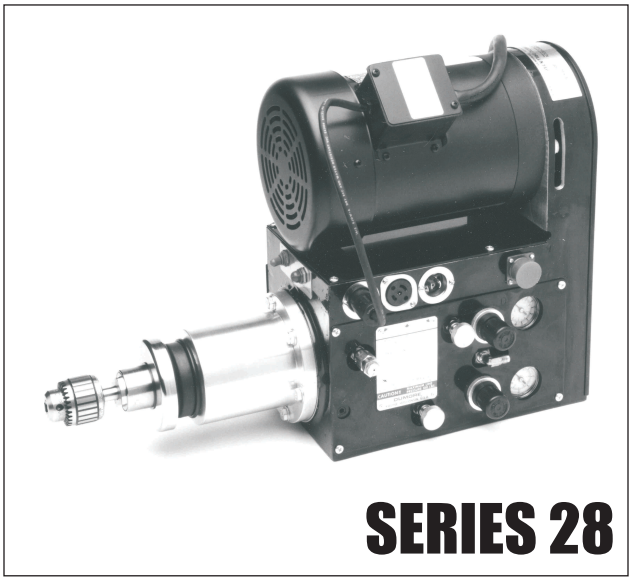
SERIES 28

OPERATING INSRUCTIONS

AUTOMATIC DRILL UNITS



DUMORE CORPORATION

Quality is our legacy

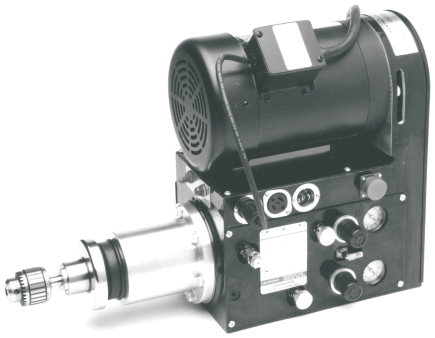
INTRODUCTION

The Dumore Series 28 is a self-contained unit, pre-wired, assembled at the factory, and ready for quick installation and operation. The unit offers a 3" stroke, a spindle speed ranging from 400 to 7,420 RPM and ample thrust and horsepower to drill up to a 3/8" diameter in mild steel. Mounting brackets are available for horizontal, vertical or angled orientation to the workpiece. A wide range of optional accessories are offered to meet the requirements of your applications.

The Series 28 has additional built-in circuitry to handle a wider range of applications. Its added features include:

- Built-in air pressure regulators
- Automatic/manual toggle switch
- Trip control switch
- All available pulleys included
- Plug-in adaption for deep-hole drilling panels
- Tapping capabilities (with purchase of control panel and reversing motor)

SERIES 28
AUTOMATIC DRILL UNITS



SPECIFICATIONS

Stroke:	0-3" fully adjustable within + .001. Will repeat within + .001.
Spindle Speeds:	400; 560; 765; 1,055; 1,430; 2,085; 2,825; 3,880; 5,300; and 7,420 RPM when using 24-151 or 24-152 motor. 265; 370; 505; 695; 945; 1,380; 1,870; 2,565; 3,500 and 4,900 RPM when using 28-152 motor. (Note: RPMs attainable by changing pully combinations. All Pulleys are included with Series 28.
Spindle Taper	#2 Jacobs. (Note: ½-threaded, 5/8-24 threaded, or straight shank available. Contact factory for price and delivery at time of ordering.)
Chuck Capacity:	From No. 60 drill to 3/8" capacity.
Drilling Capacity	3/8" in mild steel
Tapping Capacity	½"in mild steel
Thurst:	From 0 to 450 lbs. on 100 PSI line pressure. Minimum line pressure 25 PSI.
Rapid Approach Rate:	Up to 600" per minute
Return Rate:	Up to 600" per minute
Controlled Feed Rate:	Down to 2"/min. @ 450 lbs. thrust with optional hydraulic feed control.
Controls:	Most electric and pneumatic controls built in.
Bearings:	Precision sealed bearings.
Lubrication:	Automatic through filter-oiler.
Mounting:	Nose mounted at cylinder. Optional brackets available for horizontal, vertical, or angled orientation.
Shipping Weight:	Series 28 - Approximately 60 lbs.

EQUIPMENT FURNISHED WITH UNIT

SERIES 28	8 Pulleys and Timing Belt Filter-Oiler Unit No. 24-300 2 qts. Hydraulic Oil No. 50-231 36" Air Hose Assembly Geared Chuck and Key

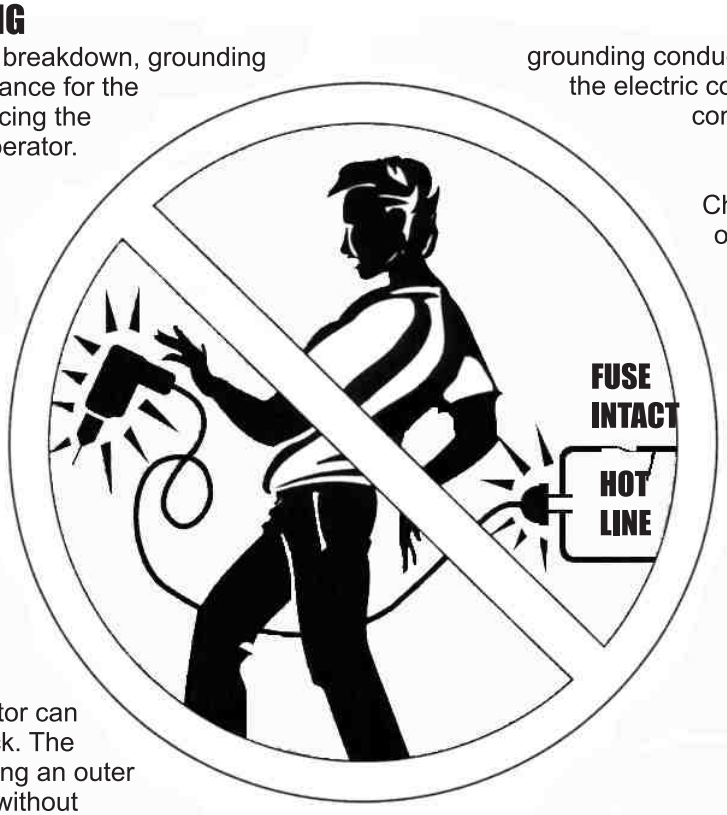
▲ SAFETY INSTRUCTIONS

THE NEED FOR GROUNDING

In the event of malfunction or breakdown, grounding provides a path of least resistance for the electric current to follow, reducing the risk of electric shock to the operator. This tool is equipped with an electrical cord having an equipment-grounding conductor and a grounding plug. The plug must be plugged into a matching outlet that is properly installed and grounded in accordance with all local codes and ordinances.

Do not modify the plug provided - if it will not fit the outlet, have the proper outlet installed by a qualified electrician.

Improper connection of the equipment-grounding conductor can result in a risk of electric shock. The conductor with insulation having an outer surface that is green, with or without



grounding conductor. If repair or replacement of the electric cord or plug is necessary, do not connect the equipment-grounding conductor to a live terminal.

Check with a qualified electrician or serviceman if you do not fully understand the grounding instructions, or if you are in doubt as to whether the tool is properly grounded.

▲ Repair or replace damaged or worn cord immediately.

Periodically check the ground circuit of the cord for continuity.

The use of ground-fault protected receptacles is recommended.

▲ THIS SYMBOL IS USED THROUGHOUT THE MANUAL TO HIGHLIGHT POTENTIAL DANGERS.

This system can be dangerous!
Don't act as a conductor - Make sure the tool is grounded through the cord.

▲ WARNING

The 24-151 motor is wired at the factory for the lower specified voltage. Internal connection changes are necessary for higher voltage operation.

24-151 115/230 VOLTS, SINGLE PHASE MOTOR

The 24-151 single phase motor is wired at the factory for **115 VOLTS** and is intended for use on a circuit that has an outlet that looks like the one illustrated in Sketch A. The motor has a grounding plug that looks like the plug illustrated in Sketch A. A temporary adapter, which looks like the adapter illustrated in Sketches B and C, may be used to connect this plug to a 2-pole receptacle as shown in Sketch B if a properly grounded outlet is not available.

The temporary adapter should be used only until a properly grounded outlet can be installed by a qualified electrician.

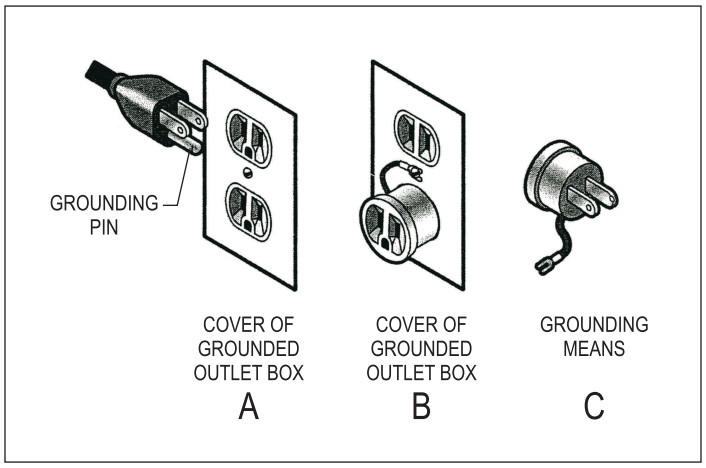
The green-colored rigid ear, lug, etc. extending from the adapter must be connected to a permanent ground such as a properly grounded outlet box.

A different type of grounding plug must be used on the 24-151 motor to enable its use with 230 volt circuits. This plug looks like the one shown in Sketch D. It is intended for use on a circuit that has an outlet that looks like the one shown in Sketch D. No grounding adapter is available or should be used with this plug. The green (or green and yellow) wire is the grounding wire. Make sure that this wire is connected to the grounding pin. Never connect the green (or green and yellow) wire to a live terminal.

Additional internal connection changes must also be performed to adapt the 24-151 to 230 volts. Any connection changes should be performed by a qualified electrician or service technician.

24-152 220/440 VOLTS, THREE PHASE MOTOR

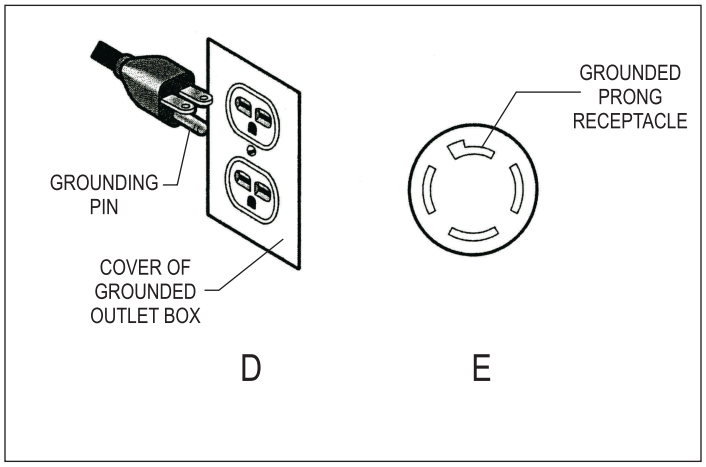
The 24-152 three phase motor is wired at the factory for **440 VOLTS**. It is supplied without a cord plug and should be connected to the power supply only by a qualified electrician or service technician.



28-152 220/440 VOLTS, THREE PHASE MOTOR

The 28-152 three-phase motor is wired at the factory for **220 VOLTS** and is intended for use on a circuit that has an outlet that looks like the one shown in Sketch E. It is equipped with an approved four-conductor cord and four-prong grounding type plug. The green (or green and yellow) wire is the grounding wire. Never connect the green (or green and yellow) wire to a live terminal.

Internal connection changes must be performed to adapt the 28-152 to 440 volts. Any connection changes should be performed by a qualified electrician or service technician.



▲ SAFETY INSTRUCTIONS

1. **KEEP GUARDS IN PLACE**
   and in working order.

2. **REMOVE ADJUSTING KEYS AND WRENCHES**
   Form habit of checking to see that keys and adjusting wrenches are removed from tool before turning it on.

3. **KEEP WORK AREA CLEAN**
   Cluttered areas and benches invite accidents.

4. **DON'T USE IN DANGEROUS ENVIRONMENT**
   Don't use power tools in damp or wet locations, or expose them to rain. Keep work area well lighted. Do not use tool in presence of flammable liquids or gases.

5. **KEEP CHILDREN AWAY**
   All visitors should be kept safe distance from work area. Do not let visitors contact tool or extension cord.

6. **MAKE WORKSHOP KID PROOF**
   with padlocks, master switches, or by removing starter keys

7. **DON'T FORCE TOOL**
   ` It will do the job better and safer at the rate for which it was designed.

8. **USE RIGHT TOOL**
   Don't force tool or attachment to do a job for which it was not designed.

9. **USE PROPER EXTENSION CORD.**
   Make sure your extension cord is in good condition. When using an extension cord, be sure to use one heavy enough to carry the current your product will draw. An undersized cord will cause a drop in line voltage resulting in loss of power and overheating. Use only 3-wire, 16 gauge extension cords with a maximum length of 50 feet and 3-prong ground type plugs. Use only 3-pole receptacles which accept the tool's plug.

10. **WEAR PROPER APPAREL**
    Do not wear loose clothing, gloves, neckties, rings, bracelets, or other jewelry which may get caught in moving parts. Non slip footwear is recommended. Wear protective hair covering to contain long hair.

11. **ALWAYS USE SAFETY GLASSES**
    (ANSI Z87.1 with side shields or an equivalent). Polycarbonate lenses have been found to provide better impact resistance than glass lenses

12. **SECURE WORK**
    Use clamps, a vise or fixture to hold work. It's safer than using your hand and it frees both hands to operate tool.

13. **DON'T OVER-REACH**
    Keep proper footing and balance at all times.

14. **MAINTAIN TOOLS WITH CARE**
    Keep tools sharp and clean for best and safest performance. Follow instructions for lubricating and changing accessories.

15. **DISCONNECT TOOLS**
    When not in use, before servicing and when changing accessories, such as grinding wheels, etc.

16. **REDUCE THE RISK OF UNINTENTIONAL STARTING**
    Make sure switch is in off position before plugging.

17. **USE RECOMMENDED ACCESSORIES**
    Consult this manual or any Authorized Dumore Distributor for recommended accessories. The use of improper accessories may cause risk of injury to persons.

18. **NEVER STAND ON TOOL.**
    Serious injury could occur if the tool is tipped or if the cutting tool is unintentionally contacted.

19. **CHECK DAMAGED PARTS**
    Before further use of the tool, a guard or other part that is damaged should be carefully checked to determine that it will operate properly and perform its intended function - check for alignment of moving parts, binding of moving parts, breakage of parts, mounting, and any other conditions that may affect its operation. A guard or other part that is damaged should be properly repaired or replaced.

20. **DIRECTION OF FEED**
    Feed work into a blade or cutter against the direction of rotation of the blade or cutter only.

21. **NEVER LEAVE TOOL RUNNING UNATTENDED, TURN POWER OFF**
    Don't leave tool until it comes a complete stop.

22. **READ AND SAVE INSTRUCTIONS!**

THEORY OF OPERATION

BASIC MOVEMENT

The two basic operating movements incorporated into the Dumore Series 28 unit are controlled rotation and traverse. Rotation is supplied by an induction type electric motor and transmitted to the cutting tool through a selective timing belt and pulley combination and a precision quill. Rate of rotation (RPM) is determined by the pulley combination selected. Eight (8) different size pulleys are included with Series 28.

When tapping with the Series 28, the reversing operation of the spindle is accompanied by electrically reversing the 28-152 motor using the 28-200 tapping control panel. Reversing is automatic when the spindle has reached the forward end of the stroke and is simultaneous with the retraction of the spindle. The motor is again reversed at the retracted end of the stroke, ready for the next cycle.

Traverse is the advance-and-retract movement of the rotating cutter and is caused by controlled air pressures. These air pressures are created at a shop air source (air compressor) and carried through an air line, filter, and oiler to the control panel of the automatic units. The Series 28 has built-in air regulators.

CONTROLS

Basic electrical and pneumatic controls have been built into the units to simplify automatic operation. The primary purpose of the controls is to determine these questions:

(1) “How much air...?”
(2) “How fast should the air move...?”
(3) “When should it act...?”

SERIES 28
PNEUMATIC SEQUENCE

Start Position (Fig. 7A) is illustrated with solenoid NOT energized. Compressed air (symbol ☐) enters at Air Intake X and flows to both Air Pressure Regulators D & B. Regulator D (HI) is adjusted according to job requirements. Regulator B (LO) is normally adjusted to approximately 15 to 20 PSI indicated air pressure. Controlled HI pressure air (symbol ■) passes through Feed Control valve A and STOPS at Electric Solenoid Valve (closed-NOT ENERGIZED). LO air (symbol ▒) passes through the system to hold piston in the retract or START position.

Forward Cycle (Fig. 7B) is illustrated with solenoid ENERGIZED. Solenoid Air Valve E is energized (open) by actuating switch to allow HI (■) air to act against HI side of piston-forcing piston forward. Excess LO air (▒) is displaced by forward piston travel and is released through poppet valve C.

Retract Cycle (Fig. 7C) is illustrated with solenoid NOT energized. After forward limit switch is actuated, at the end of predetermined length of stroke, circuit is broken and solenoid valve E is closed. HI air (■) is held at E. LO air (▒) returns piston to START position. The return of piston displaces HI air (■) through exhaust orifice in Solenoid Valve and through Feed Control Valve E.

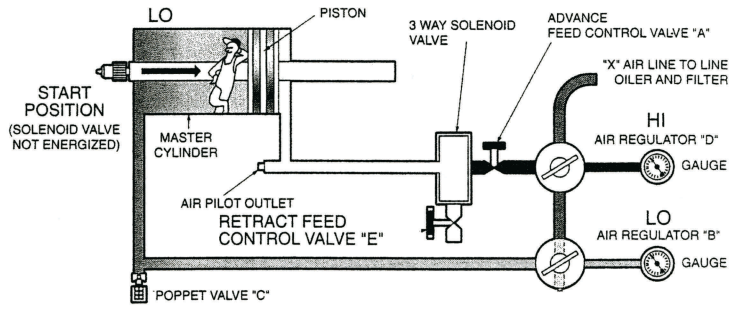


Figure 7A ▨ Air Line Pressure ■ Hi ▒ Lo

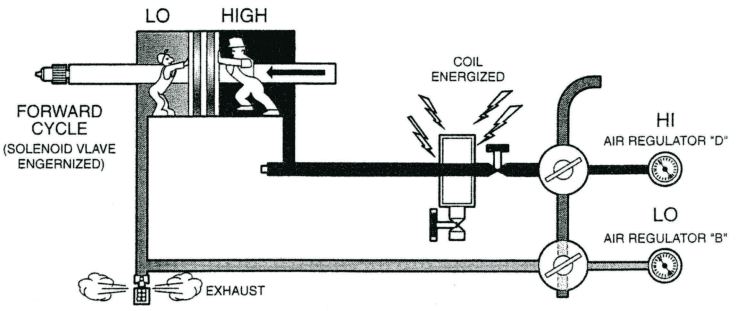


Figure 7B ▨ Air Line Pressure ■ Hi ▒ Lo

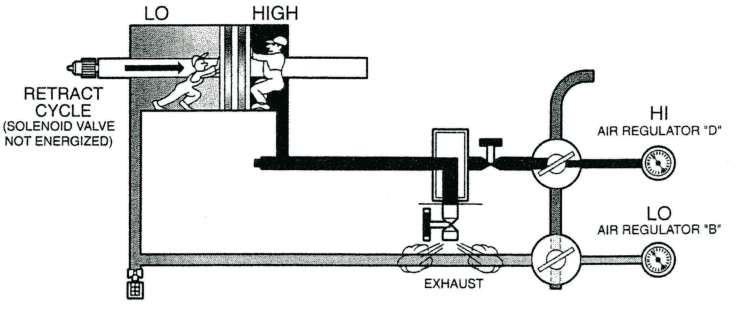


Figure 7C ▨ Air Line Pressure ■ Hi ▒ Lo

SET UP INSTRUCTIONS

WITHOUT HYDRAULIC CONTROL AND DEEP HOLE DRILLING ATTACHMENT

IMPORTANT
Clean air is vital to the efficient operation of any unit using pneumatic components. Periodic inspection of lines, controls and connectors will prevent internal damage from water, scale and other foreign materials. Do not plug this tool into the power source until it is completely set up and ready to cycle. Before actuating the unit, make sure that the work area is clear of

1. **MOUNTING**
   Dumore Automatic Units are designed FOR NOSE CYLINDER MOUNTING ONLY. Units can be mounted horizontally, vertically, or at any angle using one of the many available brackets. DO NOT MOUNT ON THE MACHINED BASE OF THE HOUSING. DO NOT OVERTIGHTEN BOLTS ON MOUNTING CLAMP.

2. Remove rectangular panel on Retract Safety Switch side of unit (right-hand side) and back off depth screw as required. The clearance between the end of the depth screw and the actuator blade is the amount of spindle travel. See Figure 12.

3. Check the clearance between the actuator blade and the head of the cap screw at the moment of switch actuation. This clearance or over-travel should be between .070" and .125". If not correct, loosen stop nut, reset cap screw, and retighten stop nut. The point of switch actuation is determined by the first audible click as the actuator blade is moved by hand toward the cap screw. See Figure 8.

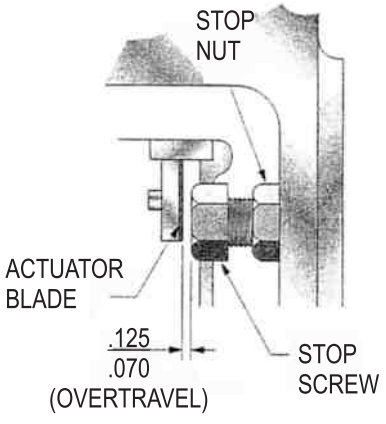


FIGURE 8 - Over-travel Adjustment

4. With the air turned off and no pressure shown on the gauges, the spindle can be extended by hand to check the alignment of the tool with the fixture and to determine the approximate depth setting.

5. **AIR CONNECTION**
   Series 28 - Connect the 24-300 filter-oiler and 3-foot air hose to the air intake fitting on the unit.

   Mount the filter-oilers in vertical position only. Dumore filter-oilers are designed for low-air volume operation and should be used to ensure proper lubrication and operation under all conditions. One oiler should be used for each Dumore Head.

6. Connect air supply from shop air source to intake side of air filter through a shut-off valve. If the air line pressure is above 100 PSI, an air regulator should be used to reduce the line pressure to 100 PSI or less.

7. With the air shut off at the line side of the filter, fill the oiler through the filter plug to the indicated level. With air "OFF" to the unit, this filter plug can be opened to bleed the air from the unit and permit hand actuated traverse of quill to check alignment of tool with fixture. Use Dumore oil (Catalog No. 50-231) or substitute Socony-Vacuum DTE light hydraulic oil. To regulate oil flow through the Oiler Unit, turn the socket screw adjustment as required. One drop of oil should be visible in the sight guage for each six inches of forward movement while the unit is traversing. Replace plug.

8. **PULLEY ASSEMBLY**
   Consult Figure 9 and attach pulleys as follows:

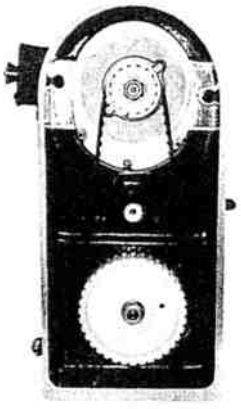


FIGURE 9 - Rear View Cover Removed

a. Remove the belt cover and insert 1/4" diameter into drive shaft spindle.
b. Loosen the motor mounting cap screws and swivel the motor to decrease the distance

between the spindle shafts of the motor and the quill assembly.

c. Slip the correct pulley on the motor shaft and lock with pulley nut.
d. Slip the correct pulley on spindle shaft and lock with pulley nut.
e. Place the timing belt around both pulleys.
f. Swivel the motor upwards to take up excess belt slack.
g. Hold the motor in position and lock the motor cap screw. With proper tension, the belt should flex approximately 1/4” in either direction, across center of span.
h. Secure the belt cover.

IMPORTANT - Failure to adequately tighten pulley nuts may result in stripped splines on motor shaft, drive spindle shaft and pulley bores.

SPINDLE / RPM	PULLEY TEETH OR NUMBER	
24-151, 24-152	MOTOR	SPINDLE
7,420	43	10
6,210	36	10
5,300	43	14
*4,435	36	14
3,880	36	16
*3,125	29	16
2,825	36	22
*2,275	29	22
2,085	29	24
*1,880	24	22
*1,580	22	24
1,430	24	29
*1,310	22	29
1,055	22	36
950	16	29
765	16	36
670	14	36
580	14	43
480	10	36
400	10	43

* Requires R429-0047 available on order.

+ Because of higher inertias, it is recommended that speeds be limited to 3,000 RPM for tapping operations.

9. Plug the short cord from the motor into Socket #1 of the unit. This connection provides 120 Volt current to the control circuit of the unit regardless of the voltage of the motor.

10. Select the correct air pressures for the size drill or tap and type of workpiece material.

RECOMMENDED DRILLING PRESSURES AND SPEEDS FOR MILD STEEL				
DRILL SIZE	SFM	RPM	SERIES 28 HI PRESSURE	SERIES LO PRESSURE
1/16”	110	6723	35	15
1/8”	110	3362	45	15
3/16”	110	2241	60	15
1/4”	110	1681	70	15
5/16”	110	1345	75	15
3/8”	110	1121	85	15

RECOMMENDED TAPPING PRESSURES AND SPEEDS FOR 1020 STEEL					
TAP SIZE	RPM	PULLEY		SERIES 28 HI PRESSURE	SERIES LO PRESSURE
		MOTOR	SPINDLE		
6-32	1870	36	22	12-15	5-8
1/4-20	945	24	29	18-22	8-12
1/2-13	370	14	43	20-25	10-14

ABOVE PRESSURES AND SPEEDS ARE SUGGESTED ONLY. LOCAL CONDITIONS MAY VARY ABOVE SETTINGS. SPECIALIZED TOOLING COULD ALLOW HIGHER RPMS AND FEED RATES

11. Turn the air supply on. Make sure that no interference is possible between the chuck (no tool) and the fixture and/or workpiece.

12. **Series 28** - Adjust HI Pressure and LO Pressure regulators to calculated settings.

Adjust the HI Pressure regulator to the desired value by unlocking the lock nut, turning knob clockwise for higher pressures, counter-clockwise for lower pressures. When lowering the pressure, it will be necessary to actuate the piston by momentarily closing the Trip Control Switch to allow the excess pressure to be dissipated before an accurate gauge reading can be obtained of the actual regulator pressure setting. See Figure 10.

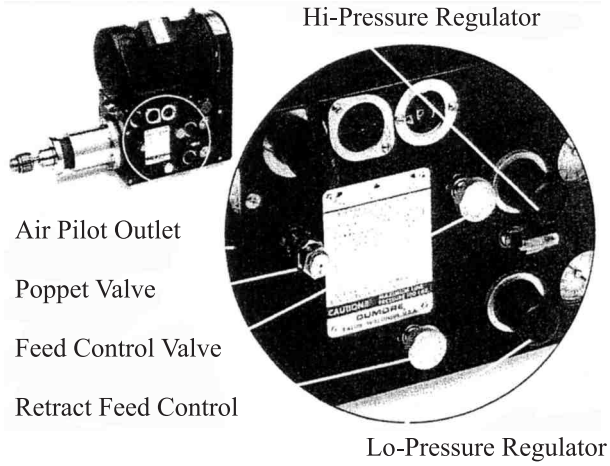


Figure 10 - Control Panel

The bottom Retract Feed Control Valve E can usually be used wide open or full counter-clockwise. If it is desired to control the retract speed, adjust the bottom valve “E” clockwise.

Loosen Poppet Valve cap and turn LO pressure regulator counterclockwise until pressure reading is zero. While manually depressing the pin in the Poppet valve, adjust the LO Pressure regulator to the desired value as indicated on the gauge. After making this adjustment of the pressure, release the hand pressure on the pin, turn the knurled cap on Poppet Valve clockwise until the set pressure is indicated on the gauge, Lock in place by tightening lock nut.

13. Check the motor nameplate for the correct supply voltage date and connect the suitable power supply to the motor. A motor starter is recommended for three phase operation.

14. Insert the drill or tap in the chuck, tightening at all three chuck wrench positions. Clamp workpiece in place.

15. Turn power ON to the motor. CHECK DIRECTION OF TOOL ROTATION. If rotation is incorrect, for three phase motors, reverse any 2 of the 3 power supply lines at the motor starter.

16. Initiate cycle by momentarily closing the Trip Control Switch or activating foot switch.

17. Adjust depth control screw if required.

18. Adjust air pressures and feed control valves as required.

    Series 28 - Adjust the HI and LO Pressure gauges and Forward-and-Retract Flow Control Valves as indicated in the following chart:

TROUBLE	CAUSE
Feed too fast	HI Pressure too High
Feed too slow	HI Pressure too Low
Slow Pre-Travel	Feed Control Valve Not Open Enough
Fast Pre-Travel	Feed Control Valve Open too Far
Fast Retraction	LO Pressure too High
Slow Retraction	LO Pressure too Low
Hole Depth Incorrect	Depth Screw Setting Incorrect

Series 28 - The preceding adjustments will be sufficient for most materials. However, if very tough materials are being tapped, one additional adjustment may be required to the Forward Limit Switches. An indication that this adjustment is necessary is if the unit, upon reaching the forward limit of its stroke, reverses the rotation of the spindle, but does not fully retract. This may be corrected by adjusting the actuating screw of the Auxiliary Forward Limit Switch (top switch) so that it is actuated nearly simultaneously but just after the Forward Limit Switch (bottom switch) is actuated. See Figure 11.

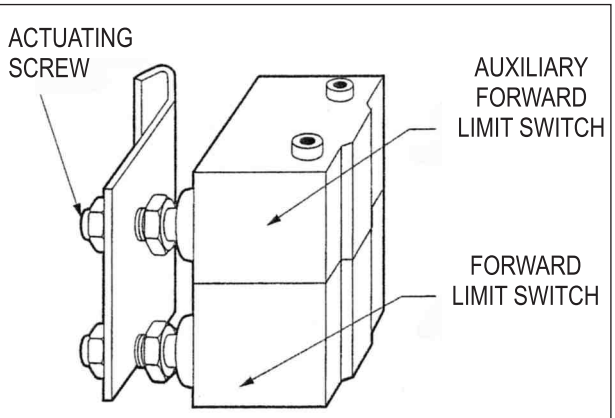


Figure 11 - Forward Limit Switch Adjustment

The Safety Retract Switch can be used for instantly retracting the spindle at any point of its forward stroke, regardless of whether the unit is tapping or drilling. For tapping, the spindle will automatically reverse as it retracts.

▲ IF THE SAFETY RETRACT SWITCH IS NOT EASILY ACCESSIBLE TO THE OPERATOR, AND EXTERNAL SAFETY RETRACT SWITCH SHOULD BE INSTALLED WITHIN CONSTANT REACH OF THE OPERATOR. SEE BELOW FOR INSTALLATION INSTRUCTIONS.

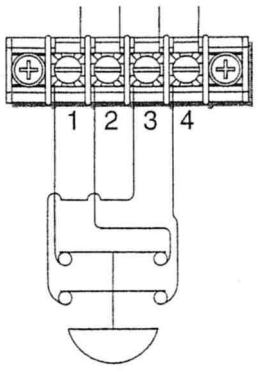


Figure 12 - Remote Safety Retract Switch

For added protection of the user, a terminal strip is located on the electric panel allowing easy installation of a remote safety retract switch.

This terminal strip has been internally wired to the forward limit switch. The user needs only to remove the jumpers between terminals 1 and 2 and terminals 3 and 4 and connect a remote safety retract switch to the terminal as illustrated in the figure above. Dumore suggests a double pole, single throw switch, with (2) normally closed contacts and a red mushroom head, such as Allen Bradley Part #800T-D6A4.

19. Series 28 - The AUTOMATIC-MANUAL switch must be on AUTOMATIC for tapping. For drilling, this switch can be on either AUTOMATIC or MANUAL. When on AUTOMATIC, a momentary closure of the actuating switch will start the unit, and it will complete a full cycle automatically. When on MANUAL, the unit will advance only as long as the actuating switch is closed, retracting when the switch is opened.

20 Series 28 - The Trip Control Switch is primarily used for setup purposes. For production runs, a more durable, external actuating switch, should be used.

21. Series 28 - For drilling operations using the 28-200 tapping control panel (now discontinued), either (1) turn the DRILL-OFF-TAP switch on the Tapping control to DRILL, or (2) eliminate use of the Tapping Control as follows: Disconnect the multi-pin connector from the Drill-N-Tap Unit: disconnect the power supply from the Tapping Control, and plug the motor power supply cord directly into the power supply. Alternative 2 is desirable since it makes available the built-in auxiliary limit-switches connected to the multi-pin connector for multiple or sequential operations, or for controlling auxiliary equipment such as indexing table, holding fixtures, etc.

22. When a rapid advance to workpiece is desired or for minimizing break through burr on through holes, Catalog No. 24-111 Hydraulic feed control is available as an optional accessory.

23. Series 28 - For deep hole drilling (holes deeper than 3 drill diameters). Repeat Cycle Timers are available to periodically retract the drill for chip removal and coolant applications to the drill point. Both deep hole drilling panels available for the Series 28 plug into Socket #3 on the side panel of the unit. (Deep hole drilling panels are no longer available from Dumore.)

24. The services of suppliers of drills, taps, other cutting tools and coolants should be utilized to obtain their recommendations for specific jobs.

25. Series 28 - For drilling operations when the Tapping Control is removed from the circuit, auxiliary limit switches connected to the multi-pin connector are available for controlling other devices or other units. The table gives the operating characteristics and terminal connections for these switches. Also readjust the Forward Limit Switches and the stop screw. For drilling operations when the auxiliary Forward Limit Switch is to be used, readjust the Auxiliary Forward Limit Switch Actuating Screw, actuated just prior to the Forward Limit Switch (bottom switch). Also, when accurate depth control is required, the stop screw should be adjusted 4” shim inserted between the stop screw and the actuator blade does not prevent retractions of the spindle while insertion of an .008” shim prevents spindle retraction.

	AUXILIARY RETRACTED LIMIT SWITCH		AUXILIARY RETRACTED LIMIT SWITCH	
TERMINALS	**A-B**	**B-C**	**D-E**	**E-F**
At Rest	Open	Closed	Closed	Open
Advancing	Closed	Open	Closed	Open
End of Stroke	Closed	Open	Open	Closed
Retracting	Closed	Open	Closed	Open

SERIES 28

SUGGESTED PRESSURES AND SPEEDS

The following pressures and speeds are listed only as a starting point for setting up your Dumore Unit. Final selection of feed and speeds is further determined by sound judgement for each particular case. When drilling brass, aluminum, stainless steel, etc., use the table for 1020 steel as a reference point. Increase speeds and feeds inaccordance with the machinability ratio od the specific material to that of 1020 mild steel.

SPINDLE RPM	SELECTIVE SPEEDS PULLEY ON MOTOR	SELECTIVE SPEEDS PULLEY ON SPINDLE
7,420	43	10
5,300	43	14
3,880	36	16
2,825	36	22
2,085	29	24
1,430	24	29
1,055	22	36
765	16	36
560	14	43
400	10	43

SERIES 28 TAPPING PRESSURE AND SPEEDS RECOMMENDED FOR 1020 STEEL

TAP SIZE	RPM	PULLEY MOTOR	PULLEY SPINDLE	SERIES 28 HI PRESSURE	SERIES LO PRESSURE
2-56	1870-1370	- -	- -	12-15	5-8
1/4-20	945	24	29	18-22	8-12
1/2-13	370	14	43	20-25	10-14

DRILL SIZE	RPM	FEED* PRESSURE	SECONDS REQUIRED TO DRILL 1 THRU 9 DRILL DIAMETERS DEEP 1	2	3		6	9
1020 MILD STEEL								
1/16	5,300	35	.8	.9	1.2		2.8	4.9
1/8	2,825	45	1.8	2.4	2.6		8.4	14.6
3/16	2,085	60	2.4	3.6	4.8		11.2	19.5
1/4	1,430	70	3.0	4.8	9.0		21.1	36.5
5/16	1,055	75	4.2	7.8	10.8		25.3	43.9
3/8	1,055	85	6.6	12.6	16.8		39.3	- -
MEDIUM GRAY IRON								
1/16	5,300	35	.6	.8	1.2		2.8	4.9
1/8	2,825	50	.9	1.1	1.2		2.8	4.9
3/16	2,085	65	1.5	1.8	2.4		5.6	9.7
1/4	1,430	70	1.8	3.0	4.2		9.8	17.0
5/16	1,055	75	3.0	5.4	7.8		19.3	31.7
3/8	1,055	80	4.2	8.4	12.0		28.2	- -
7/16	765	95	6.0	10.2	13.2		30.9	- -
1/2	560	100	8.4	15.6	21.0		49.2	- -

ALL DATA BASED ON USE OF STANDARD TWIST DRILLS GROUND TO 118° INCLUDED POINT ANGLE WITH 12° RELIEF, AND USING WATER SOLUBLE COOLANT ON MILD STEEL

* Based on return pressure of 15 lbs.

TROUBLE SHOOTING CHART

SYMPTOM	CAUSE	REMEDY	REFERENCE
Failure to ADVANCE	1. Air pressure not turned on to unit	1. Supply air to unit.	1. Series 28
	2. Adjust Feed Control Valve closed.	2. Adjust valve one or two turns counter-clockwise	2. Series 28
	3. Air Regulator not adjusted properly.	3. Adjust according to job requirement.	3. Series 28
	4. Depth Adjustment Screw set for no travel	4. Adjust for correct air gap between screw and actuator blade.	4. Series 28
	5. No Power to control panel of Dumore.	5. Connect short cord from motor to connector No. 1 on control panel.	5. Series 28
	6. Actuating Switch not working.	6. Check switch manually. Jump contacts and replace, if necessary.	6. Series 28
	7. Forward Limit Switch stuck in open position.	7. Jump limit switch contracts.	7. Series 28
	8. Binding of Quill in fixture.	8. Shut off air. Unit should slide free when traversed by hand.	8. Series 28
	9. Solenoid Air Valve inoperative for electrical or mechanical reasons	9. Check coil and leads. Check plunger and neoprene valve seals.	9. Series 28
	10. Safety Retract Switch stuck in open position.	10. Actuate manually. Jump contacts to check and replace if necessary.	10. Series 28
	11. Internal Relay ‘A’ not working.	11. Interchange relay ‘A’ with relay ‘B’. If unit operates, reorder new relay ‘B’.	11. Series 28
	12. Mounting Bracket Clamp screws too tight.	12. Release screws slightly.	12. Series 28

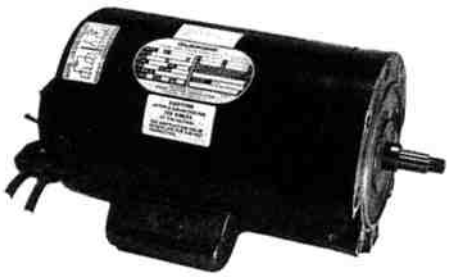
TROUBLE SHOOTING CHART

SYMPTOM	CAUSE	REMEDY	REFERENCE
Failure to RETRACT	1. Retract Feed Control Valve closed.	1. Adjust valve one or two turns counter-clockwise.	1. Series 28
	2. Forward Limit Switch not properly adjusted due to limited traverse of actuator blade.	2. Adjust STOP SCREW and NUT clockwise to allow more travel of actuator blade.	2. Series 28
	3. Binding of Quill in fixture.	3. Shut off air. Unit should slide free when traversed by hand.	3. Series 28
	4. Insufficient air return pressure.	4a. Readjust air pressure. 4b. On Series 28, increase LO air pressure, regulator B.	4. Series 28
	5. Solenoid Air Valve not shutting off HI air.	5. Check spring and plunger in valve.	5. Series 28
	6. Mounting bracket clamp screws too tight.	6. Release screws slightly.	6. Series 28
	7. Poppet Valve improperly adjusted or defective.	7. Readjust. Replace if necessary.	7. Series 28
Failure to HOLD DEPTH	1. Stop Screw not adjusted properly.	1. Adjust to allow actuator blade to trip limit switch. Lock by tightening nut.	1. Series 28
	2. Work piece loose in fixture.	2. Tighten fixture.	2. Series 28
	3. Limit Switch faulty.	3. Replace Switch.	3. Series 28
	4. Bearing Lock Nut loose.	4. Bearing Lock Nut loose.	4. Series 28
Hydraulic Control (erratic action)	1. Air in oil circuit.	1. Bleed and recharge.	1. Series 28
	2. Foreign matter in oil circuit.	2. Dismantle, clean and recharge. Recommend that unit be sent to Dumore.	2. Series 28
Unit Reverses but DOES NOT RETRACT	1. Improper adjustment of forward limit switches.	1. Readjust.	1. Series 28 Only
	2. Defective forward limit switch.	2. Replace.	2. Series 28 Only
Unit Reverses but DOES NOT REVERSE	1. Drill-Tap switch on “Drill”.	1. Readjust to “Tap”.	1. Series 28 Only.
	2. Defective auxiliary forward limit switch.	2. Replace switch.	2. Series 28 Only.

DO MORE

WITH OPTIONAL DRILLING AND TAPPING ACCESSORIES FROM

DUMORE



Non-Reversing Drill Motors

3/4 HP, totally enclosed induction motors provide spindle speed drive for Series 28 drill unit. Available in single phase (115/230V, with 8' cord and 3-prong plug) or three phase (220/440V, without cord and plug). FOR DRILLING ONLY.
Weight: 33 lbs (net), 35 lbs (shipping).

Single phase	Cat. No. 24-151	Part No. 430-0335
3 Phase	Cat. No. 24-152	Part No. 430-0334

Hydraulic Feed Control

Speeds the entire drilling cycle and increases productivity by allowing the drill to rapidly approach the workpiece. Accurately controls the feed rate for small hole drilling and minimizes burrs on breakthrough holes. Recommended for applications that require drilling hard material, spot facing, boring, angular drilling, and curved surface breakthrough.

Hydraulic Feed Control	Cat. No. 24-111 Part No. 508-0045
Feed Control Repair Kit	Part No. 858-0052

For more information on how Dumore accessories help our drilling and tapping products DO MORE for you, call 608-847-6420. Or fax us at 1-800-203-8788.

DUMORE CORPORATION
Quality is our legacy

1030 Veterans Street, Mauston, WI 53948-9314
Telephone 608-847-6420 FAX 1-800-338-6673
International FAX 608-847-7418

WARRANTY

This warranty is extended only to Dumore's commercial and industrial customers. To protect the quality of this tool, every step in its manufacture has been carefully controlled. It is constructed of only the finest materials by skilled craftsmen who take pride in their work. The latest precision production techniques and thorough repeated inspections ensure that Dumore's rigid specifications are met.

Dumore Corporation warrants the tools manufactured and/or repaired by it to be free from defects in material and workmanship for a period of 1 year after purchase. Any tool or part proved to Dumore's satisfaction top be defective during that period will be repaired or replaced, at Dumore's option, if returned prepaid to Dumore Corporation, 1030 Veterans Street, Mauston, Wiscosnin 53948-9314. Dumore's sole obligation and your exclusive remedy under this warranty shall be limited to such repair or replacement. IN NO EVENT SHALL DUMORE BE LIABLE FOR ANY CONSEQUENTIAL OR INCIDENTAL DAMAGES. This warranty does not apply to parts not manufactured by Dumore or failing to ordinary wear, or to tools subjected to abuse, accidental damage, improper operation, maintenance or repair, or to other damage by circumstances beyond Dumore's control.

THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER EXPRESS OR IMPLIED WARRANTIES INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTIES OR MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

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