MAKINEX®

SKID STEER 25HP, DIESEL, 890MM, AU

SK-25D-890-AU

OPERATOR'S MANUAL

Rev 0825

CONTENTS

INTRODUCTION

Thank you for purchasing a MAKINEX product.

This manual provides information and procedures to safely operate and maintain the Skid Steer. For your own safety and protection from injury, carefully read, understand and observe the safety instructions described in this manual.

Keep this manual or a copy of it with the machine. If you lose this manual or need an additional copy, please contact MAKINEX. This machine is designed and built with user safety in mind; however, it can present hazards if improperly operated and serviced. Please follow the operating instructions carefully. If there are any questions regarding operating or servicing of this machine, please contact MAKINEX.

The information contained in this manual was based on machines in production at the time of publication. MAKINEX reserves the right to change any portion of this information without notice.

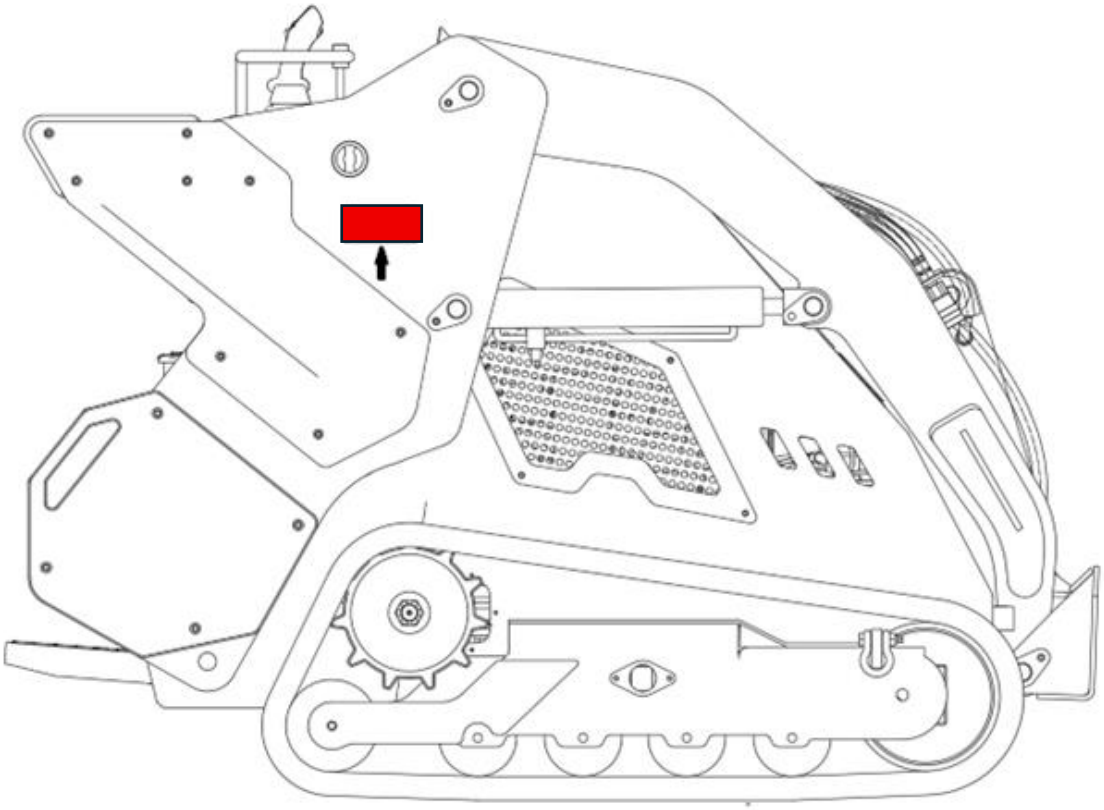
DISCLAIMER:

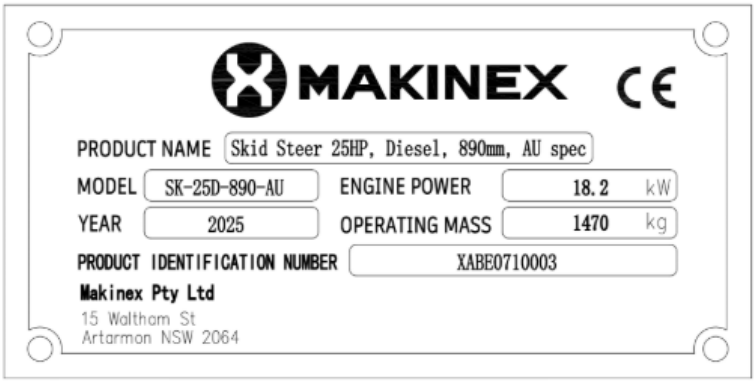
MAKINEX and its affiliates take no responsibility for any damage, injury or death resulting from the incorrect or unsafe use of this product. Use of this product should be undertaken by competent persons only. It is the operator's responsibility to ensure that the following safety procedures are followed. If you are unsure, do not operate this product.

Record the model and serial numbers as well as date and place of purchase for future reference. Have this information available when ordering parts and when making technical or warranty enquiries.

Makinex Support
Refer to contact details on pg. 82
Model No.
SD-25D-890-AU
Serial No.
Date of Purchase
Purchase Location

Serial Number Location:





Intended Use

The Makinex SK-25D-890-AU is a platform; rubber track mini skid steer machine designed for light-to medium-duty construction work. SK-25D-890-AU has a quick attachment mounting device which makes it easy for an operator to change and connect different attachments. The machine is designed for operation in temperatures typically experienced in earth moving and construction work environments. Provisions may be required to operate in extreme temperatures, please contact your MAKINEX dealer. Use in any other way is considered contrary to the intended use.

⚠ WARNING

SK-25D-890-AU should be operated, serviced, and repaired only by the people who should be familiar with its characteristics and acquainted with the relevant safety procedures. Special reminder: Minors are prohibited from operating this device.

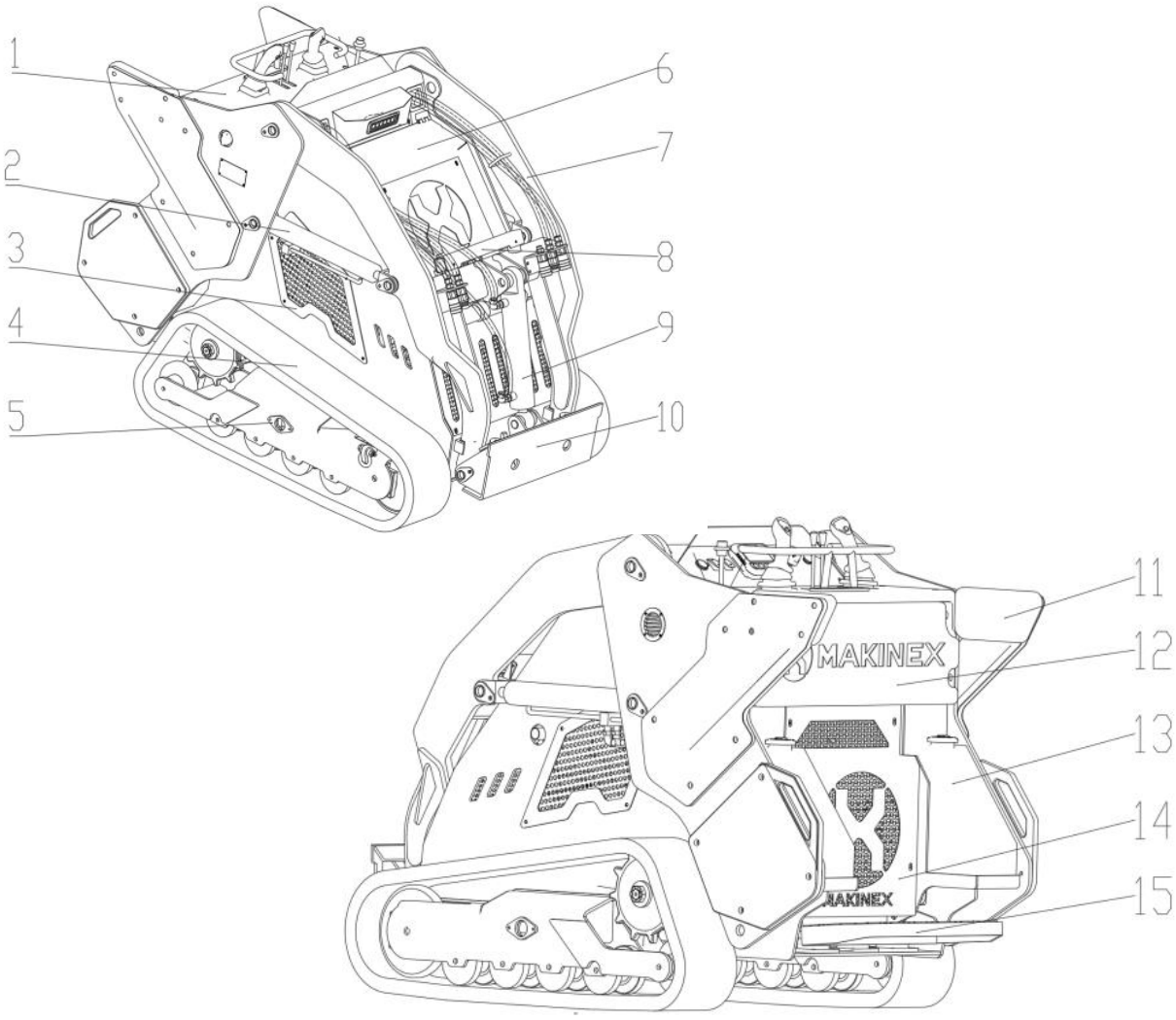
Equipment Modification

This equipment was designed and built in accordance with applicable standards and regulations. Modification of equipment could mean that it will no longer meet regulations and may not function properly or in accordance with the operating instructions.

Modification of equipment should only be made by competent personnel possessing knowledge of applicable standards, regulations, equipment design functionality / requirements and any required specialized testing.

Machine Components

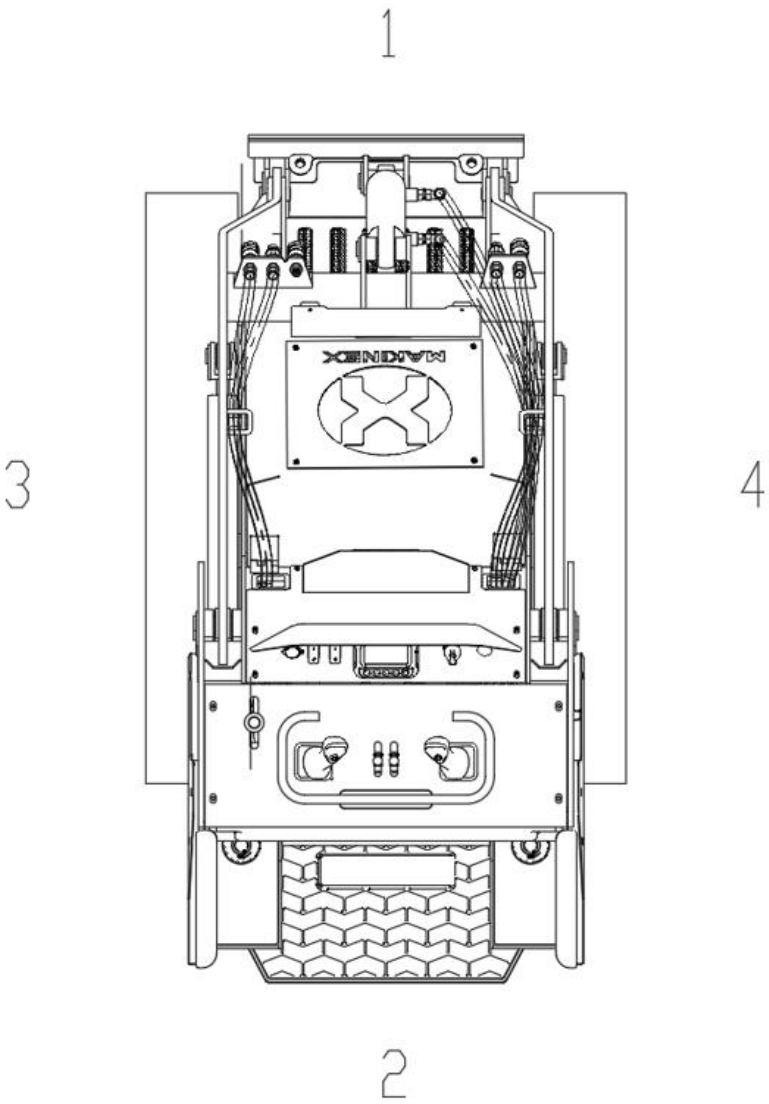
Machine Components



1. Operator Station	6. Hood	11. Handrail
2. Boom Lift cylinder	7. Lift Arms	12. Fuse Access
3. Side Access Window	8. Cylinder Lock	13. Fuel Tank
4. Tracks	9. Bucket Cylinder	14. Rear Access Panel
5. Track adjustment port	10. Mount Plate	15. Foot Pedal

Operator Orientation

1. Front of unit
2. Rear of unit
3. Left side of unit
4. Right side of unit



Guidelines

Follow these guidelines before operating the machine. Always follow all safety instructions to avoid serious injury or even death：

• Complete proper training and read operation manual before using equipment. Never allow children or untrained personnel to operate the machine.

• Contact your local One-Call or the One-Call referral number to have underground utilities located before digging.

⚠ WARNING

There may be buried utility lines in the work area. Digging into them may cause a shock or an explosion. Have the property or work area marked for buried lines and do not dig in marked areas. Contact your local marking service or utility company to have the property marked (for example, in the US, call 811 or in Australia, call 1100 for the nationwide marking service).

• Classify jobsite based on its hazards and use correct tools and machinery, safety equipment, and work methods for jobsite.

• Inspect the area where you will use the equipment and remove all debris. Keep bystanders and children out of the operating area.

• Review jobsite hazards, safety and emergency procedures, and individual responsibilities with all personnel before work begins.

• Keep your hands and feet away from the moving components and attachments.

• Do not operate the machine without the guards and other safety protective devices in place and working on the machine. Wear appropriate clothing including gloves, eye protection, long pants, substantial slip-resistant footwear, and hearing protection. Tie back long hair and do not wear loose clothing or loose jewelry.

• Replace missing or damaged safety shields and safety signs.

• Use equipment carefully. Stop operation and investigate anything that does not look or feel right.

Do not operate unit where flammable gas is present.

• Contact your MAKINEX dealer if you have any questions about operation, maintenance, or equipment use.

• Slopes are a major factor related to loss of control and tip-over accidents, which can result in severe injury or death. Operating the machine on any slope or uneven terrain requires extra caution.

• Never operate near ditches or embankments, as loose or soft ground conditions can cause the machine to collapse under it, causing the machine to become unstable.

• Do not exceed the rated operating capacity, as the machine may become unstable, which may result in loss of control.

• Operate the machine up and down slopes with the heavy end of the machine uphill

Weight distribution changes with attachments. An empty bucket makes the rear of the machine the heavy end, and a full bucket makes the front of the machine the heavy end. Most other attachments make the front of machine the heavy end.

• Do not operate the machine when you are tired, ill, or under the influence of alcohol or drugs.

• Use your full attention while operating the machine. Do not engage in any activity that causes distractions; otherwise, injury or property damage may occur.

• Stop the machine, shut off the engine, and remove the key before servicing, fueling, or unclogging the machine.

• Improperly using or maintaining this machine can result in injury. To reduce the potential for injury, comply with these safety instructions and always pay attention to the safety-alert symbol ⚠ hich means Caution, Warning, or Danger—personal safety instruction. Failure to comply with these instructions may result in personal injury or death.

• Always be environmentally responsible.

• Follow the guidelines of the EPA or other governmental agencies for the proper disposal of hazardous materials such as engine oil, diesel fuel, hydraulic fluid and engine coolant. Consult the local authorities or reclamation facility

• Never dispose of hazardous materials irresponsibly by dumping them into a sewer, on the ground, or into ground water or waterways. Failure to follow these procedures may seriously harm the environment.

Safety Alert Classifications

These classifications and the icons defined on the following pages work together to alert you to situations which could be harmful to you, job site bystanders or your equipment. When you see these words and icons in the book or on the machine, carefully read and follow all the instructions. Watch the three safety alert levels: ***DANGER, WARNING*** and ***CAUTION***. Learn what each level means.

⚠ DANGER Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

Watch two other words: ***NOTE*** and ***IMPORTANT***.

NOTE can keep you from doing something that might damage the machine or someone's property. It can also alert you against unsafe practices.

IMPORTANT can help you do a better job or make your job easier in some way.

CALIFORNIA ONLY

Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. Wash hands after handling.

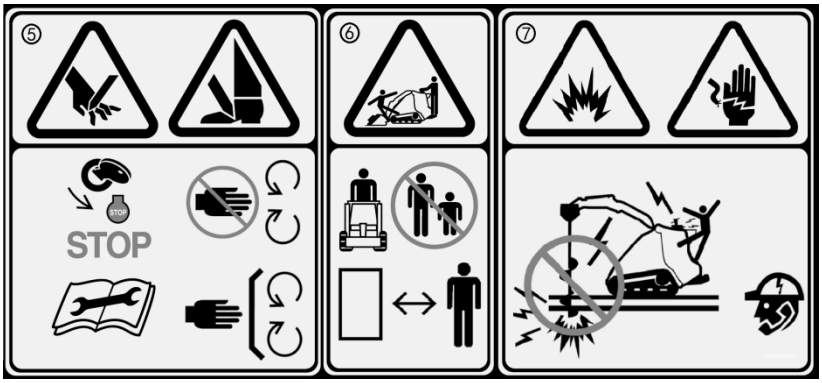
Use of this product may cause exposure to chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

Safety Labels

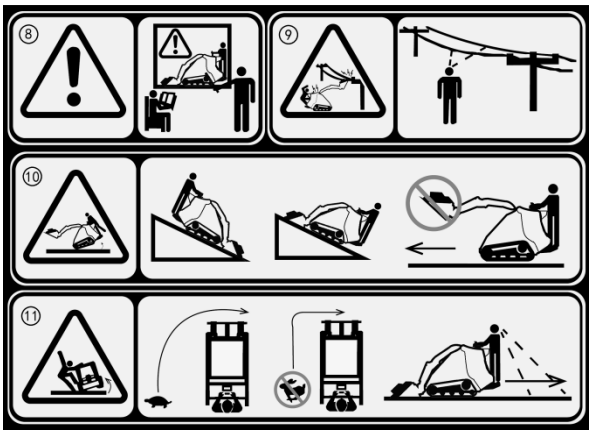
Safety Warning Signs: Safety decals and instructions are easily visible to the operator and are located near any area of potential danger. Replace any decal that is damaged or missing.

1. Warning—read the Operation Manual.
2. Warning—lower the attachment to the ground, shut off the engine, and remove the key from the ignition before leaving the machine.
3. Crushing hazard—Install the cylinder lock; read the Operation Manual before servicing or performing maintenance.

4. Warning—Never carry passengers.



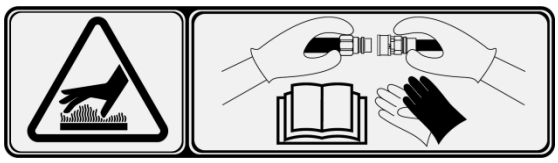
5. Cutting hazard of hand or foot—wait for all moving parts to stop before servicing; keep away from moving parts; keep all guards and shields in place.
6. Crushing hazard—keep away from the attachment when operating the machine; keep bystanders away from the machine. Always pay attention to your surroundings when operating the machine.
7. Explosion hazard; electrocution hazard—call the local utilities hotline before beginning work in an area.



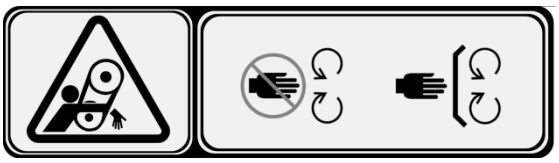
8. Warning- receive training before operating the machine.
9. Electrocution hazard, power lines—check for power lines in the area before using the machine.
10. Tipping hazard—always move up or down slopes with the attachment lowered; never drive on a slope with the attachment raised; always operate with the heavy end uphill; always carry loads low; never jerk the control levers; use a steady, even motion.

11. Tipping hazard—do not make fast turns; always check behind you before reversing the machine.

Crushing hazard of hands or feet—install the cylinder lock.



Burn hazard—wear protective gloves when handling the hydraulic couplers and read the Operation Manual for information on handling hydraulic components.

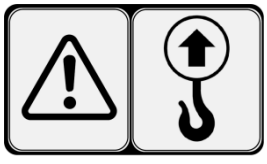


Entanglement hazard—stay away from moving parts; keep all guards and shields in place.

Crushing hazard from above; cutting hazard—keep away from the attachment and the lift arm.

Never carry passengers

Warning—do not touch the hot surface.



Lifting points

Tie-down point

Safety Alerts

DANGER

Moving digging teeth will kill you or cut off arm or leg. Stay away

DANGER

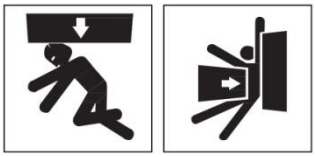
Turning shaft will kill you or crush arm or leg. Stay away.

DANGER

Electric shock. Contacting electric lines will cause death or serious injury. Know location of lines and stay away.

DANGER

Deadly gases. Lack of oxygen or presence of gas will cause sickness or death. Provide ventilation.



WARNING

Crushing weight could cause death or serious injury. Use proper procedures and equipment or stay away.

WARNING

Jobsite hazards could cause death or serious injury. Use correct equipment and work methods. Use and maintain proper safety equipment.

WARNING

Moving parts could cut off hand or foot. Stay away.

WARNING

Explosion possible. Serious injuries or equipment damage could occur. Follow directions carefully.

WARNING

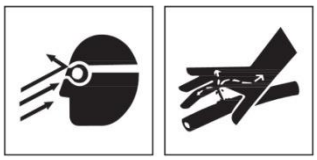
Incorrect procedures could result in death, injury, or property damage. Learn to use equipment correctly.

WARNING

Improper control function could cause death or serious injury. If control does not work as described in instructions, stop machine and have it serviced.

WARNING

Looking into fibre optic cable could result in permanent vision damage. Do not look directly into ends of fibre optic or unidentified cable.

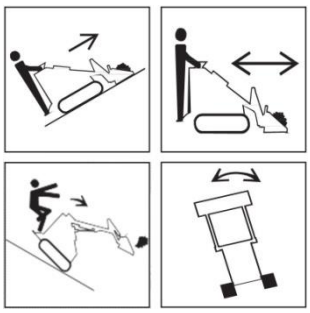


WARNING

Pressurized fluid or air could pierce skin and cause injury or death. Stay away.

WARNING

Fire or explosion possible. Fumes could ignite and cause burns. No smoking, no flame, no spark.



WARNING

Tipping hazard. Machine can tip over and crush you.
•Always operate with load end uphill.
•Always carry load low. High load can cause tipping, loss of load or loss of visibility.
•Never jerk control levers. Use a steady even motion.
•See page 79 for tip capacity.

⚠ WARNING

Flying objects may cause injury. Wear hard hat and safety glasses.

⚠ WARNING

Hot parts may cause burns. Do not touch until cool.

⚠ WARNING

Exposure to high noise levels may cause hearing loss. Wear hearing protection.

⚠ WARNING

Fall possible. Slips or trips may result in injury. Keep area clean.

⚠ WARNING

Battery acid may cause burns. Avoid contact.

⚠ WARNING

Improper handling or use of chemicals may result in illness, injury, or equipment damage. Follow instructions on labels and in material safety data sheets (MSDS).

Emergency Procedures

Before operating any equipment, review emergency procedures and check that all safety precautions have been taken.

EMERGENCY SHUTDOWN - Press the emergency stop switch.

Electric Strike

When working near electric cables, remember the following:

- Electricity follows all paths to ground, not just path of least resistance.
- Pipes, hoses, and cables will conduct electricity back to all equipment.
- Low voltage current can injure or kill. Many work-related electrocutions result from contact with less than 440 volts.

Most electric strikes are not noticeable, but indications of a strike include:

- power outage
- smoke
- explosion
- popping noises
- arcing electricity

If any of these occur, assume an electric strike has occurred.

If an Electric Line is Damaged

If you suspect an electric line has been damaged and you are **on platform**, DO NOT MOVE. Remain on platform and take the following actions. The order and degree of action will depend upon the situation.

- Warning people nearby that an electric strike has occurred. Instruct them to leave the area and contact utility.

- Raise attachments and drive from the immediate area.
- Contact utility companies to shut off power.
- Do not return to the jobsite or allow anyone into area until given permission by utility company.

If you suspect an electric line has been damaged and you are off platform, DO NOT TOUCH MACHINE. Take the following actions. The order and degree of action will depend upon the situation.

- LEAVE AREA. The ground surface may be electrified, so take small steps with feet close together to reduce the risk of being shocked from one foot to the other.
- Contact utility companies to shut off power.
- Do not return to the jobsite or allow anyone into area until given permission by utility company.

If a Gas Line is Damaged

If you suspect a gas line has been damaged, take the following actions. The order and degree of action will depend on the situation.

- Immediately shut off the engine, if this can be done safely and quickly.
- Remove any ignition source(s), if this can be done safely and quickly.
- Warn others that a gas line has been cut and that they should leave the area.
- Leave jobsite as quickly as possible.
- Immediately call your local emergency phone number and utility company.
- If the jobsite is along the street, stop traffic from driving near jobsite.

Do not return to jobsite until given permission by emergency personnel and utility.

If a Fibre Optic Cable is Damaged

Do not look into cut ends of fiber optic or unidentified cable. Vision damage can occur.

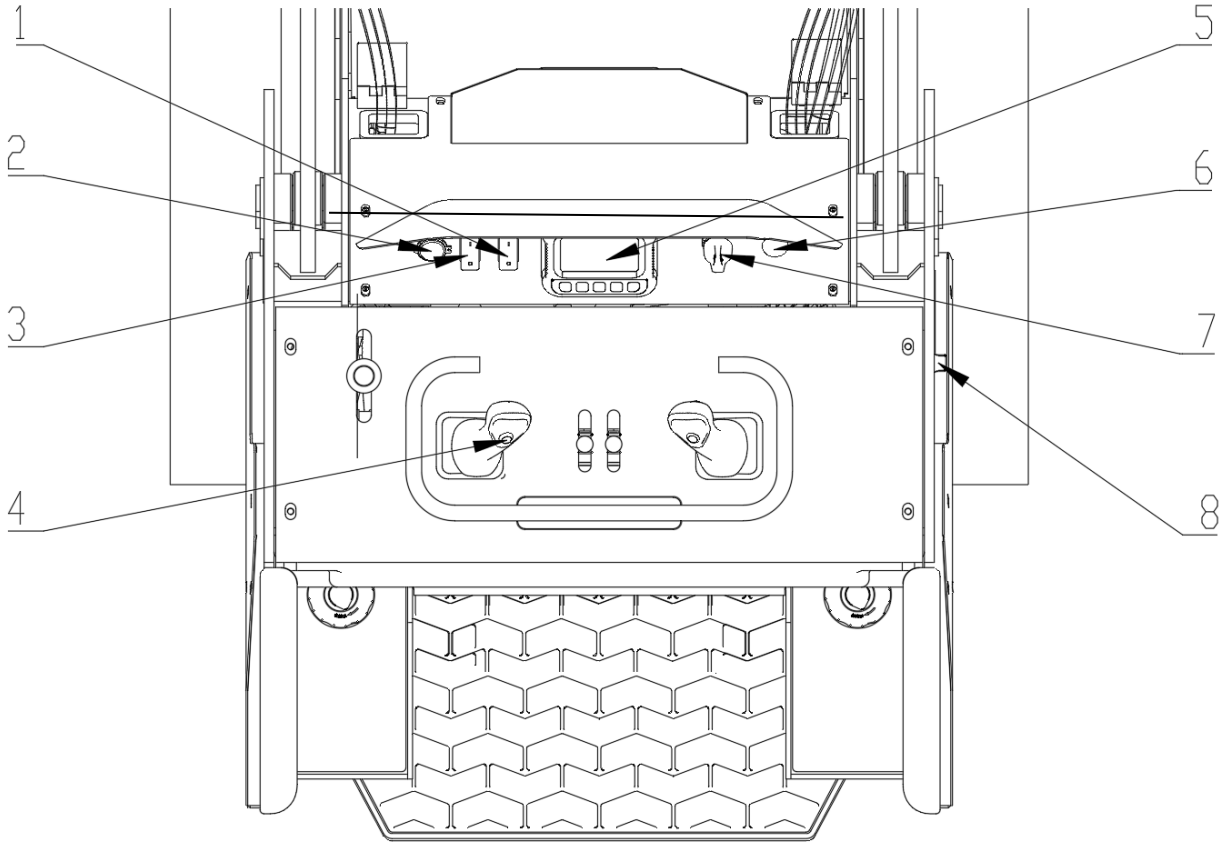
If Machine Catches on Fire

Perform an emergency shutdown procedure and then take the following actions. The order and degree of action will depend on the situation.

- Immediately move battery disconnect switch to disconnect position.
- If fire is small and fire extinguisher is available, attempt to extinguish fire.

If fire cannot be extinguished, leave area as quickly as possible and contact emergency personnel.

Gauges and Indicators



1. Work light switch

2. Electric socket

3. Parking switch

4. Horn

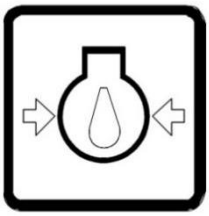
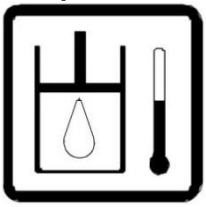
5. Integrated instrument

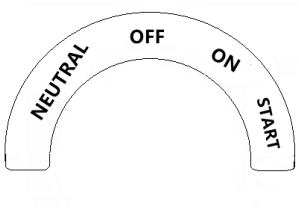
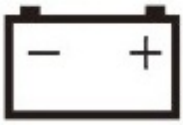
6. Emergency stop switch

7. Ignition switch

8. Battery switch

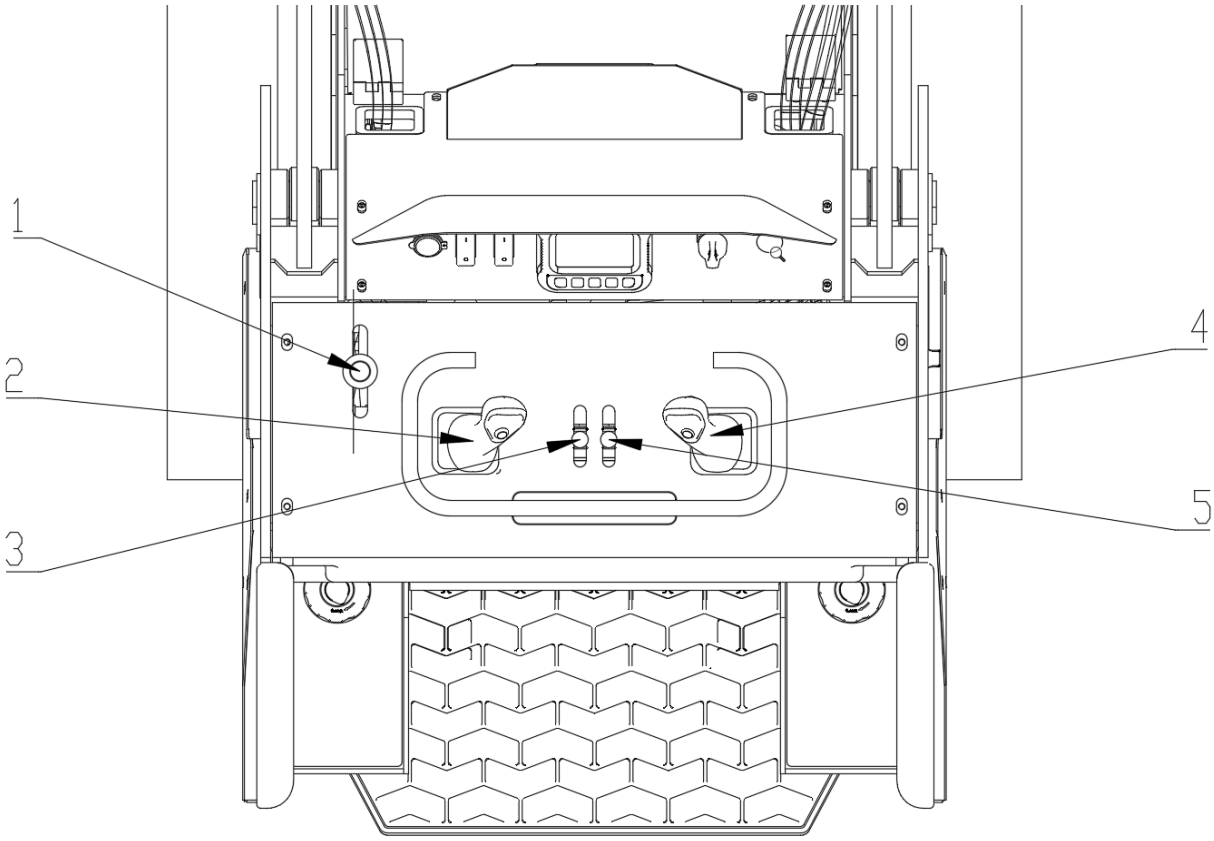
Gauges and indicators icons

Items	Description	Notes
1. Engine preheating indicator 	To warm up the engine, turn the ignition switch to ON, hold for 5-10 seconds, After the preheat light goes out, then turn clockwise to the end to start.	
2. Fuel gauge 	Displaying the amount of fuel remaining in the tank.	***NOTICE:*** Use low sulfur or ultra-low sulfur fuel only.
3. Engine oil pressure indicator 	Light on when engine oil pressure is low. Also lights on when the engine is not running, this is normal.	***NOTICE:*** The engine must be shut down when the indicator light is on. 1. Check oil level. 2. Check for leaks before starting engine.
4. Hydraulic fluid temperature indicator 	Light on when hydraulic fluid is overheating.	***NOTICE:*** 1. Check hydraulic fluid level. 2. Reduce load. 3. Ensure oil cooler is clean.
5. Engine coolant . Temperature indicator 	Displays engine coolant. Temperature. Light on when engine coolant temperature is too high.	***NOTICE:*** 1. Stop operation, set throttle to low. idle, and allow engine to cool. 2. Stop engine. 3. Check coolant level.

Item	Description	Notes
6. Ignition switch 	**NEUTRAL:** Neutral **OFF:** The engine, gauges and indicator lights will be turned off, and the key can be inserted and removed. **ON:** Turn on the meter, Electric socket, lights, electronic fuel pump and engine preheating **START:** Start the engine. After the engine starts, let go of the hand and let the key automatically return to the "ON" position	***IMPORTANT:*** 1. If the engine does not start or stalls, turnkey to STOP and restart after 30s. 2. Do not allow starter motor to run continuously for more than 15s.
7. Hour meter 	Displays operating time.	Use these times to schedule service.
8. Engine speed 	Displays engine speed.	
9. battery indicator 	Display battery voltage, alarm when the voltage is too low or too high.	
10. Air filter alarm indicator 	When the light is on, the air filter is dirty and needs to be cleaned or replaced.	

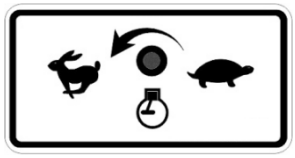
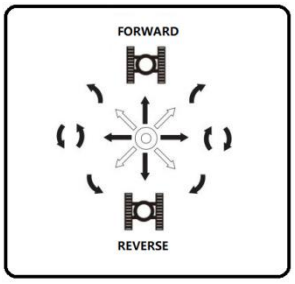
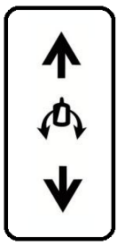
11. High Altitude Indicator 	When the altitude is higher than 800m, to ensure that the emission standard is met, the engine torque is reduced by 10%. The indicator light is on.	

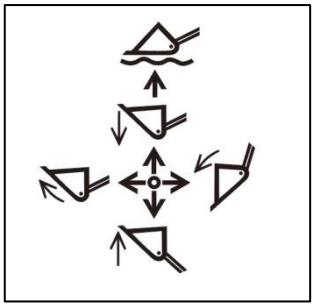
Joysticks and switches



1. Throttle lever
2. Traction control joystick
3. Control joystick of attachment hydraulic motor
4. Right main joystick
5. Control joystick of attachment cylinder

Joysticks and switches icons

Item	Description	Notes
1. Throttle lever 	Moving the control knob anticlockwise increases the engine speed and moving the knob clockwise slows the engine to idle speed.	***NOTICE:*** When you want to quickly increase the speed of the engine: 1. press the red control knob 2. at the same time, lift the knob with 2 fingers.
2. Traction control joysticks 	To move forward, push. To move backward, pull. To go faster in either direction, move control farther from neutral. To stop, move to neutral.	1. To steer while moving forward, push joystick forward, then move left or right. Machine will gradually turn left or right. 2. To steer while moving backward, pull joystick back, then move left or right. Machine will gradually turn left or right. 3. For tight steering in low speed, move joystick to center position then to left or right side. Tracks will counter rotate.
3. Control joystick of attachment hydraulic motor 	The joystick controls the running direction of the motor on the attachment. To stop, move to neutral.	

Item	Description	Notes
4. Right main joystick 	1.To move lift arms down, push. 2.To move lift arms up, pull. 3.To curl attachment up, move to left. 4.To curl attachment down, move to right. To stop, move to neutral.	To go faster in either direction, move control farther from neutral. If the Joystick is pushed all the way forward, it will lock in position, and the bucket will follow the contour of the ground without application of downward force. (Float function)
5. Control joystick of attachment cylinder 	Push forward, extends the hydraulically powered attachment's cylinder. Pull back, retracts the hydraulically powered attachment's cylinder. To stop, move to neutral.	

Collecting Information

A successful job begins before you start working. The first step in planning is reviewing information already available about the work and jobsite.

All Work

Review Work Plan

Review blueprints or other plans. Check for information about existing or planned structures, elevations, or proposed work that may be taking place at the same time.

Arrange for Traffic Control

If you work near a road or other traffic area, contact local authorities about safety procedures and regulations.

Plan for Emergency Services

Have the telephone numbers for local emergency and medical facilities on hand. Check that you will have access to a telephone.

Underground Work

Notify One-Call Services

Contact your local One-Call or the One-Call referral number to have underground utilities located before digging. Also contact any utilities that do not participate in the One-Call service.

Above-Groundwork

Locate Overhead Lines

Note location and height of all overhead lines in jobsite and ensure that fully lifted attachment and/or load will not touch lines.

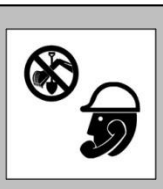
Inspect Site

Inspect jobsite before transporting equipment. Check for the following:

- changes in elevation such as hills or other open trenches
- obstacles such as buildings, railroad crossings, or streams
- signs of utilities (See “Inspect Jobsite” on page 31.)
- traffic
- access
- soil type and condition

Identify Hazards

Identify safety hazards and classify jobsite if attachment will penetrate ground. See “Classify Jobsite” on page 31.



⚠ WARNING

Jobsite hazards could cause death or serious injury. Use correct equipment and work methods. Use and maintain proper safety equipment.

To help avoid injury:

- Wear personal protective equipment including hard hat, safety eye wear, and hearing protection.
- Do not wear jewelry or loose clothing.
- Notify One-Call and companies which do not subscribe to One-Call.
- Comply with all utility notification regulations before digging or drilling.
- Verify location of previously marked underground hazards.

Classify Jobsite

Inspect Jobsite

- Inspect jobsite and perimeter for evidence of underground hazards, such as:
  - "Buried utility" notices
  - utility facilities without overhead lines
  - gas or water meters
  - junction boxes
  - drop boxes
  - light poles
  - manhole covers
  - sunken ground
- Follow U.S. Department of Labor regulations on excavating and trenching (Part 1926, Subpart P) and other similar regulations.
- Contact your local One-Call or the One-Call referral number to have underground utilities located before digging. Also contact any utilities that do not participate in the One-Call service.
- Have an experienced locating equipment operator sweep area within 20' (6 m) to each side of work path. Verify previously marked line and cable locations.
- Mark location of all buried utilities and obstructions.
- Classify jobsite.

Select a Classification

Jobsites are classified according to underground hazards present.

If working . . .	then classify jobsite as . . .
within 10' (3 m) of a buried electric line	electric
within 10' (3 m) of a natural gas line	natural gas
in sand or granite which is capable of producing crystalline silica (quartz) dust	crystalline silica (quartz) dust
within 10' (3 m) of any other hazard	other

NOTICE: If you have any doubt about jobsite classification, or if jobsite might contain unmarked hazards, take steps outlined previously to identify hazards and classify jobsite before working.

Apply Precautions

Once classified, precautions appropriate for jobsite must be taken.

Electric Jobsite Precautions

Use one or both of these methods.

- Expose line by careful hand digging or soft excavation.
- Have service shut down while work is in progress. Have electric company test lines before returning them to service.

Natural Gas Jobsite Precautions

In addition to positioning equipment upwind from gas lines, use one or both of these methods.

- Expose lines by careful hand digging or soft excavation.
- Having gas shut off while work is in progress. Have gas company test lines before returning them to service.

Crystalline Silica (Quartz) Dust Precautions

Cutting, drilling, or working materials such as concrete, sand, or rock containing quartz may result in exposure to silica dust. Use water spray or other means to control dust. If workers are exposed to dust, they must wear appropriate breathing protection. Silica dust may cause lung disease and is known to the State of California to cause cancer.

Other Jobsite Precautions

You may need to use different methods to safely avoid other underground hazards. Talk

with those knowledgeable about hazards present at each site to determine which precautions should be taken or if job should be attempted.

Check Supplies and Prepare Equipment

Supplies

- diesel fuel

  NOTICE: Use low sulfur or ultra-low sulfur fuel only.

- keys
- lubricants
- personal protective equipment, such as hard hat and safety glasses

Fluid Levels

- fuel
- hydraulic fluid
- coolant
- engine oil

Condition and Function

- filters (air, oil, hydraulic)
- tracks
- pumps and motors
- engine
- hoses and valves
- signs, guards, and shields

Accessories

Fire Extinguisher

If required, mount a fire extinguisher near the power unit but away from possible points of ignition. The fire extinguisher should always be classified for both oil and electric

fires. It should meet legal and regulatory requirements.

Attachment Connection

NOTICE: Use only MAKINEX approved attachments. Attachments can change the stability and operating characteristics of the unit.

Attachment

IMPORTANT: Before connecting attachment to unit, ensure that mount and receiver plates are free of dirt and debris.

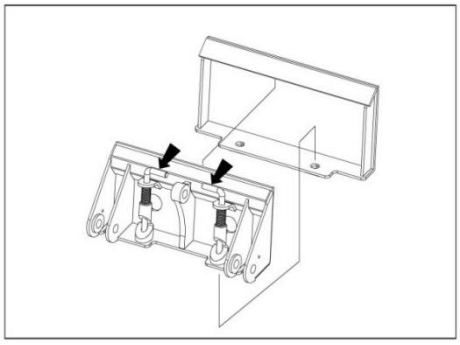


Figure1

1. Position attachment on level surface with enough space behind it to accommodate equipment.
2. Ensure that lock pin handles (shown **Figure1**) on mount plate are turned towards center of attachment.
3. Start engine.
4. Tilt mount plate (2) forward.
5. Position mount plate in the upper lip of the receiver plate (1) on attachment.
6. Raise lift arms while tilting back mount plate (2).

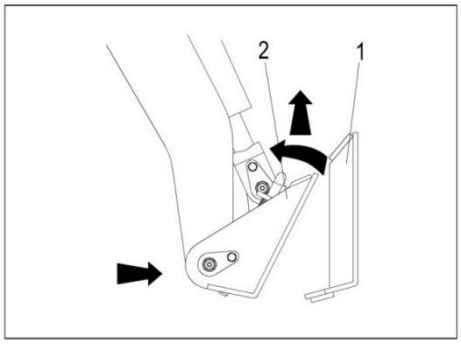


Figure2

IMPORTANT: Attachment should be raised enough to lift off the ground. Mount plate (2) should be tilted back fully.

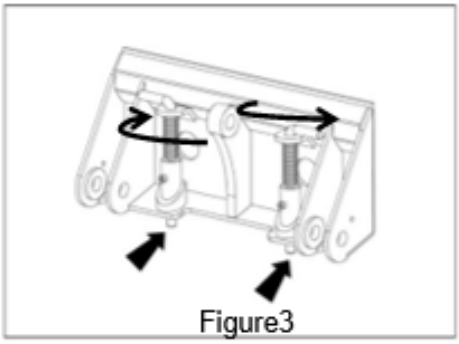


Figure3

7. Turn ignitions switch off and remove key
8. Rotate lock pin handles away from center of mount plate to secure attachment to lift plate

⚠WARNING If you do not fully seat the quick-attach pins through the attachment mount plate, the attachment could fall off the machine, crushing you or bystanders.

Ensure that the quick-attach pins are fully seated in the attachment mount plate. Bottoms of lock pins are visible under attachment receiver plate (shown **Figure3**).

Connect Attachment Hydraulic Hoses

If attachment requires hydraulic power for operation, connect hydraulic hoses after installing the attachment.

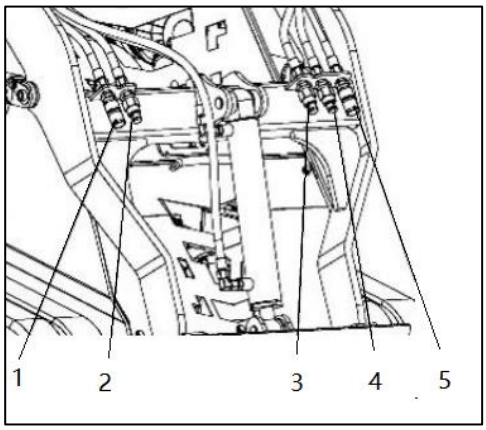

WARNING Pressurized fluid or air could pierce skin and cause injury or death. Stay away.

To help avoid injury:

- Escaping pressurized fluid can cause injury or pierce skin and poison.
- Before disconnecting a hydraulic line, turn engine off and operate all controls to relieve pressure. Lower, block, or support any raised component with a hoist. Cover connection with heavy cloth and loosen connector nut slightly to relieve residual pressure. Catch all fluid in a container.
- Before using system, check that all connections are tight and all lines are undamaged.
- Use a piece of cardboard or wood, rather than hands, to search for leaks.
- Wear protective clothing, including gloves and eye protection.
- If you are injured, seek immediate medical attention from a doctor familiar with this type of injury.

WARNING Hot parts may cause burns. Do not touch until cool.
To help avoid injury: Wear gloves when connecting and disconnecting hydraulic hoses and wait until unit has cooled before touching hydraulic components.

1. Cycle attachment drive control to relieve residual pressure at hydraulic couplers.
2. Remove dirt and debris from hydraulic couplers.
3. Connect male coupler on attachment to female coupler (1) on unit.
4. Connect female coupler on attachment to male coupler (2) on unit.
5. If needed, connect attachment case drain hose to case drain connector (3).
6. Ensure that connections are secure by pulling on hoses.



NOTICE:

1. Quick coupler (4) and (5) control motor, such as trencher.
2. Quick coupler (1) and (2) control cylinder, such as 4 in 1 bucket.

Safety Before Operation

General Safety

• Never allow children or untrained people to operate the machine.

• Become familiar with the safe operation of the equipment, operator controls, and safety decals.

• Always shut off the engine, remove the key, wait for all moving parts to stop, and allow the machine to cool before adjusting, servicing, cleaning, or storing the machine.

• Know how to stop the machine and shut off the engine quickly.

• Check that the operation presence controls, safety switches, and shields are attached and functioning properly. Do not operate the machine unless they are functioning properly.

• Locate the pinch-point areas marked on the machine and attachments; keep your hands and feet away from these areas.

• Before operating the machine with an attachment, ensure that the attachment is properly installed and that it is a genuine MAKINEX attachment.

• Have the property or work area marked for buried lines and other objects, and do not dig in marked areas; note the location of unmarked objects and structures, such as underground storage tanks, wells, and septic systems.

• Inspect the area where you will use the equipment and remove all debris. Ensure that the area is clear of bystanders before operating the machine. Stop the machine if anyone enters the area.

Fuel Safety

• Use extreme care when handling fuel. It is flammable and its vapours are explosive. Extinguish all cigarettes, cigars, pipes, and other sources of ignition.

• Do not remove the fuel cap or fill the fuel tank while the engine is running or hot.

• Do not add or drain fuel in an enclosed space.

• Do not store the machine or fuel container where there is an open flame, spark, or pilot light, such as on a water heater or other appliance.

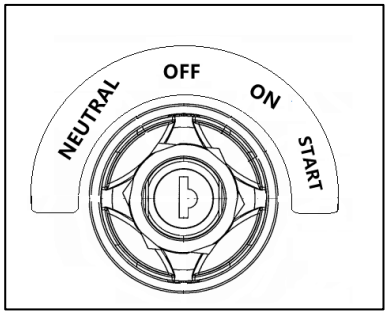
• If you spill fuel, do not attempt to start the engine; avoid creating any source of ignition until the fuel vapours have dissipated.

• To prevent a static charge from igniting the fuel, remove the machine from the truck or trailer and refuel it on the ground, away from all vehicles. If this is not possible, place a portable fuel container on the ground, away from all vehicles, and fill it; then refuel the machine from the fuel container rather than from a fuel-dispenser nozzle.

• Keep the fuel-dispenser nozzle in contact with the rim of the fuel tank or container opening at all times until fuelling is complete.

Notice: Never completely fill the fuel tank to prevent fuel expansion.

Start Machine



1. Ensure all controls are in neutral.
2. Turn on the battery switch.
3. Stand on the pedals and hold the operating handrail.
4. Move throttle to half open.
5. Turn ignition switch to the "ON" position, the preheating signal light is on, after the preheating signal light goes out, the engine can be started.
6. Turn ignition switch to “start” position and release when engine starts.

NOTE: Never hold the key in the START position for longer than 15 seconds or the starter motor will overheat. Wait at least 30 seconds before you attempt to start the engine again. Failure to follow these instructions may burn out the starter motor.

⚠WARNING The engine can only be started with the key switch. Never jump start the engine. Shorting the battery and starter terminals may create sparks that could result in a fire or explosion.

EMERGENCY SHUTDOWN - Press the emergency stop switch.

Drive

⚠WARNING Tip over possible. Machine can tip over and crush you.

To Help avoid injury：

- To help avoid injury.
- Do not overload, High load can cause tipping, loss of load or loss of visibility.

General Operation

1. Ensure all controls are in neutral.
2. Pull lift arm control to raise mount plate (and attachment) off ground.
3. Operate the left main joystick to control the walking and steering of the machine. See page 26. To go faster in either direction, move control farther from neutral. To stop, move to neutral.

NOTICE: If you need to operate the attachment, push the attachment control handle. At the same time, the walking control handle and the boom control handle can be operated.

4. Adjust throttle as needed.
5. See attachment operation manual for instructions regarding proper operation of attachment.

NOTICE: Leave the throttle setting at about the halfway position and allow the engine to idle. This will begin warming the engine coolant and hydraulic oil.

In cold weather (32º F [0º C]) after about 5 minutes of engine idling, operate all of the main hydraulic controls to cycle warmed hydraulic oil through the hydraulic lines into the cylinders and hydraulic motors. Allow the engine to idle for another 5 minutes before beginning any machine operations.

Safety During Operation

General Safety

• Use your full attention while operating the machine. Do not engage in any activity that causes distractions; otherwise, injury or property damage may occur.

• Do not move the machine unless you are standing with both feet on the platform and your hands are holding onto the reference bars. Do not try to stabilize the machine by putting your foot on the ground. If you lose control of the machine, step off the platform and away from the machine.

• Wear appropriate clothing including gloves, eye protection, long pants, substantial slip-resistant footwear, and hearing protection. Tie back long hair and do not wear loose clothing or loose jewellery.

• Do not operate the machine when you are tired, ill, or under the influence of alcohol or drugs.

• Never carry passengers and keep pets and bystanders away from the machine.

• Do not carry a load with the arms raised. Always carry loads close to the ground.

• Do not exceed the rated operating capacity, as the machine may become unstable, which may result in loss of control.

• Use only MAKINEX approved attachments and accessories. Attachments can change the stability and the operating characteristics of the machine.

• Look behind and down before backing up to ensure that the path is clear.

• Never jerk the controls; use a steady motion.

• The owner/use is responsible for preventing and taking responsibility for accidents that could result in personal injury or property damage.

• Operate the machine only in good light, keeping away from holes and hidden hazards.

• Ensure that all the drives are in neutral and engage the parking brake (if equipped) before starting the engine. Start the engine only from the operation position.

• Use care when approaching blind corners, shrubs, trees, or other objects that may obscure vision.

• Slow down and use caution when making turns and crossing roads and sidewalks. Watch for traffic.

• Stop the attachment when you are not working.

• Stop the machine, shut off the engine, remove the key, and inspect the machine if you strike an object. Make any necessary repairs before resuming operation.

• Never run an engine in an enclosed area.

• Never leave a running machine unattended.

• Before leaving the operating position, do the following:

– Park the machine on a level surface.

– Lower the loader arms and disengage the auxiliary hydraulics.

– Shut off the engine and remove the key.

• When the engine is running or just stopped, keep away from diesel and other flammable substances such as motor oil, hay, etc.

• Do not operate the machine when there is the risk of lightning.

• Operate the machine only in areas where there is sufficient clearance for you to safely manoeuvre. Be aware of obstacles near you. Failure to maintain adequate distance from trees, walls, and other barriers may result in injury as the machine backs up during operation if you are not attentive to the surroundings.

• Check for overhead clearance (i.e., electrical wires, branches, and doorways) before driving under any objects and do not contact them.

• Do not overfill the attachment and always keep the load level when raising the loader arms. Items in the attachment could fall and cause injury.

Safe Slope Operation

Operating safely on a slope depends upon many factors including:

• Distribution of machine weight, including front loading and absence of load.

• Height of load.

• Even or rough ground conditions.

• Potential for ground giving way causing unplanned tilt forward, reverse or sideways.

• Nearness of ditches, ruts, stumps or other obstructions and sudden changes in slope.

• Speed

• Turning

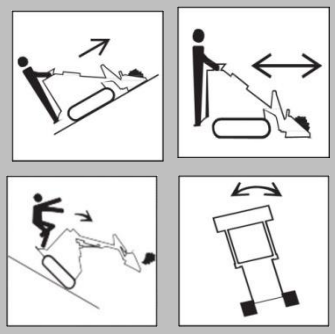
• Braking performance

• Operator skill

These varying factors make it impractical to specify a maximum safe operating angle in this manual. It is therefore important for the operator to be aware of these conditions and adjust operation accordingly.

Maximum engine angle is absolute limits which must never be exceeded. These maximums are stated below. This design limits usually exceed the operating limits and must never be used alone to establish safe operating angle for variable conditions.

⚠WARNING



Tip over possible. Machine can tip over and crush you.

To help avoid injury:

- Always operate with heavy end uphill.
- Always carry load low. High load can cause tipping, loss of load or loss of visibility.
- Always drive cautiously.
- Never jerk control levers. Use a steady even motion.
- Do not park unit on slope without lowering attachment to the ground, returning all controls to neutral position, shutting down unit, and applying parking brake.
- See “Tipping capacity” on page 79.

NOTICE: If the engine is operated at an inclination angle exceeding 25° (in any direction) for a long time or at an inclination angle exceeding 30° (in any direction) for a short time (within 3 minutes), engine oil may enter the combustion chamber causing excessive engine speed and white exhaust smoke. This may cause serious engine damage.

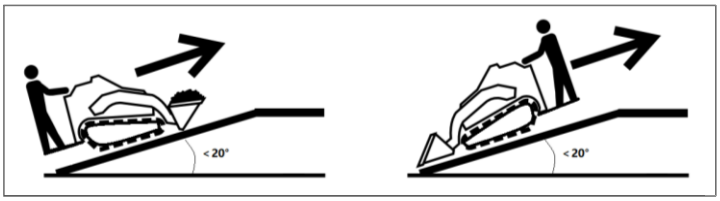
Do not travel up or across a slope steeper than **20°**. Doing so may cause the unit to tip over and cause damage to the operator and machine.

• Make sure that the tracks are extended to their widest position, providing the broadest stance for the machine.

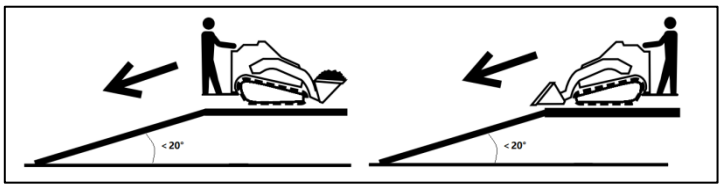
• Keep attachments as low as possible when traveling on slopes or rough terrain.

• Keep the heavy end of the machine towards the uphill direction when traveling up or down a slope.

Uphill：



Downhill:



NOTICE: Operate the machine up and down slopes with the heavy end of the machine uphill. Weight distribution changes with attachments. An empty bucket makes the rear of the machine the heavy end, and a full bucket makes the front of the machine the heavy end. Most other attachments make

Shut Down

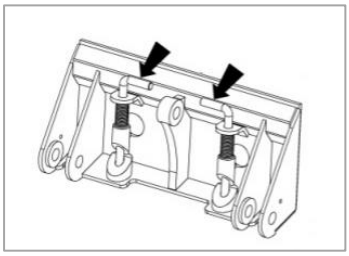
1. Lower lift arms to ground.
2. Move all controls to neutral position. Move throttle to its lowest setting.
3. Run engine at low idle for five minutes to cool. Turn ignition switch to “STOP”.

NOTICE: If the engine works continuously for a long time or the temperature is very high. Idle the engine for five minutes and then turn it off. This helps cool the engine down before shutting it down. In an emergency you can immediately shut down the engine.

4. Remove key.
5. Turn off the power switch.
6. Clean off any accumulated mud and/or dirt from the machines operating surfaces, i.e. Operation platform, both track assemblies, etc.

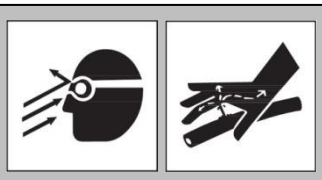
Disconnect or replace attachment.

1. Lower attachment to the ground.
2. Turn off engine.
3. Disengage lock pins by turning towards centre of attachment.
4. Move the attachment-hydraulics lever forward, backward, and back to the NEUTRAL position to relieve pressure at the hydraulic couplers. and disconnect hydraulic hoses (if used hydraulic hoses).
5. Start engine.
6. Tilt mount plate forward and back equipment away from attachment.
7. Then follow the instructions in "Attachment Connection" on page 32 to complete the attachment replacement (if needed).



Disengaged

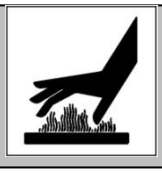
Disconnect Attachment Hydraulic Hoses



WARNING Pressurized fluid or air could pierce skin and cause injury or death. Stay away.

To help avoid injury:

- Escaping pressurized fluid can cause injury or pierce skin and poison.
- Before disconnecting a hydraulic line, turn engine off and operate all controls to relieve pressure. Lower, block, or support any raised component with a hoist. Cover connection with heavy cloth and loosen connector nut slightly to relieve residual pressure. Catch all fluid in a container.
- Before using system, check that all connections are tight and all lines are undamaged.
- Use a piece of cardboard or wood, rather than hands, to search for leaks.
- Wear protective clothing, including gloves and eye protection.
- If you are injured, seek immediate medical attention from a doctor familiar with this type of injury.

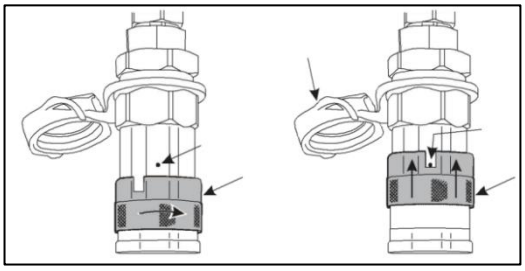


WARNING Quick couplers and hydraulic hoses will be very hot after use, wear gloves when disconnecting the hydraulic hose of the attachment!

To remove a hydraulically powered attachment:

1. Lower the attachment to the ground and shut off the engine.

2. Move the attachment control lever forward or backward to release any stored hydraulic pressure.



3. Some of the female couplings will have a lock button preventing accidental disconnection. To release this type of quick connect, rotate the collar on the female quick connect to align the notch on the collar with the lock button.

4. Slide the collar backwards on the female quick connect until it stops against the lock button. The male connector will be released. Move the attachment hose away from the bulkhead fitting.

5. Repeat this procedure on the other hydraulic line.

6. Cover the hose connections with the dust caps and store the hydraulic hoses to prevent damage.

8. Follow the instructions in “Disconnect Attachment” earlier in this section to complete the attachment removal.

Transportation

Lifting Points

WARNING Crushing weight. If load falls or moves it could kill or crush you. Use proper procedures and equipment or stay away.

To help avoid injury: Only lift unit without attachment installed.

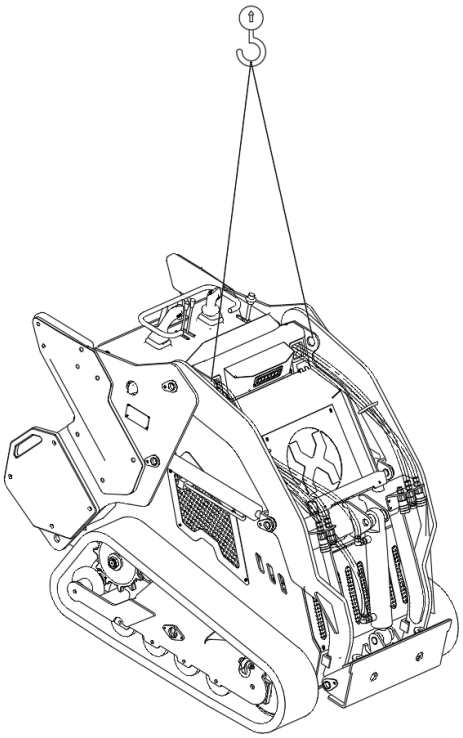
Lifting points are identified by lifting decals. Lifting at other points is unsafe and can damage machinery.

Procedure

Use lifting equipment and chains that support the size and weight of the equipment. See “Specifications” on page 76 or measure and weigh equipment before lifting.

IMPORTANT: Front of unit will be lower than rear of unit when using only two lift points.

- Use two points as shown.



Haul Load

WARNING Crushing weight. If load falls or moves it could kill or crush you. Use proper procedures and equipment or stay away.

To help avoid injury:

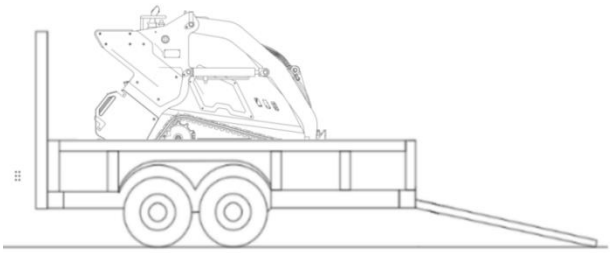
- Get on and off the trailer on level ground.
- Improper loading position can cause trailer to shake
- Operate the machine only while standing on the foot pedals.

1. Move the throttle control lever to the mid-range engine speed. Raise the attachment so that it will clear the ramp of the transport trailer.

NOTE: Follow general load carrying safety. Always carry the heaviest load pointing uphill. When operating without an attachment, the operator becomes the load.

2. Drive slowly to move unit onto trailer until tie down position is reached.

3. Position the machine so that the heaviest weight (centre of balance) is towards the front (hitch end) of the trailer. （When without attachment see Figure.)



4. When the machine is positioned on the trailer properly, lower the attachment to the trailer deck.

5. Ensure that all controls are in neutral position.

6. Shut the engine off and remove the key.

7. Secure the unit to the transport vehicle. Make sure to use the appropriate tie-down locations on the machine and trailer.

NOTE:

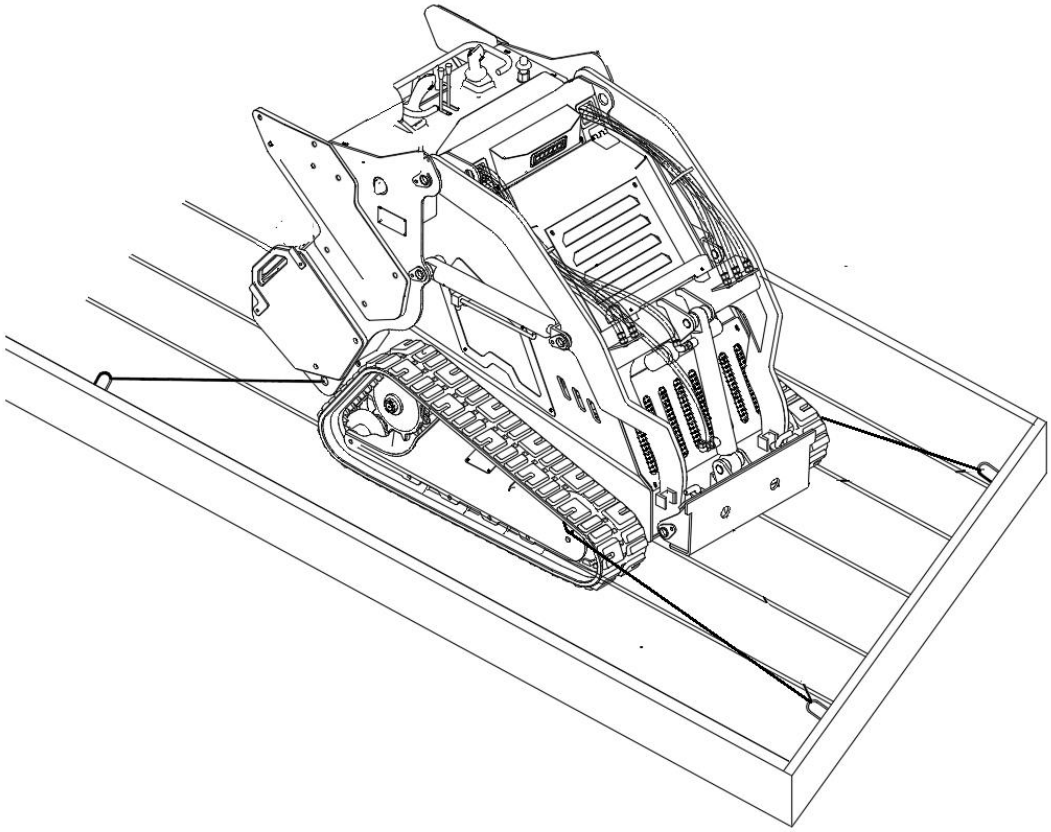
- Never tow or pull the machine. Damage to the hydraulic motors could result.
- If the machine is totally in-operable, using lifting straps and a machine that can safely lift 4,000 lbs (1820 Kg), lift the machine and place it on a trailer.

Tie Down Points

Tie down points are identified by tie down decals.

Securing to truck or trailer at other points is unsafe and can damage machinery.

When transporting the machine, make sure to use approved chains and binders to secure the machine to the “D” rings on the trailer.
Secure the machine with a ring at the front of the machine and two rings at the rear of the machine.



Unloading

WARNING Crushing weight. If load falls or moves it could kill or crush you. Use proper procedures and equipment or stay away.

To help avoid injury:

- Load and unload trailer on level ground.
- Attach trailer to towing vehicle before loading or unloading.

1. Prepare trailer and ramps for unloading.
2. Remove the tie down.
3. Disengage parking brake.
4. Start engine.
5. Pull lift arm control to raise mount plate (and attachment) off ground but keep it low.
6. Adjust throttle to low speed. Drive the equipment slowly down the ramp to the ground.

After Completing the Job

Rinse Equipment

1. Spray water onto equipment to remove dirt and mud. Take care to protect the air filter and electrical components.

NOTICE: Turn off the engine and battery switch before cleaning. Do not spray water onto Operation console. Electrical components could be damaged. Wipe down instead.

2. Open hood and allow unit to cool. Remove debris from inside of unit.
3. Remove mud from track sprockets.
4. Wash undercarriage.

Disconnect Attachment

Follow the instructions in “Disconnect Attachment” page 42 to complete the attachment removal.

Long-term Storage

Make sure the equipment and attachments are stored in a dry garage for safekeeping。

Before you place the equipment in long-term storage (more than 6 months).

1. Perform the next Preventive Maintenance procedure. For example, if there are 10 hours remaining before the 250-hour maintenance, you should do the maintenance before you place the equipment in storage.

See Periodic Maintenance Schedule on page 55.

2. Drain the fuel tank.
3. Disconnect the negative (-) battery cable to prevent the battery from discharging.
4. Protect the equipment from water and dust.
5. Charge the battery once a month during storage.

Maintenance

Precautions

WARNING Incorrect procedures could result in death, injury, or property damage. Learn to use equipment correctly.

To help avoid injury:

- Unless otherwise instructed, perform all service with engine off.
- Refer to engine manufacturer's manual for engine maintenance instructions.

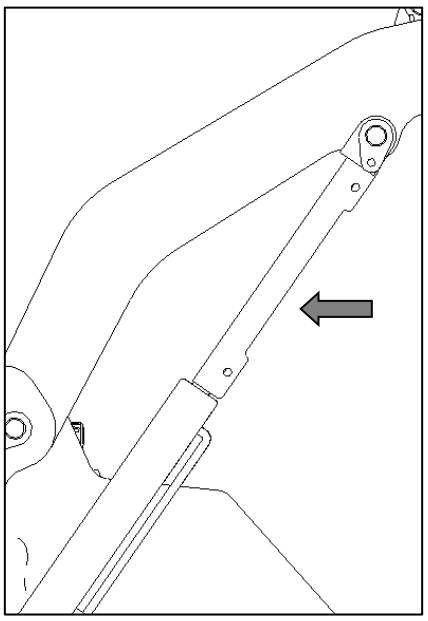
Working Under Raised Lift Arms

WARNING Crushing weight could cause death or serious injury. Use proper procedures and equipment or stay away.

To help avoid injury: Support lift arm before working under raised lift arm.

WARNING

Use safety supports as indicated when working under raised lift arms.



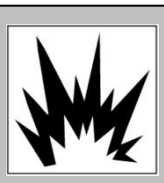
Jump Starting Precaution

WARNING Explosion possible. Serious injury or equipment damage could occur. Follow directions carefully.

To help avoid injury:

- Keep sparks and flames away from battery. Battery gas can explode.
- Follow instructions to prevent damage to electronic components.
- Only jump-start in extreme circumstances. Follow procedures on page 76

Welding Precaution



WARNING Explosion possible. Serious injury or equipment damage could occur. Follow directions carefully.

NOTICE:

- Disconnect battery to prevent damage to battery. Do not turn off battery disconnect switch with engine running, or alternator and other electronic devices may be damaged.
- Connect welder ground clamp close to welding point and make sure no electronic components are in the ground path.
- Always disconnect the Engine Control Unit ground connection from the frame, harness connections to the ECU, and other electronic components prior to welding on machine or attachments.

Maintenance Safety

> ***NOTE:*** If you leave the key in the switch, someone could accidently start the engine and seriously injure you or other bystanders.

Remove the key from the switch before you perform any maintenance.

• Park the machine on a level surface, disengage the attachment hydraulics, lower the attachment, shut off the engine, and remove the key. Wait for all movement to stop and allow the machine to cool before adjusting, cleaning, storing, or repairing it.

• Clean up spilled oil or fuel promptly. Discharged engine oil, fuel oil and hydraulic oil need to be prepared in advance with appropriate receiving and discharging containers and handled properly。

• Do not allow untrained personnel to service the machine.

• Use jack stands to support the components when required.

• Repeatedly operate the hydraulic control lever， carefully release pressure from components with stored energy.

• Disconnect the battery before making any repairs, When disconnecting, first disconnect the negative terminal of the battery, and then disconnect the positive terminal. When connecting, connect the positive wire first, and then connect the negative wire last. wash your hands after work.

• Keep your hands and feet away from the moving parts. If possible, do not make adjustments with the engine running.

• Do not disconnect the battery wiring while the engine is running. There may be instantaneous high voltage damage to the electronic control components.

• Keep all parts in good working condition and all hardware tightened. Replace all worn or damaged decals.

• Do not tamper with the safety devices.

• Use only Makinex-approved attachments. Attachments can change the stability and the operating characteristics of the machine. You may void the warranty if you use the machine with unapproved attachments.

• Use only genuine Makinex replacement parts.

• After running out of fuel and fuel has been added to the fuel tank, after fuel system maintenance such as changing the fuel filter and draining the water separator or replacing a fuel system component. ***To prime the fuel system:***

1. Turn the key to the ON position for 15 seconds. This will allow the electric fuel pump to prime the fuel system.
2. Do not start the engine while pumping oil, this may cause the starter motor to overheat and damage the coils, pinion and ring gear.

• If any maintenance or repair requires the loader arms to be in the raised position, secure the arms in the raised position with the hydraulic-cylinder lock.

Periodic maintenance chart

○*: Initial check ○: Periodic check ◇*: Initial replace ◇: Periodic replace

System	Check item	Every 10 hours	Every 50 hours	Every 100 hours	Every 250 hours	Every 500 hours	Every 1000 hours or 2 years
Cooling System	Check and refill engine coolant	○					
	Check and clean radiator fins			○			
	Check and adjust cooling fan V-belt		○*	○			
	Change coolant					◇	
Electrical equipment	Check lamp and meter	○					
	Check battery		○				
Engine oil	Check engine oil level	○					
	Drain and fill engine oil		◇*	◇			
	Replace engine oil filter		◇*	◇			
Engine speed control	Check and adjust governor lever and engine speed control	○					
Fuel	Check and refill fuel tank level	○					
	Check oil-water separator	○					
	Drain oil-water separator		○	◇			
	Clean oil-water separator		◇	◇			
	Replace fuel filter			◇			
Hoses	Check and replace fuel hoses and engine coolant hoses		○				◇
Intake and exhaust	Check air cleaner element	○					
	Clean air cleaner element	○		○			
	Replace air cleaner element		◇	◇			
Hydraulic system	Check hydraulic tank level	○					
	Check hydraulic hoses	○					
	Replace hydraulic fluid return filter		◇*			◇	
	Replace hydraulic fluid, oil suction filter					◇	
Undercarriage	Check Bolt Torque	○*	○*	○			
	Check Track Tension	○					
complete unit	Check equipment condition	○					

Oil lubricant type

Item	Description
Engine oil	Use engine oil that meets or exceeds the following guidelines and classifications: • API service categories CD, CF, CF-4, CI-4 • ACEA service categories E-3, E-4, E-5 • JASO service category DH-1 Select the appropriate engine oil viscosity based on the ambient temperature and use the SAE service grade viscosity chart on page 57.
Hydraulic fluid	Hydraulic fluid uses ISO VG46
Grease	Multipurpose grease meeting NLGI GC-LB Grade 2

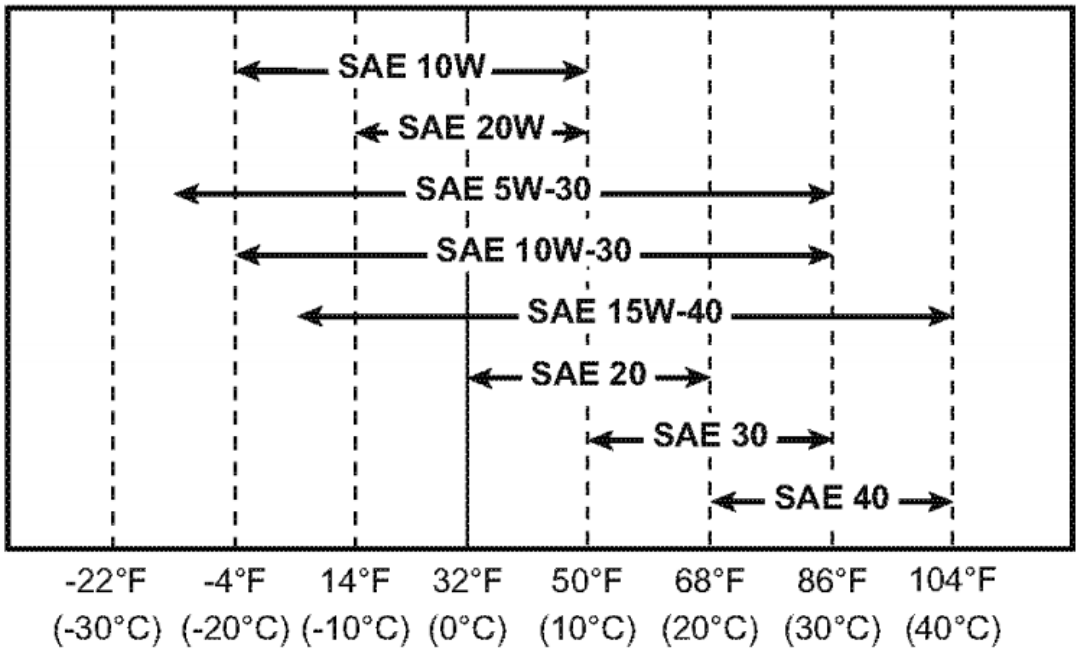
Notice: Proper lubrication and maintenance protect equipment from damage and failure. Service intervals listed are for minimum requirements. In extreme conditions, service machine more frequently.

IMPORTANT: For more detailed specifications of diesel fuel, engine oil, coolant, and specific information on periodic maintenance procedures of the engine, please refer to the **engine operation manual**.

NOTICE:

- Use only genuine Makinex parts, filters, and approved lubricants to maintain warranty.
- Use the “Service Record” on page 86 to record all required service to your machine.

Engine Oil Viscosity



NOTICE: Select the appropriate engine oil viscosity based on the ambient temperature. For more information on engine lubrication and maintenance, see your operation manual.

Engine Coolant Specifications

Use a Long-Life Coolant (LLC) or an Extended Life Coolant (ELC) that meets or exceeds the following guidelines and specifications.

• ASTM D6210, D4985(US)

• JIS K-2234(Japan)

• SAE J814C, J1941, J1034 or J2036(International)

Alternative engine coolant

If an Extended or Long-Life Coolant is not available alternatively, you may use an ethylene glycol or propylene glycol based conventional coolant(green). Before using any other kind of coolant, completely flush radiator.

NOTICE: Do not mix heavy-duty diesel engine coolant and automotive-type coolant. This will lead coolant breakdown and engine damage. Never mix extended or long-life coolants and conventional coolants. Never mix different types and/or colours of extended life coolants.

Fuel Specification

The engine of this unit is designed to run on diesel fuel. Diesel fuel should comply with the following specifications. The table lists several worldwide specifications for diesel fuels.

Diesel fuel Standards	Location
ASTM D975 No. 1D S15 No. 2D S15	USA
AS/NZS 2869	Australia/NZ
EN590 (2009)	European Union
ISO 8217 DMX	International
BS 2869-A1 or A2	United Kingdom
JIS K2204 Grade No. 2	Japan
KSM-2610	Korea
GB19147-2016	China

• When operating the engine in cold districts on high altitudes the fuel cetane number should be equal to 45 or higher.

• The sulphur content must not exceed 15 ppm by mass. A higher sulphur content fuel may cause sulfuric acid corrosion in the cylinders of the engines. Especially in U.S.A. and Canada, Ultra Low Sulphur fuel must be used.

• In EU, sulphur content shall not exceed 10 ppm (15 ppm at point of final distribution).

• Use the fuel that can be used where the temperature is 12°C(53.6°F) lower than the expected lowest temperature to prevent the fuel from freezing.

• Never use kerosene.

• Never mix kerosene or used engine oil with the diesel fuel.

• Never use residual fuels that cause diesel fuel filter clogging and carbon deposits on the nozzles.

• Never use fuels stored for long time in a drum can or the like.

• Never keep fuel in containers with zinc plating on the inside.

For more information on fuel, see your engine operation manual.

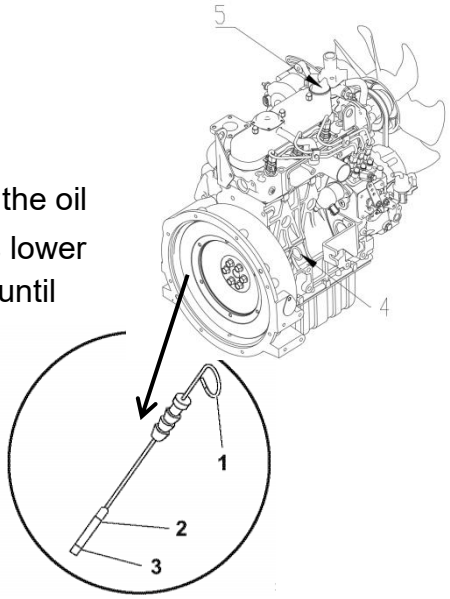
10 Hour Checklist

Do the following procedures daily or every 10 operating hours:

Task	Notes
Check engine oil level	
Check engine air filter	
Check engine coolant level	
Check hydraulic fluid level	
Check Bolt Torque	initial service
Check track tension	
Check hydraulic hoses	
Check oil-water separator	
Check and refill fuel tank level	
Check lamp and meter	
Check equipment condition	

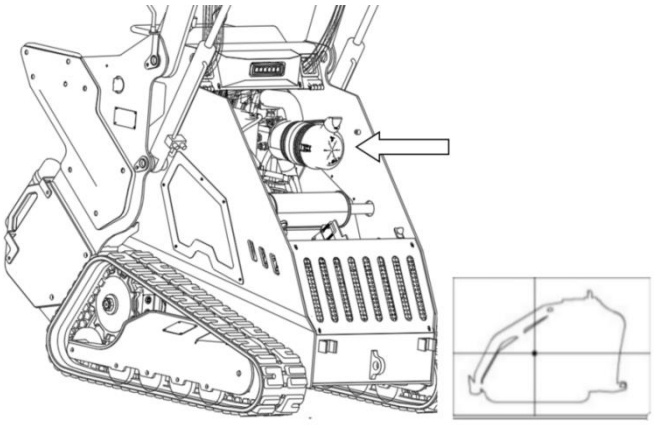
Check Engine Oil Level

Check engine oil level at dipstick opening (4) every 10 hours， the oil should be between the scales (2) and (3) on the dipstick. If it is lower than the marked position, add engine oil from the filler port (5) until the engine oil reaches the marked position on the oil dipstick, check the oil level again after 3 minutes.



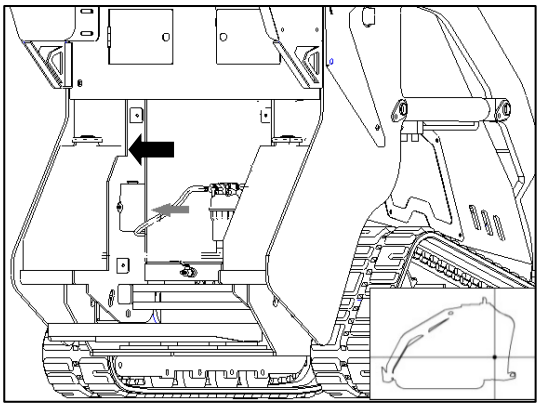
IMPORTANT: Use oil specified in “Engine Oil Temperature Chart” on page 53 or see your engine manual.

Check Engine Air Filter



Check the air filter every 10 hours and observe whether the instrument has an alarm for clogging of the air filter. If there is an alarm, it is necessary to clean the outer air filter element or replace the filter element. Release dirt from separator tube at the bottom of the air filter by squeezing the rubber dust ejector valve underneath the air filter.

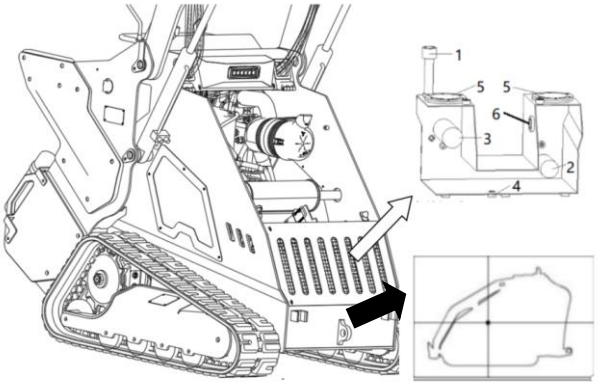
Check Coolant Level



Every 10 hours, check the coolant level after the engine has cooled. Make sure the coolant in the bottle is between the high- and low-level marks. If low, fill with the same type of coolant.

> ***IMPORTANT:*** See page 57 for information on approved coolants. DO NOT check until the engine radiator is cool to the touch.

Check Hydraulic Fluid Level

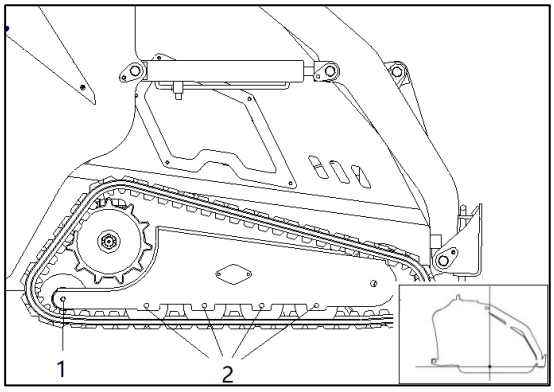


Check hydraulic fluid level every 10 hours.

Maintain oil level at halfway point on sight glass (fully retracted, and fluid is cool. If low, fill with the

> ***NOTICE:*** Check until all the control handles are in neutral, the engine stops, and the hydraulic fluid cools down.

Check Bolt Torque



Check lug nut torque at 10 hours, 50 hours and every 250 hours thereafter.

Bolt (1) should tighten to

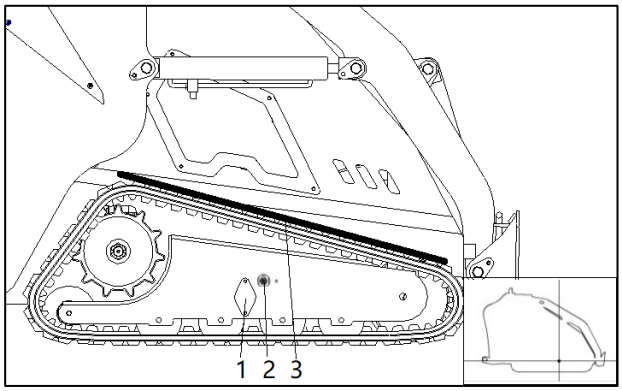
133-155 ft•lb (180-210 N•m).

Bolt (2) should tighten to

81-96 ft•lb (110-130 N•m).

NOTICE: Check until the engine stops and remove the key.

Check Track Tension



Check track tension every 10 hours and adjust as needed. Track is correctly tensioned when measurement between track and straight edges (3) is 1/2 in (13 mm).

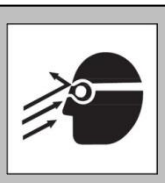
To adjust:

1. Park machine on smooth flat surface. Lower the attachment, shut off the engine, and remove the key.
2. Lay straight edge on top of track, spanning from sprocket to front idler roller.
3. Loosen the bolts of cover plate (1). Turn one end of the cover plate (1) towards the ground.
4. Clean track cylinder grease nipple (2). Pump MPG into grease nipple until distance between track and straight edge (3) is 1/2” (13 mm).
5. Test: Drive forward one track length and check tension again.

• If tension is too loose, repeat step 4 above.

• If tension is too tight, loosen fitting on grease cylinder and allow a small amount of grease to discharge from cylinder. Tighten fitting and test again.

Check Hydraulic Hoses



WARNING Pressurized fluid or air could pierce skin and cause injury or death. Stay away.

To help avoid injury:

• Before disconnecting a hydraulic line, turn engine off and operate all controls to relieve pressure.

• Lower, block, or support any raised component with a hoist. Cover connection with heavy cloth and loosen connector nut slightly to relieve residual pressure. Catch all fluid in a container.

• Before using system, check that all connections are tight and all lines are undamaged.

WARNING hydraulic hoses will be very hot after use, wear gloves when disconnecting the hydraulic hose!

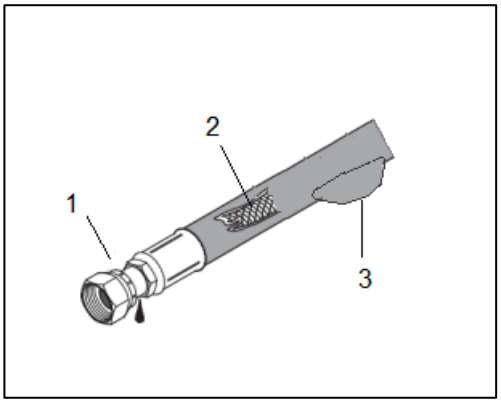
Visually inspect all of the hydraulic hoses, lines and fittings for signs of damage, wear or leaking at startup and every 10 hours. If any signs of damage are visible, do not operate the machine until repairs have been made.

Some examples of common hydraulic hose damage:

• End fittings damaged or leaking.

• Outer covering chafed or cut, and wire reinforcing is exposed.

• Outer covering ballooning.



Check oil-water separator

Check the water inside the oil-water separator every 10 hours. If there is a lot of water, please refer to page 66 to drain the water in the oil-water separator.

Check and refill fuel tank level

WARNING Fire and Explosion Hazard!

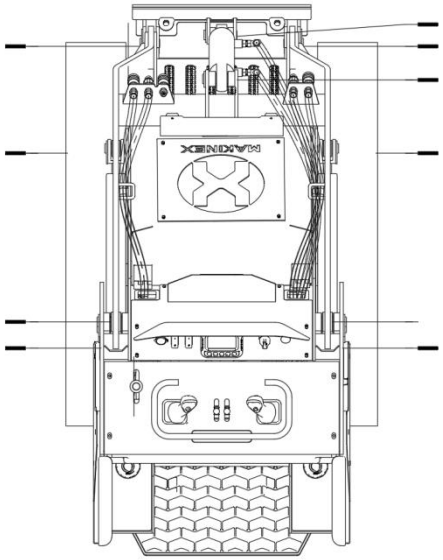
- Diesel fuel is flammable and explosive under certain conditions.
- When you remove any fuel system component to perform maintenance (such as changing the fuel filter) place an approved container under the opening to catch the fuel. Never use a shop rag to catch the fuel. Vapours from the rag are flammable and explosive. Wipe up any spills immediately.

Watch the fuel level icon on the gauge each time the machine is started. If the fuel level is low. Fuel needs to be refilled, please refer to page 37 for fuel safety.

Check lamp and meter

Check that gauges and lights are working properly each time the machine is started.

Check equipment condition



Every time the machine starts and every 10 hours, check for loose or missing fasteners. Inspect for any loose or missing bolts. Tighten or replace any missing bolts immediately.

Inspect the machine for any signs of damage, such as missing or damaged components, cracked welds, etc.

Grease pivot shafts with proper type of grease. There are 10 grease points on this machine.

Check to make sure all parts are in good working order and replace any worn or damaged decals.

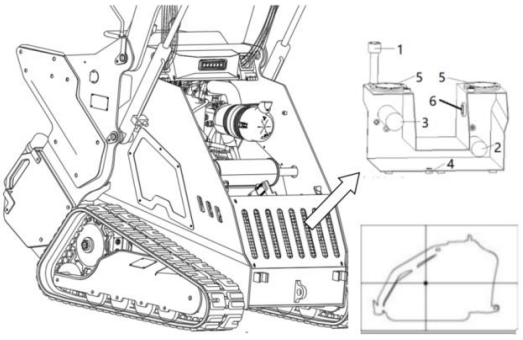
50 Hour Check List

Do the following procedures weekly or every 50 operating hours:

Task	Notes
Replace hydraulic oil return filter	initial service
Check and adjust cooling fan V-belt	initial service
Check fuel hoses and engine coolant hoses	
Check battery	
Drain oil-water separator	
Check Bolt Torque	second service

Replace hydraulic oil return filter（initial）

Change hydraulic fluid return filter after 50 hours.
Change every 500 hours thereafter.



Remove the upper inspection cover (5) of the hydraulic oil tank, remove the oil return filter (3) counterclockwise, and install a new filter.

Properly dispose of used filters.

⚠WARNING hydraulic oil will be very hot after use, make sure to allow the engine and hydraulic system to cool off before beginning this procedure.

Check and adjust cooling fan V-belt（initial）

1.Stop the engine and remove the key.

2.Apply moderate thumb pressure to the belt between the pulleys.

3.If the tension is incorrect, loosen the alternator mounting bolts, and pull the alternator out until the belt tension reaches the proper range using a lever placed between the alternator and the engine block.

4.Replace the fan belt if it is damaged.

IMPORTANT:

• If the belt is loose or damaged, or if the cooling fan is damaged, it could result in overheating or insufficient charging. Adjust or replace the belt.

Use a sonic tension meter to measure tension. Make sure to measure properly according to the operation manual of the device being used.

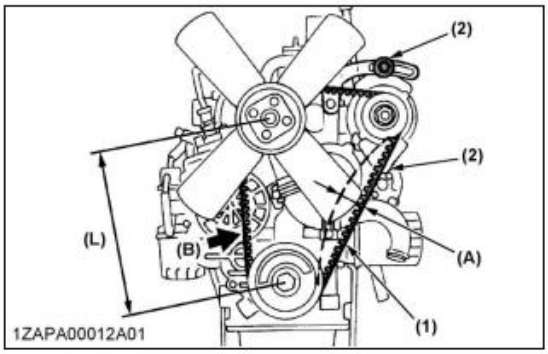
Proper fan belt tension		
Adjustment	**Replacement**	**(A)**
200 N to 300 N	267 N to 361 N	Approximately 10 mm (0.39 in.) Under load of 10 kgf (22.1 lbs)

• Measure immediately after installing the belt without rotating the pulleys. Measure at location (B) in the following figure with (L) as the distance between the pulleys.

• For belt specifications, contact your Kubota dealer.

• If a tension meter cannot be used, adjust based on the deflection.

The deflection must be as indicated by (A) in the following figure when pressing the middle of the belt between the pulleys.



(1) Fan belt
(2) Bolt and nut
(A) Deflection
(B) Measuring point
(L) Distance between the pulleys

Replace the belt when it is worn and sinks into the pulley groove.

Check fuel hoses and engine coolant hoses.

⚠WARNING Fire and Explosion Hazard!

• Diesel fuel is flammable and explosive under certain conditions.

• When you remove any fuel system component to perform maintenance (such as changing the fuel filter) place an approved container under the opening to catch the fuel. Never use a shop rag to catch the fuel. Vapours from the rag are flammable and explosive. Wipe up any spills immediately.

• Wear eye protection. The fuel system is under pressure and fuel could spray out when you remove any fuel system component.

Check all hoses and clamps every 50 hours. If the clamp is loose, it needs to be tightened; if the hose is broken, replace it in time. After replacing the fuel hose or clamps, the fuel system needs to be primed. Refer to page 54 for fuel system filling.

Check Battery

⚠WARNING Explosion possible. Serious injury or equipment damage could occur. Follow directions carefully.

To help avoid injury:

• Keep sparks and flames away from battery. Battery gas can explode.

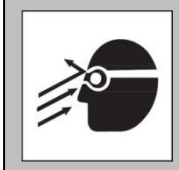
• Always remove negative (-) battery cable first and replace it last.

• Do not splash battery electrolyte onto skin; it will burn and cause blindness if splashed into eyes. Wash hands after working around battery.

• Never disconnect battery terminals with engine running. Voltage spike may occur and damage electronic control modules or other components.

Check the battery every 50 hours. Keep the battery and terminals clean and free from corrosion. Keeping the connectors and the entire battery case clean helps prolong battery life.

Drain oil-water separator.



⚠WARNING Fire and Explosion Hazard!

- Diesel fuel is flammable and explosive under certain conditions.
- When you remove any fuel system component to perform maintenance (such as changing the fuel filter) place an approved container under the opening to catch the fuel. Never use a shop rag to catch the fuel. Vapours from the rag are flammable and explosive. Wipe up any spills immediately.
- Wear eye protection. The fuel system is under pressure and fuel could spray out when you remove any fuel system component.
- Failure to comply will result in death on serious injury.

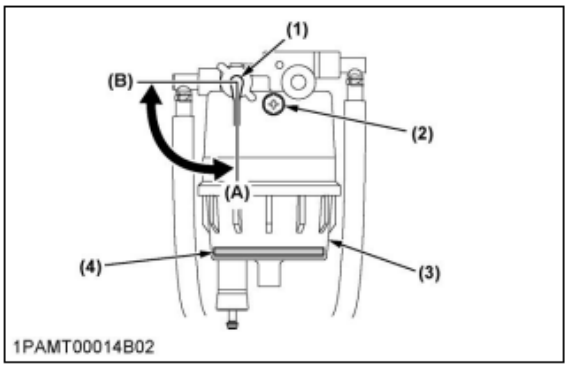
Water and dirt contained in fuel will settle in the water separator. When deposits of such foreign substances build up, drain and clean the water separator as follows.

Draining

1. Set the fuel shutoff-valve to the “CLOSED” position.

2. Loosen the top screw first and then loosen the bottom drain valve to let the foreign substances out of the separator.

3. Air-bleed the fuel system.



(1) Fuel shutoff-valve
(2) Screw
(3) Cup
(4) Float
(A) "OPEN"
(B) "CLOSED"

Cleaning

1. Set the fuel shutoff-valve to the “CLOSED” position.

2. Loosen and remove the cup properly and clean its inside with diesel fuel.

3. Tighten up the cup properly.

IMPORTANT:

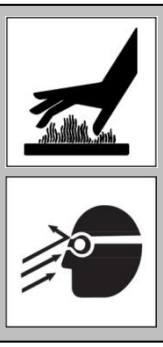
•As water is collected, the red float goes up. Drain the water separator before the float reaches the top of the cup.

• In reattaching the water separator, be careful to keep off dust and dirt.

• Always air-bleed the fuel system before restarting the engine.

Check Bolt Torque

Check Bolt Torque at 10 hours, 50 hours and every 250 hours thereafter， See page 57 for inspection methods.



⚠WARNING

• Stop the engine before draining the engine oil.

• When draining the engine oil, place a container underneath the engine, and dispose of the oil according to local regulations.

•Do not drain the oil immediately after running the engine. Allow engine to

Change engine oil and filter.

Change oil after the initial 50 hours of operation and then at the intervals listed in the following table thereafter.

Engine oil change intervals

Model	Oil pan depth	Initial	Interval
D1005-E4 D1105-E4 D1305-E4 V1505-E4	125 mm (4.9 in.) or above (110 mm D1305-E4)	50 hours	200 hours
	Below 101 mm (4.0 in.)*1		150 hours

*1 Oil pans below 101 mm (4.0 in.) are optional.

• For engine oil grades, see RECOMMENDED OILS AND FUELS on page 53.

• Ambient temperature: below 35°C (95°F)

Drain the engine oil as follows:

1. Remove the drain plug at the bottom of the engine, and drain out.
2.Add new engine oil up to the upper limit of the oil level gauge.

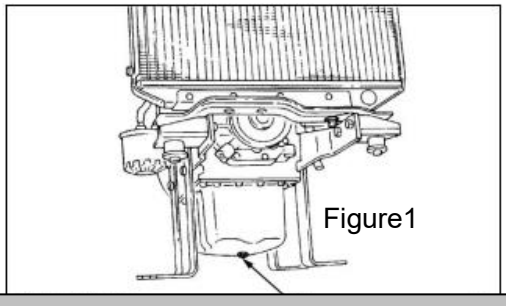


Figure1

To avoid personal injury or death:

•Stop the engine before changing the oil filter cartridge.

•Allow the engine to cool down sufficiently. Oil can be hot and cause burns.

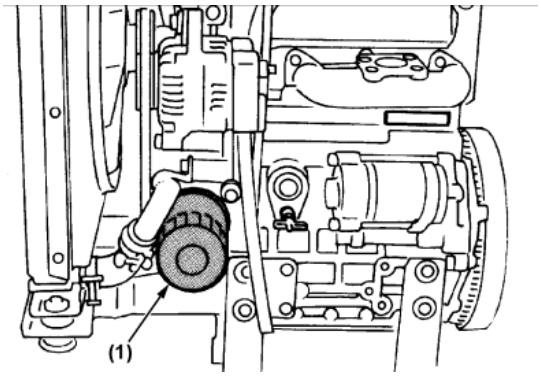
Replace the oil filter cartridge at the intervals.

listed in the following table.

Engine oil filter cartridge replacement intervals

Model	Oil pan depth	Initial	Interval
D1005-E4 D1105-E4 D1305-E4 V1505-E4	125 mm (4.9 in.) or above (110 mm D1305-E4)	50 hours	200 hours
	Below 101 mm (4.0 in.)*1		150 hours

*1 Oil pans below 101 mm (4.0 in.) are optional.



1. Remove the old oil filter cartridge with a filter wrench.

2. Apply a film of oil to the gasket for the new cartridge.

3. Screw in the cartridge by hand. When the gasket contacts the seal surface, tighten the cartridge sufficiently by hand.

IMPORTANT:

• Do not use the filter wrench to tighten the cartridge. Using a wrench will cause the cartridge to be overtightened.

4. Run the engine for a while and check for oil leaks through the seal.

5. Check the engine oil level and add oil if necessary.

After the new cartridge has been installed, the engine oil level normally decreases sightly.

NOTE:

• Completely wipe off any oil that sticks to the machine.

Clean air cleaner element

WARNING Flying Object Hazard!

· Always wear eye protection when servicing the engine and when using compressed air or high-pressure water. Dust, flying debris, compressed air pressurized water or steam may injure your eyes.

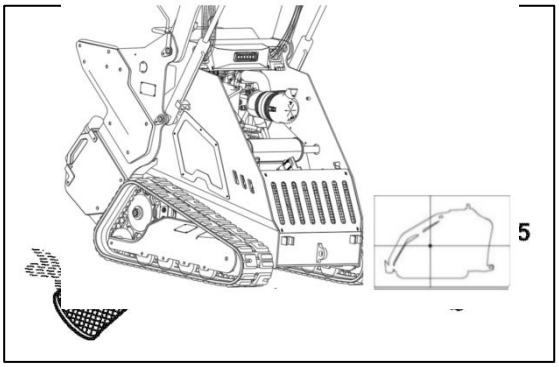
Check the intake airline every 250 hours. If the clamp is loose, retighten it. If the hose appears cracked or worn, replace it.

The engine performance is adversely affected when the air cleaner element is clogged with dust. Be sure to clean the air filter element periodically.

1. Unlatch and remove the air cleaner cover (1).

2. Remove the outer element (2).

3. Blow air (3) through the element from the inside out using 42-71 psi (0.29-0.49 MPa, 3.0 - 5.0 kgf/cm2) compressed air to remove the particulates. Use the lowest possible air pressure to remove the dust without damaging the element.



4. only remove and replace the inner element, if the engine lacks power or the dust indicator actuates.

NOTICE: The inner element should not be removed when cleaning or replacing the outer element. The inner element is used to prevent dust from entering the engine while servicing the outer element.

5. Replace the element with a new one if the element is damaged, excessively dirty or oily.

6. Clean inside of the air cleaner cover.

7. Reinstall the element into the air cleaner case (4).

8. Reinstall the air cleaner cover making sure the arrow (5) is pointing up.

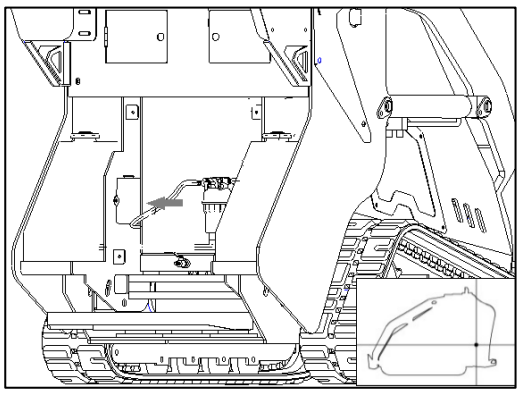
9. Latch the air cleaner cover to the case.

When the engine is operated in dusty conditions clean the air cleaner element more frequently. Never operate the engine with the air cleaner element(s) removed. This may

allow foreign material to enter the engine and damage it.

Check and clean radiator fins.

> **⚠ WARNING** Flying Object Hazard!
>
> • Always wear eye protection when servicing the engine and when using compressed air or high-pressure water. Dust, flying debris, compressed air pressurized water or steam may injure your eyes.



Check and clean the dust, catkins, grass and other sundries on the radiator and hydraulic oil condenser every 250 hours. If there is debris, clean it with an air gun or a water spray gun. Be careful not to damage the heat sink. If you often work in an environment with poplar catkins, weeds and dust, the inspection cycle should be shortened reasonably.

Check radiator hoses for wear, check clamps for tightness.

Check and adjust cooling fan V-belt.

Check fan belt tension and damage every 250 hours. See page 64 for inspection steps.

Check Bolt Torque

Check Bolt Torque every 250 hours thereafter， See page 61 for inspection methods.

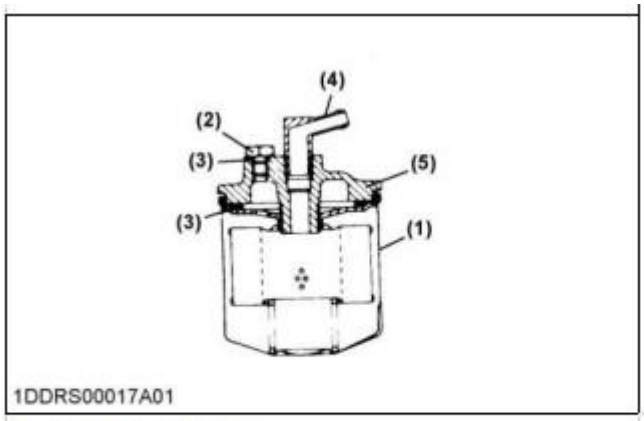
400 Hours Check list

1. Replacing fuel filter cartridge

IMPORTANT:

• Replace the fuel filter cartridge periodically to prevent wear of the fuel injection pump or supply pump plunger or the injection nozzle due to dirt in the fuel.

Replace the fuel filter cartridge with a new one every 400 operating hours.



(1) Fuel filter cartridge
(2) Air vent plug
(3) O ring
(4) Pipe joint
(5) Cover

1.Remove the existing fuel filter cartridge.

2.Apply a thin layer of fuel over the gasket.

3.Tighten the new cartridge into position by hand-tightening only.

4.Vent the air.

2. Cleaning water separator

(See Draining water separator on page 63)

500 Hours Checklist

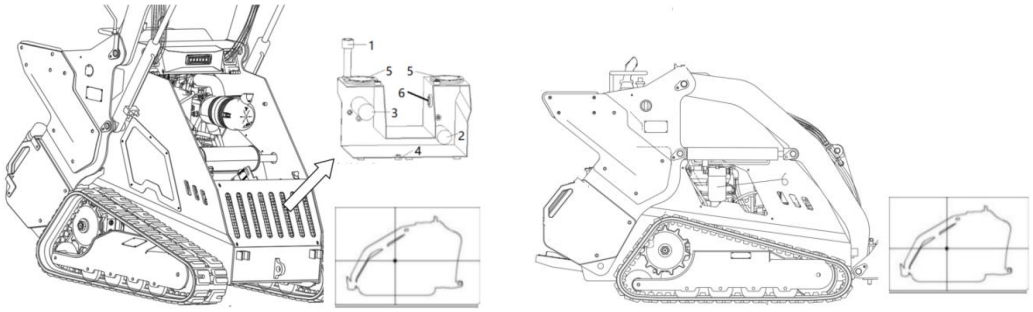
Do the following procedures every 500 operating hours:

Task	Notes
Replace hydraulic oil return filter	
Replace air cleaner element	
Replace fuel filter	
Clean oil-water separator	

Replace hydraulic oil return filter.

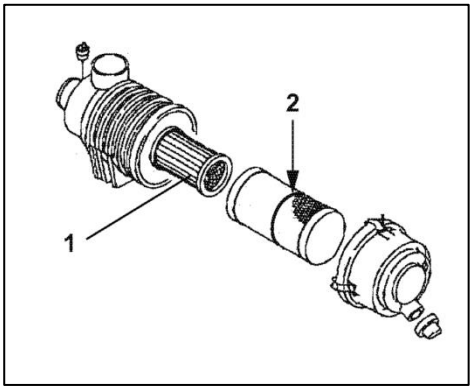
⚠WARNING hydraulic oil will be very hot after use, make sure to allow the engine and hydraulic system to cool off before beginning this procedure.

Replace hydraulic oil return filter (3) and hydraulic external return filter（6） every 500 hours. See page 64 for replacing the hydraulic return filter (3). Place the oil tray under the filter (6), remove the oil return filter (6) counterclockwise, and install a new filter. Dispose of used filters properly.



Replace air cleaner element.

Change air filter (2) every 500 hours. Only remove and replace the inner element (1), if the engine lacks power or the dust indicator actuates.



1. Unlatch and remove the air cleaner cover (1).
2. Remove the outer element (2).
3. Clean inside of the air cleaner cover.
4. Replace the element (2) with a new one.
5. Reinstall the air cleaner cover making sure the arrow is pointing up.
6. Latch the air cleaner cover to the case

Clean oil-water separator

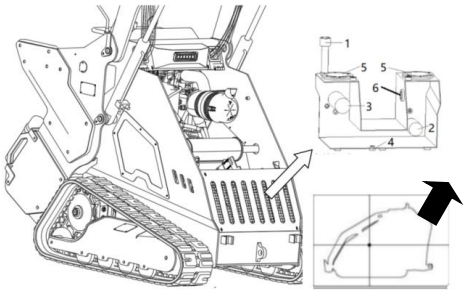
Clean the oil-water separator element and inside cup every 500 hours, Wash the inside of the element and cup with new fuel. if the element is damaged or broken, replace with a new one. See removal and installation method on page 66.

1000 hours and above

Do the following procedures every 1000 operating hours and above:

Task	Notes
Replace hydraulic oil, oil suction filter	
Change coolant	
Check and replace fuel hoses and engine coolant	

Replace hydraulic oil, oil suction filter.



Change hydraulic fluid and suction filter every 1000 hours. Change every 500 hours if jobsite temperature exceeds 100°F (38°C) more than 50% of the time.

1. Place a suitable sized container under the hydraulic tank drain plug.

2. Remove the hydraulic tank drain plug (4) and drain all hydraulic fluid from the machine.

3. When all of the hydraulic fluid has drained out of the tank, reinstall and secure the drain plug. Wipe up any spills.

Notice: Make sure to dispose of the used hydraulic fluid and hydraulic filter in an appropriate manner and according to State and Local regulations.

4. Remove the inspection cover (5) of the fuel tank, remove the oil return filter element (2) and the oil suction filter element (3) by counterclockwise rotation, and replace with new filter elements.

5. Add hydraulic fluid at fill (1) until fluid level is at halfway point on sight glass. Capacity is 10.6 gal (40 L).

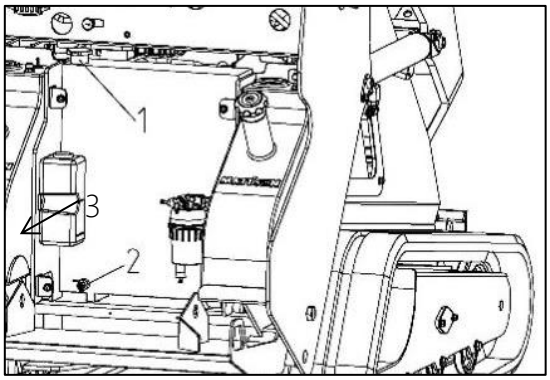
Changing Coolant

⚠WARNING

• The coolant is hot and under pressure. DO NOT begin this procedure until the engine radiator is cool to the touch.

• Wear eye protection and rubber gloves when you handle long life or extended life engine coolant. If contact with the eyes or skin should occur, flush eyes and wash immediately with clean water.

Change the coolant every 2 years or 2000 hours.



1. Position a container of suitable size under the behind of the machine.

2. Rotate counterclockwise to remove radiator cap (1).

3. Connect a hose to the cock at the bottom of the radiator, open the petcock (2) and allow all of the coolant to drain from the radiator. Proper Disposal of Used Coolant.

4. Close the petcock (2). Add approved coolant at radiator cap (1) until full. Capacity is 1.3 gal (5 L).

NOTE: Do not mix coolants of different types/colours, as this may damage the engine or cause malfunctions, voiding the warranty. See page 57 for coolant specifications.

5. Drain the coolant from the overflow bottle (3) and add new coolant, make sure the coolant in the bottle is between the high- and low-level marks.

Check and replace fuel hoses and engine coolant hoses

⚠ WARNING Fire and Explosion Hazard!

- Diesel fuel is flammable and explosive under certain conditions.
- When you remove any fuel system component to perform maintenance (such as changing the fuel filter) place an approved container under the opening to catch the fuel. Never use a shop rag to catch the fuel. Vapours from the rag are flammable and explosive. Wipe up any spills immediately.
- Wear eye protection. The fuel system is under pressure and fuel could spray out when you remove any fuel system component.
- Failure to comply will result in death on serious injury.

Replace fuel hoses and coolant hoses every 2 years or 2000 hours and check the fuel system and coolant hoses frequently. If damaged or aged, replace them in time. After replacing the fuel hose or clamps, the fuel system needs to be primed. See Priming the Fuel System on page 54.

As Needed

Jump Start Unit

⚠ WARNING

Incorrect procedures could result in death, injury, or property.

damage. Use equipment correctly.

To help avoid injury:

- Park on level area.
- Put all drive controls in neutral and lower all attachments.
- Turn off all electrical loads.
- Turn off engine and remove key from ignition.
- Block wheels or tracks.

⚠WARNING Explosion possible. Serious injury or equipment damage could occur. Follow directions carefully

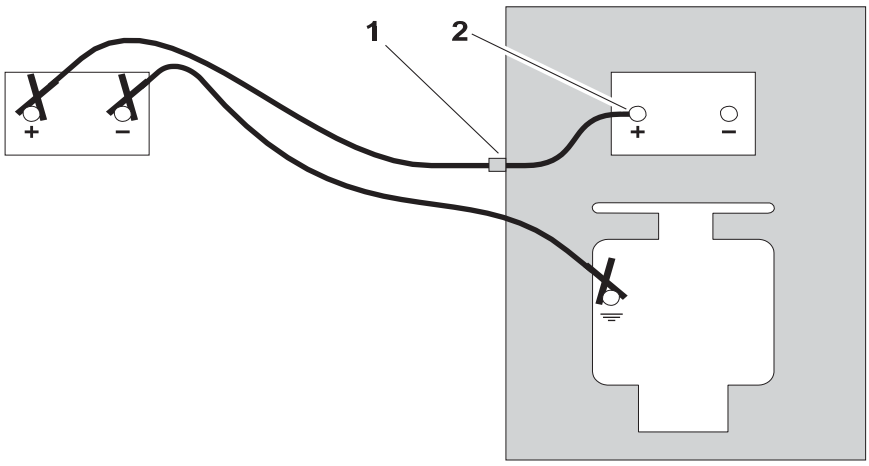
To help avoid injury:

- Lead-acid batteries vent explosive hydrogen gas when charging.
- Do not smoke, create sparks, or use flames around batteries.
- NEVER lean over battery when making connections.
- Do not allow vehicles to touch when jump starting.
- Wear eye protection and remove metal jewellery and watches.
- Do not attempt to jump start a battery that is leaking, bulging, heavily corroded, frozen, or otherwise damaged.

Before You Start

Electronic components can be easily damaged by electrical surges. Jump starting can damage electronics and electrical systems and is not recommended except in extreme circumstances. Use quality large diameter jumper cables capable of carrying high currents (400 amps or more). Cheap cables may not allow enough current flow to start a dead/discharged battery.
Read all steps thoroughly and review illustration before performing procedure.

Jump Start Procedure (Engine Off)



1. Park service vehicle close to disabled equipment but do not allow vehicles to touch.
2. Engage parking brake in vehicles.
3. Turn the ignition switch to the OFF position in both vehicles and turn off all electrical loads.
4. Inspect battery in disabled equipment for signs of cracking, bulging, leaking, or other damage.

Connect red positive (+) jumper cable clamp to positive (+) post (2) of battery in disabled vehicle first.

6. Connect the other red positive (+) jumper cable clamp to positive (+) post of battery (A) in the service vehicle.
6. Connect black negative (-) cable clamp to negative (-) post of battery (A) in service vehicle.
7. Connect the other black negative (-) cable clamp to the engine or frame ground on the disabled vehicle, at least 12” (305 mm) from the failed battery, as shown.
8. Operate service vehicle engine at 1500-2000 rpm for a few minutes to build an electrical charge in the failed battery.
9. Stop engine in service vehicle.
10. Remove jumper cables from the service vehicle, black negative (-) clamp first. Do not allow clamps to touch.

11. Attempt to start disabled vehicle.

12. If engine starts, operate at full throttle for a few minutes to build an electrical charge in the battery.

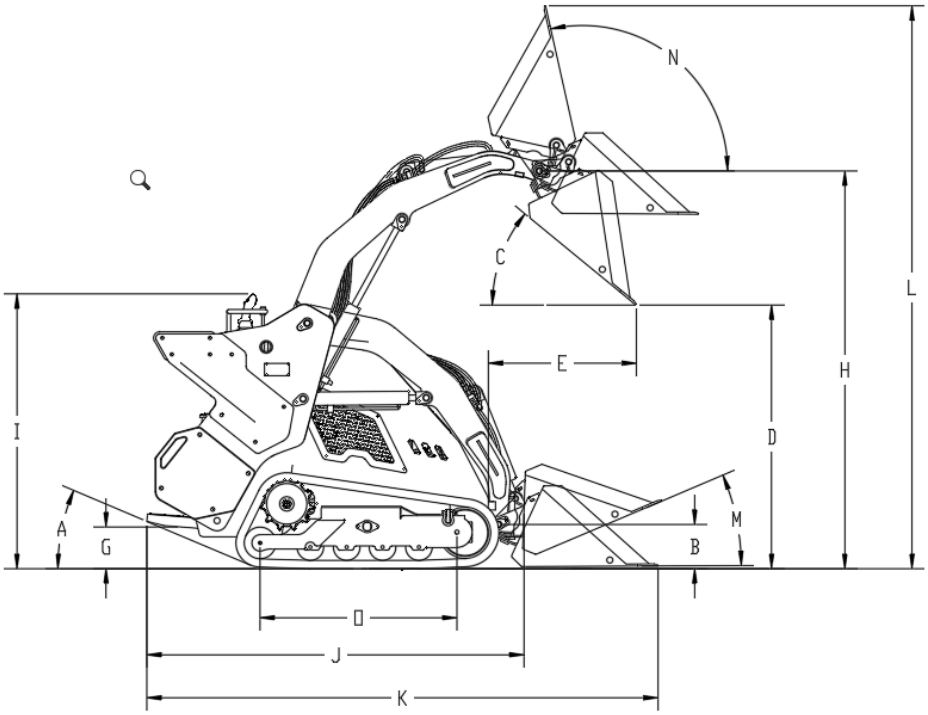
13. Remove black negative (-) cable clamp from the disabled engine or frame ground first.

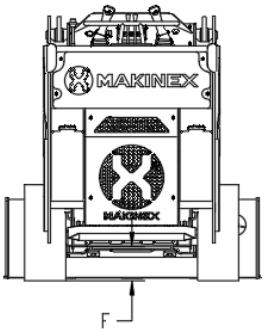
14. Remove red positive (+) cable clamp from the disabled vehicle positive (+) battery post last.

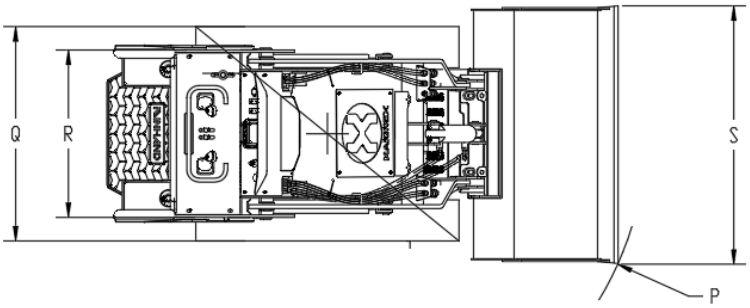
If the disabled vehicle did not start, check for loose or corroded battery cable connections. Poor connections will prevent current from charging the failed battery. Clean terminals and posts if necessary and repeat steps above. If a running jump is necessary, repeat steps above with engine running.

NOTE: Jumping with engine running can damage the alternator and electronic components on both vehicles and should be performed only if necessary.

SPECIFICATIONS







Dimensions		U.S.	Metric
A	Angle of Departure	22°	22°
B	Carry Position	8.1 in	205 mm
C	Dump Angle Maximum Height	35°	35°
D	Dump Height with Standard Bucket	52.2 in	1327mm
E	Dump Reach @ Maximum Height	30.6 in	778 mm
F	Ground Clearance	5.7 in	145 mm
Dimensions		**U.S.**	**Metric**
G	Ground Clearance-under platform	7.3 in	186 mm
H	Height to Bucket Hinge Pin, max	75.6 in	1921 mm
I	Height	51.7 in	1300 mm
J	Length without Attachment	71.9 in	1825 mm

K	Length with Standard Bucket	98.2 in	2500 mm
L	Operating Height	106.9 in	2716 mm
M	Rollback @carry Position	23°	23°
N	Rollback Fully Raised @ Maximum height	102°	102°
O	Ground Contact Length	37.8 in	960 mm
P	Turning Radius with Standard Bucket	61.8 in	1570 mm
Q	Width	41.3 in	1050 mm
R	Wheel Tread (over tracks)	33.5 in	850 mm
S	Width with Bucket	49.2 in	1250 mm

Performance	**U.S.**	**Metric**
Ground drive speed, forward and reverse	3.3 mph	5.25 km/h
Ground pressure, 8” (200 mm) tracks *	4.52 psi	31.2 kPa
Tipping capacity The rated operating capacity for this machine was determined using a standard bucket in the drive position with center of gravity 7 in (18 cm) from the mounting plate. Depending on the attachment, the actual operating capacity of the attachment may vary.	2094 lb	950 kg
OPERATING MASS	2646 lb	1200 kg
Standard-bucket:capacity(m^3)	5.65ft^3	0.16m^3
Gradeability	<20°	<20°

Battery
12 volts; 475 cold cranking amps @ 0°F (-18°C)

Fluid Capacities	**U.S.**	**Metric**
Fuel tank	9 US gal	34 L
Engine oil, with filter	0.8 US gal	3 L
Hydraulic System	11.9 US gal	45 L

Specifications are called out according to SAE recommended practices. Specifications are general and subject to change without notice. If exact measurements are required, equipment should be weighed and measured. Due to selected options, delivered equipment may not necessarily match that shown.

Power Specifications

Power	**U.S.**	**Metric**
Engine: Kubota D1105-E4B-CSL-1(1J996-15000)		
Number of cylinders	3	

Displacement	77.3cu.in	1.266 L
Bore	3.2 in	80 mm
Stroke	3.3 in	84 mm
Manufacturer’s gross power rating (per SAE J1955)	24 .2hp	18.5 kW
Rated engine speed	3000 rpm	3000 rpm

Hydraulic System	**U.S.**	**Metric**
Auxiliary：gear pump		
Flow rate	10.5gpm	40 L/min
Pressure	2610 psi	180 bar
Ground drive: Hydrostatic transmission		
Flow rate	10.5 gpm	40 L/min
Pressure	2610 psi	180 bar

Specifications are called out according to SAE recommended practices. Specifications are general and subject to change without notice. If exact measurements are required, equipment should be weighed and measured. Due to selected options, delivered equipment may not necessarily match that shown.

LIMITED WARRANTY

To take advantage of the MAKINEX limited warranty, you must have maintenance performed according to the maintenance schedule (contained in relevant owner's manual supplied with this product), by an authorised MAKINEX dealer or MAKINEX service technician. You are free to have your MAKINEX product serviced by any suitably qualified mechanic or electrician (depending on the mechanical or electrical requirement) and this will not affect your statutory warranties, however, failure by the owner to have the recommended servicing carried out by an authorised MAKINEX dealer/service technician means that you cannot take advantage of the MAKINEX limited warranty.

To ensure your safety, we strongly recommend that you only use an authorised MAKINEX dealer for servicing. Only authorised MAKINEX dealers have access to all the special tools, technical information, parts and training required to maintain your MAKINEX product in peak operating condition.

MAKINEX warrants each new Skid Steer to be free from defects in material and workmanship under normal domestic and industrial use and service for the period specified below, conditional to the limitations and exclusions printed on this page. This warranty applies only to new MAKINEX products distributed by us and by our authorised MAKINEX dealers.

WARRANTY: (EX-FACTORY/RESELLER PREMISE):

- 1 year warranty or 2000hrs on defect in Material or workmanship whichever comes first.

Note: Maintenance is not warranty. Excludes service and consumables required at scheduled maintenance intervals.

WARRANTY EXCLUSIONS

This warranty does not cover the following repairs and equipment:

NORMAL WEAR:

This warranty does not cover repair when normal use has exhausted the life of a part or the equipment.

INSTALLATION, USE, AND MAINTENANCE:

This warranty will not apply to parts and/or labour if the skid steer is deemed to have been misused, neglected, involved in an accident, abused, loaded beyond its limits, modified, installed improperly or connected incorrectly.

OTHER EXCLUSIONS:

This warranty excludes:

- Cosmetic defects such as paint, decals, etc.
- Failures due to acts of God and other force majeure events beyond the manufacturer’s control.
- Problems cause by parts that are not original MAKINEX parts.
- Maintenance service costs.
- Freight costs.

OWNER'S RESPONSIBILITY UNDER LIMITED WARRANTY

Strict adherence to the maintenance checks and with **proof of scheduled maintenance history** is required by an authorised agent or qualified mechanic. It is the consumer's responsibility to deliver the machine in question to our service premises or to the premises of our appointed agent at the consumer's expense for repair as applicable. Maintenance services are not covered under warranty.

CLAIM PROCEDURE:

- Contact MAKINEX by phone or email informing us of your machines problem or defect.
- Once the extent of the claim has been assessed, we retain the right to compensate the consumer for such defect, or repair (parts & labour), or replace the machine under warranty.
- All warranties will be carried out by MAKINEX authorised staff or appointed agents at a premise to be determined by the Manufacturer.
- Transportation charges on product submitted for repair under this warranty are the sole responsibility of the purchaser. This warranty only applies to the original purchaser and is not transferable.
- Warranty repair will only be carried out by our representatives and not via client's choice of repairer. We will not accept back charges for any work not carried out by our representatives or accept any charges due to equipment being un-operational for any reason even during its warranty period.

CONTACT INFORMATION

For sales, service, warranty, and parts for all MAKINEX products; please refer below.

	SALES, SERVICE, SPARE PARTS & WARRANTY
AUSTRALIA	**Sales** **TEL:** 1300 795 953 or +61 2 9460 8071 **WEB:** www.makinex.com.au **Service, Spare Parts & Warranty** **EMAIL:** service@makinex.com.au
USA	**Sales** **TEL:** +1 855-625-4639 **WEB:** www.makinex.com **Service, Spare Parts & Warranty** **EMAIL:** service@makinex.com
	Or your nearest MAKINEX distributor

We have very knowledgeable, experienced staff to assist you with help and advice.

EU DECLARATION OF CONFORMITY (CE)

MAKINEX®

EU Declaration of Conformity

In accordance with European Parliament and Council Decision No 768/2008/EC Annex III

CE

1. ***Product model / product:***

Product	Skid Steer
Model/type	SK-25D-890-AU

2. ***Manufacturer:***

Name	Makinex Pty Ltd
Address	15 Waltham Street, Artarmon, NSW 2064, Australia.

3. ***This declaration is issued under the sole responsibility of the manufacturer.***

4. ***Object of the declaration:***

Product	Skid steer loader suitable for light-to-medium duty construction industry.
Specification	Engine power: 18.2 kW / 25hp Operating mass: 1470 kg

5. ***The object of the declaration described above is in conformity with the relevant Union harmonisation legislation:***

2006/42/EC	Machinery Directive (MD)
2014/30/EU	Electromagnetic compatibility (EMC)

6. ***References to the relevant harmonised standards used or references to the other technical specifications in relation to which conformity is declared:***

Reference & Date	Title
EN ISO 12100:2010	Safety of machinery – General principles for design – Risk assessment and risk reduction
EN 474-1:2022	Earth-moving machinery – Safety – Part 1: General requirements
EN ISO 13766-1:2018	Earth-moving and building construction machinery – Electromagnetic compatibility (EMC) of machines with internal electrical power supply – Part 1: General EMC requirements under typical electromagnetic environmental conditions.

7. ***Signed for and on behalf of Makinex Pty. Ltd***

Place of issue:	Artarmon NSW, Australia
Date of issue:	August 12, 2025
Name and Signature:	Hayden Ellis
Position:	Group New Products Manager

RISK ASSESSMENT

A full risk assessment is available from Makinex at sales@makinex.com.au

MAKINEX®

ASSESSMENT REPORT
According to EN ISO 12100:2010
Safety of Machinery -General principles for design
Risk assessment and risk reduction

Report Reference No. ..... :	N/A
Compiled by..... :	Percival dela Peña
Reviewed by ..... :	Hayden Ellis
Date of issue ..... :	August 12, 2025
Standard..... :	EN ISO 12100:2010
Test Procedure ..... :	N/A
Non-standard test method..... :	N/A
Number of page(s) (Report)..... :	49
Number of page(s) (Attachments)..... :	N/A
Type of test object ..... :	Skid Steer
Model and/or type reference..... :	SK-25D-890-AU
Manufacturer(s):.....	Makinex Pty Ltd
Address..... :	15 Waltham St. Artarmon, New South Wales, 2064 Australia
Rating ..... :	Engine power: 18.2 kW/25 hp Operating mass: 1470 kg

General Information:

The machine is a platform, rubber track mini skid steer machine designed for light-to-medium duty construction work that operates in temperatures typically experienced in earth moving and construction work environment.

Test result..... : Pass

Compiled by..... :	Percival dela Peña	Approved by..... :	Hayden Ellis
(+ signature)		(+ signature)	

SERVICE RECORD

Service Performed	Date	Hours

Service Performed	Date	Hours

MAKINEX®