

THISTOOLISFORUSEONLYBYLICENSEDOPERATORS. YOU MUST OBTAIN A LICENSE BEFORE USING IT. A TOOL OPERATOR'S CARD WILL BE ISSUED TO YOU AFTER SUCCESSFULLY COMPLETING THE ENCLOSED EXAM AND RETURNING IT TO RECEIVE YOUR CARD AND ACTIVATE YOUR WARRANTY. OPERATOR'S LICENSE CAN ALSO BE OBTAINED AT: www.ramset.com



# MODEL RS22 LOW VELOCITY POWDER ACTUATED TOOL Operator's Instruction & Training Manual



- The model RS22 is a low velocity piston type fastening tool. It is designed for use with Ramset .22 caliber CW powder loads and Ramset fasteners.
- Do not operate the Model RS22 before studying this manual carefully and thoroughly understanding the material contained herein.

**IMPORTANT**: The tool warranty is only activated upon receipt by ITW Brands of the completed Operator's Exam.

# WARRANTY

ALL WARRANTIES OF THE PRODUCTS DESCRIBED HEREIN, EXPRESSED OR IMPLIED, INCLUDING THE WARRANTY OF MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSES ARE SPECIFICALLY EXCLUDED, EXCEPT FOR THE FOLLOWING: ITW BRANDS WILL REPAIR OR REPLACE AT ITS SOLE OPTION ANY TOOL PART OR FASTENER WHICH WITHIN 6 MONTHS AFTER SALE BY ITW BRANDS IS FOUND BY ITW BRANDS TO BE DEFECTIVE IN MATERIAL OR WORKMANSHIP, NORMAL WEAR AND TEAR EXCLUDED. THIS IS THE SOLE WARRANTY OF ITW BRANDS AND THE SOLE REMEDY AVAILABLE TO THE BUYER.

NOTE: It is very important that the operator of this tool completely reads and understands the entire tool manual and completes the Operator's Exam on the last page. The warranty will not be valid until the test is received, along with a copy of your sales receipt, and reviewed by ITW Brands. Operator's license can also be obtained at: www.ramset.com

# TO AVOID SERIOUS INJURY OR DEATH



Operators and bystanders must wear eye and hearing protection.



Read manual before operating tool.





Never close tool with hand over fastener loading end of the tool.

A serious hand injury from penetration by the piston or a discharged fastener could result.

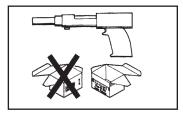
**IMPORTANT:** In order to activate your warranty, you must read this manual thoroughly, complete the exam and return to the address on the back page of this manual.

WARNING! The following pages contain detailed warnings, cautions, and rules of safe operation with which the operator must be familiar and follow to avoid serious injury or death. After thoroughly reviewing this manual, complete the Operator's Exam and return to ITW Brands for your Operator's Card and to activate your warranty.

# BEFORE LOADING AND FIRING PROTECT YOURSELF AND OTHERS

- Never place your hand or fingers over the front muzzle of the tool - the fastener or piston can seriously injure your hand in the event of an accidental discharge.
- 2. Always use only Ramset fasteners and loads at all times for consistent tool functioning.
- 3. Operators and bystanders must wear eye and hearing protection at all times. Serious eye injury and hearing loss can result if proper gear is not worn.
- Keep work area clear and where required always post warning signs when using the tool. Sign should state, "Powder Actuated Tool in Use" and can be obtained by contacting Technical Services at 1-877-ITW-BRANDS (1-877-489-2726).



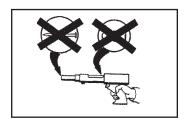






# Prepare for Loading

 Prior to using the tool, make sure it is unloaded and then do the functional check: Check the functioning of the tool, without a powder load or fastener, by pushing down against the work surface, compressing the back end of tool, pulling the trigger and releasing the tool from the work surface. Repeat this several times to insure tool is operating properly.



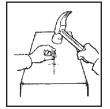
Always check the material being fastened into, by performing the Center Punch Test: Using a fastener as a center punch, strike the fastener against the work surface using an average hammer blow and check the results. Wear eye protection while performing this test.



 If the fastener point is blunted, material is too hard.



2. If material cracks or shatters, material is too brittle.



3. If the fastener penetrates the material easily, material is too soft.



4. If the fastener makes small indentation into material, material is suitable for fastening.

(Typical base materials: poured concrete, structural steel and masonry.)

3. If the base material is suitable for powder actuated fasteners, make a test fastening into a suitable base material with a number 1 (gray) load. If the number 1 load does not fully set the fastener, try the next higher power load until the proper level is found. Failure to properly test fire to determine correct power level may result in overpowering the fastener, causing it to pass completely through the work material, injuring someone on the other side. Overpowering the fastener may also damage the tool.

Power Levels Available for RS22:		
Power Level No.	Color	
1. Gray 2. Brown 3. Green 4. Yellow	Weakest Strongest	

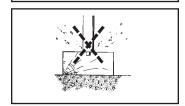
NOTE: Ramset loads are designed for use with Ramset tools. Do not attempt to use other power loads. Doing so may lead to unintentional load discharge as well as damage to the tool. This tool is NOT designed to use red (5) or purple (6) power level loads. Using red (5) or purple (6) loads can result in serious injury to the operator or bystanders.

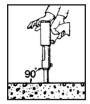
# **Operating the Tool**

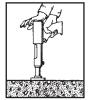
- Always point the tool away from people and in a safe direction.
- Never use tool when explosives or flammable materials are nearby.
- Never fire the tool without a fastener.
   The piston will protrude from the muzzle of the tool, enter the work surface and possibly cause injury to the operator or a bystander. Firing without a fastener may also damage the tool.
- Always hold the tool perpendicular to the work surface to avoid serious injury or death from ricocheting fasteners. Use a spall guard\* whenever possible.
- Never set a fastener too close to another fastening or a free edge. This can cause the fastener to ricochet. Always follow the minimum spacing and edge distance requirements.
- Never fire into very hard or brittle materials such as cast iron, tile, glass or rock. These materials can shatter, causing sharp fragments and/or the fastener to fly freely.
- \*To order optional spall guard, call 1-877-ITW-BRANDS (1-877-489-2726)





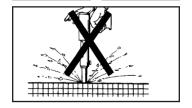












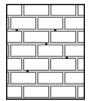
- 7. **Never** fasten into structural steel base material thinner than 3/16". Never fasten into concrete base material thinner than 3 times shank penetration. Always maintain minimum penetration requirements.
- 8. Fastening into block and masonry is not recommended. When it is necessary to fasten into masonry walls, it is recommended that fasteners be driven into the horizontal joints only. Published holding values for these materials is not available due to the inconsistency of the materials.
- 9. **Never** fasten through or into a hole. Always maintain at least 1/2" distance from any pre-drilled or pre-punched hole.
- 10. Should you decide not to make a fastening after the tool has been loaded, always remove the powder load first, then the fastener. **Never** attempt to pry an unfired load out of the tool. Call The Technical Department at 1-877-ITW-BRANDS (1-877-489-2726) for assistance.

# **Handling Tool and Powder Loads**

 Never leave a loaded tool unattended. Someone may pick it up, not know it is loaded and accidentally discharge the tool causing serious injury or death. Never load the tool until you are prepared to complete the fastening. Always store loads and tool, unloaded, under lock and key.







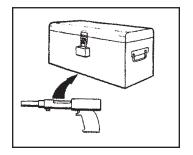








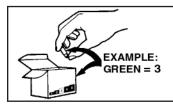




- Never carry fasteners or other hard objects in the same pocket or container with powder loads. The loads could be set off, causing serious injury or death.
- A person that is color blind must be extra careful when loading the tool. One must only take a load from a box that is identified by powder load number. Never use loose loads that can be misidentified.
- Powder loads must never be used in firearms. They are more powerful than the charges normally used in small firearms. This could result in serious injury or death.





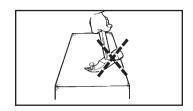






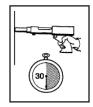
# Fasteners

 A powder actuated fastener, after it has been installed, is considered a permanent fastening. Do not attempt to pull a fastener out of concrete or steel. Attempting to do so may result in serious injury.



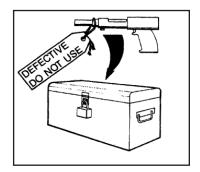
# **Operating Problems**

 If the tool fails to fire, hold the tool firmly against the material for 30 seconds. Remove the tool from the work surface, open the barrel to reset the piston. Re-chamber the load and repeat firing sequence. If the tool fails to fire again, hold for 30 seconds, unload the tool, and then discard the load into a bucket of water. Never attempt to pry an unfired load out of the tool. Call The Technical Department at 1-877-ITW-BRANDS (1-877-489-2726) for assistance.





2. **Never** unload or disassemble a jammed, stuck or broken tool which contains a live powder load. This may cause the tool to fire unintentionally. Always point a jammed tool away from yourself and other people. Immediately store a jammed or broken tool in a locked container after tagging it "Defective - Do Not Use". Call 1-877-ITW-BRANDS (1-877-489-2726) for technical assistance.



# **RAMSET FASTENER SELECTION GUIDE**

.300 Head Plastic Fluted Drive Pins		
Shank Length	Shank Diameter	
1/2"	.145	
5/8"	.145	
3/4"	.145	
1"	.145	
1-1/4"	.145	
1-1/2"	.145	
1-3/4"	.145	
2"	.145	
2-3/8"	.145	
2-1/2"	.145	

.300 Head Plastic Fluted Drive Pin with 7/8" Washer		
Shank	Shank	
Length	Diameter	
1"	.145	
1-1/4"	.145	
1-1/2"	.145	
2"	.145	
2-1/2"	.145	
3"	.145	

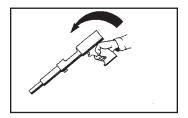
# **TOOL OPERATION**

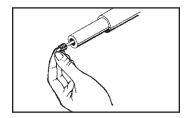
**CAUTION!** Be sure to read and understand all safety precautions and complete the Operator's Exam before attempting to operate the tool. Check to be sure the tool is unloaded and no foreign objects or fasteners are in the barrel. Perform daily function test before operating.

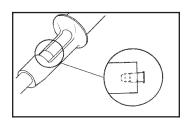
### **OPERATION**

Check the functioning of the tool, without a powder load or fastener in the tool, by pushing down against the work surface. Depress muzzle bushing on the work surface and pull the trigger. You should hear an audible click as the firing pin releases. Function unloaded tool several times and insure that the breech parts and firing mechanism operate freely before fastening with the tool.

- Point the tool in a safe direction and slide the barrel forward with your other hand. This action resets the piston for the next fastening. Loss of power may be the result of an improperly reset piston.
- Place a fastener, point out, into the front end of the barrel until the plastic fluted tip fits inside. Always load the fastener before inserting the power load to prevent accidental discharge. Do not use excessive force when inserting the fastener. Stop if excessive force is required and call 1-877 ITW-BRANDS for technical assistance.
- Insert the powder load after making sure the chamber is clear. The powder load will not fully set until the tool is compressed against the work surface. Always start with the lowest level and increase until the proper level is found. Note: Overpowering a fastener into steel or concrete is dangerous.



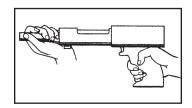




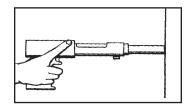
Note: Before making the fastening, the base material should be center punch tested for suitability of powder actuated fastenings (see pg. 2).

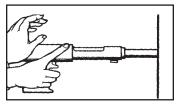
# **TOOL OPERATION**

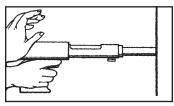
4. Close tool by pulling the barrel back to the semi-closed position. Never attempt to close the tool by exerting force on the front of the barrel. Never place your fingers or hands over the muzzle end of the barrel. The proper position of the hands and fingers are shown in the illustration.

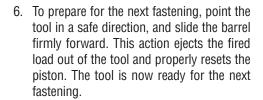


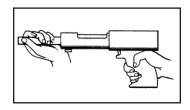
5. With the tool in the closed position. 1. Place the tool against the materials to be fastened. Hold the tool firmly with one hand and completely depress the tool. 2. Pull the trigger. Always hold the tool firmly and perpendicular to the work surface. Excessive recoil may be experienced if the tool is not held firmly against the work surface. Do not depress the tool in any manner except against the work surface. If the tool does not fire after pulling the trigger, hold the tool firmly against the material for 30 seconds. Remove the tool from the work surface, open the barrel to reset the piston. Re-chamber the load and repeat firing sequence. If the tool fails to fire again, hold for 30 seconds then remove the load and discard the load into a bucket of water.











# THOROUGH CLEANING

To maintain your tool in good working condition, it is recommended that the tool be cleaned after heavy use or constant exposure to dirt and debris. See pages 14 and 15.

# **TROUBLESHOOTING**

Tool operator must carefully follow all operating instructions and precautions to successfully operate the tool. Following is a list of potential situations an operator may encounter and the probable causes:

• If a tool problem occurs and technical assistance is required, please call 1-877-ITW-BRANDS (1-877-489-2726)

WARNING: Do not operate a tool that is not functioning properly.

# CORRECTING DIFFICULTIES ALWAYS CHECK INSTRUCTION MANUAL FOR PROPER ASSEMBLY OF PARTS

DIFFICULTY	PROBABLE CAUSE	REMEDY	
Over driving of fastener (Piston overdrive)	Excessive power	Change to next lower power level load color and number (see pg. 2)	
	Soft base material	Check base material (see pg. 2)	
Tool fails to fire	Failure to depress tool completely	Tool must be held firmly and completely depressed before pulling the trigger	
	Excessive dirt build up on firing mechanism. Damaged firing mechanism.	Call 1-877-ITW-BRANDS (1-877-489-2726) for technical assistance	
Tool does not completely depress	Misassembled or damaged firing mechanism parts	Call 1-877-ITW-BRANDS (1-877-489-2726) for technical assistance	
Reduction or loss of power or inconsistent fastener penetration	Barrel not returning to full front position	Barrel must be pulled completely forward to properly position the pistor	
	Worn or damaged piston or piston ring	Replace piston assembly	
	Damaged pawl	Replace pawl	
Fired cartridge will not extract	Tool not being opened completely	Firmly snap the tool open. If necessary, dismantle and clean.	
	Bent piston or damaged piston ring	Replace piston assembly	
	Broken ejector tip on piston	Replace piston assembly	
	Build-up of dirt in load chamber	Clean chamber with a detergent oil and wire brush	
	Stuck fired load	Remove barrel assembly from tool. Dissemble barrel and piston assembly. Use a 1/8" dia. brass or aluminum rod to gently push load out of chamber.	

# TROUBLESHOOTING CONT.

DIFFICULTY	PROBABLE CAUSE	REMEDY	
Unfired load will not extract	Load stuck in chamber	Call 1-877-ITW-BRANDS technical (1-877-489-2726) for assistance. Never attempt to pry a load from the chamber.	
Tool cannot be cocked	Lack of proper cleaning	Clean tool thoroughly	
	Damaged or bent piston	Replace piston assembly	
	Broken or damaged tool parts	Tag tool with warning "Defective - Do Not Use", place tool in locked container and call 1-877-ITW-BRANDS (1-877-489-2726) for assistance.	
Piston stuck in down position	Piston overdriven and stuck in muzzle bushing	Be sure tool is unloaded, tap on hard surface or drive piston back with a lead or brass hammer. Replace buffer. Wear safety goggles.	
Chipped or damaged piston tip	Tool not held on work surface squarely. This allows the piston to slip off the head of the pin and cause damage to the piston.	Replace piston assembly	
Barrel tight, won't	Bent piston	Replace piston assembly	
slide open easily	Excessive carbon buildup	Disassemble and clean tool	
	Barrel pawl inoperative or damaged	Replace pawl	
	Pieces of brass or steel jammed between the barrel and housing	Disassemble and clean parts	
Barrel slides open	Pawl cap loose.	Tighten pawl cap	
too easily	Barrel pawl spring too weak or missing	Replace pawl spring	

# **Fastening to Concrete**

When fastening into concrete always maintain a minimum 3" spacing between fastenings and 3" from any free edge. Penetration into concrete should always be 1" (see page 16, "How to Select a Powder Actuated Fastener"). The concrete thickness should be at least 3 times the penetration depth.

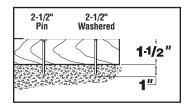
# **Fastening to Steel**

When fastening into steel always maintain a minimum 1-1/2" spacing between fastenings and 1/2" from any free edge. Fastener length should be long enough to penetrate the steel completely (see page 16) Steel thickness is limited to 3/16" to 5/16".

# **APPLICATIONS**

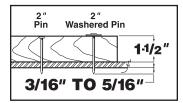
# **Wood to Concrete**

7/8" washer provides a greater bearing surface to the wood member, minimizing uplift.



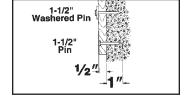
# **Wood to Steel**

Fastener should penetrate steel completely for maximum holding power.

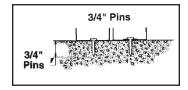


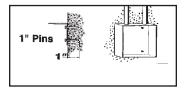
# Furring Strip to Concrete or Masonry Walls

When fastening into masonry, shoot into horizontal joints only.

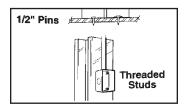


# Thin Gauge Metal to Concrete or Masonry

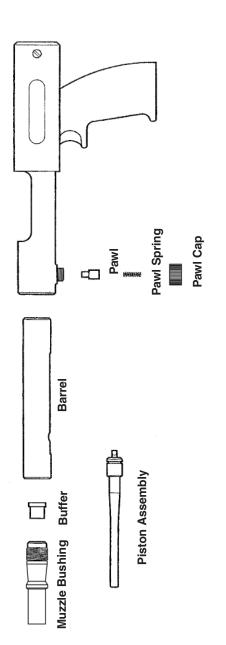




# Thin Gauge Metal to Steel



# **PARTS ASSEMBLY**



# **REPLACEMENT PARTS AVAILABLE**

# DESCRIPTION

- Barrel
- Pawl Piston Assembly Muzzle Bushing
- Pawl CapPawl Spring Buffer
  - Spall Guard

Replacement parts can be ordered by phoning 1-877-ITW-BRANDS (1-877-489-2726)

# **CLEANING AND MAINTENANCE**

# PROPER MAINTENANCE AND CLEANING INSTRUCTIONS

Make sure the tool is not loaded prior to attempting disassembly or cleaning.

# DAILY FUNCTION TEST

Check the functioning of the tool, without a powder load or fastener in the tool, by depressing the tool against the work surface, compressing the rear button, pulling the trigger and releasing from work surface. Function unloaded tool several times and insure that the firing mechanism operates freely before fastening with the tool.

# **ROUTINE CLEANING**

All parts should be cleaned with detergent oil and wire brushes. Remove heavy dirt and carbon buildup with the brush. After cleaning with oil, all parts should be wiped thoroughly dry. Excess oil will tend to collect dirt and dust. Wear eye protection when cleaning the tool.

The piston rod, barrel assembly, and receiver should all be cleaned of excess dirt on a daily basis. Instructions for disassembly of the components are on pages 14 & 15.

# THOROUGH CLEANING

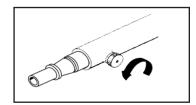
To maintain your tool in good working condition, it is recommended that the tool be cleaned after heavy use or constant exposure to dirt and debris. See pages 14-15. Call 1-877-ITW-BRANDS (1-877-489-2726) for service information.

# PISTON ROD DISASSEMBLY

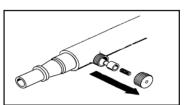
### REPLACING THE PISTON:

The piston is an expendable tool part and must be replaced periodically. Breaking, bending, or mushrooming are typical signs of a worn out piston. Make sure there is no powder load in the tool before proceeding. Be careful not to lose or damage any tool parts.

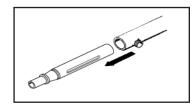
 Unscrew and remove the knurled pawl cap. Use pliers if necessary. When using pliers be sure not to create sharp burrs on the pawl cap which may cause finger cuts.



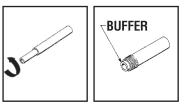
2. Remove the pawl spring and pawl.



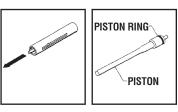
3. Pull the barrel assembly out of the barrel receiver



4. Unscrew the muzzle bushing from the front end of the barrel. Inspect the muzzle bushing for wear. Inspect the buffer and replace it if worn or damaged. It is good practice to always install a new buffer when replacing the piston assembly.

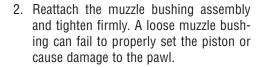


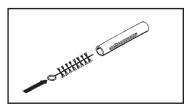
5. Pull the piston assembly out of the barrel. Check the piston and piston ring for excessive wear or deformation. Replace the piston assembly if worn or damaged.



# **PISTON ROD REASSEMBLY**

 Clean the inside of the barrel housing with a detergent oil and wire brush. Wipe off any excess oil and insert the piston assembly in the barrel.



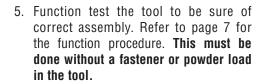


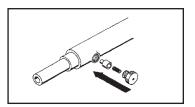


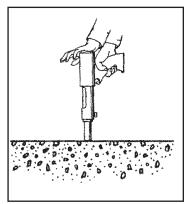
3. Slide barrel assembly back into receiver and align barrel slot with pawl housing.



4. Insert the pawl. Insert the pawl spring and screw pawl cap back on, finger tight.







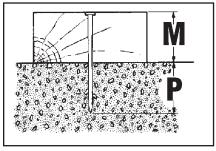
# HOW TO SELECT A POWDER ACTUATED FASTENER

### **DETERMINE FASTENER TYPE**

Drive pins are used to directly fasten an object (permanent installation). Threaded studs are used where the object fastened may later be removed or where shimming is required. The following shows how to determine shank and thread length:

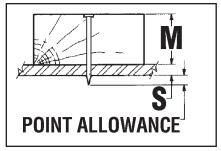
# PERMANENT INSTALLATION

1A To Concrete



Minimum Thickness Required
Shank Length = of Material + Penetration
(M) (P)

### 1B To Steel

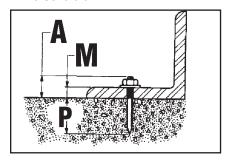


Minimum Thickness Thickness
Shank Length = of Material + of Steel +1/4" min. pt.

(M) (S) allowance

# REMOVABLE INSTALLATION

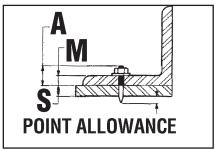
2A To Concrete



Thread Thickness Allowance\*
Length = of Material + for
(A) (M) Nut &Washer

Shank Length = Required Penetration (P)

### 2B To Steel



Thread Thickness Allowance\*
Length = of Material + for
(A) (M) Nut &Washer

Minimum Thickness of Steel (S) + allowance

<sup>\*</sup>Allowance for thickness of nut & washer = thread size (i.e. allow 1/4" for 1/4-20 thread, etc.)

# **OPERATOR'S EXAMINATION**

After studying and understanding the material in this tool manual, answer the following questions. Complete the information on the other side of this page. Enclose a copy of your sales receipt and send to the address on the back of this manual to activate your tool warranty and receive your tool license. Operator's license can also be obtained at: www.ramset.com

<ol> <li>Safety goggles and hearing protection must always be worn by the operator and any neces- sary bystanders when using the tool.</li> <li>True  False</li> </ol>	12. Do not drive fasteners into steel that is thinner than 3/16".  □ True □ False
2. The strongest power level should be tried first when making the first fastening.    True   False	13. Powder actuated tools, fasteners and loads, must always be kept in a secure, locked area when not in use to avoid access by unauthor- ized persons.
<ul> <li>3. Never attempt to fire the tool until the muzzle end is compressed against the work surface and you are ready to make a fastening.</li> <li>True  False</li> </ul>	☐ True ☐ False  14. When considering the safety of a particular application, the operator must think about all of the following: a) the powder load power level, b) the operator's safety, c) the safety of
4. Sheet rock, drywall board, wood, fiberglass, ceramic tile, brick and thin sheet metal are examples of materials not to be fastened into.	bystanders and fellow workers, d) the base or receiving material.   True  False
5. A powder actuated tool can be safely used in an explosive or flammable atmosphere.   True  False	15. It is not necessary to read the Operator's Manual prior to operating the Model RS22 low velocity powder actuated tool. True  False
6. Malfunctioning tools can be used and do not have to be removed from service immediately?  ☐ True ☐ False	16. The best way to check the receiving material is to set several fasteners using the most powerful load.
<ol> <li>When operating a powder actuated tool, your hand should never be placed in front of the tool muzzle.</li> <li>☐ True ☐ False</li> </ol>	☐ <b>True</b> ☐ <b>False</b> 17. Piston overdrive is caused by overpowering of the tool or by discharging the tool against
8. Poured concrete and structural steel are suitable materials for fastening into.	a soft surface.  □ True □ False
9. To determine the suitability of a base material, use a fastener as a center punch as follows:	<ul><li>18. One should never attempt to pry a stuck load out of a tool.</li><li>True</li><li>False</li></ul>
A) If the fastener is blunted, do not fasten; the material is too hard.	19. Placing a hand over the muzzle end of a loaded tool can result in serious injury from piston overdrive or an escaping fastener if the tool is discharged accidentally. True
<ul><li>10. In concrete, a fastener should be driven no closer to a free edge than 3".</li><li>☐ True ☐ False</li></ul>	Signed
11. When fastening into concrete, the base material should be greater than the shank penetration by at least 3 times.  □ True □ False	Date

# LICENSE AND WARRANTY ACTIVATION

The Model RS22 Tool is warranted for 90 days from date of purchase.

I certify that I have read and understand the Model RS22 Tool Operator's Instruction and Training Manual and have taken the Operator's Exam on the reverse side.

(Please Print Clearly)			
The serial number on my tool is:			
Please send my tool license to:			
Name			
Address			
City	State	_ Zip	
Phone			
Email			
☐ Yes. I would like to receive product updates and information from Ramset.			
RETURN TO:			

# In USA

ITW Brands ATTN: License Coordinator 955 National Parkway, Suite 95500 Schaumburg, IL 60173

# **In CANADA**

ITW Construction Products ATTN: Retail Marketing 120 Travail Road, Markham Ontario, L3S 3J1