



CUT-OFF WHEEL TOOL INSTRUCTION MANUAL

101 mm (4 in.)

18,000 RPM

Important Safety Information

Please read, understand and follow all safety information contained in these instructions prior to the use of this tool. Retain these instructions for future reference.

Intended Use

This pneumatic tool is intended for use in industrial locations, and used only by skilled, trained professionals in accordance with the instructions in this manual. This pneumatic tool is designed to be used with the appropriate size Type 1 and Type 41 abrasive cut-off wheel for cutting metals. It should only be used for such cutting applications and within its marked capacity and ratings. Only accessories specifically recommended by 3M should be used with this tool. Use in any other manner or with other accessories could lead to unsafe operating conditions.

Do not operate tool in water or in an excessively wet application.
Do not use cut-off wheels that have a Max RPM less than the marked RPM rating on the tool.




Summary of device labels containing safety information	
Marking	Description
	WARNING: Refer to Instruction Manual
	Direction of Rotation
90psi / .62Mpa / 6.2Bars Max	Maximum Pneumatic Inlet Pressure
18,000 RPM	Maximum Rotational Speed
Use accessories rated at tool RPM or higher	Accessories Safety Note
Prolonged vibration may cause injury	Vibration Safety Note

Explanation of Signal Word Consequences

WARNING: Indicates a potentially hazardous situation which, if not avoided, may result in death or serious injury and/or property damage.

CAUTION: Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury and/or property damage.

Read the Material Safety Data Sheets (MSDS) before using any materials.

Contact the suppliers of the workpiece materials and abrasive materials for copies of the MSDS if one is not readily available.

WARNING

Exposure to **DUST** generated from workpiece and/or abrasive materials can result in lung damage and/or other physical injury.

Use dust capture or local exhaust as stated in the MSDS. Wear government-approved respiratory protection and eye and skin protection.

Failure to follow this warning can result in serious lung damage and/or physical injury.



WARNING

To reduce the risks associated with impact from abrasive product or tool breakup, sharp edges, hazardous pressure, rupture, vibration and noise:

- Read, understand and follow the safety information contained in these instructions prior to the use of this tool. Retain these instructions for future reference.
- Only personnel who are properly trained should be allowed to service this tool.
- Practice safety requirements. Work alert, have proper attire, and do not operate tools under the influence of alcohol or drugs.
- Operators and other personnel must always wear protection for eyes, ears, and respiratory protection when in the work area or while operating this product. Follow your employer's safety policy for PPE's and/or ANSI Z87.1 or local/national standards for eyewear and other personal protective equipment requirements.
- Wear leather apron or other protective apparel, taking into consideration the type of work being done.
- Never exceed marked maximum input pressure (90psi / .62Mpa / 6.2Bars).
- Proper eye protection must be worn at all times.
- Tool is not to be operated in the presence of bystanders.
- If you notice any abnormal noise or vibration when operating the product, immediately discontinue its use and inspect for worn or damaged abrasive product or accessories. Correct or replace the suspect component. If abnormal noise or vibration still exists, return the tool to 3M for repair or replacement. Refer to warranty instructions.
- Never operate this tool without all guards or safety features in place and in proper working order.
- Prior to use, ensure guard is oriented to protect the operator from flying fragments and is properly secured.

WARNING

- Make sure the tool is disconnected from its air source before servicing, inspecting, maintaining, cleaning, and before changing abrasive product.
- Only use wheel retainers (flanges) and wheel arbors supplied by 3M.
- Never use this tool with depressed center wheels.
- Prior to use, or if dropped or jammed, inspect wheel retainers and wheel arbors and abrasive product for possible chips, cracks or other damage, and insure the abrasive product is correctly secured. If damaged, or if safety labels cannot be read, replace with new abrasive product, wheel retainers, wheel arbors and/or labels available from 3M.
- Never use a damaged cut-off tool until it has been repaired.
- Never over-ride or disable the safety features of the start-stop control such that it is in the on position.
- Use only with mounting hardware recommended by 3M; check with 3M for mounting hardware requirements.
- If the tool is jammed, shut off the tool and ease it free. Ensure the abrasive product is correctly secured.
- Do not use cut-off wheel tool for side grinding.
- Never allow this tool to be used by children or other untrained people.
- Do not leave an unattended tool connected to air source.

To reduce the risks associated with skin abrasion, burns, cutting & severing, impact or entrapment:

- Never install and use router bits in a cut-off tool.
- Never install cut-off wheels in a tool which is unguarded.
- Keep hands, hair, and clothing away from the cutting part of the tool.
- Wear suitable protective gloves while operating tool.
- Do not touch the rotating parts during operation for any reason.
- Do not force tool or use excessive force when using tool.

To reduce the risks associated with vibration:

- If any physical hand/wrist discomfort is experienced, work should be stopped promptly to seek medical attention. Hand, wrist and arm injury may result from repetitive work, motion and overexposure to vibration.

To reduce the risks associated with loud noise:

- Always wear hearing protection while operating this tool. Follow your employer's safety policy or local/national standards for personal protective equipment requirements

To reduce the risks associated with fire or explosion:

- Do not operate the tool in explosive atmospheres, such as in the presence of flammable liquids, gases, or dust. The abrasives are able to create sparks when working material, resulting in the ignition of the flammable dust or fumes.
- Refer to MSDS of material being worked as to potential for creating fire or explosion hazard.

To reduce the risks associated with hazardous dust ingestion or eye/skin exposure:

- Use appropriate respiratory and skin protection, or local exhaust as stated in the MSDS of the material being worked on.

To reduce the risks associated with hazardous voltage:

- Do not allow this tool to come into contact with electrical power sources as the tool is not insulated against electrical shock.

CAUTION!

To reduce the risks associated with whipping or hazardous pressure/rupture:

- Ensure supply hose is oil resistant and is properly rated for required working pressure.
- Do not use tools with loose or damaged air hoses or fittings.
- Be aware that incorrectly installed hoses and fittings might unexpectedly come loose at any time and create a whipping/impact hazard.

To reduce the risks associated with flying off of accessory parts:

- Use care in attaching abrasive product and mounting hardware; following the instructions to ensure that they are securely attached to the tool before use.
- Never point this product in the direction of yourself or another person, or start tool unintentionally.
- Never over-tighten accessory fasteners.

PARTS LIST FOR PN 28407, 18,000 RPM, 4" CUT-OFF WHEEL, EXTENDED

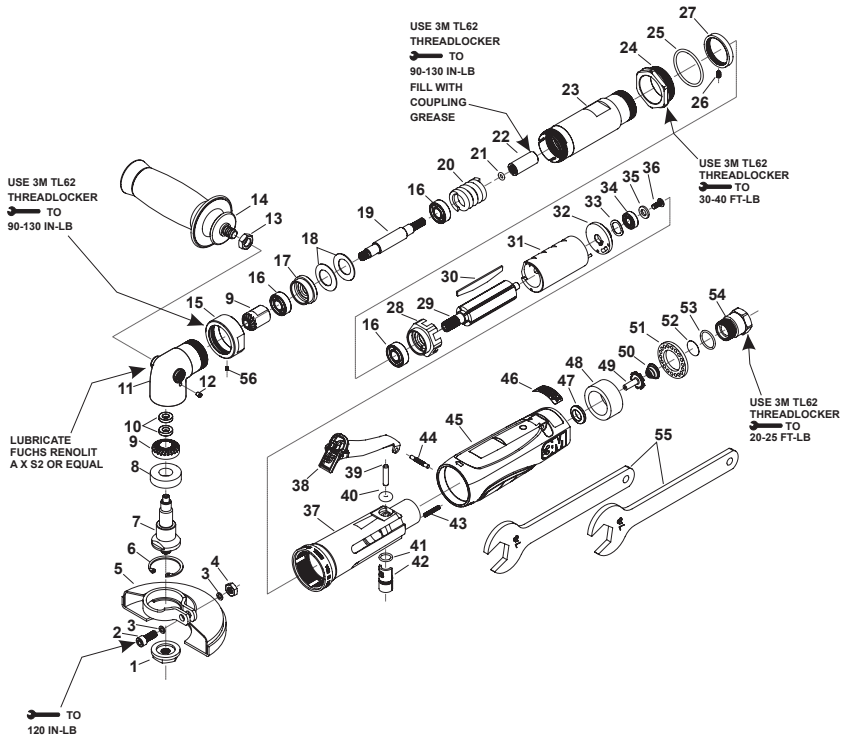


Fig	3M PN	DESCRIPTION	Fig	3M PN	DESCRIPTION
1	06585	Type 1 Wheel Retainer	30	06643	Vane Set
2	55076	Socket Head Hex Screw, 1/4-20	31	06563	Cylinder
3	66766	Washer (2)	32	06560	Rear End Plate
4	55083	Hex Nut, 1/4-20	33	06527	Wave Washer
5	55104	4" Cutoff Guard	34	06508	Ball Bearing
6	55088	Retaining Ring	35	06567	Washer
7	55105	Output Spindle 5/8-11 Thread	36	06568	Button Head Cap Screw 8-32 x 3/8 in.
8	55078	Ball Bearing	37	06638	Housing
9	28832	Gear Set	38	06642	Lever Assembly
10	55114	Ball Bearing 1/2 in. x 1/4 in. x 1/8 in. (2)	39	06558	Pin Torr 3/16 in. x 7/8 in.
11	55111	Angle Head	40	06543	O-Ring
12	06523	Grease Fitting 1/8 in.	41	06511	O-Ring 1/16 in. x 3/8 in. x 1/2 in.
13	06503	Jam Nut	42	06556	Regulator
14	28402	Support Handle	43	06501	Set Screw 6-32 x 3/4 in.
15	28731	Tapered Clamp Nut	44	06559	Knurl Pin
16	06510	Ball Bearing (3)	45	06598	Housing Cover
17	55092	Bearing Holder	46	06566	Warning Label
18	55110	Disc Spring (2)	47	06552	Throttle Valve Seat
19	28732	Shaft	48	06557	Muffler
20	55097	Spring	49	06553	Throttle Valve
21	28733	O-ring	50	06554	Taper Spring
22	28734	Coupler	51	55084	Exhaust Deflector
23	28735	Extension Housing	52	06555	Screen
24	06653	Angle Head Clamp Nut	53	06608	O-Ring 1/16 in. x 5/8 in. x 3/4 in.
25	06609	O-ring	54	55107	Bushing 3/8 in. NPT
26	66774	6-32 x 1/4 in. Socket Head Set Screw	55	06522	Wrench 7/8 in. Flat (2)
27	28736	Locking Clamp Nut	56	55077	Set Screw 6-32 x 1/8 in.
28	06639	Front End Plate			
29	06561	Rotor (5 slot)			

Product Configuration/Specifications:

Model Number	Wheel Size mm (in.)	Speed RPM	Product Net WT. kg. (lb.)	Height mm (in.)	Length mm (in.)	*Noise Level dBA Pressure (Power)	**Vibration Level m/s ² (ft/s ²)	**Uncertainty K m/s ²
28407	102 (4)	18,000	1.26 (2.77)	119 (4.7)	216 (8.5)	85.5 (97.1)	3.9 (12.8)	0.09

* Declared noise levels; measurements carried out in accordance with standard EN ISO 15744.

** Declared vibration levels in accordance with EN ISO 20643 and EN ISO 28927-1.

IMPORTANT NOTE: The noise and vibration values stated in the table are from laboratory testing in conformity with stated codes and standards and are not sufficient risk evaluation for all exposure scenarios. Values measured in a particular work place may be higher than the declared values. The actual exposure values and amount of risk or harm experienced to an individual is unique to each situation and depends upon the surrounding environment, the way in which the individual works, the particular material being worked, work station design, as well as upon the exposure time and the physical condition of the user. 3M cannot be held responsible for the consequences of using declared values instead of actual exposure values for any individual risk assessment.

Operating/Maintenance Instructions

The tool is intended to be operated as a hand held tool. It is always recommended that while using the tool, operators stand on a solid floor, in a secure position with a firm grip and footing. Be aware that the tool can develop a torque reaction. See the section "SAFETY PRECAUTIONS".

Use a clean lubricated air supply that will give a measured air pressure at the tool of 6.2 bar (90 psig) when the tool is running with the lever fully depressed. It is recommended to use an approved 10 mm (3/8 in) x 8 m (25 ft) maximum length airline for the 3 in. cut-off wheel tool and a 12.7 mm (1/2 in) x 8 m (25 ft) maximum length airline for the 4 in. and larger cut-off wheel tools. Connect the tool to the air supply as shown in Figure 1. Do not connect the tool to the airline system without an easily accessible air shut off valve. It is strongly recommended that an air filter, regulator and lubricator (FRL) be used as shown in Figure 1 as this will supply clean, lubricated air at the correct pressure to the tool. In any case appropriate air pressure regulators shall be used at all times while operating this tool where the supply pressure exceeds the marked maximum of the tool. Details of such equipment can be obtained for your tool distributor. If such equipment is not used, the tool should be manually lubricated. To manually lubricate the tool, disconnect the airline and put 2 to 3 drops of suitable pneumatic motor lubricating oil such as 3M™ Air Tool Lubricant PN 20451, Fuji Kosan FK-20 or Mobil ALMO 525 into the hose end (inlet) of the tool. Reconnect tool to the air supply and run tool slowly for a few seconds to allow air to circulate the oil. If the tool is used frequently, lubricate it on a daily basis or lubricate it if the tool starts to slow or lose power. It is recommended that the air pressure at the tool be 6.2 bar (90 psig) while the tool is running so the maximum RPM is not exceeded. The tool can be run at lower pressures but should never be run higher than 6.2 bar (90 psig). If run at lower pressure the performance of the tool is reduced.

Recommended Airline Size - Minimum		Recommended Maximum Hose Length		Air Pressure	
10 mm	3/8 in	8 meters	25 feet	Maximum Working Pressure	6.2 bar 90 psig
12.7 mm	1/2 in			Recommended Minimum	NA NA

Lubricate the angle head every 6-8 working hours with premium grease with the following properties:

- High and low temperature performance
- Shear stable
- Anti-wear protection
- Low viscosity base flare for high speed application
- Very low coefficient of friction

Fuchs Renolit AX S2 or equal is recommended. Grease gun and grease available from your grease supplier.

Safety Precautions

1. Read all instructions before using this tool. All operators must be fully trained in its use and aware of these safety rules.
2. The tool RPM should be checked on a regular basis (at shift change).
3. Make sure the tool is disconnected from the air supply. Select a suitable abrasive cut-off wheel and secure it to the mounting shaft using the wheel retainer and wheel arbor supplied with the tool. Be careful to center the cut-off wheel on the wheel arbor before tightening the wheel retainer nut. Do not over tighten the wheel retainer or you will crack the wheel.
4. Always wear required safety equipment when using this tool.
5. Always disconnect the air supply to the tool before fitting, adjusting or removing the abrasive cut-off wheel.
6. Always adopt a firm footing and grip and be aware of torque reaction developed by the tool.
7. Use only 3M approved spare parts.
8. Always ensure the material being worked is firmly fixed to avoid movement.
9. Check hose and fittings regularly for wear. Do not carry the tool by its hose; always be careful to prevent the tool from being started when carrying the tool with the air supply connected.
10. Dust can be highly combustible. Keep work area clean.
11. If tool is serviced or rebuilt check to ensure that the maximum tool RPM is not exceeded and that there is no excessive tool vibration.
12. Do not exceed maximum recommended air pressure. Use safety equipment as recommended.
13. Prior to installing any abrasive cut-off wheel, always check that its marked maximum operating speed is equal or higher than the rated speed of this tool.
14. The tool is not electrically insulated. Do not use where there is a possibility of contact with live electricity, gas pipes, and/or water pipes.
15. Take care to avoid entanglement with the moving parts of the tool with clothing, ties, hair, cleaning rags or loose hanging objects. If entangled, stop air supply immediately to avoid contact with moving tool parts.
16. Keep hands clear of the spinning cut-off wheel during use.
17. If the tool appears to malfunction, remove from use immediately and arrange for service and repair.
18. Do not allow the tool to free spin without taking precautions to protect any persons or objects from the rupture of the abrasive cut-off wheel.
19. Immediately release the start handle in the event of any disruption of pressure; do not attempt to re-start until the disruption has been corrected.
20. When tool is not in use, store in a clean, dry environment free of debris and in a manner that ensures that the cut-off wheel is not damaged.
21. Fixture workpiece such that the cut slot is kept at a constant or increasing width during the operation.
22. Operate tool in a well lit work area.
23. Recycle or dispose of tool according to Local, State, and Federal regulations.
24. Whenever performing maintenance procedures, use care to avoid exposure to any hazardous substances deposited on the tool as a result of work processes. Also, refer to warnings related to dust exposure.

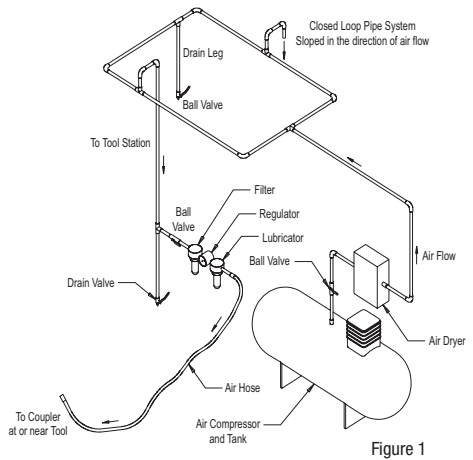


Figure 1

3M™ Cut-Off Wheel

3M Cut-Off Wheels are designed for use on the 3M Cut-Off Wheel Tools. Cut-Off Wheel Tool Model number 28407 is designed for use with 4" diameter and 102 mm diameter abrasive wheels. When mounting new, unused abrasive wheels, ensure the true wheel diameter is no larger than 106.3 mm and no smaller than 96.3 mm.

See 3M ASD Accessories to Optimize Performance catalog 61-5002-8098-9 and Engineered Metalworking Solutions. catalog 61-5002-8097-1 for additional accessories.

Cut-Off Tools Removing and Mounting Cut-Off Wheels on Tool

1. Disconnect air line from tool.
2. Use the 7/8" wrench for 4" cut-off tools to secure the tool spindle.
3. Use the second 7/8" wrench for 4" cut-off tools to turn the outer wheel retainer (flange) counter clockwise.
4. After the old cut-off wheel has been removed from the tool, inspect the threaded shaft to ensure that the threads are free of debris and undamaged.
5. Place the new cut-off wheel on the arbor with the center hole aligned on the smooth centering section of the wheel arbor.
6. Secure the tool spindle and wheel retainer (flange) with the appropriate wrenches and tighten the wheel retainer (flange). Be careful not to over tighten the wheel retainer (flange) or the cut-off wheel could be damaged.

Product Use: All statements, technical information and recommendations contained in this document are based upon tests or experience that 3M believes are reliable. However, many factors beyond 3M's control can affect the use and performance of a 3M product in a particular application, including the conditions under which the 3M product is used and the time and environmental conditions in which the product is expected to perform. Since these factors are uniquely within the user's knowledge and control, it is essential that the user evaluate the 3M product to determine whether it is fit for a particular purpose and suitable for the user's method of application.

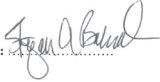
Warranty and Limited Remedy: 3M warrants this tool against defects in workmanship and materials under normal operating conditions for one (1) year from the date of purchase. 3M MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY IMPLIED WARRANTY ARISING OUT OF A COURSE OF DEALING, CUSTOM OR USAGE OF TRADE. User is responsible for determining whether the 3M tool is fit for a particular purpose and suitable for user's application. User must operate the tool in accordance with all applicable operating instructions, safety precautions, and other procedures stated in the operating manual to be entitled to warranty coverage. 3M shall have no obligation to repair or replace any tool or part that fails due to normal wear, inadequate or improper maintenance, inadequate cleaning, non-lubrication, improper operating environment, improper utilities, operator error or misuse, alteration or modification, mishandling, lack of reasonable care, or due to any accidental cause. If a tool or any part thereof is defective within this warranty period, your exclusive remedy and 3M's sole obligation will be, at 3M's option, to repair or replace the tool or refund the purchase price.

Limitation of Liability: Except where prohibited by law, 3M will not be liable for any loss or damage arising from the 3M product, whether direct, indirect, special, incidental or consequential, regardless of the legal theory asserted, including warranty, contract, negligence or strict liability.

Submitting a Warranty Claim: Contact your dealer when submitting a warranty claim in accordance with the restrictions listed above. Please note that all warranty claims are subject to manufacturer's approval. Be sure to keep your sales receipt in a safe place. This must be submitted when filing a warranty claim, within 1 year from the date of purchase. For additional assistance call 1-800-362-3550.

Product Repair after Warranty Has Expired: Repair of 3M Abrasive Power tools that are not under warranty is available through 3M or a 3M Authorized Tool Repair Representative. Contact your 3M Abrasive Power Tool Distributor for details, or call 1-800-362-3550.

For 3M Product Information Call:
800-3M HELPS (800-364-3577) toll free
651-737-6501 direct dial

EC Declaration of Conformity		CE
Manufacturers Name:	3M , Abrasive Systems Division	
Manufacturers Address:	3M Center, Building 223-6N-02 St Paul, MN USA 55144	
Does hereby declare that the machinery described below complies with those applicable essential health and safety requirements of the Machinery Directive 2006/42/EC; together with all amendments to date.		
Descriptions:	-3M™ Extended-Right Angle 4" Type-1 Cut-off, 18,000RPM, 1 HP, 3/8-24 Ext.Shaft, MOS 18,000	
Model Numbers:	28407	
Serial Number Range:	DT00011A0001 - DT103651A9999, where last 4 digits represent the sequential unit manufactured on the date specified in the first 5 numeric characters	
The following standards have either been referred to, or complied with, in full or in part as relevant:		
EN ISO 12100-1:2003 A1:2009	Safety of machinery. Basic concepts, general principles for design – Basic terminology and Technical principals	
EN ISO 12100-2:2003 A1:2009	Hand-held non-electric power tools – Safety Requirements – Part 7: Grinders	
EN 792-7:2001 A1:2008	Safety of machinery. Safety requirements for fluid power systems and components – Pneumatics	
EN 983:1996 A1:2008	Safety of machinery. Risk assessment principles	
EN ISO 14121-1:2007	Hand-held portable power tools. Test methods for evaluation of vibration emission. Part 1. Angle and vertical grinders	
EN ISO 28927-1:2009	Hand-held non-electric power tools. Noise measurement code. Engineering method (grade 2)	
EN ISO 15744:2008		
Full Name of responsible person.		
Stefan A. Babirad	Position:	Technical Director
Signature: 	Date:	4/12/2011 St. Paul, Minnesota, USA
Full Name and address of individual responsible to compile technical file within the Community:		
Mr. Claus Geiger - Marketing Operations, Abras. Syst. Div., 3M Deutschland GmbH, Carl-Schurz-Strasse 1, D-41453 Neuss, Germany		

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