



Assembly and Operating Instructions Strap On Surface Grinder Attachment



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Made in Australia



WARNING: This manual provides manufacture's information on the assembly, set up and operation of this equipment. Failure to understand the contents of this document may result in serious harm or injury.

The owner/operator of this equipment is responsible for the safe assembly and operation of the equipment. 84Engineering is not liable for any injury or damage as a result of operator negligence, misuse of the machine, failure to utilise approved accessories or spare parts or unauthorised modifications to the machine.

If there are any questions or comments. Please contact your 84Engineering equipment provider.



WARNING: All dust created as a result of surface grinding utilising the Strap on Surface Grinder attachment should be considered harmful to human health at all levels of exposure.

An appropriate respiratory mask should be used whenever the machine is being operated.



WARNING: Packing materials may present a choking or suffocation hazard to children or pets. Dispose of all packing materials in an environmentally responsible manner.

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1. Safety instructions

1.1. General Machinery


- Read and understand the entire manual before assembling or operating machinery.
- Always use correct safety equipment including hearing protection, eye protection and respiratory protection.
- Wear suitable clothing. Remove loose clothing, remove jewellery such as rings and necklaces and keep loose hair tied back or contained.
- Keep machinery and work area clean and tidy and free of trip hazards.
- Do not use machinery when tired or under the influence of prescription drugs, non-prescription drugs or alcohol.
- All machinery operators must be properly trained in the operation of the equipment and suitably supervised.
- Do not reach over an operating machine and ensure footing is secure.
- Check machine for damaged components and maintain as necessary.
- Only use original manufacturer's accessories and spare parts.
- Do not force the machine or exceed its capacity.
- Do not leave the machine running when unattended and ensure the machine has come to a stop before walking away following machine operation.
- Ensure machine is securely mounted or where mobile bases are utilised ensure wheels are locked prior to operating the machine.
- Keep children and visitors away from operating machines and consider childproofing the workshop area.
- Do not use machine in wet or damp areas or in areas that may have flammable or noxious fumes.
- Ensure there is sufficient lighting around the machine and on the machine workface.
- If the machine is powered using an extension cord ensure that the extension cord is the correct amperage and the cord is correctly sized for the length of extension cordage. Ensure cord is installed in a manner that ensures it cannot be damaged. Inspect cord prior to starting the machine.
- Disconnect power before servicing the machine.

1.2. Grinders


- Make sure that the grinder is turned off and has come to a complete rest before moving the belt tension adjuster, loosen or adjust support arms or tool rest or carrying out cleaning or inspection of the belt grinder.
- Never start or operate a grinder that is damaged or excessively worn.
- Ensure all lock levers are sufficiently tightened prior to operating the grinder.
- Do not operate the grinder with damaged or torn belts or damaged or torn abrasives on disc grinders.
- Ensure belts that are marked with a direction of travel on the reverse side are correctly orientated on the belt grinder.

- Ensure the direction of travel for the belt is commensurate with the task being performed.
- All dusts should be considered harmful to human health. Suitable respirators should be worn whenever using the belt grinder. Some dusts may cause allergic reactions to skin and surface membranes.
- Do not wear gloves while operating grinders.
- Do not turn on grinders with the workpiece in contact with the abrasive grinding surface.
- When operating disc grinders, only grind on the portion of the disc rotating in a downwards direction.
- Never leave the grinder running whilst unattended.
- The grinder is a hand hazard. Keep fingers and hands clear of moving parts and moving abrasive surfaces.

1.3. Spark Control

 WARNING	WARNING: The surface grinder may produce a considerable concentration of sparks at the end of the linear rail directed towards the base of the grinder when operated in the vertical position or beside the grinder when operated in the horizontal position. This may be an ignition source for any nearby combustible materials.
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1.4. Dust Extraction Systems

 WARNING	WARNING: Dust extraction systems may present a fire hazard when grinding metallic materials due to potential build-up of hot/inflammable grinding debris.
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2. Technical Data

Table 1 – Technical Data

	Specification	Surface Grinder
Strap On Surface Grinder Attachment (SOSGA)	Grinder compatibility	Suitable for use with: <ul style="list-style-type: none"> • 48" Shopmate • 60" Shopmate • 72" Shop Master • 72" Gibson 72
	Weight	Approx 13 kgs
	Max Belt Speed when utilising surface grinder	4500 surface feet per minute belt speed (full speed)
	5" contact wheel	Yes
	Platen Size	35 cm
	Magnetic Chuck	Yes
	Attachment point for digital travel indicator	Yes
	Precision taper grinding roll pins	Yes
	Magnetic chuck end stop	Yes
Spare Parts and Attachments	Replacement magnetic chuck face	
	48" Shopmate SOSGA arm	
	60" Shopmate SOSGA arm	
	72" Shop Master SOSGA arm	
	Gibson 72 SOSGA arm	

3. Assembly

3.1. Component assembly

Connect the aluminum Strap on Surface Grinder Attachment (SOSGA) arm to the arm mount utilizing the 2 off M10 bolts provided and mount the support arm on the grinder in the top arm slot.

Slide the magnetic chuck rail on to the three rail guide wheels.

Figure 1 – Assembly of SOSGA arm to inner tube

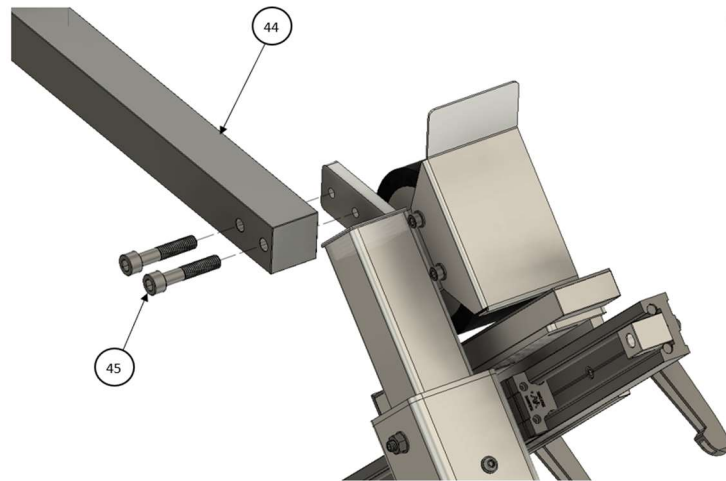


Figure 2 – Inner tube components

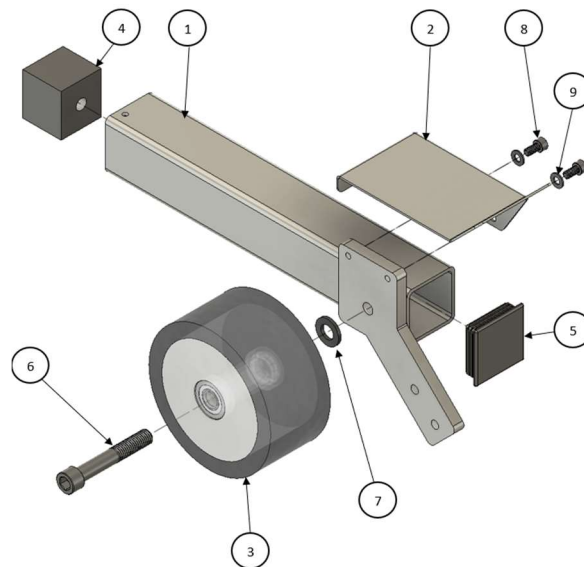


Figure 3 – SOSGA body components

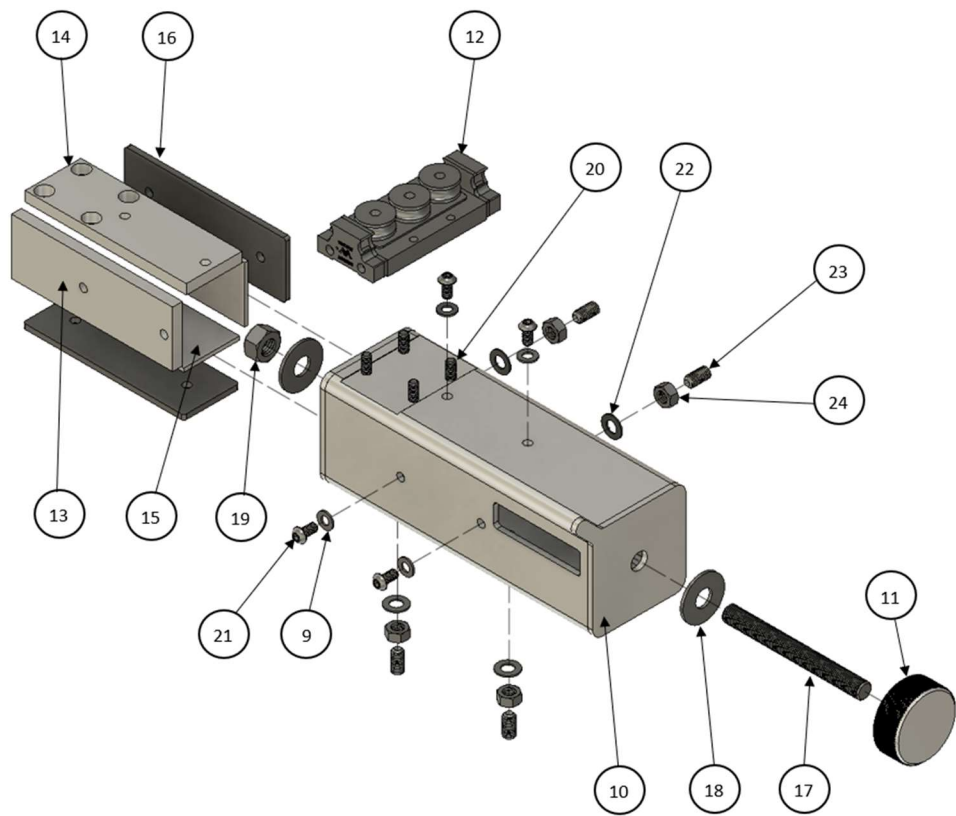


Figure 4 – SOSGA final assembly

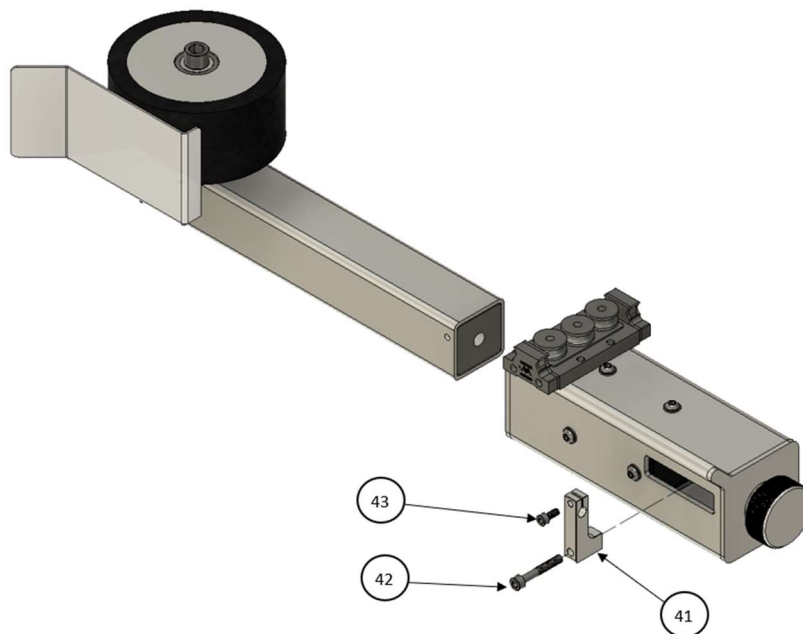
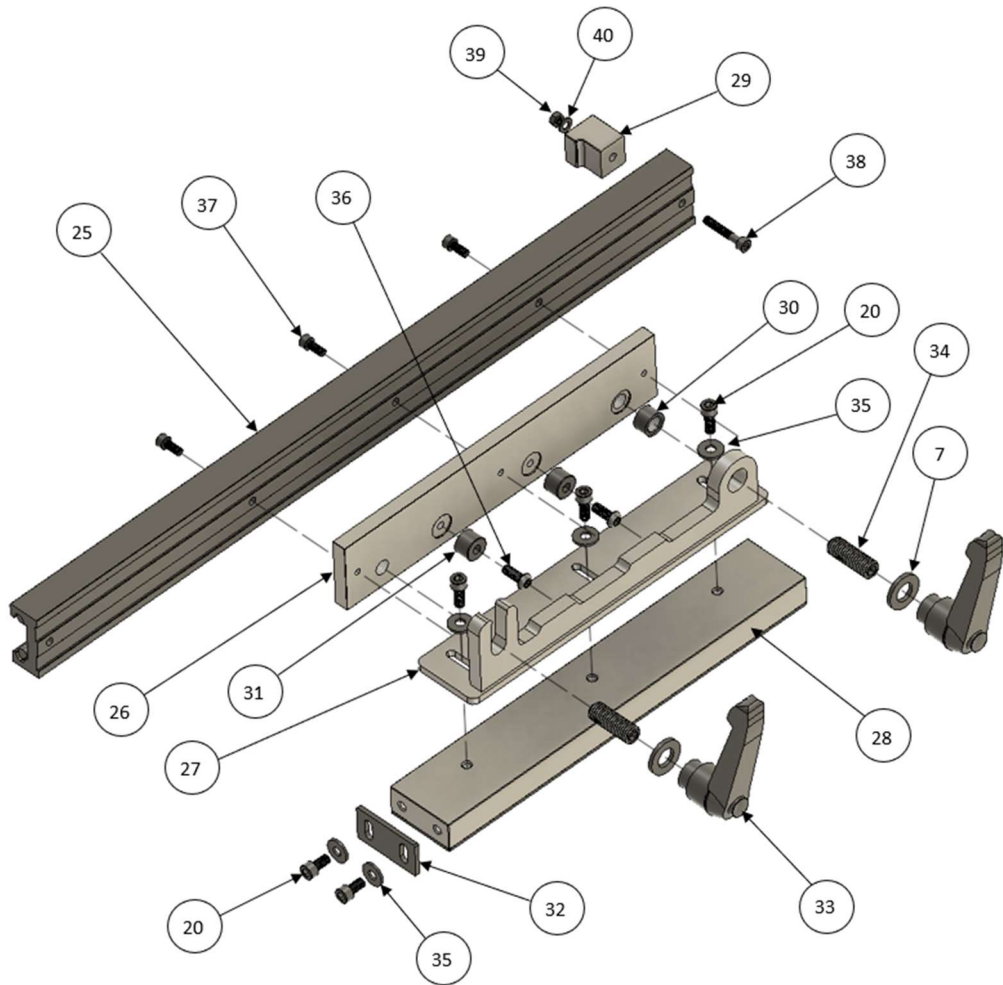


Figure 5 –Linier rail and magnetic chuck components



Parts List

Table 2

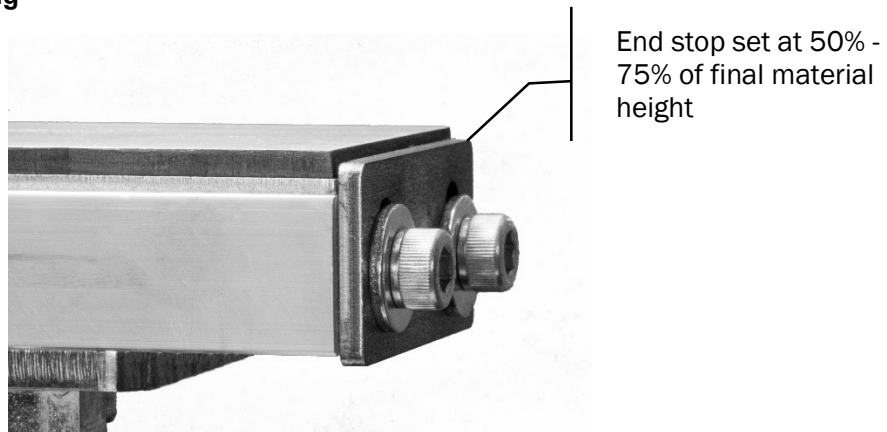
Item	QTY	Part Name	Bolt torque required
		Arm mount/inner tube	
1	1	SOSGA Arm Mount/Inner tube assembly	
2	1	SOSGA Guard	
3	1	SOSGA Wheel	
4	1	SOSGA Infeed nut	
5	1	50mm SHS end cap	
6	1	M12x75 SHCS	40NM
7	3	M12 Washer	
8	2	M6x12 SHCS	10NM
9	6	M6 Washer (small)	
		Body	
10	1	SOSGA Body	
11	1	SOSGA Infeed knob	
12	1	Linear rail guide rollers assembly	
13	1	SOSGA LHS UHM liner	
14	1	SOSGA Top UHM liner	
15	2	SOSGA RHS/Bot UHM liner	
16	2	SOSGA RHS/Bot Steel liner	
17	1	SOSGA Infeed thread	
18	2	M12 Nylon washer	
19	1	M12 Nylock nut	6NM
20	9	M6x16 SHCS	10NM
21	4	M6x12 BHCS	6NM
22	4	M8 Washer (small)	
23	4	M8x16 Grub screw	4NM
24	4	M8 Nut	15NM
		Chuck/Linear rail	
25	1	Linear Rail	
26	1	SOSGA Sine bar base	
27	1	SOSGA Sine bar/chuck mount assembly	
28	1	SOSGA Chuck	
29	1	SOSGA Linear rail stop	
30	1	SOSGA Sine bar pivot	
31	2	SOSGA Sine bar roll	
32	1	SOSGA Chuck stop	
33	2	M12 Adjustable handle	
34	2	M12x35 Grub screw	50NM
35	5	M6 washer (large)	
36	2	M6x15 BHCS	7NM
37	3	M5x12 SHCS	7NM
38	1	M5x30 SHCS	4NM
39	1	M5 Nut	
40	1	M5 Washer	
		Final Assembly	
41	1	SOSGA Dial gauge bracket	
42	1	M6x40 SHCS	6NM
43	1	M5x12 SHCS	3NM
		Mounting to arm	
44		SOSGA Arm **Not included**	
45a	2	M10x30 for SM-48	50NM
45b	2	M10x40 for SM-72/Gibson 72	50NM

4. Operation

The following guidelines should be followed when operating the strap on surface grinder

- Ensure the belt is running in the normal forward direction.
- The belt should be running at maximum belt speed for course grinding of ferrous materials and below maximum speed for fine grinding or when grinding non-ferrous materials.
- Grinding “cuts” should be no more than 0.01mm deep. This equates to approximately 1/12 of a turn of the depth adjustment knob located on the base of SOSGA Body. For fine belt grits reduced cut depths are required.
- Best results are obtained from commencing with a course belt (40 – 50 grit) and finishing with a 120 grit belt.
- The material being ground should be in contact with the end stop at the base of the magnetic chuck and the end stop should be set to 50% - 75% of the thickness of the material being ground or to the maximum setting of the end stop.

Figure 6 End stop setting



A digital dial indicator may be mounted on the support bracket as shown in Figure 7. The dial indicator allows precise measurement of material removal. NOTE: The digital indicator is not supplied as a component of the SOSGA and must be sourced from other equipment suppliers.

Figure 7 – Digital dial indicator mounting

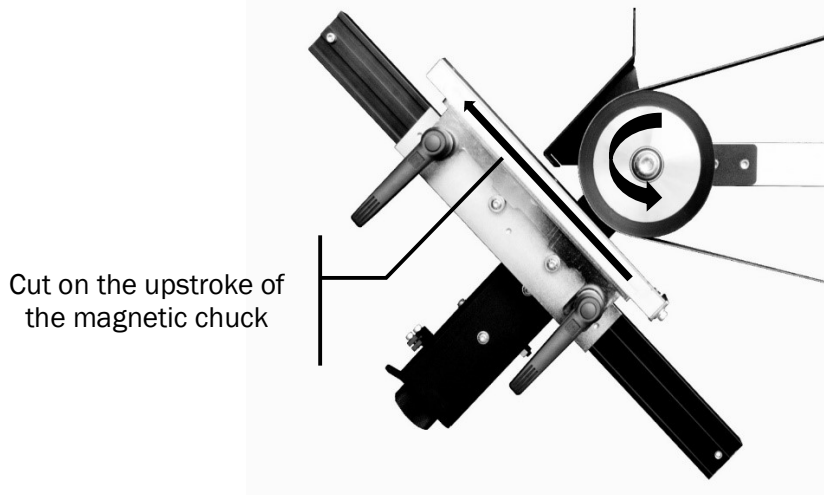




WARNING:

- Ensure the 5" contact wheel is not in contact with the magnetic chuck or the material to be ground when the grinder is switched on.
- Only cut on the "up stroke" moving the linear rail magnetic chuck towards you.

Figure 8 Material cutting direction



5. Trueing the Chuck Face

Prior to using the strap on surface grinder, the magnetic chuck face must be trued to ensure it is parallel with the surface of the 5" grinding wheel. The following steps outline the process for trueing the magnetic chuck face.

- Ensure the taper tang adjustment arm is set to zero and is hard against the roll pins and that the adjustable handles are tightened. (Refer section 6 below)
- Using a new 40-50 grit belt, flatten the magnetic chuck face using small increment passes



CAUTION:

If grinding passes are excessively deep the replaceable chuck face may overheat and warp.

- Once the magnetic chuck face has been trued, refine the finish using a new 120 grit belt.
- Use the belt tracking adjustment to move the position of the belt to overlap the edge of the magnetic chuck face to ensure the full surface area of the magnetic chuck face is ground.
- Chamfer the edges of the magnetic chuck face with a fine hand file.

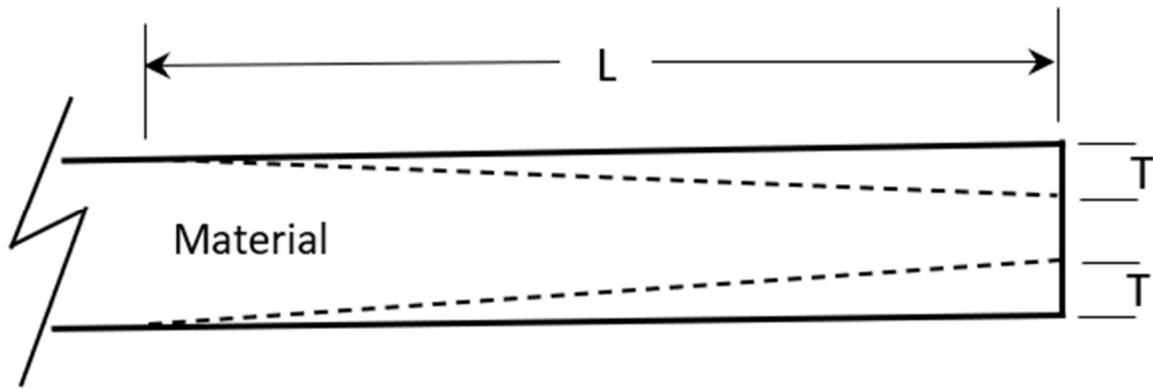
6. Grinding Tapers

The Strap on Surface Grinder allows grinding of distal tapers on blades and tangs by tilting the sliding magnetic chuck by known amounts.

6.1. Calculation of Chuck Offset (CO)

The Chuck Offset is calculated as a function of the amount of material to be removed and the length over which the material is to be removed as shown in Figure 9 below.

Figure 9 Taper grinding set up



$$CO = \left[\frac{T}{L} \right] \times 150$$

CO = Chuck Offset

T = Maximum thickness of material to be removed from each side

L = Length of the taper

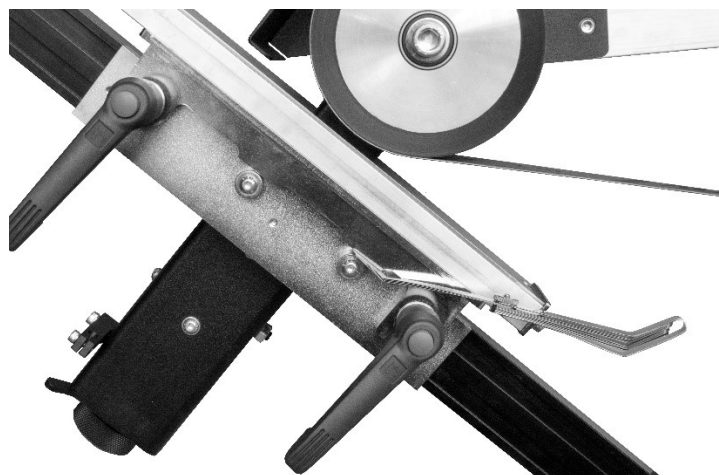
150 = Distance (mm) between the magnetic chuck fulcrum point (front locking handle) to the end taper grinder roll pin.

6.2. Set-up for grinding

Initial Side

- Using feeler gauges make a shim equal to CO as calculated above.
- Loosen taper stop handles.
- Place the shim under the end (closest to the grinder) precision taper grinder roll pin and tighten handles (refer Figure 10 below). Remove shim.

Figure 10 End roll pin shim set-up

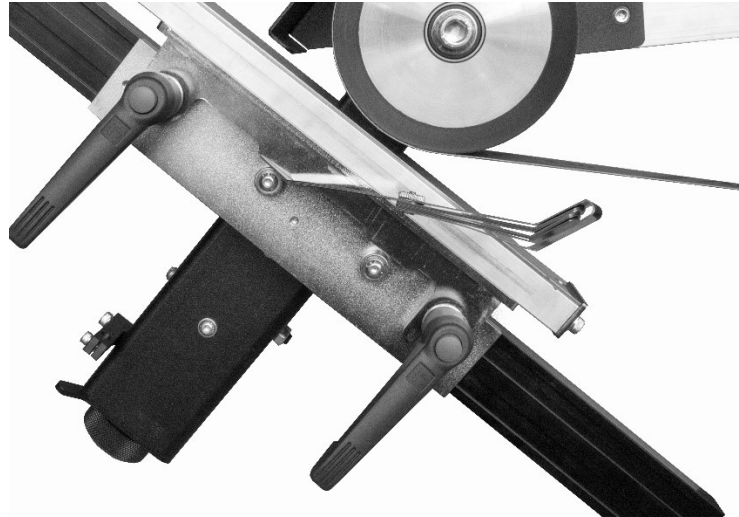


- Grind the taper until the desired taper length has been reached.

Revers Side

- Loosen taper stop handles.
- Place the shim under the middle (closest to the operator) precision taper grinder roll pin and tighten handles (refer Figure 11 below). Remove shim.

Figure 11 Middle roll pin shim set-up



- Flip the material and commence grinding the taper until the desired taper length has been reached. Care needs to be taken so that the face of the taper just ground is sitting flat on the chuck.
- Grind the taper until the desired taper length has been reached.



HELPFUL HINT:

- When grinding the reverse side taper, wedge the front end of the material being ground to ensure the previously ground taper is sitting flat on the magnetic chuck. This will prevent the material from flexing resulting in a curved taper.
- Mark the limit of the taper grind with layout dye or similar to make the length of the grind easily visible.



CAUTION:

Ensure the magnetic chuck is returned to zero taper setting and tighten handles on completion to ensure unwanted tapers are not ground.

7. Cleaning and maintenance

Metal dust and belt debris are highly abrasive. Keep the Strap on Surface Grinder and in particular moving parts and guide wheels free of dust and debris



CAUTION:

All components are self-lubricating and lubricants of any type should not be used as it will attract and hold grinding dust and belt debris. Compressed air must **not** be used to clean the grinder or SOSGA.

8. Tips and hints

This section is for information only. It remains the operator's responsibility to ensure that the Strap On Surface Grinder Attachment is operated in a safe manner at all times.

- Clean the magnetic chuck often to reduce damage to already ground surfaces in contact with the magnetic chuck face.
- If the metal that will be in contact with the magnetic chuck has been ground to a high-grade finish, after removing all metal dust and belt debris, place a thin piece of paper between the magnetic chuck and the material to protect the finished face.



CAUTION:

- Use thin paper as the paper will reduce the effectiveness of the magnetic chuck.
- Be aware that the paper may catch fire

- To thickness wood, finish one side on the belt grinder platen. Attach the wood to the magnetic chuck using thin (nil foam) double sided tape or by gluing the wood to support steel using cyanoacrylate glue (super glue).



CAUTION:

Ensure the wood is supported by the magnetic chuck end stop to help prevent breakaway from the double-sided tape or supporting steel.

- When grinding non-ferrous metals attach them to a piece of support steel using cyanoacrylate glue.



CAUTION:

Materials such as brass may heat quickly which may cause the cyanoacrylate glue to fail releasing the brass. It is recommended that the brass is placed at the end of the support steel so that it can be supported by the magnetic chuck end stop.

- When surface grinding narrow materials, track the belt from side to side to even out wear of the belt.
- Best results are obtained from using stiff backed grinding belts.

9. Trouble Shooting

Table 3

Issue	Possible Cause	Action
Following surface grinding of both sides of materials, the two surfaces are not parallel.	Magnetic chuck face plate is not true and parallel to the 5" grinding wheel face	Re-true the magnetic chuck face plate (refer section 5 above)
Finish quality low or flatness is not achieved.	Excessive material removal from each pass of the magnetic chuck and linear rail	Reduce depth of cut
Magnetic chuck not holding materials properly	Debris between the magnetic chuck face plate and the material	Clean magnetic chuck of debris.
	Magnetic chuck face plate is warped	Replace magnetic chuck face plate
The grind is uneven along the length of the material	Material is not placed straight on the magnetic chuck	Straighten the material
Grinder bogs down whilst grinding	Taking an excessive depth cut in one pass	Reduce grinding depth
	Grinding belt is loose	Check and adjust belt tension as necessary