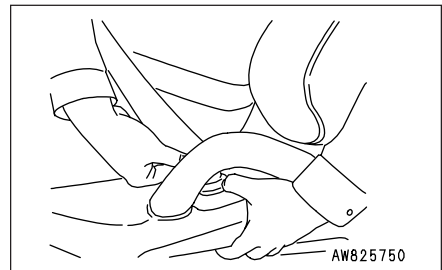
1. Pull the belt out from the holder at the right side of the seat, then insert the tongue into the buckle until a click is heard. (In this condition the seat belt is locked in position.)

The seat belt is designed to give a shock in the holder when the belt locks. The same shock may occasionally be felt if the belt locks when it is pulled out of the holder.

If this happens, grip the tongue end of the belt with both hands, pull up strongly, and when the belt loosens, pull the belt out again slowly.



2. To release the lock, hold the tongue portion of the belt with your right hand, then press the red button in the buckle with your left hand
3. The belt will automatically be wound into the holder. When this happens, hold the belt and let it wind in slowly.



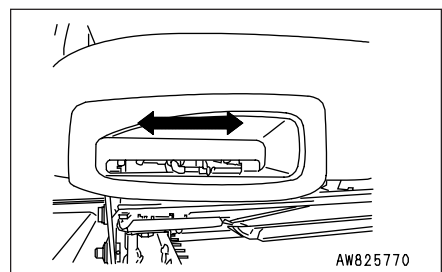
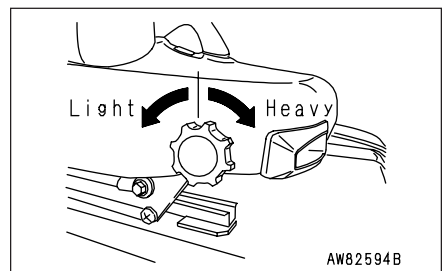
With the suspension seat, it is also possible to adjust the suspension to match the operator's weight in addition to adjusting the fore-and-aft position and reclining angle.

Method of adjusting suspension (suspension seat only)

Turn the adjustment knob on the right side of the operator's seat to adjust the suspension to match your weight.

Adjust as follows:

To INCREASE the weight setting, turn to the RIGHT
To DECREASE the weight setting, turn to the LEFT
(Weight adjustment range: 50 – 120 kg (110 – 265 lb))



15. EXPLANATION OF COMPONENTS

● ENGINE HOOD

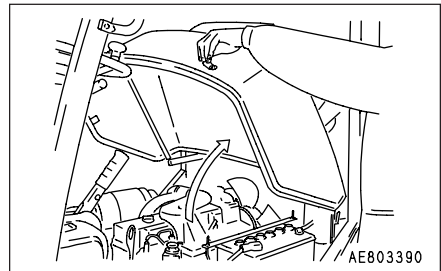
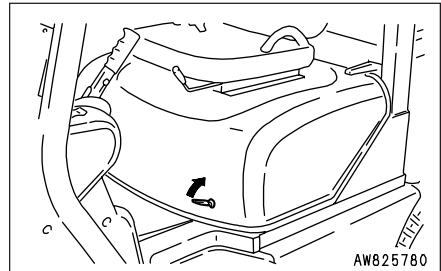


CAUTION

Be careful not to get your hand caught when opening or closing the hood.

When opening engine hood

1. Hold the lever at the front left of the engine hood with your left hand and turn it up.
2. Lift the engine hood up and push up until the engine hood stopper is fitted in place. (When this is done, the steering column will move to the front to avoid interference with the engine hood.)



CAUTION

The meter panel also moves to the front together with the steering column, so be careful not to put your hand between the meter panel and the dashboard.

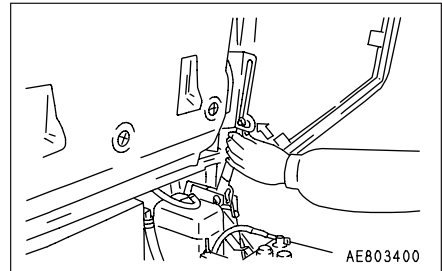
When closing engine hood

1. Lift the engine hood up slightly with your right hand, push in the stopper with your left hand, then lower the engine hood slowly and check that the lock is applied.



CAUTION

Be careful not to get your hand caught when closing the hood.



2. Pull the steering column back to its original position.



WARNING

It is dangerous to operate the lift truck with the steering column pushed forward because the steering wheel will not be fixed in position. Always be sure to return the steering column to its original position and check that the lock is securely applied.

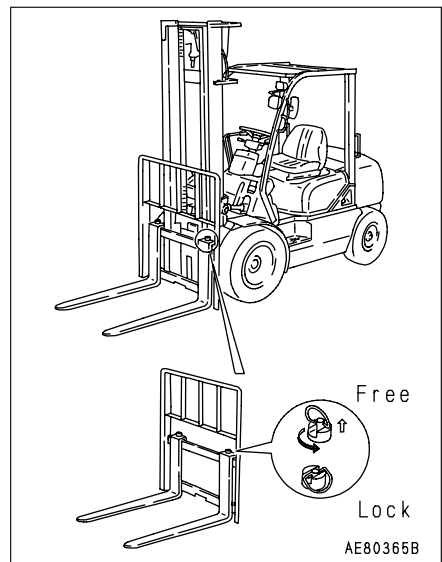
● FORK STOPPER

LOCK position: The forks are secured to the fork carriage. Always use this position during operations.

FREE position: The forks can be moved to the left and right, so it is possible to adjust the spread of the forks to match the size of the load.

NOTICE

For details of the method of adjustment, see FORK SPREAD ADJUSTMENT.



16. OPERATION

16.1 CHECK BEFORE OPERATION

WARNING

- Never operate the lift truck before the check before operation is completed.
- If any abnormality is found during checking, immediately consult a Komatsu Forklift distributor and do not operate the lift truck until repaired.
- Oil leakage can cause a lift truck fire.

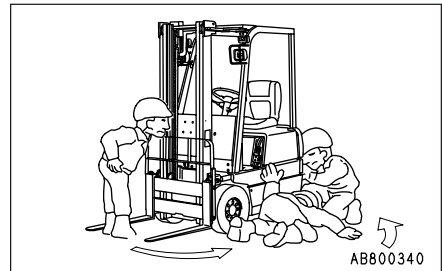
Check the lift truck thoroughly. If any abnormality is found, always repair it or consult your Komatsu Forklift distributor.

16.1.1 CHECK BEFORE OPERATION (WITH KEY SWITCH OFF)

1. CHECK FOR OIL LEAKAGE AND BATTERY FLUID LEAKAGE

Check for leakage by conducting a walk-around check. Check the following items, in particular.

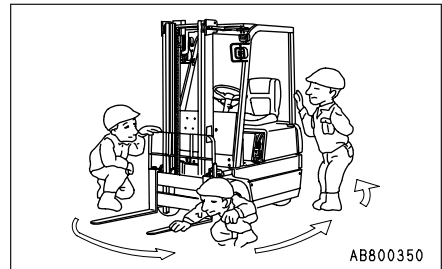
- Tubing
- Control valve
- Hydraulic pump
- Hydraulic cylinder



2. CHECK FOR CRACKS AND DAMAGE

Visually check for cracks and damage. Particularly check the following items.

- Head guard
- Mast
- Fork
- Fuel tank
- Load back-rest
- Hydraulic tank
- Fork carriage



3. CHECK TIRES AND RIMS

Check the tires and rims for the following items.

- Whether the tire pressure matches the specified pressure.

Specified pressure:

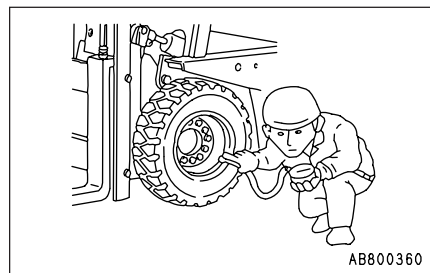
Front tires: 250-15-16PR: 0.83 MPa (8.5 kgf/cm²)

8.25-15-12PR: 0.68 MPa (7.0 kgf/cm²)

300-15-18PR: 0.78 MPa (8.0 kgf/cm²)

Rear tires: 0.83 MPa (8.5 kgf/cm²)

- Check that there are no loose hub nuts or rim mating nuts.



Tightening torque:

Check item	Hub nut tightening torque	Rim mating nut tightening torque
Front tires	294 – 490 Nm (30 – 50 kgfm)	–
Rear tires	294 – 490 Nm (30 – 50 kgfm)	196 – 294 Nm (20 – 30 kgfm)

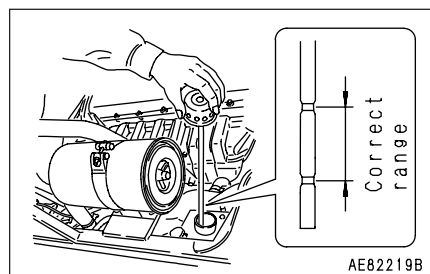
NOTICE

Tighten the hub nuts to the specified torque.

- Check the tires for excessive wear, damage, and adhesion of foreign matter.
- Check the rims for deformation or damage.

4. CHECK OIL LEVEL IN HYDRAULIC TANK

- Lower the forks fully to the floor and stand the mast vertically (perform on flat floor).
- Open the engine hood and remove the dipstick (combined with breather) on the right side of the lift truck.
- Wipe off hydraulic oil with a clean cloth and insert dipstick into the tank.
- Take out the dipstick again and check to see if it indicates the proper level.
- If the oil level is low, add Komatsu Forklift genuine oil through the oil filler.



NOTICE

Always use Komatsu Forklift genuine hydraulic oil.

16. OPERATION

5. CHECK OIL LEVEL IN BRAKE RESERVOIR TANK

1. Remove the floor plate.
2. Remove the connector of the brake fluid level sensor, then remove the cap.
Correct range: The oil should be within a range of 24.5 mm (0.96 in) from the top surface of the tank.
3. If the oil level is low, add Komatsu Forklift genuine brake fluid.

NOTICE

Always use Komatsu Forklift genuine brake fluid for the brake fluid.

4. Install the cap and insert the connector of the brake fluid level sensor.
5. Install the floor plate.

6. CHECK BATTERY ELECTROLYTE LEVEL

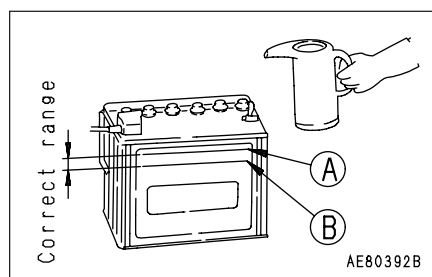
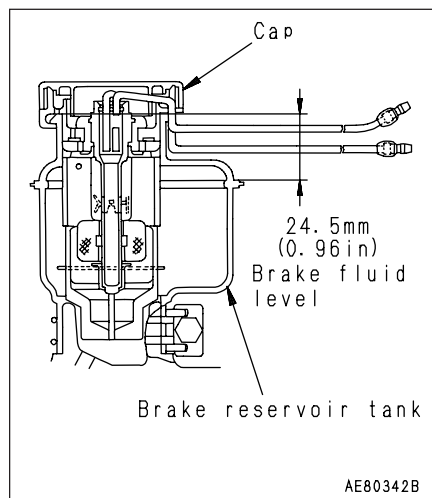


WARNING

- **Battery electrolyte is dangerous. If it gets in your eyes or on your skin or clothes, wash it off with large amounts of water. In particular, if it gets in your eyes, consult a doctor quickly.**
- **To avoid gas explosions, do not smoke or cause short circuits or sparks near the battery.**

If the battery electrolyte level is not within the correct range, add distilled water to top line ①.

Clean the battery cap breathers and terminals.



NOTICE

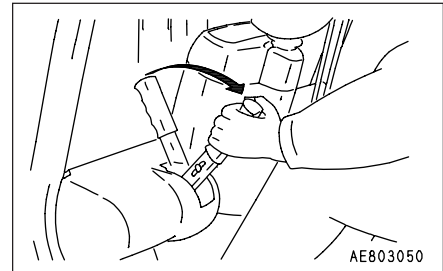
- **If the battery electrolyte has spilled and the level has gone down, have your battery repair shop add dilute sulphuric acid of the same density.**
- **Do not use a metal funnel when adding distilled water or dilute sulphuric acid.**

7. CHECK PARKING BRAKE

The operating effort for the parking lever should be 196 – 294 N (20 – 30 kgf). If it is less than 196 N (20 kgf), please contact your Komatsu Forklift distributor.

8. CHECK HORN

Check that the horn sounds normally when the horn button is pressed.



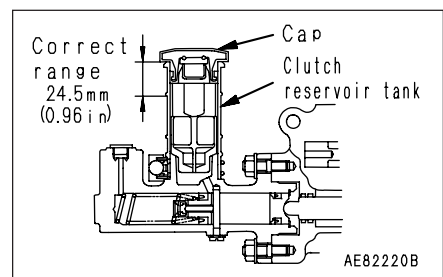
9. CHECK LAMPS

Check that the head lamps and turn signal lamps work properly. Check also for any dirt or damage to the lamps.

10. CHECK OIL LEVEL IN CLUTCH RESERVOIR TANK

1. Remove the floor plate.
2. Remove the cap and the center cover, and check that the oil level is within the correct range.

Correct range: The oil level should be within a range of 24.5 mm (0.96 in) from the top surface of the tank.



3. If the oil level is low, add Komatsu Forklift genuine brake fluid.

NOTICE

Always use Komatsu Forklift genuine brake fluid for the brake fluid.

4. Install the cap and the center cover.

NOTICE

Install the center cover with the embossed letters facing up.

5. Install the floor plate, and fit the floor mat.

16. OPERATION

11. CHECK PEDAL

Depress the pedal and check that there is no abnormal heaviness or catching.

BRAKE PEDALS

Play	3 – 7 mm (0.12 – 0.28 in)
Pedal height when depressed (h)	90 – 100 mm (3.54 – 3.94 in)

CLUTCH PEDAL (CLUTCH TYPE LIFT TRUCKS)

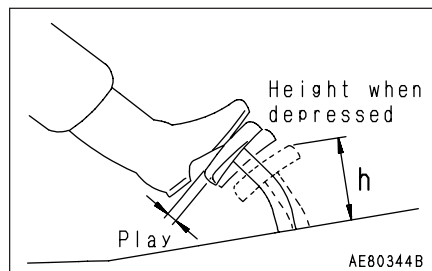
Play	3 – 5 mm (0.12 – 0.20 in)
------	---------------------------

INCHING PEDAL (TORQFLOW TRANSMISSION LIFT TRUCKS)

Play	2 – 3 mm (0.08 – 0.12 in)
Interconnected travel	35 – 41 mm (1.38 – 1.61 in)

REMARK

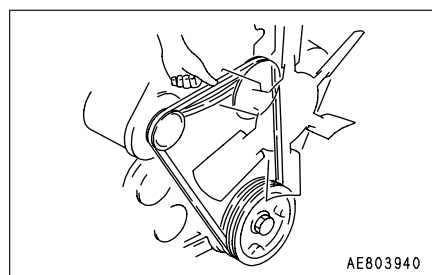
The interconnected travel is the distance that the brake pedal and inching pedal move together.



12. CHECK DEFLECTION OF V-BELT

Push the belt at the mid-point between the pulleys with your finger and check that the deflection is the specified value.

FG35/40/45	15 – 17 mm (0.59 – 0.67 in) (98 N finger pressure)
FG35Z/40Z	15 – 17 mm (0.59 – 0.67 in) (10 kgf finger pressure)
FG50A	
FD35/40/45	Since the auto-tensioner is installed, the deflection of the V-belt does not need to be checked.
FD35Z/40Z	
FD50A	



NOTICE

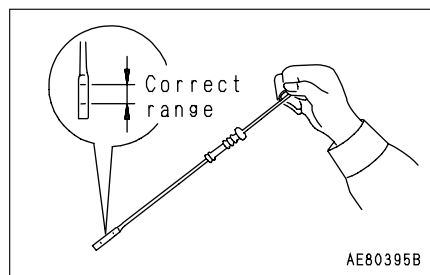
Replace the belt if the belt is stretched and there is no allowance for adjustment, or if the belt is cut or cracked.

13. CHECK OIL LEVEL IN ENGINE OIL PAN

Use the dipstick to check that the oil is within the correct range. If the oil level is low, add engine oil through the oil filler.

NOTICE

- If the oil is markedly dirty or discolored, change the oil.
- Always use genuine Komatsu Forklift engine oil. (See "21. LUBRICANT LIST".)

**14. CHECK COOLANT LEVEL****WARNING**

- Carry out a regular inspection of the coolant level through the sub-tank before beginning the day's work when the engine is still cold.
- When the coolant temperature is still high, do not try to remove the radiator cap or sub-tank cap. Steam or boiling water may spurt out, causing burns.
- When removing the radiator cap after the coolant temperature has gone down, turn the cap slowly to release the pressure before removing it.

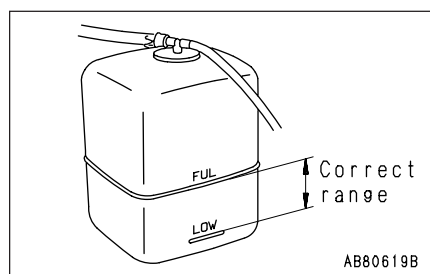
NOTICE

Even if the coolant level in the sub-tank seems normal, check the coolant level inside the radiator every month or every 200 hours of hour meter reading according to the maintenance schedule. If the coolant level inside the radiator is lower than specified, that may invite an engine overheating problem.

Check the radiator and radiator hose for any water leakage.

Check that the coolant in the radiator reservoir tank is cold, and if the coolant level is low, add coolant to the FUL level.

If there is no more water in the reservoir tank, remove the radiator cap and add water directly to the radiator, then add water to the reservoir tank.

**15. CHECK ABNORMALITIES FOUND ON PREVIOUS DAY**

If any abnormality was found during the checks or operation on the previous day, check that the repairs have been carried out and that there is no abnormality.

16. OPERATION

16.1.3 CHECK AFTER STARTING (WITH STARTING SWITCH ON)

This is used to start and stop the engine.

- **Clutch type lift truck:**

When starting the engine, place the forward/reverse control lever and high/low speed control lever at the neutral position, pull the parking brake lever, and depress the clutch pedal fully, then turn the key.

- **TORQFLOW transmission lift truck:**

When starting the engine, place the forward/reverse control lever at the neutral position, pull the parking brake lever, and depress the inching pedal fully, then turn the key.

OFF: Engine stop position

The key can be inserted or removed. The lamps and horn are activated at this position.

ON: Engine running position

For diesel engine lift trucks, carry out preheating before starting the engine.

START: Position for starting engine

After the engine starts, release the key. It will automatically return to the ON position.

NOTICE

Read "16.2 MOUNTING/DISMOUNTING", "16.3 OPERATOR'S SEAT POSITION ADJUSTMENT" AND "16.4 STARTING LIFT TRUCK OFF", then check the following items.

16. CHECK FOR ABNORMAL NOISE, ABNORMAL VIBRATION

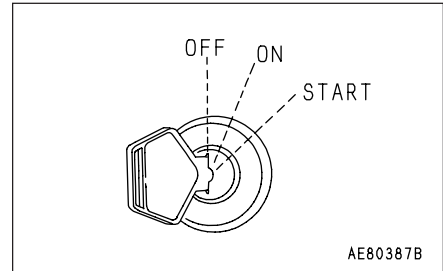
Check in particular that there is no abnormal noise or abnormal vibration from the engine or hydraulic pump.

17. CHECK ENGINE EXHAUST GAS COLOR

No color, light blue: Normal

Black: Incomplete combustion

White: Oil leaking into cylinder



18. CHECK FUEL LEVEL IN FUEL TANK

WARNING

When adding fuel, never let the fuel overflow. This may cause a fire. If you spill fuel, thoroughly clean up any spillage.

NOTICE

Never use any fuel mixed with kerosene. (Diesel engine lift truck)

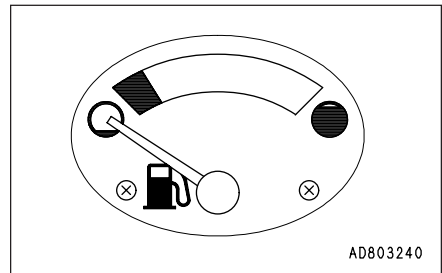
If the fuel gauge indicator is at the  position, the tank is full.

If the fuel level is low, stop the engine and fill the tank through the fuel filler port.

For details of the fuel to use, see “21. LUBRICANT LIST”.

When adding fuel, remove all dirt from around the cap and be careful not to let any dirt get into the tank.

After adding fuel, tighten the fuel filler cap securely and wipe up any fuel that was spilled.

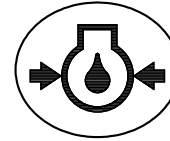


16. OPERATION

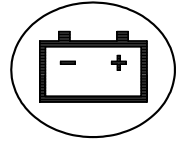
19. CHECKS USING GAUGES AND WARNING LAMPS [ENGINE OIL PRESSURE WARNING LAMP, CHARGE WARNING LAMP]

These lamp should not light up.

Engine oil
pressure
warning lamp



Charge
warning
lamp

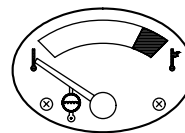


AE80346B

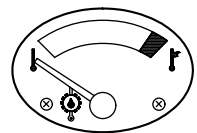
[ENGINE WATER TEMPERATURE GAUGE, TORQUE CONVERTER OIL TEMPERATURE GAUGE]

The indicator should be in the white range.

Engine water
temperature
gauge



Torque converter
oil temperature
gauge



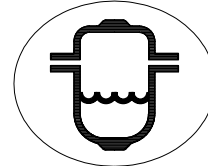
AE80347B

[SEDIMENTER WARNING LAMP]

This lamp should not light up.

If it lights up, drain the water.

(See PERIODIC MAINTENANCE.)



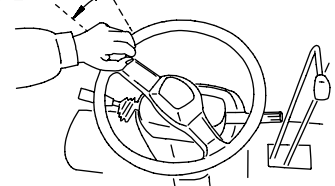
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20. CHECK STEERING WHEEL

Check the following points.

- Play (the play should be 30 – 60 mm (1.2 – 2.4 in)).
- There must be no up-down play.

30–60mm
(1.2–2.4in)



AE80348B

21. CHECK REAR VIEW MIRROR

Check the following points.

- Check that it is easy to see the rear.
- Check that there is no dirt or damage to the mirror.



AE803960

22. CHECK BACK-UP BUZZER

WARNING

Set the high/low speed lever (clutch type lift truck to the neutral position, pull the parking brake lever, and depress the clutch pedal (inching pedal on TORQFLOW transmission lift truck) when checking.

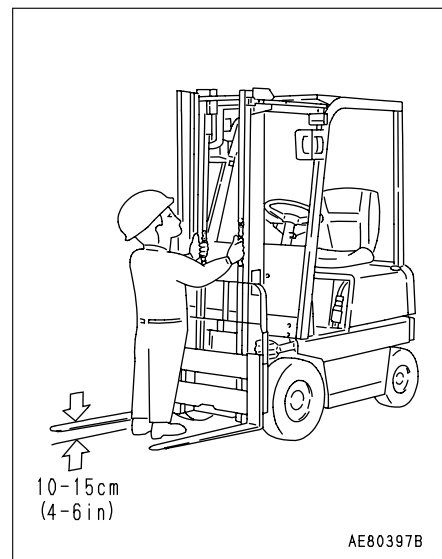
Check that the back-up buzzer sounds when the forward/reverse lever is placed at REVERSE.

If the back-up buzzer does not sound when the forward/reverse lever is placed at REVERSE, carry out repairs or replacement immediately.

23. CHECK LIFT CHAIN

WARNING

- **Set the forward/reverse lever to the “NEUTRAL” position and apply the parking brake. Then perform checking.**
 - **Never insert feet under the forks.**
-
- **Check lift chain tension**
 1. Lift the forks 10 – 15 cm (4 – 6 in) from the ground.
 2. Check the right and left deflections of the lift chain by pressing it at the center.
The tension is normal when both deflections are approximately equal.
 3. If the deflections differ from each other, adjust with the nut of the lift-chain stopper bolt.



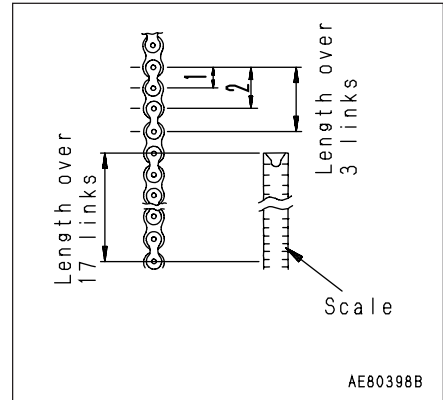
16. OPERATION

● Check elongation of the lift chain

Measure the length over 17 links and check that the length is within the following specified value.

Length over 17 links	3.5, 4 ton lift truck	Max. 440 mm (17.3 in)
	4.5 ton lift truck	Max. 440 mm (17.3 in)

If the measurement value exceeds this range, replace the chain.



● Check the lift chain lubricant

⚠ WARNING

- The lift chain is liable to snap if heavily rusted. If lubrication is insufficient, apply engine oil to prevent rusting.
- Visually check the lift chain for damage or cracks. If any abnormality is found, consult your Komatsu Forklift distributor.

If there is insufficient lubrication, apply engine oil.

NOTICE

Use Komatsu Forklift genuine engine oil.
(See "21. LUBRICANT LIST".)

16.1.4 CHECK WHILE ADVANCING SLOWLY

24. CHECK STEERING WHEEL OPERATION

Check the following items while advancing slowly.

- No deviation of steering wheel.
- No unstable steering in straight travel.
- No feeling of abnormally-heavy steering when the steering wheel is turned.

25. CHECK OF BRAKE OPERATION

Check the following items by depressing the brake pedal to apply the brake while advancing slowly.

- The brake is properly applied.
- The brake is applied uniformly.

26. CHECK OPERATION OF CLUTCH PEDAL (CLUTCH TYPE LIFT TRUCK)

- When the pedal is depressed, the clutch must be completely disengaged with a margin to spare.
- When the pedal is released, there must be no slipping of the clutch.

27. CHECK OPERATION OF INCHING PEDAL (TORQFLOW TRANSMISSION LIFT TRUCK)

- Depress the pedal slightly (partially engage the clutch) and check that it is possible to carry out inching.
- Check that the lift truck stops when the pedal is completely depressed.

28. CHECK FOR ABNORMAL NOISE, ABNORMAL SMELL

Check that there is no abnormal noise or abnormal smell when traveling at low speed.

16.1.5 CHECKS WHILE OPERATING CONTROL LEVERS

29. CHECK OPERATION OF WORK EQUIPMENT

Operate the work equipment control levers from the operator's seat and check that the forks can be raised and lowered and that the mast can be tilted forward and back smoothly. If there is any abnormality, please contact your Komatsu Forklift distributor immediately.

30. CHECK FOR ABNORMAL NOISE, ABNORMAL SMELL

Operate the work equipment control levers from the operator's compartment and check that there is no abnormal noise or abnormal smell during travel.

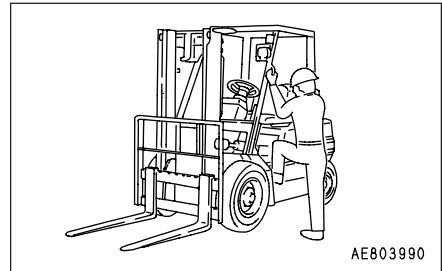
16. OPERATION

16.2 MOUNTING/DISMOUNTING

WARNING

- Always mount/dismount only after first completely stopping the lift truck.
- Never jump on or off the lift truck as this is very dangerous.

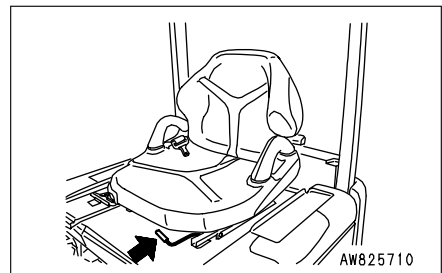
Mount and dismount facing the lift truck, using the foot of the head guard as shown in the illustration.



16.3 OPERATOR'S SEAT ADJUSTMENT

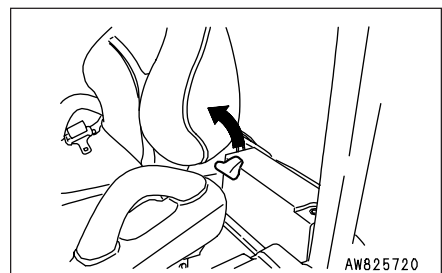
Method of adjusting fore-and-aft position

1. Set the parking brake.
(See "16.7 TEMPORARY STOPPING AND PARKING".)
2. Sit in the seat and lift the lever.
(The seat may be slide 160 mm (6.3 in) forwards and backwards at this condition.)
3. Set the seat to a position where operation is easy, then release the hand to lock the lever. (Seat will be locked.)
4. After setting the seat, confirm that it is firmly locked by sliding it forwards/backwards.



Method of adjusting reclining angle (suspension seat only)

1. Pull up the lever. (When the lever is raised, the angle of the seatback can be adjusted.)
2. Adjust the angle of the seatback to a position where operation is easy, then release the lever. After adjusting, move the seat lightly to the front and rear to check that it is securely be locked in position.



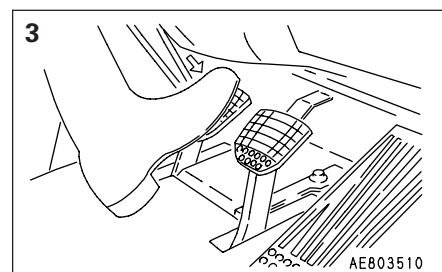
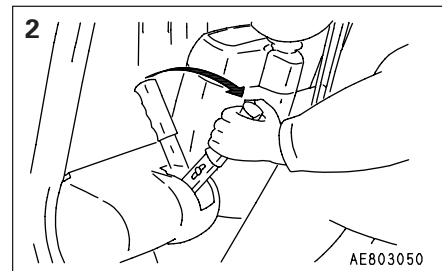
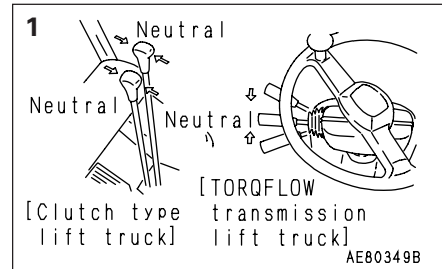
16.4 STARTING LIFT TRUCK OFF

WARNING

- Do not attempt to start the engine by short-circuiting the engine starting circuit. Such an act may cause a serious bodily injury or fire.
- When starting the lift truck off, check that the area around the lift truck is safe and sound the horn before starting.
- Do not allow anyone to enter the area around the lift truck.
- There is a blind spot behind the lift truck, so be particularly careful when traveling in reverse.
- When starting the engine, set the forward/reverse lever and high/low speed lever (clutch type lift trucks) to the neutral position and pull the parking brake lever, then depress the clutch pedal (inching pedal for lift trucks with torque converter) and start the engine.

STARTING ENGINE

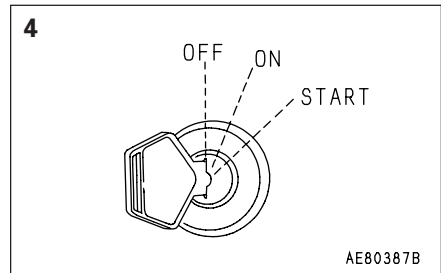
1. Set the forward/reverse lever and high/low speed lever (clutch type lift trucks) to the neutral position.
2. Pull the parking brake lever.
3. Depress the clutch pedal (clutch type lift trucks) or inching pedal (TORQFLOW transmission lift trucks).



16. OPERATION

4. (1) **Gasoline engine lift truck:** Pressing the accelerator pedal lightly, insert the key in the starter switch and turn it to the "START" position, and the engine will start.

Diesel engine lift truck: Turn the starter switch to the "ON" position. After the glow indicator goes off, press the accelerator pedal to the end and turn the starter switch to the "START" position, and the engine will start.



CAUTION

When starting the engine, do not step on the accelerator pedal hard. That can cause an engine failure.

- (2) When the engine starts, release the key. (The key will return automatically to the ON position.)
- (3) Release the accelerator pedal and keep the engine running for a while to warm it up.

NOTICE

- **Do not run the starting motor continuously for longer than the times given below.**

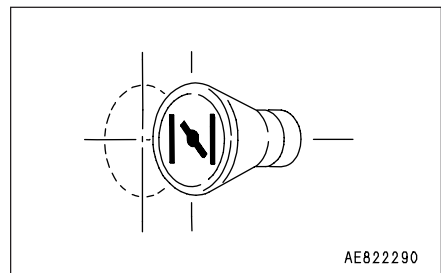
Gasoline engine lift truck	Max. 5 seconds
Diesel engine lift truck	Max. 20 seconds

- **If the engine does not start, wait for at least 2 minutes before trying to start again.**
- **Do not turn the key to the START position when the engine is running.**

STARTING THE ENGINE IN THE COLD SEASON (GASOLINE ENGINE LIFT TRUCK)

When starting the cold engine in the morning, etc., pull the choke button.

1. Pull the choke out fully, turn the engine starting switch to the "START" position and start cranking.
2. While cranking, release the accelerator pedal once or twice. Repeat this process until the engine startup sound is heard.
3. When the engine startup sound is heard, release the accelerator pedal while cranking, and push the choke in by 2 to 3 mm (0.08 to 0.12 in).
4. After the engine gets started, push the choke in gradually as the engine warms up.



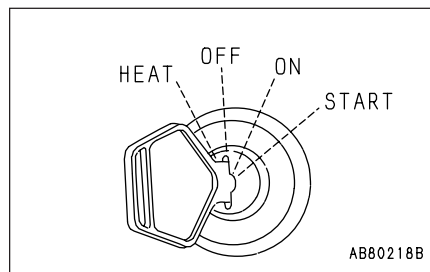
STARTING THE ENGINE IN THE COLD SEASON**(DIESEL ENGINE LIFT TRUCK)**

(When the ambient temperature is -10°C to -20°C)

**WARNING**

Never use any starting fluid. If starting fluid is used, there is danger of explosion when the engine is started.

1. Set the forward/reverse lever and high/low speed lever to the neutral position. (The engine cannot be started if this lever is not at the N (neutral) position.)
2. Pull the parking brake lever.
3. Depress the clutch pedal (clutch type lift trucks) or inching pedal (TORQFLOW transmission lift trucks).
4. Turn the starting switch to the "HEAT" position. When the heater signal to glow, release the starting switch. (It takes the pre-heater lamp about 1 to 2 seconds to light up.) The starting switch will return automatically to the "OFF" position.

**REMARK**

To activate the engine pre-heater, turn the engine starting switch to the "HEAT" position, and hold it in that position for 1 to 2 seconds, then the pre-heater lamp lights on. When the lamp lights on, release the starting switch.

5. To start up the engine, heater signal goes off, and then turn the starting switch to the "START" position while slightly depressing the accelerator pedal.

**CAUTION**

When starting the engine, do not step on the accelerator pedal hard. That can cause an engine failure.

6. When the engine is start, release the key. (The key is automatically to the "ON" position.)
7. Release the accelerator pedal and keep the engine running for a while to warm it up.

REMARK

- The engine pre-heater is factory-set to work for 30 seconds. (Even if the starting switch is turned to the "HEAT" position again, while pre-heating is going on, the pre-heating time cannot be extended.)
- To stop pre-heating midway, turn the starting switch "ON". If the engine is not started, turn the starting switch "OFF".

16. OPERATION

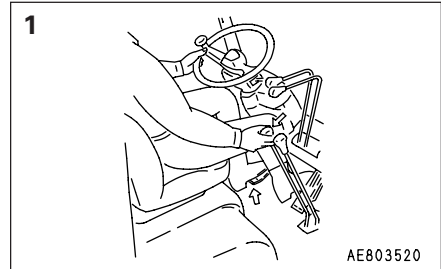
STARTING LIFT TRUCK OFF

NOTICE

Do not rest your feet on the clutch pedal or inching pedal if you are not operating the pedal.

1. Clutch type lift truck:

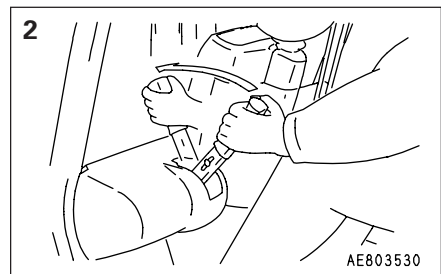
Depress the clutch pedal, set the forward/reverse control lever to the F or R position, and set high/low speed control lever to position 1.



TORQFLOW transmission lift truck:

Depress the inching pedal and place the forward/reverse control lever at the F or R position.

2. Release the parking brake and check that the direction of travel and the area around the lift truck are safe.

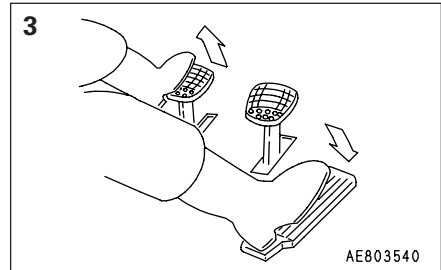


3. Clutch type lift truck:

Depress the accelerator pedal slowly with your right foot while releasing the clutch pedal slowly with your left foot.

TORQFLOW transmission lift truck:

Depress the accelerator pedal slowly with your right foot while releasing the inching pedal slowly with your left foot.

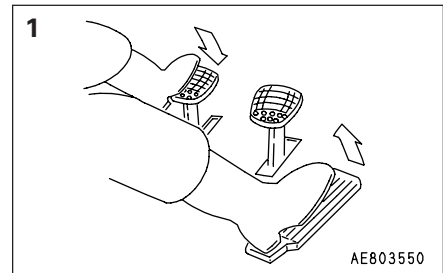


REMARK

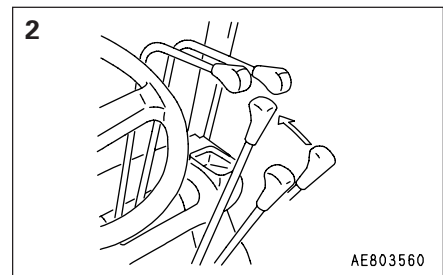
If the clutch pedal or inching pedal are partially engaged, it is possible to carry out inching.

SHIFTING GEAR (CLUTCH TYPE LIFT TRUCK)

Release the accelerator pedal and depress the clutch pedal at the same time.



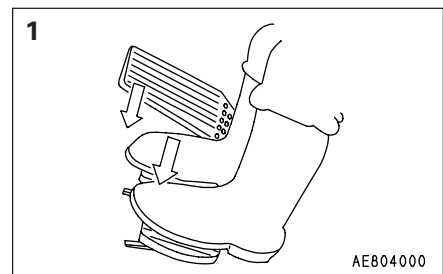
Shift the high/low speed lever to position 2. When it meshes, gradually release the clutch pedal while depressing the accelerator pedal.



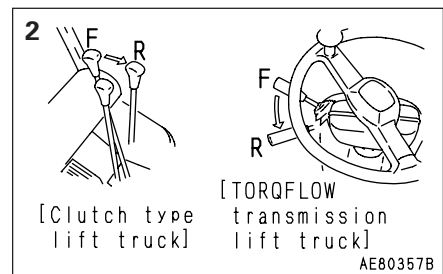
SHIFTING DIRECTION

Always stop the lift truck completely before shifting between forward and reverse.

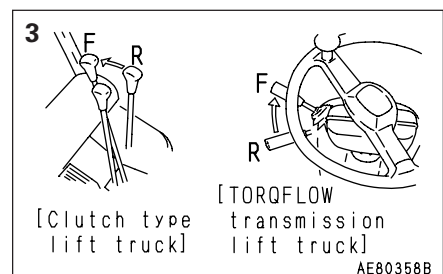
Stop the lift truck completely. (For details of the method of stopping the lift truck, see "16.7 TEMPORARY STOPPING AND PARKING".)



Move the forward/reverse lever from F to R.



Or move the forward/reverse lever from R to F.



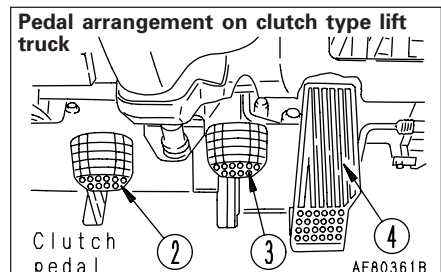
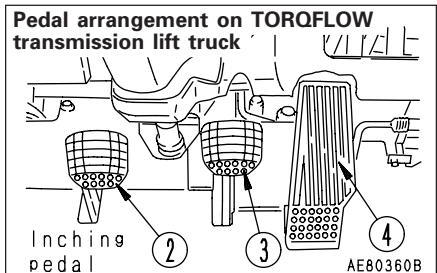
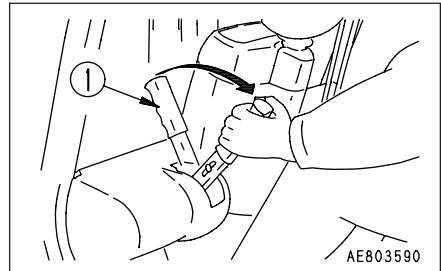
16. OPERATION

16.5 STARTING, INCHING ON SLOPE

WARNING

Never carry out inching by depressing the accelerator pedal fully and then adjusting the amount the brake pedal is depressed.

1. When starting the lift truck on a slope, first pull parking brake lever ① and check that the lift truck is held in position.
2. Depress accelerator pedal ④ a little at a time (for the clutch type lift truck, release the clutch pedal at the same time), then release parking brake lever ① slowly so that the lift truck starts up the slope.
3. When the lift truck starts to move up the slope, release parking brake lever ① fully. Adjust the uphill travel speed with accelerator pedal ④.
4. When slowing down or stopping on slopes, gradually release accelerator pedal ④ (on the clutch type lift truck, depress the clutch pedal at the same time), and depress brake pedal ③ just before stopping.
5. After stopping the lift truck, always pull parking brake lever ① fully.

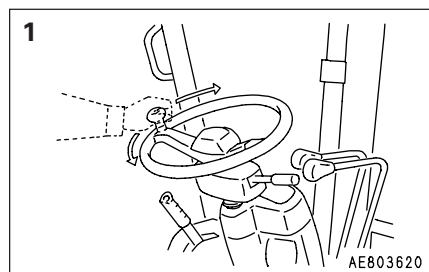


16.6 TURNING

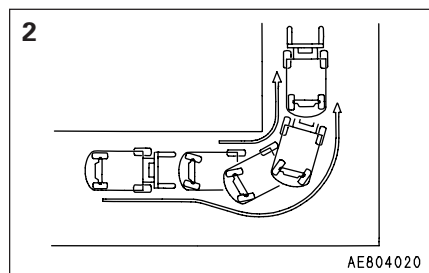
WARNING

Take care to avoid the outside of the counterweight hitting against objects when turning.

1. Operate steering wheel knob with the left hand.



2. When turning, keep to the inner side when advancing and outer side when reversing, considering the properties of the rear steering system.



16. OPERATION

16.7 TEMPORARY STOPPING AND PARKING



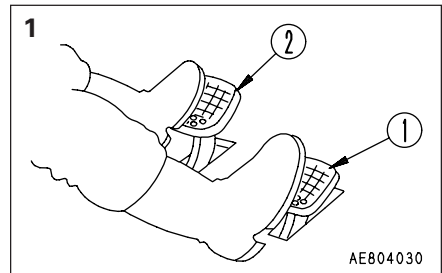
WARNING

Do not park the lift truck on the travel route.

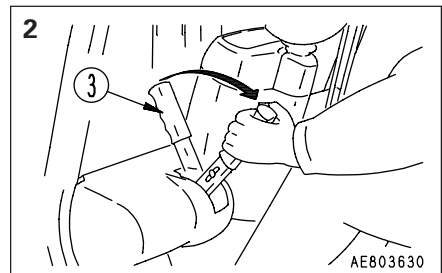
1. **Clutch type lift truck:** Release the accelerator pedal, depress brake pedal ①, then depress clutch pedal ② immediately before the lift truck stops.

TORQFLOW transmission lift truck:

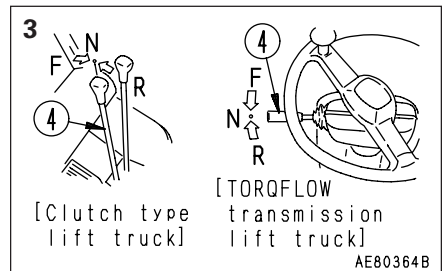
Release the accelerator pedal, then depress brake pedal ①.



2. After the lift truck stops, pull parking brake lever ③ to apply the parking brake.
After the lift truck stops, return the forward/reverse lever and high/low speed lever (clutch type lift truck) to the neutral position.



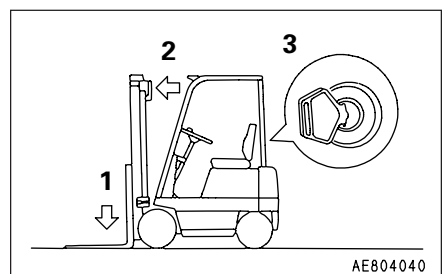
3. Return forward/reverse lever ④ to the neutral position.



WHEN LEAVING LIFT TRUCK

When leaving the lift truck, always do as follows.

1. Lower the forks to the ground.
2. Tilt the mast full forward.
3. Turn the starting key to the OFF position, then remove the key.

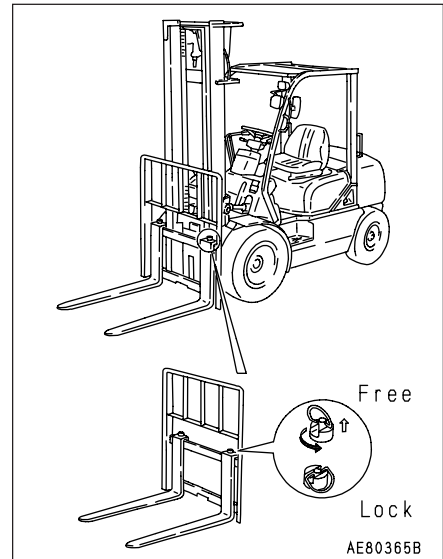


16.8 FORK SPREAD ADJUSTMENT

WARNING

Take extreme care not to get hands or fingers caught while adjusting the fork spread.

1. Move the lift truck in front of the load, and stop.
2. Position the mast vertically and lift the forks 10cm (4 in) above the ground.
3. Tilt the mast forward.
4. Move up the fork stopper knob to the free position. (The forks are movable to left and right at this position.)
5. Adjust the fork spread corresponding to the load size so that the load center of gravity coincides with the center of the lift truck.
6. Set the mast vertically, lower the knob and insert the fork stopper to lock the forks. (Forks are fixed.)

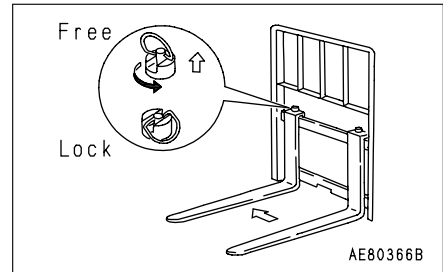


16. OPERATION

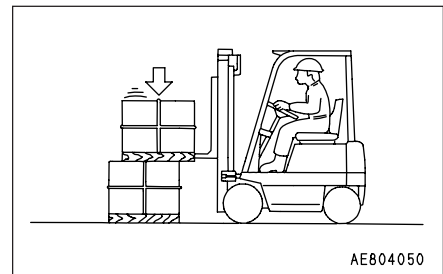
16.9 LOAD HANDLING OPERATION

16.9.1 PICKING UP

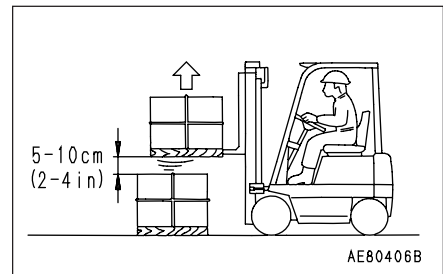
1. Adjust the fork spread corresponding to the load size. (See "16.8 FORK SPREAD ADJUSTMENT".)



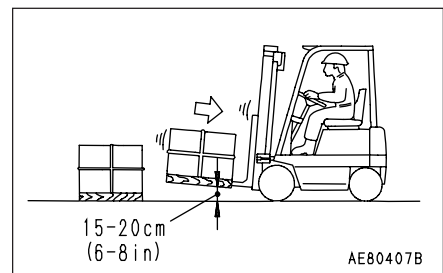
2. Advance the lift truck until 2/3 to 3/4 of the forks enter under the load, and raise the load 5 – 10 cm (2 – 4 in).
3. Reverse the lift truck 10 – 20 cm (4 – 8 in) slowly and lower the load once. Advance again and fully insert the forks.



4. Raise the load 5 – 10 cm (2 – 4 in) and reverse the lift truck to a position where the load can be lowered.

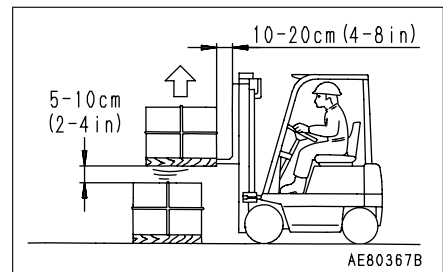
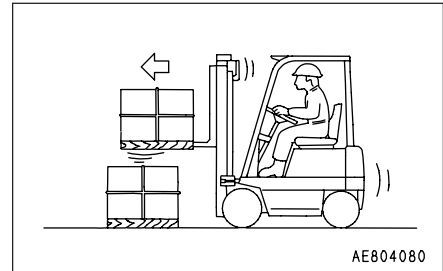


5. Lower the load to a height of 15 – 20 cm (6 – 8 in) above the ground and tilt the mast fully backward.



16.9.2 STACKING

1. Stand the mast vertically and lift forks 5 – 10 cm (2 – 4 in) past the stacking position. Advance the lift truck slowly.
2. Lower the load once to the desired place.
3. Reverse the lift truck and withdraw the forks by 10 – 20 cm (4 – 8 in). Lift the load 5 – 10 cm (2 – 4 in) again and advance to the correct stacking position. Lower the load slowly and reverse the lift truck so that the forks are fully withdrawn.



16.10 CHECK AFTER OPERATION

On completion of operation, wipe off any dirt and dust. Before storage, check for the following items.

1. Oil leakage or battery fluid leakage from the units.
2. Cracks or damage
3. Check faults found during operation and report them to the person responsible for the lift truck.
4. Lubricate the units (if necessary).

17. COLD WEATHER OPERATION

17.1 PREPARATIONS FOR LOW TEMPERATURE

If the temperature becomes low, it becomes difficult to start the engine, and the coolant may freeze, so do as follows.

17.1.1 FUEL AND LUBRICANTS

Change to fuel and oil with low viscosity for all components.
For details, see "21. LUBRICANT LIST".

17.1.2 HYDRAULIC OIL

Always use genuine Komatsu Forklift oil. This gives better protection against rust than normal hydraulic oil.

17.1.3 COOLANT



WARNING

Coolant is flammable, so keep it away from open flame.
Never smoke when handling coolant.

NOTICE

When the truck is shipped out from the factory, it is filled with low-emission type (non-amine type) long life coolant. It may be used in the ambient temperature as low as -20°C , unless otherwise instructed.

Precautions when handling coolant

- Coolants are commonly used after being diluted. When diluting coolants, use distilled water or tap water.
- Check that there is no leakage of water from the radiator, water pump, or hoses.
- Drain all coolant and flush the inside of the system before adding new coolant.
- Do not mix the low- emission type coolant with other conventional ones for use in the truck.

Long life coolant (FAF-NAC)

Dilution

Use dilution commensurate with an environment in which the truck is used. Take note, however, that the allowable lowest dilution is 30%, so be sure to use dilution higher than that.

Min. temperature ($^{\circ}\text{C}$)	-10	-15	-20	-25	-30	-35	-40	-45	-50
Dilution (%)	30	36	41	46	50	54	58	61	64

- Dilution in the table allows for approx. 2% safety margin as against the standard values.
- If dilution exceeds 65%, freezing temperature rises conversely. Be careful not to add too much coolant.

17.1.4 BATTERY

When the ambient temperature drops, the capacity of the battery will also drop. If the battery charge is low, the battery electrolyte may freeze.

- Maintain the battery charge above 75%, and insulate the battery against cold temperature so that the lift truck can be started easily in the morning.
- If distilled water is to be added, to prevent freezing, wait until before starting operations the next morning before adding the distilled water.

17.1.5 CHECK OF ELECTRIC HEATER TO PREHEAT ENGINE INTAKE AIR

Before starting the engine in the cold season (once a year), request us to check the electric heater for wire breakage and dust sticking to it.

17.2 PRECAUTIONS AFTER COMPLETION OF OPERATIONS

DRAIN WATER

Drain any water accumulated in the fuel tank to prevent water from freezing during the night.

ADD FUEL

To prevent moisture from collecting inside the fuel tank, always fill the fuel tank after completing operations.

18. ACTIONS IN ENGINE OVERHEATING

ACTION WHEN ENGINE HAS OVERHEAT



WARNING

Always wait for the engine to cool down before removing the radiator cap. If it is attempted to cool the radiator quickly and the radiator cap is removed too soon, steam may spurt out.

If the coolant temperature gauge enters the overheat range, park the truck in a safe place immediately and take the following actions. (See "COOLANT TEMPERATURE GAUGE".)

1. Keep the engine running at low idling, open the engine hood for better airing of the engine room and wait for the engine to cool down.
Should the radiator cooling fan be not turning, stop the engine immediately and let the engine cool down.
2. Stop the engine, after checking the coolant temperature gauge and being satisfied that the coolant temperature has dropped sufficiently.
3. Check out the coolant level and water leakage from the radiator or radiator hose, only after the engine has sufficiently cooled down.
4. If the coolant is short, refill the radiator and sub-tank with cooling water. If water leakage is found, stop using the truck and call your Komatsu Forklift distributor for repairs.

CLEANING INSIDE OF COOLING SYSTEM

Scale and rust form easily in the cooling system, so flush the system with Komatsu Forklift genuine radiator rust prevention fluid, and take other steps to ensure that there is always clean water circulating in the system.

CLEAN RADIATOR FINS



WARNING

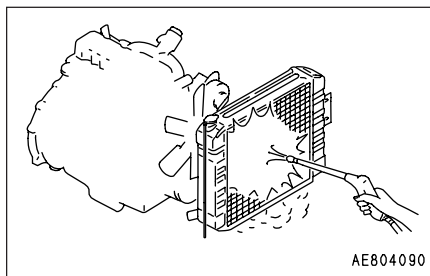
Dirt may fly and get into your eyes, so always wear protective glasses or goggles.

If the radiator fins are clogged, it will cause overheating, so blow the radiator fins with compressed air, steam, or water.

- When using air or steam, always point the nozzle at a right angle to the radiator when cleaning.

Air pressure: Max. 0.98 MPa (10 kgf/cm²)

Steam pressure: Max. 0.39 MPa (4 kgf/cm²)



CHECK FAN BELT TENSION

If the fan belt is loose, adjust it to the specified tension.

19. LONG-TERM STORAGE

19.1 BEFORE STORAGE

When putting the lift truck in storage for a long time, do as follows.

- Wash, clean, and dry every part, then house the lift truck in a dry building. Never leave it outdoors.

NOTICE

In case it must be left outdoors, park the lift truck on flat, dry ground, and cover it securely with a waterproof sheet.

- Completely fill the fuel tank, grease all parts, and change the oil before storage.
- Apply a thin coat of grease to the exposed surface of the piston rods of the hydraulic cylinders.
- Disconnect the negative terminal of the battery and cover the battery, or remove the battery from the lift truck and store it separately.
- If the temperature drops below 0°C, add antifreeze to the cooling water.

19.2 DURING STORAGE



WARNING

If it is necessary to carry out the rust prevention operation while the lift truck is indoors, open the doors and windows to improve ventilation and prevent gas poisoning.

- **RUST PREVENTION OPERATION**

Operate the engine and move the lift truck for a short distance once a month so that a new film of oil will be coated over lubricated surfaces. This prevents loss of the oil film over the long period of storage.

Before operating the work equipment, wipe off the coat of grease from the hydraulic cylinders.

- **CHARGE BATTERY**

Even if the battery is not used, it will naturally discharge if left for a long period. Always charge the battery once a month.

19. LONG-TERM STORAGE

19.3 AFTER STORAGE

NOTICE

If the lift truck has been stored for a long period without being covered or without carrying out the monthly rust prevention operation, do as follows before using it.

- Remove the drain plugs from the oil pan and each case, and drain out the water.
- Wipe off the grease from the hydraulic cylinder rods.
- Remove the cylinder head cover, add oil to the valves and rocker arms, and check the operation of the valves.
- After starting the engine, carry out the warming-up operation until the engine oil pressure warning lamp goes out in order to settle all the parts thoroughly.

MAINTENANCE

20. OUTLINE OF SERVICE

- Use Komatsu Forklift genuine parts for replacement.
- When changing or adding oil, do not use a different type of oil.
- Unless otherwise specified, the oil and coolant used at delivery from the factory shall be as shown in the table below.

1) Tank, cases

Item	Type of fluid
Differential case	SAE90
Hydraulic tank	SAE10W-CD
TORQFLOW transmission case	SAE10W-CD

2) Cooling system

Fresh water + long life coolant

(This dilution is applicable to the ambient temperature as low as -20°C)

20.1 SUITABLE OIL

20.1.1 OIL

- Since the oil is used for the work equipment, etc., under severe conditions (at high temperature and high pressure), it will deteriorate as the operation time passes. Always use an oil matching the grade and working temperatures given in the operation manual. Always replace oil at the specified period even if not deteriorated.
- Oil is often likened to human blood. A lift truck should be maintained with the same care taken for the human body so that impurities (water, metal chips, dust etc.) do not enter the lift truck system. Most lift truck malfunctions are caused by entry of impurities. Take special care to avoid entry of impurities during storage and lubrication, etc.
- Never blend oils of different grades or brands.
- Add specified volume of oil. Insufficient or excessive amounts of oil may both cause problems.
- If the oil in the work equipment becomes cloudy, it is likely that air or water have entered the circuit. Consult a Komatsu Forklift distributor.
- When replacing oil, replace the relevant filters at the same time.

20.1.2 GREASE

- Grease prevents the generation of squeaking or noise from the joints, etc.
- Lift trucks are provided with grease nipples in various places. Some of these are not mentioned in this manual since they are for overhauling purposes, and do not require greasing.
If friction is noticed in movable parts after operation, grease.
- After greasing, wipe off old grease forced out, especially on rotating parts that will be worn by adhering sand and dirt.

20.1.3 OIL STORAGE AND PRESERVATION

- Store and preserve oil so as not to allow entry of any water or dust.
- When storing oil drums for long periods, place them side by side with the filler sides facing in the same direction.
If necessary to store outdoors, cover them with waterproof sheets.
- To prevent deterioration during long-term storage, use drums on a "first in, first out" basis.

20.1.4 FILTERS

- Filters are very important safety items which prevent problems caused by impurities contained in the oil or hydraulic circuit which sends oil into important units.
Periodically replace the filters referring to this manual.
- When replacing oil filters, check for metal powder accumulated on the used filters.
- Do not unpack replacement filters until immediately before installation.
- Always use genuine Komatsu Forklift filters.

21. LUBRICANT LIST

21.1 GASOLINE ENGINE LIFT TRUCK

[FG35/40/45, FG35Z/40Z, FG50A]

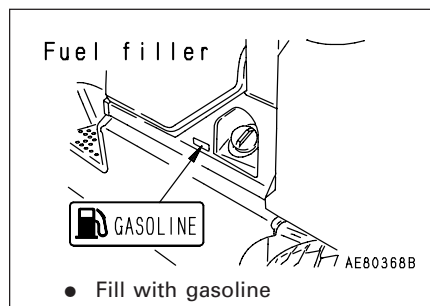
NOTICE

Always use genuine Komatsu Forklift oil and grease.
(Oil, grease, and anti-freeze are available from Komatsu Forklift distributors.)



CAUTION

Never use the wrong type of brake fluid.



Lubrication point	Type of fluid	Ambient temperature							Capacity
		-4 -20	14 -10	32 0	50 10	68 20	86°F 30°C		
Engine oil pan	Engine oil								7.8 ℓ 2.06 US gal, 1.72 UK gal
TORQFLOW transmission case	Engine oil								16 ℓ 4.22 US gal, 3.52 UKgal
Differential case	Gear oil								TORQFLOW transmission lift truck: 13 ℓ 3.43 US gal, 2.86 UK gal Clutch type lift truck: 25 ℓ 6.60 US gal, 5.50 UK gal
Hydraulic tank	Hydraulic oil								55 ℓ 14.53 US gal, 12.10 UK gal
Fuel tank	Gasoline								FG35/40/45: 100 ℓ 26.4 US gal, 22.0 UK gal FG35Z/40Z: 80 ℓ 21.1 US gal, 17.6 UK gal FG50A: 100 ℓ 26.4 US gal, 22.0 UK gal
Brake reservoir tank	Brake fluid								0.15 ℓ 0.040 US gal, 0.033 UK gal
Clutch reservoir tank	Brake fluid								0.1 ℓ 0.026 US gal, 0.022 UK gal
Greasing points	Lithium grease								—
Cooling system	Coolant (FAF-NAC)								14 ℓ 3.70 US gal, 3.08 UK gal

21.2 DIESEL ENGINE LIFT TRUCK

[FD35/40/45, FD35Z/40Z, FD50A]

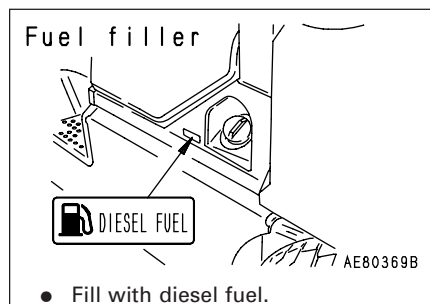
NOTICE

- Never use fuel mixed with kerosene.
- Always use genuine Komatsu Forklift oil and grease. (Oil, grease, and anti-freeze are available from Komatsu Forklift distributors.)



CAUTION

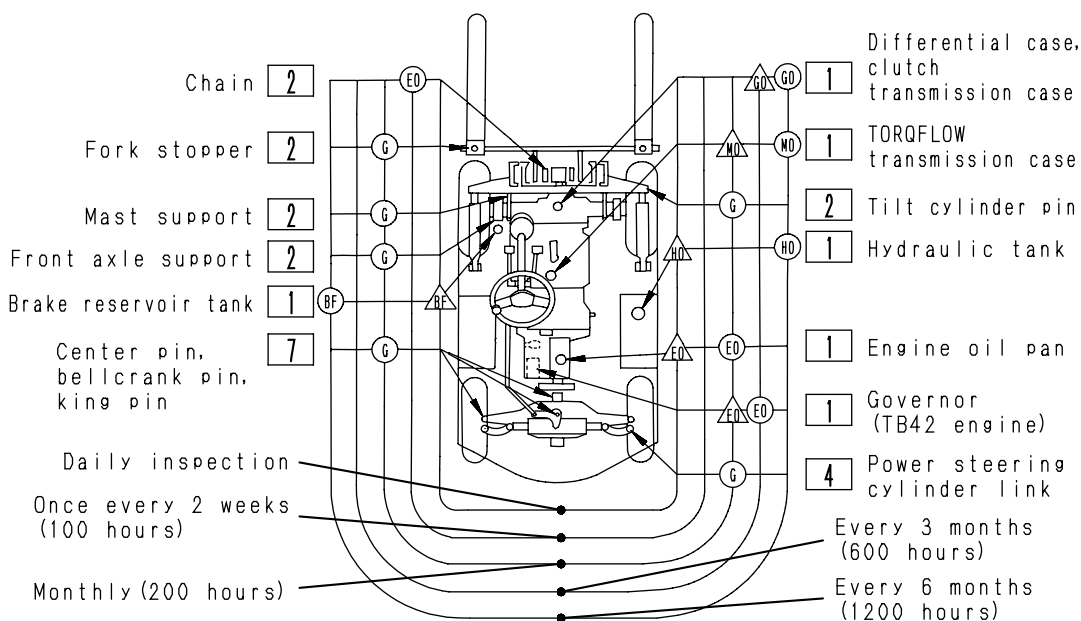
Never use the wrong type of brake fluid.



Lubrication point	Type of fluid	Ambient temperature							Capacity
		-4 -20	14 -10	32 0	50 10	68 20	86°F 30°C		
Engine oil pan	Engine oil			SAE10W-CD					11.5 ℓ 3.04 US gal, 2.53 UK gal
					SAE30-CD				
TORQFLOW transmission case	Engine oil			SAE10W-CD					16 ℓ 4.22 US gal, 3.52 UKgal
Differential case	Gear oil			SAE80					TORQFLOW transmission lift truck: 13 ℓ 3.43 US gal, 2.86 UK gal Clutch type lift truck: 25 ℓ 6.60 US gal, 5.50 UK gal
				SAE90					
Hydraulic tank	Hydraulic oil			SAE5W-CD					55 ℓ 14.53 US gal, 12.10 UK gal
				SAE10W-CD					
Fuel tank	Diesel fuel								FD35/40/45: 100 ℓ 26.4 US gal, 22.0 UK gal FD35Z/40Z-7: 80 ℓ 21.1 US gal, 17.6 UK gal FD35Z/40Z-8: 90 ℓ 23.8 US gal, 19.8 UK gal FD50A: 100 ℓ 26.4 US gal, 22.0 UK gal
		ASTM D975 No.1		ASTM D975 No.2					
Brake reservoir tank	Brake fluid			SAE70R-1, SAE70R-3					0.15 ℓ 0.040 US gal, 0.033 UK gal
Clutch reservoir tank	Brake fluid								0.1 ℓ 0.026 US gal, 0.022 UK gal
Greasing points	Lithium grease			NLGI No. 2					—
Cooling system	Coolant (FAF-NAC)								14 ℓ 3.70 US gal, 3.08 UK gal

21. LUBRICANT LIST

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



AE82221B

Symbol	Type of fluid
EO	Diesel engine oil
	Gasoline engine oil
MO	Engine oil
GO	Gear oil
HO	Hydraulic oil
BF	Brake fluid
G	Grease

MEMO

22. SERVICE DATA

22.1 SERVICE DATA (GASOLINE ENGINE LIFT TRUCK)

Component		Inspection item		Unit	FG35/40/45-7, FG35Z/40Z-7, FG50A-7
Engine	Engine proper	Engine model		–	NISSAN TB42
		Idling speed		rpm	850 – 900
		Max. speed		rpm	2300 – 2400
		Compression		MPa/rpm	Min. 1.2 (12 kgf/cm ²)/200
	Lubricating oil cooling system	Fan belt deflection		mm	15 – 17 (0.59 – 0.67 in) (finger pressure: 98N) 15 – 17 (0.59 – 0.67 in) (finger pressure: 10 kgf)
	Fuel system	Injection timing		BTDC°	–
		Injection order		–	–
		Injection pressure		MPa	–
	Intake, exhaust system	Valve clearance	Intake	mm	0.38 (0.015 in) (Warm)
			Exhaust	mm	0.38 (0.015 in) (Warm)
	Electric system	Distributor point gap		mm	–
		Spark plug gap		mm	0.7 – 0.8 (0.028 – 0.031 in)
		Spark plug type		m	NGK : B-4ES, BPR-4ES (Noise protect type) HITACHI : L47W
		Ignition timing		BTDC° /rpm	7/700
		Firing order		–	1–5–3–6–2–4

Component		Inspection item		Unit	FG35/40/45-7, FG35Z/40Z-7, FG50A-7
Travel system	Tires	Tire inflation pressure	Front wheel	MPa	250-15-16PR: 0.83 (8.5 kgf/cm ²) 8.25-15-12PR: 0.68 (7.0 kgf/cm ²) 300-15-18PR: 0.78 (8.0 kgf/cm ²)
			Rear wheels	MPa	0.83 (8.5 kgf/cm ²)
	Hub nuts	Tightening torque	Front wheels	Nm	294 – 490 (30 – 50 kgfm)
			Rear wheels	Nm	294 – 490 (30 – 50 kgfm)
	Rim mating nuts	Tightening torque	Front wheels	Nm	–
			Rear wheels	Nm	196 – 294 (20 – 30 kgfm)
Steering, braking system	Steering wheel	Play		mm	30 – 60 (1.2 – 2.4 in)
	Clutch pedal	Play		mm	3 – 5 (0.12 – 0.20 in)
	Inching pedal	Play		mm	2 – 3 (0.08 – 0.12 in)
		Interconnected travel		mm	35 – 41 (1.38 – 1.61 in)
	Brake pedal	Play		mm	3 – 7 (0.12 – 0.28 in)
		Pedal height when pedal is depressed		mm	90 – 100 (3.54 – 3.94 in)
	Brake	Parking brake operating force		N	Min. 196 (20 kgf)
Tightening torque for back plate mounting bolts		Nm	245 – 309 (25 – 31.5 kgfm)		
Loading equipment	Forks	Fork thickness (at base)		mm	FG35/35Z: Min. 48 (1.89 in) FG40/40Z/45: Min. 50 (1.97 in) FG50A: Min. 55 (2.17 in)
	Chain	Length over 17 links		mm	Max. 440 (17.3 in)
	Hydraulic system	Relief pressure		MPa	18 (185 kgf/cm ²)

22. SERVICE DATA

22.2 SERVICE DATA (DIESEL ENGINE LIFT TRUCK)

Component		Inspection item	Unit	FD35/40/45-7 FD50A-7	FD35/40/45-8 FD35Z/40Z-8, FD50A-8
Engine	Engine proper	Engine model	—	KOMATSU 6D102E	KOMATSU S6D102E
		Idling speed	rpm	675 – 725	
		Max. speed	rpm	2300 – 2400	
		Compression	MPa/rpm	3.35 (36 kgf/cm ²) / 280 – 320	
	Lubricating oil cooling system	Fan belt deflection	mm	6 – 10 (0.24 – 0.39 in) (finger pressure: 79N) 6 – 10 (0.24 – 0.39 in) (finger pressure: 8 kgf)	—
	Fuel system	Injection timing	BTDC°	ATDC1 (Injection pump cam lift 1 mm)	
		Injection order	—	1–5–3–6–2–4	
		Injection pressure	MPa	19.6 (200 kgf/cm ²)	21.6 (220 kgf/cm ²)
	Intake, exhaust system	Valve clearance	Intake	mm	0.25 (0.0098 in) (Cool)
			Exhaust	mm	0.51 (0.0200 in) (Cool)
	Electric system	Distributor point gap	mm	—	
		Spark plug gap	mm	—	
		Ignition timing	BTDC° /rpm	—	
		Firing order	—	—	

Component		Inspection item		Unit	FD35/40/45-7/8 FD35Z/40Z-8 FD50A-7/8
Travel system	Tires	Tire inflation pressure	Front wheel	MPa	250-15-16PR: 0.83 (8.5 kgf/cm ²) 8.25-15-12PR: 0.68 (7.0 kgf/cm ²) 300-15-18PR: 0.78 (8.0 kgf/cm ²)
			Rear wheels	MPa	0.83 (8.5 kgf/cm ²)
	Hub nuts	Tightening torque	Front wheels	Nm	294 – 490 (30 – 50 kgfm)
			Rear wheels	Nm	294 – 490 (30 – 50 kgfm)
	Rim mating nuts	Tightening torque	Front wheels	Nm	—
			Rear wheels	Nm	196 – 294 (20 – 30 kgfm)
Steering, braking system	Steering wheel	Play		mm	30 – 60 (1.2 – 2.4 in)
	Clutch pedal	Play		mm	3 – 5 (0.12 – 0.20 in)
	Inching pedal	Play		mm	2 – 3 (0.08 – 0.12 in)
		Interconnected travel		mm	35 – 41 (1.38 – 1.61 in)
	Brake pedal	Play		mm	3 – 7 (0.12 – 0.28 in)
		Pedal height when pedal is depressed		mm	90 – 100 (3.54 – 3.94 in)
	Brake	Parking brake operating force		N	Min. 196 (20 kgf)
		Tightening torque for back plate mounting bolts		Nm	245 – 309 (25 – 31.5 kgfm)
Loading equipment	Forks	Fork thickness (at base)		mm	FD35/35Z: Min. 48 (1.89 in) FD40/40Z/45: Min. 50 (1.97 in) FD50A: Min. 55 (2.17 in)
	Chain	Length over 17 links		mm	Max. 440 (17.3 in)
	Hydraulic system	Relief pressure		MPa	18 (185 kgf/cm ²)

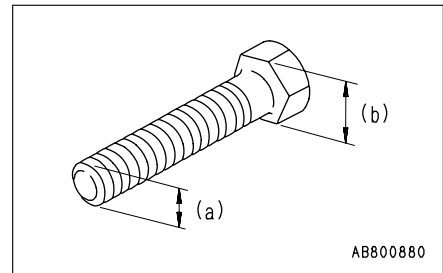
22. SERVICE DATA

22.3 TORQUE LIST

For unspecified bolts and nuts, use the torques specified in this list.

Select a proper torque corresponding to the width across flats (b) of bolts and nuts.

When replacing bolts and nuts, always use genuine Komatsu Forklift parts the same size as the previous ones.



Thread diameter of bolt (mm) (a)	Width across flat (mm) (b)	Tightening torque		
		Nm	kgfm	lbft
6	10	13.2 ± 1.4	1.35 ± 0.15	9.73 ± 1.03
8	13	31.4 ± 2.9	3.2 ± 0.3	23.2 ± 2.1
10	17	65.7 ± 6.8	6.7 ± 0.7	48.5 ± 5.0
12	19	112 ± 9.8	11.5 ± 1.0	82.6 ± 7.2
14	22	177 ± 19	18.0 ± 2.0	131 ± 14
16	24	279 ± 29	28.5 ± 3	206 ± 21
18	27	383 ± 39	39 ± 3	282 ± 29
20	30	549 ± 58	56 ± 6	405 ± 43
22	32	745 ± 78	76 ± 8	549 ± 58
24	36	927 ± 98	94.5 ± 10	684 ± 72
27	41	1320 ± 140	135 ± 15	973 ± 100
30	46	1720 ± 190	175 ± 20	1270 ± 140
33	50	2210 ± 240	225 ± 25	1630 ± 180
36	55	2750 ± 290	280 ± 30	2030 ± 210
39	60	3280 ± 340	335 ± 35	2420 ± 250

23. PERIODIC REPLACEMENT OF SAFETY CRITICAL PARTS

To ensure safety at all times when operating or driving the lift truck, the lift truck user must always carry out periodic maintenance. In addition, to further improve safety, the user should also perform periodic replacement of parts given in the table on the next page. These parts in particular are closely related to safety and fire prevention.

The material of these parts may change over time, or may easily wear or deteriorate. However, as it is difficult to judge the condition of the parts simply by periodic maintenance, they should always be replaced after a fixed time has passed, regardless of their condition. This is necessary to ensure that their full function is always maintained.

However, if these parts show any abnormality before the replacement interval has passed, they should be repaired or replaced immediately.

If the hose clamps show any sign of deterioration such as deformation or cracking, replace them at the same time as the hoses.

Note that the periodic replacement is not covered by warranty.

IMPORTANT PARTS LIST

No.	Part name	Years elapsed
1	Brake valve, wheel cylinder cup and dust seal, etc.	1
2	Brake hose or tube	2
3	Clutch reservoir tank, tube	2 – 4
4	Power steering hose	2
5	Stop lamp switch (hydraulic type)	2
6	Fuel hose	2
7	Rubber parts inside power steering system	2
8	Lift chain	3
9	Hydraulic hose for lifting mechanism	2

24. MAINTENANCE SCHEDULE CHART

(Perform maintenance at interval of months or operation hours, whichever occurs first)

Service item	Page
First one month or initial 200 hours service (only after the first one month)	
Change oil in hydraulic tank, replace line filter, clean strainer, clean inside of tank	3-18
Change oil in engine oil pan	3-18
Replace engine oil filter cartridge	3-18
Check, adjust engine valve clearance	3-18
Tighten engine cylinder head bolts	3-18
Clean TORQFLOW transmission strainer	3-18
Change oil in differential case (for clutch type lift trucks, includes oil in transmission case)	3-18
Change oil in TORQFLOW transmission case	3-18
Tighten bolts and nuts (in particular, hub nuts, and mounting bolts of overhead guard, backrest, and operator's seat)	3-19
Check before operation (for details, see "16.1 CHECK BEFORE OPERATION").	
Every 2 weeks or every 100 hours service	
Grease lift chain	3-19
Every month or every 200 hours service	
Check rim for deformation, cracking, and damage	3-19
Check wheel bearing for play and abnormal noise	3-19
Check hydraulic cylinder for looseness, deformation, cracking, damage, and wear	3-19
Check piping for damage, oil leakage, and deformation	3-19
Check operation of hydraulic cylinders	3-19
Check hydraulic drift of lift cylinder	3-19
Check hydraulic drift of tilt cylinder	3-19
Check movement of work equipment control lever	3-19
Check forks and fork stopper for deformation, cracking, damage, and wear	3-20
Check forks for unevenness and twisting	3-20
Check mast for deformation, cracking, damage, and wear	3-20
Check mast roller for play	3-20
Check chain and chain wheel for deformation, damage, rust, and poor lubrication	3-20
Check chain wheel bearing for play	3-20

24. MAINTENANCE SCHEDULE CHART

Service item	Page
Every month or every 200 hours service (continued)	
Check chain anchor bolt for deformation, damage	3-20
Check gear box for oil leakage, looseness of mount	3-20
Check mounting condition of power steering, check for looseness at connections	3-20
Check brake link for play, looseness, damage, and wear	3-21
Check brake piping for damage, leakage, looseness, contact, looseness of brake pipe clip, disconnection	3-21
Check clearance between brake drum and lining, check brake for dragging	3-21
Check pedal height when clutch pedal is depressed	3-21
Check shift lever for play, meshing	3-21
Check for oil leakage from transmission case, differential case	3-21
Check oil level in TORQFLOW transmission, add oil	3-21
Check pedal height when inching pedal is depressed	3-21
Check starting of engine	3-22
Check idling speed	3-22
Clean radiator fins, check for damage	3-22
Check for catching, stalling, and knocking when accelerating	3-22
Clean air cleaner element	3-23
Check operation of governor (maximum speed)	3-23
Check for fuel leakage	3-23
Check fuel filter for cracking, damage	3-23
Check radiator hoses for cracking	3-24
Check operating condition of radiator cap, check installation	3-24
Check fan for deformation, cracking, and damage	3-24
Check fan for looseness of mount	3-24
Check, adjust fan belt tension	3-24
Check, adjust alternator belt tension	3-24
Check distributor cap for cracking and damage	3-24
Check clearance of distributor points, check contact surface for roughness	3-24
Check spark plug for burning, burning of insulator	3-24
Change oil in engine oil pan	3-25
Drain water from fuel filter (diesel engine lift trucks)	3-28
Check operation of starting switch, check meshing of pinion gear	3-29

24. MAINTENANCE SCHEDULE CHART

Service item	Page
Every month or every 200 hours service (continued)	
Check specific gravity of battery electrolyte	3-29
Check wiring connections for looseness	3-30
Check ignition timing	3-30
Check overhead guard, backrest for deformation, cracking, damage, and looseness	3-30
Check operator's seat mount for looseness, damage	3-30
Grease all lubrication points	3-30
Every 3 months or every 600 hours service	
Replace oil filter cartridge	3-31
Grease fuel injection pump governor, change governor oil	3-31
Replace fuel filter cartridge (diesel engine lift trucks)	3-31
Check oil level in transmission case, add oil (for clutch type lift trucks, includes differential case)	3-31
Check oil level in differential case, add oil (for clutch type lift trucks, includes transmission case)	3-31
Every 6 months or every 1200 hours service	
Check steering link for bending, damage, and wear	3-31
Check knuckle for play, deformation, and damage	3-31
Check for marked variation in minimum turning radius	3-31
Change oil in differential case (for clutch type lift trucks, includes transmission case)	3-32
Change oil in TORQFLOW transmission case	3-33
Replace line filter in transmission oil pressure circuit	3-34
Change clutch oil	3-34
Change brake oil	3-34
Check, adjust valve clearance	3-34
Measure compression pressure	3-34
Check, adjust fuel injection timing	3-34
Check blowby gas reduction system for clogging, damage	3-34
Check distributor cap center piece for wear	3-34
Replace fuel filter element (gasoline engine lift trucks)	3-34

24. MAINTENANCE SCHEDULE CHART

Service item	Page
Every 6 months or every 1200 hours service	
Clean inside of cooling system	3-35
Replace air cleaner element	3-36
Change oil in hydraulic tank, replace hydraulic line filter, clean hydraulic tank strainer, clean inside of hydraulic tank	3-37
Every year or every 2400 hours service	
Check operation of master cylinder, check for oil leakage, damage, and wear	3-38
Check operation of wheel cylinder, check for oil leakage, damage, and wear	3-38
Check operating condition of brake drum, check for damage and wear	3-38
Check brake lining for wear	3-38
Check operating condition of brake shoe	3-38
Check brake adjustment lever and ratchet for wear and damage	3-38
Check brake spring for deterioration	3-38
Check brake back plate for deformation and cracking, check mounting condition	3-38
Check air tightness of brake piping	3-38
Check axle for deformation, cracking, and damage	3-38
Check mounting condition of differential	3-38
Check root of forks for cracking (use color check)	3-38
Check roller shaft of loading equipment for cracking and damage	3-38
Check mast support for damage and wear	3-38
Check operation of relief valve, check relief pressure	3-38
Replace air breather	3-38
Clean inside of fuel tank	3-39
Check injection pressure, injection amount, injection condition	3-39
Tighten engine cylinder head bolts	3-39
Check frame and cross member for cracking and damage	3-39

25. MAINTENANCE

25.1 FIRST ONE MONTH OR INITIAL 200 HOURS SERVICE

Carry out this maintenance for only new lift trucks after the first one month or initial 200 hours, whichever comes sooner.

[Hydraulic equipment]

25.1.1 CHANGE OIL IN HYDRAULIC TANK, REPLACE LINE FILTER, CLEAN STRAINER, CLEAN INSIDE OF TANK

For details of the method of replacing and cleaning, see "25.6.17 CHANGE OIL IN HYDRAULIC TANK, REPLACE HYDRAULIC LINE FILTER, CLEAN HYDRAULIC TANK STRAINER, CLEAN INSIDE OF HYDRAULIC TANK".

[Engine]

25.1.2 CHANGE OIL IN ENGINE OIL PAN

For details of the method of changing the oil, see "25.4.43 CHANGE OIL IN ENGINE OIL PAN".

25.1.3 REPLACE ENGINE OIL FILTER CARTRIDGE

For details of the method of changing the oil, see "25.4.43 CHANGE OIL IN ENGINE OIL PAN".

25.1.4 CHECK, ADJUST ENGINE VALVE CLEARANCE

25.1.5 TIGHTEN ENGINE CYLINDER HEAD BOLTS

[Power train]

25.1.6 CLEAN TORQFLOW TRANSMISSION STRAINER

25.1.7 CHANGE OIL IN DIFFERENTIAL CASE (FOR CLUTCH TYPE LIFT TRUCKS, INCLUDES OIL IN TRANSMISSION CASE)

For details of the method of changing the oil, see "25.6.4 CHANGE OIL IN DIFFERENTIAL CASE".

25.1.8 CHANGE OIL IN TORQFLOW TRANSMISSION CASE

For details of the method of changing the oil, see "25.6.5 CHANGE OIL IN TORQFLOW TRANSMISSION CASE".

[General]

25.1.9 TIGHTEN BOLTS AND NUTS (IN PARTICULAR, HUB NUTS, AND MOUNTING BOLTS OF OVERHEAD GUARD, BACKREST, AND OPERATOR'S SEAT)

25.2 CHECK BEFORE OPERATION

For details, see "16.1 CHECK BEFORE OPERATION".

25.3 EVERY 2 WEEKS OR EVERY 100 HOURS SERVICE

[Loading equipment]

25.3.1 GREASE LIFT CHAIN

25.4 EVERY MONTH OR EVERY 200 HOURS SERVICE

[Travel equipment]

25.4.1 CHECK RIM FOR DEFORMATION, CRACKING, AND DAMAGE

25.4.2 CHECK WHEEL BEARING FOR PLAY AND ABNORMAL NOISE

[Hydraulic equipment]

25.4.3 CHECK HYDRAULIC CYLINDER FOR LOOSENESS, DEFORMATION, CRACKING, DAMAGE, AND WEAR

25.4.4 CHECK PIPING FOR DAMAGE, OIL LEAKAGE, AND DEFORMATION

25.4.5 CHECK OPERATION OF HYDRAULIC CYLINDERS

25.4.6 CHECK HYDRAULIC DRIFT OF LIFT CYLINDER

25.4.7 CHECK HYDRAULIC DRIFT OF TILT CYLINDER

25.4.8 CHECK MOVEMENT OF WORK EQUIPMENT CONTROL LEVER

25. MAINTENANCE

[Loading equipment]

25.4.9 CHECK FORKS AND FORK STOPPER FOR DEFORMATION, CRACKING, DAMAGE, AND WEAR

25.4.10 CHECK FORKS FOR UNEVENNESS AND TWISTING

25.4.11 CHECK MAST FOR DEFORMATION, CRACKING, DAMAGE, AND WEAR

25.4.12 CHECK MAST ROLLER FOR PLAY

25.4.13 CHECK CHAIN AND CHAIN WHEEL FOR DEFORMATION, DAMAGE, RUST, AND POOR LUBRICATION

25.4.14 CHECK CHAIN WHEEL BEARING FOR PLAY

25.4.15 CHECK CHAIN ANCHOR BOLT FOR DEFORMATION, DAMAGE

[Steering system]

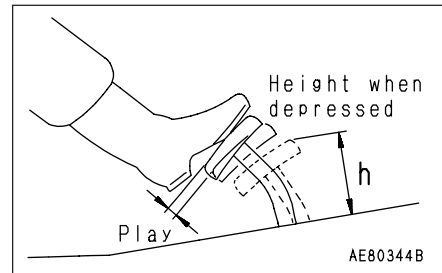
25.4.16 CHECK GEAR BOX FOR OIL LEAKAGE, LOOSENESS OF MOUNT

25.4.17 CHECK MOUNTING CONDITION OF POWER STEERING, CHECK FOR LOOSENESS AT CONNECTIONS

[Braking system]**25.4.18 CHECK BRAKE LINK FOR PLAY, LOOSENESS, DAMAGE, AND WEAR****Checking**

1. Check the play and the height of the brake pedal when it is depressed to check that it is the specified value.

Play	3 – 7 mm (0.12 – 0.28 in)
Pedal height when depressed (h)	90 – 100 mm (3.54 – 3.94 in)



2. Test the brake while gradually increasing the speed from low speed. Check that there is no pulling or dragging of the brakes. If necessary, adjust the brake until it is applied smoothly.

**WARNING**

Inspect the lift truck in an area where it will not obstruct other vehicles or workers.

25.4.19 CHECK BRAKE PIPING FOR DAMAGE, LEAKAGE, LOOSENESS, CONTACT, LOOSENESS OF BRAKE PIPE CLIP, DISCONNECTION**25.4.20 CHECK CLEARANCE BETWEEN BRAKE DRUM AND LINING, CHECK BRAKE FOR DRAGGING****[Power train]****25.4.21 CHECK PEDAL HEIGHT WHEN CLUTCH PEDAL IS DEPRESSED****25.4.22 CHECK SHIFT LEVER FOR PLAY, MESHING****25.4.23 CHECK FOR OIL LEAKAGE FROM TRANSMISSION CASE, DIFFERENTIAL CASE****25.4.24 CHECK OIL LEVEL IN TORQFLOW TRANSMISSION, ADD OIL**

For details of the method of checking the oil level and adding oil, see "25.6.5 CHANGE OIL IN TORQFLOW TRANSMISSION CASE".

25.4.25 CHECK PEDAL HEIGHT WHEN INCHING PEDAL IS DEPRESSED

25. MAINTENANCE

[Engine]

25.4.26 CHECK STARTING OF ENGINE

25.4.27 CHECK IDLING SPEED

25.4.28 CLEAN RADIATOR FINS, CHECK FOR DAMAGE

Cleaning



WARNING

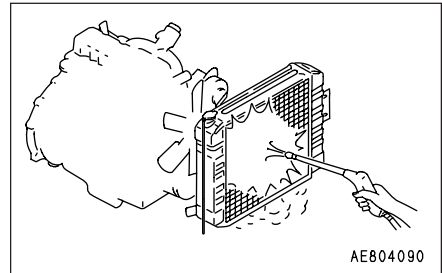
Dirt may fly and get into your eyes, so always wear protective glasses or goggles.

Blow the radiator fins with compressed air, steam, or water.

Air pressure: Max. 0.98 MPa (10 kgf/cm²)

Steam pressure: Max. 0.39 MPa (4 kgf/cm²)

- When using air or steam, always point the nozzle at a right angle to the radiator when cleaning.



Testing

Check visually that there are no dents or damage to the fins.

25.4.29 CHECK FOR CATCHING, STALLING, AND KNOCKING WHEN ACCELERATING

[Engine continued]

25.4.30 CLEAN AIR CLEANER ELEMENT**WARNING**

Always wear safety goggles when using compressed air.

NOTICE

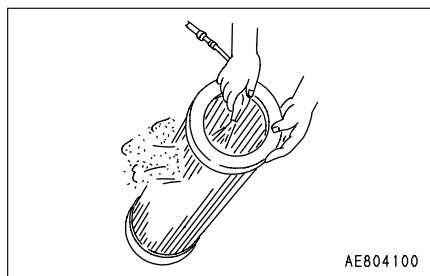
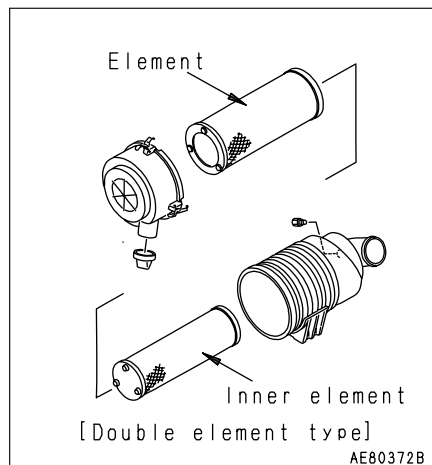
- If oil, grease, or carbon are stuck to the element, clean the element with special element cleaner. Follow the instructions given with the cleaner.
- Do not remove the inner element (FD35/40/45, FD35Z/40Z)
- In heavy-duty operating environment or conditions, clean and replace the element sooner.

Cleaning

1. Remove the element, blow the element from the inside with dry compressed air at 0.68 MPa (7 kgf/cm²) and clean the whole circumference.
2. After cleaning the element, install it again.

Testing

Check visually that there is no damage to the element.

25.4.31 CHECK OPERATION OF GOVERNOR (MAXIMUM SPEED)**25.4.32 CHECK FOR FUEL LEAKAGE****25.4.33 CHECK FUEL FILTER FOR CRACKING, DAMAGE**

25. MAINTENANCE

[Engine continued]

25.4.34 CHECK RADIATOR HOSES FOR CRACKING

25.4.35 CHECK OPERATING CONDITION OF RADIATOR CAP, CHECK INSTALLATION

25.4.36 CHECK FAN FOR DEFORMATION, CRACKING, AND DAMAGE

25.4.37 CHECK FAN FOR LOOSENESS OF MOUNT

25.4.38 CHECK, ADJUST FAN BELT TENSION

25.4.39 CHECK, ADJUST ALTERNATOR BELT TENSION

25.4.40 CHECK DISTRIBUTOR CAP FOR CRACKING AND DAMAGE

25.4.41 CHECK CLEARANCE OF DISTRIBUTOR POINTS, CHECK CONTACT SURFACE FOR ROUGHNESS

25.4.42 CHECK SPARK PLUG FOR BURNING, BURNING OF INSULATOR

For details of the method of checking for burning of the spark plugs and insulators, see "25.4.43 GASOLINE ENGINE".

[Engine continued]

25.4.43 CHANGE OIL IN ENGINE OIL PAN



WARNING

When carrying out maintenance of the engine, stop the engine and wait for it to cool down fully before starting.

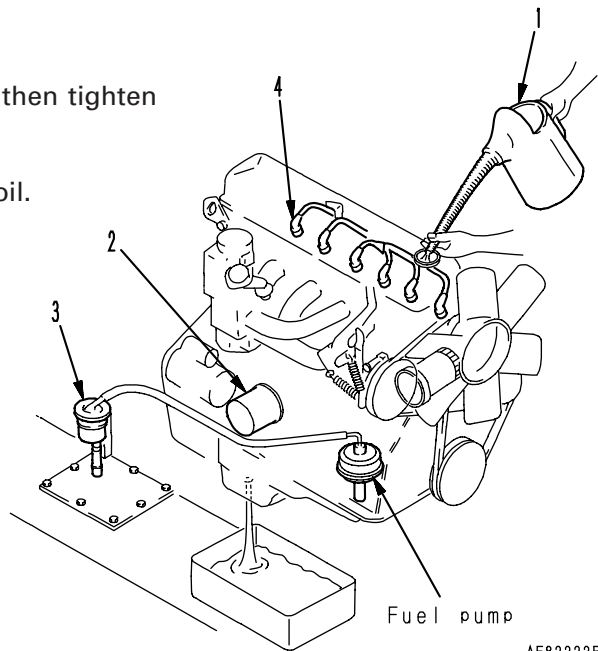
GASOLINE ENGINE (TB42 ENGINE)

1. CHANGE ENGINE OIL

1. Remove the drain plug, drain the oil, then tighten the plug again.
2. Add the specified amount of engine oil.
3. Check the oil level with the dipstick.

Refill amount:

7.8 ℓ (2.06 US gal, 1.72 UK gal)



AE82222B

2. REPLACE ENGINE OIL FILTER

1. Using a filter wrench, remove the cartridge.
2. Clean the filter holder, coat the thread and the seal of the new cartridge with engine oil, then install.

NOTICE

After installing the cartridge, start the engine and check that there is no leakage of oil from the filter mount surface.

25. MAINTENANCE

3. REPLACE FUEL FILTER

1. Loosen the nut, remove the glass bowl, then take out the filter.
2. Drain the water and clean out the dirt accumulated at the bottom.
3. Install the new filter.

NOTICE

- If the packing of the glass bowl is damaged, replace it.
- After replacing, check that there is no leakage of fuel from the hose mount.

4. CHECK SPARK PLUG

1. Remove the plug using the plug wrench supplied with the lift truck.
2. Clean off any carbon stuck to the tip of the plug or the surrounding area.
3. Measure gap (A) with a plug gap gauge.

Brands of plug

NGK	B-4ES BPR-4ES (Noise protect type)
HITACHI	L47W

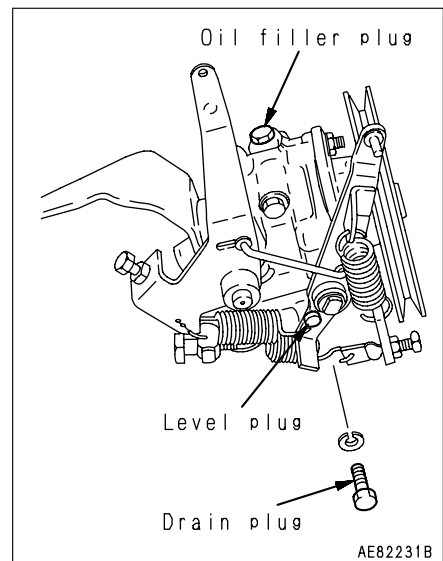
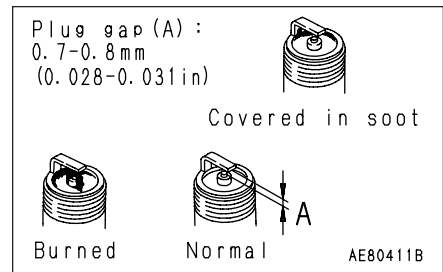
5. CHANGE GOVERNOR OIL

1. Remove the drain plug, drain the oil, then tighten the plug again.
2. Remove the oil filler plug and level plug.
3. Add oil through the oil filler until the oil flows out from the level plug hole.

NOTICE

Use the same oil as is used in the oil pan. (Capacity: 35 – 40 cc)

4. Tighten the oil filler plug and level plug.



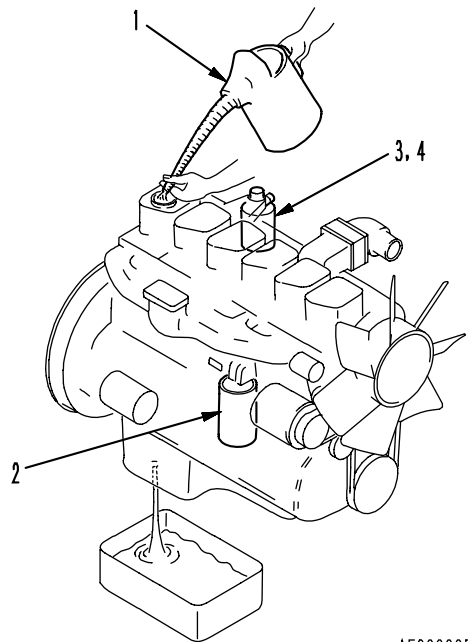
DIESEL ENGINE (6D102E ENGINE)

1. CHANGE ENGINE OIL

1. Remove the drain plug, drain the oil, then tighten the plug again.
2. Remove the dipstick.
3. Add the specified amount of engine oil.
4. Check the oil level with the dipstick.

Refill amount

11.5 ℓ (3.04 US gal, 2.53 UK gal)



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2. REPLACE ENGINE OIL FILTER

1. Using a filter wrench, remove the cartridge.
2. Clean the filter holder, coat the thread and the seal of the new cartridge with engine oil, then install.

NOTICE

After installing the cartridge, start the engine and check that there is no leakage of oil from the filter mount surface.

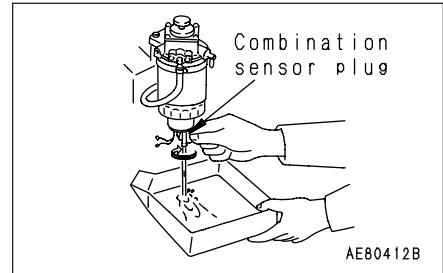
25. MAINTENANCE

3. DRAIN WATER FROM FUEL FILTER

1. Loosen the combination sensor plug and drain the water and sediment accumulated at the bottom.

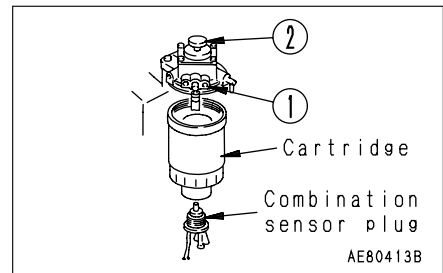
NOTICE

- Fuel is drained out at the same time, so prepare a container to catch it.
- Always be sure to wipe up any spilled fuel.



4. REPLACE FUEL FILTER

1. Remove the combination sensor plug at the bottom of the cartridge.
2. Using a filter wrench, remove the cartridge.
3. Install the combination sensor plug to the new cartridge.
4. Fill the new cartridge with fuel, coat the packing surface thinly with engine oil, then install.
5. Loosen plug ① and pump knob ② up and down until no more bubbles come out with the fuel.
6. Tighten plug ①.



25.4.44 DRAIN WATER FROM FUEL FILTER (DIESEL ENGINE LIFT TRUCKS)

For details of the method of draining the water, see "25.4.43 CHANGE OIL IN ENGINE OIL PAN".

[Electrical components]**25.4.45 CHECK OPERATION OF STARTING SWITCH, CHECK MESHING OF PINION GEAR****25.4.46 CHECK SPECIFIC GRAVITY OF BATTERY ELECTROLYTE****⚠ WARNING****Precautions when handling battery**

- Battery electrolyte is dangerous. If it gets in your eyes or on your skin or clothes, wash it off with large amounts of water. In particular, if it gets in your eyes, consult a doctor quickly.
- Keep away from sparks or flame
To avoid gas explosions, do not smoke or cause short circuits or sparks near the battery.

CHECK SPECIFIC GRAVITY OF BATTERY ELECTROLYTE

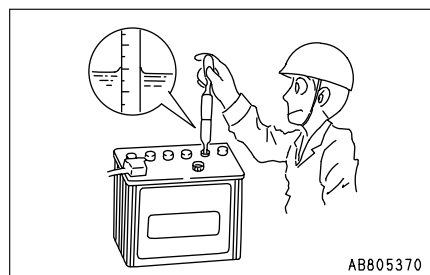
1. Charge the battery, and after charging, check that the battery electrolyte level is correct.
2. Using a specific gravity meter and thermometer, measure the specific gravity and temperature of the battery electrolyte.
3. Insert the values measured in Steps 1 and 2 in the formula below, and calculate S_{20} .

$$S_{20} = S_t + 0.0007 (t - 20)$$

S_{20} : Specific gravity at 20°C
 S_t : Specific gravity (measured value) at t°C
 t: Temperature of battery electrolyte (measured value)

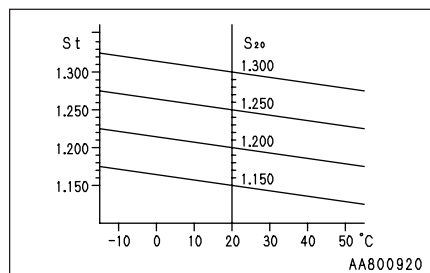
Normal value: $S_{20} = 1.27 - 1.29$

4. Charge the battery if necessary.



AB805370

Relation between specific gravity and temperature of electrolyte



AA800920

Specific gravity of electrolyte	Condition of charge	Necessity to charge
1.280	Fully charged	No
1.240	1/4 discharged	
1.210	1/2 discharged	Yes
1.130	Fully discharged	

25. MAINTENANCE

[Electrical components continued]

25.4.47 CHECK WIRING CONNECTIONS FOR LOOSENESS

25.4.48 CHECK IGNITION TIMING

[Others]

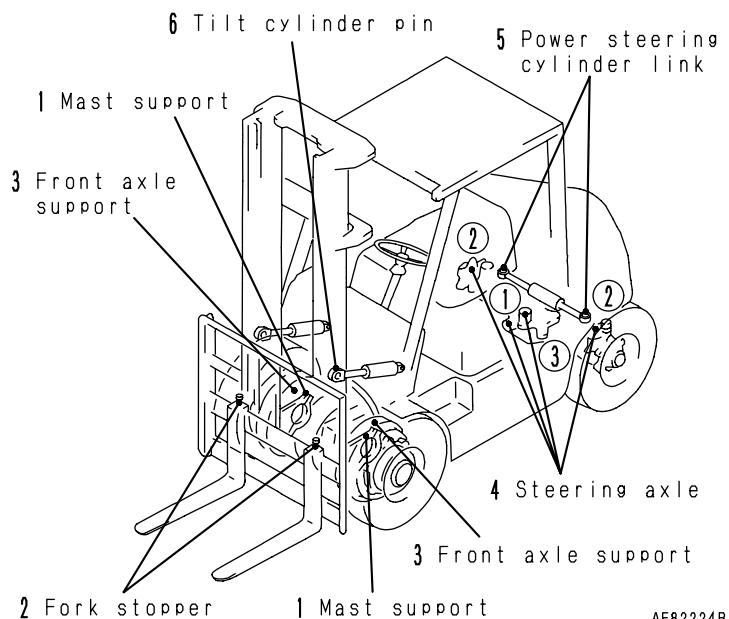
25.4.49 CHECK OVERHEAD GUARD, BACKREST FOR DEFORMATION, CRACKING, DAMAGE, AND LOOSENESS

25.4.50 CHECK OPERATOR'S SEAT MOUNT FOR LOOSENESS, DAMAGE

25.4.51 GREASE ALL LUBRICATION POINTS

LUBRICATION POINTS

1. Mast support (left and right: 2 points)
2. Fork stopper (left and right: 2 points)
3. Front axle support (left and right: 2 points)
4. Steering axle
 - ① Center pin (front and rear: 2 points)
 - ② King pin (left and right: 4 points)
 - ③ Bellcrank pin (1 point)
5. Power steering cylinder link (left and right: 4 points)
6. Tilt cylinder pin (left and right: 2 points)



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25.5 EVERY 3 MONTHS OR EVERY 600 HOURS SERVICE

[Engine]

25.5.1 REPLACE OIL FILTER CARTRIDGE

For details of the method of replacing the oil filter, see "25.4.43 CHANGE OIL IN ENGINE OIL PAN".

25.5.2 GREASE FUEL INJECTION PUMP GOVERNOR, CHANGE GOVERNOR OIL

For details of the method of changing the governor oil, see "25.4.43 CHANGE OIL IN ENGINE OIL PAN".

25.5.3 REPLACE FUEL FILTER CARTRIDGE (DIESEL ENGINE LIFT TRUCKS)

For details of the method of replacing the cartridge, see "25.4.43 CHANGE OIL IN ENGINE OIL PAN".

[Power train]

25.5.4 CHECK OIL LEVEL IN TRANSMISSION CASE, ADD OIL (FOR CLUTCH TYPE LIFT TRUCKS, INCLUDES DIFFERENTIAL CASE)

For details of the method of checking and adding oil, see "25.6.4 CHANGE OIL IN DIFFERENTIAL CASE (FOR CLUTCH TYPE LIFT TRUCKS, INCLUDES TRANSMISSION CASE)" and "25.6.5 CHANGE OIL IN TORQFLOW TRANSMISSION CASE".

25.5.5 CHECK OIL LEVEL IN DIFFERENTIAL CASE, ADD OIL (FOR CLUTCH TYPE LIFT TRUCKS, INCLUDES TRANSMISSION CASE)

For details of the method of checking and adding oil, see "25.6.4 CHANGE OIL IN DIFFERENTIAL CASE (FOR CLUTCH TYPE LIFT TRUCKS, INCLUDES TRANSMISSION CASE)".

25.6 EVERY 6 MONTHS OR EVERY 1200 HOURS SERVICE

[Steering system]

25.6.1 CHECK STEERING LINK FOR BENDING, DAMAGE, AND WEAR

25.6.2 CHECK KNUCKLE FOR PLAY, DEFORMATION, AND DAMAGE

25.6.3 CHECK FOR MARKED VARIATION IN MINIMUM TURNING RADIUS

25. MAINTENANCE

[Power train]

25.6.4 CHANGE OIL IN DIFFERENTIAL CASE (FOR CLUTCH TYPE LIFT TRUCKS, INCLUDES TRANSMISSION CASE)



WARNING

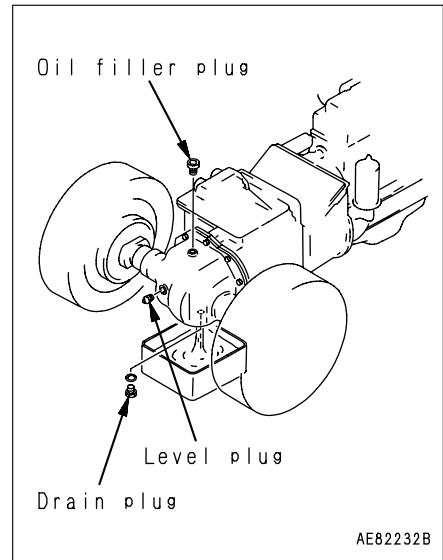
Immediately after operations, the oil is at high temperature. Wait for the temperature to go down before starting this operation.

CHECK OIL LEVEL

1. Remove the level plug and check that the oil is near the bottom edge of the plug hole.
There are two level plugs on the front side of the differential case. The upper one is for the clutch transmission lift truck (Letter "C" is cast by the level plug), and the lower one is for the TORQFLOW transmission lift truck (Letter "T" is cast by the level plug).
If the oil level is low, remove the oil filler plug and add oil.

CHANGE OIL

1. Remove the oil filler plug, then remove the drain plug and drain the oil.
2. After draining the oil, tighten the drain plug and add the specified amount of oil through the oil filler.
3. After filling with oil, check the oil level.



Refill amount

Clutch type lift truck	25 ℓ (6.60 US gal, 5.50 UK gal)
TORQFLOW transmission lift truck	13 ℓ (3.43 US gal, 2.86 UK gal)

NOTICE

Always use genuine Komatsu Forklift gear oil (SAE90).
(For details, see "21. LUBRICANT LIST".)

REMARK

On clutch type lift trucks, the oil is used for both the differential case and the transmission case. However, on the TORQFLOW transmission lift truck, each case has its own special oil, so it is necessary to check and change the oil in the TORQFLOW transmission case in addition to checking and changing the oil in the differential case.

[Power train continued]

25.6.5 CHANGE OIL IN TORQFLOW TRANSMISSION CASE**WARNING**

Immediately after operations, the oil is at high temperature. Wait for the temperature to go down before starting this operation.

CHECK OIL LEVEL

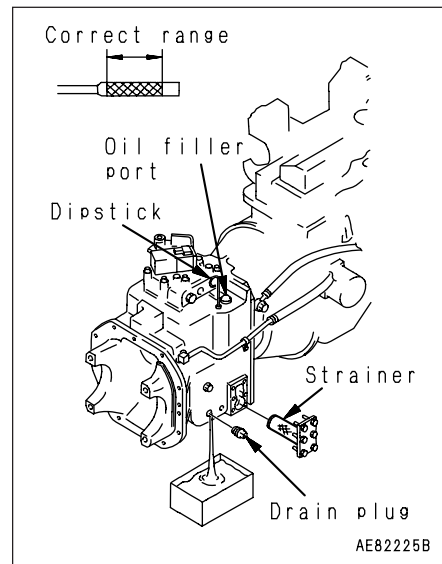
1. Remove the floor plate and check with the dipstick.
2. If the oil level is low, remove the oil filler plug and add oil.

CHANGE OIL, CLEAN STRAINER

1. Remove the drain plug, drain the oil, then tighten the plug again.
2. Remove the mounting bolts, take out the strainer, and wash it in flushing oil.
3. After washing the strainer, blow air from the inside of the strainer to dry it completely, then install it again.
4. Add the specified amount of oil through the oil filler port.
5. After filling with oil, check the oil level.

Refill amount:

16 ℓ (4.22 US gal, 3.52 UK gal)
(includes torque converter)

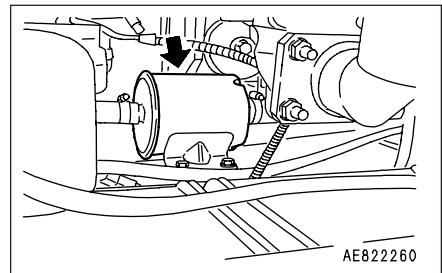
**NOTICE**

Always use genuine Komatsu Forklift engine oil (SAE10W-CD).
(For details, see "21. LUBRICANT LIST".)

25. MAINTENANCE

[Power train continued]

25.6.6 REPLACE LINE FILTER IN TRANSMISSION OIL PRESSURE CIRCUIT



25.6.7 CHANGE CLUTCH OIL

[Brake system]

25.6.8 CHANGE BRAKE OIL

[Engine]

25.6.9 CHECK, ADJUST VALVE CLEARANCE

25.6.10 MEASURE COMPRESSION PRESSURE

25.6.11 CHECK, ADJUST FUEL INJECTION TIMING

25.6.12 CHECK BLOWBY GAS REDUCTION SYSTEM FOR CLOGGING, DAMAGE

25.6.13 CHECK DISTRIBUTOR CAP CENTER PIECE FOR WEAR

25.6.14 REPLACE FUEL FILTER ELEMENT (GASOLINE ENGINE LIFT TRUCKS)

For details of the method of replacing the element, see "25.4.43 CHANGE OIL IN ENGINE OIL PAN".

[Engine continued]

25.6.15 CLEAN INSIDE OF COOLING SYSTEM

WARNING

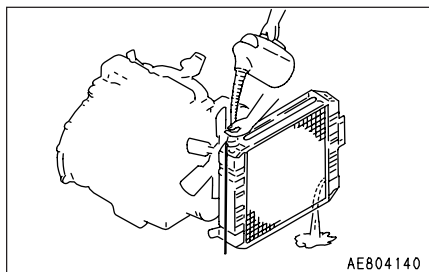
- If air bleeding is carried out in an insufficient way after coolant has been replaced, or after the radiator or carburetor has been replaced, that may invite engine overheating. For this reason, be sure to bleed air from the engine cooling system completely.
- After the engine has been operated, the cooling water is at a high temperature, so there is danger of burns if the cooling water is drained immediately. Always wait for the engine to cool down before draining the water.
- The cleaning is carried out while running the engine, and there is danger that the truck may move unexpectedly, so it is extremely dangerous to go under the lift truck. Never go under the lift truck when the engine is running.
- Do not remove the radiator cap when the radiator water is hot. Boiling water may spurt out. Always wait for the temperature to go down, and turn the cap slowly to release the pressure before removing the cap.

CLEAN RADIATOR

Stop the lift truck on level ground.

1. Open the drain valves at the bottom of the radiator and the engine cylinder block to drain the water.
2. Close the drain valves, fill the radiator with fresh water (tap water) and radiator flushing fluid through the water filler, then run the engine at idling for approx. 15 minutes.
3. Stop the engine, open the drain valves to drain the water, then add fresh water and run the engine at idling until clean water comes out from the drain valves (5 – 10 minutes).
4. Stop the engine, drain all the water from the drain valves, then close the drain valves and fill the radiator with fresh water and long life coolant.

Water amount: 14.0 ℓ (3.70 US gal, 3.08 UK gal)



25. MAINTENANCE



WARNING

Coolant is flammable, so keep it away from open flame.

NOTICE

- In cold areas, add long life coolant (Non-amine type). (For details, see "17. COLD WEATHER OPERATION".)
- When not using long life coolant, add rust prevention fluid to the radiator.
- Always use genuine Komatsu Forklift products for the flushing fluid, rust prevention fluid, and long life coolant.

25.6.16 REPLACE AIR CLEANER ELEMENT

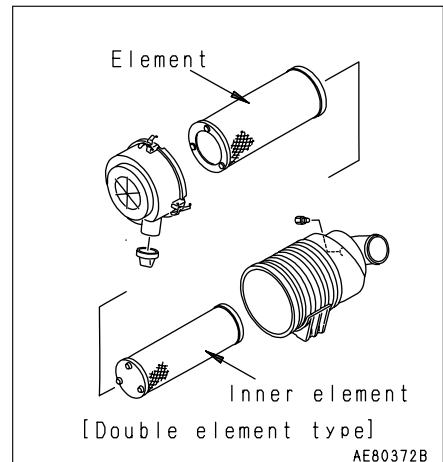


WARNING

- Never clean or replace the air cleaner while the engine is running.
- If compressed air is used to clean the element, dust will fly and there is danger that it may get into your eyes, so always wear safety goggles.

REPLACE ELEMENT

1. Remove the element.
2. Remove the nut and take out the inner element.
3. Cover the air connector end with a clean cloth or tape.
4. Clean the inside of the body, then remove the cover fitted in Step 3.
5. Install a new element.



[Hydraulic equipment]

**25.6.17 CHANGE OIL IN HYDRAULIC TANK,
REPLACE HYDRAULIC LINE FILTER,
CLEAN HYDRAULIC TANK STRAINER,
CLEAN INSIDE OF HYDRAULIC TANK**

⚠ WARNING

Immediately after operations, the oil is at high temperature. Never change the oil immediately after stopping operations. Wait for the oil temperature to go down before changing the oil.

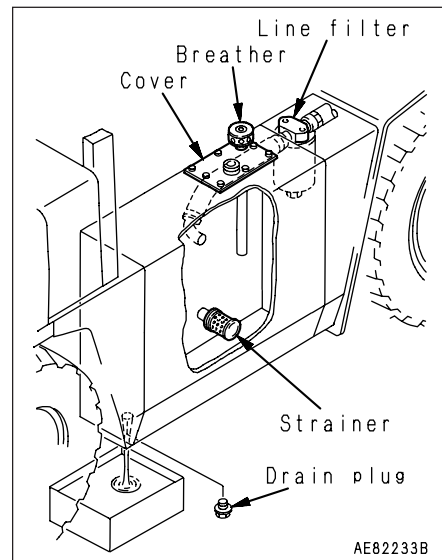
1. Drain the oil from the drain plug at the bottom of the tank, then remove the cover, take out the strainer, and wash it in flushing oil.
2. Clean the inside of the tank, then install the drain plug.
3. After washing the strainer, blow air from the inside of the strainer to dry it completely, then install it again.
4. Replace the line filter, then install the cover.
5. Add the specified amount of hydraulic oil through the insertion port of the breather (with dipstick), then check the oil level with the dipstick.

Refill amount: 55 ℓ (14.53 US gal, 12.10 UK gal)

6. Start the engine, then operate the cylinders (lift, tilt) to the end of their travel 5 – 6 times to bleed the air.

NOTICE

Always use genuine Komatsu Forklift hydraulic oil.



25. MAINTENANCE

25.7 EVERY YEAR OR EVERY 2400 HOURS SERVICE

[Brake system]

- 25.7.1 CHECK OPERATION OF MASTER CYLINDER, CHECK FOR OIL LEAKAGE, DAMAGE, AND WEAR**
- 25.7.2 CHECK OPERATION OF WHEEL CYLINDER, CHECK FOR OIL LEAKAGE, DAMAGE, AND WEAR**
- 25.7.3 CHECK OPERATING CONDITION OF BRAKE DRUM, CHECK FOR DAMAGE AND WEAR**
- 25.7.4 CHECK BRAKE LINING FOR WEAR**
- 25.7.5 CHECK OPERATING CONDITION OF BRAKE SHOE**
- 25.7.6 CHECK BRAKE ADJUSTMENT LEVER AND RATCHET FOR WEAR AND DAMAGE**
- 25.7.7 CHECK BRAKE SPRING FOR DETERIORATION**
- 25.7.8 CHECK BRAKE BACK PLATE FOR DEFORMATION AND CRACKING, CHECK MOUNTING CONDITION**
- 25.7.9 CHECK AIR TIGHTNESS OF BRAKE PIPING**

[Travel system]

- 25.7.10 CHECK AXLE FOR DEFORMATION, CRACKING, AND DAMAGE**
- 25.7.11 CHECK MOUNTING CONDITION OF DIFFERENTIAL**
- 25.7.12 CHECK ROOT OF FORKS FOR CRACKING (USE COLOR CHECK)**
- 25.7.13 CHECK ROLLER SHAFT OF LOADING EQUIPMENT FOR CRACKING AND DAMAGE**
- 25.7.14 CHECK MAST SUPPORT FOR DAMAGE AND WEAR**

[Hydraulic equipment]

- 25.7.15 CHECK OPERATION OF RELIEF VALVE, CHECK RELIEF PRESSURE**
- 25.7.16 REPLACE AIR BREATHER**

[Engine]

25.7.17 CLEAN INSIDE OF FUEL TANK

**25.7.18 CHECK INJECTION PRESSURE, INJECTION AMOUNT, INJECTION
CONDITION**

25.7.19 TIGHTEN ENGINE CYLINDER HEAD BOLTS

[Others]

**25.7.20 CHECK FRAME AND CROSS MEMBER FOR CRACKING AND
DAMAGE**

26. REPLACEMENT PROCEDURE

26.1 REPLACING FUSES

NOTICE

- When replacing the fuses, always turn off the electric power (turn the starting switch to the OFF position) before starting.
- Always replace the fuses with a fuse of the same capacity.

The fuses are used to protect the electrical components and wiring from burning out.

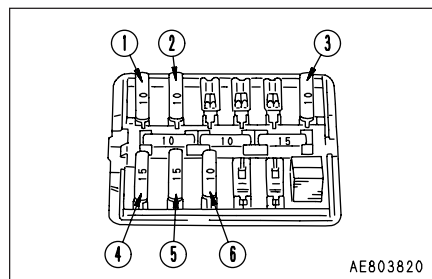
1. Turn the starting switch to the OFF position.
2. Open the cover of the fuse box and replace the fuses inside.

To remove the cover from the fuse box, push the side face of the cover lightly with your fingers and pull it out.

- Check the relationship between the fuses and the electrical components when replacing.

Fuse capacity and related electrical component

No.	Capacity	Color	Related electrical component
①	10 A	Red	Meters
②	10 A	Red	Back lamp
③	10 A	Red	Starting relay
④	15 A	Blue	Stop lamp
⑤	15 A	Blue	Lamps
⑥	10 A	Red	Horn



AE803820

The unmarked fuses (10A x 2, 15A x 1) are spares.

26.2 REPLACING TIRES

1. Stop the lift truck on a flat, safe area and apply the parking brake.
2. Chock the wheel in the diagonal position to the one to be replaced.

WARNING

- After confirming that the rim nuts are not loose, loosen the hub nuts.
- Never mistakenly loosen the rim nuts instead of the hub nuts.

3. Using a hub nut wrench, loosen the hub nuts until they can be rotated by hand.

WARNING

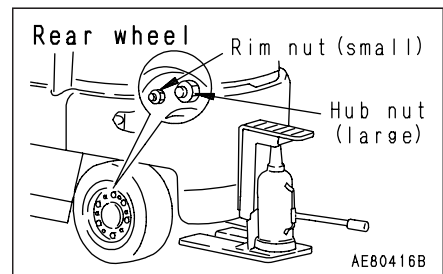
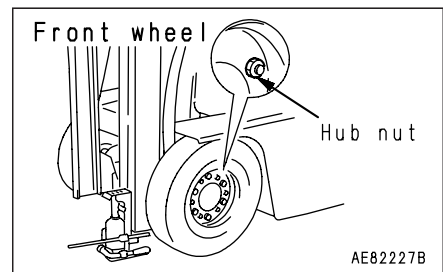
Jack up the machine after confirming that the jack will not slip. Never enter under the lift truck body.

4. Place the jack on the jacking point and raise the lift truck above the ground.
5. Remove the hub nuts then replace the wheel.

WARNING

Ask a specialist to carry out disassembly and assembly of the tires.

6. Install the replacement wheel on the hub and temporarily tighten it with the hub nuts.
7. Tighten the hub nuts again ensuring no play is generated, by alternately tightening diagonally-located nuts.
8. Let the jack down to lower the lift truck. Tighten the hub nuts to the specified torque.
(For specified torque see "22. SERVICE DATA".)



26. REPLACEMENT PROCEDURE

WARNING

- Always ask a specialist to carry out disassembly and assembly of the tires, tubes, and rims, and inflation of the tires. The tires used on forklift trucks are at a high inflation pressure, so operations with tires are extremely dangerous.
- The tires are inflated to a high pressure, so deformed or cracked rims are extremely dangerous. Check carefully before inflating tires. Never use tires with deformed or cracked rims.
- Before inflating the tires, adjust the pressure of the air compressor to the set pressure so that the tires are not inflated above the set pressure.

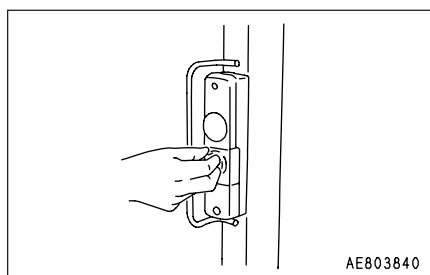
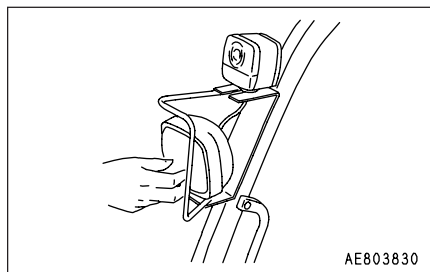
9. Adjust the tire inflation pressure to the set pressure.
(For details of the set inflation pressure, see "22. SERVICE DATA".)

26.3 REPLACING LAMPS

Check for any blown fuses or disconnections in the wiring harnesses, and replace the lamps.

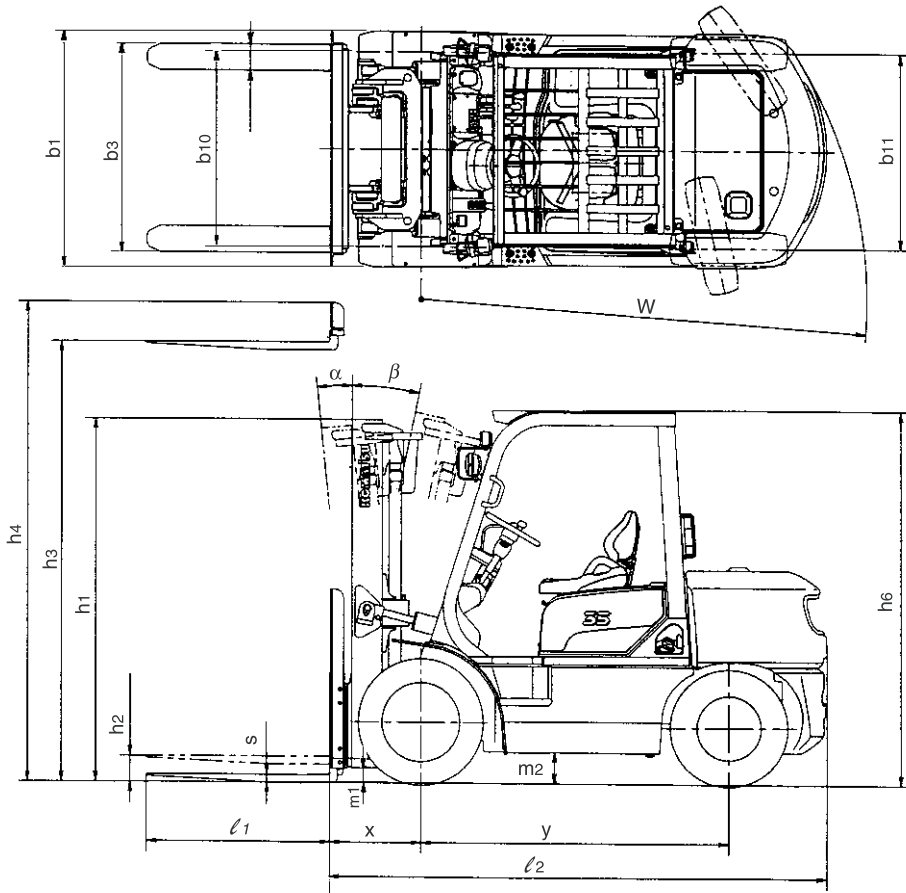
Lamp capacity

Kind of lamp	Gasoline engine lift truck	Diesel engine lift truck
Head lamp	55 W (For 12V)	70 W (For 24V)
Turn signal lamp	23 W (For 12V)	25 W (For 24V)
Clearance lamp	8 W (For 12V)	5 W (For 24V)
Number plate lamp (option)	10 W (For 12V)	10 W (For 24V)
Back lamp	8 W (For 12V)	8 W (For 24V)
Stop lamp	27 W (For 12V)	27 W (For 24V)
Warning lamp	1.4 W (For 12V)	1.4 W (For 24V)
Meter lighting lamp	3.4 W (For 12V)	3 W (For 24V)



TECHNICAL DATA

27. TECHNICAL DATA



Gasoline engine lift truck

Characteristics	1.2	Model	Manufacturer's Designation		FG35T-7	FG40T-7	
	1.3	Power Type	Electric, Diesel, Gasoline, LPG, Cable		Gasoline	Gasoline	
	1.4	Operation Type	Pedestrian, Driver Standing, Sitting, Order Picking		Sitting	Sitting	
	1.5	Rated Capacity	Q	Rated Capacity kg	4000	4500	
	1.6	Load Center	c	Rated Load Center mm	500	500	
	1.6.1	Alternative Capacity		Capacity @600mm Load Center kg	3500	4000	
	1.8	Load Distance	x	Front Axle Center to Fork Face mm	570	575	
	1.9	Wheelbase	y	mm	2000	2000	
Weight	2.1	Service Weight			kg	5645	6070
	2.2	Axle Loading	Loaded	Front	kg	8070	8830
	2.2.1			Rear	kg	1075	1240
	2.3		Unloaded	Front	kg	2520	2480
	2.3.1			Rear	kg	3125	3590
Type	3.1	Tyre Type	Cushion, Elastic Cushion, Pneumatic, Polyurethane		Pneumatic	Pneumatic	
	3.2	Tyre Size	Front		8.25-15-12PR(I)	300-15-18PR(I)	
	3.3		Rear		7.00-12-12PR(I)	7.00-12-12PR(I)	
	3.5	Number of Wheel	Front/Rear (x = driven)		2 x / 2	2 x / 2	
	3.6	Tread, Front	b ₁₀	mm	1115	1150	
	3.7	Tread, Rear	b ₁₁	mm	1120	1120	
	3.8	Wheel Diameter	b ₁₂	mm	508	508	
Basic Measurement	4.1	Tilting Angle	α/β	degree	6 / 12	6 / 12	
	4.2	Mast Height, Lowered	h ₁	mm	2105	2105	
	4.3	Std. Free Lift	h ₂	mm	150	155	
	4.4	Std. Lift Height	h ₃	mm	3000	3000	
	4.5	Mast Height, extended	h ₄	mm	4130	4130	
	4.6	Height, Overhead Guard	h ₆	mm	2240	2240	
	4.19	Length, with Std. Forks	ℓ ₁	mm	4150	4215	
	4.20	Length, to Fork Face	ℓ ₂	mm	3080	3145	
	4.21	Width, at Tyre	b ₁	mm	1350	1450	
	4.22	Forks	s/e/ℓ	Thickness/Width/Length mm	45/150/1070	50/150/1070	
	4.23	Fork Carriage Class	ISO 2328, Type A/B		Class 3, Type A	Class 3, Type A	
	4.24	Width, Fork Carriage	b ₃	mm	1190	1190	
	4.31	Ground Clearance	m ₁	Under Mast mm	145	145	
	4.32		m ₂	at Center of Wheelbase mm	230	230	
	4.33	Right Angle Stacking Aisle	Ast	with 1000 x 1200 pallet mm	4300	4345	
	4.34		Ast	with 1200 x 800 pallet mm	4500	4545	
	4.35	Turning Radius	W _a	mm	2730	2770	
Performance	5.1	Travel speed (FWD)	Loaded, 1st/2nd/3rd	km/h	18.5	18.5	
	5.1.1		Unloaded,1st/2nd/3rd	km/h	19.5	19.5	
	5.2	Lifting Speed	Loaded/Unloaded	mm/s	450/480	450/480	
	5.3	Lowering Speed	Loaded/Unloaded	mm/s	480/550	480/550	
	5.6	Max. Drawbar Pull	Loaded at 1.5 km/h	kN	24	24	
	5.8	Max. Gradeability	Loaded at 1.5 km/h	%	27	24	
	5.10	Service Brake	Operation/Control		Foot/Hydraulic	Foot/Hydraulic	
	5.11	Parking Brake	Operation/Control		Hand/Mechanical	Hand/Mechanical	
5.12	Steering			Hydraulic Power Steering	Hydraulic Power Steering		
I.C. Engine	6.4	Battery	Voltage/Capacity at 5-hour rating V/Ah		12 / 48	12 / 48	
	7.1	Make/Model			NISSAN / TB42	NISSAN / TB42	
	7.2	Output, SAE gross					
	7.3		kW @min ⁻¹		63 @2100	63 @2100	
	7.3.1	Max. Torque, SAE gross	Nm @min ⁻¹		275 @1900	275 @1900	
	7.4	No. of Cylinder/Displacement	Number of cylinder, cm ³		6 / 4169	6 / 4169	
	7.6	Fuel Tank Capacity	Ltr		100	100	
Others	8.2	Relief Pressure for Attachment	bar		181	181	
	8.2.1	Tank Capacity	Ltr		55	55	
	8.6	Clutch			Torque Converter	Torque Converter	
	8.7	Transmission			TORQFLOW	TORQFLOW	

27. TECHNICAL DATA

Characteristics	1.2	Model	Manufacturer's Designation		FG45T-7	
	1.3	Power Type	Electric, Diesel, Gasoline, LPG, Cable		Gasoline	
	1.4	Operation Type	Pedestrian, Driver Standing, Sitting, Order Picking		Sitting	
	1.5	Rated Capacity	Q	Rated Capacity	kg	5000
	1.6	Load Center	c	Rated Load Center	mm	500
	1.6.1	Alternative Capacity		Capacity @600mm Load Center	kg	4500
	1.8	Load Distance	x	Front Axle Center to Fork Face	mm	585
Weight	1.9	Wheelbase	y		mm	2000
	2.1	Service Weight			kg	6625
	2.2	Axle Loading	Loaded	Front	kg	9855
	2.2.1			Rear	kg	1270
	2.3		Unloaded	Front	kg	2690
	2.3.1			Rear	kg	3935
Type	3.1	Tyre Type	Cushion, Elastic Cushion, Pneumatic, Polyurethane		Pneumatic	
	3.2	Tyre Size	Front		300-15-18PR(I)	
	3.3		Rear		7.00-12-12PR(I)	
	3.5	Number of Wheel	Front/Rear (x = driven)		2 x / 2	
	3.6	Tread, Front	b ₁₀		mm	1150
Basic Measurement	3.7	Tread, Rear	b ₁₁		mm	1120
	4.1	Tilting Angle	α/β		degree	6 / 12
	4.2	Mast Height, Lowered	h ₁		mm	2205
	4.3	Std. Free Lift	h ₂		mm	140
	4.4	Std. Lift Height	h ₃		mm	3000
	4.5	Mast Height, extended	h ₄		mm	4130
	4.7	Height, Overhead Guard	h ₆		mm	2240
	4.19	Length, with Std. Forks	ℓ ₁		mm	4265
	4.20	Length, to Fork Face	ℓ ₂		mm	3195
	4.21	Width, at Tyre	b ₁		mm	1450
	4.22	Forks	s/e/ℓ	Thickness/Width/Length	mm	50/150/1070
	4.23	Fork Carriage Class	ISO 2328, Type A/B		Class 3, Type A	
	4.24	Width, Fork Carriage	b ₃		mm	1190
	4.31	Ground Clearance	m ₁	Under Mast	mm	145
	4.32		m ₂	at Center of Wheelbase	mm	230
	4.33	Right Angle Stacking Aisle	Ast	with 1000 x 1200 pallet	mm	4405
	4.34		Ast	with 1200 x 800 pallet	mm	4605
	4.35	Turning Radius	W _a		mm	2820
Performance	5.1	Travel speed (FWD)	Loaded, 1st/2nd/3rd	km/h	15.5/23.0	
	5.1.1		Unloaded, 1st/2nd/3rd	km/h	16.5/24.0	
	5.2	Lifting Speed	Loaded/Unloaded	mm/s	390/410	
	5.3	Lowering Speed	Loaded/Unloaded	mm/s	450/520	
	5.6	Max. Drawbar Pull	Loaded at 1.5 km/h	kN	29	
	5.8	Max. Gradeability	Loaded at 1.5 km/h	%	26	
	5.10	Service Brake	Operation/Control		Foot/Hydraulic	
	5.11	Parking Brake	Operation/Control		Hand/Mechanical	
I.C. Engine	5.12	Steering			Hydraulic Power Steering	
	6.4	Battery	Voltage/Capacity at 5-hour rating V/Ah		12 / 48	
	7.1	Make/Model			NISSAN / TB42	
	7.2	Output, SAE gross				
	7.3		kW @min ⁻¹		63 @2100	
	7.3.1	Max. Torque, SAE gross	Nm @min ⁻¹		275 @1900	
	7.4	No. of Cylinder/Displacement	Number of cylinder, cm ³		6 / 4169	
Others	7.6	Fuel Tank Capacity	Ltr		100	
	8.2	Relief Pressure for Attachment	bar		181	
	8.2.1	Tank Capacity	Ltr		55	
	8.6	Clutch			Torque Converter	
	8.7	Transmission			TORQFLOW	

27. TECHNICAL DATA

Characteristics	1.2	Model	Manufacturer's Designation		FG35ZT-7	FG40ZT-7	
	1.3	Power Type	Electric, Diesel, Gasoline, LPG, Cable		Gasoline	Gasoline	
	1.4	Operation Type	Pedestrian, Driver Standing, Sitting, Order Picking		Sitting	Sitting	
	1.5	Rated Capacity	Q	Rated Capacity kg	3500	4000	
	1.6	Load Center	c	Rated Load Center mm	500	500	
	1.6.1	Alternative Capacity		Capacity @600mm Load Center kg	3250	3500	
	1.8	Load Distance	x	Front Axle Center to Fork Face mm	530	530	
	1.9	Wheelbase	y	mm	1800	1800	
Weight	2.1	Service Weight			kg	5260	5580
	2.2	Axle Loading	Loaded	Front	kg	7795	8505
	2.2.1			Rear	kg	965	1075
	2.3		Unloaded	Front	kg	2290	2215
	2.3.1			Rear	kg	2970	3365
Type	3.1	Tyre Type	Cushion, Elastic Cushion, Pneumatic, Polyurethane		Pneumatic	Pneumatic	
	3.2	Tyre Size	Front		250-15-16PR(I)	250-15-16PR(I)	
	3.3		Rear		7.00-12-12PR(I)	7.00-12-12PR(I)	
	3.5	Number of Wheel	Front/Rear (x = driven)		2 x / 2	2 x / 2	
	3.6	Tread, Front	b ₁₀	mm	1115	1150	
	3.7	Tread, Rear	b ₁₁	mm	1120	1120	
Basic Measurement	4.1	Tilting Angle	α/β	degree	6 / 12	6 / 12	
	4.2	Mast Height, Lowered	h ₁	mm	2100	2100	
	4.3	Std. Free Lift	h ₂	mm	150	150	
	4.4	Std. Lift Height	h ₃	mm	3000	3000	
	4.5	Mast Height, extended	h ₄	mm	4130	4130	
	4.7	Height, Overhead Guard	h ₆	mm	2150	2150	
	4.19	Length, with Std. Forks	ℓ ₁	mm	3970	4020	
	4.20	Length, to Fork Face	ℓ ₂	mm	2900	2950	
	4.21	Width, at Tyre	b ₁	mm	1350	1350	
	4.22	Forks	s/e/ℓ	Thickness/Width/Length mm	50/150/1070	50/150/1070	
	4.23	Fork Carriage Class	ISO 2328, Type A/B		Class 3, Type A	Class 3, Type A	
	4.24	Width, Fork Carriage	b ₃	mm	1190	1190	
	4.31	Ground Clearance	m ₁	Under Mast mm	140	140	
	4.32		m ₂	at Center of Wheelbase mm	175	175	
	4.33	Right Angle Stacking Aisle	Ast	with 1000 x 1200 pallet mm	4060	4110	
	4.34		Ast	with 1200 x 800 pallet mm	4260	4310	
	4.35	Turning Radius	W _a	mm	2530	2580	
Performance	5.1	Travel speed (FWD)	Loaded, 1st/2nd/3rd	km/h	18.5	18.5	
	5.1.1		Unloaded,1st/2nd/3rd	km/h	19.5	19.5	
	5.2	Lifting Speed	Loaded/Unloaded	mm/s	450/480	450/480	
	5.3	Lowering Speed	Loaded/Unloaded	mm/s	480/550	480/550	
	5.6	Max. Drawbar Pull	Loaded at 1.5 km/h	kN	25	25	
	5.8	Max. Gradeability	Loaded at 1.5 km/h	%	29	27	
	5.10	Service Brake	Operation/Control		Foot/Hydraulic	Foot/Hydraulic	
	5.11	Parking Brake	Operation/Control		Hand/Mechanical	Hand/Mechanical	
5.12	Steering			Hydraulic Power Steering	Hydraulic Power Steering		
I.C. Engine	6.4	Battery	Voltage/Capacity at 5-hour rating V/Ah		12 / 48	12 / 48	
	7.1	Make/Model			NISSAN / TB42	NISSAN / TB42	
	7.2	Output, SAE gross					
	7.3		kW @min ⁻¹		63 @2100	63 @2100	
	7.3.1	Max. Torque, SAE gross	Nm @min ⁻¹		275 @1900	275 @1900	
	7.4	No. of Cylinder/Displacement	Number of cylinder, cm ³		6 / 4169	6 / 4169	
Others	7.6	Fuel Tank Capacity	Ltr		80	80	
	8.2	Relief Pressure for Attachment	bar		181	181	
	8.2.1	Tank Capacity	Ltr		55	55	
	8.6	Clutch			Torque Converter	Torque Converter	
	8.7	Transmission			TORQFLOW	TORQFLOW	

27. TECHNICAL DATA

Characteristics	1.2	Model	Manufacturer's Designation		FG50AT-7	
	1.3	Power Type	Electric, Diesel, Gasoline, LPG, Cable		Gasoline	
	1.4	Operation Type	Pedestrian, Driver Standing, Sitting, Order Picking		Sitting	
	1.5	Rated Capacity	Q	Rated Capacity	kg	5000
	1.6	Load Center	c	Rated Load Center	mm	600
	1.6.1	Alternative Capacity		Capacity @600mm Load Center	kg	—
	1.8	Load Distance	x	Front Axle Center to Fork Face	mm	575
	1.9	Wheelbase	y		mm	2000
Weight	2.1	Service Weight			kg	7240
	2.2	Axle Loading	Loaded	Front	kg	10820
	2.2.1			Rear	kg	1420
	2.3		Unloaded	Front	kg	2880
	2.3.1			Rear	kg	4360
Type	3.1	Tyre Type	Cushion, Elastic Cushion, Pneumatic, Polyurethane		Pneumatic	
	3.2	Tyre Size	Front		300-15-18PR(I)	
	3.3		Rear		7.00-12-14PR(I)	
	3.5	Number of Wheel	Front/Rear (x = driven)		2 x / 2	
	3.6	Tread, Front	b ₁₀		mm	1150
	3.7	Tread, Rear	b ₁₁		mm	1120
	3.7	Tread, Rear	b ₁₁		mm	1120
Basic Measurement	4.1	Tilting Angle	α/β		degree	6 / 12
	4.2	Mast Height, Lowered	h ₁		mm	2205
	4.3	Std. Free Lift	h ₂		mm	145
	4.4	Std. Lift Height	h ₃		mm	3000
	4.5	Mast Height, extended	h ₄		mm	4345
	4.7	Height, Overhead Guard	h ₆		mm	2240
	4.19	Length, with Std. Forks	ℓ ₁		mm	4435
	4.20	Length, to Fork Face	ℓ ₂		mm	3215
	4.21	Width, at Tyre	b ₁		mm	1450
	4.22	Forks	s/e/ℓ	Thickness/Width/Length	mm	50/150/1220
	4.23	Fork Carriage Class	ISO 2328, Type A/B		Class 4, Type A	
	4.24	Width, Fork Carriage	b ₃		mm	1270
	4.31	Ground Clearance	m ₁	Under Mast	mm	145
	4.32		m ₂	at Center of Wheelbase	mm	230
	4.33	Right Angle Stacking Aisle	Ast	with 1000 x 1200 pallet	mm	4425
	4.34		Ast	with 1200 x 800 pallet	mm	4625
	4.35	Turning Radius	W _a		mm	2850
Performance	5.1	Travel speed (FWD)	Loaded, 1st/2nd/3rd	km/h	15.5/23.0	
	5.1.1		Unloaded, 1st/2nd/3rd	km/h	16.5/24.0	
	5.2	Lifting Speed	Loaded/Unloaded	mm/s	390/410	
	5.3	Lowering Speed	Loaded/Unloaded	mm/s	450/520	
	5.6	Max. Drawbar Pull	Loaded at 1.5 km/h	kN	29	
	5.8	Max. Gradeability	Loaded at 1.5 km/h	%	26	
	5.10	Service Brake	Operation/Control		Foot/Hydraulic	
	5.11	Parking Brake	Operation/Control		Hand/Mechanical	
	5.12	Steering			Hydraulic Power Steering	
I.C. Engine	6.4	Battery	Voltage/Capacity at 5-hour rating		V/Ah	12 / 48
	7.1	Make/Model			NISSAN / TB42	
	7.2	Output, SAE gross			kW @min ⁻¹	63 @2100
	7.3				Nm @min ⁻¹	275 @1900
	7.3.1	Max. Torque, SAE gross			Nm @min ⁻¹	275 @1900
	7.4	No. of Cylinder/Displacement	Number of cylinder, cm ³		6 / 4169	
	7.6	Fuel Tank Capacity			Ltr	100
Others	8.2	Relief Pressure for Attachment			bar	181
	8.2.1	Tank Capacity			Ltr	55
	8.6	Clutch			Torque Converter	
	8.7	Transmission			TORQFLOW	

Diesel engine lift truck

Characteristics	1.2	Model	Manufacturer's Designation		FD35T-7	FD35W-7	FG35T-8	FD35W-8	
	1.3	Power Type	Electric, Diesel, Gasoline, LPG, Cable		Diesel		Diesel		
	1.4	Operation Type	Pedestrian, Driver Standing, Sitting, Order Picking		Sitting		Sitting		
	1.5	Rated Capacity	Q	Rated Capacity	kg	4000	4500		
	1.6	Load Center	c	Rated Load Center	mm	500	500		
	1.6.1	Alternative Capacity		Capacity @600mm Load Center	kg	3500	3500		
	1.8	Load Distance	x	Front Axle Center to Fork Face	mm	570	570		
	1.9	Wheelbase	y		mm	2000	2000		
Weight	2.1	Service Weight			kg	5835	5775	5835	5775
	2.2	Axle Loading	Loaded	Front	kg	8165	8120	8135	8090
	2.2.1			Rear	kg	1170	1155	1200	1185
	2.3		Unloaded	Front	kg	2615	2575	2585()	2450
	2.3.1			Rear	kg	3220	3205	3250	3235
Type	3.1	Tyre Type	Cushion, Elastic Cushion, Pneumatic, Polyurethane		Pneumatic		Pneumatic		
	3.2	Tyre Size	Front		8.25-15-12PR(I)		8.25-15-12PR(I)		
	3.3		Rear		7.00-12-12PR(I)		7.00-12-12PR(I)		
	3.5	Number of Wheel	Front/Rear (x = driven)		2 x / 2		2 x / 2		
	3.6	Tread, Front	b10		mm	1115	1115		
	3.7	Tread, Rear	b11		mm	1120	1120		
Basic Measurement	4.1	Tilting Angle	α/β		degree	6 / 12	6 / 12		
	4.2	Mast Height, Lowered	h1		mm	2105	2105		
	4.3	Std. Free Lift	h2		mm	150	150		
	4.4	Std. Lift Height	h3		mm	3000	3000		
	4.5	Mast Height, extended	h4		mm	4130	4130		
	4.7	Height, Overhead Guard	h6		mm	2240	2240		
	4.19	Length, with Std. Forks	ℓ1		mm	4150	4150		
	4.20	Length, to Fork Face	ℓ2		mm	3080	3080		
	4.21	Width, at Tyre	b1		mm	1350	1350		
	4.22	Forks	s/e/ℓ	Thickness/Width/Length	mm	45/150/1070	50/150/1070		
	4.23	Fork Carriage Class	ISO 2328, Type A/B			Class 3, Type A	Class 3, Type A		
	4.24	Width, Fork Carriage	b3		mm	1190	1190		
	4.31	Ground Clearance	m1	Under Mast	mm	145	145		
	4.32		m2	at Center of Wheelbase	mm	230	230		
	4.33	Right Angle Stacking Aisle	Ast	with 1000 x 1200 pallet	mm	4300	4300		
	4.34		Ast	with 1200 x 800 pallet	mm	4500	4500		
	4.35	Turning Radius	Wa		mm	2730	2730		
	Performance	5.1	Travel speed (FWD)	Loaded, 1st/2nd/3rd		km/h	18.5	8.5/18.5	18.5
5.1.1		Unloaded,1st/2nd/3rd		km/h	19.5	9.0/19.5	19.5	9.0/19.5	
5.2		Lifting Speed	Loaded/Unloaded		mm/s	530/570	530/570		
5.3		Lowering Speed	Loaded/Unloaded		mm/s	480/550	480/550		
5.6		Max. Drawbar Pull	Loaded at 1.5 km/h		kN	28	27	28	27
5.8		Max. Gradeability	Loaded at 1.5 km/h		%	31	25	31	25
5.10		Service Brake	Operation/Control			Foot/Hydraulic	Foot/Hydraulic		
5.11		Parking Brake	Operation/Control			Hand/Mechanical	Hand/Mechanical		
5.12	Steering				Hydraulic Power Steering	Hydraulic Power Steering			
I.C. Engine	6.4	Battery	Voltage/Capacity at 5-hour rating		V/Ah	24 / 56	24 / 56		
	7.1	Make/Model				KOMATSU / 6D102E	KOMATSU / S6D102E		
	7.2	Output, SAE gross			kW @min ⁻¹	70 @2150	70 @2150		
	7.3								
	7.3.1	Max. Torque, SAE gross			Nm @min ⁻¹	343 @1500	372 @1000		
	7.4	No. of Cylinder/Displacement	Number of cylinder, cm ³			6 / 5880	6 / 5880		
	7.6	Fuel Tank Capacity			Ltr	100	100		
Others	8.2	Relief Pressure for Attachment			bar	181	181		
	8.2.1	Tank Capacity			Ltr	55	55		
	8.6	Clutch				Torque Converter	Wet	Torque Converter	Wet
	8.7	Transmission				TORQFLOW	Synchromesh	TORQFLOW	Synchromesh

27. TECHNICAL DATA

Characteristics	1.2	Model	Manufacturer's Designation		FD40T-7	FD40W-7	FD40T-8	FD40W-8
	1.3	Power Type	Electric, Diesel, Gasoline, LPG, Cable		Diesel		Diesel	
	1.4	Operation Type	Pedestrian, Driver Standing, Sitting, Order Picking		Sitting		Sitting	
	1.5	Rated Capacity	Q	Rated Capacity kg	4500		4500	
	1.6	Load Center	c	Rated Load Center mm	500		500	
	1.6.1	Alternative Capacity		Capacity @600mm Load Center kg	4000		4000	
	1.8	Load Distance	x	Front Axle Center to Fork Face mm	575		575	
	1.9	Wheelbase	y	mm	2000		2000	
Weight	2.1	Service Weight		kg	6260	6200	6285	6225
	2.2	Axle Loading	Loaded	Front kg	8925	8880	8910	8865
	2.2.1			Rear kg	1335	1320	1375	1360
	2.3		Unloaded	Front kg	2575	2530	2560	2515
	2.3.1			Rear kg	3685	3670	3725	3710
Type	3.1	Tyre Type	Cushion, Elastic Cushion, Pneumatic, Polyurethane		Pneumatic		Pneumatic	
	3.2	Tyre Size	Front		300-15-18PR(I)		300-15-18PR(I)	
	3.3		Rear		7.00-12-12PR(I)		7.00-12-12PR(I)	
	3.5	Number of Wheel	Front/Rear (x = driven)		2 x / 2		2 x / 2	
	3.6	Tread, Front	b ₁₀	mm	1115		1115	
Basic Measurement	3.7	Tread, Rear	b ₁₁	mm	1120		1120	
	4.1	Tilting Angle	α/β	degree	6 / 12		6 / 12	
	4.2	Mast Height, Lowered	h ₁	mm	2105		2105	
	4.3	Std. Free Lift	h ₂	mm	155		155	
	4.4	Std. Lift Height	h ₃	mm	3000		3000	
	4.5	Mast Height, extended	h ₄	mm	4130		4130	
	4.7	Height, Overhead Guard	h ₆	mm	2240		2240	
	4.19	Length, with Std. Forks	ℓ ₁	mm	4215		4215	
	4.20	Length, to Fork Face	ℓ ₂	mm	3145		3145	
	4.21	Width, at Tyre	b ₁	mm	1450		1450	
	4.22	Forks	s/e/ℓ	Thickness/Width/Length mm	50/150/1070		50/150/1070	
	4.23	Fork Carriage Class	ISO 2328, Type A/B		Class 3, Type A		Class 3, Type A	
	4.24	Width, Fork Carriage	b ₃	mm	1190		1190	
	4.31	Ground Clearance	m ₁	Under Mast mm	145		145	
	4.32		m ₂	at Center of Wheelbase mm	230		230	
	4.33	Right Angle Stacking Aisle	Ast	with 1000 x 1200 pallet mm	4345		4345	
	4.34		Ast	with 1200 x 800 pallet mm	4545		4545	
	4.35	Turning Radius	W _a	mm	2770		2770	
Performance	5.1	Travel speed (FWD)	Loaded, 1st/2nd/3rd	km/h	18.5	8.5/18.5	18.5	8.5/18.5
	5.1.1		Unloaded, 1st/2nd/3rd	km/h	19.5	9.0/19.5	19.5	9.0/19.5
	5.2	Lifting Speed	Loaded/Unloaded	mm/s	530/570		530/570	
	5.3	Lowering Speed	Loaded/Unloaded	mm/s	480/550		480/550	
	5.6	Max. Drawbar Pull	Loaded at 1.5 km/h	kN	28	27	28	27
	5.8	Max. Gradeability	Loaded at 1.5 km/h	%	28	22	28	25
	5.10	Service Brake	Operation/Control		Foot/Hydraulic		Foot/Hydraulic	
	5.11	Parking Brake	Operation/Control		Hand/Mechanical		Hand/Mechanical	
I.C. Engine	5.12	Steering			Hydraulic Power Steering		Hydraulic Power Steering	
	6.4	Battery	Voltage/Capacity at 5-hour rating V/Ah		24 / 56		24 / 56	
	7.1	Make/Model			KOMATSU / 6D102E		KOMATSU / S6D102E	
	7.2	Output, SAE gross						
	7.3		kW @min ⁻¹		70 @2150		70 @2150	
	7.3.1	Max. Torque, SAE gross	Nm @min ⁻¹		343 @1500		372 @1000	
	7.4	No. of Cylinder/Displacement	Number of cylinder, cm ³		6 / 5880		6 / 5880	
Others	7.6	Fuel Tank Capacity	Ltr		100		100	
	8.2	Relief Pressure for Attachment	bar		181		181	
	8.2.1	Tank Capacity	Ltr		55		55	
	8.6	Clutch			Torque Converter	Wet	Torque Converter	Wet
	8.7	Transmission			TORQFLOW	Synchromesh	TORQFLOW	Synchromesh

27. TECHNICAL DATA

Characteristics	1.2	Model	Manufacturer's Designation		FD45T-7	FD45W-7	FD45T-8	FD45W-8
	1.3	Power Type	Electric, Diesel, Gasoline, LPG, Cable		Diesel		Diesel	
	1.4	Operation Type	Pedestrian, Driver Standing, Sitting, Order Picking		Sitting		Sitting	
	1.5	Rated Capacity	Q	Rated Capacity kg	5000		5000	
	1.6	Load Center	c	Rated Load Center mm	500		500	
	1.6.1	Alternative Capacity		Capacity @600mm Load Center kg	4500		4500	
	1.8	Load Distance	x	Front Axle Center to Fork Face mm	585		585	
	1.9	Wheelbase	y	mm	2000		2000	
Weight	2.1	Service Weight		kg	6815	6755	6840	5780
	2.2	Axle Loading	Loaded	Front kg	9950	9905	9930	9885
	2.2.1			Rear kg	1365	1350	1410	1395
	2.3		Unloaded	Front kg	2785	2740	2770	2720
	2.3.1			Rear kg	4030	4015	4070	4060
Type	3.1	Tyre Type	Cushion, Elastic Cushion, Pneumatic, Polyurethane		Pneumatic		Pneumatic	
	3.2	Tyre Size	Front		300-15-18PR(I)		300-15-18PR(I)	
	3.3		Rear		7.00-12-12PR(I)		7.00-12-12PR(I)	
	3.5	Number of Wheel	Front/Rear (x = driven)		2 x / 2		2 x / 2	
	3.6	Tread, Front	b ₁₀	mm	1150		1150	
Basic Measurement	3.7	Tread, Rear	b ₁₁	mm	1120		1120	
	4.1	Tilting Angle	α/β	degree	6 / 12		6 / 12	
	4.2	Mast Height, Lowered	h ₁	mm	2205		2205	
	4.3	Std. Free Lift	h ₂	mm	140		140	
	4.4	Std. Lift Height	h ₃	mm	3000		3000	
	4.5	Mast Height, extended	h ₄	mm	4130		4130	
	4.7	Height, Overhead Guard	h ₆	mm	2240		2240	
	4.19	Length, with Std. Forks	ℓ ₁	mm	4265		4265	
	4.20	Length, to Fork Face	ℓ ₂	mm	3195		3195	
	4.21	Width, at Tyre	b ₁	mm	1450		1450	
	4.22	Forks	s/e/ℓ	Thickness/Width/Length mm	50/150/1070		50/150/1070	
	4.23	Fork Carriage Class	ISO 2328, Type A/B		Class 3, Type A		Class 3, Type A	
	4.24	Width, Fork Carriage	b ₃	mm	1190		1190	
	4.31	Ground Clearance	m ₁	Under Mast mm	145		145	
	4.32		m ₂	at Center of Wheelbase mm	230		230	
	4.33	Right Angle Stacking Aisle	Ast	with 1000 x 1200 pallet mm	4405		4405	
	4.34		Ast	with 1200 x 800 pallet mm	4605		4605	
	4.35	Turning Radius	W _a	mm	2820		2820	
Performance	5.1	Travel speed (FWD)	Loaded, 1st/2nd/3rd	km/h	15.5/23.0	8.5/18.5	15.5/23.0	8.5/18.5
	5.1.1		Unloaded, 1st/2nd/3rd	km/h	16.5/24.0	9.0/19.5	16.5/24.0	9.0/19.5
	5.2	Lifting Speed	Loaded/Unloaded	mm/s	460/490		460/490	
	5.3	Lowering Speed	Loaded/Unloaded	mm/s	450/520		450/520	
	5.6	Max. Drawbar Pull	Loaded at 1.5 km/h	kN	33	27	33	27
	5.8	Max. Gradeability	Loaded at 1.5 km/h	%	30	20	30	21
	5.10	Service Brake	Operation/Control		Foot/Hydraulic		Foot/Hydraulic	
	5.11	Parking Brake	Operation/Control		Hand/Mechanical		Hand/Mechanical	
I.C. Engine	5.12	Steering			Hydraulic Power Steering		Hydraulic Power Steering	
	6.4	Battery	Voltage/Capacity at 5-hour rating V/Ah		24 / 56		24 / 56	
	7.1	Make/Model			KOMATSU / 6D102E		KOMATSU / S6D102E	
	7.2	Output, SAE gross						
	7.3		kW @min ⁻¹		70 @2150		70 @2150	
	7.3.1	Max. Torque, SAE gross	Nm @min ⁻¹		343 @1500		372 @1000	
	7.4	No. of Cylinder/Displacement	Number of cylinder, cm ³		6 / 5880		6 / 5880	
Others	7.6	Fuel Tank Capacity	Ltr		100		100	
	8.2	Relief Pressure for Attachment	bar		181		181	
	8.2.1	Tank Capacity	Ltr		55		55	
	8.6	Clutch			Torque Converter	Wet	Torque Converter	Wet
	8.7	Transmission			TORQFLOW	Synchromesh	TORQFLOW	Synchromesh

27. TECHNICAL DATA

Characteristics	1.2	Model	Manufacturer's Designation		FD35ZT-8	FD40ZT-8	FD40ZW-8	
	1.3	Power Type	Electric, Diesel, Gasoline, LPG, Cable		Diesel	Diesel		
	1.4	Operation Type	Pedestrian, Driver Standing, Sitting, Order Picking		Sitting	Sitting		
	1.5	Rated Capacity	Q	Rated Capacity kg	3500	4000		
	1.6	Load Center	c	Rated Load Center mm	500	500		
	1.6.1	Alternative Capacity		Capacity @600mm Load Center kg	3250	3500		
	1.8	Load Distance	x	Front Axle Center to Fork Face mm	530	530		
	1.9	Wheelbase	y	mm	1800	1800		
Weight	2.1	Service Weight			kg	5430	5750	5690
	2.2	Axle Loading	Loaded	Front	kg	7850	8555	8510
	Rear			kg	1080	1195	1180	
	2.3		Unloaded	Front	kg	2380	2295	2250
	2.3.1			Rear	kg	3050	3455	3440
Type	3.1	Tyre Type	Cushion, Elastic Cushion, Pneumatic, Polyurethane		Pneumatic	Pneumatic		
	3.2	Tyre Size	Front		250-15-16PR(I)	250-15-16PR(I)		
	3.3		Rear		7.00-12-12PR(I)	7.00-12-12PR(I)		
	3.5	Number of Wheel	Front/Rear (x = driven)		2 x / 2	2 x / 2		
	3.6	Tread, Front	b ₁₀	mm	1115	1115		
	3.7	Tread, Rear	b ₁₁	mm	1120	1120		
Basic Measurement	4.1	Tilting Angle	α/β	degree	6 / 12	6 / 12		
	4.2	Mast Height, Lowered	h ₁	mm	2100	2100		
	4.3	Std. Free Lift	h ₂	mm	150	150		
	4.4	Std. Lift Height	h ₃	mm	3000	3000		
	4.5	Mast Height, extended	h ₄	mm	4130	4130		
	4.7	Height, Overhead Guard	h ₆	mm	2190	2150		
	4.19	Length, with Std. Forks	ℓ ₁	mm	3970	4020		
	4.20	Length, to Fork Face	ℓ ₂	mm	2900	2950		
	4.21	Width, at Tyre	b ₁	mm	1350	1350		
	4.22	Forks	s/e/ℓ	Thickness/Width/Length mm	50/150/1070	50/150/1070		
	4.23	Fork Carriage Class	ISO 2328, Type A/B		Class 3, Type A	Class 3, Type A		
	4.24	Width, Fork Carriage	b ₃	mm	1190	1190		
	4.31	Ground Clearance	m ₁	Under Mast mm	140	140		
	4.32		m ₂	at Center of Wheelbase mm	185	185		
	4.33	Right Angle Stacking Aisle	Ast	with 1000 x 1200 pallet mm	4060	4110		
	4.34		Ast	with 1200 x 800 pallet mm	4260	4310		
	4.35	Turning Radius	W _a	mm	2530	2580		
	Performance	5.1	Travel speed (FWD)	Loaded, 1st/2nd/3rd	km/h	18.5	18.5	8.5/18.5
5.1.1		Unloaded,1st/2nd/3rd		km/h	19.5	19.5	9.0/19.5	
5.2		Lifting Speed	Loaded/Unloaded	mm/s	530/570	530/570		
5.3		Lowering Speed	Loaded/Unloaded	mm/s	480/550	480/550		
5.6		Max. Drawbar Pull	Loaded at 1.5 km/h	kN	28	28	27	
5.8		Max. Gradeability	Loaded at 1.5 km/h	%	34	32	26	
5.10		Service Brake	Operation/Control		Foot/Hydraulic	Foot/Hydraulic		
5.11		Parking Brake	Operation/Control		Hand/Mechanical	Hand/Mechanical		
5.12	Steering			Hydraulic Power Steering	Hydraulic Power Steering			
I.C. Engine	6.4	Battery	Voltage/Capacity at 5-hour rating V/Ah		24 / 56	24 / 56		
	7.1	Make/Model			KOMATSU / S6D102E	KOMATSU / S6D102E		
	7.2	Output, SAE gross			kW @min ⁻¹	70 @2150		
	7.3							
	7.3.1	Max. Torque, SAE gross	Nm @min ⁻¹		372 @1000	372 @1000		
	7.4	No. of Cylinder/Displacement	Number of cylinder, cm ³		6 / 5880	6 / 5880		
7.6	Fuel Tank Capacity	Ltr		90	90			
Others	8.2	Relief Pressure for Attachment	bar		181	181		
	8.2.1	Tank Capacity	Ltr		55	55		
	8.6	Clutch			Torque Converter	Torque Converter	Wet	
	8.7	Transmission			TORQFLOW	TORQFLOW	Synchromesh	

27. TECHNICAL DATA

Characteristics	1.2	Model	Manufacturer's Designation		FD50AT-7	FD50AT-8	
	1.3	Power Type	Electric, Diesel, Gasoline, LPG, Cable		Diesel	Diesel	
	1.4	Operation Type	Pedestrian, Driver Standing, Sitting, Order Picking		Sitting	Sitting	
	1.5	Rated Capacity	Q	Rated Capacity kg	5000	5000	
	1.6	Load Center	c	Rated Load Center mm	600	600	
	1.6.1	Alternative Capacity		Capacity @600mm Load Center kg	—	—	
	1.8	Load Distance	x	Front Axle Center to Fork Face mm	575	575	
	1.9	Wheelbase	y	mm	2200	2200	
Weight	2.1	Service Weight			kg	7005	7030
	2.2	Axle Loading	Loaded	Front	kg	10705	10690
	2.2.1			Rear	kg	1300	1340
	2.3		Unloaded	Front	kg	3035	3020
	2.3.1			Rear	kg	3970	4010
Type	3.1	Tyre Type	Cushion, Elastic Cushion, Pneumatic, Polyurethane		Pneumatic	Pneumatic	
	3.2	Tyre Size	Front		300-15-18PR(I)	300-15-18PR(I)	
	3.3		Rear		7.00-12-12PR(I)	7.00-12-12PR(I)	
	3.5	Number of Wheel	Front/Rear (x = driven)		2 x / 2	2 x / 2	
	3.6	Tread, Front	b ₁₀	mm	1150	1150	
	3.7	Tread, Rear	b ₁₁	mm	1120	1120	
Basic Measurement	4.1	Tilting Angle	α/β	degree	6 / 12	6 / 12	
	4.2	Mast Height, Lowered	h ₁	mm	2205	2205	
	4.3	Std. Free Lift	h ₂	mm	145	145	
	4.4	Std. Lift Height	h ₃	mm	3000	3000	
	4.5	Mast Height, extended	h ₄	mm	4345	4345	
	4.7	Height, Overhead Guard	h ₆	mm	2240	2240	
	4.19	Length, with Std. Forks	ℓ ₁	mm	4605	4605	
	4.20	Length, to Fork Face	ℓ ₂	mm	3385	3385	
	4.21	Width, at Tyre	b ₁	mm	1450	1450	
	4.22	Forks	s/e/ℓ	Thickness/Width/Length mm	55/150/1220	55/150/1220	
	4.23	Fork Carriage Class	ISO 2328, Type A/B		Class 4, Type A	Class 4, Type A	
	4.24	Width, Fork Carriage	b ₃	mm	1270	1270	
	4.31	Ground Clearance	m ₁	Under Mast mm	145	145	
	4.32		m ₂	at Center of Wheelbase mm	230	230	
	4.33	Right Angle Stacking Aisle	Ast	with 1000 x 1200 pallet mm	4625	4625	
	4.34		Ast	with 1200 x 800 pallet mm	4825	4825	
	4.35	Turning Radius	Wa	mm	3050	3050	
Performance	5.1	Travel speed (FWD)	Loaded, 1st/2nd/3rd	km/h	15.5/23.0	15.5/23.0	
	5.1.1		Unloaded,1st/2nd/3rd	km/h	16.5/24.0	16.5/24.0	
	5.2	Lifting Speed	Loaded/Unloaded	mm/s	460/490	460/490	
	5.3	Lowering Speed	Loaded/Unloaded	mm/s	450/520	450/520	
	5.6	Max. Drawbar Pull	Loaded at 1.5 km/h	kN	33	33	
	5.8	Max. Gradeability	Loaded at 1.5 km/h	%	28	28	
	5.10	Service Brake	Operation/Control		Foot/Hydraulic	Foot/Hydraulic	
	5.11	Parking Brake	Operation/Control		Hand/Mechanical	Hand/Mechanical	
5.12	Steering			Hydraulic Power Steering	Hydraulic Power Steering		
I.C. Engine	6.4	Battery	Voltage/Capacity at 5-hour rating V/Ah		24 / 56	24 / 56	
	7.1	Make/Model			KOMATSU / 6D102E	KOMATSU / S6D102E	
	7.2	Output, SAE gross					
	7.3		kW @min ⁻¹		70 @2150	70 @2150	
	7.3.1	Max. Torque, SAE gross	Nm @min ⁻¹		343 @1500	372 @1000	
	7.4	No. of Cylinder/Displacement	Number of cylinder, cm ³		6 / 5880	6 / 5880	
Others	7.6	Fuel Tank Capacity	Ltr		100	100	
	8.2	Relief Pressure for Attachment	bar		181	181	
	8.2.1	Tank Capacity	Ltr		55	55	
	8.6	Clutch			Torque Converter	Torque Converter	
	8.7	Transmission			TORQFLOW	TORQFLOW	

FG(D)35/50A-7, FD35/50A-8 FORKLIFT TRUCK

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