

AGRICULTURAL TRACTOR

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**OPERATOR'S  
MANUAL**

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***LION X1000***

**BAWOO COMPANY CORP**





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### SAFETY MANUAL

**BAWOO COMPANY CORP.**



## **FOREWORD**

Congratulations, on being an owner of a Agricultural tractor.

This manual contains a number of instructions and safety recommendations regarding driving, handling, lubrication, maintenance and adjustment of the Agricultural tractor.

This manual is to promote safety maintenance and enhance machine performance.

The procedures and precautions given in this manual apply only to intended uses of the machine. If you use your machine for any unintended uses that are not specifically prohibited, you must be sure that it is safe for you and others. In no event should you or others engage in prohibited uses of actions as described in this manual.

Continuing improvement in the design of this machine can lead to changes in detail which may not be reflected in this manual. Consult BAWOO or your BAWOO distributor for the latest available information for your machine or for questions regarding information in this manual.

Your Agricultural tractor distributor will be happy to help you.



## SAFETY INSTRUCTIONS

### WARNING

Instructions are necessary before operating or servicing machine. Read Operation & Maintenance Manual and signs (decals) on machine. Follow warning and instruction in the manuals when making repairs, adjustments or servicing. Check for correct function after adjustment, repairs or service. Failure to follow instructions can cause injury or death.

## SAFETY IS THE OPERATOR'S RESPONSIBILITY

Most accidents happen because operators do not observe safety instructions. Accidents can be avoided if you are careful enough to recognize dangerous situations before they happen. Please have thorough knowledge of safety instructions before you carry out maintenance, operation and oil supply for Agricultural tractor. Basic precautionary measures and operation at a dangerous place are shown on safety instructions.

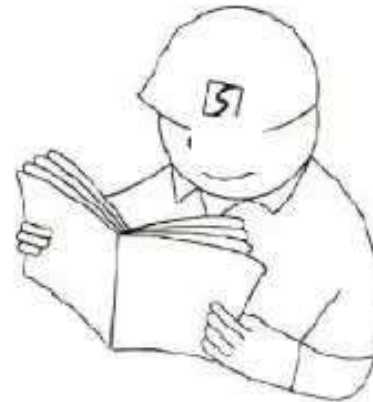
 THIS SIGNAL MEANS WATCHFULNESS, PRECAUTION FOR YOUR SAFETY.

BEFORE YOU OPERATE THE Agricultural tractor!

### WARNING

Operator should understand all the direction as follows.

- It is reasonable for you to understand each instruction about operation and maintenance of equipment and follow related rules.




### WARNING

All warnings on the Agricultural tractor are for your safety.

- Improper oil supply can sometimes cause dangerous and fatal situations when operating the Agricultural tractor.

- You are prohibited from operating and maintaining the Agricultural tractor and supplying oil before you have full knowledge of this operator's manual.

 This signal is to let you know that you must watch out, otherwise it can be the cause of fatal danger to operators and bystanders. It is attached on Agricultural tractor to let you notice dangerous situations. All warnings are marked on the signal located on the boards of Agricultural tractor and the operator's manual. We hope you are aware of all involved dangerous matters fully and try to prevent accident.

## SAFETY INSTRUCTIONS (cont'd)

- Wear tight fitting clothing. Always wear safety glasses when maintaining or servicing Agricultural tractor. Safety glasses, hearing protection or Agricultural tractor special applications kit are required for some work.
- Do not use the Agricultural tractor where exhaust, arcs, sparks or hot components can contact flammable material, explosive fire hazard and overheating.
- The engine compartment and engine cooling system must be inspected every day and cleaned if necessary to prevent fire hazard and overheating.
- Check all electrical wiring and connection for damage. Keep the battery terminals clean and tight. Repair or replace any damaged part.
- Check fuel and hydraulic tubes, hoses and fitting for damage and leakage. Never use open flame or bare skin to check for leaks. Tighten or replace any parts that show leakage. Always clean oil spills. Do not use gasoline or diesel fuel for cleaning parts. Use commercial nonflammable solvents.
- Follow any environmental safety regulation when disposing of used oil such as engine oil, grease or anti-freeze.
- Do not use ether or starting oil on this engine. It has glow plugs. These starting aids can cause explosion and injure you or bystanders.
- Always clean the Agricultural tractor and disconnect the battery before doing any welding. Cover rubber hoses, battery and all other flammable parts. Keep a fire extinguisher near the agricultural tractor when welding. Have good ventilation when grinding or welding painted parts. Wear dust mask when grinding painted parts. Toxic dust or gas can be produced.
- Stop the engine and let it cool before adding fuel. No smoking!
- Use the procedure in the Operation & Maintenance or Service Manuals for connecting the battery.

△ DANGER, △WARNING, △IMPORTANT, these signals are closely related to safety of the operator and Agricultural tractor.

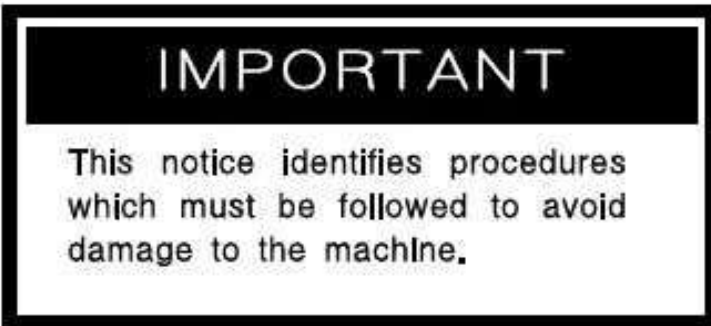
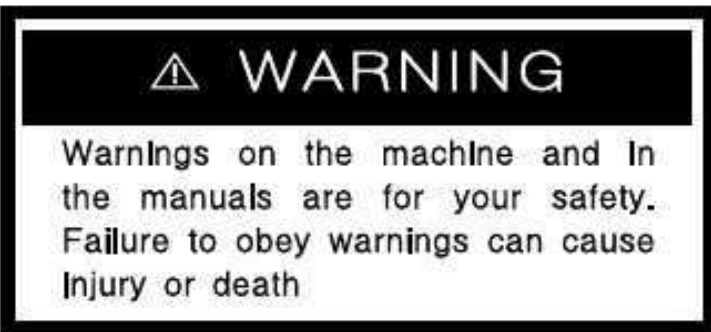




TABLE TO ENTER SERIAL NO.

Machine serial no.	
Engine serial no.	
Manufacturing year	
Manufacturer address	BAWOO COMPANY CORP. 937-2 Taegock-ri Buk-myun Jeongeup-city, Jeonbuk 580-924, The republic of Korea
Distributor address	



## SERIAL NUMBER

Always use the serial number of the Agricultural tractor when requesting service information or when ordering parts. Early or later model (Identification made by serial number) may use different parts, and it may be necessary to use a different procedure in doing a specific service operation.

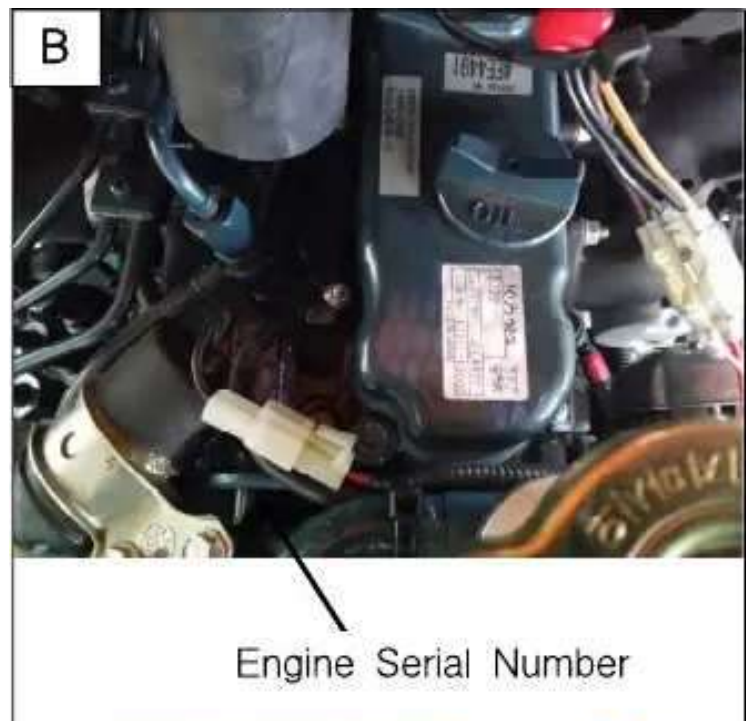
### 1) Agricultural tractor Serial Number

The Agricultural tractor serial number plate is located at the left bottom of seat when you sit on operator's seat. [A]

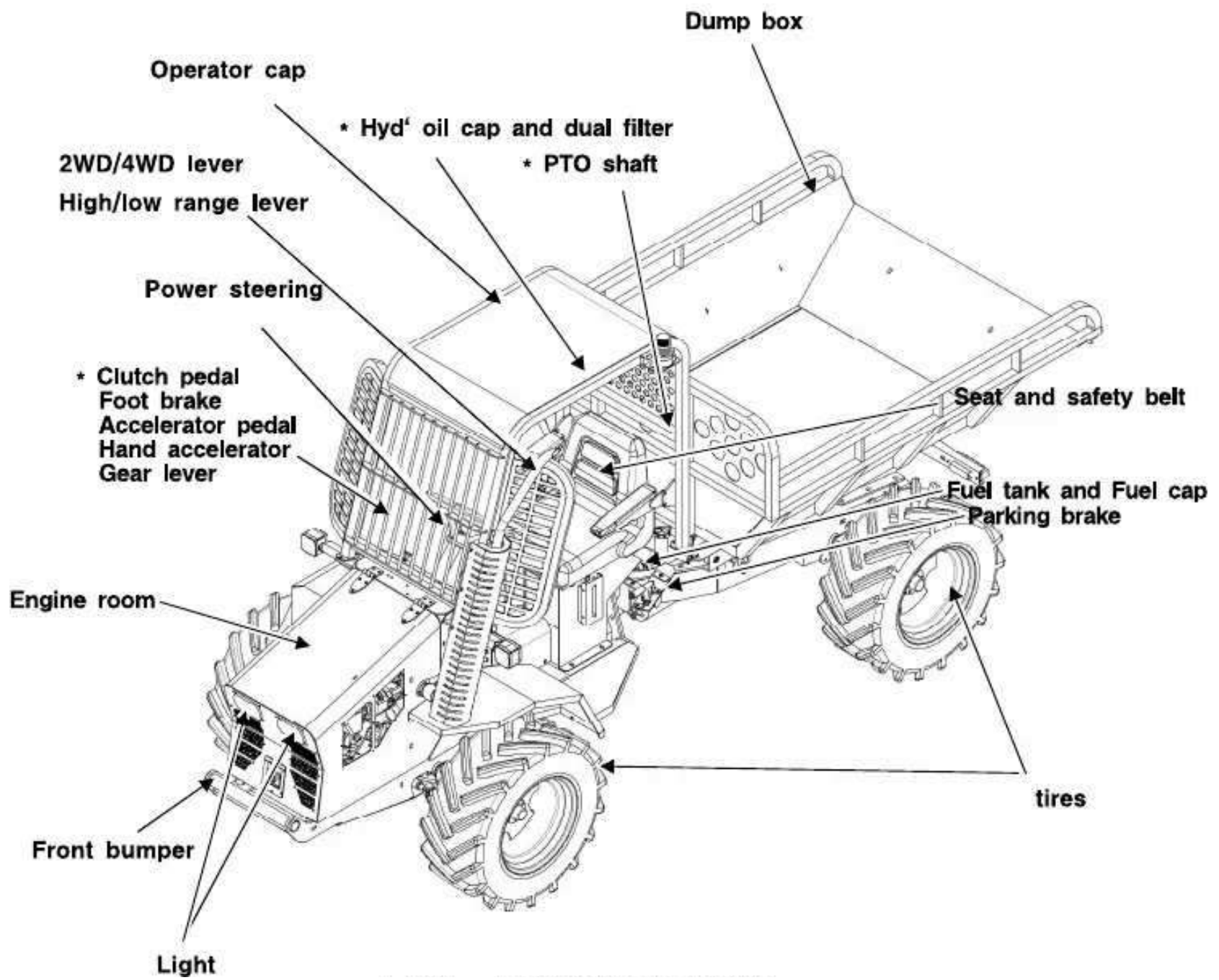


### 2) Engine Serial Number

The engine serial number is on the top of engine body. The serial number is in the location shown. [B]



# IDENTIFICATION



\* mark - located inside the frame









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## FOR NEW Agricultural tractor

It takes about 100 operating hours to enhance its designed performance.

Operate according to below three steps and avoid excessive operation for the initial 100 hours.

Hour	Load
Until 10 hours	about 60%
Until 100 hours	about 80%
After 100 hours	100%

Be careful during the initial 100 operating hours.

Each equipment is tested and inspected carefully before delivering the Agricultural tractor to customers.

To operate each parts well, you need to operate the Agricultural tractor carefully for about 100 hours since you purchased it. If you handle it roughly in an abnormal way, the life span would be reduced and efficiency might be fallen, too.

In case of new equipment, please especially pay attention to the matters below.

- Please warm up the engine properly for 5 minutes after starting the engine.
- Please avoid operating the Agricultural tractor at full speed.
- Please avoid quick start, acceleration, unnecessary quick stop and rotation.
- When you replace the oil filter element, please wash out dust and debris on it.
- If operation conditions get worse, please inspect possible causes before operating the Agricultural tractor.
- Change engine oil at the first 50 working hours (or 1 working month)
- Regularly check there is no loss of oil and all nuts and bolts are well fastened, specially the wheel nuts.

### WARNING

Excessive operation may deteriorate the potential performance of machine and shorten lifetime of the machine.

### WARNING

Operator must have instructions before running the Agricultural tractor. Never allow an untrained or unqualified person to operate your machine. Agricultural tractor must be operated by well-trained and competent operator. Agricultural tractor Untrained operators can cause injury and death.

### WARNING

When you are driving, don't keep your feet on the clutch pedal. even the simple weight of your feet on the pedal for long time can soon wear clutch system out.



## GETTING READY FOR OPERATION

Read the Operation & Maintenance Manual before operating the Agricultural tractor.

Use the grab handle and safety treads to get on and off the Agricultural tractor. [A]

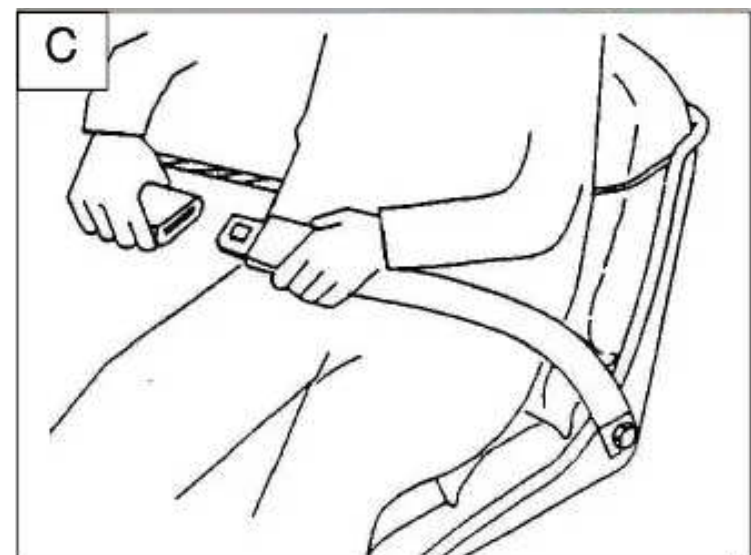
Safety treads are installed on Agricultural tractor to provide a slip resistant surface for getting on and off the Agricultural tractor. Keep safety treads clean and replace when damaged.

The Agricultural tractor is equipped with a padded seat made with water repellent material.

Pull the seat lever (ITEM 1) and adjust the seat position for comfortable operation of the Agricultural tractor controls.

Fasten the seat belt (ITEM 2) snugly and adjust it so that the buckle is centered between the hips.

[B]



**⚠ WARNING**

Avoid injury or death

When operating the Agricultural tractor :

- Keep the seat belt fastened snugly.
- The safety bar must be lowered

## DAILY INSPECTION

The Agricultural tractor must be in good operating condition.

Look around machine and under the machine to check loose nut or bolts, collection of dirt or leakage of oil, fuel or cooling fan and check the condition of the work equipment and hydraulic system.

- Check daily for the following items :
  - Engine cooling system
  - Operator cap, seat belt
  - Tires & tire pressure
  - Pump device
  - Any loose or broken parts
  - Safety signs
  - Instrument panel
- Check and clean the air filter on a daily basis.
- Check for the level and leakage of engine oil, hydraulic oil and fuel.
- Check regularly the lubrication and fill.
- Check the gauges and lights during operation.
- Check if the machine is operation normally during operation.
- Check loose wiring.
- Check collection of dust at places which reach high temperature.
- Grease daily all lubrication points.
- Tighten bolts
- Warm up the machine fully before operation.

### **WARNING**

Before working,

- Check and add engine oil, if needed.
- Check cooling system for cooling fan.
- Check and add hydraulic oil, if needed.
- Walk around machine and check for leakage, damaged or missing parts and proper tire inflation.



## INSTRUMENT PANEL

### Gauges and Switches



#### ① Ignition Switch

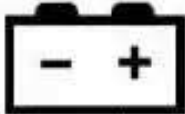


Insert the key and then turn 90° anticlockwise. After preheating (about 4sec.), turn the key clockwise. Two warning light are on and Agricultural tractor is in a wait state.

Turn the key one more time in order to start the engine. Release the key if engine start.

If all warning light go off and OK light turn to "green", put the accelerator lever to the upper position. Do that this procedure at low RPM.

#### ② Alternator warning light



It light up when the starting circle is on. Engine start to generate the power, this light go off.

If engine start and this light is still on, it mean alternator could be faulty and don't charge battery normally.

#### ③ Engine oil warning light



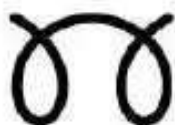
This light will be on when engine oil pressure is low abnormally.

When you start the engine, this light is on till the engine oil come to the working pressure.

If this light is on during operation or still is on, stop the engine and then check the system.

Too low engine oil can damage engine oil filter and so on.

#### ④ Preheating light



It light up when the Agricultural tractor is on preheating or starter is rotating. If you release the key, this light will go off. If this light is no on, inspect the preheating system.

#### ⑤ Water temp. warning light



It light up when engine is overheating. (above 115degree). If this light is up, turn down the engine rpm to idle and then cool the engine down. Stop the engine and inspect the cooling system.



## CONTROLS

### Steering

Hydraulic steering system that controls the steering by the steering wheel.

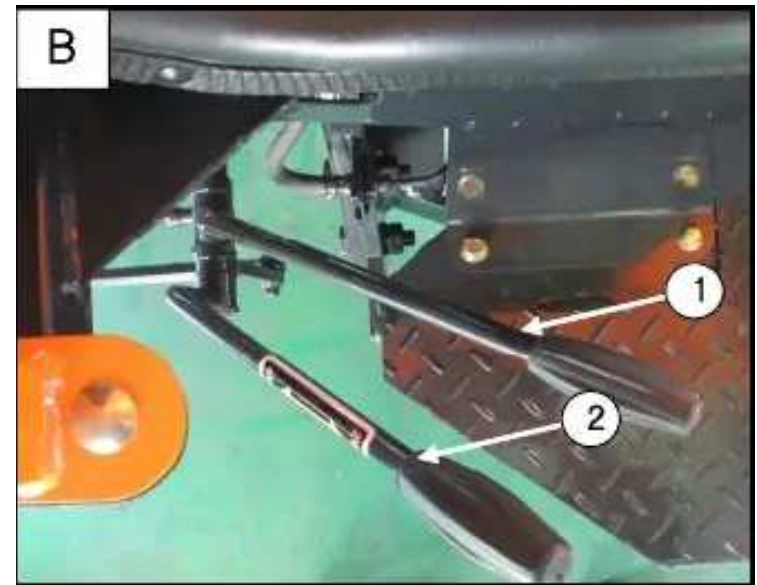
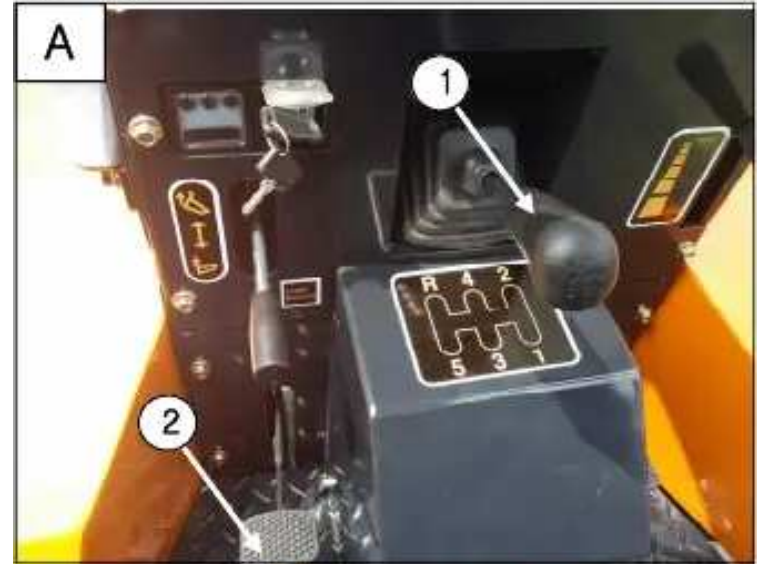
### Clutch Pedal

It's operated when :

- You operate the gear lever (ITEM 1) [A]
- You change from low range to high range or vice versa. (ITEM 1) [B]
- You engage or disengage the wheel drive (ITEM 2) [B]

To put levers (ITEM 1) and (ITEM 2) [B] of the reduction unit into position easily, we advice you to press the clutch pedal (ITEM 2) [A] at the same time.

When the clutch pedal does not run correctly or you may have troubles inserting the gears, it is necessary to adjust the movement and the play of the clutch system. [C]



### ⚠ WARNING

When the engine is stopped and the gear is engaged, don't hold the clutch pedal down for a long time. This will avoid wear, tear and damage to the thrust bearing.

Dont hold the Agricultural tractor on a steep slope using the clutch. Use the brake. This will avoid wear and tear of the bearings and overheating of the clutch.

**NOTE :** When you are driving, do not keep your feet on the clutch pedal. even the simple weight of your feet on the pedal for a long time can wear the clutch system out soon.

### Hand Accelerator

To be used only during engine starting operation and engine warm-up or when the Agricultural tractor is stopped, to adjust the PTO (power take off rpm) [D]



## CONTROLS (Cont'd)

### Foot Brake

Foot brake (ITEM 1) controls directly the hydraulic brake pump. [A]

Return stroke is 15 to 20mm.

If braking start pushing down more, check the brake fluid level or check and eventually change the brake shoes/ pads.



### Accelerator Pedal

Do not over accelerate the pedal (ITEM 2) when the Agricultural tractor is under strain, during running-in or in bad conditions. [A]



### Gear Lever

Select the gears according to the diagram. [B]

### Steering switch (2S/4S)

#### 4 wheel steering (4S) [C]

Push the switch down and turn the steering wheel to align front wheels and rear wheels. Use Agricultural tractor after turning wheels one time to the right and left.

#### 2 wheel steering (2S)

Make sure if front wheels and rear wheels are aligned well at 4S mode. Push the switch up and then turn front wheels one time to the right and left completely.



## ⚠ WARNING

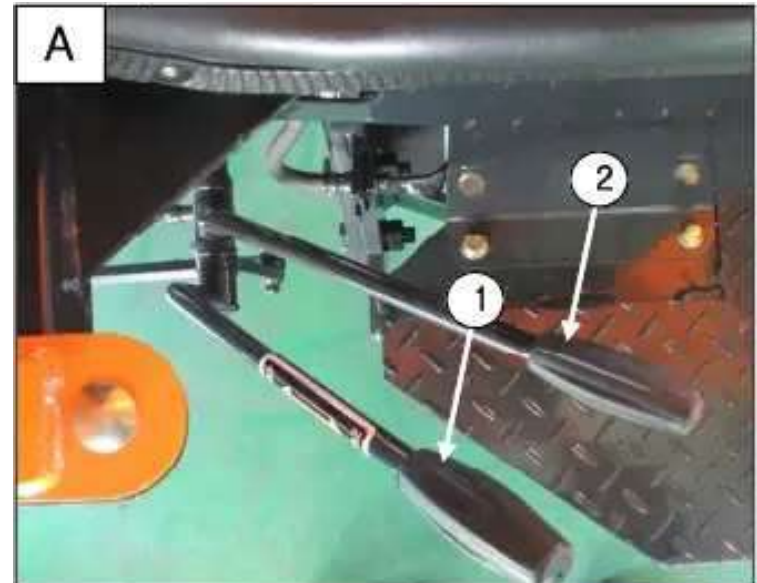
When you use 2 wheel steering mode, make sure if rear wheels are aligned well. Not aligned wheels can cause unexpected movement. It can cause death or serious injury.

## CONTROLS (Cont'd)

### 2WD / 4WD Lever

Pull lever (ITEM 1) upwards to engage 4\*4 traction performances. [A]

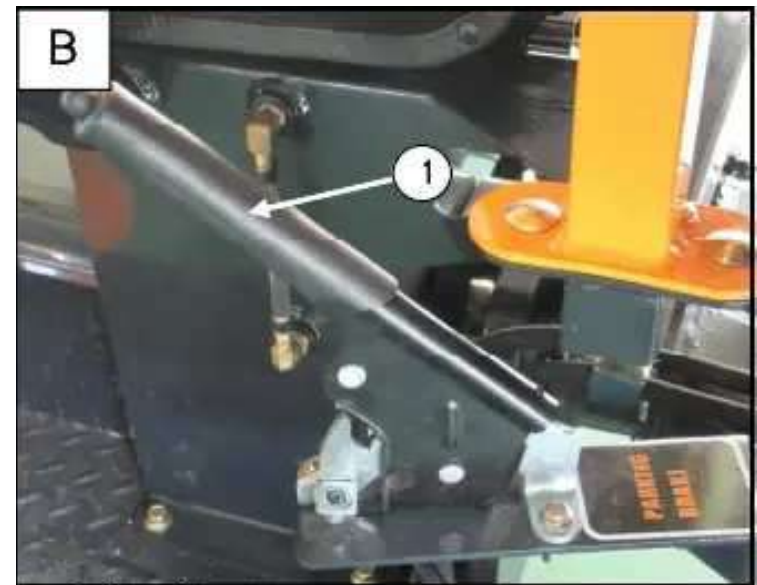
For easy engagement / disengagement is better to move this lever when the Agricultural tractor is slowly moving and if need, gently steering both sides to help gears connection.



### High / Low Range Lever

The high / low range lever (ITEM 2) must be moved only when the vehicle is fully stopped and then clutch pedal is fully pushed down.

Central neutral position to be used for PTO usage. Changing or trying to change high / low range during vehicle running could irreparably damage gears. [A]



### **⚠ WARNING**

The lever can also be put in neutral. This position must be used when you are working with the rear PTO which depends on the gear box. In this position, you must stop the vehicle by means of the parking brake.

### Parking Brake

Parking brake (ITEM 1) controls the rear wheels and must be used when :

- Parking
- You have to leave the Agricultural tractor.
- You have to work with the Agricultural tractor and fixed tools using the PTO To be used only during engine starting operation and engine warm-up or when the vehicle is stopped, to adjust the PTO (power take off rpm) [B]



## OPERATING PROCEDURE

### Starting the engine

**NOTE :** Watch out for animal or people nearby, especially children, before you start the engine. Don't start the engine if there are people or animal near the vehicle or it's equipment. Take care to keep away your hands, feet and clothing from moving or rotating.

Adjust the seat position for comfortable operation of wheel.

Fasten the seat belt snugly and adjust it so the buckle is centered between the hips.

Check there is enough fuel in the tank by using the front transparent indicator.

Before you start the engine, check that the gear lever (ITEM 1) is in neutral position and parking brake is full pulled up. [A]

Insert the key (ITEM 2) and then turn 90° clockwise. [A]

Two warning lights are on and Agricultural tractor is in a wait state.

Turn the key one more time in order to start the engine.

**NOTE :** stop the engine if the warning lights do not go off.

Before getting down from the vehicle :

- Put the gear lever into low speed (ITEM 1) [B]
- Put on the parking brake
- Lower the dump box, if needed.
- Stop the engine.

### ⚠ WARNING

Agricultural tractor warmed up with moderate engine speed and light load have longer life.

### ⚠ WARNING

When an engine is running in an enclosed area, fresh air must be added to avoid concentration of exhaust fumes. If the engine is stationary, vent the exhaust outside. Exhaust fumes contain odorless, invisible gases which can kill without warning.

### ⚠ WARNING

Do not engage the starter for longer than 15 seconds at a time. Longer use can damage the starter by overheating. Cool the stater for one minute between uses.



## OPERATING PROCEDURE

### Stopping the engine

**NOTE :** When you have finished working, fill up the fuel tank in order to avoid condensate which could prevent the engine from restarting.

Before stopping the engine, check the gear is in neutral.

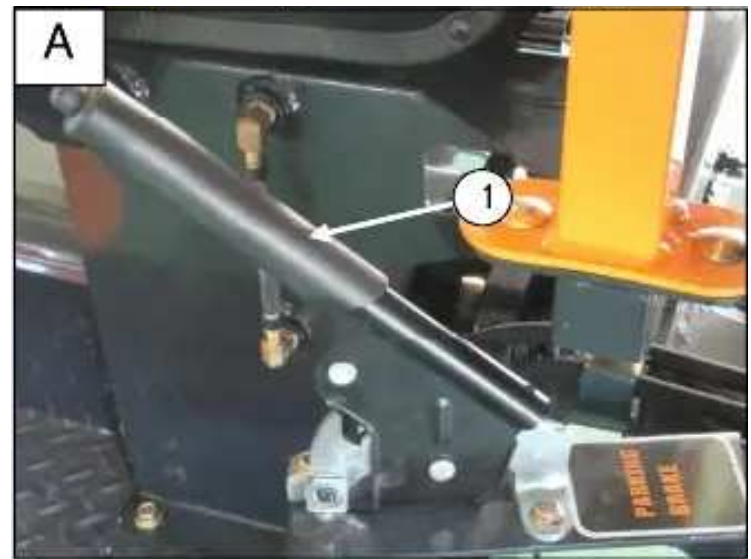
Pull up the parking brake (ITEM 1) [A]

Lower the engine rpm.

Turn the ignition key (ITEM 1) anti-clockwise completely. [B]

Disconnect battery – terminal, if the Agricultural tractor being stored for a long time.

If the engine has been running at high revs for a long time, let it run slowly for few minutes to cool off and better lubricating and then switch it off.





## OPERATING PROCEDURE (cont'd)

### Keeping the Agricultural tractor

#### Keeping after completion of work

Remove the mud and water on the machine body.

Park the Agricultural tractor on concrete or hard ground. If this is impossible, park the Agricultural tractor on wooden boards.

As battery capacity drops at low ambient temperature, cover the battery or remove it from the Agricultural tractor to be kept warm at night.

#### Long-term keeping

Clean each part carefully.

Perform lubrication and oil change for all necessary parts without omission.

Apply grease thinly on the exposed portions of hydraulic cylinder piston rods.

Drain the coolant from the cylinder block and radiator.

Remove the battery after full charging and keep it in a cool & dry place.

Keep the Agricultural tractor indoors. If outdoor keeping is unavoidable, place the Agricultural tractor on blocks and cover with waterproof canvas.

### IMPORTANT

Machines warmed up with moderate engine speed and light load have longer life.

### ⚠ WARNING

During long-term keeping

- Run the engine
- Move the Agricultural tractor back and forth
- Operate each pedal

Practice the above work at least once a month for lubrication of each part.

### ⚠ WARNING

After long-term keeping

- Remove the drain plug from the fuel tank, oil pan etc. to drain water accumulated in each part.
- After starting the engine, carry out sufficient warm up and inspect each part carefully.



## OPERATING PROCEDURE (cont'd)

### Travelling and loading

Always warm up the engine before operating the Agricultural tractor.

New operators must operate the Agricultural tractor in an open area without bystanders. Operate the controls until the Agricultural tractor can be handled at an efficient and safe rate for all conditions of the work area.

Travel the Agricultural tractor slowly to avoid obstructions on rough ground.

The operation on slope is dangerous. Avoid operating the machine on a slope of over 10 degree.

### WARNING

Check at ground or floor level. Inspect the surface over which you will travel. Look for soft soil, deep mud. Watch for anything that might make you lose control or cause the agricultural tractor to rollover.

### WARNING

- Stop the Agricultural tractor on flat compact ground when you load materials into dump box.
- The center of weight could be changed. Put materials to the inside of dump box first.
- Be careful to put sticky materials into dump box. Materials sticking in dump box can pour out of dump box for unloading. It can cause serious injury.  
Or materials sticking in dump box remaining could be polluted.

### WARNING

Be careful to operate mini loader on slopes, the ice or slippery roads.  
The Agricultural tractor must be blocked or supported when loading or unloading materials into dump box on slopes, the ice or slippery roads.



## OPERATING PROCEDURE (cont'd)

### Using dump box

Max operating capacity is 700kg.

**NOTE :** Operate the Agricultural tractor within this capacity. Overloaded Agricultural tractor could shorten the safety as well as the life span of machine. And mini loader could be operated in the unexpected direction. It can cause serious Injury or death.

The Agricultural tractor can be equipped with dump box with hydraulic lifting system.

#### To lift dump box

- Raise the dump lever. [A]
- Return the dump lever if dump body lift to the



### ⚠ WARNING

When dump box is raised with engine stopping, dump box could drop down when you operate the dump lever. Make sure to install the suitable safety device during maintenance.

#### To lower dump box

- Lower the dump lever. [C]
- Return the dump lever if dump body lowered to the desired height. [D]

**NOTE :** Before moving the Agricultural tractor (also for brief moves), check that the dump box is lowered.

**NOTE :** Check there are no people, things or animals near the main body.

### ⚠ WARNING

Do not go under the dump box when dump box is raised. To go under the dump box could cause serious Injury or death.



## OPERATING PROCEDURE (cont'd)

### Using lift

Max. Roc is 1000kg.

Operate the Agricultural tractor within rated operating capacity.

Overload drop the stability and make the span of life short.

Overload can cause unintended movement and death or serious injury in rollover accident.

### To lift the lift

- Raise the lift lever. [A]
- Return the lift lever if dump box lift to the desired height. [B]



**⚠ WARNING**  
When dump box is raised with engine stopping, dump box could drop down when you operate the dump lever. Make sure to install the suitable safety device during maintenance.

### To lower the lift

- Lower the lift lever. [C]
- Return the lift lever if dump box lowered to the desired height. [D]

**NOTE :** Before moving the Agricultural tractor (also for brief moves), check that the dump box is lowered.

**NOTE :** Check there are no people, things or animals near the main body.

**⚠ WARNING**  
Operate the function of dump or lift when the Agricultural tractor stop. Lifting and dumping at slope can cause the turnover of Agricultural tractor. Check the ground condition when you dump or lift the dump box.



## OPERATING PROCEDURE (cont'd)

### Using PTO (Power take off)

PTO enables to operate an external accessory, for example a spreader or sprayer.

Check that all connections between the shaft are complete to reduce any wear or damage.

For PTO speed and rotation follow the instruction on specification chart.

Both POT internal (standard) and external (optional) works at same rotation speed. They have different spline sections has showed in the drawing.

#### To use PTO :

Check the specification chart and choose the correct speed and sense of rotation you need, then select which gear is the best to matching power requirement with lowest engine speed.

Refer to accessory operator instructions for data in order to provide correct using of universal shafts, speeds, and tools requirement.

Lift the transfer box reduction lever to neutral position.

Push down the clutch pedal and insert the gear you choose into the gear box and then gently release the clutch.

The PTO starts to rotate. Adjust manual accelerator lever to give the required engine speed.

#### Rear PTO drive shaft (optional)

- Connect the PTO shaft an the reduction unit box to the rear of Agricultural tractor to give a 6 spline 1 3/8 tractor PTO shaft near to the rear towing ring.
- To connect or disconnect the rear connector near the reduction box and pull off the shaft. Push it on the false shaft located on the left chassis frame for storage when not in use.



### ⚠ WARNING

PTO is rotating device with power.  
Keep clear of rotating PTO.  
Wrapping or entanglement may result  
in serious injury or death.

## OPERATING PROCEDURE (cont'd)

### Transporting the Agricultural tractor

#### Procedure

#### **⚠ WARNING**

Instructions are necessary before operating or servicing machine. Read and understand the Operation & Maintenance Manual and signs (decals) on machine. Follow warnings and instructions in the manuals when making repairs, adjustments or servicing. Check for correct function after adjustments, repairs or service. Failure to follow instructions can cause injury or death [A]

Be sure the transport and towing vehicles are of adequate size and capacity.

The rear of the trailer must be blocked or supported when loading or unloading the Agricultural tractor to prevent the front end of the trailer from raising up.

[B]

Set left and right gangplanks which can sufficiently endure the vehicle weight.

Install gangplanks without level difference between left and right. Fasten gangplanks firmly to the vehicle by using proper fittings.

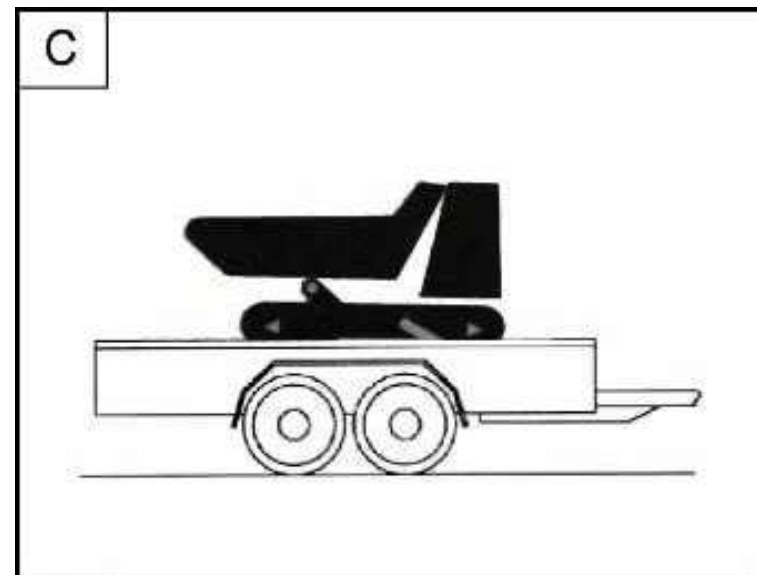
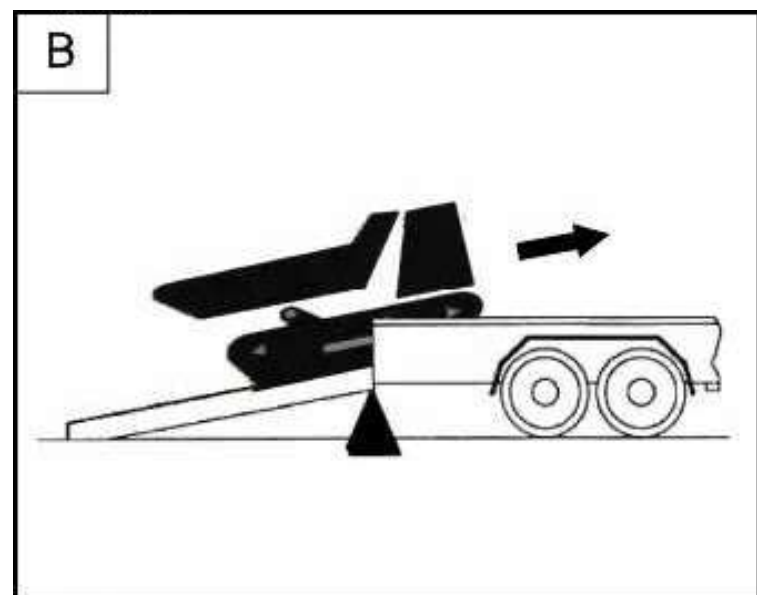
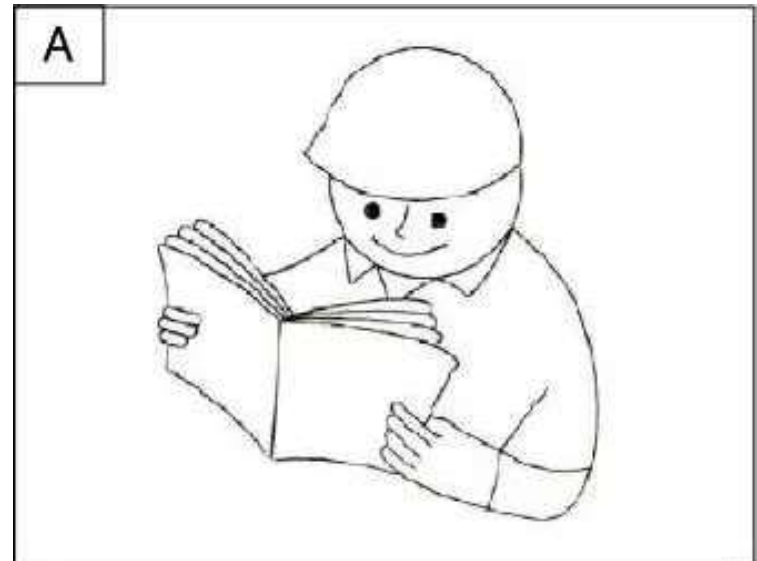
Limit the board indication within 15 degree.

Adjust the vehicle direction before getting on the gangplanks and a Agricultural tractor must be loaded forward onto the vehicle. [B]

Use the following procedure to fasten the Agricultural tractor to the transport vehicle to prevent the Agricultural tractor from moving during sudden stops or when going up or down slopes. [C]

- Stop the engine.
- Install chains to the front side and rear towing rings.
- Fasten each end of the chain to the transport vehicle.

**NOTE :** Dump box must be empty during transportation. If something is loaded at dump box, Agricultural tractor can overturn or fall.



#### **⚠ WARNING**

Adequately designed ramps of sufficient strength are needed to support the weight of the machine when loading onto a transport vehicle. Wood ramps can break and cause personal injury.



## OPERATING PROCEDURE (cont'd)

### Towing the Agricultural tractor

#### Front towing ring

The front hitch enables the Agricultural tractor to be towed and must be used only for self recovery.

Any other use may damage the hitch or the chassis.

[A]

#### Rear towing ring

The rear hitch is designed to tow a maximum mass of 500kg and could be used for self recovery towing.

[B]

Make sure to check lifting devices visually before you use them.

Check the weight, length, width and height of the Agricultural tractor when you are going to hoist the Agricultural tractor.

Use a proper chain or cable.

Fix chain or cable to towing rings.

Put a rubber plate on a contact surface of chain or cable and Agricultural tractor to prevent damage.

**NOTE :** To prevent damage to the Agricultural tractor mechanical gear system, the Agricultural tractor must be towed only a short distance at slow speed,

(Example : Moving the Agricultural tractor onto a transport vehicle)

The towing chain or cable must be rated at 1-1/2 times the weight of the Agricultural tractor, (see Specification chart)



### **⚠ WARNING**


- Make sure chain or cable is proper size.
- The wrong hoisting method or installation of chain or cable can cause damage to the machine.
- Do not load abruptly.
- Keep area clear of personnel.



## PREVENTIVE MAINTENANCE

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MAINTENANCE SAFETY

 <b>WARNING</b>	<p>Instructions are necessary before operating or servicing machine. Read Operation &amp; Maintenance Manual and signs (decals) on machine. Follow warning and instruction in the manuals when making repairs, adjustments or servicing. Check for correct function after adjustment, repairs or service. Failure to follow instructions can cause injury or death.</p>
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△ Safety Alert Symbol : This symbol with a warning statement means : "warning, be alert! your safety is involved !" Carefully read the message that follows.


<p>△ Never service the Agricultural tractor without instructions.</p>	<p>△ Cleaning and maintenance are required daily.</p>
<p>△ Have good ventilation when welding or grinding painted parts.</p> <p>△ Wear dust mask when grinding painted parts. Toxic dust and gas can be produced.</p> <p>△ Avoid exhaust fume leaks which can kill without warning. Exhaust system must be tightly sealed.</p>	<p>△ Lead-acid batteries produce flammable and explosive gases.</p> <p>△ Keep arcs, sparks, flames and lighted tobacco away from batteries.</p> <p>△ Batteries contain acid which burns eyes or skin on contact. Wear protective clothing. If acid contacts body, flush well with water. For eye contact flush well and get immediate medical attention.</p>
<p>△ Stop, cool and clean engine of flammable material before checking fluids.</p> <p>△ Never service or adjust Agricultural tractor with the engine running unless instructed to do so in the manual.</p> <p>△ Avoid contact with leaking hydraulic oil or diesel fuel under pressure. It can penetrate the skin or eyes.</p> <p>△ Never fill fuel tank with engine running, while smoking or when near open flame.</p>	<p>△ Keep body, jewelry and clothing away from moving parts, electrical contacts, hot parts and exhaust.</p> <p>△ Wear eye protection to guard from battery acid, compressed springs, fluids under pressure and flying debris when engines are running or tools are used. Use eye protection approved for type of welding.</p> <p>△ Keep engine room cover closed except for service. Close the engine room cover before operating the Agricultural tractor.</p>

Maintenance procedures which are given in the operation & Maintenance Manual can be performed by the owner/operator without any specific technical training. Maintenance procedure are not in the Operation & Maintenance Manual must be performed **ONLY BY QUALIFIED BAWOO SERVICE PERSONAL**. Always use genuine BAWOO replacement parts. The Service Safety Training Course is available from your dealer.



## SERVICE SCHEDULE

Maintenance work must be done at regular intervals. Failure to do so will result in excessive wear and early failures. The service schedule is a guide for correct maintenance of the all Agricultural tractor.

 <b>WARNING</b>	<p>Instructions are necessary before operating or servicing machine. Read and understand Operation &amp; Maintenance Manual and signs (decals) on machine. Follow warning and instruction in the manuals when making repairs, adjustments or servicing. Check for correct function after adjustments, repairs or service. Failure to follow instructions can cause injury or death</p>
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The amount of wear to each part varies according to whether or not the periodic maintenance is carried out, machine operating skill, working condition, quality of lubricants in service, working environment, and amount of excavation. Operators are required to determine service intervals for their Agricultural tractors based on engine conditions, hour meter readings, extent of wear of each component, hydraulic system condition and their own experience and related data.

### Pre-operations Inspection

Check points	Check items	Remarks
Engine oil pan	Check oil level	Check before start-up
Fuel tank	Check fuel level	Ensure that oil level should be above the center of level gauge
Each grease point	Grease	
Check for looseness or damage of each part	Looseness, missing, oil leaks, coolant leaks	
Steering	Check for operation	Check to see if steering work properly
Hydraulic oil tank	Check oil level	Add if required
Electric wiring	Looseness or damage	Check terminals for looseness, missing or damage
Each part of main body	Oil leaks, coolant leaks, looseness, damage etc	Remove mud, foreign matters etc. sticking to the main body



**SERVICE SCHEDULE (Cont'd)**

Subject	How often	
	Hours	Months
Check of engine oil level	8	
Replacement of engine oil	200	3
Cleaning of engine oil filter	400	6
Replacement of engine oil filter	800	12
Cleaning of engine air filter	200	3
Replacement of engine air filter	400	6
Cleaning of engine fuel filter	200	3
Replacement of engine fuel filter	400	6
Cleaning cooling fins	When needed	
Checking of gear box oil level	200	3
Replacement of gear box oil level	800	12
Checking of transfer box oil level	200	3
Replacement of transfer box oil level	800	12
Checking of axles oil level	200	3
Replacement of axles oil (front and rear)	800	12
Checking of brake fluid level	200	3
Replacement of brake fluid	1600	24
Central joint pivot lubrication	50	1
Universal joint lubrication	50	1
Checking lifting pump oil level	200	3
Replacement of lifting pump oil	800	12

SERVICE SCHEDULE (Cont'd)

Speciflcation of all oil

Kind of fluid	Capacity	Ambient temperature °C (°F)						
		-20 (-4)	-10 (14)	0 (32)	10 (50)	20 (68)	30 (86)	40 (104)
Engine oil	3.1 ℓ	SAE 30						
		SAE 10W						
		SAE 15W-40						
Hydraulic oil	8 ℓ	ISO VG 32						
		ISO VG 46						
		ISO VG 68						
Fuel	12 ℓ	ASTM D975 NO.1						
							ASTM D975 NO.2	
Coolant	Mixture of antifreeze and water 50 : 50 ℓ	Ethylene glycol base permanent type						
Grease	as required	NLGI NO.1						
							NLGI NO.2	
Gear oil (Each different gears)	1.2 ℓ	ISO VG 32						
		ISO VG 46						
		ISO VG 68						

Engine oil : API CI-4/15W-40

Hydraulic oil : AW46

Fuel : Diesel

Coolant : Mixture of 50% ethylene glycol base antifreeze and 50% water. To prevent freezing of the cooling system in extremely cold places, be sure to add a specified amount of antifreeze to coolant.

Grease : Lithium base grease ZRG#2

Gear oil : EP100-(AW46)

\* Use only oils listed below or equivalent.

\* Do not mix different brand oil.



## SAFETY BELT

When buckling the belt, make sure that it is not twisted and insert the plate on the right side into the buckle on the left until it clicks to the position.

If the belt length is short, lengthen the belt by adjusting it.

If the belt is loose, pull the belt to eliminate any slack.

When releasing the belt, press the button in the front of the buckle.



### **⚠ WARNING**

Always buckle the safety belt when operating the Agricultural tractor.

Always make sure the safety belt is disconnected when leaving the operator's seat.

## AIR CLEANER

### Cleaning the air filter (or element)

A dirty air cleaner will decrease engine output at worst. It will also cause increased fuel consumption and increase in harmful contents of exhaust emissions and black smoke.

So clean th air filter cyclically.

**NOTE :** Clean the air filter on a daily basis not to get dirty.

To clean the air cleaner, use the following procedure :

Loosen the cover clip (ITEM 1) and remove the element. [B]

Clean the inside of the body.

Blow compressed air (2kg/cm<sup>2</sup> or lower) from the inside of the element to remove dust on the surface.

If the element is extremely dirty or damaged, replace it with a new one.

Clean the inside of the air cleaner, remove dust from the dust pan, and then install the element.

### Replacing the air filter

The period of replacement : every 1000 hours or after four cleaning.

**NOTE :** when the engine is operated in dusty place, shorten the cleaning intervals properly.

When clean the air filter, don't strike the air filter

Clean the air filter as follows. :

Open the cover clip from the dust cover.

Remove the element.

### ⚠ WARNING

Dally Inspeclon of air cleaner filter

- Remove air cleaner filter
- Blow compressed air from the inside of filter out, from about 10cm distance.





## AIR CLEANER (Cont'd)

### Replacing the air filter (cont'd)

Install the new air filter in the opposite order:

: Air filter → Dust cover → Cover clip

**NOTE :** Make sure that a sealing surface are free of dirt and debris.

**NOTE :** Make sure that the air filter is installed securely.

If it is installed loosely, dust will be drawn in and the air cleaner will fail to function properly.

**NOTE :** Check and clean the air filter on a daily basis. Cleaning interval depends on working condition.

## FUEL SYSTEM

### Filling The Fuel

Use only clean, high quality diesel fuel.

- Grade No.1 or No.2

We recommend an operator to contact their fuel supplier for local recommendations.

#### **⚠ WARNING**

Stop and cool the engine before adding fuel. **NO SMOKING!** Failure to obey warnings can cause an explosion or fire.

Check there is enough fuel in the tank by using the front transparent indicator (ITEM 1). [A]

Remove the fuel cap (ITEM 2). [A]

Use a clean, approved safety container to add fuel of the correct specifications. Add fuel only in an area that has free movement of air and no open flames or sparks. **NO SMOKING!** [B]

Install and tighten the fuel cap (ITEM 1). [A]

**NOTE :** Be sure to lock the cap of fuel tank.

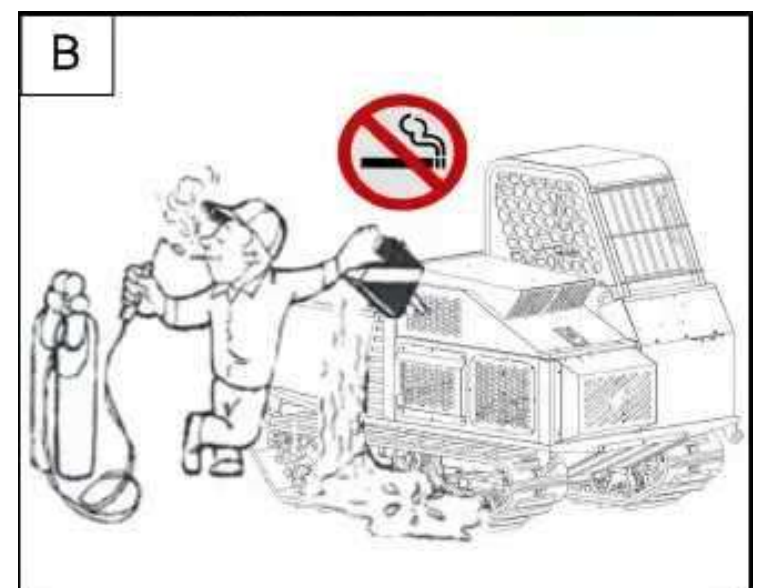
A problem with the components that send fuel to the engine can cause low fuel pressure. This can decrease engine performance.

Check the fuel level in the fuel tank. Ensure that the vent in the fuel cap is not filled with dirt.

Check all fuel lines for fuel leakage. The fuel lines must be free from restrictions and faulty bends. Verify that the fuel return line is not collapsed.

Inspect the fuel filter for excess contamination. If necessary, install a new fuel filter. Determine the source of the contamination. Make the necessary repairs.

Remove any air that may be in the fuel system.



#### **⚠ WARNING**

Work carefully around an engine that is running. Engine parts that are hot, or parts that are moving, can cause personal injury.



## FUEL SYSTEM (cont'd)

### Replacement Of Fuel Filter

Clean around the filter head.

Loosen the drain plug at the bottom of the filter element to drain any water from the filter. [A]

Remove the filter and clean the gasket surface.

To replace the fuel filter element, use a filter wrench to remove the filter element.

Replace the o-ring.

Fully fill fuel in the new filter.

Apply engine oil on the gasket of filter (ITEM 1) when mounting. [B]

### Bleeding Of Air

#### ⚠ WARNING

Check for fuel leakage after the engine start.

If air is in the fuel system, the engine will not start. Start engine after bleeding the air according to the method of bleeding air.

The fuel system should be bled to remove air as described below if the fuel supply is exhausted during driving. When the fuel filter is replaced, or if the engine is not used for a long time.

Loosen the air plug at the top of the fuel filter.

Pump the push pump until there are no more bubbles in the fuel coming out of the air plug. [C]  
When doing this, place a cloth around the air plug to prevent the escaping fuel from spewing about.

Tighten the air plug when there are no more bubbles in the fuel.

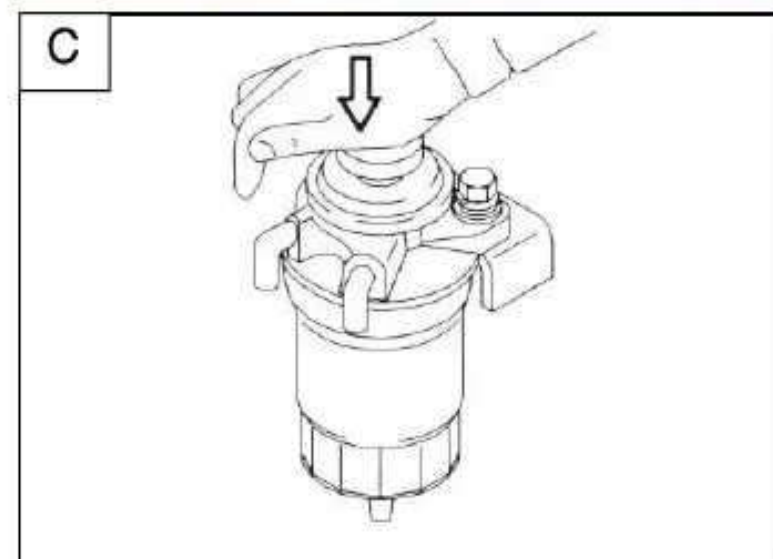
Continue pumping until the push pump becomes stiff.

Finally, check to be sure that there is no leakage of fuel. If in doubt, consult your nearest authorized BAWOO dealer.

#### ⚠ WARNING

If air enters the fuel system, the air must be purged before the engine can be started. Air can enter the fuel system when the following events occur :

- The fuel tank is empty or the tank has been partially drained during normal operation.
- The fuel filter or the fuel pump is replaced.



## FUEL SYSTEM (cont'd)

### Removal Of Water

Remove the water as the following procedure when you replace engine oil or once every month.

Loosen the drain plug at the bottom of the fuel filter.

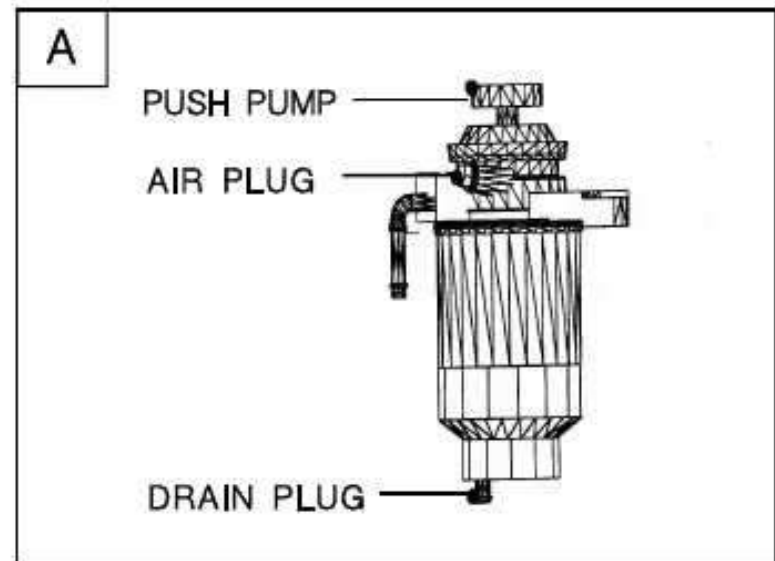
Operate the push pump slowly 6 or 7 times in order to force the water out through the drain plug.

Tighten the drain plug when water no longer comes out.

Loosen the air plug bleed the air.  
(refer to "bleeding of air".)

### NOTE

- Do not smoke or have any other open flame near the engine while bleeding the fuel system.
- Be sure to carefully wipe away any water in this manner, because the fuel mixed in the water might be ignited and result in a fire.



### ⚠ WARNING

Diesel fuel or hydraulic oil under pressure can penetrate skin or eyes, causing serious injury or death. Oil leaks under pressure may not be visible. Use a piece of cardboard or wood to find leaks. Do not use your bare hand. Wear safety goggles. If oil enters skin or eyes, get immediate medical attention from a physician familiar with this injury.

### ⚠ WARNING

Always clean up spilled fuel or oil. Keep heat, flames, sparks or lit tobacco away from fuel and oil. Failure to use care around combustibles can cause explosion or fire which can result in injury or death.



## ENGINE LUBRICATION SYSTEM

### Checking Engine Oil

Check the engine oil level every before starting the engine for the work shift.

Open the engine room cover and remove the dip stick (ITEM 1) [A]

Keep the oil level between the marks on the dip stick.



**⚠ WARNING**

If the oil is contaminated or diluted, change the oil regardless of the regular change interval. Check oil level after engine has been stopped for 15 minutes.

**⚠ WARNING**

Engine and related parts may be hot while the engine is off. Make sure to check if engine is cool before inspection or service.

Use a good quality motor oil that meets CE or better (refer to the Oil Chart below).

#### \* Recommended viscosity grades

Kind of fluid	Capacity	Ambient temperature °C (°F)							
		-30 (-22)	-20 (-4)	-10 (14)	0 (32)	10 (50)	20 (68)	30 (86)	40 (104)
Engine oil	3.5 ℓ	SAE 30							
		SAE 10W							
		SAE 15W-40							

## ENGINE LUBRICATION SYSTEM (cont'd)

### Replacing Engine Oil And Oil Filter

Warm up the engine and then stop the engine.  
Open the engine room cover.

Remove drain bolt (ITEM 1). [A]

Drain the oil into a container and dispose of used oil in an environmentally safe manner.

Remove the oil filter (ITEM 1) by using filter wrench and clean the gasket surface. [B]

Put clean oil on the new oil filter gasket.

Install the new filter and tighten.

**NOTE :** Mechanical over-tightening may distort the threads or damage the filter element.

Install and tighten the drain bolt.

Remove the cap (ITEM 1) from the engine upper frame. [C]

Fill the engine with clean oil to the proper level.

Start the engine and let it run for several minutes.

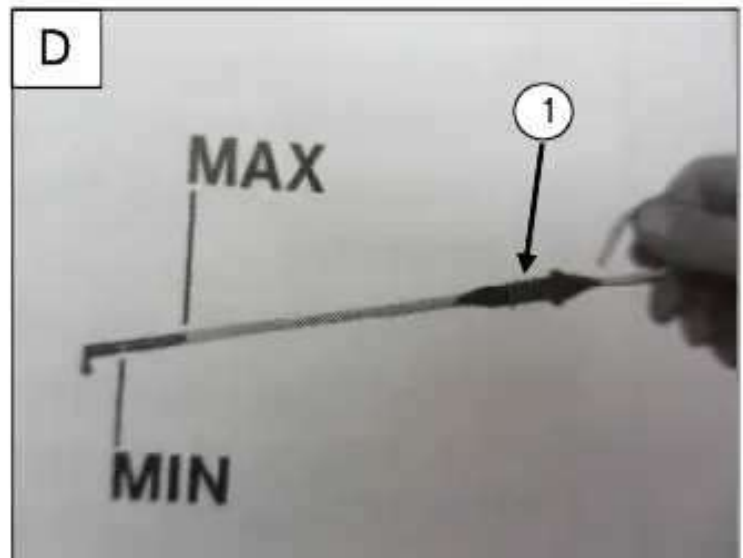
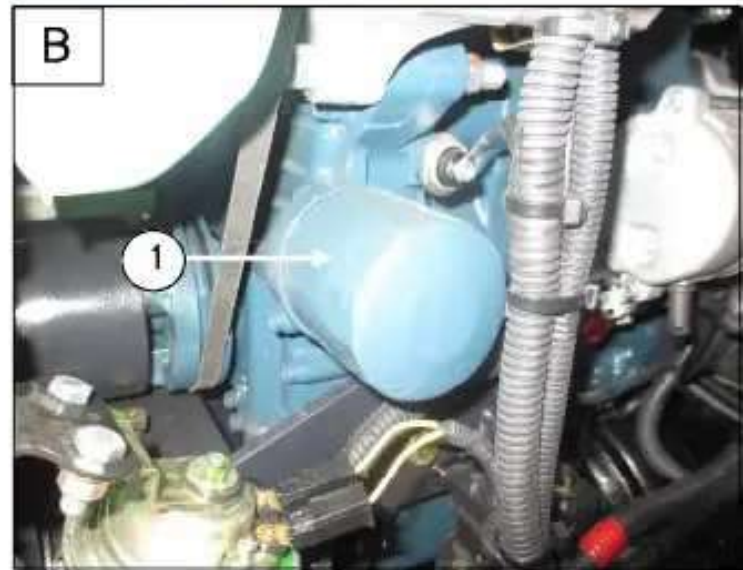
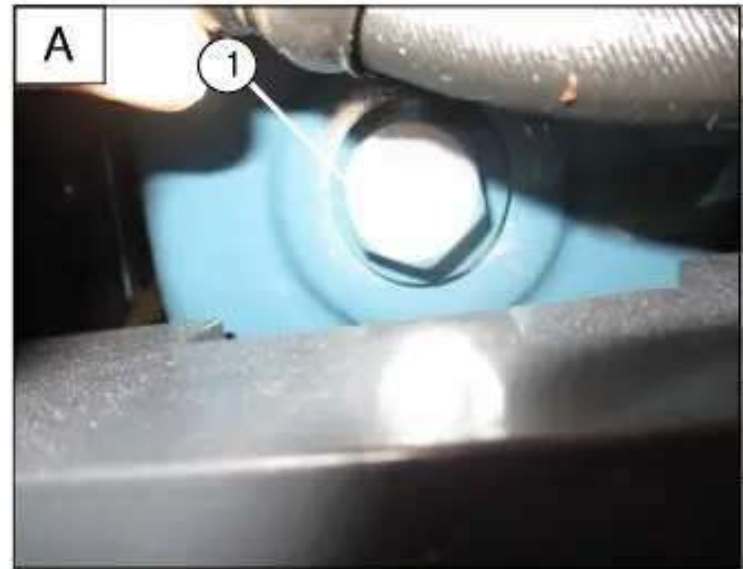
Stop the engine.

Check for leaks at the oil filter and check the oil level.

Pull out the dip stick and wipe with a clean cloth.

Check the oil level by inserting the dip stick completely into the hole and pulling out again.

Add oil as needed if oil indication is not between the bottom mark and the top mark (ITEM 1) on the dip stick. [D]





## HYDRAULIC SYSTEM

### GEAR BOX OIL

#### Checking oil level

To check the gear box oil level, open the oil plug near clutch pedal.

Oil level must be the bottom of hole.

Add oil to the injector located on gear box left side underneath (ITEM 1). [A]

#### Replacement of oil

After preparing the appropriate containers, unscrew and remove underneath cap (ITEM 1) [A] and left side cap (ITEM 1). [B]

Wait for oil to run out.

When the oil has been completely drained, replace the cap (ITEM 1) [B] and refill the gear box through the cap (ITEM 1) [A]

**NOTE :** The oil must be collected and destroyed by specialized firms in accordance with the laws in force.



### **⚠ WARNING**

Wear the Safety glasses, goggles, or face shield. Flowing hydraulic oil can cause burns or allergies.

## HYDRAULIC SYSTEM (Cont'd)

### TRANSFER BOX OIL

#### Checking oil level

To be carried out at room temperature with the Agricultural tractor braked on flat ground.

Take off cap (ITEM 1) and check that oil is touching the lower edge of the hole.

The cap acts as filling hole as well as level check.

[A]

Top up the level with oil.

#### Replacement of oil

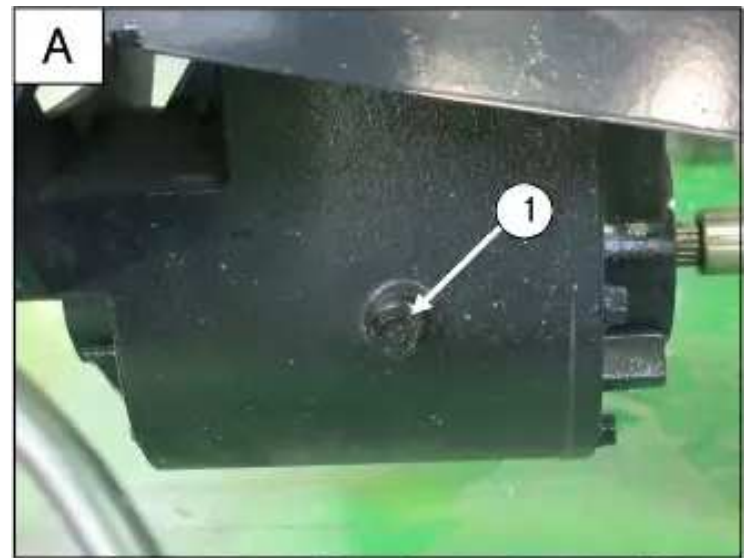
After preparing the appropriate containers, empty the transfer box by removing caps (ITEM 1) [A] and (ITEM 1) [B]

Let all the oil flow out and replace cap (ITEM 1) [B]

Fill through the cap (ITEM 1) and remember that level must touch the cap. [A]

Screw on the cap (ITEM 1). [A]

**NOTE :** The oil must be collected and destroyed by specialized firms in accordance with the laws in force.





## HYDRAULIC SYSTEM (Cont'd)

### AXLES OIL

#### Checking oil level

To be carried out on flat ground with an unloaded Agricultural tractor which has not been running for at least 2 hours.

NOTE : These controls must be done immediately if you note any loss or spot of oil on the floor where Agricultural tractor is usually parked.

If you note a recurring decrease, you have to find the reason for the loss and try to eliminate it.

Take off cap (ITEM 1) and check that oil is touching the lower edge of the hole.

The cap acts as filling hole as well as level check.

[A]

Top up the level with oil.

#### Replacement of oil

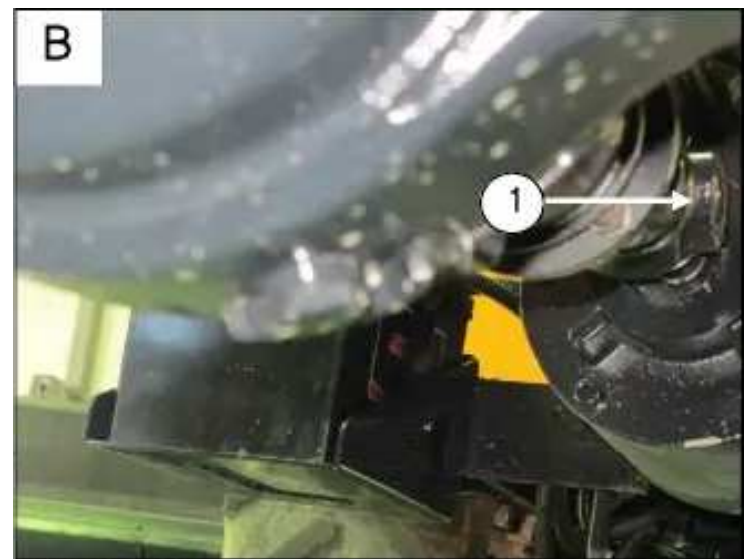
After preparing the appropriate containers, empty the differentials by removing caps (ITEM 1) [A] and (ITEM 1) [B]

Let all the oil flow out and replace cap (ITEM 1) [B]

Fill through the cap (ITEM 1) and remember that level must touch the cap. [A]

Screw on the cap (ITEM 1). [A]

NOTE : The oil must be collected and destroyed by specialized firms in accordance with the laws in force.



## HYDRAULIC SYSTEM (Cont'd)

### BRAKE FLUID

#### Checking brake fluid

Check the level of the brake fluid at regular intervals and each time you note that in order to brake it is necessary to press the pedal further down than usual.

On the tank, the minimum and maximum level is normally indicated.

Should the level not be shown, fill the tank up to 80% full.

#### Replacement of brake fluid

In order to replace the brake fluid, follow these operations.

Prepare the necessary containers and the new brake fluid.

Remove the old fluid from the tank by turning upside down the tank. If you remove 2 clips under the tank, you can remove the fluid more easily.

Replace and fill the tank with new brake fluid.

Gently pump down the pedal and release completely a few times.

With the pedal pressed down, slowly open the valve (ITEM 1) on a wheel until the pedal go down to the end of its stroke.

Close the valve and release the pedal and then go for another wheel.

Repeat this operation at least 3 times each wheel. Check regularly and refill the brake fluid as necessary.

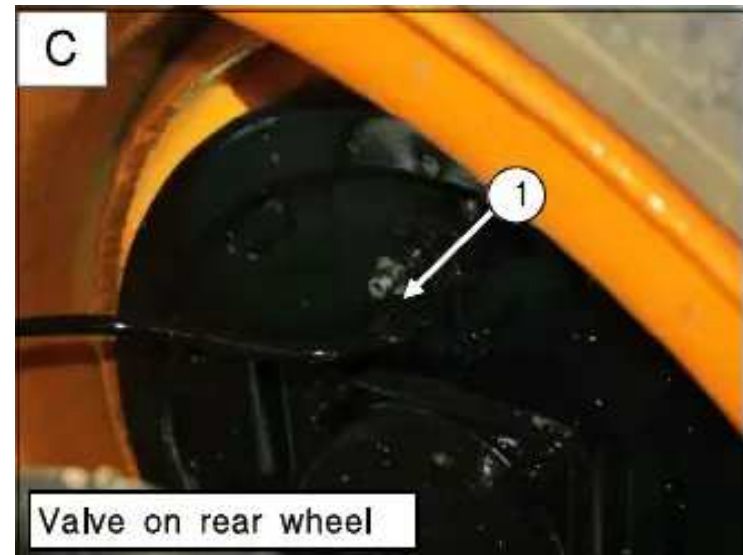
By using a hose fitted on the head of valve helps you to check when the fluid flowing out without air bubbles from the drain.

**NOTE :** Never open 2 valves at the same time.

**NOTE :** The oil must be collected and destroyed by specialized firms in accordance with the laws in force.



Valve on front wheel



Valve on rear wheel

### ⚠ WARNING

- Old fluid can not be used again and must be disposed as special waste according to the law in force.
- If you come into contact with brake fluid, wash yourself properly with lots of water and soap.
- This fluid may damage the painted parts. For this reason, clean the parts which come into contact with water.



## HYDRAULIC SYSTEM (Cont'd)

### LIFTING PUMP OIL

#### Checking oil level

The oil tank is under the pump and there is the cap (ITEM 1). The cap acts as air bleed hole as well as filling hole. [A]

The level must be checked with body fully down in travelling position.

The correct level is the red spot of oil level gauge (ITEM 2). [A]

#### Replacement of oil

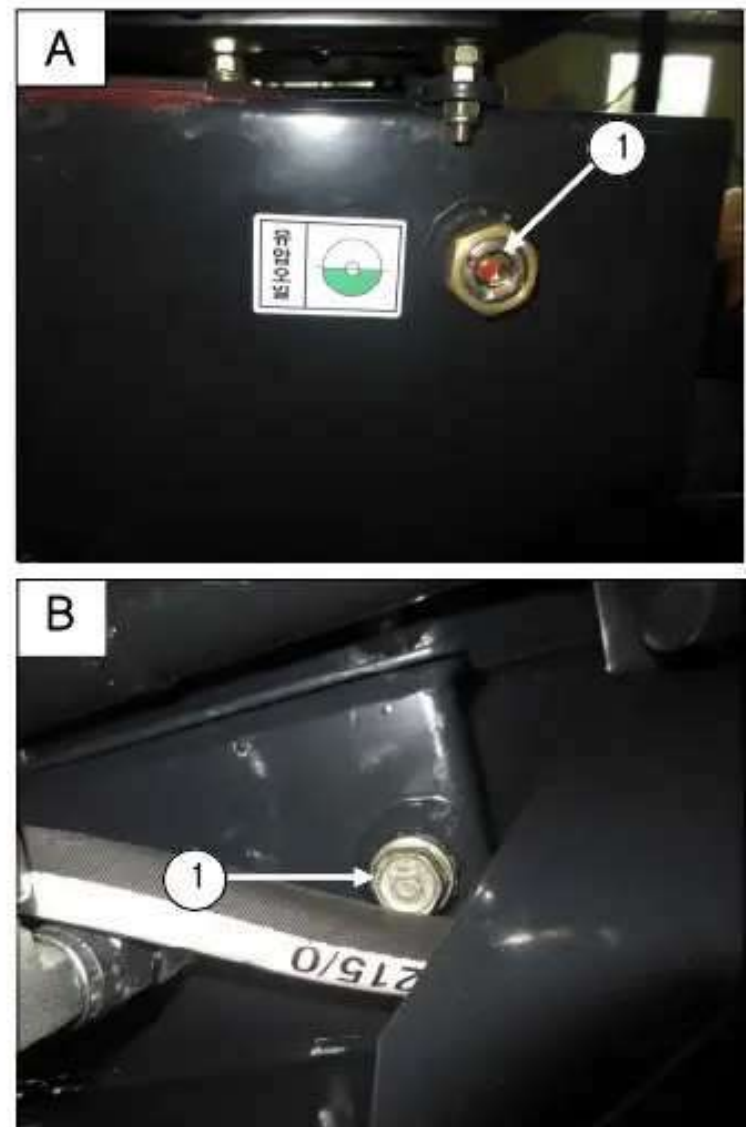
To drain out the old oil, use the lower cap (ITEM 1). [B]

After closing cap (ITEM 1) [B], refill from the cap (ITEM 1) up to the correct level. [A]

If the level is too low, the lifting system will not reach its maximum height.

If the level is too high, the oil could come out from the cap (ITEM 1) who is a breather cap too. [A]

**NOTE :** The oil must be collected and destroyed by specialized firms in accordance with the laws in force.



## **LUBRICATION**

Clean both heads of grease nipples (one each side)

Add new grease until old one comes out.

Carefully clean off any excess of grease before using the Agricultural tractor.

Central joint pivot lubrication [A]

**NOTE :** Universal joint with grease ball type (cross bearing) is not needed grease.

Replace universal joint If you find some play.





## ELECTRICAL SYSTEM

### Wiring and Gauges

Check regularly and repair loose or malfunction gauges when found.

The Agricultural tractor has a 12 volt, negative ground alternator charging system. The electrical system is protected by fuses located in the instrument panel. The fuses will protect the electrical system when there is an electrical overload. The reason for the overload must be found before starting the engine again. [A]



### Battery

#### Removal And Installation

Stop the engine and pull the start key out.

Disconnect the negative  $\ominus$  cable first.  
Disconnect the positive  $\oplus$  cable later.

Loosen the fixing bolts and then Remove the fixed bar holding battery.

Remove the battery and then remove battery from the Agricultural tractor.

Confirm directions of terminal on the battery which will be installed.

Always clean the terminals and cable ends when installing a new battery.

When installing the battery in the Agricultural tractor, do not touch any metal parts with the battery terminal posts.

Connect and tight the battery cables. Connect the negative  $\ominus$  cables last to prevent sparks.

**NOTE:** Be sure that you should not connect each  $\oplus, \ominus$  terminal in the opposite place.

Tighten the M 5 terminal to 20 - 30 (kgf- Cm) torque and M 6 terminal to 40 - 50 (kgf- Cm) torque.

#### ⚠ WARNING

The battery cables must be clean and tight. Check the water level in the battery. Remove any acid or corrosion from the battery and cables with a sodium bicarbonate and water solution.

#### ⚠ WARNING

- Wear proper personal safety gear (safety goggle, rubber gloves, etc) when handle the battery. Handle It with care because It contains sulfuric acid.
- Wash out sulfuric acid immediately with which skin or clothes is stained, or It can cause serious Injury or death.
- Keep the battery away from flames or heat.
- Use the battery only for the purpose of starting the engine, or It can cause the battery to be damaged or flames by hydrogen gases which are generated from the battery.

## ELECTRICAL SYSTEM (cont'd)

### Battery (Cont'd)

#### Inspecting electrolyte and repair

Disconnect the  $\ominus$  cable of the battery.

Loosen the vent plug.

Check for a amount of electrolyte in each cell.

Inject regulation rated-distilled water when the level of electrolyte is below "the lowest limit".

Fill with distilled water to the prescribed level as necessary.

Wash the terminal with hot water if it is contaminated, and apply grease to the terminals after washing.

#### Handling the battery in winter

While the battery needs a higher voltage and more sufficient electric current to start the engine especially in winter than other seasons, the slow diffusion of electrolyte due to low temperature can cause the battery to fall its capacity for supplying an electric current. That is why it is more difficult to start the engine in winter than summer.

Don't keep the battery being electric discharged.

Never try to restart the engine immediately when you can not start it with only one try. It need more about 1 minute to restore a voltage.

Inspect and maintain the battery lineage especially in winter.

#### WARNING

Never start the engine by means of the battery of other vehicles in case the Agricultural tractor's battery is discharged electricity and electrolyte

#### WARNING

Never connect with the cathode terminal of the discharged battery directly. Link the other edge of the jump cable which is connected with the cathode terminal of the battery to the engine block.

#### WARNING

Do not stain clothes or skin with electrolyte as it is acid. Be careful not to get the electrolyte in eyes. Wash with clean water and go to the doctor if it enters the eyes.

#### WARNING

##### Treatment of battery

Keep the battery at a cool area where air is well ventilated.

Don't expose the battery under a direct ray of the sun and avoid humid area.

Don't hit it with metal tools when installing.

Don't place metal tools on the upper part of the battery.

Wash the terminal with hot water if it is contaminated, and apply grease to the terminals after washing.



## MUFFLER

### Muffler maintenance

Do not operate the Agricultural tractor with a defective exhaust system.

Make a visual inspection of the muffler and replace the damaged muffler with new one, if there are holes and cracks on the muffler (ITEM 1). [A]



### ⚠ WARNING

When an engine is running in an enclosed area, fresh air must be added to avoid concentration of exhaust fumes. If the engine is stationary, vent the exhaust outside. Exhaust fumes contain odorless invisible gases which can kill without warning.

Stop the engine and allow the muffler to cool before checking for the muffler. Wear safety glasses or goggles. Failure to obey can cause serious injury.

Never use machine in atmosphere with explosive dust or gases or where exhaust can contact flammable material. Failure to obey warnings can cause injury or death.

## TIRE

### Tire Pressure

Check the tire when the tire is at normal temperature and the machine is not loaded.

Check the tires regularly for wear, damage and pressure.

Inappropriate tire pressure is a primary cause for tire damage. Insufficient tire pressure will damage internal carcass of tire. Excessive tire pressure will also cause premature damage of tire.

The three major causes for excessive heat and pressure of tire are insufficient pressure, excessive load and overspeed.

Avoid excessive load and overspeed in order to keep tires in good shape.

Recommended tire pressure (when tire is cooled)

Size	Pressure
29*12.5*15 (6PR)	from 5 psi to 20 psi

The pressure must always checked with cold tires. Every time for mounting or demounting rims and tires follow warning and safety instructions reported onto the tires and never exceed inflation pressure from recommended ones by the manufacturer of they tire.

For other sizes does not indicate in this manual, please refer to the instructions of the tire's manufacturer or written directly on the tire.

The following table regard flotation tire 29\*12.5\*15 and gives an idea of load capacity and ground pressure you could obtain from each tire, related to different inflation pressures possible.

The considered speed is 25km/h.

For speeds lower than 15km/h, add 20% on the load capacity.

Inflation pressure (psi)	Max payload capacity each wheel (kg)	Ground pressure (psi)
5	565	5
7	850	7
10	1365	10
14.5	1700	14.5
20	1980	20
22	2090	22

### ⚠ WARNING

Do not inflate tires above specified pressure. Failure to use correct tire mounting procedure can cause an explosion which can result in injury or death.

### ⚠ WARNING

Inflate tires to the MAXIMUM pressure shown on the sidewall of the tire. DO NOT mix brands of tires used on the same loader.

### ⚠ WARNING

Flotation tire 29\*12.5\*15 at very low pressure for minimum soil compaction keep attention on the payload. Because the permitted load is reduced proportionally to the inflation pressure and so lower pressure means less payload the tire could carry. Moreover when using the Agricultural tractor with tire pressures under 10psi, could be possible in very extreme conditions, the wheel come off from the rim side.



## TIRE (Cont'd)

### Changing wheels

Stop the Agricultural tractor on flat compact ground.

Put the parking brake on and engage 4 wheel drive.  
Stop the engine and put into 1st gear or reverse.

If the road is on a slope or is unbalanced, put some block under the wheels to stop the agricultural tractor moving.

Use the wheel spanner to unscrew the wheel bolts about one revolution.

Place an hydraulic jack in the position shown at pictures.

Lift the agricultural tractor until you are able to raise the wheel off the ground.

Remove the wheel bolts completely.  
Remove the wheel to change and replace it with new one.

Screw up the wheel bolts by hand and afterwards tighten them lightly with the wheel spanner.

Remove the jack and then tighten each alternative wheel bolts.

Check other wheels are well tightened.



**⚠ WARNING**

Stop the Agricultural tractor on flat compact ground.  
Agricultural tractor could fall down if hydraulic jack is slippery. Make sure to support the strong support in order to avoid the pressing accident.

## TIRE (Cont'd)

### Wheel Nut

Check torque on all wheels to prevent shearing of the wheel studs and wheel damage.

**NOTE : CHECK** that the wheel nuts (ITEM 1) holding the wheels are well tightened. This check must be carried out once a week during running in and afterwards once per month.

The correct torque is 10 kgf.m torque. [A]  
Replace damaged wheel.



### Tire Maintenance

Tires are to be repaired only by an authorized person using the proper procedures and safety equipment. Tires and rims must always be checked for correct size before mounting. Check rim and tire bead for damage.

The rim flanges must be cleaned and free of rust. The tire bead and rim flange must be lubricated with a rubber lubricant before mounting the tires, avoid excessive pressure which can rupture the tire and cause serious injury or death. During inflation of the tire, check the tire pressure frequently to avoid over inflation.

### Storing tires

As basic rule, store tires in a warehouse which unauthorized persons cannot enter. If tires are stored outside, always erect a fence around tires and put up "NO ENTRY" and other warning signs that even young children can understand.

Stand the tire on level ground, and block it securely so that it cannot roll or fall over.

If the tire should fall over, get out of the way quickly. The tires for construction equipment are extremely heavy, so trying to hold the tire may lead to serious injury.

#### **⚠ WARNING**

- Do not inflate tires using flammable gases or alcohol injector. This cause explosion or personal injury.
- Inflate tires at the recommended pressure level by the manufacturer, and check periodically pressure and wear of tires.
- When replacing the inflated tire, do not stand near the tire.

#### **⚠ WARNING**

When you inflate tires, tires could be separated from wheels or could be burst.  
Inflate tires on the sturdy device made in shatterproof steel.

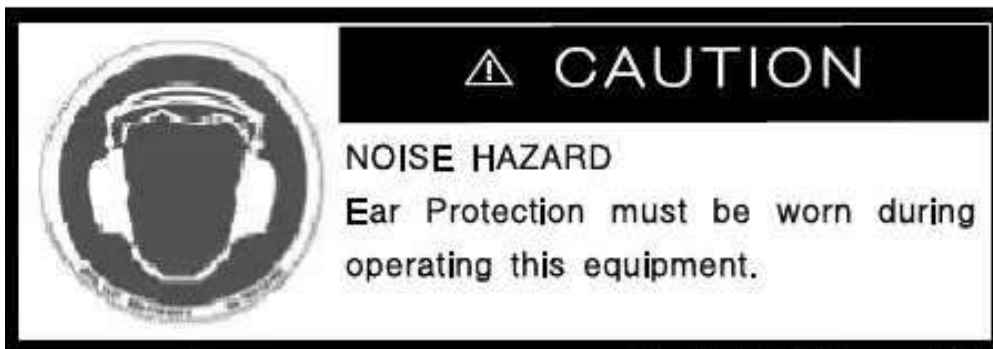


## NOISE (EAR PROTECTION)

This noise level is little more than 80dB in Normal Operation of this equipment.

Operator and service personnel must wear appropriate safety equipment; including hearing protection.

If the operator work with this machine for long time, the operator's ear can be injured by noise hazard condition.



## TROUBLE SHOOTING – ENGINE

This trouble shooting is not intended to cover every conditions, however many of the more common possibilities are listed.

Trouble	Service	Remark
Engine oil warning light fails to go off immediately after the engine is started.	<ul style="list-style-type: none"> <li>• Add the oil to the specified level.</li> <li>• Replace the oil filter</li> <li>• Check oil leakage from the tube or the joint.</li> </ul>	
Engine does not start when the starting motor is turned over.	<ul style="list-style-type: none"> <li>• Repair where air is inhaled into fuel system.</li> <li>• Check the injection pump or the nozzle.</li> </ul>	
Exhaust gas is white or blue.	<ul style="list-style-type: none"> <li>• Check the valve clearance.</li> </ul>	
Exhaust gas occasionally turns black.	<ul style="list-style-type: none"> <li>• Adjust the oil level to the specified level.</li> <li>• Replace the fuel.</li> <li>• Clean or repair the air cleaner filter.</li> <li>• Check the nozzle.</li> </ul>	
Combustion noise occasionally change to breathing sound.	<ul style="list-style-type: none"> <li>• Check engine compression pressure.</li> </ul>	
Unusual combustion noise or mechanical noise	<ul style="list-style-type: none"> <li>• Check the nozzle.</li> <li>• Check the injection pump.</li> <li>• Replace the fuel.</li> <li>• Check overheating.</li> <li>• Check the muffler.</li> <li>• Check the valve clearance.</li> </ul>	



## TROUBLE SHOOTING – ELECTRICAL SYSTEM

Trouble	Service	Remark
Starting motor does not turn main switch is turned on.	<ul style="list-style-type: none"> <li>· Inspect and repair the wiring.</li> <li>· Charge the battery.</li> <li>· Inspect the main switch.</li> </ul>	
Starting motor turns the engine sluggishly.	<ul style="list-style-type: none"> <li>· Charge the battery.</li> <li>· Inspect the starting motor.</li> </ul>	
Starting motor disengages before the engine starts up.	<ul style="list-style-type: none"> <li>· Check and repair the wiring.</li> <li>· Charge the battery.</li> </ul>	
Engine oil warning light does not light up when engine is stationery (when the main switch is "ON" position.)	<ul style="list-style-type: none"> <li>· Inspect the warning light.</li> <li>· Inspect the engine oil warning light.</li> </ul>	
Charging warning light does not light up when engine is stationery (when the main switch is "ON" position.)	<ul style="list-style-type: none"> <li>· Inspect the warning light.</li> <li>· Check and repair the wiring.</li> </ul>	

## TROUBLE SHOOTING – HYDRAULIC SYSTEM

Trouble	Service	Remark
Dump box lifting speed is slow. Dump box lacks lifting power.	<ul style="list-style-type: none"> <li>• Check the hydraulic oil level and add if necessary.</li> <li>• Replace filter on rear.</li> </ul>	
Bubbles in oil.	<ul style="list-style-type: none"> <li>• Replace oil.</li> <li>• Add oil if needed.</li> </ul>	
Oil pressure is low.	<ul style="list-style-type: none"> <li>• Bleed air from oil line.</li> <li>• Add oil and bleed air.</li> </ul>	
Cylinder vibrates when operating.	<ul style="list-style-type: none"> <li>• Add oil.</li> </ul>	



# CHECK LIST

## Pre-delivery

The following check list must be carried out prior to delivery of vehicle to customer. To guarantee the maximum life and operation of the machine in safety , it's important to carry out these checks. Check each list after prescribed action is taken.

Check that :

- Unit has not been damaged in shipment.  
Check for such things as dents and loose or missing parts correct or replace components as required.
- Engine : Check the quantity of oil in the engine by means of the oil dip stick, if the level is below the minimum, you must add oil up to the maximum level before restarting the unit.  
Make sure there is enough fuel in the tank.
- Gear box / axles / reduction unit : Check the level of oil in the gear box, axles and reduction unit and top it up if necessary.
- Greasing and lubrication : Check every unpainted part is protected by grease and all the pins of the levers and the mechanical counter-shafts are lubricated enough.
- Battery is securely mounted and not cracked.  
Cable connections are tight and electrolyte is at proper level and strength.
- Dump cylinder, hoses and fittings are not damaged, leaking or loosely connected.
- Radiator hoses and fittings are not damaged, leaking or loosely connected.
- Filters are not damaged, leaking or loosely secured.
- Tires are properly and securely attached and tires have proper tension.
- Agricultural tractor is properly lubricated and no grease fittings are missing and damaged.
- Hydraulic tank, engine crankcase are filled to their proper levels.
- All guards and decals are in place and securely attached.

Start engine and test run the Agricultural tractor while checking that proper operation is exhibited by all controls.

Check that :

- Joystick lever operate properly and are not damaged or binding.

I acknowledge that pre-delivery procedures were performed on this unit at outlined above.

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AGRICULTURAL TRACTOR

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# SAFETY MANUAL

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# BAWOO COMPANY CORP







## INDEX

SAFETY ALERT SYMBOL	1
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PERFORM MAINTENANCE SAFELY	8
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**BAWOO COMPANY CORP.**





## Safety alert symbol

This safety alert symbol means :  
 "ATTENTION!  
 BECOME ALERT!"  
 "YOUR SAFETY IS INVOLVED!"



The Safety Alert Symbol identifies important safety message on machines, safety signs, in manuals, or elsewhere. When you see this symbol, be alert to the possibility of personal injury or death. Follow the instruction in the safety message.

## Foreword

This Safety Manual is intended to point out some of basic safety situations which may be encountered during the normal operation and maintenance of your machine and to suggest possible ways of dealing with these conditions.

Additional precautions may be necessary, depending on attachments used and conditions at the worksite or in the service area. The manufacturer has no direct control over machine application, operation, inspection, lubrication, or maintenance. Therefore, it is YOUR responsibility to use good safety practices in these areas.

This information provided in this manual supplements the specific information about your machine that is contained in the manufacturer's manual(s). Other information which may affect the safe operation of your machine may be concerned on safety signs, or in insurance requirements, employer's safety programs, safety codes, local laws, rules and regulations.

**Important :** If you do not have the manufacturer's manual(s) for your particular machine, get a replacement manual from your employer, equipment dealer or from the manufacturer of your machine. Keep this safety manual and the manufacturer's manual(s) with your machine.

## **A word to the user/ operator**

It is your responsibility to read and understand this safety manual and the manufacturer's manual(s) for this machine. This safety manual takes you step-by-step through your working day.

In reading this manual, you will note that any illustration depicting an unsafe work procedure or illustration is labeled both with the word "wrong" and the mark of an "X" on the illustration. Each illustration is also numbered and the same number appears in the next in parenthesis. This number is placed at the end of the written text that refers to the illustration.

Remember that YOU are the key to safety. Good safety practices not only protect you but also protect the people around you. Study this manual and the manufacturer's manual(s) for your specific machine. Make them a working part of your safety program. Keep in mind that this safety manual is written for only this type of machine. Practice all other usual and customary safe working precautions, and above all-

**REMEMBER- SAFETY IS UP TO YOU.  
YOU CAN PREVENT SERIOUS INJURY OR DEATH.**



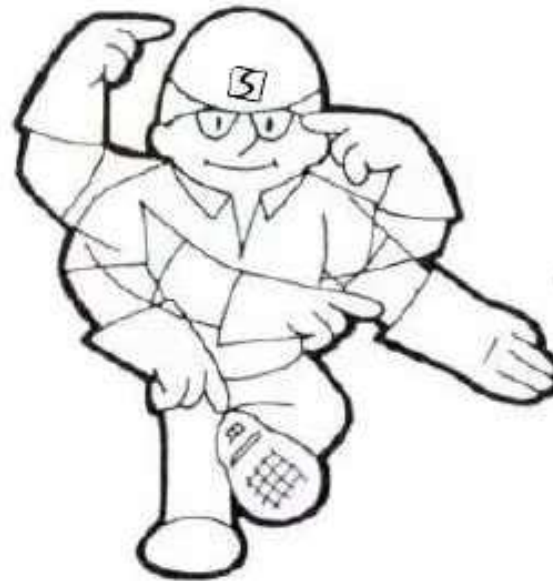
## Follow a safety program

### Protect Yourself.

Wear all the protective clothing and personal safety devices issued to you or called for by job condition.

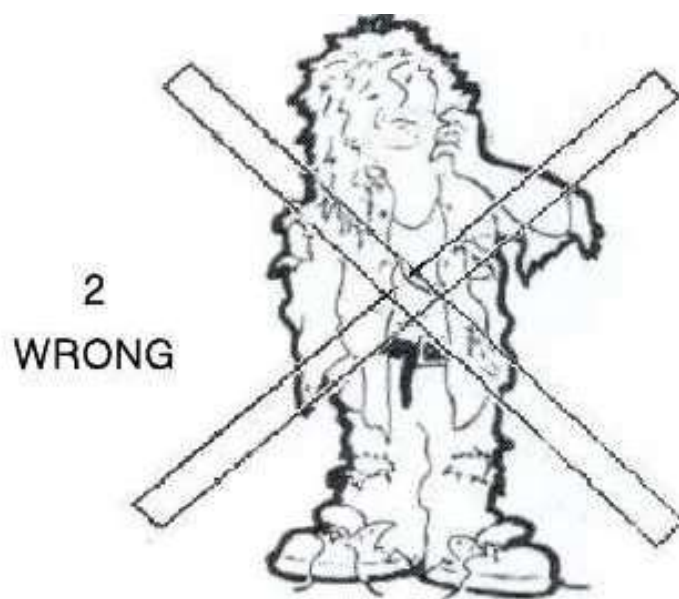
You may need:

- A hard hat
- Safety shoes
- Safety glasses, goggle, or face shield
- Heavy gloves
- Hearing protection
- Reflective clothing
- Wet weather gear
- Respirator or filter mark



1  
RIGHT

Wear whatever is needed, don't take chances .(1)



2  
WRONG



**Warning :** Do not wear loose clothing or any accessory -flopping cuffs, dangling neckties and scarves, or jewelry and wrist watches- that can catch in moving parts.(2)

### Be Alert!

Know where to get assistance. Know how to use a first aid kit and fire extinguisher/ fire suppression system.

### Be Aware!

Take advantage of training programs offered.

### Be Careful!

Human error is caused by many factors: carelessness, fatigue, overload, preoccupation, unfamiliarity of operator with the machine, drugs, and alcohol to name a few. Damage to the machine can be fixed in a short period of time, but injury or death, has a lasting effect.

For your safety and the safety of others, encourage your fellow workers to act safely.

## Follow a safety program

### For safe operation

For safe operation of this machine, you must be a qualified and authorized operator. To be qualified, you must understand the written instruction supplied by the manufacturer, have training, including actual operation of this machine and know the safety rules and regulation for the jobsite.



**Warning :** Do not operate this machine if you are under the influence of drugs or alcohol which can impair your alertness or coordination. An operator on prescription or over-the-counter drugs needs medical advice on whether or not he can safely operate machines.

### Know The Rules

Most employers have rules governing operation and maintenance of equipment. Before you start work at a new location. Check with your supervisor or the safety coordinator. Ask about rules you will be expected to obey.(3)



These are some of the rules you must work by :

- Know the capacity and operating characteristics of this machine.
- Never modify or remove any part of the machine. (except for service and reinstall before operating)
- Fasten your seat belt before you start.
- Keep others away from your operation.
- Look before you backing up.
- Carry the load low.

Make sure you understand the rules covering traffic at your jobsite. Make sure you know what all signs, flags, and markings mean.

### Know Your Equipment

Know your agricultural tractor. Know how to operate all equipment on your machine. Know the purpose of all the controls, gauges and indicators. Know the rated load capacity, speed range, braking and steering characteristics, turning radius, and operating clearances. Keep in mind that rain, snow, ice, loose gravel, soft ground, etc., change the operating capabilities of your machine.

Study the DANGER, WARNING, safety signs on your machine and the information signs.

Read and understand the manufacturer's operator's manual before starting the engine.

If there is no manual with the machine, get one.

Study it before you start work.(4)

If there is something in the manual you don't understand, ask your supervisor or equipment dealer to explain it to you.

4  
RIGHT



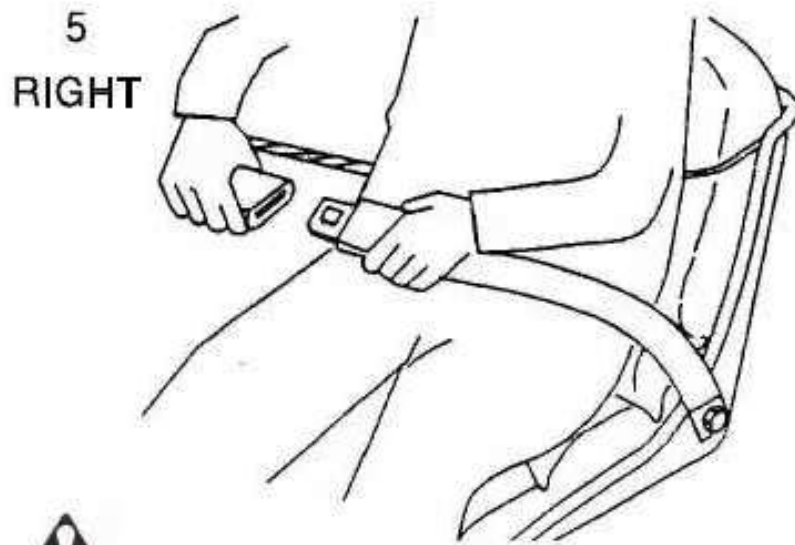


## Prepare For Safe Operation

### Check the safety equipment

To protect you and others around you, your machine may be equipped with the following safety equipment. See that each item is securely in place and in operating condition.

- FOPS (Falling object protective structure)
- ROPS (Rolling object protective structure)
- Seat belt
- Grab handle
- Lights
- Warning stickers



Use them!(5) Never remove or disconnect any safety device.

- Check cooling system. If air cooled, check for unobstructed air flow. If liquid cooled, check coolant level (at overflow tank provided).



**Warning :** If liquid cooled, allow the radiator to cool before checking the level. (See page 22, Be Careful with Hot Cooling System). (6)

### Check The Machine

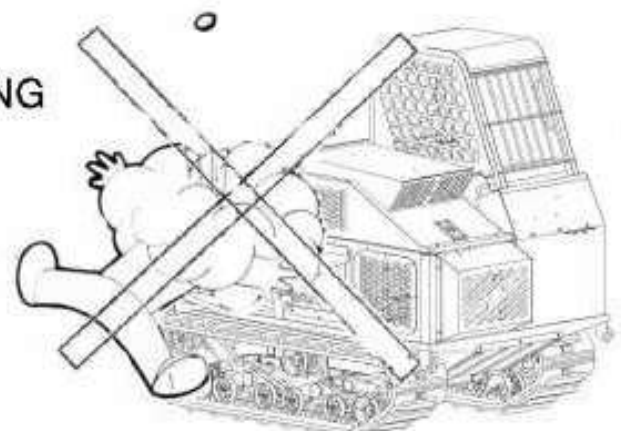
Before you begin your workday, you must inspect your machine and have all systems in good operational condition. Do not operate the machine until all deficiencies are corrected.

- Check for broken, missing or damaged parts. Make necessary repairs.
- Check the tension of track.  
Replace badly worn or damaged track.
- Check the brake for proper operation.
- Perform all maintenance procedures outlined by the manufacturer of your machine.
- Check the hydraulic system. Have any leaks repaired.



**Warning :** Diesel fuel or hydraulic fluid under pressure can penetrate the skin or eyes and cause serious injury, blindness or death. Fluid leaks under pressure may not be visible. Use a piece of cardboard or wood to find leaks but do not use bare hand. Wear a face shield or safety goggles for eye protection. If any fluid is injected into the skin, it must be removed within a few hours by a doctor familiar with this type of injury.

6  
WRONG



## Prepare For Safe Operation

### Clean Up

Clean windshield, lights and safety signs.

Make sure the operator's area, steering levers, pedals, steps and grab handles are clean.(7) Oil, grease, snow, ice, mud or debris in these areas can cause you to slip and fall. Clean your boots of excess mud before getting on the machine.

Remove all personal items or other objects from the operator's area. Secure these item in a tool box or remove from the machine.

7  
RIGHT




### Know The Working Area

Learn-beforehand-as much about your working area as possible. Check at ground or floor level. Inspect the surface over which you will travel. Look for holes, drop-offs and obstacles. Look for rough spots or hidden obstacles on surfaces which could cause a collision or loss of control.

Look for soft soil, deep mud, standing water. Watch for anything that might make you lose control or cause the agricultural tractor to rollover.

### Use Caution When Fueling

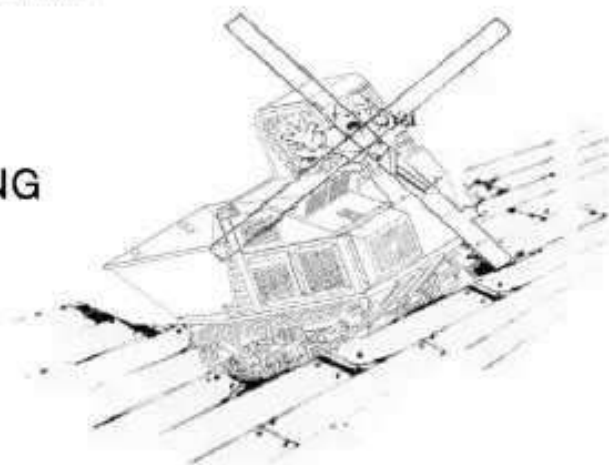
 **Warning :** Never fill the fuel tank with the engine running, while smoking or when near an open flame.(8)

Never overfill the tank or spill fuel. If fuel is spilled, clean it up immediately.

Be sure to use the correct type and grade of fuel.

Ground the fuel funnel or nozzle against the filler neck to prevent sparks and be sure to replace the fuel tank cap

9  
WRONG



8  
WRONG

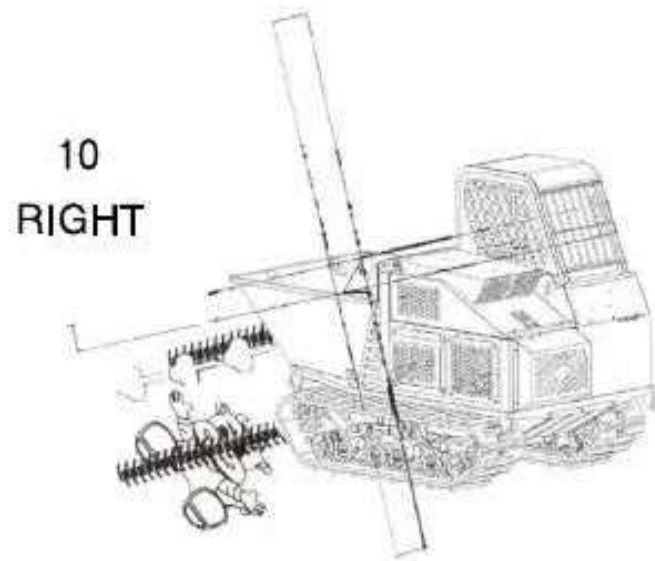




## Start safely

### Warn Personnel Before Starting

Before starting, Walk completely around the machine. Make sure no one is under the machine, on it, or close to it. Let other workers and bystanders know you are starting up and don't start until everyone is clear of the machine. (10)



### After Starting Engine

Observe gauges, instrument, and warning lights to assure that they are functioning and their readings are within the operating range.

### Run An Operating Check

Do not use a machine that is not in proper operating condition.

It is the operator's responsibility to check the condition of all systems, and to run the check in a safe area.

### Test Controls

Make sure the engine is operating correctly.

Operate each control pedal or joystick lever to make sure all functions are correct.

## Perform maintenance safely

### Prepare Yourself

Safety glasses or goggles are always needed for eye protection from electric arcs from shorts, fluids under pressure, and flying debris or loose material when engine is running or tools are used.(11)

Wear a face shield when you disassemble spring loaded components or work with battery acid. Wear a helmet or goggles with special lenses when you weld or cut with a torch.

Do not stand, grind, flame-cut, braze or weld without appropriate ventilation or an approved respirator.

If welding is required on this machine, refer to the manufacturer's manuals or consult your equipment dealer for proper procedures.

11  
RIGHT



**Warning :** Keep clear of all rotating components. Wrapping or entanglement may result in serious injury or death.

Keep hands and clothing away from moving parts. Do not tempt fate with dangling ties, loose sleeves, rings or long hair.

### Avoid Battery Hazards

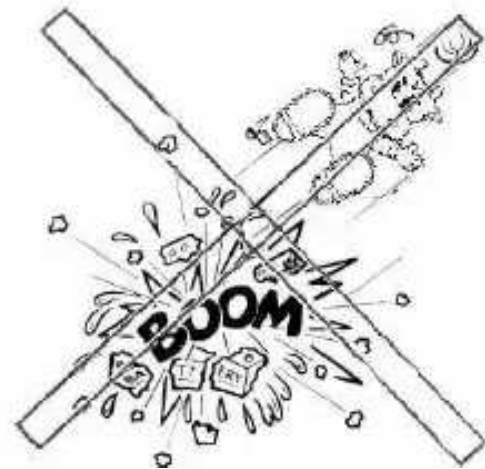


**Warning :** Lead-acid batteries contain sulfuric acid which will damage eyes or skin on contact. Always wear a face shield to avoid acid in eyes. If acid contacts eyes, flush immediately with clean water and get medical attention. Wear rubber gloves and protective clothing to keep acid off skin. If acid contacts skin, wash off immediately with clean water.



**Warning :** Lead-acid batteries produce flammable and explosive gases. Keep arcs, sparks, flames and lighted tobacco away. (12)

12  
WRONG



Use a flashlight to check battery electrolyte level. Always check with engine stopped.(13)  
Do not charged a battery or jump-start the engine if the battery is frozen. Warm to 60°F (15°C) or the battery may explode.

13  
RIGHT






## Perform maintenance safely

### Use Jacks And Hoists Carefully

If you must work beneath raised equipment, always use wood (NOT concrete) blocks, jack-stands or other rigid and stable supports. When using jacks and hoists, always be sure they are adequately supported.

 **Warning :** Never use concrete blocks for supports. They can collapse under even light block. (14)

Make sure the hoists or jacks you use are in good repair. Never use jacks with cracked, bent or twisted parts. Never use frayed, twisted or pinched cables. Never use bent or distorted hooks.



### Avoid Electrical System Hazards

Disconnect the battery before working on the electrical system. Remove the ground cable first. When reconnecting the battery, connect the ground cable last.

Never work on the electrical system unless you are thoroughly familiar with system details and the special handling required. (15)

15  
RIGHT




### Be Careful With Fluids Under Pressure

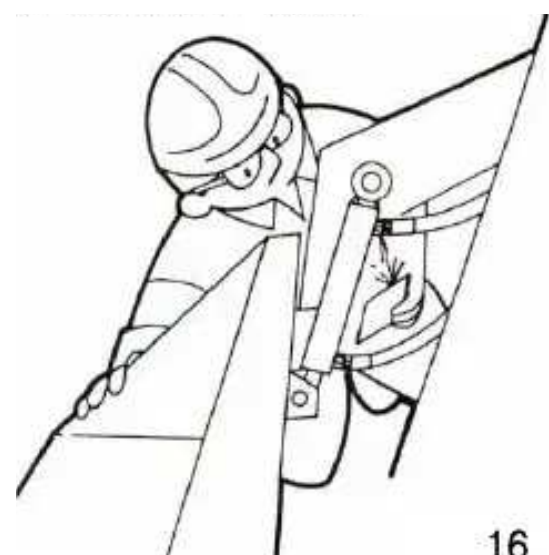
The hydraulic system is under pressure whenever the engine is running and may hold pressure even after shutdown.

Install lift arm restraints (cylinder rod collars) or block the cylinders and equipment securely working on the hydraulic system.

Cycle steering and other controls after shutdown. When venting or filling the hydraulic system, loosen the filler cap slowly and remove it gradually.

Do not permit an open flame around the hydraulic system. Clean up spilled fluid immediately.


 **Warning :** Diesel fuel or hydraulic fluid under pressure can penetrate the skin or eyes and cause serious injury, blindness or death. Fluid leaks under pressure may not be visible. Use a piece of cardboard or wood to find leaks but do not use bare hand. Wear a face shield or safety goggles for eye protection. If any fluid is injected into the skin, it must be removed within a few hours by a doctor familiar with this type of injury.(16)



16  
RIGHT

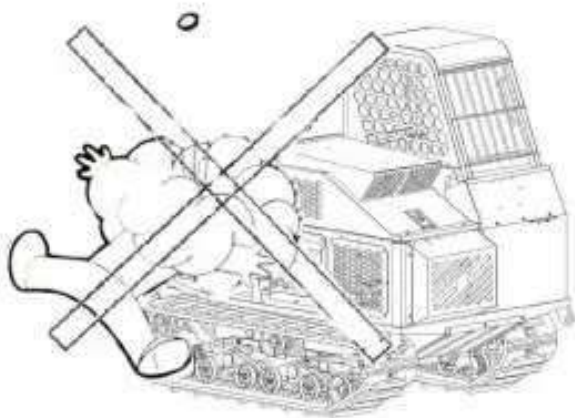
## Perform maintenance safely

### Be Careful With Hot Cooling System

 **Warning :** Liquid cooling systems build up pressure as the engine gets hot. Before removing the radiator cap, stop the engine and let the system cool. Remove the radiator cap only after the coolant is cool .(17)

For cooling system with an overflow tank, the coolant can usually be checked at the tank without removal of the radiator cap. See manufacturer's instructions.


17  
WRONG



18  
WRONG

### Avoid Fire And Explosion Hazards

Stop the engine and shut off electrical equipment while filling the fuel tank. Use extra caution when fueling a hot engine. Always ground the fuel nozzle against the filler neck to avoid sparks.

 **Warning :** Never smoke while handling fuel or working on the fuel system. The fumes in an empty fuel container are explosive. Never cut or weld on fuel lines, tanks or containers.

Handle all solvents and dry chemicals according to procedures identified on manufacturer's containers. Work in a well ventilated area.

Remove all trash or debris from the machine. Make sure that oily rags or other flammable material are not stored on the machine.

Check for fuel, oil or hydraulic fluid leaks. Stop the leaks and clean the machine before operate it.

Ether is flammable. Do not smoke when using ether. Always follow the instructions on the ether can and in the manufacturer's manual(s) for your machine. Do not use ether if the engine is equipped with a glow plug or other type of preheater.

Always use a nonflammable solvent when you clean parts. Do not use gasoline, diesel fuel or other flammable fluids. (18)

Store all flammable fluids and materials away from your work area.

Know where fire extinguishers are kept -how they operate- and for what type of fire!

Check readiness of fire suppression systems and fire detectors. (if so equipped.)



## Perform maintenance safely

### Complete Service And Repairs Before Machine Is Released

Tighten all bolts, fittings, connections to torques specified by the manufacturer.

Install all guards, covers, and shields after servicing. Replace or repair any damaged ones. Refill and recharge pressure systems only with manufacturer approved or recommended fluids.

Start the engine and check for leaks.

Operate all controls to make sure machine is functioning properly.

Road test machine if necessary.

After testing, shut down, check the work you performed (any missing cotter pins, washers, locknuts, etc.)

Recheck all fluid levels before releasing machine for operation.

All parts should be inspected during repair and replaced if worn, cracked or damaged. Excessively worn or damaged parts can fail and cause injury or death. Replace any damaged or illegible decals.

## A final word to the user

You have just finished reading the BAWOO agricultural tractor safety manual. It is impossible to cover every hazardous situation you may encounter. But, your knowledge of these safety precautions and your adherence to the basic rules of safety will help build good judgment in all situations. Our objective is to help you develop good safety habits and make you a better agricultural tractor operator.



**Remember! safety is your business and your responsibility.**