1.2 INFORMATION ON SAFETY

Many accidents are caused by insufficient knowledge of and failure to comply with the safety regulations prescribed for the maintenance operations that must be performed on the machine.
In order to avoid accidents, before starting work and before carrying out any maintenance operation, carefully read and be sure to understand all the information and warnings contained in this manual and given on the plates applied on to the machine.
To identify the messages regarding safety that are included in this manual and written on the machine plates, the following words have been used.

DANGER

- **This word is used in the safety warnings in the manual and on the plates when the situation is dangerous and it may possibly result in serious injuries or even death.**
  These warning messages and plates describe the safety precautions to be taken in order to avoid any risk. Non-compliance with these instructions may also result in serious damage to the machine.

CAUTION

- **This word is used in the safety warnings in the manual and on the plates to signal risks that may cause moderate damage or injuries.**
  This kind of message can be used even to indicate the risk of damage to the machine only.

IMPORTANT

- **This word is used when precautions are indicated, which must be taken to avoid actions that may shorten the life of the machine.**

Komatsu Utility cannot reasonably predict every circumstance that might involve a potential hazard during the operation or maintenance of the machine; for this reason, the safety messages included in this manual and applied on to the machine plates may not include all possible safety precautions.
If all the procedures and operations prescribed for this machine are kept to, you can be sure that the operator and the persons in the vicinity of the machine will work in total safety, with no risk of injuries or damage. In case of doubt regarding the safety measures necessary for some procedures, contact Komatsu Utility or your local Dealer.

DANGER

- **Before starting any maintenance operation, position the machine on a firm and level surface, lower the equipment to the ground, engage the safety locks of the equipment and of the controls and stop the engine.**

DANGER

- **To make the information clearer, some illustrations in this manual represent the machine without safety guards. Do not use the machine without guards and do not start the engine when the engine hood is open, unless this is expressly prescribed for some specific maintenance operations.**

1.3.3 MAIN CHARACTERISTICS

- Simple and easy operation.
- Hydrostatic transmission obtained through a double variable displacement pump and axial piston motors operating epicyclic reduction gears.
- Four driving wheels always engaged through oil-immersed roller chains.
- Main equipment and travel control through servo levers ensuring also combined movements that can be modulated proportionally and continually.
- Foot control for the optional equipment (if installed).
- Foot accelerator.
- Lever accelerator.
- Parking brake control.
- Complete series of instruments visible from the operating position.
- Easy maintenance with simplified intervals.
- Road travel (on request).

1.3.4 RUNNING-IN

Every machine is scrupulously adjusted and tested before delivery.
A new machine, however, must be used carefully for the first 100 hours, in order to ensure proper running-in of the various components.
If the machine is subjected to excessive work load at the beginning of operation, its potential yield and its functionality will be untimely reduced.
Every new machine must be used carefully, paying special attention to the following indications:

- After starting the engine, let it idle for 5 minutes, in such a way as to warm it up gradually before actual operation.
- Avoid operating the machine with the limit loads allowed or at high speed.
- Avoid abrupt starts or accelerations, useless sudden decelerations and abrupt reversals.
- After the first 50 hours of use, carry out the following operations, in addition to those to be performed every 50 hours:
  1 - Check the gearing chain tension.
  2 - Check the wheel nut tightening.
- After the first 250 hours of use, carry out the following operations, in addition to those to be performed every 250 hours:
  1 - Change the hydraulic circuit drain filter.

SYNTHETIC BIODEGRADABLE OIL TYPE HEES

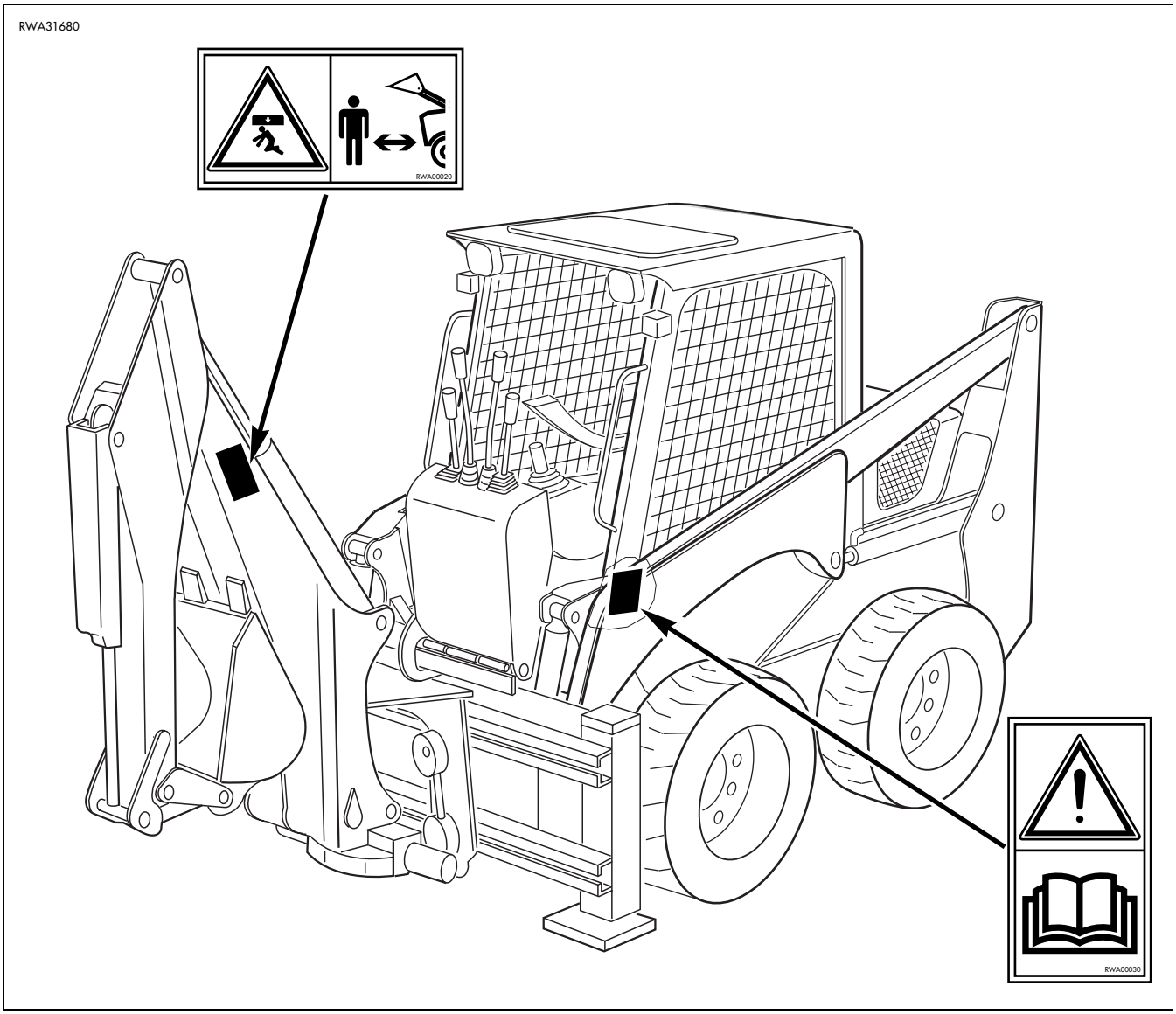
On machines in which the synthetic biodegradable oil type HEES is used, carry out the following operations in addition to the routine maintenance:

- After the first 50 hours of operation, change the hydraulic circuit drain filter.
- After the first 500 hours of operation, change the hydraulic circuit oil.

☞ **IMPORTANT**

- **When changing the oil filters (cartridges), check their inner part to make sure that there are no deposits. If considerable deposits can be observed, find out what may have caused them before restarting the machine.**
- **The number of operating hours is indicated by the hour meter.**

2.1.1.2 SAFETY PLATES FOR MACHINES WITH EXCAVATOR

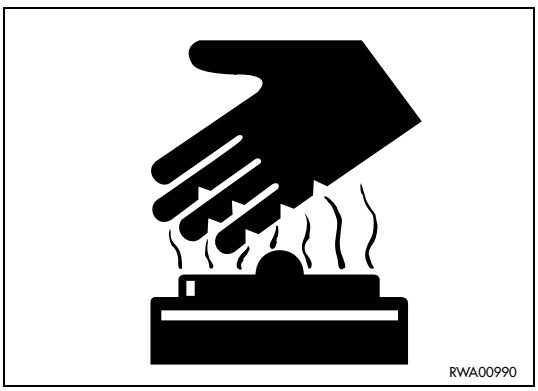


2.2.8 PREVENTING FIRES DUE TO FUEL AND OIL

Fuel, oil and some types of antifreeze can be easily ignited if they get in contact with a flame. Fuel is particularly flammable and therefore extremely hazardous.

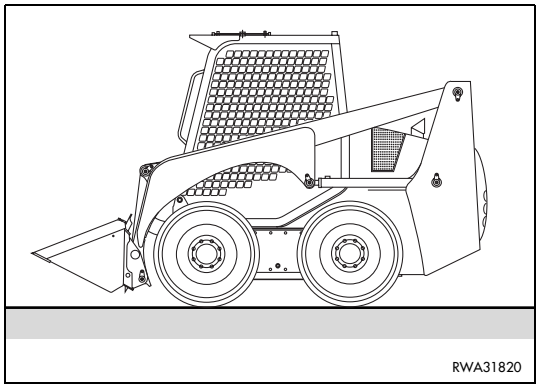
- Keep any naked flame away from flammable fluids.
- Stop the engine and do not smoke when refuelling.
- Top up with fuel and oil only after stopping the engine and in well ventilated areas.
- Top up with fuel and oil in a well delimited area and do not allow unauthorized persons to approach.
- When refuelling, hold the fuel gun firmly and keep it constantly in contact with the filler until you have finished, in order to avoid sparks due to static electricity.
- After topping up, tighten the safety caps of the fuel and oil tanks securely.
- Do not fill the tank completely, in order to leave room for the fuel to expand.
- In case some fuel is spilled, wipe it up immediately.

2.2.9 PREVENTING BURNS



- If the engine coolant, the engine oil and the hydraulic oil are hot, use heavy cloths and wear gloves, heavy clothing and safety goggles before carrying out any check or touching the hot parts.
- Before checking the coolant level, stop the engine and let the fluid cool down.
  If a check is necessary due to the overheating of the engine, slowly loosen the radiator cap to release any residual pressure before removing it. The hot fluid that spurts out may cause serious burns.
- Before checking the engine oil and the hydraulic circuit oil levels, stop the engine and let the oil cool down. The hot oil that can be sprayed out of the tank may cause serious burns.

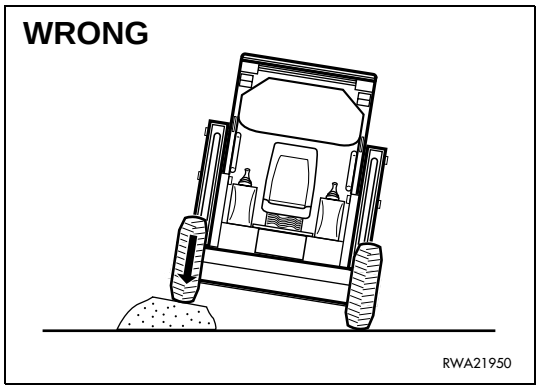
2.4.4 MOVING THE MACHINE



☞ **IMPORTANT**

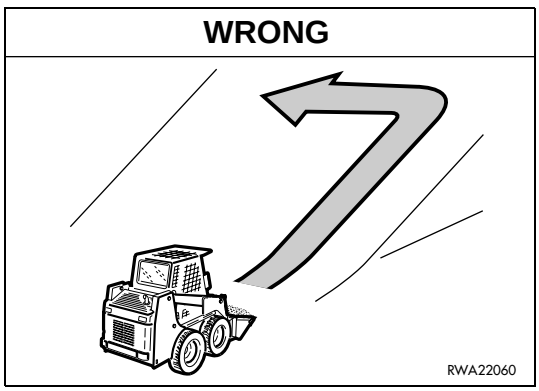
- **The use of the speed increase function is allowed only for the fast speed transfers of the machine.**

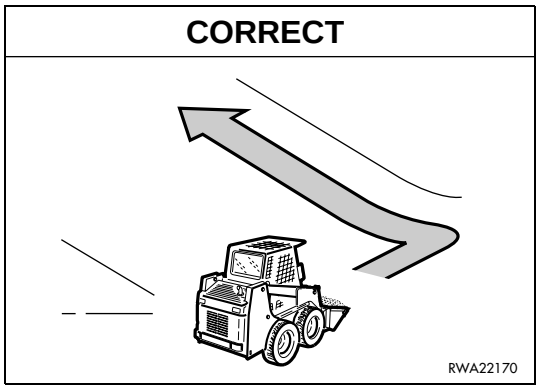
- When moving the machine, lower the arm and fold the bucket completely; this position makes it possible to evaluate the space required for the movements more precisely and at the same time ensures the stability of the machine.
- If the equipment control levers must be used during travel, avoid moving them abruptly; sudden manoeuvres change the attitude of the machine and make driving difficult.
- When travelling on rough ground, keep the speed low and avoid sudden movements of the bucket arm.
- If possible, avoid moving on obstacles.
  If the machine has to travel over an obstacle, keep the equipment as close to the ground as possible and travel at low speed. Never move on obstacles that may incline the machine considerably (over 10°).
- If one of the two wheels goes over an obstacle or gets into a hole in the ground, the machine may overturn.
  In these cases, reduce the speed to minimum and be very careful to the balance of the machine.



2.4.5 WORKING ON SLOPES

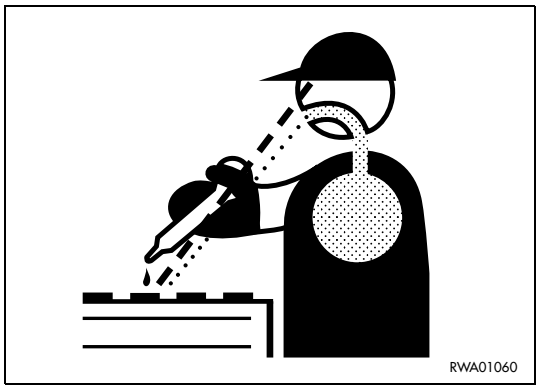
- Operations on slopes and on river or lake banks with damp ground may result in the tipping over or slipping of the machine.
- Do not operate with the bucket before the tractor.
- On hills, banks or slopes, keep the arm lowered and the bucket folded and in case of emergency quickly lower it to the ground to help the machine stop.
- Do not change direction and if possible avoid travelling obliquely when working on slopes. It is advisable to go down or up to a flat surface before performing these manoeuvres.



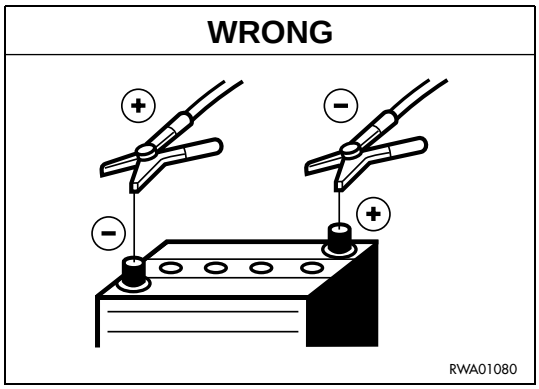


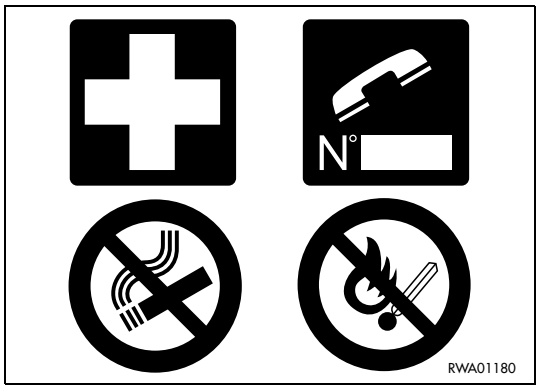
2.6 BATTERY

2.6.1 SAFETY PRECAUTIONS FOR WORK ON BATTERIES

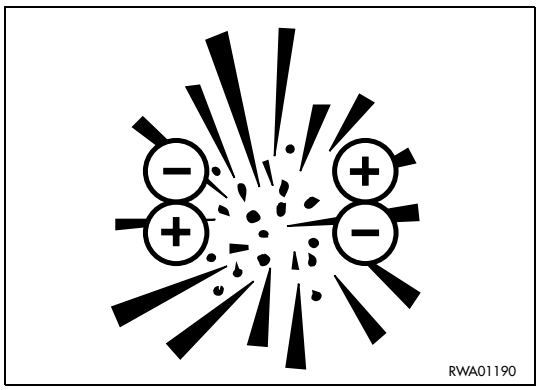


- Electrolytic batteries contain sulphuric acid which can cause burns. It can also corrode clothing and make holes in it. If you inadvertently splash battery acid on yourself or on someone else, immediately wash the affected part with plenty of water.
- Battery acid may cause blindness if it comes into 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 naked 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.



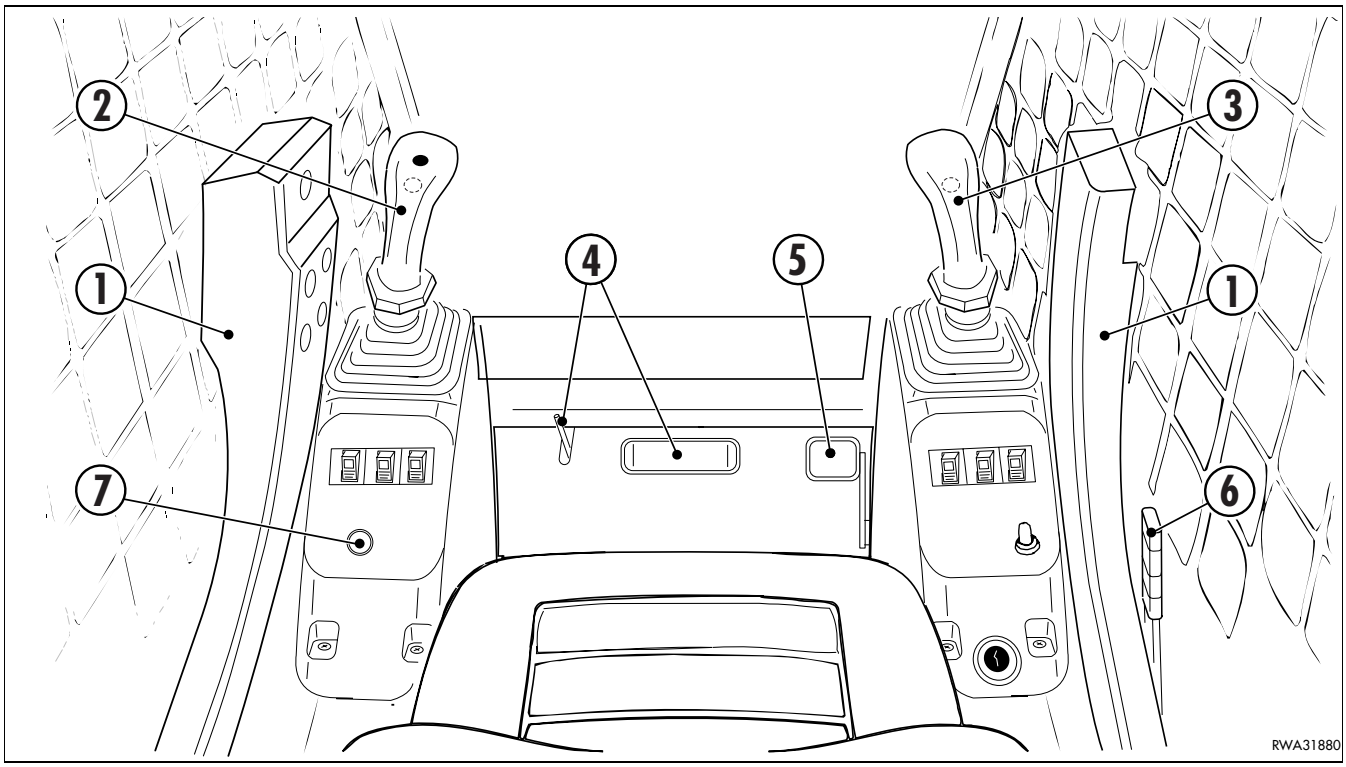


2.6.2 STARTING WITH BOOSTER CABLES

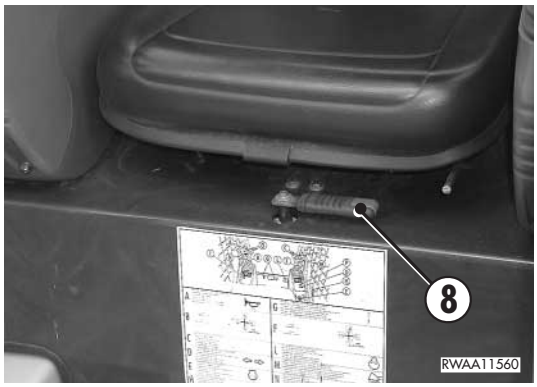


- When starting the machine with booster cables, always wear safety goggles.
- When starting the engine by means of another machine, avoid any contact between the two machines.
- Be sure to connect the positive cable (+) first and then the negative or earth cable (-) when connecting the booster cables. After the start, disconnect first the negative or earth (ñ) cable and then the positive cable (+).
- Connect the batteries in parallel: positive to positive and negative to negative.
- When connecting the earth 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").

3.2.3 CAB INSIDE GENERAL VIEW

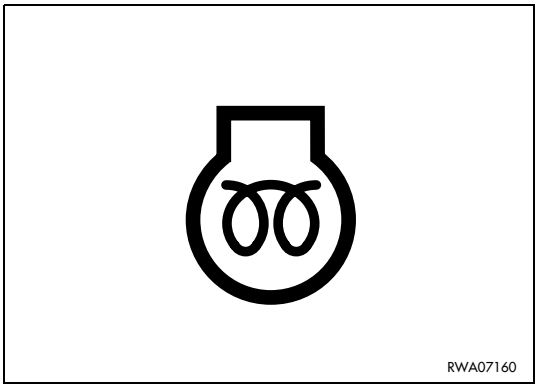


1 - Safety bars
2 - Travel and steering control lever (ISO PATTERN SYSTEM)
- Left wheel travel and arm lifting control lever (OPTIONAL PATTERN SYSTEM)
3 - Bucket lifting control lever (ISO PATTERN SYSTEM)
- Right wheel travel and bucket folding control lever (OPTIONAL PATTERN SYSTEM)
4 - Auxiliary hydraulic kit control pedal (if installed)
5 - Foot accelerator
6 - Hand accelerator
7 - Parking brake
8 - Equipment control locking lever (if installed)
9 - Dashboard



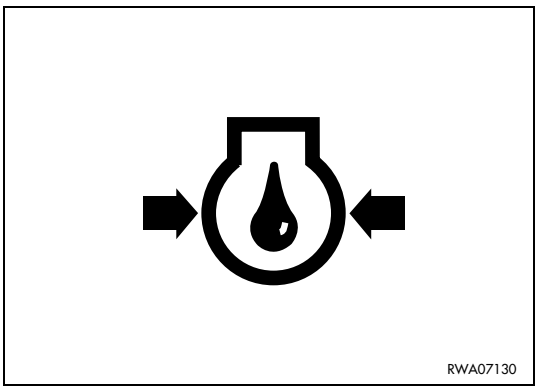
2 - PREHEATING WARNING LIGHT

This warning light comes on when the ignition key is turned to position « » to start the engine at low temperatures and goes out automatically after approximately 13 seconds (see «3.6.2.2 Starting with cold engine or in cold climates»).



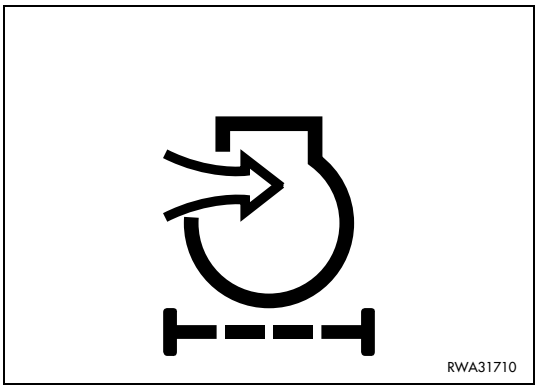
3 - ENGINE OIL PRESSURE WARNING LIGHT

This warning light comes on and activates the acoustic alarm with engine at rest when the starting circuit is energized and goes out as soon as the engine lubrication circuit is pressurized.
If this warning light remains on or comes on with the engine running, stop the machine immediately and try to locate the trouble.



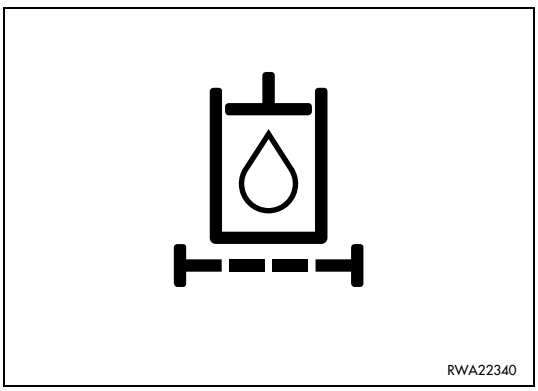
4 - AIR CLEANER CLOGGING WARNING LIGHT

This warning light comes on when the engine air filter needs cleaning.

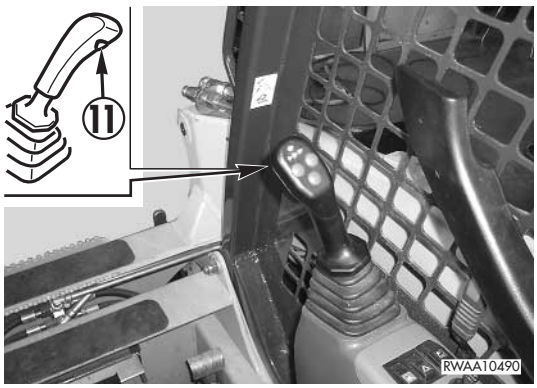


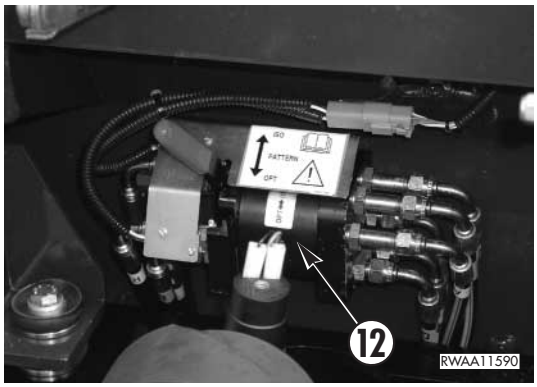
5 - HYDRAULIC OIL FILTER CLOGGING WARNING LIGHT

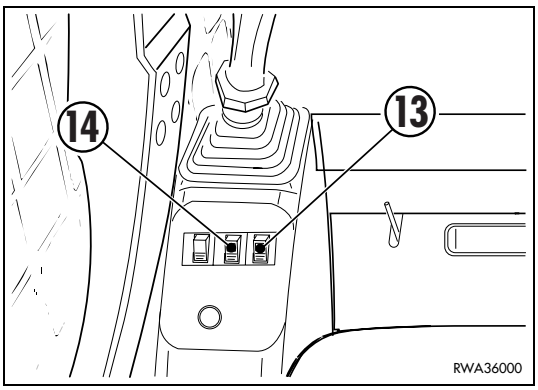
This warning light comes on when the hydraulic circuit filter needs replacing.

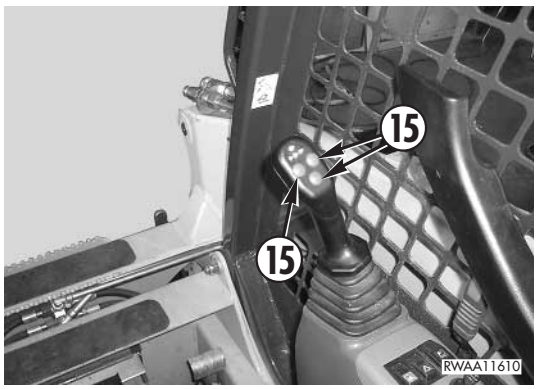


11 - Floating device control (if installed)
12 - Pattern shifting control (if installed)
13 - Right stabilizer control (if installed)
14 - Left stabilizer control (if installed)
15 - Optionals









OPTIONAL PATTERN CONTROL SYSTEM

2 - LEFT WHEEL TRAVEL, STEERING AND ARM LIFTING CONTROL LEVER

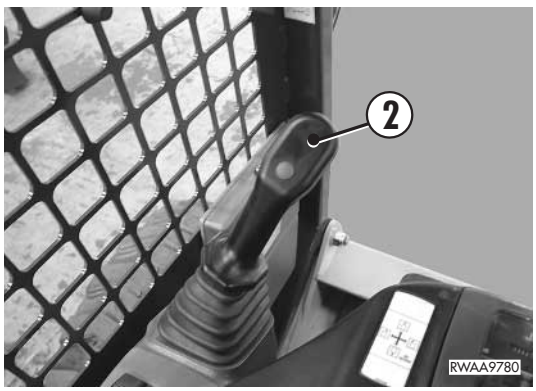
DANGER

- **Before carrying out any manoeuvre with this lever, the operator must be seated in the work position with fastened safety belt; before every manoeuvre the operator must take all the precautions indicated in "3.6.5 HOW TO MOVE THE MACHINE" and "3.13 USING THE EQUIPMENT".**
- **Before moving, make sure that the parking brake is disengaged.**
- **When travelling on roads, always lock the equipment control (see "3.3.5 pos. 8 EQUIPMENT CONTROL LOCKING LEVER").**
- **When travelling on roads, make sure that all the safety devices have been engaged.**
- **Before leaving the work position, lower the equipment to the ground and lock the safety bars (vertical position), then stop the engine.**
- **Failure to comply with these rules 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.**

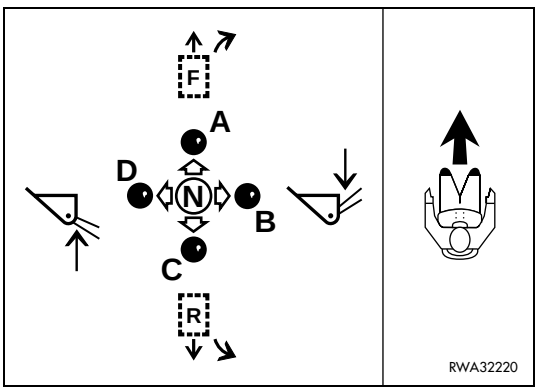
The travel control lever (2) is positioned on the operatorís left and serves to control the forward and reverse movements, the steering of the machine to the right, the arm lifting and lowering function, according to the movements indicated in the diagram.



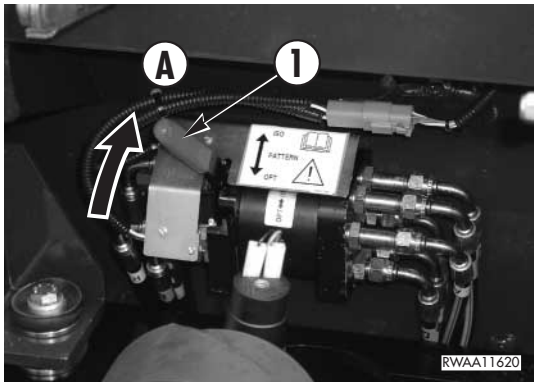
IMPORTANT

- **To move the machine forward or backward, shift the control levers (2) and (3) at the same time and in the same direction.**

N - Neutral
A - Forward right steering
B - Arm lowering
C - Reverse right steering
D - Arm lifting

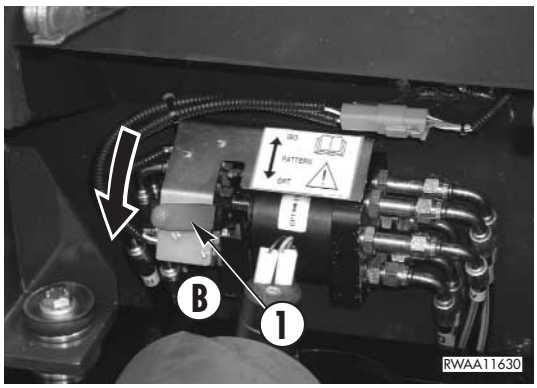


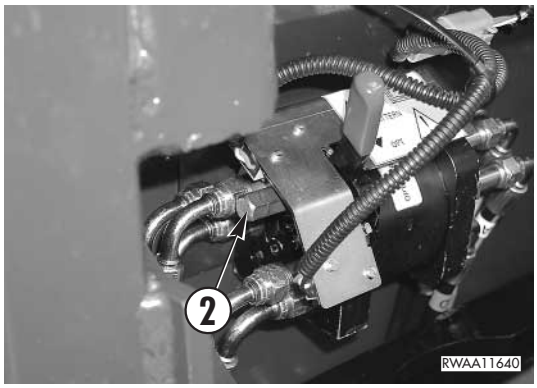
The control system selection lever (1) is held in the correct position by means of a safety screw (2).
When it is necessary to modify the control system, loosen the safety screw (2) until releasing the lever (1). Use a 13 mm spanner.
Select the desired control system and fix the lever in position with the safety screw (2).



☞ **IMPORTANT**

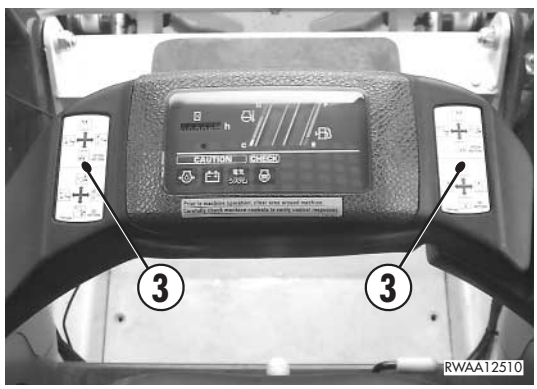
- **Before moving the machine, the operator must make sure that the selected control system is the one that is required.**





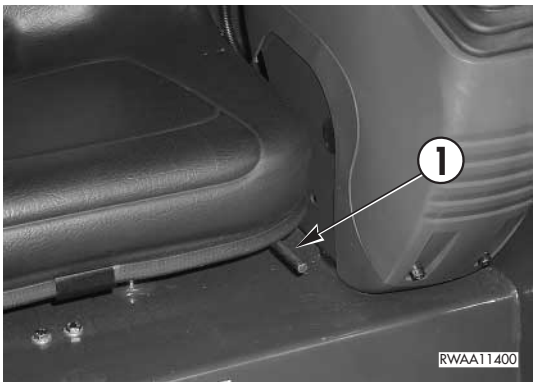
☞ **IMPORTANT**

- **The control panels (3) positioned at the sides of the central dashboard are lit from behind. The lighting of the plates is useful to the operator for the identification of the type of control selected (ISO PATTERN control or OPTION control).**



3.5.4 STANDARD SEAT

The seat can be adjusted longitudinally and the operator can choose the driving position that is most suitable for his physique.
The longitudinal adjustment of the seat is obtained by operating the lever (1) and making the seat slide on the guides; once the desired position has been found, release the lever and carry out slight movements, in order to make sure that the lock pin is engaged in its seat.



3.5.5 CUSHIONED SEAT

This seat is extremely comfortable, offering four adjustment options:

a - longitudinal adjustment;

b - back inclination adjustment;

c - adjustment of the suspension, aimed at dampening the inevitable vibrations and jerks as much as possible;

d - seat cushion inclination adjustment.

The operator can choose the driving position that is most suitable for his physique.
The longitudinal adjustment of the seat is obtained by operating the lever (1) and making the seat slide on the guides; once the desired position has been found, release the lever and carry out slight movements, in order to make sure that the lock pin is engaged in its seat.
The back adjustment is achieved by operating the lever (2); operate the lever and try to find the position that is most suitable for the operatorís physical structure. Three different degrees of inclination are possible.
The adjustment of the suspension is carried out with the lever (3), according to the operatorís weight. The suspension can be stiffened or lightened according to the operatorís needs; adjust the seat suspension by positioning the lever (3) in one of the five seats available for this purpose. Shift the lever to the left to stiffen the suspension or to the right to lighten it.
The inclination of the seat cushion is obtained by operating the lever (4) and positioning the front part of the cushion at the same time; it is possible to select 2 different positions.

3.6.2 STARTING THE ENGINE

DANGER

- **Before starting the engine, carefully read the instructions and information regarding safety given in this manual and make sure that you know the controls perfectly.**
  From the moment in which the engine is started, the operator is directly responsible for any damage that may be caused by wrong manoeuvres and non-compliance with the safety regulations in force.
- **Before starting the engine, make sure that there is no one within the operating radius of the machine and sound the horn.**

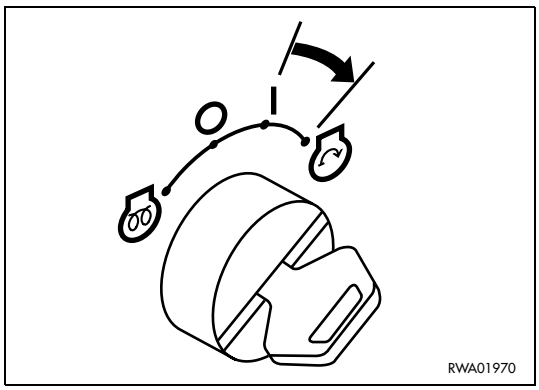
3.6.2.1 STARTING WITH WARM ENGINE OR IN TEMPERATE CLIMATES

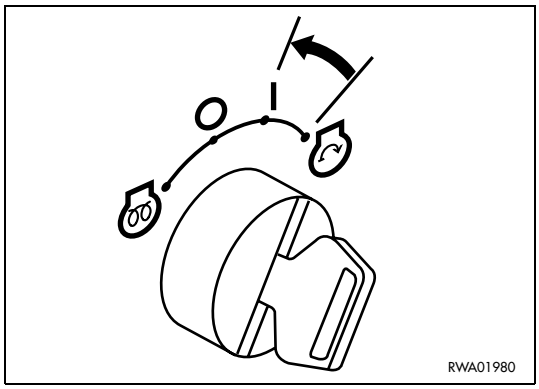
1 - Turn the ignition key directly to position «» (START).

2 - As soon as the engine starts, release the ignition key, which will automatically return to position «**I**».

IMPORTANT

- **If the engine does not start within 15 seconds, release the key, which will automatically return to position «I» and wait for 30 seconds before trying again.**



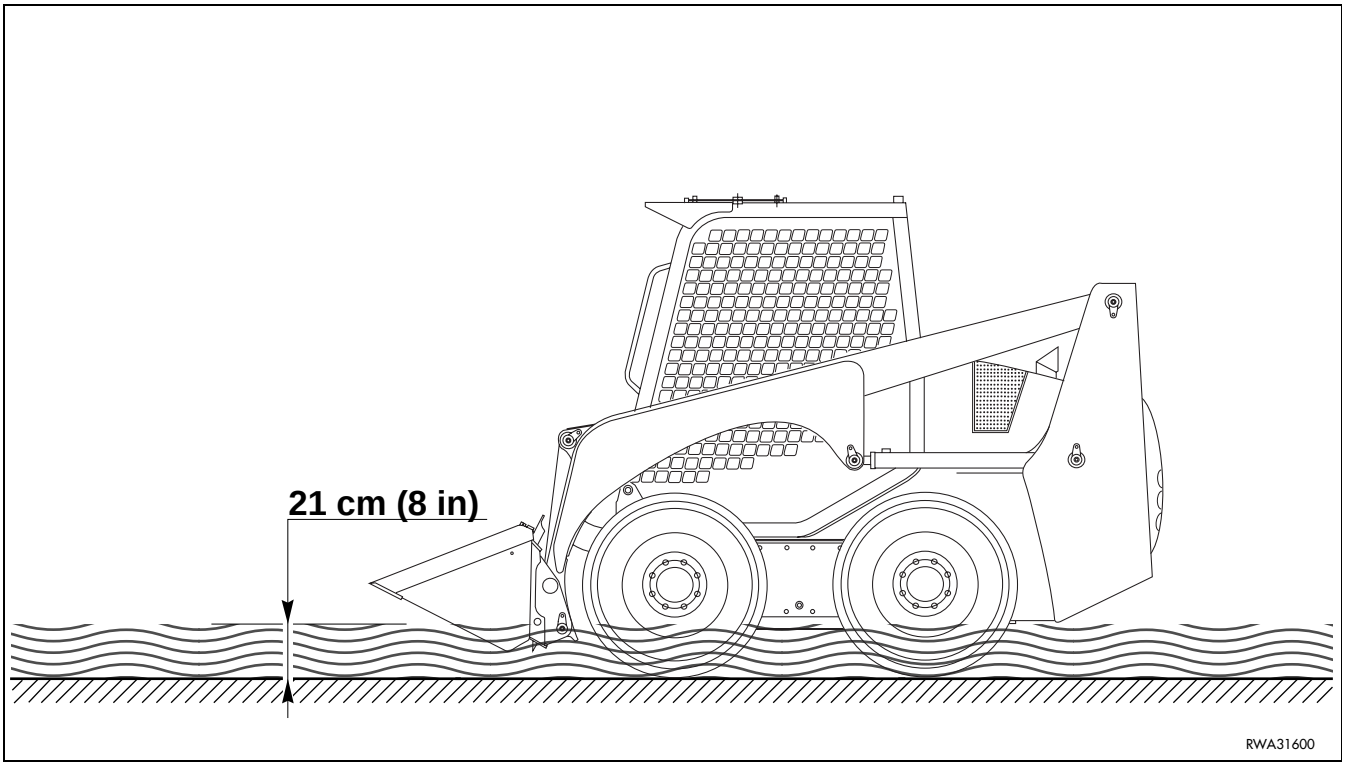


3.6.8 MAXIMUM IMMERSION DEPTH

DANGER

- **If it is necessary to work with the machine immersed in water on river banks or sea shores, always check the water depth and the current flow.**
- **Make sure that the surface on which you are working is sufficiently firm.**

If it is necessary to work with the machine immersed in water, make sure that the maximum immersion depth does not exceed 21 cm and in any case that the engine cooling fan does not touch the water, since it may get damaged or even break.



CAUTION

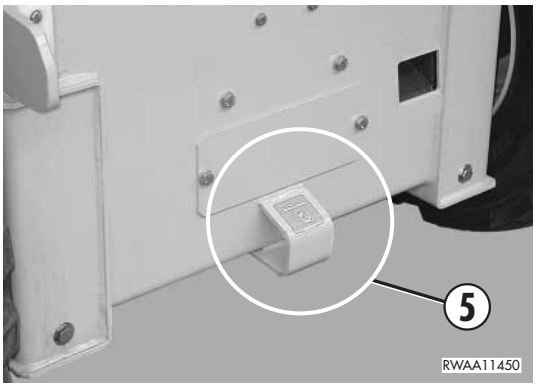
- **When working in water or on muddy ground, lubricate the articulated joints more frequently than usual.**
- **After work, remove any dirt or mud and lubricate the articulated joints.**

3.9 TRANSPORTING THE MACHINE ON OTHER VEHICLES

3.9.1 LOADING AND UNLOADING THE MACHINE

DANGER

- **The loading and unloading of the machine on/from the means of transport must be carried out on a flat surface and at a safety distance from the edges of ditches or from roadsides.**
- **Block the means of transport by positioning wedges before and behind each wheel.**
- **Make sure that the ramps are sufficiently strong; if necessary, reinforce them with blocks, in order to prevent any dangerous bending.**
- **Make sure that the ramps have the same length, are firmly anchored to the vehicle, are parallel to each other and perpendicular to the loading board; the distance between the ramps must be suitable for the machine gauge.**
- **Position the ramps with a maximum inclination of 15º.**
- **Remove any trace of oil, grease or ice from the ramps and the loading board.**
- **Do not change direction when the machine is already on the ramps; if necessary, go down and find the correct direction.**



1 - The machine with empty bucket or without optional accessories must get on the ramps with the bucket (1) at the back and raised from the ground.

2 - Once the machine has been loaded, lower the work equipment to the ground and shift the safety bars to the lock position.

3 - Apply the parking brake.

4 - Stop the engine and remove the ignition key.

5 - Keep the machine in position by putting wedges (2) before and behind the wheels.

6 - Fix the machine with tie-downs or chains (3) in the anchorage points (5) and (6).

7 - Protect the end of the exhaust pipe (4).