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AGRISON™

TX SERIES

WHEEL LOADER

OPERATION / MAINTENANCE MANUAL

TX Series Wheel Loader

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1：Preface

This manual provides you rules and guidelines to use the machine safely and efficiently. Keep this manual on hand and ensure ALL operators read the manual prior to operating the machine.

If you sell the machine, please attach the manual together with the machine to your new user.

As the design of the machine is continuously improved, this manual could not cover all detailed changes. Should queries on this manual arise and should the latest information of the machine be needed, please contact Agrison.

Maybe in your region you cannot purchase the attachments and options of the machine included in this manual, you can contact Agrison or your local dealer.

ATTENTION

- Incorrect operation and maintenance of the machine can cause serious injury or death.
- Before operating and maintaining the machines, the operator and the maintainer should understand this manual completely.
- Should you operate and maintain the machine not according to stipulated styles in this manual, serious accident could occur.
- The operation regulations and precautions provided in this manual are only suitable for specified usage of the machine. If your machine will be used for those usages not banned and not specified, you should ensure the safety of the operation upon you and other people. In any case, those operations and behaviors clearly prohibited in this manual are not allowed.
- Refer to descriptions of the safety, please read “Safety Events” on Page 0-2 and “SAFETY” Section from Article 1-1.

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2：Safety Events

Most accidents arise from that the stipulations of operation and maintenance of the machine are not observed. In order to prevent occurrence of accident, please read and understand all attentions and warnings on the machines in this manual before operation and maintenance are started.

Following words are used in this manual for identification of safety information:

DANGER — used in the place where the possibilities of serious injury upon human body will be very high if do not take care to avoid danger. This prompt is to tell you what precautions should be taken to avoid injury upon human body. Should this kind of danger cannot be avoided, the machine could be seriously damaged.

WARNING — used in the place where the possibility of serious injury or death of potential danger exists if do not take care to avoid danger.

ATTENTION — used in the place where light or medium injury could happen if do not take care to avoid danger. This word is also used in the dangerous place where the machine could be damaged.

ATTENTION — used in the place where precautions should be taken in order to avoid the service life to be shortened.

Safety measures are described on “SAFETY” Section from Page 1-1.

Agrison could not forecast all potential dangerous operation and maintenance therefore the description of safety on the machine and in the manual could not cover all safety precautions. Should any steps or operations not recommended on the manual be carried out, you should ensure you can safely operate it and no damage will cause upon the machine. Should you not ensure the safety of some operations, please contact your local dealer.

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3：Brief Introduction

3.1 Range of Operation

This machine is mainly engaged in following operations:

- Excavating operation
- Leveling operation
- Stacking operation
- Loading operation

Details can be seen at “12.10 Application Range of the Wheel Loader”

3.2 Features

- Improved seals can reduce noise. The vibration dumper driving cab is installed by rubber cushion.
- Under the operation desk and the steering wheel there are rectangular space without any protrusion, which gives you comfortable feeling just like in the car.
- Maintenance-free wet brake.

3.3 Running-In of the Vehicle

The Agrison machine you purchased has been checked and adjusted carefully before it is sold. However if it will be used in worse working condition from the very beginning, it will obviously shorten its service life.
The running-in should be carried out in the first 100 hours (displayed by the timing meter).
During the running-in period:

- Let the machine idling for 5 minutes.
- Heavy load and high speed should be avoided.
- Sudden start, accelerating, steering and braking should be avoided except for emergencies.

The precautions listed in the regulations of operation, maintenance and safe operation given in this manual are only suitable for the usage stipulated by the machine. If the machine is used in the area not listed in the manual, Agrison shall not bear any safe responsibility, which should be born by the user himself.

Those operations prohibited in this manual could be in no case exerted.

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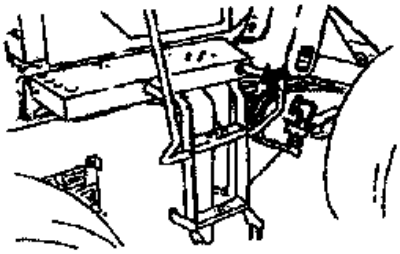
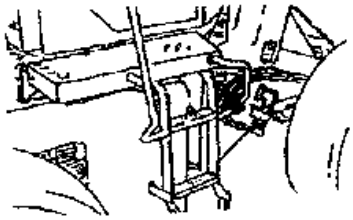
4：Position of the Nameplate, Form for Filling Out the Number and the Dealer

4.1 The Position of the Number Plate of the Machine

This position of the nameplate
The right side of the center on the front frame



The position of the steel seal
The steel seal is stamped on the right side of the front frame and on the side of the articulated plate of the rear frame.



4.2 The Position of the Serial Number of the Engine

This position of the nameplate
It is on the right side of the gearbox of the engine if viewing from the direction of the fan.

The position of the steel seal
It is on the right side of the gearbox of the engine if viewing from the direction of the fan.

4.3 The Form for Filling Out the Serial Number and the Dealer

Number of the Vehicle:
Number of the Engine:
Name of the Dealer: Address: Telephone: After-Sale Server:

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1: Preface 0-1

2: Safety Events 0-2

3: Brief Introduction 0-3

4: Position of the Nameplate and the Form for Filling Out the Number and Dealer 0-4

SAFETY

6: General Attentions 1-2

7: Attentions in Operation 1-7

7.1 Before Start 1-7

7.2 When Operating the Machine 1-9

7.3 Transportation 1-13

7.4 Storage Batteries 1-14

7.5 Trailing 1-15

8: Attentions for Maintenance 1-16

8.1 Before the Maintenance 1-16

8.2 When in Maintenance 1-18

8.3 Tyre 1-22

9: Position of the Safe Boards 1-24

OPERATION

10: Full View 2-2

10.1 The General View of the Machine 2-2

10.2 The General View of the Operating Levers and Meters 2-3

11: Description of Equipments 2-4

https://truckmanualshub.com/

11.1 Monitors and Lamps of the Vehicle
2-6
11.2 Switches
2-9
11.3 Control Lever and Step Treads
2-11
11.4 Safety Lever
2-12
11.5 Drawing Pin
2-12
11.6 Alarm for Reverse Running
2-13
11.7 Fuses
2-13
12: Operation
2-13
12.1 Check Before Start
2-13
12.2 Start the Engine
2-19
12.3 Operation and Check after the Engine is Started
2-20
12.4 Start of the Loader
2-21
12.5 Shift Gears
2-22
12.6 Steering
2-23
12.7 Turn Direction
2-23
12.8 Brake
2-24
12.9 Operation of Working Device
2-25
12.10 Application Range of Wheel Loader
2-26
12.11 Precautions of Operation
2-29
12.12 Adjust the Position of the Working Device
2-30

12.13 Parking of the Machine
2-32
12.14 Check after Operation is Finished

https://truckmanualshub.com/

2-33
12.15 Go Out
2-33
12.16 Check after Stop the Machine
2-33
12.17 Locking
2.33
12.18 Usage of Tyres
2-34
13: Transportation
2-35
13.1 Loading and Unloading of the Loader
2-35
13.2 Attentions before the Transportation
2-36
13.3 Attentions to the Transportation
2.36
14: Operation in Cold Weather
2-37
14.1 Attentions under Low Temperature
2-37
14.2 Attentions after Working is Finished
2-38
14.3 After Cold Weather Passed
2-38
15: Storage For Long Time
2-39
15.1 Storage For Long Time
2-39
15.2 During the Period of Storage
2-39
15.3 After Storage
2-39
16: Troubleshooting
2-40
16.1 When Fuel is Exhausted
2-40
16.2 Draw the Vehicle
2-40
16.3 In Case the Storage Battery Discharging Off
2-43
16.4 Solution of other Troubles
2-46

MAINTENANCE

17: Guide of Maintenance

https://truckmanualshub.com/

3-2
18: Essentials of Maintenance
3-4
18.1 Generals of Oils, Fuel and Coolant
3-4
18.2 Generals of Electrical System
3-6
19: List of Consumables
3-7
20: Use Fuel, Coolant and Lubricant based ion Ambient Temperature
3-8
21: Standard Tightening Torque of Bolts and Nuts
3-10
21.1 Brief Introduction of Tools Used
3-10
21.2 Torque Table
3-11
22: Regular Replacement of Key Safety Parts
3-12
23: Schedule Table of Maintenance
3-15
23.1 Schedule Table of Maintenance
3-15
24: Procedures of Maintenance
3-19
24:0 Maintenance of First 100 Hours
3-19
24:1 Maintenance of First 250 Hours
3-19
24:2 Maintenance as Required
3-19
24:3 Check Before Start
3-29
24:4 Maintenance Every 50 Hours
3-33
24:5 Maintenance Every 100 Hours
3-34

24:6 Maintenance Every 250 Hours
3-35
24:7 Maintenance Every 500 Hours
3-39
24:8 Maintenance Every 1000 Hours
3-42

https://truckmanualshub.com/

24:9 Maintenance Every 2000 Hours
3-45
24:10 Maintenance Every 2000 Hours
3-48

SPECIFICATIONS
4-1

25: Specifications
4-2

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SAFETY

WARNING

Read and exert all safety attentions carefully otherwise serious injury could occur.

The “SAFETY” Section covers attentions for both options and attachments.

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Principles of Safety

- Only persons who are specially trained and permitted can operate and maintain the machine.
- When operating and maintaining the machine, all safety regulations, precautions and descriptions should be observed.
- When working with other operators and people who is responsible to command traffic on the field, it should be ensured that all persons can understand signs of gestures.

Safety Devices

- Be ensured that all protect hoods and covers are on correct positions. Repair well all damaged parts.

Correct positions → see "12.1.1 Touring Check"

- Correctly operate safety devices such as the operate lever and the safety belt of the seat.
- Never remove any safety device. Be ensured that they are in good working conditions.

Operating lever of safety → see "12.13 Packing of the Machine"
Safety belt → see "12.1.3 Adjustment before Using the Driving Seat"
Incorrect usage of safety devices can cause serious injury and death.

Costumes and Personal Protective Gears

- Do not wear loose clothes and ornaments and leave hair long and loose otherwise they could be wound by the operating lever or moving parts to cause serous injury and death. In addition, do not wear oily and dirty clothes to avoid catching fire.

When operating and maintaining the machine, put on the helmet, glasses, gloves and safety shoes. If you can contact splashed metal chips or other articles, you must wear goggles, solid safety hat and thick gloves. When you knock pins by hammer or clean the cartridge of the air filter, you should check if there is anybody nearby.

The cartridge of the air filter → see "24.2 Maintenance as Required" in MAINTENANCE Section

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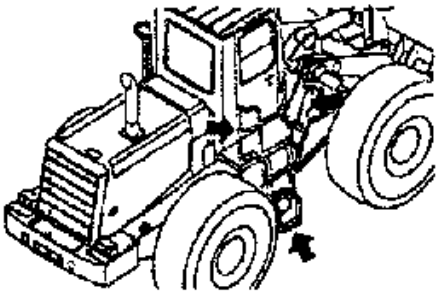
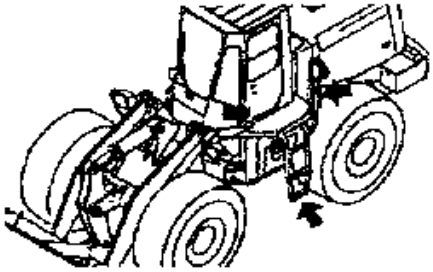
Make Modification without Permission

- Any modification without Agrison's permission shall be possible to cause danger.
- Please consult with Agrison before the modification shall be made. Agrison shall have no responsibilities for injury and damage caused by any modification without permission.

Step Up and Drop Down the Vehicle

- Do not jump up or jump down on the vehicle and do not step up or drop down the moving vehicle.
- When stepping up or dropping down the vehicle, please face the vehicle and use the arm rail and the step tread.
- When stepping on or dropping down the vehicle, never seize any operating lever.
- Always keep touch at three points between you and the arm rail and the ladder in order to ensure safety.
- Should any dirt or mud be on the arm rail and the ladder, you should wipe them out at once. Keep them clean and repair all damaged parts, tighten all loosen screws.





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Fireproof of Oily Goods

- Fuels, machine oil and anti-freeze liquid are all inflammable, especially fuel is easier inflammable and dangerous.
- When filling fuel, make the engine go out and keep no smoking.
- Be ensured to tighten the covers of the fuel tank and the running oil tank.
- Fill fuel or lubricating oil in the place where it is well ventilated.
- Keep fuel and machine oil in a particular place where people could not get access if no permission.

Safety Measures when Operating under High Temperature

- When the machine is stopped, cooling water and oil of the engine and hydraulic oil are all under high temperature and high pressure. If you want to remove covers to drain oil and water, or change the strainer, you could be scalded seriously. Follow stipulated steps to do these jobs only when temperature is lowered down.
- Shut off the engine before removing the cover of the radiator. When it is cooled down, turn off the cover slowly to release internal air with high pressure, can then the cover be taken out.
- When removing the cover of the hydraulic oil tank, oil could be sprayed out. Slowly loosen the cover before removing it in order to release pressure.

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Prevent Harm of Asbestos Dust

It is dangerous to intake asbestos dust.
Following instructions should be observed when dealing with materials of asbestos fiber:

- Do not use compressed air to clean dirt.
- Clean dirt with water to avoid dust flying up.
- Being out of the wind as can as possible when making operation.
- Adopt qualified mask if needed.

Prevent Body to be Crushed or Cut

- Do not stretch or place your hand, arm or other part of your body between moving parts, for example between the working device and the oil cylinder, or between the vehicle body and the working device etc. When the machine is running, the clearance shall be changed so as to cause damage or injury upon human body.

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Attentions to the Anti-Rolling Frame

- If the anti-rolling frame is installed, it can never be removed when operating the machine.
- The anti-rolling frame is used to protect driver when the vehicle is turned over. It can not only endure the load when the vehicle is turned over, but also absorb shock energy.
- Agrison's ant-rolling frame is in accordance with the national norm and standard however modification without permission or damage could cause its strength to be lowered and fails to meet the requirement of the design. Only it is repaired or modified as per stipulated procedures can it play its role again.
- When modifying or repairing the anti-rolling frame, you are sure to make contact with Chenglin's dealer.
- Even though the anti-rolling frame is installed however driver does not used the safety belt correctly, it cannot still protect you well. Therefore when operating the machine, the safety belt must be tied well.

Attentions to the Attachments

- When installing or using optional attachments, please read the guide book of the attachments and relative contents in this manual first.
- Do not use those attachments not permitted by Agrison. It could cause safety problem if adopting those attachments without permission, and affect normal operation and service life of the machine.
- Agrison shall not undertake any responsibilities upon injury, accident or mechanical trouble caused by those attachments without permission.

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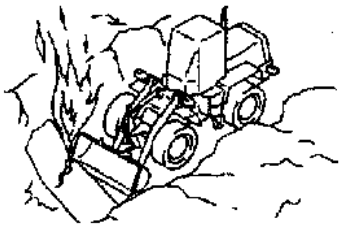
7.1 Before the Engine is Starting

Safety on the Field

- Before starting the machine, check if abnormal conditions which can cause danger are existed.
- Check topography and soil texture to select best working manner.
- When working on the highway, it should have special person to command traffic and set the roadblock to ensure safety of transportation and pedestrians.
- When working on the place where water and gas pipes or high voltage cables are buried underground, it should make contact with responsible departments to define the location of pipelines, and take care not to damage them during the working period.
- When working on water or running through sand dike, first check soil texture, water depth and flow speed to ensure that the allowed depth is not exceeded.
  The allowed depth → see "12.11 Attentions in Working".



Fireproof

- Completely clear out inflammables such as wood bits, leaves and paper scraps which accumulated on the engine and could catch fire.
- Check if there is leakage on fuel, lubrication oil and hydraulic systems, repair any leakage and remove all excess oil, fuel and other inflammable liquids.
  The Check Position → see "12.11 Touring Check".
- Be ensured that one extinguisher is available.
- Do not operate the machine near the fire.

In Driving Cab

- Never put tools or spares carelessly in the driving cab because they could damage or break the operating lever or switches. Keep them in the toolbox on the right side of the machine at any time.
- Keep the floor, operating lever, step tread and arm rail in the driving cab from oil, grease, snow or other dirt..
- Check the safety belt, buckle and parts to see if they are damaged or worn out. Replace all damaged parts. Tie the safety belt (option) well in the driving cab.

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Ventilation in Closed Space

- If it is needed to start the engine in a closed space, it should keep enough ventilation because excess waste gas from the engine can cause people to death.

Attentions to Rearview Mirror, Windows and Lamps

- Clean all windows and lamps to ensure that you have a bright view of version.
- Adjust the side rearview mirror so as to make you see clearly. Keep clean on the surface of mirrors and make replace if broken.
- Be ensured the top lamp and working lamp are normal.

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7.2 Operate the Machine

When Staring the Engine

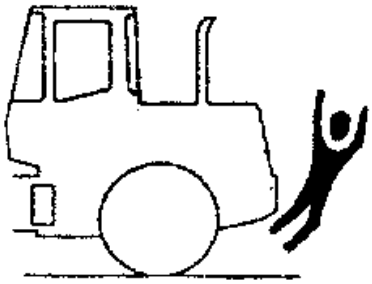
- Before starting the machine, check around the vehicle if there is people or blocks existed.
- Never start the engine if the warning sign is hung on the operating lever.
- Only sitting well can the engine be started.
- Do not let anybody except driver enter into the driving cab or any other place in the vehicle.
- Check if the reverse running buzzer can work normally if it is installed.

Check When Running Back the Vehicle

First exert following matters when operating the machine or working device:

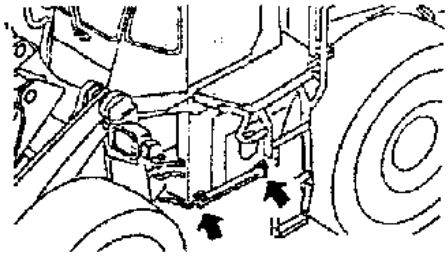
- Warning people around the machine by tooting.
- Be ensured nobody is around and behind the machine.
- It should have special person to check safety if needed, especially when the vehicle is tunning back.
- It should have special person to commend traffic on the field in case in dangerous area or in the place where the view of version is bad.
- Do not allow people to close to the running route of the vehicle.

Above stipulations should be observed even the reverse running buzzer and the rearview mirror are installed.



Safety Check

Before starting the machine, check and ensure that the Safety lever should be on the neutral position.



Attentions When Running

- The scraper bowl should be 40 to 50 cm apart from the ground when running on plain road.
- When running on uneven road, keep lower speed and stable steering and avoid sudden turn.
- If the engine goes out when running, the steering wheel cannot be used any more. This is very dangerous and you should brake and stop the vehicle immediately.

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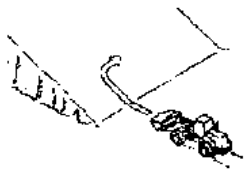
Running on the Slope

- When running on steep slope, dike or hillside, it could cause turn over or slippage.
- When running on slope, dike or hillside, make the scraper bowl be 20 to 30 cm (8 to 12 inches). In emergency case, quickly lower the scraper bowl down to the ground to help stop and prevent the vehicle to turn over.
- Do not turn the vehicle on the slope or run across it. They can be done on plain place.
- Do not run across on grass land, fallen leaves or wet steel plate to avoid slippage. If running on the edge of the slope, it should be at a very lower speed.
- When running down the slope, it should keep lower speed and make the engine as the brake.
- When the engine goes out on the slope, immediately step down the brake, put down the scraper bowl and stop the vehicle by the brake.
- When loading weights, run forward when going up the slope and run backward when going down the slope.

INCORRECT



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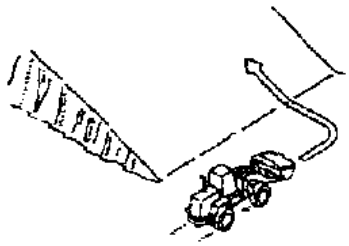
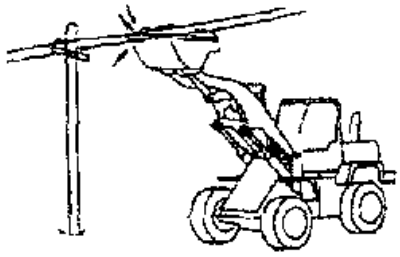


Do not Close to High Voltage Wire Pole

- It can cause electrical shock if closing to high voltage wire pole. Keep the distances between the machines and poles given below.
- Following approaches can prevent accidents effectively:
  1) Wear rubber shoes or leather cushion.
  2) If closing to electrical wires, it should have special person to commend.
- If working device contacts electrical wires, driver cannot leave the driving cab.
- When working near electrical cables, do not let anybody close to the vehicle.
- Before working, contact with power supply company to ensure voltage of wires.

Voltage	Min. Safety Distance
6.6 kV	3 m
33.0 kV	4 m
66.0 kV	5 m
154.0 kV	8 m
275.0 kV	10 m



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Attentions When Operating

- Be care not to close to the edge of the cliff.
  When building a dike, or dumping soil on the edge of the cliff, dump one heap first and push the first heap by the second heap.
- Be care that the scraper bowl could not be touched with the dumper or the side surfaces of the ditch.
- When push loads out of the cliff or when the vehicle arrives at the top of the slope, the load will suddenly reduced and the speed will be increased. Therefore speed reduction is necessary.
- Do not load against the wind so as to prevent dust.
- When the vehicle is fully loaded, it should prevent sudden start, turn or brake.
- When loading the dumper, be ensured nobody is in working area and to reduce shock as can as possible when loading.

Ensure a Good View of Version

- When working in dark area, install the working lamp and the top lamp. The lighting device on the field should be considered if needed.
- Stop working if the view of version is not good, for example in foggy, rainy or snowy days until safe working is possible in fine days.

Be Care to Operate in Snow

- When working on road with snow or ice, it is dangerous to slip if running on a small slope. Therefore it should run slowly and avoid sudden start, turn or brake.
- When sweeping snow on roads, special care is needed because road shoulder or something under snow are unseen.
- When running on road with accumulated snow, do not brake the vehicle suddenly. You can lower the scraper bowl down to the ground to stop the vehicle.
- Loading work can be changed largely due to kinds of snow, therefore loading amount should be decreased to avoid slippage of the vehicle.

Do not Bump Working Device

- Be care not to bump working device when working in height-restricted areas such as in tunnel, under bridge of electrical cables or in garage.

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Ways of Brake

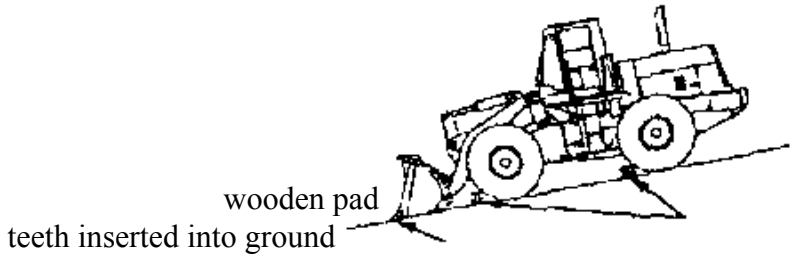
- Do not put feet on the step tread unless it is necessary.
- Do not brake repeatedly unless it is necessary.
- When running down the slope, use the engine to brake and always step on the brake tread.

When Working on Soft Ground

- Do not be too close to cliff, steep or deep ditch. If they'll collapse, you and your machine will drop down and turn over and a series of injuries and deaths will occur. Remember the bearing capacity of soil in these areas will be lowered after strong wind and heavy rain.
- Soil near the ditch is something loose and soft. It can be collapsed because of the weight and vibration of your machine.
- When working in dangerous area or the place where sands and stones will drop down, the roll-over protection structure (ROPS) should be installed.
- When working in the place where sands and stones will drop down and the vehicle will turn over, the roll-over protection structure (ROPS) and the safety belt should be installed and used.

Packing of the Vehicle

- To park the vehicle on the plain ground as can as possible. If it is needed to park on the slope, you should use wooden pad to block wheels so as to prevent moving of the vehicle.



- When parking on the highway, be care of vehicle, flag and protective railing not to hinder traffic. The use of protective railing, mark, flag, light and other necessary signs should ensure that running vehicles and pedestrians can see the loader clearly.

  The parking procedures → see "12.13 Parking of the Machine".
- When leaving the machine, put the working device on the ground completely, then stop the engine, lock all devices and bring the key with yourself.

  The position of working device → see "12.13 Parking of the Machine".

  The locking position → see "12.17 Locking".

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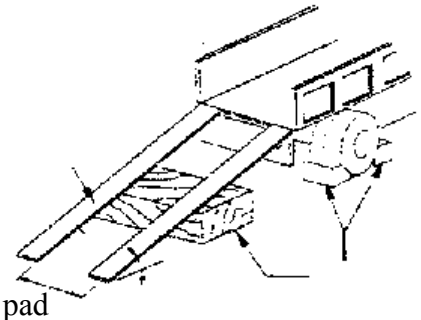
7.3 Transportation

Loading and Unloading

- It has always potential dangers when loading on or unloading from the loader, so special care should be always taken.
- When loading the loader, operate the engine at idling speed and run at lower speed.
- Before loading, be sure to place wooden pads to block the wheel of the trailer and the slope board.
- Only loading and unloading on solid ground and keep a certain section of safe distance from the edge of road.
- The slope boards used should have enough strength and enough length and width so as to form a structure with safe slope.
- The slope boards should be placed and fixed stably and two boards should be on same plane.
- The slope boards should have clean surfaces without dirt, ice or other loose matters. Clear out dirt on the tyres of the loader.
- Do not rotate the steering wheel on the slope board. If needed, return from the slope board and adjust the direction, then step on the board again.
- After loading is finished, block wheels by wooden pads and stop the vehicle reliably.

Loading and unloading → see "13. Transportation".
Tying tightly → see "13. Transportation".

CORERCT



max. 15° pad
distance between two slope

Transportation

- When loading and transporting, observe laws referring to length, width and height of cargo as well as all available laws.
- When deciding transporting routes, the length, width and height of cargo should be considered.

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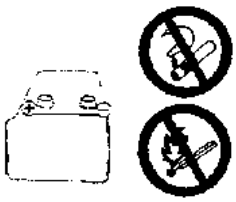
7.4 Storage Batteries

Prevent Danger of Storage Batteries

- There are sulfuric acid in the electrolyte of the batteries. If it is splashed, cloths will be burnt out soon. If you are splashed by sulfuric acid, flush with water immediately until it is cleaned.
- If eyes are splashed they could cause blind. Should acid enter into eyes, flush with large amount of water immediately and go to see doctor as soon as possible.
- If you eventually drink acid, drink large amount of water or milk, eggs or vegetable oil immediately and call doctor as soon as possible.
- Always wear glasses or goggles when you treat storage batteries.
- Storage battery can produce hydrogen which is easily exploded and can be ignited by small sparkle or flame.
- Stop the engine and set the ignition switch at OFF position before treating batteries.
- Check positive and negative poles when installing or uninstalling batteries.
- Tighten the cover of batteries reliably.
- Tighten poles reliably otherwise they can catch fire and cause explosion.

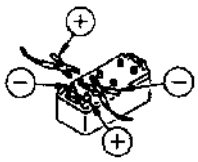


Start with Charging Cable

- When starting with charging cable, be sure to wear safe glasses or goggles.
- When starting with batteries from other machine, do not let two machines to be contacted.
- When using charging cable, be sure to connect positive pole of the cable first, and remove the negative pole of the cable or the ground wire first when uninstalling.
- Sparkles will occur if contact positive pole and the chassis at the same time. This is very dangerous therefore operation should be careful.
- When connecting batteries in parallel, the positive poles should be connected together while the negative poles should be connected as well.
- When connecting the ground wire with the frame of running vehicle, the connection should be reliably.

  Starting with charging cable → see “16.3 When Battery is Exhausted”.

INCORRECT



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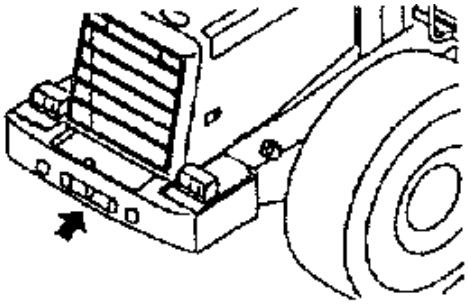
7.5 Trailing

When Trailing, Tie the Trailing Pin by Rope

- Trailing with wrong manner can cause a series of injuries of human body and damages.
- When trailing the vehicle by other vehicle, ropes should be enough in relation to the weight of the vehicle.
- Never trail the vehicle on the slope.
- Do not use any curled or twisted trailing rope.
- Do not stride across or close to the trailing rope.
- When connecting with trailed vehicle, nobody should be allowed to enter into the place between trailing and tailed vehicles.
- Make the axial line of the trailed vehicle to be in the same axial line with trailed part so as to ensure that it is in correct position.

Trailing style → see "16. Remedies of Troubles".



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8.1 Before the Maintenance

Warning Sign

- If somebody starts the engine or operates the operating lever when you are making maintenance or lubrication, it could cause a serious of injury and death upon you.
- Be sure to hang the warning board on the operating lever to tell people you are making maintenance upon the vehicle. Hang up other warning boards around the vehicle if necessary.

Suitable Tools

- Only suitable tools can be used here. If damaged or temporary tools with low quality and faults are used, they could cause injury upon you.

Tools → see “21.1 Brief Introduction of Required Tools”.

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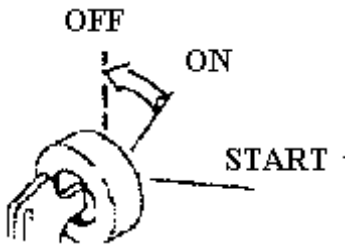
Change Key Safety Parts Regularly

- Regularly change parts in connection with fire:
  Fuel system: fuel hose, oil return hose.
  Hydraulic system: output hose of the pump.
- Above mentioned parts should be changed regularly whatever they are broken or not. They will be aged as the time goes.
- Change them if they look some defective whatever the change term is up or not.

Change key safety parts → see "22. Regular Change of key Safety Parts".

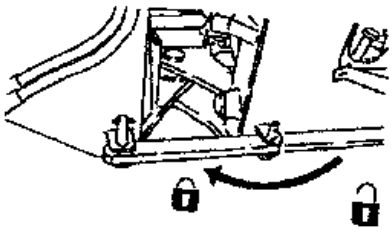
Stop the Engine First before Check and Maintenance

- Before making check and maintenance, stop the vehicle on the plain and solid ground first and shut off the engine.
- If making maintenance when the engine is running, for example to clean inside the heat radiator, set the safety operating lever on the locking position and the operation should be done by two persons.
- One operator should sit on the driver's seat so as he can shut off the engine immediately when needed. He should be specially careful and not to operate the operating lever wrongly.
- Peoples who make maintenance should be specially careful and not to contact moving parts or to be stuck by them.



Lock both Front and Rear Frame

Lock the front and rear frame by the safety lever lock.



LOCK

UNLOCK

Support the Working Device

- When making check and maintenance in case the working device is lifted, you can use the stand to support the lifted boom in order to avoid dropping down. In addition, set the operating lever of the working device on the neutral position.

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8.2 When in Maintenance

Personnel

- Only professionals can carry out maintenance and repair. When using grinding, welding and hammering, additional safety measures should be taken.

Parts

- Put parts removed from the machine on a safe place and ensure that they cannot drop or fall down. If they pound upon you or some others, it can cause serious injury.

Working under the Machine

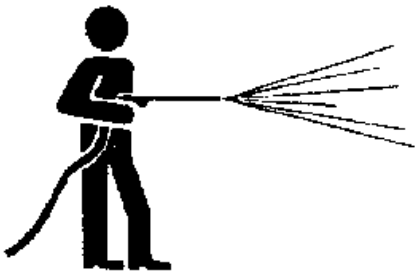
- Before making maintenance or repair under the machine, lower down all mobile working devices on the ground or to their lowest position.
- Be sure to fix tyres by wedges.
- Do not work under the vehicle which cannot be supported well.

Keep the Vehicle Clean

- It is dangerous if fuel and grease are spilled out or tools and broken parts are scattered everywhere, because they can cause you to fall down or to be injured.

Keep the machine clean and neat at any time.

- If water comes into the electrical system, it can cause the machine not run or run suddenly.
  Do not use water or steam to clean the censor, plug or driving cab.



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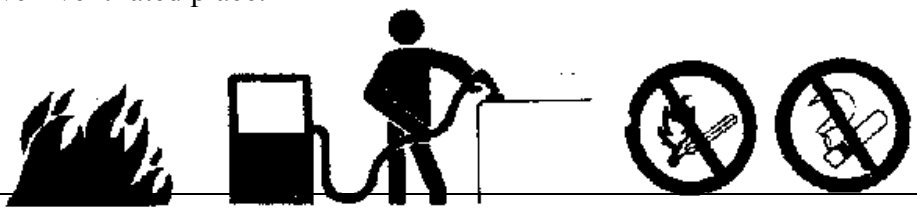
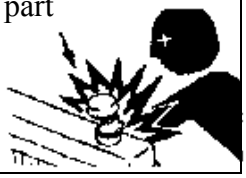
Principle to Filling Fuel and Machine Oil

- Spilled fuel and machine oil can cause you to slide down so they must be cleared out on time.
- Be ensured to tighten the cover of the filling port.
- Never use fuel to clean parts.
- Fill fuel at well-ventilated place.



Water Amount in Heat Radiator

- Check water amount only after the engine is stopped and the engine and the radiator are cooled. middle
- When taking out the cover, slowly loosen it to release internal pressure. part



Use of Lighting

- Check fuel, machine oil, coolant and electrolyte of batteries, be sure to use explosion-proof lamp, otherwise explosion could occur.

Attentions to Maintain Storage Batteries

- When repair electrical system or use weld something, it should disconnect the negative pole of the storage batteries to switch off power supply.

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Treat High Pressure Hose

- Do not bend or knock high pressure hose. Do not use any bent hose or pipe with crack as they could be burst when using.
- Be ensured to repair well all loosen or broken oil pipe. If leakage exists, fire could be caught.

Attentions to High Pressure Oil

- Do not forget that there is always pressure in oil pipes of working device.
- Do not fill oil, drain oil or make maintenance and check before the internal pressure is released.
- If high pressure oil leaks from small hole, flows on your skin or spills into your eyes, it is dangerous. Therefore you must wear safety goggles and thick gloves, and check leakage by thick paperboard or small wooden piece.
- If you are flushed by high pressure oil, contact doctor for treatment immediately.

Attentions to Maintenance under High Temperature and High Pressure

- Cooling water of the engine and all oil are under high temperature and high pressure while work is just stopped.
- In this case, if you remove the cover, drain oil and water or change filter, you could be scalded or injured. Only when temperature is lowered down, can check and maintenance be carried out as per procedures given on this manual.

Clean cooling system, check lubricant oil, filling oil → see “24.2 Maintenance as Required”.

Check cooling water amount, fuel amount on the base of the engine, brake oil amount, filling fuel or water → see “24.3 Check Before Start”.

Check hydraulic oil amount and filling oil → see “24.5 Regular Maintenance”.

Change oil and strainer → see “24.6-9 Regular Maintenance”.

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Turning Fan and Belt

- Do not close to turning parts to be hanged by something.
- If your body or tool touches blades of the fan, they could be cut or stroke out so you should never contact any turning parts and their components.

Operate in Case the Chassis is Propped Up

- When operate in case the chassis is propped up, lock the front and rear frames by locking bar and set the operating lever at the neutral position.
- When propping the machine by the jack, you should put wooden pad under the wheels on the other side to fix position when the machine is propped up.

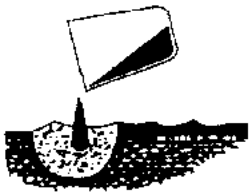
Maintenance of Tyres

It should have special tools and technique to remove, repair or install tyres. Repair tyres at special shops.

Scraps

- Do not dump waste oil into sewage system or rivers.
- Be ensured to drain oil from the machine into containers, never drain it directly on the ground.
- When treating scraps such as machine oil, fuel, coolant, solvent, filter, storage batteries or other poisonous substances, concerned laws and regulations should be followed.

INCORRECT



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8.3 Tyres

Treatment of Tyres

If tyres are not used under required environment, they could be burnt due to overheat or cut, and serious damage and injury could be caused.
For the sake of safety, tyres should be used under following conditions.

- Tyre should be filled up to specified pressure otherwise it is easily heated.
  Suitable air pressure → see “12.18 Use of Tyres”.
- Avoid overload
  Applicable load → normal load of the scraper bowl
  ZL30G-5 500 kg
  [when 3.0 m^3 normal scraper bowl is installed]
- Use specified tyres.
  The estimation value of pneumatic pressure and allowed speed given on this manual are general data. In fact, they can be decided as per the model of tyres and working conditions. You can contact with your dealers or manufacturer of the tyres for more information.
  If heated in case the rim in installed on the tyres, inflammable gas could occur and the tyres could be exploded if catching fire thus to cause a series of damages and injuries. This is not like to be pierced or burst and great destructive force could occur. Therefore when installing tyres, following operations are absolutely prohibited:
- Weld the rim.
- Use fire to make welding near the rim or the tyres.

If you do not know correct procedures to make maintenance or change of tyres and rim instead of wrong manner, the rim or the tyres could be exploded and a series of injuries and damages could occur. If you make such maintenance, please contact with your dealers or manufacturer of the tyres.

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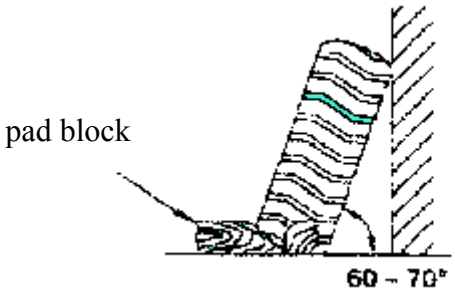
Stacking of Removed Tyres

- As a basic rule, tyres should be stored in the warehouse and no person is allowed to enter into without permission. If tyres are stacked in open area, railing should be set around tyres and the warning board of "NO RNTRY" should be hanged on which even child could understand.
- Place tyres vertically on the plain ground and fixed by pads to prevent rolling or falling down.
- If tyres are falling down, you should dodge them as soon as possible. As the tyres of engineering machines are very heavy, you could be injured if you want to give a support.



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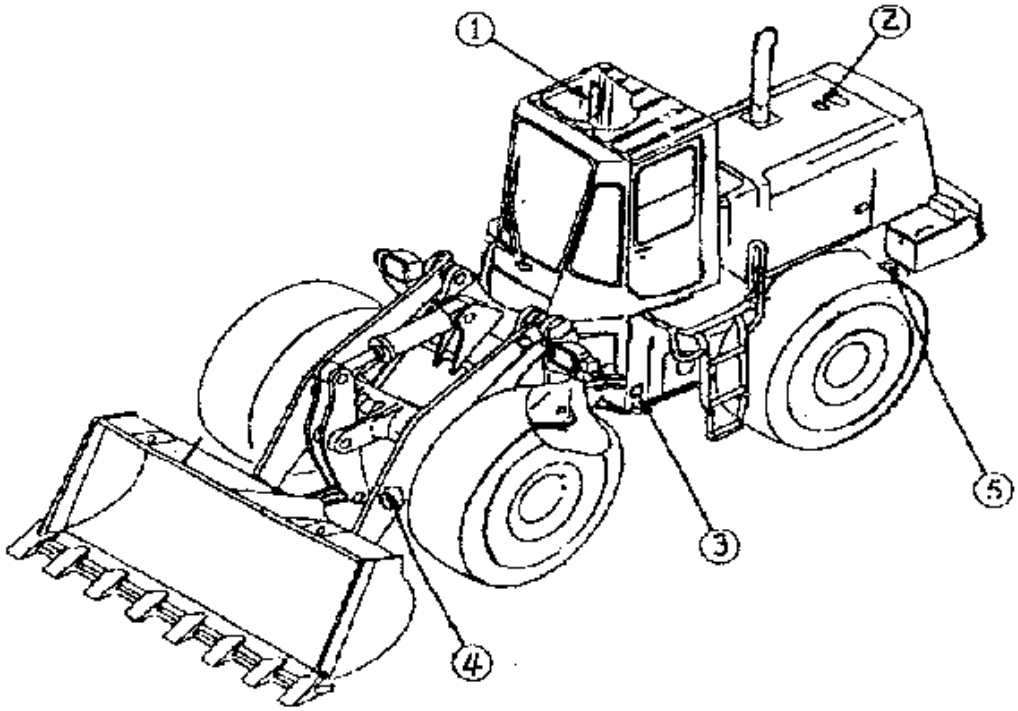
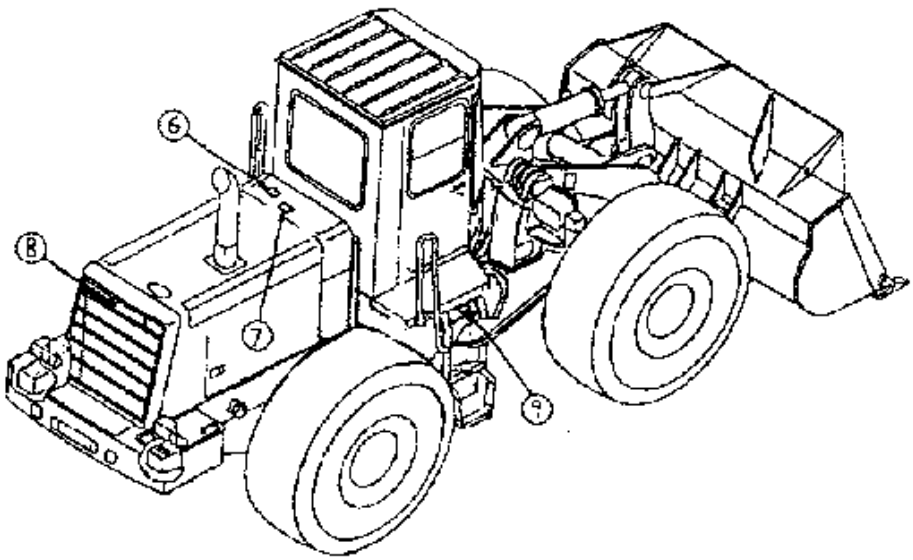
9. Positions of Safety Boards ⚠ Warning: please follow safety attentions below for the sake of safety.

Keep cleanness of these boards. If they are missing or damaged, reinstall them or change new ones. Following other boards not marked should be treated as well.
Boards written rather than English are also available. You can contact with your dealers to know which kinds of boards they have.

9.1 Positions of Safety Boards





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9: Positions of Safety Boards ⚠ Warning: serious accident could occur if don't observe these precautions.

1. Notes to Driver

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⚠ Notes to the Driver

1. The driver should be familiar with traffic rules. Informal driver could not drive the loader. The practitioner should drive under the guidance of the formal driver sit aside.
2. The driver should read the <Operation and Maintenance Manual> carefully, understand and be familiar with locations and functions of all operation devices, meters and indicating lamps, understand main properties of the machine and strictly follow operation regulations and maintenance requirements.
3. The driver should understand all prompt and warning signs on the loader.
4. Check the vehicle as per regulations and make preparations well before starting.
5. Toot first before start and operation. Only the brake air pressure rises to 0.6 – 0.8 Mpa can the vehicle be started and operated.
6. Check and maintain the brake system every day. Should it not work temporarily, it should dismount and check if the piston of the main pump and the seal cup are good. Replace if damaged. Dismount and check the main pump once a month, fill up specified brake oil as per requirement, make adjustment and ensure reliable brake.
7. Sliding with the gear disengaged is strictly prohibited when running down on the slope in order to prevent the flameout of the engine otherwise the hydraulic steering will not work and cause driving accident.
8. If the engine is flameout, brake immediately and make emergency brake to stop the machine.
9. Do not repair and maintain the vehicle when it is operating. If it does need, it should be supervised by skillful driver sit on the vehicle.
10. When running, unsuitable high speed and sudden turn should be avoided, especially on roads with bad conditions and narrow, steep and crooked roads in hilly area, only low speed is allowed.
11. When passing through the bridge, take care if the bearing capacity of the bridge is allowed it to pass through.
12. When loading, the loader is not allowed to rush the materials at high speed.
13. When running, except the driver nobody is allowed to sit on any place of the loader.
14. When operating, people are not allowed to stand or walk under the boom and the scraper bowl. If maintenance under the boom is needed when the loader is not in operation, it should have safety measures to fix the boom, grab bucket and scraper bowl in order not to injure persons.
15. When grabbing or scrapping, avoid overload, unbalance and transportation at the highest position. If some hinder should be over-passed, drive the machine carefully and lower the boom down to normal transportation position, 40 to 50 cm from the ground after the hinder.
16. Switch off power supply when check or repair the engine and the electrical system.
17. Before leaving the driving cab, lower the scraper bowl or the boom down to the ground, set the operating lever at the neutral or locked position, shut the engine, take out the key and switch off power supply.
18. When pull the covers of the hot water tank of the engine and the hydraulic oil tank, wear gloves and loosen slowly to prevent to be scalded by hot water or oil sprayer from tanks.
19. Should the vehicle have trouble and be trailed by other vehicle, remove the pins on front and rear transmission shafts and the steering oil tank otherwise the steering device and speed variator would be damaged.
20. Take care of fireproof. When adding oil and maintain the loader, do not smoke.
21. Bleeding off air from the tyre when removing tyre and steel hub. Check inner and outer tyres to see if they are well before filling air. Check the rim if it is safely locked. Bolts and nuts are not allowed to change with those with less strength. Air pressure should be in specified range.
22. All oils should be clean and in accordance with specified brands and standards.

9. Positions of Safety Boards ⚠ **Warning: please follow safety attentions below for the sake of safety.**

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2. Warning Board of High Water Temperature

WARNING	
水温高时，决不可开盖。	NEVER OPEN COVER WHEN WATER IS HIGH TEMPERATURE.

3. Board of Danger when Turning

WARNING	
车辆转弯危险，不许进入此处。	DO NOT GET INTO THIS AREA ! WHEN OPERATING， THIS VEHICLE BODY WILL BE BENT. IT IS SO DANGEROUS THAT YOU MIGHT BE INJURED.

4．Prohibition Board

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5. Board for Using Specified Fuel

必须使用指定燃料
MUST USE APPOINTED FUEL

6. Board for Attention

注意 ⇧ATTENTION
1. This screw plug should be always tight and sealed. 2. When repairing, loosen the screw plug 4 to 6 turns the oil supply shall be stopped automatically. 3. After repairing is finished, retighten the screw plug again.

7. Warning Board of Oil Tank

警告 ⚠ WARNING	
1. 开盖之前，须先停机。 2. 油温尚高时，决不可开盖。 3. 工作油箱盖应缓缓的卸开以便放泄残压。 4. 油温高时，放泄塞决不可放松。	1. MUST STOP ENGINE BEFORE OPENING THE COVER. 2. NEVER OPEN THE COEVR WHRN OIL IS IN HIGH TEMPERATURE. 4. REMOVE THE COVER SLOWLY TO RELEASE REMAIN PRESSURE. 5. DRAIN PLUG CANNOT BE LOOSENED WHEN THE OIL IS IN HIGH TEMPERATURE.

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9. Positions of Safety Boards ⚠ Warning: please follow safety attentions below for the sake of safety.

8. Board for Adding Anti-Freeze Liquid

ANTI-FREEZE LIQUID HAS BEEN ADDED INTO THE WATER TANK

⚠If temperature is higher than –18℃, no water should be drained from the water tank. If less than –18℃, prepare the anti-freeze liquid again as per the description of the anti-freeze liquid.

9. Board for Attentions to the Gas Storage Tank

⚠ ATTENTION
1. After completion of work every day, drain all water from the gas storage tank. 2. Check safety valve regularly to ensure its normal working.

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OPERATION

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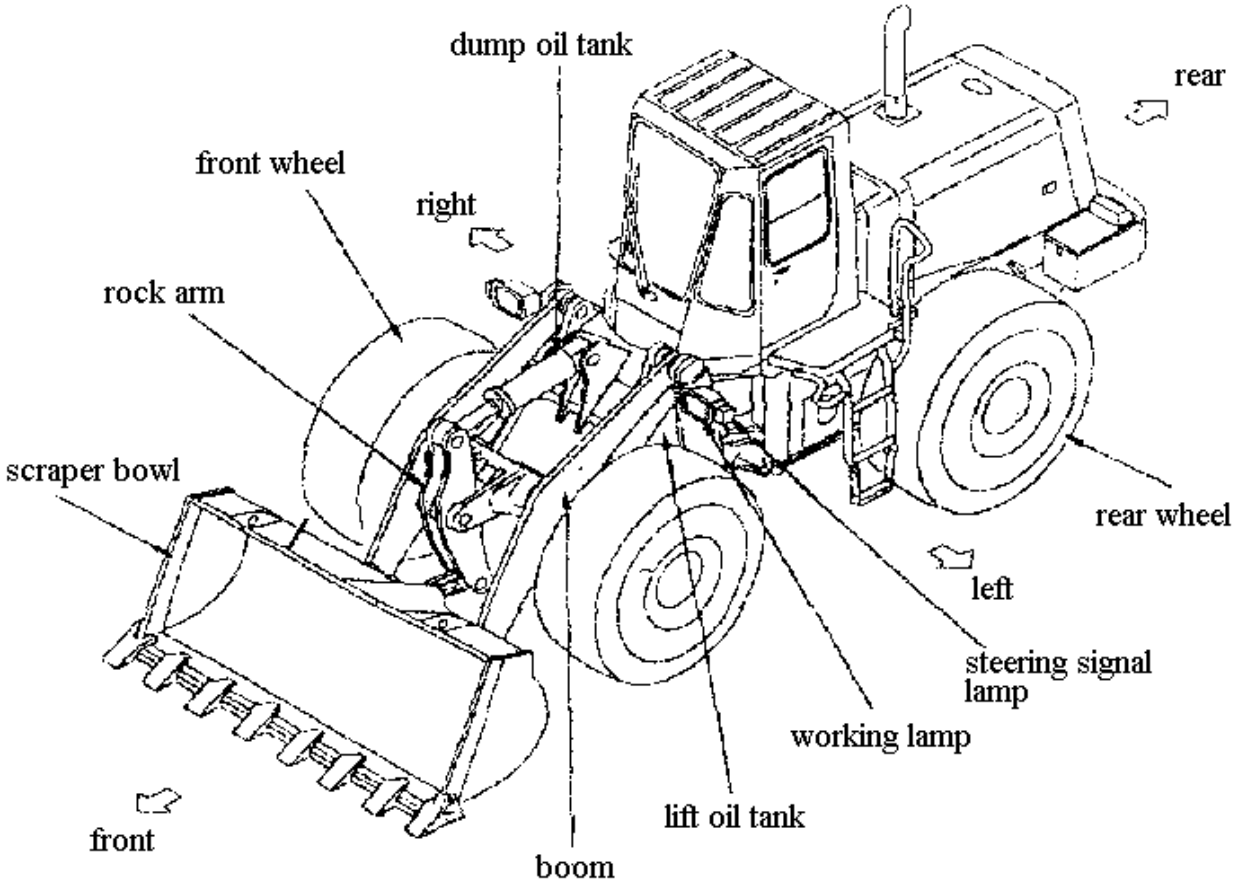
10.1 The General View of the Machine

The directions indicated in this paragraph are the directions arrows indicate in the drawing below.



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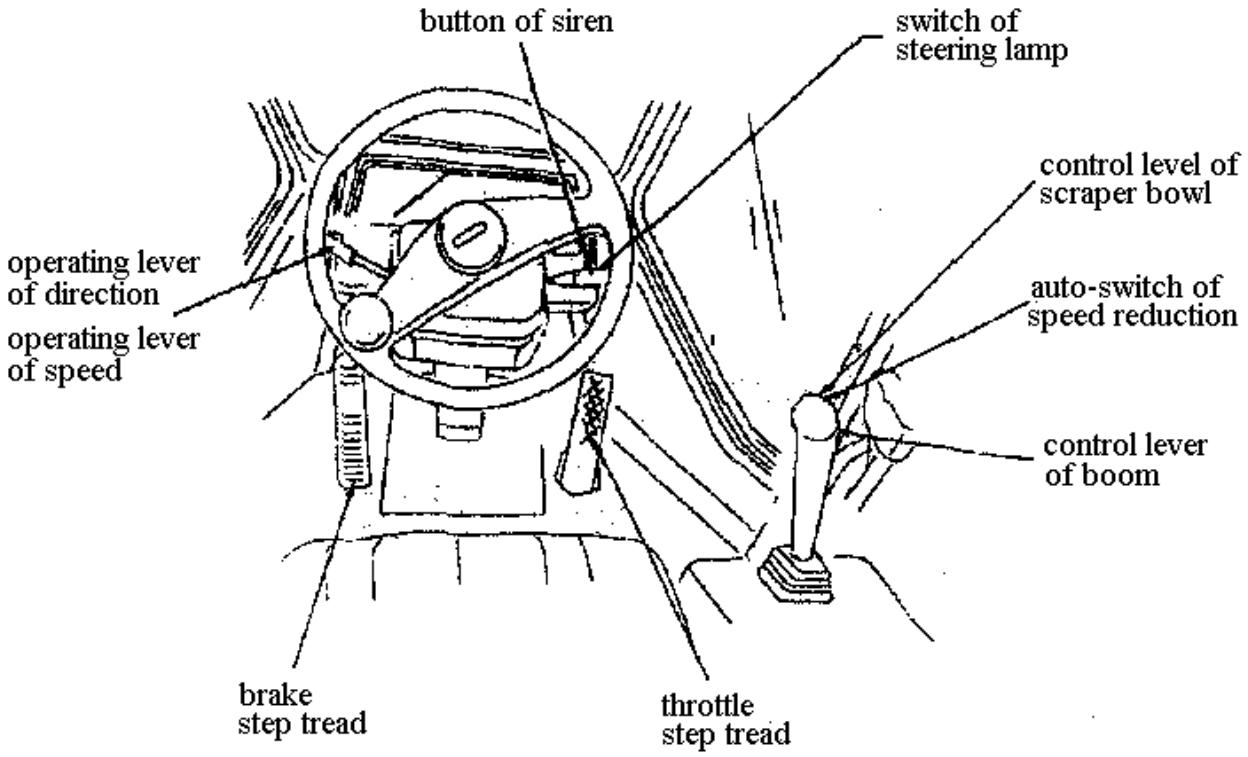
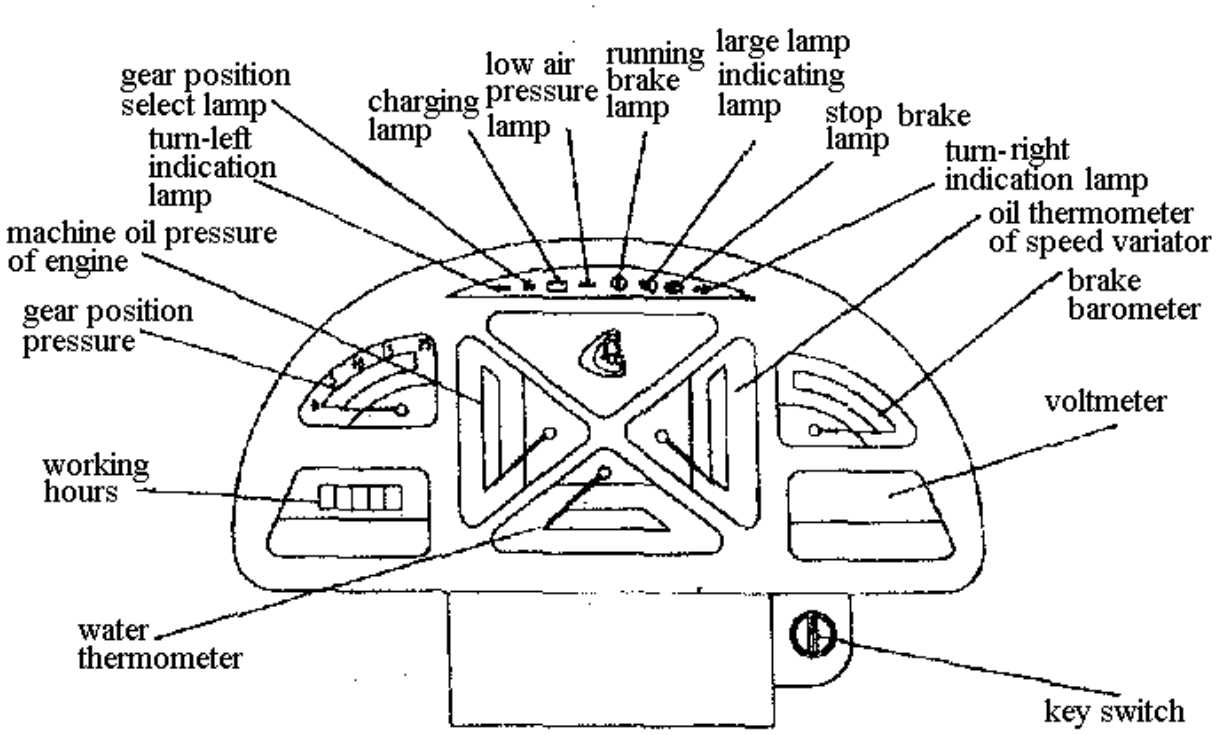
10.2 The General View of the Operating Levers and Meters





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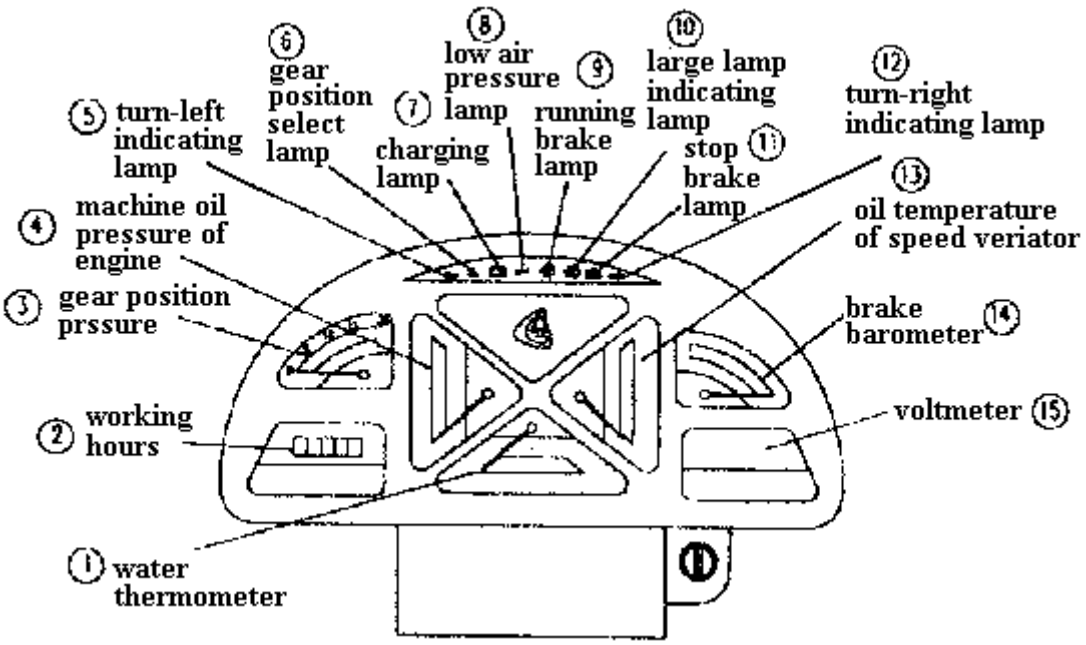
The descriptions of equipments used when operating the machine are as follows.
It is very important to completely understand the operation methods and functions of equipments below so as to make safe, correct and suitable operations.

11.1 Monitors and Lamps of the Vehicle



1. Water Thermometer

Used to monitor temperature of cooling water.

2. Working Hours Meter

The accumulated working hours meter of the machine.

3. Gear Position Pressure

Used to monitor oil pressure of gearbox.

4. Machine Oil Pressure of Engine

Used to monitor oil pressure of the engine.

5. (12.) Turn Indicating Lamps (both left and right one each)

To indicating turn direction, it lights as the turn lamp lights at same side at same time.

6. Gear Position Select Lamp

When it lights, motive power is not cut-off when braking while it goes out, motive power is

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cut-off when braking.

7. Charging Lamp

When the generator is normally running, the batteries are charged and the lamp lights otherwise it goes out.

8. Low Air Pressure Lamp

The lamp lights when air pressure is lower than the specified value and it is strictly prohibited to drive the machine.

9. Running Brake Lamp

When braking the vehicle, this lamp lights with the brake lamp lights at same time.

10. Large Lamp Indicating Lamp

It lights when one of the working lamp, front license lamp and the rear license lamp lights to remind the driver to switch off lamps if leaving for some long time.

11. Stop Brake Lamp

It lights when manual brake is used.

13. Oil Temperature of Torque-Changer

To monitor oil temperature of the torque-changer.

14. Brake Barometer

To monitor air pressure in air storage tank of the brake system.

15. Voltmeter

To indicate voltage of storage batteries.

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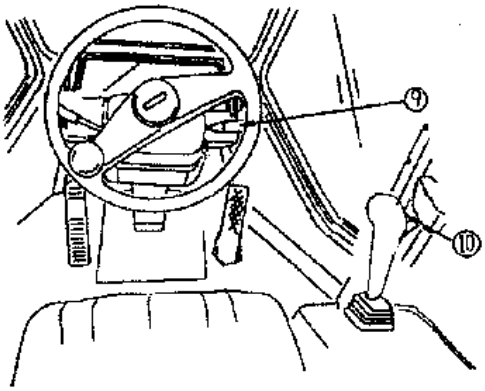
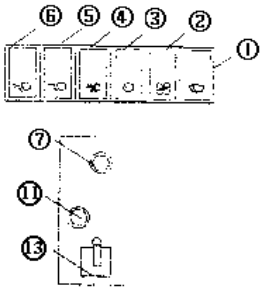
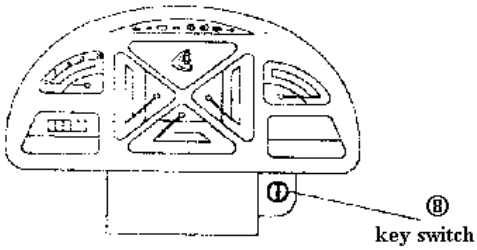
11.2 Switches







1. Switch of the Rain Scraper

To control the rain scraper. When switching on, the rain scraper works otherwise it stops. The switch has two working positions. Position 1 means high speed while 2 means low speed.

Position of Switch	Operation
0	Off
1	Scraping at low speed
2	Scraping at high speed

2. Switch of the Fan

It can control working states of the fan. When the fan is needed to work, open the switch (pull up) and the fan starts to work otherwise close it (push down to the lowest position). It has two positions. The highest position is for high speed while the middle position is for low speed.

3. Switch of Meter the Lamp

Open it the indicating lamp lights. It also controls indicating lamps for the lamps of the front and rear licenses. Only it is switched on, can two indicating lamps light.

4. Switch of the Working Lamp

It can control working states of the working lamp. Open it (pull up) when the loader is running or operating at night or in dark place while close it (push down) the working lamp goes out.

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5. Switch of the Rear License

Open the indicating lamp of the rear license, the lamp lights.

6. Switch of the Front License

Open the indicating lamp of the front license, the lamp lights.

7. Stop Brake Handle (Emergency Lamp)

It can control working states of the manual brake. Pull it up the manual brake is at working state while push it down the manual brake is inactive.

8. Key Switch

It is used to start or stop the vehicle.

OFF Position

At this position you can insert or withdraw the key. If turning the key to this position, the electrical circuit is switched off and the engine stops.

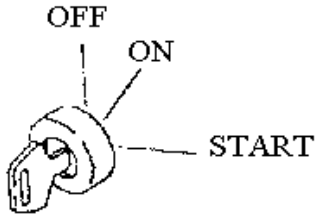
ON Position

At this position current flows in charging and lamp circuits.

Keep the key at ON Position when the engine is running.

START Position

This is the place to start the engine. When the motor is starting, keep the key at this position while the engine is started, loose the key immediately and it can return to ON Position automatically.

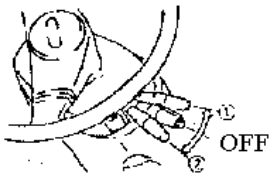


9. Operating Lever of Steering Lamps

This lever is used to operate the steering lamps.

(1) Turn-Left: push the lever forward.

(2) Turn-Right: pull the lever backward



Remarks:

- When operating this lever, the turn indicating lamp will flash at the same time.

10. Button of Siren

The siren will sound when pushing down the button on the operating lever.

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11. Automatic Speed Reduction Switch

When the gear lever is shifted at Gear II, push down this switch at the top end of the operating handle of the boom, the gearbox can be reduced to Gear I automatically.

This switch can be used to increase drawing force when it is in scraping and excavating operation.

Remarks:

When releasing the automatic speed reduction switch, you can set the operating lever to the neutral or the return position, or set at any gears rather than the gear II, or you can switch off the start switch.

12. Select Switch for Gear Disconnection

When it is set at ON, the indicating lamp on the panel lights and the motive power is not cut-off when braking while it is set at OFF, motive power is cut-off when braking.

13. Main Switch of Power Supply

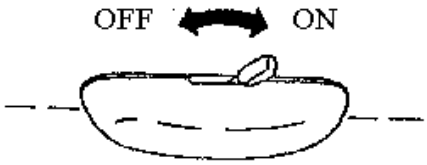
When pressing down, power supply is on; while pulling up, power supply is off.

Remarks:

Power supply should be switched off when not working.

14. Lighting Switch in the Driving Cab (not displayed in above drawing)

It is used to switch on the lamp in the driving cab.
Position ON: switch on the lamp.
Position OFF: switch off the lamp.



Remarks:

• Even the main switch is switched off, the lamp in the driving cab can be still switched on. So when you leave the driving cab, please set the switch at OFF position.

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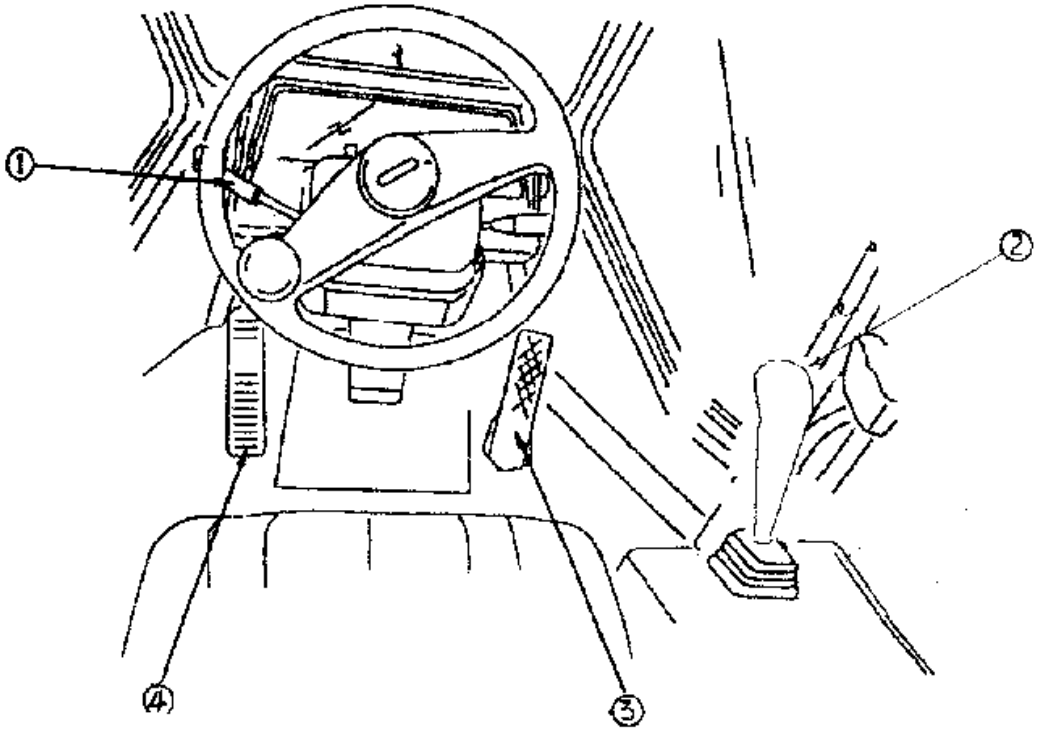
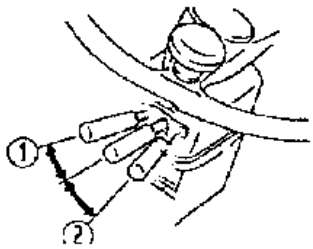
11.3 Control Lever and Step Treads



1. Gearshift Lever, Direction Lever

This operating lever is used to control running speed of the vehicle and change running direction of the vehicle. It has a gearbox with three forward gears and three backward gears. Set it at suitable position you can get hopeful speed.



There are positions 1 to 3 on the turning switch, which can reach speed from Gear I to Gear III:
Gear I is used for working; Gear II is used for working with loose materials and Gear III is used for running.

Position ①: for running forward;
Position ②: for running backward.

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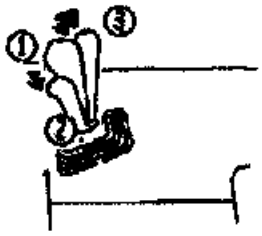
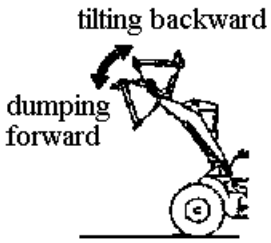
2. Operating Lever of the Scraper Bowl

This lever is used to operate the scraper bowl.



(1) Tilting Backward: if the operating lever pushes forward from the "Tilting Backward", it will stop at this position until the scraper bowl reaches at the preset position set by the positioning device. The operating lever returns to the keeping position.

(2) Holding: the scraper bowl will be kept at the certain position.



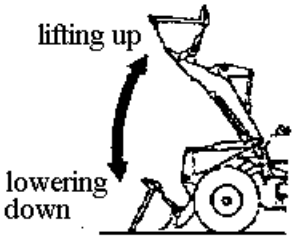
(3) Dumping Forward: unloading materials.

3. Operating Lever of the Boom

This lever is used to operate the boom.

(1) Lifting Up: if this lever is pushed forward to the lifting up position from the keeping position, it will stop at this position until the boom reaches at the preset position set by the limiter. The operating lever returns to the "keeping" position.

(2) Holding: the boom will be held at the certain position.



(3) Lowering:

(4) Floating: the boom moves freely under the role of external force.

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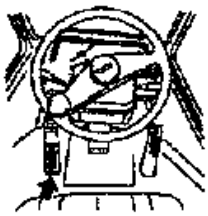
4. Braking Step Tread

⚠ WARNING

- When running down on the slope, the engine brake should be used and the brake step tread must be used.
- Do not repeatedly use the brake step tread if it is not necessary.
- Do not step your feet on the tread if it is not necessary.



Brake Step Tread

The brake step tread controls the brake of wheels. In addition, if the select switch for gear disconnection in the gearbox is only set at ON position, it will set the gearbox at neutral position to cut off the motive power.

If the select switch for gear disconnection in the gearbox is set at OFF position, it will not set the gearbox at neutral position to cut off the motive power when the brake step tread is stepped down.

Remarks:

If stepping down the throttle to operate the working device, after the select switch for gear disconnection in the gearbox is set at ON, it must use the brake step tread to reduce speed or to stop the vehicle.

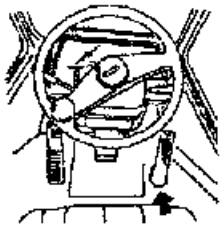
5. Throttle Step Tread

This step tread controls the speed and the output of the engine.
The speed of the engine can control the low idling and full range of the speed arbitrarily.

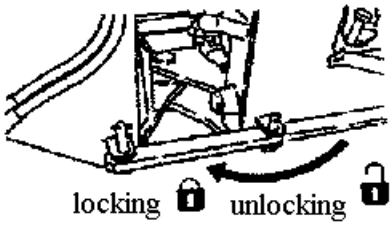
11.4 Safety Lever

⚠ WARNING

- The safety lever must be used at the time to make maintenance and transportation of the machine.
- The safety lever should be taken out when the machine is running normally.



When the safety lever is used for maintenance and transportation of the machine, it locks both front and rear frames and can prevent them from being bent.



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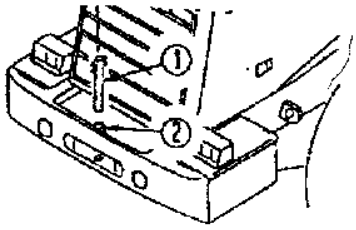
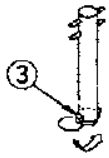
11.5 Drawing Pin

1. Insert the drawing pin ① into the balance weight ②.



2. Insert the pin ③ to prevent the drawing pin from dropping off.
   Take out the drawing pin by operations in reverse procedures.



11.6 Alarm for Reverse Running

It can sound alarm when the direction lever is set at the reverse gear in order to warn people behind the vehicle that it will run backward.

11.7 Fuses (Fuse Box)

Attention:

Before changing the fuse, be sure to close the start switch first.

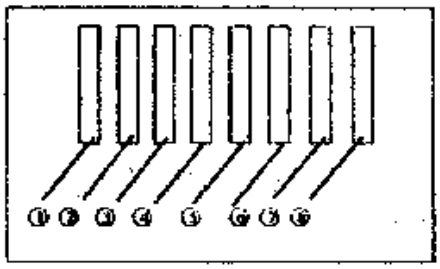
The fuses are used to protect electrical devices and cables to prevent to be burnt out.
Should the fuses be corroded or white powder be seen or the fuses be loosen on the fuse seat, they should be replaced.

Replace the fuse with another one with the same content.

11.7.1 Capacity of Fuses and Names of Circuits

Fuse Box

S/N	Capacity	Name of Circuit
1	30 A	Main circuit
2		
3	20 A	Start and meters
4	20 A	Air conditioner
5	20 A	Driving cab
6	20 A	Front and rear large lamp
7	20 A	Trumpet and steering lamp
8	20 A	Brake and reverse lamp



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12.1 Check Before Start

12.1.1 Touring Check

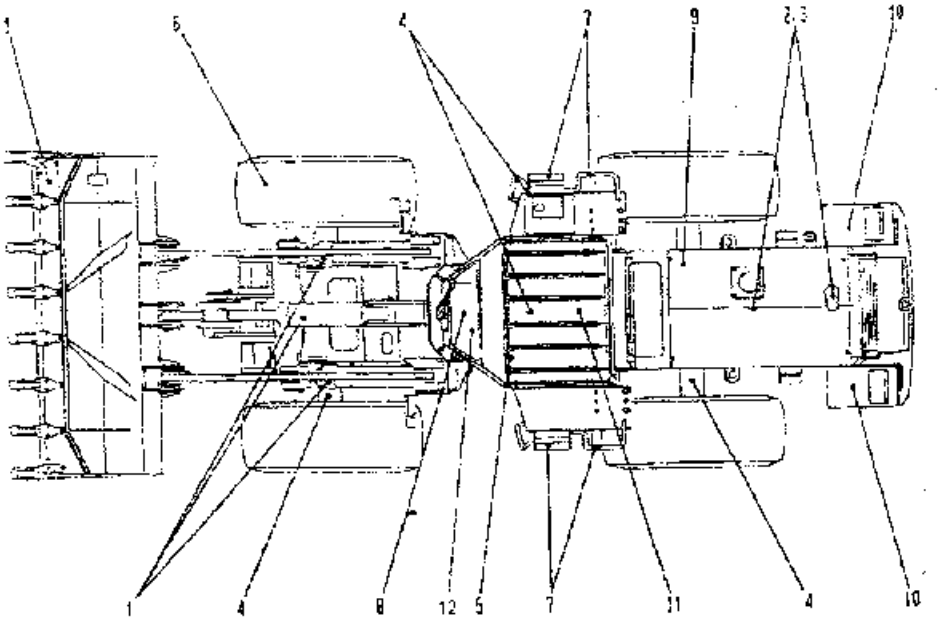
⚠ WARNING

Leaked machine oil and fuel or those inflammables gathered around the silencer of the engine and the turbocharger can cause fire.
Check carefully to find if something is abnormal. Please repair it and contact with your Agrison's dealer.

Before starting the engine, check if some nuts and bolts around the machine and under the machine are loose, check if fuel, machine oil or coolant are leaked, and check working device and hydraulic system.

In addition, check if some connecting wires are loose, if oil flees or dust gathers at high temperature part.

Before starting the machine every day, all items in this part should be checked.



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1: Check damage, weariness, loosening etc. of working device, hydraulic cylinder, connecting pins and shafts

Check working device, hydraulic cylinder, connecting pins and shafts and hose to see if crack, over-weariness and loosening are exist. If something abnormalities are found, please repair it.

2: Clear out dirt and dust around the engine, the storage batteries and the radiator

Check if there is something dirt around the engine and the radiator. Check if there is something inflammable (fallen branches, leaves and grass etc) gathered on the silence of the engine or turbocharger etc. Clear out all of these things.

3. Check leaking water and oil around the engine

Check if there is oil leaked from the engine or water leaked from the cooling system. If something abnormalities are found, please repair it.

4. Check if leakage exists on the casing of gearbox, driving bridge, hose of hydraulic oil tank and connectors etc.

Check and confirm if leakage exists or not. If something abnormalities found, please repair it.

5. Check leakage on the brake oil pipe

Check and confirm if leakage exists or not. If something abnormalities found, please repair it.

6. Check tyres if they are worn out or damaged, and if mounting bolts are loose.

Check crack and peeling on tyres and wheels (rim, rim base and lock ring). Tighten any loose bolts and nuts. If something abnormalities are found, please repair or change damaged part.
If the throttle core is missing, please install a new one.

7: Check the railing and step tread if they are damaged and if bolts are loose.

Repair any damaged parts and tighten loose bolts.

8: Check meters and monitors if they are damaged and if bolts are loose.

Check and confirm if meters and monitors in the driving cab are damaged. Replace damaged part and clear out dirt on surfaces.

9: Check bolts on the air strainer if they are loose.

Check all loosened mounting bolts, and tighten them if necessary.

10: Check loose terminals

Tighten all loose terminals.

11: Check safety belts and concerned equipments (options)

⚠ **WARNING**
Change safety belt once every three years even no abnormalities are found.

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Remarks:
Confirm the connecting bolts between the safety belt and the machine are not loosened, and tighten them if necessary.
Tighten torque: 25.4±4.9 Nm (2.5±0.5 Kgm)

If the safety best is damaged or fluffed, or it the safety belt seat is damaged or deformed, then the safety belt and damaged part should be changed.

12: Clean windows in the driving cab
Clean the windows in the driving cab so as to ensure it has good view of version when operating the machine.

12.1.2 Check Before Start
Before starting the machine every day, do following matters first.

Check Amount of Cooling Liquid and Add Water

⚠ WARNING
In normal case do not open the heat radiator. Check water amount only after the engine is cooled down.

1. Open the cover before the air exhaust pipe of the engine. If water level is too low, add water to the specified level via the filling port on the water tank.

2. After water is added, tighten the cover reliably.

Check Fuel Level and Add Fuel

⚠ WARNING
Do not let fuel spill out when adding fuel because it can catch fire. Wipe it out if it is spilled out.

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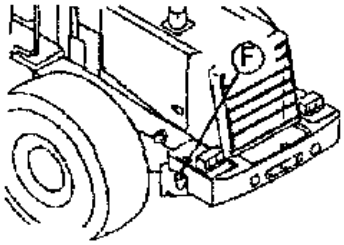
1. Check fuel level by mark ruler.
2. After work is completed, add fuel up via the filling port (F).

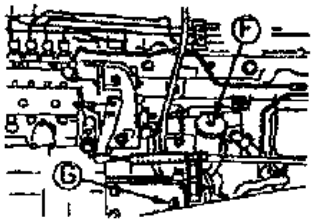
   The details of fuel can be seen from “20. Apply Fuel, Coolant and Lubrication Oil Depending on Temperature of Environment”.



3. After adding fuel, tighten the cover of the fuel tank reliably.
   Content of the oil tank: 300 L

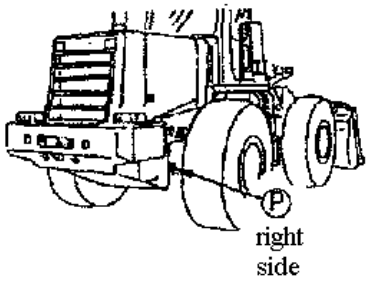
Check Oil Amount under the Bottom Case of the Engine, Add Oil

1. Open the engine and make measurement by the mark ruler at the right rear side.



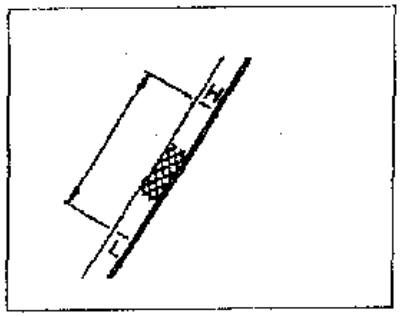
2. Draw out oil ruler (G) and wipe out oil on it by cloth.

3. Insert the oil ruler (G) completely into the oil filling pipe (F) and draw out again.



4. The oil level should between marks H and L on the oil ruler (G). If it is lower than the mark L, add oil via the filling port (F).

   The details of fuel can be seen from “20. Apply Fuel, Coolant and Lubrication Oil Depending on Temperature of Environment”



5. If the level of oil is higher than the mark H, drain excess oil via the drain port (P) and check the level again.

6. If the level of oil is normal, tighten the cover reliably and close the side door of the casing of the engine.

   Remarks:
   If check the level of oil after the engine is working, it should check 15 minutes after the engine has gone out.
   If the vehicle is on the slope, let it be level before check.

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Check Cables

⚠ WARNING

- If fuses are always burnt out and there is short circuit trace on cables, find reasons and repair it.
- Inflammables (leaves, tree branches and grass etc.) gathered around the storage batteries could catch fire, so always check and clear out them.

Check fuse to see I fit is damaged and check any short circuit or trace of short circuit. Check and tighten any loose terminals and any loose parts.

Carefully check following items:
- Storage batteries
- Start motor
- AC generator

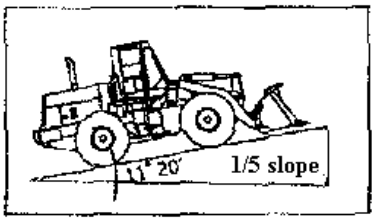
When making check around the vehicle and check before start, always take care if inflammables are gathered around the storage batteries, and clear out all these inflammables.

Please let your Agrisons dealer make check and repair.

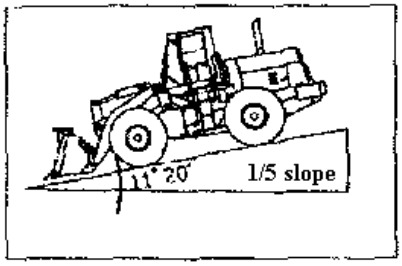
Check Result of Manual Brake

⚠ WARNING

Even the manual brake switch is opened, it is still dangerous before the indicating lamp lights.



Measuring states:
- Tyre pressure: specified pressure
- Road surface: with a slope of 1/5 on dry road
- Machine: in operation state



Measuring method:
1. Start the engine, let the vehicle run toward the front side with empty scraper bowl on the 1/5 slope.
2. Stepping the brake and set the speed lever at neutral gear position and shut the engine.
3. Press down the manual brake handle and loosen the brake step tread to confirm the vehicle is immobile.

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Check Result of Brake

Run on the dry and plain cement road with the speed of 34 km/h, confirm the brake distance is not larger than 17 m.

Check sound of the siren and alarm of reverse running.

Check flash of the lamp, if spoiled and damaged

Check color and sound of exhaust air

Check operation of meters

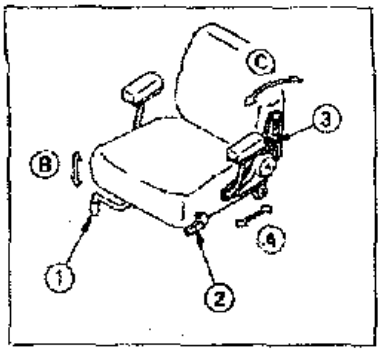
Check steering clearance of the steering wheel and check steering operation

Check rearview mirror, if spoiled and damaged

12.1.3 Adjustment Before Using the Driving Seat

⚠ WARNING

- When adjusting the driving seat, park the vehicle in a safe place and shut the engine.
- Adjust the driving seat before operation or before changing driver.
- Be ensured that when your back leans on the seat back, you can step down the brake tread completely.



A. Adjust forward or backward

Move the level ① to right, and move the seat to the position you need then release the level ①. Adjust forward or backward: 150 mm

B. Adjustment of height

Push the lever ② up and down and move the seat up and down as you need, then release the lever ②. The range of adjustment: (60 mm) Grade 3

C. Adjustment of the seat back

Push the lever ③, move the seat back to a suitable position and release the lever ③.

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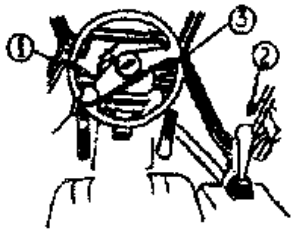
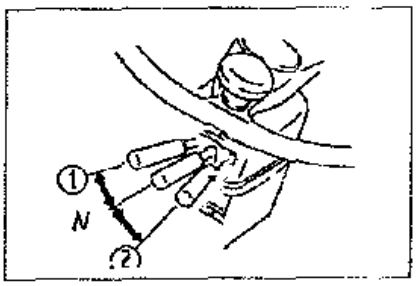
12.1.4 Operation and Check Before Starting the Engine

⚠ WARNING

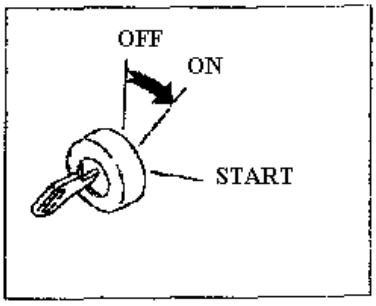
- If touch the operating lever unexpectedly, the working device could move suddenly.
  Before starting the engine, wipe out dust gathered on surfaces of storage batteries, start motor and AC generator by a wet cloth.



1. Confirm the direction lever 1 is at position N.



2. Insert the key into the start switch 3, turn to position ON to confirm if the lamp lights.



12.2 Start the Engine

⚠ WARNING

Confirm that nobody are roundabout, press the siren and then start the engine.

Attention:
Do not rotate the engine for continuous 10 seconds to start the engine.
If the engine doesn't be started, restart it only after waiting two minutes at least.

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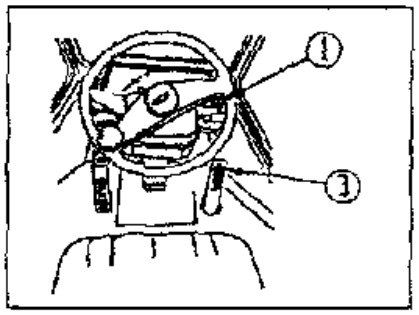
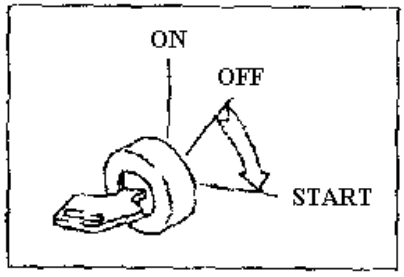
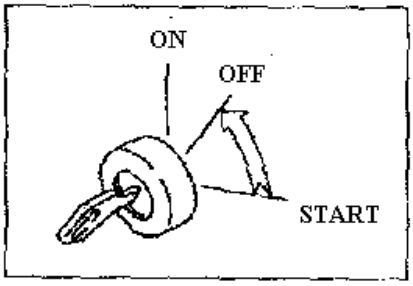


1. Step down the throttle tread 3 slightly.

2. Turn the key in the start switch 1 to the position START to start the engine.



3. After the engine is started, release the key in the start switch 1, it will return back to the position ON automatically.



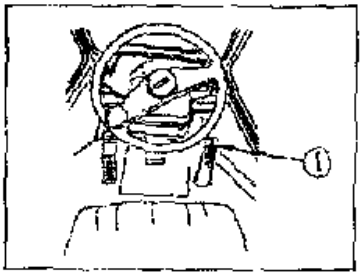
12.3 Operation and Check after the Engine is Started

After the engine is started, you could not start work immediately, instead, make following operation and check first.

Attention:

You cannot speed up the engine suddenly in preheating period.

You cannot let the engine run at the neutral gear position at high or low speed for over 20 minutes continuously.



If it is needed to let the engine run at the neutral gear position, you should often apply a load or let it run at middle speed gear position.

1. Step down the throttle tread 1 slightly to let the engine run without load for about 5 minutes

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2. The hydraulic oil should be preheated only in cold area. Operations are as follows:
   When preheating, first check the engine to see if it can turn smoothly. Pull the operating lever of the scraper bowl forward or backward to preheat hydraulic oil, and keep the scraper bowl within 10 seconds at the unloading position of tilting backward and dumping forward. Following these operations, hydraulic oil will reach its working pressure soon and speed up its preheating.

3. After preheating, check the oil meter and make repair or re-repair if abnormalities are found. Start the engine under small load until water temperature of the engine and oil temperature of the torque-changer are in normal range.

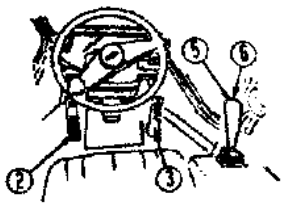
4. Check color and sound of exhausted air and vibration to see if there is abnormality. Make repair if abnormalities exist.

12.4 Start of the Loader

⚠ WARNING

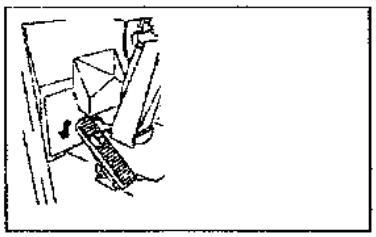
- When starting the loader, check safety conditions roundabout. Sound the siren before starting. Do not let people access the loader as there is a blind area behind, so great care should be taken when run backward.
- When climbing on the slope, set the select switch for gear disconnection at position ON, step down the throttle 3 slowly when stepping down the brake tread 2, then release the brake tread slowly to make the loader run.

1. Check and confirm that the main alarm lamp lights or not.



2. Set the operating levers of the boom 6 and the scraper bowl 5 at middle positions.

3. Operate the operating lever of the boom 6 as per the right drawing and set the working device at running state.



4. Step down the brake tread 2, release the stop brake and continue to step the brake tread.

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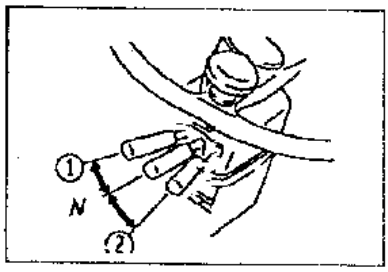
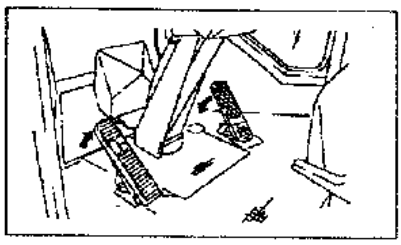
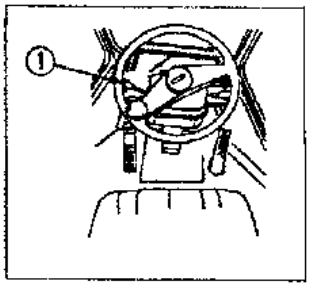
5. Set the operating levers of speed and direction at intended positions.



6. Loosen the brake step tread 2, step down the throttle tread 3 to start the loader.





12.5 Shift Gears

⚠ WARNING

You cannot change speed when running the load at high speed. If speed change is needed, you should reduce the speed first before changing.

The way to change speed is as follows:

Turn the gearshift lever 1 at the intended position.
Make excavation of load operation at Gear I or Gear II.

Remarks:
The vehicle has an automatic speed reduction switch. When you are in Gear 2 speed, press the button on the end of the operating lever of the boom, the speed can be reduced at Gear I.
When the loader is excavating or loading at Gear I or Gear II, this automatic speed reduction switch is recommended to use.
Detailed description can be seen on “11. Descriptions of Parts”.

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12.6 Steering

⚠ WARNING

- When selecting running forward or backward gears, take care it new running direction is safe or not, because there is a bind area behind the loader, so special care is needed when running backward.
- Do not steering when running at high speed.
  If steering is needed, step down the brake tread to reduce speed fully, then steering (the maximum speed of steering is 12 km/h).

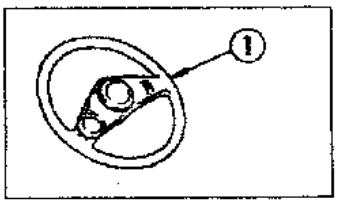
When changing direction, it is not needed to stop the vehicle.
Set the operating lever of direction 1 at the intended position.

12.7 Turn Direction

⚠ WARNING

- It is very dangerous to turn direction in a sudden or to turn direction on a slope when the loader is running at high speed.
- If the vehicle goes out in a sudden when it is running, you cannot turn direction.

When the vehicle is running, use the steering wheel I to turn direction.
The front and the rear frames of the vehicle are connected by a central hinge pin and both frames can be turned each other. Therefore when steering direction, both front and rear wheels have the same traces.
Turn the steering wheel suitably to turn direction. When you need to turn direction in a big margin, take care not to excess its range.



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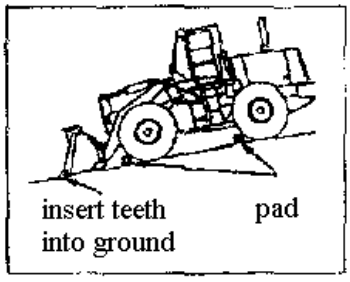
12.8 Brake

⚠ WARNING

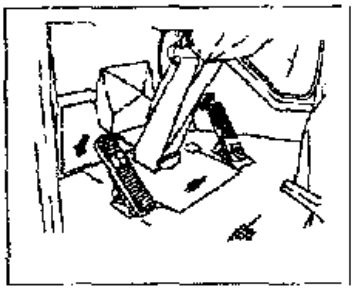
- Avoid to make brake in a sudden. You must leave a spacious room for brake.
- Do not stop the vehicle on a slope. If it is needed, you should make the vehicle towards in descending direction and insert teeth of the scraper into ground, and put pad under wheels to prevent its moving.
- If knocking the operating lever to make the working device and the vehicle moving, it may cause serious accident.
- You should step down the brake tread even the stop brake switch is opened.



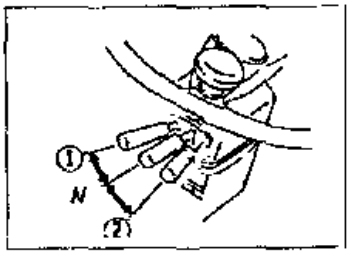
Attentions:

You cannot use the stop brake device to stop the vehicle when it is running except in case of emergency. The stop brake device is only used when the vehicle is stopped.

1. Loosen the throttle tread ①, and step down the tread ② to brake.



2. Set the operating lever of direction at position N (neutral gear).



3. Pull up the lever of the stop brake valve to make stop brake.

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12.9 Operation of Working Device

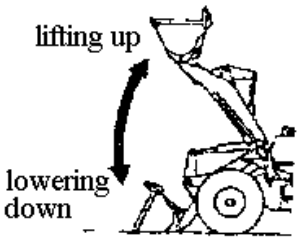
Operations of the boom and the scraper bowl by operating levers are as follows:

Operation of the Boom (control lever ①)

① Lifting Up

② Holding: hold the boom in same position

③ Lowering

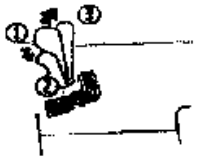


④ Floating: the boom can move freely at this state

When the operating lever of the boom is pulled inward at the lifting position, the operating lever shall stay at this position until the boom is lifted at preset limit position, then the operating lever will reset to the holding position.

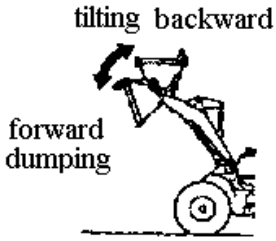
Attention:
Do not tilt the scraper bowl at the floating position.

Operation of the Scraper Bowl (control lever ②)



① Drawing in the bowl

② Holding: hold the scraper bowl in same position



③ Dumping

When the operating lever of the scraper bowl is pulled inward from dumping position, the operating lever shall stay at this position until the scraper bowl is moving at preset position, then the control lever will reset to the holding position.

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12.10 Application Range of Wheel Loader

Except following functions, it is possible to add functions by change different attachments.

12.10.1 Excavation

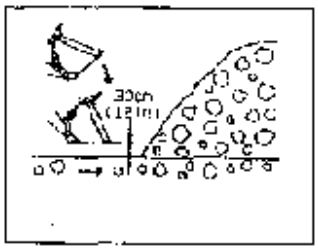
⚠ ATTENTION
When the loader is excavating or loading, you should let the loader go against the right front and without leaving angles for the front frame.

Attention:
If the tyres are sliding, the service life of tyres will be reduced therefore do not let tyres to be slid.

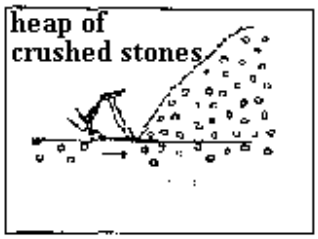
- When scraping and loading soil or stones, the vehicle should go right against the heap of materials. Following operations should be done carefully in order to prevent tyres to be slid or damaged.
  Keep the working field to be level, clear our any dropped stones. When scraping materials in bits, keep the speed at Gear I or Gear II while scraping stones, keep the speed at Gear I.

1. When lowering down the scraper bowl during the vehicle is running, stop the vehicle when the scraper bowl is 30 cm far from the ground and lower down the scraper bowl slowly.

   Remarks:
   If the scraper bowl knocks the ground, the front wheels will be off the ground and slid.



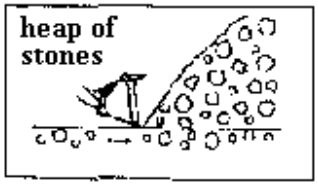
2. Change and reduce speed in front of the heap of materials. Step down the throttle tread when speed is changing and inset the scraper bowl into the heap.



3. If materials are in pieces or bits, keep the scraper bowl horizontally while materials are stones, keep the scraper bowl a downward angle.

   Take care not let stones come under the scraper bowl to make the front wheel off the ground and to be slid.

   Keep the load in the central position of the scraper bowl as can as possible. If the gravity center is eccentric at one side, it will be imbalanced.



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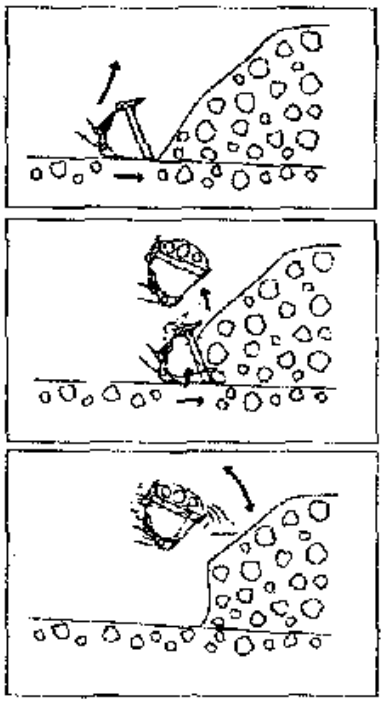
4. When the scraper bowl is inserted into the heap of materials, lift up the boom not to let it insert too deep. Lifting up the boom can make tyres have enough drawing force.



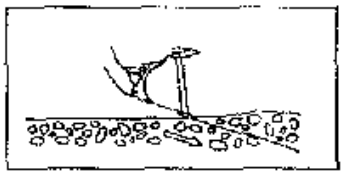
5. When there are enough materials in the scraper bowl, operate the lever to draw in the bowl so as to load more materials.

Remarks:
When the scraper bowl is inserted the heap of materials or is excavated, if the edge of the bowl is moved up or down, the front tyres will be off the ground and to be slid.

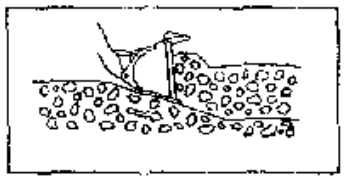
6. If load is too much in the scraper bowl, you should dump and draw in the bowl quickly to remove excess load so as to prevent dropping of materials when transporting.

- When excavating or scraping on plain ground, set the scraping edge a bit tilting toward the ground, however care should be taken not to centralize the load in one side to cause imbalance. Operate with Gear I carefully.

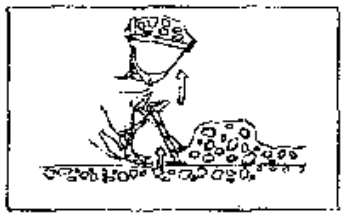
1. Set the scraping edge a bit tilting downward.



2. When the vehicle is running forward, control the lifting boom forward so as to cut a thin layer of soil when excavating.



3. When the vehicle is running forward, move the control lever of the boom up or own slightly so a to reduce resistance when the vehicle is running.



When the scraper bowl is excavating, it should avoid the case the force is exerted on one side.

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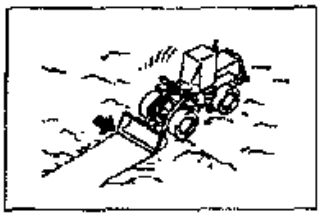
12.10.2 Operation of Ground Leveling



Attention:

When leveling the ground, you should run backward.
If run forward is needed to level the ground, keep the scraper bowl with an inclined angle less than 20°.

1. After loading materials, run the vehicle backward and dump materials lowly and evenly.
2. Make the scraper bowl touch the ground and level the ground by the back of the bowl.
3. Load a bit of crushed materials in the bowl and make the boom at the floating state, set the scraper bowl on the ground horizontally, run backward the vehicle to level the ground

12.10.3 Operation of Bulldozing

Attention:

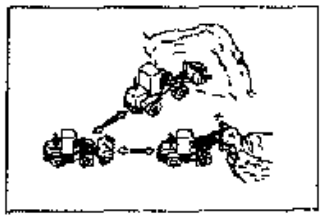
When making bulldozing operation, the scraper bowl cannot be in dumping state.

1. When making bulldozing operation, the bottom plate of the scraper bowl should be parallel with the ground.

12.10.4 Operation of Loading and Transportation

⚠ ATTENTION

When making transportation, lower the scraper bowl to make its center of gravity to be lower than that of the whole machine.



The loading and transportation of the loader can be regarded as a circulation: materials scraping - transporting - dumping (into warehouse or deep pit).
Keep cleanness on transporting road.
The way of loading and transportation can be referred to “12.18 Usage of Tyres”.

12.10.5 Operation of Loading

Based on field conditions, it is a select a best operation plan to make steering and transportation with less time.

⚠ ATTENTION

- Keep levelness of the working field. When transporting with load, you cannot turn or brake in a sudden because these actions are dangerous.
- Insert the scraper bowl into the heap of materials is also dangerous.

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Attentions:

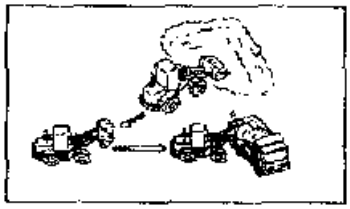
- If tyres are slid, their service life will be affected therefore do not let tyres to be slid.
- Do not vibrate the scraper bowl excessively.

Cross Loading and Unloading

Facing with the heap of materials, let the loader turn an angle to right, scrape materials and run backward, then let the self-dump truck come between the loader and the heap of materials. This way needs the least time and can effectively reduce the circulation time.

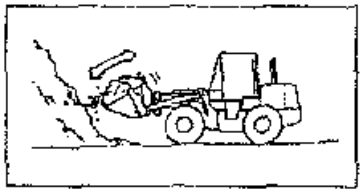
V-Shaped Loading and Unloading

Set the position of the self-dump truck to form an angle about 60° between itself and the backward direction of the loader. After materials are scraped, the loader run backward and turn an angle to unload materials into the self-dump truck. The less of the angle the loader turns, the higher the working efficiency.



When the scraper bowl is loaded and lifted at the highest position, vibrate the bowl to make materials in it to be stable so as to prevent dropping down.

Precautions when Stacking Materials

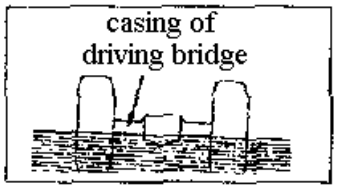


When stacking materials, take care that the balance weight cannot touch the ground.

When stacking materials, do not set the scraper bowl at the dumping position.

12.11 Precautions of Operation

12.11.1 Allowed Depth of Water



When the loader is working in water or on bog area, do not let the bottom of casing of the driving bridge touch water. After completion of work, clean and check filling parts of lubrication oil.

12.11.2 When Brake is Out of Order

If the brake is out of order when making brake, you should use the stop brake to brake the vehicle.

Attention:

If the stop brake is used in emergency case, contact your Agrison's dealer to check if there is something abnormality.

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12.11.3 Precautions When Running Up or Down the Slope

Lower the center of gravity when steering direction

When steering direction on the slope, first lower the working device under the center of gravity of the whole machine. It is very dangerous if steering direction when working device is lifting up.

Brake when running down on the slope

If braking frequently when running down on the slope, the brake will be worn out due to overheat. Lowering speed to increase the braking force of the engine so as to avoid the said problem.

Use the brake step tread to make braking.

If speed control lever is not set at suitable position, the hydraulic torque-changer will be heated up. Set the speed control lever at low speed gear so as to lower temperature of oil.

If the engine goes out

If the engine goes out when running on the slope, step down the brake tread completely and set the working device down on the ground, open the stop brake and set the direction and speed control levers at the neutral gears and re-start the engine.

12.11.4 Precautions When the Vehicle is Running

If the vehicle runs at high speed for a long distance, tyres will be heated up and will be worn out early. Should the vehicle will run for a long distance, take care of following operations to avoid the said problem.

- Drive carefully as per operation rules of the vehicle.
- Check before starting the vehicle.
- Conduct your Agrison dealer or the manufacturer of tyre to know suitable air pressure of tyres, driving speed and model of tyres based on conditions of road surface.
- If running on the road, suitable air pressure and driving speed for standard tyres are as follows: air pressure of tyres (front and rear tyres): 3.5 kg/cm^2; speed: 14 km/h.
  - Before starting, check air pressure of tyres if they are not heated.

  After running for 1 hour, stop for 30 minutes, check tyres and other parts if they are damaged, and also check levels of oil and coolant liquid.
  - Be ensured that the scraper bowl should be empty when running.
  - Do not let dry road slag to be embedded into tyres.

12.12 Adjust the Position of the Working Device

⚠ ATTENTION

- Put pads before and after tyres when parking on plain road.
- Open the stop brake.
- Use frame lock to secure both front and rear frames.
- Do not enter under the device when the boom is lifting up.

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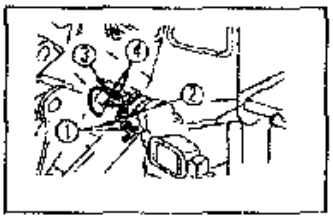
The limit device of the boom can make the boom stop at an intended position (the boom is a bit higher than horizontal position). Meanwhile the lying device of the scraper bowl can also set the scraper bowl at an intended position, i.e. excavating position of the scraper bowl.

1. Adjust the limit device of the boom, set the operating lever at the holding position, then let the engine go out, make adjustment as follows:

2. Loosen two bolts ①, adjust the plate ② to make its bottom aim against the middle line of the induction surface of the approximate switch ③, then tighten bolts to fix the plate.

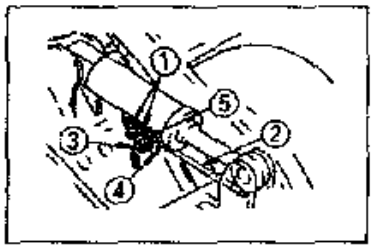
3. Loosen two nuts ④ to make the clearance between the plate ② and the induction surface of the approximate switch ③ be 3 – 7 mm, then tighten nuts.
   Tighten torque: 17.2±2.5 Nm



4. After adjustment is completed, start the engine and operate the operating lever of the boom, check if the lever can automatically return to the holding position when the scraper bowl arrives at required position.

12.12.1 Adjust the leveling Device of the Scraper Bowl

1. Lower the scraper bowl on the plane, adjust the scraper bowl to required excavating angle, set the operating lever of the scraper bowl at holding position, shut the engine and make the adjustment of the whole machine as follows:



2. Loosen two bolts ①, adjust the fixed holder ④ of the approximate switch, make the end of the angle iron ② aim against the middle position of the induction surface of the approximate switch ③, then tighten the fixed plate of bolts.

3. Loosen two nuts ④, adjust the clearance between the lever ② and the induction surface of the approximate switch ③ be 3 – 7 mm, then tighten nuts.
   Tighten torque: 17.2±2.5 Nm

4. After adjustment is completed, start the engine and lift up the boom and set the operating lever of the scraper bowl at the dumping position, then set it at the draw-in position, check if the operating lever of the scraper bowl can automatically return to the holding position when the scraper bowl arrives at set position.

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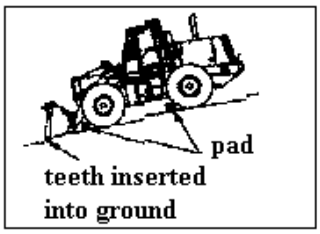
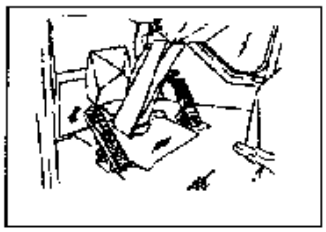
12.13 Parking of the Machine

⚠ WARNING

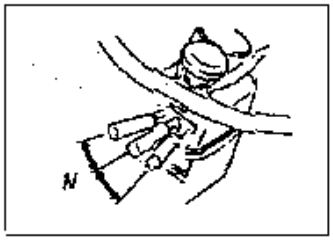
- Avoid to make brake in a sudden. You must leave a spacious room for brake.
- Do not stop the vehicle on a slope. If it is needed, you should make the vehicle towards in descending direction and insert teeth of the scraper into ground, and put pad under wheels to prevent its moving.
- If knocking the operating lever to make the working device and the vehicle moving, it may cause serious accident. Therefore when leaving the driving cab, always set the operating lever at the middle position.





Attentions:

You cannot use the stop brake device to stop the vehicle when it is running except in case of emergency. The lever of the stop brake valve is only used when the vehicle is stopped.

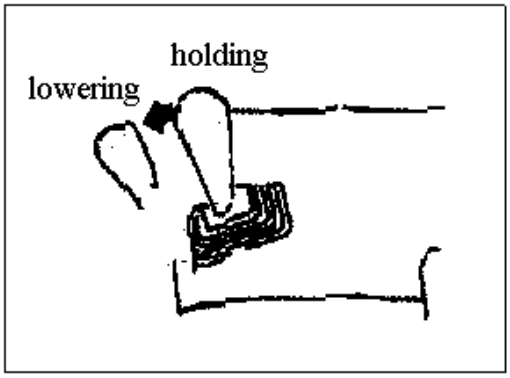


1. Loosen the throttle tread ①, and step down the tread ② to brake.

2. Set the operating lever of direction at position N.

3. Pull up the lever of the stop brake valve to make stop brake.

4. Operate the operating lever of the boom ③, and place the scraper bowl on the ground.



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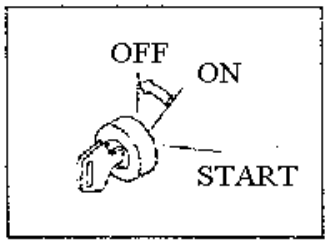
12.14 Check after Operation is Finished

Check water temperature and oil pressure of the engine, oil temperature of the torque-changer by meters and indicating lamps. If the engine is overheated, do not let it go out immediately until it is running at middle speed and cooled down gradually.

12.15 Go Out

Attention:
If the engine goes out I a sudden under high temperature, its service life will be greatly shortened. Therefore do not let it go out in a sudden except in case of emergency.
Do not let the engine go out in a sudden if it is overheat until it is running at middle speed and cooled down gradually.



1. Let the engine run at low speed for 5 minutes and cools down gradually.

2. Set the start key ① at the position OFF to let the engine go out.

3. Take out the start key ①.

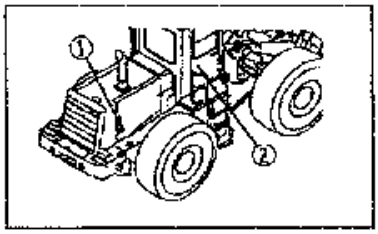
12.16 Check after Stop the Machine

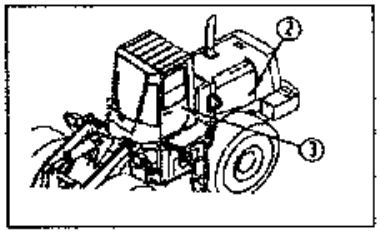
1. Check the working device, vehicle body and frames around the loader, and check leakage of oil and water. Make repair if leakage or abnormalities found.

2. Fill up fuel in the fuel tank.

3. Remove waste paper and fallen leaves in the engine room as they could catch fire.

4. Remove mud stuck on the chassis.





12.17 Locking

Normally following parts should be locked.

1. The side plated of the engine (both right and left).
2. The door of the driving cab.

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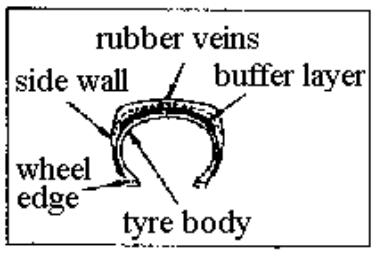
12.18 Usage of Tyres



12.18.1 Precautions when Changing Tyre

For the purpose of safety, change tyres if following conditions are found.

- The side wall of the tyre is broken, twisted or worn out severely.
  Excess worn out and the peripheral layer of tyre (excluded buffer layer) exposed over one fourth of the circumstance.
- The damage of the tyre layer exceeded one third of the width of the tyre.
- The tyre is split in levels
- The radial crack extends to the tyre layer.
- The tyre could not be used due to deformation and worn out.

12.18.2 Pressure of the Tyre

Before working, measure the pressure of the tyre under cold state.
If the pressure of the tyre is too low, it can create load while if the pressure is higher, the tyre could be cut or burst. Therefore you should check the pressure of the tyre based on following table.

$$\text{Deviation rate} = \frac{H - h}{H} \times 100$$

As the guideline of check, the sunk rate of the front tyre (sunk depth / free height) is as follows:
When rated load is transported (the boom is horizontal): about 15 – 20%.
When excavating (the rear wheel off the ground): about 25 30%.

When you check the air-filled pressure of tyre, you should also check scratch and peeling condition as well as abnormal worn-out and if pierced by nail or metal pieces.

Clear out stones and slurry on the working field to keep cleanness of the road so as to prolong the service life of tyres and rise up economic result.

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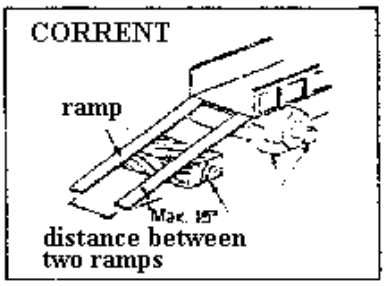
When transporting the loader, all rules should be well followed and take care to ensure safety.

13.1 Loading and Unloading of the Loader

⚠ ATTENTION

- Select boards with suitable length, width and thickness to ensure safe loading and unloading of the loader.
- When loading and unloading the loader, top the trailer on the solid and plain ground and ensure enough long distance between the loader and the trailer.
- Remove slurry f the chassis and prevent the vehicle to slide on the ramps. Be ensured that the ramps have no grease, oil, water and pieces of materials.
- Do not change running direction on the ramps. If changing direction is needed, you should drive down the ramps, turn the direction and drive up the ramps again.

When loading and unloading the loader, normally ramps and stand can be used and following operations should be followed.



1. Block two sides of the tyres of the trailer with stopper to avoid moving. Fix the ramps on the middle line of the loader and the trailer, keep two ramps on the same plane. If ramps are hung down, put pads under the ramps.

2. Define the position of the ramps, load and unload the loader slowly.

Remarks:
When the select switch for gear disconnection in the gearbox is set at position ON, step down the brake tread and the throttle tread simultaneously.

3. Place the loader on the specified position on the trailer.

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13.2 Attentions before the Transportation

When the loader is fixed on the place, the loader should be fixed itself as follows:

1. Lower down the scraper bowl slowly.
2. Set the start switch at OFF position, let the engine go out and take out the key.
3. Lock the front and rear frames by the frame lock.
4. Add pads before and after the tyres to prevent moving of vehicles during the period of transportation.

13.3 Attentions to the Transportation

⚠ ATTENTION

When deciding the running routes, consider the width, height and weight of the loader.

Observe rules of weight, width and length when transportation the load.

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14.1 Attentions under Low Temperature

If temperature is something low, the engine will be too difficult to start and the coolant could be frozen, therefore following points should be met:

14.1.1 Fuel and Lubricant

Fuel and lubricant with low viscosity should be used for all parts. Detailed information about the viscosity can be seen on “20. Apply Fuel, Coolant and Lubrication Oil Depending on Temperature of Environment”.

14.1.2 Coolant

⚠ ATTENTION
The antifreeze agent should be far from fire and smoking is not allowed when using coolant.

Attention:

- Do not use antifreeze agent containing methyl alcohol, ethanol and propyl alcohol etc.
- Absolutely do not use any leak preventive agent whatsoever it is used independently or used together with the antifreeze agent.
- Do not mix antifreeze agents with different brands for use.

When changing coolant, the details of mixing ratio of antifreeze agents can be seen on “24.2 Making Maintenance as Required”.

Adopt the permanent antifreeze agent which is in accordance with following standard (mixture of ethylene, ethylene glycol, preservative and defoamer). You do not need to change the coolant if permanent antifreeze agent is used. If you do no know it existing antifreeze agent can meet the requirement of standard, contact the dealer for relative information.

Remarks:

If no permanent antifreeze agent, the ethylene and ethylene glycol without preservative can only be used in winter. Thus you should clean cooling system twice a year (spring and autumn). When change coolant, you should add antifreeze agent in autumn and do not add in spring.

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14.1.3 Storage Batteries

⚠ ATTENTION

- Avoid gas explosion, do not let fire or sparkle to be closed to storage batteries.
- The electrolyte of storage battery is dangerous. If it comes into your eyes or touches your skin, flush with a lot of water and see doctor for treatment.

The content of storage batteries will lower as the ambient temperature lowers. It the charging rate of the storage batteries lowers, the electrolyte could be frozen. Keep the charging rate as close to 100% as possible and keep temperature as can as possible, thus the engine can be started easily the next day.

Remarks:

Measure Specific Weight and Calculate the Charging Rate According to Following Conversion Table

Ambient Temperature / Charging Rate	20℃	0℃	-10℃	-20℃	-30℃
100%	1.28	1.29	1.30	1.31	1.32
90%	1.26	1.27	1.28	1.29	1.30
80%	1.24	1.25	1.26	1.27	1.28
70%	1.23	1.24	1.25	1.26	1.27

14.2 Attentions after Working is Finished

In order to prevent soil water and frame to be frozen to hinder the start the vehicle next day, following precautions should be taken:

- Clear out soil and water on the vehicle to avoid soil, water or mud entering into the seals and damage air tightness due to be frozen.
- Stop the vehicle on dry and solid ground. If impossible, stop the vehicle on the board which can avoid to be frozen with the ground and facilitate to start next day.
- Open the water drain valve to drain water from the tank to avoid to be frozen.
- As the content of storage batteries will be remarkably lowered under low temperature state, you should cover the batteries and move them to a warm area and install them next day.

14.3 After Cold Weather Passed

When season changes and weather gets warmer, following measures should be taken:

- The semi-sticky fuel and working oil should be changed for all parts.
  Details can be seen on “20. Apply Fuel, Coolant and Lubrication Oil Depending on Temperature of Environment”.
  If ethylene and ethylene glycol antifreeze agent or no antifreeze agent is used (in winter only) rather than permanent antifreeze agent due to some reasons, then drain all water in the cooling system, clean the cooling system and add new water.

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15.1 Before Storage

If the loader should be stored for a long time, following procedures should be taken.
Clean all pars of the vehicle, let cool by air and store in a dry room. Do not place then under open air.

If the vehicle can only be parked under open air, park it on the concrete ground on which water is easily drained and cover with canvas.

- Fill fuel into the fuel tank, fill lubricant and change hydraulic oil.
- Coat a layer of thin grease on exposed part of the hydraulic piston rod.
- Remove the negative pole of the storage batteries and cover it, or remove it from the vehicle and store separately.
- If air temperature lowered below 0℃, normally add coolant in cooling water.
- Pull off stop brake.

15.2 During the Period of Storage

⚠ ATTENTION

If antirust agent is used in room, open windows and door to keep ventilation so as to remove poisonous gases.

Start the vehicle once a month so as to make moving parts and partial surfaces to be coated with new lubricant. Meanwhile, the storage batteries can also be charged.
Before and after operation and work, wipe out grease on the piston rod.

15.3 After Storage

Attention:

Should the loader have no antirust treatment during the period of storage every month, consult with your Agrison dealer.

After completion of storage for a long term, following operations should be carried out:
- Wipe out grease on the hydraulic piston rod.
- Fill lubricant at all places.

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16.1 When Fuel is Exhausted

⚠ ATTENTION

Before starting the engine, carefully check around the engine to see if it is safe.

If fuel is exhausted in the vehicle, fill fuel before starting and exhaust air from the fuel system.

Procedures to Exhaust Air

Set the key of the start switch at START position, start the engine for 5 to 10 seconds. Repeat this operation two to three times to exhaust air.

Do not let the starting time over 10 seconds. Restart the engine after an interval of 2 minutes.

If the oil tank is full of oil, air can be exhausted quickly.

16.2 Draw the Vehicle

⚠ ATTENTION

- If draw the vehicle with troubles on a bad road, further serious damage will be caused.
- If troubles occurred in brake pipelines, the brake cannot be used again so special care should be taken to draw the vehicle.

Attentions:

- It is only used to draw the vehicle to the place where repair is enabled, not for long distance moving.
  The vehicle cannot be drawn for long distance.
- If the vehicle has trouble, consult with Agrison's dealer for drawing procedures.
  The loader cannot be drawn except in case of emergency. The drawing procedures are as follows:
- If the brake is not possible, put the blocks under tyres to prevent moving of the vehicle. If no blocks, the vehicle could move in s sudden.
- When drawing the loader, the speed should be less than 2 km/h, and it should be drawn to the nearest shop for repair. The drawing is only drawn in case of emergency. If moving for long distance, the special trailer should be used.

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- Install protect board on the vehicle to protect operator in case the drawing rope or the pin will break.
- If the steering and the brake of the drawn loader cannot work, nobody is allowed to board the vehicle.
- Check the drawing rope and the pin to see if they have strength to endure the weight of the drawn vehicle. If the vehicle shall rub through the mud or the slope, double ropes or pins, which can endure at least 1.5 times of the weight should be used.
- Reduce the angle of the drawing rope as can as possible, and ensure the included angle between the drawing rope and the central line of two machines is within 30°.
- If start the loader in a sudden, the force exerted on the drawing rope on the drawing rod shall be doubled or broken. Normally drive he vehicle slowly in a suitable speed.
- Normally, the drawing vehicle and the drawn one should have the same class. Check the brake force, weight, trailing force of the trailer to see if it can control two vehicles on the slope or on the drawing road.
- When drawing the vehicle to go down on the slope, it should have a vehicle with enough drawing force and brake force to draw, and plus another vehicle to draw after the drawn vehicle, thus the drawn vehicle can be ensured to be drawn and under control without turning over.
- As drawing the vehicle can be done under various different conditions, it is difficult to make a unified standard. Less drawing force is needed to draw the vehicle on a plain and horizontal road while much drawing force is needed if drawing the vehicle on a slope or uneven road.

16.2.1 In Case the Engine Can be Started

- If the gearbox and the steering wheel can be started and the engine can run, thus the vehicle can be drawn out of the mud or to the roadside.
- When the loader is drawn, operator should sit on the drawn vehicle.

16.2.2 In Case the Engine Cannot be Started

If the drawn vehicle cannot be started, operation procedures are as following:

1. If hydraulic oil cannot be supplied to the gearbox, then remove the front and rear driving shafts. Put the pad under tyres if necessary to prevent the vehicle to be moved.

If the steering cannot be operated, then remove the steering oil cylinder.

2. The connections between drawing and drawn vehicles should be firm. When drawing work is needed, there should be at least two vehicles which have same class with the drawn vehicle, being one each before and after the drawn vehicle, then take out pads under tyres.

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16.2.3

⚠ WARNING

- Release the stop brake and park the vehicle on plain ground, check around the vehicle if safe. In case of emergency it had to release the stop brake on the slope, place the wooden pad under wheels before releasing the stop brake.
- After releasing the stop brake, other brake cannot be used any more, therefore before starting the vehicle, be sure to check circumstance carefully if it is safe.

If the engine cannot be started due to some reasons, release the stop brake as follows, and drawing the vehicle.

1. Remove the joint pin under the spring tube to release the stop brake.

If the air pressure is too low (less than 0.4 Mpa), do as following way:

1. First remove the cotter pin.
2. Prop up the valve rod on the spring tube by tool, then remove the joint pin.

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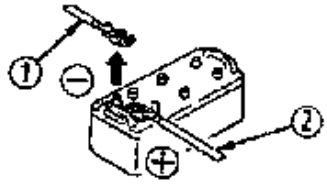
16.3 In Case the Storage Battery Discharging Off

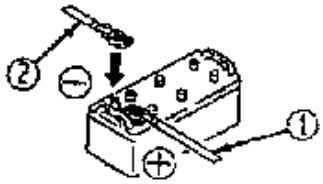
⚠ WARNING

- Let the engine go out and set the start switch at position OFF when check or treat the storage batteries.
- Before starting the engine, wipe out dirt gathered on the surface of the storage batteries by a wet cloth.
- As the storage battery can produce hydrogen so it is dangerous. Do not approach the storage battery with smoking or do something by which sparkle can be produced.
- The electrolyte of the storage battery is thin sulfur acid, which can corrode your clothes and skin. Should your clothes or skin contact with thin sulfur acid, flush with a lot of water immediately, If it comes into your eyes, flush with clean water and call doctor.
- When treating the storage batteries, be ensured to wear goggles.
- When removing the storage batteries, first disconnect the grounding wire (normally negative terminal) while installing, first connect the positive terminal. If there is tool to be contacted with the positive terminal and the chassis, it could be dangerous to produce sparkle.
- If the terminal is loose, sparkle can arise from it to cause explosion. Therefore the terminal should be tightened.
- When uninstalling, be sure to confirm positive and negative terminals.

disconnecting grounding wire first when removing



connecting positive terminal first when installing



16.3.1 Removal and Installation of the Storage Batteries

When starting the engine with charging cables, ways are as follows:

- When removing the storage batteries, first disconnect the grounding wire (normally negative terminal) while installing, first connect the positive terminal. If there is tool to be contacted with the positive terminal and the chassis, it could be dangerous to produce sparkle.
- When installing the storage batteries, the grounding wire should be installed at last.

Remarks:
The storage batteries are on both sides of the rear part of the vehicle. The storage battery connecting with the grounding wire in normally on the right side of the vehicle.

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16.3.2 Attentions in Case the Storage Battery is Charging

Charging the Storage Batteries Which are Installed on the Vehicle

- Before charging, first disconnect the cables from the negative terminal of the storage battery, otherwise high voltage will be produced to damage AC generator.
- When charging the storage battery, all screw plugs should be drawn out to keep a good ventilation. Do not let fire or sparkle to approach the battery to avoid explosion of gas.
- If the temperature of electrolyte is above 45℃, stop charging for a while.
- After completion of charging, switch off the charger immediately.
  Excess charging can cause following conditions:
  1) The storage batteries will be overheated.
  2) Amount o electrolyte will be reduced.
  3) The electrode plate will be damaged
- Do not mix wires (positive and negative terminals), otherwise it can cause damage of AC generator.
- Do not touch cables of the storage batteries when checking the level of electrolyte and measuring the specific gravity.

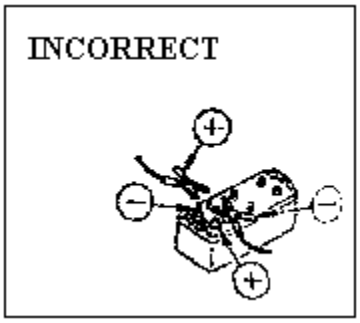
Remarks:
The storage batteries are on both sides of the rear part of the loader. The storage battery connecting with the grounding wire is normally on the right side of the vehicle.

16.3.3 Start the Engine By Charging Cables

Following operations should be followed when starting the engine by charging cables:
Attentions When Removing and Installing Charging Cables

⚠ WARNING

- Do not let both positive and negative terminals to be contacted when connecting cables.
- Wear goggles when starting the engine by charging cables.
- Be care not to let normal loader to be contacted with the loader with trouble as it could produce sparkle near the storage batteries to ignite hydrogen leaked from the storage batteries, thus to cause serious damage.
- Do not connect charging cables wrongly. When connecting with the engine with trouble finally, it can cause sparkle so leave the storage batteries as can as possible.
- When removing cables from started vehicle, do not allow the ends of the cables to be contacted each other or to contact the frame in order to avoid explosion of hydrogen.



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Attentions:

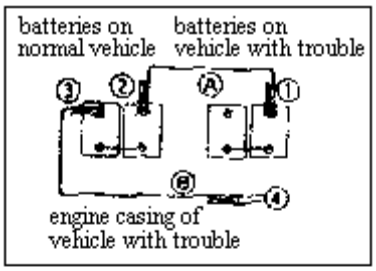
- The sizes of the charging cables and the clip should be suitable for the storage batteries.
- The capacity of the storage batteries on the normal vehicle should be the same with that in drawn vehicle.
- Check damage and corrosiveness of the cables and the clip.
- The cables and the clip should be connected firmly.

The storage batteries are on both sides of the rear part of the loader. The storage battery connecting with the grounding wire is normally on the right side of the vehicle.

Connecting Charging Cables

Keep the start switch on the OFF position.

When connection, operate in the order of figures marked on the drawing.



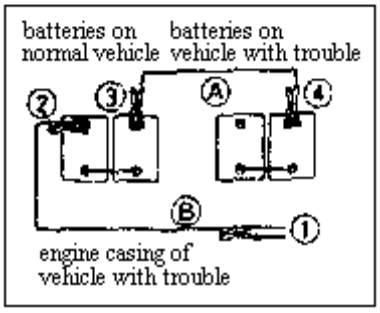
1. Ensure that the start switches of the normal machine and the machine with trouble are all on OFF position.
2. One clip of charging cable A is clipped on the positive terminal of the vehicle with trouble.
3. The other clip of charging cable A is clipped on the positive terminal of the normal vehicle.
4. One clip of charging cable B is clipped on the negative terminal of the normal vehicle.
5. The other clip of charging cable B is clipped on the negative terminal of the vehicle with trouble.

Start the Engine

1. Be sure that clips are reliably clipped on the terminals of the storage batteries.
2. Turn the start switch of the vehicle with trouble to start the vehicle. If the first time fails, wait at least two minutes to start again.

Disconnecting Charging Cables

When the engine is started, disconnect charging cables in reverse order of connecting cables.



1. Remove one clip of charging cable B from the engine.
2. Remove the other clip of charging cable B from the negative terminal of the storage battery on the normal vehicle.
3. Remove one clip of charging cable A from the positive terminal of the storage battery on the normal vehicle.
4. Remove the other clip of charging cable A from the negative terminal of the storage battery on the vehicle with trouble.

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16.4 Solution of other Troubles

16.4.1 Troubles in Electrical Circuit

- Be sure to consult with your Agrison's dealer when treating these troubles.
- Should troubles you meet not listed in the table, please let your Agrison's dealer to deal with.

Trouble	Main Causes	Remedies
Lamps do not light even the engine is running at high speed	• Cable has defect • Incorrect adjustment of the tightness of fan belt	• (Check and repair loose terminals and circuit) • Adjust the tightness of fan belt. Details see: Maintenance Every 250 Hours
Lamp flashes when the engine is running		
Charging lamp does not light even the engine is running at high speed	• AC generator has defect • Cable has defect • Incorrect adjustment of the tightness of belt	• (Change) • (Check and repair) • Adjust the tightness of fan belt. Details see: Maintenance Every 250 Hours
Abnormal sound from AS generator	• Generator has defect	• (Change)
Start motor does not run when switching on the start switch	• Cable has trouble • Insufficient charging of batteries	• (Check and repair) • Charging
Pinions of start motor do not mesh or keeping mesh	• Insufficient charging of batteries	• Charging
Powerless start of start motor	• Insufficient charging of batteries • Start motor has defect	• Charging • (Change)
Start motor disengages before start	• Cable has trouble • Insufficient charging of batteries	• (Check and repair) • Charging
Even engine stops, oil pressure attention indicating lamp of the engine also does not light (start switch at ON position)	• Attention indicating lamp broken • Switch of attention indicating lamp broken	• (Ch7ange) • (Change)
Even engine stops, charging indicating lamp of the engine also does not light (start switch at ON position)	• Cable has trouble • Monitor has trouble	• (Check and repair) • (Change)

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16.4.2 Chassis

- Be sure to consult with your Agrison's dealer when treating these troubles.
- Should troubles you meet not listed in the table, please let your Agrison's dealer to deal with.

Trouble	Main Causes	Remedies
Gearbox		
Engine is running but the machine does not run	• Use the stop brake • Incorrect transform of direction lever • Lack of oil in gearbox	• Release the stop brake • Use the operating lever correctly • Fill oil to specified amount. See: "24.2 Maintenance as Required".
Even the engine in running at high speed, the machine can only run slowly and powerlessly	• Lack of oil in gearbox • Oil strainer blocked	• Fill oil to specified amount. See: "24.2 Maintenance as Required". • (Remove and clean)
Overheat	• Oil too much or less • Machine does not run in suitable speed range • Stop using of torque-changer for long time • Overheat of he engine	• Fill oil to specified amount. See: "24.2 Maintenance as Required". • Run in suitable speed range • Reduce idling time • (Check the engine)
Noise occurs	• Lack of oil	• Fill oil to specified amount. See: "24.2 Maintenance as Required".
Driving Bridge		
Noise occurs	• Lack of oil	• Fill oil to specified amount. See: "24.2 Maintenance as Required".
Brake		
Press down the brake tread but no function	• Friction disc worn out • Lack of brake oil • Air in brake pipes • Air pressure too low • Leather cup of assistor worn out • Air entering slowly in brake valve • Leakage of exhaust valve of brake valve • Oil inlet of the main brake pump blocked	• (Change friction disc) • Fill oil to specified amount. See: "24.2 Maintenance Every 100 Hours" • Bleeding air See: "24.2 Maintenance as Required". • Check leakage and remove • Change • Check and adjust the opening of inlet valve of brake valve • Repair • Cleaning

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Braking slowly or cannot be loosened	• Air vent of brake valve blocked • Bad action of assistor • Air in brake hydraulic system	• Cleaning • Check assistor • Bleeding air
Sharp sound of brake	• Disc worn out • A lot of water in bridge box • Oil in bridge box deteriorated due to using brake excessively	• (Change disc) • Change oil in bridge box • Change oil in bridge box

Brake

Press down the brake tread but no function	• Friction disc worn out excessively • Lack of Brake oil • Air in brake hydraulic system	• (Change friction disc) • Fill oil to specified amount. See: “Maintenance Every 100 Hours” • Bleeding air See: “24.2 Maintenance as Required”
Braking slowly or cannot be loosened	• Air vent of brake valve blocked	• Cleaning
Sharp sound of brake	• Disc worn out • A lot of water in bridge box • Oil in bridge box deteriorated due to using brake excessively	• (Change disc) • Change oil in bridge box • Change oil in bridge box

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Chassis (continued from 16.4.2)

Trouble	Main Causes	Remedies
Manual Brake		
Bad brake effect	• Loose connecting rod • Disc worn out	• Adjustment • Adjust or change disc
Steering		
Large operation fore of steering wheel	• Oil hydraulic system has defect O ring is lack of oil	• Fill oil to specified amount. O ring see: “Maintenance Every 100 Hours”
Loose steering wheel	• Clearance in steering oil cylinder pin • Oil hydraulic system has defect O ring is lack of oil	• Lubricating bearings, replace pin or add bush in clearance • Fill oil to specified amount. O ring see: “Maintenance Every 100 Hours”
Hydraulic System		
Bowl lifted powerlessly Bowl lifted for long time	• Lack of oil • Filter of hydraulic oil tank blocked	• Fill oil to specified amount. See: “Maintenance Every 100 Hours” • Change filter. See: “Maintenance Every 2000 Hours”
Excessive bulb in oil	• Bad oil used • Low level of oil • Air in oil pipe	• Replace with top quality oil • Fill oil to specified amount. See: “Maintenance Every 100 Hours”. • Bleeding air. See: “Maintenance Every 100 Hours”
Oil pressure too low	• Oil level too low, air sucked into the pump	• Fill oil to specified amount. See: “Maintenance Every 100 Hours”. Then Bleeding air, See: “Maintenance Every 2000 Hours”
Irregular moving of hydraulic cylinder	• Oil level too low	• Fill oil to specified amount. See: “Maintenance Every 100 Hours”.

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16.4.3 Engine

- Be sure to consult with your Agrison dealer when treating these troubles.
- Should troubles you meet not listed in the table, please let your Agrison dealer to deal with.

Trouble	Main Causes	Remedies
Oil pressure indicating lamp of the engine lights	• Low oil level in the bottom casing of the engine • Oil strainer blocked • Bad connector of oil pipe, oil leaks from damaged part • Oil pressure sensor of the engine ineffective	• Fill oil to specified amount. See: Check before Start. • Release the strainer tube See: “Maintenance Every 250 Hours”. • (Check and replace) • (Check and replace sensor)
(Pressure valve) steam radiated from the top of radiator Water thermometer in red area Oil pressure indicating lamp of the engine lights	• Low level of cooling water, water leakage • Loose belt of fan • Dirt gathered or rusted in cooling system • Radiator fins blocked or damaged • Temperature regulator inactive • Cover of water tank loose (working in high elevated area)	• Fill cooling water and repair See: Check before Start. • Adjust tightness of fan belt See: “Maintenance Every 250 Hours”. • Replace cooling water, clean inside of cooling system See: “24.2 Maintenance as Required”. • Clean and replace radiator fins See: “24.2 Maintenance as Required”. • Replace temperature regulator • Tighten cover or replace stuffing
Water thermometer in white area in left side	• Temperature regulator out of control • Monitor inactive	• (Replace temperature regulator) • (Replace)
Start motor running but the engine doesn’t starting	• Lack of fuel • Air comes into fuel system • Lack of fuel • Air comes into fuel system • Lack of fuel	• Fill oil See: Check before Start. • Repair the part where air is sucked See: “Maintenance Every 250 Hours”. • (Replace pump and nipple) • See: Electrical system • (Adjust clearance of air

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	• Air comes into fuel system	valve)

Engine (continued from 16.4.3)

Smoke is white and blue	• Excessive oil in the bottom casing • Fuel model incorrect	• Fill oil to specified amount. See: Check before Start. • Release with specified fuel
Waste gas often returned	• Element of air strainer blocked • Nipple broken • Cylinder has defect • Turbocharger damaged	• Clean or replace See: “24.2 Maintenance as Required”. • Replace nipple • See the same item mentioned above. • Clean or replace turbocharger
Abnormal sound of burning	• Nipple damaged	• Replace nipple
Abnormal sound occurs (burning or machine sounds)	• Low grade fuel used • Overheat • Silencer damaged • Big clearance of air valve	• Replace with specified fuel • Same as abovementioned “Water thermometer in red area” • (Replace silencer) • Adjust clearance of air valve

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MAINTENANCE

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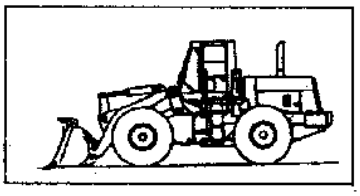
Never adopt check and repair methods which are not described in this manual.
Repair should be done on solid and plain road.

Preparation Before Repair

Following work should be carried out except some special cases.



- Let the working device close to the ground as shown in drawing.
- All operating levers should be set at middle position.
- Pull up the stop brake lever to make brake in work.
- Put pad blocks before and after tyres.
- Lock the front and rear frames by safety lever.

Check all nuts and bolts and tighten or replace as required.

Working Hours Meter:

Check readings on the meter every day to see if the maintenance time is up.
Agrison spare parts:
Take specified spare parts in the spare parts list to make maintenance and change.

Agrison's Oil:

Adopt oil and lubricant recommended by Agrison (select oil and lubricant with suitable viscosity according to ambient temperature).

Clean Washing Liquid:

Adopt window-washing liquid for automobile (do not let dirt come in).

Use Clean Oil and Lubricant:

Keep cleanness of oil tank and lubricant tank. Adopt clean oil and lubricant. Do not let oil and lubricant attach impurities.
Keep cleanness of the machine:
Keeping machine cleanness can make troubles to be found easily. In addition, it should be mentioned that grease nipple, ventilating plug and oil ruler should be clean without impurities.

Pay Attention to Oil and Water with High Temperature:

When the engine stops, it is dangerous to drain high temperature oil and coolant and to take out oil strainer. It should be done when engine is cooled down. The suitable temperature to drain oil is 20 – 40℃. If it is lower than this temperature, it should be heated up to the said range can drain then be carried without.

Check Exhausted Oil and Oil Strainer:

After oil and oil strainer are replaced, check oil and the strainer to see if metal grains or other impurities are existed. Should they are existed in big quantity, contact your Agrison's dealer.

Fuel Strainer:

If the fuel strainer is supplied, do not take it out when adding fuel.

Change of Oil:
Change oil on the place where there is less dust so as to prevent pollution.

17：Guide of Maintenance

Precautions:
When making maintenance, pay attention and observer all precautions.

Guides to Welding:
- Shut off the start switch of the engine.
- You cannot use a voltage over 200V continuously.
- The distance between welding area and the grounding cable should be within 1 m.
- Avoid the seal ring and bearings are between welding area and the grounding cable.
- Never weld steel pipe with fuel or machine oil.
- Draw off the plug of control cable of the speed variator.

Fireproof:
Use clean agent or light oil which is not flammable to clean parts. Do not approach sparkle or smoke.

Sealing Surface:
When changing O ring or seal cushion, clean seal surface and change with new O ring or seal cushion. When assembling, put hem on correct position.

Check the Frame:
When working in rocky area, check the frame if damaged, check bolts and nuts if they are loosened, cracked, worn out and damaged.

Attentions to Cleaning:
Never spray the heat radiator.
Do not allow to splash water upon any electrical devices

Check Before and After Work:
Before working on mud, rain field, snow land or sea bank, check tightness of screw plug and valve.
Clean the loader immediately after the work to avoid to be rusted.
Make more lubrication than usual If the working device is immersed in water, you should fill lubricant every day.
As the working environment is bad, the maintenance period should be shortened, and lubricant should be filled frequently.

In Much Dust Environment:
Following points should be noted if working under much dust environment:
- Check the dust indicating lamp of the air filter to see if it is blocked. Clean the air filter more often.
- Often clean the core of the radiator in order to avoid blocked.
- Often clean and replace fuel strainer.
- Clean electrical devices, especially the start motor and generator to avoid dust to be gathered.

Avoid to Mixing Oils:
Never use mixed oil with different brands. If you have only one kind of oil, which is different with what you are using, then replace it completely.

18：Essentials of Maintenance

Use Agrison's spare parts.
When you replace or fill oil, do not use oil with different models.
Except in special case, normally oils can be used as following table:

ITEM	KIND OF LIQUIDS		
Machine oil in Engine	Meifu 1300 (SAE15W-40-CD)		
Speed Variator	No. 8 Hydraulic Driving Oil		
Bridges (front and rear)	Meifu 1330 (use the same oil when replacing oil, two kinds of different oils cannot be mixed)		
Working Oil Tank	GB11118.1-94 Mineral oil or synthetic hydrocarbon hydraulic oil (L-HM)	Bitter cold	22
		In winter	32
		In summer	46
Pins and Axles	GB/T5671-1995 universal lithium-base grease		ZL-2H
	SH/T0380-1992 compound lithium-base grease		ZL-3H
Fuel	GB252-1994 Light diesel	Bitter cold	-35 -50
		In winter	-20 -10
		In summer	0 10
Heat Radiator	Meifu Antifreeze Liquid		

18.1 Generals of Oils, Fuel and Coolant

18.1.1 Oils

- Oils are always used in the engine and in all working devices. They are easily to be deteriorated due to using conditions (high temperature and high pressure) are bad. It should strictly follow the operation and maintenance manuals to apply oils. Even oils are clean they should be still replaced regularly.
- Oils are like blood in human bodies, therefore you should take care to protect them not to be invaded by impurities (water, metal grains, dust etc).

Most troubles are caused by uncleanness of oils. Take great care not to let oils to be invaded by impurities when replacing or filling oils.

- Never use oils with different brands and grades.

- Be sure to fill oil as per stipulated amount.

Troubles can be caused if filling more or less oil.

- If oil in all working device are not clean, maybe water or air have come it. You can contact with your Agrison's dealer.

- When replacing oil, relative oil strainer should be also replaced.

- It is suggested that make regular analysis upon oils to check working conditions. If you hope so, you can contact with your Agrison's dealer so as to get relative maintenance.

18.1.2 Fuel

- The fuel pump is a precision device and it could not work normally if water or dirt is mixed with fuel.
- Take great care not to let impurities to be mixed in when replacing or adding fuel.
- It should strictly follow the stipulations in operation and maintenance manual to use fuel.
  As oil is easily to be condensed under low temperature (especially below –15℃), therefore it is very important to change fuel depending on ambient temperature.
- In order to avoid wet air to be condensed into water and come into the fuel tank, if should be filled up after completion of work every day.
- Drain sediment and water from the fuel tank before starting the engine and 10 minutes after filling fuel.
- If fuel cannot be sucked up when starting the engine of just after replacement of the strainer, it is necessary to remove air in pipeline.

18.1.3 Coolant

- As river water has a lot of calcium and other impurities, if it is used, water scale can block the engine and the radiator so as to lower radiating function and cause high temperature of oil.
  Do not use undrinkable water.
- When using antifreeze liquid, be care of precautions in operation and maintenance manual.
- When the loader is delivered, the coolant in it is Meifu Antifreeze Liquid or Suzhou Model YX-III –45℃ top grade antifreeze liquid for automobile.
  This kind of antifreeze liquid is effective to prevent corrosion of the cooling system.
  This kind of antifreeze liquid can be used for 2 years or 4000 hours continuously, and can also be use din tropical area.
- The antifreeze liquid is inflammable, so let it never be close to fire.

The concentration of the antifreeze liquid to be used should be based on ambient temperature. Detailed mixing method can be seen on "24.2.2 Clean Inside the Cooling System".

- If the engine is overheated, let the engine cool down before adding coolant.
- If the level of coolant in the engine is too lower, it can cause overheat and corrosion of the cooling system.

18.1.4 Lubricant Oil

- The lubricant oil can prevent deformation and noise at connecting place.
- The connecting parts (for example connector and coupling sleeve) not mentioned in "Maintenance" Part should be treated at the time of overhaul. They do not need to fill lubricant. If some parts are not flexible due to using for long time, please fill lubricant.

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- When filling lubricant, wipe out overflowed lubricant. As lubricant mixed with sands and dirt can speed up worn-out of connecting pieces, so great care should be taken to wipe them out if found.

18.1.5 Storage of Oil and Fuel

- Prevent water, dirt and other impurities to be mixed in them.
- If oil in drum should be stored for a long time, it should be placed in such a way that the filling port is at the side (to prevent wet air to come in).
  If drum-packed oil is placed outdoor, waterproof hood or other protect measures should be taken.

18.1.6 Strainer

- The strainer is a very important safety part. It can prevent impurities and sediments in fuel to enter into important device and cause trouble.
  Regularly replace all strainers. Detailed procedures can be seen on operation and maintenance manual.
  When working environment is bad, it is necessary to change strainers in a short period of time based on features of oils and fuel (sulfur contained).
- Do not intend to use the strainer after it (filter screen) is cleaned. It should be replaced with anew one.
- When replacing new strainer, check if the old one is blocked by metal particles. If so, please contact with your Agrison's dealer.
- Do not unpack the strainer and its attachments until the time they are used.
- Be sure to use genuine Agrison's strainer and attachments.

18.2 Generals of Electrical System

- If electrical wires are wet or insulation is broken, the electrical system will leak electricity so as to cause danger.

- Relative maintenance in relation to the electrical system: 1) Check tightness of pulley belt of the fan; 2) Check damage of the pulley belt; 3) Check the height of electrolyte in the storage batteries.

- Do not remove any installed electrical parts.

- It is not allowed to increase any electrical parts except those stipulated by Agrison.

- Keep the electrical system dry when clean the whole machine of under rain.

- When working on the seaside, carefully clean the electrical system to avoid corrosion.

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- The backup power supply should never be connected with fuses, start switch and storage batteries.

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19：List of Consumables

Consumables such as core of strainer, cartridge of air filter, connecting scraper edge of bolts etc. should be replaced within the regular maintenance and worn-out period.

Correctly replace consumables under the principle to use the loader economically.

It should use Agrison's attachments with superior quality (list of attachment is as follows).

S/N	CODE	NAME	SPECIFICATION	UNIT	QUANTITY	REMARKS
1	GB235-76	O ring	8×1.9	piece	4	
2			11×1.9	piece	17	
3			14×2.4	piece	6	
4			16×2.4	piece	2	
5			20×2.4	piece	4	
6			31×3.5	piece	4	
7			32×3.1	piece	2	
8			36×3.5	piece	1	
9			38×3.5	piece	3	
10			40×3.5	piece	2	
11			41×3.5	piece	4	
12			44×3.5	piece	5	
13			48×3.5	piece	1	
14	GB3452.1-93	O ring	30×3.55	piece	2	

NAME	UNIT	QUANTITY	SEE REMARKE IN DATAILS
Reflector	set	2	
Labor clothes	set	1	Upper outer garment

20：Use Fuel, Coolant and Lubricant based ion Ambient Temperature

Select fuel, coolant and lubricant correctly.

Device	Type of Medium	Ambient Temperature -32 -4 14 32 50 68 86 104 122°F -30 –20 –10 0 10 20 30 40 50° C		Oil Amount Stipulated Amount	Oil Amount Adding Amount
Bottom Casing of Engine	Engine Oil	SAE15W-40		19L	19L
Gearbox	Engine Oil	8# Hydraulic Driving Oil		45L	45L
Hydraulic System		GB1111.1-94 Mineral oil or synthetic hydrocarbon hydraulic oil (L-HM)	Bitter cold 22		
			In winter 32		
			In summer 46	220L	220L
Bridge		Meifu 1330		37L	37L
		-			
Brake Oil		SAE 10W		2×1.5L	2×1.5L
Pin Axle	Lubricating Grease	GB/T5671-1995 universal lithium-base grease SH/T0380-1992 compound lithium-base grease	In winter ZL-2H	-	-
			In summer ZL-3H		
Fuel Tank	Diesel	GB252-1994 Light diesel	Bitter cold -35 -50		
			In winter -20 -10		
			In summer 0 10	300L	300L
Cooling System	Water	Fill antifreeze liquid		20L	-

Remarks:

When sulfur content in fuel is lower than 0.5%, it should be replaced in stipulated period of maintenance in manual.

When sulfur content in fuel is higher than 0.5%, it should be replaced as per following table.

Sulfur content in fuel	Replace Period
0.5-1.0%	1/2 period of maintenance
higher than 1.0%	1/4 period of maintenance

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- When ambient temperature is less than 0℃, it should be ensured that SAE 10W-30 and SAE 15W-40 are used even temperature in daytime is high than 10℃.
- The engine oil should be CF4 of API Grade. If CE and CD oils of API Grade are used, the replace period should be reduced a half.

Total Volume: it means oil in all parts and pipelines.
Supplementary Volume: during the time to make maintenance and check, oil should be supplemented into the system.

SAE: Society of Automobile Engineering
API: American Petroleum Institute

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21：Standard Tightening Torque of Bolts and Nuts

21.1 Brief Introduction of Tools Used

Tools listed in the table are suitable for the machine:

S/N	Code	Name	Specifications	Unit	Quantity	Remarks
1	GB1432-78	Minus head wooden handle screwdriver	100×6 mm	piece	1	
2	GB1432-78	Minus head wooden handle screwdriver	150×10 mm	piece	1	
3	GB1433-78	Crosshead wooden handle screwdriver	100×5 mm	piece	1	
4	GB6295.1-86	Pliers	180 mm	piece	1	
5	GB4388-84	Fixed spanner (11 piece)	6 ~ 32 mm	piece	1	
7	GB4388-84	Double-head fixed spanner	5.5×7 mm	piece	1	
8	GB4388-84	Double-head fixed spanner	32×36 mm	piece	1	
9	GB4388-84	Double-head fixed spanner	41×46 mm	piece	1	
10	GB4440-84	Adjustable wrench	300×36 mm	piece	1	
11	GB5356-85	Socket wrench (7 pieces)	3 ~ 17 mm	set	1	
12	SG216-80	Round head hammer	0.66 kg	piece	1	
13	WZ40.29.5.1	Hub socket wrench	(27 ~ 36)	set	1	
14		Socket wrench (24 pieces)	10 ~ 32 mm	set	1	
15		High pressure grease gun		piece	1	
16		Manometer for tyre	0 ~ 0.8 Mpa	piece	1	
17		Angle jaw for retainer ring	175 mm	piece	1	
18		Straight jaw for retainer ring	175 mm	piece	1	

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21.2 Torque Table

Strength Class of Bolts	Nominal Diameter of Bolt mm							
	6	8	10	12	14	16	18	20
	Tightening Torque Nm							
4.6	4-5	10-12	20-25	36-45	55-70	90-110	120-150	170-210
5.6	5-7	12-15	25-32	45-55	70-90	110-140	150-190	210-270
6.8	7-9	17-23	33-45	58-78	93-124	145-193	199-264	282-376
8.8	9-12	22-30	45-59	78-104	124-165	193-257	264-354	376-502
10.9	13-16	30-36	65-78	110-130	180-210	280-330	380-450	540-650
12.9	16-21	38-51	75-100	131-175	131-175	326-434	448-597	635-847

Strength Class of Bolts	Nominal Diameter of Bolt mm						
	22	24	27	30	33	36	39
	Tightening Torque Nm						
4.6	230-190	300-377	450-530	540-680	670-880	900-1100	928-1237
5.6	290-350	370-450	550-700	680-850	825-1100	1120-1400	1160-1546
6.8	384-512	488-650	714-952	969-1293	1319-1759	1694-2259	1559-2079
8.8	512-683	651-868	952-1269	1293-1723	1759-2345	2259-3012	2923-3898
10.9	740-880	940-1120	1400-1650	1700-2000	2471-3298	2800-3150	4111-5481
12.9	864-1152	1098-1464	1606-2142	2181-2908	2968-3958	3812-5082	4933-6577

22：Regular Replacement of Key Safety Parts

In order to ensure the safety of the loader in application course, customer should persist in regular maintenance. In addition, in order to increase the safety, customer should replace parts listed in the table regularly, because these parts are so important in fields of safety and fireproof.

The materials of these parts will be deteriorated as time goes, or be easily worn out or corroded. However these parts should be replaced regularly in spite of their application states. It is necessary to ensure their application features.

If the replacement period does not expire but the abnormal running is found, they should be replaced immediately.

If hose clip has any damage such as deformation or crack, they should be replaced together with hoses. When replacing hose, O-ring, seal cushion or some other parts should be also replaced together. Contact your Agrison dealer in order to replace key safety parts.

Key Safety Parts

S/N	Key Part To be Replaced Regularly	Quantity	Time to be Replaced
1	Fuel Pipe (Oil Tank – Oil Spray Pump)	1	Every two years or 4000 hours (whichever is first)
2	Fuel Return Pipe (Oil Spray Pump – Fuel Tank)	1	
3	Fuel Outlet Pipe (between Nipples)	1	
4	Oil Return Pipe for Turbocharger	5	
5	Steering Pipe (Pump – Optimizing Valve)	1	
6	Steering Pipe (Steering Device – Steering Oil Cylinder)	4	
7	Steering Pipe (Optimizing Valve – Working Pump)	1	
8	Steering Pipe (Optimizing Valve – Steering Device)	1	
9	Steering Pipe (Steering Device – Hard Pipe)	2	
10	Cushion, Seal Piece and O Ring of Steering Oil Cylinder	2	
11	Brake Oil Pipe (Brake Valve – Front Brake)	2	
12	Brake Oil Pipe (Brake Valve – Rear Brake)	1	

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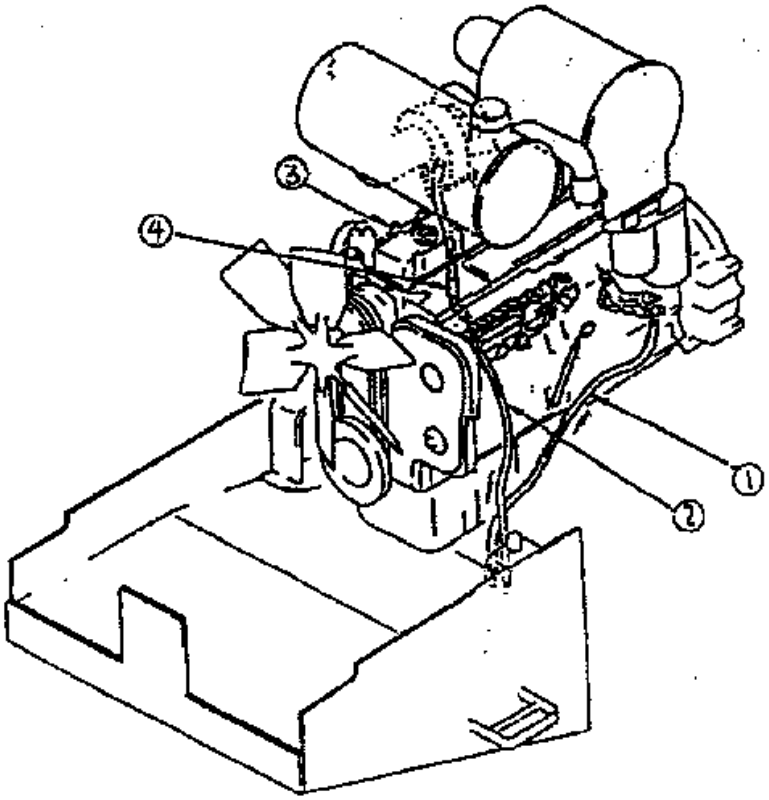
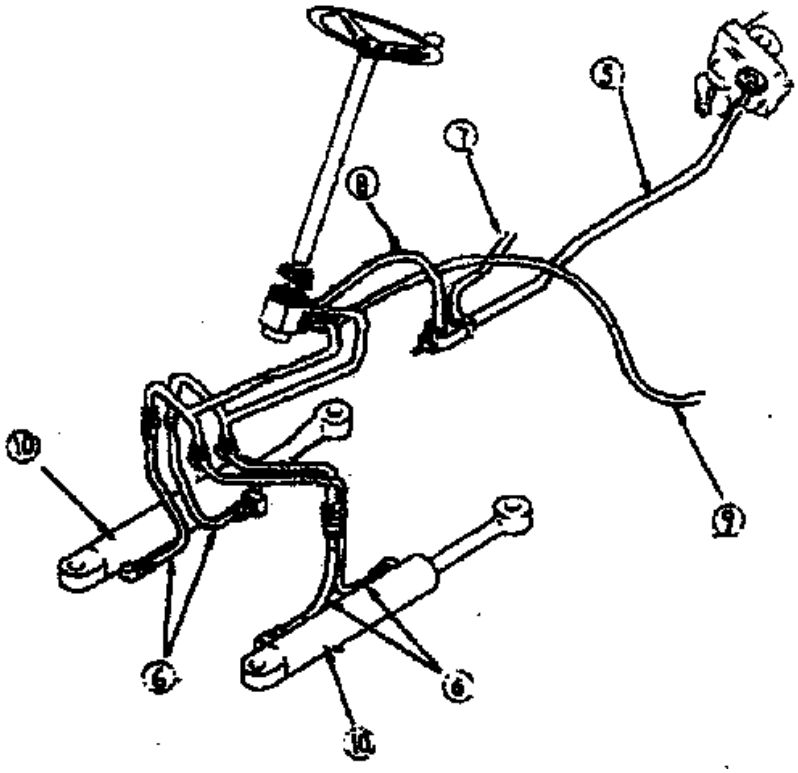
22：Regular Replacement of Key Safety Parts





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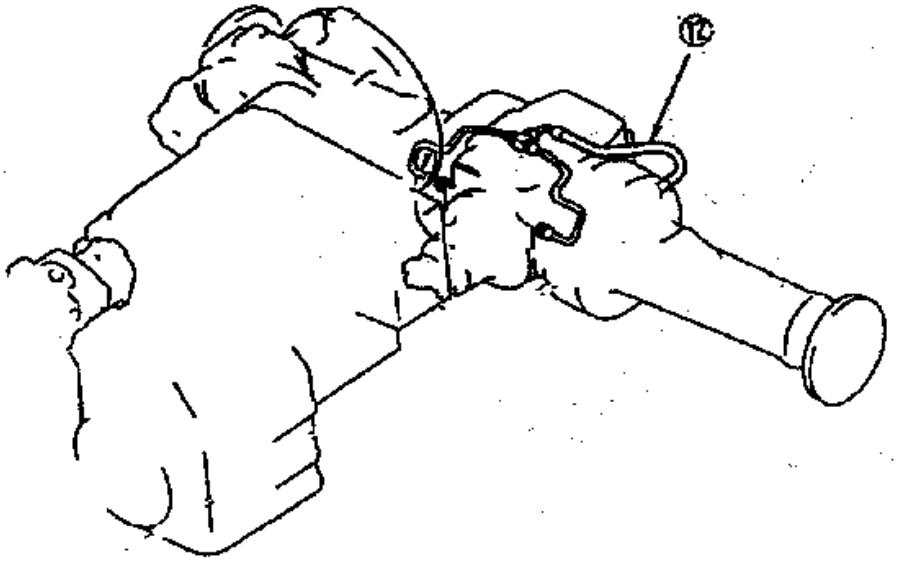
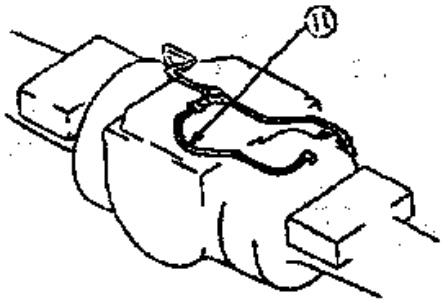
22：Regular Replacement of Key Safety Parts





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23：Schedule Table of Maintenance

23.1 Schedule Table of Maintenance

Maintenance Items	Page
Maintenance of First 100 Hours (only after the first 100 hours)	
Replace the strainer in the gearbox	3-19

Maintenance Items	
Maintenance of First 250 Hours (only after the first 250 hours)	3-19
Replace the filter screen of the fuel strainer	3-19
Replace the cartridge of strainer of the working oil tank	3-19
Check clearance of air valve of the engine and make adjustment	3-19
Maintenance as Required	
Check, clean or replace the cartridge of air filter	3-19
Clean the inside of the cooling system	3-21
Check oil level of the gearbox and fill oil	3-23
Check oil level inside the bridge and fill oil	3-24
Clean the aerator of the bridge casing	3-25
Clean the core of the radiator	3-25
Replace bolt-connected scraper edge (option)	3-26
Replace scraper teeth	3-27
Check the air conditioner	3-28
Clean the condenser of the air conditioner	3-29
Drain water from the oil-water separator	3-29
Check Before Start	
Check height of coolant and fill water	3-29
Check level of fuel and fill fuel	3-30
Check oil level of the engine panel and fill oil	3-30
Check electrical circuit	3-31

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23：Schedule Table of Maintenance

Maintenance Items	Page
Check stop brake	3-32
Check running brake	3-32
Check the siren and reverse running buzzer	3-32
Check lamps if clean and good	3-32
Check color and sound of exhausted air from the engine	3-32
Check working feature of meters	3-32
Check turning clearance of the steering wheel and working feature of steering device	3-32
Check the position of rearview mirror and if clean and good	3-32
Maintenance every 50 hours	
Check pneumatic pressure of tyres	3-33
Drain water and sediment from the fuel tank	3-33
Lubricate the spline of front middle driving shaft (1 places)	3-33
Maintenance Every 100 Hours	
Check oil level in oil tank and fill oil	3-34
Clean element of the air filter at the air inlet of the air-conditioner	3-34
Lubricate the hinged pin at the rear bridge (3 places altogether)	3-35
Maintenance Every 250 Hours	
Replace the engine oil and the screen of the oil filter	3-35
Check tightness of belt on the fan and the generator and make adjustment	3-36
Check if nuts are loosened at the hub and make tightening	3-37
Check tightness of the belt of the compressor of the air-conditioner	3-37
Check the height of electrolyte level of the storage batteries	3-38
Lubrication	3-38
• Hinged pin on scraper bowl (two places)	3-39
• Hinged pin on the connecting rod of the scraper bowl (two places)	3-39
• Hinged pin on the bowl-turning oil cylinder (two places)	3-39
• Hinged pin on the lifting oil tank (four places)	3-39

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23：Schedule Table of Maintenance

Maintenance Items	Page
Maintenance Every 250 Hours (continued from the last page)	
• Hinged place of the lifting arm (two places)	3-39
• Hinged pin on the connecting rod of the scraper bowl (one places)	3-39
• Hinged pin on the steering oil tank (four places)	3-39
Maintenance Every 500 Hours	
Replace the filter screen of the fuel strainer	3-39
Replace the cartridge of the oil strainer of the gearbox	3-41
Maintenance Every 1000 Hours	
Replace oil in of the gearbox and clean the strainer	3-42
Clean the aerator of the gearbox	3-43
Lubricating	3-44
• Hinged pin on the frame (one place)	3-44
• Front driving shaft (two places)	3-44
• Support of the front driving shaft (one places)	3-44
• Middle driving shaft (two places)	3-44
• Rear driving shaft (two places)	3-44
Check fasteners of the turbocharger	3-45
Check clearance of rotor of the turbocharger	3-45
Maintenance Every 2000 Hours	
Replace oil in working oil tank and elements of oil strainer	3-45
Replace the cartridge of the aerator of working oil tank	3-47
Replace oil in the bridge casing ★	3-47
Check weariness of the brake disc	3-48
Check the generator and the start motor	3-48

★ It is stipulated maintenance to replace oil in the bridge casing every 2000 hours. If brake is so frequent and noise occurs, it should be replaced in shorter time.

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23：Schedule Table of Maintenance

Maintenance Items	Page
Check clearance of the air valve of the engine and make adjustment	3-48
Check the Vibration Dumper	3-48
Clean and check the turbocharger	3-48
Maintenance Every 2000 Hours	
Check the cooling water pump	3-48

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24.0 Maintenance of First 100 Hours

- Replace the strainer in the gearbox

24.1 Maintenance of First 250 Hours

After running for first 250 hours, the new vehicle should be maintained as follows:

- Replace the filter screen of the fuel strainer
- Replace the cartridge of strainer of the working oil tank
- Check clearance of air valve of the engine and make adjustment

Details of replace and maintenance can be seen on “Maintenance Every 500 Hours and Maintenance Every 2000 Hours”

24.2 Maintenance as Required

24.2.1 Check, Clean or Replace the Cartridge of Air Filter

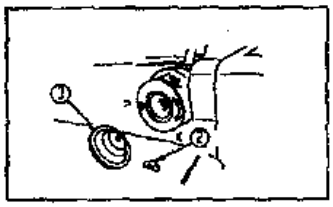
⚠ ATTENTION

- Never clean and replace the Cartridge of Air Filter when the engine is running.
- When cleaning the cartridge with compressed air, wear safety glasses or goggles to protect eyes.

Check

If the red piston of the dust monitor (1) appears, clean assembles of the filter.

Clean or Replace Outside Elements



1. Remove butterfly nuts ② and the cover ③, take out the outer cartridge.
2. Clean inside the air purifier.
3. Flush with dry compressed air (max. 700 kPa (7 kg/cm^2)) from the inside of the cartridge along the folded mark, and flush the inside and the outside as well.
   1) Once outside parts are cleaned, remove its seal piece on it.
   2) Replace the outer cartridge if it has cleaned 6 times or used for over 1 year, and replace the inner cartridge as well.

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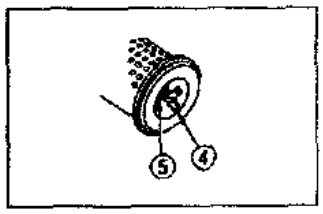
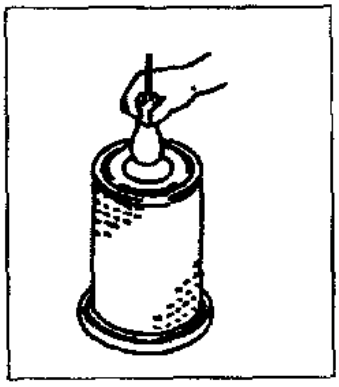
3) If the dust indicator flashes when the outer cartridge is used after cleaned, then outer and inner cartridges should be all replaced whatever the outer cartridge has been cleaned 6 times or not.
4) Check if nuts of the inner cartridge are loose, and tighten them if needed.
5) Replace the seal pad ⑤ of the butterfly nut ④ if broken.





Attention:
After the cartridge has been cleaned and dried, check with lamp. If orifice or particles found, replace the cartridge.
When the cartridge is cleaned, do not let it touch other things.
Do not use the cartridge whose folding seam or seal piece or pad has been damaged.

4. Mount clean cartridge.

Replace the Inner Cartridge
1. First take out the outer cartridge and then take out the inner cartridge.
2. In order to prevent dust entering, cover the exit of the outlet pipe by clean cloth or ribbon.
3. Clean inside the air purifier and take out the case, which is installed in the second step when assembling.
4. Replace a new inner cartridge, and fix it with nuts. Never clean and reuse it.
5. Mount the outer cartridge.

Spare parts are needed if following approaches are used.

Water
Clean inside with high pressure water (no higher than 294.2 kPa (3 kg/cm^2)) from inside of the cartridge along the folded mark, and then clean the outside and the inside as well.

Clean Agent
If removing oil, grease or carbon like on the element, first clean them with lukewarm clean agent with thin concentration, then clean them on clean water and cool them dry.

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Or you can use compressed air (no higher than 700 kPa (7 kg/cm^2)) to blow from the inside to the outside to reach fast dry.
Never heat the element.
Use lukewarm (about 40℃) instead of soap water can get better results.

24.2.2 Clean the Inside of the Cooling System

⚠ ATTENTION

- When the engine stops running, cooling water is very hot and can injury persons. So you can drain water only after it is cooled down.
- As cleaning work is done when the engine is running, it is quite dangerous to enter into the lower part of the machine body as the loader could start in a sudden. Therefore when the loader is working, never enter into the lower part of the machine.
- When the loader is at working temperature, never take out the cover on the inlet of the radiator because the boiling water with pressure and steam could come out to injury persons. Only when the engine is cooled down, and touch the cover on the inlet to feel if it is cooled, then turn the cover down slowly to release pressure.

- When clean or replace cooling water, park the loader on the plain ground.
- Adopt the antifreeze agent with fixed brand. If it is impossible due to some reasons, please use the antifreeze agent with ethylene and ethylene glycol.
- Be ensured that the replaced screen is made of stainless steel.
- Clean the cooling system as per following table, and replace cooling liquid and antirust agent.

Type of Coolant	Clean Cooling System and Replace Coolant	Replace Antirust Agent
Antifreeze agent with fixed brand (used in four seasons)	Every year (in autumn) or every 2000 hours	Every 1000 hours or when cleaning the inside of the cooling system or replacing coolant
Non-fixed brand of antifreeze agent with ethylene and ethylene glycol (used in winter)	Every six months (in spring and autumn) (removing preservative in spring and adding preservative in autumn)	
Antifreeze agent is not in use	Every 6 months or every 1000 hours	

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- Define the mixing ratio of preservative and water depending on the lowest temperature in locality and the following table.
  Actually, when defining the mixing ratio, it will be better if assuming the temperature in locality 10℃ below than normal.

The Mixing Ratio between Water and Preservative

Lowest Ambient Temperature	℃	**-13**	**-19**	**-23.5**	**-33.5**	**-40**	**-45**
Amount of Antifreeze Agent (volume in %)	Meifu Antifreeze Liquid	50	60	70	80	90	100
Amount of Water (volume in %)		50	40	30	20	10	0

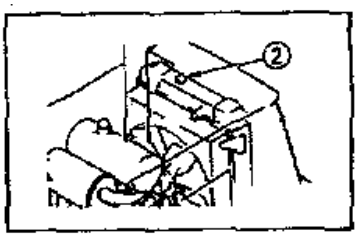
Lowest Ambient Temperature	℃	**-12**	**-17**	**-22**	**-28**
Value of Antifreeze Agent	Suzhou Model YX-III	1	1	1	1
Value of Water		1	0.75	0.5	0.25

⚠ ATTENTION

The antifreeze agent in inflammable do not let it approach fire.

- Take running water as cooling water. If water from river, well or other sources should be used, contact with your Agrison's dealer.
- We suggest you to control mixing ratio according to the Concentration Table of the Antifreeze Agent.

1. Turn the cover ② of the radiator slowly, then take it down.



2. Prepare a container to fill cooling water, open the drain valve ③ located at the lower left part of the radiator to drain cooling water.

3. Close the drain valve after cooling water removed and add new running water.

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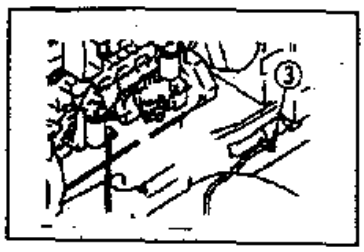
4. After water is filled in the radiator, start the engine to let it at idling state.
   Open the water drain valve ③, the engine is at idling state, add water continuously for 10 minutes.
   When above work is carrying out, adjust speed of water adding and draining to keep water full in the radiator.
   When adding water, be care the hose of water adding does not disconnect with the water inlet of the radiator.



5. After above work is finished, close the engine and open the water drain valve ③, drain all water and close it again.

6. After completion of water draining, clean with cleaning agent. Details can be seen on cleaning method and the description on cleaning agent.

7. After completion of cleaning, open the water drain valve ③, drain all cooling water and close it tightly, then add clean running water.

8. When the height of water is closing to the water inlet, open the water drain valve ③ to start the engine at idling state to make cooling water to be circulated repeatedly until drained water is clean.
   When above work is carrying out, adjust speed of water adding and draining to keep water full in the radiator.

9. When water is completely clean, close the engine and the water drain valve ③ as well.

10. Add cooling water until it is over filled.

11. In order to remove air from water, let the engine run at idling state for 5 minutes. During this period, the cover of the radiator should be taken out.

12. After closing the engine for three minutes, add cooling water up to the water inlet, close the cover and confirm it is tightened.

24.2.3 Check oil level of the gearbox and fill oil

⚠ ATTENTION

- When checking the height of oil, make stop brake working and lock the front and rear frames by safety lever and pin.
- When the engine stops, oil temperature is high. You should carry out following procedures only when oil temperature is cooled down.

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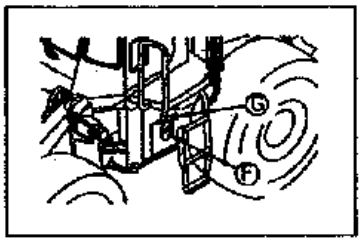
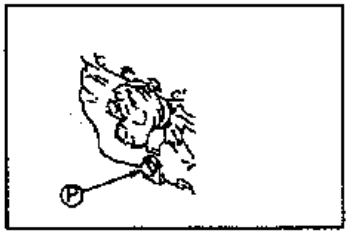
If oil in the gearbox has any abnormality or oil is mixed in cooling water, carry out following procedures:





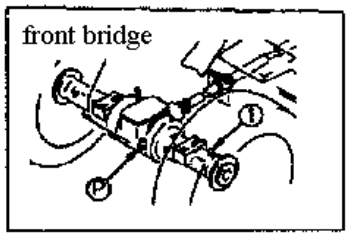
1. Start the engine at least for 5 minutes.
2. Open the cover of oil filling port (F), take out the mark ruler (G) and wipe oil out by cloth.
3. Insert the oil mark ruler (G) into the filling port until the bottom, then take it out.
4. Oil should be between the marks “H” and “L” on the oil mark ruler (G). If oil level is lower than the mark “L”, fill oil from the oil filling port.
   Referring to oil, see details in “20. Apply Fuel, Coolant and Lubrication Oil Depending on Temperature of Environment”.
5. If oil level is high than the mark “H”, drain excess oil from the drain plug (P) and recheck the oil level again.
6. If the height of the oil level is correct, insert the oil mark ruler in the inlet pipe and turn the oil inlet cover tightly.

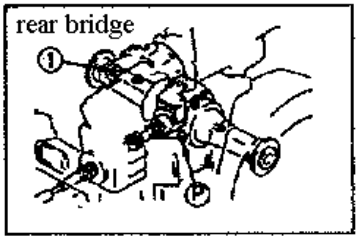
24.2.4 Check Oil Level Inside the Bridge and Fill Oil

⚠ ATTENTION

- When checking the height of oil, make stop brake working and lock the front and rear frames by safety lever and pin.
- When the engine stops, oil temperature is high. You should carry out following procedures only when oil temperature is cooled down.

If oil in the bridge casing has any abnormality, carry out following procedures:
Check on the plain road (if the road is uneven, the measured height of oil level is incorrect.





1. Close the engine and take out the measuring meter.
2. Wipe out oil on the oil level meter connected with the measuring meter by wet cloth.
3. Set the oil level meter (G) at the place shown on the right drawing.
4. If the oil height in between two lines on the oil meter, it is correct. If it is less than the lower line, fill oil from the inlet port (F) of the bridge casing.

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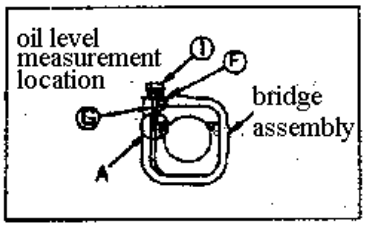
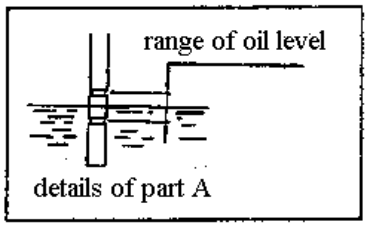
Referring to oil, see details in “20. Apply Fuel, Coolant and Lubrication Oil Depending on Temperature of Environment”.



5. If oil level is high than the higher line, drain excess oil from the drain plug (P) and recheck the oil level again.
6. If the height of the oil level is correct, set the measuring meter well.



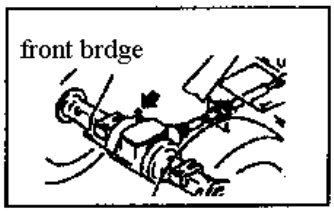
Tighten torque: 132±39 Nm (13.5±4 kgm)

24.2.5 Clean the Aerator of the Bridge Casing

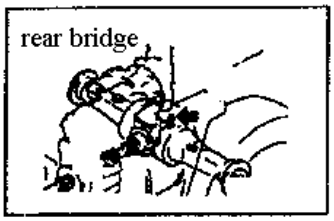
⚠ ATTENTION

When cleaning, make stop brake working and lock the front and rear frames by safety lever and pin.

Cleaning soil and dirt around the aerator by the brush.



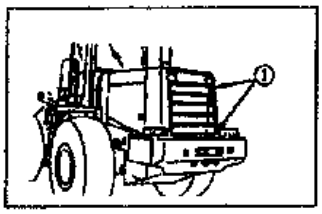
When cleaning aerator, clean the aerator before and after the bridge.



24.2.6 Clean the Core of the Radiator

If any soil or dirt is found on the radiator, carry our following procedures:

1. Take out the bolts, open the protect grid on the tail of the loader, and remove the plug of the tail lamp.



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2. Clean soil and dust stuck on the radiator by compressed air. It is also possible to clean by steam or water without pressure.

24.2.7 Replace Bolt-Connected Scraper Edge (Option)

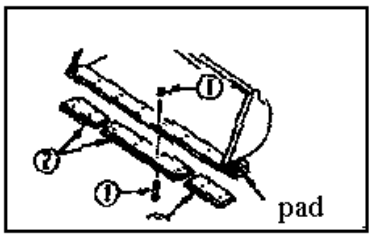
⚠ ATTENTION

When adjusting or replacing scraper edge, any action of the working device is very dangerous.
Set the working device at the fixed position and shut the engine.

Change or replace the scraper edge when it is worn out but not reach the edge of the bowl.

1. Lift the scraper bowl to a suitable height. It is necessary to put pads underneath to avoid its falling down.
   Lift the scraper bowl to make its bottom to be horizontal.

2. Take down nuts and bolts ①, and take out the scraper edge.



3. Clean the connecting parts of the scraper edge ②.

4. Change the position of the scraper edge ②, and refit on the scraper bowl. When mounting the scraper edge after changing position, it should set on the place symmetrical to the original position (the left scraper edge lies on the right side and the right scraper edge lies on the left side).
   If both edges of the scraper have been worn out, finish the connecting surfaces before mounting.

5. Tightening all bolts and nuts to prevent clearance left between scraper bowl and edges.
   The maximum torque of bolts and nuts: 745.3±107.9 Nm (76±11 kgm).

6. Retightening all bolts and nuts after working for several hours.

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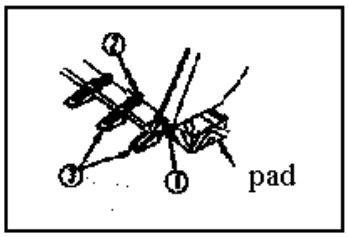
24.2.8 Replace the Scraper Teeth

⚠ ATTENTION

When replacing scraper teeth, any action of the working device caused by error action is very dangerous.
Set the working device at the fixed position and shut the engine.

After the scraper teeth are worn out, replace them as per following procedures:



1. Lift the scraper bowl to a suitable height. It is necessary to put pads underneath to avoid its falling down.
   Lift the scraper bowl to make its bottom to be horizontal.

2. Take down bolts ① and nut ②, and then take out the scraper teeth ③.

3. Clean the connecting parts of the scraper teeth ③.

4. Refit the new scraper teeth on the scraper bowl. Meanwhile, insert thin wooden piece to remove clearance between the scraper teeth and the scraper bowl.
   Continuously insert thin wooden piece until the thin wooden piece with the thickness of 0.5 mm couldn't be inserted. If connecting surfaces have been worn out, finish them before new teeth are mounted.

5. In order to prevent clearance left between scraper teeth and the bowl, regularly tighten bolts and nuts and knock tightly by the hammer.
   The tightening torque of bolts: 902±39 Nm (92±4 kgm).

6. Retighten all bolts after the loader has worked for several hours.

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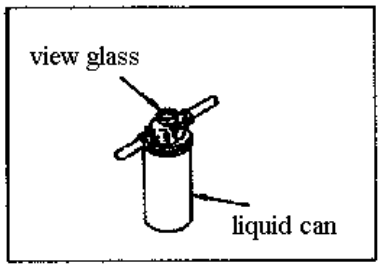
24.2.9 Check the Air Conditioner

Check twice every year in spring and autumn separately.

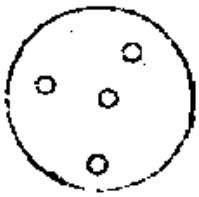
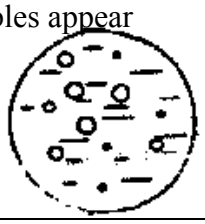
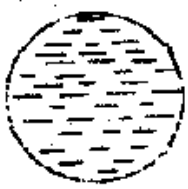
Check the level of refrigerant.

⚠ ATTENTION

If liquid inside stuck on eyes or hands it will damage the sight and make skin to be frozen, therefore do not loosen any parts on the circuit of refrigerant.



Let the cooler of the air conditioner work 5 to 10 minutes, then touch the high pressure part and low pressure part (or connectors of hose of high pressure and low pressure) by hand. Meanwhile, check flowing of refrigerating bubbles (R134a) via the view glass in order to check density of bubbles.
Please contact with Agrison's dealer for details of check.
The view glass is mounted on the energy accumulator on the side of condenser.

State of Cooler	Normal	Abnormal	
Temperature of high pressure pipe and low pressure pipe	High pressure pipe is hot and low pressure pipe is cold, the temperature difference is obvious	High pressure pipe is warm and low pressure pipe is cold, the temperature difference is not obvious	Almost no temperature difference between high pressure pipe and low pressure pipe
View glass	Transparent No bubbles if the engine increases or decreases speed 	Air bubbles always exist, sometimes they are transparent, sometimes white bubbles appear 	There is turbid substances flowing 
Connection between pipes	Quite normal	Some dirt in oil	Some substances in oil are very dirty
Normal state of the cooler	Level of coolant is normal without abnormality and can be used	Some places have leakage. Contact with repairing shop to make check	Almost all coolant is leaked, contact with repairing shop immediately

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24.2.10 Clean the Condenser of the Air Conditioner

⚠ ATTENTION
Do not use high pressure water to flush the condenser, otherwise it will be heated up to be damaged.

If there is mud or dirt on the condenser of the air conditioner, wash them out by water.
If water pressure is too high, the core will be deformed. Therefore when use high pressure water to wash, it should keep a suitable distance.

Cleaning Method

1. Open the cover of the condenser on the right side of eh driving cab.
2. Remove bolts from the condenser.
3. Clean the condenser from the upper part of the condenser (by water).

24.2.11 Drain Water from the Oil-Water Separator

When the floating core reaches or surpasses the redline, drain water according to following procedures.

1. Loosen the drain plug and the ventilating plug (if available) to drain gathered water until the floating core reaches at the bottom.
2. Tighten the ventilating plug (if available) and the drain plug.
3. If exhausting air with the same style to drain water, see “24.7 Maintenance Every 50 Hours” of the screen of the fuel strainer.

24.3 Check Before Start

24.3.1 Check Height of Coolant and Fill Water

⚠ ATTENTION
Normally do not open the cover of the radiator. Let the engine cool down before checking the height of level in water tank.

1. After completion of water adding, tighten the cover.

2. If the water tank is empty, check if there is something leak, then add water to the radiator.

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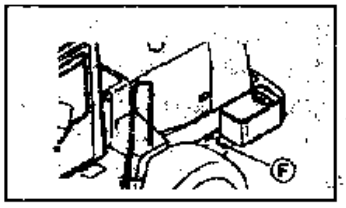
24.3.2 Check Level of Fuel and Fill Fuel

⚠ ATTENTION

When adding fuel, never let fuel to be overfilled, otherwise it can cause fire. So if overfill is found, wipe it out thoroughly.



Check the level of fuel through the oil mark ruler on the oil tank.

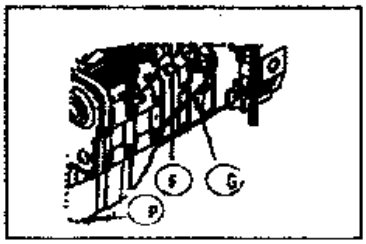
After that, add fuel from the oil adding port (F).

Referring to usage of fuel, see “20. Apply Fuel, Coolant and Lubrication Oil Depending on Temperature of Environment”.

After fuel is filling up, turn the cover tightly.

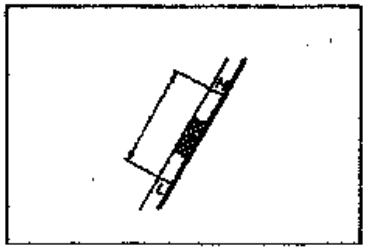
Fuel amount: 300 L.

24.3.3 Check Oil Level of the Engine Panel and Fill Oil



First open the door on the side of the engine casing at the rear part of the loader.

Then take out the oil ruler (G), and wipe oil out by cloth.



Insert the oil ruler (G) completely into the oil inlet pipe, and take it out again.

The level of fuel should be between marks L and H on the oil ruler (G). If the oil level is lower than the mark L, fill the engine oil from the inlet (F).

Referring to usage of oil, see “20. Apply Fuel, Coolant and Lubrication Oil Depending on Temperature of Environment”.

If the oil level is higher than the mark H, drain excess oil from the oil drain plug (P) and recheck the oil level again.

If the oil level is correct, cover the oil inlet and turn tightly, then close the door of the engine casing.

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Attention:
If the engine just worked, you should check the oil level at least 15 minutes after the engine goes out.
If the loader is parking on the slope, you should let it on the plain ground first and make check then.

24.3.4 Check Electrical Circuit

⚠ ATTENTION

- If the fuse in electrical circuit is often broken or cause short circuit, find reasons and make repair.
- Inflammables (such as fallen leaves, branches and grass) gathered around the storage batteries could cause fire, so they should be clear out.

Check electrical circuit to see if there is broken fuse, if short circuit or broken circuit is existed. Meanwhile, check if connections are loosened, If found, tighten it.

Following positions should be checked carefully:
- Storage batteries
- Start motor
- Generator

When making touring check or make check before start, check if there is flammables around the storage batteries, and clear then out if found.

Referring to causes of trouble and their remedies, contact with Agrison.

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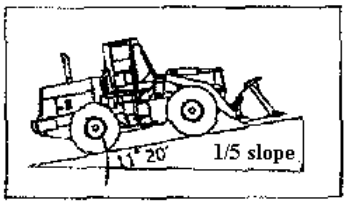
24.3.5 Check Stop Brake

⚠ ATTENTION

Even the lever of the stop brake valve is pulled up, it is still dangerous before the brake lamp lights. So the brake step tread should be also stepped down.

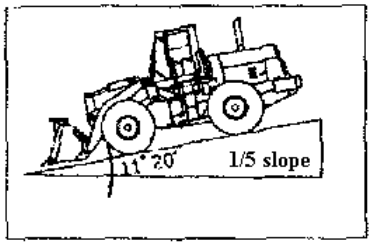
Inspection Condition

- Pneumatic pressure of tyres: specified value
- Road surface: rough road surface with 1/5 slope (5°20’)
- Loader: working state



Inspection Method

1. Start the engine, make the loader run against the slope, let the scraper be empty and run up on the slope.
2. Step down the brake tread to stop the loader, recover the direction lever to the neutral position, then shut the engine.
3. Pull up the lever of the stop brake valve, release the brake step tread slowly and check if the loader is still on the original position.



24.3.6 Check the Stop Brake

Drive the loader on rough and dry cement road with the speed of 34 km/h, check if the distance of brake sliding is less than 17 m.

Carefully check the brake system before driving the loader every day to see lf leakage exists. Fill up oil in the pond of the brake assistor. During the whole working period, the oil in the pond should be at least kept above half the level and air should be exhausted from the brake hydraulic part after oil is filled up.

24.3.7 Check the Siren and Reverse Running Buzzer

24.3.8 Check Lamps if Clean and Good

24.3.9 Check Color and Sound of Exhausted Air from the Engine

24.3.10 Check Working Features of Meters

24.3.11 Check Turning Clearance of the Steering Wheel and Working Feature of Steering Device

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24.4 Maintenance Every 50 Hours

24.4.1 Check Pneumatic Pressure of Tyres

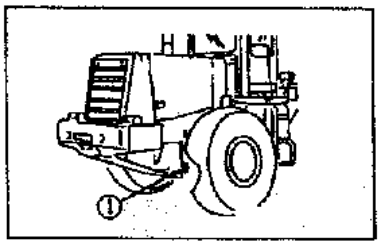
First of all, check pneumatic pressure of tyres before working when tyres are cooled.
Pneumatic Pressure of Standard Tyres:
Standard Tyres 20.5-25-16PR(L3 rock):
Front Tyres: 343.2 kPa (3.5 kg/cm^2)
Rear Tyres: 343.2 kPa (3.5 kg/cm^2)

Large-Scale Tyres 23.5-25-16PR(L3 rock)::
Front Tyres: 343.2 kPa (3.5 kg/cm^2)
Rear Tyres: 304.0 kPa (3.2 kg/cm^2)

Attention:
Suitable pneumatic pressure shall differ with different working conditions. See “12.8 Usage of Tyres” in details.

24.4.2 Drain Water and Sediment from the Fuel Tank

Loosen the valve ① on the right side of the fuel tank to drain sediment, water and oil together.



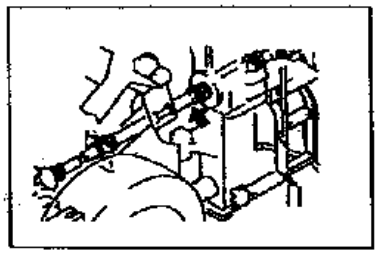
24.4.3 Lubricate the Spline of Middle Driving Shaft (1 place)

⚠ ATTENTION

- Make the stop brake in effect and lock the front and back frames by the safety lever and the pin.
- Set the working device in the fixed position and shut the engine.

1. Use the grease gun to fill lubricant oil into the oil nipple as shown on the drawing.

2. After lubricating, wipe out excessive useless lubricant oil.



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24.5 Maintenance Every 100 Hours

The Maintenance Every 50 Hours should be carried out simultaneously.

24.4.1 Check Oil Level in the Hydraulic Oil Tank and Fill Oil

⚠ ATTENTION

- When taking out the cover of the oil filling port, oil could be sprayed out. Therefore you should shut the engine first, and turn the cover slowly after oil temperature is cooled down in order to release internal pressure, and take out the cover at last.
- If filling excess oil beyond the mark, you should shut the engine first, and drain excess oil from the oil drain plug after hydraulic oil is cooled down.

1. Lower the scraper bowl down to close the ground, shut the engine or 5 minutes, then check the view glass.

Attention:

Do not fill oil if oil level is above he mark, otherwise the hydraulic device will be damaged and oil could be sprayer out.

2. If oil level is below the oil mark, open the check cover and fill oil from the filling port.

Referring to the usage of oil, see details in “20. Apply Fuel, Coolant and Lubrication Oil Depending on Temperature of Environment”.

24.5.2 Clean Element of the Air Filter at the Air Inlet of the Air-Conditioner

⚠ ATTENTION

When using compressed air, wear safety goggles or other necessary safety tools

After using air-conditioner, clean the air filter.

When cleaning elements of the air-conditioner, first shut the air-conditioner.

1. Flush with dry compressed air (max. 700 kPa (7 kg/cm^2)) from the inside of the cartridge along the folded mark, and flush the inside and the outside as well.

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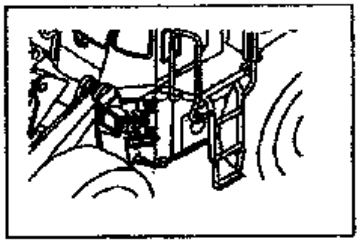
24.5.3 Lubricate the Hinged Pin at the Rear Bridge (3 Places Altogether)

⚠ ATTENTION

- Make the stop brake at the brake state and lock the front and back frames by the safety lever and the pin.
- Set the working device in the fixed position and shut the engine.



1. Use the grease gun to fill lubricant oil into the oil nipple as shown on the drawing.

2. After lubricating, wipe out excessive useless lubricant oil.

24.6 Maintenance Every 250 Hours

The Maintenance Every 50 Hours and Every 100 Hours should be carried out simultaneously.

24.6.1 Replace the Engine Oil and the Screen of the Oil Filter

⚠ ATTENTION

When the engine just finished work, oil temperature is high, so do not change oil immediately. Change oil when it is cooled down.

Preparations:
- Volume of Oil Container: at least the container with volume of 28 liter
- Changed Oil Amount: 28 liter
- Wrench of the oil strainer

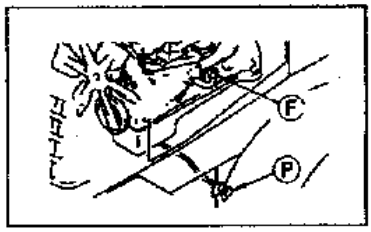
1. Open the door at the left side on the engine casing of the loader.

2. Open the oil filling port (F).

3. Place the oil container under the oil drain plug (P).

4. Loosen the oil drain plug (P) to drain oil.

5. Check drained oil. If more metal particles or impurities are found, please contact with Agrison.



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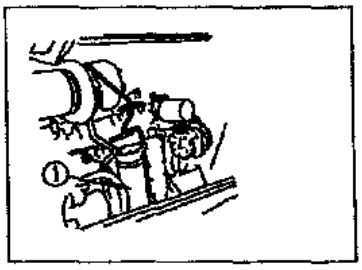
6. Mount the oil drain plug (P) well.

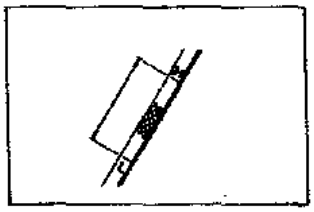


7. Open the door at the left side on the engine casing of the loader.

8. Use the wrench of the oil strainer to takeout the filtering screen in counterclockwise direction.

Caution! If carry out such operation when the engine is just shut, a lot of oil will rush out. Therefore do it after waiting 10 minutes.

9. Clean the support of the oil strainer. Fill engine oil into the new screen, then coat engine oil (or thin layer of lubricant oil) on the seal mouth of the new screen and screw, then making installation.



10. When installing, put the sealing mouth on the support of the oil strainer, and rotate 3/4 to 1 turn.

11. After the screen is installed, fill engine oil from the oil strainer (F) up to the level between marks H and L on the oil ruler.
    Referring to usage of oil, see details in "20. Apply Fuel, Coolant and Lubrication Oil Depending on Temperature of Environment".

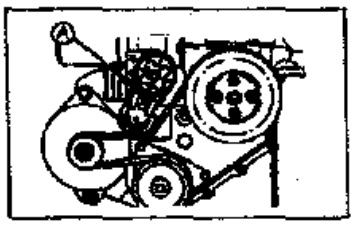
12. Start the engine and make it running at idling speed for a not too long time, then shut the engine to check if the oil level is between marks H and L on the oil ruler. Details can be seen on "24.3 Check before Start".
    Even the engine has not run for 250 hours but already for six months, oil and the screen should be also changed.

    Likewise, if the loader has not run for six months but already for 250 hours, oil and the screen should be also changed as well.
    Use CD oils of API Grade. If CC oil should be used, the time to change oil and the screen should be shortened a half (125 hours).

24.6.2 Check Tightness of Belt on the Fan and the Generator and Make Adjustment

Check

Exert a force about 6 kg by finger on the middle of the belt on the fan and the generator. The deformation of the belt in normal direction is about 7.5 mm.



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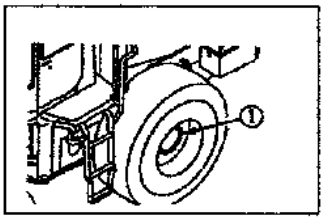
As the engine has a automatic belt tensioner A therefore no need to make adjustment.

24.6.3 Check if Nuts are Loosened at the Hub and Make Tightening



If nuts ① of the hub are loosened, they'll speed up weariness of tyres and cause accident to be happened.

1. Check if nuts are loosened. Tightening if needed.
   When checking if nuts are loosened, you should check from tightening direction.
   Tighten torque: 927±103 Nm (94.5±10.5 kgm)

2. If any bolts are damaged, all bolts on the wheel should be replaced.

24.6.4 Check Tightness of the Belt of the Compressor of the Air-Conditioner, and Make Adjustment

Check

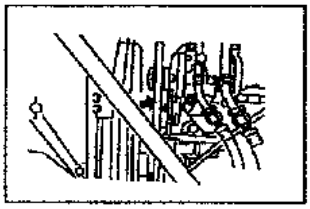
Exert a force about 10 kg by thumb on the middle of the belt on the compressor and the fan. The deformation of the belt in normal direction is about 11 to 15 mm.

If the belt measurement meter is used, the pulling force kept with 36 – 54 kg is reasonable.

Check When V-Belt is Replaced

Exert a force about 10 kg by thumb on the middle of the belt on the compressor and the fan. The deformation of the belt in normal direction is about 8 to 11.5 mm.

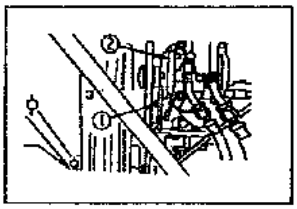
If the belt measurement meter is used, the pulling force kept with 54 – 76 kg is reasonable.



Adjustment

Loosen nuts ① to move the compressor ② so as to adjust the tension of the belt.

Check each pulley to see if damaged, if V-shaped grooves and V-belt are worn out. Special care should be taken that V-belt cannot touch the bottom of V-shaped groove.



When belt is completely loosened and couldn't be adjusted or there is cutting trace or cracks on it, then replace belt.

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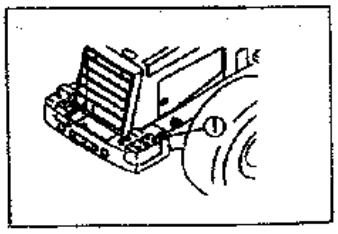
When adjusting V-belt, you cannot use round pole instead of wrench to move the compressor

24.6.5 Check the Height of Electrolyte Level of the Storage Batteries

⚠ ATTENTION

- Never let sparkle to be closed to the storage batteries in order to prevent explosion.
- The electrolyte is very dangerous to human body. If it is stuck by eyes or skin, it should be flushed by a lot of water and go to see doctor.

Make such a check before the loader starts to work.



1. Open the cover of the storage batteries box.
   There are two storage batteries: equipped on both sides of the tail part of the loader.
2. Remove the cover ①, check the height of the electrolyte if it is at the specified height (10 to 12 mm from the bottom of the box). If the level of the electrolyte is too lower, add distilled water up to the specified height. If the electrolyte is overfilled, add thin sulfur acid.
3. If any electrolyte tank ① is filled with distilled water, all other electrolyte tanks should be also added with distilled water.
4. Clean the vent hole on the cover of the storage batteries, then turn the cover tightly.

Attention:
If fill distilled water in winter, you should fill before work in the morning in order to prevent from condensation.

24.6.6 Lubrication

⚠ ATTENTION

- Make the stop brake in effect and lock the front and back frames by the safety lever and the pin.
- Set the working device in the fixed position and shut the engine.

1. Use the grease gun to fill lubricant oil into the oil nipple as shown on the drawing.
2. After lubricating, wipe out excessive useless lubricant oil.

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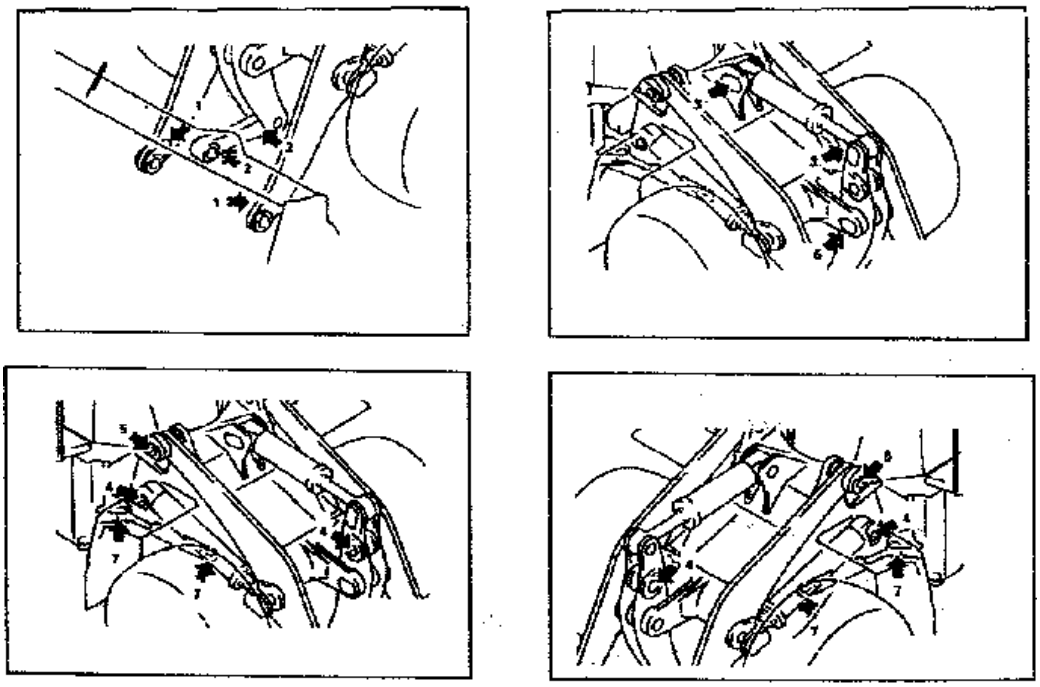
1. Hinged pin on the scraper bowl (two places)
2. Hinged pin on the connecting rod of the scraper bowl (two places)
3. Hinged pin on the bowl-turning oil cylinder (two places)
4. Hinged pin on the lifting oil tank (four places)
5. Hinged place of the boom arm (two places)
6. Hinged pin on the rocking arm (one places)
7. Hinged pin on the steering oil tank (four places)



24.7 Maintenance Every 500 Hours

The Maintenance Every 50 Hours, 100 Hours and 250 Hours should be carried out simultaneously.

24.7.1 Replace the Filter Screen of the Fuel Strainer

⚠ ATTENTION

- When the engine just finished work, the engine has higher temperature. You can only replace the strainer when the engine is cooled down.
- Never let sparkle to be closed to fuel.

Prepare the wrench and the container to fill fuel.

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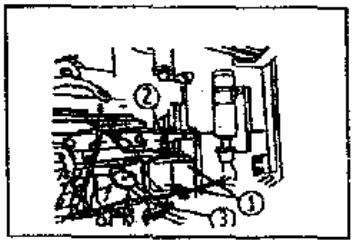
1. Open the door on the left casing of the loader.

2. Place the container under the filtering screen to receive drained fuel.

3. Use the wrench of the filter to turn the filtering screen in counterclockwise direction and take it down.

4. Clean the filter support, fill clean fuel on the new filtering screen, coat engine oil on its and install it on the support of the filter.



5. When installing, tightening until screen and the sealing surface of the support are combined completely, then further rotate about 2/3 turn. If rotate too tight, the sealing surface could be damaged to cause leakage of fuel however if rotate too loose, fuel can also be leaked. Therefore the tightness should be suitable.

6. After replacing the screen ①, loosen the air drain plug ②.

7. Draw out the connecting lever ③ from the oil filling pump, shake the pump up and down to suck fuel until no air is exhausted from the drain plug.

8. After air is exhausted, tighten the ventilating plug and press into the connecting lever of the oil filling pump and tighten it.

⚠ ATTENTION
When rocking the crankshaft of the engine, be ensured that it is safe roundabout as the engine could be started.

9. After replacement of the filtering screen, turn the key in the start switch to the position START. In the initial seconds there will be air bled, then the engine will be started. When the engine is started, check if leakage exists in sealing part of the strainer. If so, check if the screen is tightened. Replace it if damaged or if impurities and dust on it, then repeat procedures from 4. to 9. to install it.

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24.7.2 Replace the Cartridge of the Oil Strainer of the Gearbox

- Prepare a container to receive oil.

1. Place the container under the oil strainer to receive drained oil.

2. Remove the oil drain plug on the bottom of the strainer casing to drain oil. After drained, turn the oil plug tightly.

3. Hold the strainer casing to loosen the central bolt on the bottom, then take out the strainer casing.

4. Take out the cartridge and clean the inside of the strainer casing.

5. Replace with new sealing pad and O ring. Before installing, coat clean engine oil on the sealing pad and O ring.

6. Install the new cartridge into the strainer casing and turn the central bolt tightly.

   Tighten torque: 76.5±11.8 Nm (7.8±1.2 kgm).

7. Start the engine and set it at the idling state without long time. Then check the height of oil to see if it is suitable. Details can be seen on “24.2 Maintenance When Required”.

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24.8 Maintenance Every 1000 Hours

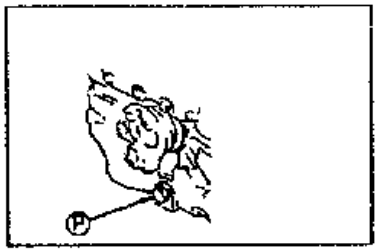
The Maintenance Every 50 Hours, 100 Hours, 250 Hours and 500 Hours should be carried out simultaneously.

24.8.1 Replace Oil in Gearbox

⚠ ATTENTION

When the loader just finished work, oil temperature is high. Make maintenance only when the oil temperature is cooled down.

The container to fill drained oil: at least 45 liter
Oil amount to be replaced: 45 liter



1. Place the container under the oil drain plug (P), then take out the oil drain plug (P) to drain oil.
   In order to prevent oil rushing out, you should loosen it slowly then take out the oil drain plug (P).

2. After oil is drained, place the oil drain plug (P) well.

   Tighten torque: 68.6±9.8 Nm (7.0±1.0 kgm).

3. Place the container under the strainer of the gearbox.

4. Take out the oil drain plug of the strainer of the gearbox to drain oil, then turn the oil drain plug tightly.

   Tighten torque: 107.9±14.7 Nm (11±1.5 kgm).

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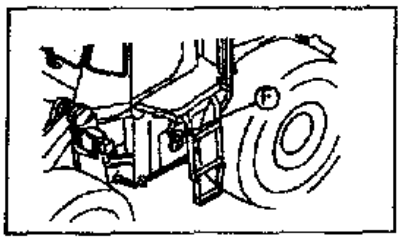
5. Fill the engine oil with specified amount into F from the strainer.

   Referring to usage of oil, see details in “20. Apply Fuel, Coolant and Lubrication Oil Depending on Temperature of Environment”.



6. After oil is filled, check if it is up to specified amount. Details can be seen on “24.2 Maintenance When Required”

7. Check from the gearbox and the strainer to see if there is leakage.

24.8.2 Clean the Aerator of the Gearbox

Clean mud and dirt around the aerator then take out the ventilating plug, add clean cleaning liquid to wash the aerator.

When taking out the aerator, be care not let dust and impurities enter into from the ventilating hole.

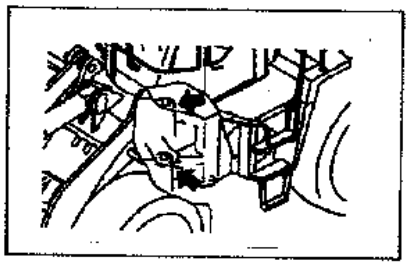
24.8.3 Lubrication

⚠ ATTENTION

- Make the stop brake in effect and lock the front and back frames by the safety lever and the pin.
- Set the working device in the fixed position and shut the engine.

1. Use the grease gun to fill lubricant oil into the oil nipple as shown on the drawing.
2. After lubricating, wipe out excessive useless lubricant oil.

1. Hinged axles on the frame (two places)



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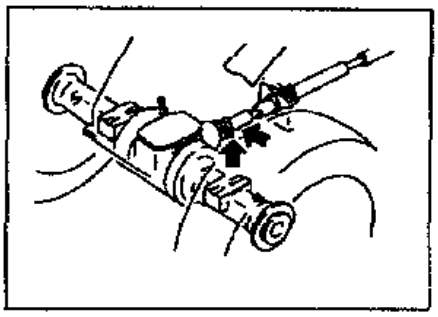
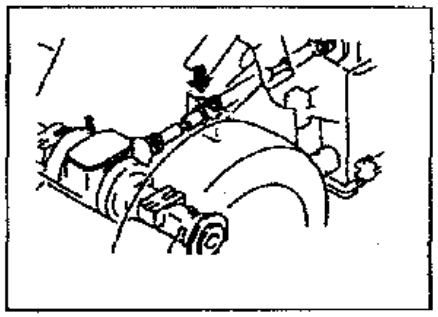
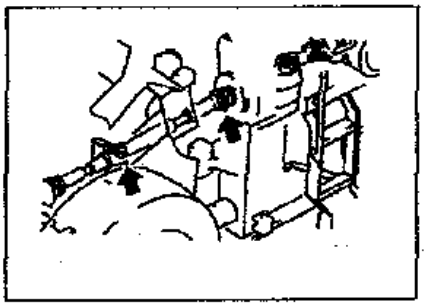
2. Front driving shaft (two places)



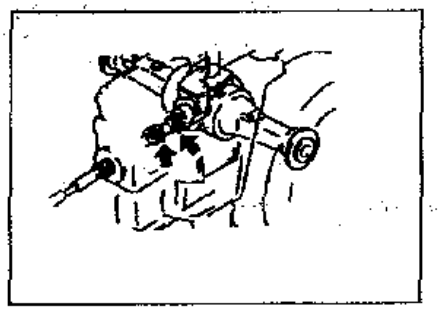
3. Middle Support of the front driving shaft (one places)



4. Middle driving shaft (two places)



5. Rear driving shaft (two places)



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24.8.4 Check Fasteners of the Turbocharger

Referring to check in this field, you can contact with Agrison.

24.8.5 Check Clearance of Rotor of the Turbocharger

Referring to check in this field, you can contact with Agrison.

24.9 Maintenance Every 2000 Hours

The Maintenance Every 50 Hours, 100 Hours, 250 Hours, 500 Hours and 1000 Hours should be carried out simultaneously.

24.9.1 Replace Oil in Working Oil Tank and Elements of Oil Strainer

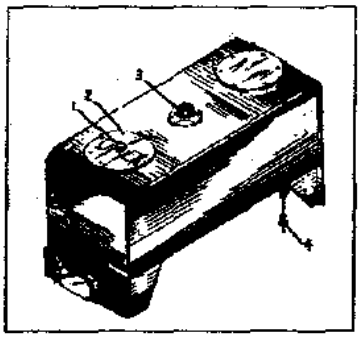
⚠ ATTENTION

When the loader just finished work, oil temperature is very high. Oil replace should be waited until oil is cooled down. When opening the cover of oil inlet port, you should turn it slowly to release pressure inside the box, then take it down.

Preparation:

- Volume of the container to fill drained oil: 220 liter
- Oil amount to be filled: 220 liter

1. Place the scraper bowl horizontally on the ground, to let the loader stop brake and shut the engine.



2. Remove the screw ① and the cover ②.

3. Open the cover ③ of the oil filling port.

4. Place the container to be filled with oil under the oil drain plug ④.

5. remove the oil drain plug to drain oil.

6. After draining oil, install the oil drain plug and turn the cover tightly.

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7. Loosen the two tightening bolts on the cover of the strainer on the top of oil tank, and remove the cover.

8. Take out elements such as cartridges etc.

9. First check inside the strainer casing to see if impurities exist, then clean it.

10. Replace with the new cartridge and mount the elements in order. If O-ring on the cover has been damaged and deteriorated, remove the new one.

11. Install bolts on the cover, press the cover and tighten all bolts evenly.

12. Fill specified amount of oil from the oil filling port, then install the cover.
    Referring to the usage of oil, see details in “20. Apply Fuel, Coolant and Lubrication Oil Depending on Temperature of Environment”.

13. Check the level of hydraulic oil to see if it is within specified height. Details can be seen in “24.5 Maintenance Every 100 Hours”.

14. Start the engine and let it at idling state, make oil cylinders of steering, scraper bowl and lifting boom working for 4 to 5 reciprocations. It should be noted that do not let the oil cylinder run to its end of stroke (about 100 mm far from the end of the stroke).
    Attention: If the engine runs directly at high speed or the oil cylinder run to its end, the gas in the cylinder can damage the cushion of the piston.

15. Then operate the oil cylinders of steering, scraper bowl and lifting boom to its end of the stroke for 4 to 5 reciprocations.

16. Check the level of hydraulic oil and fill oil to the specified height. Details can be seen on “24.5 Maintenance Every 100 Hours”.

17. Then rise up the speed of the engine and repeat steps 15, exhaust air until all air is exhausted.

18. Check the level of hydraulic oil to see if it is at the specified height. Details can be seen on “24.5 Maintenance Every 100 Hours”.

19. Check fixing parts on the cover of the oil strainer to see if oil is leaking.

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24.9.2 Replace the Cartridge of the Aerator of Working Oil Tank

⚠ ATTENTION

When the loader just finished work, oil temperature is very high. Oil replace should be waited until oil is cooled down. When opening the cover of oil inlet port, you should turn it slowly to release pressure inside the box, then take it down.

1. Take out the oil filling cover.
2. Take out the clip ring of the aerator and open the cover of the aerator.
3. Replace with the new cartridge of the aerator and install the cover.
4. Turn the oil filling cover tightly.

24.9.3 Replace Oil in the Bridge Casing

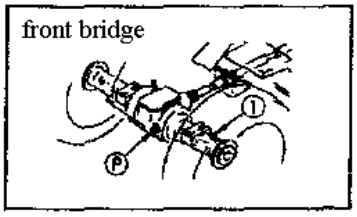
⚠ ATTENTION

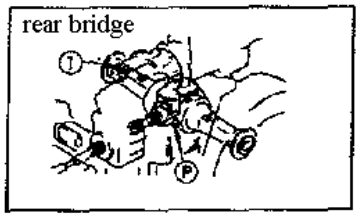
When the loader just finished work, oil temperature is very high. Following operations should be done only after oil temperature is cooled down.

Preparation:

- Volume of the container to fill drained oil: at least 74 liter
- Oil amount to be replaced: 37 liter (for front and rear bridges each)

1. Place the container under the oil drain plug (P).
2. Open the oil filling plug on both front and rear bridges, then open the oil drain plug (p) to drain oil.
3. After oil is drained, clean the oil drain plug (P) and install it.
4. Fill oil from the oil filling plug to the specified height. Referring to the usage of oil, see details in “20. Apply Fuel, Coolant and Lubrication Oil Depending on Temperature of Environment”.
5. After oil if filled, check the level if it is within the specified height. Details can be seen on “24.2 Maintenance When Required”.





Attention:

If brake is used frequently, the replacement period of oil in the bridge casing should be shortened.

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24.9.4 Check Weariness of the Brake Disc

Contact with Agrison's dealer to make repair upon the brake disc.

24.9.5 Check the Generator And the Start Motor

Electrical brush could be worn out and no lubricant oil in bearings, so you should contact with Agrison's dealer to make repair.

If the engine is found to start frequently, make check every 1000 hours.

24.9.6 Check Clearance of the Air Valve of the Engine and Make Adjustment

It should have special tools to take out these parts and make adjustment, therefore contact with your Agrison's dealer and ask for maintenance in this field.

24.9.7 Check the Vibration Dumper

Check the outer surface of rubber to see if crack or peeling exists.

If crack or peeling is found, you can contact with your Agrison's dealer to replace this part.

24.9.8 Clean and Check the Turbocharger

If the blades of the turbocharger have stuck carbon or oily soil, it can reduce features of the turbocharger and damage it, so you should contact with your Agrison's dealer.

24.10 Maintenance Every 4000 Hours

The Maintenance Every 50 Hours, 100 Hours, 250 Hours, 500 Hours, 1000 Hours and 2000 Hours should be carried out simultaneously.

24.10.1 Check the Cooling Water Pump

Check if there is abnormalities such as pulley swinging, lubricant and water leakage, block of holes (air, oil and water exhausting) etc. If so, contact with your Agrison's dealer to make removal, maintenance and replacement.

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