

Operation & Maintenance Manual

VEAM940200

WA65-3

WHEEL LOADER

SERIAL NUMBER

HA940051 and up



WARNING

Unsafe use of this machine may cause serious injury or death. Operators and maintenance personnel must read this manual before operating or maintaining this machine. This manual should be kept inside the cab for reference and periodically reviewed by all personnel who will come into contact with the machine.

CALIFORNIA

Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects and other reproductive harm.

KOMATSU

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6. NOTES ON SAFETY REGULATIONS

The procedures and precautionary measures concerning operation and maintenance only apply on the provision that the machine is used as intended.

6.1 CORRECT USE

A loader is a machine which has its own drive and which is moving on either tracks or wheels. By moving in forward direction, a loader can load material or cut the ground with the work unit (use of bucket) provided for loading which is attached to its front.

The standard working cycle of a loader comprises filling and lifting the loading bucket, transporting material, and emptying the loading bucket.

If you use the machine for any other purpose than specified above, we will not accept any responsibility for safety. All considerations concerning safety will then be up to the owner or the operating and maintenance personnel. In any case, neither you nor any other person are/is authorised to perform work and functions explicitly prohibited in these operating instructions.

6.2 SAFETY NOTES IN THE OPERATING INSTRUCTIONS

Most accidents are caused by disregard of basic safety regulations during operation and maintenance of machines. In order to avoid accidents and thus damage to persons and property, read all applicable safety notes and warnings in these operating instructions and on the machine, before you start operation or maintenance of the machine and always adhere to these safety notes and warnings.

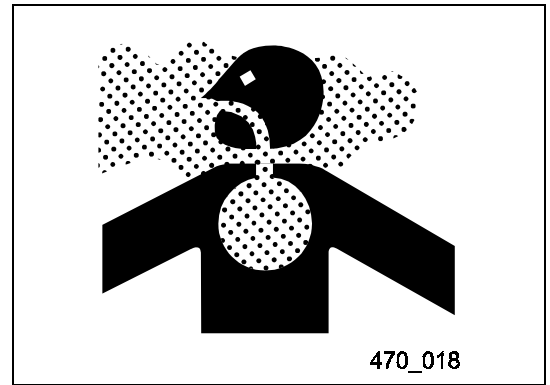
The chapter "Safety" contains a summary of all safety notes applying to this machine. We cannot, however, predict all circumstances resulting in potentially dangerous situations when operating and maintaining the machine. For this reason, it may be possible that the safety notes in these operating instructions and on the machine do not comprise all possible safety measures. If procedures or measures are required which are not recommended or approved, you must ensure that performing them is neither dangerous nor involving potential damage to the machine. Should you have any doubt concerning safety of a procedure, either directly contact Komatsu America International Company or your local Komatsu dealer.

SAFETY

10.1.3 IN-DOOR OPERATION

Do not operate machines in-door unless these areas are sufficiently ventilated (e.g. workshops).

Caution - Danger of intoxication!



10.1.4 GAS, DUST, AND INFLAMMABLE VAPOURS

Do not operate combustion engines in an environment that may contain inflammable gases or vapours. These gases, dusts, or vapours may ignite or be sucked in by the suction system, thus causing a rise in engine speed or an exceeding of the engine's maximum rpm. This may lead to a fire, an explosion, and major damage to property. It may also happen that the engine cannot be switched off anymore. Also refer to chapter "10.1.3 In-Door Operation".

10.1.5 MIRRORS, WINDOWS, AND LIGHTING

- Clean the windows and the headlights to ensure maximum sight.
- Adjust the rear-view mirror in such a way that you have an excellent view of the rear from the driver's seat. Keep the mirrors clean.
- Ensure that the complete lighting system operates properly and that it is correctly adjusted.
- Immediately replace broken window panes by new ones.

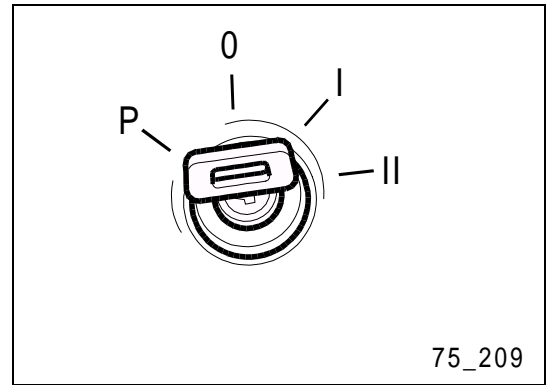
11.2.4 PRIOR TO START OF INSPECTION AND MAINTENANCE

Prior to start of inspection and maintenance operations, park the machine on solid, even ground. Lower the work unit. Switch off the engine (start switch to position '0') and safeguard the machine.

If the engine has to be running during maintenance, e.g. for pressure checks of the hydraulic system, proceed with particular care. Perform such measures with two persons with whom you have arranged clear hand signs beforehand.

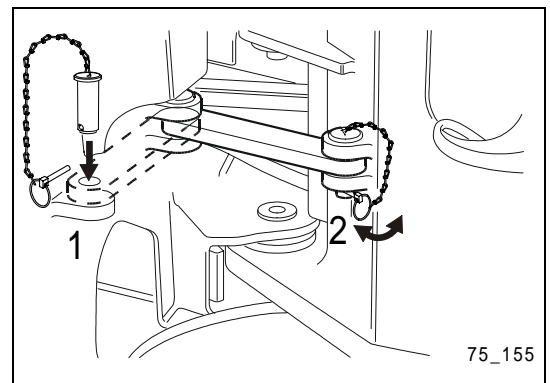
One person must be seated on the driver's seat to ensure that the engine can be immediately switched off, if required. This person must always ask the second person before actuating the control levers.

The person performing the maintenance measures must take care not to touch or get caught by moving parts.



11.2.5 SECURING THE ARTICULATED STEERING

Before starting maintenance, secure the articulated steering against accidental movement using the locking bar (position '2').



11.2.6 SUPPORTING THE WORK UNIT

Before work under a lifted work unit is started, the work unit must be supported to ensure safety. For this purpose, use a support block. In addition, set the control lever for the work hydraulic unit to its neutral 'HOLD' position and secure it with the safety lever.

If the area under the boom is to be cleaned and a support has not been erected, the machine must be parked as follows:

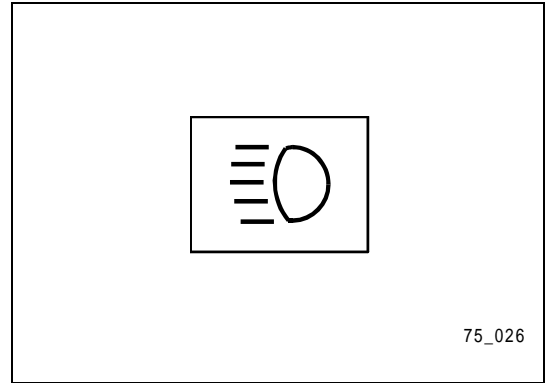
- 1 - Park the machine on even ground.
- 2 - Apply the parking brake.
- 3 - Place wheel chocks in front of the wheels to prevent the machine from rolling away.
- 4 - Lower the cutting edge or the teeth of the completely empty bucket onto the ground.

These steps are only permitted for cleaning measures.

CONTROLS AND INDICATORS

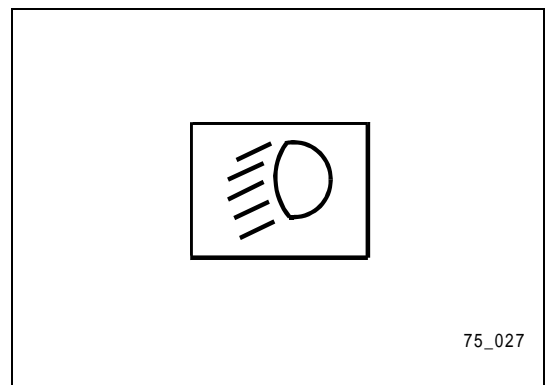
5 - HIGH BEAM CONTROL LAMP

The high beam control lamp lights up if you change from low beam to high beam. It also lights up if you flash your lights.



6 - LOW BEAM CONTROL LAMP

The low beam control lamp lights up when you switch on the low beam.



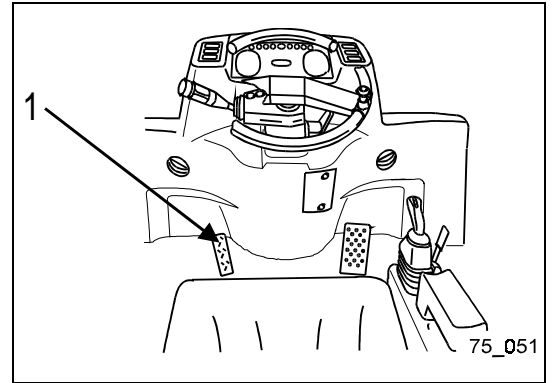
1 - BRAKE PEDAL



CAUTION

- If you are driving downhill, let the engine run and use the braking effect of the engine. If required, brake additionally using the brake pedal.
- **Danger of accidents due to unintentional braking!**
Do not use the brake pedal as a foot rest.

The brake is operated via a combined brake/inch pedal. The brake has an effect on the two multi-disk brakes in the rear axle. The inching exerts an additional braking effect on the hydrostatic drive system.



2 - PARKING BRAKE

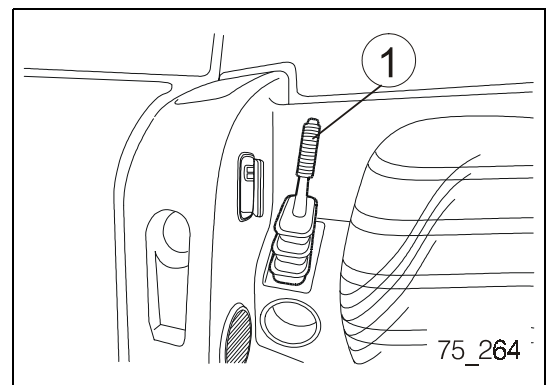
The parking brake is a mechanical device for operating the two multi-disk brakes in the rear axle.

As soon as you pull the parking brake lever from its normal position, the braking action comes into effect. If the start switch is set to the 'I' operating position, the parking brake warning light lights up in the instrument panel. The machine will drive again, if you re-loosen the parking brake.



IMPORTANT

- **You cannot start the machine with the parking brake being applied. If you set the driving direction parking switch to the 'F' position (forward driving) or 'R' (reversing) with the parking brake still being applied, the alarm buzzer will sound.**

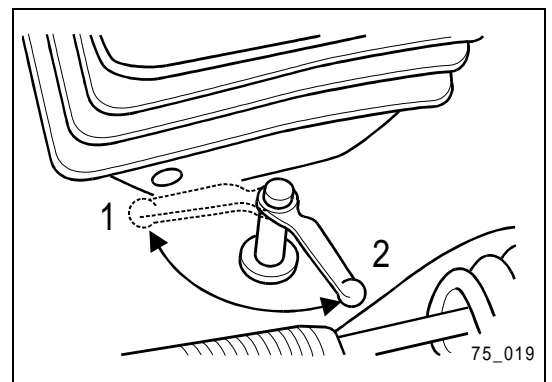


3 - SAFETY LEVER FOR THE WORK HYDRAULIC SYSTEM

The safety lever for the work hydraulic system protects the work hydraulic system against unintentional activation. Before driving on streets or beginning maintenance operations, it is required to block the work hydraulic system with this safety lever.

Position '1': Control lever secured

Position '2': Operating position



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17. ADJUSTMENTS PRIOR TO MACHINE START

17.1 ADJUSTING THE DRIVER'S SEAT

After each change of the driver, re-adjust the driver's seat. Before you start operation, check that the seat is adjusted in such a way that you can fully floor the brake pedal when you lean against the backrest. Proceed as follows to adjust the seat according to your requirements:

1 - WEIGHT ADJUSTMENT

Turn the handwheel (3) to set the vibration absorbing system to the weight of the driver.

2 - ADJUSTMENT OF HORIZONTAL POSITION

To adjust the horizontal seating position, pull the lever (4) and slide the seat forward or backward. To lock the position of the seat, release the lever again.

3/4 - ADJUSTING HEIGHT AND ANGLE OF INCLINATION

You may adjust the height and the angle of inclination of the driver's seat with the spring-supported levers (1) and (2). Use lever (2) to set the front part of the seat, use lever (1) to set the rear part of the seat.

Adjusting the seat's height

Adjust the front and the rear section of the seat uniformly. For this purpose, pull lever (2) and hold it in this position. To lift up the front part of the seat, it is necessary to relieve your weight from the front section of the seat cushion by standing up. Then, sit down on the front part in order to press down the front section of the seat. Release the lever if you have reached the right position. The seat is now locked in its position.

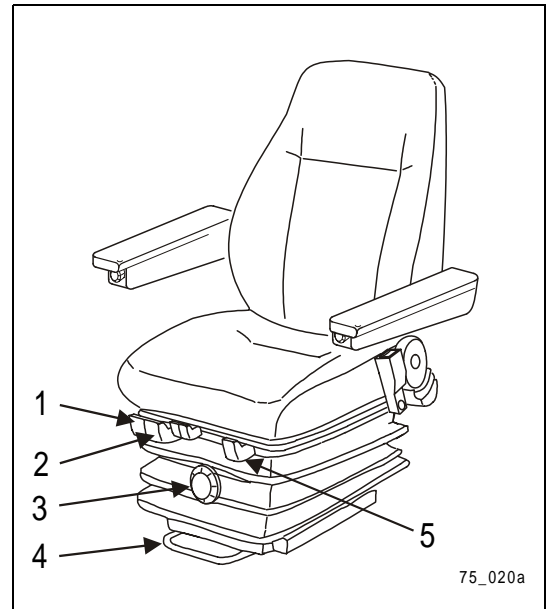
Then, pull lever (1) and hold it in this position. To lift up the rear part of the seat, it is necessary to relieve your weight from the rear section of the seat cushion by standing up. Then, sit down on the rear part in order to press down the rear section of the seat. Release the lever if you have reached the right position. The seat is now locked in its position.

Adjusting the angle of inclination of the seat

Adjust the front and rear section of the seat with different settings. Proceed as described above.

5 - ADJUSTING THE BACKREST

To adjust the position of the backrest, slightly lean against the backrest, pull lever (5) and hold it in this position. Relieve the backrest in order to bend it to the front. Press it to the back in order to bend it to the back. Release lever (5) if the backrest is in the desired position. The backrest will lock in automatically in this position.

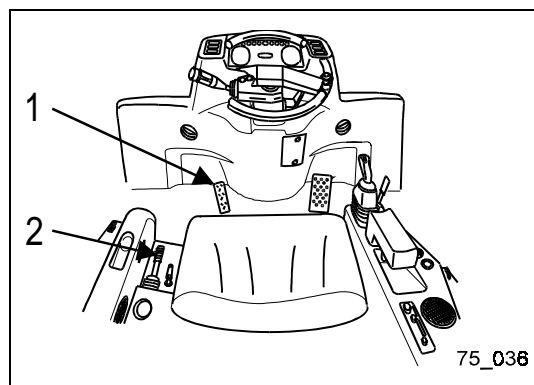


19.5 BRAKING

While driving, you may reduce your speed with the service brake (1). After the machine has stopped, you must secure it with the parking brake (2).

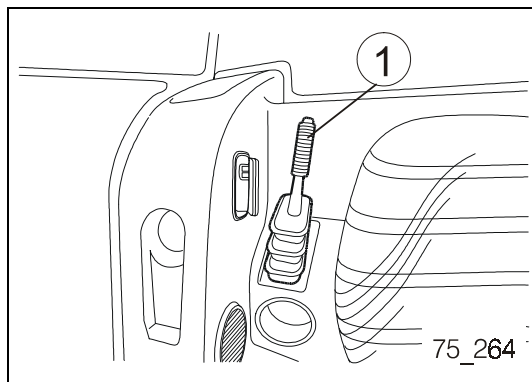
19.5.1 PULLING THE PARKING BRAKE

- 1 - Press the locking button.
- 2 - Pull up the parking brake lever.
- 3 - Release the locking button. The control lamp of the parking brake lights up.



19.5.2 RELEASING THE PARKING BRAKE

- 1 - Lift up the parking brake lever a little.
- 2 - Press the locking button.
- 3 - Push the parking brake lever down.
- 4 - Release the locking button. The control lamp of the parking brake goes out.

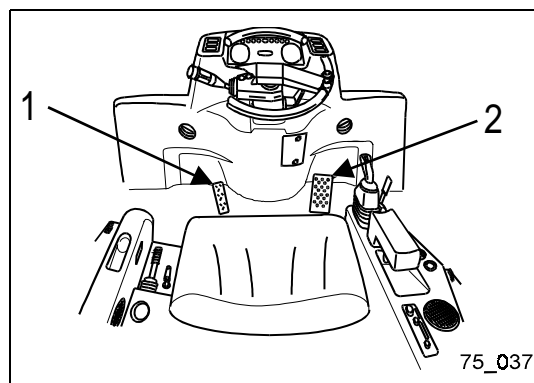


19.5.3 BRAKING WITH THE SERVICE BRAKE

If the braking delay is not sufficient by relieving the pressure from the accelerator pedal, you must brake the machine with the service brake. For this purpose, press down the brake pedal.

The service brake (1) can also be used to adapt the driving speed to the respective driving and operating situation (2), independent of the accelerator pedal position.

If it is required to press down the accelerator pedal completely, in order to be able to use the full-load output of the engine of the work hydraulic system, you can nevertheless use the brake pedal to reduce the speed of the machine or to stop it completely.



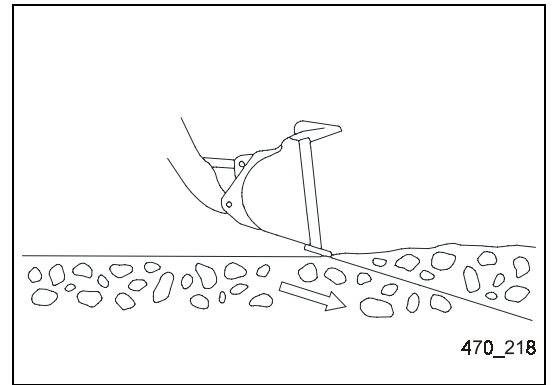
19.5.4 IF THE SERVICE BRAKE BREAKS DOWN

If the machine is not stopped after pressing down the brake pedal, you must use the parking brake.

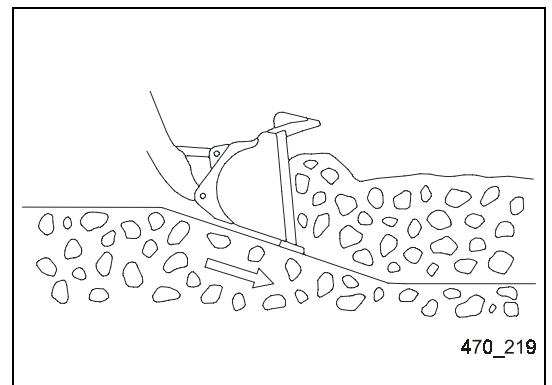
20.3.2 EXCAVATION WORKS

During excavation works, ensure that you do not load the bucket only on one side, since the equilibrium of the machine may be impaired.

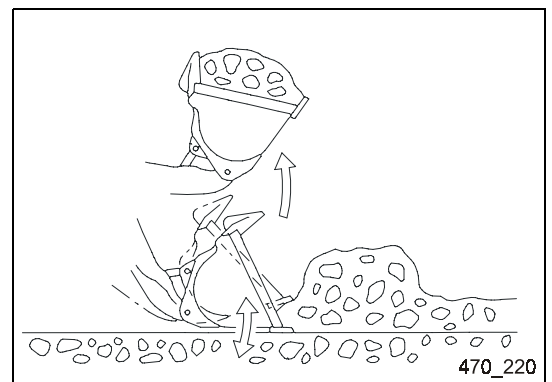
- 1- Drive up to the soil heap in a straight line.
- 2- Slow down the machine using the service brake while keeping the accelerator pedal pressed down at the same time.
- 3- Bend the bucket edge slightly down.



- 4- While driving forward, move slightly the multi-function lever of the boom in order to remove only a thin layer of the surface of the soil to be removed.



- 5- Move the multi-function lever of the boom slightly up and down to reduce the resistance during driving forward. While removing, ensure that the digging force is not applied only on one side of the bucket.



21.2 ELECTRICAL SYSTEM

| ELECTRICAL SYSTEM | | |
|--|---|---|
| FAULT | CAUSES | REMEDY |
| Warning light charging current: warning light charging current is off, when the engine is switched off and the start switch is set to its operating position 'I' | Electrical connection without function | *) Check terminals, connections, and cables |
| Warning light charging current: warning light charging current does not go out when engine is running | Electrical connection without function | *) Check terminals, connections, and cables |
| | Generator without function | *) Check function of generator; replace defective generator |
| | Tension of generator drive belt too low | Increase tension of drive belt |
| Generator produces unusual noise | Generator defective | Replace generator |
| Starter does not start the engine | Electrical connection without function | *) Check terminals, connections, and cables |
| | Battery charge insufficient | Re-charge battery *) Check function of battery; replace defective battery |
| Starter pinion repeatedly engages and disengages | Battery charge insufficient | Re-charge battery |
| | Starter defective | *) Replace starter |
| Starter turns engine only slowly | Battery charge insufficient | Re-charge battery |
| | Starter defective | *) Replace starter |
| Starter disengages before engine is started | Battery charge insufficient | Re-charge battery |
| | Starter defective | *) Replace starter |

*) These measures must be performed by your local Komatsu dealer.

21.10 STARTING THE ENGINE

The engine of the machine with the charged battery must run at high idle-running speed. Start the engine of the machine with the discharged battery. If the engine does not start up immediately, wait at least two minutes, before you make a second attempt.

21.10.1 DISCONNECTING THE BATTERY JUMPER CABLE

**CAUTION**

- **Danger of short-circuit! When disconnecting the cables, pay attention not to let the cable ends touch each other or the machine. When the cable ends touch each other or the machine, a short-circuit is produced which may damage parts of the electrical system!**
When disconnecting the cables, pay attention not to let the cable ends touch each other or the machine.
-

After starting of the engine, disconnect the battery jumper cables by reversing the steps you performed to connect the cables.

- 1- Disconnect one clamp of the battery jumper cable from the engine block.
- 2- Disconnect the other clamp of the battery jumper cable from the negative terminal (-) of the charged battery.
- 3- Disconnect the clamp of the battery jumper cable from the positive terminal (+) of the charged battery.
- 4- Disconnect the other clamp of the battery jumper cable from the positive terminal (+) of the discharged battery.

Blank for Technical Reason

22.10 TORQUE FOR STANDARD NUTS AND BOLTS

Provided that no other values are given, tighten the metric screws with a strength value of 10.9 and the nuts with a strength value of 10 applying the torques given in the tables.

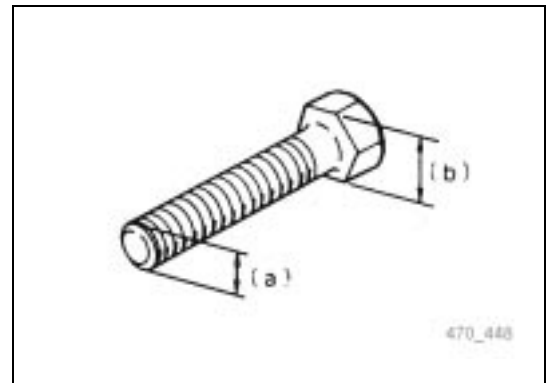
The torque that must be applied depends on the diameter of the thread (a) and the size of the spanner (b) of both the nut and the screw.

Always replace nuts and screws by original parts. Dimensions and quality of replaced parts and original parts must be identical.



NOTE

- Do not apply excessive torque to plastic parts. Tighten plastic parts only manually.



| METRIC BOLTS COARSE-PITCH-THREAD - TENSILE STRENGTH CLASS 10.9 | | | | | |
|--|-------------------------|-------|-------|----------------|-------|
| Thread diameter of bolt mm | Width across flat mm | Steel | | Aluminium Cast | |
| | | Nm | kpm | Nm | kpm |
| (a) | (b) | | | | |
| M6 | 10 | 14 | 1.4 | 7.7 | 0.77 |
| M8 | 13 | 35 | 3.5 | 19.0 | 1.9 |
| M10 | 17 (15) | 70 | 7.0 | 37.0 | 3.7 |
| M12 | 19 | 115 | 11.5 | 64.0 | 6.4 |
| M14 | 22 | 185 | 18.5 | 101.5 | 10.15 |
| M16 | 24 | 280 | 28.0 | 158.0 | 15.8 |
| M18 | 27 | 390 | 39.0 | 218.0 | 21.8 |
| M20 | 30 | 560 | 56.0 | 306.5 | 30.65 |
| M22 | 32 | 750 | 75.0 | 416.0 | 41.6 |
| M24 | 36 | 960 | 96.0 | 528.5 | 52.85 |
| M27 | 41 | 1400 | 140.0 | 774.0 | 77.4 |
| M30 | 46 | 1900 | 190.0 | 1053.0 | 105.3 |
| M33 | 50 | 2600 | 260.0 | - | - |
| M36 | 55 | 3300 | 330.0 | - | - |
| M39 | 60 | 4300 | 430.0 | - | - |

24.9 CHECKING THE ELECTRICAL CONNECTIONS



CAUTION

- **Danger of ignition! Inflammable material (leaves, twigs, grass, etc.) may ignite within the electrical system!**
Remove inflammable material from the electrical system.



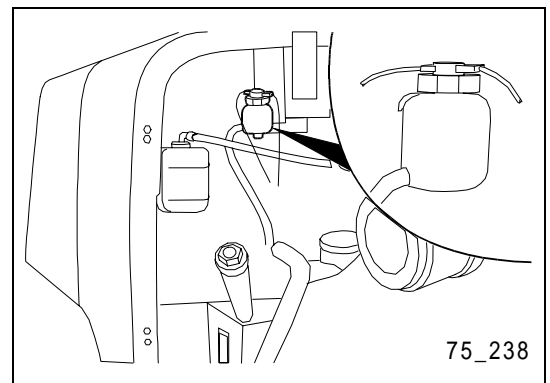
NOTE

- **If a fuse blows, or if there are any signs of a short-circuit within the electrical system, inform your local Komatsu dealer.**

Regularly check that the terminals are fastened tightly, retighten loose terminals.

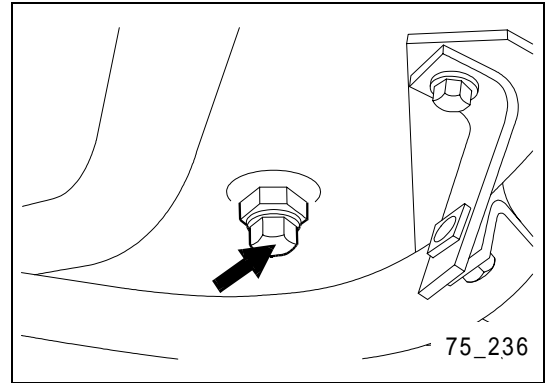
24.10 OTHER MAINTENANCE MEASURES PRIOR TO START

- Check that the brake oil level reaches up to the marking.
- Check that the contacts at the float of the brake oil container are tightened correctly.
- Check that the lighting equipment operates correctly; check it for dirt and damage.
- Check the measuring instruments.
- Check both the horn and the reversing warning horn.
- Check both clearance and operation of the steering wheel.
- Check the function of the rear-view mirror; check it for dirt and damage.



27.2 DRAINING OFF WATER AND DIRT DEPOSITS FROM THE FUEL TANK

- 1- Place a container under the drain plug of the fuel tank (see arrow).
- 2- Open the drain plug, drain off water and dirt.
- 3- Close the drain plug when clean fuel starts to leak out.



27.3 CHECKING THE SERVICE BRAKE AND OIL LEVEL, REFILLING OIL



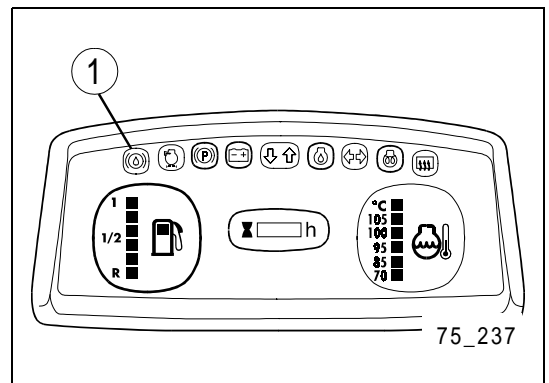
WARNING

- **Danger of accidents! If the oil level is too low, the service brake may break down!**
If the brake fluid supply control lamp (1) lights up, you must immediately stop and check the oil level.

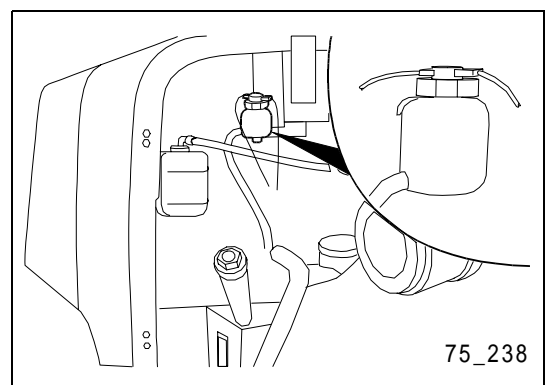


CAUTION

- **Danger of accidents! If you use usually available brake fluid for filling up, the operational efficiency of the brake system may be impaired!**
Use only the prescribed oil for filling up! Do not use brake fluid! Pay attention to utmost cleanness!



- 1- For maintenance operations, park and secure machine as described in chapter "22.1 Preparing the Machine for Maintenance".
- 2- Check the brake fluid level at the expansion tank. The oil level must be 0.394 in (10 mm) to 0.787 in (20 mm) below the upper edge of the expansion tank (marking).
- 3- If the oil level is too low, fill prescribed oil into the expansion tank.
For detailed specifications, see section "22.4 Lubricants and Operating Agents".
- 4- If you detect a significant oil loss, inform your local Komatsu dealer.



30. MAINTENANCE EVERY 500 OPERATING HOURS

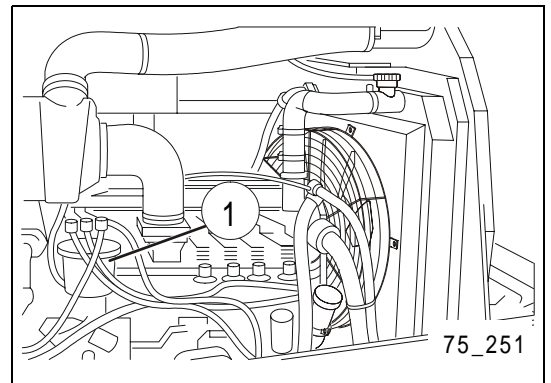
All maintenance operations to be performed after 10, 50, 100 and 250 hours of operation also fall into this maintenance category.

30.1 CHANGING THE FUEL FILTER AND FILTER ELEMENT



- **Danger of fire! Fuel may ignite on hot surfaces!**
Only change the filter elements if the engine has sufficiently cooled down. Stay away with open fire or sparks while handling with fuel. Do not smoke.

- 1- For maintenance operations, park and secure machine as described in chapter "22.1 Preparing the Machine for Maintenance".
- 2- Clean the area around the fuel filter (1).
- 3- Unscrew the filter element counterclockwise with the filter screwdriver.
- 4- Clean the filter head.
- 5- Fill up the new filter element with clean fuel.
- 6- Lubricate the sealing faces of the filter element lightly with engine oil.
- 7- During reassembly, re-tighten the filter element manually, until the seal is fitting. Then re-tighten the filter element.
 (Consider the specifications of the filter manufacturer on the filter).
- 8- Then purge the fuel system.
 (see section "30.1.1 Bleeding the Fuel System").
- 9- Start the engine and check for leaks.



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