12912 Farnham Avenue White Bear Lake, Minnesota 55110

WILSON WHEEL®

OPERATOR'S MANUAL

for
Trumpf Punch Presses

Rolling Shear
Rolling Rib
Rolling Offset
Rolling Pincher

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I. Safety Warning

Wilson Wheel®
Family of Tooling

The Wilson Wheel family of tooling represents a unique and innovative approach to sheet metal fabrication. The operation of this tooling is unlike any other style of tooling manufactured for use in a punch press. Therefore, it is imperative that all persons involved in the operation and programming of the punch press read and become thoroughly familiar with the entire contents of this manual prior to the installation, use or maintenance of this tooling. Failure to do so may result in operator injury, damage to the punch press and/or press tooling.

For further information about the Wilson Wheel family of tooling, contact your local Wilson Tool Sales Engineer, or our turret tooling Sales Desk.

II. Basic Tooling Information

This section is intended to acquaint you with the uses and limitations of the Wilson Wheel® Family of Tooling. Please read all instructions carefully before operating this tool.

A. Material Thickness

1. With the exception of the Rolling Pincher, tools in the Wilson Wheel Family of Tooling are designed for use with a specific material thickness.

A. The material thickness range for the Wilson Wheel Family of Tooling is as follows:

Minimum material thickness = 0.8mm
Maximum material thickness (Rolling Rib) = 2.3mm
Maximum material thickness (all others) = 2.3mm in Aluminium
2.0mm in Mild Steel
1.5mm in Stainless Steel

B. The Rolling Shear tool cannot cut material thicker than what it was ordered for. Both the upper and lower wheel assemblies must be replaced for use on thicker materials. To run thinner material than what the tool was originally designed for, first run the tool in the thinner material and determine if the results are acceptable. If the results are not acceptable, both the upper and lower wheel assemblies must be replaced. (Please follow the instructions provided in **Assembly / Disassembly**)

4. The Rolling Rib and Rolling Offset tools can be used on thicker materials, but the results may not be satisfactory.

5. The Rolling Pincher tool can be used on any of the above listed materials.

B. Interchangeability with Other Tools in the Wilson Wheel Family

Components within the Wilson Wheel Family of Tooling are not interchangeable. Punch and Die assemblies for the Rolling Shear are matched sets. Do not interchange punch and die assemblies from multiple Rolling Shear tools.

C. Sharpenability

The wheels used in the Wilson Wheel Family of Tooling are not sharpenable.

D. Machine Requirements

These tools are suitable for sheet metal fabrication on the TC 3000 R.

III. Tool Assembly / Disassembly

A. Die Wheel Assembly

1. Clean the slot and pocket in the die base. Remove any accumulated grit or debris.

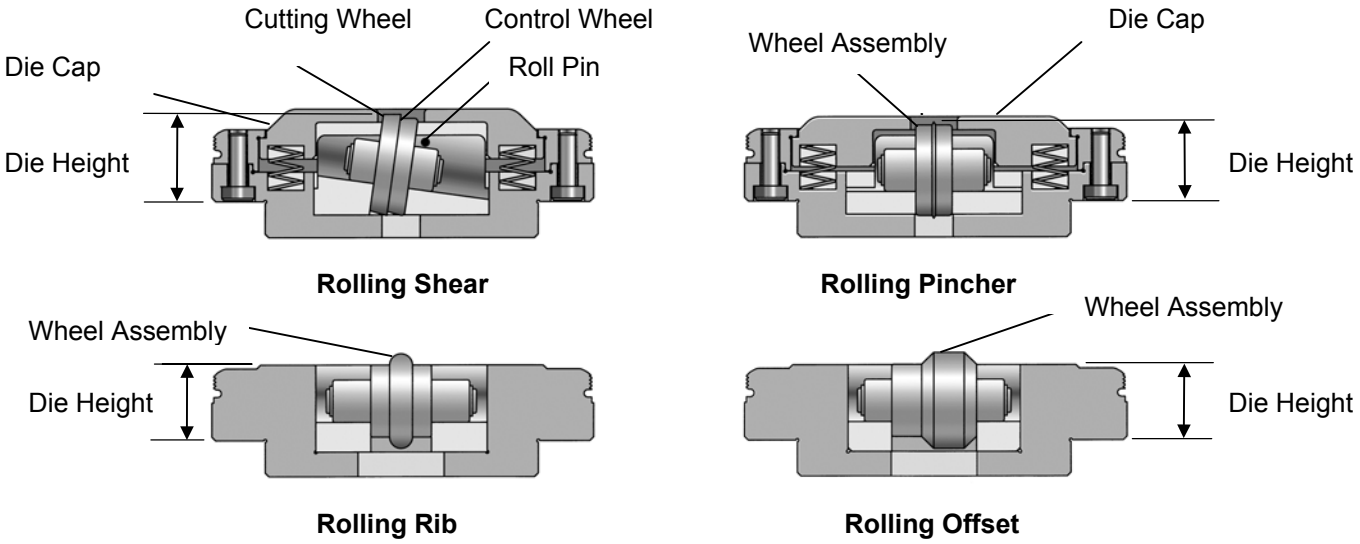
2. Place the wheel assembly into the die base opening. Press down firmly on the wheel assembly until it seats into the bottom of the die base shaft slot.

3. On the Rolling Shear tool, insert the roll pin.

4. Lubricate the wheel assembly and the die base opening liberally with a light to medium weight machine oil. On Rolling Shear tool, make sure that the cutting wheel and the control wheel move freely and independently of each other.

5. On the Rolling Shear and Rolling Pincher, reassemble the die cap. Make sure that the die cap moves up and down freely.

6. Die height should measure 23mm for the Rolling Shear and Rolling Pincher, 20mm for the Rolling Rib and Rolling Offset.



B. Die Wheel Disassembly

1. On the Rolling Shear and Rolling Pincher, remove the die cap by unscrewing the four M5 cap screws from the bottom of the die base. The Retaining Ring also needs to be removed.

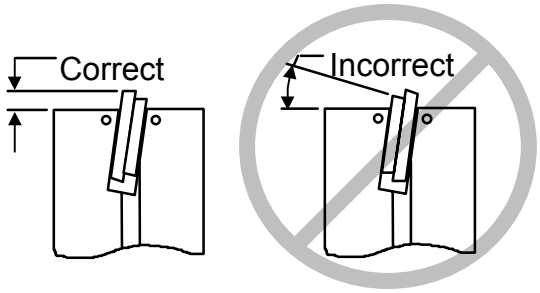
2. On the Rolling Shear, remove the roll pin.

3. Using a piece of soft brass or aluminium, drive out the wheel assembly. Be careful not to mark the cutting edges.

C. Punch Wheel Assembly

1. Clean the slot in the punch body. Remove any accumulated grit or debris.

2. Place the wheel assembly into the punch body opening. **NOTE:** On the Rolling Shear tool, press down firmly until the wheel assembly seats into the bottom of the punch body shaft slot. Make sure that the wheel assembly is loaded correctly. Wheel flats must be parallel with the punch face.



3. Lubricate the wheel assembly liberally with a light to medium weight machine oil. On the Rolling Shear tool, make sure that the cutting wheel and the control wheels turn freely and independently.

4. Reassemble the punch cap, or insert the roll pin and tap it into place. Make sure that the roll pin completely engages both sides of the punch face and is below the surface of the punch.

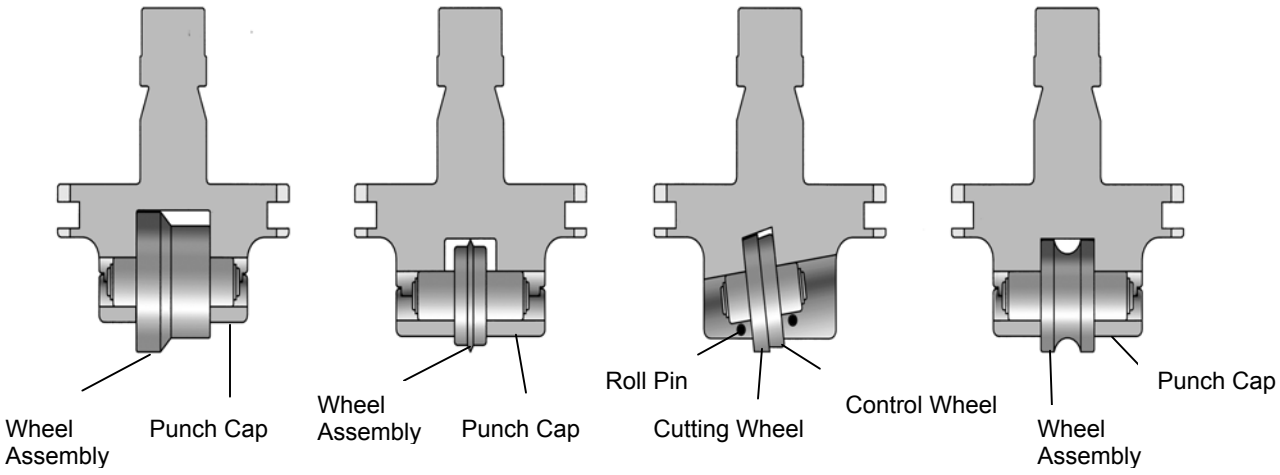
D. Punch Wheel Disassembly

1. Rolling Shear tool

   Remove the roll pin from the punch body by tapping it out with a small rod. Secure the body firmly. Insert a screwdriver under the punch wheel and pry upward being careful careful not to mark the cutting edge.

4. Other tools in the Wilson Wheel Family of Tooling

   Remove the four M3 screws from the punch face. Lift off the punch cap and remove the punch wheel assembly.



Rolling Offset **Rolling Pincher** **Rolling Shear** **Rolling Rib**

IV. Installation and Operating Instructions

LOADING THE TOOL INTO YOUR MACHINE

A. Machine Alignment
Good machine alignment is imperative when operating the Wilson Wheel Family of Tooling.

B. Cleaning and Lubricating the Rolling Tool

1. Before operation, **clean and inspect** the tool to make sure it is free from all dirt and shavings. **DO NOT** use compressed air to clean the tool as this may force debris into the bearings and cause premature wheel failure.

2. On Rolling Shear tool, check to ensure that the cutting wheel and the control wheel turn freely and independently of each other.

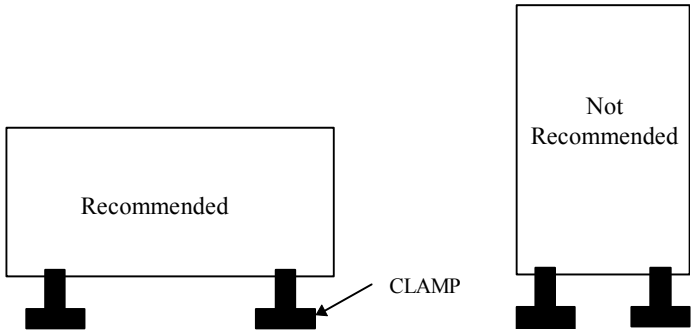
3. Lubricate lower unit by adding light to medium weight machine oil to the top of the wheel assembly while turning the wheels manually.

4. Visually inspect the tool.

NOTE: Repeat steps 2 through 4 at the beginning of each shift.

LOADING THE SHEET ON THE MACHINE

A. Sheet Clamping
If at all possible, you should clamp the sheet along its long side rather than its short side. Make sure the clamps are positioned near the edges of the sheet.



B. Sheet Lubrication
The sheet **must** be lubricated if you are running aluminium or hot-dipped galvanized materials. Wilson Tool recommends the use of X-Cel Sheet Lubricant. Lubrication should be applied to both sides of the sheet. Lubrication is not mandatory for stainless or mild steel.

When running hot-dipped galvanized steel, you **must** clean the tool frequently. Improper sheet lubrication and/or tool cleaning will result in material buildup and premature tool failure.

V. Troubleshooting

BURRS

CAUSE	SOLUTION
The edge on the tool may be too sharp.	Run a few strips of stainless steel through until the burr disappears.
The tool length is set too deep.	Reduce punch length in tool table by 0.1mm or smaller increments until proper depth is obtained.
The machine is improperly aligned.	Align the machine
The tool key(s) are worn.	Replace the worn key(s).

SHEET DISTORTION

CAUSE	SOLUTION
The tool is stroking too deep.	Reduce punch length in tool table by 0.1mm or smaller increments until proper height is obtained.
Material of 1.2mm or thinner is over 500mm from the clamps.	Slow your machine speed. Approximately 37 meters per minute is recommended on straight lines.
You are running toward the clamps.	Run the tool away from the clamps.
The wheel is not turning.	Clean and lubricate the tool (See Installation and Operating Instructions). Inspect the bearings for flat spot.
Strips are twisting (Rolling Shear).	Alternate the tool angle from 0° to 180°.

VI. Tool Maintenance

A. Cleaning and Lubricating

It is important to clean and visually inspect the bearings for flat spots at least every 8 hours of operation and more if the need arises. Likewise, clean the wheels for ease of motion and clean bearings if wheels do not turn freely. Visually inspect the wheels for chips or cracks. Wipe away any accumulated dirt and grit.

After cleaning, lubricate the wheels and bearings with a light to medium weight machine oil.

The wheel assembly should be replaced if you notice any chips or cracks in the wheels, or if flat spots occur in the bearings. The Wilson Wheel Family of tooling is **not** resharpenable.

VII. Machine Specifics and Programming

GENERAL INFORMATION

A. Parameters

All parameters are based on the following:

1. Punch length is 38mm.

B. Tool Length Adjustment

1. The maximum recommended stroke change at any one time is 0.1mm.

2. The tips of the Rolling Pincher must never touch. Final stroke adjustment with this tool is critical. Approximately 0.1mm of material should remain for best results.

5. Two passes are recommended for the Rolling Pincher. On materials thicker than 1.2mm **multiple passes must be used**. For example, when using the Rolling Pincher on 2.0mm mild steel: The first pass should pinch .95mm, the second pass should pinch an additional .95mm, total material pinched = 1.9mm.

C. Operating Restrictions

1. Standard dead zone restrictions apply with this tool.

2. Minimum distance from the edge of a form is 25mm.

3. Minimum radius increases with material thickness, the following values are minimum radii for 1.2mm material:

Shear tool	45mm
Offset tool	25mm
Rib tool	16mm
Pincher tool	500mm

D. Table Speed Specifications

1. Straight lines can be run at full table speed, but Wilson Tool recommends approximately 37 metres per minute.

2. A table speed of 37 metres per minute would apply when running large arcs, i.e. 2000mm radius. Table speed should be reduced for smaller arcs i.e. 7.5 metres per minute for a radius of 100mm.

E. Multiple Passes

1. The Rolling Shear should never pass over a cut line more than once.

2. The Rolling Pincher provides better results if two passes are used and must always take multiple passes of increasing depth if the material is over 1.2mm.

3. Rolling Rib and Rolling Offset tools can take multiple passes if desired. Multiple passes must be made if the form height is greater than 4.0mm.

F. Starting Location

1. When running the tool in a straight line, always start in the middle of the sheet or at the edge. Do not roll through hole. Stop the tool at the edge of the hole, move to the other side and start rolling again.

G. Penetration of Material

1. When using the Rolling Shear, if you make a cut and it fails to penetrate the material, **DO NOT** re-cut in the same place to set the stroke. Adjust the stroke and start again in a new location.

H. Establishing the Stroke Length

1. When installing a Wilson Wheel tool in a machine, the tool length must be determined. The tool length is measured from the top of the alignment ring to the underside of the punch. A value of 38.0mm is applicable for these tools.

2. Always use a straight line to establish the correct stroke length.

3. Stroke length usually varies depending on material thickness. When changing materials, shorten the tool length on your machine before testing.

I. Programming

1. ToPs 300 as of Version 4.1 supports the wheel tools.

J. Machine and Wheel Technology

1. In the case of steel plates with higher yield strengths or if the contour is located in an unfavourable position in the sheet, the form should be produced in several steps with increasing plunge depth offset (BDC).

2. With wheel tools, machining is possible at up to the maximum axes traverse rate if working in the preferred direction, Y+. Processing should preferably take place in a pulling manner, i.e. away from the clamps.

3. The start point must always be located inside the sheet.

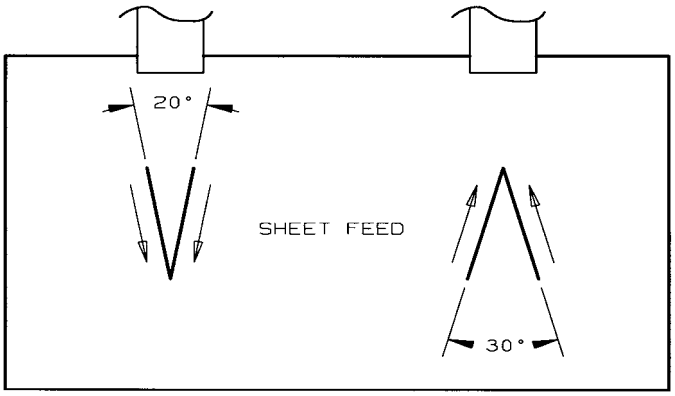
4. The Rolling Shear tool must never be run without material as cutting edges will be damaged.

5. The wheel tool must always be removed from the punch adapter before switching the machine off.

6. A tangential withdrawal motion of at least 6mm must be programmed after each cut.

7. Inside corners must be punched free at least 6mm.

8. Angles up to 20° must be cut in a pulling motion, over 20° can be cut in a pushing motion. The resulting angles are **very** sharp.



9. For sheets longer than 1250mm, the use of at least 3 clamps is recommended.

10. Orientation of the cutting wheels relative to the workpiece must be uniform throughout a contour.

11. Burr from the Shear Wheel and form on Offset Wheel are dependant on sheet feed direction and tool angle. Reverse the feed direction to reverse the form / burr.

12. Parts / scrap can be removed only at the end of the cut, after the withdrawal motion.

13. Automated part removal is not possible. Due to the tool principle, the die clearance is 0mm. The part could therefore become tilted.