WEAM000704

Operation & Maintenance Manual

WB97S-2

BACKHOE-LOADER

SERIAL NUMBER

WB97S-2 97SF11205 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.

KOMATSU

Utility

1.1 FOREWORD

- This manual has been carried out by Komatsu Utility in order to supply their customers with all the necessary information on the machine and the safety regulations related to it, together with the use and maintenance instructions that enable the operator to exploit the capacity of the machine with optimal results and to keep the machine efficient over time.
- The operation manual, together with the spare parts catalogue, is an integral part of the machine and must accompany it, even when it is resold, until its final disposal.
- The manual must be handled with the greatest care and always kept on board the machine, so that it can be consulted at any moment; it must be placed in the appropriate compartment behind the seat, where also the ownership documents and the logbook are usually kept (see “3.5.10 TECHNICAL DOCUMENTATION”).
- This manual must be given to the persons who have to use the machine and carry out the routine maintenance operations; they must read the contents carefully more than once, in such a way as to clearly understand what are the correct operating conditions and the dangerous conditions that must be avoided.
  In case of loss or damage, request a new copy to Komatsu Utility or your Komatsu Utility Dealer.
- The illustrations contained in this manual may represent machine configurations available upon request.
  Komatsu Utility machines are constantly improved in order to increase their efficiency and reliability; this manual sums up all the information regarding the most recent techniques applied at the moment in which the machine is marketed.
  For any further and/or updated information, contact your Komatsu Utility Dealer.
- For the various maintenance phases it is advisable to consult the hour meter and in particular the maintenance plan set on the electronic unit of the machine frequently. The display of the maintenance plan can be obtained by means of an appropriate screen positioned on the upper part of the front dashboard. In any case, the maintenance plan can be also consulted on the relevant manual provided. Keep to the various maintenance intervals indicated on the screen and on the use and maintenance manual.
- Over the years Komatsu Utility Dealers have gathered considerable experience in customer service.
  If more information is needed, do not hesitate to contact your Komatsu Utility Dealer: he always knows how to get the best performance from the machine, he can suggest the use of the equipment that is most suitable for specific needs and can provide the technical assistance necessary for any change that may be required to conform the machine to the safety standards and traffic rules.
  Furthermore, Komatsu Utility Dealers also ensure their assistance for the supply of Komatsu Utility genuine spare parts, which alone guarantee safety and interchangeability.
- The table included in this manual must be filled in with the machine data, which are the data that must always be indicated to the Dealer when requiring assistance and ordering spare parts.

CAUTION

- **The incorrect use of the machine and inappropriate maintenance operations may cause serious injuries and even death.**
- **Operators and maintenance personnel must carefully read this manual before using the machine or performing maintenance operations.**
- **Any serious accident that may occur during the use of the machine or during maintenance operations is due to failure to comply with the instructions given herein.**
- **The procedures and precautions described in this manual are valid for application to the machine only when it is used correctly.**
  If the machine is used for any purpose or in any way other than those described herein, the operator shall be responsible for his own safety and for the safety of any other person involved.

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 onto the machine, so that you can follow the instructions without making mistakes.
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 messages 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.**
  The 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 onto the machine 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 can work in total safety, with no risk of damaging the machine. 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 firm and level ground, engage the safety locks of the equipment and controls, stop the engine and apply the parking brake.**

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 protection casing is open, if this is not expressly prescribed for some specific maintenance operations.**

DANGER

- **It is strictly forbidden to modify the setting of the hydraulic system safety valves; Komatsu Utility cannot be held liable for any damage to persons, property or the machine, if this has been tampered with by modifying the standard setting of the hydraulic system.**

DANGER

- **Before carrying out any electrical welding, disconnect the battery, the alternator and the connector of the gearshift unit installed under the steering wheel (see "2.8.13 PRECAUTIONS CONCERNING THE BATTERY AND THE ALTERNATOR" - "2.8.15 PRECAUTIONS CONCERNING THE GEARSHIFT").**

DANGER

- **Install only authorized additional equipment (see "6.1 AUTHORIZED OPTIONAL EQUIPMENT").**

DANGER

- **The machine can travel on roads only if provided with homologated equipment; before travelling on roads, make sure that the equipment with which the machine is provided is homologated and that the safety locks are correctly connected.**

1.3 INTRODUCTION

1.3.1 INTENDED USES

The Komatsu Utility BACKHOE LOADERS described in this manual have been designed and constructed to be used mainly for the following functions:

- LOADER
- EXCAVATOR

Through the installation of optional equipment, the machine can also be used for the following applications:

- HANDLING OF MATERIALS (4IN1 BUCKET - PALLET FORKS)
- SNOWPLOUGH (ANGLEDOZER BLADE - SNOWPLOUGH)
- DEMOLITION (HAND HAMMER - HAMMER ON THE BACKHOE)
- DITCH CLEANING AND DIGGING (SPECIAL BUCKETS)

1.3.2 IMPROPER OR UNAUTHORIZED USES

CAUTION

- **This paragraph describes some of the improper or unauthorized uses of the machine; since it is impossible to predict all the possible improper uses, if the machine happens to be used for particular applications, contact your Komatsu Utility Dealer before carrying out the work.**

IMPORTANT

- **The instructions regarding the authorized optional equipment are given in the relevant operation and maintenance manuals; if the equipment is supplied by Komatsu Utility, these publications are enclosed to this manual.**
- **The instructions regarding the assembly of the authorized equipment, the controls requiring special arrangement on the machine and the hydraulic couplings necessary for the operation of the equipment are grouped in the final section of this manual.**

Komatsu Utility backhoe loaders are constructed exclusively for the handling, excavation and treatment of inert materials; therefore, the following uses are absolutely forbidden:

- USE OF THE MACHINE BY MINORS OR INEXPERIENCED PERSONS.
- USE OF THE MACHINE FOR LIFTING PERSONS OR OBJECTS.
- TRANSPORTATION OF PERSONS even if they are in the operator's cab.
- TRANSPORTATION OF CONTAINERS with fluids, flammable fluids, loose material, without the appropriate slinging equipment.
- TRANSPORTATION AND LIFTING (EVEN IF IN EXCEPTIONAL CASES) OF EQUIPMENT OR MATERIALS THAT PROTRUDE FROM THE BUCKET OR ARE NOT SECURED TO THE BUCKET BY MEANS OF ROPES OR CHAINS.
- USE OF THE BUCKET FOR DRIVING OR EXTRACTING PILES.
- USE OF THE MACHINE FOR TOWING DAMAGED VEHICLES ON ROADS.
- USE OF THE MACHINE FOR LIFTING DAMAGED VEHICLES.

1.3.3 MAIN CHARACTERISTICS

- Simple and easy operation.
- Servo-assisted steering with priority hydraulic system.
- Three steering modes that can be selected with a push button:
  - Two-wheel steering
  - All-wheel steering
  - Crab steering
- Gearshift with electronic gear selection through solenoid valve actuators and transmission with hydraulic converter; reversal and gear shifting with controls on a single lever.
- Loader control through a single lever ensuring also combined movements that can be modulated proportionally and continually.
- Backhoe controls with two levers ensuring also combined movements that can be modulated proportionally and continually.
- Complete series of instruments visible from the two operating positions (loader or backhoe).
- Separate accelerator controls for the two operating positions.
- Foot brake control.
- Easy maintenance with simplified intervals.
- Automatic engagement and disconnection of the differential locking on both axles (front and rear).

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 shortly and untimely reduced.
Every new machine must be used carefully, paying special attention to the following indications:

- After the start, let the engine 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 250 hours, carry out the following operations, in addition to those to be performed every 250 hours:
  1 - Change the hydraulic transmission oil and filter.
  2 - Change the differential unit oil (front and rear axle).
  3 - Change the oil in the final reduction gears (front and rear axle).
  4 - Check and adjust the engine valve clearance.
  5 - Change the hydraulic circuit oil filter.

SYNTHETIC BIODEGRADABLE OIL TYPE HEES

On machines in which the synthetic biodegradable oil type HEES is used, the following operations are to be performed besides the standard maintenance operations:

- 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 innner part to make sure that there are no deposits.**
  If considerable deposits are observed, find out what may have caused them before starting the machine.
- **The number of operation hours is indicated by the hour meter, while the partial service hours for the various maintenance operations to be carried out on the machine are stored and displayed on the electronic screen positioned on the front dashboard.**

1.4 PRODUCT IDENTIFICATION

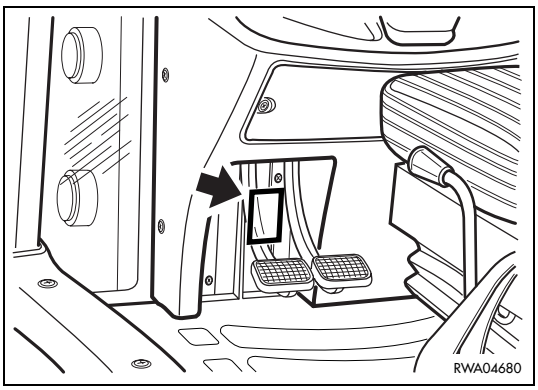
The Komatsu Utility backhoe loader and its main components are identified by serial numbers stamped on the identification plates.
The serial number and the identification numbers of the components are the only numbers that must be indicated to the Dealer when requiring assistance and ordering spare parts.

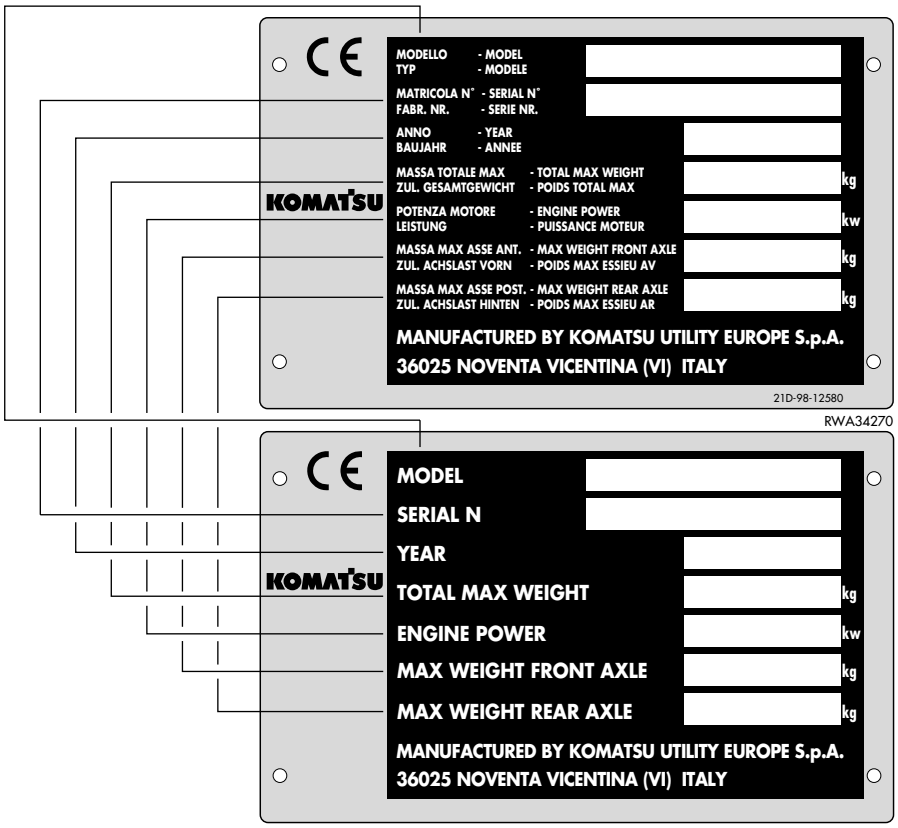
1.4.1 MACHINE SERIAL NUMBER

The machine serial number is stamped on the front part of the main frame, on the right side.

1.4.2 MACHINE IDENTIFICATION PLATE

The Komatsu Utility backhoe loaders described in this manual are provided with the CE mark, which certifies that they are in compliance with the CE harmonized standards.
The plate with the mark is applied inside the operator's cab, on the left vertical wall of the frame, in correspondence with the brake pedals.

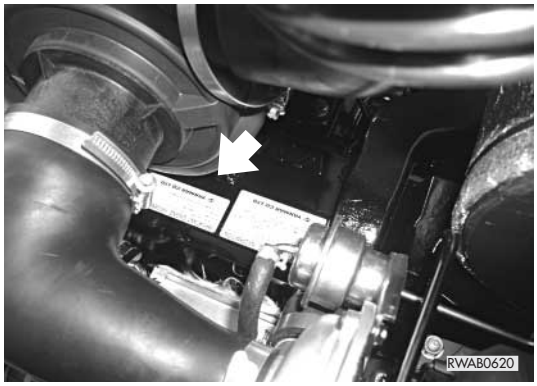




1.4.3 ENGINE SERIAL NUMBER AND EXHAUST GAS EMISSION PLATE

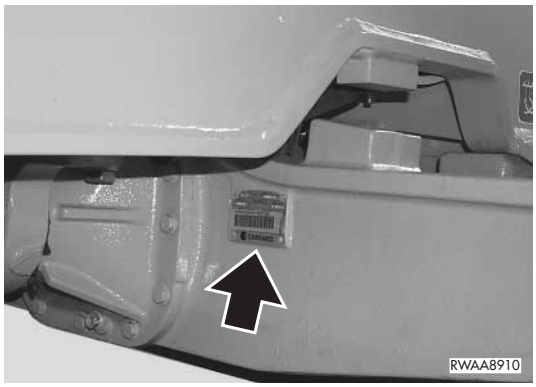
The engine serial number is stamped on the plate positioned on the rear side of the tappet cover.

The plate regarding the exhaust emission regulations is applied to the front side of the tappet cover.



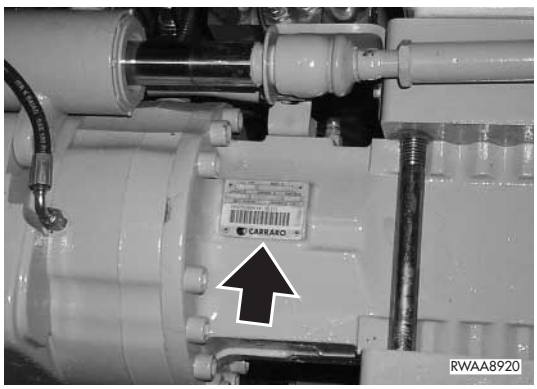
1.4.4 FRONT AXLE SERIAL NUMBER

The serial number of the front axle is stamped on the plate positioned on the right side of the axle body.



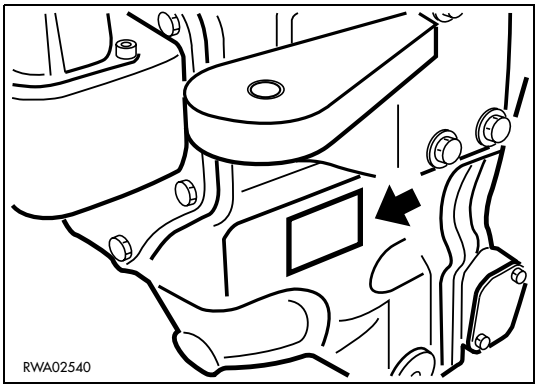
1.4.5 REAR AXLE SERIAL NUMBER

The serial number of the rear axle is stamped on the plate positioned on the left side of the axle body.



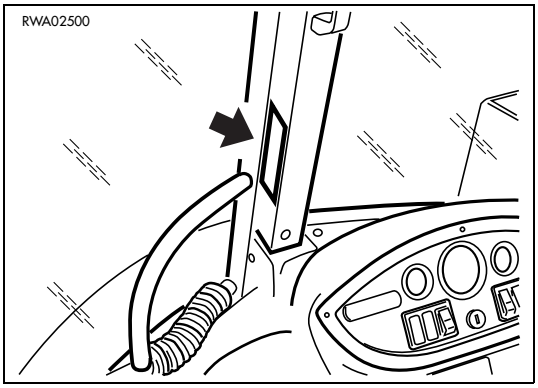
1.4.6 TRANSMISSION SERIAL NUMBER

The transmission serial number is stamped on the plate positioned on the right side of the transmission case.



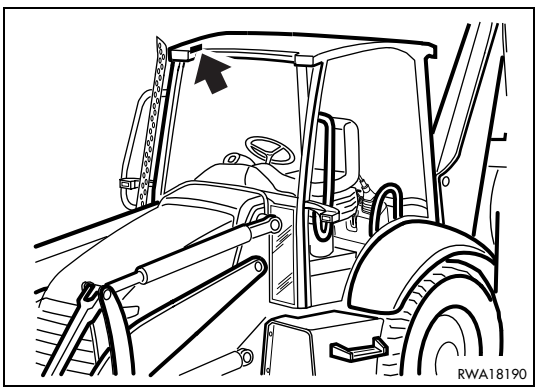
1.4.7 CAB SERIAL NUMBER

The cab serial number is stamped on the plate positioned on the right center pillar.



1.4.8 CANOPY SERIAL NUMBER (if provided)

The serial number is stamped on the plate positioned inside the canopy, on the front right part.



1.4.9 SERIAL NUMBERS AND DEALER'S ADDRESS

Machine n. _____ Model _____

Engine n. _____

Front axle n. _____

Rear axle n. _____

Transmission n. _____

Cab n. _____

Canopy n. _____

Dealer:

_____

_____

_____

_____

Address: _____

_____

_____ Tel. _____

Person to contact: _____

NOTES: _____

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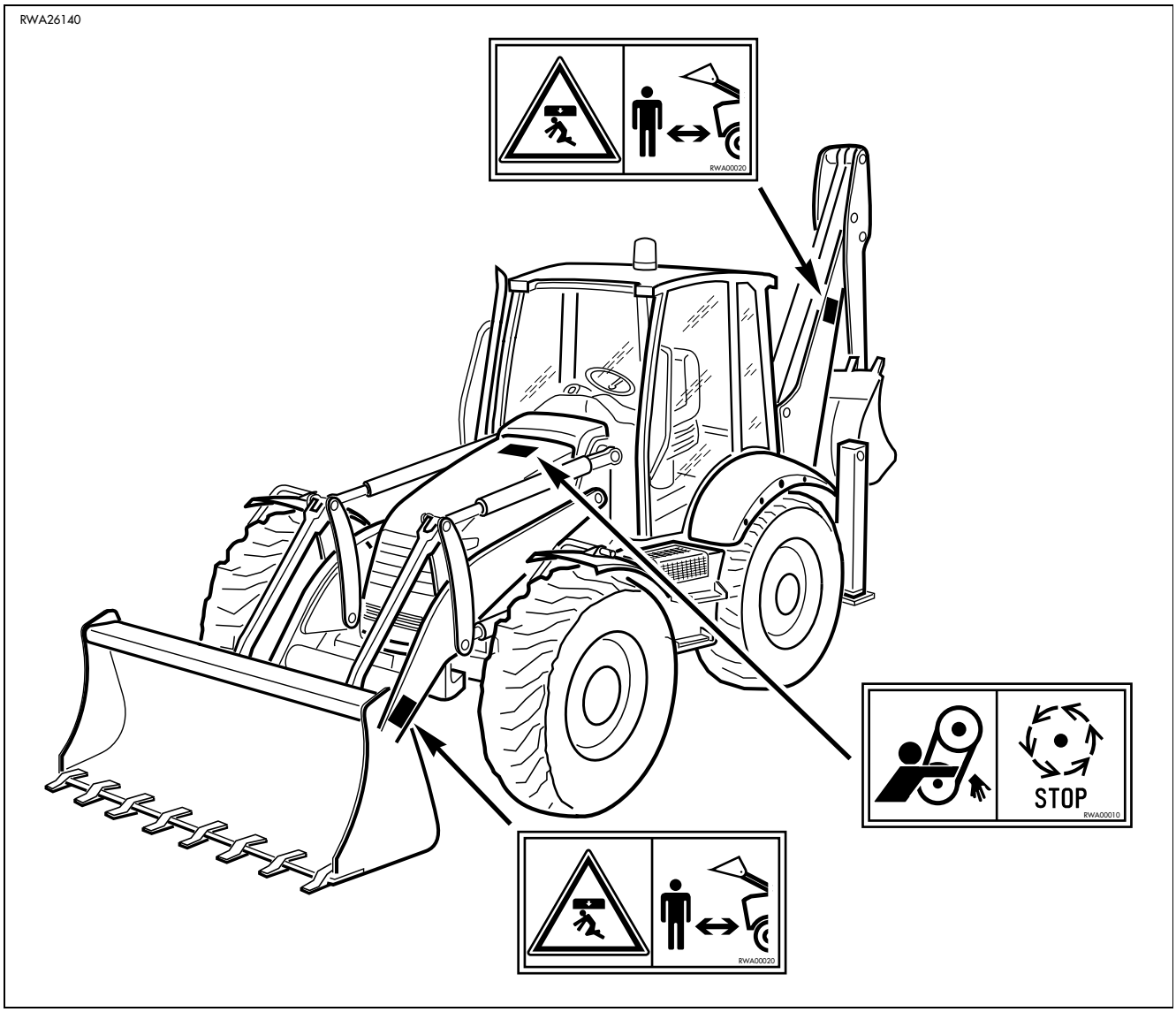
SAFETY AND ACCIDENT PREVENTION

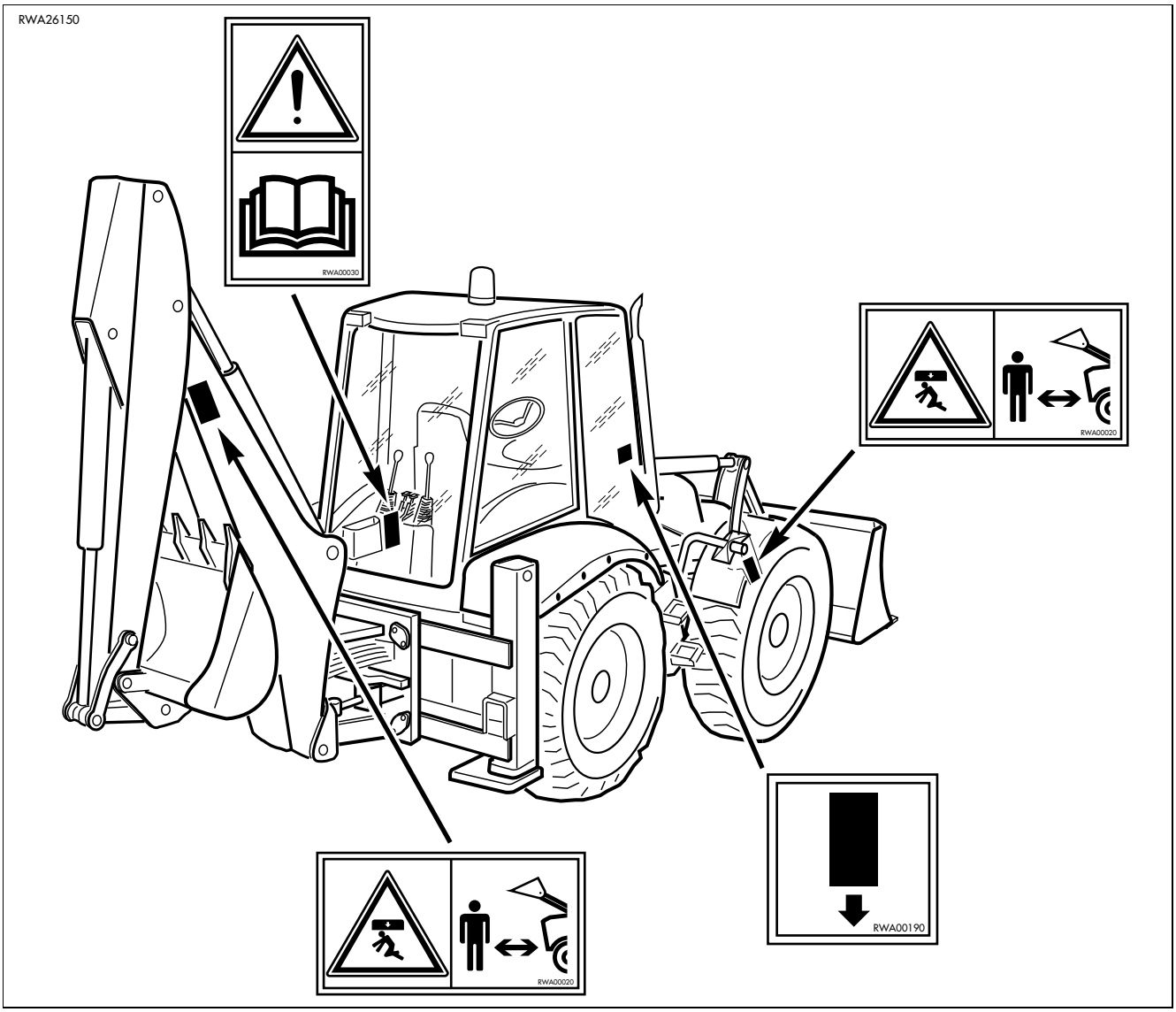
2.1 SAFETY, NOISE AND VIBRATION PLATES

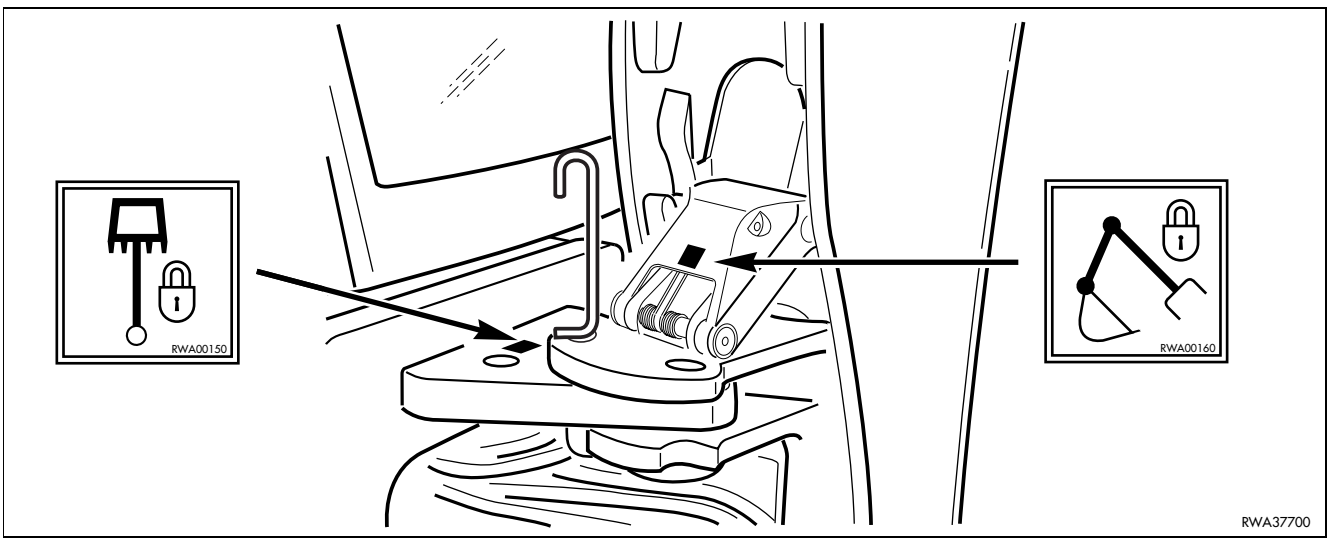
2.1.1 POSITION OF THE SAFETY PLATES

- The safety plates must always be legible and in good conditions; for this reason, if they are dirty with dust, oil or grease, it is necessary to clean them with a solution made of water and detergent.
  Do not use fuel, petrol or solvents.
- If the plates are damaged, ask for new ones to Komatsu Utility or to your Komatsu Utility Dealer.
- In case of replacement of a component provided with a safety plate, make sure that this plate is applied also on the new piece.
- The machine can be provided with other plates in addition to those indicated below; keep also to the instructions given in the additional plates, in any case.



RWA26150


RWA00030
RWA00020
RWA00190
RWA00020

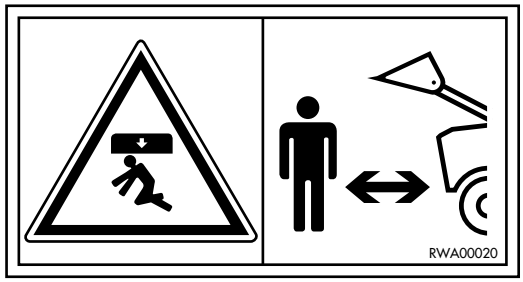

RWA00150
RWA00160
RWA37700

2.1.2 PICTOGRAMS AND RELEVANT MEANINGS

The warning and danger plates applied onto 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.

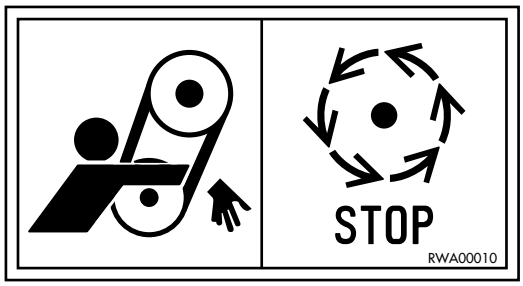
DANGER IN THE WORK AREA

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



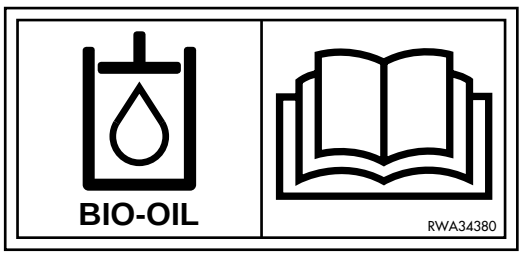
DO NOT OPEN THE HOOD

- Do not open or remove the hood when the engine is running.



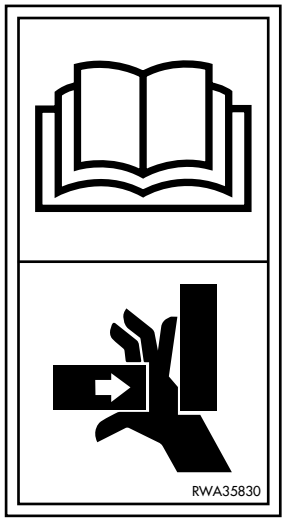
FILLING THE HYDRAULIC SYSTEM WITH OIL

(Only for machines in which the synthetic biodegradable oil type HEES is used)



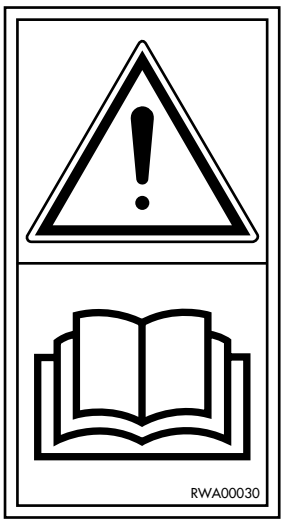
OVERTURNING THE FORKS

- **When the forks are overturned for use or storage, be careful to the grasping points, since hands and feet may be injured and even cut.**

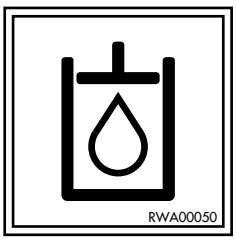


CONSULT THE MANUAL

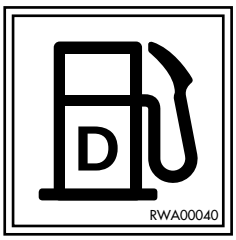
- Carefully read the contents of the manual before using the machine or performing maintenance operations.



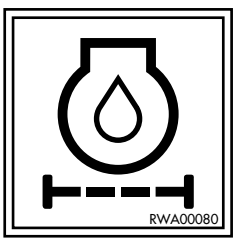
HYDRAULIC OIL TOPPING UP



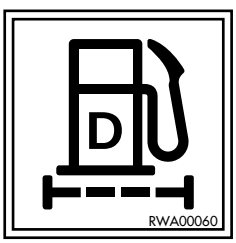
REFUELLING



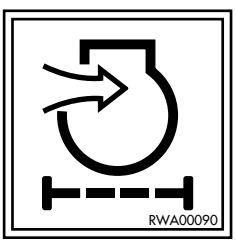
ENGINE LUBRICATING OIL FILTER



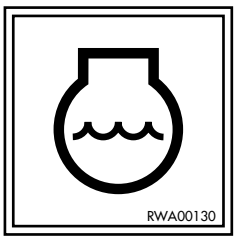
FUEL FILTER



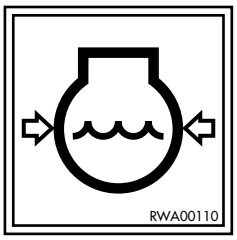
ENGINE AIR SUCTION FILTER



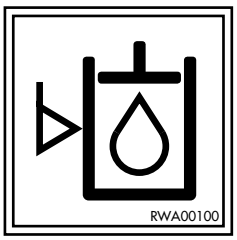
ENGINE COOLANT



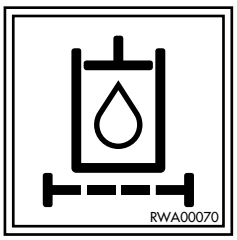
ENGINE COOLANT PRESSURE



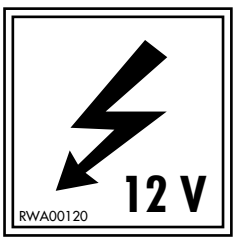
HYDRAULIC OIL LEVEL



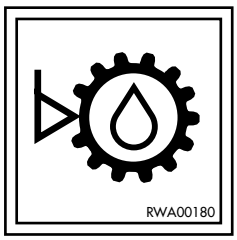
HYDRAULIC OIL FILTER



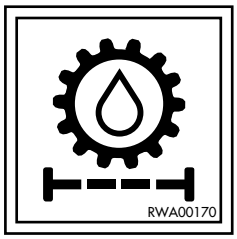
ELECTRIC OUTLET



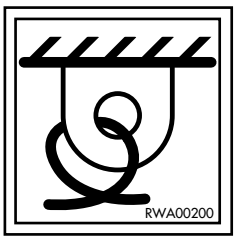
TRANSMISSION OIL LEVEL



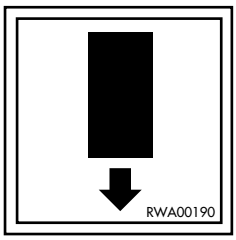
HYDRAULIC TRANSMISSION OIL FILTER



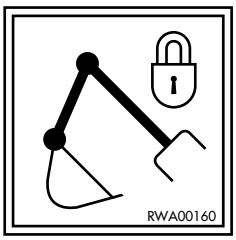
ANCHORAGE POINT



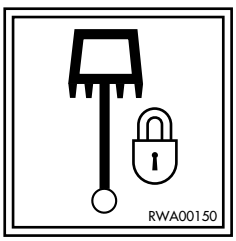
EMERGENCY EXIT



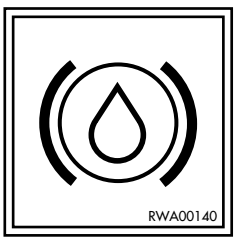
BOOM LOCK



SWING LOCK



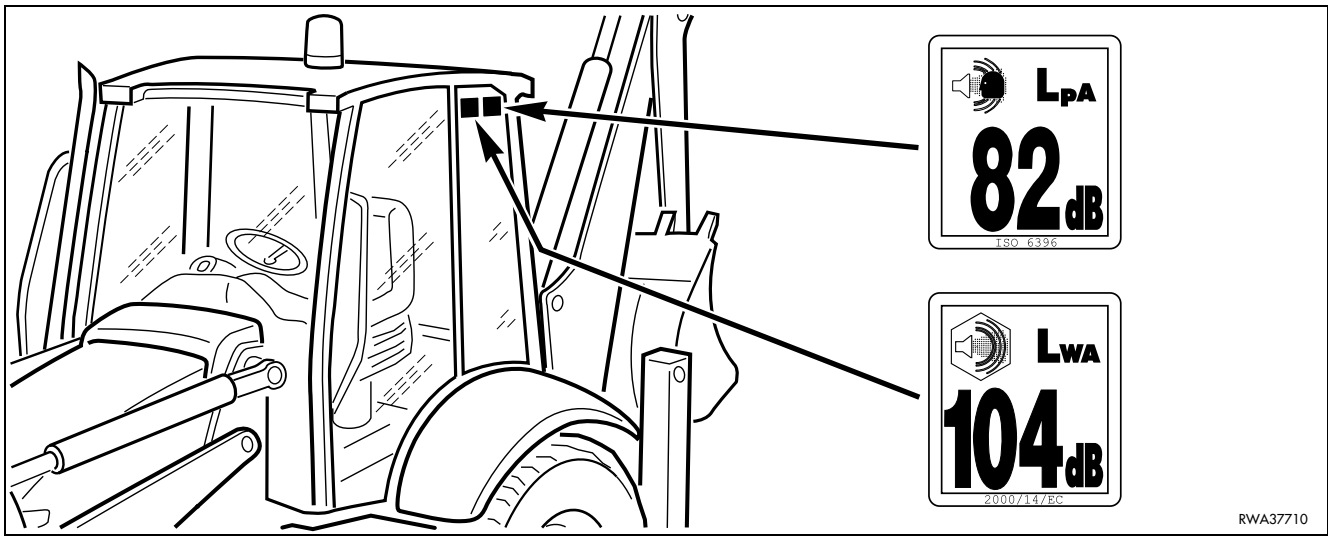
BRAKE OIL



DO NOT LIFT MORE THAN 1000 kg

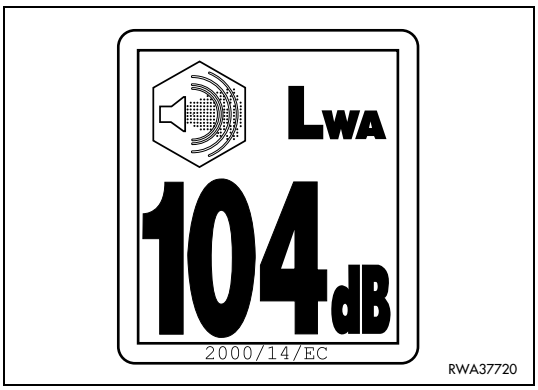
2.1.3 POSITION OF THE NOISE PLATES ON MACHINES WITH CAB

- The noise plates must always be legible and in good conditions; for this reason, if they are dirty with dust, oil or grease, it is necessary to clean them with a solution made of water and detergent.
  Do not use fuel, petrol or solvents.
- If the plates are damaged, ask for new ones to Komatsu Utility or to your Komatsu Utility Dealer.
- In case of replacement of a component provided with a noise plate, make sure that this plate is applied also on the new piece.



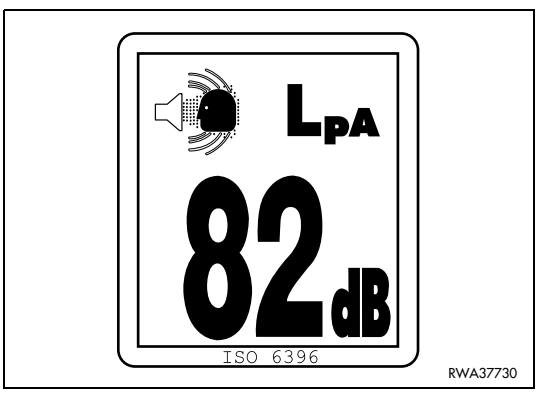
NOISE OUTSIDE THE CAB

- This value indicates the noise level outside the machine and refers to the noise perceived by persons in the vicinity of the work area.



NOISE INSIDE THE CAB

- This value indicates the maximum noise level perceived by the operator's ears inside the cab when this is completely closed.



2.1.4 VIBRATIONS TO WHICH THE OPERATOR IS SUBJECTED

- According to the results of the tests carried out to determine the vibrations transmitted to the operator by the machine, the upper limbs are subjected to vibrations lower than 2.5 m/sq.sec., while the seated part of the body is subject to vibrations lower than 0.5 m/sq.sec.

2.2 GENERAL PRECAUTIONS

2.2.1 GENERAL SAFETY RULES

- Only trained and authorized personnel can use the machine and perform maintenance operations.
- Follow all the safety rules, precautions and instructions when using the machine or performing maintenance operations.
- When working with other operators or when the work site is often occupied by other operators, make sure that everyone knows and understands all the signals described above and, in any case, that everyone works in such a way as to be able to see the machine and to be visible to the operator.

2.2.2 SAFETY DEVICES AND GUARDS

- Make sure that all the guards and covers are in the correct position. Have guards and covers changed or repaired if damaged. Neither use the machine without guards, nor remove the guards when the engine is running.
- Always use the proper safety devices to lock the machine when parking and fasten the safety belt.
- For the safety devices, see “3.1 SAFETY LOCKS”.
- For the safety belt, see “3.5.7 SAFETY BELT”.
- Do not remove the safety devices and always keep them in good operating conditions.
- Any improper use of the safety devices may result in serious injuries or even death.

2.2.3 CLOTHING AND PERSONAL PROTECTION ITEMS

- Do not wear large or loose clothes, rings and watches and do not approach the machine with loose long hair, since they can get entagled in the moving parts of the machine and cause serious injuries or damage.
  Avoid also wearing clothes dirty with oil or fuel, since they are flammable.
- Wear a hard hat, goggles, safety shoes, mask, gloves and headphones when operating the machine or performing maintenance operations.
- Always wear safety goggles, a hard hat and heavy gloves if your job involves scattering metal chips or minute materials; these precautions are particularly useful when driving the equipment connection pins with a hammer and when blowing compressed air into the air filter and the radiator to clean them.
  During these operations, make also sure that no one is standing or working near the machine without the necessary protections.
- When working for 8 hours with a noise level exceeding 90 dBA, it is necessary to use headphones or ear plugs and be particularly careful, especially at the end of the work shift.