



# Operating Instructions and Parts Manual

## 20-inch Disc Grinder

Models J-4421-2 and J-4421-4



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# 1.0 Warranty and Service

JET warrants every product it sells against manufacturers' defects. If one of our tools needs service or repair, please contact Technical Service by calling 1-800-274-6846, 8AM to 5PM CST, Monday through Friday.

## Warranty Period

The general warranty lasts for the time period specified in the literature included with your product or on the official JET branded website.

- JET products carry a limited warranty which varies in duration based upon the product. (See chart below)
- Accessories carry a limited warranty of one year from the date of receipt.
- Consumable items are defined as expendable parts or accessories expected to become inoperable within a reasonable amount of use and are covered by a 90 day limited warranty against manufacturer's defects.

## Who is Covered

This warranty covers only the initial purchaser of the product from the date of delivery.

## What is Covered

This warranty covers any defects in workmanship or materials subject to the limitations stated below. This warranty does not cover failures due directly or indirectly to misuse, abuse, negligence or accidents, normal wear-and-tear, improper repair, alterations or lack of maintenance. JET woodworking machinery is designed to be used with Wood. Use of these machines in the processing of metal, plastics, or other materials outside recommended guidelines may void the warranty. The exceptions are acrylics and other natural items that are made specifically for wood turning.

## Warranty Limitations

Woodworking products with a Five Year Warranty that are used for commercial or industrial purposes default to a Two Year Warranty. Please contact Technical Service at 1-800-274-6846 for further clarification.

## How to Get Technical Support

Please contact Technical Service by calling 1-800-274-6846. **Please note that you will be asked to provide proof of initial purchase when calling.** If a product requires further inspection, the Technical Service representative will explain and assist with any additional action needed. JET has Authorized Service Centers located throughout the United States. For the name of an Authorized Service Center in your area call 1-800-274-6846 or use the Service Center Locator on the JET website.

## More Information

JET is constantly adding new products. For complete, up-to-date product information, check with your local distributor or visit the JET website.

## How State Law Applies

This warranty gives you specific legal rights, subject to applicable state law.

## Limitations on This Warranty

JET LIMITS ALL IMPLIED WARRANTIES TO THE PERIOD OF THE LIMITED WARRANTY FOR EACH PRODUCT. EXCEPT AS STATED HEREIN, ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE EXCLUDED. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU. JET SHALL IN NO EVENT BE LIABLE FOR DEATH, INJURIES TO PERSONS OR PROPERTY, OR FOR INCIDENTAL, CONTINGENT, SPECIAL, OR CONSEQUENTIAL DAMAGES ARISING FROM THE USE OF OUR PRODUCTS. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

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## Product Listing with Warranty Period

90 Days – Parts; Consumable items
1 Year – Motors; Machine Accessories
2 Year – Metalworking Machinery; Electric Hoists, Electric Hoist Accessories; Woodworking Machinery used for industrial or commercial purposes
5 Year – Woodworking Machinery
Limited Lifetime – JET Parallel clamps; VOLT Series Electric Hoists; Manual Hoists; Manual Hoist Accessories; Shop Tools; Warehouse & Dock products; Hand Tools; Air Tools

NOTE: JET is a division of JPW Industries, Inc. References in this document to JET also apply to JPW Industries, Inc., or any of its successors in interest to the JET brand.

## 2.0 Table of contents

Section	Page
1.0 Warranty and Service.....	2
2.0 Table of contents.....	3
3.0 Warnings.....	4
3.1 Machinery General Safety Warnings.....	4
3.2 General Electrical Cautions.....	5
3.3 Wire Sizes.....	5
3.4 Safety requirements for abrasive grinding machines.....	5
4.0 General Specifications.....	6
5.0 Machine set-up.....	7
5.1 Grinder set-up.....	7
5.2 Spotting and anchoring the grinder.....	7
5.3 Checking table level.....	7
6.0 Electrical.....	7
6.1 Service wiring.....	7
6.2 To correct disc rotation.....	8
6.3 Changing service voltage.....	8
6.4 Replacing the LVP switch cut-out coil.....	8
6.5 Changing motor connections.....	8
7.0 Operating Instructions.....	9
7.1 Applying a workpiece to the disc face.....	9
7.2 Rotary Switch.....	9
7.3 Raising and lowering the table.....	10
7.4 Adjusting the table angle.....	10
7.5 Using the miter system.....	11
8.0 Recommended abrasives.....	11
9.0 Maintenance procedures.....	12
9.1 Removing and replacing grinding discs.....	12
9.2 Removing and replacing motor and/or drive disc.....	13
10.0 Lubrication.....	14
11.0 Replacement Parts.....	14
11.1.1 J-4421 Motor and Trunnion – Exploded View.....	15
11.1.2 J-4421 Motor and Trunnion – Parts List.....	16
11.2.1 J-4421 Foot Brake – Exploded View.....	19
11.2.2 J-4421 Foot Brake – Parts List.....	19
12.0 Electrical Connections – J-4421.....	20



## 3.0 Warnings

- Misuse of this machine can cause serious injury.
- For safety, machine must be set up, used and serviced properly.
- Read, understand and follow instructions in the operator's and parts manual which was shipped with your machine.

### When setting up machine:

- Always avoid using machine in damp or poorly lighted work areas.
- Always be sure machine is securely anchored to the floor.
- Always keep machine guards in place.
- Always put start switch in "OFF" position before plugging in machine.

### When using machine:

- Never operate with machine guards missing.
- Always wear safety glasses with side shields (See ANSI Z87.1)
- Never wear loose clothing or jewelry.
- Never overreach — you may slip and fall into the machine.

- Never leave machine running while you are away from it.

- Always shut off the machine when not in use.

### When servicing machine:

- Always disconnect machine from electrical power while servicing.
- Always follow instructions in operator's and parts manual when changing accessory tools or parts.
- Never modify the machine without consulting JET.

Read and follow these simple rules for best results and full benefits from your machine. Used properly, JET machinery is among the best in design and safety. However, any machine used improperly can be rendered inefficient and unsafe. It is mandatory that those who use our products be properly trained in how to use them correctly. They should read and understand the Operating Instructions and Parts Manual as well as all labels affixed to the machine. Failure to follow all of these warnings can cause serious injuries.

## 3.1 Machinery General Safety Warnings

1. Always wear protective eye wear when operating machinery. Eye wear shall be impact resistant, protective safety glasses with side shields which comply with ANSI Z87.1 specifications. Use of eye wear which does not comply with ANSI Z87.1 specifications could result in severe injury from breakage of eye protection.
2. Wear proper apparel. No loose clothing or jewelry which can get caught in moving parts. Contain long hair. Rubber soled footwear is recommended for best footing.
3. Do not overreach. Failure to maintain proper working position can cause you to fall into the machine or cause your clothing to get caught — pulling you into the machine.
4. Keep guards in place and in proper working order. Do not operate the machine with guards removed.
5. Avoid dangerous working environments. Do not use stationary machine tools in wet or damp locations, or in an explosive environment. Keep work areas clean and well lit. Special electrics should be used when working on flammable materials.
6. Avoid accidental starts by being sure the start switch is "OFF" before plugging in the machine.
7. Machinery must be anchored to the floor.
8. Never leave the machine running while unattended. Machine shall be shut off whenever it is not in operation.
9. Disconnect electrical power before servicing. Whenever changing accessories or general maintenance is done on the machine, electrical power to the machine must be disconnected before work is done.
10. Maintain all machine tools with care. Follow all maintenance instructions for lubricating and the changing of accessories. No attempt shall be made to modify or have makeshift repairs done to the machine. This not only voids the warranty but also renders the machine unsafe.
11. Secure work. Use clamps or a vise to hold work, when practical. It is safer than using your hands and it frees both hands to operate the machine.
12. Never brush away chips while the machine is in operation.
13. Keep work area clean. Cluttered areas invite accidents.
14. Remove adjusting keys and wrenches before turning machine on.
15. Use the right tool. Don't force a tool or attachment to do a job for which it was not designed.
16. Use only recommended accessories and follow manufacturer's instructions pertaining to them.
17. Keep hands in sight and clear of all moving parts and cutting surfaces.
18. All visitors should be kept a safe distance from the work area. Make workshop completely safe by using padlocks, master switches, or by removing starter keys.
19. Know the tool you are using; its application, limitations, and potential hazards.

### 3.2 General Electrical Cautions

This machine should be grounded in accordance with the National Electrical Code and local codes and ordinances. This work should be done by a qualified electrician. The machine should be grounded to protect the user from electrical shock.

### 3.3 Wire Sizes

**Caution:** For circuits which are far away from the electrical service box, the wire size must be increased in order to deliver ample voltage to the motor. To minimize power losses and to prevent motor overheating and burnout, the use of wire

sizes for branch circuits or electrical extension cords according to the following table is recommended:

Conductor Length	AWG Number	
	240 Volt Lines	120 Volt Lines
0 – 50 Ft.	No. 14	No. 14
50 – 100 Ft.	No. 14	No. 12
Over 100 Ft.	No. 12	No. 8

### 3.4 Safety requirements for abrasive grinding machines

Abrasive grinding can be hazardous to operators and bystanders. Grinding sparks, chips and dust particles thrown off by the grinding disc can cause serious injury by contact or inhalation. To avoid such injuries you must comply with the following safety requirements:

1. CAUTION: The gap between the abrasive surface and table edge must not exceed 3/16". If it does, loosen the four motor mount bolts and move the motor forward to minimize gap.
2. Always wear protective eyewear when operating machinery. Eye wear shall be impact resistant, protective safety glasses with side shields which comply with ANSIZ87.1. Use of eye wear which does not comply with ANSIZ87.1 specifications could result in severe injury from breakage of eye protection. See Figure A, below.
3. Wear leather safety gloves, arm guards, leather aprons and safety shoes.
4. A dust collection system is recommended. Operator shall also wear a dust mask at all times. See Figure B, below.
5. Additional precautions may be necessary for grinding materials which are flammable or have other hazardous properties. You should always consult the manufacturer of such materials for instructions on grinding and handling.
6. Do not force or jamb the workpiece into the grinding disc.
7. Before grinding, always allow the motor to come up to operating speed, then check the grinding disc for wobble, runout, or any unbalanced condition. If the disc is not operating accurately and smoothly, immediately stop the motor and make repairs before attempting any grinding operations.
8. Abrasive discs must be stored in a controlled environment area. Relative humidity should be 35% to 50% and the temperature should be between 60 and 80 degrees Fahrenheit. Failure to do so could cause premature disc failure.
9. Examine the face of the grinding disc carefully. Excessive grinding which wears down to the backing material can result in tearing of the disc. Never use a disc which shows backing, nicks or cuts on the surface or edge or damage due to creasing or poor handling.
10. When installing a new disc, be certain the disc is accurately centered on the drive wheel. Failure to do so could cause a serious unbalanced condition.
11. Always present the workpiece to the wheel while resting the workpiece firmly on the table. Failure to do so could result in damage to the workpiece or throwing of the workpiece off the wheel.
12. Safety shoes which comply with ANSI Z41.1 shall be worn. See Figure C.
13. Personal hearing protection such as ear plugs or earmuffs shall be used to protect against the effect of noise exposure. See Figure D.



Figure A

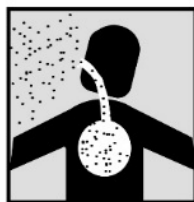


Figure B



Figure C



Figure D

**⚠ WARNING:** This product can expose you to chemicals including lead which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to <http://www.p65warnings.ca.gov>.

**⚠ WARNING:** Some dust, fumes and gases created by power sanding, sawing, grinding, drilling, welding and other construction activities contain chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. Some examples of these chemicals are:

- lead from lead based paint
- crystalline silica from bricks, cement and other masonry products
- arsenic and chromium from chemically treated lumber

Your risk of exposure 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 dust masks that are specifically designed to filter out microscopic particles. For more information go to <http://www.p65warnings.ca.gov/> and <http://www.p65warnings.ca.gov/wood>.

## 4.0 General Specifications

The JET Model J-4421 20-inch diameter disc grinder is a high production, rapid stock removal tool. The stock removal rate is controlled by the amount of pressure the operator applies to the work piece and the grit of the abrasive sheet mounted on the drive disc. By using different grit values and materials, a wide range of materials can be ground and an equally wide range of surface finishes achieved.

Because the Model J-4421 is of heavy-duty design throughout, large piece parts can be ground. The use of either the miter system or the tilt table allows high production grinding of angles. When used in combination, the miter/tilt design allows the grinding of compound angles.

The table tilt mechanism is a rigid, precision worm-and-sector gear controlled with a crank. Table angle is shown on a protractor mechanism.

Table height with respect to the drive disc can be adjusted using a rack and pinion gear system controlled by a crank. The table assembly is counterbalanced to make raising and lowering the table easier and to increase the service life of the lifting components.

Model number .....	J-4421-2 .....	J-4421-4
Stock numbers .....	577010 .....	577011
.....	(prewired 220V) .....	(prewired 440V)
Motor .....	TEFC, 3HP, 3PH, 220/440V, 1725 RPM	
Table size .....	27-1/2 x 10-1/2 in. (68.75 x 26.25 cm)	
Disc speed .....	1725 RPM	
Disc diameter .....	20 in. (508 mm)	
Table slot.....	3/8 x 3/4 in. (9.3 x 19 mm)	
Table tilt.....	45 degrees downward; 15 degrees upward	
Dust Port Diameter.....	3 in. (76.2 mm)	
Overall dimensions.....	30 x 27-1/2 x 53 in. (75 x 68.75 x 132.5 cm)	
Net weight .....	397 lb (180 kg)	
Shipping weight.....	452 lb (205 kg)	

*The specifications in this manual were current at time of publication, but because of our policy of continuous improvement, JET reserves the right to change specifications at any time and without prior notice, without incurring obligations.*

## 5.0 Machine set-up

### 5.1 Grinder set-up

1. Uncrate the grinder and remove it from its shipping skid.
2. Remove the table raiser crank which is taped to the grinder and install the crank on the raiser shaft, securing it with the set screw in the crank.
3. Spot and anchor the grinder according to instructions in the next section.
4. Remove the grinding disc (which is in a protective sleeve) from the machine.
5. Clean the protective coating on the machine surfaces with mineral spirits or other type of non-flammable cleaning fluid.
6. Clean the surface of the drive disc using a film-free cleaner such as naphtha.
7. Remove the grinding disc from its protective sleeve and install it on the drive disc according to instructions in *sect. 9.1 Removing and replacing grinding discs*.
8. Tilt the table to level using the protractor on the table, then raise the table assembly until it is more-or-less in the middle of the drive disc.
9. Check table for level according to instructions following in this section.
10. Establish power to the grinder using instructions in *sect. 6.0 Electrical* which follow in this section.
11. Grinder may be released for service.

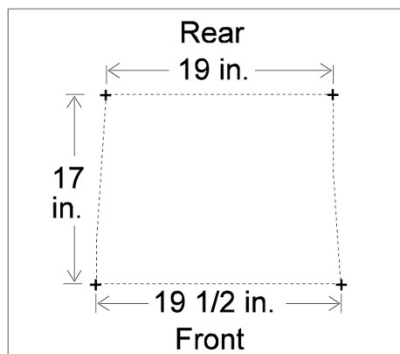


Figure 1: Base hold-down diagram

### 5.2 Spotting and anchoring the grinder

1. Set 3/8 inch floor anchors in the pattern indicated in Figure 1.
2. Set the grinder on its anchors.
3. Level the table using the protractor on the table.
4. Put a machinist's level on the table.

5. Use the two leveling bolts on the rear of the base to level the grinder. Shim under the anchor positions as needed to level the grinder.
6. Secure the grinder to the floor using the anchors.

### 5.3 Checking table level

While the machine has been run at the factory and checked before shipment, you may want to check the table level before releasing the grinder for service.

1. Disconnect the grinder from its electrical power source to prevent accidental start-up (if you have already connected it to power.)
2. Unlock the table tilt lock handle.
3. Place a machinist's square against the table and disc face.
4. Using the table tilt adjustment handle, adjust the table until it is at a right angle to the disc face.
5. Check the protractor pointer. It should be on the ZERO degree mark of the protractor. If not, adjust the pointer by loosening its attachment screw and moving it to the ZERO mark, then retighten the screw.

## 6.0 Electrical

The Model J-4421 has a 220/440 Volt, 3-phase motor. It is shipped wired to the specifications on the customer order.

The machine uses a LVP or "low voltage protection" ON/OFF switch which trips to the OFF position when voltage drops below a pre-determined safe level. This feature protects the operator from a quick re-start when service voltage cuts out or varies excessively. After tripping, the LVP switch must be positively reset by the operator before the motor receives power.

The LVP switch has a coil inside its case which is designed to work with a specific voltage level. If you decide to change the voltage source to the grinder from 220 to 440 (or the reverse) this coil must be replaced (in addition to changing the motor's internal wiring connections.)

### 6.1 Service wiring

1. Disconnect and lock out power to the service branch you are going to use to power the grinder.
2. Connect the branch ground wire to the ground wire in the cable. The ground wire in the cable will be either green, or green with a white trace.
3. Connect the three power wires to the three power wires in the cable.

4. Reestablish power to the service branch for the grinder.
5. Turn on the grinder using the ON/OFF switch and observe the direction of rotation of the drive disc. It should be turning **CLOCKWISE** when viewed from the front. If it is turning clockwise, the grinder is correctly connected and can be placed in service. If the disc is not turning clockwise, the electrical connections are hooked up backward and need to be corrected.

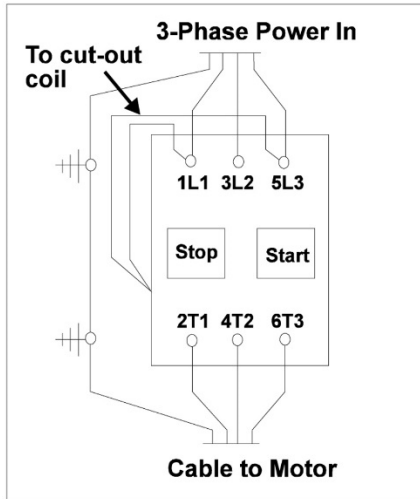


Figure 2: Service wiring diagram

## 6.2 To correct disc rotation

1. Disconnect and lock out power to the service branch for the grinder.
2. Switch any two of the three power wires to the machine service cable.
3. Re-establish power in the service branch and turn the grinder ON, again. The drive disc should now be rotating in a clockwise direction and the machine can be released for service.

## 6.3 Changing service voltage

As indicated in the previous section, the grinder is shipped wired for the voltage specified on the customer order. If you decide to change the voltage in the service branch to the grinder (from 220 to 440 volts, or 440 to 220 volts) the electrical connections inside the motor must be changed to reflect the change in voltage, and the LVP switch cut-out coil must also be changed to reflect the new voltage requirement.

## 6.4 Replacing the LVP switch cut-out coil

1. Be certain the power in the service branch to the machine is disconnected and locked out.
2. Open the switch case by removing the two cover screws.

3. Locate the cut-out coil which is under the switch. See Figure 3 for position and removal/installation motion.

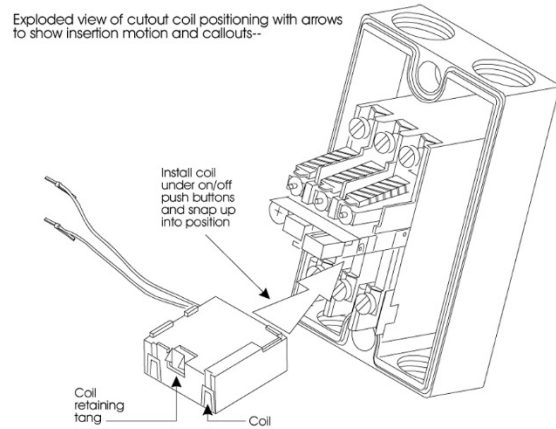


Figure 3: Cut-out coil removal and replacement

4. The cut-out coil is a "snap fit" under the switch mechanism, and is removed by pushing it to the rear of its mount and snapping it out of its retainer.
5. Remove the connectors which secure the coil to the switch mechanism.
6. Connect the new cut-out coil to the switch at the same connectors as the removed coil.
7. Insert the new coil by pushing it to the back of its seat and snapping it into position under its retainers.
8. Reinstall the switch cover to the switch base using the two retainer screws.
9. Proceed to the next step – changing the motor connections.

## 6.5 Changing motor connections

10. Again, be certain the power in the service branch to the machine is disconnected and locked out.
11. Open the electrical connection cover plate on the motor.
12. A wiring diagram for the motor is shown in Figure 4, and will also be on a label underneath the motor plate cover.
13. Switch the connectors inside the motor to meet the voltage requirements for the service branch supplying the motor.
14. Close the motor plate cover and secure it shut with its screws.
15. Reconnect power to the service branch and turn ON the grinder to verify that it runs correctly, and that the disc turns counterclockwise.



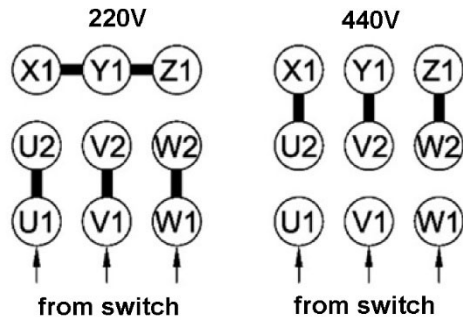


Figure 4: Motor wiring diagram

## 7.0 Operating Instructions

Use the nomenclature drawing in Figure 5 for reference when various parts and components are described in the operations and maintenance text. To order service parts you will find an exploded view of the grinder in sect. 11.1.1.

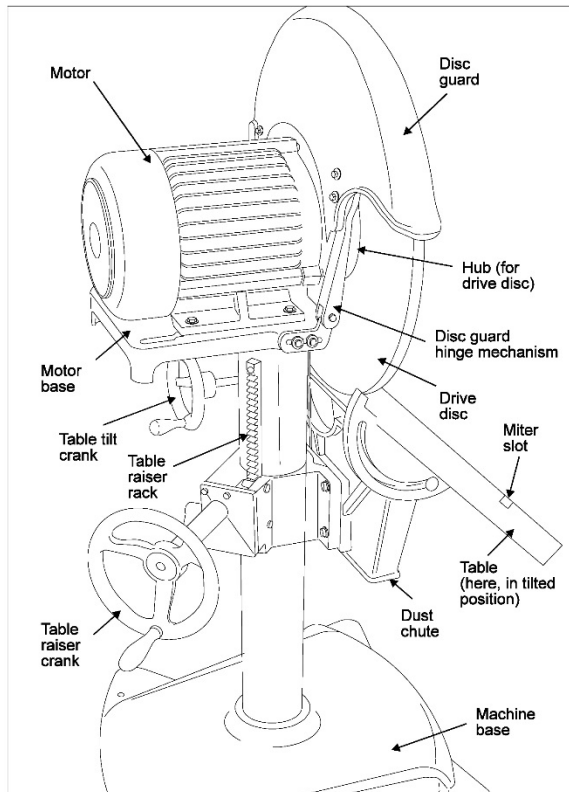


Figure 5: General grinder nomenclature

### 7.1 Applying a workpiece to the disc face

No matter what size, type or material workpiece you will be grinding, there are several important considerations you must understand if you are going to use the Model J-4421 disc grinder effectively.

1. Always be certain the wheel guard is positioned over the disc edge. Materials abraded from your workpiece will be hurled off the wheel if the wheel guard is not in position.

2. Always allow time for the disc to come fully up to motor speed before contacting the workpiece to the disc. This gives you a chance to check for possible wheel wobble (looseness of the disc or motor, or damage from some earlier operation) before working against the disc.
3. This is a very powerful and aggressive grinding device which operates at high surface speeds. Therefore, you always want to support the workpiece while using the work table. "Freehand" presentation of workpiece to the disc surface is risky to you, to the workpiece, and to bystanders. It is not possible to overemphasize the need to keep the workpiece firmly on the table.
4. The safest position at which to do any grinding is on the right hand side of the work table where the disc is moving downward past the work table. Whenever possible, keep the workpiece in this area when grinding. In addition to safety, keeping the workpiece in this area greatly increases the effectiveness of the dust control chute and any vacuum dust control system you might be using. See Figure 6.

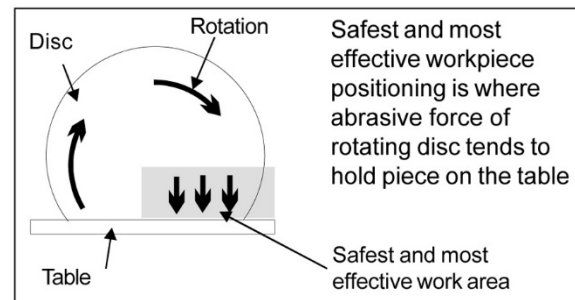


Figure 6: Correct table work area

5. The speed and aggressiveness of the machine means that CONTROL of the workpiece, by you, is absolutely essential. ALWAYS USE TWO HANDS to control the workpiece.
6. Because of the speed with which the disc can grind, heat build-up on work pieces is usually very rapid. To prevent burns and/or possible loss of control of any workpiece:
  - a. Use heat resistant gloves to hold any workpiece.
  - b. Where possible and appropriate, use additional tooling or fixturing to hold the workpiece when pressing against the grinding disc.

### 7.2 Rotary Switch

The rotary switch is located on a post on the left hand side of the grinder. It is a knob-initiated switch. See Figure 7.

The switch is a Low Voltage Protection (LVP) switch. When line voltage drops below a safe

working voltage (due to start-up of larger machines on the electrical branch or other fluctuations in line voltage) the switch automatically trips OFF. The switch will not activate the machine while it remains in overload condition.

If the switch trips off, wait 3 to 5 minutes for the overload relay to automatically reset. To restart the machine you should remove the workpiece from the table and turn the switch ON, again. Then wait for the motor to come up to full speed before continuing your grinding.

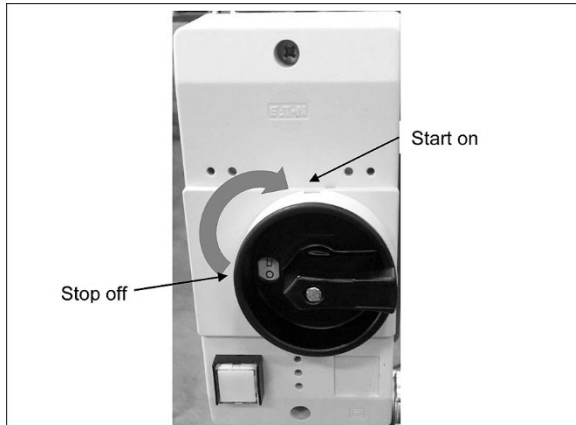


Figure 7: Rotary switch

### 7.3 Raising and lowering the table

For grinding most workpieces, the table should be positioned more-or-less in the middle of the disc. This allows you to do most of your work on the right-hand side of the disc where downward motion of the disc provides the safest grinding torque.

To grind larger workpieces, a larger disc surface area can be exposed by lowering the table. This is done as follows:

1. Turn off the ON/OFF switch and disconnect the machine from its electrical power source to prevent the possibility of accidental start-up.
2. Unlock the table lock handle.
3. Turn the table height handle until the table is at a height appropriate to your workpiece size.
4. Lock the table lock handle.
5. Reconnect the machine to the electrical power source.

**Note:** Never expose more of the grinding disc than necessary to do an effective job of grinding the workpiece. The more disc you have exposed, the more hazardous any operation may become. And, the more disc you have exposed, the harder it is to control dust when using a vacuum dust control system.

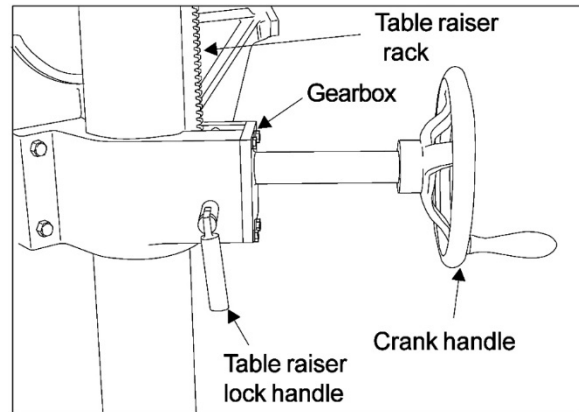


Figure 8: Table raiser system

### 7.4 Adjusting the table angle

The table can be adjusted downward to a maximum angle of 45 degrees and upward to a maximum angle of 15 degrees.

To adjust the table angle (Figure 9):

1. Be sure the ON/OFF switch is in the off position.
2. Disconnect the machine from its electrical power source to prevent any chance of an accidental start-up.
3. Unlock the table lock handle.
4. Turn the table tilt handle until the pointer on the angle protractor is on the angle you want to achieve.
5. Lock the table lock handle.
6. Reconnect the machine to its electrical power source.

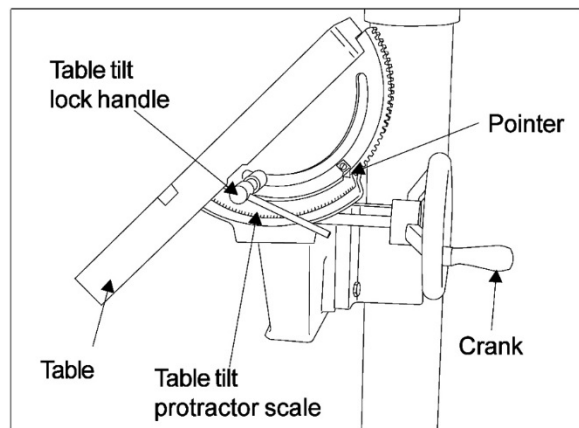


Figure 9: Table tilt system

**Note:** The table protractor, while accurate, may not give you the precision required for highly accurate grinding. For these cases requiring high precision angles, use a machinist's protractor to establish the required angle between table and disc as shown in Figure 10.

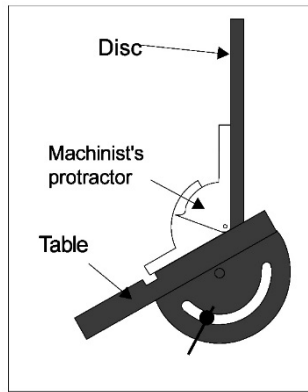


Figure 10: Achieving accurate angles using a machinist's protractor

## 7.5 Using the miter system

The miter slot in the table allows you to use a miter gauge to grind angles on workpieces. Use the following procedure:

1. Put the table in a level position. Use the table tilt mechanism to adjust it, if necessary.
2. Loosen the lock knob on the miter gauge.
3. Adjust the miter gauge to the angle you want to cut.
4. Lock the lock knob on the miter gauge.
5. Put the miter gauge in its miter slot on the table.
6. Turn the grinder ON and allow the motor and disc to come up to full speed.
7. Hold the reference edge of the workpiece against the miter gauge face and move the workpiece into contact with the abrasive disc.
8. Allow the workpiece to slide forward, along the face of the miter gauge, until the required depth of cut has been achieved.

Figure 11 shows how to set and use the miter gauge to grind a simple angle on a workpiece. To grind a compound angle you can set the miter gauge to one required angle and set the table tilt to a second required angle, thus achieving the compound angle desired. Remember: When grinding complex compound angles, always test your table and miter set-up on scrap material before attempting a finish machining task on the actual part you will be grinding.

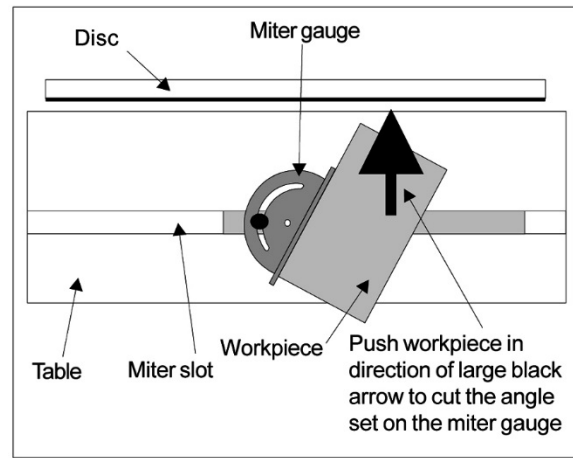


Figure 11: Use of the miter system

## 8.0 Recommended abrasives

By using different abrasive types and different weights of grit it is possible to produce a very wide variety of cutting speeds and surface finishes on a very wide range of materials – from metals, to plastics, to wood.

The following information is provided as a general guide to the types of discs appropriate to many materials. Your industrial distributor may be able to provide you with special abrasive discs for specific production applications. And of course, your workpiece supplier should be consulted for recommendations, as well.

### Aluminum Oxide

Aluminum oxide is available in cloth backed discs in a very wide range of grits – typically from 24 (extremely aggressive) to 400 (almost a polishing grade.) Aluminum oxide is suitable for use on virtually all materials – ferrous and non-ferrous. The list of materials appropriate for aluminum oxide cutting includes low, medium and high carbon/alloy steels, brass, aluminum, bronze, copper and titanium.

### Garnet

Garnet is available in a cloth backed disc, typically in a range of grits from 80 to 220. Garnet is a material used almost exclusively on wood. This makes it appropriate to shops such as pattern shops. It has the beneficial property of grit fracturing at low pressure levels. This quick renewal of the cutting surface results in more rapid wear-out of the disc, of course. But it also allows very low temperature sanding of wood – thus permitting rapid sanding without burns. This is particularly beneficial when doing sanding on end grains.

## Silicon carbide

While discs may be available for 20 inch grinding, this material is not recommended for use on the Model J-4421 because a water coolant/lubricant is typically required for effective use of this material.

### Application tip

While the 20 inch grinder can mount the full range of grits available – from 24 to 400 – the most efficient production and the longest abrasive disc life can be achieved when the production manager is aware of the capabilities of the grits offered. If you start with a workpiece which has been rough cut with an 80 grit wheel of some type, and you eventually want to achieve a finish at the 400 grit level – don't go directly from the 80 to the 400 disc machine. The 400 grit wheel will eventually do the job, but it will take an excessive amount of time and the disc will have a short service life. Plan your surface finishing to take advantage of the full range of grits available to the shop.

## 9.0 Maintenance procedures

### 9.1 Removing and replacing grinding discs

**CAUTION:** The gap between the abrasive surface and table edge must not exceed 3/16". If it does, loosen the four motor mount bolts and move the motor forward to minimize gap.

Grinding discs are secured to the aluminum drive disc using an adhesive on the grinding disc backing. To remove an abrasive disc:

1. Turn the ON/OFF switch OFF.
2. Disconnect the machine from its power source to prevent accidental start-up of the motor.
3. Move the table to the bottom of its travel using the table raiser mechanism. (See sect. 7.3, *Raising and lowering the table*)
4. Tilt the disc guard to the rear to expose the top of the drive disc.
5. Pull at the edge of the mounted grinding disc to pull it away from the drive disc, then pull it completely off of the drive disc.
6. Be certain the drive disc surface is clean. If necessary, use a cleaner which dries film-free (such as naphtha) to remove any old adhesive (or dust) which might adhere to the drive disc.
7. Remove a small portion of the protective cover from the back side of the new grinding disc you are mounting on the drive disc. A typical amount to remove is about a third of the protective cover. See Figure 12.

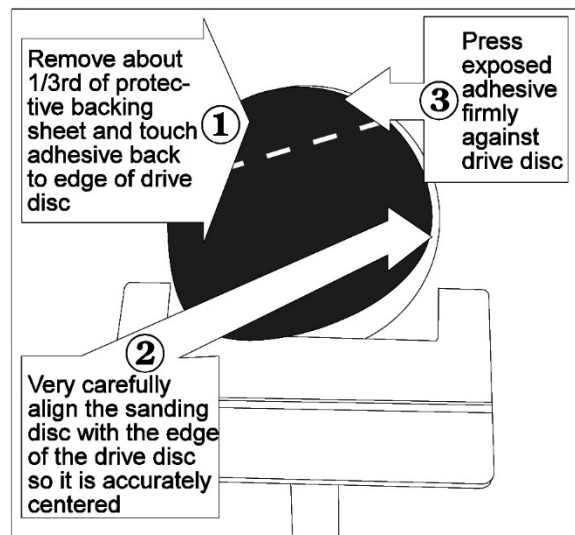


Figure 12: Replacing a grinding disc

8. Put the exposed edge of the new grinding disc against the drive disc and center the grinding disc carefully on the drive disc. When you are certain it is accurately centered, press on grinding disc so the exposed portion of the adhesive anchors the grinding disc to the drive disc.
9. Rotate the drive disc 180 degrees. See Figure 13. The part of the grinding disc which is attached to the drive disc will now be at the bottom of the drive disc, and will be slightly hidden behind the table.

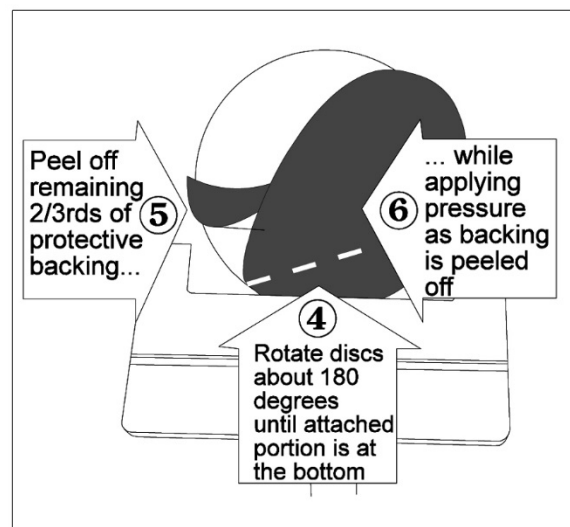


Figure 13: Replacing a grinding disc

With the components in this position you can keep the grinding disc accurately centered while reaching behind the grinding disc to remove the rest of the protective backing and progressively pressing the grinding disc against the face of the drive disc. The reason for this care is that a grinding disc, once firmly pressed into position, is often extremely difficult to remove. In other words: Once it is down... it is down to stay.

10. Press firmly against the full surface of the disc. The idea here is to be sure the grinding disc makes full contact with the drive disc and is laying absolutely flat on the disc surface.
11. Move the wheel guard forward so it covers the edge of the grinding and drive disc.
12. Adjust the table height to working height.
13. Reconnect power to the machine.
14. Turn the machine "ON" and observe the action of the disc for possible imbalance. When you are certain all systems are operating correctly, grinding operations may resume.

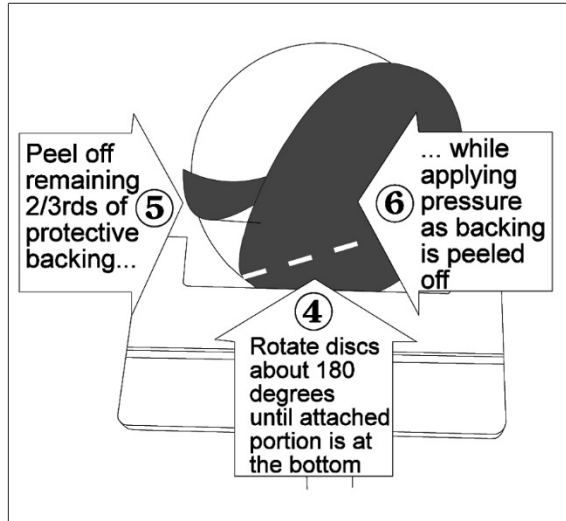


Figure 13 (repeated)

## 9.2 Removing and replacing motor and/or drive disc

In the rare event that damage to the drive disc might require its replacement, or electrical failure might require motor replacement, the following procedure can be used. Since motor replacement requires removal of the drive disc, these procedures are treated as a single procedure. Ignore the motor replacement instructions if you are only servicing the drive disc.

### To remove drive disc from motor shaft:

1. Disconnect the grinder from its electrical power source to prevent accidental start-up and to allow motor replacement without danger of electrical shocks.
2. Lower the table to its lowest position. (See sect. 7.3, *Raising and lowering the table.*)
3. If you are replacing the metal drive disc, remove the abrasive disc before proceeding. (See sect. 9.1)
4. Remove the socket head screw and washer from the center of the drive disc.
5. Loosen the two socket head set screws which secure the drive disc hub to the motor shaft.

6. Loosen the four bolts which hold the motor to the stand.
7. Slide the motor toward the rear of the stand while pulling the drive disc and hub toward the front of the stand. This is a combined effort. The disc and hub can be separated from the motor shaft only if you perform these two operations at the same time.
8. Slide the drive disc and hub off of the motor shaft.

### To replace the drive disc:

9. Remove the three bolts and washers which hold the disc to the hub.
10. Position the new disc on the hub and secure it with the bolts and washers.
11. Align the support plate keyway with the key on the motor shaft and slide the hub plate onto the motor shaft as you also pull the motor forward on its plate. Do this until the assembly bottoms out against the shaft.
12. Reinstall and tighten the retaining screw and washer which screws into the center of the motor shaft.
13. Tighten the two set screws which secure the hub to the motor shaft.

### To replace the motor:

Note: be certain you have performed all of the steps above – through step 8 – which remove the drive disc assembly from the motor. And, BE CERTAIN YOU HAVE TURNED OFF POWER TO THE MOTOR AND HAVE LOCKED OUT POWER TO THE BRANCH ON WHICH YOU WILL BE WORKING. JET recommends that a licensed electrician perform all electrical service work for this grinder.

14. Open the plate on the motor frame where the electrical service cable enters the motor.
15. Remove the wires from their connectors to free the cable from the motor. Note and label the positions of the wires.
16. Remove the four bolts and washers which secure the motor to the stand.
17. Place the replacement motor on the frame and secure it loosely with the four bolts and washers.
18. Open the motor plate to expose the electrical connections.
19. Connect the switch-to-motor cable to the wire positions noted in step 15, above, then close the motor electrical cover plate and tighten the cover plate screws.
20. Install the drive disc and hub plate as outlined in steps 11-13, above.
21. Raise the table to its highest position.

22. If the drive disc does not have a grinding disc installed on it – install a disc now, using the instructions in *sect. 9.1 Removing and replacing grinding discs*.
23. Slide the motor forward on the frame until the disc is 1/8-inch from the table. Be certain that both the right and left hand gaps between the table and disc are equal.
24. Tighten the motor mounting bolts securely.
25. Reconnect the machine to its electrical power source.
26. Verify the motor and disc rotation. If you have connected everything correctly, the disc will rotate clockwise when viewed from the front. If the disc rotates counterclockwise, correct the electrical connections according to instructions in *sect. 6, Electrical*.
27. The machine is ready to return to service.

## 10.0 Lubrication

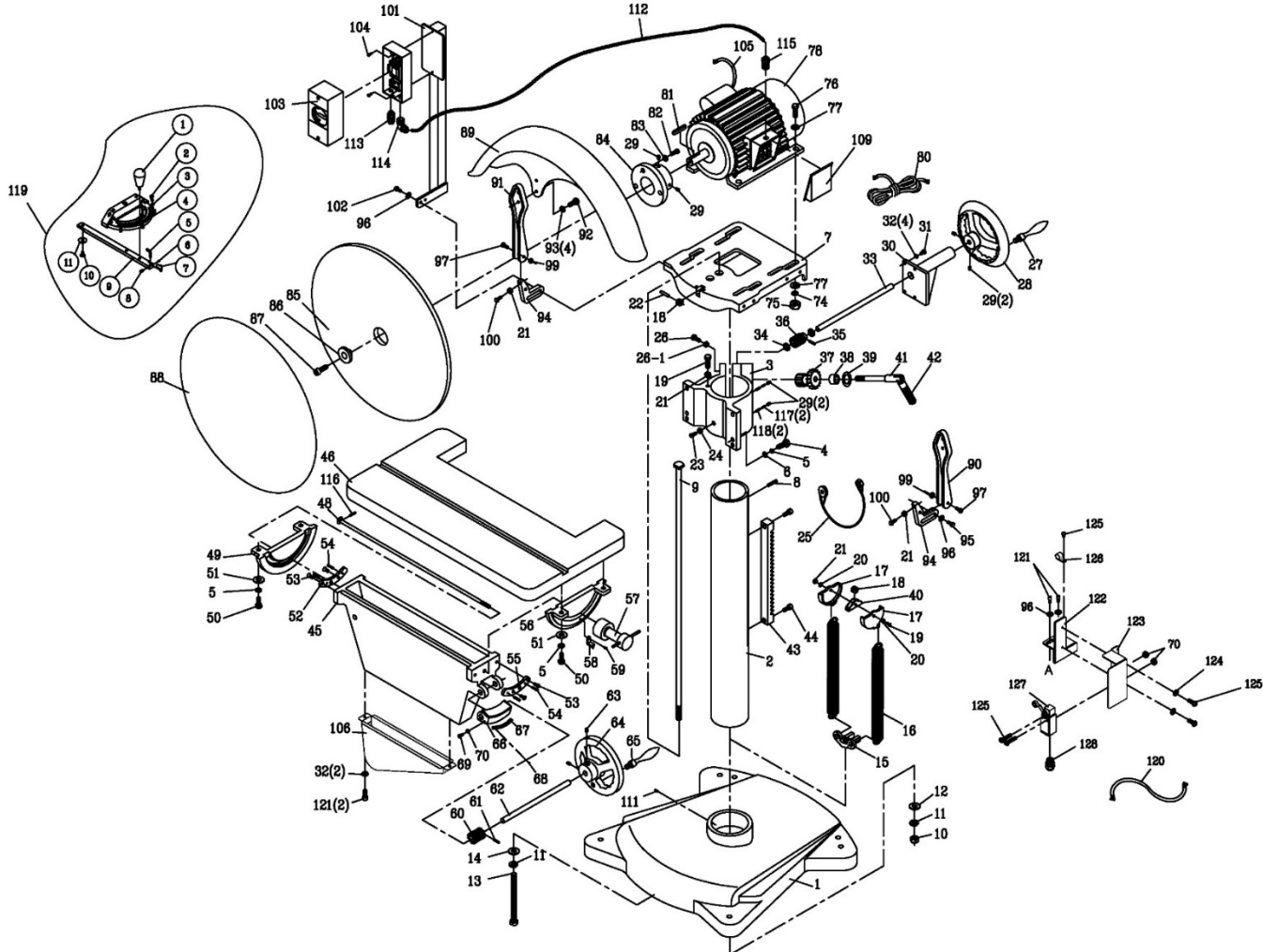
Since the grinder operates in an environment of high amounts of dust and grit, most lubrication would simply pick up the grit and cause increased wear to the machine and its parts. Therefore, the primary method of keeping the machine working surfaces in good order is KEEPING THE MACHINE AS CLEAN AS POSSIBLE. Before using the tilt table or table raising mechanism the operator should use a stiff brush to remove excessive dust and grit from the tilt worm-and-sector and/or table raising rack. The single exception to this "no-lubrication" recommendation is the right angle drive used for the table raising rack-and-pinion system. This gearbox is pre-lubricated at the factory and should require no additional lubrication unless it is disassembled. If this is done, use Shell Retinax A or a similar grease to refill the gearbox.

## 11.0 Replacement Parts

Replacement parts are listed on the following pages. To order parts or reach our service department, call 1-800-274-6848 Monday through Friday, 8:00 a.m. to 5:00 p.m. CST. Having the Model Number and Serial Number of your machine available when you call will allow us to serve you quickly and accurately.

Non-proprietary parts, such as fasteners, can be found at local hardware stores, or may be ordered from JET. Some parts are shown for reference only, and may not be available individually.

# 11.1.1 J-4421 Motor and Trunnion – Exploded View



## 11.1.2 J-4421 Motor and Trunnion – Parts List

Index No	Part No	Description	Size	Qty
1	J-5644311G	Base		1
2	5644321	Column		1
3	J-5644331G	Support Bracket		1
4	5644341	Hex Cap Bolt	3/8"-16 x 1-3/4"	4
5	5644351	Lock Washer	3/8"	8
6	5644361	Flat Washer	3/8"	4
7	J-5644371G	Support		1
8	5644381	Spring Pin	Ø5 x 20 mm	1
9	5644391	Stud Bolt		1
10	5644411	Hex Nut	1/2"-12	1
11	5644421	Lock Washer	1/2"	1
12	5644431	Flat Washer	1/2"	1
13	5644441	Spring Stud Bolt		1
14	5644451	Flat Washer	1/2"	1
15	5644461	Bracket		1
16	5644471	Spring		2
17	5644481	Keeper		2
18	5644491	Sheave		2
19	5644511	Hex Cap Bolt	1/4"-20 x 5/8"	2
20	5644521	Washer	1/4"	2
21	5644531	Hex Nut	1/4"	4
22	5644541	Shaft (Pin)		1
23	5644551	Hex Cap Bolt	1/4"-20 x 1-1/2"	1
24	5644561	Hex Nut	1/4"	1
25	5644571	Wire Rope		1
26	5644581	Hex Cap Bolt	5/16"-18 x 1-3/4"	1
26-1	5644581A	Hex Nut	5/16"	2
27	5644591	Handle		1
28	5644611	Crank Wheel		1
29	5644621	Hex Socket Set Screw	5/16"-18 x 3/4"	6
30	J-5644631G	Shaft Guide		1
31	5644641	Hex Cap Bolt	1/4"-20 x 1"	4
32	5644651	Lock Washer	1/4"	6
33	5644661	Shaft		1
34	5644671	Special Washer		2
35	5644681	Spring Pin	Ø4 x 20 mm	1
36	5644691	Worm, Pinion		1
37	5644711	Worm Gear		1
38	5644721	Special Washer		1
39	5644731	Flat Washer		1
40	5644741	Sheave Stand		1
41	5644751	Lock Handle		1
42	5644761	Knob		1
43	5644771	Rack		1
44	5644781	Socket Hex Cap Screw	5/16"-18 x 1/2"	2
45	J-5644791G	Solid Segment		1
46	J-5644811G	Table		1
48	5644831	Table Pivot Shaft		1
49	J-5644841G	Trunnion		1
50	5644851	Hex Cap Bolt	3/8"-16 x 1"	4
51	5644861	Flat Washer	3/8"	8
52	5644871	Trunnion Shoe		1
53	5644881	FH Screw	1/4"-20 x 1/2"	4
54	5644891	Spring Pin	Ø5 x 20 mm	4
55	5644911	Trunnion Shoe		1
56	J-5644921G	Sector Gear		1
57	5644931	Table Lock Handle		1
58	5644941	Pointer		1
59	5644951	Round HD Screw	M4 x 0.7p x 6	1

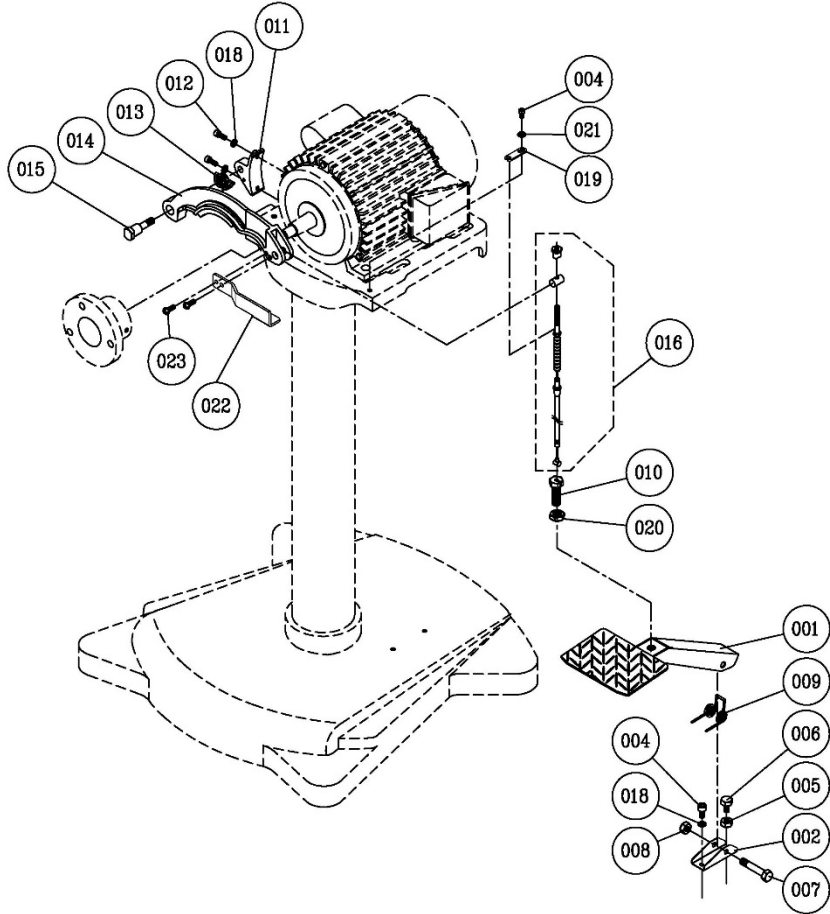


Index No	Part No	Description	Size	Qty
60	5644961	Worm Gear		1
61	5644971	Spring Pin	Ø4 x 20 mm	1
62	5644981	Shaft		1
63	5644991	Hex Socket Set Screw	5/16"-18 x 3/4"	2
64	5645011	Crank Wheel		1
65	5645021	Knob		1
66	J-5645031G	Bracket		1
67	5645041	Protractor		1
68	5645051	Drive Rivet		3
69	5645061	Hex Cap Bolt	3/16"-24 x 3/4"	1
70	5645071	Hex Nut	3/16"	1
74	5645121	Flat Washer	3/8"	4
75	5645131	Hex Nut	3/8"	4
76	5645141	Hex Cap Bolt	3/8"-16 x 1-1/2"	4
77	5645151	Flat Washer	3/8"	8
78	J-5645161	Motor		1
80	5645181A	Electric Cord	14AWGx4C, 600V, ST	1
81	5645191	Key	7 x 7 x 30	1
82	5645211	Socket Hex Cap Screw	3/8"-16 x 7/8"	3
83	5645221	Lock Washer	3/8"	3
84	J-5645231G	Hub		1
85	5645241	Drive Disc		1
86	5645251	Clamp Washer		1
87	5645261	Socket Hex Cap Screw	1/4"-20 x 3/4"	1
88	5645271	Sanding Paper	36 grit	1
	5645281	Sanding Paper	50 grit	1
	5645291	Sanding Paper	80 grit	1
	5645311	Sanding Paper	120 grit	1
89	J-5645321G	Disc Guard		1
90	J-5645331G	LH Guard Arm		1
91	J-5645341G	RH Guard Arm		1
92	5645351	Hex Cap Bolt	1/4"-20 x 5/8"	4
93	5645361	Lock Washer	1/4"	4
94	J-5645371G	Bracket		2
95	5645381	Hex Cap Bolt	1/4"-20 x 1"	2
96	5645391	Flat Washer	1/4"	4
97	5645411	Hex Cap Bolt	1/4"-20 x 1-1/2"	2
99	5645431	Hex Nut	1/4"	2
100	5645441	Hex Cap Bolt	1/4"-20 x 1"	2
101	J-5645451G	Magnetic Switch Arm		1
102	5645461	Hex Cap Bolt	1/4"-20 x 1"	2
103	5645471	LVP Switch (MOELLER, PKZM0-10A)	For 3Ph, 460V	1
	J-4421-103	LVP Switch (MOELLER, PKZM0-16A)	For 3Ph, 230V	1
104	5645481	Switch Screw	3/16"-24 x 3/4"	2
105	9139071	Motor Cable	440V cut coil	2
106	J-5514646G	Dust Chute		1
108	5507546	Cooling fan and cover (not shown)		1
109	J-5507545	Junction Box		1
111	5514796	Spring Pin	Ø5 x 20 mm	1
112	5514797	Sleeve	1/2"	1
113	5514800A	Strain Relief	MG25A-16B	1
114	5514801	90° Connector	1/2"	1
115	5514802	Connector	S-FZS21-21-1/2"	1
116	5645500	Spring Pin	Ø3 x 16 mm	1
117	5514808	Spring		2
118	5645501	Brass Pin		2
119	5646000	Miter Gauge Complete Assembly (item #119-1 to #119-11)		1
119-1	5646001	Knob		1
119-2	TS-2205201	Hex Cap Screw	M5-0.8p x 20	3
119-3	TS-1540031	Hex Nut	M5	3
119-4	5646002	Miter Gauge		1

Index No	Part No	Description	Size	Qty
119-5	5646003	Pointer		1
119-6	5646004	Roll Pin	Ø3 x 6 mm	1
119-7	5646005	Stop Link		1
119-8	TS-0267021	Socket Set Screw	1/4"-20 x 1/4"	1
119-9	5646006	Guide Bar		1
119-10	5646007	Flat Head Screw	1/4"-20 x 5/16"	1
119-11	5646008	Guide Disc		1
120	J-4421-120	Connection Wire		1
121	TS-0207011	Socket Head Cap Screw	1/4"-20 x 3/8"	4
122	J-4421-122	Bracket		1
123	J-4421-123	Guard		1
124	TS-0680011	Flat Washer	3/16"	2
125	TS-0810012	Machine Screw Round Head	#10-24 x 1/4"	5
126	J-4421-126	Fixed Clamp		1
127	J-4421-127	Limit Switch		1
128	J-4421-128	Strain Relief		1

Note: When ordering parts, please use your grinder serial number as a reference number.

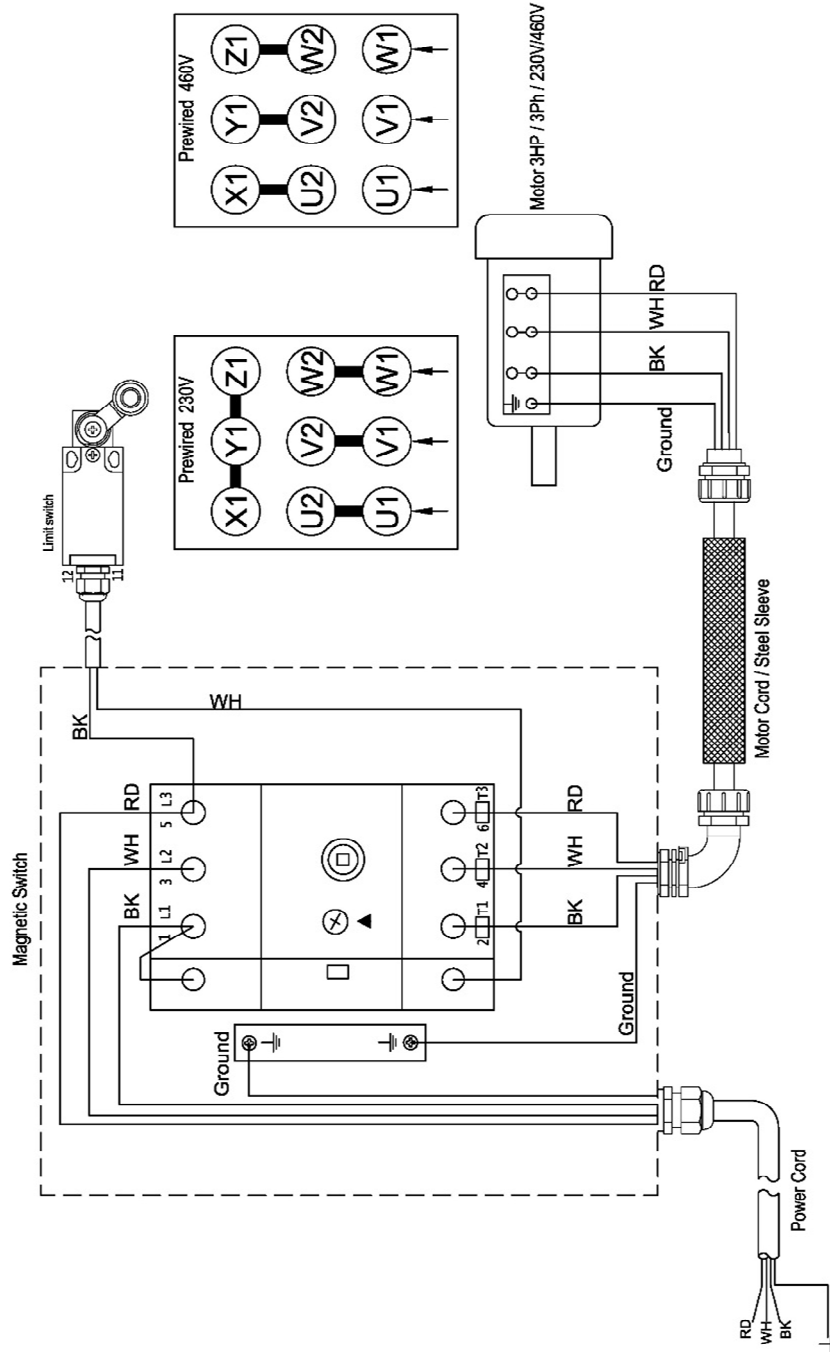
### 11.2.1 J-4421 Foot Brake – Exploded View



### 11.2.2 J-4421 Foot Brake – Parts List

Index No.	Part No.	Description	Size	Qty
1	J-4421-001	Foot brake		1
2	J-4421-002	Bracket		1
4	TS-0207021	Socket HD Cap Screw	1/4"-20 x 1/2"	2
5	TS-0570011	Hex Nut	1/4"-20	1
6	TS-0050061	Hex Cap Screw	1/4"-20 x 1-1/4"	1
7	TS-0060091	Hex Cap Screw	3/8"-16 x 2"	1
8	TS-0561031	Nylon Nut	3/8"-16	1
9	J-4421-009	Spring		1
10	J-4421-010	Adjusting Bolt		1
11	J-4421-011	Bracket		1
12	TS-0207041	Socket HD Cap Screw	1/4"-20 x 3/4"	2
13	J-4421-013	Spring		1
14	J-4421-014	Brake bracket		1
15	J-4421-015	Fixed Shaft		1
16	J-4421-016	Wire		1
18	TS-130205	Spring Washer	1/4"	3
19	J-4421-019	Plate		1
20	J-4421-020	Hex Nut	1/2"-12	1
21	TS-0680021	Flat Washer	1/4"*13 x 1t	1
22	J-4421-022	Plate		1
23	TS-081C022	Pan Head Machine Screw	#10-24UNC x 3/8"	2

# 12.0 Electrical Connections – J-4421



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