



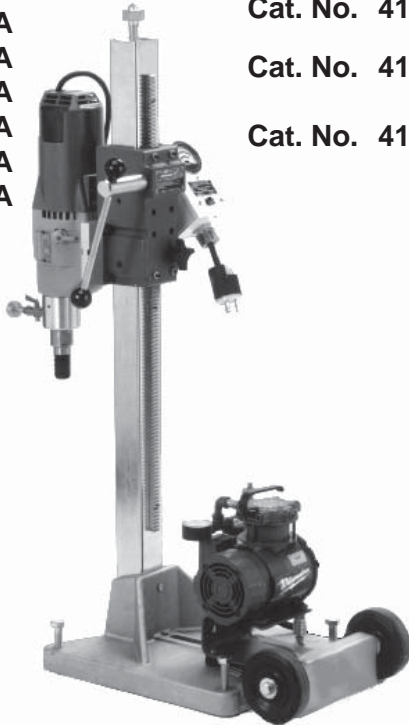
OPERATOR'S MANUAL

DYMODRILLS

Cat. No. 4004	20A
Cat. No. 4005	20A
Cat. No. 4079	20A
Cat. No. 4090	15A
Cat. No. 4094	20A
Cat. No. 4096	20A
Cat. No. 4097-20	15A

DYMORIGS

Cat. No. 4115	Small base
Cat. No. 4125	Small base
Cat. No. 4120	Large base
Cat. No. 4130	Large base



HEAVY-DUTY DIAMOND CORING EQUIPMENT

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

GENERAL POWER TOOL SAFETY WARNINGS



WARNING READ ALL SAFETY WARNINGS AND ALL INSTRUCTIONS. Failure to follow the warnings and instructions 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 residual current device (RCD) protected supply.** Use of an RCD 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 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 energising 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 jewellery. Keep your hair, clothing and gloves away from moving parts.** Loose clothes, jewellery 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.

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 the battery pack 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. 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.

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

- **Diamond coring equipment requires the use of water. When drilling overhead, use a liquid collection system.** Water in contact with the electrical system of the tool may make exposed metal parts of the tool "live" and could give the operator an electric shock.
- **Operate power tool by insulated grasping 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.
- **Wear ear protectors when diamond drilling.** Exposure to noise can cause hearing loss.
- **When the bit is jammed, stop applying downward pressure and turn off the tool.** Investigate and take corrective actions to eliminate the cause of the bit jamming.
- **When restarting a diamond drill in the workpiece check that bit rotates freely before starting.** If the bit is jammed, it may not start, may overload the tool, or may cause the diamond drill to release from the workpiece.
- **When securing the drill stand with anchors and fasteners to the workpiece, ensure that the anchoring used is capable of holding and restraining the machine during use.** If the workpiece is weak or porous, the anchor may pull out causing the drill stand to release from the workpiece.
- **When securing the drill stand with a vacuum pad to the workpiece, install the pad on a smooth, clean, non-porous surface. Do not secure to laminated surfaces such as tiles and composite coating.** If the workpiece is not smooth, flat or well affixed, the pad may pull away from the workpiece.
- **Ensure there is sufficient vacuum level before drilling.** If the vacuum level is insufficient, the pad may release from the workpiece.
- **Never perform overhead drilling with the machine secured only by the vacuum pad.** If the vacuum is lost, the pad will release from the workpiece.
- **When drilling through walls or ceilings, ensure to protect persons and the work area on the other side.** The bit may extend through the hole or the core may fall out on the other side.
- **Always use a liquid collection system when drilling overhead.** Water in contact with an electrical system of the tool may make exposed metal parts of the tool "live" and could give the operator an electric shock.
- **Maintain tools carefully.** Keep handles dry, clean and free from oil and grease. Keep cutting edges sharp and clean. Follow instructions for lubricating and changing accessories. Periodically inspect tool cords and extension cords for damage. Have damaged parts repaired or replaced by a MILWAUKEE service facility.
- **Maintain labels and nameplates.** These carry important information. If unreadable or missing, contact a MILWAUKEE service facility for a free replacement.

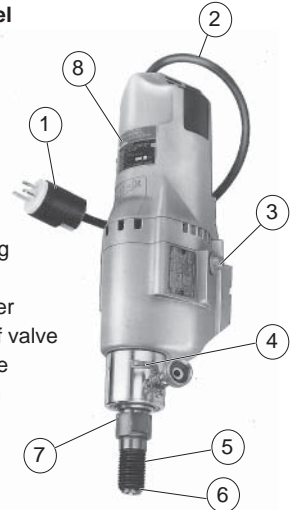
• **WARNING:** Some dust created by power sanding, sawing, grinding, drilling, and other construction activities contains chemicals known to cause cancer, birth defects or other reproductive harm. Some examples of these chemicals are:

- 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.

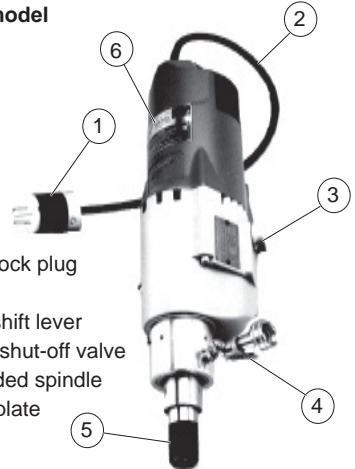
FUNCTIONAL DESCRIPTION

Shear pin model




1. Twist-lock plug
2. Cord
3. Gear shift lever
4. Water shut-off valve
5. Spindle sleeve
6. Retaining ring
7. Shear pin
8. Nameplate

Clutch model



1. Twist-lock plug
2. Cord
3. Gear shift lever
4. Water shut-off valve
5. Threaded spindle
6. Nameplate

SYMBOLOLOGY

A	Amperes
V	Volts
~	Alternating Current
n_o <u>xxxx</u> /min.	No Load Revolutions per Minute (RPM)
	Underwriters Laboratories, Inc. United States and Canada

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*

Nameplate Amperes	Extension Cord Length				
	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.**

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.

MILWAUKEE Dymodrills are provided with a 20 amp locking plug (NEMA L5-20). **MILWAUKEE** meter boxes may be provided with either a 20 amp locking or a 30 amp (NEMA L5-30) locking plug depending on the model .

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 Figures A and B). 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.

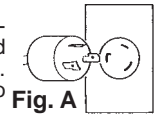


Fig. A

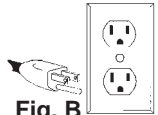


Fig. B

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 Figures A and B.

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 C and D.

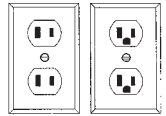


Fig. C Fig. D

⚠ WARNING To reduce the risk of injury, always use a Ground Fault Circuit Interrupter (GFCI) with diamond coring equipment to reduce the risk of shock hazards. Always position the GFCI as close as possible to the power source.

SPECIFICATIONS

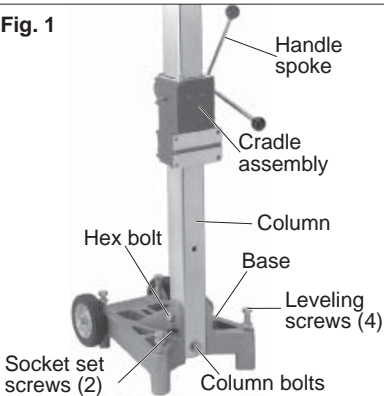
Cat. No.	Amps	Volts	Motor Protection	Speed		Suggested Diameters in Medium Aggregate	
4004	20	120	Clutch	Low - 300	High - 600	Low - 7" - 14"	High - 4" - 7"
4005	20	120	Clutch	Low - 600	High - 1200	Low - 4" - 7"	High - 3/4" - 4"
4079	20	120	Shear Pin	Low - 300	High - 600	Low - 7" - 14"	High - 4" - 7"
4090	15	120	Shear Pin	Low - 375	High - 750	Low - 5" - 8"	High - 2-1/2" - 5"
4094	20	120	Shear Pin	Low - 450	High - 900	Low - 6" - 10"	High - 2" - 6"
4096	20	120	Clutch	Low - 450	High - 900	Low - 6" - 10"	High - 2" - 6"
4097-20	15	120	Clutch	Low - 500	High - 1000	Low - 3" - 5"	High - 1-1/4" - 3"

ASSEMBLY

⚠ WARNING To reduce the risk of injury, always unplug tool before changing or removing accessories. Only use accessories specifically recommended for this tool. Others may be hazardous.

Assembling Dymorigs & Vac-U-Rig® Stands For Cat. No. 4125 & 4130 only

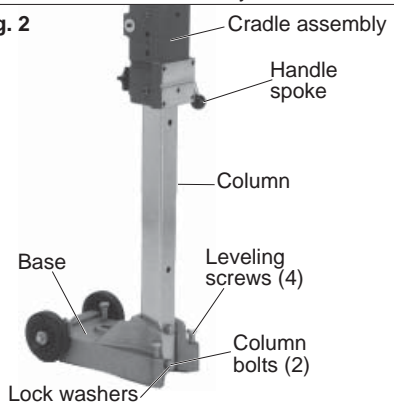
Fig. 1



1. Set the base on the ground. Loosen the hex bolt and nut (wrench not supplied). Raise the column upright.
2. **To core vertically or horizontally**, insert the large column bolt (provided in separate accessory bag) through the bottom of column and into the base. Tighten hex bolt and nut (wrench not supplied).
To angle core, tilt the column to the desired angle and tighten the hex bolt and nut. Save the column bolt for future use when vertical or horizontal coring.
3. Tighten the two (2) black socket set screws located on the base with the supplied wrench.
4. Screw the four (4) handle spokes (provided in separate accessory bag) into the hub on the cradle assembly.

For Cat. No. 4115 & 4120 only

Fig. 2

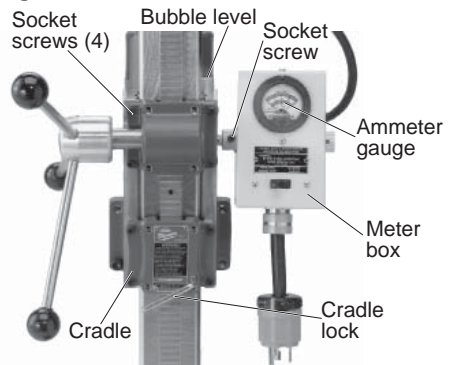


1. Set the base on the ground.
2. Remove two (2) bolts and two (2) lockwashers from accessory bag.
3. Place the column in the slot of the base.
4. Insert two (2) bolts and two (2) lockwashers and tighten securely.

Moving the Handle to the Other Side

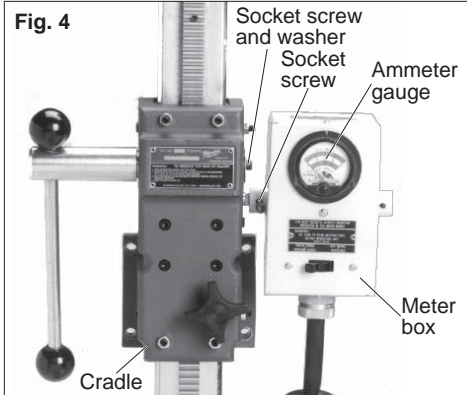
For Cat. Nos. 4125 & 4130 only

Fig. 3



1. Tighten the cradle lock.
2. Loosen the socket head screw and remove the meter box.
3. Remove four (4) socket head screws holding the spoked handle housing.
4. Turn the assembly around 180°.
5. Replace the four (4) socket head screws and tighten securely.
6. Attach meter box to opposite side (see "Mounting the Meter Box").

For Cat. Nos. 4115 & 4120 only



1. Loosen the cradle lock.
2. Raise the cradle to the maximum height.
3. Lift the cradle an additional 1/2" by hand.
4. Tighten the cradle lock.
5. Loosen the socket head screw and remove the meter box.
6. Remove the meter box stud from the cradle.
7. Remove the screw and washer from the end of the pinion shaft.
8. Remove the handle and pinion shaft assembly.
9. Turn the assembly around 180° and insert into cradle.
10. Replace the screw and washer and tighten securely.
11. Replace the meter stud on the side opposite the handle.
12. Attach meter box to opposite side (see "Mounting the Meter Box").
13. Loosen the cradle lock and lower the cradle until the pinion engages the rack.
14. Tighten the cradle lock.

Mounting the Meter Box

For All Catalog Nos.

A meter box is standard equipment with the Vac-U-Rig®, but it must be purchased separately for other Dymorigs (see "Accessories"). Attach the meter box to the cradle on the side opposite of the handle.

1. Slip the collar on the meter box over the stud on the cradle.
2. Position the meter box as desired and tighten the 1/4"-20 threaded socket head screw.

NOTE: For horizontal (wall) coring, the ammeter gauge must face upward in view of the operator. Otherwise, water flow from the water shut-off valve might drip into the outlets on the meter box.

Mounting the Dymodrill Motor to the Stand

For All Cat. Nos.

Dymorigs include a mounting bracket which mounts Dymodrill motors to the stand. An optional spacer assembly is available (see "Accessories"), which can be used when coring with any bits; but it **must** be used with any bit over 10" (outside diameter).

1. To mount the motor, loosen the cradle lock. Raise the cradle on the column using the spoked handle to allow room for installing the bit later. Tighten the cradle lock.

NOTE: If the cradle is difficult to move on the column, loosen the gib screws (see "Adjusting the Gib Screws").

2. Fasten the mounting bracket or the optional spacer assembly to the Dymodrill (Fig. 5) motor using the four (4) 1/4"-20 threaded socket head screws and four (4) lock washers (they are the smaller of the two provided in separate accessory bag). Make sure the square key on the mounting bracket or spacer assembly engages with the slot on the Dymodrill motor.
3. Fasten the mounting bracket (or optional spacer assembly) and motor assembly to the cradle slot (Fig. 6) by inserting the four (4) 3/8"-16 threaded socket head cap screws and lock washers (they are the larger of the two provided in separate accessory bag) through the cradle. Place screws through the holes from the other side of the Dymorig and place lock washers on the side of the mounting bracket.

After the Dymodrill motor is mounted, make sure the cradle is rigid against the column to prevent the motor or bit from wobbling during coring. Before coring, try to wiggle the cradle and motor with your hands. If the cradle is secure, it should not move. If it does move, tighten the gib screws that secure the cradle to the column (see "Adjusting the Gib Screws").

Fig. 5



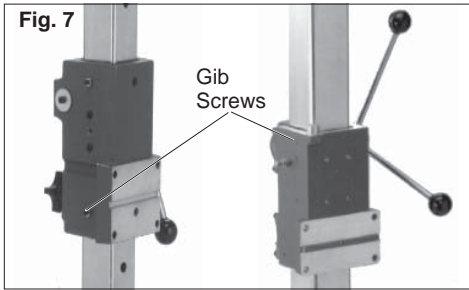
Fig. 6



Adjusting the Gib Screws

After the motor is mounted, make sure the cradle and motor are rigid against the column to prevent the motor or bit from wobbling during coring. Before coring, try to wiggle the cradle with your hands. If the cradle is secure, it should not move. If it does

move, tighten the six (6) gib screws that secure the cradle to the column as follows.
For Cat. No. 4125 & 4130 only.

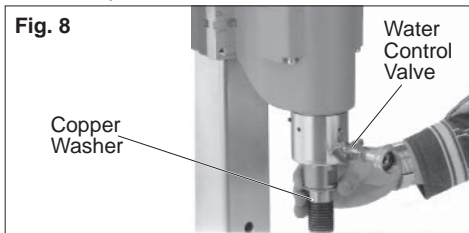


Tighten the six (6) gib screws with the hex wrench (supplied in a separate accessory bag).

For Cat. No. 4115 & 4120 only.
To tighten the six (6) gib screws: loosen the hex nuts, tighten the screws and then tighten the hex nuts.

Selecting and Installing a Core Bit (Fig. 8)

MILWAUKEE offers both standard and premium Dymbobits designed to cut through a variety of materials including poured concrete, steel-reinforced concrete, and prestressed concrete. Always use clean, sharp bits.

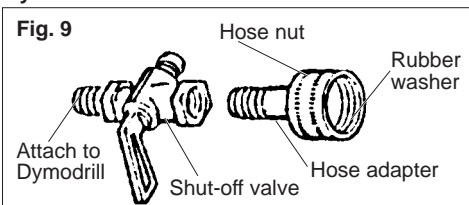


1. To install a bit, grease the spindle and bit threads to prevent corrosion and to help prevent the bit from seizing on the threaded spindle.
2. Slip one copper washer (provided in separate accessory bag with the water shut-off valve components) onto the threaded spindle against the spindle shoulder. The bag should contain an extra copper washer; save it for future use.
3. Thread the bit securely onto the threaded spindle.

Selecting Speeds

Dymodrills operate in either high or low gear. Use low speed for large diameter bits and high speed for small diameter bits (see "Specifications").

Assembling the Water Shut-Off Valve to the Dymodrill



1. Remove the water shut-off valve components from the accessory bag. (The copper washers inside the bag are for bit installation.)
2. Insert the hose adapter into the hose nut. Then insert the rubber washer into the hose nut.
3. Insert the hose nut assembly into the shut-off valve and securely tighten the assembly with the supplied socket wrench; some threads on the hose adapter will still be exposed.
4. Screw the shut-off valve assembly into the water swivel housing on the Dymodrill motor (Fig. 8). Hand-tighten the assembly and then tighten it approximately 1/4 turn with an adjustable wrench (not provided).

Methods for Securing Equipment to Work Surface

⚠ WARNING To reduce the risk of injury always secure the rig to the work surface to help prevent personal injury and to protect the rig. An unsecured rig could rotate during coring and possibly cause injury.

NOTE: Some building materials contain steel reinforcements. *MILWAUKEE* Dymbobits can cut through embedded steel, but are not recommended for coring solid steel plates.

Horizontal Coring (walls)

For specific instructions on using anchors, see "Using an Expansion-Type Anchor".

⚠ WARNING To reduce the risk of injury always use an expansion-type anchor during horizontal coring. Vacuum systems can slip when used on a vertical surface.

Vertical Coring (floors)

Two methods will work to secure the rig for vertical coring: either an expansion-type anchor OR a vacuum pump and vacuum pad system. Securing the rig with an anchor gives better bit performance because the attachment is more rigid. For specific instructions on assembling the vacuum system, see "Assembling and Using a Vacuum System".

Optional Telescoping Assembly

The telescoping assembly can be used to supplement either securing method.

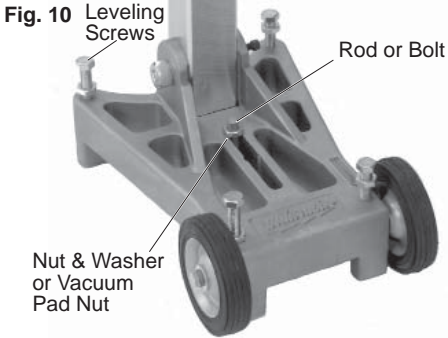
NOTE: Vac-U-Rig® Cat. No. 4136 includes a vacuum pump and vacuum pad. However, for some applications, you may choose to use an expansion-type anchor to secure the tool.

Anchors and Telescoping Assembly are not supplied with any of the above rigs. Telescoping Assembly can be purchased separately (see "Accessories"). Anchors unavailable through *MILWAUKEE*.

OPERATION

Securing the Equipment to the Work Surface - Using an Expansion-Type Anchor

For Catalog No. 4125 & 4130 only.

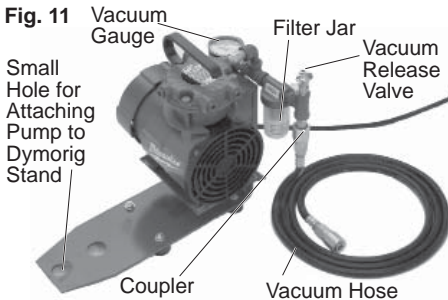


Use a 5/8" expansion-type anchor (not supplied) that will accept a 5/8" threaded rod or bolt to secure the base to the work surface.

1. Level the stand with the four (4) leveling screws using the bubble level as a guide. When the stand is level, tighten the four (4) nuts on the leveling screws.
2. Using an expansion-type anchor, insert a threaded rod or bolt through the slot located on the base of the Dymorig and tighten the bolt or washer and nut firmly in the anchor following the anchor manufacturer's instructions.

Assembling and Using a Vacuum System

For Catalog No. 4115, 4125 & 4130 only.



One vacuum pad is supplied with the Vac-U-Rig® and they can be purchased separately for other Dymorigs. The vacuum pad is most effective when it is secured to a relatively smooth surface such as poured concrete. If the surface is too porous or rough, the pad may not hold securely. Before using a vacuum pad, always check the gasket on the underside of the pad to make sure it isn't worn, cracked or torn. If it is, immediately replace the gasket, otherwise the vacuum pad may not hold the rig securely. To replace the gasket, see "Replacing Vacuum Pad Gaskets" in the "Maintenance" section. See "Accessories" for gasket part number.

1. To use the vacuum pad, tilt the base of the rig and slide the vacuum pad under it so the threaded stud goes through the hole on the end of the center slot on the base. Then set the stand upright.
2. Position the rig as required for coring the hole.
3. Level the rig with the four (4) leveling screws using the bubble level (4125 & 4130 only) as a guide. When the rig is level, tighten the four (4) nuts (4125 & 4130 only) on the leveling screws.
4. Connect one end of the supplied vacuum hose to the vacuum line coupler on the vacuum pad. To do this, pull back the collar on the hose and push the end of the hose onto the coupler until it snaps into place. Then, connect the other end of the vacuum hose to the coupler on the vacuum pump following the same procedure.
5. The vacuum pump may be set on a dry surface away from the rig or mounted to the base of the Dymorig as shown. However, DO NOT mount the vacuum pump to the Dymorig when angle coring. To mount the vacuum pump on the Dymorig, place the small hole on the vacuum pump mounting bracket over the vacuum pad stud on the Dymorig.
6. Plug the vacuum pump into the power source—the pump will start automatically. Step on the vacuum pad or the vacuum pad stud until the vacuum pad lowers and adheres to the work surface.
7. After the pad is secured to at least 20 inches of mercury vacuum, tighten the vacuum pad nut securely.



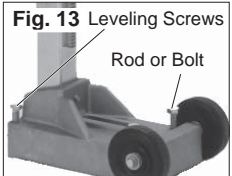
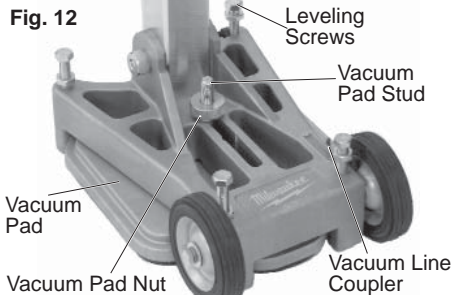
WARNING The vacuum gauge must read a minimum of 20 inches of mercury vacuum. To reduce the risk of injury DO NOT CORE if the gauge reads less than 20 inches of mercury vacuum.

Using an Expansion-Type Anchor

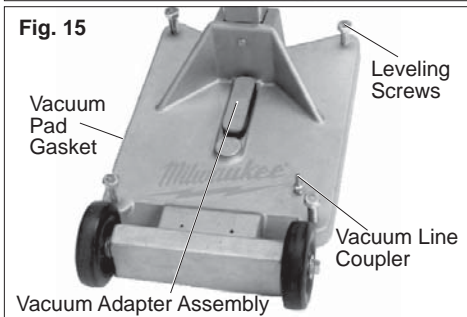
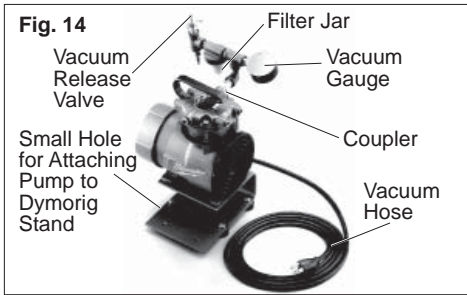
For Cat. No. 4115 & 4120 only.

Use a 5/8" expansion-type anchor (not supplied) that will accept a 5/8" threaded rod or bolt to secure the base to the work surface.

1. Remove the rubber gasket from the base.
2. Level the rig with the four (4) leveling screws.
3. Using an expansion-type anchor, insert a threaded rod or bolt through the slot located in the base of the Dymorig and tighten the bolt or washer and nut firmly in the anchor following the manufacturer's instructions.



Assembling and Using a Vacuum System For Cat. No. 4120 only.



The vacuum pad is most effective when it is secured to a relatively smooth surface such as poured concrete.

If the surface is too porous or rough, the vacuum pad may not hold securely. Before using the vacuum pad, always check the gasket on the underside of the base to make sure it isn't worn, cracked or torn. If it is, immediately replace the gasket, otherwise the vacuum may not hold the rig securely. To replace the gasket, see "Replacing Vacuum Pad Gaskets" in the "Maintenance" section. See "Accessories" for gasket part number.

1. Position the rig as required for coring the hole.
2. Loosen the four (4) leveling screws until the ends are above the bottom surface of the base.
3. Place the vacuum adapter assembly into the slot in the base.
4. Connect one end of the supplied vacuum hose to the vacuum line coupler on the vacuum base. To do this, pull back the collar on the hose and push the end of the hose onto the coupler until it snaps into place. Connect the other end of the vacuum hose to the coupler on the vacuum pump following the same procedure.
5. The vacuum pump may be set on a dry surface away from the rig or mounted to the base of the Dymorig as shown. To mount the vacuum pump on the base, place the small holes on the vacuum pump mounting bracket over the two tapped holes on the base. Attach the vacuum pump to the base with two (2) 1/4" - 20 screws supplied in the accessory bag.
6. Plug the vacuum pump into the power source - the pump will start automatically. Step on the base until it lowers and adheres to the work surface.

7. Tighten the four (4) leveling screws only enough to eliminate rocking. Over-tightening can lift the gasket off the ground and release the vacuum.

⚠ WARNING The vacuum gauge must read a minimum of 20 inches of mercury vacuum. To reduce the risk of injury **DO NOT CORE** if the gauge reads less than 20 inches of mercury vacuum.

Using the Optional Telescoping Assembly

1. Secure the rig using either an expansion-type anchor or a vacuum system (see "Securing the Equipment to the Work Surface").
2. Place the top flange of the extension against a ceiling or wall and place the other end of the jack screw at the top of the Dymorig column.

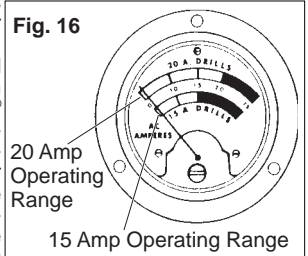
The assembly is adjustable up to 14 feet. Turn the jack screw to tighten the assembly and to make small adjustments.

Supply an Adequate Water Flow

An adequate supply of water must flow freely and constantly during the entire cut. Dymodrills are equipped with a built-in water shut-off valve to allow water to flow down the inside and up around the outside of the bit. This acts to cool the bit and flush cuttings from the hole.

Reading the Meter Box

The ammeter is the dial indicator on the meter box, which is standard equipment with the Vac-U-Rig® and can be purchased separately for other Dymodrills. The ammeter provides pressure feedback during coring, allowing you to help prevent motor overload and premature bit wear. The green area on the ammeter is the operating range and the red area indicates that you are applying too much pressure.



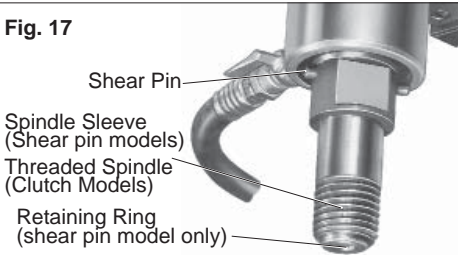
⚠ WARNING To reduce the risk of injury, always use Dymodrills in conjunction with meter boxes. Meter Boxes provide a switch to turn the Dymodrill motor OFF and ON and an optimum operation range to help prevent motor overload.

Shear Pin and Clutch

Dymodrill Nos. 4079, 4090, and 4094 contain a shear pin to protect the gear and motor against overload. This pin drives the spindle sleeve. If the bit binds, the pin will shear to prevent gear and motor damage. Extra shear pins are supplied with each Dymodrill and can be replaced (see "Accessories" for part numbers). It is important to check the condition of the spindle before using the tool each

time. The spindle must be smooth without grooves or pitting. If the spindle is not in good condition, it is possible for the threaded spindle sleeve and the internal spindle to weld together and seize during coring (see "Lubricating the Spindle for Dymodrills with a Shear Pin" in the "Maintenance" section for spindle lubricating instructions).

Fig. 17



Cat. Nos. 4004, 4005, 4096 and 4097 feature a friction clutch rather than a shear pin to protect the motor and gears. If the motor overloads, the clutch will begin to slip and the bit will stop rotating. The clutch is factory-set and does not require adjustment. Nuisance (frequent) clutch slippage should be addressed by an authorized **MILWAUKEE** service center.

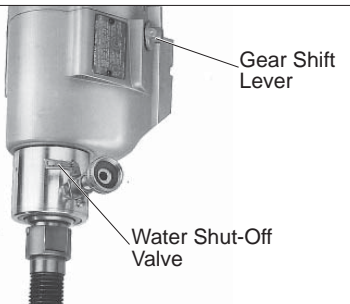
WARNING To reduce the risk of injury, always check the work area for hidden wires before coring.

Coring Procedure

1. Select and install a bit following guidelines in "Selecting and Installing a Core Bit".
2. Secure the rig to the work surface using one of the methods described in "Methods for Securing Equipment to Work Surface".
3. With the motor OFF, adjust the gear to either high or low speed according to the guidelines in "Selecting Speeds".

NOTE: DO NOT SHIFT SPEEDS WHEN THE DYMODRILL MOTOR IS ON. To adjust the speed on all Dymodrills, move the gear shift lever to the desired setting.

Fig. 18



4. Connect the water hose to the Dymodrill water shut-off valve and to the water supply. Make sure the seal is watertight. Use a standard garden hose if you require additional length. Set up a water collection system.

5. If you are using a vacuum system, read the instructions for specific setup in "Assembling & Using a Vacuum System".

Do not continue the following steps until the vacuum gauge reads at least 20 inches of mercury vacuum. Never operate the Dymodrill if the gauge reads less than 20 inches (see "Methods for Securing Equipment to Work Surface"). Always monitor the vacuum gauge during coring. If water collects in the vacuum pump filter jar, empty it to prevent damage to the pump.

WARNING To reduce the risk of injury, do not operate the Dymorig if the gauge reads less than 20 inches of mercury vacuum.

6. Turn the Dymodrill motor ON. Turn the water on so it flows freely through the water shut-off valve (see "Supply an Adequate Water Flow"). Turn the valve clockwise to increase water flow and counterclockwise to decrease water flow.
7. While holding the handle, slightly loosen the cradle lock handle and slowly rotate the handle to lower the bit into the workpiece, applying steady, even pressure. To help reduce bit wandering, always use a light load to start the hole and wait for the tip of the bit to penetrate the work surface completely before increasing the load.
8. Use sufficient pressure so the bit cuts constantly. Use the ammeter on the meter box as a guide for proper pressure.

NOTE: If the rig shifts during coring, stop the motor, reposition the rig and resume coring.
9. Monitor the water flow (see "Diamond Coring"). Generally, water should flow at a rate of approximately one to two gallons per minute. If the water flow is too heavy, the two holes in the water swivel housing will leak. If that happens, reduce water flow. Water flow is adequate when the water and cuttings are flushed in a circular pattern about 1/2" around the bit. Keep the work area dry.
10. When the cut is complete, keep the drill motor ON and rotate the handle clockwise to remove the bit. The bit may become stuck in the hole if you turn the motor OFF before the bit is completely removed. Once the bit is removed from the work surface, turn the motor OFF. Tighten the cradle lock handle. Unplug the meter box from the power supply before removing the vacuum pump to prevent accidental starting of the motor when the vacuum pump is released.

If you are using a vacuum pump, unplug it and open the vacuum release valve to release the vacuum.

Retrieving Cores and Deep Coring

When coring holes that are longer than the core bit, follow the steps below.

1. Begin coring the hole as usual. When you have cored to the length of the bit, stop the Dymodrill motor.
2. Remove the core by driving a chisel or slender wedge into the cut between the core and the work surface. You may also use a special core tongs, bent wire or anchor bolts to remove the core.

- After removing the core, reinsert the bit or use a bit extension and continue coring (see "Accessories"). Removing cores with diameters greater than twice their length can be difficult. One method to remove such cores is to first break the core into smaller pieces and then remove the pieces. Electric hammers and chisels are ideal for breaking cores.

⚠ WARNING When coring through floors, cores generally drop from the bit. To reduce the risk of injury, provide proper protection for people and property below the coring area.

Diamond Coring

Factors that influence diamond core performance:

- Amount of coolant
- Dymorig rigidity
- Dymorig condition
- RPM of drill motor
- Feed pressure applied to bit by operator
- Amount of steel
- Size of embedded steel
- Age of concrete
- Aggregate (size, type, hardness, abrasiveness)
- Type of sand—manufactured vs. river (natural)
- Operator technique
- Operator care
- Bit runoff

Operator Technique

Core with consistent, firm feed pressure. Do not subject the bits to sudden impacts. Uneven feed rate cracks diamonds. Low feed pressure polishes diamonds, slows penetration and contributes to bit glazing. High feed pressure can overload the drill motor or can cause diamonds to pull out prematurely, particularly when coring embedded steel. Make the bit work, but do not try to jam the bit through the material.

If vibration occurs:

1. Stop drilling.
2. Turn motor off.
3. Check for loose bolts, nuts and gib screws. Tighten if required.
4. Check for bit runoff. Replace if required.

If vibration continues to occur, remove the core and loose material.

If vibration continues to occur after attempting these measures, return the rig to the nearest *MILWAUKEE* service facility.

Water

Water provides two main benefits during coring:

1. Water acts as a coolant, eliminating the heat caused by the friction of the coring action. This preserves the integrity of the diamonds, the bond matrix, the segment solder, and core tube. Without a coolant, the heat buildup during coring can cause all of these components to fail.
2. Water flushes loose, abrasive particles created during coring. These particles consist of aggregate, sand, diamond particles and various metals from embedded steel and the core bit matrix. The hole must be free of debris to allow the core bit to work. If loose particles are not properly flushed from the hole, an unnecessary

drag will occur along the side of the core barrel. This can contribute to bit glazing through lack of power as well as motor damage through amperage increases due to bit resistance. In addition, loose particles tend to wear the bit tube, which can eventually result in the loss of segments.

Monitor water flow. Water volume should be adjusted until water return is a muddy, solid color. Clear water or clear streaks indicate too much water volume. Excess water is a leading cause of bit glazing and failure. Other factors contribute to glazing, but water adjustment is one of the most easily controlled by the operator. Excessive water prevents adequate segment/material contact. When the bit segments do not properly contact the work surface, the desired "controlled erosion" effect which maintains bit sharpness does not occur and the bit begins to glaze. This happens especially with smaller diameter bits. Adequate water volume varies according to the bit diameter. Use only enough water during coring to flush the cuttings from the work surface.

Equipment

- Make sure machinery is in good operating condition. The column, carriage, motor connection and base should all be firmly connected and should not vibrate during coring.
- Motors should be of proper size (amperage and RPM) for the diameter of the core bit used. Consult motor guide in catalog.
- Always make sure the Dymorig is rigidly mounted with an anchor or vacuum; any movement or vibration will shorten the life of the core bit. Standing on the rig's base as a form of anchoring is dangerous and does not provide the necessary rigidity.

Diamond Core Bits

- For the first 2 or 3 holes, use light feed pressure, so the new diamond gradually breaks in.
- Lower the bit very slowly onto the work surface. Use light feed pressure until the bit crown has penetrated or "seated" into the material.
- If the core bit encounters embedded steel, slow down the feed pressure and let the bit core at its own pace. Don't force the bit. Typically the water around the bit will clear when embedded steel is encountered. Do not allow any vibration whatsoever or severe diamond breakage or pullout will occur.
- Keep bits sharp.

Bit Glazing & Diamond Core Motor Shear Pins

Bit binding is caused by one of two things: a dull (glazed) bit or a poorly stabilized rig.

Causes of bit glazing:

- Wrong RPM for bit diameter
- High feed pressure
- Low feed pressure
- High steel content in work surface
- Large, hard aggregate
- Too much water
- Low motor power

A sharp bit typically has good diamond exposure and will cut/grind almost anything in its path, including embedded steel.

Sharpening Procedure for Core Bits

To work efficiently, diamond core bits must maintain good diamond exposure. Many factors work together to provide the "controlled erosion" cycle of the tool's segment to occur. When this "controlled erosion" cycle is altered, the bit can become dull or "glazed." Glazing becomes noticeable when the coring feed rate slows dramatically or the bit does not cut. Examine the bit immediately. If the diamonds are flush with the metal, they are under-exposed or "glazed."

The following steps will often correct the problem:

1. Reduce water flow until it becomes very muddy. Continue using as little water as possible until penetration increases.
2. If the bit does not open up, remove from hole. Pour into the kerf a thick (1/4") layer of silica sand (the coarser the better).
3. Resume drilling for approximately 3 to 5 minutes with very little water and at a lower RPM if possible.
4. Gradually increase water flow to flush sand from kerf.
5. Repeat as needed.

The Effects of Steel in Coring


- To self-sharpen, diamond-impregnated core bits require interaction with an abrasive material. This abrasive material wears away the metal composition in the segment's matrix. As this is done, sharp diamonds are exposed and the grinding action created by the diamonds continues.
- Embedded metal (rebar) is not an abrasive material. It does not provide the degree of abrasiveness required for matrix wear to occur and expose sharp diamonds embedded in the segment's matrix.
- A high degree of exposure to embedded metal by the bit's segments creates glazing. Glazing prevents the bit from cutting and coring.

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 Tools

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

Lubricating Rack and Pinion

Maintain a light coat of **MILWAUKEE** Type "E" Grease on the rack and pinion gears to reduce friction and wear.

Lubricating the Spindle for Dymodrills with a Shear Pin

Before each use, clean and lubricate the spindle or spindle sleeve with **MILWAUKEE** Type "E" Grease to prevent the spindle from seizing during coring.

1. To maintain the spindle on shear pin models, remove the retaining ring with a screwdriver. Then remove the spindle sleeve.
2. Remove dust and debris from the inside and outside diameter of the spindle and spindle sleeve and from the water hole in the spindle. Place a light coating of **MILWAUKEE** Type "E" grease on the spindle.
3. Replace the spindle sleeve onto the spindle. Make sure the spindle sleeve rotates freely on the spindle. Then replace the retaining ring.

Replacing Vacuum Pad Gaskets

For Cat. No. 4115, 4125 & 4130 only.

Through normal use, the rubber gaskets on the underside of the vacuum pads can become worn, requiring replacement. If replacement is required, take the pad to an authorized service center or replace the gasket as follows:

1. Remove the old gasket and thoroughly remove the old glue from the groove.
2. Squeeze a continuous bead of rubber cement (Cat. No. 44-22-0060) in the entire bottom of the groove.
3. Immediately place a new gasket (Cat. No. 43-44-0570) in the groove and press firmly in place.
4. Turn the pad over and place the gasket side on a smooth flat surface and apply pressure to all edges of the pad.
5. Allow cement to dry for 24 hours before using.


For Cat. No. 4120 only.

With normal use, the rubber gasket on the underside of the base can become worn, requiring replacement. If replacement is required, take the base to an authorized service center or replace the gasket as follows:

1. Remove the motor and bit.
2. Tip the Dymorig on its back so that the wheels point down.
3. Remove the old gasket.
4. Squeeze a continuous bead of rubber cement (Cat. No. 44-22-0060) in the entire bottom of the groove.
5. Place the new gasket (Cat. No. 43-44-0605) into the groove making sure it is pushed in completely.
6. Stand the Dymorig upright again.
7. Reinstall the motor and bit.

Cleaning the Filter on the Vacuum Pump

Periodically clean the filter felts to keep the vacuum pump operating efficiently. To clean the filter felts, remove the plastic jar and remove the felts from the plastic tube. Remove dust and debris from the felts and clean the plastic jar. Then replace the felts on the plastic tube and position the jar

 **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.