



RA27 TOOL SERVICE MANUAL



**SEMI-AUTOMATIC, LOW VELOCITY
PISTON TYPE FASTENING TOOL**

The Model RA27 troubleshooting/service manual has been developed to assist ITW CCNA field sales and distributor field/service personnel in servicing the RA27 powder actuated tool. This manual is designed to reduce the amount of tool down time when a problem occurs by giving field and service personnel troubleshooting techniques and the proper corrective measures to take. In many cases, servicing can be done right at the job site in a very short time. This manual can also be used as an educational tool for teaching perspective operators and service personnel on the inner workings of the tool and proper service techniques. Using this manual wisely will reduce tool down time, promote customer confidence and allow more quality time for selling.

This manual is broken into 5 chapters with 2 sections on tool disassembly / assembly:

1. Introduction
2. Troubleshooting
3. Tool Disassembly
 - a. Front End
 - b. Firing Pin/Backend
4. Tool Schematic
5. Glossary

When troubleshooting, or servicing a tool it is important to understand the function of each component. Knowing the function of each component will quickly lead to the troubled area. It is also important to be able to accurately describe a condition using the correct terminology.

When troubleshooting, or servicing a tool it is always important to function test the tool first. **Always check the tool first to make sure that it does not contain a live load.** Test the tool several times by depressing the muzzle bushing fully on a hard surface such as a workbench or concrete floor and actuate the tool. You should hear an audible click as the firing pin releases. Let up on the tool and check to be sure the barrel has opened to the full open position. This function test may lead you to the proper area of the tool needing service.

When attempting any repair on a Ramset tool, be certain you have read and understand the operator's manual, you have the correct tools to perform the repair, and have/wear the correct personal protective equipment for the circumstance.

Many powder loads contain lead. Lead residue within the tool is a possibility. Proper personal protective equipment (PPE) must be worn.

There may be cases where this manual may not supply the information needed, or the user may need additional information. For further information, the ITW Service and Parts Center or Ramset Technical Service can be contacted.

Further information on obtaining parts can be found at www.itwconstructionparts.com or www.ramsetrepair.com

The troubleshooting section is intended to direct the user or repair technician to some of the more probable occurrences that may exist in the tool. It does not list all possible occurrences. To master the repair of any tool you must first know and understand how each part functions. The basic symptoms, probable causes and solutions are listed below.

Tool stuck in closed position and piston tip at end or protruding from the tool.

- Cause – tool was overdriven or debris caught in front end
 1. Inspect Front end components for damage/debris
 - Chipped piston
 - Bent piston
 - Fastener debris
 2. Replace Buffer Assembly

Tool lacks power, may experience “poof” or “dud” loads, or fastener stand-off

- Cause – piston not fully returning or dropping before taking a shot
 1. Note where power adjust level is at, Inspect power adjust mechanism.
 2. Clean Piston and Barrel Assembly
 3. Inspect pawls, replace
 4. Inspect piston for wear or damage
 5. Inspect/replace retention ball and clip in muzzle

Tool clicks or fires once and next load **does not** advance

- Cause – Check strip tracks and load advance lever
 1. Clean residue build-up in strip tracks
 2. If load strip does not move at all, replace advance lever assembly

Tool skips powder loads

- Cause – Tool front end is not fully compressed before the trigger is pulled
 1. The front end must be fully compressed before the trigger is pulled.
NOTE: End users moving too quickly can anticipate the shot and back off the front end before or at the same time the trigger is pulled.
 2. If the tool is equipped with a magazine, the magazine may not be fully closed/depressed prior to pulling the trigger. This could be due to debris within the magazine or improper magazine function.

Fastener frequently breaks during installation

- Cause – End of piston excessively worn or trying to shoot at an angle
 1. Instruct user on proper 90-degree tool placement/operation
 2. Replace Piston
 3. Inspect end of fastener guide for wear, replace if necessary

Depress tool, tool does not click and load does not fire

- Is the barrel fully closing? If No
 1. Barrel installed backward
 2. Front Collar not installed correctly
 3. Pawls incorrectly positioned behind piston
 4. Debris in receiver or around barrel
 5. Cocking rod loose/damaged

Tool is difficult to close the front end or sticks at times

- Cause - Tool is dirty or has a broken component
 1. Clean front end of tool
 - Follow instruction in this manual
 - Follow instruction in RA27 operator's manual
 - Watch video on Ramset You Tube channel

Tool trigger does not fully return.

- Cause – Tool strip tracks are dirty
 1. Clean tracks where powder load strip rides through tool
 2. Damaged advance lever or advance lever spring

The result of a problem in the front barrel assembly is inconsistent fastenings or premature damage to any of the component parts. The front barrel assembly is the simplest part of the tool to service and maintain; however, it does require the greatest amount of servicing. Ramset recommends cleaning the front barrel assembly after each day's use. This section will provide a guide to evaluating problems, taking corrective actions and prevent further problems.

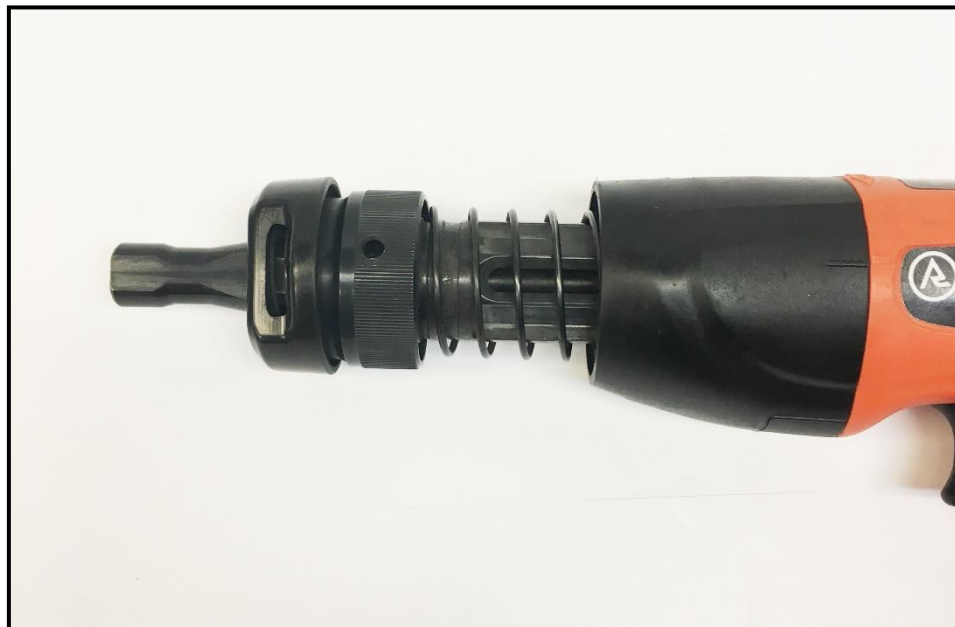
Inconsistent Fastenings

Inconsistent fastenings are caused by variations in the chamber volume from shot to shot. Simply put, the piston does not fully return after each shot. The level of inconsistency can vary from a "poof load" or "dud shot" to variations in fastener penetration.

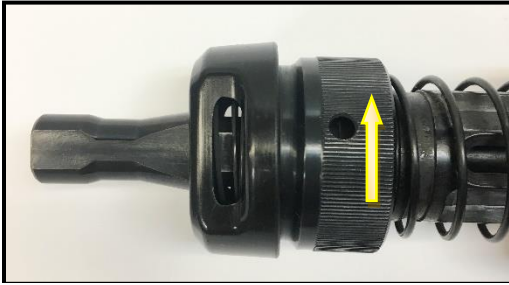
In the RA27 piston reset is accomplished with two components, the pawls and fastener guide with integrated retention clip and ball. Inconsistent fastening is likely to be caused by dirt and debris preventing the piston from falling back into position. Damage to the pawls may also be a contributing factor. The pictures on the following pages show how to disassemble the front end and diagnose the components.

Damage to Front End Components

When a tool needs service with damaged front end components, there is not much troubleshooting involved. The problem is typically obvious, broken parts. It is important to understand what caused the failure and what to do to prevent the damage from happening again. This damage is likely caused due to misapplication or misuse of the tool. The pictures on the following pages show how to disassemble the front-end components. Function testing the tool before and after servicing the tool will help diagnose the issue and can assure the problem is corrected. Instructions on tool function testing can be found in the operator's manual. Additional instructions for front end service of the RA27 tool can be found in the Operator's Manual.



RA27 Front End Disassembly



1. Be sure the tool is unloaded!

Grasp the knurled collar and unscrew the Fastener Guide Assembly. Once unthreaded, pull it from the tool.

While the single pin muzzle is shown, the magazine is removed in the same manner



2. On the Barrel Retention Collar, locate the raised lines on the side and top of tool. Turn the barrel collar 90 degrees so that the side mark on the collar is aligned with the top mark on the tool. Lift off the collar. A rubber strap wrench may be needed to turn the collar.



3. Grasp the Barrel Assembly and then pull open the two pawls. Use caution as the barrel is under light spring pressure. Note that the pawl assembly is hinged and not removed from the tool.



4. Remove the Barrel and Spring from the tool housing.

Inspect the Pawls. Remove any powder residue from the Pawls with a small wire brush. Any large chips or breakage would indicate the need to replace the pawl.



5. Remove the Barrel Spring and Piston from the Barrel Assembly.

There is no need to disassemble the Fastener Guide Assembly. If damaged, it is replaced as an assembly.



6. Inspect the front end components. Check the Piston is straight and free of chipping on the fastener striking end. Photo to the left shows a damaged piston. Note worn tip and slight bend.



7. Clean the front end components with a wire brush. Ramset part number PATCK contains a variety of wire brushes to assist with cleaning the RA27 tool and a variety of other powder actuated tools.



8. Industrial spray solvents or automotive brake cleaners that are safe for plastic can be used to remove other oils and debris.

The use of any lubricant on reassembly is not recommended.

Should the tool sit un-used for a long period of time, an oil can be used on the outer surfaces of the metal parts provided the parts are wiped dry before reassembly.

Excess oil or lubricants will attract powder residue and increase maintenance frequencies.



9. To speed up the cleaning process, a wire wheel mounted to a bench grinder can be used to clean the outer surfaces.



10. A round, wire tube brush is used to clean the inner surfaces. The looped handle end of the brush can be removed and chucked into a drill to speed up cleaning of the inner surfaces; i.e. inside of the Barrel, inside of the Receiver, Fastener Guide, Power Adjust Hole, etc.



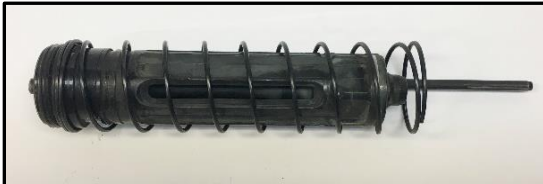
11. Clean the Load Chamber with a wire brush. After cleaning, should the barrel stick closed on the first shot, it may be necessary to polish the load chamber with a polishing bob and an extra smooth/fine lapping paste.



12. To reassemble, place the Piston into the Barrel. Piston should be pushed all the way to the back of the Barrel.



13. Insert the Buffer into the end of the Fastener Guide as shown. Push into place until the rubber lip at the front of the Buffer engages into the slot inside the Fastener Guide



14. Place the Barrel Spring over the end of the Barrel



15. Note the slot in the top of the Barrel. This should align with the top of the Housing. This slot allows the Barrel to go in one way.



16. Be sure the Pawls are open and insert Barrel back into tool housing. Once fully inserted, push the Pawls into place. Hold the two pawls in the closed position until the retention collar is installed.



17. While holding the Pawls, slide the Retention Collar over the Barrel. Align the Collar so the side notch is aligned with the top notch in the housing. Then slide over the thread area. Once fully positioned over the threads, turn the collar 90 degrees so the notches align on the side



18. Retention Collar is fully installed. Note notches on the side.

19. Install Fastener Guide assembly. Position Fastener Guide over Barrel. Apply slight pressure to the top side of the fastener guide while threading the knurled collar.



It helps to firmly push the Fastener Guide onto the Barrel before threading. This will help seat the Buffer into the Barrel and allow engagement of the first thread.



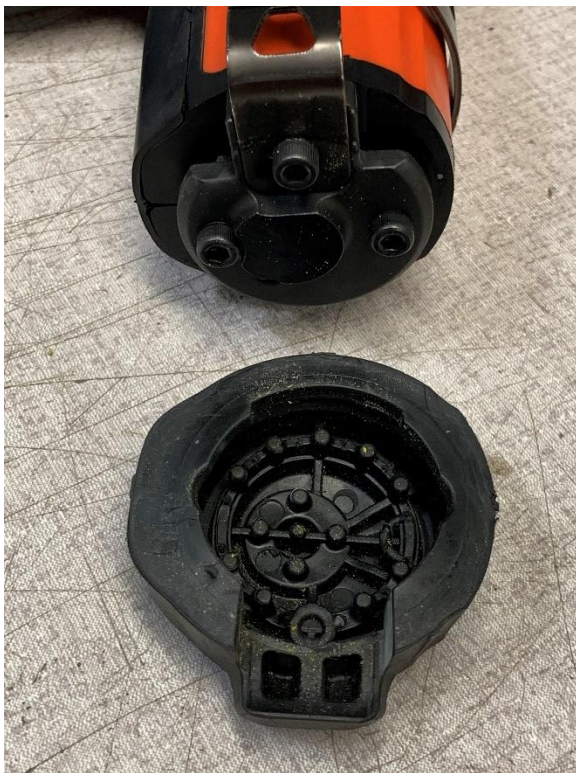
20. As you are tightening the knurled collar on the muzzle, you should feel the part begin to tighten against the rubber O-ring inside the collar. If the muzzle is properly installed, the shroud should click when turned or indexed.

21. Should the tool use a Magazine instead of the Fastener Guide, the Magazine is installed in the same way.

This next section covers service on the backend of the RA27. Should the tool experience problems with load advancement, or problems within the firing mechanism, the following steps will guide you through replacing the various components and thoroughly cleaning the backend assembly. Before beginning, make sure the tool is unloaded. It is also recommended to remove the front-end components. Follow the previous section for further information on how to do this.



1. Begin by removing the rubber Backend Cover from the rear of the tool. The cover is held in place by a rubber tab feature fitting into a recess in the rear hook assembly plate. Locate an edge of the cover and pry it off by hand.



2. Under the Backend Cover there are three screws, one holding the belt hook and the other two at 12:00 and 6:00 are to be removed to gain access to the back components. Use a 5/32" or 4mm hex key wrench to remove these screws.

NOTE: There is spring force under this plate. Use caution when removing these screws.

It is not necessary to remove the screw holding the belt hook in place. The back cap can be removed with this screw in place.



3. After loosening the screws, pull the plate back noting its orientation. There are two spacer sleeves that the screws go through. These sleeves stick in the Mech. Housing or could come off with the plate.



4. To remove the Rear Handle Grip, turn the tool over and locate the screw at the base of the handle. Using a 3mm hex key wrench, remove the screw.



5. Once the screw is removed, slide the Rear Handle Grip back and remove it from the tool housing.



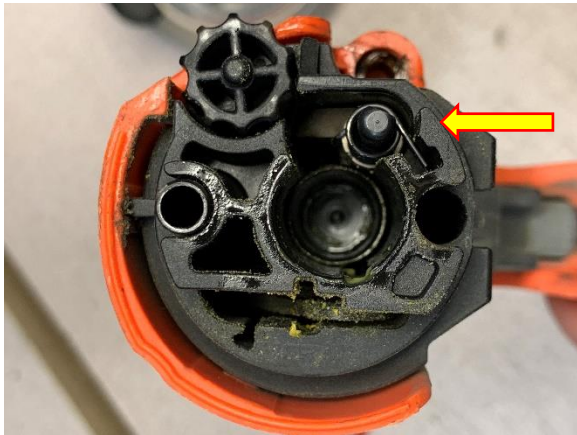
6. The folding Swivel Hook can be removed at this point. Note one part of the hook fits into the orange housing the other part fits into the Rear Handle Grip.



7. When removing the Swivel Hook, note that there is a small spring that fits over the post on the hook and is contained in the rear handle grip



8. Remove the Strip Compartment. This has a small amount of spring pressure behind it from the Trigger Spring. Slightly push down and maneuver the Compartment from the orange housing. Next remove the Trigger Spring from the backside of the trigger.



9. Before removing the Mech. Housing Assembly, take note of the position of the Releaser, Releaser Spring and position of other components in the back end.



10. The Mech. Housing Assembly can now be removed from the tool housing as a complete assembly. Pull the trigger as you normally would to fire the tool. This will push the Mech. Housing Assembly back to where it can be removed from the tool.

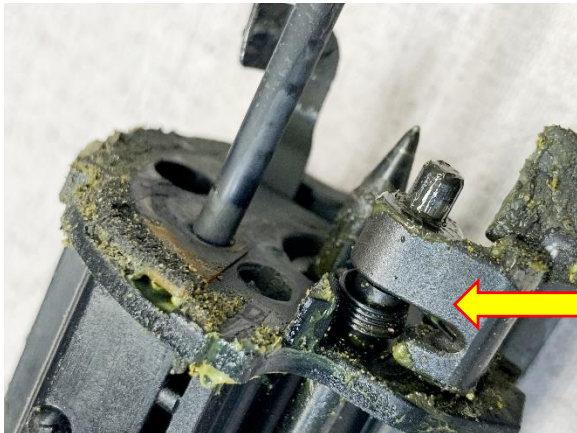


11. The following photos are for reference to note position of components.



12. Mech. Housing Assembly removed from tool housing.

Note the use of grease in several places in the Mech. Housing. The small amount of grease will help lubricate moving parts



13. Note position of the control rod and control rod spring.



14. Advance lever side of the Mech. Housing Assembly.



15. The Receiver Assembly should begin to slide out the front. The pawls hang off one of the ribs on the Receiver. As the Receiver is removed from the Housing, the pawls should fall out of position.

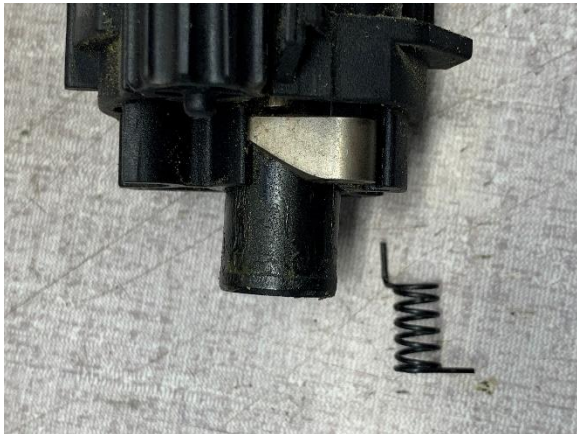


16. Note the pawls just fall out of place.

The pawls collect a fair amount of residue. Be sure to remove the residue to allow for smooth operation with the barrel assembly



17. As you remove the Receiver assembly from the plastic housing, note its orientation with the cut-out at the top on the advance lever side.



18. The next series of photos show the disassembly of the Mech. Housing assembly.

Note the use of grease in areas of movement. As the parts are cleaned and reassembled, the grease should be applied in these areas for smooth operation. A white lithium grease or similar with a wide working temperature of 0°F to 300°F or better should be used.

CRC SUPER WHITE™ MULTI-PURPOSE LITHIUM GREASE No. SL3150

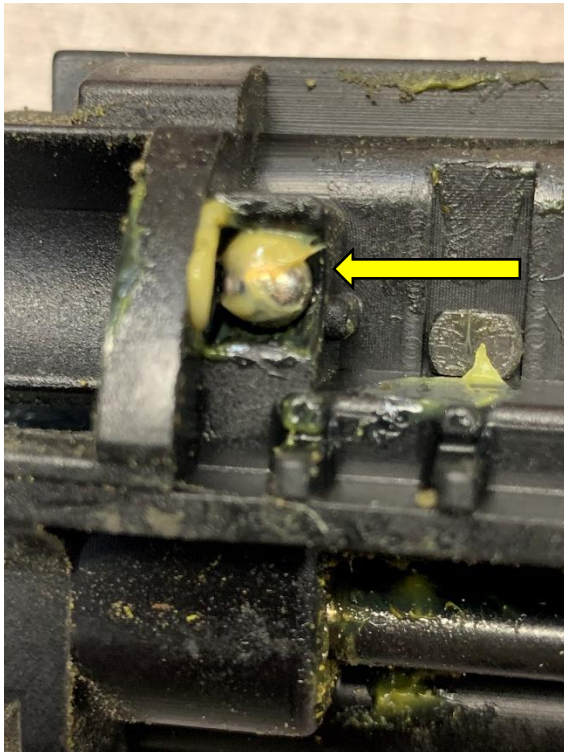
19. Note the Releaser and Releaser Spring. Note the orientation on the ends of the spring. The photo below shows a different installed view. The releaser is pointed at the 12 'o-clock position, with the spring ends holding it in position



20. Firing pin, Releaser and Releaser spring removed.



21. Find the power adjust dial assembly. Unthread this from the indicator slider.



22. Note that there is a ball detent under the threaded portion.



23. Remove the Control Rod. Note the orientation of the spring on the end of the control rod.



24. On the opposite side of the Mechanism housing is the advance lever. Inspect the advance lever for straightness and determine it is not bent or damaged.

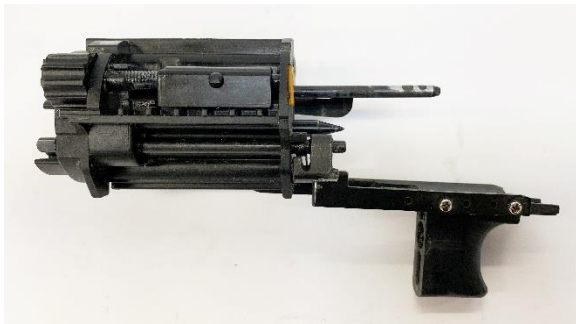
One reason a tool may not advance the load is dirty strip load tracks. A damaged advance lever could be another cause.



25. Loosen the Nyloc hex nut to remove the Advance Lever and Spring

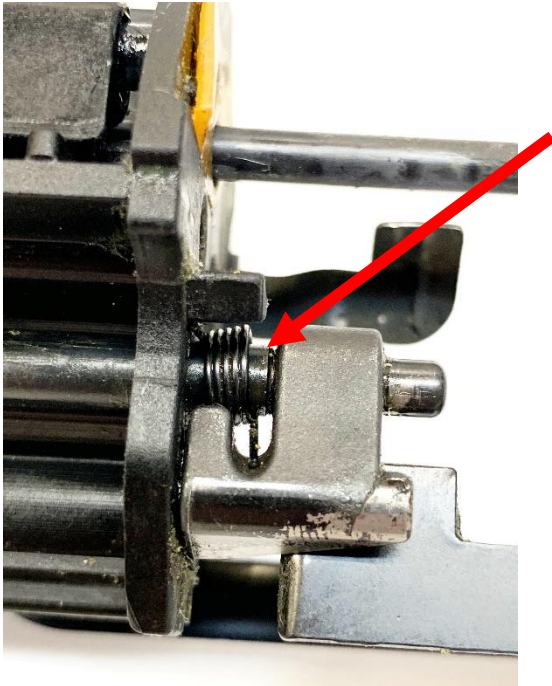


26. The Mech. Housing can be cleaned in a variety of ways. Find a cleaner that is safe for plastic material and will dissolve the grease and debris.



27. After cleaning the Mech. Housing and its associated parts, reassembly can begin. The next several photos are for reference in placement of the various components. Refer back to some of the disassembly photos for further reference.





28. Note the position of the spring ends. One end of the spring rests on the Control Rod Key, the other on the tab of the Mech. Housing.

Note position of the Control Rod Key and the arm on the Trigger. As the Trigger is pulled back against the Control Key, the Control Key should rotate itself and the Control Rod.

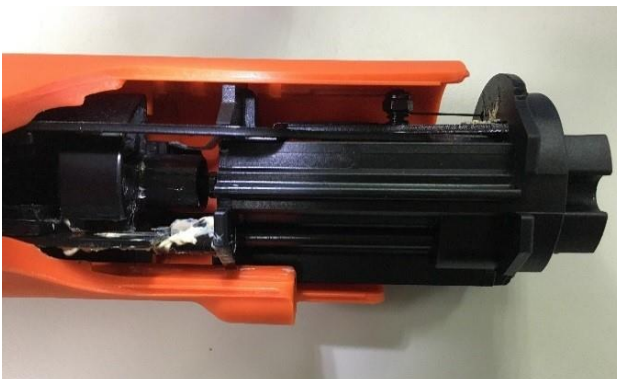
Once fully assembled, set the Mech. Housing aside for a moment.



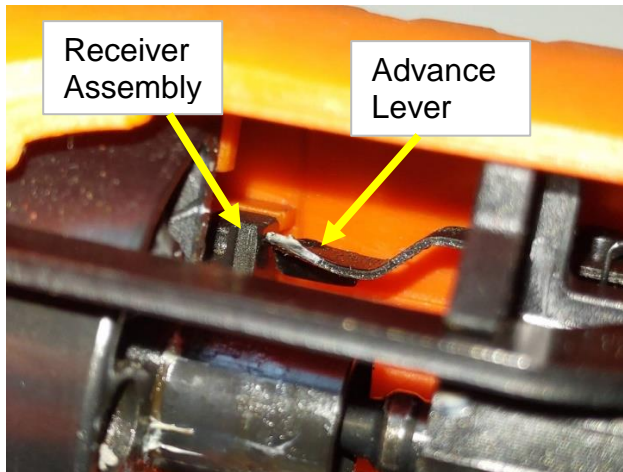
29. Clean the Outer Housing, Pawls and Receiver. Reassemble these components into the front of the Housing.

Note the position of the Barrel Stop in the Receiver (Arrow)

Fully seat Receiver into Housing. The Pawl Stop should be covered by the Housing.



30. Take the fully assembled Mech. Housing and place it back into the orange Tool Housing until it stops. It will stop short of being fully inserted.



31. The Mech. Housing will stop at a point where the advance lever is against the rear part of the receiver.



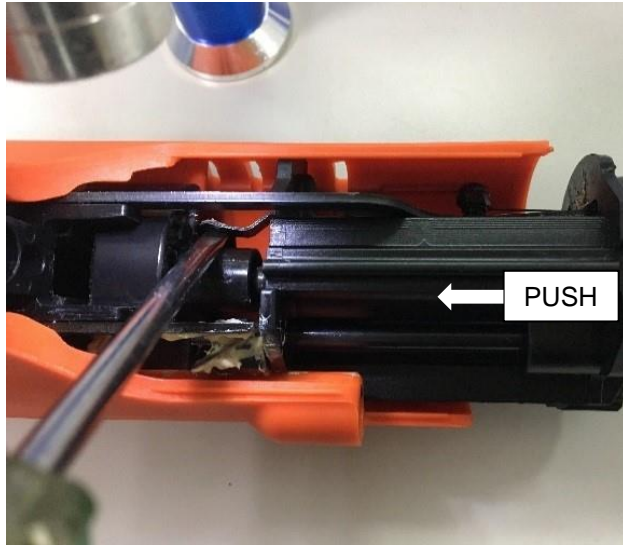
32. Push the Trigger and make the Link Rod move to the end. The photos below show additional detail

Before pushing the trigger



After pushing the trigger





33. Use a small screwdriver and move the Advance Lever aside while applying slight pressure on the back of the Mech. Housing. This will cause it to slide into place.

As you apply pressure to the Mech. Housing care should be taken as to not push the Receiver out of the front of the housing.



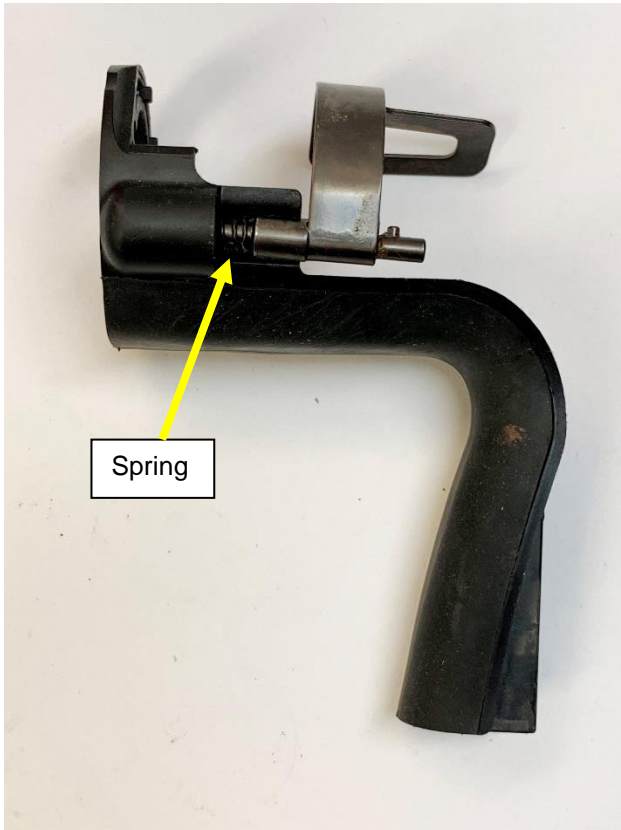
34. Receiver properly installed



35. Insert the Trigger Spring into position



36. Locate the Strip Compartment. Install over the top of the trigger spring. This item is held in place by the pressure of the trigger spring and confined by the Tool Housing and Mech. Housing.



37. Locate the Rear Handle, Swivel Hook and Swivel Hook Spring. Assemble the components together as shown in the photo. Be sure the spring is placed over the post on the Swivel Hook.



38. Place the Rear Handle and Swivel Hook Assembly on to the tool housing



39. Insert the Firing Pin Spring

40. Locate the metal back cap / Fixed Hook Assembly, the long screws and the tube spacers.

The spacers can be inserted into the Mech. Housing first. The alternate method is to place the rear screws through the back end cap and then slide the tube spacers over the screws. The assembly can be placed into the back end of the tool.

Be sure to capture the Firing Pin Spring with the post protruding from the metal back cap.

41. When tightening the back end screws, the torque spec is 26 to 28 in/lbs. Blue Loctite is recommended on these screws.



42. Once the back end screws are tightly fastened into place, the rubber Back End Cover can be installed. There is a groove formed by the Metal End Plate and the Rear Handle. The lip of the rubber Back End Cover tucks into this groove. Begin on one side of the belt hook and work around the metal end cap until in position. You may need to twist the Back End Cover to fully seat.

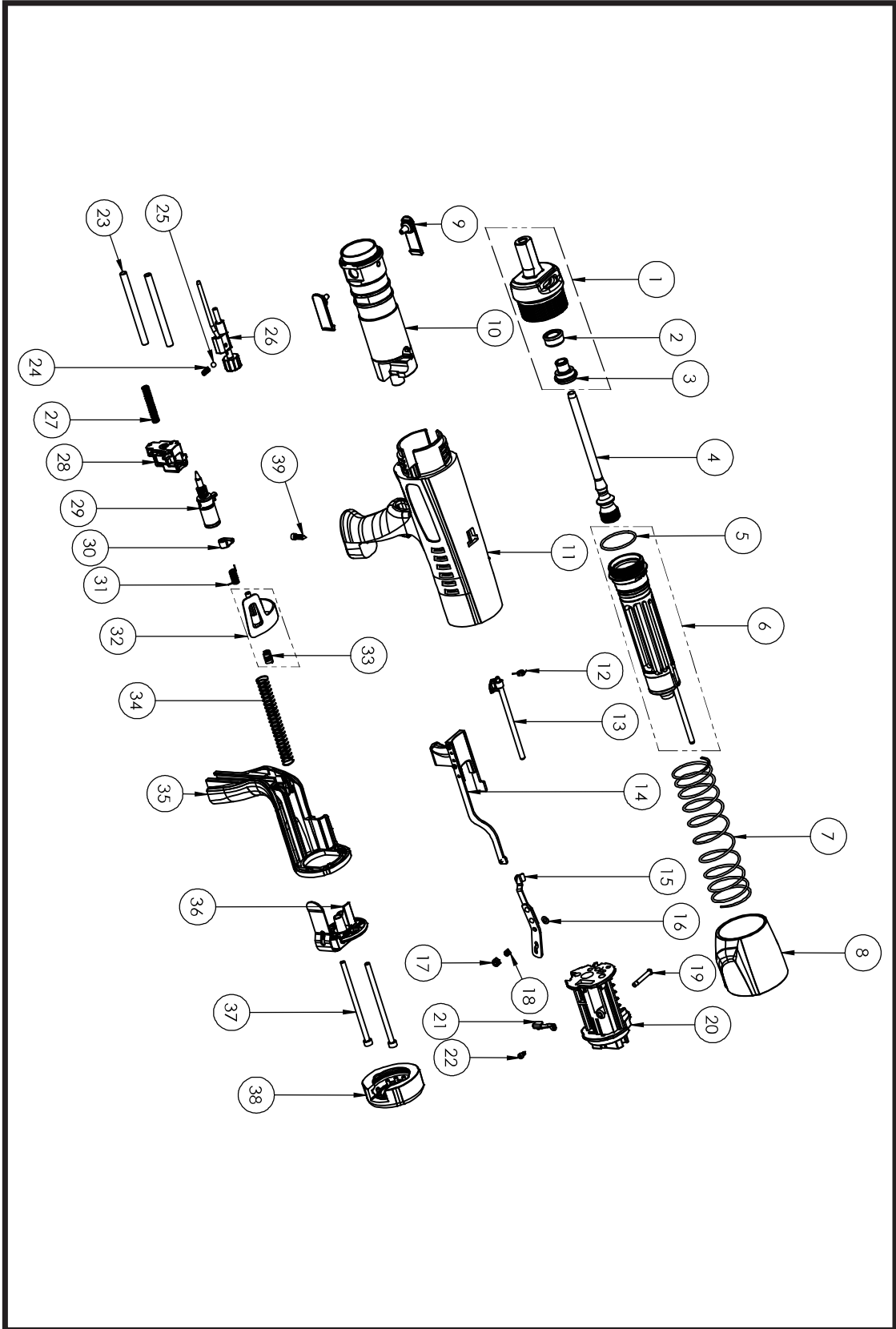


43. Once the back end is fully assembled, the front end can then be reassembled. Refer to the previous chapter or the operator's manual on how to reassemble the front end. A video is also available on front end disassembly as well as assembly at the Ramset YouTube channel.



44. After the tool is fully assembled, the tool should be function checked to be sure of proper operation. If the function check is successful, it is recommended to fire the tool 10 times with a live load and fasteners, before placing the tool back into service.

PARTS SCHEMATIC



PARTS LIST**RAMSET RA27 TOOL PARTS LIST**

KEY	PART NO.	DESCRIPTION	QTY
1	751330	GUIDE ASSEMBLY	1
2	751332	BUFFER RING	1
3	751333	BUFFER	1
4	751321	PISTON	1
5	751315	O-RING	1
6	751310	BARREL ASSEMBLY	1
7	751202	SPRING,BARREL ASSEMBLY	1
8	751220	RETENTION COLLAR	1
9	751241	PAWL,(pkg of 2)	2
10	751210	RECEIVER ASSEMBLY	1
11	751110	FRONT HOUSING ASSEMBLY	1
12	751234	SPRING, CONTROL ROD	1
13	751231	CONTROL ROD	1
14	751460	TRIGGER ASSEMBLY	1
15	751450	ADVANCE LEVER ASSEMBLY	1
16	751404	WASHER	1
17	300107	NUT, ADVANCE LEVER ASSEMBLY RETENTION	1
18	751436	SPRING, ADVANCE LEVER ASSEMBLY	1
19	751402	PIN, ADVANCE LEVER ASSEMBLY	1
20	751401	MECHANISM HOUSING	1
21	751405	CLAPBOARD	1
22	751406	SCREWS, CLAPBOARD	1
23	751403	TUBE	2
24	751444	SPRNG, POWER ADJUSTMENT ASSEMBLY	1
25	301046	BALL	1
26	751440	POWER ADJUSTMENT ASSEMBLY	1
27	751483	SPRING, TRIGGER ASSEMBLY	1
28	751482	COMPARTMENT	1
29	751410	FIRING PIN ASSEMBLY	1
30	751235	RELEASER	1
31	751236	SPRING, RELEASER	1
32	751800	SWIVEL HOOK ASSEMBLY	1
33	751803	SPRING, SWIVEL HOOK ASSEMBLY	1
34	751432	SPRING, FIRING PIN	1
35	751120	REAR HANDLE	1
36	751500	FIXED HOOK ASSEMBLY	1
37	751001	SCREW	2
38	751131	BACKEND COVER	1
39	751002	HANDLE SELF-TAPPING SCREWS	1

PARTS LIST

- **Overdriving a Fastener** – When a fastener is overdriven into the work material, the result is the fastener head is driven below the surface of the work material, essentially leaving a hole or countersink. This is caused by the load being too powerful or a soft spot in the base material. To correct this condition, reduce the level of the powder load, and/or dial back on the power adjust wheel.
- **Overdriving the Tool** – When taking a shot and the user allows the tool to recoil. When a tool is fired, its natural tendency is for the body of the tool to be pushed rearward, while the front barrel assembly will be pushed forward. If separation of these two components reaches a certain point an impact occurs internally in the barrel between the piston, buffer assembly and barrel. This situation is not easily detectable, but it does cause the most damage. In most cases, there are no warning signs. The fastenings are usually flush with the surface, then suddenly the tool loses power or stops working depending on severity.
- **Blank Fire** – The powder load in the tool goes off, but a fastener does not come out
- **Function Test** – After the tool is fully assembled, yet does not contain a fastener or powder load, the tool is depressed against the work surface and the trigger is pulled. The end result is an audible click of the firing pin