



Mini Trencher

Owner's Manual



⚠ WARNING: Read carefully and understand all ASSEMBLY AND OPERATION INSTRUCTIONS before operating. Failure to follow the safety rules and other basic safety precautions may result in serious personal injury.

Item # 985619

READ & SAVE THESE INSTRUCTIONS

Thank you very much for choosing a NorTrac product!

For future reference, please complete the owner's record below:

Serial Number/Lot Date Code (if applicable): _____

Purchase Date: _____

Save the receipt, warranty, and this manual. It is important that you read the entire manual to become familiar with this product before you begin using it.

This product is designed for certain applications only. Northern Tool and Equipment is not responsible for issues arising from modification or improper use of this product such as an application for which it was not designed. We strongly recommend that this product not be modified and/or used for any application other than that for which it was designed.

For technical questions, please call **1-800-521-0438**.

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Intended Use

Use the Mini Trencher, is easy to dig trenches, landscape, lifting weights, loading and unloading of sand and gravel. The excavator has two hydraulic power systems, one hydraulic power systems for routine operation such as dig, lift; the other hydraulic power systems can provide 8GPM hydraulic flow rate for connecting hydraulic tools. Take it anywhere by ATV, utility vehicle or pickup truck.

Packaging Contents

- Bucket Assembly (1)
- Engine (1)
- Seat (1)

- Main Boom (1)
- Pump (1)
- Leg Assembly (2)

- Frame Assembly (1)
- Tire (2)
- Control Panel (1)

Technical Specifications

Property	Specification
Gas Engine	
Engine Type	Horizontal Single Cylinder 4-stroke, OHV, 15HP, Electrical Start / Recoil Start
Engine Family	ECRPS.3012GA
Displacement	420cc
Cooling System	Forced air cooled
Speed	Idle: 1,740± 50 RPM / Maximum: 3600 RPM
Fuel	1.7 Gallon
Engine Oil	0.29 Gallon
Battery Required	12V
Hydraulic Oil Tank	3.9 Gallon
Excavator	
Tire Inflation	41 PSI
Digging Depth	6.7 Feet
Maximum Digging Reach	8.4 Feet
Single Valve	Rated 16.6 GPM
Pump	Rated 10.3 GPM
Boom Travel	60° Left / Right
Bucket Load Capacity	1.24 Cubic Feet
Hitch Ball size	2" Diameter

Important Safety Information

WARNING

- Read and understand all instructions. Failure to follow all instructions may result in serious injury or property damage.
- The warnings, cautions, and instructions in this manual cannot cover all possible conditions or situations that could occur. Exercise common sense and caution when using this tool. Always be aware of the environment and ensure that the tool is used in a safe and responsible manner.
- Do not allow persons to operate or assemble the product until they have read this manual and have developed a thorough understanding of how it works.
- Do not modify this product in any way. Unauthorized modification may impair the function and/or safety and could affect the life of the product. There are specific applications for which the product was designed.
- Use the right tool for the job. DO NOT attempt to force small equipment to do the work of larger industrial equipment. There are certain applications for which this equipment was designed. This product will be safer and do a better job at the capacity for which it was intended. DO NOT use this equipment for a purpose for which it was not intended.
- Industrial or commercial applications must follow OSHA requirements.
- Do not allow used the Mini Trencher indoor.

WARNING

PROP 65

- This product can expose you to chemicals including lead, which is known to the State of California to cause cancer. For more information, go to www.p65warnings.ca.gov.
- Some dust created by power sanding, sawing, grinding, drilling, and other construction activities contains chemicals known to the state of California to cause cancer, birth defects, or other reproductive harm. Some examples of these chemicals are:
 - - lead from lead-based paints,
 - - crystalline silica from bricks and cement and other masonry products, and
 - - arsenic and chromium from chemically-treated lumber.
- Your risk from these exposures varies depending on how often you do this type of work. To reduce your exposure to these chemicals, work in a well-ventilated area, and work with approved safety equipment, such as dust masks that are specially designed to filter out microscopic particles.
- Handling power cords on corded products may expose you to lead, a chemical known to the state of California to cause cancer and birth defects or other reproductive harm. Wash your hands after handling.

WARNING

WORK AREA SAFETY

- Inspect the work area before each use. Keep work area clean, dry, free of clutter, and well-lit. Cluttered, wet, or dark work areas can result in injury. Using the product in confined work areas may put you dangerously close to cutting tools and rotating parts.
- Do not use the product where there is a risk of causing a fire or an explosion; e.g., in the presence of flammable liquids, gases, or dust. The product can create sparks, which may ignite the flammable liquids, gases, or dust.
- Do not allow the product to come into contact with an electrical source. The tool is not insulated and contact will cause electrical shock.
- Keep children and bystanders away from the work area while operating the tool. Do not allow children to handle the product.
- Be aware of all power lines, electrical circuits, water pipes, and other mechanical hazards in your work area. Some of these hazards may be hidden from your view and may cause personal injury and/or property damage if contacted.

WARNING

PERSONAL SAFETY

- Stay alert, watch what you are doing, and use common sense when operating the tool. Do not use the tool while you are tired or under the influence of drugs, alcohol, or medication. A moment of inattention while operating the tool may result in serious personal injury.
- Dress properly. Do not wear loose clothing, dangling objects, or jewelry. Keep your hair, clothing and gloves away from moving parts. Loose clothes, jewelry, or long hair can be caught in moving parts. Air vents on the tool often cover moving parts and should be avoided.
- Wear the proper personal protective equipment when necessary. Use ANSI Z87.1 compliant safety goggles (not safety glasses) with side shields, or when needed, a face shield. Use a dust mask in dusty work conditions. Also use non-skid safety shoes, hardhat, gloves, dust collection systems, and hearing protection when appropriate. This applies to all persons in the work area.
- Do not overreach. Keep proper footing and balance at all times.
- Remove keys or wrenches before connecting the tool to an air supply, power supply, or turning on the tool. A wrench or key that is left attached to a rotating part of the tool may cause personal injury.
- Secure the work with clamps or a vise instead of your hand when practical. This safety precaution allows for proper tool operation using both hands.

CAUTION

PRODUCT USE AND CARE

- Do not force the product. Products are safer and do a better job when used in the manner for which they are designed. Plan your work and use the correct product for the job.
- Check for damaged parts before each use. Carefully check that the product will operate properly and perform its intended function. Replace damaged or worn parts immediately. Never operate the product with a damaged part.
- Do not use a product with a malfunctioning switch. Any power tool that cannot be controlled with the power switch is dangerous and must be repaired by an authorized service representative before using.
- Disconnect the power/air supply from the product and place the switch in the locked or off position before making any adjustments, changing accessories, or storing the tool. Such preventive safety measures reduce the risk of starting the tool accidentally.
- Store the product when it is not in use. Store it in a dry, secure place out of the reach of children. Inspect the tool for good working condition prior to storage and before re-use.
- Use only accessories that are recommended by the manufacturer for use with your product. Accessories that may be suitable for one product may create a risk of injury when used with another tool. Never use an accessory that has a lower operating speed or operating pressure than the tool itself.
- Keep guards in place and in working order. Never operate the product without the guards in place.
- Do not leave the tool running unattended.

Specific Operation Warnings

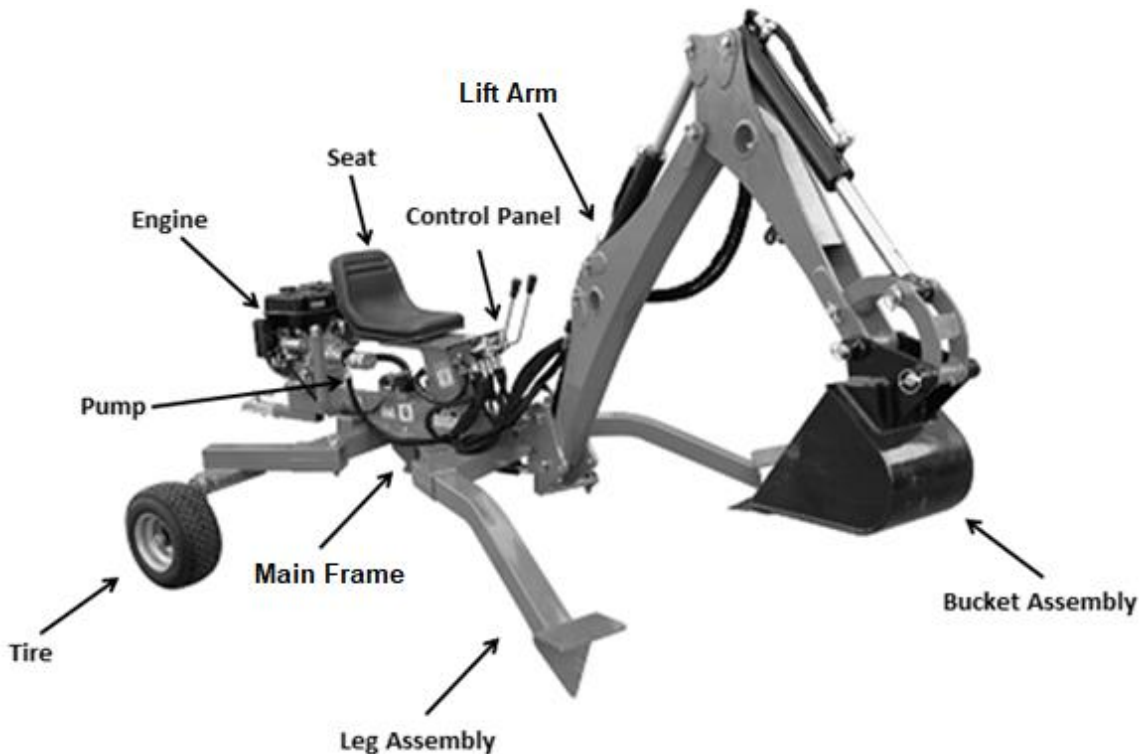
WARNING

- The Mini Trencher must work outdoor.
- Wear hearing protection
- Risk of Fire while handling fuel. Do not smoke while handling fuel.
- Do not refuel while operating. keep flammable objects away from engine
- Not for use by or around children.
- Keep all spectators at least 20 feet from the equipment during operation.
- Do not leave the equipment unattended when it is running.
- Use only accessories that are recommended for your model.
- Use this equipment with both hands only. Using equipment with only one hand can easily result in loss of control.
- Always make sure the hitch coupler is securely fixed to the vehicle before moving it.
- Only use a suitable means of transport and lifting devices with sufficient weight bearing capacity when transporting the equipment.

- Do not exceed 30 MPH when towing the Trencher
- Do not tow the Trencher on roads or highways. This product is not D.O.T. compliant, and is not road legal.
- Do not allow the hydraulic hose to come in contact with any hot part of the unit. The hose might be damaged, possibly causing it to burst or leak under high pressure.

Main Parts of Product

Subassembly
Bucket Assembly
Lift Arm
Main Frame
Engine
Pump
Tires
Seat
Leg Assembly
Control Panel



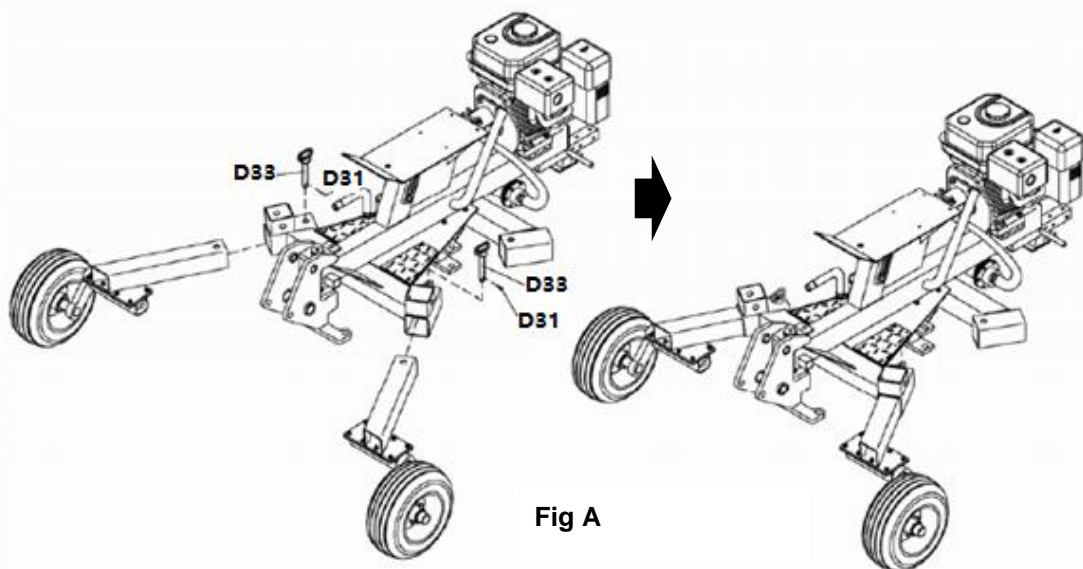
Assembly Instructions

WARNING

- Do not start the engine during the entire assembly

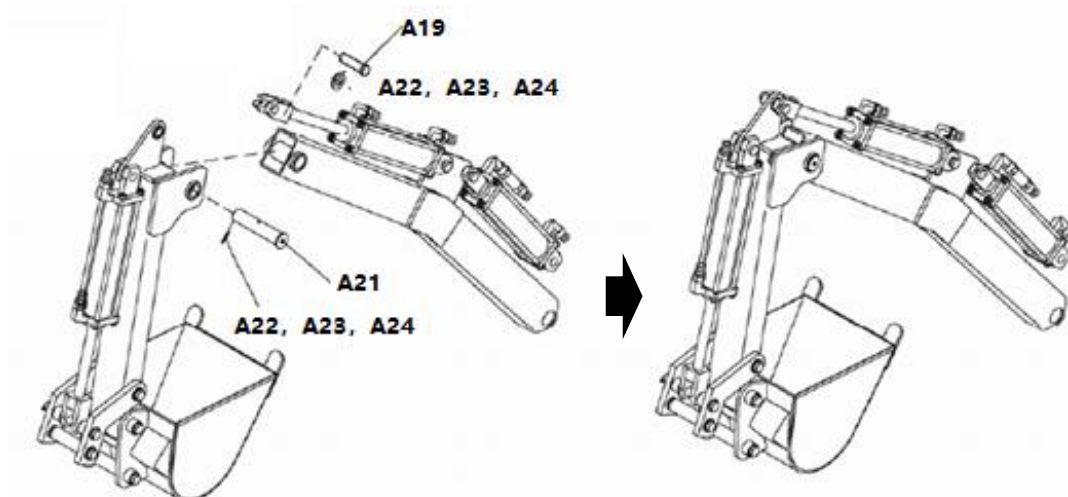
Assemble the Wheel Leg

1. Insert the wheel leg into the Main Frame (D49), insert the Pin (D33) then lock with Pin $\varnothing 6$ (D31). See the Fig A

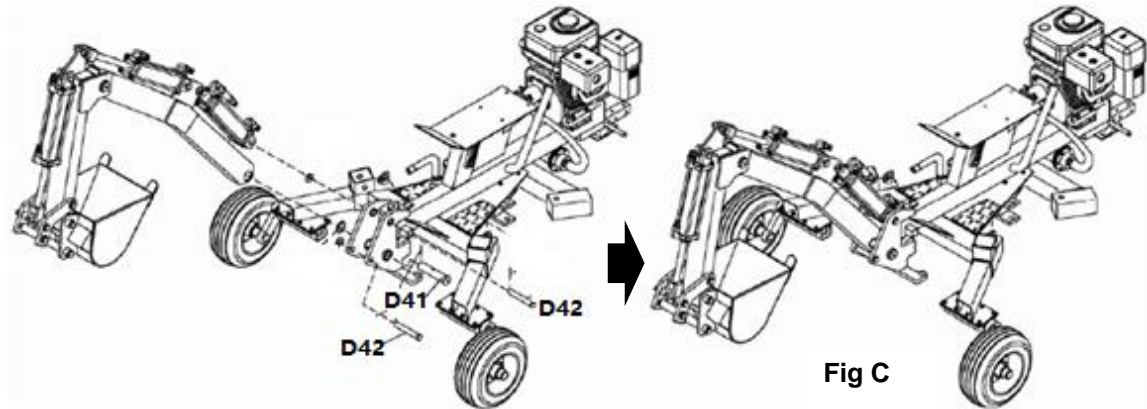


Assemble the Arm

1. Connect the Digging Arm (A20) with Lift Arm (A6) by using Pin N.8 (A21), Flat washer M6 (A22), Spring Washer M6 (A23), Bolt M6x16 (A24).
2. Connect the Digging Arm Cylinder (A1) on Lift Arm (A6) to the Digging Arm (A20) by using Digging Arm Pin (A19), Flat washer M6 (A22), Spring Washer M6 (A23), Bolt M6x16 (A24). See the Fig B



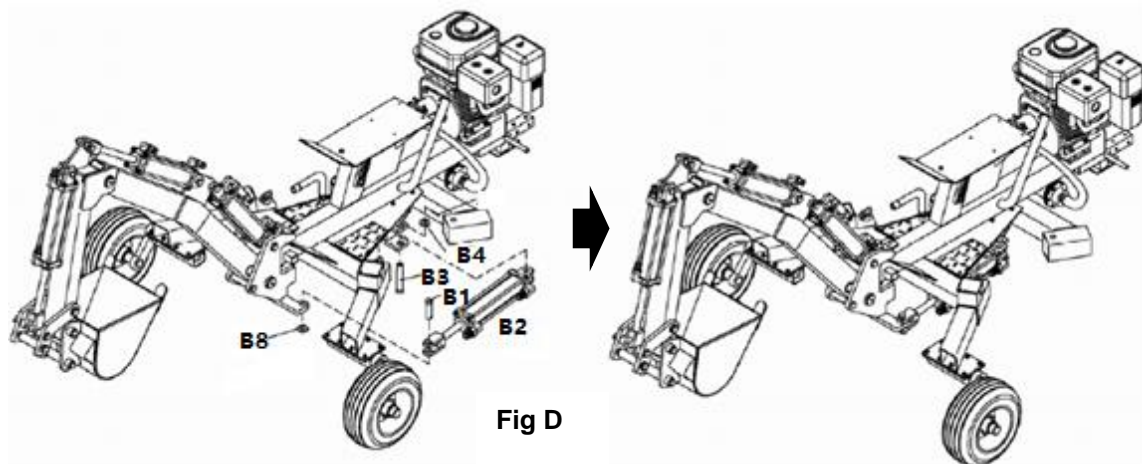
3. Attach the Lift Arm (A6) to the Swivel Joint (D43) by using Lift Arm Safe Pin (D41), Bolt M6 x 16 (D39), Spring Washer M6 (D40)
4. Put the Arm to the Main Frame (D49) by using Big Pin (D42), Bolt M6 x 16 (D39), Spring Washer M6 (D40). See the Fig C



Note: The Pin (D41) is a safety Pin. Remove it before using the machine and insert it when you want remove.

Assemble the Swivel Cylinder.

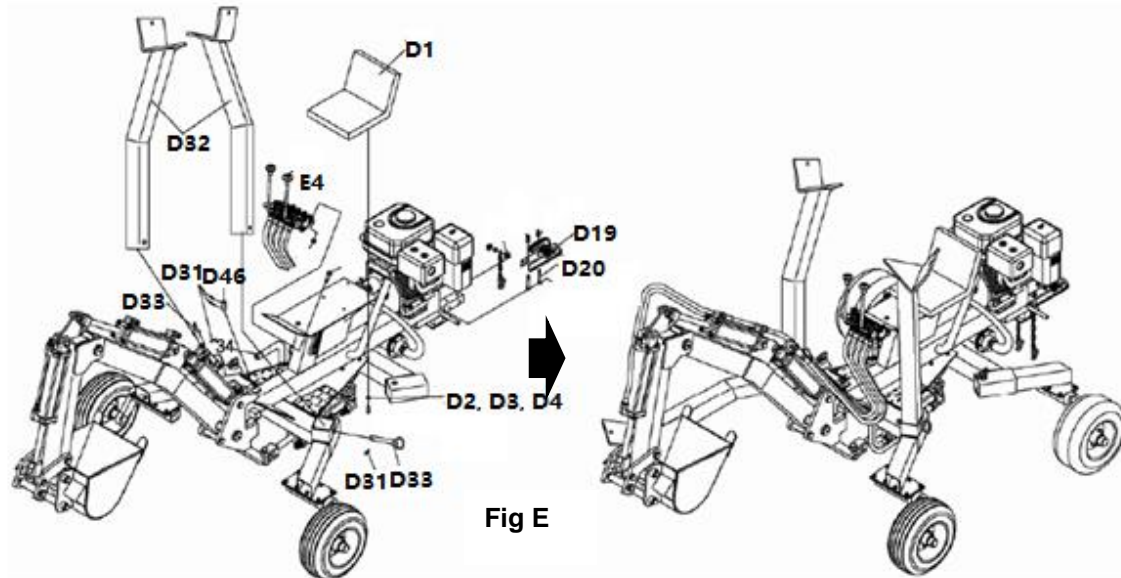
1. Attach the Steering Cylinder (B2) to the Steering Weldment (B4) by using the Steering Pin (B3), then lock with Pin $\varnothing 6$ (B8).
2. Connect the Steering Cylinder (B2) to the Swivel Joint (D43) by using Pin 135 (B1), then lock with Pin $\varnothing 6$ (B8). See the Fig D



Assemble the Seat, Control Valve and Coupler

1. Attach the Seat (D1) to the Frame by using Bolt M8 x 25 (D2) Flat Washer M8 (D3) Lock Nut M8 (D4).
2. Attach the assembled of Valve (E4) to the valve plate

3. Insert the Supporting Leg Weldment (D32) to the square tube, then insert the Pin (D33) and lock with Pin $\varnothing 6$ (D31).
4. Insert the Swivel Safe Pin (D46) into the Main Frame (D49)
5. Attach the 2" Trailer Couple (D19) to the tow bar by using Bolt M12 x 70 (D20),.See Fig E



Note: The Swivel Safe Pin (D46) is a safety Pin. Remove it before using the machine and insert it when you want remove.

Connect the Hydraulic Hose.

1. Attach the Hydraulic hose 1A to the Connector of Valve 1A (as the label), at the right side of Arm. use the Clamp Clip to lock it
2. Attach the Hydraulic hose 1B to the Connector of Valve 1B (as the label). at the right side of Arm. use the Clamp Clip to lock it
3. Assemble others as above. at the left side of Arm, use the Clamp Clip to lock the hydraulic hose of 2A & 2B. See the Fig F & Fig G

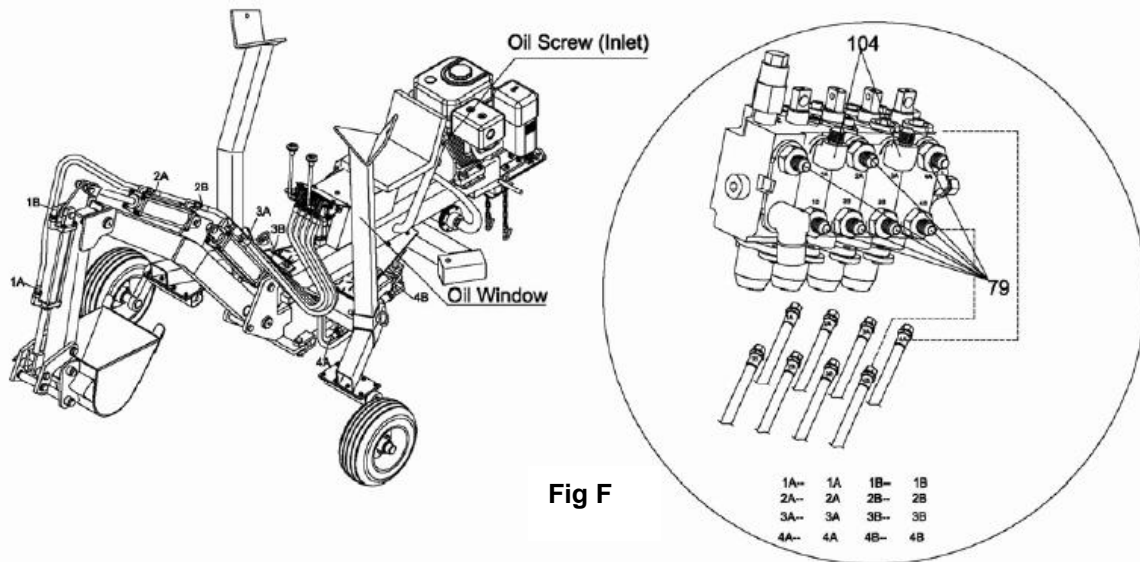


Fig F

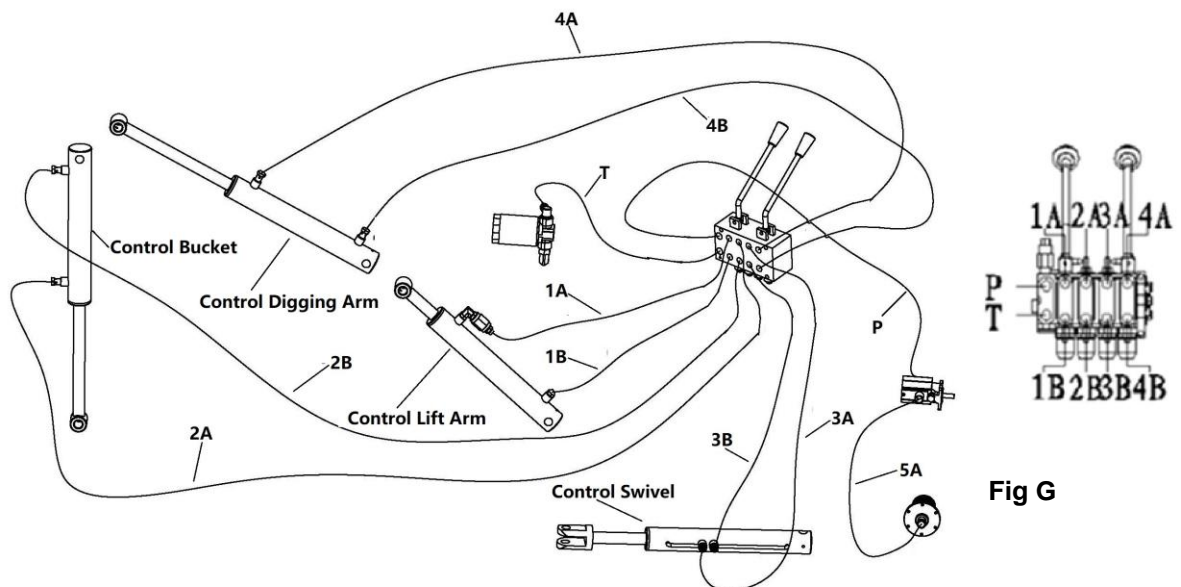


Fig G

Add the Hydraulic Oil

1. There is a Breathable Plug (D10) behind the seat, screw off the Breathable Plug (D10). Fill the tank slowly with 10wt hydraulic oil
2. While checking the oil sight gauge. Once the tank is full, stop to add hydraulic oil and screw the Breathable Plug (D10) back on the tank.
3. When the first time to add Hydraulic Oil, the oil should be between the black and red line of Oil window. Then start the engine, manipulate the control handle, make every cylinder stretch out and draw back for one time, let the cylinder with full oil. Then, add oil between the black and red line of Oil window for the second time.
4. Start the engine and run at slow idle
5. Push and pull lever#4 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, that is normal. If a 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. After lever#4 is completed,

do the same with lever#3, lever#2, and lever#1. Watch the oil levels. Once all four levers are done, fill the tank up to the black line on the oil sight gauge in the hydraulic tank. The whole hydraulic system contains about 3 gallons of oil.

6. Shut off the engine; screw the Breathable Plug (D10) back on the tank. See the Fig H

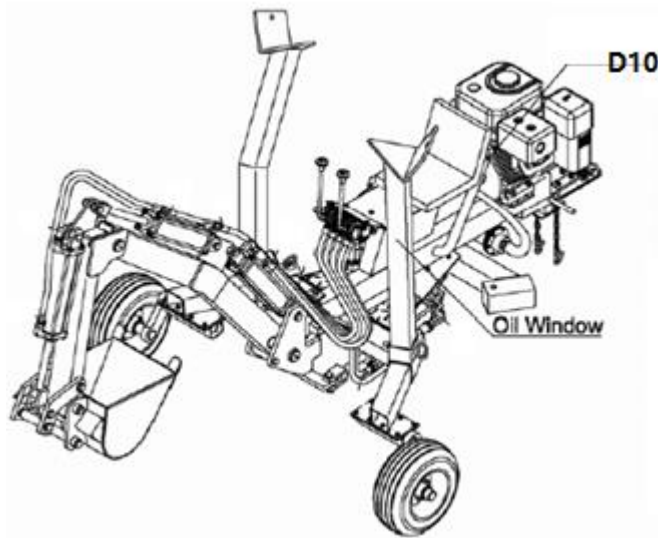


Fig H

Before Each Use

WARNING

Check the General Condition of the Engine

- Look around and underneath the engine for signs of oil or gasoline leaks.
- Remove any excessive dirt or debris, especially around the muffler and recoil starter.
- Look for signs of damage.
- Check that all shields and covers are in place, and all nuts, bolts, and screws are tightened.

Check the Engine

- Check the fuel level. Starting with a full tank will help to eliminate or reduce operating interruptions for refueling.
- Check the engine oil level. Running the engine with a low oil level can cause engine damage.
- The Oil Alert system will automatically stop the engine before the oil level falls below safe limits. However, to avoid the inconvenience of an unexpected shutdown, always check the engine oil level before startup.
- Check the air filter element. A dirty air filter element will restrict air flow to the carburetor, reducing engine performance.
- Check the equipment powered by this engine

Starting the Engine

1. Move the fuel shut-off to the ON position.

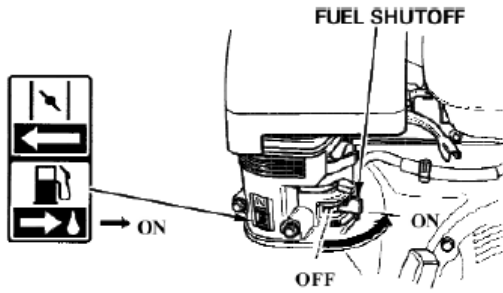
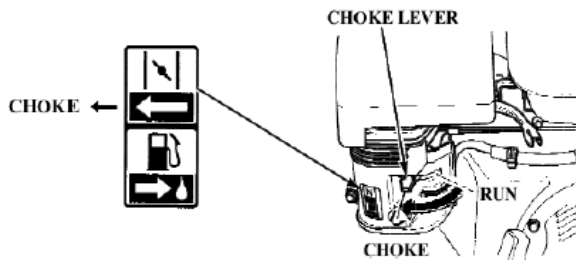
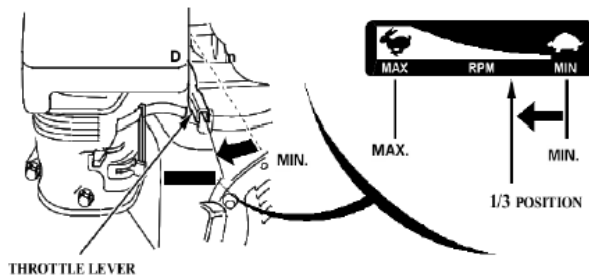


Fig H

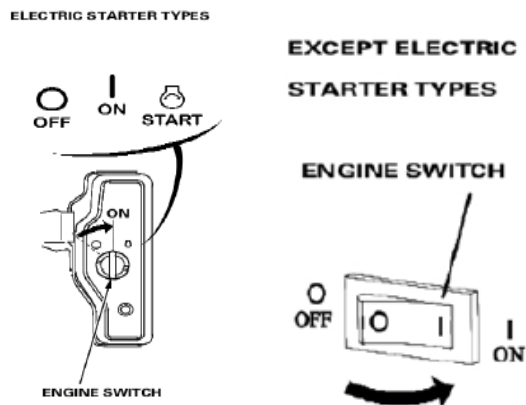
- To start a cold engine, move the choke lever to the CHOKE position.
To restart a warm engine, leave the choke lever in the RUN position.



- Move the throttle lever away from the MIN. position, about 1/3 of the way toward the MAX. position.



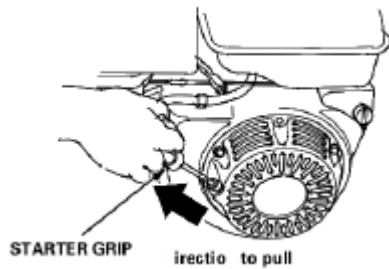
- Turn the engine switch to the ON position.



- Operate the starter.

Recoil Start

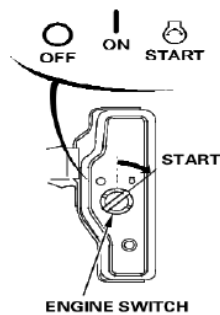
Pull the starter grip lightly until you feel resistance, then pull briskly in the direction of the arrow as shown below. Return the starter grip gently.



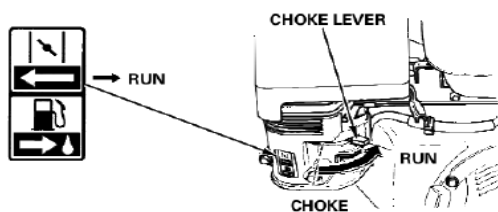
Electric Starter

Turn the key to the START position, and hold it there until the engine starts. If the engine fails to start within 5 seconds, release the key, and wait at least 10 seconds before operating the starter again.

When the engine starts, release the key, allowing it to return to the ON position.



6. If the choke lever has been moved to the CHOKE position to start the engine, gradually move it to the RUN position as the engine warms up.

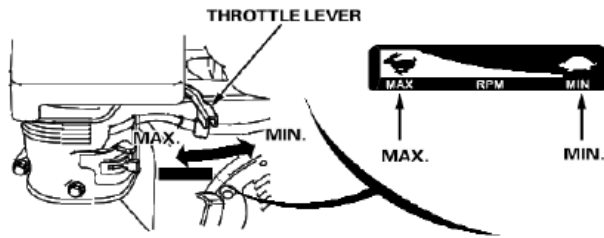


Setting Engine Speed

Position the throttle lever for the desired engine speed.

Some engine applications use a remote-mounted throttle control rather than the engine-mounted throttle lever shown here. Refer to the instructions provided by the equipment manufacturer.

For engine speed recommendations, refer to the instructions provided with the equipment powered by this engine

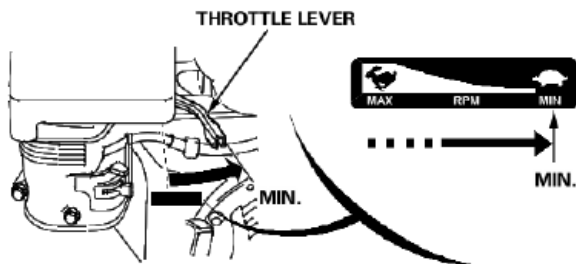


Stopping the Engine

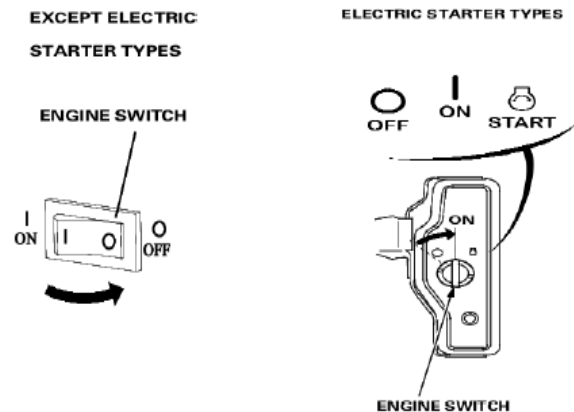
To stop the engine in an emergency, simply turn the engine switch to the OFF position. Under normal conditions, use the following procedure. Refer to the instructions provided by the equipment manufacturer.

1. Move the throttle lever to the MIN. position.

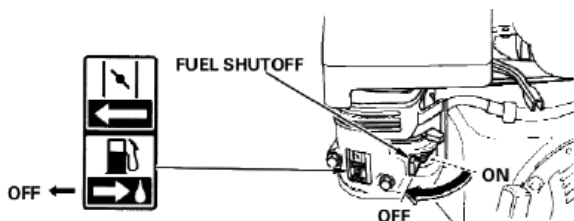
Some engine applications use a remote-mounted throttle control rather than the engine-mounted throttle lever shown here.



2. Turn the engine switch to the OFF position.

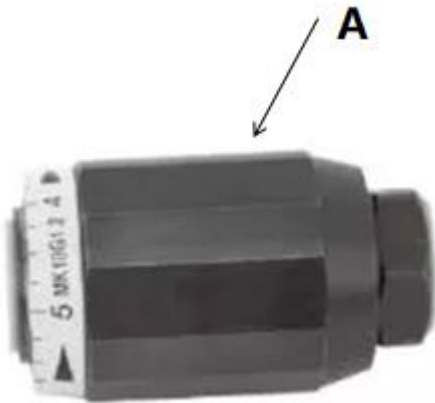


3. Turn the fuel shutoff to the OFF position.



How to Adjust Lift Arm Descending Speed

The descent speed has been set at the factory. If you want to speed up or reduce the descent speed of **Lift Arm (A6)**, you can use an adjust wrench (36mm) to adjust Part A of **One Way Throttle Valve (A3)**. Tighten A in the direction of the number 5 to increase the flow, twist to number 1 to reduce flow



Operating Instructions

WARNING

- **WARNING!** If the Hitch Coupler is not secured properly, the ball could come loose while the Trencher is in motion, possibly causing property damage or **SERIOUS PERSONAL INJURY**.
- **WARNING!** This technique can be difficult to control and should only be attempted by an experienced operator. The stability of the Trencher is dependent on the stability of the ground; if you choose to move the Trencher in this way, do so at your own risk. Do not use the Trencher near ditches or drop-offs.
- Care must be taken when backing up the Trencher. Only back up the Trencher on a straight path. If the Trencher is allowed to turn off the straight path while backing up, the Trencher could jackknife, causing severe damage to the Trencher and to the towing vehicle.

Move Backward

1. Make sure backhoe is in digging mode.
2. Curl the arm in and lower the boom to rest bucket teeth into the ground. The bucket should rest in the center of the work area, two feet from the front of the backhoe frame.
3. Raise the until off its outriggers by lowering the boom.
4. Once the outriggers are clear of the ground, rotate the arm out.
5. This will cause the backhoe to move backward.
6. Raise the boom until weight is on the outriggers again.

Move Forward

1. Make sure backhoe is in digging mode.

2. Rotate the arm out and lower the boom to rest bucket teeth into the ground. The bucket should rest in the center of the work area.
3. Raise the until off its outriggers by lowering the boom.
4. Once the outriggers are clear of the ground, curl the arm in. This will cause the backhoe to move forward.
5. Raise the boom until weight is on the outriggers again.

Move Side to Side

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

After Each Use

WARNING

- Clean the Mini Trencher must shut down the engine
- Clean the bucket
- Clean the oil cylinder
- Clean the engine
- Lubrication if necessary

Maintenance

WARNING

- The inspection of the engine must wait for the engine to cool down

Changing the Hydraulic Oil

1. Remove the Oil Suction Weldment (D24) on the bottom part of the Main Frame (D49) below the engine. Once the old hydraulic oil is removed, tighten the Filter back onto the tank. Be sure to properly dispose of the old hydraulic oil. When changing the hydraulic oil, the Oil Suction Filter (D22) & Hydraulic Oil Filter (D35) needs to be changed
2. Screw off the Breathable Plug (D10) behind the seat. Fill the tank with 10wt hydraulic oil. While checking the oil level on the sight gauge. Screw the Oil Screw back onto the tank.
3. Remove the up-down travel pin and the side-to-side travel pin.

4. Start the engine and run at slow idle
5. Push and pull lever#4 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, that is normal. If a 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. After lever#4 is completed, do the same with lever#3, lever#2, and lever#1. Watch the oil levers. Once all four levers are done, fill the tank up to the black line on the oil sight gauge in the hydraulic tank. The whole hydraulic system contains about 2-1/2 gallons of oil. Shut off the engine,
6. Reattach the up-down and side-to-side traveling pins.

Maintenance Interval	Maintenance Point
Daily before operating	<ol style="list-style-type: none"> 1. Brush off outside of engine 2. Check engine oil level 3. Check air cleaner 4. Check deposit cup
After the first 20 operating hours	<ol style="list-style-type: none"> 1. Brush off outside of engine 2. Check engine oil level 3. Change engine oil
Every 25 operating hours or Monthly	<ol style="list-style-type: none"> 4. Brush off outside of engine 5. Check engine oil level 6. Change engine oil 7. Clean/replace air filter* 8. Check and clean spark plug 9. Blow out water filters
Every 50 operating hours or 3 Monthly	<ol style="list-style-type: none"> 1. Brush off outside of engine 2. Check engine oil level 3. Check air cleaner 4. Change engine oil 5. Clean/replace air filter* 6. Check and clean spark plug 7. Blow out water filters 8. Replace fuel Filter
Every 100 operating hours or 6 Monthly	<ol style="list-style-type: none"> 1. Brush off outside of engine 2. Check engine oil level 3. Check air cleaner 4. Check deposit cup

	<ol style="list-style-type: none"> 5. Change engine oil 6. Clean/replace air filter* 7. Check and clean spark plug 8. Blow out water filters 9. Replace fuel Filter 10. Replace spark plug
Every 300 operating hours or 1 year	<ol style="list-style-type: none"> 1. Brush off outside of engine 2. Check engine oil level 3. Check air cleaner 4. Check deposit cup 5. Change engine oil 6. Clean/replace air filter* 7. Check and clean spark plug 8. Blow out water filters 9. Replace fuel Filter 10. Replace spark plug 11. Clean fuel tank, strainer and carburetor** 12. Clean carbon build-up from combustion chamber**
Periodically	<ol style="list-style-type: none"> 1. Brush off outside of engine 2. Check engine oil level 3. Check air cleaner 4. Check deposit cup 5. Change engine oil 6. Clean/replace air filter* 7. Check and clean spark plug 8. Blow out water filters 9. Replace fuel Filter 10. Replace spark plug 11. Clean fuel tank, strainer and carburetor** 12. Clean carbon build-up from combustion chamber** 13. Apply grease to boom axis-movement points(see Fig O: Lubrication Points on page 25) 14. Replace fuel line if necessary**

*Service more frequently when used in dusty areas.

**These items should be serviced by a qualified technician.

Long-Term Storage

When the equipment is to remain idle for longer than 20 days, prepare the engine for storage as follows:

1. CLEANING:

Wait for engine to cool, then clean engine with dry cloth. NOTICE: Do not clean 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.

2. FUEL:

To protect the fuel tank during storage, fill the tank with gasoline that has been treated with a fuel stabilizer additive. Follow fuel stabilizer manufacturer' recommendations for use.

WARNING! TO PREVENT SERIOUS INJURY FROM FIRE:

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.

3. LUBRICATION:

- a. Change engine oil.
- b. Clean out area around spark plug. Remove spark plug and pour one tablespoon of engine oil into cylinder through spark plug hole.
- c. Replace spark plug, but leave spark plug cap disconnected.
- d. Pull Starter Handle to distribute oil in cylinder. Stop after one or two revolutions when you feel the piston start the compression stroke (when you start to feel resistance).

4. BATTERY:

Disconnect battery cables (if equipped). Recharge batteries monthly while in storage.

5. STORAGE AREA:

Cover and store in a dry, level, well-ventilated area out of reach of children. Storage area should also be away from ignition sources, such as water heaters, clothes dryers, and furnaces.

NOTICE: During extended storage periods the Engine must be started every 3 months and allowed to run for 15 – 20 minutes or the Warranty is VOID.

6. STARTING ENGINE DURING/AFTER STORAGE:

Before starting the Engine during or after storage, keep in mind that untreated 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 stabilizer' recommended time period, or if the Engine does not start. For Engine starting instructions refer to Starting the Engine

Troubleshooting

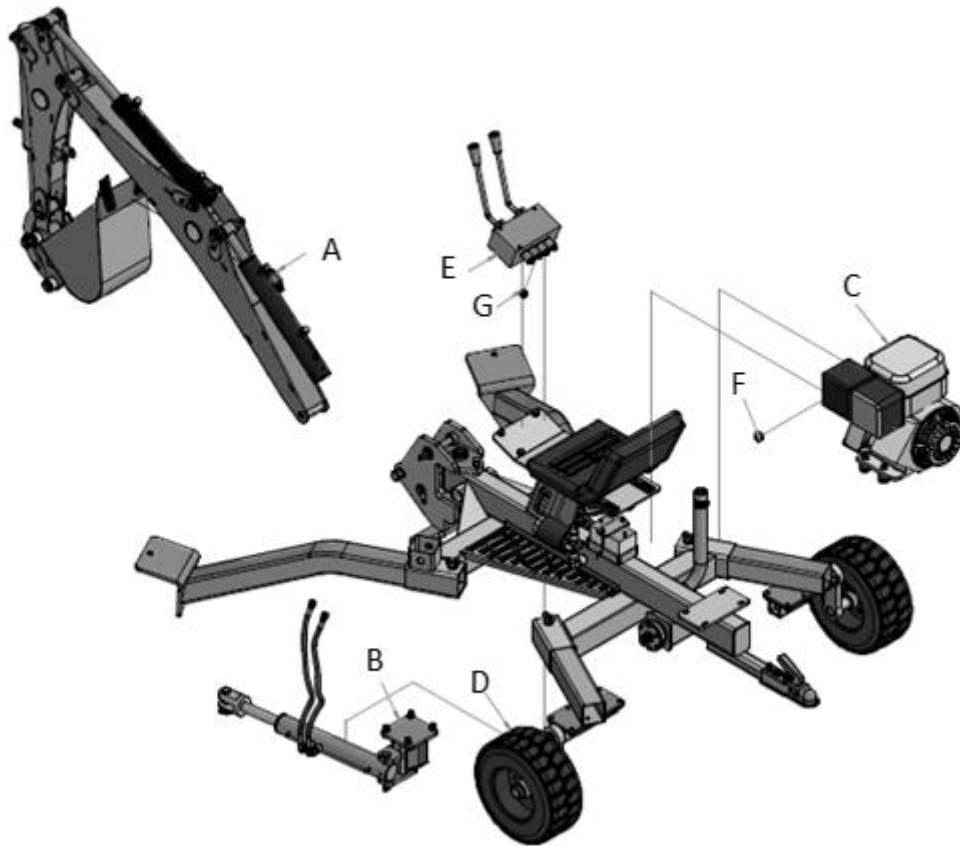
Failure	Possible Cause	Corrective Action
Engine will not start	FUEL RELATED:	
	1. No fuel in tank or fuel valve closed	1. Fill fuel tank with fresh 87+ octane stabilizer treated unleaded gasoline and open fuel valve. Do not use gasoline with more than 10% ethanol (E15, E20, E85, etc.).
	2. Choke not in START position, cold engine.	2. Move Choke to START position.
	3. Gasoline with more than 10% ethanol used. (E15, E20, E85, etc.)	3. Clean out ethanol rich gasoline from fuel system. Replace components damaged by ethanol. Use fresh 87+ octane stabilizer treated unleaded gasoline only. Do not use gasoline with more than 10% ethanol (E15, E20, E85, etc.).
	4. Low quality or deteriorated, old gasoline.	4. Use fresh 87+ octane stabilizer-treated unleaded gasoline. Do not use gasoline with more than 10% ethanol (E15, E20, E85, etc.).
	5. Carburetor not primed.	5. Pull on Starter Handle to prime.
	6. Dirty fuel passageways.	6. Clean out passageways using fuel additive. Heavy deposits may require further cleaning.
	7. Carburetor needle stuck. Fuel can be smelled in the air.	7. Gently tap side of carburetor float chamber with screwdriver handle.
	8. Too much fuel in chamber. This can be caused by the carburetor needle sticking.	8. 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 START position.
	9. Clogged Fuel Filter.	9. Replace Fuel Filter.
	IGNITION (SPARK) RELATED:	
	1. Spark plug cap not connected securely.	1. Connect spark plug cap properly.
	2. Spark plug electrode wet or dirty.	2. Clean spark plug.
	3. Incorrect spark plug gap.	3. Correct spark plug gap.
	4. Spark plug cap broken.	4. Replace spark plug cap.
	5. Incorrect spark timing or faulty ignition system.	5. Have qualified technician diagnose/repair ignition system.
	COMPRESSION RELATED:	

	1. Cylinder not lubricated. Problem after long storage periods.	1. Pour tablespoon of oil into spark plug hole. Crank engine a few times and try to start again.
	2. Loose or broken spark plug. (Hissing noise will occur when trying to start.)	2. Tighten spark plug. If that does not work, replace spark plug. If problem persists, may have head gasket problem, see #3.
	3. Loose cylinder head or damaged head gasket. (Hissing noise will occur when trying to start.)	3. Tighten head. If that does not remedy problem, replace head gasket.
	4. Engine valves or tappets mis-adjusted or stuck.	4. Have qualified technician adjust/ repair valves and tappets.
	ENGINE OIL RELATED:	
	1. Low engine oil.	1. Fill engine oil to proper level. Check engine oil before EVERY use.
	2. Engine mounted on slope, triggering low oil shutdown.	2. Operate engine on level surface. Check engine oil level.
Engine misfires	1. Spark plug cap loose.	1. Check cap and wire connections.
	2. Incorrect spark plug gap or damaged spark plug.	2. Re-gap or replace spark plug.
	3. Defective spark plug cap.	3. Replace spark plug cap.
	4. Old or low quality gasoline.	4. Use only fresh 87+ octane stabilizer-treated unleaded gasoline. Do not use gasoline with more than 10% ethanol (E15, E20, E85, etc.).
	5. Incorrect compression.	5. Diagnose and repair compression. (Use Engine will not start: COMPRESSION RELATED section.)
Engine stops suddenly	1. Fuel tank empty or full of impure or low quality gasoline.	1. Fill fuel tank with fresh 87+ octane stabilizer treated unleaded gasoline. Do not use gasoline with more than 10% ethanol (E15, E20, E85, etc.).
	2. Low oil shutdown.	2. Fill engine oil to proper level. Check engine oil before EVERY use.
	3. Defective fuel tank cap creating vacuum, preventing proper fuel flow.	3. Test/replace fuel tank cap.
	4. Faulty magneto.	4. Have qualified technician service magneto.
	5. Disconnected or improperly connected spark plug cap.	5. Secure spark plug cap.

Engine stops when under heavy load	1. Dirty air filter	1. Clean element.
	2. Engine running cold.	2. Allow engine to warm up prior to operating equipment.
Engine knocks	1. Old or low quality gasoline.	1. Fill fuel tank with fresh 87+ octane stabilizer treated unleaded gasoline. Do not use gasoline with more than 10% ethanol (E15, E20, E85, etc.).
	2. Engine overloaded.	2. Do not exceed equipment's load rating.
	3. Incorrect spark timing, deposit buildup, worn engine, or other mechanical problems.	3. Have qualified technician diagnose and service engine.
Engine backfires	1. Impure or low quality gasoline.	1. Fill fuel tank with fresh 87+ octane stabilizer treated unleaded gasoline. Do not use gasoline with more than 10% ethanol (E15, E20, E85, etc.).
	2. Engine too cold.	2. Use cold weather fuel and oil additives to prevent backfiring.
After sudden impact, engine will run, but equipment will not operate	3. Intake valve stuck or overheated engine.	3. Have qualified technician diagnose and service engine.
	4. Incorrect timing. Shaft key or other shear pin broken by impact to disconnect engine and limit damage.	4. Check engine timing. Have qualified technician check and replace broken shaft key or other shear pins
Trencher loses performance	1. Cylinder rod will not move	1. Correct the engine/pump alignment
		2. Return directional valve for authorized repair
		3. Flush and clean the hydraulic system
		4. Add oil to the reservoir
		5. Flush and clean the hydraulic system
	2. Slow cylinder shaft speed when extending or retracting	1. Clean inlet hoses and free them of any leaks
		2. Have engine serviced
		3. Add oil to the reservoir
4. Clean reservoir and add oil		

	3.Backhoe will not dig or digs extremely slowly	1. Clean inlet hoses and free them of any leaks
		2. Adjust while using a pressure gauge and with assistance of a professional
		3. Add oil to the reservoir
		4. Clean reservoir and add oil
	4. Leaking pump shaft seal	1. Correct the engine/pump alignment
		2. Make sure the reservoir is properly vented

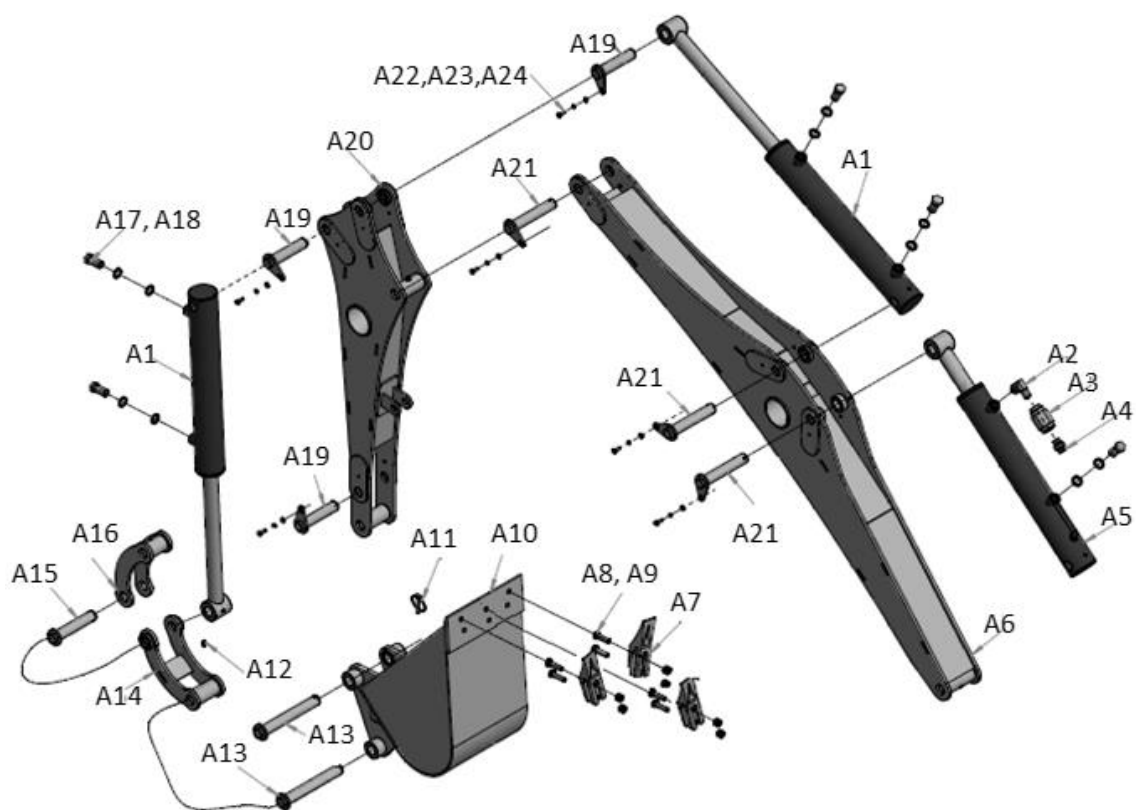
Parts Diagram



Parts List

Part Number	Part Description	Quantity
A	Digging Assembly	1
B	Steering Assembly	1
C	Gas Engine Assembly	1
D	Body Assembly	1
E	Valve Assembly	1
F	1" Hoop	1
G	3/4" Hoop	1

Parts Diagram (A)

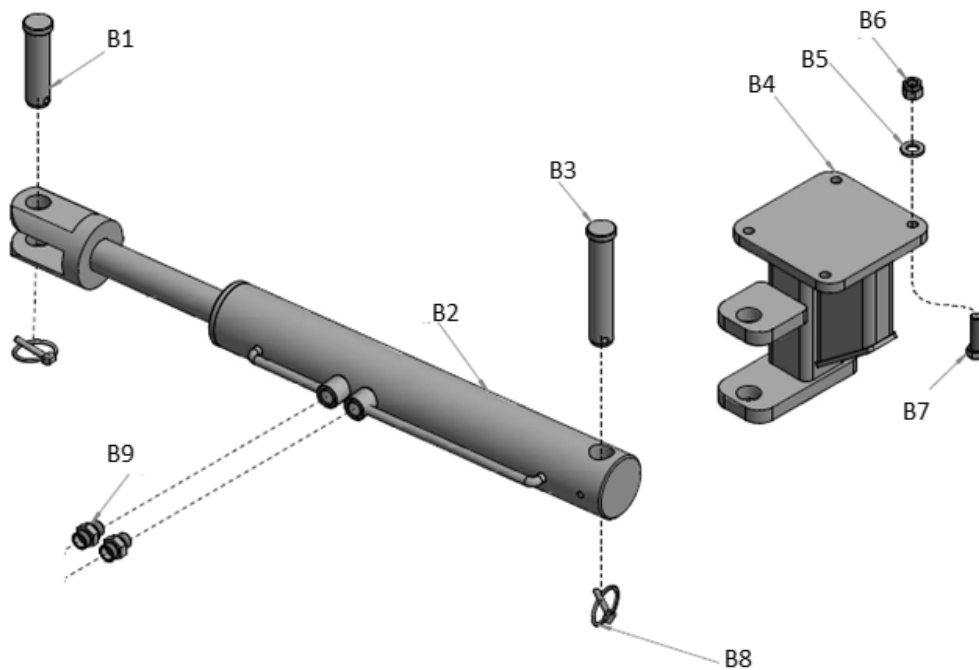


Parts List (A)

Part Number	Part Description	Quantity
A1	Digging Arm Cylinder	2
A2	Fitting	1
A3	One Way Throttle Valve	1
A4	Fitting	1
A5	Lift Arm Cylinder	1
A6	Lift Arm	1
A7	Teeth	3
A8	Bolt M10 x 40	4
A9	Lock nut M10	4
A10	Bucket 300	1
A11	Pin $\varnothing 6$	3
A12	Grease Fitting M8 x 1	4
A13	Bucket Pin Shaft	2
A14	Connecting Plate 1	1
A15	Pin	1
A16	Connecting Plate 2	1
A17	Fitting	5
A18	Combination washer	10
A19	Digging Arm Pin	3
A20	Digging Arm	1
A21	Pin N.8	3

Part Number	Part Description	Quantity
A22	Flat washer M6	6
A23	Spring washer M6	6
A24	Bolt M6x16	6

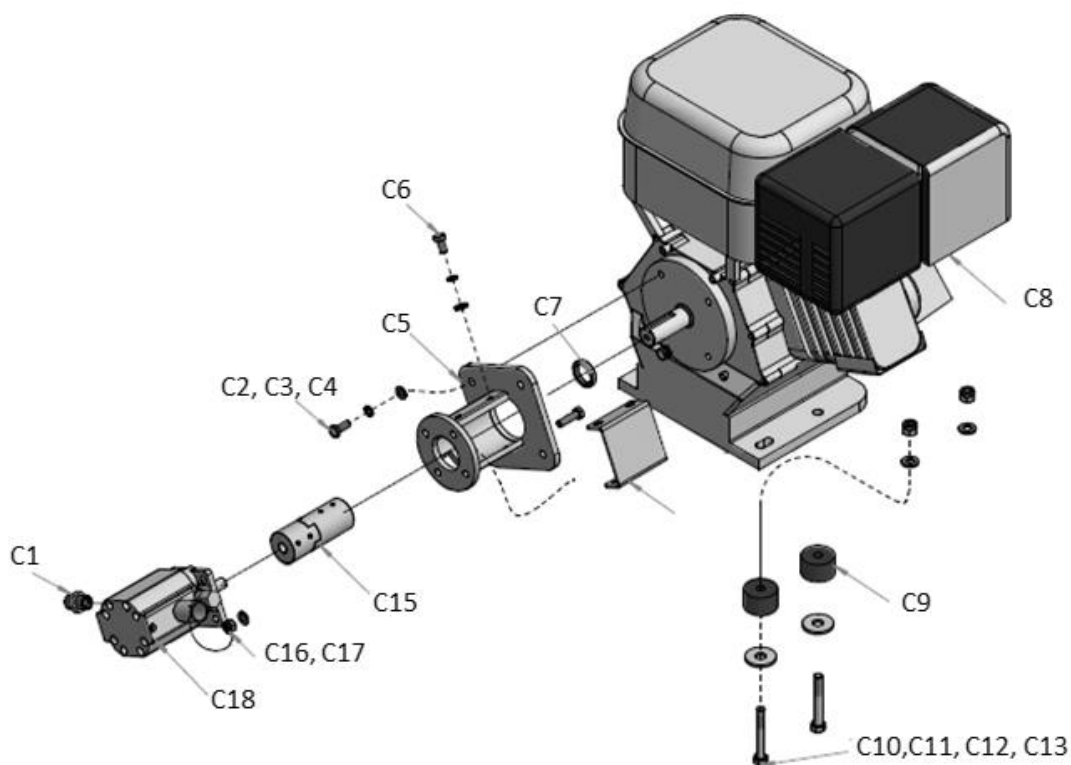
Parts Diagram (B)



Parts List (B)

Part Number	Part Description	Quantity
B1	Pin 135	1
B2	Steering Cylinder	1
B3	Steering Pin	1
B4	Steering Weldment	1
B5	Flat Washer M12	4
B6	Lock Nut M12	4
B7	Bolt M12 x 40	4
B8	Pin ø6	2
B9	Fitting	2

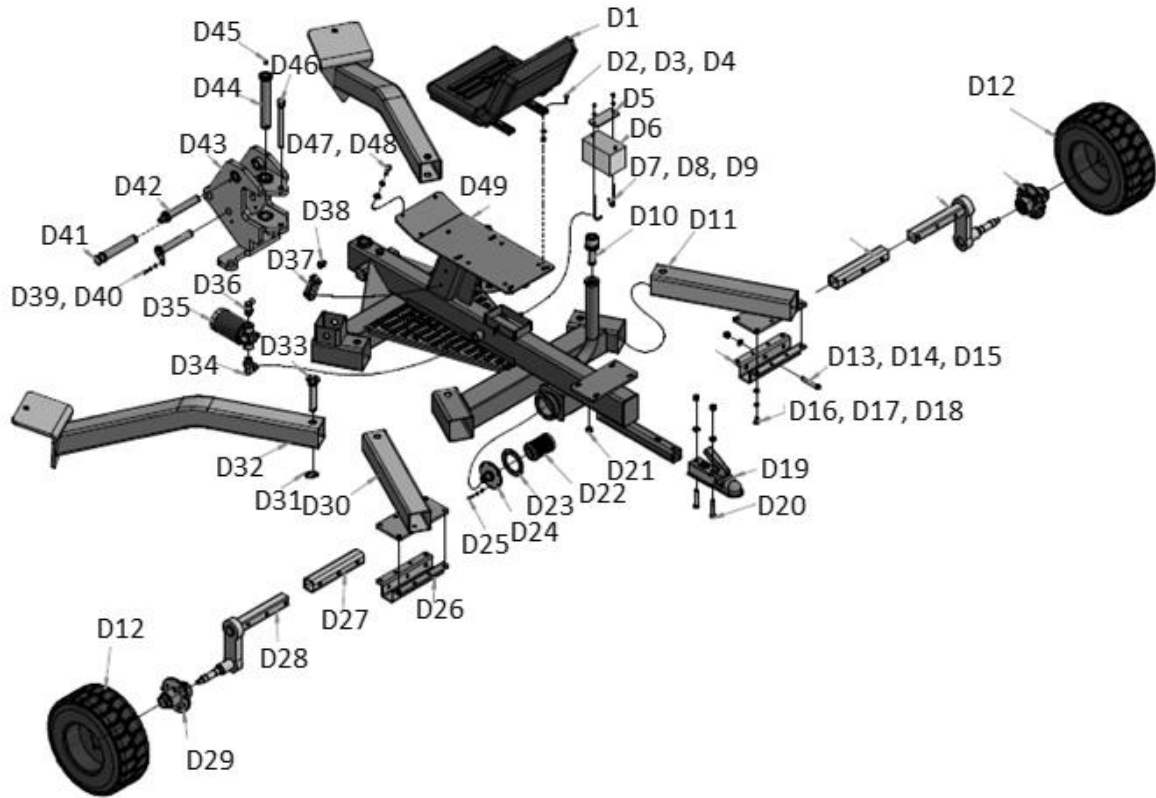
Parts Diagram (C)



Parts List (C)

Part Number	Part Description	Quantity
C1	Fitting	1
C2	Flat Washer M8	12
C3	Spring Washer M8	8
C4	Bolt M8 x 20	4
C5	Holder Weldment	1
C6	Bolt M8 x 16	4
C7	Sleeve	1
C8	Gas Engine	1
C9	Shock-reducing Rubber	4
C10	Bolt M10 x 70	4
C11	Flat Washer M12	4
C12	Flat Washer M10	4
C13	Lock Nut M10	4
C14	Engine Cover Plate	1
C15	Coupling	1
C16	Lock Nut M8	4
C17	Bolt M8 x 30	4
C18	Gear Pump	1

Parts Diagram (D)

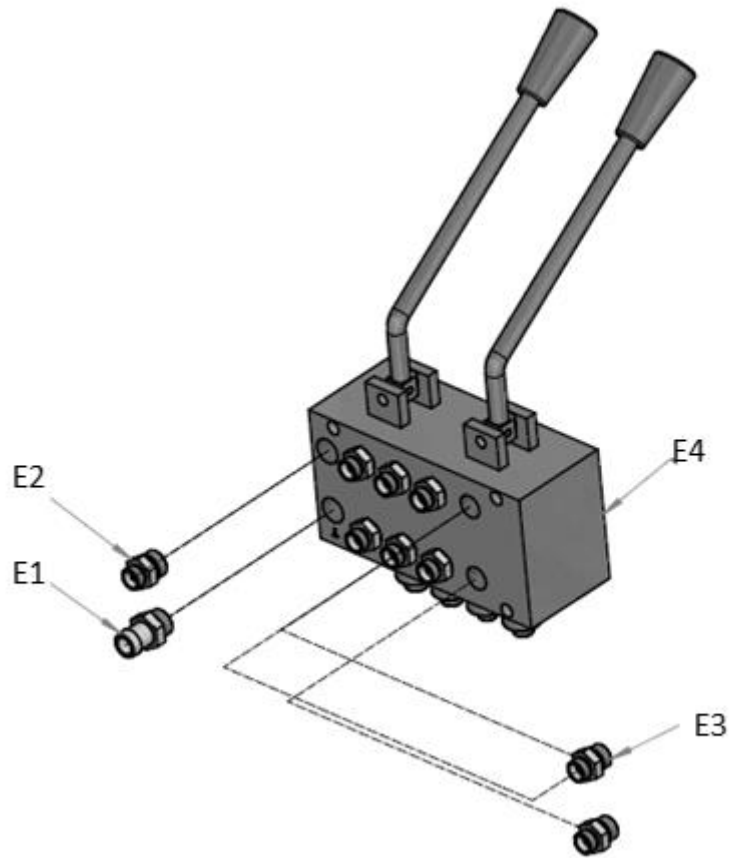


Parts List (D)

Part Number	Part Description	Quantity
D1	Seat	1
D2	Bolt M8 x 25	4
D3	Flat Washer M8	4
D4	Lock Nut M8	4
D5	Battery Fix Plate	1
D6	12VvBattery	1
D7	Hook	2
D8	Flat Washer M6	10
D9	Lock Nut M6	2
D10	Breathable Plug	1
D11	Wheel Weldment N.1	1
D12	Tire 16x7.50-8	2
D13	Bolt M12 x 80	6
D14	Flat Washer M12	11
D15	Lock Nut M12	8
D16	Bolt M10 x 20	16
D17	Spring Washer M10	16
D18	Flat Washer M10	16
D19	2" Trailer Couple	1
D20	Bolt M12 x 70	2

Part Number	Part Description	Quantity
D21	Plug M16x1.5	1
D22	Oil Suction Filter	1
D23	Rubber Gasket	1
D24	Oil Suction Weldment	1
D25	Bolt M6 x 20	6
D26	Connecting Plate	2
D27	Wheel Square Tube	2
D28	Wheel Connecting Weldment	2
D29	Wheel Hub Assembly	2
D30	Wheel Weldment N.2	1
D31	Pin ø6	6
D32	Supporting Leg Weldment	2
D33	Pin	4
D34	Filter Connector	1
D35	Hydraulic Oil Filter	1
D36	Fitting	1
D37	Thermometer	1
D38	Vent Bolt M16X1.5	1
D39	Bolt M6 x 16	2
D40	Spring Washer M6	8
D41	Lift Arm Safe Pin	1
D42	Big Pin	2
D43	Swivel Joint	1
D44	Pin	1
D45	Grease Fitting M8 x 1	1
D46	Swivel Safe Pin	1
D47	Bolt M12 x 35	3
D48	Spring Washer M12	3
D49	Main Frame	1

Parts Diagram (E)

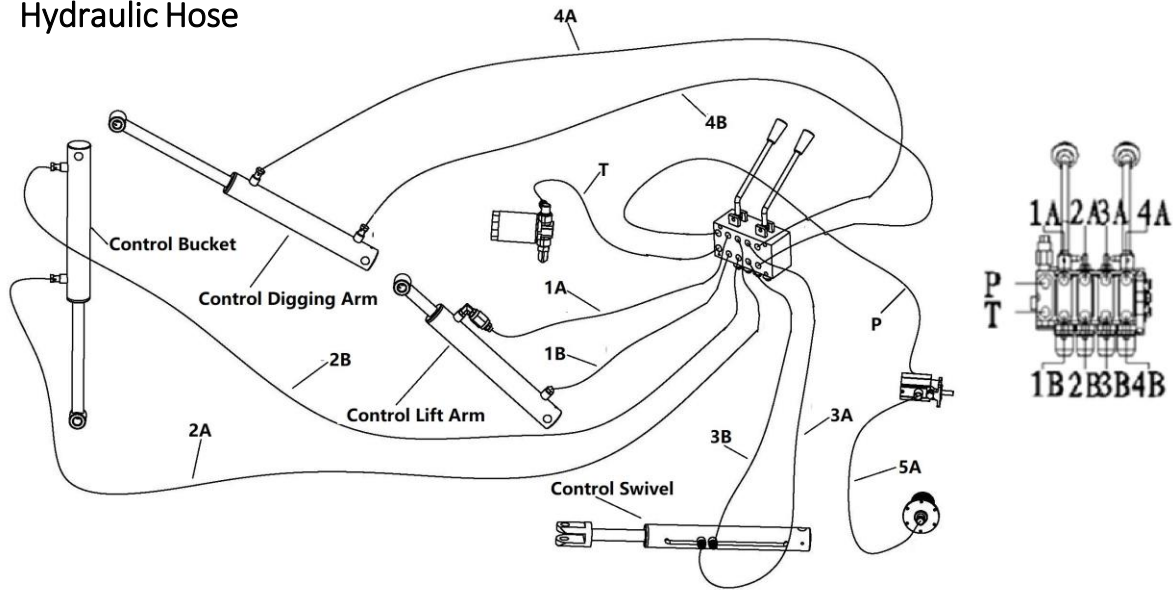


Parts List (E)

Part Number	Part Description	Quantity
E1	Fitting	1
E2	Fitting	1
E3	Fitting	8
E4	Valve	1

Parts Diagram (F)

Hydraulic Hose



Parts List (F)

Part Number	Part Description	Quantity
1A	From Lift Arm Oil Cylinder to Valve Hose (L:47-1/4", ID:1/4")	1
1B	From Lift Arm Oil Cylinder to Valve Hose(L:31-1/2", ID:1/4")	1
2A	From Bucket Oil Cylinder to Valve Hose(L:122-1/8", ID:1/4")	1
2B	From Bucket Oil Cylinder to Valve Hose(L:106-3/8", ID:1/4")	1
3A	From Swivel Oil Cylinder to Valve Hose(L:39-3/8", ID:1/4")	1
3B	From Swivel Oil Cylinder to Valve Hose(L:39-3/8", ID:1/4")	1
4A	From Digging Oil Cylinder to Valve Hose(L:82-3/4", ID:1/4")	1
4B	From Digging Oil Cylinder to Valve Hose(L:67", ID:1/4")	1
5A	From Oil Tank to Pump Hose(L: 37-1/2",ID:1")	1
P	From Pump to Valve Hose(L: 29-1/2",ID:3/8")	1
T	From Valve to Filter Hose(L: 24-1/2",ID:3/4")	1

Replacement Parts

- For replacement parts and technical questions, please call Customer Service at **1-800-222-5381**.
- Not all product components are available for replacement. The illustrations provided are a convenient reference to the location and position of parts in the assembly sequence.
- When ordering parts, the following information will be required: item description, item model number, item serial number/item lot date code, and the replacement part reference number.
- The distributor reserves the rights to make design changes and improvements to product lines and manuals without notice.

Limited Warranty

Northern Tool and Equipment Company, Inc. ("We" or "Us") warrants to the original purchaser only ("You" or "Your") that the NorTrac product purchased will be free from material defects in both materials and workmanship, normal wear and tear excepted, for a period of one year from date of purchase. The foregoing warranty is valid only if the installation and use of the product is strictly in accordance with product instructions. There are no other warranties, express or implied, including the warranty of merchantability or fitness for a particular purpose. If the product does not comply with this limited warranty, Your sole and exclusive remedy is that We will, at our sole option and within a commercially reasonable time, either replace the product or product component without charge to You or refund the purchase price (less shipping). This limited warranty is not transferable.

Limitations on the Warranty

This limited warranty does not cover: (a) normal wear and tear; (b) damage through abuse, neglect, misuse, or as a result of any accident or in any other manner; (c) damage from misapplication, overloading, or improper installation; (d) improper maintenance and repair; and (e) product alteration in any manner by anyone other than Us, with the sole exception of alterations made pursuant to product instructions and in a workmanlike manner.

Obligations of Purchaser

You must retain Your product purchase receipt to verify date of purchase and that You are the original purchaser. To make a warranty claim, contact Us at 1-800-222-5381, identify the product by make and model number, and follow the claim instructions that will be provided. The product and the purchase receipt must be provided to Us in order to process Your warranty claim. Any returned product that is replaced or refunded by Us becomes our property. You will be responsible for return shipping costs or costs related to Your return visit to a retail store.

Remedy Limits

Product replacement or a refund of the purchase price is Your sole remedy under this limited warranty or any other warranty related to the product. We shall not be liable for: service or labor charges or damage to Your property incurred in removing or replacing the product; any damages, including, without limitation, damages to tangible personal property or personal injury, related to Your improper use, installation, or maintenance of the product or product component; or any indirect, incidental or consequential damages of any kind for any reason.

Assumption of Risk

You acknowledge and agree that any use of the product for any purpose other than the specified use(s) stated in the product instructions is at Your own risk.

Governing Law

This limited warranty gives You specific legal rights, and You also may have other rights which vary from state to state. Some states do not allow limitations or exclusions on implied warranties or incidental or consequential damages, so the above limitations may not apply to You. This limited warranty is governed by the laws of the State of Minnesota, without regard to rules pertaining to conflicts of law. The state courts located in Dakota County, Minnesota shall have exclusive jurisdiction for any disputes relating to this warranty.



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