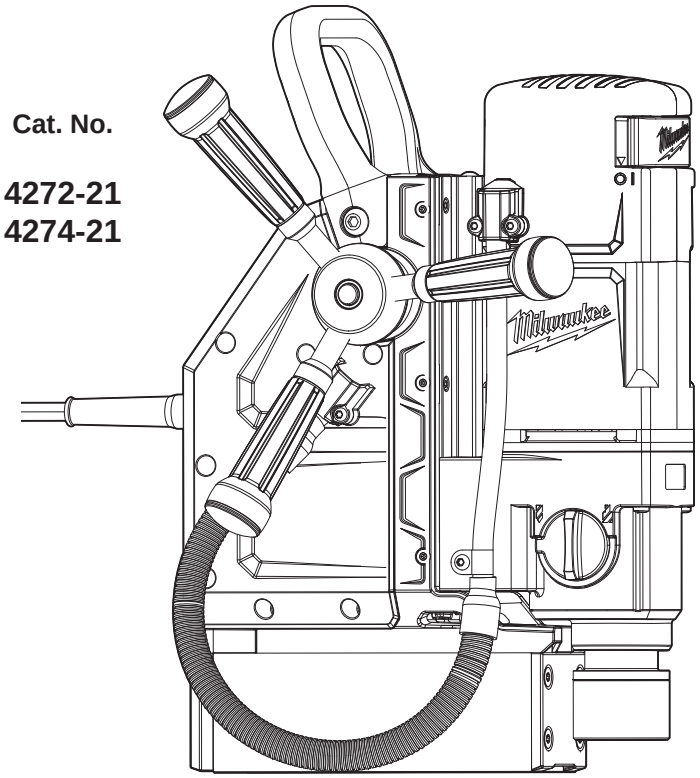
OPERATOR'S MANUAL

Cat. No.

4272-21
4274-21



1-5/8" MAGNETIC DRILLS

TO REDUCE THE RISK OF INJURY, USER MUST READ AND UNDERSTAND OPERATOR'S MANUAL.

GENERAL POWER TOOL SAFETY WARNINGS

WARNING **Read all safety warnings, instructions, illustrations and specifications provided with this power tool.** *Failure to follow all instructions listed below may result in electric shock, fire and/or serious injury.* **Save all warnings and instructions for future reference.** *The term "power tool" in the warnings refers to your mains-operated (corded) power tool or battery-operated (cordless) power tool.*

WORK AREA SAFETY

- **Keep work area clean and well lit.** Cluttered or dark areas invite accidents.
- **Do not operate power tools in explosive atmospheres, such as in the presence of flammable liquids, gases or dust.** Power tools create sparks which may ignite the dust or fumes.
- **Keep children and bystanders away while operating a power tool.** Distractions can cause you to lose control.

ELECTRICAL SAFETY

- **Power tool plugs must match the outlet. Never modify the plug in any way. Do not use any adapter plugs with earthed (grounded) power tools.** Unmodified plugs and matching outlets will reduce risk of electric shock.
- **Avoid body contact with earthed or grounded surfaces, such as pipes, radiators, ranges and refrigerators.** There is an increased risk of electric shock if your body is earthed or grounded.
- **Do not expose power tools to rain or wet conditions.** Water entering a power tool will increase the risk of electric shock.
- **Do not abuse the cord. Never use the cord for carrying, pulling or unplugging the power tool. Keep cord away from heat, oil, sharp edges or moving parts.** Damaged or entangled cords increase the risk of electric shock.
- **When operating a power tool outdoors, use an extension cord suitable for outdoor use.** Use of a cord suitable for outdoor use reduces the risk of electric shock.
- **If operating a power tool in a damp location is unavoidable, use a ground fault circuit interrupter (GFCI) protected supply.** Use of an GFCI reduces the risk of electric shock.

PERSONAL SAFETY

- **Stay alert, watch what you are doing and use common sense when operating a power tool. Do not use a power tool while you are tired or under the influence of drugs, alcohol or medication.** A moment of inattention while operating power tools may result in serious personal injury.
- **Use personal protective equipment. Always wear eye protection.** Protective equipment such as a dust mask, non-skid safety shoes, hard hat or hearing protection used for appropriate conditions will reduce personal injuries.
- **Prevent unintentional starting. Ensure the switch is in the off-position before connecting to power source and/or battery pack, picking up or carrying the tool.** Carrying power tools with your finger on the switch or energizing power tools that have the switch on invites accidents.
- **Remove any adjusting key or wrench before turning the power tool on.** A wrench or a key left attached to a rotating part of the power tool may result in personal injury.
- **Do not overreach. Keep proper footing and balance at all times.** This enables better control of the power tool in unexpected situations.
- **Dress properly. Do not wear loose clothing or jewelry. Keep your hair and clothing away from moving parts.** Loose clothes, jewelry or long hair can be caught in moving parts.
- **If devices are provided for the connection of dust extraction and collection facilities, ensure these are connected and properly used.** Use of dust collection can reduce dust-related hazards.
- **Do not let familiarity gained from frequent use of tools allow you to become complacent and ignore tool safety principles.** A careless action can cause severe injury within a fraction of a second.

POWER TOOL USE AND CARE

- **Do not force the power tool. Use the correct power tool for your application.** The correct power tool will do the job better and safer at the rate for which it was designed.
- **Do not use the power tool if the switch does not turn it on and off.** Any power tool that cannot be controlled with the switch is dangerous and must be repaired.
- **Disconnect the plug from the power source and/or remove the battery pack, if detachable, from the power tool before making any adjustments, changing accessories, or storing power tools.** Such preventive safety measures reduce the risk of starting the power tool accidentally.
- **Store idle power tools out of the reach of children and do not allow persons unfamiliar with the power tool or these instructions to operate the power tool.** Power tools are dangerous in the hands of untrained users.
- **Maintain power tools and accessories. Check for misalignment or binding of moving parts, breakage of parts and any other condition that may affect the power tool's operation. If damaged, have the power tool repaired before use.** Many accidents are caused by poorly maintained power tools.
- **Keep cutting tools sharp and clean.** Properly maintained cutting tools with sharp cutting edges are less likely to bind and are easier to control.
- **Use the power tool, accessories and tool bits etc. in accordance with these instructions, taking into account the working conditions and the work to be performed.** Use of the power tool for operations different from those intended could result in a hazardous situation.
- **Keep handles and grasping surfaces dry, clean and free from oil and grease.** Slippery handles and grasping surfaces do not allow for safe handling and control of the tool in unexpected situations.

SERVICE

- **Have your power tool serviced by a qualified repair person using only identical replacement parts.** This will ensure that the safety of the power tool is maintained.

SPECIFIC SAFETY RULES

- **Always use safety chain.** Mounting can release.
- **DANGER!** To reduce the risk of injury, always keep hands, gloves, rags, clothing, etc. away from moving parts and chips. Do not try to remove chips while the cutter is rotating. Chips are sharp and can pull objects into moving parts.
- **Clean the surface before attaching the drill stand to the work surface.** Paint, rust, scale, or uneven surfaces decrease the holding strength of the magnet. Chips, burrs, dirt and other foreign matter on the surface of the magnet base will also decrease holding power.
- **Do not attach magnetic base to nonmagnetic grades of stainless steel.** The magnet base WILL NOT hold. The 4272-21 drill attaches magnetically to 3/8" or thicker ferrous stock, and the 4274-21 to 1/4" or thicker ferrous stock. Do not use on stock less than 1/4".
- **Hold power tool by insulated gripping surfaces, when performing an operation where the cutting accessory may contact hidden wiring or its own cord.** Cutting accessory contacting a "live" wire may make exposed metal parts of the power tool "live" and could give the operator an electric shock.
- **Safety Strap**
  - **Do not use near acids or bleaching agents.**
  - **Do not use for overhead lifting.**
  - **Do not use strap if webbing is cut.**
  - **Webbing must be protected from sharp edges.**
  - **All hardware must be in line with direction of pull for rated capacity.**
- **Maintain labels and nameplates.** These carry important information. If unreadable or missing, contact a *MILWAUKEE* service facility for a free replacement.
- **WARNING** Some dust created by power sanding, sawing, grinding, drilling, and other construction activities contains chemicals known to cause cancer, birth defects or other reproductive harm. Some examples of these chemicals are:
- lead from lead-based paint
- crystalline silica from bricks and cement and other masonry products, and
- arsenic and chromium from chemically-treated lumber.

Your risk from these exposures varies, depending on how often you do this type of work. To reduce your exposure to these chemicals: work in a well ventilated area, and work with approved safety equipment, such as those dust masks that are specially designed to filter out microscopic particles.

SYMBOLOGY

	Double Insulated
V	Volts
~	Alternating Current
A	Amps
n_0 xxxxmin.$^{-1}$	No Load Revolutions per Minute (RPM)
c UL us	Underwriters Laboratories, Inc. United States and Canada
	**DANGER!** To reduce the risk of injury, always keep hands, gloves, rags, clothing, etc. away from moving parts and chips. Do not try to remove chips while the cutter is rotating. Chips are sharp and can pull objects into moving parts.

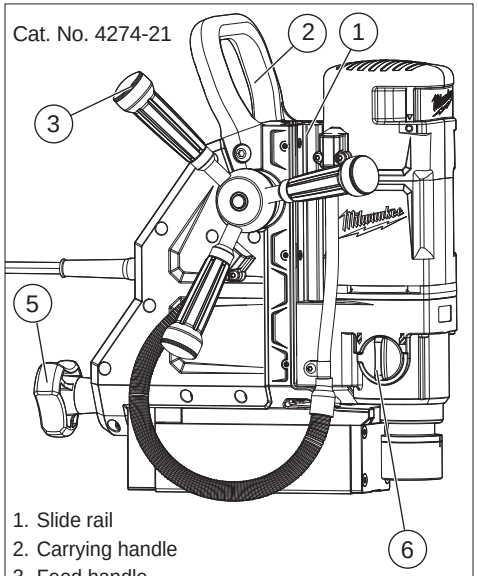
SPECIFICATIONS

Cat. No.	Magnet	Volts a.c.	Amps	No Load RPM	*Twist Drill	HSS Cutter
4272-21	Electro	120	13	High 730 Low 475	1/2"	1-5/8"
4274-21	Permanent	120	13	High 730 Low 475	1/2"	1-5/8"

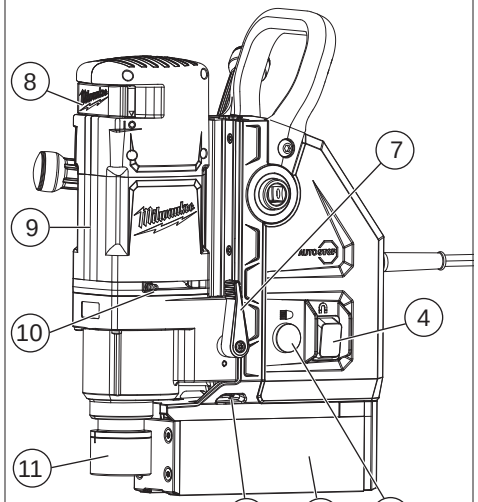
* Requires use of 1/2" drill chuck adapter, see "Accessories."

FUNCTIONAL DESCRIPTION

Cat. No. 4274-21



1. Slide rail
2. Carrying handle
3. Feed handle
4. Magnet activation switch (4272-21 only)
5. Magnet activation knob (4274-21 only)
6. Speed selector
7. Motor adjustment lever
8. On(I) / Off(O) switch
9. Drill motor
10. Cutting fluid fitting
11. Quick-change arbor
12. Safety strap bracket (strap not shown)
13. Magnetic base
14. LED button
15. Hand pump and tube (not shown)



Cat. No. 4272-21

GROUNDING

⚠ *WARNING* Improperly connecting the grounding wire can result in the risk of electric shock. Check with a qualified electrician if you are in doubt as to whether the outlet is properly grounded. Do not modify the plug provided with the tool. Never remove the grounding prong from the plug. Do not use the tool if the cord or plug is damaged. If damaged, have it repaired by a *MILWAUKEE* service facility before use. If the plug will not fit the outlet, have a proper outlet installed by a qualified electrician.

Grounded Tools: Tools with Three Prong Plugs

Tools marked "Grounding Required" have a three wire cord and three prong grounding plug. The plug must be connected to a properly grounded outlet (See Figure A). If the tool should electrically malfunction or break down, grounding provides a low resistance path to carry electricity away from the user, reducing the risk of electric shock.

The grounding prong in the plug is connected through the green wire inside the cord to the grounding system in the tool. The green wire in the cord must be the only wire connected to the tool's grounding system and must never be attached to an electrically "live" terminal.

Your tool must be plugged into an appropriate outlet, properly installed and grounded in accordance with all codes and ordinances. The plug and outlet should look like those in Figure A.

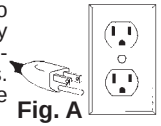


Fig. A

Double Insulated Tools: Tools with Two Prong Plugs

Tools marked "Double Insulated" do not require grounding. They have a special double insulation system which satisfies OSHA requirements and complies with the applicable standards of Underwriters Laboratories, Inc., the Canadian Standard Association and the National Electrical Code. Double Insulated tools may be used in either of the 120 volt outlets shown in Figures B and C.

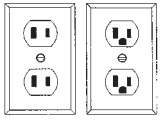


Fig. B **Fig. C**

EXTENSION CORDS

Grounded tools require a three wire extension cord. Double insulated tools can use either a two or three wire extension cord. As the distance from the supply outlet increases, you must use a heavier gauge extension cord. Using extension cords with inadequately sized wire causes a serious drop in voltage, resulting in loss of power and possible tool damage. Refer to the table shown to determine the required minimum wire size.

The smaller the gauge number of the wire, the greater the capacity of the cord. For example, a 14 gauge cord can carry a higher current than a 16 gauge cord. When using more than one extension cord to make up the total length, be sure each cord contains at least the minimum wire size required. If you are using one extension cord for more than one tool, add the nameplate amperes and use the sum to determine the required minimum wire size.

Guidelines for Using Extension Cords

- If you are using an extension cord outdoors, be sure it is marked with the suffix "W-A" ("W" in Canada) to indicate that it is acceptable for outdoor use.
- Be sure your extension cord is properly wired and in good electrical condition. Always replace a damaged extension cord or have it repaired by a qualified person before using it.
- Protect your extension cords from sharp objects, excessive heat and damp or wet areas.

Recommended Minimum Wire Gauge For Extension Cords*

	Extension Cord Length				
Nameplate Amperes	25'	50'	75'	100'	150'
0 - 2.0	18	18	18	18	16
2.1 - 3.4	18	18	18	16	14
3.5 - 5.0	18	18	16	14	12
5.1 - 7.0	18	16	14	12	12
7.1 - 12.0	16	14	12	10	--
12.1 - 16.0	14	12	10	--	--
16.1 - 20.0	12	10	--	--	--

* Based on limiting the line voltage drop to five volts at 150% of the rated amperes.

READ AND SAVE ALL INSTRUCTIONS FOR FUTURE USE.

ASSEMBLY

⚠ *WARNING* To reduce the risk of injury, always unplug tool before attaching or removing accessories or making adjustments. Use only specifically recommended accessories. Others may be hazardous.

Attaching Feed Handle

1. To attach, line up the anvil, press the center button and slide the handle into place on the desired side of the tool.
2. To remove, press the center button and pull the handle away from the tool.

Do not use a wrench, pipe, or any other lever in place of the feed handle.

Motor adjustment lever

The motor adjustment lever is used to raise and lower the motor on the slide rail. Always hold the motor securely before loosening the adjustment lever.

OPERATION

⚠ *WARNING* To reduce the risk of injury, wear safety goggles or glasses with side shields.

Typical Operation

1. Check the work surface to make sure it is clean and free of foreign materials.
   Paint, rust, scale or uneven surfaces decrease the holding strength of the magnet. Chips, burrs, dirt and other foreign materials on the surface of the magnetic base will also decrease holding power. Use a smooth, flat file to keep the magnet clean and free of nicks.
   The 4272-21 drill attaches to 3/8" or thicker ferrous stock, and the 4274-21 to 1/4" or thicker ferrous stock. Do not use on stock less than 1/4". The magnetic base WILL NOT hold on nonmagnetic grades of stainless steel.
2. To install/remove cutter:
   A. Unplug tool.
   B. Raise the drill motor to its highest position on the slide rail.
   C. Twist the quick-change arbor. Insert the cutter into the arbor and release collar. Tug on cutter to ensure it is secure. Cutter should be fully seated into spindle.
   D. Reverse procedure to remove cutter.

   NOTE: Do not remove cutter unless slug is removed. Slug may eject unexpectedly. Avoid contact with cutter tips. Periodically inspect the cutter tips for loose or damaged tips.

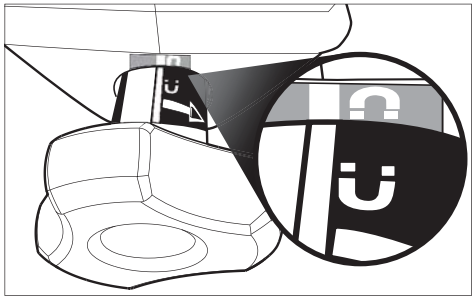
NOTE: If the cutter does not release from the arbor when the collar is turned, use a locking pliers to grasp the cutter above the cutter flutes. Holding the collar securely in one hand, rotate the pliers clockwise to release the cutter from the arbor.

⚠ *WARNING* To reduce the risk of injury, do not hold workpiece by hand.

3. Select High Speed or Low Speed, depending on your application.

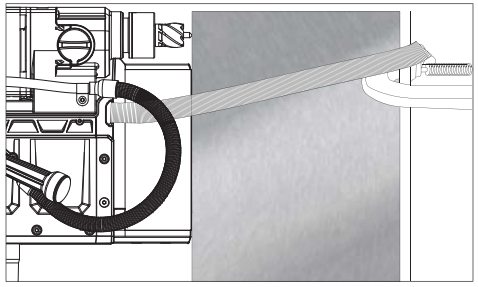
⚠ *WARNING*
- **Do not use cutting fluid in an overhead or any other position that allows cutting fluid to enter motor or switch enclosure.**
- **Wet connections are shock hazards. Prevent cutting fluid from traveling along cord and contacting the outlet, extension cord connections or tool plug. Each time tool is plugged in, elevate extension cord or gang box connections and arrange a drip loop. If plug or connections get wet, turn power off to outlet before unplugging tool.**

4. For the 4272-21, position the tool so the center pin is directly over the desired cutting location. Push the magnetic activation switch to engage the magnet. The drill will not operate unless the magnet is engaged.
   For the 4274-21, position the tool so the center pin is directly over the desired cutting location. Rotate the magnet knob to engage the magnet. The magnet icons will align. The drill will not operate unless the magnet is engaged.



⚠ *WARNING* To reduce the risk of injury, always use a safety strap on vertical, overhead, and pipe applications. Mounting can release.

5. Use a safety strap on vertical, overhead, and pipe applications.
   A. Route the safety strap, through the lower slots, and wrap it tightly around a solid, rigid structure. Make sure the strap is not twisted.
   B. Snap the safety strap snaphooks together. Eliminate any slack in the strap.
   C. When using on a vertical surface, secure the safety strap with a c-clamp or similar device. This will hold the strap in place and prevent the tool from sliding down the vertical surface. Do **not** clamp to the strap. This may damage the strap and cause it to break.



⚠ *WARNING* Do not use cutting fluid in an overhead or any other position that allows cutting fluid to enter motor or switch enclosure.

6. Plug in tool.
7. With the on(I) / off(O) switch in the off(O) position, place the rubber tube over the cutting fluid fitting. Inject cutting fluid into the rubber tube using the supplied hand pump. Keep hand pump and tube away from moving parts. Lubricate well before starting, and throughout the cutting operation as needed.
   Failure to lubricate properly will cause cutter damage. The use of HAWG WASH® cutting fluid is recommended for long life of these cutters. The operator is responsible for the application of lubricants other than HAWG WASH® cutting fluid.
   In overhead or vertical cutting applications, do not use cutting fluids. Use only lubricant pastes or sprays recommended for high speed cutting. Do not allow lubricant pastes and sprays to enter tool.

⚠ *WARNING* To reduce the risk of injury, always keep hands, gloves, rags, clothing, etc. away from moving parts and chips. Do not try to remove chips while the cutter is rotating. Chips are sharp and can pull objects into moving parts.

8. Start the drill motor by pulling the on(I) / off(O) switch out, by both sides, to the on(I) position. The drill will not operate unless the magnet is engaged.

⚠ *WARNING* Excessive force on the feed handle will break magnet free.

9. Even large bits only require a small amount of pressure on the feed handle.
   When feeding the cutter into the material, apply only enough force to produce a curled chip. Applying too little force will result in small broken chips and increased cutting time. Applying too much force will cause overheating of the cutter resulting in short cutter life. Overheating of the cutter can be noticed when cutter and chips turn brown or blue. Excessive force can cause the cutter to slow down to a point where cutting time will increase. The use of cutting lubricants will reduce cutting heat and increase cutter life. Use less feed pressure when slotting or notching because there is less support for the cutting edges in these situations.
10. Keep constant pressure throughout the entire operation to prevent chips and burrs from falling under the cutting edges. Cutting debris under the cutter can make cutting difficult or impossible. Continue lubricating as necessary.
11. When the cut is complete, withdraw the cutter while the spindle is still rotating.
12. Stop the drill motor by pushing in the on(I) / off(O) switch.
13. When the spindle has stopped rotating, use a pliers to remove cutting debris and chips from the cutter and spindle. Use care to avoid damaging the cutter teeth.
14. The center pin is spring loaded. Provide protection from ejected slug for people and property below cutting area.
15. Firmly grip the tool to disengaging the magnet. For the 4272-21, push the magnet switch to disengage. For the 4274-21, rotate the magnet knob.
16. When drilling on pipe using the 4274-21, use the accessory pipe adaptor 48-10-0130 and the safety strap.

ACCESSORIES

⚠ *WARNING* To reduce the risk of injury, always unplug the tool before attaching or removing accessories. Use only specifically recommended accessories. Others may be hazardous.

MAINTENANCE

⚠ *WARNING* To reduce the risk of injury, always unplug your tool before performing any maintenance. Never disassemble the tool or try to do any rewiring on the tool's electrical system. Contact a *MILWAUKEE* service facility for ALL repairs.

Maintaining Tool
Keep your tool in good repair by adopting a regular maintenance program. Before use, examine the general condition of your tool. Inspect guards, switches, tool cord set and extension cord for damage. Check for loose screws, misalignment, binding of moving parts, improper mounting, broken parts and any other condition that may affect its safe operation. If abnormal noise or vibration occurs, turn the tool off immediately and have the problem corrected before further use. Do not use a damaged tool. Tag damaged tools "DO NOT USE" until repaired (see "Repairs").
Under normal conditions, relubrication is not necessary until the motor brushes need to be replaced. After six months to one year, depending on use, return your tool to the nearest *MILWAUKEE* service facility for the following:
- Lubrication
- Brush inspection and replacement
- Mechanical inspection and cleaning (gears, spindles, bearings, housing, etc.)
- Electrical inspection (switch, cord, armature, etc.)
- Testing to assure proper mechanical and electrical operation

⚠ *WARNING* To reduce the risk of injury, electric shock and damage to the tool, never immerse your tool in liquid or allow a liquid to flow inside the tool.

Cleaning
Clean dust and debris from vents. Keep the tool handles clean, dry and free of oil or grease. Use only mild soap and a damp cloth to clean your tool since certain cleaning agents and solvents are harmful to plastics and other insulated parts. Some of these include: gasoline, turpentine, lacquer thinner, paint thinner, chlorinated cleaning solvents, ammonia and household detergents containing ammonia. Never use flammable or combustible solvents around tools.

Repairs
If your tool is damaged, return the entire tool to the nearest service center.