



MODEL 281A

Automatic Bedknife Grinder

Model 281S

Semi-Automatic Bedknife Grinder

OWNER'S MANUAL

Neary Technologies
1173 Benson Street
River Falls, WI 54022

SAFETY INSTRUCTIONS



Safety Awareness Symbols are inserted into this manual to alert you to possible **Safety Hazards**. Whenever you see these symbols, follow their instructions.



The **Warning Symbol** identifies special instructions or procedures which, if not correctly followed, could result in personal injury.

The **Caution Symbol** identifies special instructions or procedures which, if not strictly observed, could result in damage to or destruction of equipment.

1. **KEEP GUARDS IN PLACE** and in working order.
2. **REMOVE WRENCHES AND OTHER TOOLS.**
3. **KEEP WORK AREA CLEAN.**
4. **DON'T USE IN DANGEROUS ENVIRONMENT.** Don't use Grinder in damp or wet locations. Grinder is for indoor use only. Keep work area well lit.
5. **KEEP ALL VISITORS AWAY.** All visitors should be kept a safe distance from work area.
6. **MAKE WORK AREA CHILD-PROOF** with padlocks or master switches.
7. **DON'T FORCE THE GRINDER.** It will do the job better and safer if used as specified in this manual.
8. **USE THE RIGHT TOOL.** Don't force the Grinder or an attachment to do a job for which it was not designed.
9. **WEAR PROPER APPAREL.** Don't wear loose clothing, or loose articles which may get caught in moving parts. Nonslip footwear is recommended. Wear protective hair covering to contain long hair.
10. **ALWAYS USE SAFETY GLASSES.**
11. **SECURE YOUR WORK.** Make certain the bedknife unit is securely fastened with the clamps provided before operating.
12. **DON'T OVERREACH.** Keep proper footing and balance at all times.
13. **MAINTAIN GRINDER WITH CARE.** Follow instructions in the Manual for lubrication and preventive maintenance.
14. **DISCONNECT POWER BEFORE SERVICING,** or when changing the grinding wheel.
15. **REDUCE THE RISK OF UNINTENTIONAL STARTING.** Make sure all switch are OFF before plugging in the Grinder.
16. **USE RECOMMENDED ACCESSORIES.** Consult the manual for recommended accessories. Using improper accessories may cause risk of personal injury.
17. **CHECK DAMAGED PARTS.** A guard or other part that is damaged or will not perform its intended function should be properly repaired or replaced.
18. **KNOW YOUR EQUIPMENT.** Read this manual carefully. Learn its application and limitations as well as specific potential hazards.
19. **KEEP ALL SAFETY DECALS CLEAN AND LEGIBLE.** If safety decals become damaged or illegible for any reason, replace immediately. Refer to replacement parts illustrations in the Manual for the proper location and part number of safety decals.
20. **DO NOT OPERATE THE GRINDER WHEN UNDER THE INFLUENCE OF DRUGS, ALCOHOL, OR MEDICATION**

SAFETY INSTRUCTIONS



IMPROPER USE OF GRINDING WHEEL MAY CAUSE BREAKAGE AND SERIOUS INJURY.

Grinding is a safe operation if the few basic rules listed below are followed. These rules are based on material contained in the ANSI B7.1 Safety Code for "Use, Care and Protection of Abrasive Wheels". For your safety, we suggest you benefit from the experience of others and carefully follow these rules. Machine is meant for indoor use only, **DO NOT POWER WASH MACHINE.**

DO

DON'T

1. **DO** always **HANDLE AND STORE** wheels in a **CAREFUL** manner.
 2. **DO VISUALLY INSPECT** all wheels before mounting for possible damage.
 3. **DO CHECK MACHINE SPEED** against the established maximum safe operating speed marked on wheel.
 4. **DO CHECK MOUNTING FLANGES** for equal and correct diameter.
 5. **DO USE MOUNTING BLOTTERS** when supplied with wheels.
 6. **DO** be sure **WORK REST** is properly adjusted.
 7. **DO** always **USE A SAFETY GUARD COVERING** at least one-half of the grinding wheel.
 8. **DO** allow **NEWLY MOUNTED WHEELS** to run at operating speed, with guard in place, for at least one minute before grinding.
 9. **DO** always **WEAR SAFETY GLASSES** or some type of eye protection when grinding.
 10. **DO TURN OFF COOLANT** before stopping to avoid creating an out of balance condition.
1. **DON'T** use a cracked wheel or one that **HAS BEEN DROPPED** or has become damaged.
 2. **DON'T FORCE** a wheel onto the machine **OR ALTER** the size of the mounting hole - if wheel won't fit the machine, get one that will.
 3. **DON'T EXCEED MAXIMUM OPERATING SPEED** established for the wheel.
 4. **DON'T** use mounting flanges on which the bearing surfaces **ARE NOT CLEAN, FLAT AND FREE OF BURRS.**
 5. **DON'T EXCESSIVELY TIGHTEN** the mounting nut
 6. **DON'T** grind on the **SIDE OF THE WHEEL** (see Safety Code ANSI B7.2 for exception).
 7. **DON'T** start the machine until the **WHEEL GUARD IS IN PLACE.**
 8. **DON'T JAM** work into the wheel.
 9. **DON'T STAND DIRECTLY IN FRONT** of a grinding wheel whenever a grinder is started.
 10. **DON'T FORCE GRINDING** so that motor slows noticeably or work gets hot.



AVOID INHALATION OF DUST generated by grinding and cutting operations. Exposure to dust may cause respiratory ailments. Use approved NIOSH or MSHA respirators, safety glasses or face shields, and protective clothing. Provide adequate ventilation to eliminate dust, or to maintain dust level below the Threshold Limit Value for nuisance dust as classified by OSHA.

This machine is intended for reel mower bedknife grinding ONLY. Any use other than this may cause personal injury and void the warranty.



To assure the quality and safety of your machine and to maintain the warranty, you **MUST** use original equipment manufactures replacement parts and have any repair work done by a qualified professional.



ALL operators of this equipment must be thoroughly trained **BEFORE** operating the equipment.

Do not use compressed air to clean grinding dust from the machine. This dust can cause personal injury as well as damage to the grinder. Machine is for indoor use only. Do not use a power w

SPEIFICATIONS

Power Requirements:

115 Volts, 50/60 Hz, 15 Amps

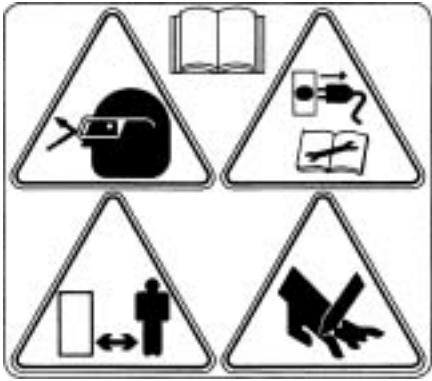
Dimensions:

58" (147cm) wide x 31" (79cm) deep x 71" (180cm) high, 900 lbs.

Shipping Dimensions:

59" (150cm) wide x 38" (97cm) deep x 78" (198cm) high, 980 lbs., 102.0 cubic feet (2.87 cu. meters)





Symbols for Read operators manual, wear safety glasses and disconnect power before servicing.

Symbols for sharp object which will cause serious injury and symbol for keep visitors a safe distance away from machine.



Symbols for caution relating to RPM of motor and minimum safe rated RPM of the grinding wheel.

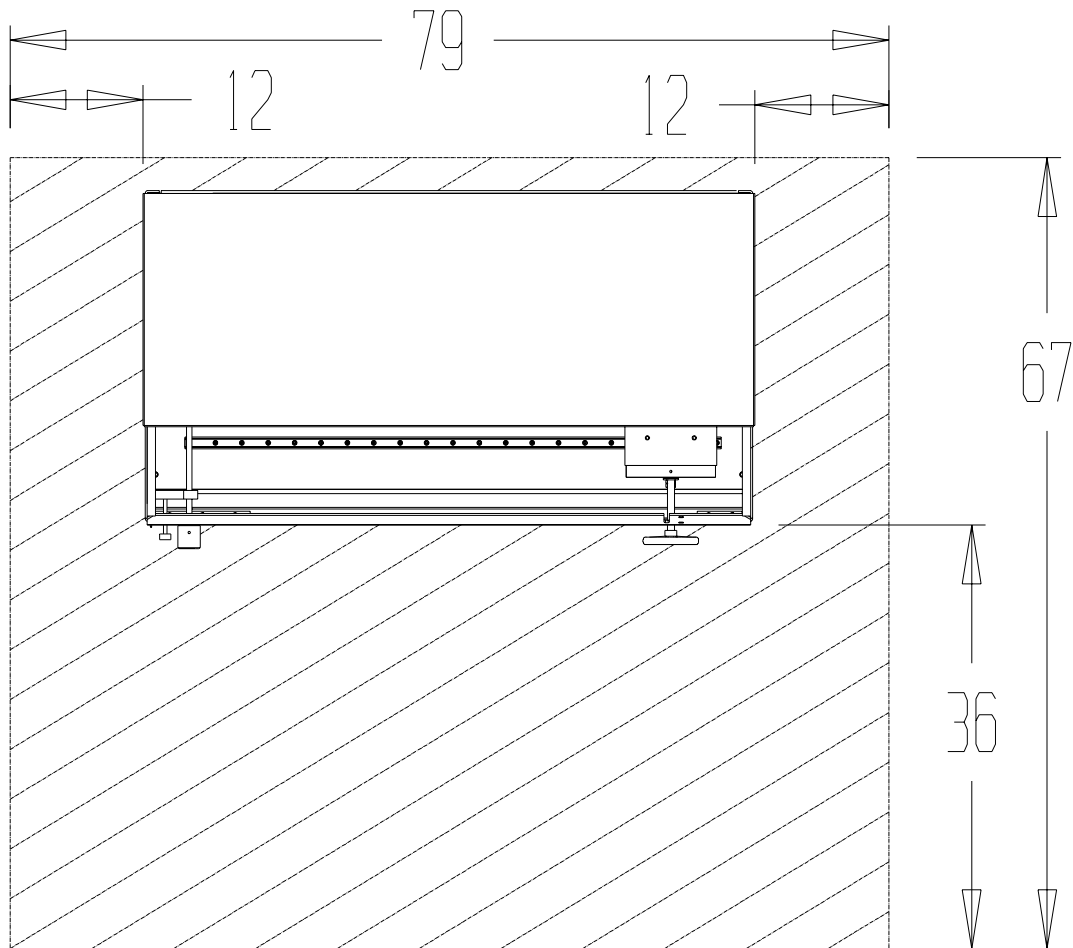


Symbol identifying a panel, cover, or area as having live electrical components within.

Features	281S	281A
Fully Enclosed Cabinet	Yes	Yes
Work Light in Cabinet	Yes	Yes
Magnetic Mount for Bed Knife	Yes	Yes
Infeed, Manual Control	Yes	
Infeed, Automatic, Programmable		Yes
Travel, Manual	Yes	Yes
Travel, Automatic	Yes	Yes
Travel, Automatic, Programmable		Yes
Flood Coolant System	Yes	Yes
27508 Frame Mounted Diamond Dresser	Yes	Yes
50546 Transformer for 220 Volts, 50/60 Hz	Optional	Optional
3702707 Magnetic Angle Finder	Yes	Yes
80330 Extra Gallon of Coolant Concentrate	Optional	Optional
28300 Operator's Manual	Yes	Yes
2810 Extra Grinding Wheels	Optional	Optional
6100501 Magnetic Base Dial Indicator	Optional	Optional

Site Requirements

1. Indoors
2. Dry
3. Reasonably level concrete floor
4. Good Lighting
5. 115 Volts, 50/60 Hertz, 15 Amp outlet (Transformer 28520 available to convert to 230 volts).
6. Adequate access to the front of the machine for the operator.
7. A **grounded** 115 Volts, 50/60 Hertz, 15 Amps wall outlet, dedicated circuit.
8. We suggest a floor space about 7.5 x 6.5 feet.



Assembly

Tools Required For Assembly:

- Hammer
- Level
- Utility Knife
- Screw Driver

The Model 281 is shipped on a pallet, fully assembled, except for the Flood Coolant System.

1. Remove the crate from the machine using the hammer.
2. Carefully use the utility knife to remove the protective wrapping.
3. Open the safety doors and remove the straps used in securing the grinding head.
4. The coolant system is standard on the 281S and 281A. It can be found in the back of the machine in the box.
5. If necessary, move the machine to the desired location. Use the leveling bolts to level the grinder

Assemble the Flood Coolant System

1. Remove the components from the plastic coolant tank, packed in the bottom of the cabinet under the coolant tray.
2. Fill the tank 3/4 full with a mixture of water and coolant concentrate. The mixing ratio is on the bottle of the concentrate.
3. Place the coolant tank on the inside bottom section of the cabinet.
4. Locate the small diameter hose already mounted on the grinder carriage. Feed this hose through the smaller of the two holes in the coolant tank cover and connect it to the pump.
5. Feed the pump electrical cord out through the same hole in the cover.
6. Place the pump into the tank.
7. Place the catch screen in the large hole in the cover.
8. Place the clear plastic cover on the tank and place the tank under the coolant tray. Make sure the screen in the plastic cover is position underneath the funnel in the coolant tray.

Electrical Requirements:

- 1 The unit is designed for 115 Volts, 50/60 Hertz, 15 Amps.
- 1 The unit requires a **grounded** 115 Volt, 15 Amp circuit for operation.
- 1 An optional transformer (28520) is available for operation at 230 volts.
- 1 **Important:** Do not use extension cords. Voltage drop due to long cords or small gauge wire may cause this machine to malfunction.



WARNING! Your grinder must always be connected to a properly grounded circuit. An improperly grounded grinder can cause electrical shock and serious injury to the operator. If necessary contact a qualified electrician to insure the Model 281 is properly grounded.



ADJUSTMENT OF THE LOW VOLTAGE RELAY MAY CAUSE ELECTRICAL COMPONENT FAILURE. ADJUSTMENT OF THE LOW VOLTAGE RELAY WILL VOID ALL ELECTRICAL COMPONENT WARRANTY.



The grinder is equipped with a low voltage relay (LVR) which is factory preset at 100 VAC. If the power supply line does not deliver 100 VAC power under load, the relay will open and trip out the starter. If this occurs, your power supply line is inadequate and must be corrected before proceeding further with the grinder.

Inspect the Grinding Wheel:

The bedknife grinder has been supplied with a medium grit wheel Part #3700411. With proper use and care, this wheel will provide maximum grinding capability, accuracy, and safety. Prior to starting the machine, visually inspect the wheel for possible damage during shipment.



WARNING! If the grinding wheel appears to be damaged, do not start the grinder.



WARNING! Always wear proper safety eyewear when operating the Model 281.

The Model 281 is now fully assembled and ready for grinding.



WARNING! Before operating this grinder, read the Operating Instructions.

ASSEMBLY INSTRUCTIONS (Continued)

APPLY POWER



BEFORE YOU APPLY POWER TO THE GRINDER, REFER TO THE "IMPORTANT GROUNDING INSTRUCTIONS".



115 Volt Model Only. Plug the control box power cord into a standard 115V AC 15-amp grounded receptacle. See FIG. 27.

FIG. 27

220 Volt Model Only. For 220 Volt Applications order Part No. 2810951 for 281S or 2810952 for 281A. The kit also includes a prewired 2 KVA 230 V to 115V 50-60 Hz step down transformer. See details on Page 10 and figure 28.



IT IS RECOMMENDED THAT THIS SPIN/RELIEF GRINDER HAS ITS OWN PERMANENT POWER CONNECTION FROM THE POWER DISTRIBUTION PANEL, WITH NO OTHER MAJOR POWER DRAW EQUIPMENT ON THE SAME LINE.



IT IS REQUIRED THAT THE POWER DELIVERED TO THIS GRINDER IS 115 VAC WITH 20 AMPS. THE TOLERANCE ON THIS POWER REQUIREMENT IS +/- 5%. THE MINIMUM VOLTAGE REQUIREMENT IS 109 VAC WITH 20 AMPS. VOLTAGE MUST BE CHECKED WITH ALL EQUIPMENT UNDER LOAD (OPERATING) ON THE CIRCUIT.

DO NOT OPERATE THIS GRINDER WITH AN EXTENSION CORD.



PROPER GROUNDING OF THE RECEPTACLE GROUND IN YOUR BUILDING MUST BE VERIFIED. IMPROPER GROUNDING IN YOUR BUILDING MAY CAUSE THE GRINDER TO MALFUNCTION.

FOR 15 AMP RATED LARGE MACHINES

For 0 to 30 Feet from panel to receptacle = Use 14 Ga. Wire.
For 30 to 50 Feet from panel to receptacle = Use 12 Ga. Wire.
For 50 to 80 Feet from panel to receptacle = Use 10 Ga. Wire.
For 80 to 140 Feet from panel to receptacle = Use 8 Ga. Wire.

For 0 to 9 Meters from panel to receptacle = Use 2.5mm Wire.
For 9 to 15 Meters from panel to receptacle = Use 4.0mm Wire.
For 15 to 24 Meters from panel to receptacle = Use 6.0mm Wire.
For 24 to 42 Meters from panel to receptacle = Use 10.0mm Wire.

ASSEMBLY INSTRUCTIONS (Continued)

FOR 220 V 50/60Hz applications Product No. 2810951 for 281S or 2810952 for 281A should be ordered. Kit 2810951 and 2810952 includes a 2 KVA 230V, step down to 115 V 50-60 Hz transformer.

The wiring diagram is shown in FIG. 28.

The power cord has no connector. A connector which is appropriate for your locality and 220 volt, 8 amp application should be installed.

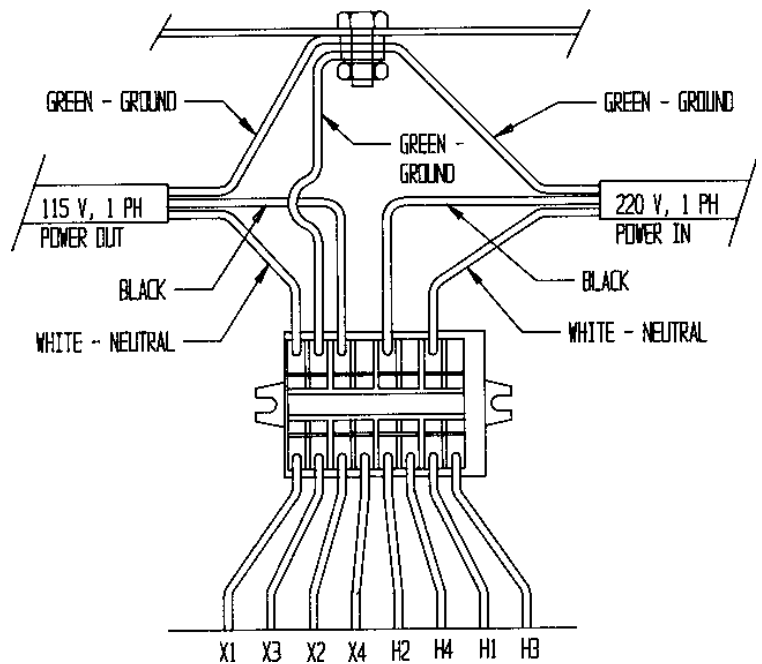


FIG. 28



Use only a qualified electrician to complete the installation.

IMPORTANT GROUNDING INSTRUCTIONS

In case of a malfunction or breakdown, grounding reduces the risk of electrical shock by providing a path of least resistance for electrical current.

This Grinder has an electrical cord with an equipment grounding conductor and a grounding plug. The plug must be plugged into a matching outlet that is properly installed and grounded according to all local or other appropriate electrical codes and ordinances.

Before plugging in the Grinder, make sure it will be connected to a supply circuit protected by a properly-sized circuit breaker or fuse.

Never modify the plug provided with the machine--if it won't fit the outlet, have a proper outlet and circuit installed by a qualified electrician.



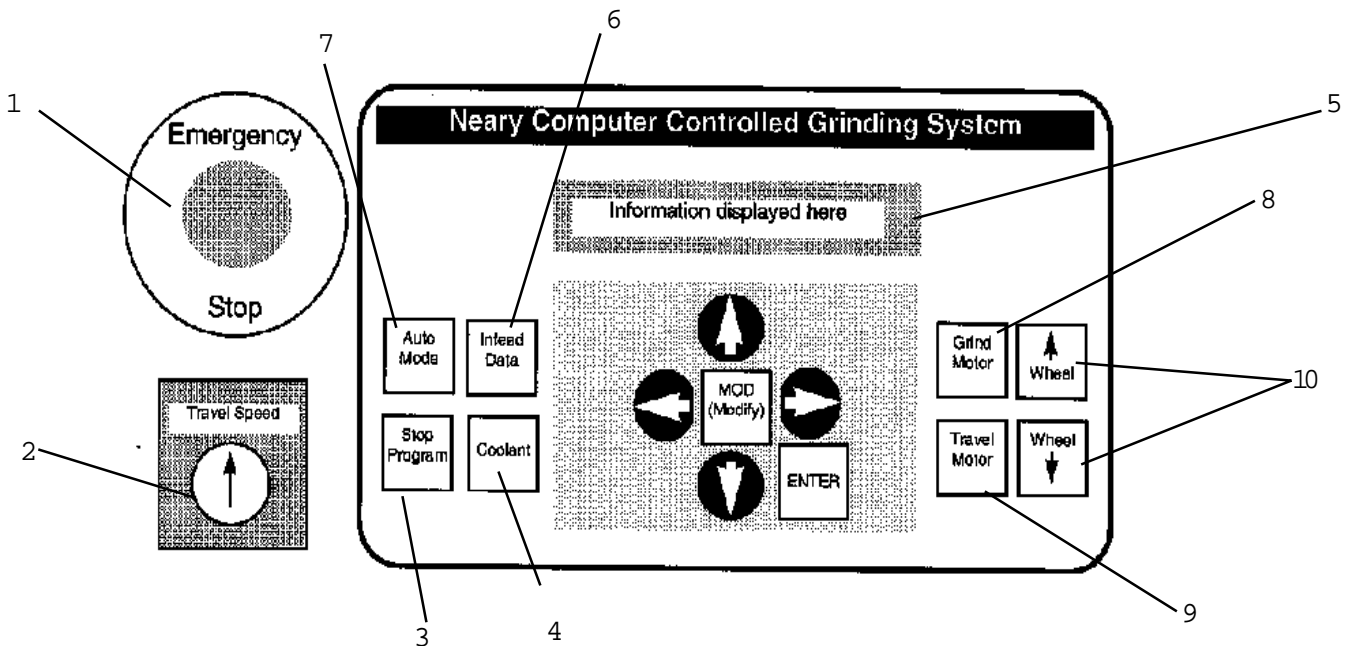
ALWAYS PROVIDE A PROPER ELECTRICAL GROUND FOR YOUR MACHINE. AN IMPROPER CONNECTION CAN CAUSE A DANGEROUS ELECTRICAL SHOCK. IF YOU ARE UNSURE OF THE PROPER ELECTRICAL GROUNDING PROCEDURE, CONTACT A QUALIFIED ELECTRICIAN.

Operation

Terms:

- Bed Knife: the stationary blade in a reel mower.
- Bed Knife Support: the bed knife is mounted to this frame member with screws or rivets.
- Top Face: the horizontal, ground surface of the bed knife.
- Front Face: the vertical surface of the cutting edge of the bed knife.
- Top Relief Angle: the angle between horizontal and the manufacturer's recommended sharpening angle.

The Controls for Model 281A



Review the following section and learn the function of each control. As you read and learn about each control feature you are encouraged to enable the controls and view that particular operation.

NOTE: The safety doors and safety switch must be engaged before the grinding motor and the travel motor will work.

1. **Emergency Stop Button:** Located on the left upper corner of the control panel. Pulling the switch out will turn the main power on and pushing it in will turn the main power off. **In case of emergency, push the emergency stop switch to turn off the main power to the machine.**

Pull out the Emergency Stop Switch so you may view the information on the display.

2. **Travel Speed Control:** This control determines the side to side travel speed of the grinding carriage. To increase speed rotate clockwise. To decrease speed rotate counterclockwise.

Set the Travel Speed Control to 5 for now.

3. **Stop Program Button:** This button stops or interrupts the program. All data input by you will be retained.
4. **Coolant Button:** This touch pad turns on and off the coolant pump. In auto mode the coolant pump is turn on automatically.

5. LCD Display: The display has two purpose. During programming, it prompts the operator for the desired input. During the running of the program, it displays the number of passes remaining or the remaining run time before completion of the program

To scroll the display, push the up (↑) or down (↓) arrows.

To change input on the LCD. The operator must remember the following sequence:

1. Push the 'MOD" touch pad (stands for Modify)
 2. Push the up (↑) or down (↓) arrow for the desired settings.
 3. Push the "Enter" touch pad to accept displayed input.
6. Infeed Data Touch Pad: Push this button to program the Model 281A for the amount of infeed and number of passes. To scroll through the display and to change the inputs follow the sequence outline above. Operator should remember 1 unit = .001 inch. And one pass is a travel out and back.

You may leave the default data at this time.

7. Auto Mode Button: Pushing this touch pad will prompt the operator to start the program. The LCD display area will display "Begin auto grind? Stop."

DO NOT START PROGRAM AT THIS TIME

To start automatic program:

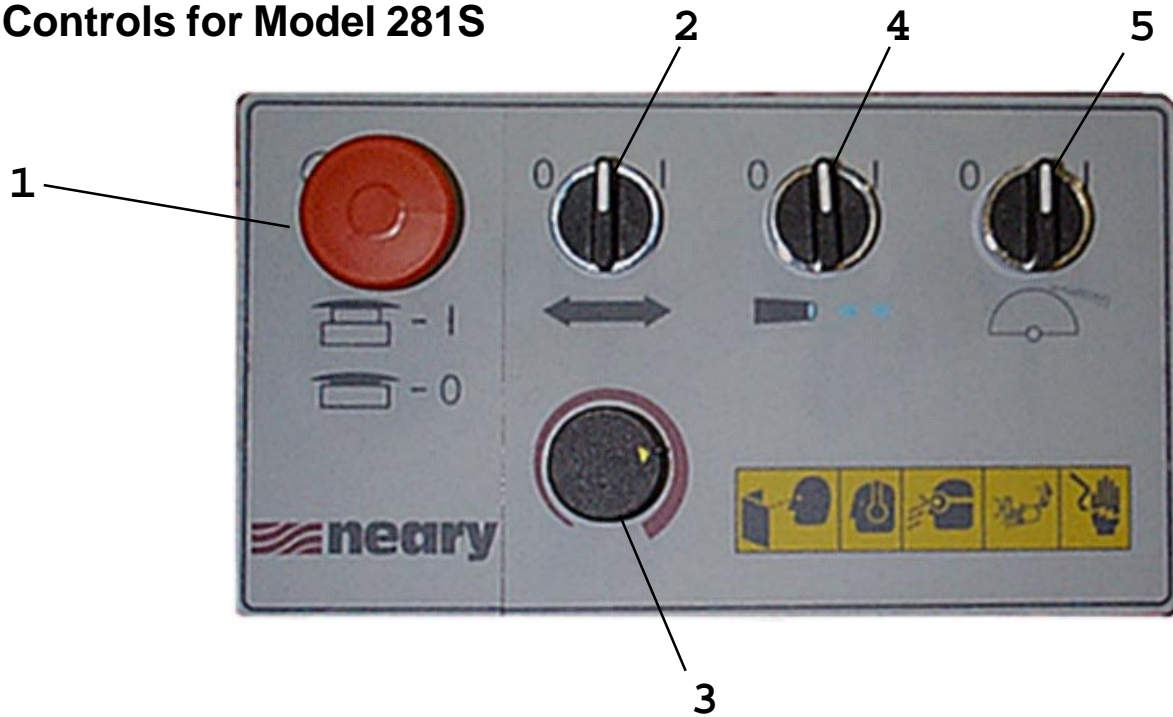
1. Push the "Auto Mode touch pad
 2. Push "MOD" touch pad
 3. Push the up (↑) arrow touch pad
 4. Push "Enter" touch pad
8. Grind Motor Button: This touch pad turns the grinding motor "on" or "off". Note the safety door must be closed and safety switch engaged.
9. Travel Motor Button: This touch pad turns the traverse motor "on" or "off". Make sure the travel pin is engaged to the travel chain. Note the safety doors must be closed and safety switch engaged.
10. "wheel ←" and "wheel →" button: These touch pads will control the movement of the grinding motor position toward or away from the bedknife support assembly. Pushing the touch pad once, infeeds the grinding motor a distance specified by the operator under the "Infeed Amount" category. Pushing the touch pad several times in succession will move the grinding motor the specified infeed amount multiplied by the number of times the touch pad had been pushed. Pushing and holding the touch pad will move the grind motor until the operator releases the touch pad.

Note: The maximum infeed increment is .009" at a time. Neary recommends an "infeed amount" category setting of .005" or 5 units.



Do not try to infeed the grinding head past its infeed limits. Doing so might cause damage to the carriage infeed system.

Controls for Model 281S



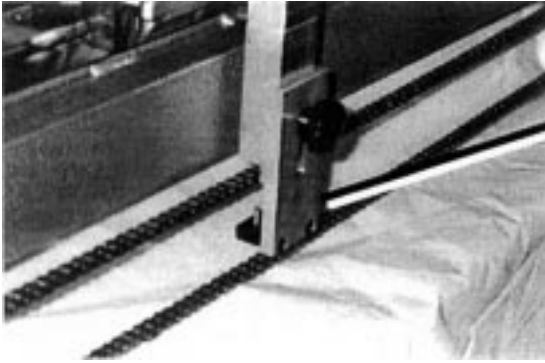
1. Emergency Stop Button: The large red button in the left hand corner of the panel. Pulling the button out will turn the main power "on" and pushing it in will turn the main power "off".
2. Traverse Switch: This button, which is located second from the left, will turn on or off the travel motor of the grinding carriage. The symbol I ="on" and the symbol 0 ="off". Note the safety doors and the safety lock out switch must be engaged before the traverse motor will operate.
3. Traverse Speed Control Knob: This knob controls the traverse speed of the grinding carriage. Rotating the knob clockwise will increase the traverse speed. Rotating it counter clockwise will decrease the traverse speed.
4. Pump Motor Switch: This switch, located second from the right turns on/off the coolant pump motor. The symbol 0 ="off" and the I = "on".
5. Grinding Motor Switch: This switch located on the far right, turns on/off the grinding motor. The symbol I ="on" and the symbol 0 ="off". Note the safety doors and the safety key must be engaged before the grinding motor will activate.
6. Manual Infeed Handle: Located on the grinding carriage in the front of the model 281S unit. Turning the hand wheel clockwise will infeed the grinding wheel toward the bedknife support. Turning the handwheel counterclockwise will move the grinding carriage away from the bedknife support.



Warning! The maximum recommended infeed is .005". This is approximately 1/16 a turn of the knob or a rotation of 20 degrees.

Traverse Mechanism Release

To move the grinding wheel side to side manually, there is a release knob located on the back of the carriage, below the carriage bottom plate (80261). With the Emergency Stop “off” locate the black knob that secures the slotted aluminum plate to the carriage. Loosen the knob and the plate will disengage the drive pin from the travel chain. To Engage, lift the slotted plate “up” until the pin engages the chain. It is not necessary to put the pin through the same link in the chain every time, any link will work. Then tighten the knob to secure the slotted plate to the carriage.



The carriage pin is disengage from the travers chain

The carriage pin is engage to the traverse chain

Before mounting the Bed Knife, check it for:

1. Cleanliness
2. Straitness
3. Uneven wear
4. Excess wear
5. Damage to bed bar
6. Loose screws or rivets

It is important to make sure the bed knife is clean. The magnets require a clean surface.

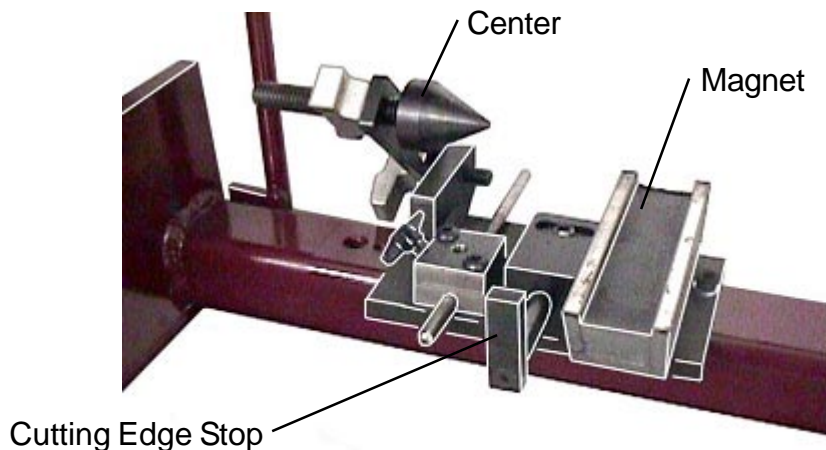
You can check the bedknife for straightness before sharpening with the optional magnetic base dial indicator, part number 6100501. The indicator can be used for checking straightness of the top face surface, the front face surface and the bed bar surface. This is accomplished by placing the magnetic base on the grinding carriage and adjusting the dial indicator anvil to ride on the bedknife. Traverse the carriage back and forth manually or automatically and check the dial reading.

NOTE: There are variations in all bed knives. What you are looking for is a consistent reading. Ideally the bedknife should read perfectly level or have a uniform drop in the reading over the length of the bed knife. What you want to avoid is an up and down fluctuation in the dial reading.

If the bed knife is excessively worn, replace the bed knife.

Replace any loose rivets, and tighten any loose screws.

Mounting the Bed Knife on the Bed Knife Support:



- Clean the area of the bed knife that will contact the magnets. Remove grass and any rust.
- The cutting edge stop is spring loaded, pull out and turn vertical, as shown in the picture. Do this for the left mounting and right mounting block.



Do not put your fingers between the magnets and the bed knife.

- Put the bed knife on the magnets with the front edge against the cutting edge stops.
 - Turn the stops horizontal and they will spring back and out of the way of the grinding process.
- ... the mounting holes of the bed knife. Turn the centers into the



TIGHTEN THE CENTERS. Excessive
and bedknife, giving a bad grind.
ugh to take out the freeplay.

————— Tooling lock

Horizontal
adjustment
knob

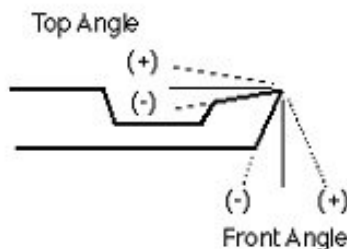
- Use horizontal adjustment knob to position the bedknife parallel to the path of the grinding wheel.
- Using the infeed knob, adjust the grinding wheel to touch the bed knife on the right end.
- Slowly move the grinding wheel to the left and adjust the horizontal adjusting knob until the grinding wheel lightly touches the edge of the knife on the left end.
- Slowly traverse the grinding head back and forth making sure the grinding wheel is staying a constant distance from the bedknife edge. Depending on the straightness of the bedknife you might need to repeat the previous steps several times before the bedknife is correctly align.

Note If the front edge of the bedknife is not straight, set up so the grinding wheel touches uniformly on each end.

Recommended Face & Top Angles

Manufacturers recommend that bedknife relief angles should always be maintained to original manufacturer's specifications. Neary Technologies has compiled these angles in a chart below. Angles vary depending on the bedknife manufacturer and bedknife model. We have included many of the popular models in the chart. If your model is not listed below, consult the manufactures manual for your bedknife unit.

Some units do not have the front face ground. For example: Some Toro units (such as the 70" Pro) have a "stellite" hard coated surface. The Toro Turf Pro 84 has a factory ground front face. Consult the bedknife manufacturer when in doubt about grinding the front face.



Bed Knife Grind Angles

Make	Model	Top Angle In Degrees	Front Angle In Degrees
Jacobsen	19" & 22" Greens Mower	-8 to -10	0 to -5
Jacobsen	Blitzer, F133, Fairway	+4 to +6	0 to -5
Jacobsen	Greens King 418, 518, 422, 522	-8 to -10	0 to -5
Jacobsen	Greens King 426, 526	-8 to -10	0 to -5
Jacobsen	Greens King II, IV, IV Plus, V	-8 to -10	0 to -5
Jacobsen	HF5, HM11	+4 to +6	0 to -5
Jacobsen	LF100, 123, 128, 3810	-8 to -10	0 to -5
Jacobsen	Ranger, ST5111	+4 to +6	0 to -5
Jacobsen	TF60	-8 to -10	0 to -5
Jacobsen	Tri King 1671, 1672, 1684, 1900	+4 to +6	0 to -5
Jacobsen	Trim King, Turf King II, 76, 84	+4 to +6	0 to -5
John Deere	All Models	-5	-5
Lesco	All Models	-6	-5
National	All Models	-5	-5
Ransomes	G-Plex 160	-8 to -10	0 to -5
Ransomes	Fairway, 250, 305, 405	-3	0
Ransomes	Motor 180, 350D, T-Plex 185	-3	0
Toro	GR500, 1000, 3000, HTM 175	-5	-15**
Toro	RM 5100, 5300, 6500	-5	-15**
Toro	RM108, 216, 2300, 3500, 4500	-5	-15**
Toro	RM5, RM7, RMII, Spartan, Turf Pro	-5	-15**

** If height of cut is less than 1/2", increase angle up to -30 degrees

Top Face and Front Face Grinding (281S)

1. Mount the bedknife on the magnets to the bed knife support. (Refer to page 14)
2. Rotate the bed knife support until the angle finder (Part No. 3702707) shows the desired angle for the bedknife face to be ground.
3. Lock the bedknife support at the desired angle using the locking lever on the left side of the bedknife support bar.
4. Disengage the traverse chain from the grinding carriage. (Refer to page 11)
5. Manually position the grinding wheel so it lightly touches the right side of the bedknife. For top face grinding make sure the grinding wheel extends into the gutter of the bed knife.
6. Slowly traverse the grinding carriage while making sure the grinding wheel is lightly touching the bedknife. Use the horizontal adjustment knob to align the bedknife with the grinding wheel. (Refer to page 14)
7. Adjust the position of the travel limit switch so the grinding wheel disengages the bedknife at the end of its traverse. Note: make sure the grinding head does not hit anything else.
8. Engage the grinding carriage to the traverse chain. (Refer to page 11)
9. Adjust the coolant nozzle position. Turn the coolant pump on and adjust the coolant flow valve located on a bracket adjacent to the left side of the motor.
10. Close the safety doors and make sure the safety switch is engaged.
11. Turn the grinding motor on.
12. Turn the traverse motor on and adjust the rate of travel.
13. Using the manual infeed wheel, slowly infeed to the desired grinding depth.

Warning! The maximum recommended infeed is .005". This is approximately 1/16 of a clockwise turn of the infeed wheel or a rotation of 20 degrees.

14. Let the grinding carriage make several back and forth passes.
15. Repeat steps 13 and 14 as needed.
16. When desired grinding depth is reached, make 15 passes with out infeeding for spark out.

Repeat steps 2 to 16 for grinding the other bedknife face.

Note to the operator: Some bedknives do not need front face grinding. Check your bed knife manufacturer to determine if front face grinding is required.

Top Face and Front Face Grinding (281A)

1. Mount the bedknife on the magnets of the bedknife support. (Refer to page 14)
2. Rotate the bedknife support until the angle finder (Part No. 3702707) shows the desired angle for the bedknife face to be ground.
3. Lock the bedknife support at the desired angle using the locking lever on the left side of the bedknife support bar.
4. Disengage the traverse chain from the grinding carriage. (Refer to page 11)
5. Manually position the grinding wheel so it lightly touches the right end of the bedknife. For top face grinding make sure the grinding wheel extends into the gutter of the bedknife.
6. Slowly traverse the grinding carriage back and forth while making sure the grinding wheel is slightly touching the bedknife. Use the horizontal adjusting knob to align the bedknife with the grinding wheel. (Refer to page 14)
7. Adjust the position of the travel limit switch so the grinding wheel disengages the bedknife at the end of its traverse. Note: make sure the grinding head does not hit anything else.
8. Engage the grinding carriage to the traverse chain . (Refer to page 11)
9. On the 281S Auto Interface, set the desired settings for the number of infeeds, the infeed incremental distance, the number of passes, and the spark out duration time. (Refer to page 10)
10. Adjust the coolant nozzle position. Turn the coolant pump on and adjust the coolant flow valve located on a bracket adjacent to the left side of the motor.
11. Close the safety door and start the automatic program.

Repeat steps 2 to 11 for grinding the other bedknife surface..

Note: Some bedknives do not need front face grinding. Check the bedknife manufacturer to determine if front face grinding is required.

Maintenance



WARNING! *Before performing any maintenance procedure unplug the unit from its main power source.*

- □ Clean excess dirt and grit from machine daily.
- □ Wipe grit and dirt from the traverse rails daily !
- □ Protect the rails with light oil to prevent rust.
- □ Protect any bare metal surfaces from the atmosphere if the machine is not in use for
- □ extended periods of time.

Dressing the Grinding Wheel:

The grinding wheel should be dressed anytime it becomes “loaded” or out of balance. The term “loaded” refers to the condition of the wheel when the surface of the wheel is clogged with material. Periodically dressing the grinding wheel will improve both the quality and the efficiency of the grind. The Model 281 comes with a diamond dresser mounted on the left side of the machine, incorporated into the bed knife support bar adjuster.

To dress the grinding wheel:

1. Move the grinding carriage to the furthest left travel position.
2. Engage the diamond dresser by manipulating the handle on the left side of the machine.
3. Using the knurled knob next to the bedknife support adjuster, set your depth for dressing the wheel.
4. To start, let the diamond dresser rest on the surface of the wheel and infeed .001 at a time.
This is about 10 degree turn on the knurled knob.
5. Turn on the grinding motor and manipulate the handle up and down to dress the grinding stone.
6. When done, engage diamond dresser handle to its lock position.

Changing the Grinding Wheel #3700411:

Using a 3/4 open end wrench, remove the grinding wheel flange. The thread in the flange are ***left handed thread***. To remove the wheel, hold the wheel and turn the nut ***clockwise***.

When installing a new grinding wheel, it is important to follow the instructions provided by the grinding wheel manufacturer. These instructions include the following important points:

- □ Always make sure the main power source is off.
- □ Always inspect the wheel for damage.
- □ Always make sure there are blotters on each side of the wheel. The blotter’s diameter must be larger than the mounting flange diameter.
- □ Always check to see that the wheel is rated for the same or greater RPM as the grind motor, 3450 RPM.

Maintenance (cont.)

- □ Always check the flanges for damage. They must be flat and of the same diameter.
- □ If the wheel is supplied with a spacer bushing, make sure the bushing is a snug fit to the wheel and the grinding shaft. Improper alignment or poor fit may cause excessive vibration.
- □ If the grinding wheel is mounted directly on the grinding motor shaft, make sure the grinding motor is not loose on its motor mount.
- □ Make sure the wheel mounting nut is tight, but do not over tighten as to crack the grinding wheel.
- □ With the new grinding wheel installed, slowly rotate the wheel and check for runout. New wheels might not be to runout specification before dressing by 1/16". If proper runout seems to be a problem, loosen the mounting nuts and rotate the wheel 90 degrees in relationship to the motor shaft. Check for runout again.
- □ Start the grinding motor and check for excessive vibration. If necessary repeat the previous step several times.
- □ If reasonable balance is not attained after trying several different positions on the grinding adapter, the wheel may not be properly balanced from the factory and should be returned for replacement

Tighten the Traverse Chain:

Over time the traverse chain might need some adjustment and retightening. On the right side of the grinding channel, locate the block holding the sprocket. Loosen the two mounting screws and slide the block to tighten the chain. While keeping the chain tight, tighten the two mounting screws.

Tighten the Bed Knife Support Pivot:

On the left side of the bedknife support there are two screws next to the locking handle. They control the resistance of the bedknife support bar from rotating about its pivot point. To increase resistance, tighten the two screws.

Fuse and Circuit Breaker Location:

The main power circuit breaker is in the back of the upper electrical box. See the diagram of the electrical control panel for reference. (Refer to page 44)



Before performing any maintenance procedure unplug the unit from its power source. The main power (115V, 15 amp) circuit breaker is in the back of the upper electrical box, see the diagram for the electrical control panel. (Refer to page 45)

USING FLOOD COOLANT

For quality grinding, we highly recommend using flood coolant to prevent heat buildup.



IF YOU DO DRY-GRIND, NEVER ALLOW THE BEDKNIFE EDGE TO CHANGE COLOR OR YOU MAY LOSE THE TEMPER IN THE KNIFE EDGE.

ALWAYS READ THE MATERIAL SAFETY DATA SHEET (MSDS) FOR THE COOLANT YOU ARE USING. BELOW ARE WARNINGS THAT APPLY TO MOST COOLANTS.

AVOID CONTACT OF COOLANT WITH EYES: IT WILL CAUSE EYE IRRITATION. WEAR FACE SHIELD OR GOGGLES WHEN HANDLING CONCENTRATE. IN CASE OF CONTACT, FLUSH EYES WITH WATER FOR 15 MINUTES AND CONTACT A PHYSICIAN.



CONTINUED CONTACT OF CONCENTRATE ON SKIN MAY CAUSE IRRITATION. WASH WITH SOAP AND WATER AFTER CONTACT.

DO NOT TAKE INTERNALLY. IF INGESTED, CONSULT PHYSICIAN AND DO NOT INDUCE VOMITING.

(HAZARD POTENTIAL APPLIES TO CONCENTRATE, AND IS LESS AT NORMAL USE DILUTION.)

Mixing the Coolant

Mix Part No. 80340 Coolant in the Coolant Tank, at a ratio of 50 parts water to 1 part concentrate. Refer also to the label on the Coolant container. If the Tank is empty, this will take about 3 gallons of water and 1/2 pint of concentrate [12.5 liters of water, and 0.25 liter of concentrate].



THE COOLANT RATIO AS SPECIFIED MUST BE USED. TOO HIGH OR LOW A CONCENTRATION WILL CAUSE CORROSION AND PERFORMANCE PROBLEMS.

AVOID BREATHING MISTS. PROVIDE LOCAL VENTILATION. KEEP CONCENTRATED BOTTLE CLOSED WHEN NOT IN USE.

Using the Coolant

Direct the nozzle so the coolant sprays onto the bedknife face being ground. Some coolant will then also be deflected onto the grinding wheel. Adjust the flow valve so there is a steady stream of coolant. Avoid a stronger flow than needed, excessive coolant doesn't cool more, and increases splattering.

Fluid Level in Coolant Tank

Check the fluid level in the Coolant Tank daily to avoid running out while grinding. Keep the coolant level between 1" and 3" [25 and 75 mm] from the top of the tray. The pump inlet must **always** be completely submerged in water. Never add plain water to the coolant when the level is low. Always add water and concentrate in the correct proportions. It is recommended to pre-mix coolant and water in a separate container for this purpose.

Troubleshooting:

1. Ask Questions???
2. Double check the easy things first.
3. Establish a sequence.
4. Use common sense.
5. Use the manual.

Ask Questions???

What does it do right?

What won't it do?

Did it fail suddenly?

What does the failure look Like?

Was there a smell?

What does it do wrong?

Did it fail gradually?

Did it ever work right?

Was there smoke?

Were there any different Sounds?

Electrical Control Boxes: Double check the following to assure that something simple as a loose connection is not the source of the problem. When a 1/2 HP motor starts, it draws up to 55 amps for a very brief period of time. A loose connection cannot carry enough current to start some of these motors.

1. Double check the easy things first!!!
 2. Tighten all screws (wire connections).
 3. Push all buttons (on contactors, motor starters and relays).
 4. Push on all relays (to assure they are seated in their sockets).
 5. Reset all circuit breakers.
- Then try it again...

Motors: To determine if an AC Motor is good, unplug the machine, sketch wiring diagram for motor. Disconnect wires from machine and hook up a cord with a plug. Then plug it directly into the outlet. If the motor runs directly from the wall and not while wired to the machine, the problem is in the machine. Beware that Neary does use some DC travel motors. Check the label on the motor.

Model 281 Electrical System Color Code:

Connector Color:

Red

Purple

Black

Green

Function

Door Interlock Switch

Travel Motor

Travel Limit Switch

Infeed Motor

AC Plugs

Red

Blue

Yellow

Black

Function

Grind Motor

Coolant Pump

Light

Accessory or Fan

Troubleshooting:		
Symptoms	Cause	Remedy
Grind motor will not start	The guard is open. The safety key is not engaging the safety lockout switch. Motor not plugged into panel.	Close the guard . Check the key and switch. Turn off power and open control box, check red AC plug. Plug Red AC plug into extension cord, but not panel, check door switch.
Auto Travel does not move	The guard is open. The safety key is not engaging the safety lockout switch. Speed is turned to low. Carriage not engaged to chain. Pin on the chain drive is sheared. Fuse blown at travel motor driver. Drive sprocket is loose. Travel Motor driver defective. Travel Motor defective.	Close the guard. Check the key and switch. Increase travel speed . Engage travel chain. Replace Pin . Check Fuses. Replace if needed. Tighten set screw in sprocket Replace motor driver. D.C. motor does not plug into A.C. outlet. Replace motor.
Carriage does not change direction	Check the contact point between the travel limit switch and the carriage. Relay loose in socket on panel. Damaged limit switch or wiring. Damaged relay on panel.	Adjust switch. With power turn off, pull out and reinsert relays on the panel. Replace switch or wiring. Check to assure relay moves when limit switch is actuated, if the relay does not move with the switch, replace relay.
Carriage movement not smooth	Travel chain is loose or binding on the sprockets. Travel speed set too slow. Carriage binding on rails.	Check the chain tension and alignment. Turn up travel speed. Check for obstructions.
Travel Motor overload or blowing fuse	Travel chain is loose or binding on the sprockets. Carriage binding on rails.	Check the chain tension and alignment. Check for obstructions.

Symptoms	Cause	Remedy
Coolant will not flow	Valve closed. Coolant level low. Coolant hose clogged. Pump defective.	Open valve. Add coolant. Clean hose. Open panel and locate blue AC plug. Plug it into an extension cord. If it does not run from wall current, replace pump. If it runs from the wall current, check circuit breakers.
Grinding Wheel will not infeed	Grinding wheel is at end of travel. Wheel wear. Loose hardware or belt on infeed drive (281A).	Move grinding wheel back toward operator, check wheel wear and set up. As the grinding wheel wears away, forward travel is reduced, replace wheel. Remove the belt guard and check the set screws on the pulleys, and the condition of the belt. Replace if worn.
Magnets seem to lack power to hold bedknife	Dirt, rust, or paint on contact surface. Set up with magnet on a screw or rivet head. Bed Knife not straight.	Clean back of knife. Relocate bedknife on magnets. Check with straight edge, use centers to hold in place during grinding
Turn on power and the machine immediately shuts off	Low voltage coming into the machine.	This machine is equipped with a low voltage detector (LVR). If voltage is too low at the outlet, or an extension cord is used, the machine will turn itself off.
Infeed or automatic program will not work	Loose connections or relays on panel. Red "err" light is lit on PLC.	With power off, check all connections on the panel. Make sure screws are tight and all wires go to a terminal or component. Check to assure all relays are seated in their sockets. With power on, if the red "err" light on the PLC is lit, contact the distributor service department for assistance.

Neary 28543 Display, Instructions for Removal and Replacement

To remove or replace the display in the Model 281:

1. Unplug the machine from the wall.
2. Open the top of the cabinet.
3. Remove the spring-loaded clips, sides and top.
4. Gently pull the display out the front to expose the plugs.
5. Gently unplug the green plug.
6. Unscrew two screws and unplug the white plug.
7. To install, the new display, reverse the steps.

To replace the dashboard and panel Assembly:

1. Unplug the machine from the wall.
2. Open the top of the cabinet.
3. If there are spring-loaded retainer clips on top of the display, remove them. This is required to pull the assembly through the hole in the front of the cabinet. See picture earlier in this section.
4. Remove the four screws that secure the front of the dashboard to the front of the cabinet.
5. Gently pull the panel forward a few inches.
6. Unplug the connections from the back of the panel. Notice that these connections are color coded for your convenience.
7. Carefully pull the panel through the hole in the front of the cabinet. After the display is out of the cabinet, it is necessary to lift the panel slightly so the back portion of the panel will pass through the hole in the cabinet.
8. To install the new dashboard and panel, remove the spring-loaded clips from the top of the display so that it will fit through the hole in the front of the cabinet.
9. Install by reversing these steps.
10. Contact Neary Technologies Customer Service Department for correct followup action.

Door Switch:

The door switch allows different functions to operate based on whether the door is open or closed.

Function	Enabled when door is open	Enabled when door is closed
Auto Mode	No	Yes
Infeed Data	Yes	Yes
Coolant	Yes	Yes
Grind Motor	No	Yes
Travel Motor	No	Yes

Model 281A Control/Software Test

Use this list to check the functions on the Model 281A and determine that they are working correctly.

Important: If a function does not work, it may be the control, or it may be the motor, or it may be a loose connection between the control and the motor. To check AC Motors, unplug them from the control and plug them directly into a wall outlet.

Pull out the Emergency Stop and proceed with the following test.

Auto Mode Button:

Push the Auto Mode Button.

The display shows "Begin Auto Grind? Stop".

Push "MOD".

Use the Arrows to change between "Stop" and "Grind"

Infeed Data Button:

Push the Infeed Data Button.

Use the "MOD" and Arrow Buttons to change the Data.

Change # of Infeeds, acceptable numbers are 1-9.

Change the Infeed Amount, acceptable numbers are 1-9.

Change the number of passes, acceptable numbers are 1-9.

Wheel \square Button with the door open or closed:

Turn the infeed knob clockwise several turns to assure the carriage is not at its inner limit of travel.

Observe the large infeed pulley turning while pushing the \square Wheel Button.

With a momentary push, the large pulley should turn about 30 degrees counterclockwise.

With a push and hold, the large pulley should move until you release the button.

Wheel \square Button with the door open or closed:

Turn infeed knob counterclockwise several turns to assure the carriage is not at its limit of travel.

Observe the large infeed pulley turning while pushing the \square Wheel Button.

With a momentary push, the large pulley should turn about 30 degrees clockwise.

With a push and hold, the large pulley should move until you release the button.

Coolant Button with the door open or closed:

Push the Coolant Button. The Coolant Pump should run with the door open or closed.

Grind Motor Button with the door open:

Push the Grind Motor Button with the door open. The grind motor should **not** run.

Travel Motor Button with the door open:

Set the Travel Speed Knob above “3”, so you can detect the traverse if there is any.
Push the Travel Motor Button with the door open, the travel motor should **not** function.

Grind Motor Button with the door closed:

Push the Grind Motor Button with the door closed, the grind motor should function.

Travel Motor Button with the door closed:

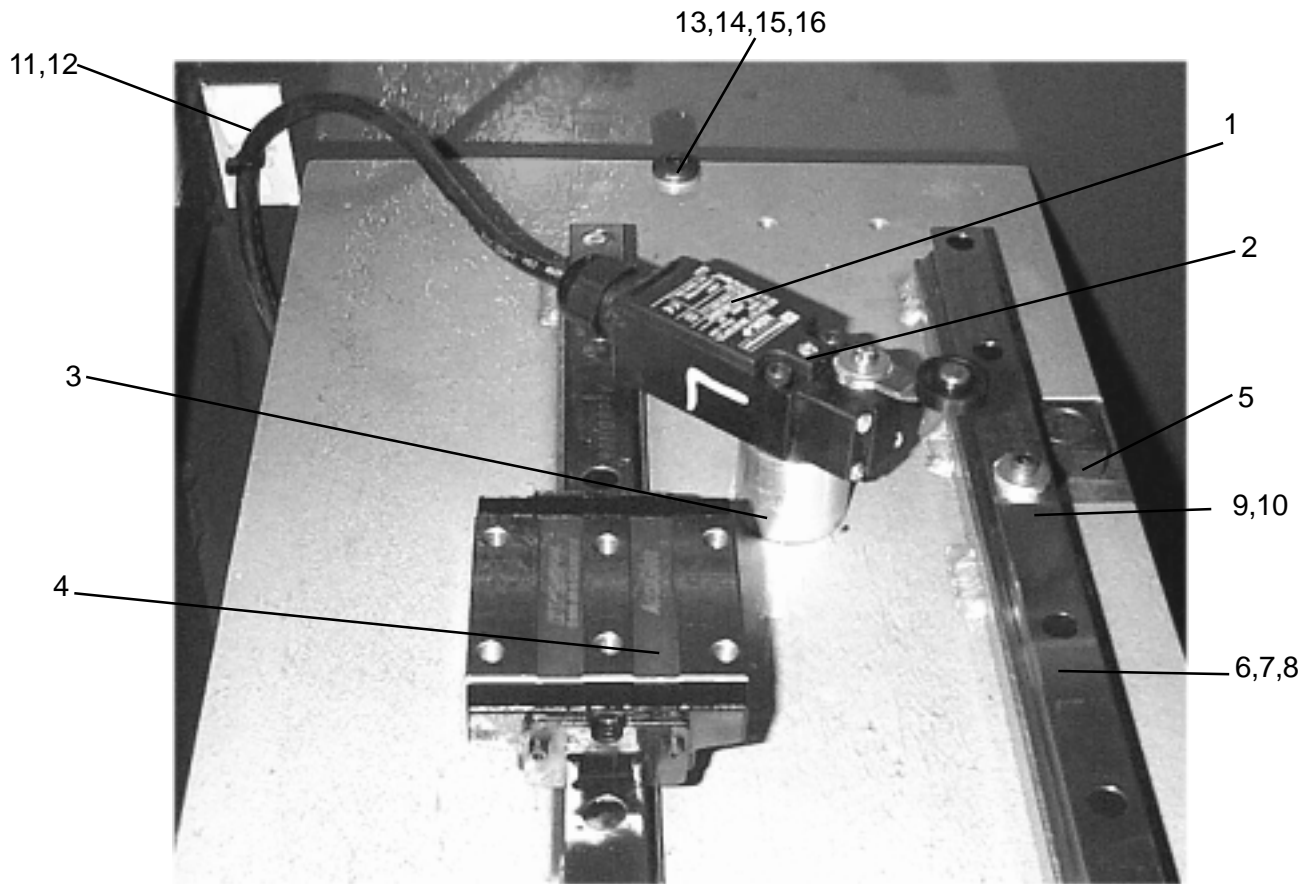
Set the Travel Speed Knob about 1/4 rotation. Detection of traverse movement should be observed.
Push the Travel Motor Button with the door closed, the travel motor should function.
Verify that the Travel Limit Switches changes the direction of the grinding carriage.
Turn the Travel Speed Knob to “0”, the travel should stop.
Turn the Travel Speed Knob slowly up to full rotation. The travel should increase as you turn the knob.

Check the Auto Mode Relief Program with the door closed:

1. Check to assure there is nothing in the path of the grinding wheel.
2. Engage the Travel Chain Release.
3. Adjust the Travel Limit Switches. To speed up the test, move the switches closer together.
4. Close the door.
5. Push the Input Data Button and input 4 passes.
6. Push the Auto Mode Button and start the program.
7. Observe that the grinding wheel does start and the carriage moves back and forth until it completes the program.
8. If you input 4 passes and 2 infeeds, the count down on the display should count down from 8 to zero, as the grinding wheel completes the 8 passes.
9. Continue this process until you are satisfied that it is working correctly.
10. If you complete the program, the program will back the infeed away from the bed knife one turn.
11. If you use the “Stop Program Button”, the program will back the infeed away from the bed knife one turn.

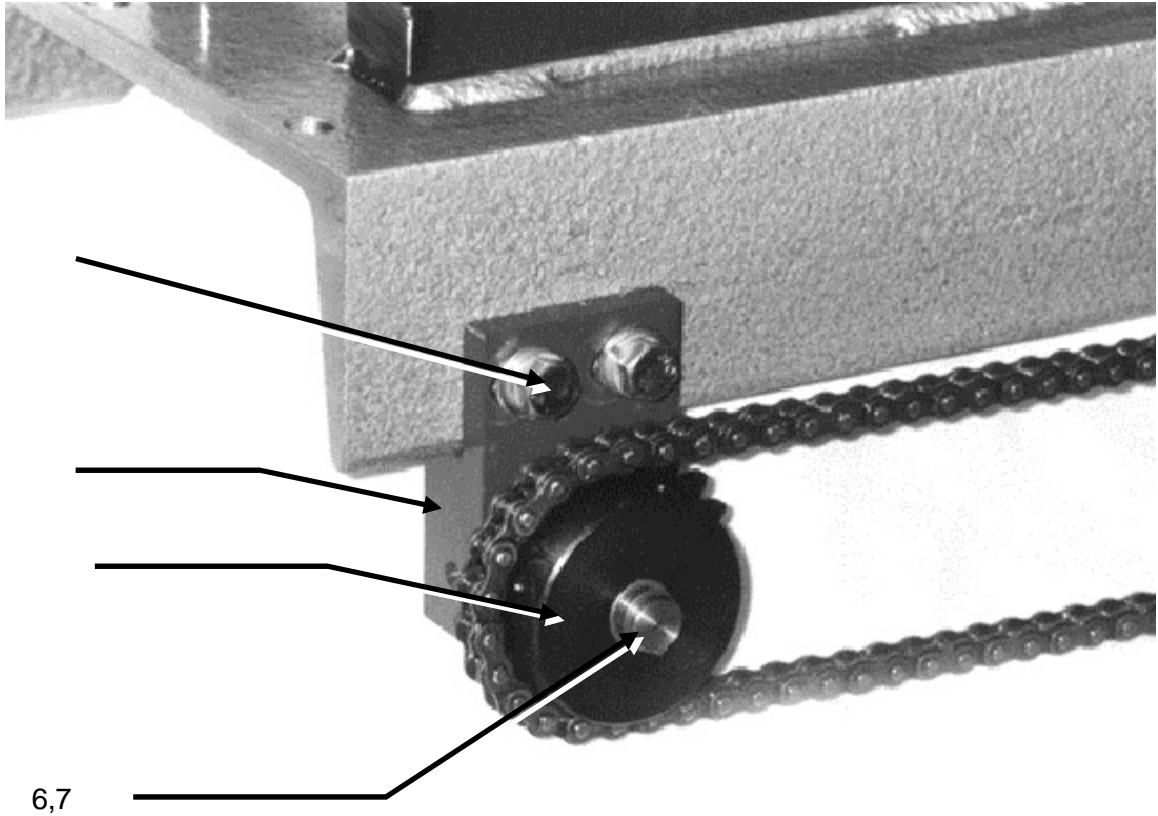
Stop Program Button:

1. Close the door.
2. Push the Auto Mode Button.
3. Start the program.
4. In the middle of the program, push the Stop Program Button.
5. The travel motor should stop (and remain stopped).
6. The grinding wheel should back away from the bed knife one turn.
7. The grinding wheel should stop rotating.



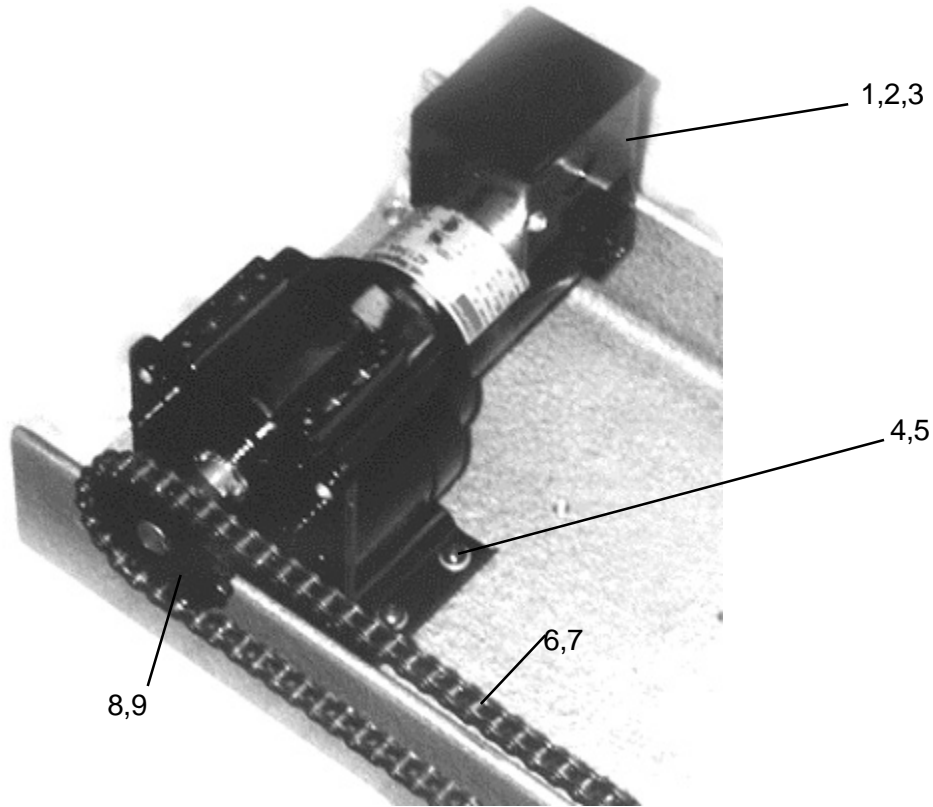
Profile Rails and Travel Switch

Diagram No.	Part No.	Description
1	09791	Travel-limit switch
2	09543	8-32 x 1 SHCS
3	80312	Magnet
4	80313	Bearing
5	80310	Clamp, screw, block
6	80314	Rail, steel 20mm
7	B191031	10-32 x 5/8 SCHS
8	80334	Plugs, rails
9	09944	10-32 x 1 SHCS
10	3708691	Washer-Flat .25 x .62 x .12
11	3707224	Mount cable tie
12	3707225	Tie wire
13	B371616	3/8-16 x 1 BHSCS
14	K371501	3/8 Lockwasher split
15	28126	Channel grind support
16	K370101	3/8 Flat Washer-heavy (between channel & mounting block)



Travel Idler Sprocket

Diagram No.	Part No.	Description
1	B311601.....	5/16-18 x 1 HHCS
2	K310001.....	5/16 Flat Washer
3	K311501.....	5/16 Split Lockwasher
4	28047	Block, Idler
5	09407	Sprocket, 35B21 x .62 ID
6	09935	Bearing
7	09274	Ring, Retaining



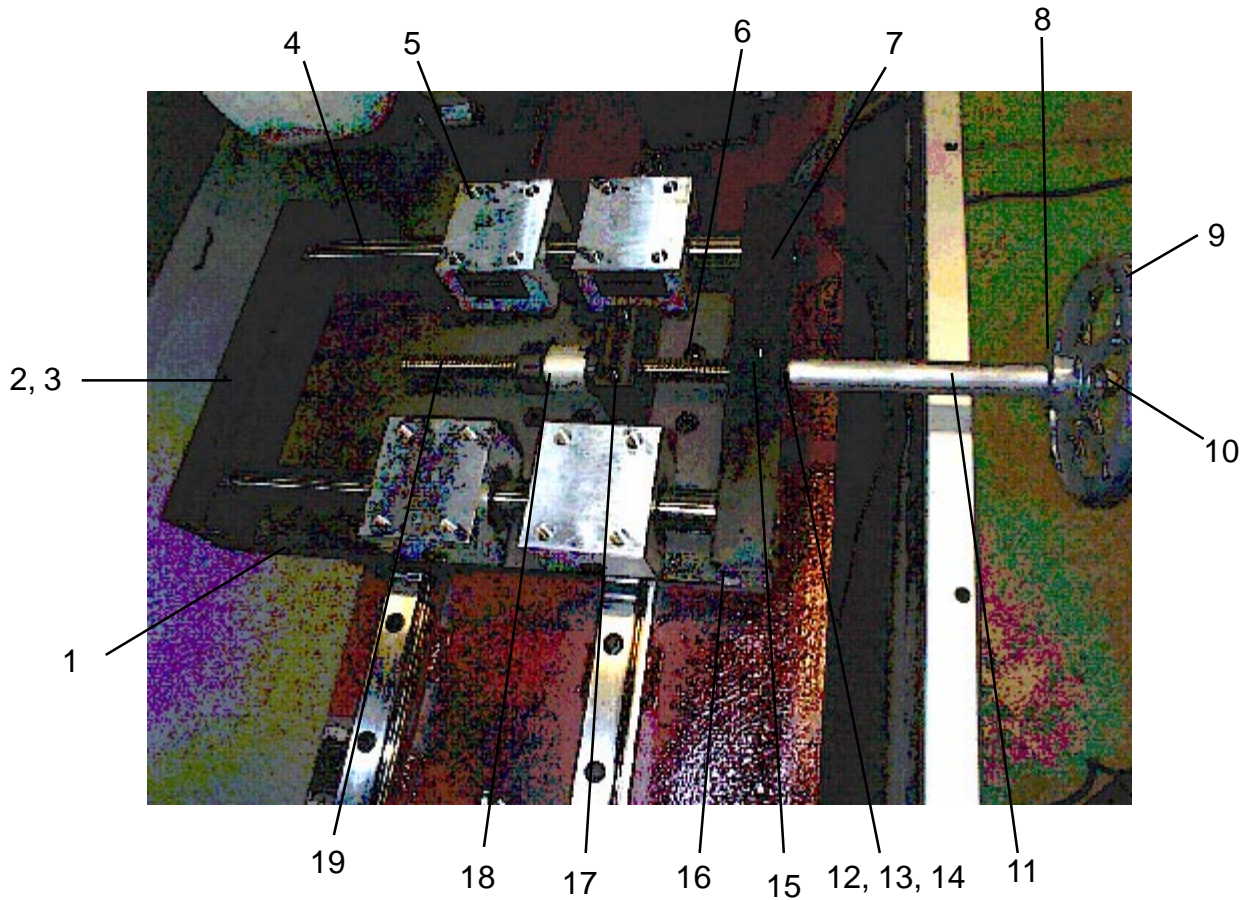
Travel Motor

Diagram No.	Part No.	Description
1	09615	Motor 1/20 hp, 90 VDC
2	09612	Strain relief
3	09372	Nut-conduit 1/2"
4	B250816.....	1/4-20 x .5 BHCS
5	K251501.....	1/4 split lockwasher
6	09947	Chain, #35x 274 pitch
7	09890	Link master
8	09407	Sprocket, 35 B21 x 62B
9	80126	Key, 3/16 Square x 1"

Travel Motor Wiring:

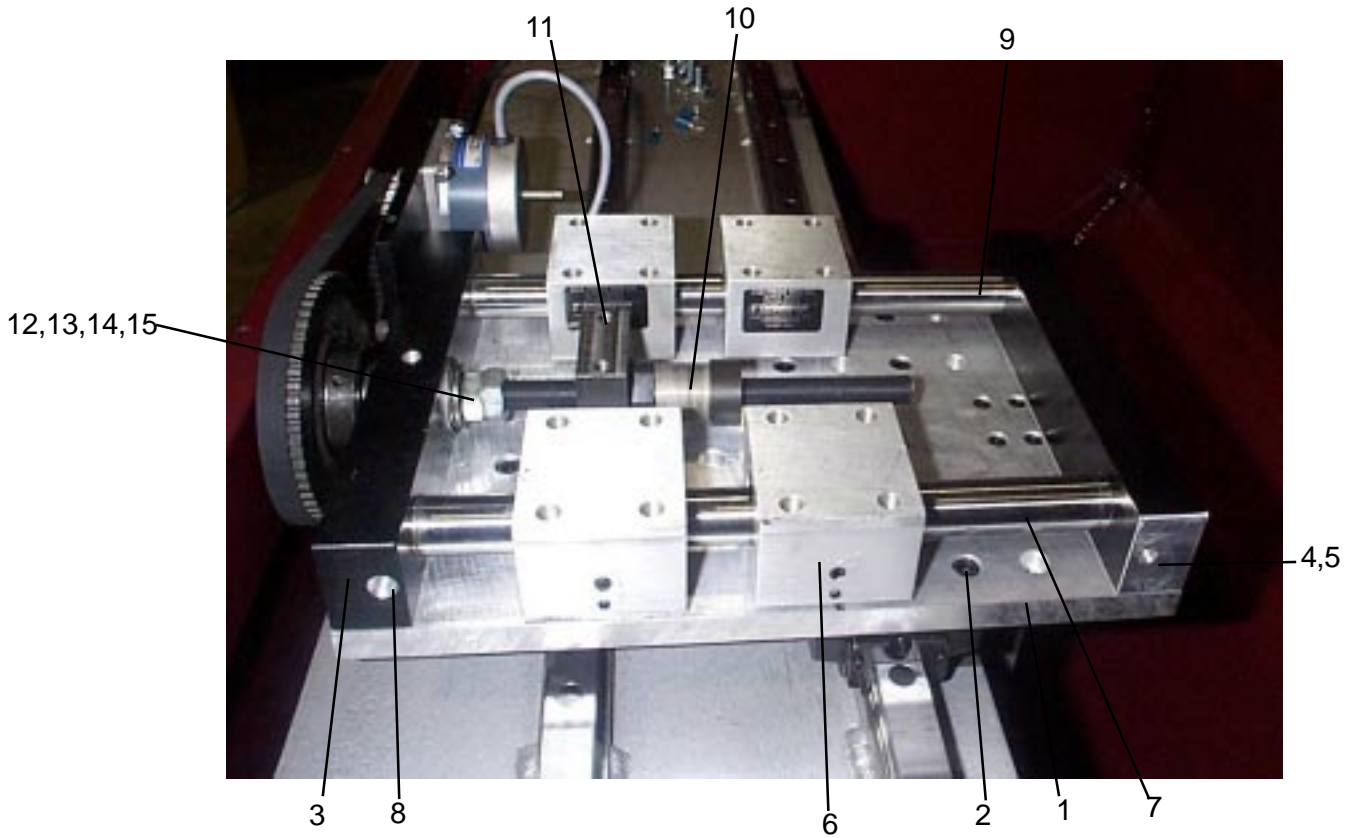
Travel Motor	Power Cord
Green	Green
Black	Black
Red	White

Important: After wiring the travel motor, confirm the travel motor is wired correctly by turning the travel speed to zero, start the travel function, then slowly turn up the speed until the carriage contacts the first limit switch. If it reverses, the wires are correct. If it does not reverse, turn off the machine, unplug it from the wall, then change the wiring to Motor Black to Cord White, and Motor Red to Cord Black. Then test as before to confirm proper operation.



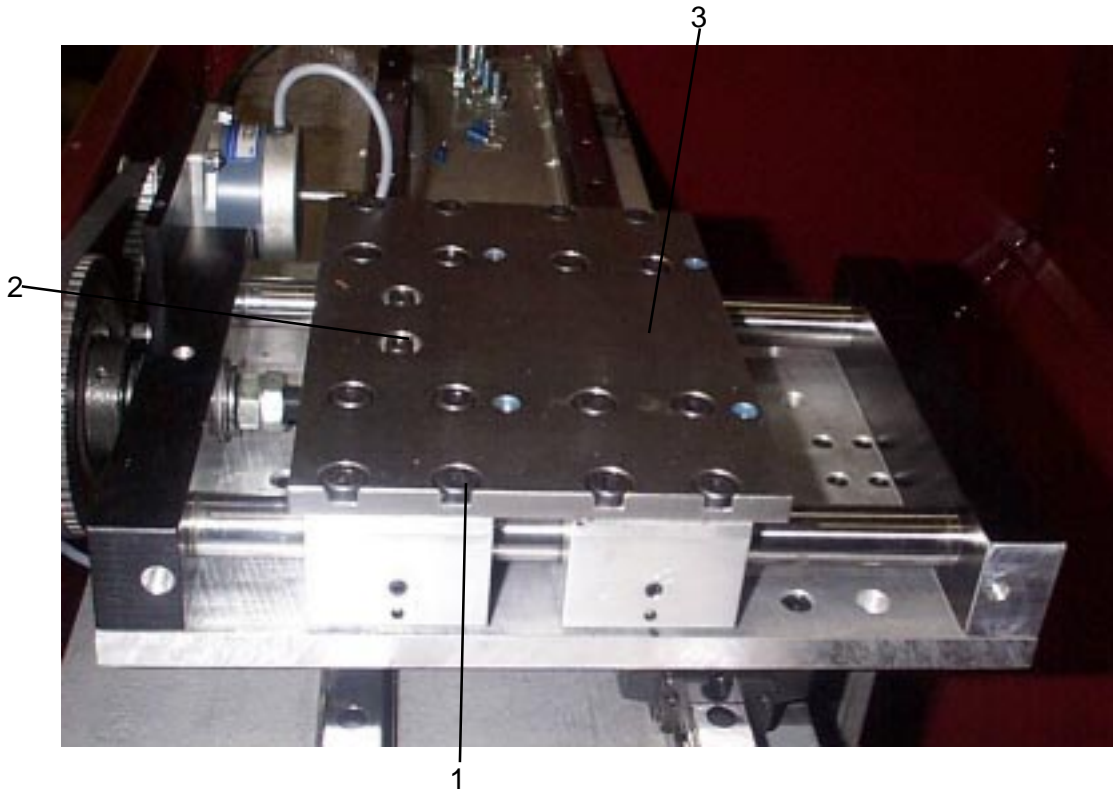
281S Carriage (without top plate)

Diagram No.	Part No.	Description
1	80261	Bottom, carriage
2	28164	Bar carriage rear
3	B310813	5/16-18 x .5 BHSCS
4	28163	Shaft 20mm
5	80091	Bearing 20mm
6	80163	M6-1x 18 SHCS metric
7	28167	Bar carriage front
8	C310420	5/16-18x 1/4 sss cp-pt
9	3708148	Handwheel
10	J377000	3/8-16 Nylon locknut thin
11	28217	Spacer
12	3589106	Washer flat
13	3709304	Washer thrust
14	3709062	Washer conical
15	28205	Spacer
16	C250620	1/4-20x 3/8 sss cp-pt
17	28168	Block antibacklash
18	80379	Nut antibacklash
19	28216	Lead screw



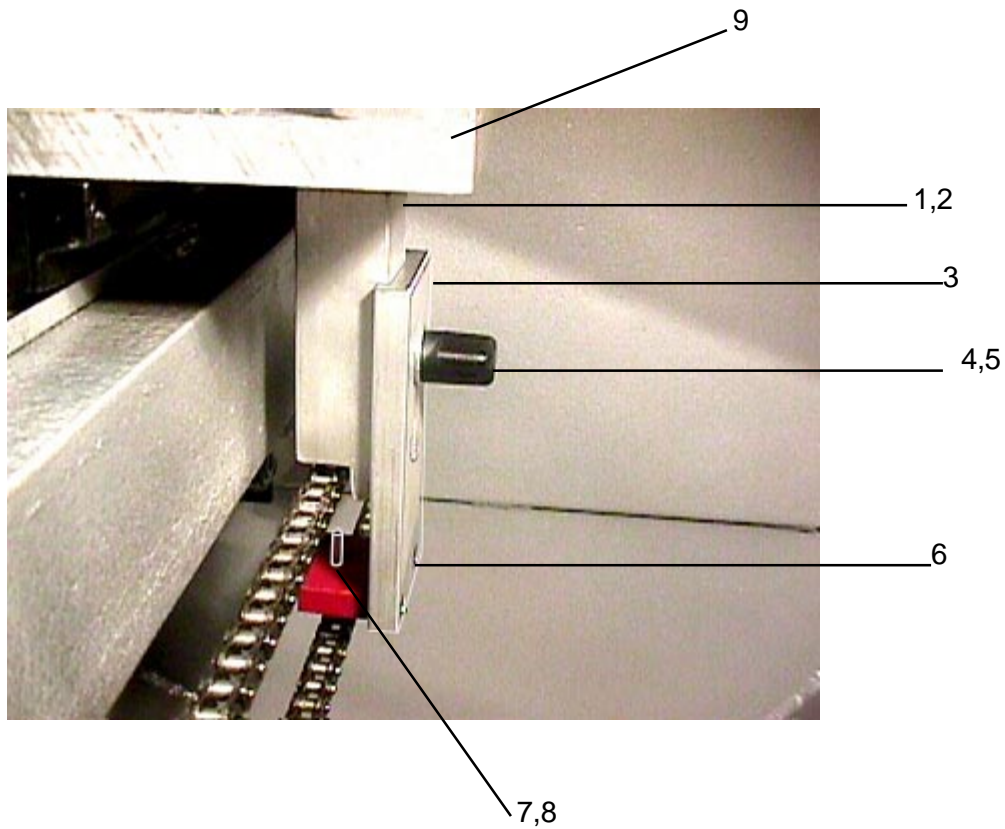
281A Carriage (without top plate)

Diagram No.	Part No.	Description
1	80261	Bottom, carriage
2	80163	M6-1 x 18 SHCS metric
3	28167	Bar, carriage front 281A
4	28164	Bar, carriage rear 281A
5	B310813.....	5/16-18 x .5 BHSCS
6	80091	Bearings - 20 mm
7	28163	Shaft - 20 mm
8	C250620.....	1/4-20 x 3/8 SSS CPPT
9	28166	Lead screw
10.....	80119	Nut-antibacklash 1/2-20
11.....	28168	Block antibacklash
12.....	J502100.....	1/2-20 Hex Jam Nut
13.....	3709620.....	Washer conical
14.....	80273	Cone - bearing
15.....	80274	Race - bearing cup



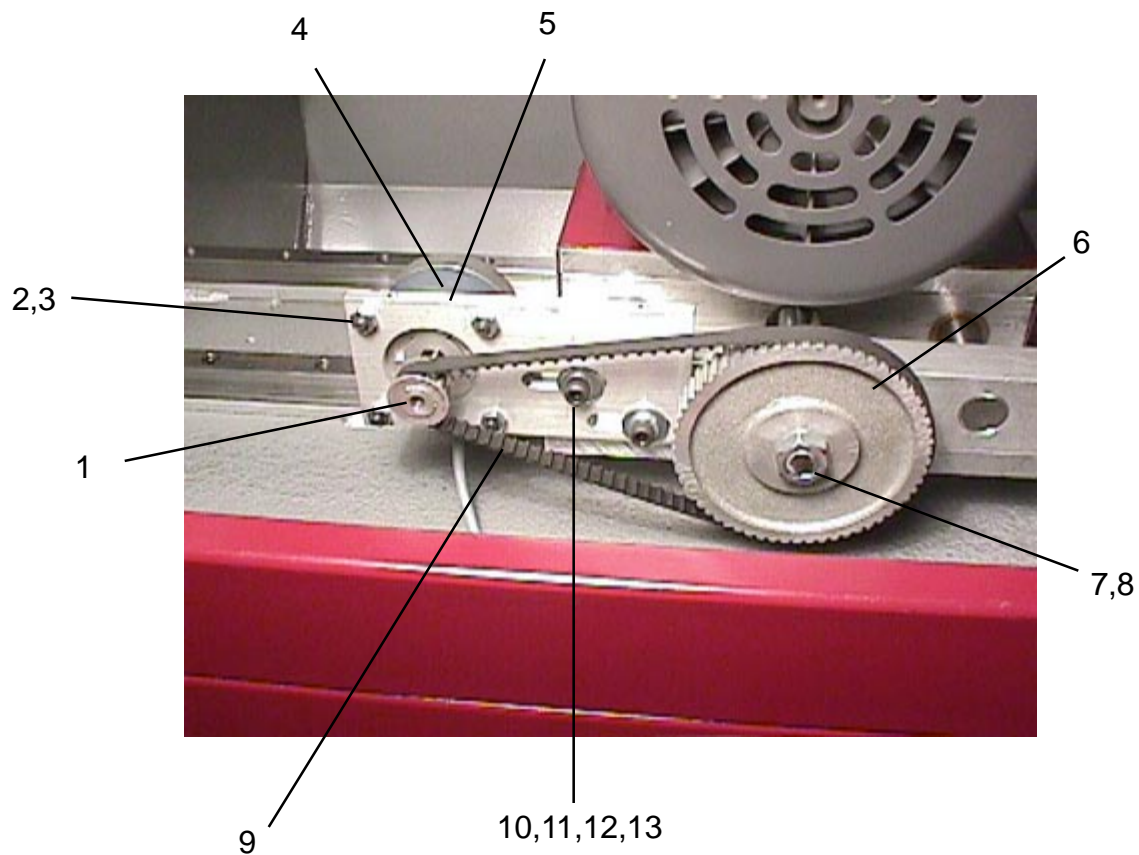
281 Carriage (with top plate)

Diagram No.	Part No.	Description
1	80245	M8-1.25 x 20 SHCS Low Head
2	B251211.....	1/4 - 20 x 3/4 SHCS
3	28165	Plate - top carriage



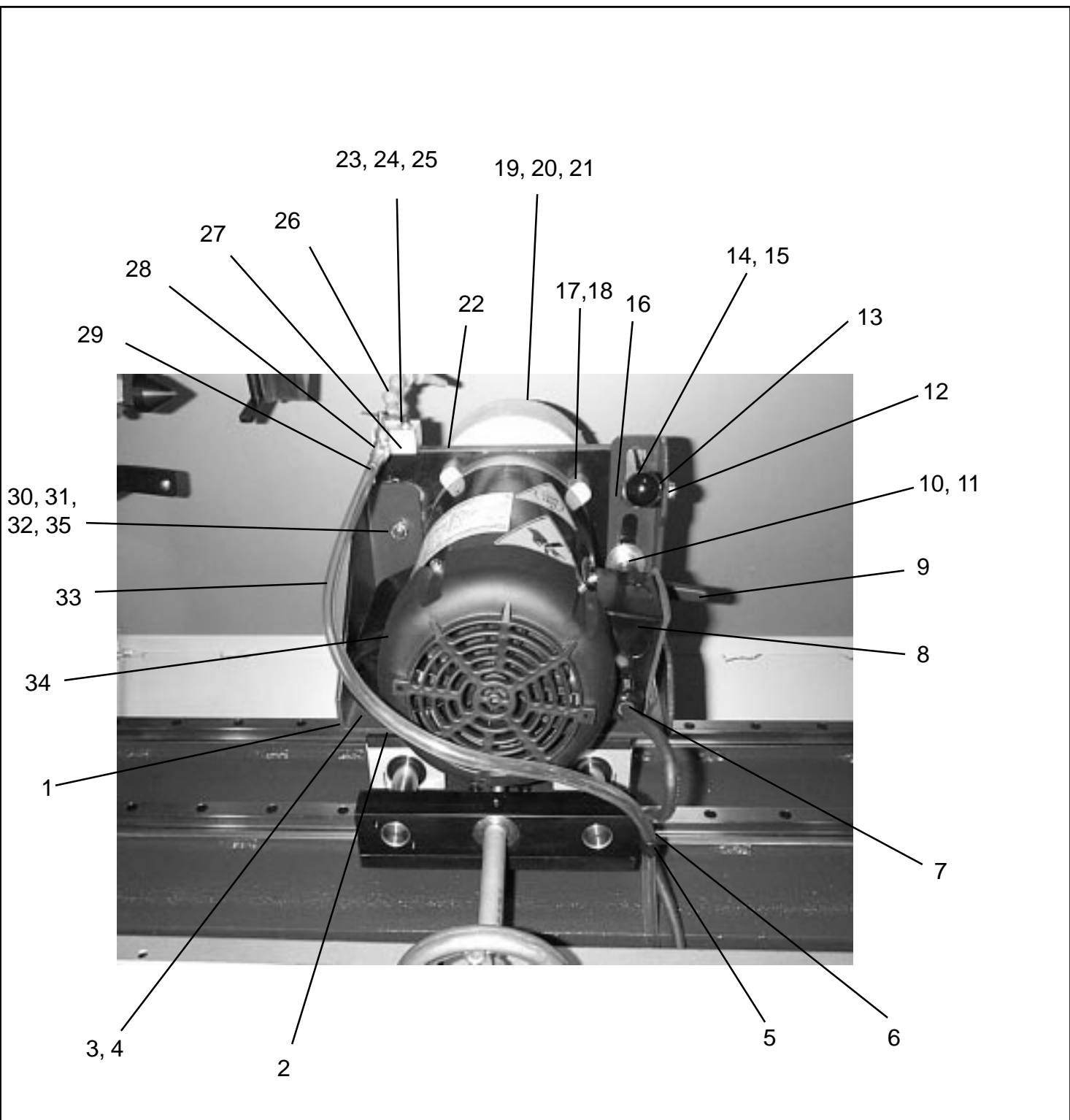
Travel Release

Diagram No.	Part No.	Description
1	17324	Extension
2	B191231.....	10-32 x 3/4 SHCS
3	28056	Slide, chain release
4	80053	Knob
5	K250001.....	1/4 washer flat
6	09249	10-24 flat head screw
7	28046	Catch, include pin
8	80261	Bottom, carriage
9	09687	Travel pin



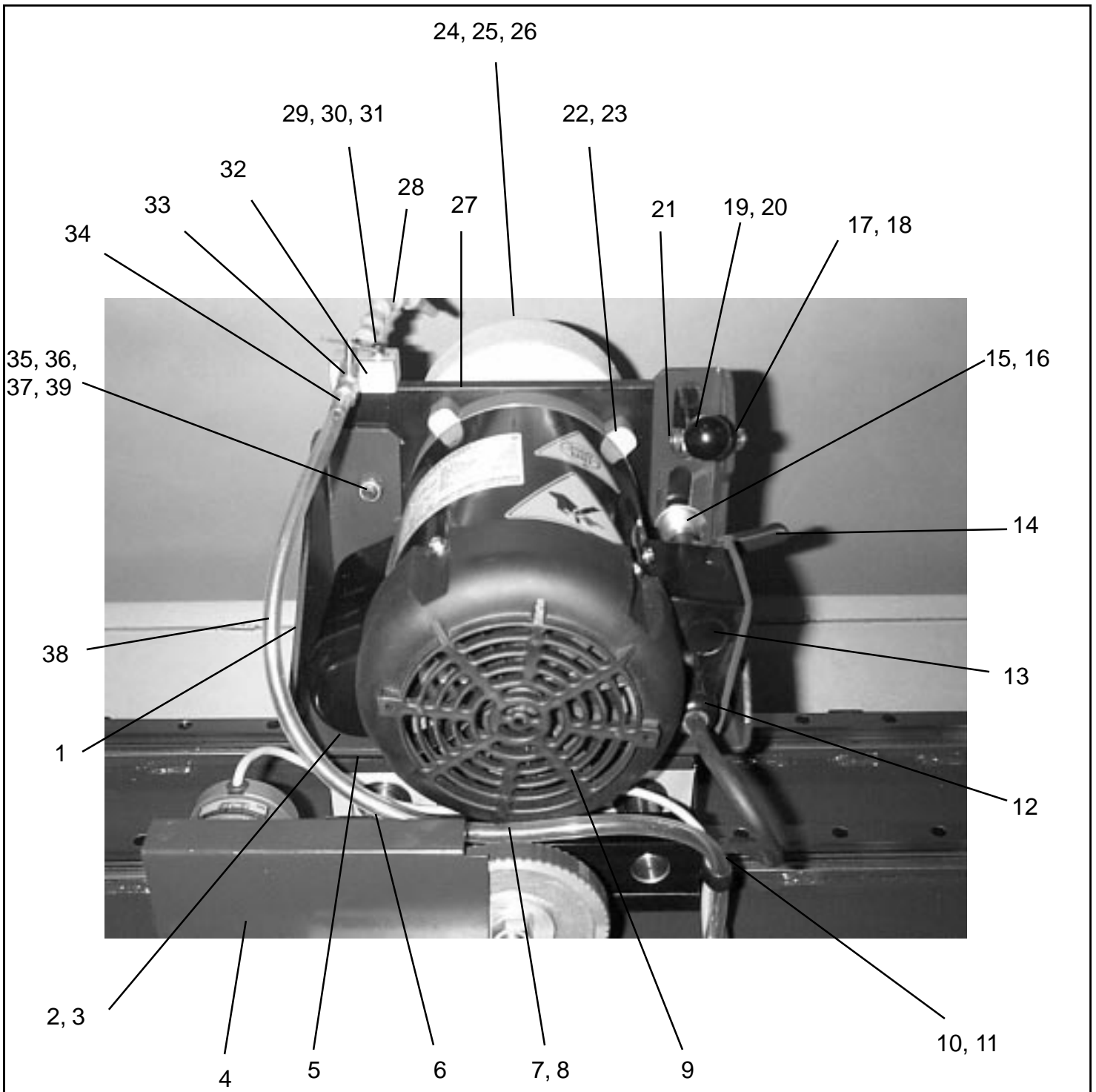
281A Carriage and Auto Infeed System

Diagram No.	Part No.	Description
1	80276	Pulley, Infeed Motor
2	B191213	10-24 BHSCS
3	J197100	10-24 Nylon locknut
4	09948	Motor - stepper
5	80275	Bracket, Infeed Motor
6	80277	Pulley, lead screw
7	2109096	Spacer
8	J502100	1/2-20 Hex jam nut
9	80278	Belt, infeed
10	B251211	1/4-20 x 3/4 BHSCS++
11	K250001	1/4 washer, flat
12	K251501	1/4 split lockwasher
13	7309069	Spacer



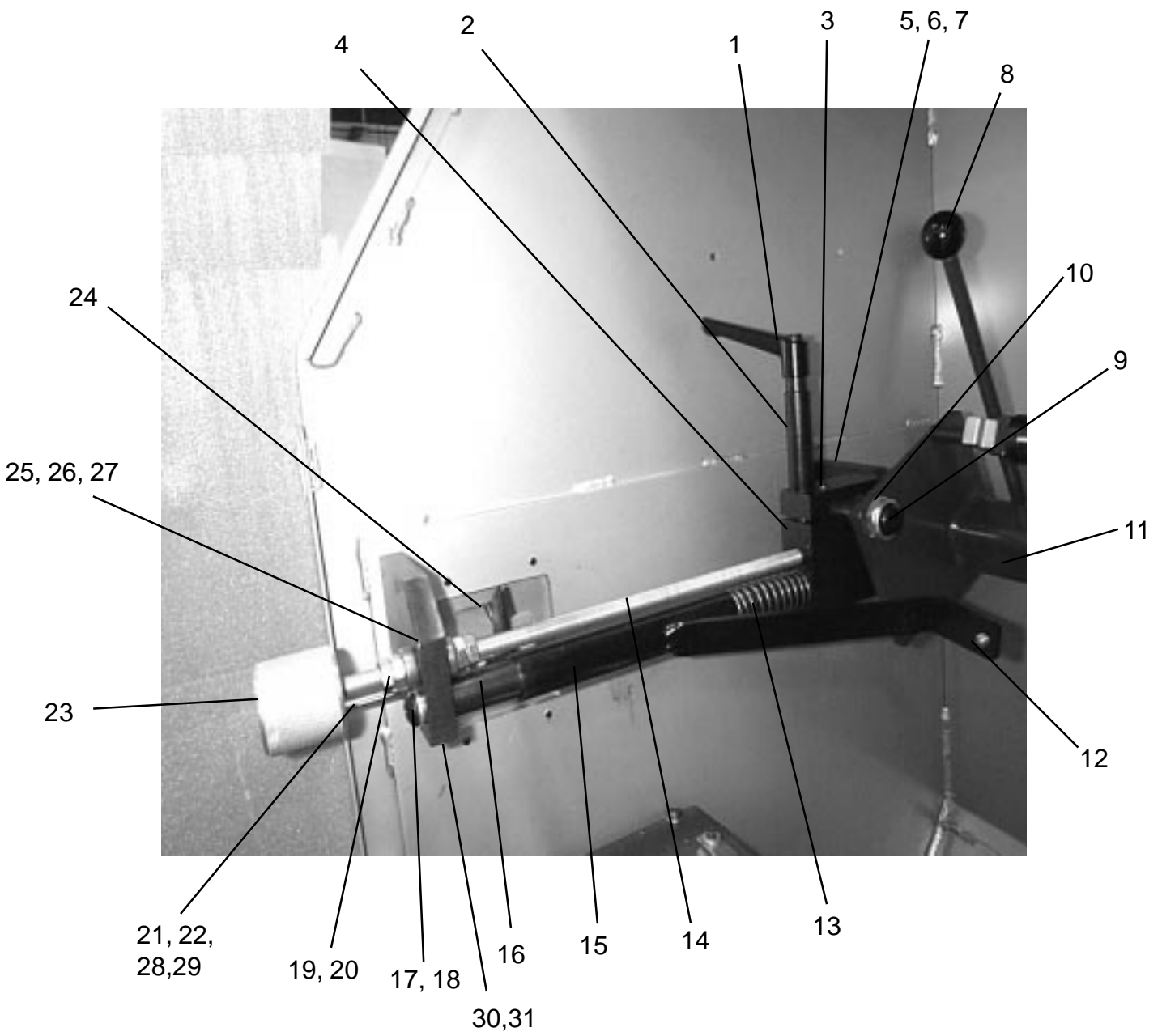
281S Carriage

Diagram No.	Part No.	Description
1	28214	Base motor support
2	28206	Shield carriage
3	B311201	5/16-18 x3/4 HHCS
4	K311501	5/16 split lockwasher
5	3708121	Clamp double tube
6	B250616	1/4-20 x.375 BHSCS
7	3707009	Strain relief
8	3707155	Wire nut
9	3708094	Handle adjustable
10	3708798	Spacer
11	3589106	Flat washer
12	J317000	5/16-18 nylon locknut jam
13	7309067	Spacer
14	3709526	Knob, ball 1"
15	28215	Lever grinding head lift
16	3708709375 x 1.0 Shoulder bolt
17	B371611	3/8-16 x1 SHCS
18	K371501	3/8 split lockwasher
19	6709103	Flange
20	3700409	Bushing
21	3700411	Grinding wheel
22	28213	Plate motor pivot
23	K190001	Flat washer
24	K191501	#10 split lockwasher
25	B191611	10-24 x1 SHCS
26	3709642	Swivel nozzle
27	3679116	Connector shut off valve
28	3709595	Valve shut off needle
29	3709593	Connector barbed
30	J377100	3/8-16 nylon locknut jam
31	3709019	Thrust washer
32	370878750 x.625 Shoulder bolt
33	7469138	Tube coolant
34	6609502	Motor 3/4 hp
35	09068	Conical washer



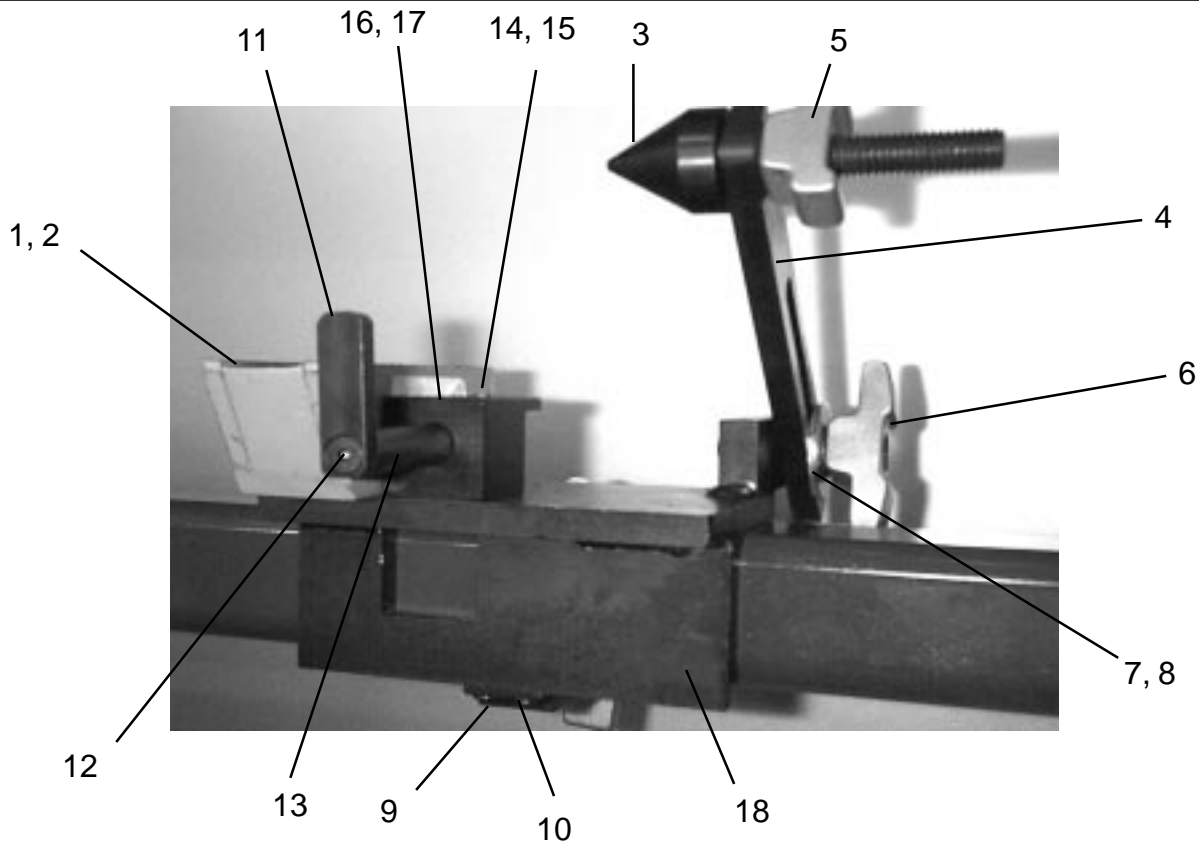
281A Carriage

Diagram No.	Part No.	Description
1	28214	Base motor support
2	B311201	5/16-18 x 3/4 HHCS
3	K311501	5/16 split lockwasher
4	80279	Guard belt
5	28206	Carriage shield
6	09218	10-24 x.5 SHCS low head
7	3707935	Tube clamp
8	09519	1/4-20 x.31BHSCS
9	6609502	Motor 3/4 hp
10	3708121	Clamp double tube
11	B250616	1/4-20 x.375 BHSCS
12	3707009	Strain relief
13	3707155	Wire nut
14	3708094	Handle adjustable
15	3589106	Flat washer
16	3708798	Spacer
17	J317000	5/16-18 nylon locknut jam
18	7309067	Spacer
19	3709526	Knob, 1" ball
20	28215	Lever grinding head lifter
21	3708709	.375 x 1.0 Shoulder bolt
22	B371611	3/8-16 x1 SHCS
23	K371501	3/8 split lockwasher
24	6709103	Flange
25	3700409	Bushing
26	3700411	Grinding wheel
27	28213	Plate, motor pivot
28	3709642	Swivel nozzle
29	K190001	Flat washer
30	K191501	#10 split lockwasher
31	B191611	10-24 x 1 SHCS
32	3679116	Connector shut off valve
33	3709595	Valve shut off needle
34	3709593	Connector barbed
35	J377100	3/8-16 nylon locknut full
36	3709019	Thrust washer
37	3708787	.50 x.625 Shoulder bolt
38	7469138	Tube coolant
39	09068	Conical washer



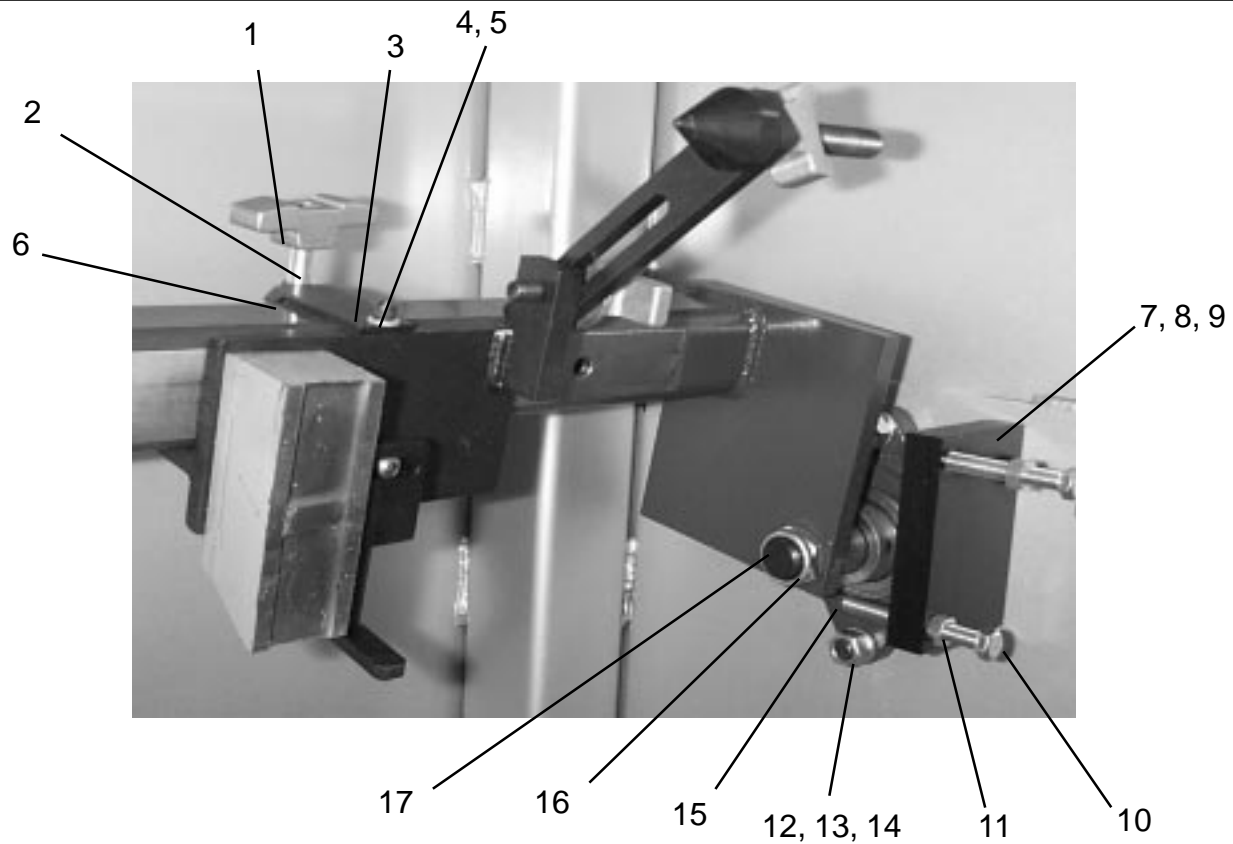
Tooling Bar Adjusters

Diagram No.	Part No.	Description
1	28514	Handle
2	27086	Spacer
3	B251611	1/4-20 x 1 SHCS
4	28020	Block, adjustment
5	28030	Block, support
6	B371616	3/8-16 x 1 BHSCS
7	K371501	3/8 lockwasher split
8	09909	Knob
9	28154	Pin tooling bar
10	J887200	7/8-14 locknut nylon
11	28150	Tooling Bar
12	3702086	Diamond dresser tip
13	28224	Compression spring
14	28133	Shaft Threaded
15	28508	Diamond dresser arm
16	28129	Shaft slide
17	K501501	1/2 split lockwasher
18	80048	1/2-13 x3/4 BHSCS
19	3709042	Bearing
20	J502100	1/2-20 hex jam nut
21	80382	Shaft
22	3109236	Knurled knob
23	28132	Knob 2" OD
24	3709526	Knob 1" ball
25	28222	Block support
26	B371616	3/8-16 x1 BHSCS
27	K371501	3/8 split lockwasher
28	C250424	1/4-20 x 1/4 Socket head Setscrew
29	3708810	5/16-24 Nylon Capped Locknut
30	3579284	1/8 Dia. Nylon plug
31	C190420	#10-24 x 1/4 Socket heas Setscrew



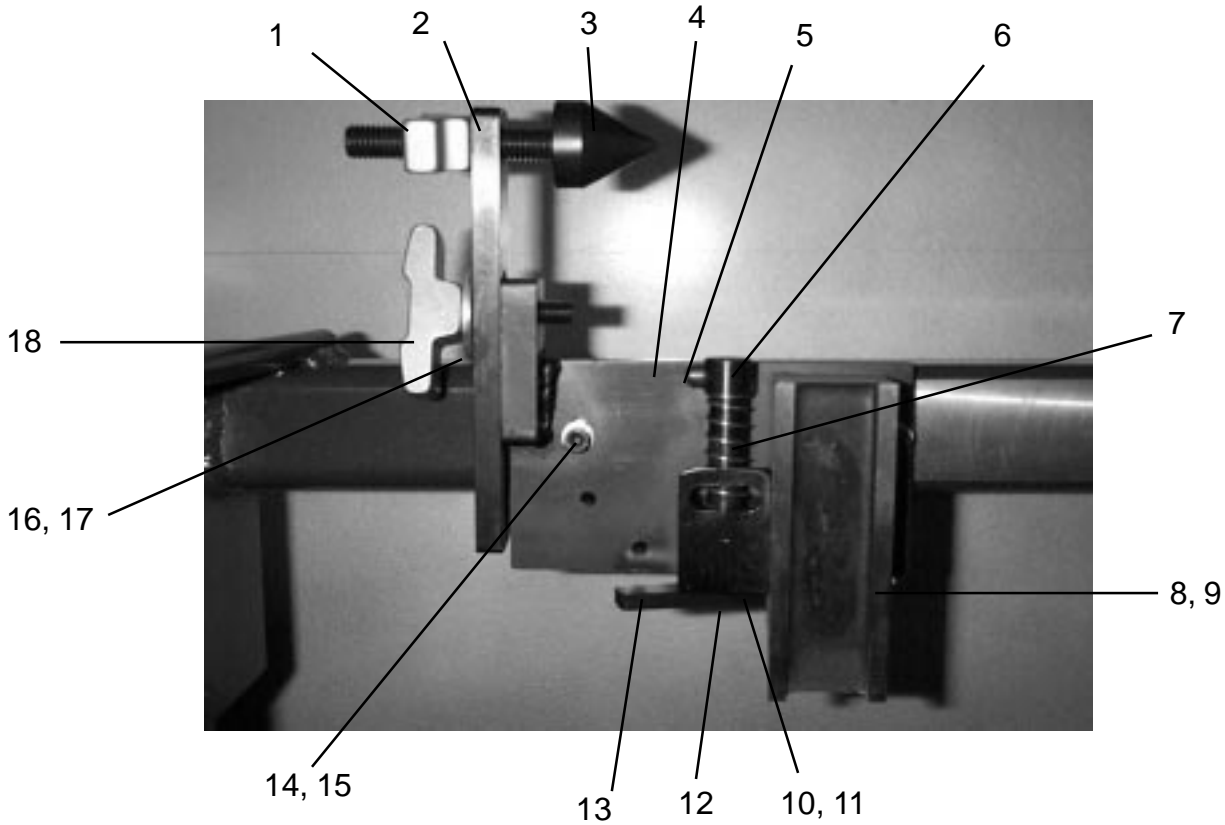
Bed Knife Support & Magnet RH

Diagram No.	Part No.	Description
1	6609019.....	Magnet
2	B250611.....	1/4-20 x 3/8 SHCS
3	6609538.....	Center
4	6609021.....	Plate, Slotted
5	80318	Knob
6	6009555.....	Knob
7	3589106.....	Washer flat
8	3709062.....	Washer conical
9	6609038.....	Plate
10.....	B190813.....	10-24 x 1/2 BHSCS
11.....	6709021.....	Tip gage
12.....	B190805.....	10-24 x 1/2 FHSCS
13.....	6609018.....	Shaft gage
14.....	3708654.....	Spring
15.....	6609023.....	Screw, modified
16.....	6609013.....	Block gage
17.....	B190811.....	10-24 x .5 SHCS
18.....	6609536.....	Base RH



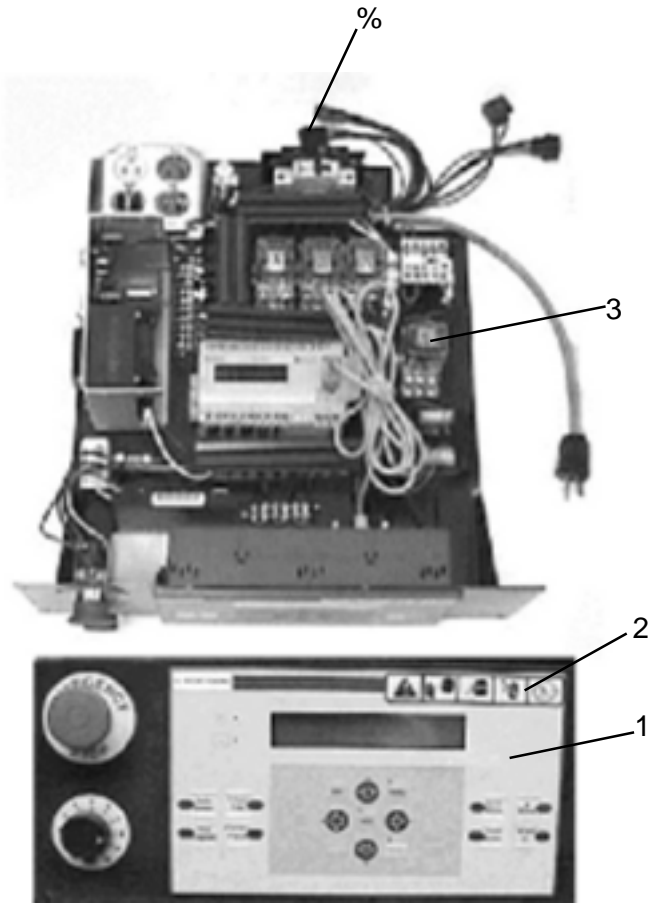
Bed Knife Support RH and Angle Stop

Diagram No.	Part No.	Description
1	6609501	Knob
2	3529069	Spacer
3	6609039	Plate
4	B250811	1/4-20 x 1/2 SHCS
5	K251501	1/4 split washer
6	C190620	10-24 x 3/8 SSS CP-PT
7	17322	Stop block
8	B371616	3/8-16 x1 BHSCS
9	K371501	3/8 split lockwasher
10	09263	3/8-16 x3 HHCS
11	J371000	3/8-16 hex nut
12	80048	1/2-13 x1.5 BHSCS
13	K501501	1/2 split lockwasher
14	J501000	1/2-13 hex nut
15	09414	Bearing
16	J887200	7/8-14 nylon lock nut
17	28154	Pin tooling bar



Bed Knife Support & Magnet LH

Diagram No.	Part No.	Description
1	80318	Knob
2	6609021	Plate, Slotted
3	6609538	Center
4	6609535	Base LH
5	6609023	Screw modified
6	6609018	Shaft gage
7	3708654	Spring
8	6609019	Magnet
9	B250611	1/4-20 x 3/8 SHCS
10	6609538	Block gage
11	B190811	10-24 x1/2 SHCS
12	B190805	10-24 x1/2 FHSCS
13	6709021	Tip gage
14	B251211	1/4-20 x3/4 SHCS
15	K251501	1/4 split lockwasher
16	3709062	Conical washer
17	3589106	Flat washer
18	6009555	Knob



281A Dashboard and Panel

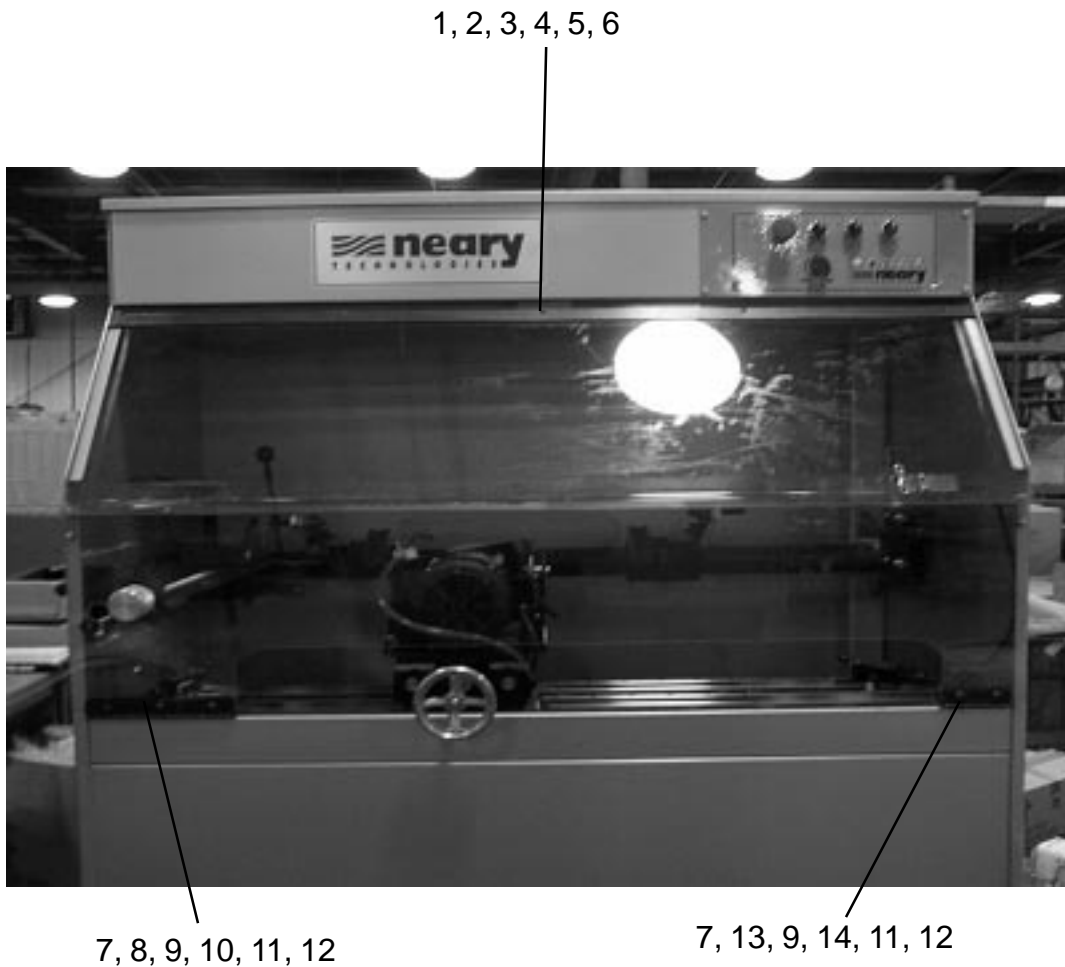
Diagram No.	Part No.	Description
1	28535	Control Panel
2	44027	Decal Warning
3	3708683.....	Decal LVR Warning

Black circuit breaker is for main power to unit.
 White circuit breaker is for power to the PLC.



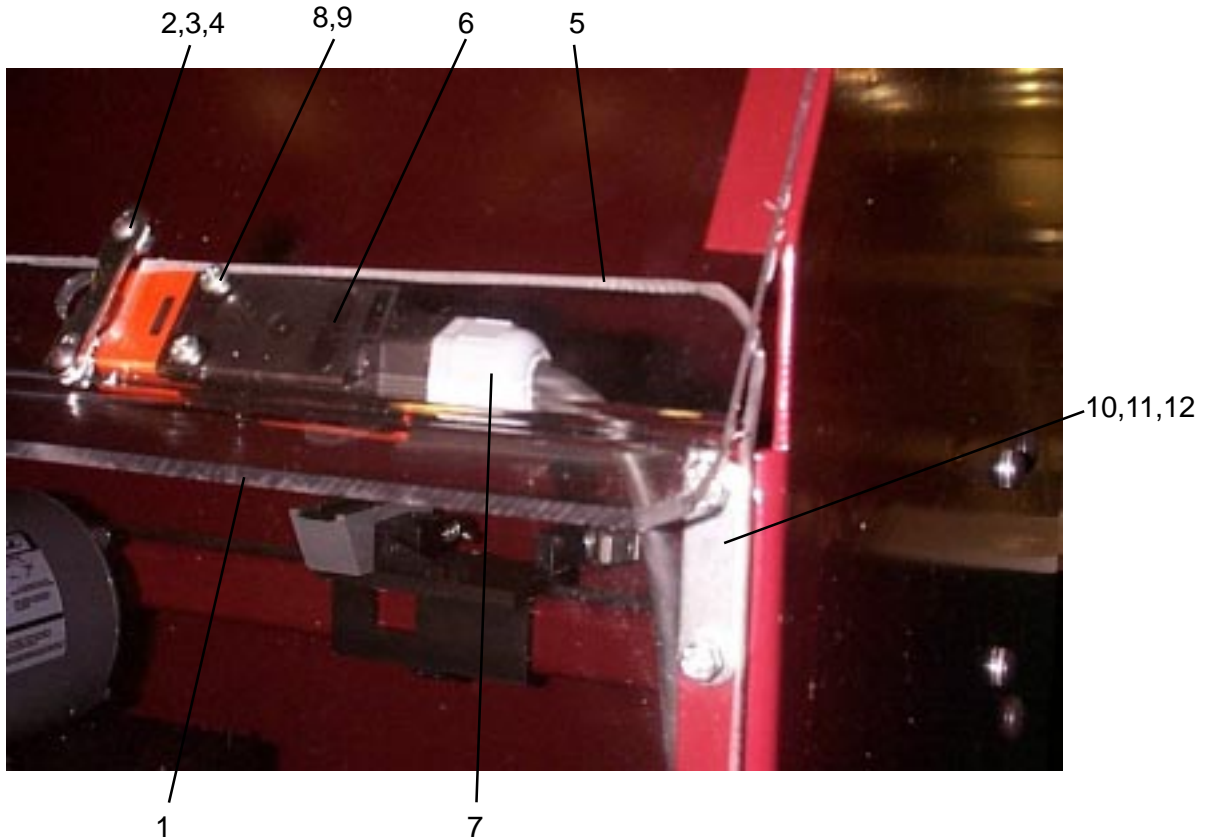
281A Safety Doors

Diagram No.	Part No.	Description
1	28161	Plate - upper guard door
2	3708378.....	Foam strip
3	28089	Guard - door - upper
4	28069	Channel - upper guard door
5	B191013.....	10-24 x 5/8 BHSCS
6	J197000.....	10-24 locknut insert jam
7	B311213.....	5/16 -18 x .75 BHSCS
8	6509300.....	Hinge
9	28087	Guard door lower
10.....	28092	Plate - guard door
11.....	J317000.....	5/16-18 Nylon jam locknut
12.....	B310813.....	5/16-18 x .5 BHSCS



281S Safety Doors

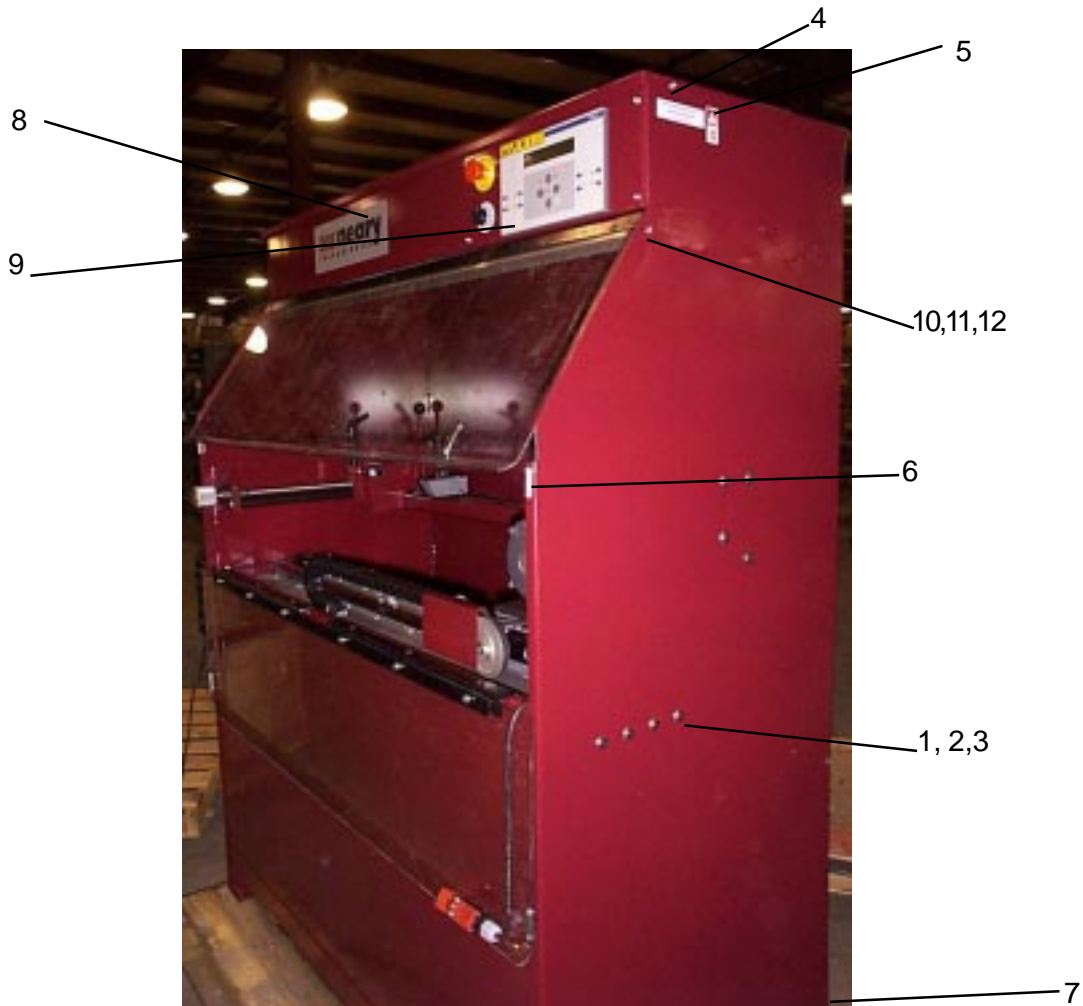
Diagram No.	Part No.	Description
1	28161	Plate - upper guard door
2	3708378	Foam strip
3	28089	Guard - door - upper
4	28069	Channel - upper guard door
5	B191013	10-24 x 5/8 BHSCS
6	J197000	10-24 locknut insert jam
7	B311213	5/16 -18 x .75 BHSCS
8	28159	Hinge LH
9	28038	Guard door lower
10	28158	Plate - guard door LH
11	J317000	5/16-18 Nylon jam locknut
12	B310813	5/16-18 x .5 BHSCS
13	28160	Hinge RH
14	28139	Plate - guard door RH



Safety Inter Lock Switch

Diagram No.	Part No.	Description
1	28089	Guard Door upper
2	3707132	Key - Safety switch
3	B160807	8-32 x 1/2 BHSCS
4	J167000	8-32 Nylon jam locknut
5	28087	Guard door lower
6	3707129	Switch - Safety interlock *
7	09372	Nut conduit 1/2
8	B162414	8-32 x 1-1/2 PHMS
9	J167000	8-32 Nylon jam locknut
10	28198	Strike plate magnetic catch
11	09289	6-32 Flat head slotted screw
12	J137000	6-32 Locknut insert thin

* Notes: Rotate key receiving face 180° from the front face wiring of switch, white wire goes to terminal 21, black wire goes to terminal 22.



281 Frame

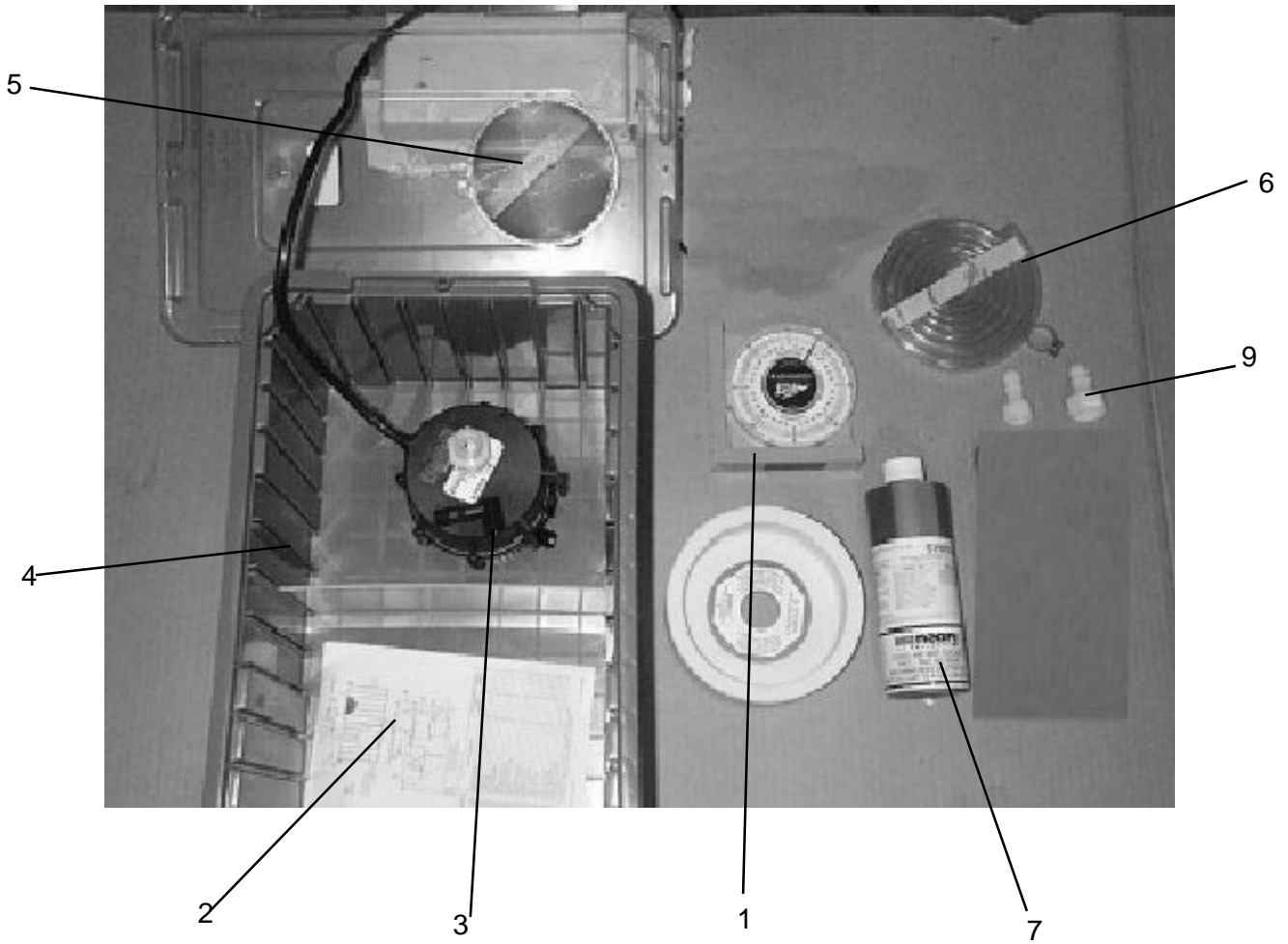
Diagram No.	Part No.	Description
1	28199	Bar channel support (not shown)
2	B371616.....	3/8 x 16 x 1 BHSCS
3	K371501.....	3/8 Split washer
4	80141	#10 x 1 hex wash head screw
5	09914	Decal - electrical warning
6	80094	Catch magnetic
7	B502401.....	1/2-13 x 1-1/2 HHCS
8	80006	Decal - Neary Technologies
9	28535	Control Panel
10.....	B253211.....	1/4-20 x 2 SHCS
11.....	28174	Spacer .26ID x.44OD x1.5L
12.....	J257100... ..	1/4-20 Nylon locknut



2,3

Light

Diagram No.	Part No.	Description
1	80236	Light fixture
2	B251216.....	1/4-20 x 3/4 BHSCS
3	J257100.....	1/4-20 Nylon locknut
4	K310001.....	5/16 washer

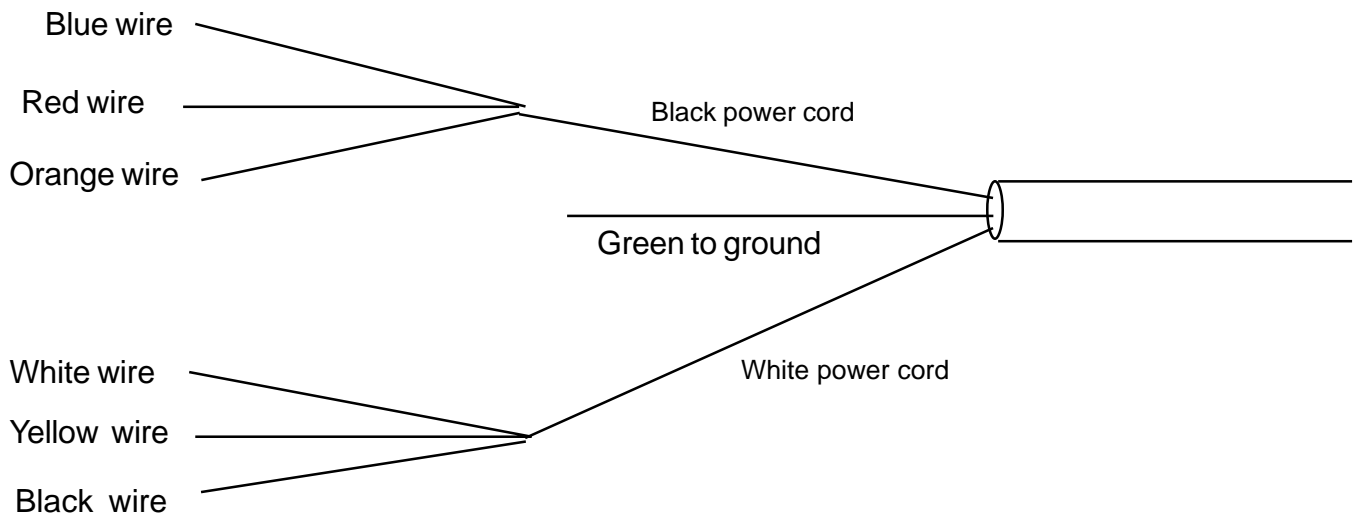


Parts Kit

Diagram No.	Part No.	Description
1	3702707	Protractor
2	28300	Manual
3	80026	Pump
4	80027	Tank
5	Screen (part of 80027)
6	Tube .62 ID (part of 80027)
7	80340	Coolant 1 pint
9	Adapters (part of 80027)
.....	09687	Extra Pins for traverse block (not shown)

Grind Motor 80320 Wiring 3/4 HP 3450 RPM 115 Volts, 50/60 Hz

Motor rotation is correct when the sparks go down and to the left, as viewed from the operator's position. Motor should rotate counterclockwise as viewed from the operator's position.



Rotate the motor mount bracket clockwise before securing to the top of the carriage. This assures that the left edge of the grinding wheel contacts the bedknife. Only one edge of the wheel should do the grinding. If grinding occurs on both sides, loosen the motor mount bracket and rotate as shown. Then secure to top of carriage

