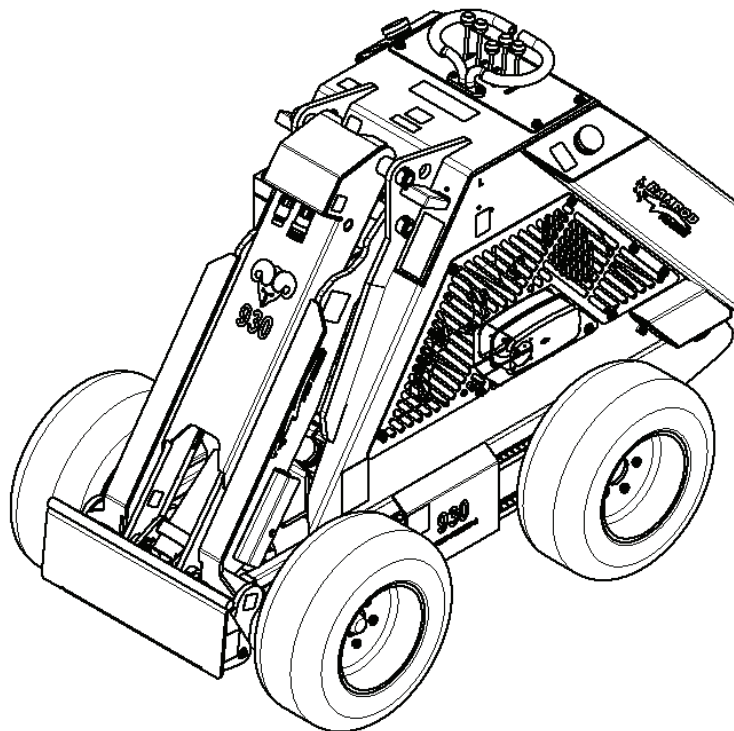




OPERATOR'S MANUAL



MINI SKID LOADER MODEL 930

RAMROD Equipment

(A Division of Leon's Mfg. Company Inc.)

Canada
P.O. Box 5002
135 York Road East
Yorkton, Saskatchewan
S3N 3Z4

Phone: (800) 667-1581

Fax: (306) 782-1884

Email: sales@ramrodequip.com
Website: www.ramrodequip.com

INTRODUCTION

TO OUR CUSTOMER:

RAMROD EQUIPMENT is pleased that you have chosen a RAMROD MINI-SKID. This loader is a simple, compact power source designed and manufactured to give you years of dependable service.

Read this Manual carefully before operating the Mini-Skid. It contains the necessary information for safe and proper operating, routine servicing and preventive maintenance.

We also recommend, that you carefully read the Engine Manufacturer's Manual before operating the Mini-Skid. Do not neglect the maintenance that is recommended. All engine notations in the manual are generic, the manufacturer's manual takes precedence in case of any differences.

The reference to "right-hand" and "left-hand" used throughout this Manual; which refers to the position when operating the machine, facing forward.

For any additional information required, please refer to your RAMROD Dealer.

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Printed in Canada



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RAMROD WARRANTY

The RAMROD EQUIPMENT warrants each new RAMROD Mini-Skid to be free from proven defects in material and workmanship under normal use and maintenance for a period of twelve (12) months, commencing with delivery to the original buyer. Under conditions of this warranty, the Mini-Skid must be operated according to manufacturer's instructions, and by a competent and careful operator.

This warranty shall not apply if the Mini-Skid or any part thereof, has been subject to misuse, negligence, alteration, accident, or used in any way, which, in the manufacturer's option, adversely affects its performance.

It is the responsibility of the Buyer, at his/her expense, to transport the Mini-Skid or any part thus in fulfilling this warranty to a designated service shop.

In no event, shall the Buyer be entitled to recover for incidental or consequential damages such as, but not limited to, rental of replacement equipment, loss of profits, and loss of Mini-Skid fluids and lubricants.

This warranty does not extend to Mini-Skid components such as, but not limited to, the engine, tires, and batteries, hydraulic/hydrostatic components which are manufactured by others, and which carry separate warranties of their respective manufacturer's.

This warranty is in lieu of all other warranty expressed or implied, and there are no warranties of merchantability or fitness for a particular purpose.

No representative of the manufacturer, nor the selling dealer has authority to change this warranty in any manner whatsoever.

Printed in Canada

NOTE: In order for warranty to be in effect, the following warranty registration forms must be completed and one copy sent to Ramrod Equipment at time of sale.



Leon's Mfg. Company Inc.

"Home of Quality Leon & Ramrod Products"

RAMROD MINI-SKID LOADER DEALER PRE-DELIVERY INSPECTION & SERVICE REPORT

Owner: _____ Dealer: _____

Address: _____ Address: _____

Model: _____ Serial No: _____ Date: _____

Engine Serial No: _____ Hour Meter Reading: _____

Item

Remarks

- () Check engine oil level
- () Check hydraulic oil level
- () Check radiator coolant level (if applicable)
- () Check battery fluid level
- () Check engine belt tension
- () Check air cleaner hoses & connections
- () Grease/lubricate all pivot points
- () Check all nuts/bolts for tightness (wheel bolts 90 ft-lbs)
- () Check tire pressure
- () Check drive chain adjustment
- () Check for loose or missing bolts, nuts, cotter pins etc.
- () Check lift cylinder adjustment



Leon's Mfg. Company Inc.
PO Box 5002, 135 York Road East, Yorkton, SK S3N 3Z4 Canada
Ph: 306.786.2600 Fx: 306.782.1884
www.leonsmfg.com www.ramrodequip.com





RAMROD Equipment

NEW MINI-SKID WARRANTY REGISTRATION FORM

Mini-Skid Serial Number

Model Number

Engine Serial Number

Name of Owner

Name of Dealer

Owner's Type of Business

Owners Address

Dealers Address

Date Mini-Skid Sold

Date Mini-Skid Delivered

OPTIONS & ACCESSORIES

TIRES:

- ☒ 18 x 8.5 x 8 Turf Tire
- ☒ 20 x 8 x 10 Turf Tire - Standard
- ☒ 18 x 6 x 8 Turf Tire
- ☒ 18 x 6 x 8 Chevron Tire
- ☒ 18 x 9.5 x 8 Chevron Tire
- ☒ Other _____

BUCKETS:

- ☐ 31 inch (787 mm)
- ☐ 36 inch (914 mm)
- ☐ 42 inch (1067 mm)
- ☐ 44 inch (1118 mm)
- ☐ Other _____

RAMROD COPY
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S3N 3Z4
Phone: (800) 667-1581
Fax: (306) 782-1884



RAMROD Equipment

NEW MINI-SKID WARRANTY REGISTRATION FORM

Mini-Skid Serial Number

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- ☐ Other _____

DEALER COPY

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RAMROD Equipment

NEW MINI-SKID WARRANTY REGISTRATION FORM

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CUSTOMER COPY

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I. SAFETY

OPERATE MINI-SKID SAFELY

IMPROPER OPERATION OF THIS MINI-SKID MAY RESULT IN DEATH OR SERIOUS INJURY. BEFORE OPERATING THIS MINI-SKID, OPERATORS MUST HAVE PROPER INSTRUCTIONS, BE FAMILIAR WITH THE SAFETY PRECAUTIONS, AND HAVE READ THIS AND THE ENGINE MANUFACTURER'S MANUAL THOROUGHLY.

THIS SAFETY ALERT SYMBOL POINTS OUT IMPORTANT SAFETY PRECAUTIONS.



OPERATORS MUST UNDERSTAND CAPABILITIES AND LIMITATIONS OF THE EQUIPMENT, WITH RESPECT TO SPEED, BRAKING, STEERING, STABILITY AND LOAD CHARACTERISTICS BEFORE STARTING TO OPERATE.

NEW OPERATORS MUST CHECK ALL CONTROLS IN A SAFE, OPEN AREA BEFORE STARTING WORK.

LEARN THE SAFETY ALERT SYMBOLS



This Symbol Advises of Actions or Hazards which will result in Death or Serious Injury.



This Symbol Advises Actions or Hazards Which Can Result in Death or Serious Injury. It may also be used to Alert against Unsafe practices.



This Symbol Advises of Actions or Hazards Which Can Result in Minor or Moderate Injury. It may also be used to Alert against Unsafe practices.



This Symbol Advises to Procedures That Need to be Followed to Prevent Machine Damage.

SAFETY PRECAUTIONS

READ YOUR OWNERS'S MANUAL AND ALL SUPPLEMENTS BEFORE OPERATING YOUR MINI-SKID.

WHEN LEARNING TO OPERATE, KEEP THE ENGINE THROTTLE BELOW 50 AND PROCEED SLOWLY AND CAREFULLY.

DO NOT PLACE FEET UNDER THE PLATFORM.

DO NOT OPERATE ANY OF THE CONTROL LEVERS INCLUDING AUXILIARY POWER TAKE-OFF UNLESS YOU ARE STANDING WITH BOTH FEET ON THE PLATFORM AND FIRMLY HOLDING THE GRIP HANDLES.

DO NOT JERK THE CONTROL LEVERS, USE A STEADY EVEN MOTION.



Wear Ear Protection When Engine is Running; anything over 85 decibels. The Sound Pressure Level is: 102 dB for A Weighted Level & 88 dB for C Weighted Level



Do Not Use The Mini-Skid During A Thunderstorm Or When There Is A Chance Of A Lightning Strike.

SAFETY

SAFETY PRECAUTIONS - CONTINUED

KEEP HANDS, FEET AND CLOTHING AWAY FROM ALL MOVING PARTS AND CYLINDERS.

DO NOT RIDE IN BUCKET.

DO NOT ALLOW MORE THAN ONE PERSON ON THE MINI-SKID AT ANY TIME.

DO NOT ALLOW ANY OTHER PERSON OR ANIMAL CLOSE TO THE MINI-SKID WHILE IN OPERATION.

WATCH FOR OTHER PEOPLE AND EQUIPMENT.

KEEP THE BUCKET LOW WHEN TRAVELLING, TURNING OR CHANGING SPEED.

TRAVEL SLOWLY OVER ROUGH TERRAIN.

BEWARE OF TRENCHES, HOLES AND SIDE SLOPES

DO NOT DRIVE THE MINI-SKID ACROSS STEEP SLOPES.

LOAD, UNLOAD AND TURN AROUND ON FLAT, LEVEL GROUND ONLY.

ENSURE ADEQUATE VENTILATION WHEN USING THE MACHINE IN CONFINED SPACES.

DO NOT CARRY LOAD WITH ARMS IN A RAISED POSITION. ALWAYS CARRY LOADS CLOSE TO THE GROUND. DO NOT STEP OFF PLATFORM WITH THE LOAD RAISED.

TO AVOID FREE-FALL OF LOAD WHEN LOWERING LIFT ARMS, DO NOT PUSH LIFT ARM LEVER FULLY FORWARD.

DO NOT EXCEED RATED LOAD CAPACITY.

ALWAYS LOWER THE BUCKET AND SHUT OFF THE ENGINE BEFORE LEAVING THE MACHINE.

DO NOT PARK ON A SLOPE.

WHEN HOOKING UP ATTACHMENTS TO THE MACHINE, CHECK TO BE SURE LOCK PINS ARE FULLY ENGAGED.

DO NOT PLACE ANY PART OF THE OPERATOR'S BODY OR ALLOW ANYONE UNDER MINI-SKID ARMS OR ATTACHMENTS.

DO NOT LUBRICATE, ADJUST OR REPAIR THE MACHINE WITH THE ENGINE RUNNING.

NEVER FUEL A HOT MACHINE.

DO NOT SMOKE WHEN FUELING OR OPERATING THE MACHINE.

ALWAYS READ THE OWNER'S MANUAL FOR PROCEDURES FOR SERVICING AND MAINTENANCE OF THE MINI-SKID.

REMEMBER, SAFETY FIRST.

II. CONTROLS

It is necessary to become familiar with the location and purpose of each control before operating the Mini-Skid.

ENGINE CONTROLS – Vanguard 23 HP AIR-COOLED ENGINE



Figure 1& 2: Instrument Panel – Vanguard Engine

Choke Control – Pull the choke control out to start a cold engine. As the engine warms up push choke control in gradually.

Throttle Control – When the throttle control lever is set down the engine is at idle speed. Pushing the control up increases engine speed.

Ignition Switch – The ignition switch is a three-position switch. Clockwise from the OFF position are the ON and START positions.

Tach/Hour meter – The tach/hour meter shows engine hours when the machine is turned off and engine rpm while the machine is running. Note that for the first 60 minutes run time is recorded in minutes.

Low Fuel Level Indicator

Low Hydraulic Oil Level Indicator

Headlight Switch (if equipped)

NOTICE

BE SURE IGNITION KEY IS IN OFF POSITION OR REMOVED, WHEN THE ENGINE IS NOT RUNNING.

NOTICE

FOR MAXIMUM POWER WHILE WORKING, THE ENGINE SHOULD BE RUNNING AT FULL THROTTLE.

CONTROL PANEL

Figure 3: Control Panel

PRIMARY CONTROLS

1. Lift Arm Lever
2. Tilt Lever
3. Auxiliary Lever
4. Left Hand Drive Lever
5. Right Hand Drive Lever
6. Grip Handle



Figure 3

DRIVE LEVERS, ITEMS 4 & 5 FIGURE 3

The left-hand drive lever controls the wheels on the left-hand side and the right-hand drive lever controls the wheels on the right-hand side. Engage the drive levers slowly because even a small movement of the levers will cause motion. All lever movements should be smooth and gradual. To drive the Mini-Skid straightforward, move both control levers forward the same amount. To drive the Mini-Skid Straight backward, move control levers back the same amount. The Mini-Skid is steered by moving one lever further forward than the other. To turn left, move the right lever further ahead than the left lever; to turn right, move the left lever further ahead than the right lever. For the Mini-skid to perform a spin-turn, or "Skid Steer", move one lever forward and the other backward the same amount. The Ramrod line up features single-handed steering. For normal operation, the most

comfortable hand position is to operate the two steering levers with the palm of the right hand, with the fingers gripping the grip handle. Flexing the fingers will allow forward travel, and simply rotating the palm will allow normal steering. To reverse, slip the palm back to the rear of the grip handle, and use the tips of the fingers to pull the steering levers backwards. This will allow for more precise control of the unit. The left hand should grip the grip handle for operator stability, but can also be used to operate the tilt and dump functions as required.

NOTE: Be sure to slowly move the levers to the center (neutral) position when stopping. The Mini-Skid will stop INSTANTLY if the operator releases the drive levers.

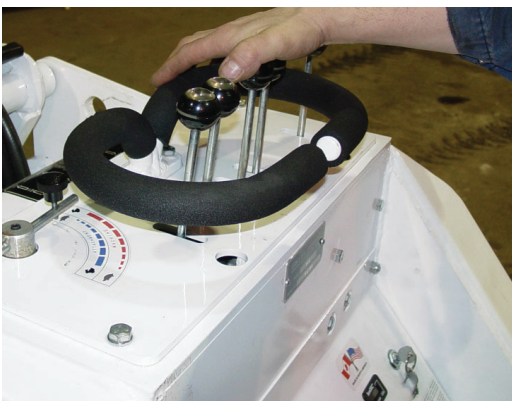


Figure 4: Single Hand Steering



WARNING

DO NOT MOVE ANY OF THE CONTROL LEVERS UNLESS STANDING WITH BOTH FEET ON THE PLATFORM AND HOLDING THE GRIP HANDLES.

LIFT CONTROL LEVER – Item 1, Figure 3

The outside control lever located on the left hand side controls the lift. Pushing the lever forward lowers the lift arm and pulling the lever back raises the lift arm. In these two positions, the lever is spring centered to neutral upon release of the lever.



WARNING

KEEP BOTH HANDS ON THE GRIP HANDLE AT ALL TIMES WHEN OPERATING THE MACHINE.

TILT CONTROL LEVER – Item 2, Figure 3

The inside control lever located on the left hand side controls the tilting action of the quick attachments. Pulling the lever back tilts the quick attachments back. Pushing forward on the lever tilts forward or “dumps” the quick attachment. The lever is spring centered to neutral upon release.



WARNING

USE EXTREME CAUTION WHEN STOPPING. IF THE BUCKET OR ATTACHMENTS IS RAISED, THE MACHINE CAN TIP. KEEP ALL MOVEMENTS SMOOTH. ALL NEW OPERATORS MUST WORK THE MACHINE IN A SAFE OPEN AREA TO BECOME FAMILIAR WITH ITS OPERATING CHARACTERISTICS.

AUXILIARY LEVER – Item 3, Figure 3

Direction of auxiliary flow and “on-off” control of attachments is provided by this lever. Pushing this lever forward will operate the attachment in one direction, while pulling it back will operate the attachment in the opposite direction. This lever locks in each position and must be returned to the center (off) position manually. Ensure the lever is set to off when not in use.

NOTICE

ENSURE THAT THE AUXILIARY LEVER IS KEPT IN NEUTRAL WHEN NOT IN USE TO AVOID WASTING POWER. ENGINE IS DIFFICULT TO START IF LEVER IS ENGAGED. HYDRAULIC OIL MAY ALSO OVERHEAT.

ATTACHMENT LOCK PIN

The “Taskmaster” tool bar design allows changing from one attachment to another quickly and easily, without having to remove pins.

Attachments are secured on the unit with two spring-loaded pins. Rotating the handles on the pins one half of a turn moves the pins from the locked to the unlocked position.

To unlock attachments, rotate both pins so that their handles are both pointing to the outside of the tool bar (as shown in Figure 5).

To lock attachments, rotate both pins inwards so that both handles are pointing towards the center of the machine (as shown in Figure 6). This will allow the springs to push the pins downwards through the mounting holes in the attachment and secure it to the unit.



Figure 5 (Lock Pins Disengaged)



Figure 6 (Lock Pins Engaged)



CAUTION

THE DESIGN OF THE QUICK ATTACH SYSTEM IS SUCH THAT ATTACHMENTS CAN BE LIFTED AND CARRIED WITHOUT THE LOCK PINS BEING ENGAGED. BEFORE USING ANY ATTACHMENT, CHECK TO BE SURE THAT THE LOCK PINS ARE FULLY ENGAGED AND PROPERLY IN PLACE. THE ATTACHMENT WILL FALL OFF WHEN DUMPED IF THE LOCK PINS ARE NOT ENGAGED, RESULTING IN POSSIBLE DAMAGE OR INJURY.



CAUTION

AFTER HOOK-UP TO ATTACHMENT, CHECK TO BE SURE LOCK PINS ARE FULLY ENGAGED, AND LOCKED INTO POSITION.

III OPERATION

You can take full advantage of all the features of your RAMROD Mini-Skid by following the operating information presented here. The Mini-Skid has been designed to do a lot of work with a minimum of operator fatigue.

Note: For more information regarding engine starting and operation, refer to your engine "Owner's Manual".

PRE-STARTING INSPECTION AND PREPARATION

Before you start the Mini-Skid for the first time each day, perform the following checks and service:

1. Check engine crankcase oil level.
2. Check engine fuel and open fuel shut-off valve(s) if closed.
3. Check Hydraulic fluid level in tank.
4. Check for fuel, engine oil or hydraulic leaks. – WARNING- Never check for hydraulic leaks with your bare hand. High-pressure fluid could penetrate your skin and cause severe injury.
5. Visually inspect all hoses, lines, fittings, tires, pivot points, mounting pins, nuts and bolts, safety shields and decals for possible failure or looseness.
6. Check that all controls are in the neutral position.

STARTING PROCEDURE

1. Push the throttle lever down slightly
2. Engage choke
3. Turn the ignition switch to "ON" and then through to the "START" position. (If the engine fails to start by cranking for 10 seconds, wait 5 seconds before trying again.
4. As the engine warms up, push back the choke control gradually.
5. Set the throttle lever for idling speed. Avoid excessive engine speed during warm-up.
6. To restart a warm engine – move throttle control slightly and turn ignition key to "START".



WARNING

DO NOT MOVE ANY OF THE CONTROL LEVERS UNLESS STANDING WITH BOTH FEET ON THE PLATFORM AND HOLDING THE GRIP HANDLES.

NOTICE

DO NOT CRANK ENGINE WITH STARTER FOR MORE THAN 10 SECONDS AT A TIME, AS THIS WILL OVERHEAT THE STARTER.

NOTICE

ENSURE THE AUXILIARY LEVER IS IN NEUTRAL WHEN NOT BEING USED TO AVOID WASTING POWER. ENGINE IS DIFFICULT TO START IF LEVER IS ENGAGED. HYDRAULIC OIL MAY ALSO OVERHEAT.

NOTICE

DO NOT PUT MINI-SKID UNDER FULL LOAD CONDITION UNTIL IT HAS WARMED UP.

SHUT-OFF PROCEDURE

1. Park the Mini-Skid on level ground.
2. Lower the lift arms and ground the bucket.
3. Return throttle control to "idle" position, and allow engine to idle for a short time.
4. Ensure Auxiliary & Control levers are in neutral position.
5. Turn ignition key off, and remove key.

NOTICE

BE SURE IGNITION KEY IS IN OFF POSITION OR REMOVED WHEN THE ENGINE IS NOT RUNNING.

MOUNTING ATTACHMENTS

INSTALLATION OF ATTACHMENT

1. Rotate Lock Pins to the unlock position (handle pointing outwards).
2. Tilt the attachment frame forward as shown in Figure 7, so that the top round edge of the attachment frame will fit under the lip of the attachment.
3. Drive into the attachment, raising the arms so that the top of the attachment frame slips under the lip on the attachment, and attachment lifts slightly.
4. Using the tilt cylinder, roll back the attachment so it drops into place, as shown in Figure 8
5. Rotate the lock pins to the locked position (handles facing inwards), and check that the lock pins are fully inserted through the lock holes in the attachment.
6. Connect attachment hydraulic hoses (if required) to the quick couplers shown in Figure 9.



CAUTION

AFTER HOOKING UP TO THE ATTACHMENT, CHECK TO BE SURE LOCK PINS ARE FULLY ENGAGED AND LOCKED INTO POSITION

REMOVAL OF ATTACHMENTS

1. Lower the lift arm and tilt forward on the attachment, so that the attachment is resting on the ground.
2. If attachment is hydraulically equipped, stop the engine, relieve hydraulic pressure in the attachment lines by shifting the auxiliary lever back and forth, and disconnect the attachment.
3. Rotate the lock pins to the unlocked (handles pointing outwards) position.
4. Start engine, tilt the attachment mount that clears lip on the attachment, and back the Mini-Skid away from the attachment.
5. Attach the two quick couplers together to avoid getting dirt in the attachment hydraulics.

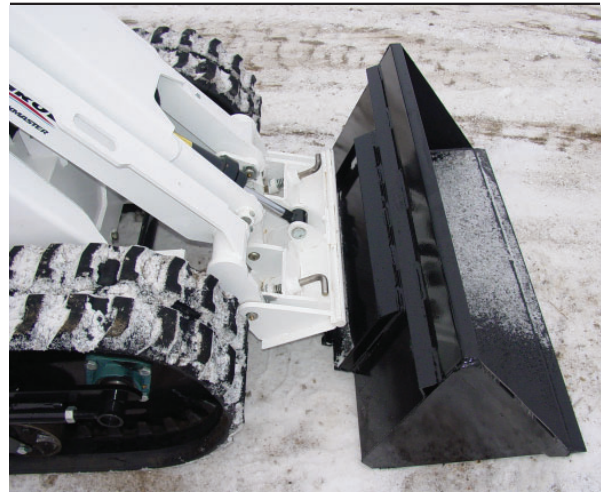


Figure 7

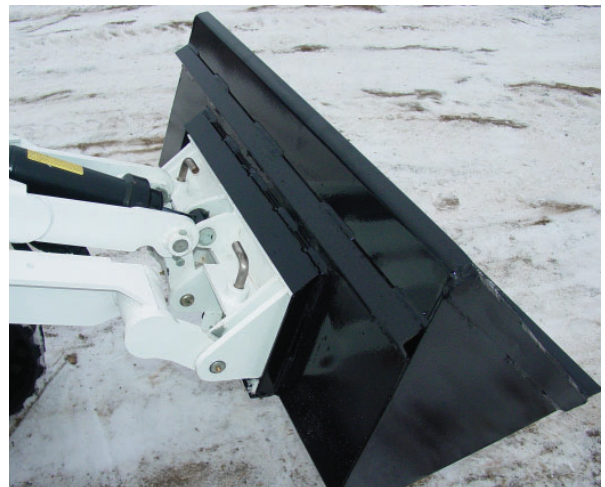


Figure 8



Figure 9

OPERATIONAL PROCEDURES

Mini-Skid operational procedure and suggestions in this manual are based on the use of a bucket. Procedures and suggestions may vary with different attachments. See your attachment manual or contact your local dealer for more information.

OPERATING SUGGESTIONS

1. Install an attachment (bucket). Set the machine throttle to half power to the machine or less. Drive carefully to a clean and level area and practice operating the Mini-Skid at a slow rate until familiar with the operation of all controls.
2. Hydraulic power transmission is instantaneous. When using the drive levers, sudden movement will result in acceleration to full speed and a very jerky ride. Use smooth and gradual movements when using the drive levers.
3. For efficient operation of the Mini-Skid, Keep the work area small, and as level as possible.
4. Decrease cycle time by "SKID" turning rather than backing up, using a slow turn, then going forward.
5. When driving on slopes keep the heaviest end of the Mini-Skid upward. When driving on a slope with an empty bucket, back up the slope in reverse, and drive down a slope forward as in Figure 10. When driving on a slope with a load, drive up the slope forward and back down the slope in reverse as in Figure 11.
6. Fill the bucket to rated capacity. Turning is easier with a full load than with a partial load.
7. To increase machine life, let the engine warm completely before starting operations each day. Avoid "over-loading" or "lugging" the Mini-Skid.

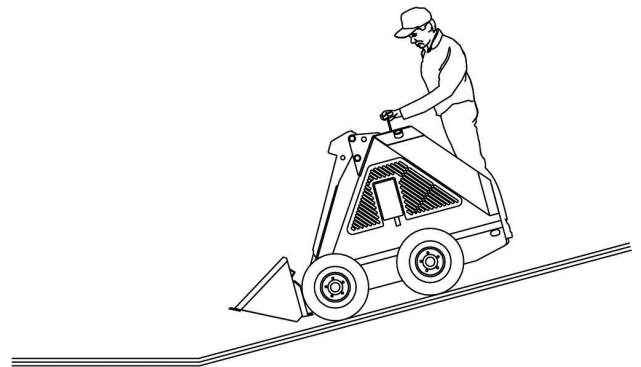


Figure 10 - Empty Bucket

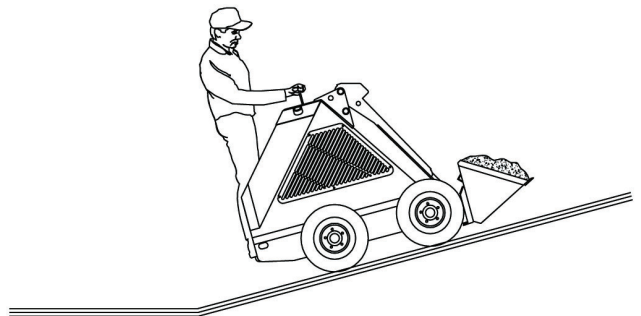


Figure 11 - Full Bucket

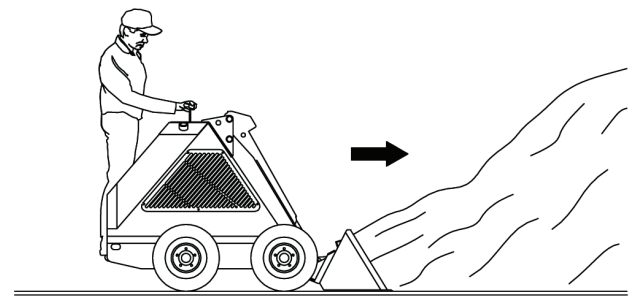


Figure 12



WARNING

ALWAYS CARRY THE BUCKET LOW WHILE MOVING. DRIVE DIRECTLY UP AND DOWN INSTEAD OF ACROSS A SLOPE.



WARNING

IF OPERATING MINI-SKID INDOORS, MAKE SURE BUILDING IS WELL VENTILATED.

FILLING AND DUMPING BUCKET

1. Approach the pile with the lift arms fully lowered and bucket cutting edge just skimming the top of the ground as in Figure 12.
2. As soon as the bucket is full, tilt the bucket back and back away from the pile, as shown in Figure 13 and 14.
3. When dumping, raise bucket high enough to clear stockpile or sides of container being loaded.
4. Drive slowly forward until bucket is over dumping area and tilt bucket forward until it completely empties.
5. Tilt bucket, back up if necessary to clear container side, and back away.



DANGER

USE EXTREME CAUTION WHEN STOPPING. IF THE BUCKET OR ATTACHMENT IS RAISED THE MACHINE CAN TIP. KEEP ALL MOVEMENTS SMOOTH AND GRADUAL WHEN MANEUVERING WITH LIFT ARMS RAISED. DO NOT CROSS OBSTRUCTIONS WITH ARMS RAISED. ALL NEW OPERATORS MUST WORK THE MACHINE IN A SAFE OPEN AREA TO BECOME FAMILIAR WITH ITS OPERATING CHARACTERISTICS.



WARNING

NEVER STEP OFF THE OPERATOR PLATFORM WITH THE LOAD RAISED

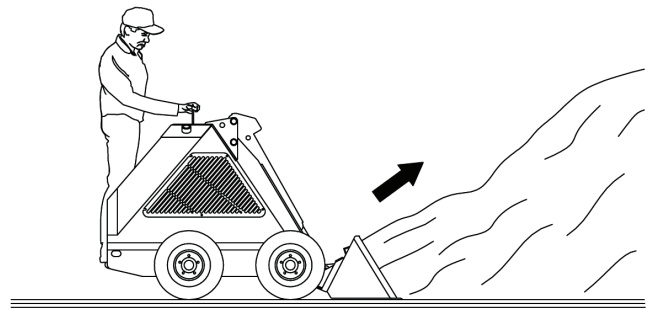


Figure 13

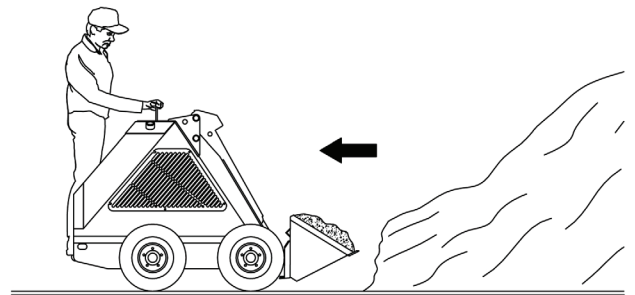


Figure 14

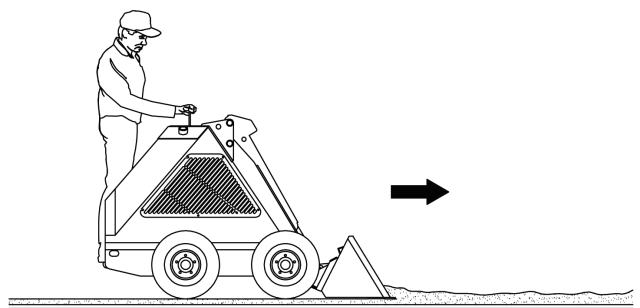


Figure 15

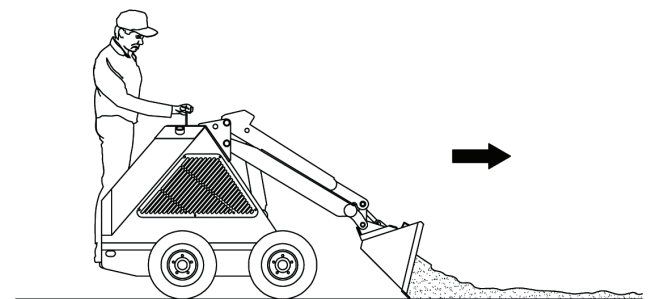


Figure 16

DIGGING WITH A BUCKET

1. Lower lift arms fully and tilt bucket forward until cutting edge is on the ground.
2. Drive Machine forward slowly and continue to tilt bucket forward until it enters the ground to desired depth and then tilt it back a small amount to keep an even depth, as show in Figure 15.
3. Continue driving forward until bucket is full and then tilt bucket fully back while driving slowly forward or stopping the machine.

LEVELLING

1. To spread material on uneven ground, raise lift arms and tilt bucket forward while driving slowly forward, as shown in Figure 16.
2. To level a filled area, tilt bucket forward and drive machine backwards to drag bucket and spread material, as shown in Figure 17.
3. Another method of leveling is to travel forward with bucket down and level, full of material and pushing excess into low areas. Depth is controlled by tilting the bucket slightly up or down, as in Figure 18.

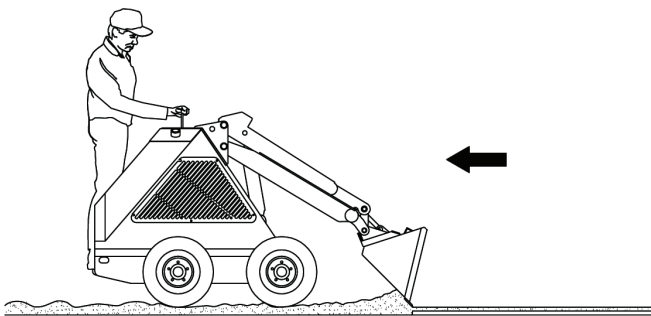


Figure 17

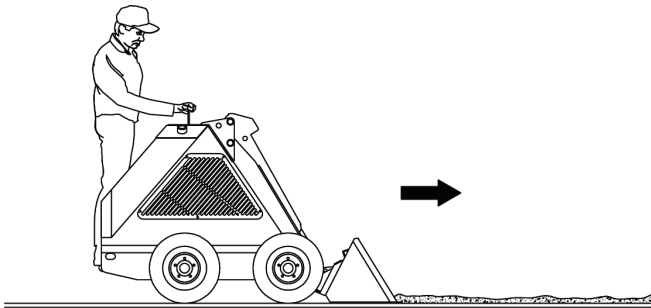


Figure 18

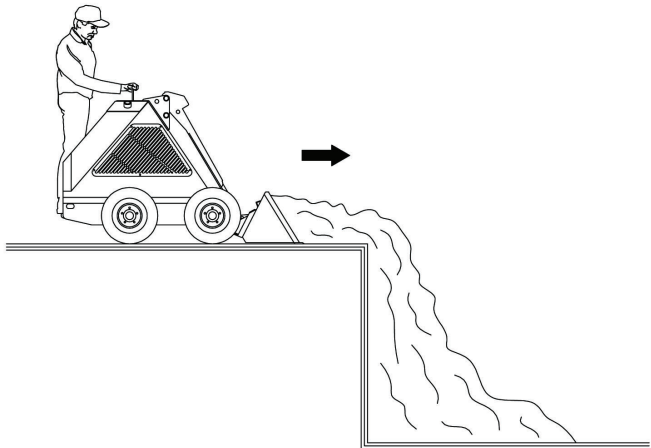


Figure 19

BACKFILLING

1. When filling a trench or a hole, drive up to the hole with bucket low or push material up to edge, as in Figure 19.
2. Tilt bucket forward as soon as it reaches the edge of the hole and when necessary raise the arms to empty the bucket.

NOTICE

NEVER TOW THE MINI-SKID DAMAGE
MAY RESULT.

TRANSPORTING THE MINI-SKID

When the machine is transported on a truck or trailer, proper ramps must be used for loading.

A Mini-Skid with an empty bucket, or no attachment should be driven backwards up a ramp onto the trailer or forward down a ramp, as shown in Figure 20.

After the Mini-Skid is driven onto the transporting vehicle, lower any attachments, and install tie straps to hold Mini-Skid from moving during sudden stops or when traveling up and down grades.

Close the fuel valve when the Mini-Skid is to be transported. Vibration during transport could cause the carburetor to flood.

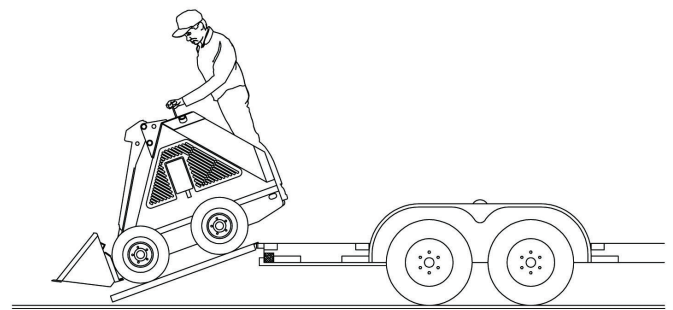


Figure 20



DANGER

WHEN TRANSPORTING ON A ROAD
OR HIGHWAY, BE SURE THAT THE
TRAILER IS EQUIPPED WITH LIGHTS
AND SIGNS AS REQUIRED BY LAW.

LIFT ARM SUPPORT DEVICE

Your Mini-Skid is equipped with a lift arm support device. This is bolted to the side of the unit, and is painted red.



In order to safely work underneath the lift arms, remove the support device from the side and remove any attachment from the Mini-Skid. Raise the lift arms to their maximum extension and place the support device onto the lift cylinder of the Mini-Skid. Lock the support in place using the bolt that attached it to the leveling arm.

Ensure the machine is shut off before performing any work on the Mini-Skid. After completing work on the Mini-Skid remove the support device from the lift cylinder and replace it on the leveling arm.

NOTICE

NEVER LOWER THE LIFT ARMS WITH THE SUPPORT DEVICE IN PLACE. DAMAGE TO THE LIFT CYLINDER WILL RESULT.



DANGER

BEFORE PERFORMING ANY WORK UNDERNEATH THE MINI LIFT ARMS REMOVE ANY ATTACHMENT AND RAISE THE LIFT ARM TO FULL HEIGHT. USE THE LIFT ARM SUPPORT TO LOCK THE ARMS IN THE RAISED POSITION.

LIFTING THE MINI-SKID

Lift lugs are provided at the top of the Mini-Skid to facilitate lifting the Mini-Skid as a unit.

Both lift lugs must be used in order to properly balance the machine when it is being lifted. Use a sling to hook each lift lug.

Ensure that all lift equipment is rated for the weight of the Mini-Skid being lifted. Machine weights vary from 1700 lbs to 2300 lbs (without attachments). Contact Ramrod Equipment or your nearest dealer for more information.

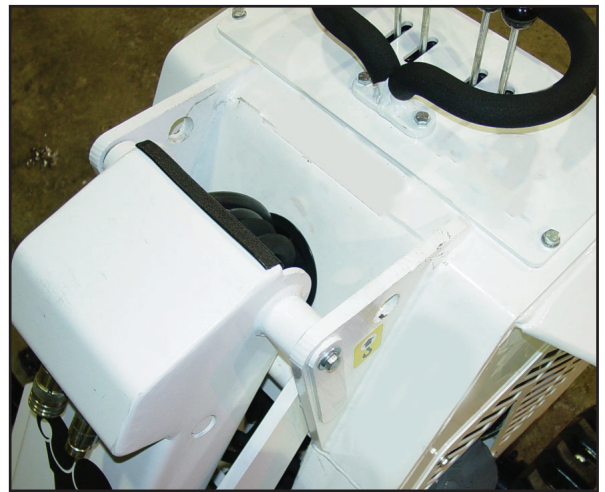


Figure 21

IV. MAINTENANCE

ENGINE MAINTENANCE

For proper engine maintenance, refer to your Engine Owner's Manual. This pertains to all applicable maintenance on your engine. Maintenance with respect to fluids and lubricants are included in the "Periodic Maintenance and Service Schedule" in your Manual.

To access engine compartment, remove louvered side panels or rear panel as required.

Service Access (23HP Vanguard)

- Oil Filter - Left side
- Oil Drain Plug - Left or Right side
- Spark Plugs - Left and Right Side
- Dipstick - Right Side
- Oil Filler - Right Side
- Air Cleaner - Rear



Figure 22



Figure 23



Figure 24

BATTERY

NOTE: Check the battery hold down bracket for tightness. Do not over tighten. Remove any acid corrosion from the battery terminals and cables with a baking soda and water solution. Terminals may be coated with a high temperature grease.

To access the battery, raise the lift arm and install the lift cylinder lock.



Figure 26: Lift Cylinder Lock

The battery is located behind the oil fill cap.

The hydraulic oil filter is located across from the battery.



Figure 27: Hydraulic Filter and Battery

FUELS, LUBRICANTS AND CAPACITIES

The service obtained from your Mini-Skid is greatly affected by the quality of the petroleum products used in it. It requires only common products, which are commercially available through the outlets of major refineries. The following chart shows which lubricant to use in the various components of the Mini-Skid.

COMPONENT	TEMPERATURES	TYPE OF LUBRICANT/FLUID	CAPACITY LITRES (US GALS.)
Engine Oil	See Engine Owners Manual	See Engine Owners Manual	See Engine Owners Manual
Fuel Tank	All Temperatures	Gas – Regular	24.5L (6.5 gal.)
Hydraulic Oil Reservoir	All Temperatures	ISO 46 Anti-Wear Hydraulic Oil	38L (10 gal.)

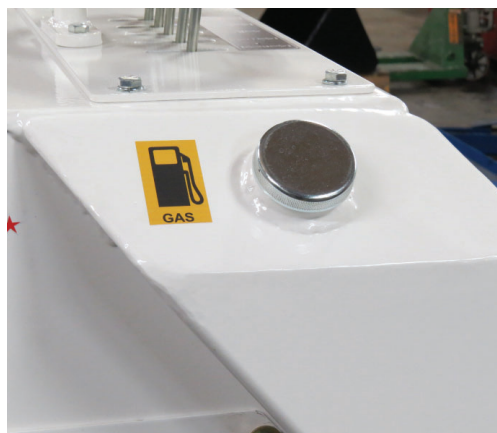



Figure 28: Fuel Fill Location

Fuel filler spouts are located on the two body side tanks shown in Figure 28. Note that each tank should be filled separately for maximum fuel load.



Figure 29: Oil Fill Location

Oil fill and level check cap are located at the left side of the lift cylinder (shown in Figure 29). Remember to always use the lift cylinder lock when working underneath the lift arm.

**WARNING**

NEVER ADD FUEL TO A MINI-SKID WHEN THE ENGINE IS RUNNING OR IS HOT.

NOTICE

DO NOT SERVICE MINI-SKID WHILE ENGINE IS RUNNING.

HYDRAULIC SYSTEM MAINTENANCE

HYDRAULIC OIL LEVEL CHECK

1. Ensure that the Mini-Skid is standing level, the lift arms are up and the tilt cylinder is closed.
2. Install the lift cylinder lock to prevent accidental injury or death.
3. Remove the oil cap, and check the level. The oil should be between 2 and 2.5 inches from the top of the tank.
4. If necessary, add the proper type and grade of oil.



Figure 30: Hydraulic Oil Drain

CHANGING HYDRAULIC OIL

1. The hydraulic oil drain is accessed from the front of the machine, as shown in Figure 30. Note: engage lift cylinder lock before working underneath the lift arm.
2. Remove the drain plug, shown in Figure 30, to drain the oil.
3. Replace drain plug and refill reservoir with clean oil.

CHANGING OIL FILTER

1. To access the filter, raise the lift arm and use the lift cylinder lock.



Figure 31: Lift Cylinder Lock

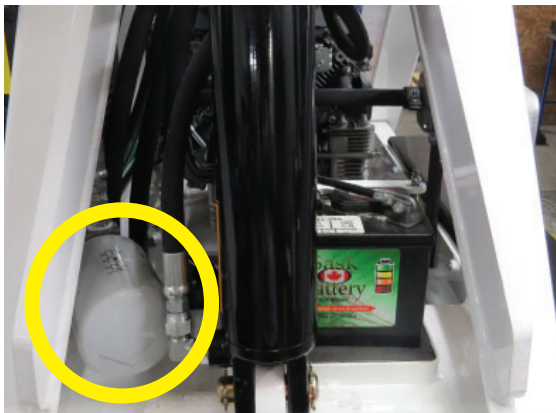


Figure 32: Oil Filter

FINAL DRIVE MAINTENANCE

There is a single wheel chain on each side of your 930 mini skid. This chain is factory tensioned for correct operation. However, as your chain wears in, some adjustment may be required.

In order to tighten your wheel chains first loosen the four bolts securing the front axle to the machine body. The bolts should be loosened only enough to allow the axle to move forward and back.

After loosening the bolts adjust the two axle bolts, shown in Figure 32, to adjust the chain tension. Note that it is important to tension each bolt equally in order to keep the axle square to the machine. If the proper chain tension cannot be achieved with the axle square, the drive chains should be replaced. After chain adjustment, tighten the four axle bolts to secure the front axle.

Chain tension should be checked on a weekly basis.

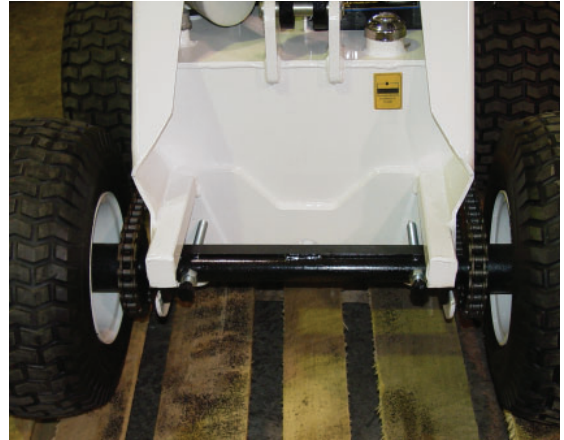


Figure 33: Chain Adjustment

CHAIN LUBRICATION (FOR 930 UNITS)

For best life, drive chains should be lubricated every 8 hours, following this schedule can extend your chain life by as much as 7 times. The manufacturer's recommendations (Renold Power Transmission Ltd) for chain lubricant and application are as follows:

Lubricant should be a good quality non-detergent mineral oil (example 10W30). Heavy oils and greases are NOT recommended as a lubricant. The following table provides a guide for lubricant viscosity at various ambient temperatures:

Ambient Temperature		Lubricant Rating	
Celsius	Fahrenheit	SAE	BS 4231
-5 to +5	23 to 41	20	46 to 68
5 to 40	41 to 104	30	100
40 to 50	104 to 122	40	150 to 220

For the majority of the above applications a multi-grade 20/50 oil would be acceptable.

Oil should be applied periodically (every 8 hours) with a brush or oil can. The goal is to keep the chain wet with oil and ensure penetration of the oil into the chain joints. Applying lubrication by aerosol is also acceptable, but it is important that the lubricant is approved for use on roller chain.

PERIODIC GREASING DETAILS

Greasing is an important factor in extending the service life of many items on your Mini-Skid including cylinders and pivot pins.

GREASING PIVOT POINTS

The pivot points may be greased with a general purpose or bearing grease. The pivot points include: both cylinder cross tubes (the lift and tilt cylinders), all quick attach pivot points, and the lift and leveling arm pivot points.

The lift cylinder, leveling arm and lift arm pivot points can be reached by raising the machine lift arms to their highest extent. The machine should be shut off and the cylinder lock installed prior to greasing. The cylinder lock is located under the left side of the leveling arms.

Greasing is recommended on a weekly basis.



Figure 34: The 3 Grease Points Under the Lift Arms

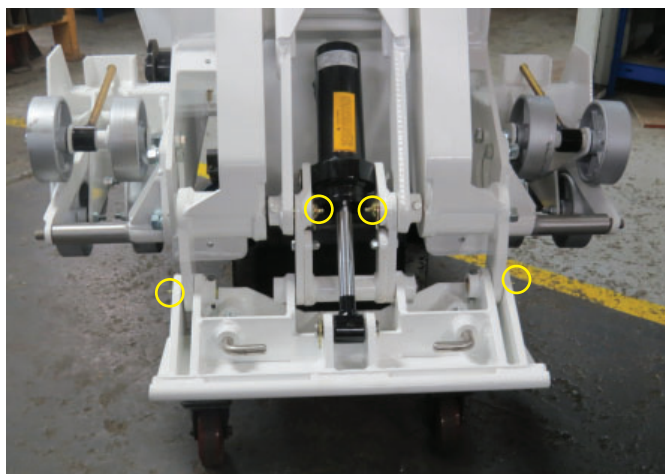


Figure 35: The 4 Grease Points on Quick Attachment

PERIODIC MAINTENANCE AND SERVICE SCHEDULE

Item	Manual	Service Required	8hrs or Daily	25hrs or Weekly	50hrs or Bi-Weekly	100hrs or Monthly	1000hrs or Annually
Engine Oil	Engine Manual	Check level of engine oil and top up if necessary	X				
Engine Fuel	Ramrod Manual	Check level and if necessary, top up.	X				
Hydraulic Oil	Ramrod Manual	Check level and if necessary, top up.	X				
Tires and Wheel Bolts	Ramrod Manual	Check tire pressure and wheel bolts (bolts to 90 lb-ft).	X				
Decals	Ramrod Manual	Check for damaged safety or instruction decals. Replace if necessary	X				
Drive Chains	Ramrod Manual	Lubricate.	X				
Wheel Drive Chain (s)	Ramrod Manual	Check and adjust tension if necessary.		X			
Air Cleaner	Engine Manual	Service element.		X			
Grease Pivot Points	Ramrod Manual	Grease all pivot points		X			
Battery	Ramrod & Engine Manual	Clean and protect battery terminals			X		
Engine Oil	Engine Manual	Change oil after first 20 hours of operation, or as indicated in engine manual.			X		
Engine Oil	Engine Manual	Replace engine oil.				X	
Fuel Filter	Engine Manual	Clean and dry thoroughly.				X	
Spark Plug	Engine Manual	Clean and check gap.				X	
Hydraulic System	Ramrod Manual	Check all hoses, tires, fittings, etc. thoroughly. Replace if needed.				X	
Hydraulic Oil Filter	Ramrod Manual	Replace oil filter.				X	
Engine Oil Filter	Engine Manual	Change oil filter.				X	
Hydraulic Oil	Ramrod Manual	Change hydraulic oil					X

TROUBLESHOOTING

The following chart is intended to help isolate problems and provide possible remedies.

SYMPTOM	POSSIBLE CAUSES	POSSIBLE REMEDIES
Starter does not crank engine	Low battery output Loose or disconnected battery cable	Recharge or replace battery Check and tighten all connections
Engine turns over but does not start	No Fuel in Tank. Fuel shut-off valve closed Improper starting procedure Auxiliary control lever engaged Spark plug fouled	Fill tank with clean fuel Open fuel shut-off valve Refer to starting procedure Set auxiliary lever to neutral Check Spark plug gap and clean or replace spark plug
Noisy hydrostatic system	Air in system Loose suction line and / or fittings Clogged oil filter Hydraulic oil too heavy Internal pump or motor damage	Check oil level, add if necessary Bleed system Tighten all fittings and connections Replace oil filter Warm up hydraulic oil when too cold See your RAMROD Dealer
Erratic or no output on transmission	Hydraulic oil too heavy Flow divider set to deliver all flow to attachment Hydraulic oil level too low Drive coupling between engine and pump broken	Use proper viscosity oil. Set flow divider to deliver flow to machine Check oil level. Add is necessary Check couplings, replace if necessary
Loss of hydraulic oil flow from gear pump	Reservoir low on oil Drive couplings between engine and pump broken Hydraulic gear pump not functioning	Check oil level. Add if necessary Check couplings, replace if necessary Inspect and repair if necessary
Hydraulic cylinders do not function properly	Loss of hydraulic flow from gear pump Air in System	See above Bleed system
Oil overheating	Reservoir low on oil Auxiliary control lever engaged Setting of relief valve too high or too low	Check oil level. Add if necessary Return auxiliary level to neutral Set to correct pressure See your RAMROD Dealer
No drive on one side of machine	Key sheared on motor shaft Wheel Motor Failure	Inspect shaft and hub for damage or wear. Replace key and tighten on slotted nut. See your RAMROD Dealer
No drive on one wheel	Chain Failure	Inspect and replace
Noisy operation	Chains too loose Chains dry	Tighten chain Lubricate chain