

FS391

Skid-Mount Shaver / Planer / Scarifier

User Manual



1-800-653-9311

www.SmithMfg.com

Phone: 954-941-9744 • Fax: 954-545-0348

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INTRODUCTION

Congratulations on purchasing the FS391™ heavy duty remover from SMITH Mfg. Company.

Your machine will:

- Clean surfaces impacted by grease, oil, plastics, tars, resins, tile adhesives, ice and more
- Plane or mill asphalt and concrete surfaces
- Remove high spots in curbs and gutters
- Eliminate trip-hazards on concrete sidewalks
- Mill areas for rumble strips
- Clean out cracks and joints
- Create anti-slip patterns in walkways and barns
- Prepare surfaces for new coating applications
- Groove-inlay asphalt for striping
- Permanently remove all road and surface coatings to include:
 - epoxy, urethane, thermoplastic, paint, glue-backed tapes and more...



BEFORE OPERATION, READ THIS..

Please read all operating instructions, and be completely familiar with your equipment before operating. When in doubt, please contact SMITH Manufacturing Customer Service for operational details. This Owner's Manual will guide you through the removal process, from start to finish, and show you how to care for your machine.

UNCRATING EQUIPMENT

When you uncrate your equipment, make certain that the machine has not been damaged and that all fasteners and guards are properly tightened.

Your machine may not have been shipped assembled with cutters and other accessories. Assembly may be required.

REMEMBER: Only authorized, experienced and properly trained personnel should operate this equipment. Operating personnel should practice safety at all times and wear protective gear (gloves, goggles, safety vests, ear plugs, steel-toe shoes, etc.)

SAFETY GUIDELINES

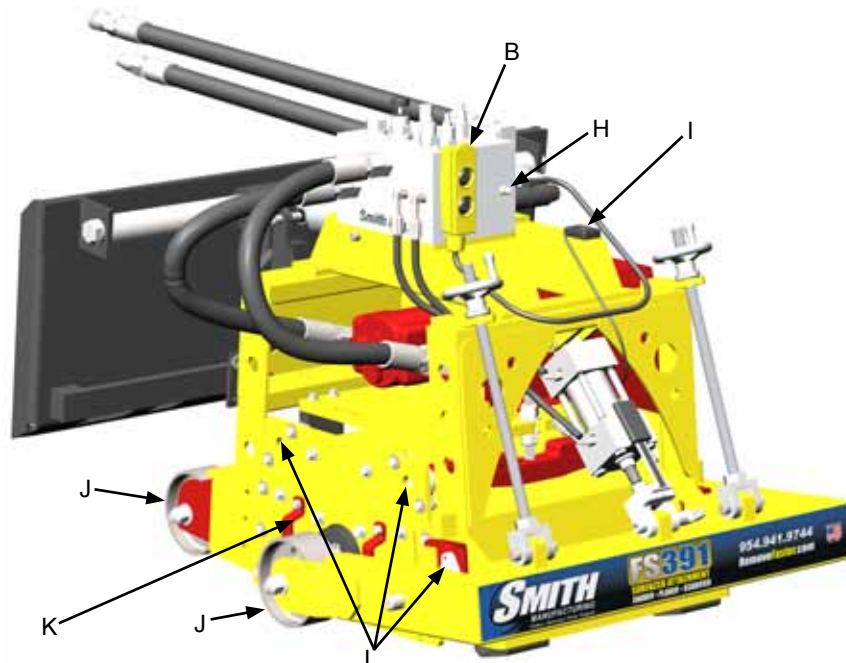
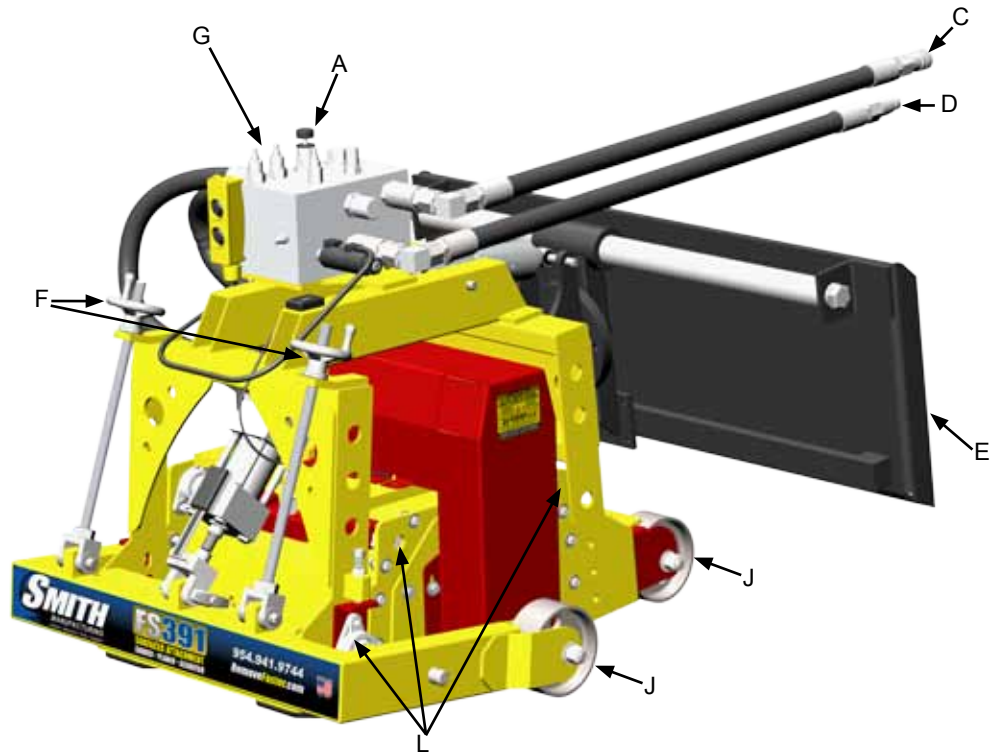


Incorrect use of the surface planer can result in property damage, personal injury, or death. Be sure to read and follow all directions and precautions as outlined in this manual.

- Always wear protective equipment, including ear protection and goggles.
- Never wear baggy or loose fitting clothing that can be caught on controls or moving parts.
- The surface preparator can emit flying particles and debris during operation. Never operate the machine near bystanders, animals or children.
- Check fluid levels and get acquainted with the controls.
- Do not operate the machine in an explosive atmosphere, near combustible materials, or when gas fumes may not be properly dispersed.
- Never leave the machine unattended when running, and you must hold onto the handle with two hands when the cutter drum is engaged.
- Ensure that all guards are in place before the machine is operated, since rotating and moving parts will cause injury upon contact.
- Make sure to disconnect all hydraulic and electrical connections and detach from front of skid steer before servicing.

YOUR FS391™ HEAVY DUTY REMOVER

Please take time to familiarize yourself with the FS391™'s controls, as well as some of the features of your new machine. Full descriptions on the next page.



CONTROLS DESCRIPTIONS

- A) CUTTER SPEED CONTROL - Do NOT exceed 2100 RPM with flail drum and 3600 RPM for diamond drum.
- B) PENDANT SWITCH CONTROL - Used to raise/lower cutter drum. May be operated in cab or along side machine.
- C) TANK RETURN LINE* - Female quick connect
- D) SUPPLY LINE* - Male quick connect
- E) BOBTACH PLATE - Attachment to skid steer. Machine may be located anywhere along bar. Loosen clamp bolts (2) to adjust the unit side to side.
- F) DEPTH STOPS - Height adjustment hand wheels with jam nuts should be secured at all times.
- G) NEEDLE VALVES - Control cylinder up / down speed.
- H) DIAGNOSTIC PORT - Contains 3 pressure indicating ports for diagnostic purposes
- I) TACHOMETER - Check before and during operation to make sure safe running speeds are being maintained.
- J) HIGH LOAD CASTER - Grease regularly (4 total)
- K) REMOVABLE SIDE PLATE - 6 access bolts. Periodically inspect inside of housing for excess build up of material.
(with unit disconnected from hydraulic supply source)
- L) PIVOT BEARINGS - Grease regularly (6 total)

* Hydraulic lines come with standard Bobcat® quick connect attachments.

PRE OPERATION CHECKLIST



The FS391 requires a hydraulic supply source capable of 3000 psi and delivering a MINIMUM of 28 gpm.

Cutter flailing drums should never exceed 2100 RPM
Diamond drums should never exceed 3600 RPM

*** VERIFY BEFORE OPERATION***

- 1) All cutters are intact, in good condition and spin freely on their drum shafts with no binding.
- 2) FS391 is riding square on its 4 wheels and depth stops (item F on pg. 4) are locked at the target depth for the job.
- 3) All components are in good operating condition, fasteners are set and tightened. Hydraulic connections are secure and leak free.
- 4) Bobtach plate is set vertically with slight down pressure on main carrier frame of the FS391.

OPERATION PROCEDURE

1) On a test surface slowly lower the FS391 using the pendant switch control and begin removal. Adjust cutting depth up or down to achieve desired finish.

****NOTE: If the FS391 begins to hop or bounce off the surface, this indicates that the drum is bottoming out on the cutters. Elevate the drum slightly to prevent premature cutter wear and possible damage****

****NOTE: The speed at which the unit raises and lowers is controlled by two adjustable needle valves on top of the manifold block (item G on pg. 4) These may need to be adjusted to suit your particular skid steer****

2) Once the right depth is achieved the hand wheel depth stops should be brought down to the front set and locked down with the jam nuts. This will allow the operator to repeatedly return to his depth without having to go through the process again.

3) Check for all of the following while operating;

A) Listen & watch for possible belt slippage, it sounds like a pop or a snap while under load (this indicates a loose or worn belt, adjust motor plate adjustment bolt if necessary).

B) Check the tachometer during operation to verify the unit is maintaining 2100 RPM while under load (failure to maintain this indicates possible supply source problems)

C) Visually verify removed materials are exiting from rear of the unit and not building up in the housing, on the cutter drum, or main frame wheels.

D) Visually check components, cutters and hardware for issues.

GENERAL NOTES

1) Clean the FS391 regularly, check all fasteners and wear components.

2) Promptly replace worn components with genuine SMITH parts to prevent downtime and possible machine damage.

3) Stock extra parts and cutters to ensure limited down time during jobs.

4) If there are any questions about performance or application contact SMITH for the answers.

STORAGE

The FS391 does not have any special considerations for long term storage.

ORDERING

To ensure product safety and reliability, and to maintain your warranty, always use genuine replacement cutters and parts from SMITH when making repairs to equipment.

When ordering please specify the model and serial number of the machine. In addition, give a part number, description, and quantity as listed on your parts list.

If you have any questions about the operation of your machine or would like to order replacement parts, contact your SMITH Manufacturing representative directly.
Contact 1-800-653-9311 (954-941-9744) for information.
Visit our website at
www.smithmfg.com

WARRANTY CLAIMS

The manufacturer reserves the right to change or improve the machine design without assuming any obligation to update any products previously manufactured before this manual. It is the customer's responsibility to complete the warranty card and mail it to the seller within 10 days from date of purchase. If a failure occurs during the warranty period, the customer must contact the seller to determine the appropriate action.

Any and all transportation charges are to be borne by the purchaser.

TROUBLESHOOTING

PROBLEM

● Possible Reason(s)/Solution(s)

CUTTERS WEARING UNEVENLY/PREMATURELY

- Drum is too low
- Incorrect set-up
- Material Build-up
- Cutters too tightly loaded
- Wrong cutters for application

CUTTERS SHAFT BREAKAGE PREMATURELY

- Drum is too low
- End plates worn
- Shafts worn
- Wrong cutter set-up
- Over 40 hours service-life

DRUM WEARING PREMATURELY OR CRACKING

- Drum hitting ground
- Shafts not replaced within 40 hours

EXCESS VIBRATION

- Bearing worn
- V-Belt loose or worn
- Drive shaft worn
- Improper cutter set-up / unbalanced drum
- Drum contacting ground
- Wheels worn out

MACHINE JUMPS ERRATICALLY

- Drum hitting ground
- RPM is too low
- Surface is severely uneven

DRIVE BELT WEARING PREMATURELY

- Pulley is misaligned
- Wrong belt
- Drum is contacting the surface

For any other problems or questions, please contact your local representative
or
SMITH Mfg today at 800-653-9311
or
(954) 941-9744.

MAINTENANCE CHECK LIST



Note: Make sure the hydraulic hoses and electrical connections are disconnected before servicing

- Keep a coating of grease on the drive shaft and threads for easy installation or removal, and for longer hex bushing life.
- Check all fasteners and re-tighten, since the machine will vibrate the fasteners loose if they are not secured. Use locktite.
- Check the belt for wear, and adjust (tension) or replace as required. After replacing belts, check for proper tension:
- Adjust Adjustment Bolt to tension belt. Do not over tighten.
- Check that the pulleys are aligned properly to ensure the Drive belt is running true.
- Grease casters and flange bearings after the first 20 hours of use and every 20 hours afterwards (items K and M on pg. 4)

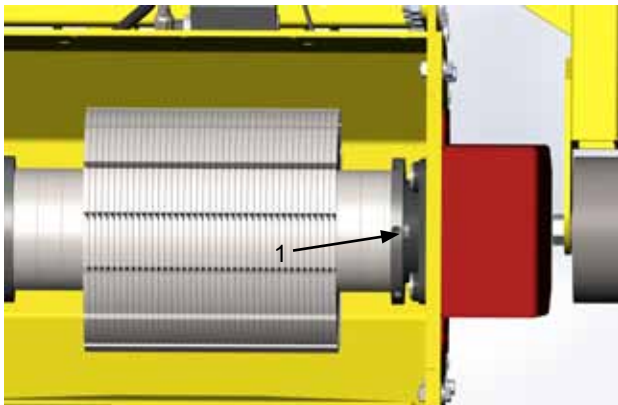
- The inside housing must be clean, and remove any build-up from inside the cage so cutters and drum rotate freely.
- Visually inspect machine, drum and cutters for wear and damage.
- Inspect and change shafts every 40 hours, or when worn.
- Inspect hydraulic fittings for leaks. Tighten as necessary.

DRUM REPLACEMENT

Drum replacement is easy and requires a few hand tools. (Flail setups ignore step 1).

1. 9/16" Socket or Wrench
2. 5/32" Hex Key
3. Rubber Mallet

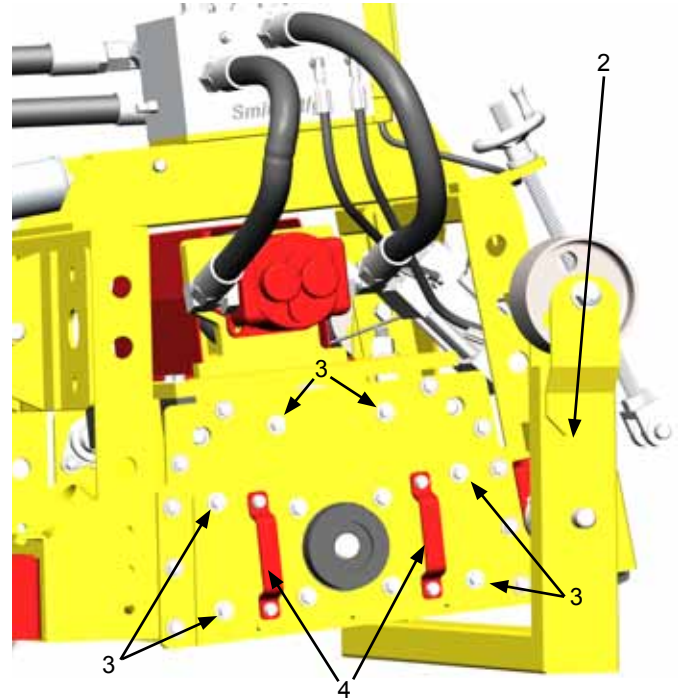
1. Diamond (High Speed) Setup only. Disconnect the hydraulics, and then lift the machine using the skid steer. While the machine is in the air, there are 6 set screws to remove from the drum (3 on each side). To access the set screws, turn the drum by hand until the set screws are visible in the notches in the bearing housing, and remove using the 5/32" hex key.



2. Diamond & Flail Setups. With the set screws removed, begin lowering the FS391 back to the ground. Before the FS391 is lowered all the way, remove the pins connecting the depth stops and height control arm actuator to the height control arm. (Use precaution, the arm will tend to swing). Once pins are disconnected, swing the arm is perpendicular to the ground with the caster wheels in the air. Lower the machine fully to the ground, the front of the machine will rest on the control arm.

3. Remove the six hex screws from the side plate using the 9/16" socket or wrench.

4. Remove the side plate using the attached handles (this may require a rubber mallet to loosen the plate).



5. Slide out drum assembly. (Use precaution, drum is HEAVY).

*Optional Drum Caddy (P/N: FSDRC-A16) can make removing and replacing the heavy drums easier and faster.

6. Once the cutter drum is removed take to a workbench for assembly.

- a) Inspect condition of cutters, spacers, shafts and drum.

7. Before replacing the drum onto hex shaft:

- a) Check that all bearings are in good working order
- b) Remove dirt and material build-up from inside drive carriage and drum.
- c) Lube all metal contacts

8. Align and slide drum back onto the hex shaft.

9. Replace side plate (lift-up and lock into place) over hex shaft and secure hardware.

DRUM REPLACEMENT CONT.

10. Lift machine to replace the set screws removed in step 1 (use locktite).

NOTE: It is recommended that you use a wooden board or something similar to place under the drum before lowering the machine to take the drum weight off the shaft which makes it easier to align with side plate

***TIP: SMITH recommends owning an extra drum loaded with cutters for rapid job-site replacement.**

DRIVE BELT REPLACEMENT

Normal wear may necessitate belt tensioning or replacement.

Time of replacement will vary according to usage and belt load factors.

Replacement is easy and requires a few hand tools.

1. 9/16" socket or wrench
2. 1 1/16" spanner/wrench (open ended)

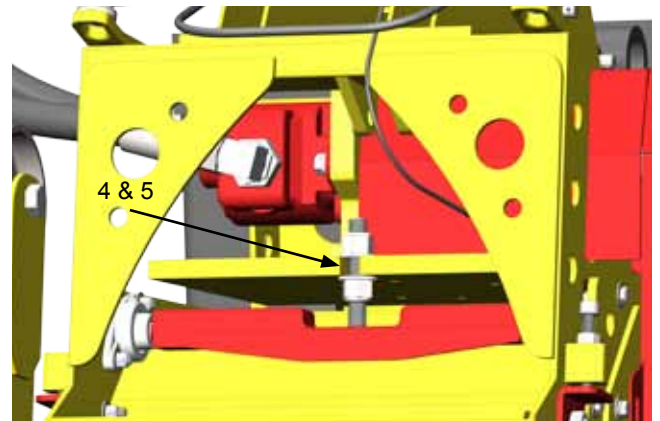
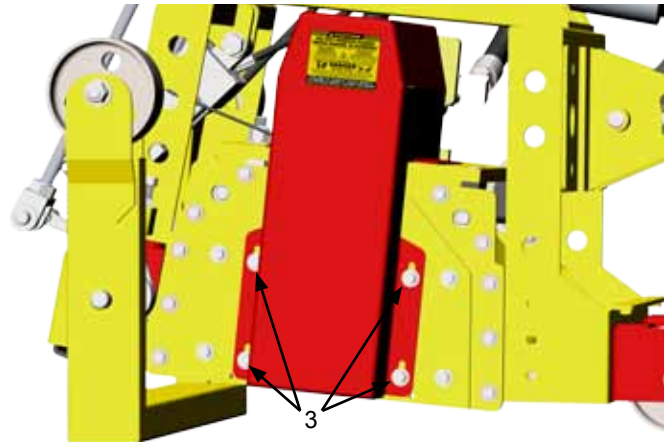


Before servicing any FS391 unit, DISCONNECT FROM HYDRAULIC SUPPLY SOURCE

1. Follow Step 2 from Drum Replacement on page 10, to provide access to the belt guard.

2. Make sure the removable side cover is installed. This insures the drive ends are in the proper position for servicing. Clean the machine exterior so you can locate all the appropriate parts.

3. Using a 9/16" socket or wrench, remove the four hex nuts attaching the belt cover to the side of the machine. Remove the cover and set it aside.



4. Turn the Base Plate Pivot Nut with a 1-1/16" socket or wrench to lower the engine base plate and loosen the drive belt. Remove / replace the belt as needed

5. To tension the belt, turn the Base Plate Pivot Nut with a 1-1/16" wrench to raise the engine base plate.

DO NOT overtighten the belt as it will cause it to wear prematurely. The belt should be able to deflect 1/4" when pressing on it.

6. Put the belt cover back in place and secure the four hex nuts with a 9/16" socket or wrench.

BEARING REPLACEMENT

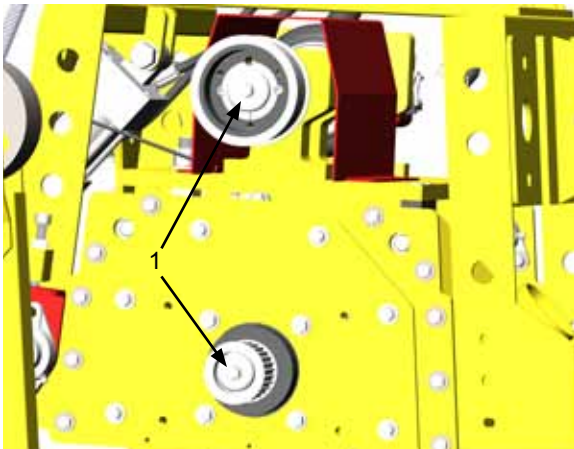
Before reading ahead go back and follow the instructions on how to remove the drum and drive belt from the machine. Bearing replacement is easy and requires a few additional hand tools.

1. 17 mm socket or wrench
2. 9/16" socket or wrench
3. Adjustable wrench up to 1.5"
4. 7/32" Hex Key
5. Circlip pliers

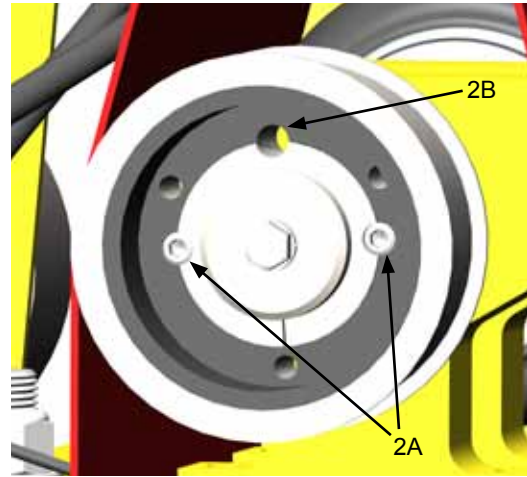


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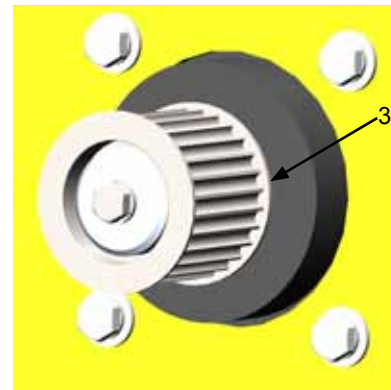
1. With the side plate off the machine, use the adjustable wrench to lock the rotation of the shaft. Using the 9/16" socket, remove the screw that locks down the pulley to the shaft. The upper pulley screw can be removed using the back pressure with the hydraulic lines connected (Take care not to operate hydraulics while plugged in).



2. (Upper Pulley) Use a 7/32" hex key to remove the 2 set screws on the drive pulley (A). Once they are removed, insert one of them into the hole directly on top of the keyway to back out the bushing as shown below (B). If needed, lightly tap pulley to separate it from the bushing.

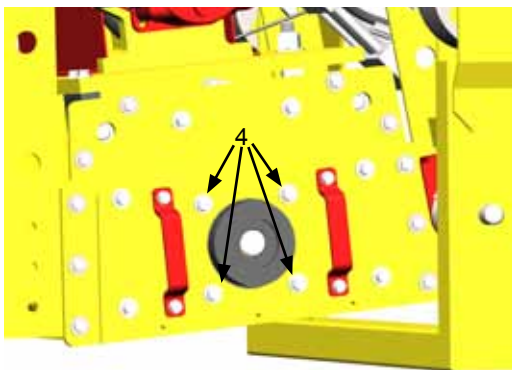


3. (Lower Pulley) With the pulley stop and screw removed from the pulley, remove the two set screws holding the lower pulley to the shaft using 7/32" hex key. The pulley should come off the shaft once the set screws are removed. If it does not move, a puller may be needed to pull the pulley from the shaft.

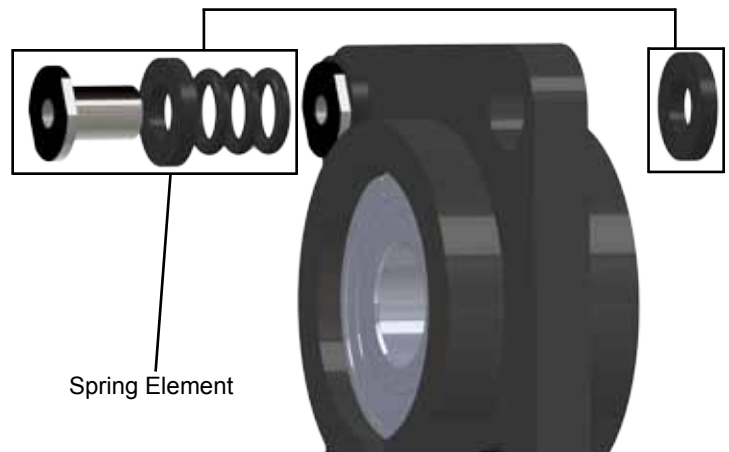
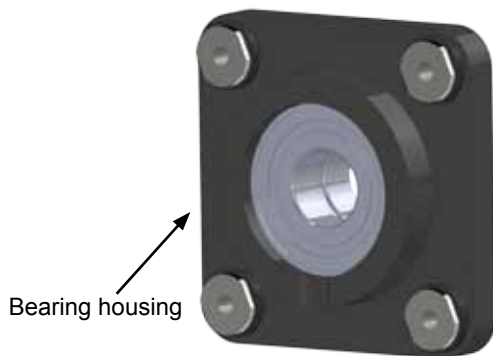


BEARING REPLACEMENT (CONTINUED)

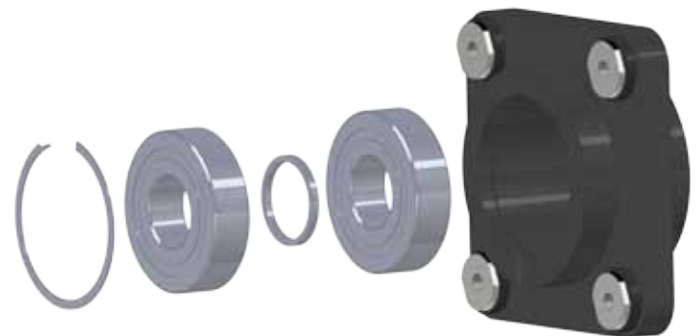
4. With the pulley and shaft removed, use the 17 mm socket or wrench to remove the bearing housing assemblies from the frame and side plate.



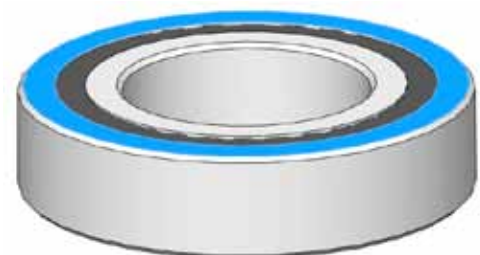
5. With the bearing housing assemblies aside, they can now be taken apart to replace the bearings as needed using the circlip pliers. When changing the bearings, the bearing spring elements must be changed as well. The old spring elements must be forced out, and new ones hammered into the four corner holes of the bearing housings.



6. The bearing assembly is shown below.



*****WARNING*****
When pressing bearings in, use a soft wooden dowel and only apply pressure to the outer race of the bearings



Limited Equipment Warranty

All statements, technical information and recommendations contained in SMITH's literature are based on tests believed to be reliable, but the accuracy or completeness thereof is not guaranteed and the following is made in lieu of all warranties, expressed or implied. SMITH warrants all equipment or part referenced in this document which is manufactured by SMITH and bearing its name to be free from defects in material and workmanship on the date of sale to the original purchaser under normal use and maintenance as herein provided. This warranty does not apply to components manufactured by others such as, but not limited to, bearings and engines; such components that may or may not have their own warranties.

With the exception of any special, extended, or limited warranty published by SMITH, SMITH will, for a period of three months (90 days) from the date of sale or up to five hundred (500) hours of use by buyer, whichever shall occur first; repair or replace any part of the equipment determined by SMITH to be defective. This warranty applies only when the equipment or part is installed, operated and maintained in accordance with SMITH's written recommendations.

SMITH's sole obligation for any breach of warranty or breach of contract for defects, deliberate or accidental omissions, shall be limited to repairing, replacing or allowing credit for, at SMITH's option, any part which, under normal and proper use and maintenance, proves defective in material or workmanship within warranty period, provided, however, that notice of any such defect or omission and satisfactory proof thereof is promptly given by buyer to SMITH, and thereafter, such defective part is returned to SMITH with transportation charges prepaid, and SMITH's examination proves such part to have been defective. This warranty does not obligate SMITH to bear any transportation charges or personnel time in connection with the replacement or repair of defective parts. This warranty does not obligate SMITH to bear any expense for travel time or of personnel in connection with any service calls. SMITH will not, in any event, be liable to the user for any consequential damages arising out of this sale for the loss of use, lost profits or revenue, interest, lost goodwill or work stoppage. SMITH shall not be liable for any injury, loss or damage, direct or consequential, arising out of the use or the inability to use the product or for environmental claims. It being understood that SMITH has no means of controlling the products final use; therefore, it shall be buyer's responsibility to determine suitability of product for intended use and buyer assumes all risks and liabilities whatsoever, in connection therewith. In no event shall SMITH be liable for consequential or special damages. Used products are sold on an "as is" basis, and there is no implied warranty of merchantability or of fitness for a particular purpose, unless made in writing by an officer at SMITH's office.

This warranty does not cover, and SMITH shall not be liable for general wear and tear, or any malfunction, damage or wear caused by faulty installation, misapplication, abrasion, corrosion, inadequate or improper maintenance, negligence, accident, tampering, or substitution of non-SMITH component parts. Nor shall SMITH be liable for malfunction, damage or wear caused by the incompatibility of SMITH equipment with structures, accessories, equipment or materials not supplied by SMITH, or the improper design, manufacture, installation, operation or maintenance of structures, accessories, equipment or materials not supplied by SMITH. This warranty does not apply in respect to damages to any product or accessory or attachment thereof caused by overloading or other misuse, neglect or accident, nor does this warranty apply to any product or accessory or attachment thereof, which has been repaired or altered in any way which, in the sole judgment of SMITH, affects the performance, stability or general purpose for which it was manufactured. In the manufacture of buyer's equipment, parts may be omitted or equivalent functioning equipment and components may be substituted for the original specified equipment upon the sole judgment and discretion of SMITH.

This warranty is conditioned upon the prepaid return of the equipment claimed to be defective to an authorized SMITH Reseller for verification of the claimed defect. If the claimed defect is verified, SMITH will repair or replace free of charge any defective parts and return of merchandise back to the customer freight collect. If inspection of the equipment does not disclose any defect in material or workmanship, repairs will be made at a reasonable charge, which charges may include the costs of parts, labor and transportation.

THIS WARRANTY IS EXCLUSIVE AND IS IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO WARRANTY OF MERCHANTABILITY OR WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.

SMITH's sole obligation and buyer's sole remedy for any breach of warranty shall be as set forth above. The buyer agrees that no other remedy (including, but not limited to, incidental or consequential damages for lost profits, lost sales, injury to person or property, or any other incidental or consequential loss) shall be available. Any action for breach of warranty must be brought within two (2) years of the date of sale.

SMITH MAKES NO WARRANTY, AND DISCLAIMS ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, IN CONNECTION WITH ACCESSORIES, EQUIPMENT, MATERIALS OR COMPONENTS SOLD BUT NOT MANUFACTURED BY SMITH.

These items sold, but not manufactured by SMITH (such as electric motors, switches, hose, etc.), are subject to the warranty, if any, of their manufacturer. SMITH will provide purchaser with reasonable assistance in making any claim for breach of these warranties. In no event will SMITH be liable for indirect, incidental, special or consequential damages resulting from SMITH supplying equipment hereunder, or the furnishing, performance, or use of any products or other goods sold hereto, whether due to a breach of contract, breach of warranty, the negligence of SMITH, or otherwise.

ADDITIONAL WARRANTY COVERAGE - SMITH does provide extended warranty and wear warranty for products.

Corrections - typographical or clerical errors contained herein are subject to correction by SMITH.

Assignment - buyer shall not assign or transfer this warranty without SMITH's written consent.

Entire agreement and applicable law - the rights and obligations of SMITH and buyer shall be governed by the laws of the state of Florida, U.S.A. In force on date hereof. The provisions hereof are intended by buyer and SMITH as a final expression of their agreement, and are intended also, as a complete and exclusive statement of all terms apply cable to buyer's order. No waiver, modification, or addition to any of the terms hereof shall be binding on SMITH, unless made in writing by an officer at SMITH's office as stated herein. In the event of conflict between buyer's purchase order and the terms hereof, the latter shall control. If any provisions herein are to any extent invalid or unenforceable, the remainder of the warranty shall not be effected thereby and shall be valid and enforceable to the fullest extent permitted by law.

Legal action - buyer shall be responsible for all costs of collection of outstanding indebtedness, including but not limited to attorney's fees and court costs to seller. Buyer shall reimburse seller for any and all litigation expenses seller incurs as a result of an unsuccessful buyer claim. The jurisdiction and venue of the court for any litigation, state or federal, brought by the buyer and/or seller shall be located in venue determined by seller.

Fair labor standards - seller's products are produced in the United States and in conformity with all applicable provisions of the fair labor standards act of 1938 as amended and any regulations and orders of the United States Department of Labor issued thereunder.

All written and visual data contained in this document reflects the most current product information available at the time of this publication. SMITH reserves the right to make changes at any time without notice.

TO ORDER, contact your SMITH distributor or call 1-800-653-9311 to identify the nearest distributor.

SMITH Manufacturing Co, Inc.
1610 South Dixie Highway
Pompano Beach, FL 33060
www.smithmfg.com





PRE-OPERATION INSPECTION - WARRANTY ACTIVATION PRODUCT REGISTRATION

1610 South Dixie Highway - Pompano Beach, FL 33060 • Ph: 954-941-9744 • Fax: 954-545-0348 • Email: info@smithmfg.com • www.SMITHMFG.com

Thank you for purchasing a SMITH. Please complete this form upon receipt of your equipment and prior to use on the job. A pre-operation inspection is required to activate your warranty. *All sections must be completed.* Should you have any questions, please add them to the comments section below. Fax the completed form to (954) 545-0348.

Organization _____

Name _____ JobTitle _____

Phone _____ Email _____

Address _____

City _____

State _____ Zip _____

SMITH Product **FS391** _____

Machine Serial # _____

Date of Purchase (MM / DD / YYYY) _____

Purchased from _____

PRE-OPERATION INSPECTION (PLEASE CHECK ALL)

1. No parts or components on the machine appear damaged or lost in shipment. Yes No
2. All bolts and fasteners are in place and tightly secured. Yes No
3. Grease points have been identified for future maintenance requirements and appear lubricated. Yes No
4. Wheels are operational. Yes No
5. Motor has been started and in good working condition. Yes No
6. All Decals appear in place and securely attached. Yes No
7. Equipment runs and tested to assure all components are operating correctly. Yes No
8. Do you have a Wear Parts Kit with an Extra Cutter set in stock? Yes No
9. Did you join Remove Faster News for tech updates, experience sharing and special offers? Yes No

Comments (add any additional or from above answers below)

NOTE: All power equipment is warranted directly from the motor/engine manufacturers direct and not from SMITH Manufacturing.

Prior to starting your equipment, please find the name of your engine/motor repair center for warranty and service:

- Honda: <http://engines.honda.com/dealer-locator/>
- Subaru: <http://robinamerica.com/dealerusacan.aspx>
- Leeson: <http://www.leeson.com/leeson/servicecenter.do?invoke=viewServiceCenterLocator>
- US Motors: <http://www.usmotors.com/Contact-Information.aspx>
- Kohler: <http://www.kohlerengines.com/contact/contact.htm>

IMPORTANT: Gas Engine owners: Never tip engine forward which will lock the recoil pull cord until the fuel and oil returns back into their respective fuel chambers and the carburetor is free before it can be started.



SMITH Manufacturing

1610 South Dixie Highway
Pompano Beach, FL 33060

Toll Free: 800.653.9311

Phone: 954.941.9744

Fax: 954.545.0348

E-mail: info@SmithMfg.com

www.SmithMfg.com