WEAM005400

Operation & Maintenance Manual

SK820-5 turbo

SKID-STEER LOADER

SERIAL NUMBERS SK820-5 turbo 37BTF50003 and up

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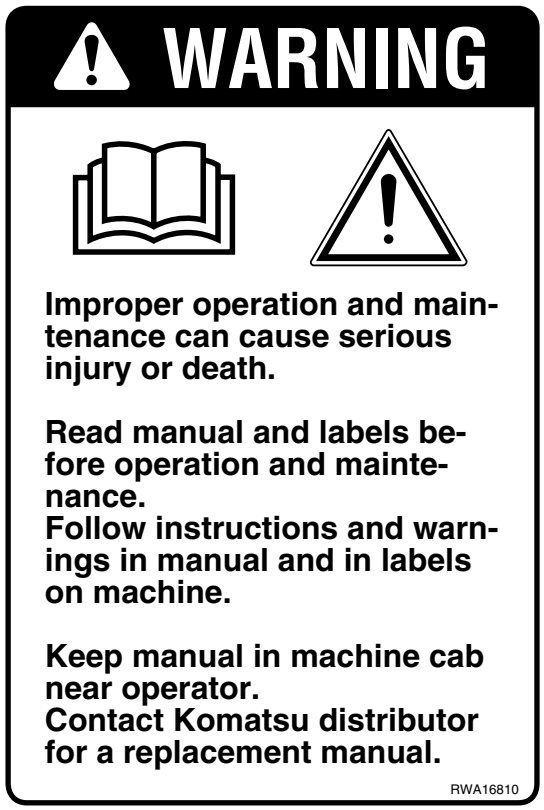
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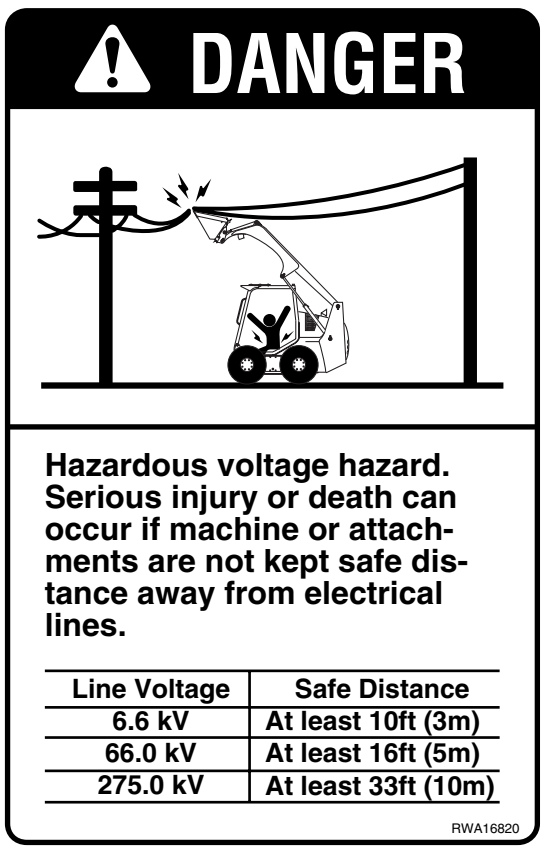
1.

- Warning Decal.



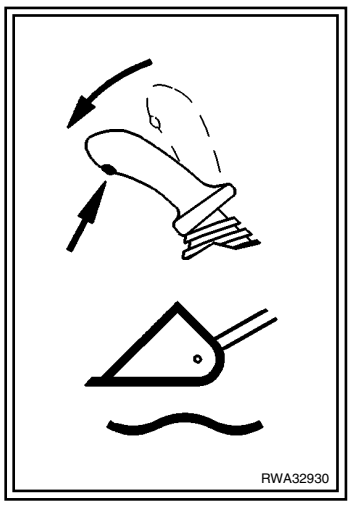
2.

- Height Decal



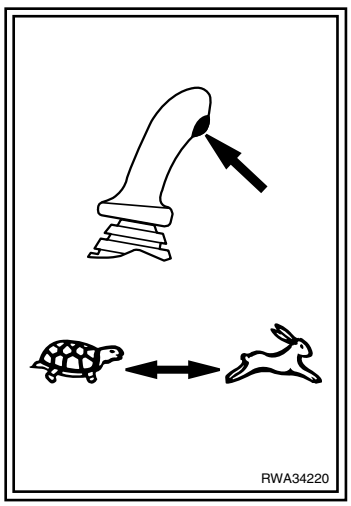
26.

- Arm floating device control (Right control lever)



27.

- Speed increase control (Left control lever)

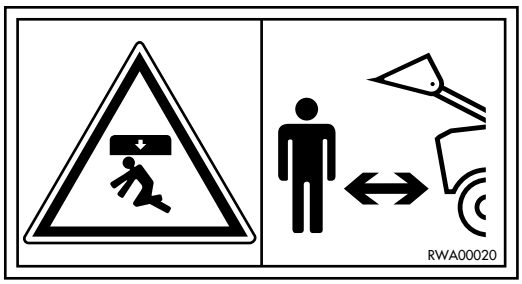


2.1.3 PICTOGRAMS AND RELEVANT MEANINGS

The warning and danger plates applied on to the machine are accompanied or represented by pictograms.
The personnel in charge with the operation and maintenance of the machine must know the symbols contained in the pictograms perfectly; the following description illustrates what they look like and their respective meanings.

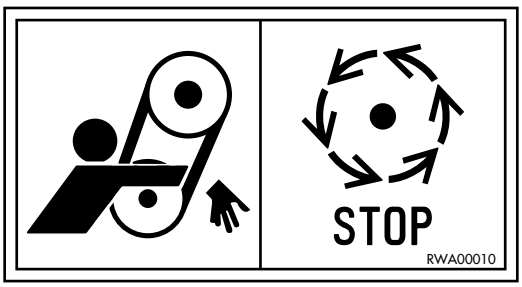
DANGER IN THE WORK AREA (Only for machines with excavator)

- Do not approach or stand within the equipment operating radius when the boom and the bucket of the excavator are raised.



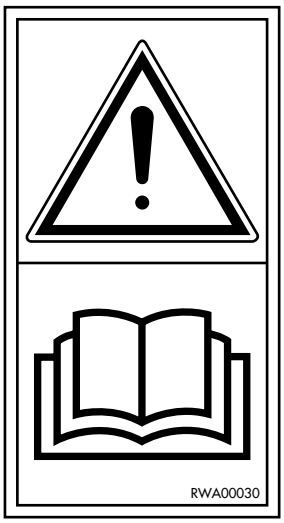
MOVING PARTS IN ENGINE COMPARTMENT

- Keep clear; moving parts hazard inside engine compartment.



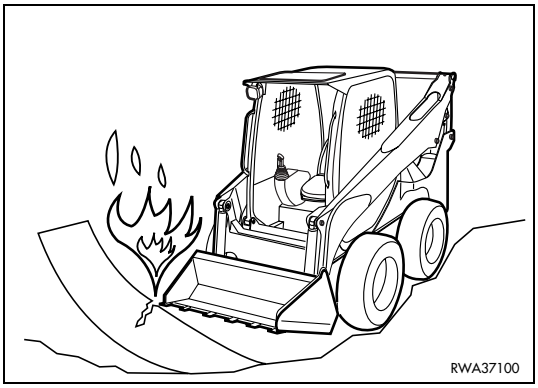
CONSULT THE MANUAL

- Carefully read the contents of the manual before using the machine or performing maintenance operations.



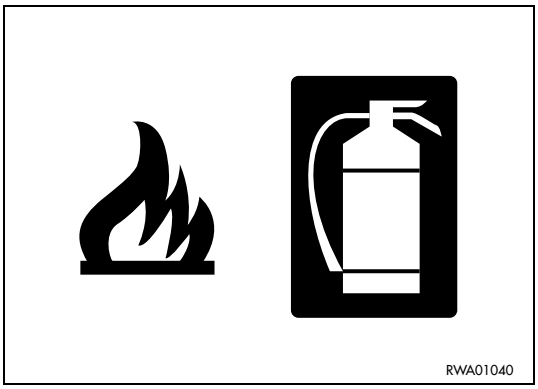
2.3 PRECAUTIONS TO BE TAKEN BEFORE STARTING THE ENGINE

2.3.1 SAFETY ON THE WORK SITE



- Before starting the engine, thoroughly check the area for any unusual condition of the ground due to which work may be dangerous.
- Check the conditions of the ground at the work site and before starting the engine define the work plan and the best and safest operating procedure.
- Make the ground surface as level as possible before carrying out any operation.
- In case of work on the road, protect pedestrians and cars by designating a person for work site traffic duty and install fences around the work site.
- If water lines, gas lines, and telephone or high-voltage electrical lines are located under the work site, contact the relevant utility company in order to find out their exact positions or to make them ineffective until the end of the operations. Be careful not to sever or damage any of these lines.
- Check the depth and flow of water before operating in water or on river banks.

2.3.2 FIRE PREVENTION



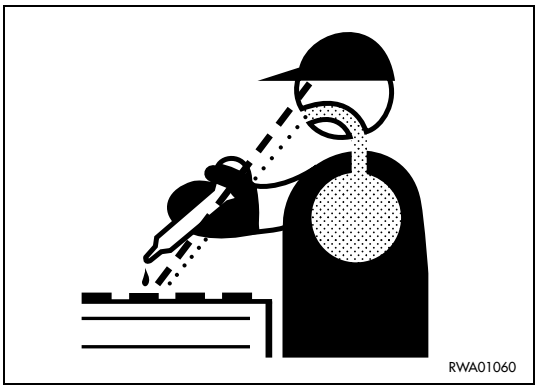
- Carefully remove all wood chips, rubbish, paper and other flammable materials that may have accumulated inside the engine compartment, since they can cause fires.
- Check the fuel and hydraulic system pipes for leaks and if necessary repair them. Wipe up any leakage of oil, fuel or other flammable fluids.
- Make sure that fire extinguishers are available for use in the work area.

2.3.3 PRECAUTIONS TO BE TAKEN FOR THE OPERATOR'S CAB

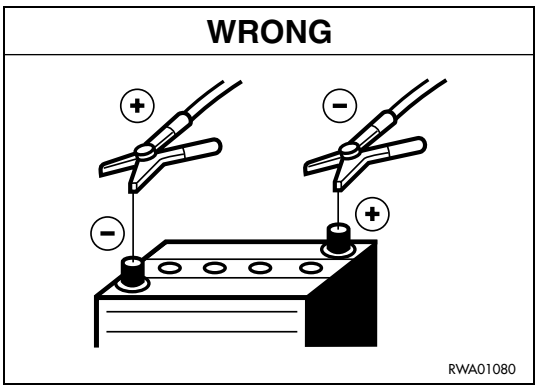
- Do not keep objects or tools in the operator's cab. They may hinder the operation of the controls and cause serious accidents.
- Keep the cab floor and the controls (pedals and levers) clean, by removing any trace of oil and grease and, as far as the floor is concerned, remove any excess dirt (earth, stones, etc.).
- Check the safety belt and change it if it is broken or damaged.
  Replace any component only with homologated parts supplied by Komatsu or its Dsrtibutors.

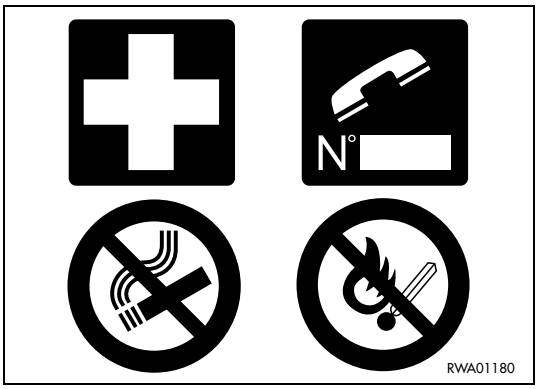
2.6 BATTERY

2.6.1 SAFETY PRECAUTIONS FOR WORK ON BATTERIES

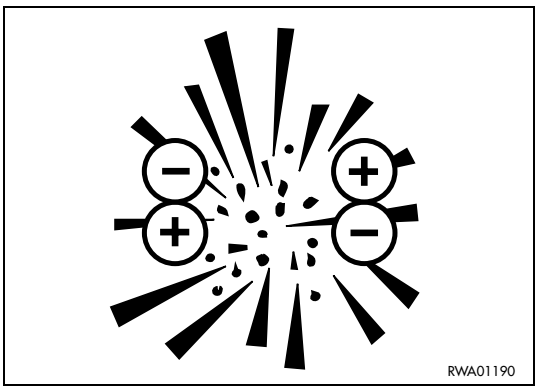


- Electrolytic batteries contain sulphuric acid which can cause burns. It can also corrode clothing and make holes in it. If you inadvertently splash battery acid on yourself or on someone else, immediately wash the affected part with plenty of water.
- Battery acid may cause blindness if it comes into contact with the eyes.
  If acid accidentally gets into your eyes, wash them immediately with plenty of water and consult a doctor right away.
- If you accidentally swallow battery acid, drink a large quantity of water or milk, beaten egg white or vegetable oil and in any case antiacid substances like magnesia, bicarbonate, etc.; call a doctor or a poison treatment center immediately.
- Always wear safety goggles when working on batteries.
- Batteries produce hydrogen, which is highly explosive and can be easily ignited with small sparks or exposed flames.
- Before working with batteries, stop the engine and remove the ignition key.
- Avoid short-circuiting the battery terminals through accidental contact with metal objects or tools or through the inversion of the terminals.
- Tighten the battery terminals securely. Loose terminals may generate sparks and even cause the explosion of the battery.





2.6.2 STARTING WITH BOOSTER CABLES



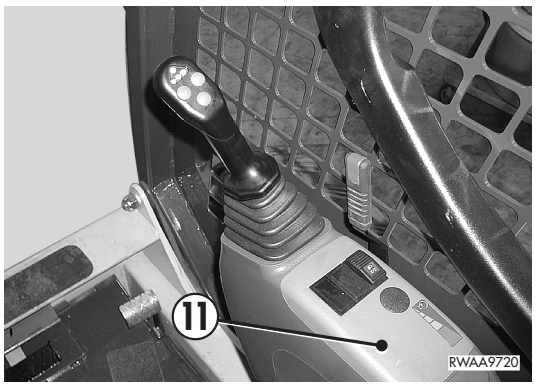
- When starting the machine with booster cables, always wear safety goggles.
- When starting the engine by means of another machine, avoid any contact between the two machines.
- Be sure to connect the positive cable (+) first and then the negative or ground cable (-) when connecting the booster cables. After the start, disconnect first the negative or ground (-) cable and then the positive cable (+).
- Connect the batteries in parallel: positive to positive and negative to negative.
- When connecting the ground cable to the frame of the machine to be started, operate as far as possible from the battery. (See "3.15.3 IF THE BATTERY IS DEPLETED").

2.8.21 PRECAUTIONS TO BE TAKEN WHEN USING THE SYNTHETIC BIODEGRADABLE OIL TYPE «HEES»

- It is not possible to mix the synthetic biodegradable oil type HEES with ordinary hydraulic oils, since when the temperature increases insoluble compounds are generated, which are deposited on the filters and clog them (the maximum concentration of ordinary oil cannot exceed 1% of the total quantity of oil).
- The biodegradable oil can be used only in the hydraulic system; it cannot be used for the endothermic engine, the transmissions, the braking system, etc.
- Before introducing the synthetic biodegradable oil in the hydraulic system, empty the system completely, disconnecting the cylinders and all the parts that may contain ordinary oil, and replace the drain filter with a new one. Start the engine and let it idle without using the work equipment , wait until the oil reaches a temperature of at least 40ºC (104°F), then start moving the equipment, so that all the parts of the system are filled with oil. Stop the engine and check the oil level (see "4.7.2.e CHECKING THE HYDRAULIC SYSTEM OIL LEVEL").

10 - Left console switches
11 - Right console switches

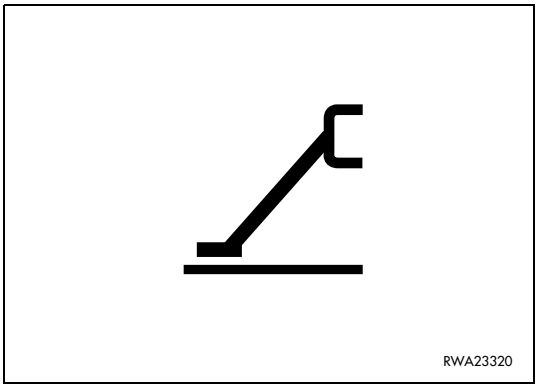




3 - LEFT STABILIZER BUTTON (if installed)

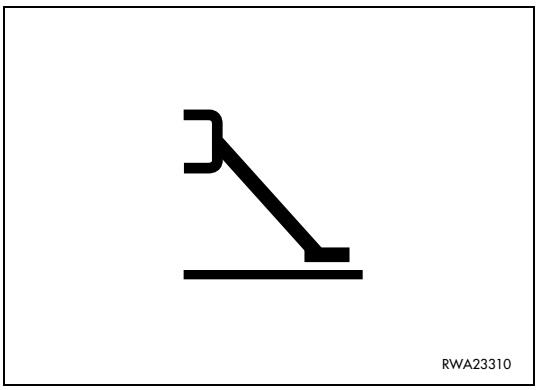
This is a button with two temporary positions and the neutral position at its centre.
Press the button forward or backward to lower or raise the stabilizer.

For use, see ”3.3.5 pos. 14 LEFT STABILIZER CONTROL”



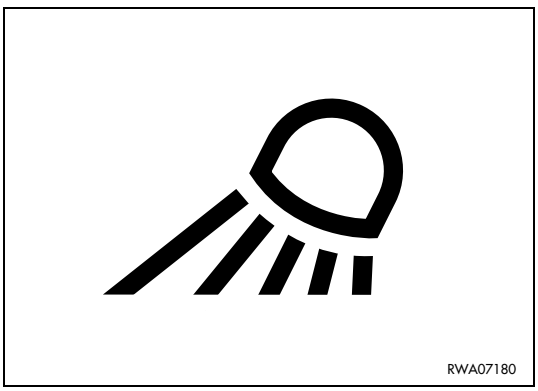
4 - RIGHT STABILIZER BUTTON (if installed)

This is a button with two temporary positions and the neutral position at its centre.
Press the button forward or backward to lower or raise the stabilizer.
For use, see “3.3.5 pos. 13 RIGHT STABILIZER CONTROL”



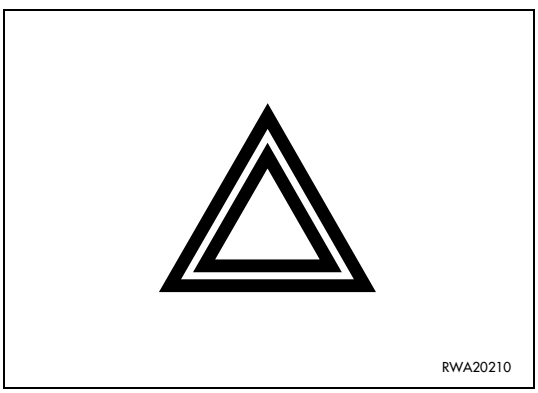
5 - WORKING LIGHT SWITCH

Enables the circuit of the working lights.



6 - EMERGENCY SWITCH (HAZARD)

Operates all the direction lights at the same time and must be used whenever the machine is temporarily parked on the roadside or in anomalous position while traveling on roads.



3 - ARM LIFTING CONTROL LEVER

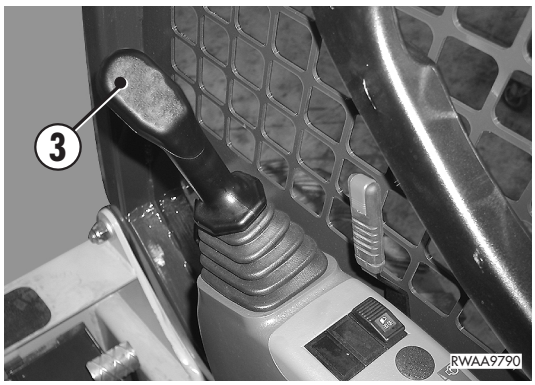
WARNING

- **Before carrying out any maneuver with this lever, the operator must be seated in the work position with fastened safety belt; before any maneuver he must perform the operations described in "3.13 USING THE WORK EQUIPMENT".**
- **When traveling on roads, always lock the equipment control (see "3.3.5 pos. 8 EQUIPMENT CONTROL LOCKING LEVER").**
- **Before leaving the operating position, lower the equipment to the ground and lock the safety bars (vertical position), then stop the engine.**
- **Failure to comply with these instructions may lead to serious accidents.**

CAUTION

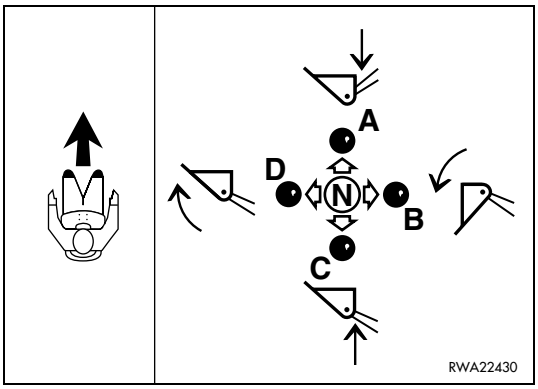
- **The self-leveling system is operated automatically only when the arm is lifted with loaded bucket. When the arm is in the lowering phase the system cannot be operated.**
- **At the maximum height the self-leveling system keeps the bucket partially folded to prevent the material from falling out of the bucket itself.**

The equipment control lever (3) is positioned on the operatorís right and controls the arm lifting and lowering and the bucket dumping and folding functions.
The following diagrams show the basic maneuvers and the possible combined maneuvers.

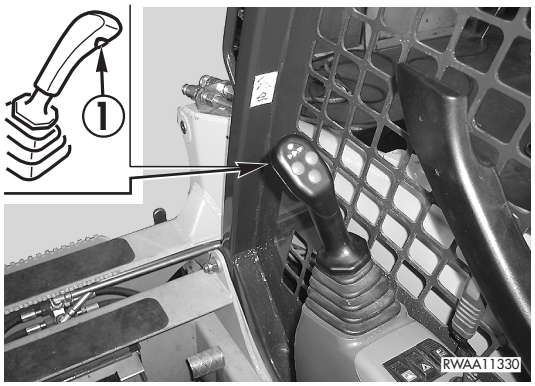


BASIC MANEUVERS

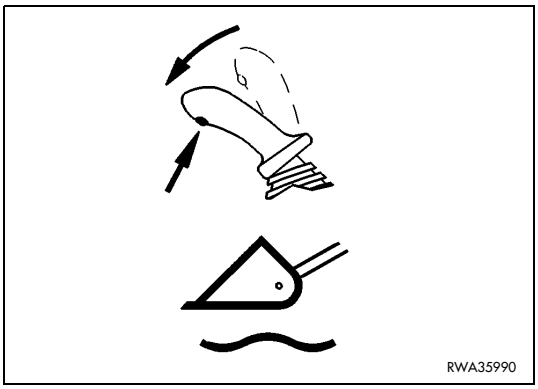
N - Neutral
A - Arm lowering
B - Bucket dumping
C - Arm lifting
D - Bucket folding



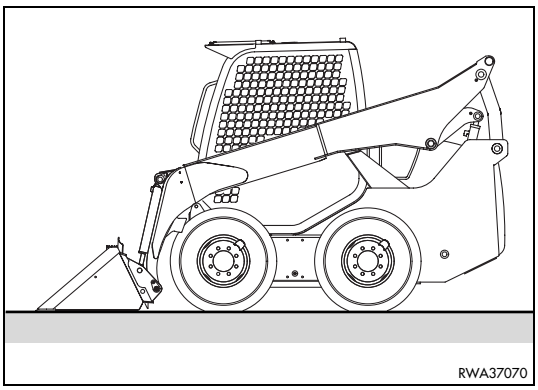
11 - FLOATING DEVICE CONTROL (IF INSTALLED)



The right joystick grip is provided with a switch (1) that when pressed (WARNING LIGHT ON) (see “3.3.2 pos. 8 FLOATING DEVICE WARNING LIGHT”) frees the loader arm (floating position), that is, allows it to automatically follow the undulations of the ground.
Press the switch again to restore the standard operating conditions (WARNING LIGHT OFF) (see “3.3.2 pos. 8 FLOATING DEVICE WARNING LIGHT”).



12 - PATTERN SHIFTING CONTROL

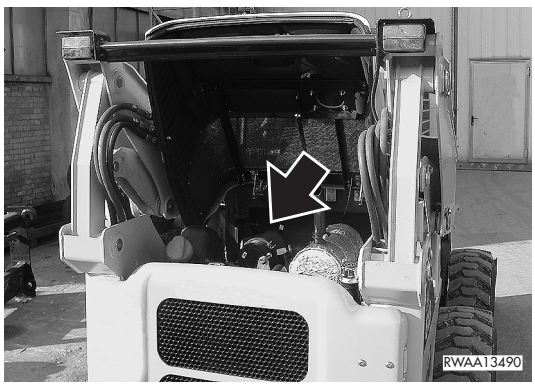


WARNING

- **Before using the pattern shifting, lower the equipment to the ground, engage the safety devices and stop the engine.**
- **Failure to comply with these instructions may lead to serious injuries or even death.**

The pattern shifting control is applied to the rear wall of the cab and can be reached after opening the engine hood (see “3.5.1 ENGINE HOOD”).
The lever (1) of the pattern shifting control has two positions:

- ISO CONTROL SYSTEM
  Lever in position A
- OPTIONAL CONTROL SYSTEM
  Lever in position B



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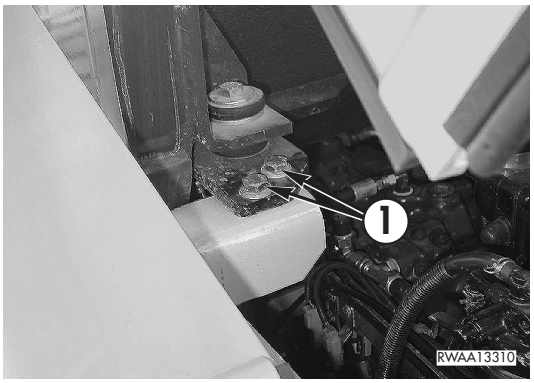
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3.5.3.1 RAISING THE CAB



WARNING

- **Raise the cab only with the machine parked on a firm and level surface and with arm lowered to the ground complete with bucket or any other optional equipment.**
  Make sure that the surface on which the machine is parked is not slippery.
- **Before raising the cab, make sure that the engine hood is open.**
- **The cab must be raised or lowered by two persons, one per side, and it is important to make sure that the handles and hold points are not dirty with oil or grease.**
- **After raising the cab, always engage the safety split pin of the cab overturning protection lock.**
- **Do not carry out any operation on the machine if the safety split pin of the cab overturning protection lock is not engaged.**
- **Always tighten the cab fastening screws with the torque indicated in "4.4.2 SPECIFIC DRIVING TORQUES".**



To carry out some maintenance or routine operations it is necessary to raise the cab, an operation that must be carried out by two persons according to the prescribed procedure.

1 - Stop the machine on firm and level ground.

2 - Lower the equipment to the ground.

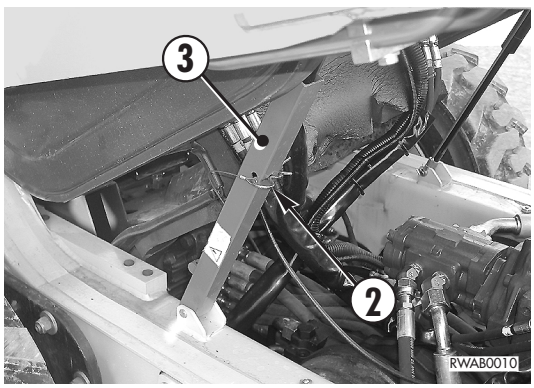
3 - Apply the parking brake and lock the controls by lifting the safety bars.

4 - Stop the engine as indicated in "3.8 STOPPING THE ENGINE".

5 - Open the engine hood (see "3.5.1 ENGINE HOOD") and remove the rear screws (1) that fasten the cab.
Use a 19 mm hexagon spanner.

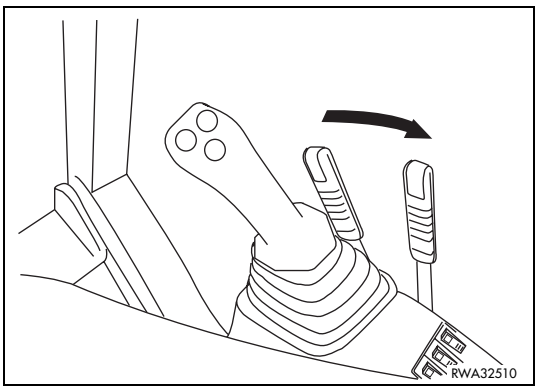
6 - With the help of another person, raise the rear part of the cab using the appropriate handles and overturn it forwards until it stops.

7 - Engage the safety split pin (2) of the cab overturning protection lock (3).

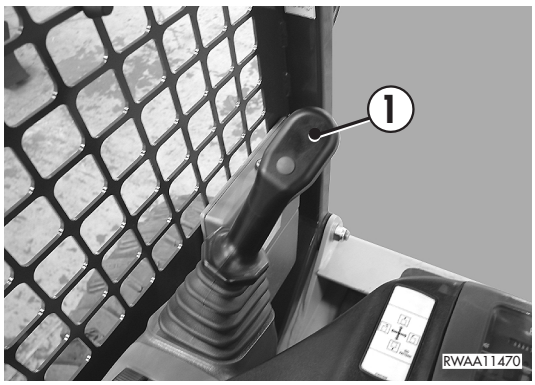


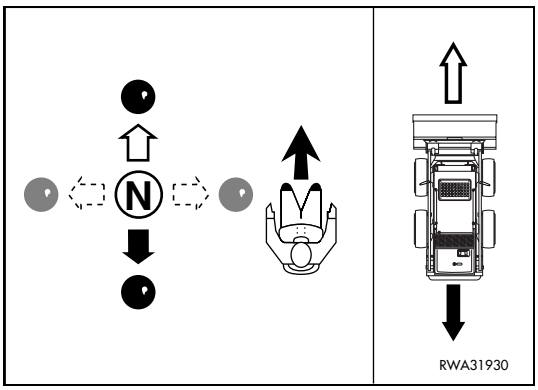
Before moving the machine, check the instruments, warm up the engine and the hydraulic system oil, make sure that the safety device of the controls is released (safety bars down) and the bucket is folded; the equipment control lever must be in neutral position.
Release the parking brake.

1 - Pull the hand accelerator lever and set the engine running at idling speed.

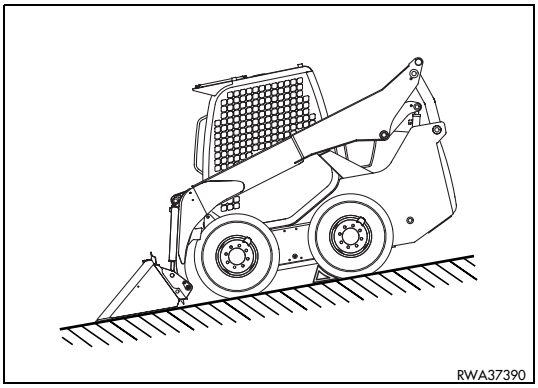


2 - Operate the lever (1), shifting it forward to make the machine advance or backward to make it move in reverse.





3.7.2 PARKING ON SLOPES



WARNING

- **The movement of the machine when the operator is not on board may cause serious accidents and even death; to prevent this, carry out the operations described below.**
- **Park on slopes only when it is absolutely necessary.**
- **Park only with the bucket directed downwards.**

1 - Park the machine with the bucket directed downwards and resting against an obstacle.
If this is not possible due to the absence of natural obstacles, rotate the bucket forward and thrust its teeth into the ground.

2 - Lock the equipment and travel hydraulic control by shifting the safety bars to the lock position (see “3.3.5 pos. 1 SAFETY BARS”).

3 - Engage the retainer to lock the optional equipment control pedal.

4 - Apply the parking brake.

5 - Stop the engine following the procedure indicated in paragraph “3.8 STOPPING THE ENGINE”.

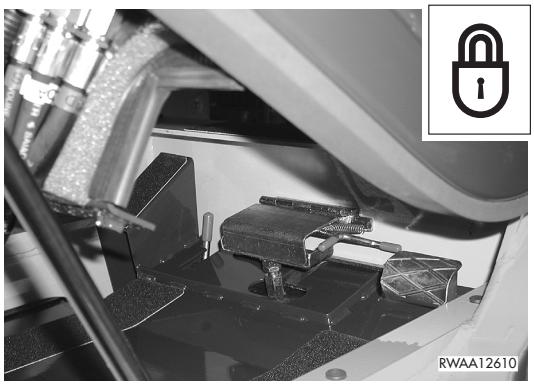
6 - Remove the ignition key.

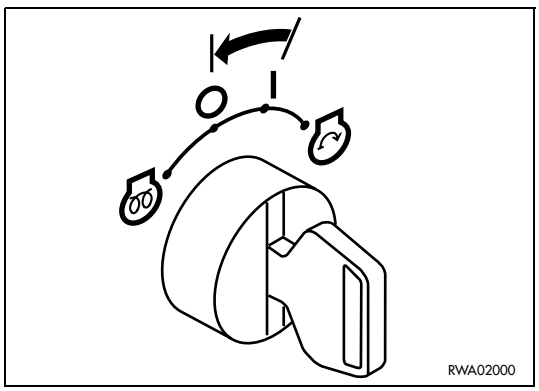
7 - Leave the cab using the handles and the footboards.

8 - Position safety wedges under the wheels.

9 - Refuel, taking the necessary precautions.







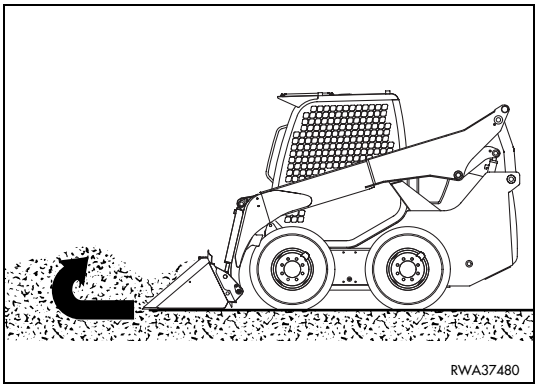


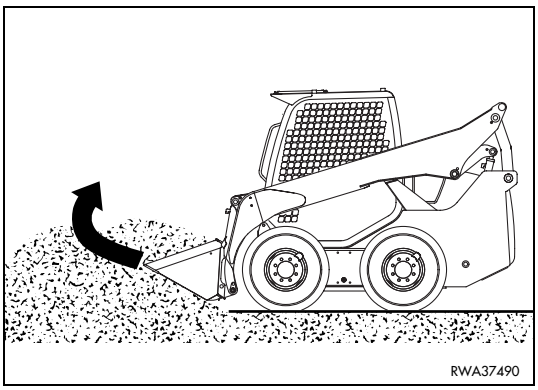
3.13.3 LOADING MATERIAL FROM PILES AND ON LEVEL SURFACES

The efficiency of the bucket depends on how the operator begins to load; keep to the following rules:

1 - Start moving with the arm completely lowered and direct the bucket toward the base of the pile.

2 - While the material on top of the pile falls into the bucket, gradually raise the arm and at the same time fold the bucket until reaching the end of stroke.

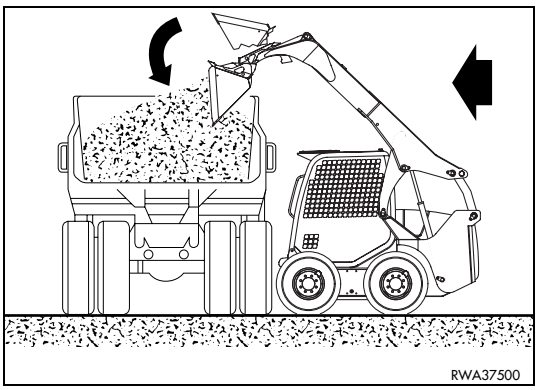




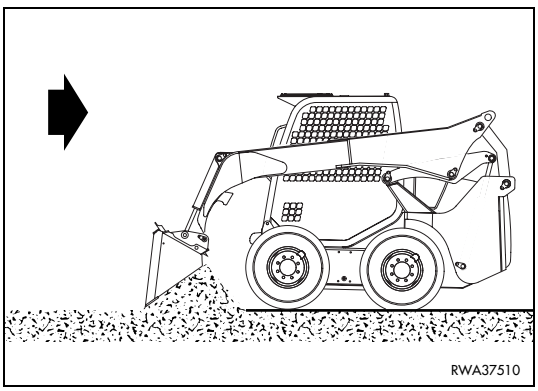
3 - Invert the machine motion and dump the bucket on to the truck.

IMPORTANT

- **Start loading the truck from the cab side and, if the material is sufficiently homogeneous, dump from the maximum height in order to increase the compactness of the material and its distribution on the loading surface.**

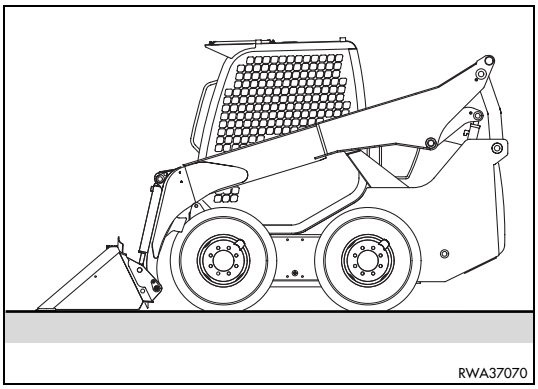


4 - After removing the pile completely, incline the bucket forward, lower the arm until raising the front wheels slightly and, proceeding in reverse, level the ground distributing the material uniformly.
Repeat the operation reducing the inclination of the bucket for the finishing work.



3.14 LONG PERIODS OF INACTIVITY

3.14.1 BEFORE THE PERIOD OF INACTIVITY



WARNING

- **When draining the fuel, do not smoke or bring exposed flames near the machine.**
  Place a container under the machine to gather the fuel and prevent it from spreading around.
  If some fuel is spilled, clean the dirty surface immediately.

IMPORTANT

- **To protect the cylinder rods when the machine is not used, position the work equipment as shown in the figure.**
  (This serves to prevent the cylinder rods from rusting).

If the machine must be stored for a long period of inactivity, it is advisable to put it in a sheltered place and to take the following precautions, in order to keep all its components sound and efficient:

1 - Clean the machine thoroughly, repainting it where necessary in order to prevent oxidation.

2 - Drain and change all the fluids of the hydraulic circuits and the lubricants (engine and transmission), following the maintenance rules.

3 - Change all the filtering elements (air cleaner, engine oil filter, hydrulic circuit filters, diesel oil filter).

4 - Drain the coolant and replace it with a corrosion inhibitor (permanent fluid).

5 - Drain the normal fuel and fill the tank with at least 5 liters of special washing and protecting fuel.

6 - Let the engine run for about 10 minutes, in such a way as to eliminate the residual normal fuel from the filters, the injection pump and the entire fuel supply system. This operation avoids the locking of the injection pump and the injectors.
Stop the engine and refuel with normal diesel oil.

7 - Remove the battery, check the electrolyte level and make sure that the battery charge is sufficient.
Store the battery in a room with suitable temperature and periodically recharge it.

8 - Grease the hydraulic cylinder rods and the equipment joints.

9 - Seal the end of the exhaust pipe.

10 - Move the machine controls to the neutral position and engage all the safety locks.

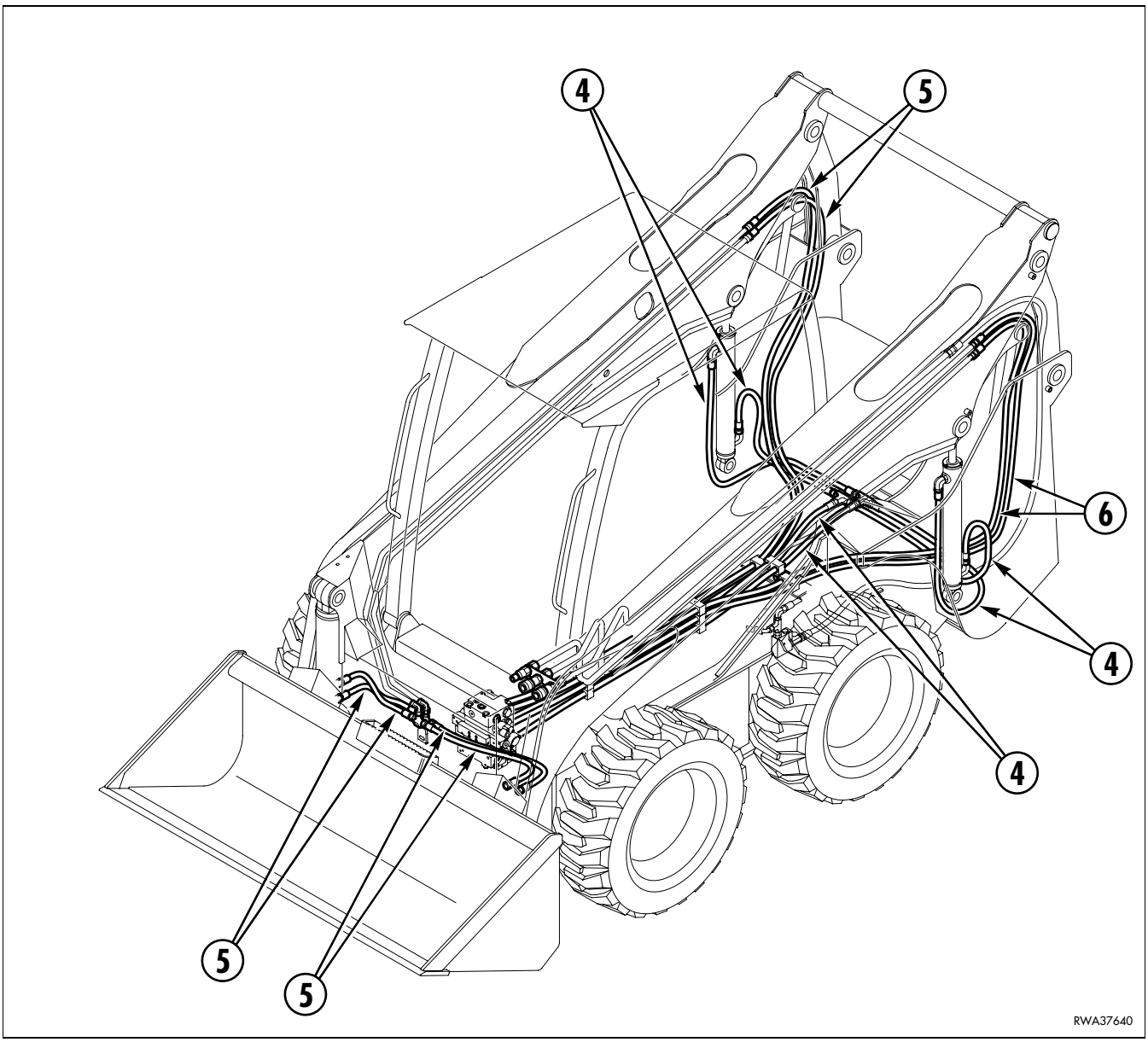
11 - Hang a warning notice on the controls to indicate the condition of the machine.

12 - Lock the engine hood.

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No.	Supplier	Engine Oil API CD, CE or CF-4	Transmission Oil GM Dexron® II C4 Allison C4	Grease LI, EP, MoS_2	Anti-freeze Coolant Permanent type
1	KOMATSU	Premium multi grade Engine Oils PM701 SAE 10W/30 SAE 15W/40	Komatsu PM704 (1902) Dexron® III	Komatsu Super Grease NLGI 2 PM706 ASTM D 128	—
2	AMOCO	Amoco 300 SAE15W/40	Dexron II ATF	Molylith grease 2	Ready Antifreeze
3	ARCO	Arcofleet S3 Plus SAE 15W/40 Hy-Vis HD extra S3 plus SAE 15W/40	ATF Dexron II	Litholine HEP 2 Arco EP moly D	Sincol-Blu (-40°C)
4	BP	Vanellus C3 SAE 15W/40 Vanellus C3 Extra SAE 15W/40	Autran MBX	Grease LTX2-M	Sigil Fluid (-40°C)
5	CALTEX	RPM Delo 500 RPM Delo 600 RPM Delo SPH	ATF-HD	Molytex EP2	AF eng. coolant CX eng. coolant
6	CASTROL	Turbomax RX super	TQ - Dexron II	Spheerol LMM	Anti-freeze (pure)
7	CHEVRON	Delo 400 Delo 500	Supreme Automatic Transmission Fluid	Moly grease	Flurant
8	CITGO	—	D-21571	—	—
9	CONOCO	Fleet motor oil SAE 15W/40	D21718 D21570	—	Fleet Heavy Duty
10	EXXON (ESSO)	Essolube TD SAE 15W/40 Heavy Truck Diesel Motor Oil SAE15W/40	ATF Dexron II D D-21849 (East Canada) D-21848 (West Canada)	MP Grease Moly	All season coolant
11	GULF	Super Duty SAE 15W/40 Super Duty plus SAE 15W/40	—	Gulfcrown EP2 Gulfcrown EP sp.I	Antifreeze and coolant
12	MOBIL	Delvac 1300 Super SAE 15W/40 Delvac 1200 Super SAE 15W/40 Delvac 1300 Super SAE 10W/30	ATF 220	Mobilgrease sp.I	—
13	PENNZOIL	Supreme duty fleet SAE 14W/40	Pennzoil ATF	Multi-purpouse white grease 705 707L white-bearing grease	Antifreeze and summer coolant
14	SHELL	Rimula Super SAE 15W/40 Myrina X SAE 15W/40 Rotella T SAE 10W/30	Donag TG (Dexron II)	Alvania EP grease MP MOS (Can.) Retinax AM (Corea)	Shellzone all season antifreeze

No.	Components related to safety that periodically need changing	Q.ty	Change interval
4	Hydraulic pipe (Lifting cylinder)	6	Every 2 years or 4000 hours, whichever occurs first
5	Hydraulic pipe (Bucket cylinder)	6	
6	Hydraulic pipe (Auxiliary hydraulic kit)	2	



4.7.2 CHECKS BEFORE STARTING

4.7.2.a VARIOUS CHECKS

WARNING

- **Dirt, oil and fuel spread in the engine compartment near the hot areas may cause fires and damage the machine.**
  Check if there are leakages frequently and carry out the necessary repairs immediately; if this occurs repeatedly, contact your Komatsu Distributor.

Before starting the engine, check:

1. if there are loose screws or nuts;
2. if there are oil, fuel or coolant leakages;
3. if the work equipment is worn;
4. the conditions of rims and tires;
5. the conditions and efficiency of: instruments and warning lights on the dashboard, acoustic alarm, working lights and horn.

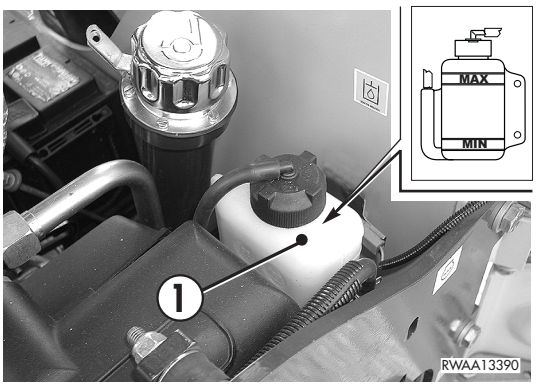
The other general checks concern safety, and precisely:

6. soundness of the safety belt;
7. soundness and legibility of the warning plates;
8. cleanliness of the handles and footboards used to reach the driverís cab, cleanliness inside the driverís cab.

4.7.2.b CHECKING THE COOLANT LEVEL

WARNING

- **Carry out this check with the machine parked on a level surface and the equipment resting on the ground.**
- **Do not remove the radiator cap; the coolant level must be checked with cold engine and by means of the compensation tank.**

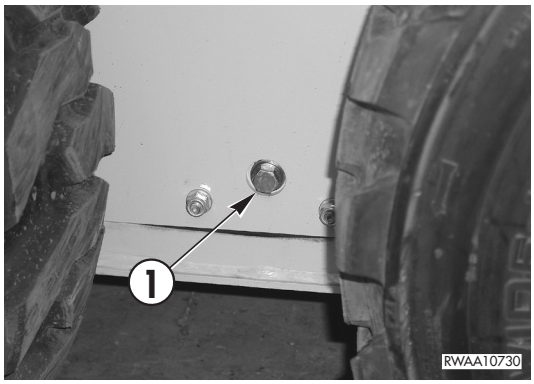


The coolant tank (1) can be reached by raising the engine hood (see “3.5.1 ENGINE HOOD”) and opening the rear panel (see “3.5.2 REAR PANEL”) and the level must be included between the MIN. and MAX. marks.
If necessary, add water or coolant and, if a constant and considerable decrease in the fluid level can be noticed, check the tightness of the radiator-engine unit and of the radiator casing.

4.7.6.e CHECKING THE OIL LEVEL IN THE FINAL TRANSMISSIONS

This check must be carried out on each transmission, with the machine at rest on level ground.
The check is visual and serves to verify that the lubricant reaches the height of the hole (1); if this is not the case, top up using the recommended type of oil.
(See “4.3 FUEL, COOLANT AND LUBRICANTS”).
Use a 19 mm hexagon spanner.





4.7.9 MAINTENANCE EVERY 1000 HOURS OF OPERATION

These operations must be carried out together with those to be carried out EVERY 50, 250, 500 HOURS.

4.7.9.a CHANGING THE OIL IN THE FINAL TRANSMISSION

WARNING

- **Oils, filters, coolants and batteries are considered special waste and must be collected and disposed of according to the anti-pollution regulations in force.**

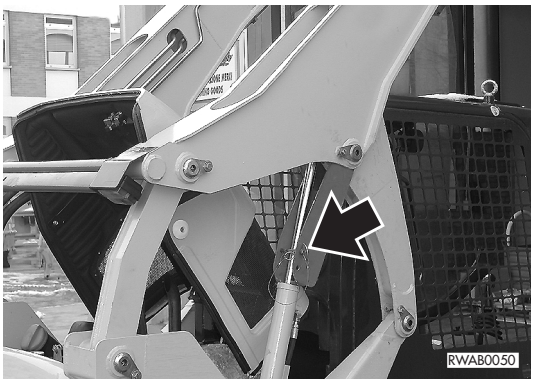
This operation must be carried out on each transmission with the machine parked on level ground and at operating temperature, so that the oil becomes fluid and can be drained easily together with the solid particles suspended in it.
Before changing the oil, lift the loader arm and secure it with the safety lock (see “3.1.1 MACHINE LOCKS”).

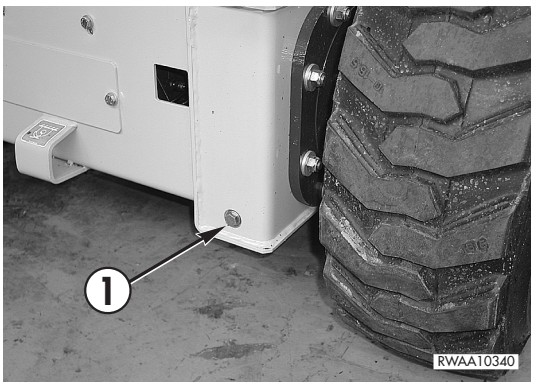
1 - Remove the drain plug (1) and let the used oil flow out completely. Use a 19 mm hexagon spanner.
While the oil flows out, remove the plug (2). Use a 19 mm hexagon spanner.

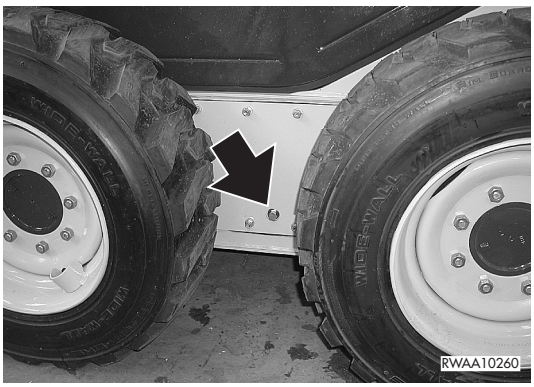
2 - After draining the used oil, put back the plug (1) and fill with the recommended oil through the hole (2) until the oil reaches the lower edge of the hole.

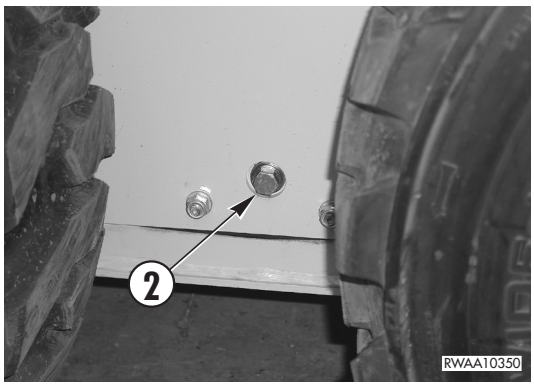
3 - Put back the plug (2).

Carry out some movements and check the level again with the machine at rest. Use only the recommended type of oil (see “4.3 FUEL, COOLANT AND LUBRICANTS”).









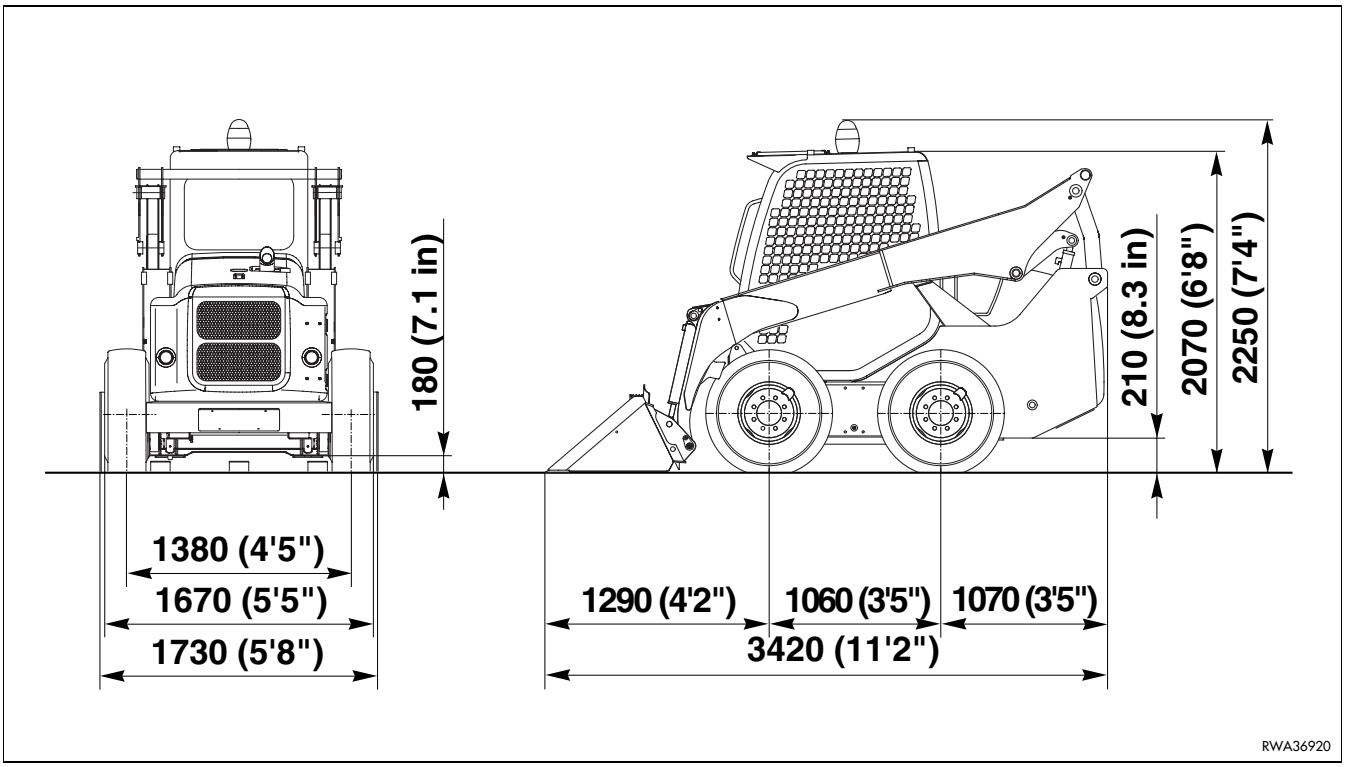
5.1 TECHNICAL DATA

5.1.1 STANDARD MACHINE OVERALL DIMENSIONS

IMPORTANT

- **The weight of the machine increases by 200 kg (441 lb) when it is equipped with solid tires.**
- **If the bucket is provided with teeth, the machine length increases by 100 mm (3.9 in).**

OVERALL DIMENSIONS WITH STANDARD BUCKET L 1730 (5’7”) AND TIRES (10x16.5)



6.1 AUTHORIZED OPTIONAL EQUIPMENT

CAUTION

- **Komatsu machines can be supplied with optional equipment in addition to the standard equipment; if optional equipment is installed and used, carefully read the relevant operation manual and keep to the instructions given therein.**
- **Use exclusively optional or special equipment recommended and approved by Komatsu and complying with the requisites indicated in the table (see "6.1.3 CHARACTERISTICS OF THE OPTIONAL EQUIPMENT").**
- **Komatsu cannot be held liable for any damage, accident, reduction of the machine efficiency due to the application and use of unauthorized equipment.**

6.1.1 PRECAUTIONS REGARDING SAFETY

The installation of optional accessories or equipment other than those authorized by Komatsu shortens the life of the machine and may also cause problems concerning safety.
It is advisable to contact a Komatsu Distributor before installing any accessory not indicated in this operation and maintenance manual.
In case of failure to comply with this recommendation, Komatsu declines any responsibility for accidents or damage.

WARNING

- **When removing or installing any equipment, take the following precautions and be careful to the safety conditions.**
- **Carry out installation and removal on a firm and flat surface.**
- **When the operations are carried out by two or more operators, decide the communication signals in advance and respect them during the operations.**
- **Use a crane to handle objects weighing more than 25 kg (55 lb).**
- **Always support any heavy part before removing it. When heavy parts are lifted, be always careful to the position of the center of gravity of the object being handled.**
- **It is very dangerous to carry out any operation with a suspended load; therefore, always position the load on a support and make sure that it is in a safe position.**
- **When installing or removing any equipment, make sure that it is stable and cannot fall down.**
- **Never stand under loads being lifted by a crane.**
  Take care to choose a safe position, where you do not run any risk in case the load should fall down.

IMPORTANT

- **Cranes must be operated by specialized personnel. Do not allow non-specialized personnel to use cranes.**

For further details regarding installation and removal operations, contact your Komatsu Distributor.

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