

ATBH15

TOABLE BACKHOE

Instruction manual



Read the instruction manual carefully before using the appliance and follow all given instructions. Save the instructions for further reference.



Weifang Fred Machinery Co., Ltd

Junbukou Industrial Estate, Weicheng District, Weifang, China

Tel. +86 536 812280 sales@fredmachinery.com www.fredmachinery.com

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INTRODUCTION

Congratulations for choosing this high-quality WPMC product! We hope it will be of great help to you. Remember to read the instruction manual before using the machine for the first time in order to ensure safe usage. If you have any doubt or problems, please contact your dealer or the importer. We wish you safe and pleasant work with this machine!

SAFETY INSTRUCTIONS

READ THESE INSTRUCTIONS CAREFULLY AND NOTE THE SAFETY INSTRUCTIONS AND WARNINGS. USE THE MACHINE CORRECTLY AND WITH CARE FOR THE PURPOSE FOR WHICH IT IS INTENDED. FAILURE TO DO SO MAY CAUSE DAMAGE TO PROPERTY OR SERIOUS PERSONAL INJURY. KEEP THIS INSTRUCTION MANUAL SAFE FOR FUTURE USE.

KEEP WORK AREA CLEAN.

Cluttered areas and benches invite accidents.

CONSIDER WORK AREA ENVIRONMENT.

Keep work area well lit. Do not use the machine near the presence of flammable liquids, gases, powders or dust.

KEEP CHILDREN AWAY.

Do not let visitors touch the machine. All visitors should be kept away from work area.

DO NOT FORCE THE MACHINE.

It will do the job better and safer at the rate for which it was intended.

USE THE RIGHT MACHINE.

Do not force small machines to do the job of a heavy duty machine. Do not use machines for purposes not intended.

DRESS PROPERLY.

Do not wear loose clothing or jewellery; they can be caught in moving parts. Rubber gloves and non-skid footwear are recommended when working outdoors. Long hair should be tied up.

ALWAYS WEAR EYE AND EAR PROTECTION.

Wear safety glasses, safety footwear, approved head protection and protective clothing at all times when using the backhoe. Also wear a respirator or a dust mask if the operation is dusty.

KEEP GUARDS AND SAFETY DEVICES IN PLACE AND IN GOOD WORKING ORDER.

Do not use the machine without guards or safety devices, if such exist.

DO NOT OVERREACH.

Keep proper footing and balance at all times. This enables better control of the machine in unexpected situations.

MAINTAIN TOOLS AND MACHINES WITH CARE.

Follow instructions for lubrication and changing accessories. Keep handles dry, clean and free from oil and grease.

REMOVE ADJUSTING KEYS AND WRENCHES.

Form the habit of checking to see that keys and adjusting wrenches are removed from the machine before turning it on.

ALWAYS STAY ALERT AND WATCH WHAT YOU ARE DOING.

Use common sense when operating the machine. Do not use the machine while you are tired, sick or under the influence of alcohol, drugs, medication or other substances that could affect your ability to react.

CHECK THE MACHINE FOR DAMAGES.

If you notice any damages in the machine, in its guards or other parts, do not use it until it has been repaired in an authorised service centre. Check for alignment of moving parts, free running of moving parts, breakage of parts, mounting and any other conditions that can affect the machine operation. Check the fastening of all parts and anything else that may affect the operation of the machine. Damaged parts should be properly repaired or replaced by an authorised service centre unless otherwise indicated in this instruction manual. Have defective switches replaced by an authorised service centre. Do not use the machine if the switch does not turn it on and off.

USE ONLY ORIGINAL SPARE PARTS AND ACCESSORIES.

The use of any other spare parts or accessories than original parts may cause a risk of personal injury.

REPAIRS SHOULD ONLY BE CARRIED OUT BY AN AUTHORISED SERVICE CENTRE USING ONLY ORIGINAL SPARE PARTS, OTHERWISE THIS MAY RESULT IN CONSIDERABLE DANGER TO THE USER.

SPECIAL SAFETY INSTRUCTIONS

- **Contact your local building authority before digging to locate buried cables before digging. Buried utility lines may not be marked and, if struck, can cause SERIOUS PERSONAL INJURY or DEATH.**
- **Check all fluid levels before each use!**
- **Grease all fittings before operating!**
- This backhoe should only be used for trenching. Do not use it for any other purpose.
- Never alter the backhoe or any part of its manufactured design.
- Use only accessories that are recommended by the manufacturer for your model. Accessories that may be suitable for one model may become hazardous when used on another model.
- Keep the machine, engine, and surrounding area clean at all times.
- Use the machine, accessories, etc., in accordance with these instructions and in the manner intended for the particular type of machine, taking into account the working conditions and the work to be performed. Also take into account the working conditions and the proper way of working. Use of the machine for operations different from those intended could result in a hazardous situation.

- Do not allow anyone to operate the machine who has not read the instruction manual or has not been instructed on the safe operation of the machine.
- Never allow children or untrained persons to operate the machine.
- Never allow anyone to ride on the backhoe while towing.
- Do not carry any cargo on the backhoe.
- Keep the operator zone and adjacent area clear for safe trenching. Use extreme caution when operating near structures or utility lines, or when other workers are present. Do not straddle the trench with the backhoe. Move the backhoe backward and away from the trench as you dig.
- The warnings, cautions and instructions discussed in this manual cannot cover all possible conditions and situations that may occur. It must be understood by the operator that common sense and caution are factors which cannot be built into this product, but must be supplied by the operator.

Personal safety

Always wear appropriate protective equipment and clothing when assembling, handling or operating the backhoe: These include:

- safety shoes or heavy boots
- safety goggles and approved head protection
- thick work gloves and dust mask or respirator
- Hearing protectors: The machine can produce high noise levels. Prolonged exposure to noise levels above 85 dBA can cause hearing impairment.
- People with pacemakers should consult their physician before use. Electromagnetic fields in close proximity to a heart pacemaker could cause pacemaker interference or pacemaker failure.
- Keep all spectators at least 6 m from the machine during operation. Do not let anyone go under any part of the machine.
- Do not leave the machine unattended when it is running. Switch off the machine before leaving the work area.
- Keep hands and feet away from moving parts.
- Always wear the seat belt when operating the backhoe.
- Do not reach over or across the machine while operating.
- Use this machine with both hands only. Using the machine with only one hand can easily result in loss of control.
- Hold the recoil starter handle during the entire start-up stroke to prevent it from hitting anything or anyone.

FIRE HAZARD AND HOT PARTS!

- If the backhoe is used near a forest, bush or grass covered land, check forest and grass fire warnings and make sure you comply with applicable local regulations. Always keep appropriate fire-fighting equipment nearby.
- Do not operate in explosive atmospheres, such as in the presence of flammable liquids, gases, or dust. Gasoline-powered engines may ignite the dust or fumes.
- Do not fill fuel tank while engine is running. Do not operate if gasoline has been spilled. Clean spilled gasoline before starting engine.
- Do not touch the engine during use. Let the engine cool down after use.
- Never store fuel or other flammable materials near the engine.
- Parts, especially exhaust system components, get very hot during use. Stay clear of hot parts.
- Do not smoke, or allow sparks, flames, or other sources of ignition around the machine, especially when refuelling.
- Do not cover the engine or machine during operation.

WARNING! FLUID LEAKS!

High fluid pressures are developed in the hydraulic backhoe. Pressurised fluid escaping through a pin hole opening can puncture skin and cause severe INJURY, GANGRENE OR EVEN DEATH. Therefore, the following instructions should be followed at all times:

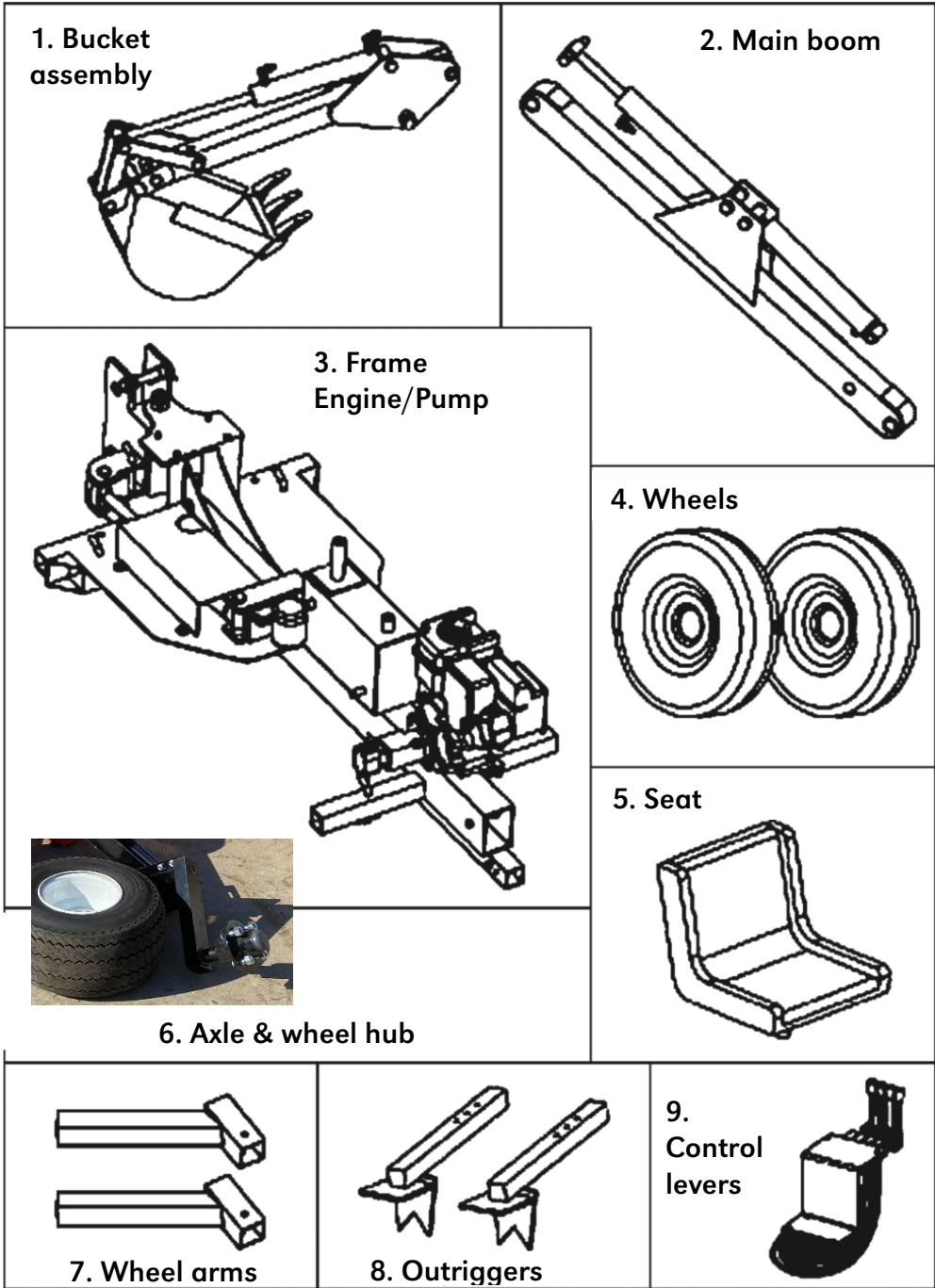
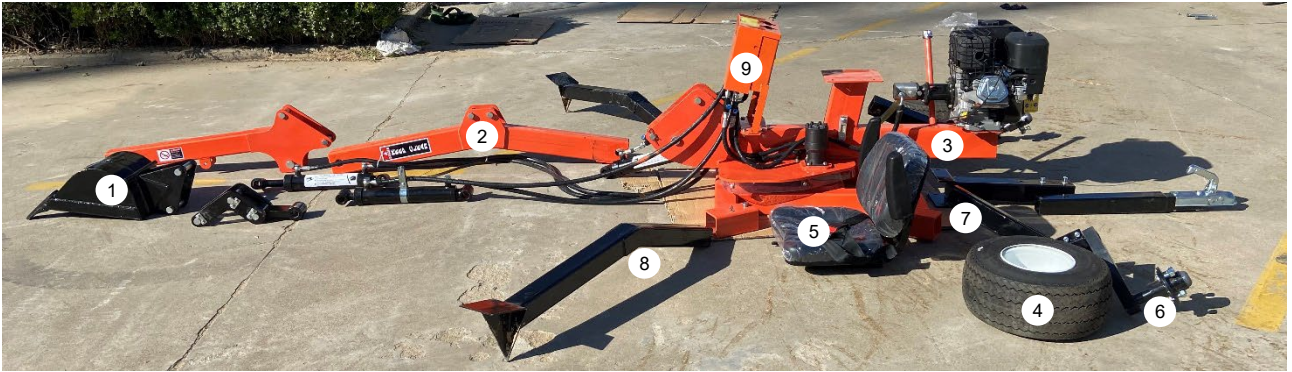
- Do not operate the unit with a leaking fuel system or with frayed, kinked, cracked or damaged hoses, fittings or tubing.
- Stop the engine and relieve hydraulic system pressure before leaving the backhoe unattended or servicing fittings, hoses, tubing or other system components.
- Do not adjust the pressure settings of the pump or control valve.
- Wear appropriate protective gloves and goggles.
- Never use your hands to locate leaks or get close to the leak. Leaks can be located by passing a piece of cardboard or wood over the suspected area. Look for discoloration.
- If injured by escaping fluid, see a doctor immediately. Oil injected under the skin should be surgically removed. Serious infection, gangrene or even death may follow if proper medical treatment is not administered immediately.
- When spills of fuel or oil occur, they must be cleaned up immediately. Dispose of fluids and cleaning materials as per any local regulations.

TECHNICAL DATA

Bucket size	22 cm
Engine power	13.5 hp
Engine speed	3600 rpm
Cylinder working pressure	16 Mpa
Cylinder diameter and stroke	Ø 63 mm x 300 mm
Cylinder quantity	3 pcs
Bucket swivel angle	120°
Max. workload	200 kg
Max. digging depth	200 cm
Max. digging semidiameter	326 cm
Max. load height	170 cm
Wheel size	16"
Hitch coupler	for 50 mm tow ball
Sound pressure level, LpA	95 dB(A), K = 4 dB
Recommended hydraulic oil	ISO VG32
Hydraulic oil capacity	14 l
Recommended engine oil	SAE 10W-30
Fuel	Small engine gasoline for 4-stroke engines prevents impurities in the carburettor (or max. 10% ethanol 98E5/95E10)
Fuel capacity	6.5 l
Tire pressure	1.5 bar (22 psi)

This product fulfils the requirements of quality class HA 2807.

Components and Controls



ASSEMBLY

Read all safety instructions before installation and operation.

Unpacking: Closely inspect all contents in the shipping carton. It takes two people to unpack and assemble because the backhoe and its parts are large and heavy.

1. Attach the arm

- Attach the main boom (longer) to the frame with a pin and washer and lock with a cotter pin.
- Attach the main boom hydraulic cylinders to the frame with M30 x 115 pin and lock nut.
- Attach the digging arm (shorter) to the main boom with a M40 x 115 pin and lock nut.
- Screw the control levers in place.
- Pull the left control lever to curl the arm in.
- Attach the hydraulic cylinder of the digging arm (shorter).

2. Attach the bucket and its bracket

- Dismantle the bucket bracket by removing the six lock nuts, washers and rectangular washers on the left side of the bracket.
- Attach the right side of the bucket bracket to the arm and hydraulic cylinder. Then attach the left side of the bracket back with the removed nuts and washers.



3. Install the seat

Remove the four nuts from the bottom of the seat and use them to secure the seat to its base.

After reading the following sections, add hydraulic and engine oil and fuel:

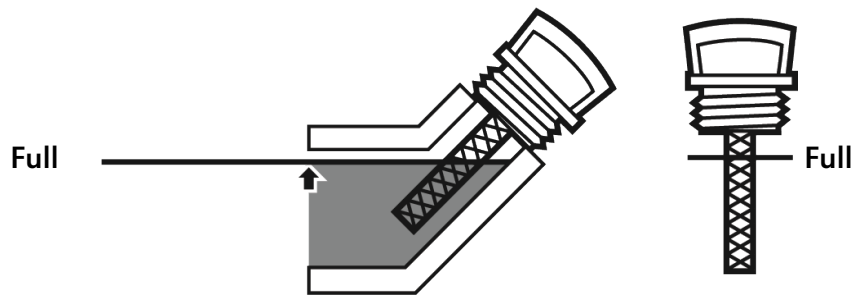
4. Add hydraulic oil

Open the hydraulic oil filler cap behind the seat. Fill the hydraulic oil tank with high quality hydraulic oil recommended in the technical data. Check the oil level in the oil sight window. Close the filler cap securely.



5. Add engine oil

Fill the engine oil to the level shown, check the oil level with the dipstick.



6. Add fuel



- Fill the fuel tank outside, away from the ignition sources. Do not smoke.
- Gasoline fuel and fumes are flammable, and potentially explosive. Use proper fuel storage and handling procedures. Do not store the fuel or other flammable materials nearby. Use an approved fuel container.
- Never fill the fuel tank indoors.
- We recommend primarily small engine gasoline for 4-stroke engines. It prevents impurities in the carburettor and is also suitable for storage.
- Alternatively you can use unleaded gasoline with a minimum octane rating of 98 that has been treated with fuel preservative. Do not use gasoline containing more than 10% ethanol (E85). Add fuel preservative if the machine is not used for long periods of time. Follow fuel stabiliser manufacturer's recommendations for use.
- Do not use gasoline that has been stored in a metal fuel container or a dirty fuel container. It can cause particles to enter the carburettor, affecting engine performance or causing damage.

Fuelling:

- Clean the fuel cap and the area around it.
- Unscrew and remove the fuel cap.
- Remove the strainer and remove any dirt and debris. Replace the strainer.
- Fill the fuel tank approximately 2.5 cm from the filler neck.
- Screw on the fuel tank cap securely.
- Wipe up any spilled fuel and allow excess to evaporate before starting engine.



To prevent fire, do not start the engine while the smell of fuel hangs in the air.

7. Turn on the engine

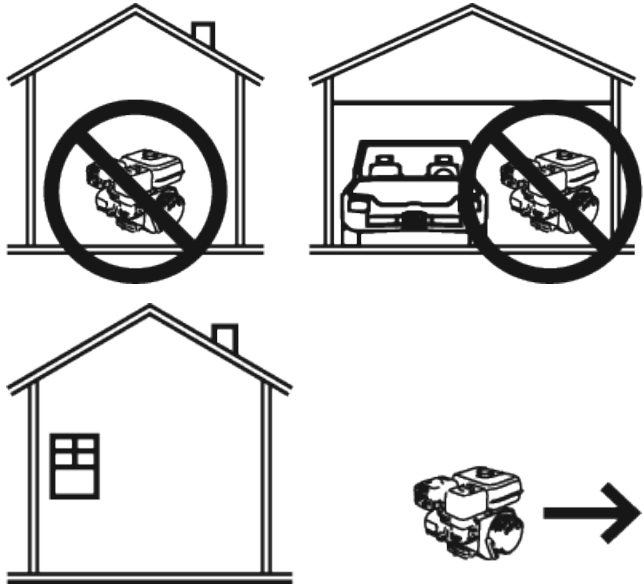


RUNNING AN ENGINE INDOORS CAN KILL YOU IN MINUTES. Never start the engine inside a home or garage, even if doors and windows are open. Only use outside and far away from windows, doors, and vents. Engine exhaust contains carbon monoxide. This is a poison you cannot see or smell.

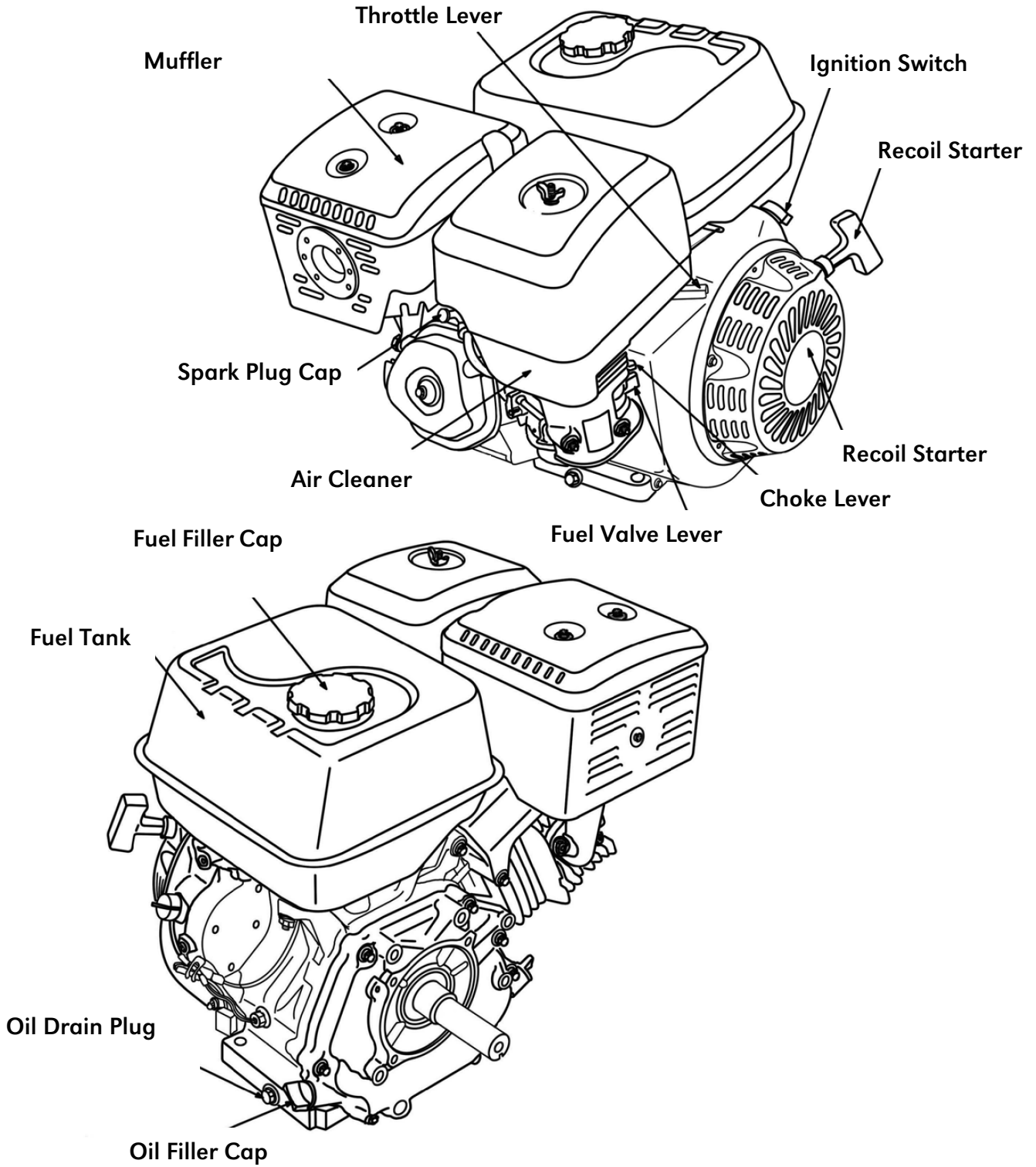
- Before starting the engine, check engine oil level and ensure the engine is filled as described.
- Inspect the engine and machine looking for damaged, loose, and missing parts before set up and starting. If any problems are found, do not use the machine until fixed properly.
- Do not run the engine with too little oil. Engine will not start with low or no engine oil.

Before starting the engine:

- Prepare the machine according to the previous instructions.
- Fill the engine with the correct amount of gasoline and oil recommended in the technical data.
- Read the machine operation section that follows.

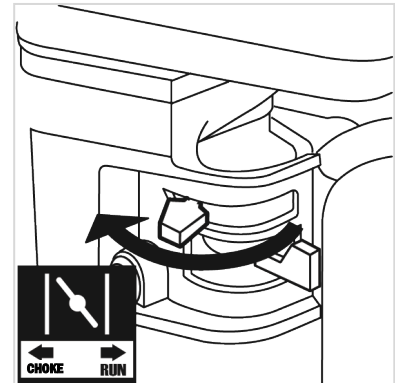
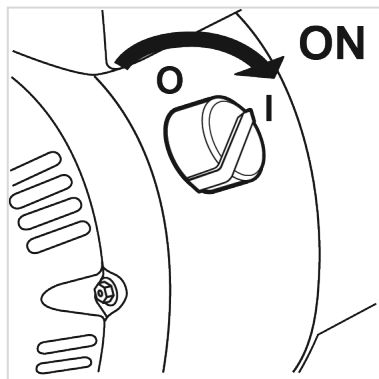
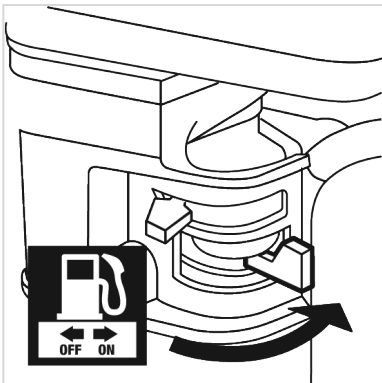


Engine components



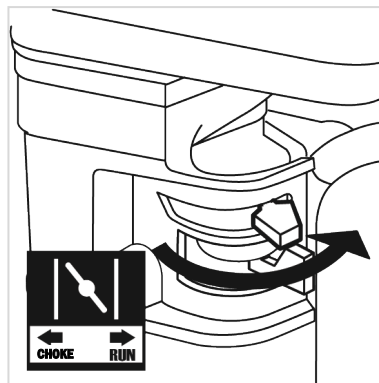
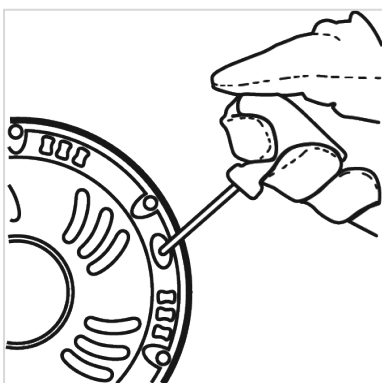
Starting up the engine

- Turn on the ignition switch.
- Open the fuel valve.
- Move choke to CHOKE position.
- If starting a warm engine, set the choke lever in the RUN position.



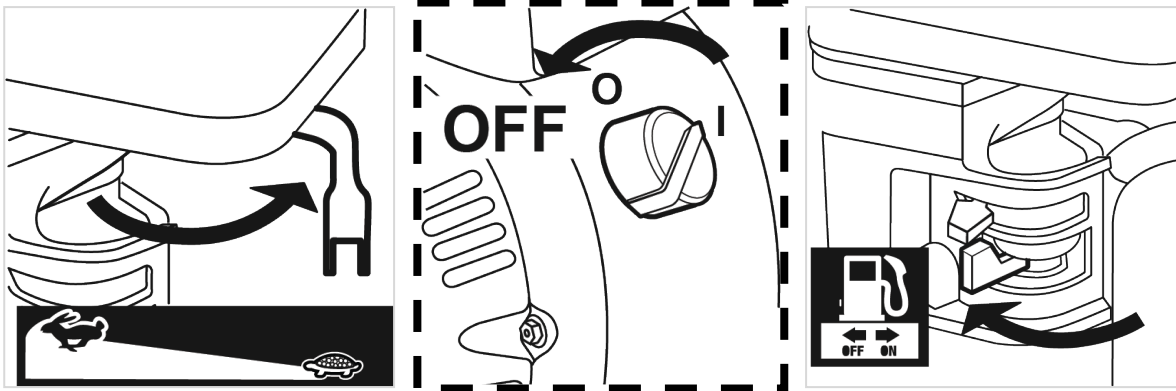
- Grip the starter handle of the engine loosely and pull it slowly several times to allow the gasoline to flow into the engine's carburettor. Then pull the starter handle gently until you can feel resistance. Allow cable to retract fully and then pull it quickly. Repeat until the engine starts.
- **Do not let the starter handle snap back against the engine. Hold it as it recoils so it doesn't hit the engine.**
- If engine does not start, check engine oil level. Engine will not start with low or no engine oil.
- Allow the engine to run for several seconds. If the choke lever is in the CHOKE position, move the choke lever very slowly to the RUN position. Moving the choke lever too fast can stall the engine.
- Slide the throttle or speed control lever 1/3 away from the slow position (turtle symbol) towards the fast position (hare symbol). Adjust as needed.

IMPORTANT: If the engine is cold, let it run unloaded for three minutes after starting.



Stopping the Engine

Turn the throttle lever to the slow position (turtle symbol). Turn off the engine. Close the fuel valve.



8. Bleed the cylinders

After adding hydraulic oil and fuel, start the engine and extend and retract each hydraulic cylinder once using the control levers to fill the cylinders with oil. Then refill hydraulic oil to between red and black lines in the oil sight window for the second time.

- Remove the transport pin, disengage the safety latch and loosen the hydraulic oil filler cap.
- Start the engine and run at slow idle.
- Extend and retract each hydraulic cylinder once using the control levers to fill the cylinders with oil. Push and pull the left lever back and forth 6–8 times to remove air from the hydraulic lines. While moving the lever, watch the clear hose on the right side under the control levers. If there is a stream of bubbles, bleeding has been carried out successfully. But if foamy solution is moving through the tube, air is still in the oil. Keep pushing and pulling the lever until the stream of bubbles appears. When bleeding is done with the left lever, repeat the same procedure with the right lever. Watch the oil level at the same time. Once the bleeding is completed, fill the tank up to the black line on the oil sight window in the hydraulic tank.
- Screw the oil filler cap back on.

9. Attach the wheel arms and outriggers

- Place the wheels on the four bolts on each wheel hub and secure with four nuts per wheel. The lug nuts must be snug.
- Inflate the tires to the recommended pressure.
- Lift the front end of the frame by lowering the bucket to the ground.
- Fit the wheel arms to the front end of the frame and secure with pins and cotter pins.
- Secure the outriggers to the vertical position for towing.

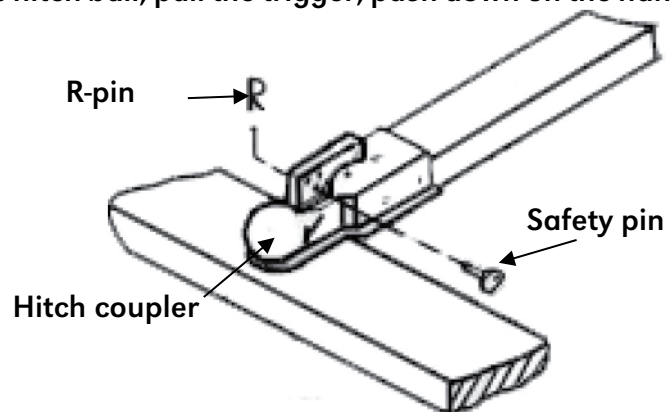
10. Attach the towing bar and hitch coupler

- Attach the towing bar to the two holes in the frame end with bolts, washers and nuts.
- Secure the hitch coupler to the towing bar with bolts, washers and nuts.

TOWING THE BACKHOE

Connect the backhoe to the towing vehicle

- When towing the backhoe, the wheels must be at the front end of the backhoe and the outriggers in the upright towing position. If necessary, change the wheels to the front end as described in "Setting up to digging position", but in reverse order.
- The hitch coupler must be properly secured to the hitch ball of the towing vehicle. After assembly and attachment, pull up and down on the hitch coupler to make sure the hitch ball is fitting snugly in the hitch coupler. There must be no play between the hitch ball and hitch coupler. If there is play, tighten the adjustment nut until no play is present. If the adjustment nut is too tight, the hitch coupler will not lock.
- If the coupler is not secured properly, the hitch coupler could come loose while the backhoe is in motion, possibly causing property damage, **SERIOUS PERSONAL INJURY**, or **DEATH**.
- Make sure that the hitch ball of the towing vehicle fits into the hitch coupler of the backhoe. The hitch coupler will only accept a 50 mm hitch ball. Follow all of the safety warnings for towing in your vehicle's manual.
- To reduce friction between the hitch ball and hitch coupler, apply a layer of heavy-weight grease over the hitch ball.
- Temporarily remove the R pin and safety pin. Then, pull up on the trigger and lift up on the handle.
- Place the hitch coupler over the vehicle's hitch ball, pull the trigger, push down on the handle, and release the trigger, making sure it locks in the slot.
- Pull up and down on the coupler to make sure the hitch ball is fitting snugly in the coupler. There must be no play between the hitch ball and hitch coupler. If there is play, tighten the adjustment nut until no play is present. However, if the adjustment nut is too tight, the handle will not lock.



Move the backhoe to the work area

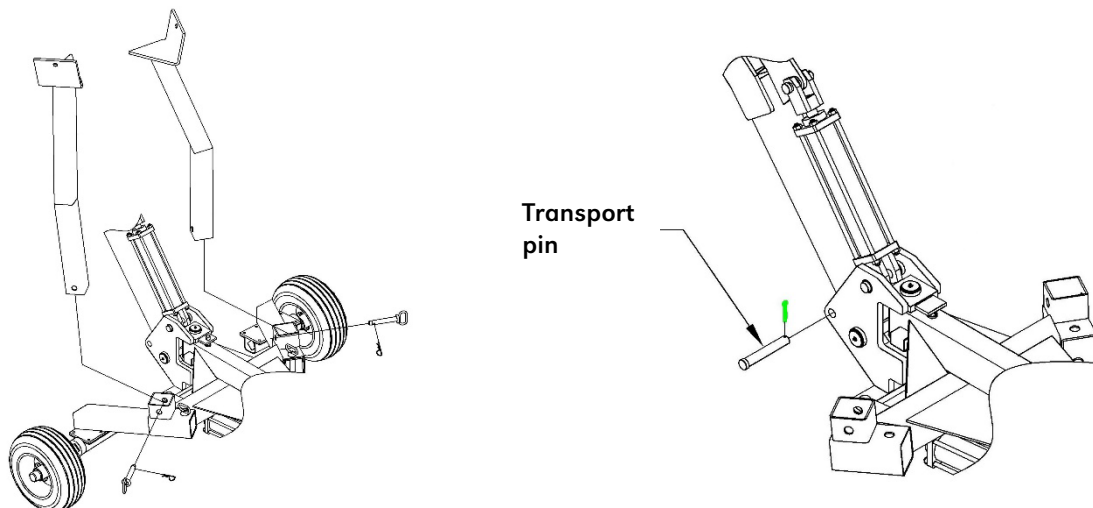
- While connected to your towing vehicle, back your backhoe to where you want to use it.
- Only use a suitable means of transport and lifting devices with sufficient weight bearing capacity when transporting the machine.
- Comply with applicable traffic laws.
- Never allow anyone to sit or ride on the backhoe. This can result in serious personal injury.
- The backhoe is not a trailer! Do not carry any cargo on the backhoe. It can fall off and endanger you and other drivers.
- Make sure the backhoe is securely attached to the towing vehicle before towing. The safety chains should be hooked onto the vehicle with sufficient slack for turning allowance. Always secure the trailer hitch with a locking bolt.
- Secure the boom up with the transport pin. With the engine off, slightly lower the boom to lock it in place and prevent it from swinging. Also, curl the bucket and arm in to achieve a compact towing configuration.
- Be sure the outriggers are secured in the vertical position before towing. Do not tow with outriggers down.
- Be aware of the added length of the backhoe when you are towing it behind a vehicle. Be careful not to jack-knife the backhoe when backing the vehicle.

- Towing speed should be adjusted to driving conditions. Use a “Slow moving vehicle” sign when driving on roads. Take extra care when driving on rough terrain.
- Ensure that the backhoe is on a flat and well-ventilated surface. The base must not be tilted by more than 10°. Block the machine as required to prevent unintended movement.
- Do not operate the backhoe near soft-bottomed slopes or in submerged areas, as the soil may give way and may not carry the weight of the machine.
- Grease wheel bearings annually and always after long trips.

SETTING UP TO DIGGING POSITION

After towing, reposition the wheels and outriggers before digging.

1. Remove the outriggers from the vertical position and set them aside.
2. Remove the transport pin. Keep it to re-insert for towing.
3. Start the engine and set it to medium idle. Extend the boom forward and lower the flat edge of the bucket against a hard surface to the front right. Push the right lever until the right side of the backhoe is lifted off the ground.
4. Remove the right-hand wheel. Fit an outrigger in place of the wheel and secure with a pin and cotter.
5. Pull the right lever to raise the boom and use the left lever to turn the boom to the front left. Push the right lever until the left side of the backhoe is lifted off the ground.
6. Remove the left wheel and fit an outrigger in its place with a pin and cotter.
7. Fit the wheel (from the front right) to the left rear corner of the frame and secure with a pin and cotter.
8. Raise the boom and lower the bucket again to the front right until the right side of the backhoe is lifted off the ground.
9. Fit the wheel (from the front left) in the right rear corner of the frame and secure with a pin and cotter.
10. Open the hitch coupler. Use the left lever to turn the boom next to the towing vehicle, and use the right lever to lower the flat edge of the bucket against the ground so that the towing bar is lifted off the hitch ball.
11. Drive the towing vehicle away from the backhoe.
12. Use the left lever to turn the boom out of the way and remove the tow bar.
13. Before digging, make sure that the pins and cotters are secure.



MOVING THE BACKHOE

WARNING! It is possible to move the backhoe under its own power when it is in digging mode. This movement should be done with extra caution. Do not attempt these manoeuvres until fully comfortable with the controls and only when the backhoe is away from hazards.

Do not straddle the backhoe over a trench. It could fall into the excavation site and cause serious injury. Move the backhoe backwards and away from the trench as you dig.

Moving backwards

- Make sure the backhoe is in digging mode.
- Curl the arm in and lower the boom to rest bucket teeth into the ground. The bucket should rest in the centre of the work area, approximately 60 cm from the front of the backhoe frame.
- Raise the unit off its outriggers by lowering the boom.
- Once the outriggers are clear of the ground, rotate the arm out. This will cause the backhoe to move backwards.
- Raise the boom until weight is on the outriggers again.

Moving forward

- Make sure the backhoe is in digging mode.
- Rotate the arm out and lower the boom to rest bucket teeth into the ground. The bucket should rest in the centre of the work area.
- Raise the unit off its outriggers by lowering the boom.
- Once the outriggers are off the ground, curl the digging arm in. This will cause the backhoe to move forward.
- Raise the boom until weight is on the outriggers again.

Moving sideways

- Make sure the backhoe is in digging mode.
- Raise and swing the boom to the side where the new work area is located.
- Lower the boom to rest bucket teeth into the ground and raise outriggers off the ground.
- Swing the boom in the direction opposite to the desired movement of the machine.
- Once the unit is facing the new work area, raise the boom until weight is on the outriggers again.

OPERATION

Contact your local building authority before digging to locate buried cables before digging and for a digging permit. Buried utility lines may not be marked and, if struck, can cause SERIOUS PERSONAL INJURY or DEATH. Use extreme caution when overhead or buried utility lines are present.

WARNING! Before using the machine, the operator must fasten the seat belt.

- Read the manual carefully before using the backhoe. Failure to follow these instructions may result in serious injury to the operator or bystanders. The machine owner should instruct all operators in safe backhoe operation.
- Before digging, make sure the backhoe is set up in digging mode following the instructions.
- Be sure the terrain allows wheels and outriggers to make firm contact with ground.

- Do not straddle the backhoe over a trench. It could fall into the excavation site and cause serious injury. Move the backhoe backwards and away from the trench as you dig.
- Before digging, take the time to learn the control levers and the function each performs. Learn how they work in conjunction with each other. A description of what each control lever does is illustrated on the valve mounting plate. Practice using the control levers before digging for safer and more efficient trenching.
- Never start or run the engine in an enclosed room as exhaust fumes from the engine contain lethal carbon monoxide – risk of carbon monoxide poisoning! Operate the engine only in a well-ventilated outdoor area. Never leave the machine unattended with the engine running.
- Always operate the backhoe with all safety equipment in place and all controls properly adjusted.
- Always operate the backhoe at the manufacturer's recommended speed. Always be ready to stop the engine.
- Always keep hands, feet and all other body parts clear of moving parts.
- Do not climb over or sit or stand on the boom – risk of serious injury!

Always check engine oil level before each use!

Before starting, always check that there is enough oil in the engine crankcase. If the engine oil level is too low, the engine will not start or may stall.

- Make sure the engine is switched off and level.
- Close the fuel valve.
- Clean the fuel cap and the area around it. Remove the dipstick by turning it counterclockwise, and wipe it off with a clean, lint free rag.
- Reinsert the dipstick without threading it in and remove it to check the oil level.
- If the oil level is at or below the low mark add the recommended type of high quality engine oil until the oil level is at the full level.
- Thread the dipstick back in clockwise.

Digging

- Always operate the backhoe from the operator seat with hands positioned near controls and feet flat on the area provided.
- Be thoroughly familiar with all controls and with the proper use of them.
- Position the bucket with teeth perpendicular to the ground.
- Extend the arm out. Then, lower the boom until the bucket lays on the ground. Do not make the outriggers lift off the ground.
- Curl the arm or bucket to scoop earth. Should either of these movements make the outriggers move, raise the boom slightly to make the outriggers dig in to provide support.
- When the bucket has scooped the earth, curl it all the way in. Raise and rotate the boom to the side, and empty the bucket.
- Repeat the previous steps for each scoop.

Refuelling between uses

Switch off the engine and wait for it to cool before adding fuel. Never refuel the machine when the engine is hot.

MAINTENANCE

- Follow the engine and machine maintenance schedule.
- Follow all service instructions in this manual. The engine may fail critically if not serviced properly.
- Keep all safety guards in place and in proper working condition. Safety guards include muffler, air cleaner, mechanical guards, and heat shields.
- Do not alter or adjust any part of the machine or its engine that is sealed by the manufacturer or distributor. Only a qualified service technician may adjust parts that may increase or decrease governed engine speed.
- Do not allow the hydraulic hose to come in contact with any hot part of the unit. The hose might get damaged, possibly causing it to burst or leak under high pressure.
- Maintain labels and nameplates on the equipment. These carry important information. If unreadable or missing, contact manufacturer for a replacement.

PREVENT SERIOUS INJURY FROM MACHINE FAILURE:

- Do not use a damaged machine. If abnormal noise, vibration, or excess smoking occurs, have the problem corrected before further use. Do not attempt any service or maintenance procedures not explained in this manual or any procedures that you are uncertain about your ability to perform safely or correctly.

Precautions before inspection, maintenance and cleaning

TO PREVENT SERIOUS INJURY FROM ACCIDENTAL STARTING

- Wear approved safety goggles, protective gloves and dust mask or respirator during service.
- Before performing any maintenance on the backhoe, it must be placed in maintenance mode according to following instructions:
- Turn off the engine. Allow the engine to cool down completely.
- Move the control levers back and forth with the engine OFF to relieve hydraulic pressure.
- Rest the boom on the ground.
- Unplug the spark plug wire.

Regular basic maintenance

- Clean all debris from the engine cylinder, cylinder head fins, blower housing rotating screen and muffler areas. Clean also all moving parts.
- Check that all nuts and bolts are tight.
- Inspect all hoses and fittings for wear and leaks. Perform all inspections and replace all damaged and worn parts prior to starting the engine.
- Check that all guards, shields and safety features are in place and in perfect working condition.
- Inspect the suction filter.

Cleaning, Maintenance, and Lubrication Schedule

Note: This maintenance schedule is intended solely as a general guide. If performance decreases or if the machine operates unusually, check all systems immediately. The maintenance needs will differ depending on factors such as duty cycle, temperature, air quality, fuel quality, and other factors.

Note: The following procedures are in addition to the regular checks and maintenance explained as part of the regular operation of the engine and machine.

What to check	When?	How?
Wheels	Before each towing	Check pressure. The pressure rating is listed on the wheel.
Hoses	Before each use	Inspect for wear and leaks. Replace all worn or damaged hoses before starting the engine.
Hydraulic fittings	Before each use	Inspect for wear and leaks. Replace all damaged fittings before starting the engine.
Nuts and bolts	Before each use	Check for loose bolts.
Hydraulic oil	Before each use	Check the oil level and add oil as needed. Replace annually or when it appears dark or cloudy.
Boom pins	Before each use	Grease.
Suction filter	Annually	Replace.
Wheel bearings	Annually	Repack with grease.

Procedure	Before each use	After 20 hours breaking-in period	Monthly / every 25 hr.	Every 3 months mo. / 50 hr.	Every 6 mo. / 100 hr.	Yearly / every 300 hr.	As necessary
Brush off outside of engine	x	x	x	x	x	x	x
Check engine oil level	x	x	x	x	x	x	x
Check air cleaner	x			x	x	x	x
Check deposit cup	x				x	x	x
Change engine oil		x	x	x	x	x	x
Clean/replace air filter			x*	x*	x*	x*	x*
Check and clean spark plug			x	x	x	x	x
Clean water filters			x	x	x	x	x
Replace fuel Filter				x	x	x	x
Replace spark plug					x	x	x
1. Clean fuel tank, strainer and carburettor 2. Clean carbon build-up from combustion chamber						x**	x**
Grease the moving points of the boom (see Fig. K: Lubrication points)							x
Replace fuel line if necessary							x**

*Service more frequently when used in dusty areas.

**These items should be serviced by an authorised service centre.

Changing hydraulic oil

Change the hydraulic oil every 12 to 18 months.

- Remove the drain plug on the bottom part of the frame below the engine.
- Drain old hydraulic oil and tighten the filter back onto the tank.
- Replace the drain plug and tighten it.
- Recycle used oil.
- Screw off the oil screw behind the seat and fill the tank slowly with recommended hydraulic oil while checking the oil sight window. Once the tank is full, stop adding hydraulic oil and screw the oil screw back on.
- After changing the oil, bleed the cylinders according to the instructions in the "Bleed the cylinders" section.

Replacing engine oil and filter

WARNING! Hot hydraulic oil can cause burns. Wait for the engine to cool before changing oil.

- Make sure the engine is switched off and level.
- Close the fuel valve.
- Place a drain pan (not included) underneath the crankcase's drain plug.
- Open the drain plug and tilt the crankcase slightly to help drain the oil out.
- Recycle used oil to an appropriate recycling point.
- Add recommended engine oil until the oil tank is full. Check the oil level on the dipstick.

Air filter element maintenance

- Remove the air filter cover and the air filter elements and check for dirt. Clean filter;
- Paper filter elements: In a well-ventilated area away from bystanders, use pressurized air to blow dust out of the air filter. If this does not get the filter clean, replace it.
- Foam filter elements: Wash the element in warm water and mild detergent several times. Rinse. Squeeze out excess water and allow it to dry completely. Soak the filter in lightweight oil briefly, then squeeze out the excess oil.
- Install the cleaned filter. Secure the air cleaner cover before use.

STORAGE

When the equipment is to remain idle for longer than 30 days, prepare the engine for storage as follows:

Cleaning

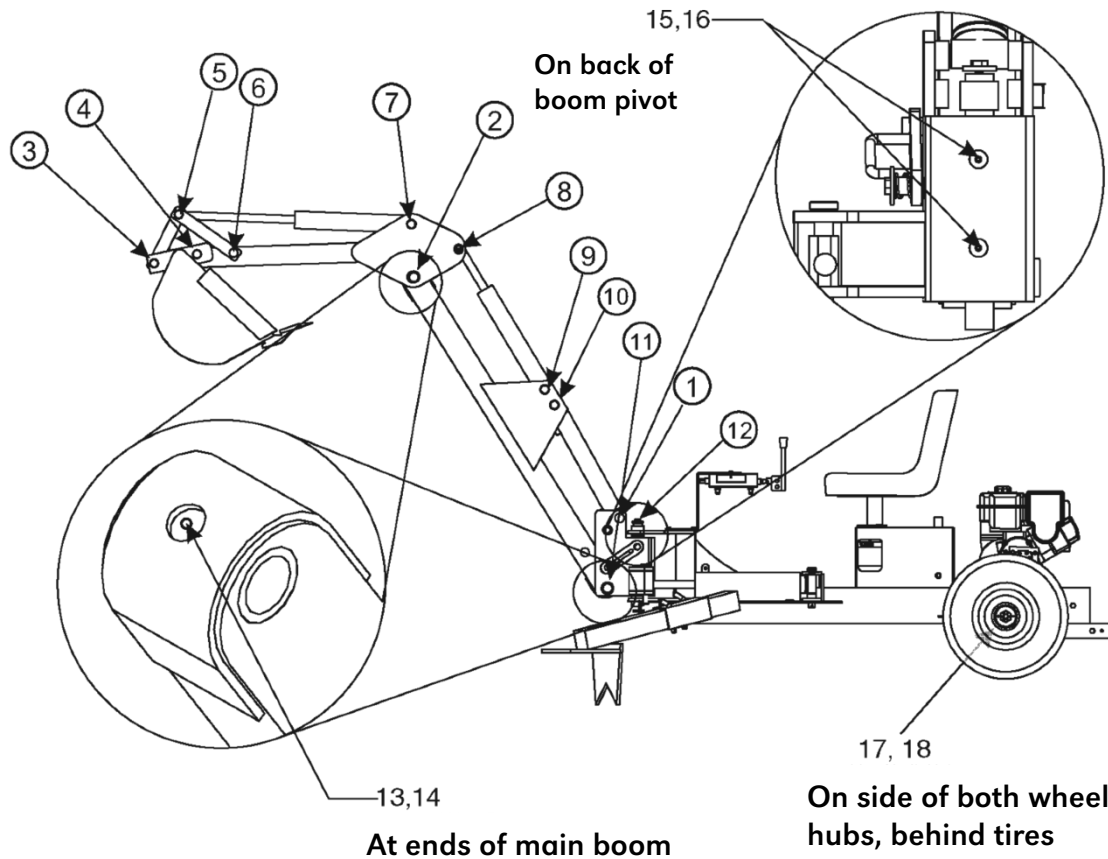
- Wait for engine to cool, then clean engine with dry cloth. **NOTICE:** Do not clean the engine using water. The water will gradually enter the engine and cause rust damage.
- Apply a thin coat of rust preventive oil to all metal parts.

Fuel

- It is recommended to use small engine gasoline for four-stroke engines as it does not cause resin formation. Run the gasoline through the machine last before placing it in storage, so that there is gasoline also in the carburettor.
- If using 98E5/95E10 petrol, empty the fuel tank or add a preservative to the fuel to prevent resin formation.

- **WARNING:** Fill tank in a well-ventilated area away from ignition sources. If the engine is hot from use, shut the engine off and wait for it to cool before adding fuel. Do not smoke.
- If you add fuel stabiliser, run the engine for five minutes.
- Turn off the engine.
- Move the control levers back and forth with the engine OFF to relieve hydraulic pressure.

Lubrication points



Storage space:

Allow the engine to cool before storing in any enclosure. Cover and store in a dry, level, well-ventilated area out of reach of children. Never store the backhoe where gasoline fumes might reach an open flame or spark. Storage area should also be away from ignition sources, such as water heaters, clothes dryers, and furnaces.

Starting engine during or after storage:

During extended storage periods the engine must be started every 3 months and allowed to run for 15–20 minutes.

If the engine is fuelled with other than small engine gasoline:

Before starting the engine during or after storage, keep in mind that untreated 98E5/95E10 gasoline will deteriorate quickly. Drain the fuel tank and change to fresh fuel if untreated gasoline has been sitting for a month, if treated gasoline has been sitting beyond the fuel stabiliser’s recommended time period, or if the engine does not start. For engine starting instructions refer to “Starting up the engine”.

TROUBLESHOOTING

Problem	
Cylinder rod will not move	Solution: A, C, E, O, Q, R, U, V
Slow cylinder shaft speed when extending or retracting	Solution: E, J, L, O, R, S, T, W
Backhoe will not dig or digs extremely slowly	Solution: D, H, J, M, R, S, T, W
Engine stalls during digging motion	Solution: K, N, P
Engine will not turn or stalls under low load conditions	Solution: B, F, K, Q, V
Leaking pump shaft seal	Solution: A, B, E, G, I
The backhoe does not rotate.	Solution: X, O, K, E, A

Cause	Solution
A – Broken driveshaft on pump	Return pump for authorized repair.
B – Engine/pump misalignment	Correct the engine/pump alignment.
C – Loose shaft coupling	Correct the engine/pump alignment.
D – Small gear section damaged	Points D to H: Return pump for authorized repair.
E – Gear sections damaged	
F – Frozen or seized pump	
G – Poorly positioned shaft seal	
H – Pump check valve leaking	
I – Plugged oil breather	Make sure the reservoir is properly vented.
J – Excessive pump inlet vacuum	Clean inlet hoses and free them of any leaks.
K – Low horsepower/weak engine	Have engine serviced at an authorised service centre.
L – Slow engine speed	Have engine serviced at an authorised service centre.
M – Low relief valve setting	Adjust while using a pressure gauge and with assistance of a professional
N – High relief valve setting	Adjust while using a pressure gauge and with assistance of a professional
O – Damaged relief valve	Return directional valve for authorised repair
P – High unloading valve setting	Adjust while using a pressure gauge and with assistance of a professional
Q – Hydraulic lines blocked	Flush and clean the hydraulic system
R – Too little oil in the pump	Add oil to the reservoir
S – Air in the hydraulic oil	Clean reservoir and add oil
T – Control valve leaking internally	Let an authorised service centre reset the directional valve
U – Damaged control valve	Let an authorised service centre reset the directional valve
V – Blocked control valve	Flush and clean the hydraulic system
W – Internally damaged cylinder	Return cylinder for authorised repair.
X – Internal damage to the engine	Take the engine to an authorised service centre for repair or replacement.

If the engine will not start, see below table for possible causes and solutions:

Problem in	Cause	Solution
Fuel	<ol style="list-style-type: none"> 1. No fuel in tank or fuel valve closed 2. Choke not in CHOKE position, cold engine. 3. Gasoline with more than 10% ethanol used (E15, E20, E85, etc.) 4. Low quality or deteriorated, old gasoline 5. There is no fuel in the carburettor. 6. Dirty fuel passageways 7. Too much fuel in chamber This can be caused by the carburettor needle sticking. 8. Clogged fuel filter 	<ol style="list-style-type: none"> 1. Fill the fuel tank with new small engine gasoline and open the fuel valve. 2. Move Choke to CHOKE position. 3. Clean out ethanol rich gasoline from fuel system. Replace components damaged by ethanol. Use small engine gasoline for four-stroke engines. 4. Use fresh small engine gasoline for four-stroke engines. 5. Press the primer 3-5 times. 6. Clean out passageways using fuel additive. Heavy deposits may require further cleaning. 7. Turn choke to RUN position. Remove spark plug and pull the start handle several times to air out the chamber. Reinstall spark plug and set Choke to CHOKE position. 8. Replace fuel filter. <p>DO NOT USE GASOLINE WITH MORE THAN 10 % ETHANOL (E15, E20, E85, ETC.).</p>
Ignition (spark)	<ol style="list-style-type: none"> 1. Spark plug is defective or damaged. 2. Incorrect spark timing or faulty ignition system 	<ol style="list-style-type: none"> 1. Replace the spark plug. 2. Have a qualified technician check/repair the ignition system.
Engine cylinder	<ol style="list-style-type: none"> 1. Cylinder not lubricated Problem after long storage periods 2. Loose or broken spark plug (Hissing noise will occur when trying to start) 3. Loose cylinder head or damaged head gasket. (Hissing noise will occur when trying to start) 4. Engine valves or tappets misadjusted or stuck 	<ol style="list-style-type: none"> 1. Pour tablespoon of oil into spark plug hole. Crank engine a few times and try to start again. 2. Tighten spark plug. If that does not work, replace spark plug. If the problem persists, it could be a head gasket problem. See the next point. 3. Tighten head. If that does not remedy problem, replace head gasket. Have an authorized service centre adjust/repair valves and tappets.
Engine oil	<ol style="list-style-type: none"> 1. Low engine oil. 2. Engine mounted on slope, triggering low oil shutdown. 	<ol style="list-style-type: none"> 1. Fill engine oil to proper level. Check engine oil before every use. 2. Operate engine on level surface. Check engine oil level.