PT-27 .27 Caliber Semi-Automatic Tool Model

Operator's Manual





WARNING - Read before operation

A. Training

- 1. All operators must complete the tool manufacturer's training before attempting to take an exam or to operate Simpson Strong-Tie® tools. You must obtain certification of training from an authorized Simpson Strong-Tie instructor. If such training is not available where you purchased the tool, call or write Simpson Strong-Tie before attempting to operate the tool for information on the nearest authorized instructor. Simpson Strong-Tie also offers online training and certification. For more information, visit your local Simpson Strong-Tie website.
- 2. Obtaining this instruction is **your responsibility**.
- Read this manual completely and understand its contents fully before attempting to operate the tool. If there is anything in this manual that you do not fully understand, ask your instructor or call Simpson Strong-Tie for information. Reading and understanding this manual is your responsibility.

B. Limitations

- Just as no instruction book of any kind can forewarn a learner against all possible situations or emergencies that may arise, neither can Simpson Strong-Tie instructors or printed instructions detail all possible conditions or circumstances surrounding the use of this tool or its supporting products. Recognizing these circumstances and reacting in a safe manner is **your responsibility**.
- Simpson Strong-Tie disclaims any responsibility for injury or death, which may result from any disregard of this manual or the verbal instruction of the authorized Simpson Strong-Tie instructor. Following the rules of safe operation given to you here and verbally is **your responsibility**.

SAFETY STARTS WITH YOU OBTAIN AUTHORIZED TRAINING

Introduction

The Simpson Strong-Tie® PT-27 tool is a low-velocity or indirect-acting, powder-actuated tool (PAT). Do not attempt to operate this or any other tool before obtaining proper training and operator certification.

Read this manual carefully

Understanding the safety features, operating principles and limitations of the tool will help you operate the tool with the greatest SAFETY and efficiency. Simpson Strong-Tie disclaims any responsibility for incidents resulting from the disregard of these instructions.

General handling of powder-actuated tools

- 1. Always point the tool away from yourself and all bystanders.
- 2. Open the tool before operating to make sure it is not loaded.
- 3. Never place your hand or any part of your body over the front of the tool.
- 4. **Never** operate the tool without checking to see if the barrel is free of obstructions and that the tool is clean and in good working condition.
- 5. Never attempt to alter, modify or manufacture parts for use in your Simpson Strong-Tie[®] tool; this can cause malfunctions and result in unsafe functioning of the tool. Use only genuine Simpson Strong-Tie parts, fasteners and powder loads at all times.
- 6. Always wear eye and ear protection for operators and bystanders. Head protection is recommended. Serious injury or death can occur if these safety items are not used.
- Posting a warning sign, "Warning, Powder-Actuated Tool in Use," is a minimum warning where PAT tools are in use. Sign to be at least 8" (203.2 mm) by 10" (254 mm) in size with 1" (25.4 mm) font height letters.
- 8. Always properly brace yourself when working on scaffolding or ladders.
- 9. Never use powder-actuated tools in flammable atmospheres.
- 10. Never use the tool for anything other than its intended purpose.
- 11. Use common sense and good judgment. Know the material you are fastening into, making certain it is compatible with the powder-actuated tool.

Handling of powder loads and powder-actuated tools

- 1. **Never** carry powder loads in the same pocket or container with fasteners or any other hard objects.
- 2. **Never** use powder-actuated loads in firearms. They are more powerful than normal small arms ammunition.
- 3. Never carry a loaded tool from job to job.
- 4. Never use powder-actuated tools in flammable atmospheres.
- 5. Never discharge the tool without a fastener. Injury or damage to the tool could result.
- 6. Never attempt to force a load into the chamber of the tool.
- 7. Never strike or pry a load.
- 8. Never leave a loaded tool or the powder loads unattended. Store under lock and key.

Base material suitability and the center punch test

Before loading the tool or fastening into any material, check the suitability and thickness of the base material. To check base material suitability, give it the center punch test.

Center punch test

Using the fastener as a punch, take a hammer and strike a solid blow to the actual material you wish to fasten into, then look for these results:

- 1. If the point of the fastener is blunted, the material is too hard and is unsuitable. If the material is too hard, the fastener can ricochet, and possibly escape, striking you or bystanders causing serious injury or death.
- If the material cracks or shatters, it is too brittle and is unsuitable. This can result in particles striking the operator or bystanders, or the fastener could pass completely through the base material causing serious injury or death.
- 3. If the fastener sinks into the material with the hammer blow, the material is too soft and is unsuitable. If the material is too soft, the fastener can pass completely through and strike someone on the other side causing serious injury or death.
- 4. If the fastener makes a small indentation in the base, the base material is suitable for fastening into.

Do not use powder-actuated tools for fastening into these materials:

1. Vertical mortar joints	6. Hardened or tool grade steel
2. Bricks	7. Cast iron
3. Hollow block or tile	8. Welded areas or torch cuts
4. Glazed tile	9. Spring steel
5. Glass	10. Natural rock

Base material thickness

Thickness of the base material is perhaps the most important consideration for good safe fastenings. In concrete, the thickness must be three times the shank penetration; in other words, for 1" (25.4 mm) of shank penetration, the concrete must be at least 3" (76.2 mm) thick. In steel, the thickness must be equal to or greater than the diameter of the shank. Fastening into any base material, which is too thin, may enable the fastener to pass through and escape — resulting in serious injury or death.

Guidelines for safe fastening

- 1. **Never** hold the tool at any angle other than perpendicular to the work surface. Make sure that no debris is present on the surface.
- 2. Never set a fastener too close to another installed fastener as this can cause a ricochet.
- 3. Never fasten less than 3" (76.2 mm) from the edge of unsupported concrete or masonry, or less than ½" (12.7 mm) from the edge of steel, except for specific applications recommended by the tool manufacturer.
- 4. Never fasten into rough, spalled, cracked or uneven concrete. Fasten at least 3" (76.2 mm) from the outer edge of a spalled area.
- Never fasten into material that is too hard, such as hardened steel, welds, cast steel, marble, spring steel, natural rock, etc. This could cause the fastener to shatter and escape and result in serious injury or death.
- 6. **Never** fasten into material that is too brittle, such as glass, glazed brick, glazed tile, slate, etc. This could cause the material to shatter and result in serious injury or death.
- 7. Never fasten into material that is too soft, such as wood, plaster, drywall composition board, plywood, etc. This could cause the fastener to pass through and escape resulting in serious injury or death.
- 8. **Never** leave the chamber loaded. If you decide not to make a fastening after having loaded the tool, remove both the powder load and fastener from the tool before returning it to its case.
- 9. Never place your hand or any part of your body over the front of the tool.
- 10. Never point the tool toward any person, loaded or not.

Prepare for loading

- 1. Always check prior to operating a tool that it is not loaded with a powder load or fastener.
- 2. Always check to be sure that the tool is clean. Excessive dirt or debris can cause accidental firing or misfiring of the tool.
- 3. Never load or fire the tool 3" (76.2 mm) from the edge of unsupported concrete or masonry, or less than ½" (12.7 mm).
- 4. Never use improper powder loads or fasteners in the tool, as this may be unsafe or damage the tool.
- 5. Always insert the fastener first, and the load last. Make sure you never double load the fasteners.
- 6. Always perform the center punch test as described in this manual before fastening into any unknown base material.
- 7. Always make a test fastening with the lowest power loads and work your way up in power as needed.

Selecting Fasteners and Loads

Only use fasteners and powder loads designed for this tool as supplied by Simpson Strong-Tie.

Powder Loads for PT-27

Model No.	Description
P27SL2/P27SL2A	.27 Cal. — Brown (level 2)
P27SL3/P27SL3A	.27 Cal. — Green (level 3)
P27SL4/P27SL4A	.27 Cal. — Yellow (level 4)
P27SL5/P27SL5A	.27 Cal. — Red (level 5)

Fasteners for the PT Tool					PT-27
Model No.	Shank Dia. (in./mm)	Head Dia. (in./mm)	Accessory	Use	Pin Length (in./mm)
PDPA	0.157/4.00	0.3/7.4		Attachment of cold-formed steel or wood to structure	Max. 21⁄2/63.5
PDPAWL	0.157/4.00	0.3/7.4	1" (25.4 mm) washer	Attachment of cold-formed steel or wood to structure with additional bearing surface	All
PDPAT	0.157/4.00	0.3/7.4	Top hat	Attachment of cold-formed steel to structure with additional clamping	All
PCLDPA	0.157/4.00	0.3/7.4	90° clip	Attachment of suspended ceilings and overhead applications	All
PECLDPA	0.157/4.00	0.3/7.4	120° clip	Attachment of suspended ceilings and overhead applications	All
PTRHA	0.157/4.00	0.3/7.4	Threaded hanger clip	Attachment of suspended ceiling, piping and other overhead items using threaded rod	All
PINW	0.157/4.00	0.3/7.4	1 7⁄16" (36.5 mm) metal washer	Attachment of insulation board (metal washers)	All
PINWP	0.157/4.00	0.3/7.4	1¾" (34.9 mm) plastic washer	Attachment of insulation board (plastic washers)	All
PHBC	0.157/4.00	0.3/7.4	Highway basket clip	Attachment of rebar and dowel basket anchorage	All
PBXDP	0.157/4.00	0.3/7.4	BX cable clip	Attachment of BX cables to structure	All
PCC	0.157/4.00	0.3/7.4	Conduit clip	Attachment of conduits to structure	All

- If the powder load does not fire after pulling the trigger, hold the tool firmly against the work surface for at least 30 seconds. Carefully remove the tool from the work surface making sure to point it away from yourself and bystanders. Remove the load and dispose of it in a can of water. Unfired loads must never be thrown in trash containers or carelessly discarded in any way.
- 2. **NEVER** attempt to force or pry an unfired powder load from the chamber with a sharp or pointed object as this may cause an accidental discharge.
- 3. NEVER attempt to disassemble a jammed tool containing a live powder load. Tag the tool "DO NOT USE" and store it safely in a locked case. Call your Simpson Strong-Tie[®] representative for tool repair.
- If at any time during the operation of the tool you feel it is not working properly, STOP using it and call your Simpson Strong-Tie representative.
- 5. Check the work surface to be sure it is clear of debris. Clear away any debris so that the tool sits flush on the work surface.
- 6. Check the work area for explosive or flammable materials. If any are found, remove them before operating the tool.
- 7. Check the chamber of the tool to be sure there is no dirt, grit or foreign objects present.
- 8. Check the nosepiece to make sure you don't double load it with fasteners and that it is clear of any obstruction.
- Any tool found not to be in proper working condition shall be immediately removed from service and tagged "Defective Tool" until it has been repaired according to the manufacturer's instructions.

BEFORE loading the tool, operate it a few times on a solid surface making certain all parts move freely and that the firing pin clicks when the tool is fully depressed and the trigger is pulled. Discharging the tool without a load in the chamber will cause "dry firing," which will not damage the tool.

There are two types of powder-actuated tools.



Direct-acting type tool

Direct-acting type tools work by expanding gases that act directly on the fastener without the use of a piston. Direct-acting tools are no longer manufactured in North America and are regarded as far less safe to operate than indirect-acting tools. Simpson Strong-Tie only provides indirect-acting type tools.

CAUTION Powder-actuated tools are capable of fastening into concrete and/or steel. The fastener enters the work surface with an extreme amount of energy. Make certain not to misdirect the energy.

SAFETY STARTS WITH YOU

As the powder-actuated tool operator, your safety and the safety of those around you should always be kept in mind. Consider that the least powerful load used in powder-actuated tools produce approximately ten times the power of a .22 caliber long rifle cartridge. Respect this power as you would a chain saw, a lawn mower or a rifle.





Fastening into masonry materials

Masonry materials suitable for fastening into include:

- Poured concrete
- Precast concrete
- Prestressed concrete
- Grout-filled concrete block
- Horizontal grouted joints

Fasteners are primarily held into masonry by a clamping of the concrete around the fastener. Factors that influence a fastener driven into concrete include:

- Depth of penetration
- Compressive strength of concrete
- Fastener spacing and edge distance
- Fastener shank diameter
- Concrete aggregate

	0.145"– 0.157" (3.68 mm – 4.00 mm) Diameter Shank Penetration		
Soft Concrete/Masonry 2,000 psi (13.8 MPa) – 2,500 psi (17.2 MPa)	9–10 times shank diameter		
Average Concrete/Masonry 3,500 psi (24.1 MPa) – 4,000 psi (27.6 MPa)	7–8 times shank diameter		
Hard Concrete/Masonry 5 000 psi (34 5 MPa) – 6 000 psi (41 4 MPa)	5–6 times shank diameter		

PATMI Recommended Penetration Depths for Optimal Holding Power

PATMI Minimum Fastener Spacing and Edge Distance into Concrete

Charle Diamator (in (mm)	Minimum Fastener		
Shank Diameter (m./mm)	Spacing (in./mm)	Edge Distance (in./mm)	
0.100/0.254 to 0.156/0.399	4.0/101.6	3.2/81.3	
0.157/4.00 to 0.199/5.07	5.1/129.5	3.5/88.9	
0.200/5.08 to 0.250/6.35	5.9/149.9	4.0/101.6	

Distances per ASTM E1190 and PATMI. Reference Powder Pin Code listing for specific pin requirements or conditions.

Concrete thickness

Concrete thickness must be at least three times the fastener penetration.

Fish-hooking

"Fish-hooking" is when the fastener curves when driven into concrete, due to the fastener hitting large, hard, or excessive amounts of aggregate, rebar or any hard object. Fish-hooking can reduce the holding power of the fastener, result in spalling, and may increase unsafe conditions due to escaping particles. Fish-hooking can be minimized by:

- Reducing shank penetration.
- Increasing shank diameter.
- Using appropriate powder load level. Excessive power can cause overdriving.
- Fastening through a metal disc.

Fastening into steel

The most common type of steel fastened into are structural steel beams, angles, channels, tees and plates. The holding power of the powder-actuated fastener is a function of the gripping action of the steel base material around the fastener and the fusion of the fastener to the base material.

Factors that influence the holding power of fasteners in steel

- Shank diameter: Larger shank diameters increase holding power.
- Thickness of steel base material: Thicker base material increases holding power.
- Fastener point penetration: Getting the point to pass through base material by approximately ¼" (6.35 mm) maximizes holding power.
- Knurled fasteners: Knurling on the fastener provides interlocking of the shank and the base material that increases the holding power.

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Chank Diamator (in /mm)	Minimum Fastener		
Shank Diameter (m./mm)	Spacing (in./mm)	Edge Distance (in./mm)	
0.100/0.254 to 0.156/0.399	1.0/25.4	0.5/12.7	
0.157/4.00 to 0.199/5.07	1.0/25.4	0.5/12.7	
0.200/5.08 to 0.250/6.35	1.6/40.6	1.0/25.4	

Distances per ASTM E1190 and PATMI. Reference Powder Pin Code listing for specific pin requirements or conditions.

How to Load and Fire the PT-27 Tool

Never place your hand over the guide/nosepiece of the tool unless inserting a fastener and then only with the chamber empty.





 Cycle the tool. Grasp the base plate and fastener guide/nosepiece and pull sharply forward until you feel a positive stop, then pull the base plate and fastener guide/ nosepiece back until it stops and is fully closed. Take care not to pinch your skin between the base plate and receiver by holding the forward portion of the base plate. This resets the piston and positions the advance lever in the correct location for inserting the strip loads.





Insert the fastener into the nosepiece of the tool, head or threaded end first. Push the fastener until the pointed end is even with the face of the nosepiece, or if a preassembled fastener is used, until the nosepiece is against the fastener accessory.





3. Prior to selecting the power level of the loads, always conduct a center punch test to determine the suitability of the base material. Always begin with the lowest power loads (brown) and work your way up in power as needed. Insert the strip load through the bottom of the handle until it is flush with the bottom.



4. Depress the tool firmly against the work surface using both hands, then pull the trigger. Make certain you hold the tool perpendicular to the work. Using the supplied rubber spall stop will help ensure the tool is perpendicular to the work surface and will help to minimize concrete spalling when the fastener is installed.



5. After making the fastening, lift the tool off the work surface and pull the base plate and fastener guide/nosepiece sharply forward. This action resets the piston and advances the powder load strip to the next powder load.



6. Remove the spent powder strip load by grasping the strip from the top side of the tool and firmly pull upwards in a smooth motion.

Dismantling the PT-27 Tool

The PT-27 tool has wearable parts that occasionally need replacing, and the tool requires periodic cleaning. The following is a step-by-step guide to dismantle the tool. Before dismantling, be sure the tool is not loaded with a powder load or fastener.

Dismantling the tool



Maintaining the PT-27 tool

A clean tool is safer and functions better. This tool should be cleaned after each day of use or after 1,000 continuous fastenings. While cleaning the tool, check the wearable parts such as the piston and piston ring for signs of wear or damage.

Cleaning the tool

With the front of the tool disassembled, spray a small amount of detergent oil; brush and wipe clean with a clean towel the following parts:

- 1. Piston make sure to clean the chamber end of the piston and wipe the shaft clean.
- 2. Barrel clean inside the breech and on the outside of the chamber end of barrel making sure the breech is free of any dirt or debris.
- 3. Base plate remove dirt and residue from inside the base plate.
- 4. Receiver remove dirt and residue from inside the receiver.
- 5. Nosepiece remove dirt and residue from outside of nosepiece.

Note: Make sure excess detergent oil is wiped clean. Excessive detergent oil attracts additional dirt.

While cleaning the tool, make sure wearable parts are in good condition

- 1. Piston if the end is flared or the shaft bent, replace the piston.
- Shear clip and connection between barrel and base plate. The shear clip should be reviewed for deformation/bending and the end of barrel for chipping/wear where the shear clip contacts.
- 3. Nosepiece if damaged or worn.

Tool parts to be cleaned or replaced



Troubleshooting Tips

Symptom	Cause	Solution
Overdriving fasteners	Excessive power	Change to next lower power level load strip
	Soft base material	Check base material – center punch test
	Pin too short for application	Use longer pin or washer pin
Test days	Tool not completely depressed	Firmly depress tool before firing
	Excessive dirt on chamber, breech or inside the receiver	Properly clean tool
not depress	Damaged firing pin or breech	Replace damaged parts*
completely	Damaged fastener guide	Repair or replace fastener guide
	Load misfire	Follow safety procedure in manual
	Tool did not advance strip	See "Strip load will not advance" below
Reduction or loss of power	Piston is not returned to rear position	Barrel assembly must be pulled fully forward to reset piston
	Damaged piston or piston ring	Replace or repair worn parts*
	Damaged piston stop	Replace damaged part
	Excess carbon build-up in barrel	Completely clean the tool
	Bent or damaged piston	Replace piston
Piston will not fully reset	Other damaged parts	Tag the tool "Defective – Do not use" Place the tool in a locked container and contact your local Simpson Strong-Tie® representative
	Plastic debris on piston or in nosepiece	Remove piston, fastener guide and debris
	Strip is inserted incorrectly	Check proper installation of strip
Strip load will not advance	Barrel is not fully retracting	Remove barrel then reinstall barrel to reset the strip advance lever
		Contact your local Simpson Strong-Tie representative
	Advance mechanism is damaged	Tag the tool and lock it in a container
	Improper strip being used	Do not use .25 caliber in this tool
Tool will not say in closed position	Ball bearing missing	Contact your local Simpson Strong-Tie representative

*Should be performed by qualified individuals.

PT-27 Tool Kit

Contents

- Operator's manual
- Spall suppressor
- Tools for disassembly
- Safety glasses/ear plugs
- Cleaning brushes
- Operator's exam and caution sign





Tool is sold in a rugged tool box

One Year Limited Warranty

Simpson Strong-Tie Company Inc. provides this Limited Warranty to original purchasers of the Simpson Strong-Tie® brand tool product ("Product"). This Limited Warranty is effective as of the date of purchase. This Product, if properly stored, maintained and used in compliance with all instructions and warnings, will be free from substantial defects in material and manufacturing for one year of purchase. This Limited Warranty does not cover normal wear and tear, as determined by Simpson Strong-Tie in its absolute discretion, and is null and void with respect to: (a) any Product that was purchased from an unauthorized dealer, retailer or distributor, (b) any Product that was modified or altered, (c) any Product that was improperly or inadequately serviced or maintained, (d) any Product that was subject to negligence or excessive or improper use, including use in improper conditions, as determined by Simpson Strong-Tie in its absolute discretion, (e) any failure or damage caused by the use of a Product with any accessories other than authentic Simpson Strong-Tie products, or (f) any Product that was subject to any use not in accordance with the applicable specifications provided with the Product or on the strongtie.com website. If any Product fails to conform to this Limited Warranty, original purchaser's sole and exclusive remedy is either the replacement or repair, at Simpson Strong-Tie election, of the defective Product. Original purchaser must return the Product to Simpson Strong-Tie along with satisfactory proof of purchase, with return shipping prepaid by original purchaser. To obtain warranty service, go to strongtie. com or contact Simpson Strong-Tie promptly at (800) 999-5099. The repaired or replaced Product is warranted under the terms of this Limited Warranty.

THE LIMITED WARRANTY HEREIN IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, AND, WHERE LAWFUL, SIMPSON STRONG-TIE DISCLAIMS ALL OTHER WARRANTIES, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AND WARRANTIES ARISING FROM COURSE OF PERFORMANCE. COURSE OF DEALING OR TRADE USAGE BEYOND THIS WARRANTY PERIOD. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU, WHERE LAWFUL, UNDER NO CIRCUMSTANCES SHALL SIMPSON STRONG-TIE BE LIABLE FOR INCIDENTAL, CONSEQUENTIAL, PUNITIVE OR SPECIAL DAMAGES OR DIRECT OR INDIRECT LOSS OF ANY KIND, INCLUDING BUT NOT LIMITED TO BODILY INJURY, DEATH OR PROPERTY DAMAGE, SIMPSON STRONG-TIE'S ENTIRE LIABILITY IS LIMITED TO THE PURCHASE PRICE OF THE DEFECTIVE PRODUCT. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU. SIMPSON STRONG-TIE IS IN NO WAY LIABLE FOR INCIDENTS RESULTING FROM USE WITHOUT PROPER CERTIFICATION OR DISREGARD OF INSTRUCTIONS AND WARNINGS. THIS LIMITED WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.



The PT-27 complies with OSHA requirements and with ANSI A10.3 standards.

For repair information, go to **strongtie.com**, type in the tool model number in "Search," locate the "Repair Forms" section on the page, and choose the repair form for your region.