

# PA3500

## OPERATING INSTRUCTION MANUAL



### Low Velocity Power Adjustable Powder Actuated Fastening Tool



DO NOT OPERATE THE PA3500™ TOOL UNTIL YOU HAVE READ THIS MANUAL AND RECEIVED THE PROPER TRAINING ACCORDING TO ANSI STANDARD A 10.3-1995.



#### WARNING!

PRIOR TO OPERATING THE PA3500™ TOOL, STUDY THIS MANUAL CAREFULLY AND DEVELOP A THOROUGH UNDERSTANDING OF THE CONTENTS.

PROPER TRAINING ACCORDING TO THE CURRENT ANSI STANDARD A 10.3, SAFETY REQUIREMENTS FOR POWDER ACTUATED FASTENING SYSTEMS MUST BE COMPLETED AND A POWERS FASTENERS QUALIFIED OPERATOR CARD MUST BE OBTAINED PRIOR TO OPERATION OF THE TOOL. STATE, LOCAL, OR OTHER REGULATIONS SHOULD ALSO BE FOLLOWED. LAWS, REGULATIONS, AND STANDARDS REGARDING THE USE OF POWDER ACTUATED TOOLS MAY PERIODICALLY BE REVISED. ANY SUCH REVISIONS MAY CHANGE THE SAFETY AND OPERATING PROCEDURES DESCRIBED IN THIS MANUAL. POWERS FASTENERS, INC. IS NOT RESPONSIBLE FOR ANY SUCH REVISIONS WHICH OCCUR AFTER PUBLICATION OF THIS MANUAL. IT IS THE RESPONSIBILITY OF THE USER TO MAINTAIN FAMILIARITY WITH THE CURRENT LAWS, REGULATIONS, AND STANDARDS THAT APPLY TO THE POWDER ACTUATED TOOL.

#### DANGER! - TO AVOID SERIOUS INJURY OR DEATH:

NEVER CLOSE TOOL WITH ANY PART OF HAND OVER MUZZLE END.

OPERATORS AND BYSTANDERS MUST WEAR EYE AND HEARING PROTECTION.

ALWAYS ASSUME TOOL IS LOADED. DO NOT PLACE A FINGER ON THE TRIGGER OF LOADED TOOL UNTIL MUZZLE END IS AGAINST WORK SURFACE AND YOU ARE READY TO MAKE A FASTENING. NEVER PLACE YOUR HAND OVER THE MUZZLE WITH A POWDER LOAD IN THE TOOL. IF THE TOOL ACCIDENTALLY DISCHARGES THE PISTON OR FASTENER MAY PENETRATE YOUR HAND RESULTING IN SERIOUS INJURY.

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, WITH A COPY OF YOUR RECEIPT, AND REVIEWED BY POWERS FASTENERS, INC.

**Powers**  
FASTENERS

## Warranty

All warranties of the products described herein, expressed or implied, including the warranties of merchantability and fitness for particular purposes are specifically excluded, except for the following:

Powers Fasteners will repair or replace at its sole option any tool part, or fastener which within five years after sale by Powers Fasteners or its distributors, is found by Powers Fasteners to be defective in material or workmanship, normal wear and tear excluded.

This is the sole warranty of Powers Fasteners and the sole remedy available to distributor or buyer.

**NOTE** — JUST AS NO ONE CAN MERELY READ A BOOK ABOUT DRIVING AN AUTOMOBILE AND THEN HOPE TO RUN IT SAFELY, NO ONE SHOULD ATTEMPT TO USE ANY POWDER TOOL WITHOUT ADEQUATE, COMPETENT, PERSONAL INSTRUCTION. AND, JUST AS NO AUTOMOBILE INSTRUCTION BOOK OR INSTRUCTOR CAN FOREWARN A LEARNER AGAINST ALL CONTINGENCIES AND EMERGENCIES, NEITHER CAN POWERS FASTENERS INSTRUCTORS OR PRINTED INFORMATION DETAIL ALL POSSIBLE CONDITIONS SURROUNDING THE USE OF POWERS TOOLS AND PRODUCTS. THE MANUFACTURER DISCLAIMS RESPONSIBILITY FOR INJURIES TO PERSONS OR PROPERTY WHICH MAY RESULT FROM DISREGARD OF THESE OPERATING INSTRUCTIONS.

## Introduction

Thank you for purchasing the Powers Fasteners PA3500™ power adjustable low velocity powder actuated tool. This tool will provide you with excellent performance provided the steps for proper operation and maintenance are followed. Powder actuated fastening systems can provide a cost effective method of attaching fixtures for light duty, static load conditions. The systems provided by Powers Fasteners consist of specially designed fasteners, installation tools, and powder loads which are designed to function in combination to provide optimum performance. While powder actuated tools can provide one of the fastest and economical means of fastening, they can also be dangerous if they are not operated properly. Prior to operating the PA3500™ tool, you must be properly trained in the operation and maintenance of this tool and be issued a Powers Fasteners Qualified Operator Card. When using the tool, you must have this card in your possession. As part of the training process, you should read and understand the contents of this instruction manual especially the safety precautions. Powder actuated tools may be operated only by properly trained operators as described in ANSI Standard A 10.3, Safety Requirements for Powder Actuated Fastening Systems. For complete tool operation details, contact your local Powers Fasteners Branch office or distributor for training.

Remember, safety begins with you! It is your primary responsibility when operating this tool. Failure to follow the proper operating, maintenance, and safety procedures can result in serious injury or death to yourself or bystanders. In addition to the training provided, you should be familiar with any local, state, and federal regulations. If you have any questions which are not covered in this manual, contact your local Powers Fasteners Branch office or distributor.

### SIZE RANGE

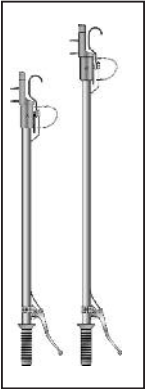
1/2" to 3" pin lengths, .27 caliber

### TOOL DESCRIPTION

The PA3500™ is a power adjustable, low velocity, semi-automatic .27 caliber tool which can be used to install .300 head drive pins, 8mm head drive pins and 1/4"-20 threaded studs, up to 3" in total length. The PA3500™ is designed for high speed and repetitive volume applications. It includes a power adjuster, allowing the operator to effectively decrease the power level of the load being used.

**TECHNICAL DATA**

TOOL BODY	PIN LENGTH	TOOL LENGTH
Precision Cast Aluminum	1/2" to 3" Total Length	13-5/8"
LOAD TYPE	TOOL WEIGHT	POWER LEVEL
.27 Caliber in a 10 Load Strip	5 lbs.	Brown (2), Green (3), Yellow (4), Red (5)
PIN TYPE		
Ballistic Point Drive Pin, .300 Head Drive Pin, 8mm Head Drive Pin, 1/4"-20 Threaded Stud		



**PA3500™ SELECTION GUIDE**

CAT NO.	DESCRIPTION	STD CTN.
52019	PA3500™ Powder Tool (Deluxe Kit)	1
52025	PA3500™ Powder Tool (Blister Pack)	1

CAT NO.	DESCRIPTION	STD CTN.	CAT NO.	DESCRIPTION	STD CTN.
52103	PA Piston Flat End with Ring	1	52112	Piston Stop	1
52108	Guide 2/F-3	1	52120	Shear Clip	1
52110	Base Plate 2/S-13	1	52122	Steel Annular Ball	1

The piston for installing 8mm drive pins is listed in the following table. For applications in tight areas, a limited access base plate/guide is also available.

CAT NO.	DESCRIPTION	STD CTN.	CAT NO.	DESCRIPTION	STD CTN.
52100	Piston 2/DN-1	1	52116	Baseplate 2/F-14-1 Limited Access	1
52114	Guide 2/F-4 Limited Access	1			

For fastening ceiling clips overhead, 6' and 8' di-electric pole tools are available.

CAT NO.	DESCRIPTION	STD CTN.	CAT NO.	DESCRIPTION	STD CTN.
50065	6' Di-electric Pole Tool	1	50066	8' Di-electric Pole Tool	1

**POWER ADJUSTMENT**

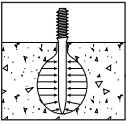
The power adjustment mechanism of the PA3500™ allows the user to adjust the penetration of the pin through the fixture ensuring a precise fastening. To operate the power adjustment mechanism, move the scroll wheel which is situated on the PA3500™ housing in the + or - direction to increase or decrease the power of the tool thus adjusting the pin penetration.

- 1 = minimum power
- 3 = medium power
- 6 = maximum power

Note: Start with minimum power. If the fastener does not penetrate deep enough, increase the power.

**FASTENER FUNCTIONING**

Prior to learning the safe operating procedures for this tool, it is important to understand how a powder actuated fastener works. A powder actuated fastener is considered to be a direct drive or forced entry type of fastener because it is driven directly into the base material. The driving action causes tremendous forces to be applied to the fastener. Powers powder actuated fasteners are specially designed and manufactured using an austempering process to withstand the forces imposed during the driving operation. Only fasteners manufactured or supplied by Powers Fasteners should be used in this tool.

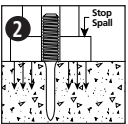
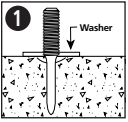


**FUNCTIONING IN CONCRETE**

The performance of a powder actuated fastener when installed into concrete or masonry base materials is based on the following factors:

1. Strength of the base material
2. Hardness and concentration of the aggregate
3. Shank diameter of the fastener
4. Depth of embedment into the base material
5. Fastener spacing and edge distance

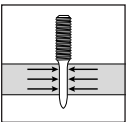
In addition to these factors, installation tool accessories such as a stop spall which reduces the tendency of the concrete surface to spall during the driving action can increase the performance of the fastener.



When a powder actuated fastener is driven into concrete, it displaces the volume of concrete around the embedded area of the fastener shank. As this occurs, the concrete directly surrounding the fastener is compressed and in turn presses back against the shank of the fastener. Additionally, the driving action generates heat which causes particles within the concrete to fuse to the shank of the fastener. This combination of compression and fusion holds the fastener in the concrete base material. A similar action occurs when fastening into block masonry.

Generally, the performance of the fastener in a given concrete strength will increase with greater embedment depths in a certain range. Depending on the fastener style and base material strength, embedment depths range from 5/8" to 1-1/2". For depths greater than this range, there is the possibility of fastener bending or fishhooking which may decrease expected load capacities and create a safety hazard.

During the driving action, some localized surface spalling of the concrete may occur. Normally, this is a surface effect which does not effect the performance of the fastener. However, it may pose an aesthetic problem for exposed applications where a fixture is not used. In cases such as this, two methods can be used to improve the appearance of the fastening. A stop spall adapter mounted on the powder actuated tool can help to reduce surface spalling. Another method used is to drive the fastener through a steel washer to improve the appearance of the application.



**FUNCTIONING IN STEEL**

The load performance of a powder actuated fastener when installed into steel base materials is based on the following factors:

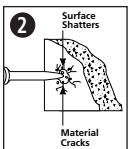
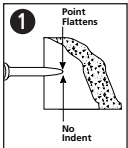
1. Thickness of the steel
2. Tensile strength of the steel
3. Shank diameter of the fastener
4. Depth of point penetration through the steel
5. Fastener spacing and edge distance.

When a powder actuated fastener is driven into steel, it displaces the steel laterally 360° around the shank of the fastener. Since steel is an elastic material, it presses back against the shank of the fastener to hold it in place. As the diameter of the fastener shank is increased, the load capacity obtained will generally increase provided the steel thickness is sufficient to accept the fastener. To further increase fastener performance in steel, some fasteners have a knurled shank which allows the steel to form a key lock into the grooves to provide higher capacities than those obtained with a smooth shank. For optimum performance, the fastener point should completely penetrate the steel. Normally, a minimum of 1/4" is allowed for the point length. An increase in performance can be expected until the fastener no longer completely penetrates through the steel. At this point, the elastic properties of the steel cause a compression force to be developed at an angle against the fastener point which reduces load capacity. In thicker steel base materials, adequate load capacities may be obtained for applications in which the point of the fastener does not fully penetrate the steel. Job site performance tests are recommended.

Fasteners should not be used in areas that have been welded or cut with a torch as these procedures may have caused local hardening of the steel. Over driving of the fastener should be avoided as the rebound created may reduce the load capacity or cause damage to the fastener. When fastening into unsupported long steel members, it may be necessary to provide support in the area of the fastening to prevent spring action which can cause inconsistent penetration and a reduction in load capacity.

**SUITABLE BASE MATERIAL**

While powder actuated fasteners can be used successfully in concrete, certain masonry materials, and A 36 steel, some materials are completely unsuitable. Fasteners should never be fired into hard or brittle materials such as cast iron, tile, glass, or rock. These materials can shatter easily resulting in a potential safety hazard. In addition, soft base materials such as wallboard, plaster, or wood are not appropriate as the fastener could pass completely through these materials. The user should never guess when fastening into any base material. Failure to follow the recommended installation and safety guidelines can result in severe injury or death to the tool operator and/or bystanders.



**CENTER PUNCH TEST**

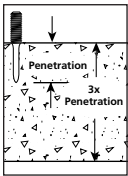
A center punch test should always be performed to determine the suitability of the base material for a powder actuated fastening. This test is relatively simple and can help to insure a safe, successful fastening. Be sure to wear the appropriate eye protection when performing this test. To begin, select the fastener to be used for the job. Then, place the point of the fastener against the proposed base material. Strike the fastener with a single hammer blow, then examine the point. If the point of the fastener is not blunted and the base material has a clear point indentation, it is acceptable to proceed with the first test installation.

Use of a powder actuated system is not recommended if the following occurs during the center punch test:

1. The fastener point has been blunted. This indicates that the base material is too hard.
2. The base material cracks or shatters. This indicates that the base material is too brittle.
3. When using an average hammer blow, the fastener penetrates the base material easily. This indicates that the base material is too soft.

**FASTENER INSTALLATION REQUIREMENTS**

It is important to understand the required minimum base material thickness requirements along with the minimum spacing and edge distance requirements. Failure to follow these requirements can result in an unsuccessful fastening and create a safety hazard.



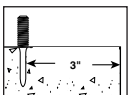
**BASE MATERIAL THICKNESS**

Concrete base material should be at least three (3) times as thick as the fastener embedment penetration. If the concrete is too thin, the compressive forces forming at the fasteners point can cause the free face of the concrete to break away. This can create a dangerous condition from flying concrete and/or the fastener and also results in a reduction of fastener holding power. For applications in the face shell of concrete masonry block, select a fastener length which will not exceed the thickness of the face shell.

**FASTENER PENETRATION GUIDE**

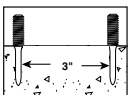
The following table lists typical embedment or penetration depths expected in the base materials listed. The penetration will vary depending on the density of the material. This table should be used as a guide since the consistency of these materials varies. When in doubt, a job site performance test should be conducted.

DENSITY	TYPICAL BASE MATERIAL	PENETRATION
Soft Masonry	Concrete block	1" - 1-1/4"
Average concrete	Poured concrete	3/4" - 1"
Dense concrete	Pre-stressed/pre-cast concrete	5/8" - 3/4"



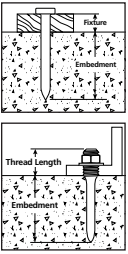
**EDGE DISTANCE**

Do not fasten closer than 3" from the edge of concrete. If the concrete cracks, the fastener may not hold. Closer edge distances for applications such as sill plates may be permitted if specific fastener testing has been conducted.



**SPACING**

Setting fasteners too close together in concrete or masonry can cause cracking. The recommended minimum distance between fasteners is 3" center to center.



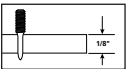
**FASTENER LENGTH SELECTION IN CONCRETE**

For permanent applications using pins in concrete, first determine the thickness of the fixture to be fastened. To this, add the required embedment or penetration into the base material. This will be the fastener shank length required. For applications in the face shell of masonry block, select a fastener length which will not exceed the thickness of the face shell. For removable applications with threaded studs, the shank length required is equal to the embedment depth required. To determine the minimum threaded length, add the thickness of the fixture and the nut / washer thickness. The nut and washer thickness is equal to the nominal thread diameter. Do not over tighten threaded parts. Maximum tightening torque values are listed in the table below. Use of a nut setter is recommended to reduce the possibility of over tightening the fasteners. For critical applications, perform a job site test.

MAXIMUM TORQUE FOR 1/4" STUD (FT.-LBS.)	MAXIMUM TORQUE FOR 3/8" STUD (FT.-LBS.)
2	4

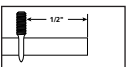
**INSTALLATION IN STEEL**

The following guidelines are based on the installation of a fastener in ASTM A 36 structural steel with the point fully penetrating the steel member. Recommended steel material thickness ranges from a minimum of 1/8" to a maximum of 3/8". For use in higher strength structural steel, applications where the point does not penetrate the steel member, or a thickness of steel greater than 3/8", job site performance tests are recommended.



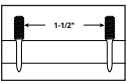
**BASE MATERIAL THICKNESS**

Steel base materials should be a minimum of 1/8" in thickness.



**EDGE DISTANCE**

For installations in A 36 steel, 1/2" is the recommended minimum edge distance.



**SPACING**

The recommended minimum distance between fastenings is 1-1/2" center to center for installations in ASTM A 36 steel.

**FASTENER LENGTH SELECTION IN STEEL**

For permanent applications when using pins in steel, first determine the thickness of the fixture to be fastened. To this, add the thickness of the steel base material plus a minimum of 1/4" to allow for proper point penetration. This will be the minimum fastener shank length required. Do not select a fastener length longer than that required for the application. An excessively long shank can burnish or polish the hole created in the steel resulting in a reduction in load capacity.

For removable applications with threaded studs, the shank length required is equal to the thickness of the steel base material plus a minimum of 1/4" to allow for proper point penetration. This will be the minimum fastener shank length required. Do not select a shank length longer than that required for the application. An excessively long shank can burnish or polish the hole created in the steel resulting in a reduction in load capacity. To determine the minimum threaded length, add the thickness of the fixture and the nut / washer thickness. The nut and washer thickness is equal to the nominal thread diameter. Do not over tighten threaded studs, the maximum tightening torque is listed in the table below. Use of a nut setter is recommended to reduce the possibility of over tightening the fasteners. For critical applications, perform a job site test.

# Powder Load Selection Guide

## .27 CALIBER SAFETY STRIP®

CAT. NO.	POWER LEVEL	LOAD COLOR	SIZE	STD. BOX	STD. CTN.	MASTER CTN.	WT./100
50620	2	Brown	.27 strip	100	1000	20000	.33
50622	3	Green	.27 strip	100	1000	20000	.33
50626	4	Yellow	.27 strip	100	1000	20000	.33
50630	5	Red	.27 strip	100	1000	20000	.33

## .27 CALIBER SAFETY STRIP® MASTER PACK

CAT. NO.	POWER LEVEL	LOAD COLOR	SIZE	STD. BOX	STD. CTN.	MASTER CTN.	WT./100
50624	3	Green	.27 strip	1000	10000	20000	.33
50628	4	Yellow	.27 strip	1000	10000	20000	.33
50632	5	Red	.27 strip	1000	10000	20000	.33

# Fastener Selection Guide

## .300 HEAD DIAMETER DRIVE PINS

CAT. NO.	SHANK LENGTH	STD. BOX	STD. CTN.	HEAD DIA.	SHANK DIA.	WT./100
50012	1/2" K	100	5000	.300	.143	.5
50016	5/8" K	100	5000	.300	.143	.5
50022	3/4"	100	5000	.300	.143	.5
50026	1"	100	5000	.300	.143	.6
50030	1-1/8"	100	1000	.300	.143	.7
50032	1-1/4"	100	1000	.300	.143	.8
50034	1-1/2"	100	1000	.300	.143	.9
50036	1-3/4"	100	1000	.300	.143	1.1
50038	2"	100	1000	.300	.143	1.2
50040	2-1/4"	100	1000	.300	.143	1.2
50042	2-3/8"	100	1000	.300	.143	1.3
50044	2-1/2"	100	1000	.300	.143	1.4
50046	2-3/4"	100	1000	.300	.143	1.6
50048	3"	100	1000	.300	.143	1.9

## .300 HEAD DIAMETER DRIVE PINS WITH TOP HAT

CAT. NO.	SHANK LENGTH	STD. BOX	STD. CTN.	HEAD DIA.	SHANK DIA.	WT./100
50136	1/2" K	100	5000	.300	.143	.5
50138	5/8" K	100	5000	.300	.143	.5
50140	3/4"	100	5000	.300	.143	.5
50144	1"	100	5000	.300	.143	.6

## .300 HEAD DIAMETER STEP SHANK PINS

CAT. NO.	SHANK LENGTH	STD. BOX	STD. CTN.	HEAD DIA.	SHANK DIA.	WT./100
50158	3/4" Step Shank	100	5000	.300	.143/130	.5
50159	1" Step Shank	100	5000	.300	.143/130	.6

## .300 HEAD DIAMETER DRIVE PINS - MASTER PACK

CAT. NO.	SHANK LENGTH	STD. BOX	STD. CTN.	HEAD DIA.	SHANK DIA.	WT./100
50980	1/2" K	1000	5000	.300	.143	.5
53300	5/8" K	1000	5000	.300	.143	.5
51040	3/4"	1000	5000	.300	.143	.5
51100	1"	1000	5000	.300	.143	.6
51160	1-1/4"	1000	5000	.300	.143	.8
51340	1/2" K TH	1000	5000	.300	.143	.5
53400	5/8" K TH	1000	5000	.300	.143	.5
51400	3/4" TH	1000	5000	.300	.143	.5
51520	1" TH	1000	5000	.300	.143	.6

## .300 HEAD DIAMETER DRIVE PINS WITH 3/4" WASHER

CAT. NO.	SHANK LENGTH	STD. BOX	STD. CTN.	HEAD DIA.	SHANK DIA.	WT./100
50070	3/4"	100	1000	.300	.143	1.6
50080	2-1/2"	100	1000	.300	.143	2.5
50082	3"	100	1000	.300	.143	2.8

## .300 HEAD DIAMETER DRIVE PINS WITH 7/8" WASHER

CAT. NO.	SHANK LENGTH	STD. BOX	STD. CTN.	HEAD DIA.	SHANK DIA.	WT./100
50090	1"	100	1000	.300	.143	1.9
50092	1-1/4"	100	1000	.300	.143	2.0
50094	1-1/2"	100	1000	.300	.143	2.1
50096	2"	100	1000	.300	.143	2.4
50098	2-1/2"	100	1000	.300	.143	2.7
50100	3"	100	1000	.300	.143	3.0

## .300 HEAD DIAMETER DRIVE PINS WITH 1" WASHER

CAT. NO.	SHANK LENGTH	STD. BOX	STD. CTN.	HEAD DIA.	SHANK DIA.	WT./100
50108	1-1/4"	100	1000	.300	.143	2.2
50110	1-1/2"	100	1000	.300	.143	2.3
50112	2"	100	1000	.300	.143	2.6
50114	2-1/2"	100	1000	.300	.143	2.9
50116	3"	100	1000	.300	.143	3.2

## .300 HEAD DIAMETER DRIVE PINS WITH 1-7/16" INSULATION WASHER

CAT. NO.	SHANK LENGTH	STD. BOX	STD. CTN.	HEAD DIA.	SHANK DIA.	WT./100
50122	1-1/2"	100	1000	.300	.143	2.1
50126	2-1/2"	50	500	.300	.143	2.7
50132	3"	50	500	.300	.143	3.0

## 1/4"-20 THREADED STUDS

CAT. NO.	THREAD LENGTH	SHANK LENGTH	STD. BOX	STD. CTN.	HEAD DIA.	SHANK DIA.	WT./100
50320	1/2"	1/2" K	100	5000	1/4"	.143	.8
50322	3/4"	1/2" K	100	1000	1/4"	.143	1.1
50326	3/4"	3/4"	100	1000	1/4"	.143	1.2
50328	1/2"	1"	100	1000	1/4"	.143	1.2
50330	3/4"	1"	100	1000	1/4"	.143	1.4
50334	1/2"	1-1/4"	100	1000	1/4"	.143	1.4
50336	3/4"	1-1/4"	100	1000	1/4"	.143	1.5
50338	1-1/4"	1-1/4"	100	1000	1/4"	.143	1.7

## .300 HEAD DIAMETER PINS WITH CEILING CLIPS

CAT. NO.	SHANK LENGTH	STD. BOX	STD. CTN.	HEAD DIA.	SHANK DIA.	WIRE HOLE	WT./100
50363	1"	100	1000	.300	.143	0.278"	3.4
50364	1"	100	1000	.300	.143	0.278"	3.5
50368	1"	100	1000	.300	.143	0.278"	3.0
50370	1-1/4"	100	1000	.300	.143	0.278"	3.7
50374	1-1/4"	100	1000	.300	.143	0.278"	3.2

## .300 DIAMETER HEAD DRIVE PINS WITH BX CABLE STRAPS AND CONDUIT CLIPS

CAT. NO.	DESCRIPTION	STD. BOX	STD. CTN.	HEAD DIA.	SHANK DIA.	WT./100
50150	1"	100	1000	.300	.143	3.5
50152	1-1/4"	100	1000	.300	.143	3.7
50380	1/2" EMT 1-1/4" pin	100	1000	.300	.143	3.4
50381	1/2" EMT 1" pin TH	100	1000	.300	.143	3.3
50382	1/2" EMT 1" pin	100	1000	.300	.143	3.3
50384	3/4" EMT 1-1/4" pin	100	1000	.300	.143	3.5
50385	3/4" EMT 1" pin TH	100	500	.300	.143	3.4
50386	3/4" EMT 1" pin	100	500	.300	.143	3.3
50388	1" EMT 1" pin TH	25	250	.300	.143	3.2

## .300 HEAD DIAMETER PIN WITH REBAR BASKET CLIP

CAT. NO.	DESCRIPTION	STD. BOX	STD. CTN.	HEAD DIA.	SHANK DIA.	WT./100
50702	32mm w/ basket clip	100	500	8mm	.143	4.0
50704	37mm w/ basket clip	100	500	8mm	.143	4.1
50710	47mm w/ basket clip	100	500	8mm	.143	4.3
50712	52mm w/ basket clip	100	500	8mm	.143	4.4
50716	62mm w/ basket clip	100	500	8mm	.143	4.6
50718	72mm w/ basket clip	100	500	8mm	.143	4.8

## FORMING PIN

CAT. NO.	DESCRIPTION	STD. BOX	STD. CTN.	HEAD DIA.	SHANK DIA.	WT./100
50789	44mm - 1-3/4"	100	5000	.205	.143	1.1
50790	62mm - 2-1/2"	100	1000	.205	.143	1.4

K=Knurled TH=Top Hat

# Safety Precautions

Safety is your primary responsibility when operating any powder actuated tool. You must read and understand the contents of this manual. You must be familiar with all functional and safety requirements of the tool. It is your responsibility to obtain proper training and a Powers Fasteners operator card prior to using this tool in compliance with the current American National Standard A10.3 Safety Requirements for Powder Actuated Fastening Systems and the Federal Occupational Safety and Health Administration Standards (OSHA). Existing state or local regulations should also be followed. When using this tool, you must have the qualified operators card in your possession. Revocation of card - Failure to comply with any of the rules and regulations for safe operation of powder actuated tools shall be cause for the immediate revocation of your qualified operator card.

The following is a summary of safety precautions to be followed when operating a Powers Fasteners powder actuated tool. Failure to follow these safety instructions can result in serious injury or death to operators or bystanders.

## PRIOR TO OPERATING THE TOOL

- Warning signs should always be posted within the area in which a powder actuated tool is to be used. These signs should be at least 8" x 10" in size with boldface type that is not less than 1" in height. The sign should state "Powder Actuated Tool In Use".
- Approved safety goggles should always be worn by operator or bystander, to protect their eyes from flying particles. Hearing protection should always be worn by the operator and bystanders when using a powder actuated tool. Other personal safety protection as required should also be used.
- Never modify or fabricate parts for use in your Powers tool. Use only Powers fasteners, loads, and tool parts.
- Hands or other body parts must never be placed in front of muzzle/barrel. Accidental discharge can cause piston and/or fastener to pass through the operator's hand.
- Never compress the tool against any part of the body. Serious injury or death may result in the event of an accidental discharge.
- Always point tool in a safe direction at all times.
- Use the tool for its intended purpose only.

## PREPARATION FOR LOADING THE TOOL

- Tools must be checked prior to operating to make sure they are not fully or partially loaded with a powder load or fastener.
- To insure safe operation, perform the daily function test described in this manual. Be sure the tool is not loaded prior to performing this test.

- Do not operate this tool unless all its parts are in place and operating appropriately. Never attempt to use a malfunctioning tool. Call 1-800-524-3244 for assistance.
- Never guess about the suitability of a base material. If you are uncertain about the suitability of a base material, perform a center punch test.
- Do not operate the tool until you learn and understand the color code / numbering system used to identify the power level of powder loads.

## OPERATING THE TOOL

- Only use fasteners and powder loads designed for this tool as supplied by Powers Fasteners.
- Do not use powder actuated tools in a flammable or an explosive atmosphere.
- Do not fire a tool without a fastener. The piston will impact the work surface possibly causing serious injury to the operator or bystanders along with damage to the tool.
- Do not load the tool until you are ready to make a fastening. Check the power load level before inserting it into the tool chamber.
- Fastener must be loaded prior to loading the powder load, to prevent injury to operator or bystander in the event of an accidental discharge.
- Do not close tool against work surface. The tool should be manually closed, with hand away from muzzle/barrel to prevent accidental discharge.
- Hold the tool perpendicular to the work surface at all times. Use a spall guard wherever possible. This will limit the possibility of fastener ricochet which could cause serious injury or death to the operator or bystanders.
- Always perform a test fastening with the lightest load level designed for use in the tool. If the lightest load fails to set the fastener, try the next highest load until the proper level is attained. Failure to follow this procedure may cause the fastener to be overpowered. If this occurs, the fastener may fully penetrate the base material causing serious injury or death to someone. Overpowering the fastener can also damage the tool, creating a safety hazard to both the operator or bystanders.
- Do not fasten into cast iron, tile, glass, or other types of brittle materials. These materials can shatter and create sharp fragments which may cause injury.
- Do not fire tool within 3" (three inches) of the edge of a concrete base material or within 1/2" (one-half inch) of the edge of a steel base material.
- Do not attempt to install a fastener closer than 3" (three inches) to another previously inserted fastener in concrete or 1-1/2" (one and one-half inch) in steel.
- Do not fasten into a concrete base material less than 3 times as thick as the fastener penetration or into a steel base material thinner than 1/8".



- 13. Never attempt to install a fastener in a cracked or spalled area in concrete. Place fastener at least 3" (three inches) away from a spalled area to prevent the possibility of the fastener bending and striking an operator or bystander.
- 14. Do not attempt to install fasteners in areas that have been welded or cut with a torch as these procedures may have caused local hardening of the steel.
- 15. Do not fasten through a predrilled hole unless proper guidance is provided.
- 16. If you decide not to make a fastening after the tool has been loaded, you must always remove the powder load first followed by the fastener.
- 17. Never attempt to override the safety features of this tool.

**HANDLING THE TOOL AND POWDER LOADS**

- 1. Never leave a loaded tool unattended. Once the tool is loaded, make the fastening immediately or unload the tool.
- 2. Always unload the tool before work breaks, changing parts, cleaning or servicing, and when storing.
- 3. To prevent accidental discharge of loads, never carry the powder loads in the same container as the fasteners or other hard objects.
- 4. Always store the powder loads in the containers

- provided or in an enclosure provided for them. Never intermix the various power levels. Keep them segregated in clearly identified containers.
- 5. Powder loads should never be used in firearms. They are normally more powerful than the cartridges supplied with the firearms.
- 6. Powder actuated tools and powder loads should always be stored under lock and key. Tools must be unloaded when not in use.

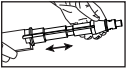
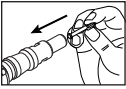
**TOOL MALFUNCTION**

- 1. In the event that a load fails to discharge after the trigger is pulled, the tool must be kept depressed against the work surface for a minimum of 30 (thirty) seconds in case of a delayed load discharge. Then carefully remove the entire load strip, and dispose of it in a can of water or other nonflammable liquid. Never attempt to force or pry a load out of a tool chamber.
- 2. Never discard unfired powder loads into a trash container.
- 3. Do not attempt to unload or disassemble a jammed, stuck or broken tool as improper handling may cause it to discharge and strike operator and/or bystander. A jammed tool must be pointed in a safe direction at all times. Tag the tool and lock it up. Call your Powers Fasteners representative for proper assistance.



# Tool Operation

**CAUTION:** — Be sure to read and understand all of the safety precautions and training in this manual before attempting to operate the tool. (Check to be sure the tool is not loaded, the piston moves freely within the barrel, and no foreign objects or fasteners are in the barrel.) Perform the daily function test before using the tool.



### OPERATION

1. Always load the fastener before inserting powder load to prevent injury to the operator or bystanders in the event of an accidental discharge. Place the fastener, point out, into the end of the guide until the fluted tip fits inside. Do not use excessive force when inserting the fastener. If excessive force is required, stop and determine why the fastener can not be inserted. Correct the problem before proceeding.

**Note:** Do not use fasteners longer than 3" as listed in the fastener selection section of this manual.

2. Always point the tool in a safe direction away from bystanders and the operator. In one movement, slide the barrel forward then close it against the stop. The barrel should be pulled fully forward to reset the piston for the next fastening. Loss of power may result from an improperly positioned piston.

Do not attempt to close the tool by exerting force on the front of the barrel. Never place your fingers or hands over muzzle end of the tool. The safe position for hands and fingers are as shown in the diagram. Hands must never be placed in front of the tool muzzle or barrel. In the event of an accidental discharge, the piston and/or fastener can pass through the operator's hand.

3. Insert the powder load strip into the bottom of the tool handle starting with the lowest power level, 3/Green. The strip should be inserted completely and should be flush with the bottom of the handle. Always insert the strip from the bottom of the handle. Set the power adjustment level to 1. If the fastener does not fully set in the base material increase the power level to 2 and so on until proper penetration is achieved. If proper penetration is not achieved using 3/green charge and power level 3, the next strongest charge should be used. Operator should then follow the above procedure regarding power level adjustment until proper penetration is achieved.

**Note:** Over driving or over powering a fastener can cause a safety hazard.

4. To make a fastening, place the tool against the work surface. Hold the tool firmly with two hands and completely depress the barrel. Then squeeze the trigger. Always hold the tool perpendicular to the work surface. Hold the tool firmly against the work surface to avoid excessive recoil. Never depress the tool against anything except the work surface.

**Note:** In the event that the load does not discharge after the trigger is pulled, continue to hold the tool depressed against the work surface for at least 30 (thirty) seconds in case of a delayed load discharge. Then carefully remove the entire load strip and dispose of it in a can of water or other non flammable liquid. Never attempt to force or pry a load out of a tool chamber. Do not discard unfired loads into a trash container.

5. To prepare for the next fastening, point the tool in a safe direction. Always insert a new fastener before loading or advancing the powder load strip. Insert the fastener as described in step 1. Once the fastener is inserted, cycle the tool as described in step 2. Repeat this procedure for subsequent fastenings. When the ten load strip has been completely fired, remove it by pulling it from the top of the tool body.

**Note:** Do not attempt to unload or disassemble a jammed, stuck or broken tool as improper handling may cause it to discharge and strike the operator and/or bystander. A jammed tool must be pointed in a safe direction at all times. Tag the tool and lock it up. Call your Powers Fasteners representative for proper assistance.

# Proper Maintenance and Cleaning

**MAKE SURE THE TOOL IS NOT LOADED. BE SURE THE TOOL IS NOT HOT 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 pushing down against the work surface, pulling the trigger, and releasing the tool from the work surface. Function the unloaded tool several times and insure that the breech parts and firing mechanism operate freely before fastening with the tool.

Your Powers Fasteners Authorized representative should be asked to assist the first time you disassemble and clean your tool. If you ever have any trouble reassembling the tool, or have any doubt about worn parts, call your Powers Fasteners Authorized Powder Distributor.

## CLEANING

All parts should be cleaned with detergent oil and the wire brushes supplied with your tool kit. Remove heavy dirt 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. Check the condition of the piston for damage from wear and deformation.

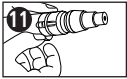
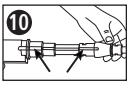
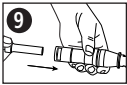
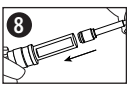
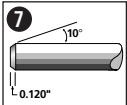
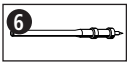
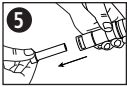
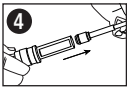
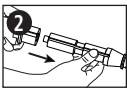
To maintain this tool in good working condition, it is necessary to disassemble and clean the entire tool if dirt is evident in the breech face, or if the tool appears to lose power. All parts should be cleaned with oil and wire brushes. Remove heavy dirt. All parts should be wiped thoroughly dry after cleaning with oil.

General tool maintenance should be performed at six month intervals or more frequently as required by the frequency of tool use.

# Troubleshooting

## ALWAYS CHECK INSTRUCTION MANUAL FOR PROPER ASSEMBLY OF PARTS

PROBLEM	POSSIBLE CAUSE	SOLUTION
Fastener Overdriving	Power level too high / Pin too short Soft base material	Use a lower powder load level number or a longer pin Check base material suitability section
Tool does not fire	Tool not depressed completely Firing pin damaged	See "Tool does not depress completely" section below Replace damaged part(s)
Tool does not depress completely	Damaged firing pin parts, ejector, etc. Parts assembled improperly	Check the parts for damage or improper assembly
Power reduction or inconsistent fastener penetration	Barrel is not pulled fully forward when cycling tool. Worn or damaged piston or piston ring	Barrel must be pulled out completely to properly reset the piston Replace piston or piston ring
Load strip cannot be inserted into tool	Improper loading	Insert strip from the bottom of the tool handle
Load strip will not advance	Wrong caliber strip Worn advance lever guide	Use proper strip Replace advance lever guide. This should be performed by qualified individuals
Load will not fire when trigger is pulled	Tool is not fully depressed	Follow safety procedure for misfired load then attempt to fully depress tool before pulling trigger
Load will not fire when tool is fully depressed and trigger is pulled	Load is already fired	Cycle tool
	Load misfire	Follow safety procedure
	Broken firing pin	Replace firing pin nut. This should be performed by qualified individuals
	Broken or missing	Replace firing pin nut. This firing pin nut should be performed by qualified individuals
Tool cannot be opened or cycled	Lack of proper cleaning Damaged or bent piston Broken or damaged parts	Clean tool thoroughly Remove and replace piston Tag tool with warning "Defective - Do Not Use" place in locked container and contact your Powers Fasteners Authorized representative for service
Piston stuck in the forward position	Piston has been overdriven and is jammed against piston reset pin	Tap the piston against a hard surface
Chipped or damaged piston	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	Machine piston as shown on page 21. Piston regrinding may be performed only by qualified individuals
Piston guide will not open easily	Bent shear clip Excessive buildup of dirt Piston stop is damaged Foreign material jammed between the piston guide and steel liner assembly	Remove and replace shear clip Disassemble and clean tool Replace piston stop Disassemble and remove foreign particles
Piston guide opens too easily	Annular ball spring or steel annular ball have worn	Remove and replace with a new spring and/or ball



**REPLACING OR REPAIRING THE PISTON**

The piston is an expendable part and must be replaced periodically. Typical signs of a worn out piston are: breaking, bending or mushrooming.

Prior to servicing the tool make sure there is no powder load in the tool. Use caution and do not lose or damage any tool parts.

1. Using a pin, lift the end of the annular ball spring and rotate toward the top of the tool body. Pull the piston stop back and out of the tool.
2. Slide the piston guide and baseplate assembly out of the tool.
3. Using a fastener, pry the shear clip off the baseplate. Replace the shear clip if it is damaged.
4. Remove the baseplate from the piston guide, then pull the piston out of the guide.

**REASSEMBLY:**

5. Tilt the baseplate and slide the fastener guide out. Press the guide out of the baseplate using a piston if it does not slide out freely. Replace the guide if it is damaged.
6. Clean the piston using a wire brush. Inspect it for worn or damaged piston ring, chipped end, or bending. Apply lubricant to the piston shank to minimize piston sticking from an overdrive condition. Wipe the piston dry.
7. If a piston tip is damaged, it can be shortened a maximum of 0.20 inches. The tip of the piston should be ground flat and at 90 degrees to the shank of the piston. The chamfer of the piston must also be reground as shown. Piston grinding should be performed by qualified personnel using the proper equipment.
8. Press the piston into the end of the piston guide. Be sure to push it all the way back into the guide. Ensure piston is positioned correctly in piston guide.
9. Insert the fastener guide into the baseplate.
10. Align the groove in both the piston guide and baseplate. Slide the baseplate (with fastener guide) onto the piston guide. Press the shear clip into place. Insert the piston guide and baseplate assembly into the liner in the tool body. Be sure to align the groove with the opening for the piston stop.
11. Replace the piston stop and rotate the annular spring into place.

Upon reassembly of the tool perform the following test. Depress the tool against a flat, hard surface and pull the trigger. The barrel assembly should slide smoothly inside the tool housing assembly. The firing pin should release after the trigger has been pulled.

**CAUTION:**

**THIS TEST SHOULD BE PERFORMED WITHOUT A PIN OR POWDER LOAD IN THE TOOL.**

**QUALIFIED TOOL OPERATOR EXAMINATION**

OPERATOR'S NAME	DATE	COMPANY NAME
HOME ADDRESS	COMPANY ADDRESS	
AGE	DATE OF BIRTH	COMPANY PHONE
SIGNATURE		DATE

Check the correct answer.

- It is necessary to read the Operator's Manual prior to operating a Powers Fasteners low velocity tool.  
 True  False
- When fastening into concrete, the base material should be greater than the shank penetration by at least:  
 1 time  
 2 times  
 3 times
- When operating a powder actuated tool, your hand should never be placed:  
 around the tool body  
 in front of the tool muzzle  
 over the tool handle
- To determine the suitability of a base material, use the fastener as a center punch.
  - If the fastener is blunted, do not fasten; the material is too:  
 soft  hard  brittle
  - If the fastener penetrates easily, do not fasten; the material is too:  
 soft  hard  brittle
  - If the material cracks or shatters, do not fasten; the material is too:  
 soft  hard  brittle
- Unsafe applications for powder actuated tools may be caused by which of the following?
  - a soft base material
  - improper powder load
  - fastening too close to an unsupported edge
  - a malfunctioning tool
  - fastening into a spalled area
  - fastening through a pre-existing hole
  - all of the above
- Which one of the following building materials is not suitable as a receiving material (base material) for powder actuated fasteners?
  - sheet rock
  - wood
  - fiberglass
  - sheet metal
  - all of the above
- When considering the safety of a particular application, the operator must think about:
  - the base material
  - the powder load power level
  - the operator's safety
  - the safety of bystanders and fellow workers
  - all of the above
- The proper loading procedure is: insert fastener first, powder load second. The fastener should always be placed in the tool prior to the load.  
 True  False
- Which one of the following materials is usually suitable for powder actuated fastenings?
  - poured concrete
  - hollow tile
  - surface hardened steel
  - glazed brick
- In concrete, a fastener should be driven no closer to an unsupported edge than:  
 1/2"  1-1/2"  3"
- Fishhooking is a condition which can occur when a powder actuated fastener strikes a piece of hard aggregate or very hard concrete, bends and comes out of the work surface. A fishhook can cause a serious injury or death.  
 True  False
- Placing a hand over the muzzle bushing of a loaded tool can result in serious injury from piston overdrive or an escaping fastener if the tool is discharged accidentally.  
 True  False
- Piston overdrive is caused by overpowering of the tool or by discharging the tool against a soft surface.  
 True  False
- Malfunctioning tools cannot be used and must be removed from service immediately.  
 True  False
- After conducting a Center Punch Test, the best way to check the base material is to set several fasteners using the least powerful load.  
 True  False
- Safety goggles and hearing protection should not be worn by the operator and any necessary bystanders when using the tool.  
 True  False
- A powder actuated tool cannot be safely used in an explosive or flammable atmosphere.  
 True  False
- List the proper powder load level number (1-6) next to each color listed.  
Red \_\_\_\_\_ Brown \_\_\_\_\_  
Green \_\_\_\_\_ Yellow \_\_\_\_\_  
Gray \_\_\_\_\_ Purple \_\_\_\_\_
- The weakest power level should be used when making the first fastening.  
 True  False
- You can fasten into weld areas of steel.  
 True  False

**PA3500**

- The proper procedure if a powder load fails to ignite is to hold the tool against the work surface and wait 30 seconds, then proceed exactly as directed in the Operator's Manual.  
 True  False
- Powers Fasteners powder loads for the PA3500™ are .27 caliber rim fire short crimped cartridges in plastic magazines. No other powder load may be used in this tool.  
 True  False
- Operators should never compress the PA3500™ or any other powder actuated tool against any part of their body.  
 True  False
- If a shear clip for the PA3500™ becomes deformed, simply remove it, hammer it back into shape and replace it in the tool.  
 True  False



# LICENSE AND WARRANTY ACTIVATION

**THE PA3500™ TOOL IS WARRANTED FOR 5 YEARS FROM DATE OF PURCHASE.**

I certify that I have read and understand the PA3500™ Tool Operating Instruction Manual and have taken the Operator’s exam. I understand the importance of following all safety procedures and that failure to read, comprehend, and follow the detailed rules and warnings regarding the safe operation of powder actuated tools can result in serious injury or death to the tool operator or bystanders. I agree to conform to all the rules and regulations regarding the use of powder actuated tools.

**(Please print clearly)**

THE SERIAL NUMBER ON MY TOOL IS:

**PLEASE SEND MY TOOL LICENSE TO:**

NAME

ADDRESS

CITY

STATE

ZIP

PHONE

**MAIL TO: Tool License Coordinator  
Powers Fasteners, Inc.  
2 Powers Lane  
Brewster, NY 10509**

TRIM ALONG DOTTED LINE, PLACE IN ENVELOPE, ADDRESS AS SHOWN AND AFFIX POSTAGE

