YANMAR

OPERATION & MAINTENANCE MANUAL

EXCAVATOR

ViO27-5
ViO35-5

ViO27-5 : S/N 50501 & Above
ViO35-5 : S/N 50501 & Above

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7. Basic Precautions

⚠ WARNING **These instructions should be strictly followed for the safety of you, others and your machine.**

Follow safety rules at your workplace

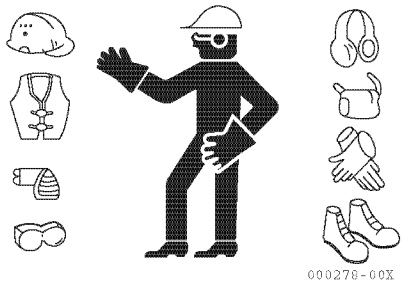
- The operation and servicing of this machine is restricted to qualified persons.
- When operating or servicing the machine, follow all the safety rules, precautions and procedures.
- Any work performed by a team or with a signal person should be conducted in accordance with signals agreed on beforehand.

Install safety devices

- Make sure that all guards and covers are installed in their correct position. If any of them are damaged, repair them immediately.
- The proper use of all safety devices, such as lock lever, should be well understood by the machine operator.
- Never remove the safety devices. Always make sure that they operate properly.
  For lock lever, refer to Section "12-3. Control levers and pedals".
- Incorrect operation of the safety devices could cause serious bodily injury.

Wear proper clothing and safety items

- Do not wear loose clothing or jewelry that can be caught on the control levers and other machine parts. Also avoid wearing working clothes stained with oil as they can ignite.
- Be sure to wear a helmet, safety goggles, safety shoes, a mask, gloves and other protective items, as appropriate.
  Take particular precautions when generating metal debris, when striking metal objects with a hammer or when cleaning components with compressed air.
  Also make sure there are no persons near the machine.



For driving the pins, refer to Section "13-22. Replacing the bucket without the quick coupler".
For cleaning the elements, refer to Section "25-2. Nonperiodic services".

Alcohol

- Never operate the machine while you are under the influence of alcohol or when you are ill or feel unwell as this results in accidents.

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9. Precautions for Servicing

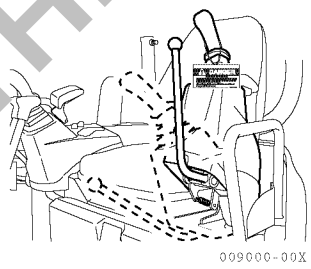
⚠ WARNING Neglecting these instructions may cause extreme hazards.

9-1. Precautions before servicing

Attach the "SERVICING IN PROGRESS" tag to an implement control lever

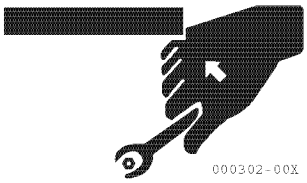
- If another person should start the engine or operate the control levers while service is in progress, the service personnel can sustain serious bodily injury.
  Attach the "SERVICING IN PROGRESS" tag indicating "Servicing in Progress" to one of the implement control levers.
  The "SERVICING IN PROGRESS" tag is enclosed with the Operation Manual.
  Article number : 172437-03250





Use appropriate tools

- Using damaged or worn tools or using tools inappropriate for the required application is very dangerous, and may also cause damage to the machine. Make sure to use the tools that are appropriate for the specific job.
  For information about tools, refer to Section "22-1. Required tools".



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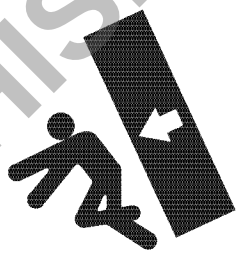
9-2. Precautions during servicing

Keep unauthorized persons away

- Never admit any persons into the work area who are not taking part in the work. Be conscious of the safety of other persons.
  Be especially careful when grinding, welding, or using a large hammer.

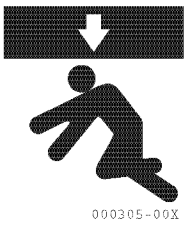
Removed attachments

- When an attachment is placed on the ground or against a wall after removing it or prior to reinstalling it, be sure that it is stable to prevent it from falling down.



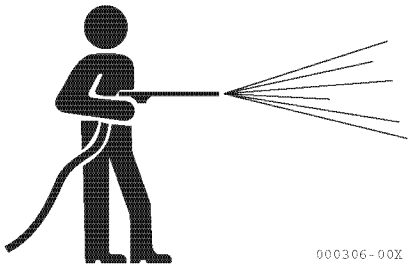
Working under the machine

- Before performing service or repairs underneath the machine, place the implement on the ground in its lowest position.
- Be sure to apply blocks to the tracks to lock the tracks securely.
- Never perform service underneath the machine if it is not completely stable.



Keep the machine clean

- Spilled oil or grease, or scattered parts are dangerous and can cause falls. Keep the machine clean.
- Getting water into the electrical system may cause it to malfunction, resulting in faulty operation of the machine. Also it may permit electrical leaks that could cause a fire or electric shocks.
- Never clean the sensors, connectors or the operator's seat with water or steam.



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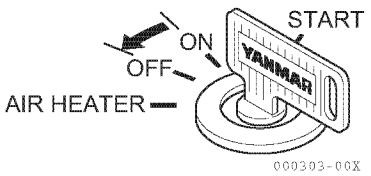
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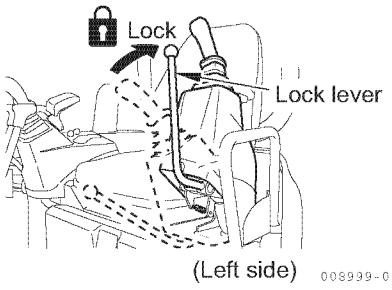
Periodically replace the parts essential to safety

- Aging or damage to the parts listed below can cause a fire.
  Make sure that they are replaced periodically.
  - Fuel system : Fuel hose and fuel tube cap
  - Hydraulic system : Outlet hose of main pump
- The parts listed above must be replaced periodically even if no abnormality is found in them. (They age with time.)
- If any abnormality is found in them, replace or repair the parts even though the suggested replacement time has not been reached.
  For information about replacing essential safety parts, refer to Section "23. Replacing Essential Parts Periodically".

Stop the engine before beginning the inspection and servicing

- Be sure to stop the engine before performing inspection and servicing.
- If necessary to perform service while running the engine, as when cleaning the inside of the radiator, be sure to set the lock lever to the lock position and do the job together with a partner.
  (One should take the operator's seat so that he or she can stop the engine at any time.)
  That person must be careful not to touch any levers in the cabin.
- Be extremely careful not to contact the moving fan or fan or fan belt, or any hot surfaces.

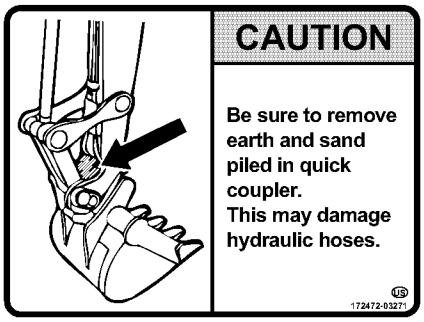




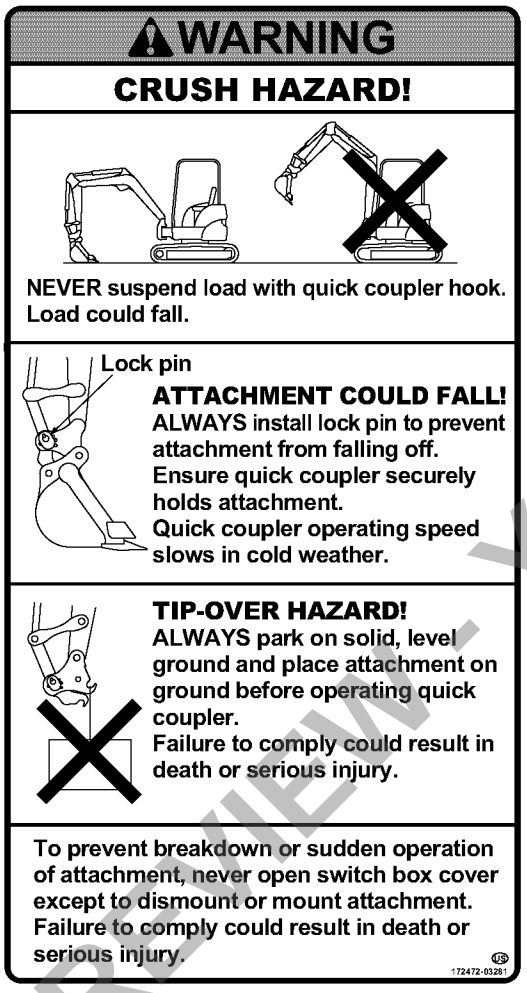
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(25) 172472-03281



(26) 172437-03551



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2. Safety Information

- The following Signal Words have been used in this Manual and on the Safety Signs to indicate the seriousness of the hazards that could be encountered by failing to comply with the applicable Product Warnings, as follows:

⚠ DANGER	Could result in death or catastrophic bodily injury.
⚠ WARNING	Could result in bodily injury.
⚠ CAUTION	Could result in property damage.
IMPORTANT	The signal Word "IMPORTANT" has been utilized in this Manual to denote those User Directions that must be followed to assure the safe operation and maintenance of the Excavator.

- **WARNING** : Never attempt to operate or service this Excavator until you have first read and understood all of the applicable Product Warnings and User Directions that are set forth in this Manual and on the Safety Signs that are affixed to this Excavator.

  The failure to comply with all relevant Safety Instructions could result in bodily injury.

- **WARNING** : Never modify the design of this Excavator or its engine; never remove or disable any of the installed safety guards or devices; and never use any unauthorized attachments in the operation of this equipment.

  The implementation of any unauthorized design modifications or the use of unauthorized attachments could result in bodily injury.

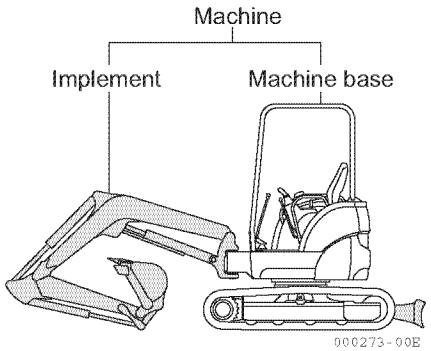
  Furthermore, since those actions would expressly violate the terms of Yanmar's Product Warranty, the applicable Warranty would also be voided.

In this Manual, the major sections of the product are designated as follows:

Machine.....refers to the entire product.

Machine base.....refers to the section consisting of the upperstructure and the undercarriage.

Implement.....refers to the section consisting of the arm, boom and bucket or other attachment.

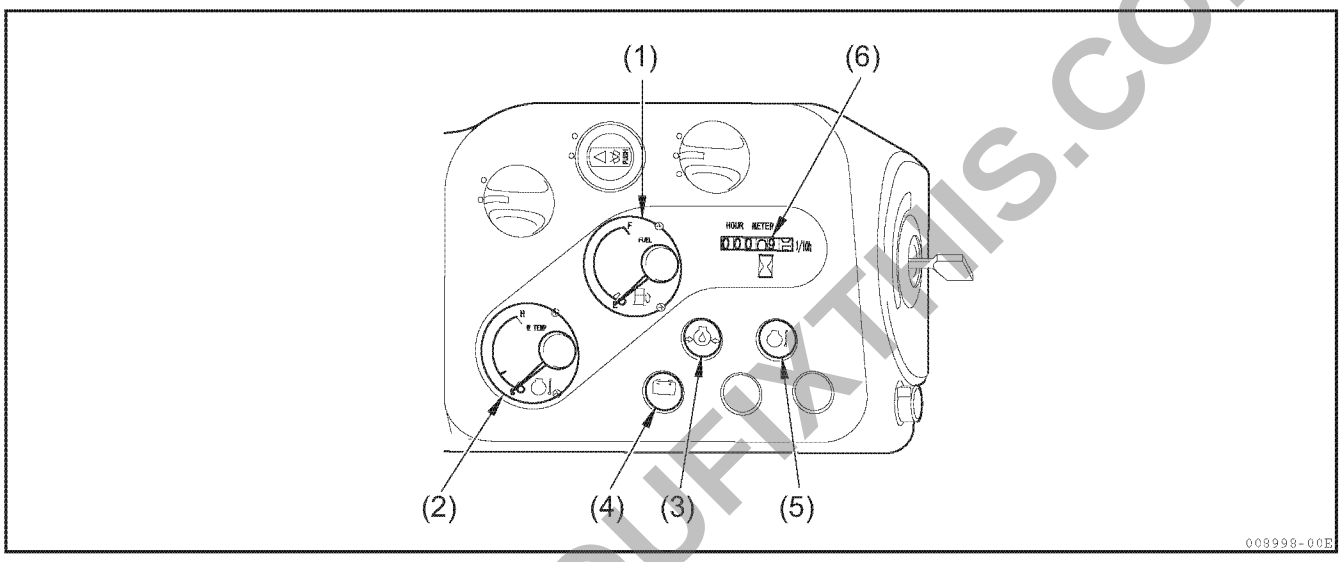


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12. Description of Control Devices

This section describes several of the control devices necessary to operate the machine. In order to ensure safety and comfort in working with the machine, it is imperative for you to fully understand how to operate and interact with these devices.

12-1. Monitor



IMPORTANT

For start-up inspection, be sure to refer to PART THREE: MAINTENANCE, or Section "13. Operating Instructions" as well as the monitor messages as shown above.

⚠ WARNING

When an indicator lamp lights and a buzzer sounds during operation, immediately stop operation and check and service the abnormality.

When the starter switch key is in the “ON” position, the monitor lamps (3), (4) and (5) light and buzzer sounds. (Only the water temp alarm lamp (5) goes off in a few seconds.)

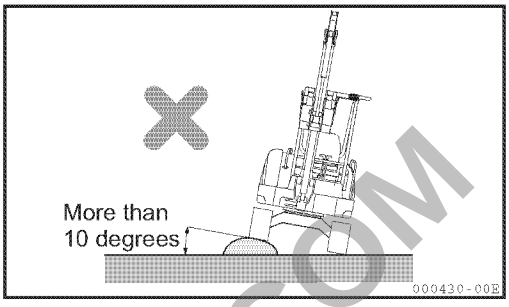
Normally, all monitor lamps go off after the engine starts. When there is any failure during operation, a lamp lights and buzzer sounds. (If the starter switch key is in the “ON” position and a monitor lamp does not light, its bulb must be burnt out.)

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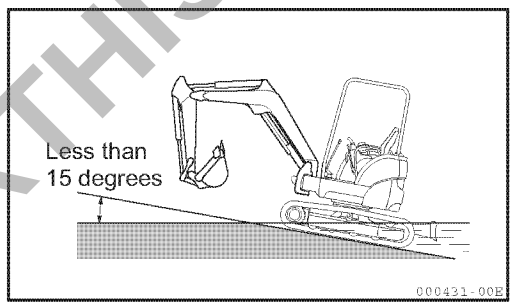
13-10. Precautions for working

■ Precautions for traveling



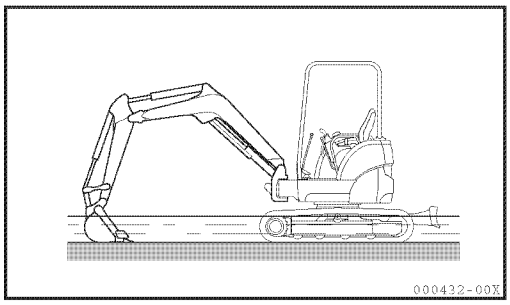
Driving over a stone or a stump subjects the machine (especially undercarriage) to a shock, which may cause damage to the machine.
Avoid such obstacles by driving around them, or removing them.
If driving over them is unavoidable, reduce speed, hold the implement close to the ground, and drive over the obstacles with the center of the track shoes.

■ Allowable water depth



IMPORTANT

When driving out of water, if the machine climbs a slope at an angle of more than 15 degrees, the rear of the upperstructure may submerge too deeply in the water, which may damage the radiator fan since the radiator fan paddles the water. Avoid this if possible when driving out of water.



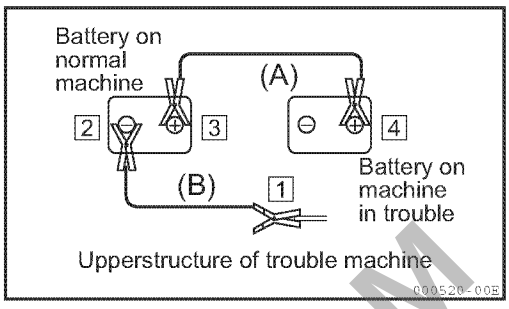
The limit of the water depth in which the machine can be used in is up to the center of the carrier roller.
Apply a generous amount of grease to the moving parts (especially bucket pin) that have been submerged in the water for a long time until the used grease is extruded out of the bearings.
Wipe the extruded used grease off with a waste cloth.

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■ **Disconnecting the booster battery cables**

After the engine on the machine in trouble has started, disconnect the booster battery cables in the reverse order of the connecting procedure.



1) Remove the clip of the booster battery cables (B) from the engine block on the machine in trouble.

2) Remove the clip of the booster battery cables (B) from the negative terminal on the normal machine.

3) Remove the clip of the booster battery cables (A) from the positive terminal on the normal machine.

4) Remove the clip of the booster battery cables (A) from the positive terminal on the machine in trouble.

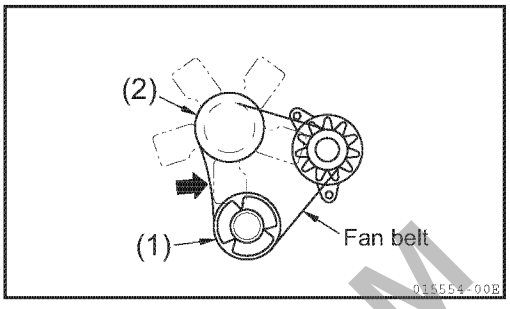
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25-3-5. Checking and adjusting the fan belt tension

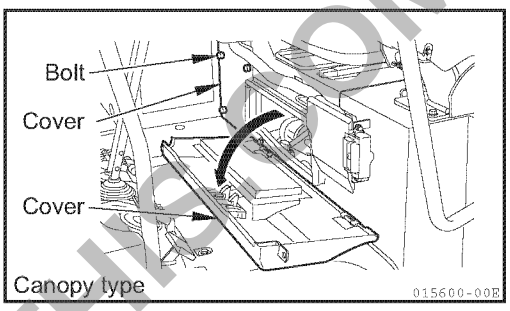
⚠ WARNING

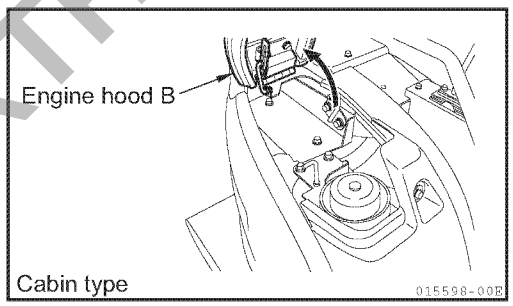
- **Stop the engine, take out the starter switch key, and attach the "SERVICING IN PROGRESS" tag to a control lever.**
- **The fan belt is hot immediately after the engine is stopped.**
  Do not adjust the fan belt tension immediately after stopping the engine.
- **Adjust the fan belt tension after all parts of the engine have fully cooled down.**



■ **Checking the fan belt tension**

1) Open the engine hood rear cover.
2) Press down fan belt between the crankshaft pulley (1) and the fan pulley (2) with a finger to check the generator belt tension.
   Pressing load : Approximately 22.1 lbs. (10 kgf)
   Adequate slack : 0.39 to 0.59 in. (10 to 15 mm)
3) Adjust the tension if necessary.
4) When the tension is proper, close the engine hood rear cover.



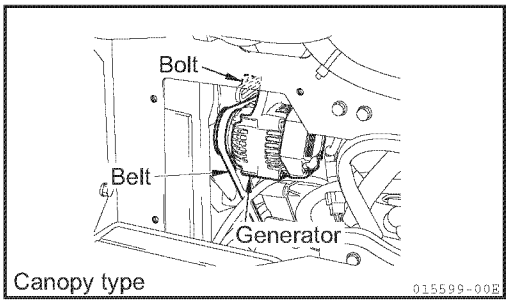


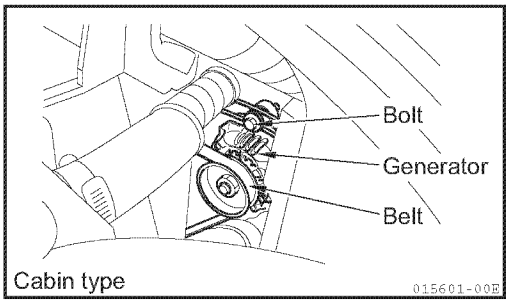
■ **Adjusting the fan belt tension**

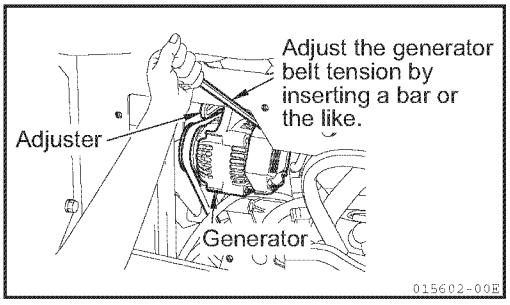
■ **Things to prepare**

• Wooden bar (the handle of a hammer or the like)

1) Open the engine hood B.
2) Loosen the generator mounting bolts.
3) Insert a wooden bar between the generator and the cylinder block, and move the generator so that the generator belt tension will be slacked approximately 0.4 to 0.6 in. (10 to 15 mm) with a pressing load of 72.3 ft•lbf (98.1 N•m).
4) Retighten the mounting bolts to secure the generator.
5) Check the pulleys, the V-groove, and the fan belt for damage, and check to see that the fan belt does not touch the bottom of the V-groove.







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