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EX-40/50 Flail Mower

A Product By:

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User Manual

For information and customer support – speak with your dealer or visit our website www.eterra-usa.com

Table of Contents

Table of Contents

1. Introduction 4
1.1. Purpose 4
1.2. Operation 4
1.3. Safety Marking 5
1.4. Operational Safety 6
2. Start-Up Procedures 7
2.1. Hydraulic Connections 7
2.2. Hose Routing 8
Operation Checklist & Set-Up 9
2.3. Pre-Operation Checklist 9
2.4. Deflection Shields – Rubber Edges 10
2.5. Travel 10
2.6. EX Mower Function 11
3. Mowing and Brush Cutting Guidelines 12
3.1. First-time Users - General 12
3.2. EX Initial Operation 13
3.3. EX - Initial Run-in 13
3.4. Equipment Matching 14
3.5. Operational Parameters – EX Mounted 15
4. Trouble Shooting 16
4.1. Trouble Shooting – EX 16
5. Parts – Exploded Views 17
5.1. Exploded Parts View EX-40 17
5.2. Exploded Parts View EX-50 17
6. Warranty 18

1. Introduction

1.1. Purpose

The EX series of excavator mowers were designed to allow excavator operators the opportunity to mow in the most efficient and economical way possible. Many features present in the EX's were suggestions by our customers. We encourage further suggestions to better serve you. This Owner's Manual is designed to help you be a safe and knowledgeable operator of this mower. With proper maintenance, your EX will provide many years of trouble free service. For sake of discussion in this manual, machine orientation will be as follows: right hand; left hand; and forward designations are those related to the operator when in the seated operating position.

1.2. Operation

Please read and understand all safety directives prior to operation and follow the initial start-up procedure before ever powering up the mower. It is extremely important that the mower is checked and re-checked prior to each operation and after any unexpected impact to the blades or housing. The EX are electronically balanced at the factory. If you notice any kind of shaking, STOP and examine the mower shaft looking for material jammed into the shaft like barbed wire or a missing blade. Repair or replace broken parts immediately. Failure to follow this directive will cause premature wear on the drive system, bearings and/or the carrier system. A few minutes and a few dollars now will save you a lot of money later.

If you hit a stationary object, STOP and examine the housing for damage. These mowers are built to be lightweight and strong enough for the toughest mowing tasks. If you are stuck, the mowers are not meant to be used to drag your excavator out of a hole. You can carefully push down on the heal of the mower and push gently, but do not attempt a drag. You will twist the housing, which is not covered under warranty. These are mowers and not buckets.

The EX Series Flail Mowers were designed for side cutting any vegetation 8" or less in diameter. This can include trimming hedges, ditch clearing on roadsides, vertical cuts along driveways where vegetation may have grown out over the path. Care must be exercised when operating to insure you do not run the EX's into fixed objects.

1.3. Safety Marking

Safety Alert Symbols are used throughout this manual and on decals on your EX mowers. When you see symbols become alert to safety information and adhere to it to prevent injury or death.

SIGNAL WORDS - There are signal words that are used in conjunction with the safety alert symbol; these signal words have been selected using the following guidelines:

DANGER – An immediate and specific hazard WILL result in severe personal injury or death if the proper precautions are not taken.

WARNING – A specific hazard or unsafe practice which COULD result in severe personal injury or death if proper precautions are not taken.

CAUTION – Unsafe practices which could result in personal injury if proper practices are not taken, or as a reminder of good safety practices.

You, as the owner of a Machine Solutions EX mower are responsible for its safe operation and maintenance. You need to make sure anyone working with, maintaining or working around the EX Mower is familiar with the operation and maintenance of the unit. Be alert, know all safety information in this manual and adhere to safety practices at all times.

Remember a safe operator is the key to avoiding most accidents. Most accidents can be avoided by – THINKING SAFETY AND WORKING SAFELY.

IMPORTANT: You must provide proper cab protection when operating this mower as material can deflect back at the operator. Be aware of the material you are cutting and its' deflection properties. You assume all risk when operating this mower to the public, property and the operator.

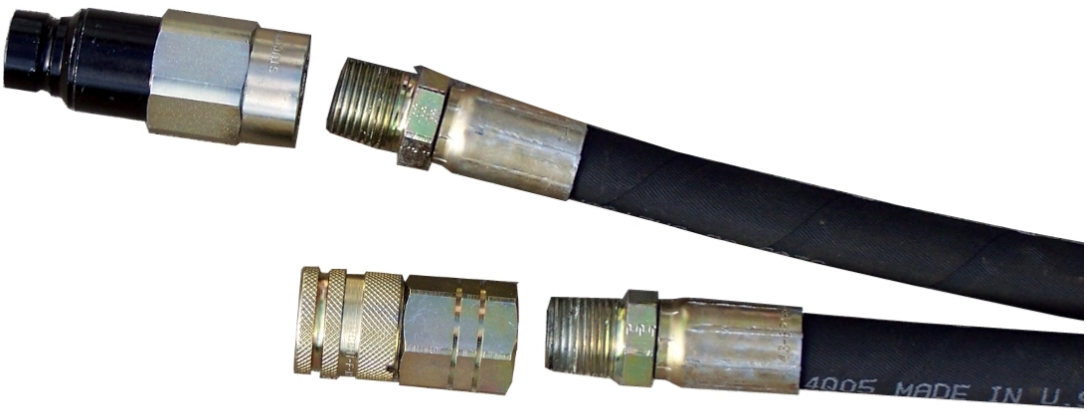
1.4. Operational Safety

- Review the Operator's Manual and all related Maintenance, and Safety information annually with all personnel who will be working with, maintaining or operating the EX Mower.
- Stop Machine engine, place hydraulic controls in neutral, set park brake, remove ignition key and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.
- Be careful when working around or maintaining high-pressure hydraulic systems. Wear proper eye and hand protection when searching for a high-pressure hydraulic leak. Use a piece of wood or cardboard as a backstop when searching for a pin-hole leak in a hose or steel line. Do not attempt any makeshift repairs to the hydraulic lines, fittings or hoses by using tape, clamps or cements. The hydraulic system operates under extremely high-pressure. Such repairs will fail suddenly and create a hazardous and unsafe condition.
- Seek immediate medical attention if a high-pressure concentrated stream of hydraulic fluid pierces the skin, as a toxic reaction and infection could develop.
- Keep hands, feet, clothing and hair away from all moving and/or rotating parts.
- Never wear ill-fitting, baggy or frayed clothing when working around or on any of the drive system components.
- Wear protective gloves when changing or performing maintenance on the boom.
- Clear the area of all bystanders, especially children, when carrying out any maintenance or making adjustments on the systems components.
- Lower boom to the ground before servicing, adjusting or repairing the machine.
- When moving on or near roadways, make sure the SMV (Slow Moving Vehicle) emblem and all the lights and reflectors that are required by the local highway and transport authorities are in place, are clean and can be seen clearly by all overtaking and oncoming traffic.
- Never transport with the boom arms extended upward. Boom arms should be in the stowed position in towards the Machine when transporting.
- Take care when working on steep ground, particularly when turning, and especially with mounted EX Mowers.
- Stay away from overhead obstructions and power lines during set-up and operation. Electrocution can occur without direct contact.
- Never operate this machine in an area with people present. You should maintain at least 100 yards of distance between the mower and people, animals or property.

2. Start-Up Procedures

2.1. Hydraulic Connections

- Depending on your order, your EX Mower may or may not have come with hydraulic quick couplers. The hose ends are furnished with fittings that will screw either directly into the back of the hydraulic couplers or a 90 degree fitting depending on your specific machine requirements. You should check the best hose routing for your machine prior to use and adjust accordingly. The mower operates only in one direction. If the opposite flow direction is set, the mower will not operate. If your controls do not work, swap the couplers as your machine may have a detent position with a reverse flow to the way your mower was tested and shipped. Couplers can be alternated on hose ends easily by the operator. Angled fitting either 45 degree or 90 degree may be used to alter the length and angle of hoses for a more optimal sweep of the hoses.



- Once the couplers are installed, you may connect them to your machine by pushing the male coupler into the female coupler on the Machine and the female coupler of the attachment into the male coupler on the Machine.

2.2. Hose Routing

- It is important that you check and recheck your hose routing each time you connect the attachment to your Machine. Each machine is different so you need to make sure that you have routed the hoses away from any potential pinch points. Check that there are no pinch points around the main Machine pivot. Average hose lengths are shipped at no-charge with each mower.
- It is the customers' responsibility to modify these hose lengths locally as required for your specific machine. Hose lengths can be varied by using or not using a 45 or 90 degree fitting.

Operation Checklist & Set-Up

2.3. Pre-Operation Checklist

- The Eterra EX Mower is designed to ensure years of trouble free use. A poorly maintained machine is an invitation to expenses and trouble. We recommend that before operation that this checklist be followed to ensure trouble free operation.

- Give the machine a “once-over” for any loose bolts, worn parts, cracked welds, hydraulic leaks, frayed hoses etc. and make necessary repairs. DOUBLE CHECK the EX Mower pins and mounts to insure nothing has come loose as you risk the mower head falling off if not properly inspected.

- Check for excessive blade & bolt wear as well as cracks in the rear of the blades. Replace as needed. Generally when the blades are worn out, so are the bolts so you should be replacing as a set. If you only replace the blades, the bolts may fail and allow the blades to fly away uncontrollably. This is not a situation you want to find yourself in and you should do everything to make sure this will never happen.

- If you feel any kind of vibration from the mower head, it is likely one of the mower blades has been broken. Stop using the mower and do not use until the blade has been changed.

- Be sure that there are no tools lying on or in the machine.

- Lubricate the main bearings daily or after each 8 hours of use. There is a greasing Zerk located near the front of the drive housing and near the input of the hoses to the housing.

- Make sure all hoses are clear of cuts, abrasions, worn spots and pinch points before operating. Check that hoses do not get caught in the pinch areas of your Machine boom.

- Check the tire pressure and make sure they are inflated to their recommended pressures. Connect to Machine and check mechanical Machine connection point for wear that could cause EX Mower to fall off. Repair any damage as needed.

- Connect two hydraulic lines to Machine as well as the power connection to power the receiver.

2.4. Deflection Shields – Rubber Edges

The EX Mower is the only of it's kind where a deflection shields are provided. These shields are provided to allow escaping material to be deflected downward while absorbing a lot of the potential energy. The deflection shield is not a stop all solution but it definitely helps. If you remove the deflectors, a lot more material will be projected forward out of the mower making it very dangerous. Do not operate without the deflection shields in place.

2.5. Travel

The EX arm should be rotated to directly in front of the operator and the mower head rotated so the blades are facing down. This position will give you the most compact footprint for travelling on a trailer or for accessing narrow areas. You should never store the mower in this position for long periods without strapping the arm back. Many Machine loaders have a small amount of bleed through which will allow the mower arm to drop when stored for longer periods. You should keep this in mind whenever you are going to leave the mower in a stowed position. The best position for stowage is in the parked position and removed from the loader.

2.6. EX Mower Function

The EX Mowers are designed to take advantage of the existing controls already furnished on your Machine as well as use your auxiliary hydraulic circuit to provide additional functions and power for your mower head.

Your machine will provide the lift and swing function for the mower as well as the forward movement for cutting. Many machines use a shared pump system so forward movement will be inhibited while the mower is operational. A few machines like Yanmar and newer Kubota's have a third pump which allows forward crawling while the mower is running.

The minimum hydraulic system requirements should be 15GPM at 2200 PSI. Less pressure means less power. Less flow means slower operation. Be sure to maintain proper system filtration. In addition to active pressure and return lines, you must have a case drain line installed if your machine produces too much back pressure in the return line. Many modern machine manufacturers recognized the issue and have reduced the back-pressure or installed (Breaker Circuits). A breaker circuit is a bypass valve that routes your return flow around the return valve and directly to tank. This provides a zero pressure return that will allow you to not have to install a case drain.

Failure to install a Case Drain can cause permanent damage to your EX Hydraulic motor. A key indication of too much back pressure will be a weeping of hydraulic oil out of the grease Zerk overflow point. If you catch this early enough and install a case drain, you may be able to save the seal. If there is a high volume of oil flowing from this point, it is too late and the seal will have to be replaced.

When setting your pressure, you may be able to run the mower in reverse and avoid this procedure because some manufacturers will only put the relief valve on the pressure line and not on the return. This is true for Kubota machines. If you connect your couplers and nothing happens in the intended direction, your couplers are on backwards. Swap them at the hose ends and your mower will start right up. This happens because there is a check valve installed which allows fluid to run when you shut off your hydraulics which protects your motor from a hard stop.

EX mowers are shipped with a blank mounting. The EX plate is designed to be the base for your Excavator coupler. It is the customers' responsibility to add the necessary coupler required for your machine type by welding the blank coupler to this plate. Once welded to the blank plate, you may bolt the plate to the top mount of your EX mower. There are many types of adaptors available allowing you to connect your mower to many types of machines. Check with your dealer for your specific application. Connect your pressure, return and case drain lines and you are ready to mow.

3. Mowing and Brush Cutting Guidelines

3.1. First-time Users - General

Step One:

Connect the mower to your machine and check hydraulic connections. Connect hoses and check that the hoses run easily up to your connection points and are not kinked or pinched in any way. Check that your mower is properly connected to your machine by lightly pushing the nose down into the ground to see if it will become dislodged. If there is any excessive movement in the connection point – STOP! Try to figure out why it is not mating properly and/or contact us 24/7 prior to operation. You do not want the mower to fall off while in use so you must establish a positive connection to your Machine.

Step Two:

Start your Machine, press the auxiliary flow switch and activate your trigger switch to lock the flow on. Insure you are in a clear area and with the mower head off the ground 12 inches, swing functions to see that the arm moves to and from the parked position. The swing/head rotate function must be selected as they share the same control buttons. Again, making sure you are in a clear area, with no bystanders, turn on the mower head and observe it spinning. Stop the flow to the mower and wait for it to spin down to a stopped position. Exit your cab and inspect the hoses and couplers for any leaks. Adjust as needed.

Step Three:

Enter your cab, start your machine, turn on auxiliary flow and start the mower. Perform a few test cuts so that you feel confident with what the mower is capable of cutting and the direction the material will exit the mower. Because of the side mounted nature of the EX, the material cut will not act like it would with other mowers. There is a high degree of certainty that material will exit the rear of the mower and rebound back beside the operator. It is imperative that your loader be equipped with penetration proof protection.

Step Four:

Progress towards larger material a try all angles so that you can see where your blind spots may occur. It is important to maintain visibility with the cutter portion of the mower so that you do not inadvertently strike a fixed object and possibly damage your mower. Always wait until the blades stop before inspecting the mower as material can become dislodged and thrown back at you when the blades are spinning down.

3.2. EX Initial Operation

Using your Thumb Control or Auxiliary control circuit of your Excavator/Backhoe, you can apply hydraulic flow and pressure to your EX Mower. Check the rotational direction of your mower the first time you use it. On excavator applications, the mower can turn in either direction. When the blades are worn on one side you can swap the hoses at the motor and operate them in the other direction as the blades are double sided.

NOTE: If your mower lacks power, check to see that you have adjusted your thumb pressure up from stock. Less pressure means poor power.

Mowing is accomplished by positioning your machine in a firm location and extending your boom outward. Lower the boom to the upper position for mowing and engage the mower so it begins to rotate. Swing your boom back and forth. It is better to start higher and work your way lower so that you have better visibility as to what you are mowing so that you do not accidentally contact a fixed item.

Trees. Try to reach as high as you can and mower the tree from the top. Once you have topped the tree, you can lower the mower on top of it slowly and mulch the tree right to the ground. If the tree is too hard or too thick, you will know it as the mower will slow down and stall. Once the mower stalls, do not push down any longer. Lift the mower up until it starts to spin again.

3.3. EX - Initial Run-in

1. The Eterra EX mowers have been pre-lubricated from the factory and therefore lubrication is not necessary when 1st purchased. Once you initially run your mower, it is a good idea to start a lubrication routine. This will ensure years of uninterrupted operation. Poor maintenance and not faulty manufacturing cause most attachment failures. We recommend Sta-Plex Extreme Pressure Red Grease. It can be purchased online through Harbor Freight for around $5 per tube.

2. Turn your hydraulics on and look for leaks. Tighten fittings or replace damaged hoses as required

3. Go ahead and perform some test mowing insuring the housing is always pointed down and away from the operator to insure the safest operation possible. Never roll the housing back at the operator with the blades exposed.

4. Test your machines operation with the mower running so you know what to expect when mowing as the mowers run from the drive circuit of your excavator. This means that it will be unlikely that you can move forward or reverse on your tracks while the mower is operational. This is because most machines share a common pump for the drive circuit and the auxiliary control circuits. The boom sweep and lift are handled by another pump so you can operate your boom while mowing. If your machine operates differently, you should contact your machines dealer to arrange to have your circuits re-plumbed or have a sequencing vale added. This is especially true on some backhoes like the Kubota M59. A

specially designed valve is required to allow the EX's to effectively operate on this machine.

5. Check for power of cutting by forcing the mower into some heavier brush. If the mower stalls easily or will not spin up very quickly, this is likely caused by your thumb pressure not being set properly. Most machines have the thumb pressure set very low to allow protection from the bucket crushing into the thumb. For breaker or mower operations, you will need to adjust the pressure up.

6. After the initial machine run-in, give the machine a "once over" again to ensure proper setup, tight couplers and zero leaks.

3.4. Equipment Matching

1. The Eterra EX mowers are designed for mini excavators/backhoes with hydraulics rated from 15 GPM – 45 GPM @ 3500 PSI maximum.

2. EX-40 – Machines weighing 9,000 – 20,000 lbs.

3. EX-50 – Machines weighing 17,000 – 25,000 lbs.

4. Any coupler or pin style that will fit on the supplied blank mounting plate.

5. Auxiliary Hydraulic Connections are required to operate the hydraulic motor on the EXs. A third line (Case Drain) is required if you have excessive back-pressure in your lines.

6. Make sure your machines comply with the State and Local laws governing highway safety and movement of farm equipment on public roads. Your machine needs to be equipped with a roll over protection system, cab protection from flying debris and seat belts.

3.5. Operational Parameters – EX Mounted

Shown below are different forms of operation and when they are used.

Standard Mowing Position

Low Bank Mowing Position

High Brush Mowing Position

Tree Top Mowing Position
(Don't Exceed 4" Specified Tree Diameter)

When operating EX Mowers on an excavator, care should be taken to never rotate the mower back towards the operator when the blades are spinning.

4. Trouble Shooting

4.1. Trouble Shooting – EX

Poor uneven cut	Dull Blades	Sharpen using a mini disk grinder, rotate blades or replace dull blades.
Mower Lacks Power.	Check pressure and flow of your machine.	Slow speed = Low flow. Poor Power = Low Pressure
Shaky Operation	Check blades and holders.	Missing blades or material stuck in the drum will cause the mower to shake.
Grinding Noise	Check motor to see if the gear set has failed.	Repair and replace as necessary.
Oil leaking from grease overflow vent.	Blown motor seal.	Repair and replace seal as necessary.
Oil leaking from inside control cover.	Remove cover and clean.	Using a white paper towel. Operate the hydraulics for a short time and wipe to see where leak occurring. Repair or replace faulty part.
Mower Shakes Uncontrollably	Broken or missing blade.	Replace blade and bolt holder.

5. Parts – Exploded Views

5.1. Exploded Parts View EX-40

5.2. Exploded Parts View EX-50

6. Warranty

Machine Solutions, Inc.'s Limited Product Warranty

If you find physical defects in the materials or the workmanship used in making the product described in this document, Machine Solutions, Inc. will repair, or at its option, replace, the product at no charge to you, provided you return it (freight prepaid, with proof of your purchase from the original reseller) during the 1 Year period after the date of your original purchase of the product.

Machine Solutions, Inc.'s RMA Replacement Product Warranty

If you find physical defects in the materials or the workmanship used in the refurbishment of an RMA product replacement, we will repair, or at our option replace, the product at no charge to you for a period of 90-days from the date the RMA was created, or until the end of your original warranty period (whichever is greater).

Machine Solutions, Inc.'s Refurbished Product Warranty

If you find physical defects in the materials or the workmanship used in a product sold as a refurbished unit, we will repair, or at our option replace, the product at no charge to you for a period of 90-days from the date of purchase.

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