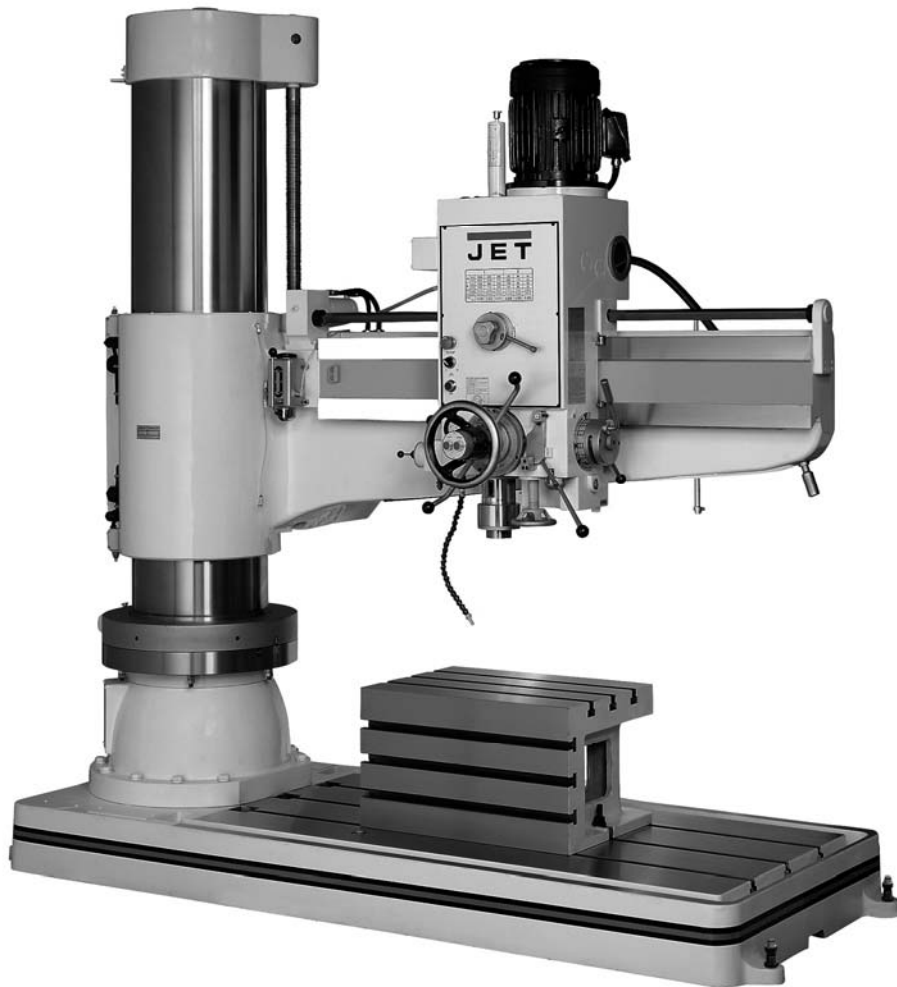




# Operating Instructions and Parts Manual

## 5-ft. Radial Arm Drill Press

Models J-1600R, J-1600R-4



**JET**  
427 New Sanford Road  
LaVergne, Tennessee 37086  
Ph.: 800-274-6848  
[www.jettools.com](http://www.jettools.com)

**Part No. M-320038**  
Revision G3 05/2014  
Copyright © 2014 JET

# 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.

## 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.

JET sells through distributors only. The specifications listed in JET printed materials and on official JET website are given as general information and are not binding. JET reserves the right to effect at any time, without prior notice, those alterations to parts, fittings, and accessory equipment which they may deem necessary for any reason whatsoever. JET® branded products are not sold in Canada by JPW Industries, Inc.

## Product Listing with Warranty Period

90 Days – Parts; Consumable items; Light-Duty Air Tools
1 Year – Motors; Machine Accessories; Heavy-Duty Air Tools; Pro-Duty Air Tools
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

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.....	1
2.0 Table of Contents.....	3
3.0 Safety.....	5
3.1 Machinery General Safety Warnings.....	5
3.2 General Electrical Cautions.....	6
3.3 Safety Instructions for Drill Presses.....	6
4.0 Specifications.....	7
4.1 Machining Capacities.....	8
4.2 Machine Environment.....	8
4.3 Power Supply Requirements.....	8
4.4 Overall Dimensions, J-1600R.....	9
5.0 General Features and Terminology, J-1600R.....	10
6.0 Set-Up and Assembly.....	12
6.1 Floor Diagrams for J-1600R.....	12
6.2 Unpacking.....	13
6.3 Machine Set-Up.....	14
6.4 Electrical Connections.....	15
7.0 Operating Controls.....	16
8.0 Operation.....	17
8.1 Clamping workpieces.....	17
8.2 Tool insertion.....	17
8.3 Tool positioning over workpiece.....	17
8.4 Unlocking arm and column mechanisms.....	17
8.5 Raising and lowering radial arm.....	18
8.6 Moving drill head along arm.....	18
8.7 Rotating arm on support column.....	18
8.8 Setting spindle speed.....	18
8.9 Feed rate and depth of cut.....	19
8.10 Setting feed rate.....	19
8.11 Feed methods.....	19
8.12 Setting depth of cut using power feed system.....	19
8.13 Spindle direction and power feed.....	20
8.14 Hand feed – roughing operations.....	20
8.15 Fine hand feed using power feed system.....	20
8.16 Tapping.....	20
8.17 Power ON/OFF.....	20
8.18 Coolant control.....	21
8.19 Spindle motor controls.....	21
8.20 Turning off spindle drive.....	21
8.21 Resetting STOP switch.....	21
8.22 Using load ammeter.....	21
8.23 Tapping operations.....	21
8.24 Arm/spindle control lever.....	22
9.0 Adjustments.....	22
9.1 Clamping device.....	22
9.2 Head/rail backlash.....	22
9.3 Clutch adjustment.....	23
9.4 Hydraulic pressure adjustment.....	23
10.0 Troubleshooting the J-1600R.....	24
11.0 Spindle speed chart (J-1600R).....	25
12.0 Maintenance for J-1600R.....	26
12.1 General Cleaning.....	26
12.2 Lubrication.....	26
13.0 Replacement Parts – J-1600R Radial Arm Drill.....	28
13.1.1 Riser Mechanism: Exploded View.....	28
13.1.2 Riser Mechanism: Parts List.....	29
13.2.1 Column and Base: Exploded View.....	30
13.2.2 Column and Base: Parts List.....	31
13.3.1 Coolant System: Exploded View.....	33

13.3.2	Coolant System: Parts List .....	33
13.4.1	Gearbox Assembly (Upper Section): Exploded View .....	34
13.4.2	Gearbox Assembly (Upper Section): Parts List .....	35
13.5.1	Gearbox Assembly (Lower Section): Exploded View .....	37
13.5.2	Gearbox Assembly (Lower Section): Parts List .....	38
13.6.1	Rear of Head: Exploded View .....	42
13.6.2	Rear of Head: Parts List .....	43
13.7.1	Feed Change Mechanism: Exploded View .....	45
13.7.2	Feed Change Mechanism: Parts List .....	45
13.8.1	Hydraulic Clamping Mechanism: Exploded View .....	47
13.8.2	Hydraulic Clamping Mechanism: Parts List .....	48
13.9.1	Hydraulic System: Exploded View .....	50
13.9.2	Hydraulic System: Parts List .....	51
14.0	Electrical Connections for J-1600R .....	52
14.1	Electrical Connections for J-1600R: Parts List .....	53
15.0	Hydraulic system of J-1600R .....	54

**Familiarize yourself with the following safety notices used in this manual:**

**CAUTION** This means that if precautions are not heeded, it may result in minor injury and/or possible machine damage.

**WARNING** This means that if precautions are not heeded, it may result in serious or even fatal injury.



## 3.0 Safety

- 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 unplug 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 must 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 must be grounded to protect the user from electrical shock.

**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

Table 1

### 3.3 Safety Instructions for Drill Presses

1. All work shall be secured using either clamps or a vise to the drill press table. It is unsafe to use your hands to hold any workpiece being drilled.
2. Drill press head and table shall be securely locked to the column before operating the drill press. This must always be checked prior to starting the machine.
3. Always use the correct tooling. Tooling shall always be maintained and properly sharpened. All tooling must be run at the proper speeds and feeds as they apply to the job. Use only recommended accessories and follow those manufacturer's instructions pertaining to them. Tooling shall not be forced into any workpiece but fed according to the proper specifications. Failure to follow these instructions will not only ruin the tooling as well as the machine, but can cause serious injury.
4. Never brush away shavings or chips while the machine is in operation. All clean up should be done after the machine is stopped.
5. Keep hands in sight. Do not put hands or fingers around, on, or below any rotating cutting tools. Leather safety gloves should be used when handling any sharp objects or cutting tools. See Figure 1A.
6. Always use protective eyewear when operating, servicing or adjusting machinery. Eyewear shall be impact resistant, protective safety glasses with side shields complying 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. See Figure 1B.
7. When drilling in material which causes dust, a dust mask shall be worn. See Figure 1C.
8. Avoid contact with coolant, especially guarding the eyes.
9. Non-slip footwear and safety shoes are recommended. See Figure 1D.
10. Wear ear protectors (plugs or muffs) during extended periods of operation. See Figure 1E.

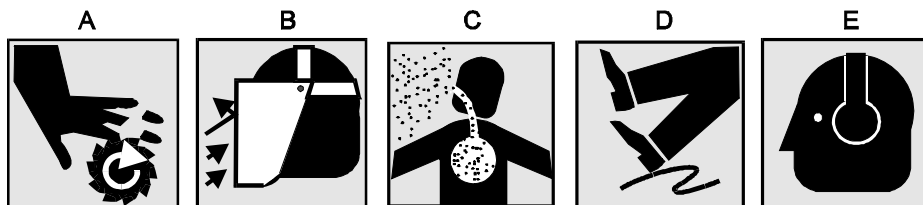


Figure 1

## 4.0 Specifications

The JET Model J-1600R is a powerful and versatile radial arm drill press. The drill head is mounted on an arm and can slide along the arm to position the spindle over the work piece. The arm itself can be rotated on its support column to allow centering the spindle over the work piece.

Drilling can be performed manually or with power feed assistance. In addition, parameters of RPM, power feed rate and drilling depth can be pre-set by the operator, using controls conveniently positioned on the drill head. The drill has an automatic tool ejector, and hydraulic head and column clamping system.

The power train gears and spline shaft are made of high quality heat-treated and ground nickel chrome steel, offering greater strength and smoothness to high-torque loads. The spindle is of case hardened steel and supported by dual row taper roller and thrust ball bearings at the nose, with thrust and radial axis bearings at the top. The frame is made of Meehanite® and high-tensile strength cast iron.

A precision machined box table allows convenient positioning and clamping of smaller work pieces. The box table can be removed from the base to allow larger workpieces to be clamped on the base itself. Both table and base have multiple T-slots for clamping set-ups.

**Model number** ..... J-1600R  
*(J-1600R-4 is the same machine but pre-wired for 460V operation)*

**Stock numbers:**

J-1600R..... 320038  
 J-1600R-4 ..... 320039

**Head and Spindle:**

Push button controls ..... 110V  
 Spindle motor (*model J-1600R*)..... TEFC Induction, 7.5 HP (5.5 kW), 3 PH,  
 230/460V (**pre-wired 230V**), 19/9.5 A, 60Hz  
 Spindle motor (*model J-1600R-4*)..... TEFC Induction, 7.5 HP (5.5 kW), 3 PH,  
 230/460V (**pre-wired 460V**), 19/9.5 A, 60Hz  
 Control circuits ..... 115V  
 Spindle taper ..... MT-5  
 Spindle speeds..... twelve speeds, within 40-1920 RPM  
 Quill (spindle) travel ..... 14-9/16" (370 mm)  
 Quill (spindle) travel with powerfeed engaged ..... 13" (330 mm)  
 Spindle travel along arm, total..... 44-7/8" (1140 mm)  
 Feed rates (distance per revolution) ..... six at 0.003 - 0.038 in/rev  
 Base surface to spindle, maximum (no tooling) ..... 63" (1600 mm)  
 Base surface to spindle, minimum (no tooling) ..... 15" (380 mm)  
 Column to spindle center distance, maximum ..... 62-1/4" (1580 mm)  
 Column to spindle center distance, minimum ..... 13-3/8" (334mm)  
 Noise emission (approx. 3-1/4 ft./1m from spindle head) \* ..... 82 dB at 1500 rpm; 79 dB at 88 RPM

**Arm and Column:**

Column diameter..... 17" (432 mm)  
 Arm vertical travel on column..... 33-15/32". (850 mm)  
 Arm elevating motor..... TEFC, 2 HP (1.5 kW), 3 PH, 230/460V, 3.2/1.6A, 60Hz  
 Clamping motor..... TEFC, 1 HP (0.75kW), 3 PH, 230/460V, 3.2/1.6A, 60Hz

**Base and Table:**

Box table dimensions ..... 27-1/2"L x 19-3/4"W x 16"H (700 x 500 x 415 mm)  
 T-slots in Table (6) ..... 1-1/2"W x 3/4" D, 7/8" W opening (38 x 19, 22 mm)  
 Base dimensions ..... 103-1/4"L x 40-1/4"W x 8"H (2623 x 1022 x 203mm)  
 T-slots in Base (3) ..... 1-1/2"W x 3/4" D", 7/8"W opening (38 x 19, 22 mm)

**Additional specifications:**

Coolant pump motor..... TEFC, 1/8 HP (0.1kW), 3 PH, 220/440V, 0.2/0.1A, 60Hz  
 Machine height (floor to motor at maximum elevation) ..... 125" (3175mm)  
 Shipping Dimensions ..... 110"L x 57"W x 115"H(2794 x 1448 x 2921mm)  
 Net weight ..... 11,000 lb / 4990 kg  
 Shipping weight..... 11,240 lb / 5098 kg

\* Measured under test conditions SS41 material, 32mm thick, Ø32mm tool.

## 4.1 Machining Capacities

	Drilling	Tapping	Boring
Mild Steel	2-1/2 in. (mm)	2" (mm)	5" (mm)
Cast iron	2-5/16 in. (58.75mm)	2-3/8" (mm)	7-3/8" (mm)

Table 2

## 4.2 Machine Environment

1. Do not position the machine where it receives direct sunlight.
2. Normal ambient temperature should be between +5°C (41°F) and 40°C (104°F).
3. Humidity: Between 30% and 95%. At maximum temperature of 40°C/104°F, relative humidity should not be over 50%. Higher humidity is acceptable at relative lower temperatures (e.g. 90% humidity at 20°C).
4. Keep machine away from gasoline, chemical substances, dust, acid, sulfides, magnetic interference and explosive environments.
5. Keep machine away from electrical interference sources such as welding machines and EDM (Electric Discharge Machining).
6. Illumination of work area should be greater than 500lux.
7. Work area must have adequate ventilation.
8. Floor must be flat.
9. Keep floor around machine free of hydraulic splash to prevent hazard of slipping and falling.

## 4.3 Power Supply Requirements

1. Acceptable voltage fluctuation: normally +/- 10%
  2. Acceptable frequency fluctuation: +/- 1Hz (50/60Hz)
  3. Acceptable momentary power-off duration: less than 10m.sec
  4. Acceptable voltage impulse:
    - Peak value: 200% or less than the line voltage of the actual value (rms.value).
    - Duration: 1.5m.sec or less.
  5. Acceptable AC voltage of the waveform distortion.
  6. Acceptable imbalance of the line voltage: 5% or less.
  7. Power capacity:
    - Main motor: 5.625 Kw (7.5HP)
    - Arm elevating motor: 1.5kW (2HP)
    - Clamping motor: 0.75kW (1HP)
    - Coolant pump motor: 0.1kW (1/8HP)
- Total power requirement: 20.203 KVA



# 4.4 Overall Dimensions, J-1600R

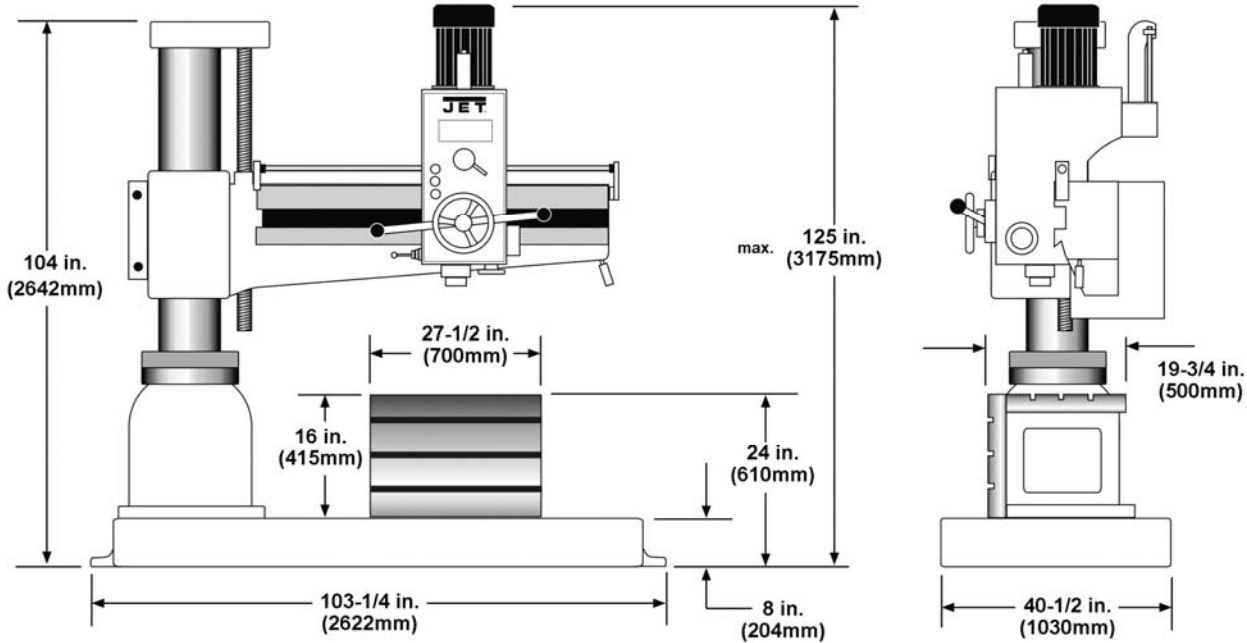


Figure 2

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 General Features and Terminology, J-1600R

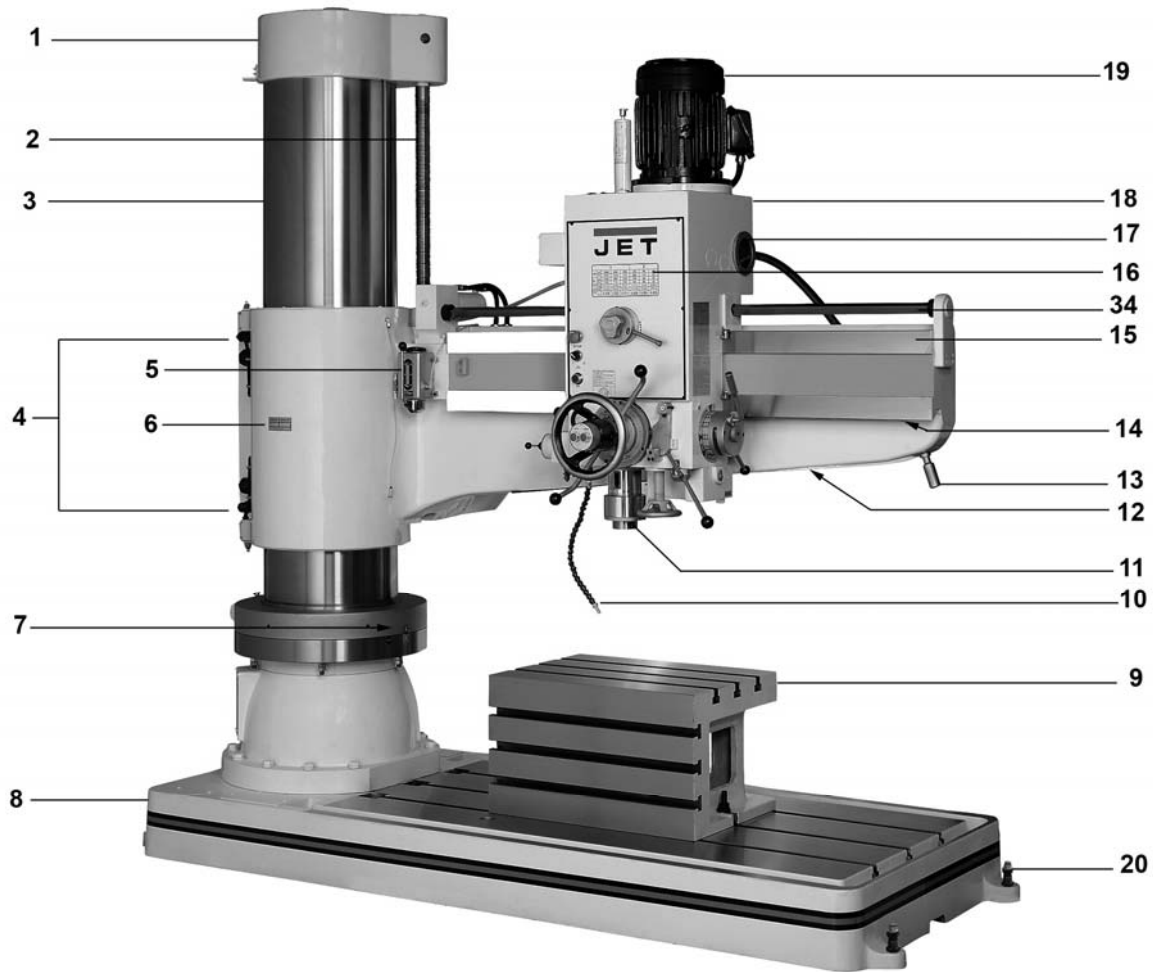


Figure 3

- |  |                                       |
|--|---------------------------------------|
| 1. Column cover (encloses arm elevating motor) | 19. Spindle motor, 7-1/2HP            |
| 2. Elevating lead screw                        | 20. Leveling screws                   |
| 3. Column                                      | 21. Work lamp toggle switch           |
| 4. Locking nuts                                | 22. Support block (for shipping only) |
| 5. One shot lube unit                          | 23. Brace (for shipping only)         |
| 6. Machine identification plate                | 24. Coolant pump                      |
| 7. Column clamping indicators                  | 25. Arm clamping cylinder             |
| 8. Base  | 26. Guard panel                       |
| 9. Box table                                   | 27. Electrical cabinet                |
| 10. Coolant nozzle                             | 28. Counterweight system              |
| 11. Spindle                                    | 29. Hydraulic clamping motor, 1HP     |
| 12. Work lamp                                  | 30. Hydraulic tank                    |
| 13. Arm rotation handle                        | 31. Pressure gauge                    |
| 14. Rack                                       | 32. Solenoid valves                   |
| 15. Arm rail                                   | 33. Clamping cylinder                 |
| 16. Spindle speed chart                        | 34. Guide bar                         |
| 17. Sight glass (and clutch access)            |                                       |
| 18. Drill head/gearbox *                       |                                       |

\*See Figure 10 for details on drill head controls.

# General Features and Terminology, J-1600R (cont.)

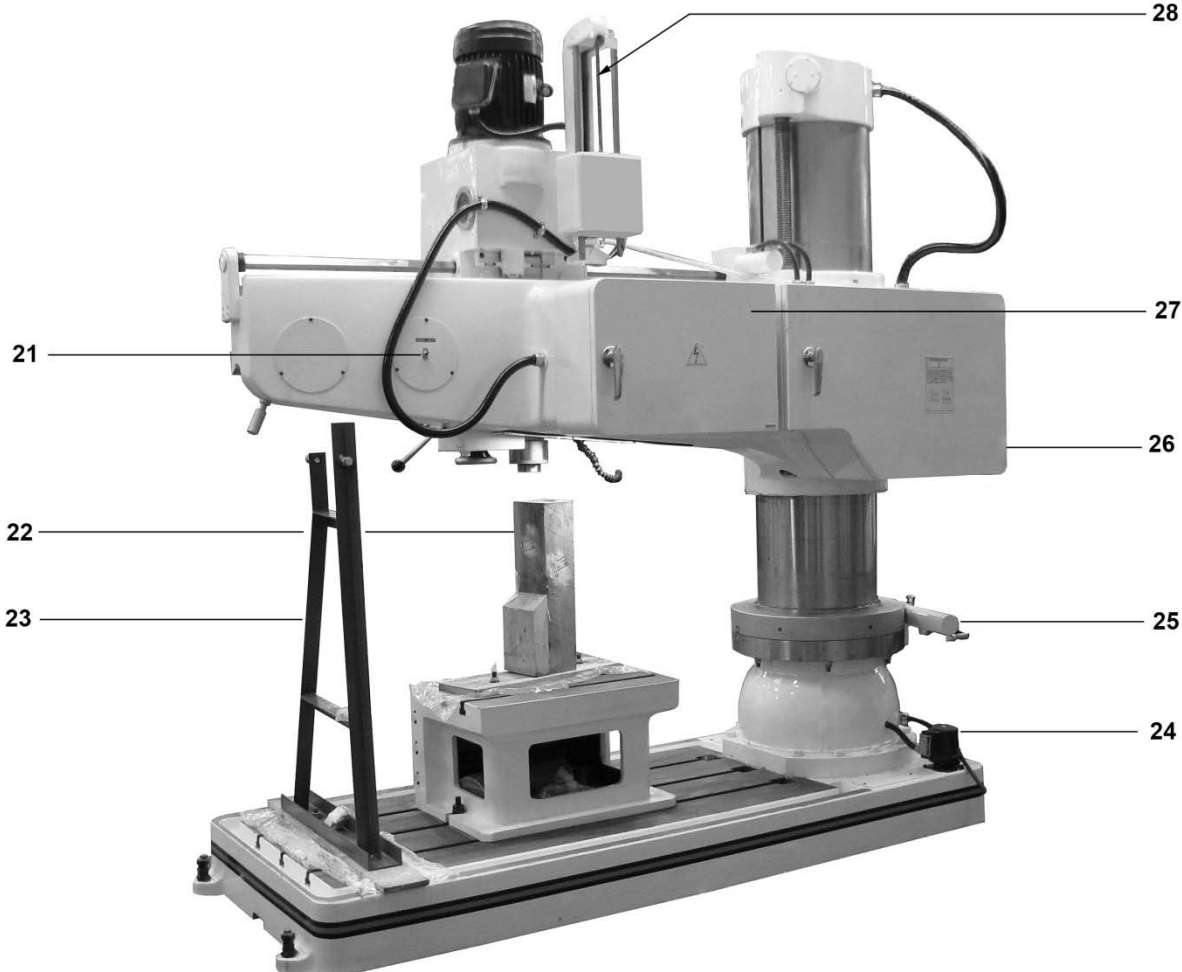


Figure 4

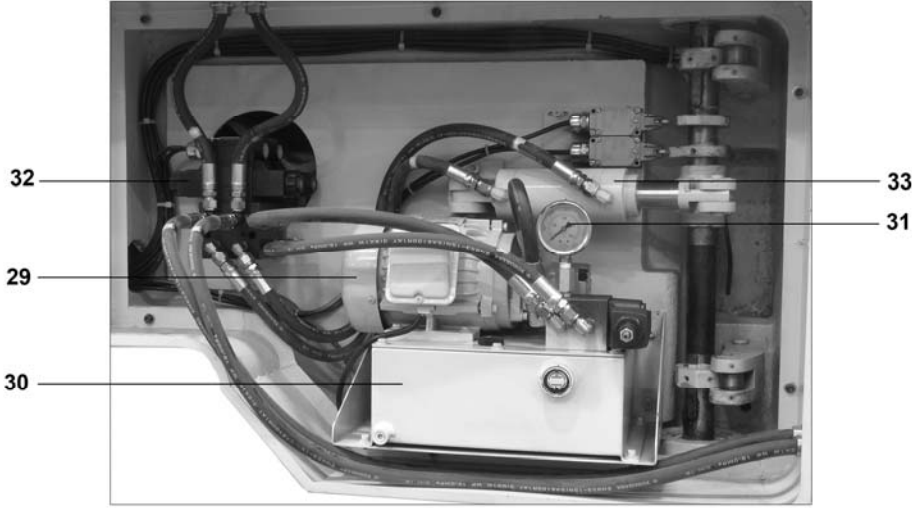


Figure 5

## 6.0 Set-Up and Assembly

### 6.1 Floor Diagrams for J-1600R

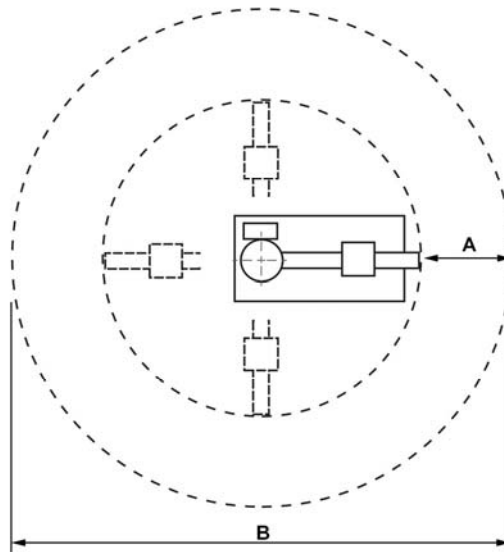


Figure 6

Figure 6 shows spacing for the 360° rotational path of the arm, plus 1000mm (approx. 40 inches) of general maintenance area on each side.

Distance column center to arm limit	Maintenance area (A)	Total space required (B)
2087mm (82 in.)	1000mm (40 in.)	6174mm (243 in./20-1/4 ft.)

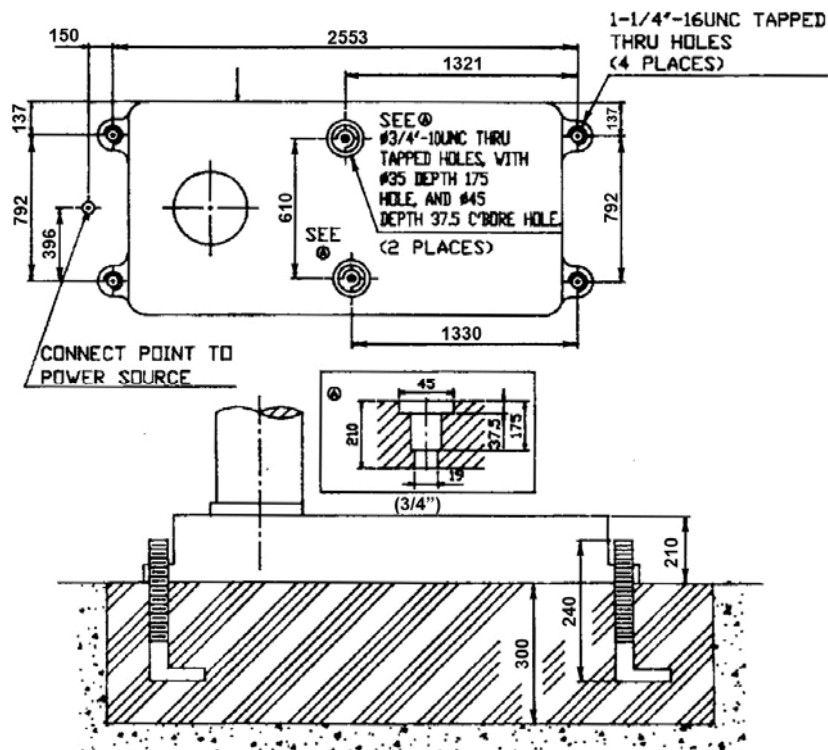


Figure 7

(all dimensions in millimeters unless otherwise noted)

## 6.2 Unpacking

Remove any remnants of shipping crate and check for shipping damage. Report any damage immediately to your distributor and shipping agent. Do not discard any shipping material until the Radial Arm Drill Press is installed and running properly.

Compare the contents of your container with the following parts list to make sure all parts are intact. Missing parts, if any, should be reported to your distributor. Read the instruction manual thoroughly for assembly, maintenance and safety instructions.

## Contents of Shipping Container

(see Figure 8)

- 1 Radial Arm Drill Press (not shown)
- 6 Leveling Pads
- 1 Tool Box, containing:
  - 1 Grease gun
  - 1 Oil bottle
  - 1 Tapered drift
  - 1 Adjustable wrench
  - 1 Set of hex keys
  - 1 Flat blade screwdriver
  - 1 Cross point screwdriver
- 1 Instructions and Parts Manual (not shown)
- 1 Warranty Card (not shown)
- 1 Manufacturer's Test Chart (not shown)



Figure 8: Tools provided

### **⚠ WARNING**

Read and understand the entire contents of this manual before attempting set-up or operation! Failure to comply may cause serious injury.

### 6.3 Machine Set-Up

1. After dismantling crate, remove toolbox and any accessory items from around machine.
2. Place lifting straps as shown in Figure 9. Use cushioning to protect machine surfaces.

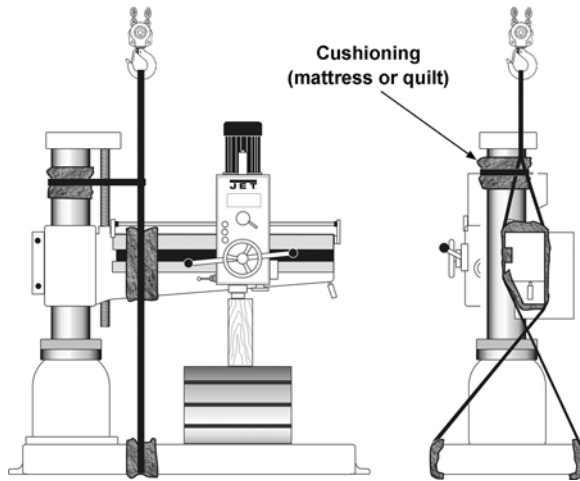


Figure 9: Method of lifting

3. Remove the bolts holding machine to pallet.

**⚠WARNING** All lifting equipment must be rated appropriately to safely sustain weight of drill press. Do not allow anyone near or beneath machine while it is being moved.

4. Lift machine and position it over anchor bolts in an area with good lighting, and a level and well-supported floor.
5. Place provided leveling pads beneath base, using appropriate spacing. Place a level (its tolerance should be within 0.02mm/m) on box table and level the machine.
6. The drill press MUST be anchored to floor. Use layout diagram in Section 6.1 as a guide, and mount the nuts to the ground bolts.

**⚠WARNING** Failure to anchor machine properly, according to the diagrams, could result in machine tipping over and consequent damage to machine and possible injury to machine operator and bystanders.

7. Connect electrical service branch to machine according to instructions which follow in section 6.4, *Electrical Connections*. This work should be done only by a qualified and licensed electrician who is familiar with machine service and national and local codes.
8. Turn on drill press (see section 8.0, *Operation*), push the unlock button, and move arm/spindle control lever to UP, until quill clears the shipping block and the arm clears

the support brace. Remove shipping block and wood platform from box table. Remove shipping brace from base. (Retain these support pieces if machine is to be transported in future.)

9. Surfaces of the machine have been treated with a protective coating for shipment; remove this with mineral spirits or a cleaner/degreaser. Then apply a light coating of oil to exposed metal surfaces. See section 12.0 *Maintenance*, for details.
10. Inspect all sight glasses on machine to be certain they are filled to their level lines. If low, add fluid as necessary according to instructions in section 12.2 *Lubrication*.
11. Perform a lubrication check at all points recommended in section 12.0.

**⚠CAUTION** Verify that the machine is properly lubricated at all points before operating.

12. Follow directions in section 8.0, *Operation*, to check all operation functions of drill press. If coolant is being used, put coolant in the sump and test coolant delivery.
13. When all of the above operations are complete, the machine is ready for service.

## 6.4 Electrical Connections

**⚠WARNING** Electrical set-up should be performed only by a licensed electrician who is familiar with national and local electrical codes. This machine must be properly grounded to help prevent electrical shock and possible fatal injury.

Model J-1600R radial drills are tested before shipping for all functions and circuits under electrical power specified for the machine and motors. The only hook-up requirement should be for correct connection to an appropriate cutout on an appropriate service branch.

Where the following instructions do not agree with local electrical codes and procedures, the applicable codes and procedures should be followed, exclusively.

### Wiring diagram

A wiring diagram for the drill press is found inside the door of the electrical cabinet. A similar diagram is shown in back of this manual. This diagram is for reference by your licensed installing or servicing electrician.

All three motors on the J-1600R are 3-phase motors of the same voltage value. All control circuits are 110 volt circuits. The motor's circuit is **NOT fused**. Thus, fuses for each leg of the 3-phase service branch **must be supplied by the installing electrician**. If a service disconnect with a fuse for each leg of the 3-phase branch is not supplied, then none of the motors are protected from electrical faults.

In addition to using a licensed electrician for connection to the drill press service branch, the servicing of components and circuits inside the control box should be serviced only by a qualified electrician. This includes fuse replacement, if required. If any of these fuses, upon replacement, should continue to fail at short service intervals, the electrician should be asked to check all machine components for excessive loads, short circuits or other failures.

### Electrical branch service

The machine is wired for either a 230V or 460V, 3-phase service branch. The cable supplying the drill press will be tagged with the voltage at which the machine was tested and corresponding to the customer's order.

If the tag has been lost, it will be necessary for you to open the electrical cabinet on the rear of the drill press and examine the connections on the transformer found inside the box. The transformer can be connected to either a 230 or 460 volt source and its taps are labeled for voltage. By locating the source tap on the transformer you will be able to determine the branch voltage required.

A service disconnect is recommended. The use of fuses or circuit breakers for each of the voltage supply wires is required. Use fuses or circuit breakers which are appropriate to the voltage for the motor system delivered.

A positive cut-out/lock-out lever or rocker switch should be located on the outside of the service disconnect to allow the machine operator to disconnect from the branch circuit when working with tooling on the machine.

It is recommended that the **230 volt** Drill Press be connected to a dedicated 25 amp circuit with a 25 amp circuit breaker or time delay fuse. Connect the **460 volt** drill press to a dedicated, 15 amp circuit with 15 amp circuit breaker or time delay fuse. **Local codes take precedence over recommendations.**

### Connecting branch to drill press

1. Disconnect service branch to machine by moving lever or rocker switch on cutout box to OFF.
  2. Connect the green wire (or green with white trace) to the branch ground.
  3. Connect the remaining three wires in the cable (labeled R, S and T) to the three power lines in the branch.
  4. Turn power to the machine ON at the cutout box.
  5. Turn coolant switch (See Figure 10) to ON position.
- ⚠CAUTION** Make sure there is coolant in flood coolant system before operating pump. Failure to comply may cause damage to pump.
6. Observe rotation through glass atop pump. The shaft should be rotating in direction of arrow cast into pump assembly. If shaft is rotating wrong direction, the power leads need to be switched. Correct as follows:
  7. Disconnect power to machine by turning it off at cutout box.
  8. Reverse *any two* of the power lead connections, R, S or T.
  9. Repeat steps 4, 5, and 6, above, and you should observe pump shaft turning in proper direction. Electrical service to machine is now complete.

# 7.0 Operating Controls

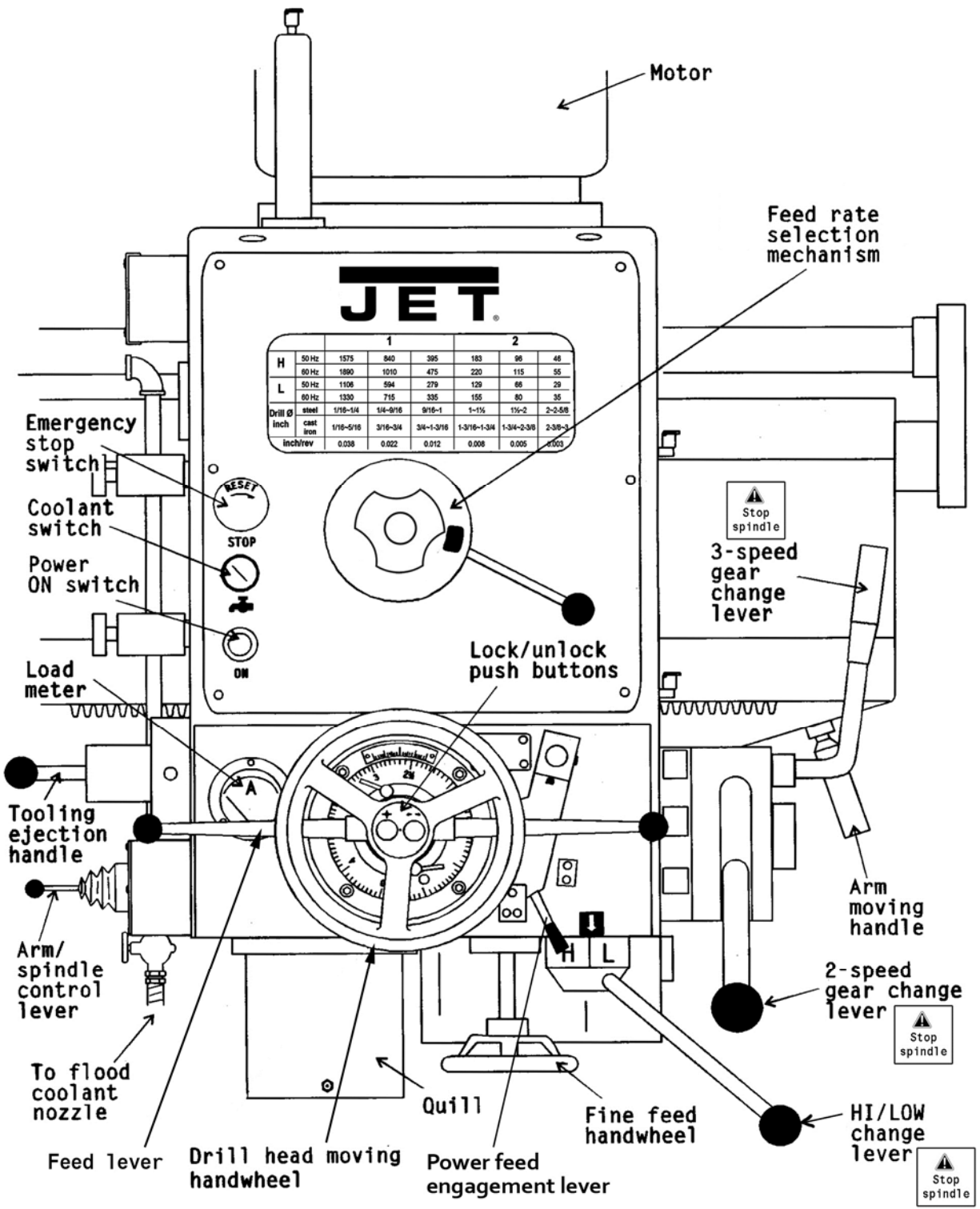


Figure 10: Operating Controls



## 8.0 Operation

### 8.1 Clamping workpieces

To load/unload heavier workpieces, unlock arm and rotate it out of the way. Lift the workpiece with slings or other properly rated lifting equipment.

Both the box table and base surface are slotted to accept a suitably sized T-slot clamp. Before beginning any work on the drill press, anchor the work piece, and box table if used, to be certain that workpiece and/or box table will not move when tool enters workpiece.

If box table will not be used, simply remove the nuts at the base, and move table off using proper lifting equipment.

**⚠WARNING** Failure to properly anchor workpiece and box table could result in damage to machine, damage to workpiece, and severe injury to machine operator. Never work on drill press without clamping the materials using a T-slot system set-up.

### 8.2 Tool insertion

The Model J-1600R uses a No. 5 Morse taper in the spindle to secure tooling. Any drill, milling cutter, or tool holder with an MT-5 can be inserted into the quill.

**⚠CAUTION** The first step in removing or inserting any tooling is to **be absolutely certain the machine cannot be accidentally started during the insertion or removal operation.** The only way to be certain of this fact is to disconnect power to machine. The service box should have a cut-out switch or lever on the outside of the box. Position switch or lever in the OFF position before inserting or removing tooling.

To insert tooling:

1. Verify that machine is disconnected from power.
2. Be certain the spindle is clean, free from oil, and ready to accept the shank of any tooling.
3. Check the shank of tooling to be certain the tooling is free from dirt, nicks or burrs. If nicks or burrs are discovered, file or stone the shank until it is smooth.
4. Pull the tooling ejection handle *out* to be certain the tooling can be inserted. See Figure 10.
5. Be certain quill is in full UP position.
6. Slide shank of tooling into spindle until it seats.
7. Use a soft-faced mallet (such as lead, plastic, brass, etc.) to give the tooling a sharp tap on its tip. This will secure the tooling in the taper.

8. Re-establish power to machine, and the drill is ready to use.

#### To remove tooling:

9. Verify that machine is disconnected from power.
10. Place a wood block under the tooling in spindle, to prevent it being damaged should it fall out during the removal process.
11. Use the feed levers to lower quill enough to allow tooling ejection handle to be pushed fully *inward*.
12. While using leather gloves to hold the tooling and prevent it from falling loosely out of the spindle taper, use the feed levers to give the quill a sharp upward stroke against the top of its travel and the tooling will be released from the taper in the spindle.
13. Remove tooling and pull tooling ejection handle *out* to allow new tooling to be inserted.

### 8.3 Tool positioning over workpiece

After workpiece has been clamped to base or table, position the tooling over workpiece, using any or all of the following methods:

1. Adjusting height of arm on support column.
2. Moving drill head along arm.
3. Rotating column upon which arm and head are attached.

### 8.4 Unlocking arm and column mechanisms

A motorized locking system is used to lock the head to the arm, the arm to the column, and the column to the base.

The buttons which control the locks are located in center of drill head handwheel (see Figure 10). Press and hold UNLOCK (green) button until arrow (Figure 11) points to "B". Release button. Clamping device is now disengaged. When locking, press and hold LOCK (red) button until arrow points to "A". Clamping device is now re-engaged.

NOTE: When you push UNLOCK, *all* of the locks are disengaged. When you push LOCK, *all* of the locks are engaged.

**⚠CAUTION** Always be certain the locks are engaged before using drill press. Pull on arm handle and try to rotate handwheel at front of head, before starting spindle. Failure to have all locks secure may result in damage to tooling, damage to workpiece, and possible injury to operator.

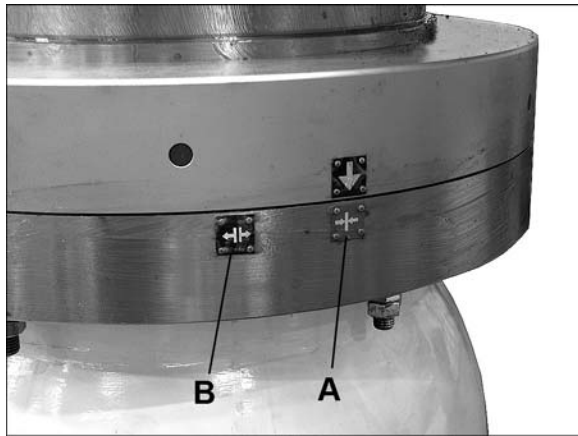


Figure 11: Locking indicators

### 8.5 Raising and lowering radial arm

1. Power to drill press must be ON – then release machine locks by pushing UNLOCK button in center of handwheel.
2. Raise or lower arm to required height using arm/spindle control lever (see Figure 10). See also section 8.24, *Arm/spindle control lever*.
3. When arm is at required height and if no other adjustments to spindle location are required, press LOCK button to engage all machine locks.

### 8.6 Moving drill head along arm

1. Power to drill press must be ON – then release machine locks by pushing UNLOCK button.
2. Turn handwheel to move drill head along arm. See Figure 10.
3. When drill head is at desired position on arm and if no other adjustments to spindle location are required, push LOCK button to engage all machine locks.

**⚠WARNING** NEVER swing drill press arm on support column unless you are absolutely certain the drill press base is firmly attached to shop floor. You can tell if base is bolted to floor by checking the mounting pads at the four corners of base. There should be a securing bolt through each mounting pad. If the arm is moved off its position directly above base and base is not bolted to floor, **THE DRILL MAY TIP OVER AND CAUSE SERIOUS INJURY TO THE DRILL PRESS OPERATOR**, and will certainly result in damage to drill press itself.

### 8.7 Rotating arm on support column

1. Power to drill press must be ON – then release machine locks by pushing UNLOCK button on front of handwheel.
2. Swing arm using handle (see Figure 10) to required spindle position.

3. When spindle is positioned correctly and no other adjustments are required, push LOCK button to engage all machine locks.

### 8.8 Setting spindle speed

Spindle speeds are established using gear change levers on lower right-hand side of drill head. The shorter of the two levers (C, Figure 12) operates a two-speed mechanism which puts the gearbox in either high or low gear. The longer gear change lever (D) operates a three speed gearbox mechanism. A detent in the middle of the three-speed lever travel indicates when lever is in intermediate gear position.

The spindle speed readout (F) is located on the three-speed change mechanism housing.

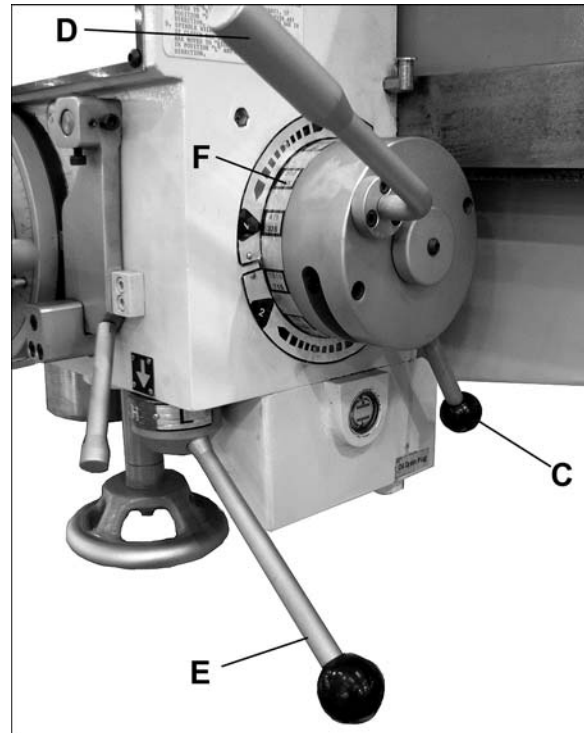


Figure 12: Gear change levers

This gearbox set-up allows a total of six spindle speeds which may be selected. Adding the two speeds possible with the HI/LOW change lever (E, Figure 12) increases the number of available speeds to twelve.

A chart on front of drill head shows gear change values required to select each speed. A similar chart is included in Table 4 of this manual.

Also on the spindle speed chart are recommended drill and tap sizes for the various speeds which are selectable. **These recommendations are only approximate.** With the wide variety of drill types and coatings available, as well as cutting fluids, and the even wider variety of workpiece materials which you might be machining – you need to consult with your tooling, coolant and/or workpiece suppliers to determine best spindle speed to use for any specific drilling operation.

**CAUTION** Do not try to change gears while spindle is turning. This may cause serious damage to spindle drive system.

To select spindle speed:

1. Allow spindle to stop rotating.
2. Press emergency stop button.
3. Move short lever (C, Figure 12) to position “1” or “2”.
4. Move long lever (D) to appropriate position. (If lever C is in position “1”, refer to arrow marker “1” for the reading. If lever C is in position “2” refer to arrow marker “2” for correct reading.)
5. Move HI/LOW change lever (E) to desired position. When this lever is in HI setting, use the red numbers on the spindle speed readout (F). When this gear is in LOW setting, use the black numbers on the spindle speed readout.

Note: An instruction plate is located near the gear change levers for quick reference to this procedure.

Allow spindle to stop completely before attempting to change gears. If gear change lever you want to move does not slip easily into new position, jog the motor for a second using the control lever. Then allow spindle to come to a stop before attempting to change gears again. Repeat this jogging process, as necessary, until gears match up properly for changing.

**CAUTION** Plan for quill movement if selecting high speed spindle rotation. High speed rotation without quill travel will increase spindle temperatures.

## 8.9 Feed rate and depth of cut

The J-1600R has limit switches on the quill which cut power to drive motor when quill has reached either upper or lower limit of its travel. This system is designed to prevent gearbox damage if power feed mechanism is engaged – damage which would occur if quill were to bottom out against upper or lower limit of quill travel. In the event of failure of either limit switch there is also a safety clutch mechanism which will slip when travel limits are reached.

However, while you are able to use virtually full travel of the quill for drilling or other operations, the drill press operator typically sets both rate of feed (travel-per-revolution of spindle), and depth of cut (quill travel to make required cut).

These two operations are described here:

### 8.10 Setting feed rate

The feed rate is set using dial/lever combination on front of drill head. See Figure 13. The dial can be rotated to select different feed rates, and the lever

can be moved to two positions, thus providing six different feed rates. The selected rate is displayed in the readout window on the dial.

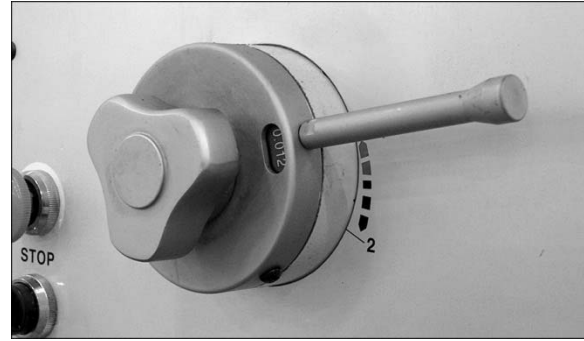


Figure 13: Feed rate setting mechanism

Any of three feed rates are available for selection using any of the spindle speeds available. There will be a recommended feed rate for any drilling or boring operation, and this rate must be determined by consulting appropriate machinery handbooks or by consulting with your tooling, coolant and workpiece suppliers.

## 8.11 Feed methods

The J-1600R has three feed methods: power feed, hand feed and fine hand feed. When using the power feed system it is possible to establish a pre-set depth of cut.

### 8.12 Setting depth of cut using power feed system

There is a mechanism for engaging power feed and there is also a “trip” mechanism which can be set to disengage power feed when a pre-set depth has been reached.

1. Set feed rate according to instructions in *section 8.10; Setting feed rate*.
2. Set spindle speed appropriate to desired cut (*section 8.8; Setting spindle speed*).
3. Push power feed engagement lever to left to engage power feed system.
4. Turn power switch to ON.
5. Move spindle/arm control lever to required spindle rotation direction.
6. Pull feed levers outward, away from drill head, to engage power feed clutch. In this power feed position, quill and spindle will be driven until one of the following happens:
  - Spindle reaches limit of travel and the limit switches disable power; or
  - The “trip” mechanism automatically disengages power feed; or
  - Drill press operator pushes feed levers into disengaged position; or

- Drill press operator pulls power feed engagement lever into disengaged (toward right) position.

#### To set depth of cut for power feeding:

Refer to Figure 14.

1. Unlock both levers (A, Figure 14).
2. Rotate feed levers (B) to lower drill until it touches workpiece.
3. Rotate dial (C) until required feed depth on scale is at zero reference mark (D).
4. Lock both levers (A).
5. Push power feed engagement lever (F) toward the left.
6. Pull feed levers (B) out to engage power feed clutch. The power feed mechanism will feed drill into workpiece at the rate selected on feed rate dial, until selected depth of cut is complete.

**Note:** The depth limit for power feed drilling is 4.0 inches (100mm). If deeper holes are needed, the machining must be done in steps.

**IMPORTANT:** Feed rate must be set (out of neutral position) before power feed can be engaged.

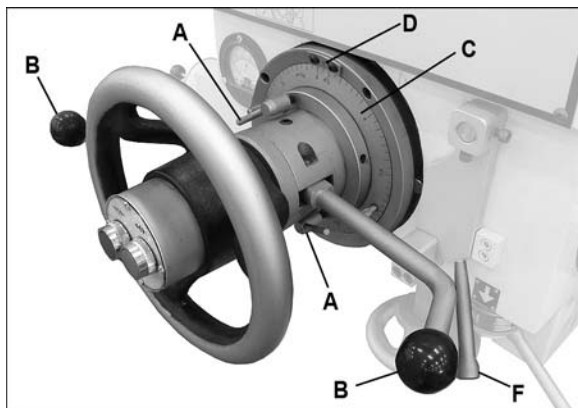


Figure 14: Depth setting; power feed engagement

#### 8.13 Spindle direction and power feed

Spindle rotation direction is managed by the arm/spindle control lever on left side of drill head. See Figure 15.



Figure 15: Spindle/arm control lever

Clockwise or "forward" rotation is the direction of rotation for right-hand tooling – the vast majority of tooling used in machine operations. Reverse spindle rotation for left hand tooling.

Power feed direction is determined by the spindle direction. When spindle is set to its most common direction – clockwise or forward – the quill and spindle are driven downward. When spindle direction is set counterclockwise (reverse), quill and spindle are driven upward.

#### 8.14 Hand feed – roughing operations

When the feed levers are pushed toward the drill head the power feed mechanism is disengaged. In this position, the feed levers can be used to move the quill and spindle and perform manual drilling or other machining operations.

#### 8.15 Fine hand feed using power feed system

The fine feed handwheel is located on underside of front of drill head. See Figure 10. The fine feed control is used as follows:

1. Set feed rate lever to far right to disengage.
2. Pull feed levers out to engage power feed clutch.
3. Turn drill press power switch to ON, and set arm/spindle control lever to desired direction.
4. Manually turn fine feed handwheel. Quill and spindle will move downward or upward (depending upon which way you turn handwheel and the direction spindle is turning) until you stop turning the handwheel.

#### 8.16 Tapping

1. Insert screw tap into spindle.
2. Move spindle into position.
3. Set spindle control to Forward.
4. Rotate feed levers counterclockwise until desired tapping depth is reached.
5. Reverse spindle direction and allow tap to withdraw completely from workpiece.
6. Stop spindle by moving spindle control switch to center (neutral).

#### 8.17 Power ON/OFF

If your J-1600R was connected to its service branch correctly, there will be a service disconnect with an external power cutoff lever or switch which disconnects the drill press from the service branch. This is your ultimate protection against accidental machine start-up when clamping work pieces or inserting and removing tooling. Always be certain

you have turned off power at this disconnect before beginning such procedures.

Once your workpiece is clamped securely and tooling is installed, you can reestablish power to machine by turning cut-out panel back ON.

## 8.18 Coolant control

The flood coolant system is controlled by the switch on front of drill head (Figure 10). If coolant has been turned on but does not flow, check pump rotation by observing pump shaft. It should be rotating in the direction of arrow on pump casting. If rotation is incorrect, see Section 6.4 *Electrical Connections*, for more information.

Open valve to coolant nozzle using handle at left of head (see Figure 10). The proximity of nozzle can be adjusted by loosening the two knobs and sliding coolant pipe up or down as needed. Retighten knobs.

## 8.19 Spindle motor controls

Power to spindle motor is controlled as follows:

1. The cutout box control lever must be in ON position.
2. The Emergency Stop switch must be disengaged (rotate clockwise), and the drill press power switch pushed ON.
3. The feed levers must be used to move quill slightly off its seat.
4. The arm/spindle control lever must be engaged for selected rotation. See Section 8.24 *Arm/spindle control lever*.

**NOTE:** The limit switch will prevent spindle rotation when quill is seated. Also, quill must be off seat before control lever is used – a safety interlock system prevents spindle rotation unless quill is off seat before control lever is used.

## 8.20 Turning off spindle drive

To turn power OFF on the spindle drive motor do one of the following:

1. Push power switch OFF, *or...*
2. Put arm/spindle control lever in neutral, *or...*
3. Push STOP switch, *or...*
4. When servicing tooling or other machine components, put service disconnect lever in OFF position.

Once STOP switch has been pushed (step 3 above), none of the other switches on the panel can be used to control power to spindle drive motor or coolant pump until STOP switch has been reset.

## 8.21 Resetting STOP switch

When pressed, the red emergency stop button remains engaged. Turn switch clockwise in direction of arrow to disengage. The switch is reset and the other spindle motor controls can be used.

## 8.22 Using load ammeter

An ammeter on the control console is used to monitor load on spindle drive motor. It is connected into one of the three power lines which supply main drive motor.

When drive motor is ON and up to speed, and there is no tooling being used to drill, tap or bore a hole, the ammeter should read approximately 2.5 amps. If it exceeds this value there is a problem internally (such as lack of lubrication in the gearboxes, bad bearings, etc.). You should turn off machine and determine the cause of any excessive free-running load.

Monitor the ammeter during machining operations. The ammeter should stay below 9 amps of current draw during machining. You should adjust spindle speed, feed rate and coolant use to maintain full load current draw below the 9 amp value.

If current draw exceeds 9 amps, a thermal overload switch in the electrical control panel will trip. If this occurs, a licensed electrician should locate and re-set the thermal switch.

## 8.23 Tapping operations

1. Determine most efficient tapping speed (spindle speed) by consulting appropriate machinist's tables, your tap supplier, coolant supplier and/or workpiece supplier. (Note that the figures on the chart on front of drill head are only approximations of appropriate tapping speed.)
2. Be certain that power feed lever is in **disengaged** position (all the way to right).
3. Turn on spindle motor. Also, turn on coolant pump if coolant is being used.
4. Move arm/spindle control lever to *Forward*.
5. Use the feed levers to move tap into its pilot hole until tap makes its initial thread cut and is engaged in work piece.
6. Allow tap to "self-feed" into pilot hole until it has completed its tapping operation.
7. Move arm/spindle control lever to neutral (center position) and allow spindle to stop completely.
8. Move arm/spindle control lever to reverse, so that tap unscrews itself from hole it has just threaded.

## 8.24 Arm/spindle control lever

The four-position arm/spindle control lever is located on left hand side of drill head console. See Figure 10. It controls spindle rotation direction and raising and lowering of the arm.

The ability to control the height of the arm is available when:

1. Main power to machine is ON at its branch service panel.
2. Emergency STOP switch is disengaged.
3. Power switch is pushed ON.
4. The column and arm UNLOCK button (right hand side of drill head – see Figure 10) is pressed to disengage machine locks.

NOTE: The control lever does not return to neutral when released, but remains in position. This means unless you return it to neutral, the arm will keep raising or lowering until it contacts a limit switch.

## 9.0 Adjustments

After extended use – usually several years – the radial arm drill may require adjustment of certain parts. Two areas require particular attention:

- The clamping device.
- The gap between head and rail.

### 9.1 Clamping device

If there is backlash in the clamping device, correct as follows.

Refer to Figure 16.

1. Press and hold *unlock button* (see Figure 10) until arrow (Figure 16) points to “B”. Release button. Clamping device is now disengaged.
2. Loosen the five *locking nuts* (C).

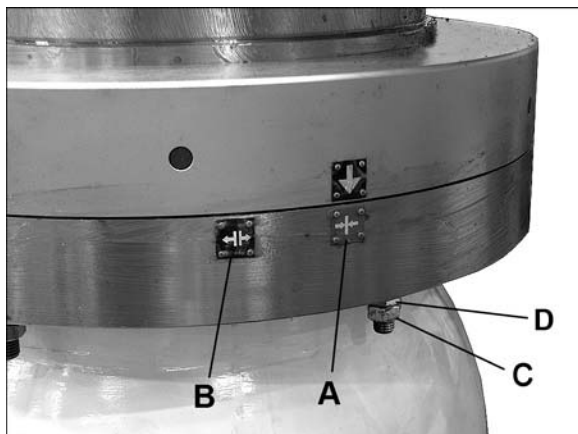


Figure 16: Clamping adjustments

3. Turn the five upper *adjusting nuts* (D) counterclockwise approximately 180°.
4. Re-tighten the five locking nuts (C).

5. Move arm/spindle control lever to Arm UP.
6. Press emergency stop button after arm has elevated a short distance.
7. Press unlock button to release clamping device.
8. Release locking nut. (E, Figure 16).
9. Rotate adjustment nut (F) approximately 180° clockwise.
10. Retighten locking nut (E).
11. Move arm/spindle control lever to neutral.
12. Reset emergency stop button.

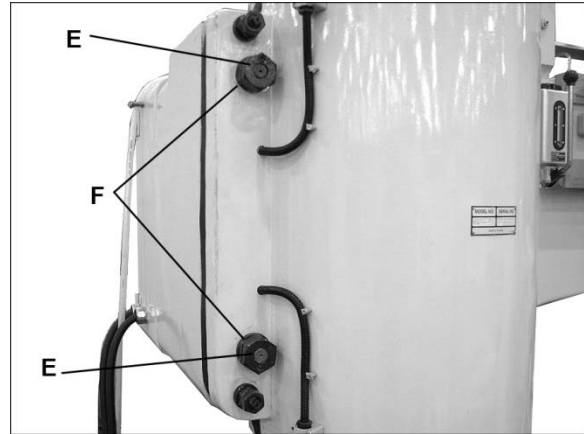


Figure 17: Clamp adjustments

### 9.2 Head/rail backlash

If backlash ever appears between gearbox head and arm rail, the tightness between rail and bearings can be corrected, as follows.

Refer to Figure 18.

1. Remove side plate (G) by removing screws.
2. Loosen set screws (H).
3. Insert hex key into holes (J), and rotate the bearing shaft. Rotate handwheel on front of head; it should be snug but still easily turned.
4. Tighten set screws (H).
5. Repeat steps 1 through 4 for opposite side of head.
6. Install side plates (G) on both sides of head.

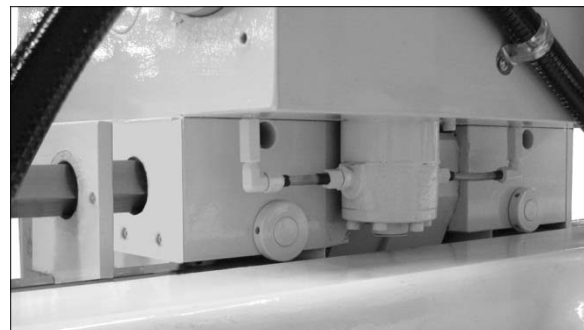


Figure 18: Head/rail backlash adjustments

### 9.3 Clutch adjustment

If the spindle, in Hi or Low speed, won't rotate fully while drilling, the clutch requires adjustment. Proceed as follows;

1. Change gear speed to highest speed, then turn off power.
2. Remove large sight glass at right side of drill head.
3. Rotate spindle with your left hand until clutch turns to the best position for adjustment, with the clutch's key facing toward you.
4. Push out upper key (K, Figure 19), and turn collar (L) right or left until key returns to notch.
5. Reinstall sight glass.
6. Operate drill to verify proper spindle rotation.

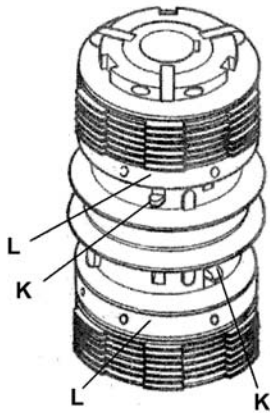


Figure 19: Clutch adjustment

### 9.4 Hydraulic pressure adjustment

If there is little or no hydraulic pressure during normal operation, adjust as follows:

1. Insert small screwdriver into valve switch and hold it there.
2. Rotate valve clockwise to increase pressure. (Counterclockwise decreases pressure.) Default pressure is 38 bar (kg/cm<sup>2</sup>).
3. Remove screwdriver.

## 10.0 Troubleshooting the J-1600R

Trouble	Probable Cause	Suggested Remedy
Spindle overloads, causing relay to trip.	Drill bit too large.	Turn off power, wait three minutes after spindle stops turning, then push re-set on the relay in the control box.
	Feed rate too fast.	
	Operation not in compliance with speed and feed rate tables.	Correct initial problem by using shorter drill bit or lower feed rate; consult appropriate feed and speed rate tables.
	Fuse burned out.	Replace fuse if needed. Verify proper voltage at power source.
Low voltage.		
Spindle overloads, causing fuse to blow.	Drill bit too large.	Replace fuse in control box.
	Feed rate too fast.	Correct initial problem by using smaller drill bit or lower feed rate; consult appropriate feed and speed rate tables.
	Operation not in compliance with speed and feed rate tables.	

Table 3

### If drill bit gets broken in spindle:

1. Move arm/spindle control lever to neutral.
2. Press emergency stop button.
3. Push head/gearbox out of the way.
4. Pinch the end of broken bit with pliers.
5. Rotate counterclockwise and pull it out.

### If screw tap gets broken in spindle:

1. Move arm/spindle control lever to neutral.
2. Press emergency stop button.
3. Using a thread reaser, rotate screw tap counterclockwise until it comes out.

### If something becomes entangled during operation:

1. Press emergency stop button.
2. Disconnect power.
3. Switch speed change lever to highest gear.
4. Rotate spindle by hand in reverse direction from that used during the operation, until the obstruction is free.



## 11.0 Spindle speed chart (J-1600R)

Note: A similar chart is found on front of drill head.

		<b>1</b>			<b>2</b>		
<b>H</b>	50 Hz	1575	840	395	183	96	46
	60 Hz	1890	1010	475	220	115	55
<b>L</b>	50 Hz	1106	594	279	129	66	29
	60 Hz	1330	715	335	155	80	35
<b>Drill Ø inch</b>	<b>steel</b>	1/16~1/4	1/4~9/16	9/16~1	1~1½	1½~2	2~2-5/8
	<b>cast iron</b>	1/16~5/16	3/16~3/4	3/4~1-3/16	1-3/16~1-3/4	1-3/4~2-3/8	2-3/8~3
<b>inch/rev</b>		0.038	0.022	0.012	0.008	0.005	0.003
<b>Threading (metric)</b>		Not recommended			M3~M6	M6~M16	M16~M20

Table 4

## 12.0 Maintenance for J-1600R

Regularly scheduled maintenance is crucial to ensure a long service life for your machine. The schedule below shows general cleaning, lubrication points and coolant replacement information for the J-1600R Radial Arm Drill Press. Item numbers are located in Figures 20-22. Using proper eye protection, clean parts using a metal brush and a rag dipped with oil (Mobil Vactra AA or equivalent). **Press E-stop button and power off before lubricating.** Follow local regulations for disposal of used coolant/lubricants.

### 12.1 General Cleaning

No.	Item	Action	Interval	Lubricant
1	Column	Clean and lightly wipe with oil	Daily	Mobil Vactra oil AA
2	Arm Rail	Clean and lightly wipe with oil	Daily	Mobil Vactra oil AA
3	Spindle	Clean and lightly wipe with oil	Daily	Mobil Vactra oil AA
4	Box Table	Clean and lightly wipe with oil	Daily	Mobil Vactra oil AA
5	Base	Remove shavings; clean and wipe exposed metal surfaces with oil	Daily	Mobil Vactra oil AA
6	Ball Screw	Clean with metal brush and oiled rag	Weekly	Mobilux Grease No. 3
7	Counterweight guide rails	Clean and lightly wipe with oil	Daily	Mobil Vactra oil AA
8	Spindle motor	Blow dust from fan housing with compressed air	Periodically	--

Table 5

### 11.2 Lubrication

No.	Item	Location	Action	Interval	Lubricant *
9	Oil Cup (for column clamp)	On cylinder rest, at bottom of column	Add lubricant to full capacity	Daily	Mobil Vactra oil AA
10	Oil Cup (for spindle)	Top of drill head	Add lubricant to full capacity.	Daily	Mobil Vactra oil AA
11	2 Oil Cups (for arm rail slide-ways)	Right side of drill head	Add lubricant to full capacity	Daily	Mobil Vactra oil AA
12	Elevating gear	Fill hole at top of column cap	Top off using fill hole (12a). Fill to sight glass full level (12b).	Check sight glass daily	Mobil Vactra oil AA
13	Counterweight Chain	Behind drill head	Wipe with oiled rag	Weekly	Mobil Vactra oil AA
14	Coolant	Reservoir in base	Monitor for cleanliness and efficiency. Replace when dirty or when cutting becomes inefficient. <b>Capacity = 30 liters (8 gal.)</b>	Frequent inspection; top off as needed	Use high quality coolant of choice. (Follow coolant manufacturer's instructions.)
15	Grease nipple (for spindle)	On quill	Lubricate with lube gun	Daily	Mobilux Grease No. 3
16	Rack	Front of arm	Lubricate with lube gun	Every 3 days	Mobil Vactra oil AA
17	Hydraulic oil reservoir	Rear of machine inside guard panel	Add lubricant into fill hole (17a) to full level of sight glass (17b).	Check sight glass daily	Mobil Vactra oil AA
			Replace annually; drain at (17c). Use sight glass (17b) to fill to capacity. <i>NOTE: Put pipe thread compound on drain plug before re-installing.</i> <b>Capacity: 4.5L (1.2 gal.)</b>	After first 6 months, then once per year	Mobil Vactra oil AA
18	Gearbox	Top and right side of drill head	Top off at fill hole (18a). Fill to sight glass full level (18b).	Check sight glass daily	Mobil Vactra oil AA
			Replace annually; drain at (18c). Use sight glass (18b) to fill to capacity. <i>NOTE: Put pipe thread compound on drain plug before re-installing.</i> <b>Capacity: 3 liters (3/4 gal.)</b>	After first 6 months, then once per year	
19	One shot lube unit (for column)	On arm near column	Push lever down to disperse oil. Keep filled to capacity.	Push lever once per hour	Mobil Vactra oil AA

Table 6

\* **IMPORTANT:** If switching brands of lubricants, prevent compatibility issues by thoroughly draining and, if possible, cleaning the reservoir before filling with the replacement brand.

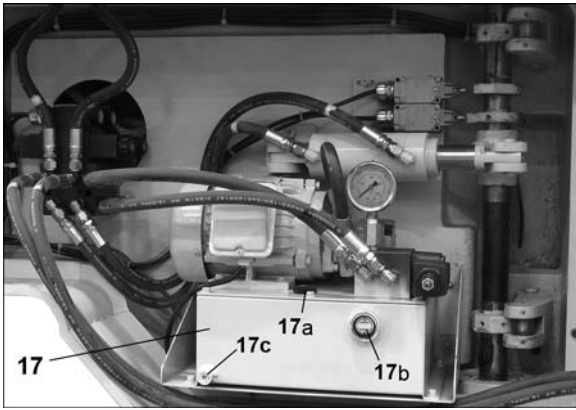


Figure 20



Figure 21

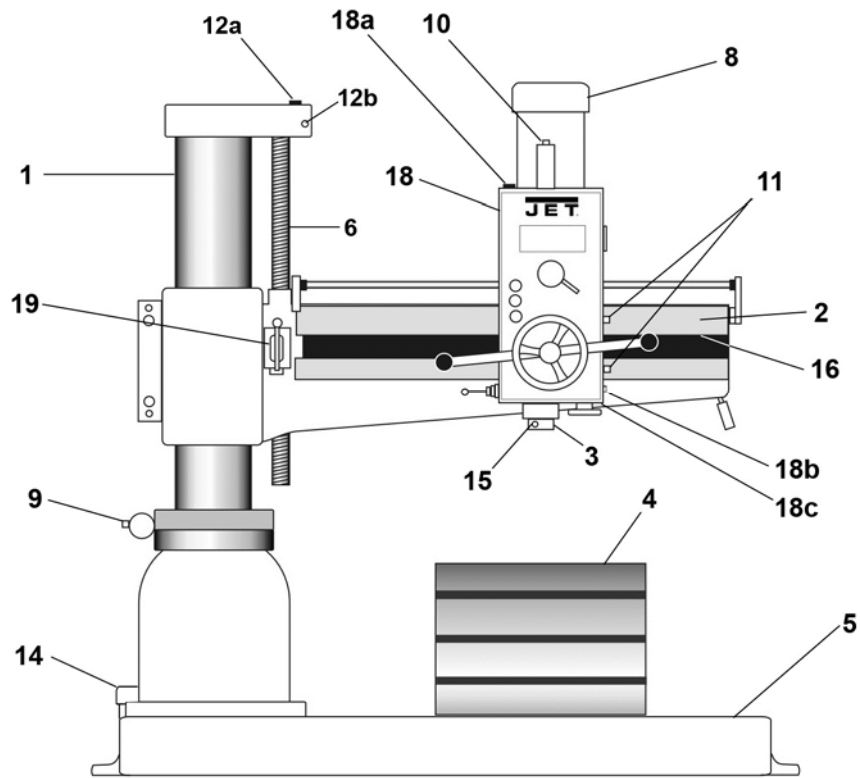
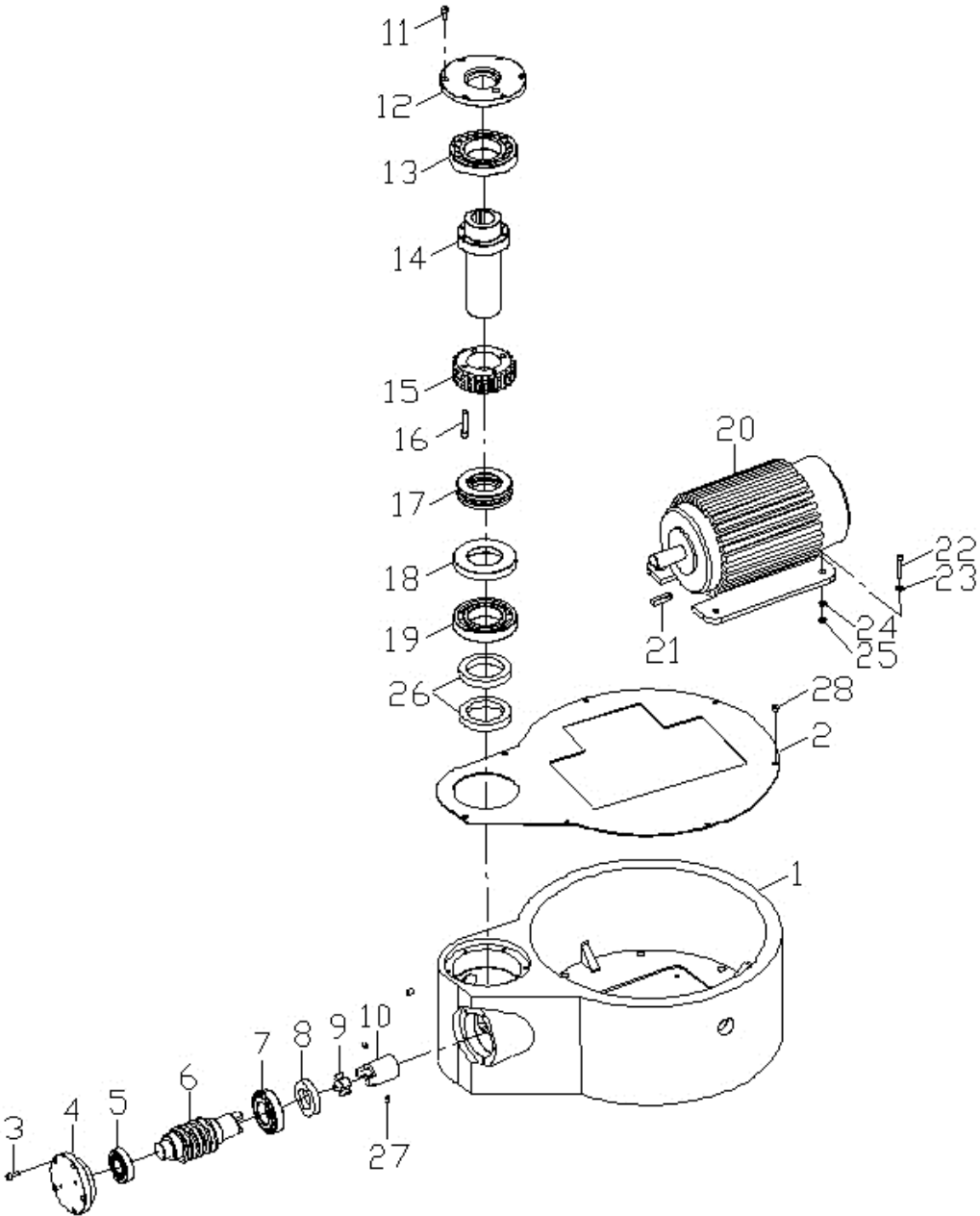


Figure 22

# 13.0 Replacement Parts – J-1600R Radial Arm Drill

Replacement parts are listed on the following pages. To order parts or reach our service department, call 1-800-274-6848, Monday through Friday (see our website for business hours, [www.jettools.com](http://www.jettools.com)). Having the Model Number and Serial Number of your machine available when you call will allow us to serve you quickly and accurately.

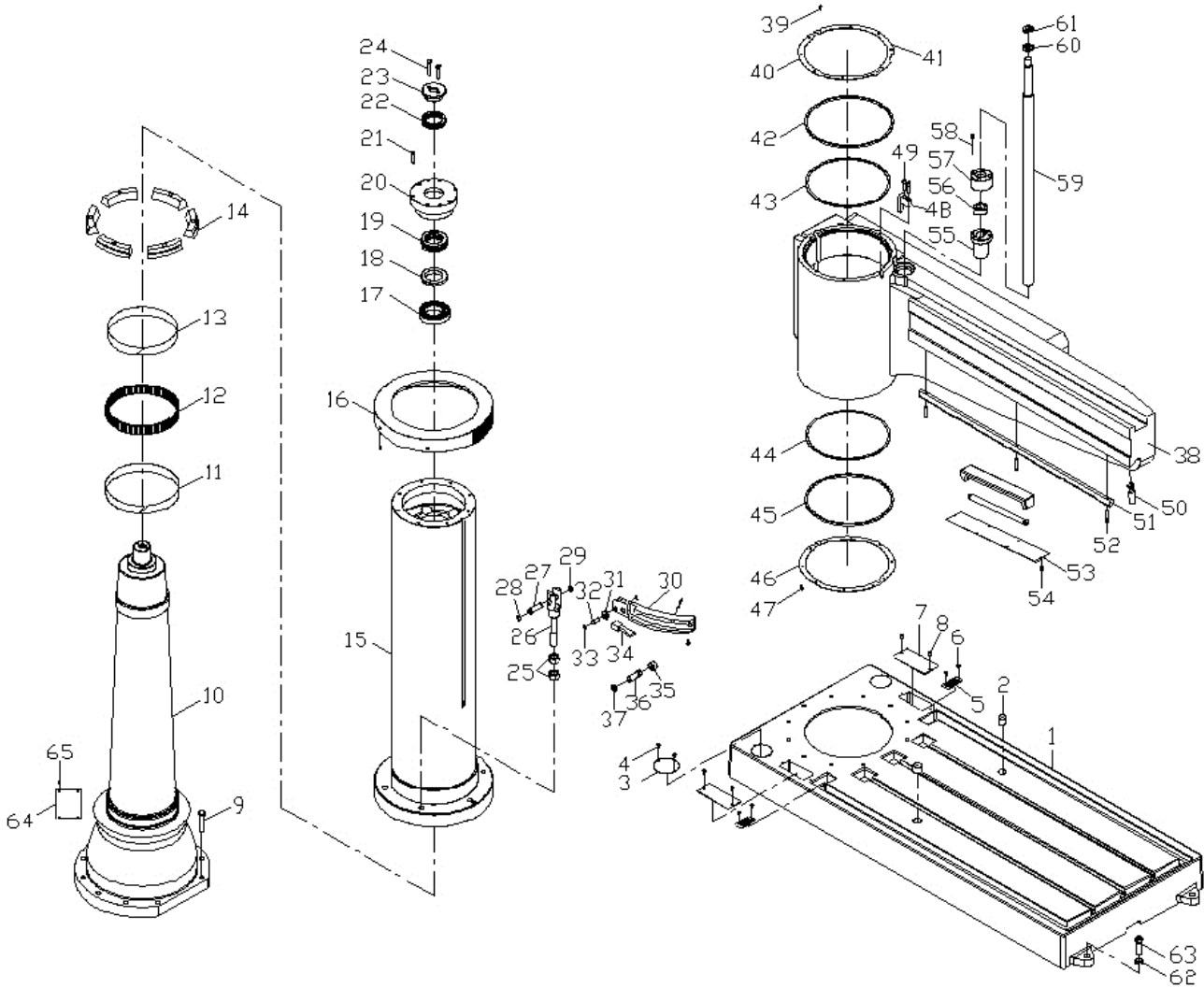
## 13.1.1 Riser Mechanism: Exploded View



### 13.1.2 Riser Mechanism: Parts List

Index No.	Part No.	Description	Size	Qty
1	J-5241361	Column Cover		1
2	10431	Nut Cover Seat		1
3	TS-1503041	Socket Head Cap Screw	M6x16L	5
4	J-524124	Bearing Cover		1
5	BB-30206	Bearing	30206	1
6	5241261	Worm Shaft		1
7	BB-30208	Bearing	30208	1
8	5241281	Oil Seal	TC40x65x12	1
9	5241291	Adapting Sheet		1
10	5241311	Adaptor		1
11	TS-1503041	Socket Head Cap Screw	M6x16L	6
12	J-524148	Compressing Cover		1
13	524147	Bearing	30213	1
14	5241451	Elevating Shaft		1
15	5241441	Worm Gear		1
16	TS-1504081	Socket Head Cap Screw	M8x40L	4
17	524142	Bearing	51212	1
18	524141	Collar		1
19	524139	Bearing	6212	1
20	J-5241381	Motor (for arm elevation)	2HP, 230/460V, 60Hz	1
21	524133	Key	8mmx35L	1
22	TS-1503091	Socket Head Cap Screw	M6x40L	4
23	TS-1550041	Flat Washer	M6	4
24	TS-2361061	Spring Washer	M6	4
25	TS-1540041	Nut	M6	4
26	524137	Oil Seal	TC60x82x12	2
27	TS-1523021	Set Screw	M6x8L	2
28	TS-1534032	Pan Head Machine Screw	M6x10L	7

13.2.1 Column and Base: Exploded View



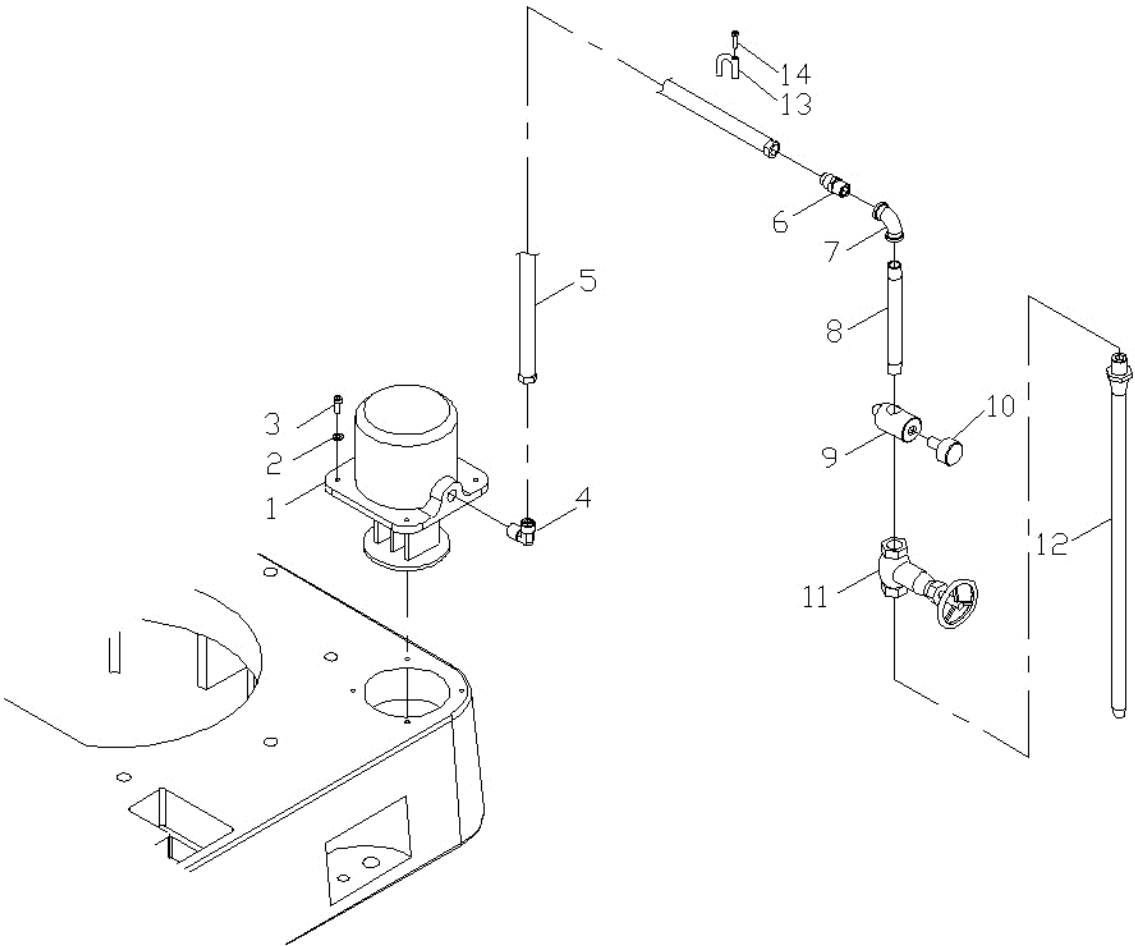
### 13.2.2 Column and Base: Parts List

Index No.	Part No.	Description	Size	Qty
1	J-524389	Base		1
2	524391	Cover		2
3	J-524393	Cover		1
4	524394	Pan Head Machine Screw	3/16"x3/8"L	2
5	10277	Filter Screen		2
6	524394	Bolt	3/16"x3/8"L	4
7	J1600R-307	Cover		2
8	TS-1534042	Pan Head Machine Screw	M6x12L	4
9	524392	Bolt	M20x110L	11
10	J-524395	Internal Column		1
	524398	Needle Roller (includes #11,12,13)		1
11		Steel Band		1
12		Needle		129
13		Steel Band		1
14	524401	Wedge		6
15	524404	External Column		1
16	524399	Locking Cover		1
17	BB-6218	Bearing	6218	1
18	524407	Collar		1
19	BB-51218	Bearing	51218	1
20	524405	Fixed Bearing Cover		1
21	TS-1505101	Socket Head Cap Screw	M10x60L	6
22	BB-51118	Bearing	51118	1
23	J1600R-323	Spindle Sleeve		1
24	5232951	Bolt	1/2"-12Nx3L	2
25	5233111	Nut	5/8"-11UNC	12
26	524425	Elevating Shaft		6
27	524427	Fixing Shaft		6
28	HVBS462-060	Retainer	S10	6
29	HVBS462-060	Retainer	S10	6
30	5244291	Slip Block		6
31	5244361	Roller		6
32	524435	Fixing Shaft		6
33	618M-158	Retainer	S9	12
34	524428	Slip Bracket		6
35	524431	Roller		6
36	524432	Slip Bar		6
37	524433	Washer		6
38	J-524439	Arm		1
39	TS-1534032	Pan Head Machine Screw	M6x10L	10
40	524437	Cover		1
41	524437A	Cover (notched)		1
42	524438	Gasket	U-10-16-14	1
43	J1600R-343	Dust Seal	5mm	1
44	J1600R-343	Dust Seal	5mm	1
45	524438	Gasket	U-10-16-14	1
46	524411	Cover		2
47	TS-1534032	Bolt	M6x10L	10
48	524441	Key		1
49	TS-1504071	Socket Head Cap Screw	M8x35L	2
50	524442	Handle		1
51	524443	Arm Rack		1
52	524444	Socket Head Cap Screw	M6x40L	3
53	524446	Glass Plate		1
54	5513357	Bolt	3/16"x3/8"L	8
55	10419/6	Brass Sleeve (includes #59 Lead Screw)		1
56	10417	Safety Nut		1
57	10418	Safety Device Cover		1
58	J1600R-358	Socket Head Cap Screw	M12x95L	4
59	10419/6	Lead Screw (includes #55 Brass Sleeve)		1

Index No.	Part No.	Description	Size	Qty
60	J1600R-360	Setting Nut		1
61	J1600R-361	Setting Nut		1
62	J1600R-362	Nut		4
63	J1600R-363	Bolt		4
64	J1600R-364	Electric Wire Cover		1
65	TS-1534042	Pan Head Machine Screw	M6x12L	4
	5515232	One Shot Lube Unit (not shown)		1



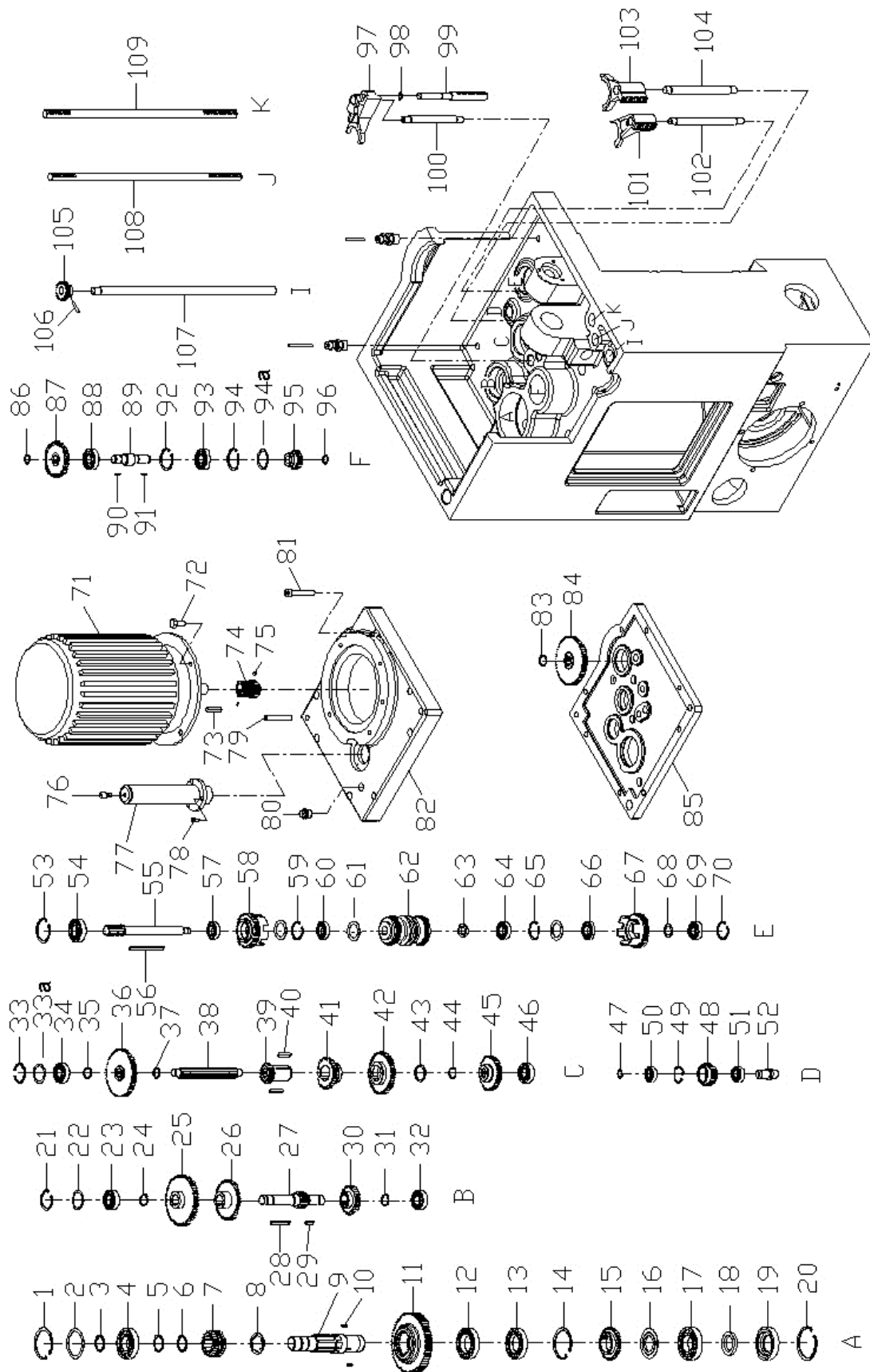
### 13.3.1 Coolant System: Exploded View



### 13.3.2 Coolant System: Parts List

Index No.	Part No.	Description	Size	Qty
1	5712921A	Coolant Pump	150L 220/440V 3PH	1
2	TS-1550041	Flat Washer	M6	4
3	TS-1503041	Socket Head Cap Screw	M6 x 16L	4
4	M0602001	90-Degree Elbow	PT3/8" x PS3/8" x 90°	1
5	M0506002	Hose	PT3/8" x 192"L	1
6	5232411	Male Connector	PT3/8" x PS3/8"	1
7	5232341	90-Degree Elbow	3/8" x 90°	1
8	M0510002	Tube	3/8" x 22"L	1
9	10014	Tube Sleeve		2
10	5232391	Knurled Screw	M10 x 25L	2
11	5232421	Brass Valve	3/8"	1
12	5232431	Coolant Hose	3/8" x 450L	1
13	M1315017	Tube Holder	UC-5	2
14	5513357	Phillips Pan Head Machine Screw	3/16" x 3/8"L	2

### 13.4.1 Gearbox Assembly (Upper Section): Exploded View

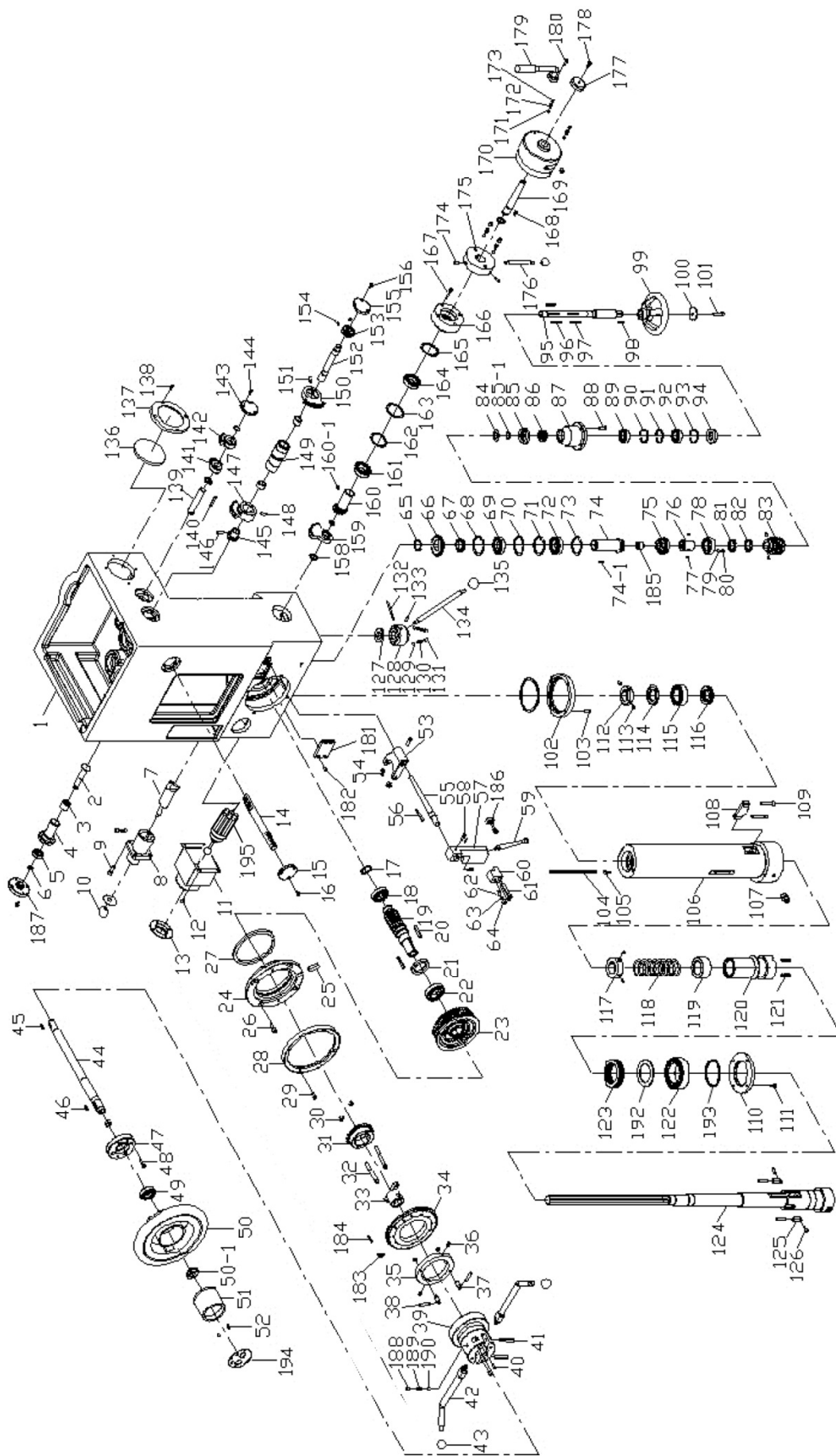


### 13.4.2 Gearbox Assembly (Upper Section): Parts List

Index No.	Part No.	Description	Size	Qty
1	5237011	Retainer	R80	1
2	5237021	Spacer		1
3	5237041	Retainer	S40	1
4	BB-6208ZZ	Bearing	6208ZZ	1
5	5237041	Retainer	S40	1
6	5237041	Retainer	S40	1
7	5237061	Gear		1
8	5237071	Spacer		1
9	5237081	Spindle		1
10	5237091	Key	5mmx18L	2
11	5237111	Gear		1
12	BB-6010ZZ	Bearing	6010Z	1
13	BB-6010ZZ	Bearing	6010Z	1
14	5237011	Retainer	R80	1
15	5237131	Gear		1
16	5237141	Washer		1
17	BB-6209ZZ	Bearing	6209ZZ	1
18	5237161	Oil Seal	TC44x62x8	1
19	5237171	Seal Housing		1
20	523718	Retainer	R85	1
21	HBS916W-94-17	Retainer	R52	1
22	523721	Spacer		1
23	BB-6205ZZ	Bearing	6205ZZ	1
24	523723	Retainer	S28	1
25	5237241	Gear		1
26	5237251	Gear		1
27	5237261	4th Transmission Shaft		1
28	523727	Key	7mmx58L	1
29	523728	Key	7mmx26L	1
30	5237291	Gear		1
31	523723	Retainer	S28	1
32	BB-6205ZZ	Bearing	6205ZZ	1
33	523719	Retainer	R52	1
33a	5237321	Spacer		1
34	523733	Bearing	6304	1
35	523723	Retainer	S28	1
36	5237351	Gear		1
37	523723	Retainer	S28	1
38	5237341	3rd Transmission Shaft		1
39	5237361	Gear		1
40	5237371	Key	7mx40L	2
41	5237381	Gear		1
42	5237391	Gear		1
43	5237041	Retainer	S40	1
44	523723	Retainer	S28	1
45	5237411	Gear		1
46	BB-6304ZZ	Bearing	6304	1
47	AB1012W-F13	Retainer	S20	1
48	523744	Gear		1
49	523746	Retainer	R42	1
50	BB-6004Z	Bearing	6004Z	1
51	BB-6004Z	Bearing	6004Z	1
52	523747	2nd Transmission Shaft		1
53	5237481	Retainer	R62	1
54	BB-6206ZZ	Bearing	6206ZZ	1
55	523751	Clutch		1
56	523752	Key	7mmx110L	1
57	BB-6005ZZ	Bearing	6005ZZ	1
58	5237531	Clutch Upper Gear		1
59	20EVS-T44-1	Retainer	R47	1

Index No.	Part No.	Description	Size	Qty
60	BB-6005ZZ	Bearing	6005ZZ	1
61	5237561	Collar		1
62	5237571	Clutch Pipe	OD-257	1
63	5237561	Collar		1
64	BB-6005ZZ	Bearing	6005ZZ	1
65	20EVS-T44-1	Retainer	R47	1
66	BB-6005ZZ	Bearing	6005ZZ	1
67	5237531	Clutch Upper Gear		1
68	523759	Collar		1
69	BB-6204ZZ	Bearing	6204ZZ	1
70	20EVS-T44-1	Retainer	R47	1
71	J-523763	Motor (for spindle)	7.5HP, 230/460V	1
72	523764	Bolt	1/2x1-1/4L	4
73	523765	Key	8mmx50L	1
74	5237661	Motor Gear		1
75	TS-1523021	Set Screw	M6x8L	2
76	5237721	Oil Cup	PT1/8"x3/4"	1
77	J-523773	Cover		1
78	523771	Bolt	M6x14L	3
79	523774	Pin		2
80	M0604005	Plug	PT1/2"	2
81	523775	Socket Head Cap Screw	M12x75L	8
82	J-523769	Upper Cover of Gear Box		1
83	523723	Retainer	S28	1
84	5237761	Gear		1
85	J-5237781	Middle Cover of Gear Box		1
86	523782	Retainer	S19	1
87	5237841	Gear		1
88	523742	Bearing	6304	1
89	523786	Shaft		1
90	GHD20PF-207	Key	5mmx16L	1
91	GHD20PF-207	Key	5mmx16L	1
92	HBS916W-94-17	Retainer	R52	1
93	523742	Bearing	6304	1
94	HBS916W-94-17	Retainer	R52	1
94a	523788	Spacer Ring		1
95	523789	Gear		1
96	523782	Retainer	S19	1
97	5237911	Swing Seat, 2 Step Speed Change		1
98	523793	Retainer	S18	1
99	5237921	Rack		1
100	523794	Shaft		1
101	5237791	Swing Seat, 3 Step Speed Change		1
102	523781	Shaft		1
103	5237951	Swing Seat for Clutch		1
104	523796	Shaft		1
105	5237971	Gear		1
106	523798	Spring Pin	5mmx35L	1
107	523799	Clutch Shaft		1
108	523801	Rack, 2-Step Speed Change		1
109	523802	Rack, 3-Step Speed Change		1

### 13.5.1 Gearbox Assembly (Lower Section): Exploded View



### 13.5.2 Gearbox Assembly (Lower Section): Parts List

Index No.	Part No.	Description	Size	Qty
1	J-523805	Gear Box Housing		1
2	523806	Roller		1
3	523807	Bearing	TAF172520	1
4	523808	Roller Housing		1
5	BB-6002ZZ	Bearing	6002ZZ	1
6	5640491	Retainer	S15	1
7	10490	Eject Bar		1
8	523813	Frame for Eject Bar		1
9	TS-1504051	Socket Head Cap Screw	M8x25L	4
9a	523815	Nameplate		1
10	5238171	Plastic Ball	3/8"	1
11	523819	Frame for Cross Switch		1
12	5238211	Pan Head Machine Screw	3/16"x3/8"L	4
13	523822	Cover		1
14	523825	Rack		1
15	523826	Cover		3
16	TS-1502021	Socket Head Cap Screw	M5x10L	3
17	5233751	Retainer	S30	1
18	BB-6006ZZ	Bearing	6006ZZ	1
19	10495	Gear Shaft		1
20	5238291	Key	6mmx45L	2
21	5238311	Oil Seal	TC40x55x8	1
22	BB-6007ZZ	Bearing	6007ZZ	1
23	5238331	Worm Gear		1
24	5238351	Setting Ring for Dial		1
25	5238361	Key		1
26	TS-1504051	Socket Head Cap Screw	M8x25L	4
27	5238341	Urethane Band	7mmx430L	1
28	5238561	Ring		1
29	JHM610-22	Socket Head Cap Screw	M6x14L	4
30	5238381	Nut	M8	2
31	5238391	Auto Feed Bolt		1
32	5238411	Bolt		2
33	5238421	Swing Frame		1
34	5238551	Dial		1
35	5238591	Set Nut		1
36	TS-1504011	Socket Head Cap Screw	M8x10L	2
37	5238631	Set Nut		2
38	5238641	Handle Lever Assembly		2
39	5238431	Feed Lever Housing		1
40	TS-1523051	Set Screw	M6x16L	2
41	5238451	Spring Pin	5mmx50L	2
42	5238511	Feed Lever		2
43	523852-1	Plastic Ball	1/2"	2
44	10510	Handwheel Shaft		1
45	5783961	Key	5x5x18L mm	1
46	5783961	Key	5x5x18L mm	1
47	523867	Bearing Case		1
48	TS-1503051	Socket Head Cap Screw	M6x20L	4
49	BB-6005ZZ	Bearing	6005ZZ	1
50	J-5238691	Handwheel		1
50-1	10513	Setting Nut		1
51	5238721	Case for Push Button Switch		1
52	TS-1532032	Pan Head Machine Screw	M4x10L	2
53	5238831	Swing Block		1
54	523884	Swing Key		2
55	5238761	Shaft for Swing Lever		1
56	523877	Key	5mmx50L	1
57	5238791	Swing Lever Seat		1
58	TS-1503041	Socket Head Cap Screw	M6x16L	2

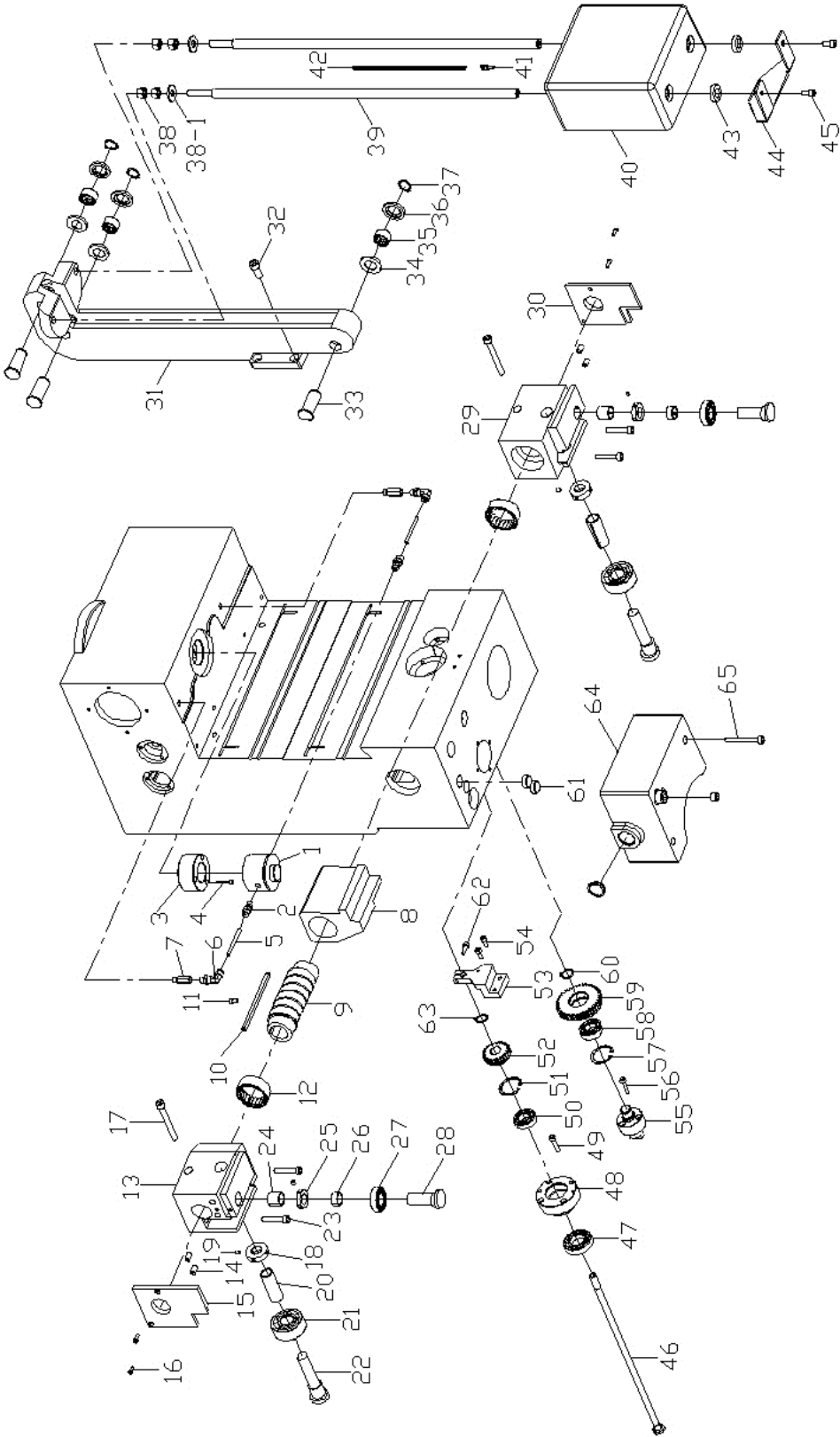
Index No.	Part No.	Description	Size	Qty
59	5238811	Swing Lever		1
60	523885	Swing Lever Frame		1
61	523888	Bolt	M6x50L	2
62	SB-3/8	Steel Ball	3/8"	1
63	523886	Spring		1
64	TS-1525011	Set Screw	M10x10L	1
65	523889	Retainer	S30	1
66	5238911	Gear		1
67	523892	Spacer		1
68	523893	Retainer	R55	1
69	BB-6006ZZ	Bearing	6006ZZ	1
70	523893	Retainer	R55	1
71	523893	Retainer	R55	1
72	BB-6006ZZ	Bearing	6006ZZ	1
73	523893	Retainer	R55	1
74	5238951	Clutch		1
74-1	523896	Key	5mmx14L	1
75	5238991	Clutch		1
76	5238971	Clutch Collar		1
77	5233811	Key	5mmx12L	2
78	5239031	Buffer Sleeve		1
79	SB-5/16	Steel Ball	5/16"	10
80	5239021	Spring		10
81	5239041	Setting Nut		1
82	5239041	Setting Nut		1
83	5239061	Worm		1
84	10566	Washer		1
85	10528	Washer		1
85-1	5239081	O-Ring	P18	1
86	BB-51104	Bearing	51104	1
87	10529	Bearing Case		1
88	TS-1503051	Socket Head Cap Screw	M6x20L	4
89	BB-6004ZZ	Bearing	6004ZZ	1
90	523746	Retainer	R42	1
91	523746	Retainer	R42	1
92	BB-6004ZZ	Bearing	6004ZZ	1
93	523746	Retainer	R42	1
94	5239151	Oil Seal	TC25x45x8	1
95	5239171	Shaft		1
96	523916	Key	5mmx38L	2
97	523918	Key	5mmx40L	1
98	5783961	Key	5mmx18L	1
99	J-5239211	Manual Feed Handwheel		1
100	10123	Washer		1
101	523923	Bolt	M6x35L	1
102	10541	Dust Proof Cover		1
103	TS-1502041	Socket Head Cap Screw	M5x16L	4
104	5239291	Chain	3/8x154	1
105	5239311	Special Bolt		1
106	10534	Quill		1
107	5239351	Grease Nipple	PT1/8"	1
108	10535A	Ejection Rammer (s/n 0809188 and higher)		1
109	TS-1504091	Socket Head Cap Screw	M8x45L	2
110	5239471	Cover		1
111	TS-1502041	Socket Head Cap Screw	TS-1502041	4
112	5239241	Setting Nut		1
113	TS-1524021	Set Screw	M8x10L	2
114	5239261	Collar		1
115	5239271	Needle Bearing	NN3007P5	1
116	5239281	Bearing	51107	1
117	5239361	Setting Nut		1
118	5239381	Spring		1

Index No.	Part No.	Description	Size	Qty
119	5239391	Collar		1
120	10539	Eject Collar		1
	10539A	Eject Collar (s/n 0809188 and higher)		1
121	5239421	Spring		2
122	5239451	Needle Bearing	NN3012KP5	1
123	BB-51112	Thrust Bearing	51112	1
124	5239491A	Spindle (re:5239491SA)		1
	5239491SA	Spindle Assembly (includes #7,9,108,120,124)		1
125	5239511	Spring Guide Pin		2
126	TS-1503041	Socket Head Cap Screw	M6x16L	2
127	5239531	Oil Seal	TC22x40x8	1
128	5239541	Hi/Low Setting Seat		1
129	SB-5/16	Steel Ball	5/16"	2
130	523957	Spring		2
131	523958	Bolt	M8x10L	2
132	523962	Spring Pin	5mmx60L	1
133	TS-1523051	Set Screw	M6x16L	1
134	5239591	Three Step Speed Change Lever		1
135	5239611	Ball	3/8"	2
136	523963	Oil Sight Glass		1
137	523964	Cover for Oil Sight Glass		1
138	TS-1502031	Socket Head Cap Screw	M5x12L	1
139	523967	Shaft		1
140	523966	Key	6mmx36L	1
141	5239681	Swing Gear		1
142	5239691	Swing Gear		1
143	523971	Cover		1
144	TS-1502021	Socket Head Cap Screw	M5x10L	3
145	5239741	Gear		1
146	523973	Spring Pin	5mmx25L	1
147	5239751	Swing Gear		1
148	TS-1523031	Set Screw	M6x10L	1
149	5239781	Pipe		1
150	5239811	Swing Gear		1
151	TS-1523031	Set Screw	M6x10L	1
152	5239771	Shaft		1
153	5239831	Swing Gear		1
154	TS-1523031	Set Screw	M6x10L	1
155	523985	Cover		1
156	TS-1502021	Socket Head Cap Screw	M5x10L	3
158	AB1012W-F13	Retainer	S20	1
159	5239871	Swing Gear		1
160	5239891	Gear Pipe		1
160-1	523991	Key	5mmx10L	1
161	BB-6006ZZ	Bearing	6006ZZ	1
162	523893	Retainer	R55	1
163	523893	Retainer	R55	1
164	BB-6006ZZ	Bearing	6006ZZ	1
165	523893	Retainer	R55	1
166	523992	Bearing Case		1
167	TS-1502081	Socket Head Cap Screw	M5x35L	4
168	523999	Key	6mmx15L	1
169	5240011	Shaft		1
170	5240021	Cover		1
171	SB-5/16	Steel Ball	5/16"	2
172	524006	Spring		2
173	524007	Set Screw	M8x10L	2
174	TS-1503041	Set Screw	M6x16L	2
175	523996	2-Step Speed Change Wheel		1
176	5234861	3-Step Speed Change Lever		1
177	524008	Cover		1
178	TS-1503021	Socket Head Cap Screw	M6x10L	1



Index No.	Part No.	Description	Size	Qty
179	524004	Change Lever		1
180	TS-1502031	Socket Head Cap Screw	M5x12L	3
181	J1600R-5181	Cover		1
182	5238211	Pan Head Machine Screw	3/16"x3/8"L	4
183	523854	Swing Key		1
184	523853	Spring Pin	5mmx20L	2
185	J1600R-5185	Bearing	TAF182620	1
186	J1600R-5186	Fixed Flange		1
187	J1600R-5187	Cover		1
188	5238481	Set Screw	7/16"x3/8"L	1
189	5238471	Spring		1
190	SB-3/8	Steel Ball	3/8"	1
191	523793	Retaining Ring	S18	1
192	5239441	Collar		1
193	5239461	Felt Wick		1
194	5238741	Name Plate		1
195	5238181	Cross Switch		1

13.6.1 Rear of Head: Exploded View

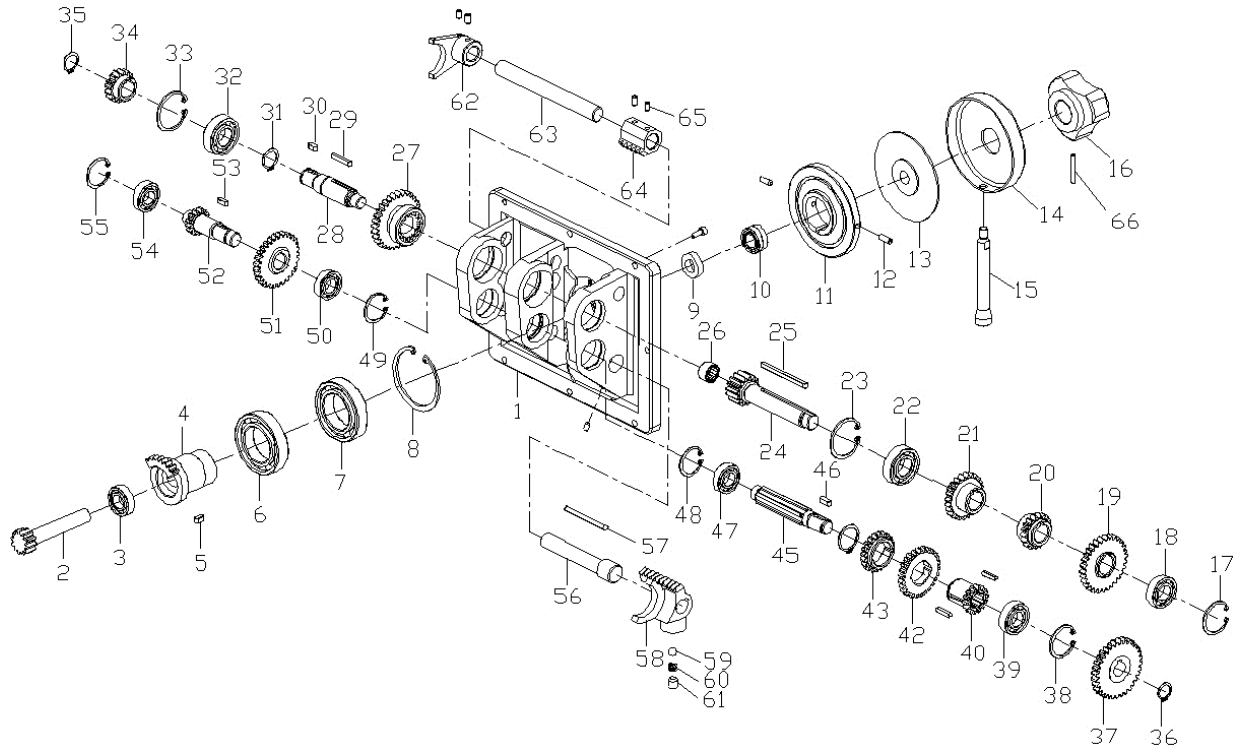


### 13.6.2 Rear of Head: Parts List

Index No.	Part No.	Description	Size	Qty
1	5240651	Oil Feed Pump	AM2	1
2	5240661	Male Fitting	PT1/4"x1/4"H	2
3	524067	Oil Pump Seat		1
4	TS-1503091	Socket Head Cap Screw	M6x40L	3
5	524068	Nylon Pipe	1/4"x100L	2
6	524069	Male Stud Elbow Fitting	PT1/8"x1/4"Hx90	2
7	524071	Straight Joint		2
8	J-5240721	Cam Shaft Sleeve		1
9	5240731	Eccentric Shaft		1
10	524074	Key	7mmx150L	1
11	TS-1502021	Socket Head Cap Screw	M5x10L	3
12	524075	Bearing	RNA4908	2
13	J-524088	Left Bearing Bracket		1
14	524093	Bolt	M10x16L	4
15	J-524092	Aluminum Plate		1
16	524089	Bolt	3/16"x1/2"L	4
17	J1600R-617	Socket Head Cap Screw	M10x85L	2
18	524077	Adjustable Collar		2
19	TS-1523021	Set Screw	M6x8L	4
20	524078	Sleeve		2
21	524086	Bearing	2305	2
22	5240791	Eccentric Shaft		2
23	TS-1504091	Socket Head Cap Screw	M8x45L	4
24	524084	Eccentric Bushing		2
25	524083	Adjustable Collar		2
26	524087	Eccentric Bushing		2
27	BB-6005ZZ	Bearing	6005ZZ	2
28	5240821	Eccentric Shaft		2
29	J-524076	Right Bearing Bracket		1
30	J1600R-630	Aluminum Plate		1
31	J-524094	Chain Frame		1
32	TS-1505031	Socket Head Cap Screw	M10x25L	4
33	524095	Shaft		3
34	524097	Retaining Collar		3
35	524098	Bearing	TA223016Z	3
36	524097	Retaining Collar		3
37	5234591	Retainer	S22	3
38	5235811	Nut	1/2"	4
38-1	TS-0680061	Washer	1/2"	2
39	J-5241051	Leading Bar		2
40	J-524106	Cast Iron Block		1
41	10352	Special Bolt		1
42	524103	Chain	3/8"x154	1
43	5235771	Oil Seal Bushing	TC19x32x8	2
44	10600	Block		1
45	TS-1504031	Socket Head Cap Screw	M8x16L	2
46	5241191	Pipe (includes #53 Support)		1
47	BB-6006ZZ	Bearing	6006ZZ	1
48	524115	Bearing Case		1
49	TS-1503071	Socket Head Cap Screw	M6x30L	4
50	BB-6004Z	Bearing	6004Z	1
51	523746	Retainer	R42	1
52	5241181	Gear		1
53	5241191	Support (includes #46 Pipe)		1
54	TS-1503041	Socket Head Cap Screw	M6x16L	2
55	5241131	Special Key		1
56	TS-1503071	Socket Head Cap Screw	M6x30L	3
57	523746	Retainer	R42	1
58	BB-6004Z	Bearing	6004Z	1
59	5231141	Gear		1

<b>Index No.</b>	<b>Part No.</b>	<b>Description</b>	<b>Size</b>	<b>Qty</b>
60	AB1012W-F13	Retainer	S20	1
61	J1600R-661	Plug		2
62	TS-1503051	Socket Head Cap Screw	M6x20L	1
63	AB1012W-F13	Retainer	S20	1
64	10874	Oil Tank		1
65	TS-2238911	Bolt	M8x100L	3

### 13.7.1 Feed Change Mechanism: Exploded View

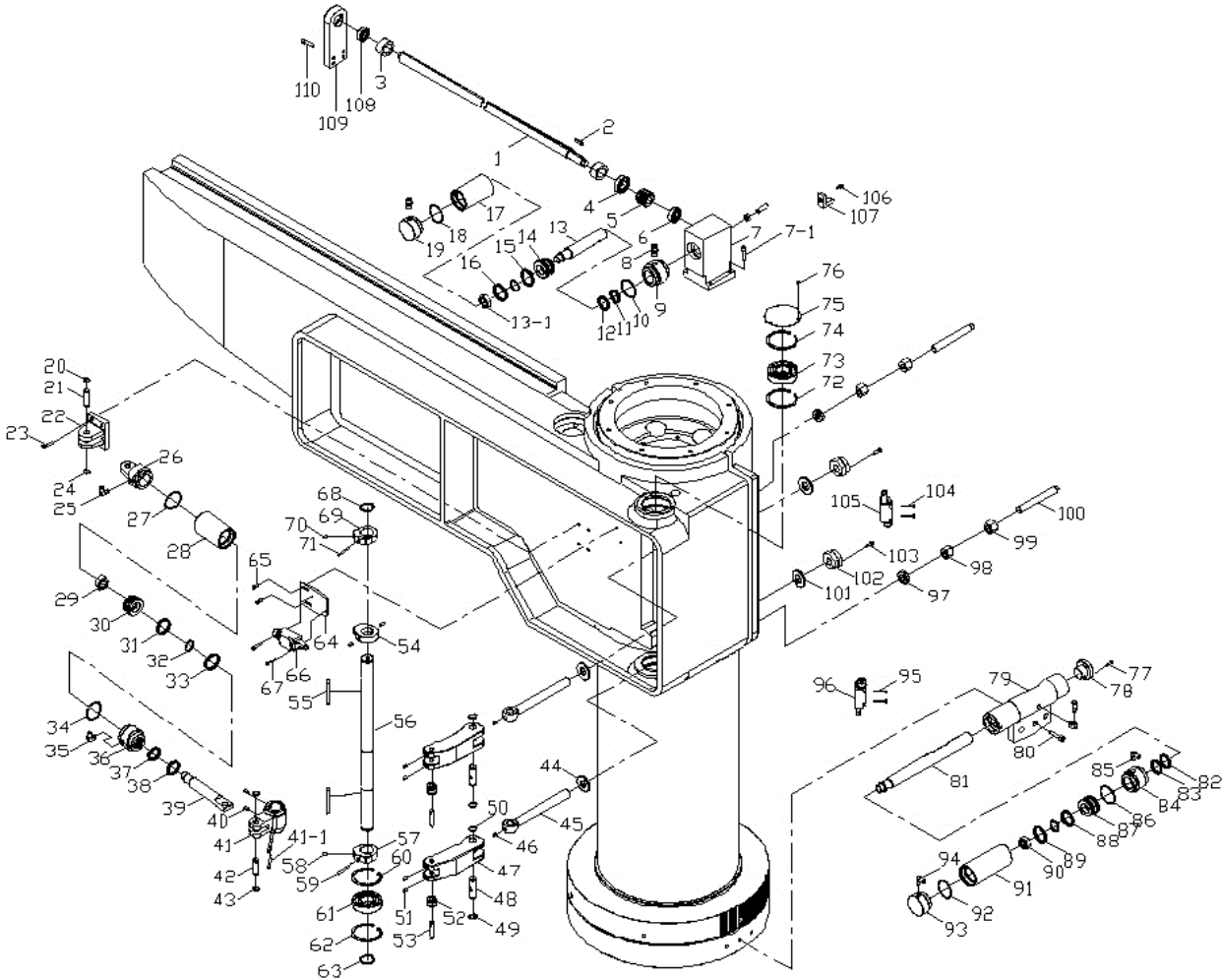


### 13.7.2 Feed Change Mechanism: Parts List

Index No.	Part No.	Description	Size	Qty
1	J-5240111	Feed Gear Frame		1
2	5240121	Gear Shaft		1
3	BB-6002ZZ	Bearing	6002ZZ	1
4	5240141	Pipe Gear		1
5	5233811	Key	5mmx12L	1
6	BB-6008ZZ	Bearing	6008ZZ	1
7	BB-6008ZZ	Bearing	6008ZZ	1
8	524016	Retainer	R68	1
9	5240171	Oil Seal	TC15x27x7	1
10	J1600R-710	Bearing	NA4902	1
11	524019	Feed Speed Change Wheel		1
12	TS-1523051	Set Screw	M6x16L	2
13	524021	Dial Seat		1
14	524023	Cover		1
15	5240311	Swing Lever		1
16	524025	Change Wheel		1
17	524037	Retainer	R35	1
18	BB-6003ZZ	Bearing	6003ZZ	1
19	5240391	Large Gear		1
20	5240411	Small Gear		1
21	524042	Middle Gear		1
22	BB-6004ZZ	Bearing	6004ZZ	1
23	523746	Retainer	R42	1
24	5240441	Gear Shaft		1
25	J1600R-725	Key	5mmx70L	1

Index No.	Part No.	Description	Size	Qty
26	J1600R-726	Bearing	TLA1412Z	1
27	524045	Gear Collar		1
28	5240461	Shaft		1
29	HVBS462-073	Key	5x5x30L	1
30	5233811	Key	5x5x12L	1
31	AB1012W-F13	Retainer	S20	1
32	BB-6004ZZ	Bearing	6004ZZ	1
33	523746	Retainer	R42	1
34	5240491	Gear		1
35	J1600R-735	Retainer	S18	1
36	524062	Retainer	S16	1
37	5240611	Gear		1
38	524051	Retainer	R35	1
39	BB-6003ZZ	Bearing	6003ZZ	1
40	524053	Gear Collar		1
42	524054	Gear		1
43	J1600R-743	Gear		1
45	524052	Hexagon Shaft		1
46	GHB1340A-G87	Key	5x5x14L	1
47	BB-6002ZZ	Bearing	6002ZZ	1
48	AB1012W-E22	Retainer	R32	1
49	AB1012W-E22	Retainer	R32	1
50	BB-6002ZZ	Bearing	6002ZZ	1
51	5240571	Gear		1
52	5240581	Gear Shaft		1
53	GHB1340A-G87	Key	5x5x14L	1
54	BB-6002ZZ	Bearing	6002ZZ	1
55	AB1012W-E22	Retainer	R32	1
56	524034	Shaft		1
57	J1600R-757	Key	5mmx65L	1
58	J1600R-758	Gear Shift Lever		1
59	SB-5/16	Steel Ball	5/16"	1
60	J1600R-760	Spring		1
61	TS-1525011	Set Screw	M10x10L	1
62	524033	Swing Seat		1
63	J1600R-763	Shaft		1
64	5240321	Swing Rack		1
65	TS-1523031	Bolt	M6x10L	4
66	524024	Spring Pin	5mmx45L	1

### 13.8.1 Hydraulic Clamping Mechanism: Exploded View



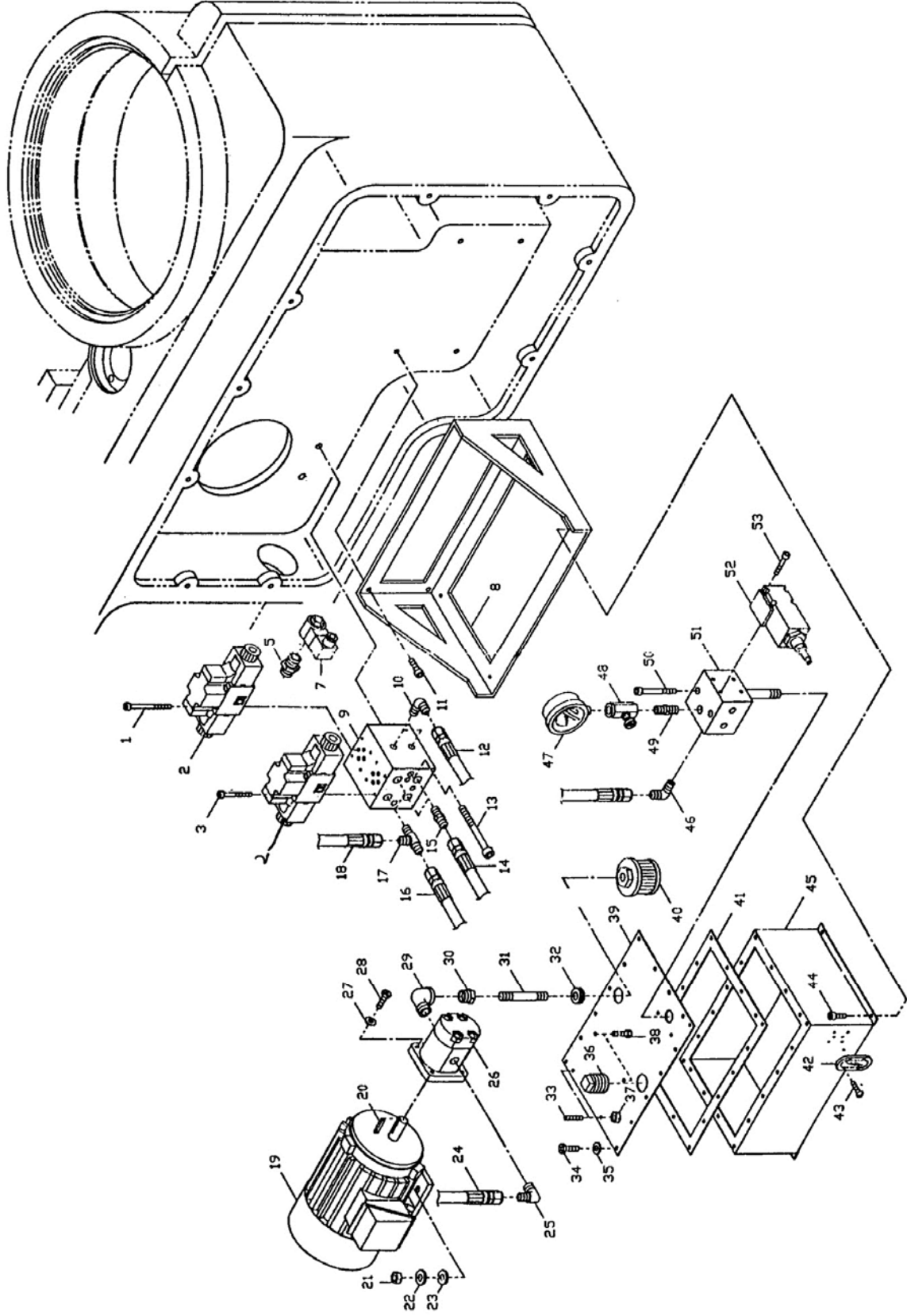
### 13.8.2 Hydraulic Clamping Mechanism: Parts List

Index No.	Part No.	Description	Size	Qty
1	524296	Leading Bar		1
2	524297	Key	7mmx30L	1
3	524298	Limit Rubber		2
4	BB-6205ZZ	Bearing	6205ZZ	1
5	524299	Gear		1
6	BB-6204ZZ	Bearing	6204ZZ	1
7	J-524309	Cylinder Rest		1
7-1	TS-1504071	Socket Head Cap Screw	M8x35L	4
8	524304	Male Connector	PT3/8"xPS3/8"	2
9	J-524303	Cylinder Joint		1
10	5515638	O-Ring	G55	1
11	524302	Oil Seal	UHS35	1
12	524302	Oil Seal	UHS35	1
13	524321	Rod		1
13-1	524316	Nut	M24	1
14	524318	Piston		1
14-1	524319	O-Ring		1
15	524317	Oil Seal	UHS45A	1
16	524317	Oil Seal	UHS45A	1
17	524315	Arm Clamping Cylinder		1
18	5515638	O-Ring	G55	1
19	J-524313	Cylinder Cover		1
20	524323	Retainer	S16	1
21	524324	Pin		1
22	524326	Cylinder Rest		1
23	TS-1504061	Bolt	M8x30L	4
24	A076	Retainer	S16	1
25	524327	90° Elbow	PS3/8"xPT1/4"x90	1
26	524328	Joint		1
27	5515638	O-Ring	G55	1
28	524331	Arm Clamping Cylinder		1
29	524332	Nut	M24	1
30	524318	Piston		1
31	524333	Oil Seal	UHS45A	1
32	524335	O-Ring	P30	3
33	524333	Oil Seal	UHS45A	1
34	5515638	O-Ring	G55	1
35	524327	90° Elbow	PS3/8"xPT1/4"x90	1
36	J-524338	Cylinder Joint		1
37	524302	Oil Seal	UHS35	1
38	524302	Oil Seal	UHS35	1
39	524336	Rod		1
40	TS-1524021	Bolt	M8x10L	2
41	J1600R-841	Rocker Arm		1
41-1	13-6030-001-2	Taper Pin	#4x64L	2
42	524352	Pin		1
43	AB1012W-A52	Retainer	S16	2
44	524378	Washer		2
45	524345	Clamping Bolt		2
46	TS-1525011	Set Screw	M10x10L	2
47	J1600R-847	Swing Key		2
48	J1600R-848	Pin		2
49	AB1012W-F13	Retainer	S20	2
50	AB1012W-F13	Retainer	S20	2
51	TS-1524011	Set Screw	M8x8L	4
52	J1600R-852	Roller		2
53	J1600R-853	Pin		2
54	J1600R-854	Stopper		1
55	J1600R-855	Key	12mmx8x90L	2
56	J1600R-856	Revolving Spindle		1



Index No.	Part No.	Description	Size	Qty
57	J1600R-857	Cam		1
58	TS-1524031	Set Screw	M8x12L	1
59	13-6030-001-2	Taper Pin	#4x64L	1
60	J1600R-860	Retainer	R90	1
61	BB-6308ZZ	Bearing	6308ZZ	1
62	J1600R-860	Retainer	R90	1
63	5237041	Retainer	S40	1
64	524353	Limit Switch Rest		1
65	TS-1503031	Socket Head Cap Screw	M6x12L	2
66	E0901010	Micro Switch	WL-D2	1
67	TS-2285352	Bolt	M5x35L	2
68	5237041	Retainer	S40	1
69	J1600R-857	Cam		1
70	TS-1524031	Set Screw	M8x12L	1
71	13-6030-001-2	Taper Pin	#4x64L	1
72	J1600R-860	Retainer	R90	1
73	BB-6308ZZ	Bearing	6308ZZ	1
74	J1600R-860	Retainer	R90	1
75	J1600R-875	Cover		1
76	TS-1532032	Pan Head Machine Screw	M4x10L	3
77	TS-1502041	Socket Head Cap Screw	M5x16L	3
78	5243581	Plug		1
79	J-5243591	Cylinder Rest		1
80	TS-1505061	Socket Head Cap Screw	M10x40L	3
81	524364	Rod		1
82	524302	Packing	UHS35	1
83	524302	Packing	UHS35	1
84	J-524366	Cylinder Joint		1
85	524327	90° Elbow	PS3/8"xPT1/4"x90	1
86	5515638	O-Ring	G55	1
87	524318	Piston		1
88	524317	Oil Seal	UHS45A	1
89	524317	Oil Seal	UHS45A	1
90	TS-1540231	Nut	M24	1
91	524374	Arm Clamping Cylinder		1
92	5515638	O-Ring	G55	1
93	J-524377	Cylinder Cover		1
94	524327	90° Elbow	PS3/8"xPT1/4"x90	1
95	524382	Bolt	M5x35L	2
96	E0901013	Micro Switch	WL-D	1
97	524378	Washer		2
98	J1600R-898	Screw Nut		2
99	J1600R-898	Screw Nut		2
100	524382	Bolt		2
101	J1600R-8101	Washer	d25xD44x4T	2
102	J1600R-8102	Lock Nut		2
103	TS-1503051	Socket Head Cap Screw	M6x20L	2
104	TS-2285352	Pan Head Screw	M5x35L	2
105	E0901010	Micro Switch	WL-D2	1
106	TS-1503031	Socket Head Cap Screw	M6x12L	1
107	J1600R-107	Mounting Bracket		1
108	BB-6004ZZ	Bearing	6004ZZ	1
109	J-5236641	Block		1
110	TS-1504081	Socket Head Cap Screw	M8x40L	4

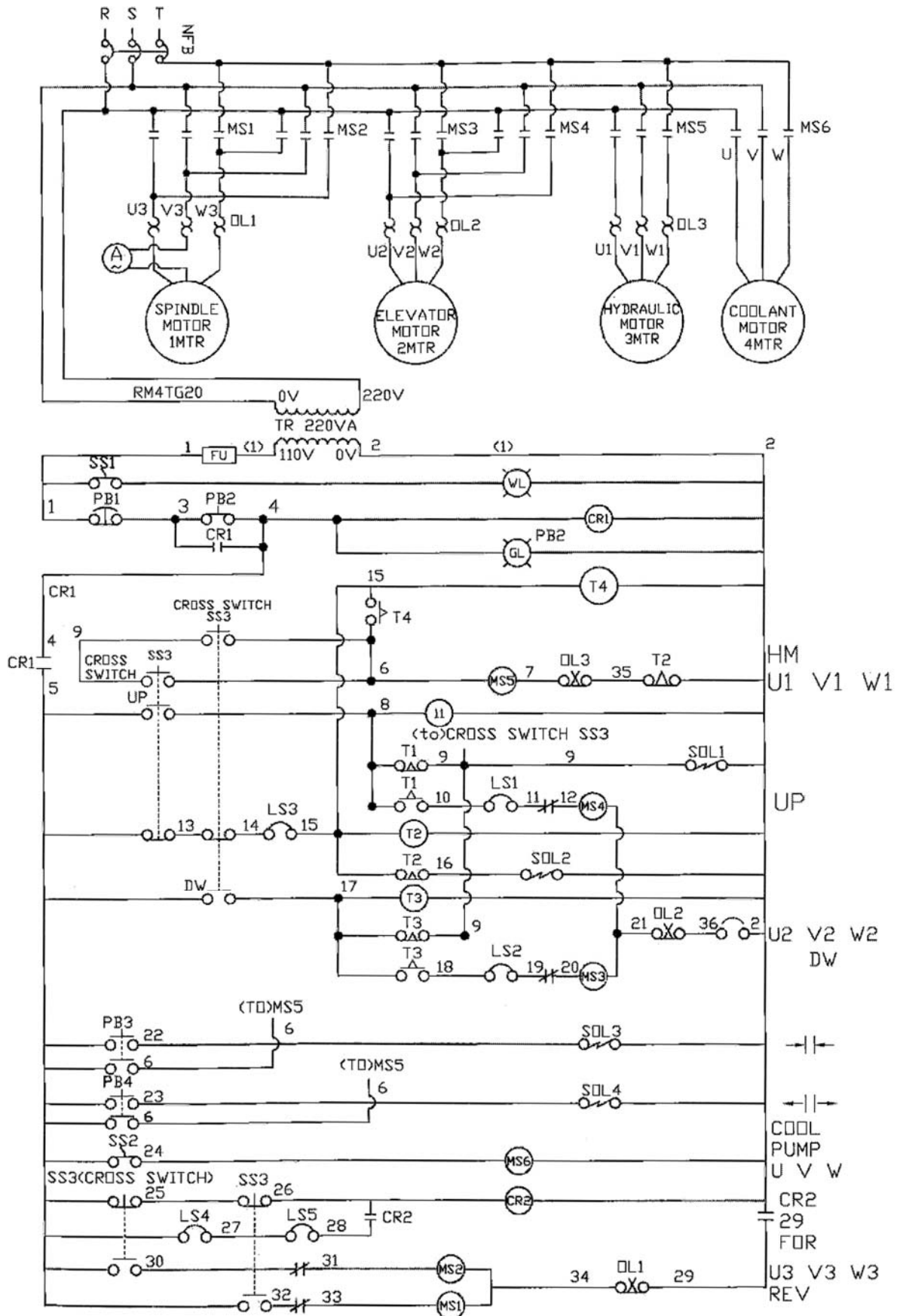
13.9.1 Hydraulic System: Exploded View



### 13.9.2 Hydraulic System: Parts List

Index No.	Part No.	Description	Size	Qty
1	524235	Bolt		2
2	5242361	Solenoid Valve	DSG-3C2	2
3	524237	Bolt		2
4	5242381	Pilot Check Valve Assembly		1
5	524239	Fitting		1
7	5242421	Solenoid Valve		1
8	524243	Oil Tank Frame		1
9	524244	Manifold		1
10	524245	Elbow		1
11	524246	Bolt		4
12	524247	Hydraulic Hose (Manifold to Manifold)		1
13	524248	Bolt		1
14	524249	Hydraulic Hose (Cylinder Arm to Manifold)		1
15	524251	Fitting		1
16	524252	Hydraulic Hose (Cylinder Column to Manifold)		1
17	524253	T-Fitting		1
18	524254	Hydraulic Hose (Cylinder Head to Manifold)		1
19	5242551	Hydraulic Motor		1
20	524256	Key		1
21	524257	Hex Nut		4
22	524258	Plain Washer		4
23	524259	Spring Washer		4
24	524261	Hydraulic Hose (Gear Pump to Manifold)		1
25	524262	Elbow		1
26	524263	Gear Pump		1
27	524264	Plain Washer		4
28	524265	Bolt		4
29	524266	Elbow		1
30	524267	Fitting		1
31	524268	Nipple		1
32	524269	Oil Tight Rubber Ring		1
33	524271	Bolt		2
34	524272	Bolt		6
35	524273	Plain Washer		6
36	524274	Plastic Plug, Oil Fitting		1
37	524275	Nut		2
38	524276	Bolt		2
39	524277	Oil Tank Cover		1
40	524278	Oil Filter		1
41	524279	Gasket		1
42	524281	Oil Sight Glass		1
43	524282	Bolt		4
44	524283	socket Head Cap Screw		4
45	524284	Oil Tank		1
46	524285	Elbow		1
47	5242861	Oil Pressure Gauge		1
48	524287	Stop Valve		1
49	524288	Bolt		1
50	524289	Bolt		1
51	524291	Manifold		1
52	524292	Relief Valve		1
53	524293	Bolt		2

# 14.0 Electrical Connections for J-1600R



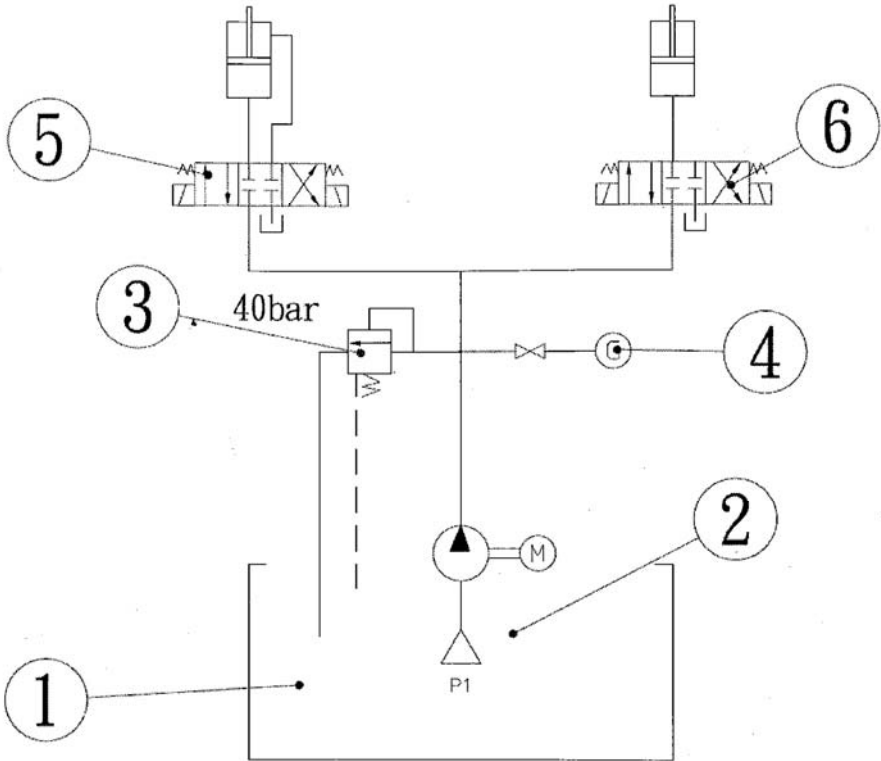
## 14.1 Electrical Connections for J-1600R: Parts List

Part No.	Symbol	Description	Size	Qty
E0701022	MS1	Magnetic Contactor	CU27, 110V	1
E0701022	MS2	Magnetic Contactor	CU27, 110V	1
E0701020	MS3	Magnetic Contactor	CU11,3a1b,110V	1
E0701020	MS4	Magnetic Contactor	CU11,3a1b,110V	1
E0701020	MS5	Magnetic Contactor	CU11,3a1b,110V	1
E0701020	MS6	Magnetic Contactor	CU11,3a1b,110V	1
E0701020	CR1	Magnetic Contactor	CU11,3a1b,110V	1
E0701020	CR2	Magnetic Contactor	CU11,3a1b,110V	1
E0208004	T1	Timer Relay	ASTP-N,6S,110V	1
E0208005	T2	Timer Relay	AH3-2,6S,110V	1
E0208004	T3	Timer Relay	ASTP-N,6S,110V	1
E0403003	NFB	Circuit Breaker	3P,30A,220V or 3P,20A,440V	1
E0208004	T4	Timer Relay	ASTP-N,6S,110V	1
5242361	SOL1,SOL2	Solenoid Valve	DSG-3C2-02, 110V	1
5242361	SOL3,SOL4	Solenoid Valve	DSG-3C2-02, 110V	1
E1801029	TR	Transformer	250VA(1:0,220,380,415,440V)	1
E3101019	Fu	Fuse Seat	10*38	1
E3101025	Fu	Fuse	10*38, 6A	1
5511707	OL1	Overload Relay (for 380-460V)	RHN-10/8.5-12.5	1
E0207037	OL1	Overload Relay (for 200-230V)	RHN80/17-25AP	1
E0207017	OL2	Overload Relay (for 200-230V)	RHN10/5.5-8.5	1
E0207016	OL2	Overload Relay (for 380-460V)	RHN-10/3.5-5	1
E0207016	OL3	Overload Relay (for 200-230V)	RHN-10/3.5-5	1
E0207018	OL3	Overload Relay (for 380-460V)	RHN-10/1.8-2.7	1
E1604001	SS1	Selector Switch	SN1021	1
E1303001	SS2	Coolant Switch	ST-302	1
5238181	SS3	Cross Switch	5-Joint, Up 2a1b, Down 2a1b	1
E1701002	WL	Work Lamp	FS 51441	1
E1203002	PB1	Emergency Push Button	SBT-307	1
E1618001	PB1	Emergency Push Button	YK30Φ 1B	1
E1203003	PB2	Push Button (Green)	YK30Φ, 110V	1
E0901013	LS1	Limit Switch	WLD	1
E0901010	LS2	Limit Switch	WLD2	1
E0901010	LS3	Limit Switch	WLD2	1
E0901008	LS4	Limit Switch	TZ-8104	1
E0901008	LS5	Limit Switch	TZ-8104	1
E0901010	LS6	Micro Switch	WLD2	1
E1202004	PB3	Push Button	YK22Φ, 2A(Red)	1
E1202005	PB4	Push Button	YK22Φ, 2A(Green)	1
E3602004	Ⓐ	Ammeter	SO65, 50A	1
E0303002		Terminal Block	20P, 20A	1
E0303004		Terminal Block	TS015, 28P	1
E0303001		Terminal Block	12P*20A	1
E0303003		Terminal Block	3P*30A	1
*		Hydraulic Clamping Motor	1HP, 3PH, 4P	1
*		Elevating Motor	2HP, 3PH, 4P	1
*		Main (Spindle) Motor	7.5HP,3PH,4P	1
*		Coolant Pump	1/8HP, 2P, 3PH, L:130mm	1

\* see relevant breakdowns for stock numbers

# 15.0 Hydraulic system of J-1600R

P1: The pressure set to 38 bar.



- 1 – Tank
- 2 – Hydraulic Pump
- 3 – Release Valve (40 bar)
- 4 – Pressure Gauge, 2-1/2" x 70 bar
- 5 – Solenoid Valve
- 6 – Solenoid Valve

This page intentionally left blank



427 New Sanford Road  
LaVergne, Tennessee 37086  
Phone: 800-274-6848  
[www.jettools.com](http://www.jettools.com)