

Single Spindle Automatic Dovetailer

Owner's Manual



Warranty

Oliver makes every effort possible to assure that its equipment meets the highest possible standards of quality and durability. All products sold by Oliver are warranted to the original customer to be free from defects for a period of 2 (two) years on all parts, excluding electronics and motors, which are warranted for 1 year. Oliver's obligation under this warranty shall be exclusively limited to repairing or replacing (at Oliver's option) products which are determined by Oliver to be defective upon delivery F.O.B. (return freight paid by customer) to Oliver, and on inspection by Oliver. This warranty does not apply to defects due, directly or indirectly, to misuse, abuse, negligence, accidents, unauthorized repairs, alterations, lack of maintenance, acts of nature, or items that would normally be consumed or require replacement due to normal wear. In no event shall Oliver be liable for death, personal or property injury, or damages arising from the use of its products.

Warning

Read this manual thoroughly before operating the machine. Oliver Machinery disclaims any liability for machines that have been altered or abused. Oliver Machinery 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.

For More Information

Oliver Machinery is always adding new Industrial Woodworking products to the line. For complete, up-to-date product information, check with your local Oliver Machinery distributor, or visit www.olivermachinery.net

1.1. SAFETY REGULATIONS

1.1.1. GENERAL SAFETY RULES

WARNING and understand completely all instructions, rules, etc. contained in this manual. Failure to comply can result in accidents involving fire, electric shock, or serious personal injury. Keep owners manual and review frequently for continuous safe operation.

1. KNOW YOUR MACHINE.

For your own safety, read the owner's manual carefully. Learn its application and limitations as well as specific potential hazards pertinent to this machine.

2. KEEP GUARDS IN PLACE AND IN WORKING ORDER.

3. REMOVE ADJUSTING KEYS AND WRENCHES.

For habit of checking to see that keys and adjusting wrenches are remove from the machine before turning it on.

4. KEEP WORK AREA CLEAN.

Cluttered areas and benches invite accidents.

5. DO NOT USE IN DANGEROUS ENVIRONMENTS.

Do not use power tools in damp or we locations, or expose them to rain. Keeps work area well illuminated.

6. KEEP CHILDREN AWAY.

All visitors should be kept at a safe distance from work area.

7. MAKE WORKSHOP CHILDPROOF.

With padlocks, master switches, or by removing starter keys.

8. DO NOT FORCE THE MACHINE.

It will do the job better and be safer at the rate for which it was designed.

9. USE THE RIGHT TOOLS.

Do not force the machine or attachments to do a job for which they were not designed.

10. WEAR PROPER APPAREL.

Avoid loose clothing, gloves, neckties, rings, bracelets, or jewelry, which could be caught in moving parts. Nonslip footwear is recommended. Wear protective hair covering to contain long hair.

11. SECURE WORK.

Use clamps or a vice to hold work when practical. It is safer than using your hand and frees both hands to operate the machine.

12. DO NOT OVERREACH.

Keep proper footing and balance at all times.

13. MAINTAIN MACHINE IN TOP CONDITION.

Keep machine clean for best and safest performance. Follow instructions for lubricating and changing accessories.

14. DISCONNECT MACHINE FROM POWER SOURCE.

Before servicing and when changing accessories, or when mounting and remounting motor.

15. USE RECOMMENDED ACCESSORIES.

Consult the owner's manual for recommended accessories.

16. NEVER LEAVE MACHINE RUNNING UNATTENDED. TURN POWER OFF.

- 17. Protective guards and shields must be in place at all times unless that specific part requires servicing.
- Never clean or remove chips while the machine is running.
- 19. Do not remove or alter warning labels and replace any that become obscured.

1.1.2. ADDITIONAL SAFETY RULES FOR AUTOMATIC MILLING MACHINE

- Proper operation of this machine requires the specific knowledge of the following instructions and of the risks consequent to improper utilization.
- Therefore only qualified and authorized personnel must operate the machine. The operator will be trained on the proper use of the equipment, its protection devices and accessory tools.
- Safe operation of the machine is guaranteed only for the functions and materials
 indicated in these user's instructions. We decline any responsibility if the machine is
 used for purposes outside those indicated in the user's instructions or not complying
 with them.

- 4. We declines any responsibility related to equipment safety, reliability and performance if warnings and instructions contained in this manual are not observed, with specific reference to: Equipment utilization, routine and emergency maintenance, repair.
- 5. The manufacturer declines any responsibility if the machine is not properly connected to the equipotent ground line or if the appropriate circuit breakers are not installed and coordinated between electrical power lines and the machine, according to the above Regulations.
- All protection devices are provided and mounted on the machine appropriately. We
 recommend complying with the periodical routine and extraordinary maintenance
 scheduled for the protection devices and the entire machine.
- 7. The operator must wear appropriate working clothes from a safety and operational point of view. Bracelets, necklaces and other apparel that can get caught in the machine will not be allowed.
- 8. It is important to think about potential risks and consequences before approaching hands to the most dangerous zones such as: Piece locking pistons, Mill cutter, Cams slide, Electrical control panel.
- 9. Keep the machine power off when not in use.
- The machine does not include its own illumination. User must provide appropriate lighting of working area.
- 11. The machine may not be operated in environments polluted by gas and flammable compounds.
- 12. All operations of adjustment and tuning will be performed with machine power off.

3.1. SAFETY RULES FOR MACHINE LIFTING

- 1. Pay special attention to the balance of the machine while lifting.
- 2. Use a forklift or a hydraulic hand pallet truck with sufficient loading capacity to lift the machine.
- 3. Have another person help guide the way when lifting the machine.
- 4. The forks of forklift must protrude from under the machine.
- 5. The forklift must only be driven by an experienced forklift driver.

3.2. SELECTION OF LOCATION

Requirement of operating environment the operating temperature for this machine should be between $+5^{\circ}$ C and $+40^{\circ}$ C, while the relative humidity should not exceed 50% at a maximum temperature of $+40^{\circ}$ C.

3.3. LIFTING THE MACHINE

- 1. A forklift or a hydraulic hand pallet truck can lift the machine.
- 2. Their forks should insert through the machine bottom.
- 3. Attention should be paid to the balance of the machine while lifting.
- 4. The weight of the machine is listed below.

Model	Machine weight	Forklift or hydraulic hand pallet truck capacity
JD-75	500 Kg	1 ton

3.4. POWER SUPPLY REQUIREMENT

Insufficient voltage from factory power source may affect the power output of the motor.

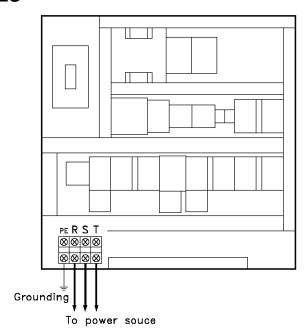
It is important to connect this machine to the correct voltage in the factory power source. Use only an independent power source.

Table for power supplies requirement:

Kw	Voltage	Current	Breaker capacity	Wire size
2.3 Kw	220 V, 60 Hz	9.5 A	15A	3.5mm ²
2.3 Kw	400 V, 50 Hz	5.2 A	15A	3.5mm ²
2.3 Kw	575 V, 60 Hz	9.5 A	15A	3.5mm ²

3.6. CONNECT POWER SOURCE WIRES

- Before connecting the power wires make sure the voltage between the machine and your factory power source is the same.
- 2. Take out the electrical cover (A) at the machine base outside.
- 3. Connect the power wires to the R.S.T.
- 4. The machine must be properly grounded to prevent possible injury from electrical shock.
- 5. Qualified electrical personnel should perform all electrical connections.



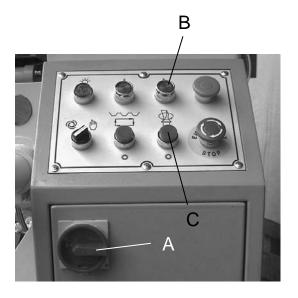


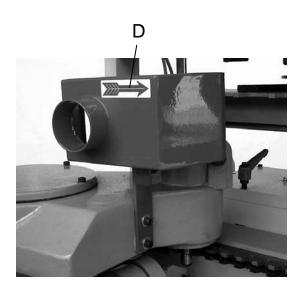
WARNING

Grounding should be based on the local regulations.

3.7. CHECK POWER WIRES CONNECTION

- 1 After the power wires have been connected it is necessary to check if the power wires are connected to the correct connection points.
- 2 Turn on the power switch (A) on the control cabinet.
- 3 Verify proper rotation of mill cutter by starting (B) and stopping (C) the machine immediately afterwards; then the mill cutter should be rotate according to the indicate direction (D). If not, swap two phases of the electrical connection.



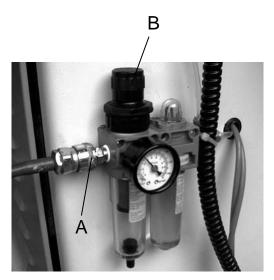


3.8. COMPRESSED-AIR CONNECTION

Some of the individual units function electro pneumatically. Therefore, compressed air must be connected on the machine. The "F.R.L" unit is installed at the machine front. Connect the adapters (A) to the compress air source.

The nominal pipe diameter is 10 mm.

Operation pressure is at 6 bar, pulling and turning knobs (B) to adjust the air pressure.

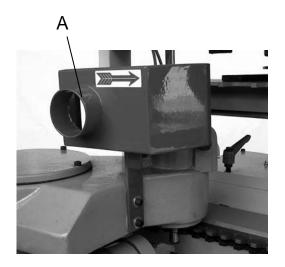


3.9. CONNECT DUST COLLECTION SYSTEM

- 1. There is a dust hood provided on the mill cutter unit for sucking dust from the machine.
- 2. Fit the flexible hose to the dust hood (A) and connect it to the dust collector.
- 3. The outlet diameter for dust hood is 60mm.



Do not perform milling operations until the dust collection system is started.



4.1. CONTROLS

4.1.1. SWITCHES FUNCTION ON ELECTRICAL CONTROL PANEL



SWITCH	NAME	FUNCTION
1		When turns the switch to the ON
0		position the machine is connected
	DOWED COURCE	to the power and is ready to
	POWER SOURCE SWITCH	operate.
		When the machine is not in use.
		Turn the switch to the OFF position.
QS1		
2		
\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		
		When the power source switch is
		turned on, this lamp will light up,
	POWER LAMP	indicating that the machine is under
(((power.
HL1		

SWITCH	NAME	FUNCTION
3	OPERATE MODE SELECTION SWITCH	Set the switch left for mill head travel automatic cycle and the switch rights for mill head travel single cycle.
4 SA2	MOTION MOTOR START SWITCH	Press this switch for starting the motion motor. The switch light comes on.
5 O	MOTION MOTOR STOP SWITCH	Press this switch to stop the motion motor.
	MILLING SPINDLE START SWITCH	Press this switch for starting the milling spindle. The switch light comes on.

SWITCH	NAME	FUNCTION
7 O SA4	MILLING SPINDLE STOP SWITCH	Press this switch to stop the milling spindle.
ω () () () () () () () () () (MILL HEAD TRAVEL MANUAL START SWITCH	When the operate mode selection switch are set to right position. The switch must be pressed for start automatic return travel.
9 RGF	EMERGENCY STOP	In the event of any abnormality occurring during operation, the machine should be stopped immediately.

4.1.2. OPERATION STOP

Depressing the red stop button performs it.

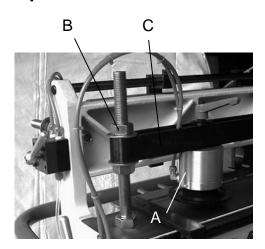
4.1.3. EMERGENCY STOP

At any time depressing the mushroom shaped emergency push button can disconnect power. Power is restored pulling out the cap.

4.2. MACHINE ADJUSTMENT

4.2.1. Adjustment for the thickness of workpiece

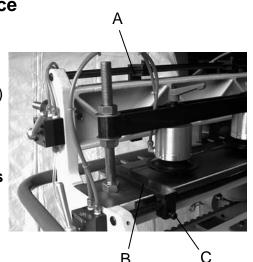
Adjust the height of locking actuators assembly (A) by rotating adjustment nuts (B), which allows raising or lowering such assembly (C).



4.2.2. Adjustment of position of workpiece

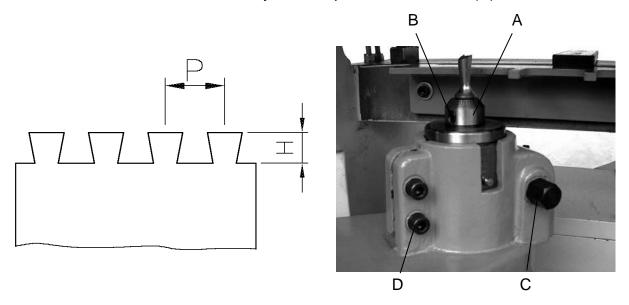
Determine the position of workpiece for indent cutting, position horizontal and vertical fixtures (A, B) and fix them by tightening the screws (C).

Bear in mind that to match the top of drawer front and side panel edges, such two workpieces must be different in height of half a pitch (e.g. pitch = 25 mm, difference = 12.5 mm.).



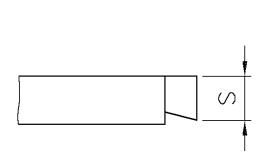
4.2.3. Adjustment of indent height "H"

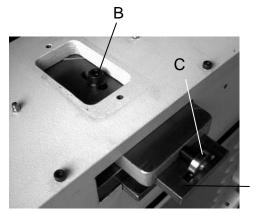
Choose on spindle shaft (A) the desired height. The lowest value of 6 mm. is obtained by positioning the mill cutter on the first notch to the left of the scale, identified with minus (-) sign, and lock the setscrew (B). Each notch of the scale will increase the indent height of 1 mm. (Every time the mill cutter is shifted of one indexing clockwise (+) sign, the spindle assembly must be raised of 1 mm. acting on the adjustment shaft (C) to maintain the same indent accuracy. Lock in position with screw (D).



4.2.4. Adjustment of male indent thickness "S"

Position the support of mobile chaser (A) to the limit stop backwards by operating the start cycle push button. Remove cover, unlock screw (B), and adjust regulator (C) with special tool and then lock.

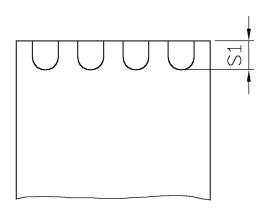


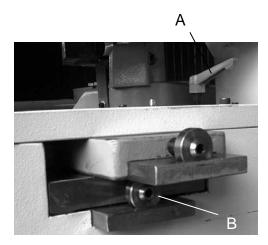


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4.2.5. Adjustment of female indent depth "S1"

Position the support of mobile chaser to beginning of travel forward, loosen handwheel (A) operate the register (B) to desired depth and lock handwheel.





4.2.6. Adjustment of automatic return travel of mill head:

Return travel limit can be positioned at any point to speed up process when working small parts.

Move mill head to position A.

Wait for the copying shaft to settle in the chaser, stop automatic feed, and unlock the limit stroke beat (C) and shift it in contact with travel limit stop (D).



Mill head must not be in position B to avoid breaking of cutter at the time of pneumatic return operation.



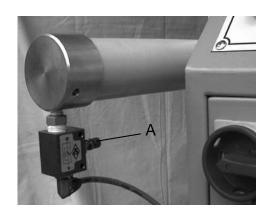
Position A



Position B

4.2.7. Adjustment of return speed of mill head assembly:

Adjust flow regulator (A) to reach the desired speed.

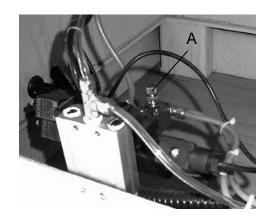


4.2.8. Adjustment of return speed of copying shaft

Adjust flow regulator (A) to reach the desired speed.

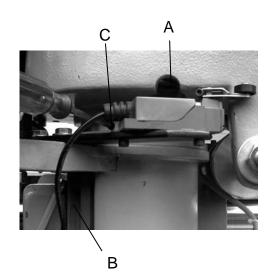


The return speed of copying shaft into the chaser must be kept adequately slow.



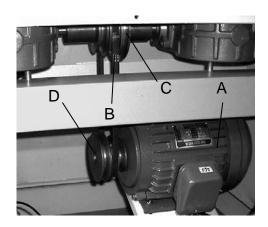
4.2.9. Adjustment of spindle belt

Loosen screw (A). Memorize the position of motor (B), rotate knob (C) to obtain proper belt tension. Reposition motor in original position and lock screw (A).



4.2.10. Adjustment of mill head assembly speed

Change gear ratio of motor (A) shifting the belt (B) on pulleys (C, D).



4.3. WORKING CYCLE

Locking workpiece takes place with a 4 mm travel of the piston. Such small gap prevents operator's fingers to get caught between pusher and workpiece inadvertently.



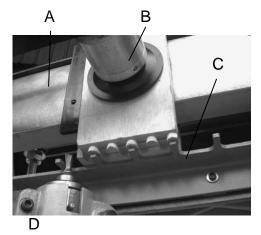
WARNING

Machine operator must pay maximum attention in the workpiece locking area because clamping takes place at a working pressure of 0.6 mpascal.

It is possible to operate in a semiautomatic mode, working male and female parts individually.

4.3.1. Simultaneous work of male-female elements

- Workpieces to be cut with male indents between vertical bed (A) and pushers (B) striking them on fixed chaser (C). Lock pushers by means of manual valves (D).
- Insert workpieces to be cut with female indents between horizontal and pushers until they strike on workpieces previously locked on the vertical bed. Lock pushers by means of manual valves.
- 3. Push start button to start mill cutters.
- 4. Push the start motion cycle button. The machine performs the work cycle.





Female indents are cut on drawer front panels. Such panels will be worked on one side first, then rotated of 180 degrees and worked on the other side, repeating the work cycle described above.

This machine is designed and manufactured for easy operation and maintenance. Design technical solutions, materials used, protective coatings, were planned to reduce maintenance requirements.

Nevertheless we recommend performing a set of tasks with the aim to grant machine safety, reliability and efficiency in the long run.

5.1. ROUTINE MAINTENANCE

The machine must be performed daily at the end of utilization.

- Clean machine bed with compressed air.
- Verify status of electric power cord, which should not show cuts or abrasion.
- Check mill cutters wear.
- Verify debris level in pneumatic system filter collection tank.

5.2. PERIODIC MAINTENANCE

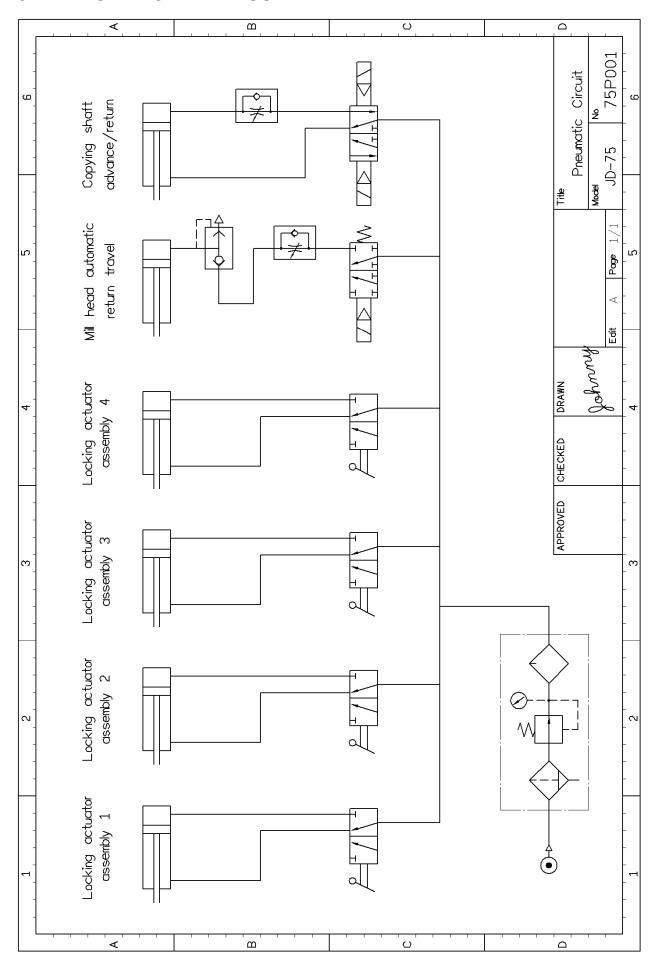
To be carried out weekly.

- Verify safety of electrical installation: electrical insulation, working conditions of differential safety circuit breaker, continuity of protection cable.
- Check proper locking of all mechanical elements of machinery.
- Periodically lubricate and oil all joints subject to seizure, particularly the cams plates and the sliding bar of the mill cutter unit.
- Lubricate bearings on mill spindle.

5.3. LIST OF RECOMMENDED LUBRICANTS

Reduction gear	MOBIL GEAR 632
Cams	MOBIL VACTRA No. 2 Oil
Spindle bearings	KLUBER ISOFLEX LDS 18 SPECIAL A Grease
Ball bushings	MOBIL Mobilux No. 2 Oil
F.R.L	MOBIL D.T.E Oil Medium

5.4. PNEUMATIC DRAWINGS



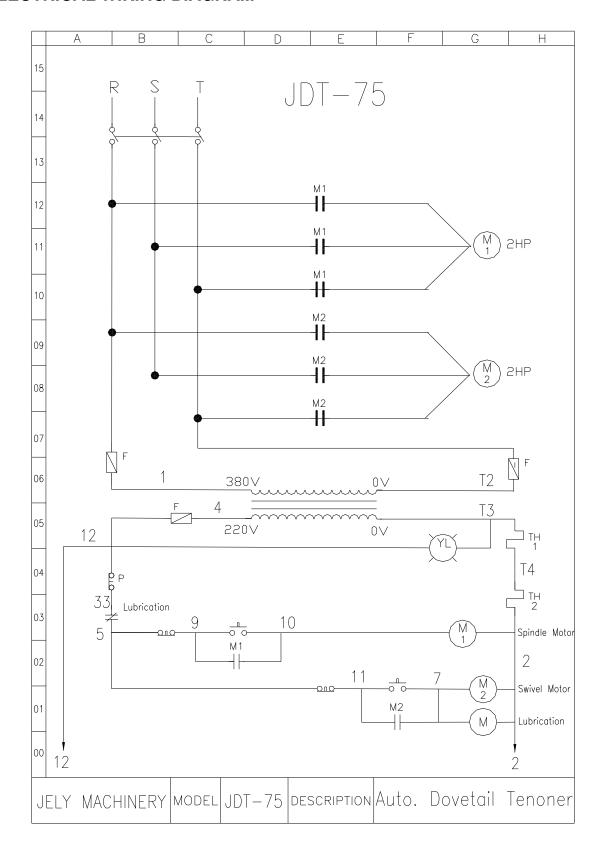
6. ELECTRIC 6-1

6.1. SAFETY RULES FOR ELECTRICAL CONTROL SYSTEM

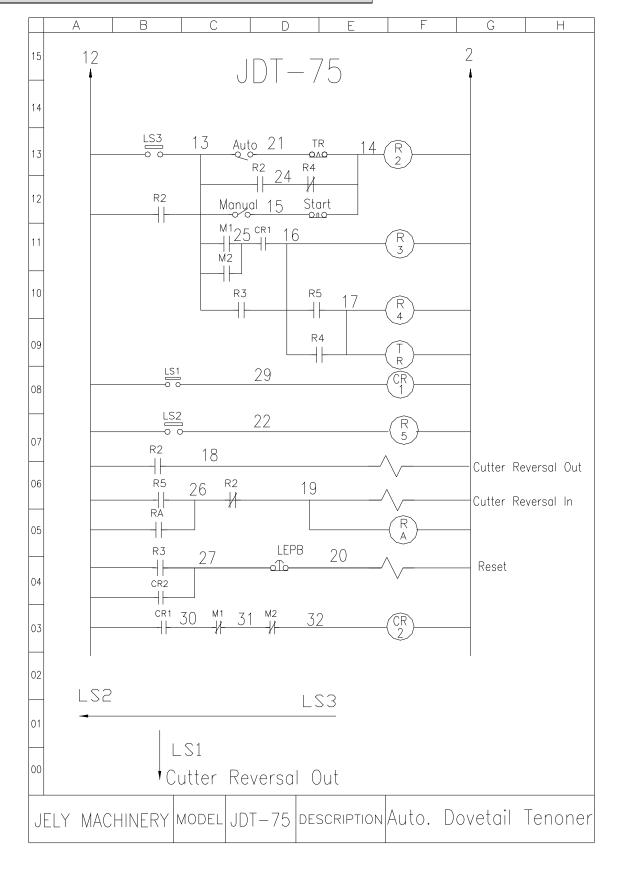
1. Only personnel who are properly trained and have adequate knowledge and skill should undertake all electrical/electronic troubleshooting and repair.

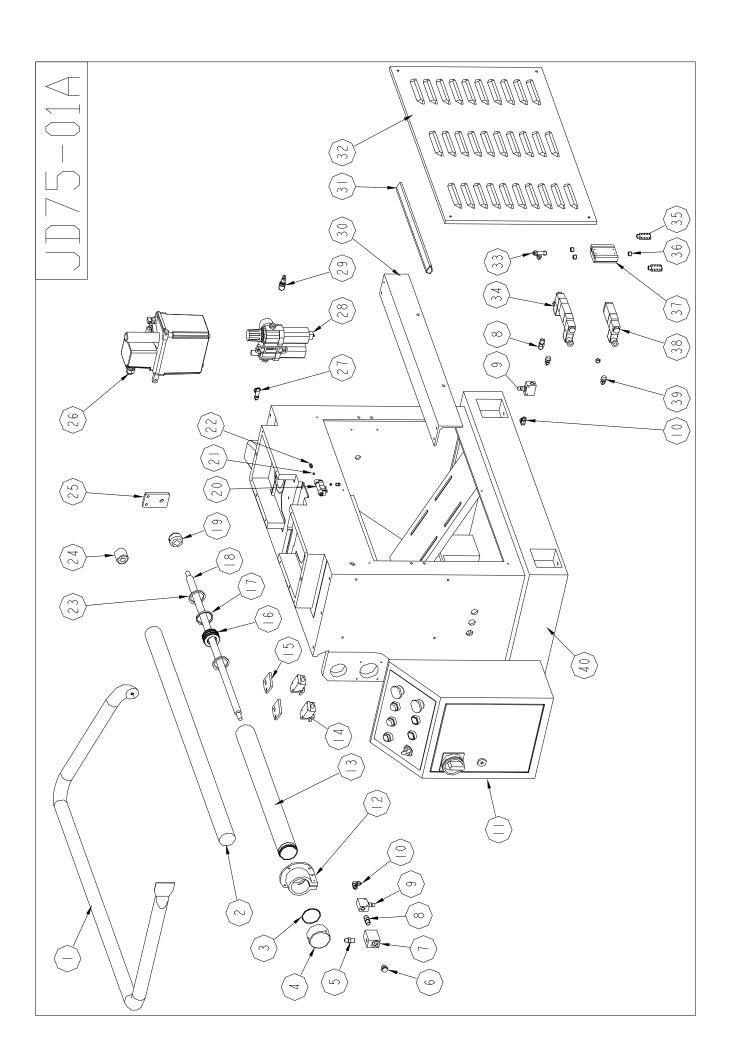
- 2. Do not alter or bypass protective interlocks.
- 3. Before starting, read and observe all warning labels.
- 4. When troubleshooting makes sure the power source has been disconnected.
- 5. Take extra precautions in damp areas to protect you from accidental grounding.
- 6. Before applying power to any equipment it must be established, without a doubt, that all persons are clear.
- 7. Do not open the electrical control panel unless it is necessary to check the electrical equipment.
- 8. Do not alter the electrical circuits unless authorized to do so by the manufacturer.
- 9. When replacing electrical components, make sure they conform to the manufacturer's specifications, including proper color coding.
- 10. Do not wear metal frame glasses, metallic necklaces or chains while working on any electrical equipment. Also do not wear any ring, watch or bracelet while operating electrical equipment.

ELECTRICAL WIRING DIAGRAM



6-2

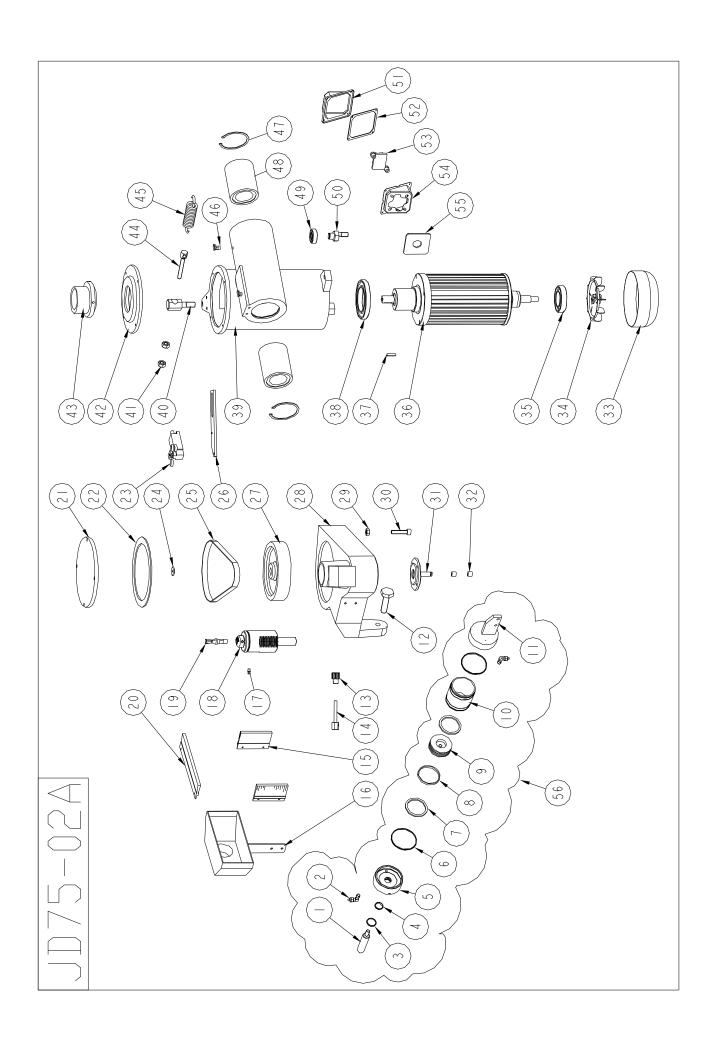




JD75-01A

NO	Code number	Description	Q'TY
1	D75-1170	Handle bar	1
2	D75-1020	Guide round bar	1
3	JTCG55	O-ring	1
4	D75-1040	Cylinder head cover	1
5	JNEE02P01P	Connector 1/4*1/8	1
6	JNCM03	Silencer 3/8	1
7	JVGK02	Air valve 1/4	1
8	JNEE02P02P	Nipple tube 1/4*1/4	2
9	JVKA02	Adjustable pressure valve 1/4	2
10	JNL02P006H	Tube fittings(L TYPE) 1/4 x φ6	2
11		Electric control box	1
12	D75-1100	Clamping seat	1
13	D75-1030	Cylinder tube	1
14	AZ8104	Limit switch	2
15	D75-1110-2	Limit switch fixing plate	2
16	D75-1070	Piston	1
17	JMRR50466	Wearing	1
18	D75-1050	Piston rod	1
19	D75-1060	Stop collar	2

20	JDB-5	Fuel injection connector	1
21	JNCPB004	Cap 4 mm	5
22	JCESMB5-09	Connecting Tube	5
23	JTER50*40*4	Piston packing	2
24	D75-1120	Buffer	1
25	D75-1080	Connecting plate	1
26	JCESMB5-01	Central lubricating oil-feeding equipment 5 mins	1
27	JNT03P006H006H-1	Tube fittings(T TYPE) 3/8" x φ6	1
28	JKL03BC	Air filter(OIL TYPE) MACP300-10A	1
29	CM-1/4-SI	Quick fittings 1/4 inch	1
30	D75-1130	Angle iron	1
31	R005	Plastic holder 9mm	1
32	D75-1090	Cover	1
33	JNT02P006H006H-1	Tube fittings (T TYPE) 1/4" x φ6	1
34	JMVSCO2E2	Solenoid valve-MVSC-220-4E2	1
35	JNMM02	Silencer 1/4"	2
36	SCD1/4	Plug 1/4" x 10	4
37	JFA02-2	Wind direction plate 1/4 * 2	1
38	JMVSCO2E1	Solenoid valve-MVSC-220-4E1	1
39	JNS01P006H	Copper connector 1/8	2
40	D75-1010	Machine frame	1



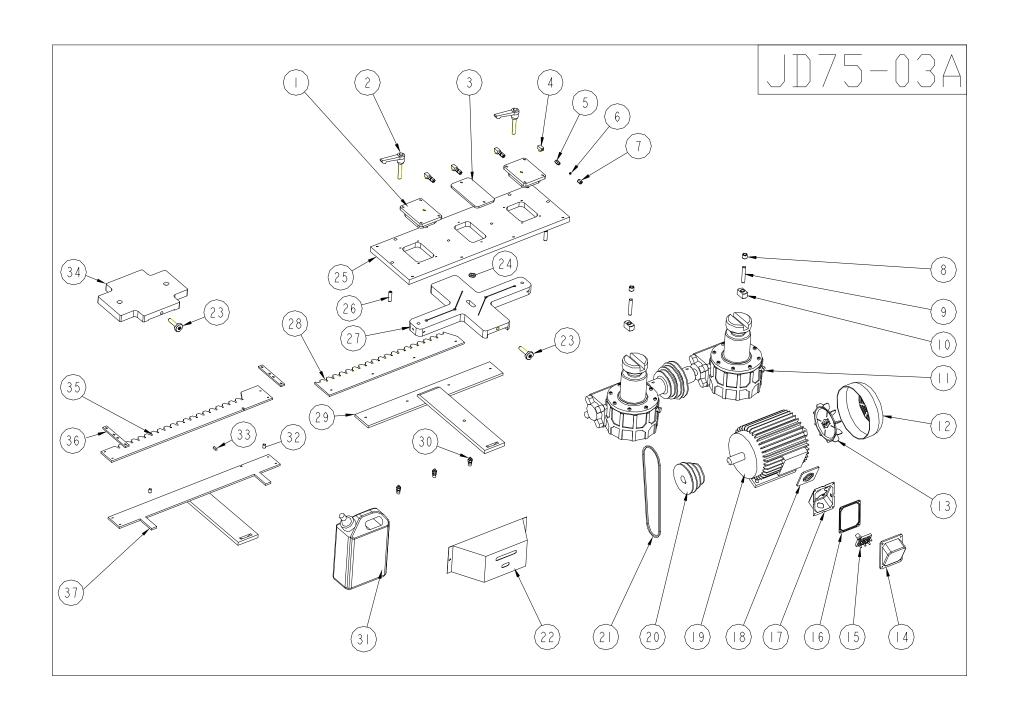
JD75-02A

NO	Code number	Description	Q'TY
1	D75-2210	Piston Rod	1
2	JNL01P006H	Copper Connector 1/8	2
3	JTCDH20	O-ring DH20	1
4	JTCP20	O-ring P20	1
5	D75-2220	Piston Front Cover	1
6	JTCG70	O-ring G70	2
7	JTER63*53*4	Double Ring 63*53*4	2
8	JMRR63596	Packing, 63*59*6	1
9	D75-2200	Pressure feeding piston ring	1
10	D75-2180	Cylinder Tube	1
11	JD75-2190	Piston Back Cover	1
12	D75-2330	Hex. Bolt M16	1
13	D75-2140	Gear	1
14	D75-2150	Gear Shaft	1
15	D65-0313	Brush for Dust Hood, L90	2
16	JD75-2300	Dust Hood	1
17	JCFM-01	Oil Tip	1
18	JD75-02A012	Main Spindle for 2 flute cutter	1
19	JDT75T12*15.5*2T	2 flute cutter	1

20	D65-0315	Brush for Dust Hood, L215	1
21	JD75-2230	Belt guard cover	1
22	JCQ040300	Packing	1
23	AZ8104	Limit switch	1
24	D75-2310-01	Packing for pulley	1
25	JLBFL30675	Flat Belt (Old # JLBFL30692)	1
26	D75-2280	Fixing Plate for Limit switch	1
27	JD75-2090	Motor Pulley	1
28	D75-2080	Belt guard housing	1
29	SA10X8	Hex. Nut	1
30	SC10x45	Socket Head Cap Screw	1
31	D75-2160	Copier Shaft	1
32	IRT-121616.5	Bearing	2
33	JC3EV020206HN-2	Motor Front Cover	1
34	JB3EE020406HN-3	Motor Fan	1
35	6009ZZ	Bearing 6009ZZ	1
36	JC3EV020206HN	Spindle Motor	1
37	JB3EE020406HN-8	Key	1
38	16014	Ball Bearing	1
39	JD75-2060	Motor Seat	1
40	D75-2250	Support Bolt	1

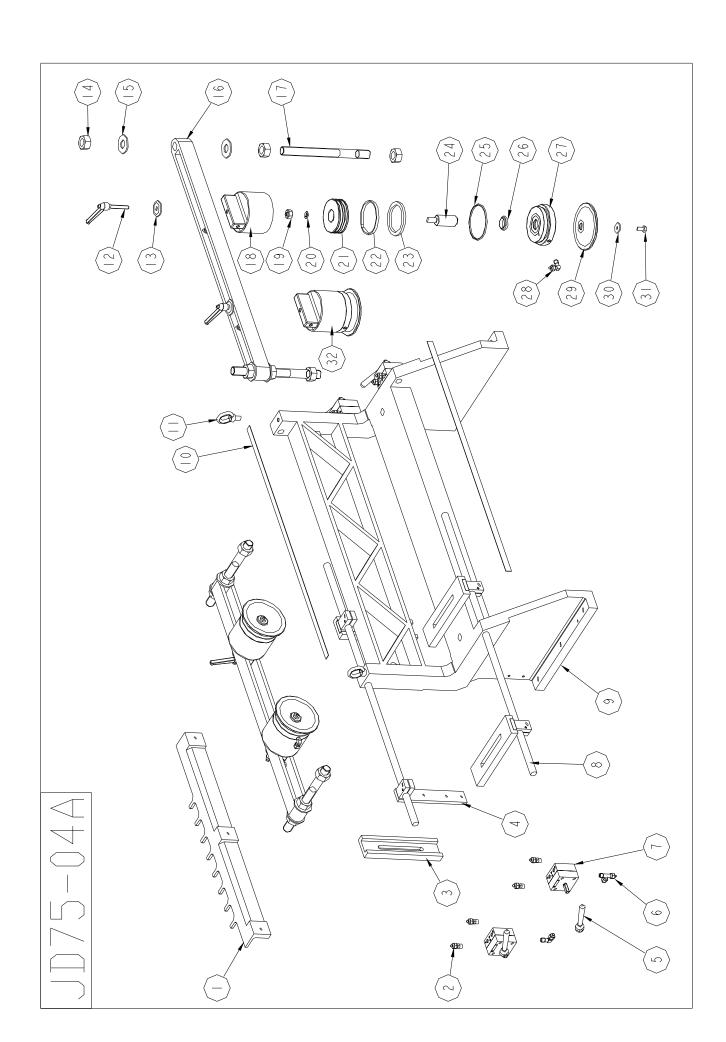
41	SA12X10	Hex. Nut M12	2
42	D75-2050	Motor Guard Cover	1
43	D75-2070	Belt Tension Tub	1
44	D75-2260	Spring Tension adjustment screw	1
45	D75-2270	Spring	1
46	JOC-108	Oil Tip	2
47	SR80	Retaining Ring	2
48	JBNBSM50GUU	Linear Bushing	2
49	JBNSK6203VVCM	Ball Bearing	1
50	D75-2170	Eccentric Shaft	1
51	JB3EV020206HN-4	Wiring upper cover	1
52	JB3EV020206HN-6	Rubber packing	1
53	JB3EV020206HN-7	Wiring board	1
54	JB3EV020206HN-5	Wiring bottom cover	1
55	JB3EV020206HN-9	Rubber packing	1
56	JD75-02A02	Cutter reversal cylinder	1

		JD75-03A	
NO	Code number	Description	Q'TY
1	JD75-3230-2311	Cam 25mm	2
2	PH095HB0M1260	Locking handle M12x60	2
3	JD75-3170	Cover	1
4	JCESMB5-05	Straight Connector	4
5	JCESMB5-07	Connector	4
6	JNCPB004	Cap 4mm	4
7	JCESMB5-08	Nut	4
8	JD75-3130	Driver shaft	2
9	JD75-3060	Shaft	2
10	JD75-3080	Slide block	2
	JWG7040VWA-L	Reducer box-L	1
	JWG7040VWA-R	Reducer box-R	1
	JD75-3140	V-belt pulley	1
	SCA5*10	Socket Set Screw M5x10	2
11	SHA8*50	Spring Pinφ8x50	2
	JD75-3130	Upper Idler Roller	2
	SCA8*10	Socket Set Screw M8x10	2
	SHA10*50	Spring Pinφ10x50	2
	JD75-3080	Slide block	2



12	JB3EE020406HN-2	Motor Cover	1
13	JB3EE020406HN-3	Motor Fan	1
14	JB3EE020406HN-4	Wiring upper cover	1
15	JB3EE020406HN-7	Wiring board	1
16	JB3EE020406HN-6	Packing	1
17	JB3EE020406HN-5	Wiring bottom cover	1
18	JB3EE020406HN-9	Rubber packing	1
19	JB3EE020406HN-1	Swivel Motor	1
20	JD75-3150	V-Belt Pulley	1
21	JLB35A30	V-Belt	3
22	JD75-319A	Guard	1
23	JD75-319B	Window	1
24	JD75-1200	Fence for upper rules	1
25	150-105202	Rules	1
26	JD75-3110	Adjustment Screw	2
27	JD75-3200	Thickness Washer	1
28	JD75-3120	Cams Plate	1
29	JD75-3180	Pin	2
30	JD75-3050	Cross Slider	1
31	JD75-3100	Male Chaser 25mm	1
32	JD75-3090	Male Chaser Slider	1
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33	JNS01P006H	Copper Connector PT-1/8"xφ6	3
34	JOD2	Oil Tank	1
35	JD75-3181	Pin	2
36	SWA5*5*15	Gear Reducer	1
37	JD75-1190	Pointer	2
38	JD75-3040	Cross Plate	1
39	150-105302	Rules	1
40	JD75-1180	Fence for bottom rules	1
41	JD75-3020	Female Chaser 25mm	1
42	JD75-3030	Fixing Plate	2
43	JD75-3010	Female Chaser Slider	1
44	JD75-3220	Skip Board(4* 2 inch),	1
45	JD75-3210	Skip Board(3* 2 inch),	1



JD75-04A

NO	Code number	Description	Q'TY
1	D75-4040	Chaser support	1
2	JNS01P006H	Copper Connector	8
3	D75-4140	Buffer pad	4
4	D75-4020	Fence	4
5	312-026A	Handle	4
6	JNT01P006H006H-1	Tube fittings (T TYPE) 1/8" x φ6	2
7	JHS5201	Control valve1/8"	4
8	D75-4030	Round rod	2
9	D75-4010	Worktable	1
10	D75-4190	Scale	2
11	SI10X1.5	Eye bolt M10	2
12	PH080KBOM1035	Adjustable hand lever	4
13	D75-2320	Packing washer	4
14	SA20	Hexagon nut	12
15	SD20X45X3	Flat washer	8
16	D65-1550	Holder bracket	2
17	D75-4100	Stud bolt	4
18	D75-4110	Cylinder body	4
19	SA12X10	Hexagon nut	4

20	SDI12	Spring washer	4
21	DRT-115-4480	Piston	4
22	JMRR80756	Wearing	4
23	JTER80*65*5.5	Piston packing	4
24	D75-4120	Piston rod	4
25	JTCG80	O-ring	4
26	JTCDH25	Rod packing	4
27	DRT-115-4500	Cylinder head cover	4
28	JNL01P006H	Tube fittings (L TYPE) 1/8" x φ6	10
29	D75-4130	Clamping disc	4
30	SD8X25X3	Flat washer	4
31	SB8X16	Socket head cap screw	4
32	JD75-04A01	Clamping cylinder	1