

# 6520570

## PREVENTIVE MAINTENANCE MANUAL

### FOR MODEL NUMBERS:

MODEL 6520910/6520915 S/N 1001 THRU 1039, MODEL 6520920/6520925 S/N 1001 THRU 1013,  
MODEL 6320910/6320915 S/N 1001 THRU 1109, MODEL 6320920/6320925 S/N 1001 THRU 1027,  
MODEL 6320930/6320935 S/N 1001 THRU 1014, MODEL 6320940/6320945 S/N 1001 THRU 1004



### WARNING

You must thoroughly read and understand this manual before operating the equipment, paying particular attention to the Warning & Safety instructions.

# **INSTALL THE FOLLOWING PARTS INCLUDED IN THIS KIT:**

**FOLLOW THE INSTRUCTIONS INCLUDED IN THIS MANUAL.**



## **TRAVERSE BEARINGS:**

Replace the four traverse bearing (3709044). Follow the instructions provided on pages 8-9.



## **SPINDLE REPLACEMENT KIT:**

Install the spindle replacement kit ( Part No. 6329536) included in this kit. Follow the instructions provided in the kit.

# MAKE THE FOLLOWIN RECOMMENDED ADJUSTMENTS:

FOLLOW THE INSTRUCTIONS INCLUDED IN THIS MANUAL.



## LUBRICATE RELIEF FINGER ASSEMBLY:

- a) Grease the dovetail using fitting on bottom of assembly (See pg 11)
- b) Lubricate the grinding wheel diameter adjusting screw (See pg 11)



## ADJUST REEL FINGER DOVETAIL GIB AND ADJUSTING KNOB:

Follow the instruction on page 14 of the manual to adjust dovetail gib and knob.



## GRINDING HEAD BELT TENSION:

After installing the SPINDLE REPLACEMENT KIT, follow the instructions on page 14 to correctly set the grinding head belt tension.



## SET THE TENSION ON THE GRINDING WHEEL DIAMETER ADJUSTING SCREW:

See page15 of this manual to adjust tension on wheel diameter screw.



## CHECK THE CROSS SLIDE:

Move the cross slide through its full range of motor and check for any binding. Check the cross slide shafts for any scarring or gnarling that could interfere with the function of the cross slide. Replace shafts if necessary following procedure in the manual.



## CHECK FUNCTION OF THE SETUP GAGE:

Verify the setup gage works smoothly. Clean gage as specified on page 22.



## INSPECT WINCH AND BOOM:

Check winch cable for any fraying or kinks. Replace cable assembly if necessary. Fix any cracks, rust or defects in the boom weldment. Replace if necessary. Verify Trolley and winch work well.



## INSPECT MACHINE FOR LOOSE FASTENERS:

Check the frame for any loose fasteners. Replace any worn or damaged components.



## CHECK TRAVERSE CLAMP FORCE AND BELT TENSION:

Follow the instruction on page 18 of the manual to adjust clamp tip to block distance.



## CLEAN VACUUM :

(Optional on 632). Empty bag. Order cloth replacement bag (3708937) and filter (3708903) if needed. (The production vacuum for these serial numbers has a grey bottom with a black top) For the New Vacuum Kit order kit Part No. 6529550.



## INFEEED SWITCH (632 MANUAL MODEL ONLY)

If the infeed switch sticks and does not return immediately when released, replace the switch with Part No. 3707713.

# 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. Machine 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.** Wear no loose clothing, gloves, neckties, or jewelry which may get caught in moving parts. Nonslip foot wear is recommended. Wear protective hair covering to contain long hair.
10. **ALWAYS USE SAFETY GLASSES.**
11. **SECURE YOUR WORK.** Make certain that the cutting 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 Service 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 the switch is 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 illustration in Service Manual for the proper location and part numbers 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.

## DO

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.
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.

## DON'T

1. **DON'T** use a cracked wheel or one that 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** ever **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 TIGHTEN** the mounting nut excessively.
6. **DON'T** grind on the **SIDE OF THE WHEEL** (see Safety Code 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 maintain dust level below the Threshold Limit Value for nuisance dust as classified by OSHA.

This machine is intended for grinding the reel of reel type mower units 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 manufacturers 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 washer to clean the machine.



## CONTENTS

Safety Warnings .....	Page 4 - 6
Service Data .....	Page 7
Bearing tester fork .....	Page 8
Linear Bearing Installation .....	Page 9
Spindel Kit Installation .....	Page 10
Lubrication and Adjustments .....	Page 11 -13
Adjustments .....	Page 14-20
Maintainance .....	Page 21-22
Mechanical Troubleshooting .....	Page 23-24

# SERVICE DATA

## SKILL AND TRAINING REQUIRED FOR SERVICING

This Service Manual is designed for technicians who have the necessary mechanical and electrical knowledge and skills to reliably test and repair the ACCU-Master Spin/Relief Grinder. For those without the background, service can be arranged through your local distributor.

This Manual presumes that you are already familiar with the normal operation of the Grinder. If not, you should read the Operators Manual, or do the servicing in conjunction with someone who is familiar with its operation.

Persons without the necessary knowledge and skills should not remove the control box cover or attempt any internal troubleshooting, adjustments, or parts replacement.

If you have questions not answered in this manual, please call your distributor. They will contact the manufacturer if necessary.

## TORQUE REQUIREMENTS

Throughout this manual we refer to torque requirements as "firmly tighten" or the like. For more specific torque values, refer to the information below.

### Bolts Going Into a Nut, or Into a Thread Hole in Steel.

Refer to the table at the right.

### Bolts Going Into a Thread Hole In Aluminum

Use the Grade 2 values in the table at the right.

### Socket-Head Screws Going Into a Nut or Steel




Use the Grade 8 values in the table at the right.

### Machine Screws

No. 6 screws: 11 in.- lbs (0.125kg - m)

No. 8 screws: 20 in. - lbs (0.23 kg - m)

No. 10 screws: 32 in. - lbs (0.37 kg - m)

	GRADE 2  SMOOTH HEAD	GRADE 5  3 MARKS on HEAD	GRADE 8  6 MARKS on HEAD
<b>1/4 In. thread</b>	6 ft-lbs (0.8 kg-m)	9 ft-lbs (1.25 kg-m)	13 ft-lbs (1.8 kg-m)
<b>5/16 In. thread</b>	11 ft-lbs (1.5 kg-m)	18 ft-lbs (2.5 kg-m)	28 ft-lbs (3.9 kg-m)
<b>3/8 In. thread</b>	19 ft-lbs (2.6 kg-m)	31 ft-lbs (4.3 kg-m)	46 ft-lbs (6.4 kg-m)
<b>7/16 In. thread</b>	30 ft-lbs (4.1 kg-m)	50 ft-lbs (6.9 kg-m)	75 ft-lbs (10.4 kg-m)
<b>1/2 In. thread</b>	45 ft-lbs (6.2 kg-m)	75 ft-lbs (10.4 kg-m)	115 ft-lbs (15.9 kg-m)

# ADJUSTMENTS

## TESTING FOR PLAY IN THE BEARINGS USING THE BEARING TESTER FORK

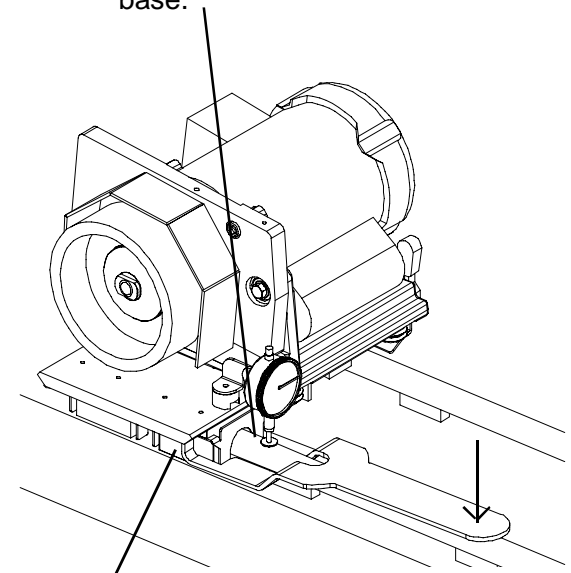
The traverse bearings on this grinder tend to wear and last typically around 3-6 years depending on the amount of use and periodic maintenance done. If you believe your bearings are still in good working condition they may be tested and adjusted on the machine using the Bearing Tester Fork and a dial indicator. If you does not have an dial indicator you may purchase a Dial Indicator kit 3706060 designed to be used with the Bearing Tester Fork. If the bearings are being replaced follow the procededures on the next page. The tester fork may be used at a later date to adjust the bearings in place if needed.

### TESTING PROCEDURE:

1. Position Dial Indicator assembly on the machine grinding head assembly next to the bearing to be tested. (Remove the bellows if the machine has them installed) The dial indicator should be within 1" of the side of the Grinding head carriage directly above the bearing being tested. It is best to measure to the traverse shaft with a wide flat tip.
2. Insert Bearing Testing Fork 3706055 until the fork contacts the wiper bracket or the bearing.
3. With the tip of the Dial Indicator on the traverse shaft zero out the Dial Indicator.
4. Use your hand and press on the end of the Bearing Tester Fork until it contacts the traverse rail. See Fig 1. Read the movement on the dial indicator. If the movement exceeds .003" the bearing needs to be adjusted. Retest the bearing after adjusting the tension on the bearing. If the bearing does not improve to below the .003" reading then the bearing needs to be replaced.

Repeat steps 1-4 for the other other bearings on the located installed on the carriage.

Dial Indicator must be positioned over the bearing being tested and located within 1" of the side of the carriage base.



Press down on Bearing Tester Fork and Read Dial.

**FIG. 1**

If dial reads more than .003" of movement, adjust bearing tension. Using the bearing tension screw. See Fig 2.



# INSTALLATION OF LINEAR BEARINGS

## CARRIAGE LINEAR BEARING REPLACEMENT

**STEP 1**--Detach the bellows mounting brackets from the carriage. Detach front and rear shields. See FIG. 3.

**STEP 2**--Remove the three screws of one linear bearing and slide the linear bearing off the end of the carriage shaft.

**STEP 3**--Insert a new linear bearing onto the end of the carriage shaft with the tension adjustment screw pointing outward. See FIG. 2. Adjust the tension screw of the linear bearing so when you radially rotate the linear bearing around the carriage shaft there should be no free play between the linear bearing and the carriage shaft.

**NOTE: Tension** is too tight if you feel a cogging action when you rotate the linear bearing around the shaft. This cogging is from the skidding of the bearing on the shaft and indicates tension screw is too tight.

Finally, sliding the bearing block back and forth should be a smooth uniform motion.

**! BEARING TENSION IS CRITICAL TO PROPER GRINDING. BEARINGS WHICH ARE TOO TIGHT OR TOO LOOSE WILL CAUSE POOR GRIND QUALITY. ALSO, BEARINGS WHICH ARE TOO TIGHT WILL HAVE SUBSTANTIALLY SHORTER LIVES AND MAY DAMAGE THE SHAFT.**

**STEP 4**--Slide linear bearing under carriage and attach with the three screws.

**NOTE: Repeat Steps 2 thru 4 with the other three linear bearings.**

**STEP 5**--After all four linear bearings are reattached to the carriage check for correct bearing tension. The bearing tension is correct when you try to lift the carriage and can feel no carriage movement, which is free play up and down. The most dependable method of checking free play is to use a magnetic base dial indicator attached to the traverse frame weldment and reading the vertical movement above each bearing. This movement should be within .001" [.03 mm] Also, when pulling the carriage in the traversing direction, there should be only approximately a 3 lb force, with the actuator disengaged. To check this attach a spring scale to the carriage and pull parallel to the carriage shafts. To double check the assembly, slide the carriage assembly from "end of travel" to "end of travel", it should have very uniform resistance through the full range of travel.

**STEP 6**--Replace front and rear shields. See FIG. 3. Replace the bellows carriage mounting brackets onto the carriage after the actuator bearings are replaced (see next page).

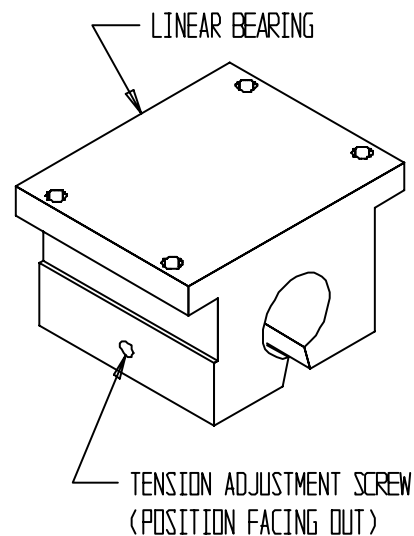


FIG. 2

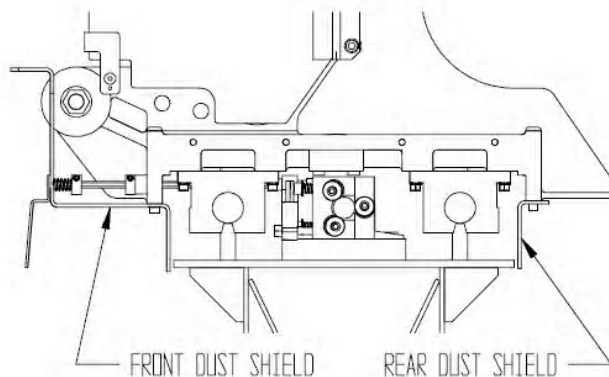


FIG. 3

# INSTALLATION OF SPINDLE KIT

## REPLACEMENT OF GRINDING HEAD SHAFT & BEARINGS

Remove grinding wheel and grinding wheel knob. The Grinding Head Spindle Assembly consists of the grinding head spindle and a ball bearing press fit together. The left side ball bearing is slip fit on the opposite end. To replace the spindle assembly remove the left side grinding wheel grip knob, square key and belt cover. See FIG. 4. Loosen the 4 socket head cap screws on the motor plate to remove the poly-V belt. Loosen the 2 set screws on the spindle pulley and remove the pulley, square key and pulley spacer. Push on the right hand side of the spindle assembly to compress conical washers so there is no pressure on the shaft retaining ring. Using a retaining ring pliers remove the small external retaining ring from the spindle assembly. You can now remove the spindle assembly out the right side by lightly tapping on the left end with a rubber mallet. The second ball bearing can be removed from the belt side of the Grinding Head Housing.

To reassemble place the 4 conical washers (2 Pair nested and then place the 2 pairs back to back) against the ball bearing on the new spindle assembly. See FIG. 5. Thoroughly clean the housing bore and the outside diameter of both bearings. Apply blue Loctite #242 to the outside diameter of the two bearings. Slide the spindle assembly into the right side of the Grinding Head Housing. Install the bearing sleeve against the bearing on the spindle assembly. Slip fit the new left side ball bearing onto the spindle assembly and into grinding head housing. Install the 9/16-18 Locknut onto the spindle shaft and using a spanner wrench on the right side of the spindle and a 7/8 deepwell socket on the left side, torque the locknut to 20 Ft. Lbs.

Replace the square key and the pulley pushing the pulley against the locknut with no end play. Apply blue locktie to the pulley bore before installation. Next install blue Loctite #242 on the pulley setscrews and tighten the two pulley set screws. Then remount the poly-V belt. (See Grinding Head Belt Tension Adjustment in the adjusting section). Replace belt cover and square key and mount the left side grinding wheel grip knob and tighten the two set screws.

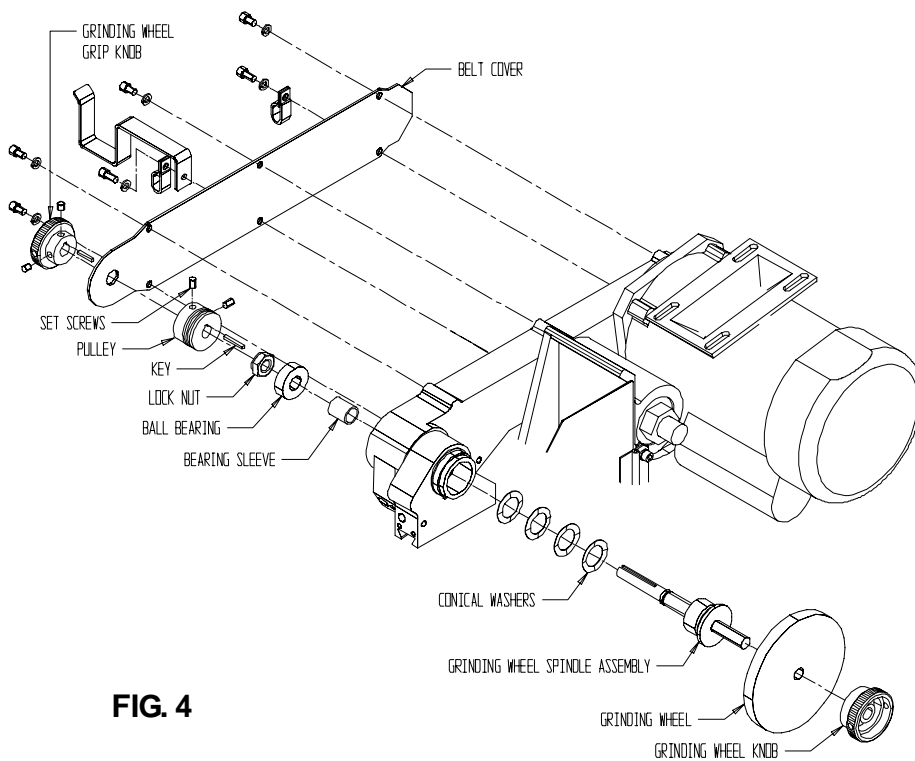


FIG. 4



FIG. 5

# LUBRICATION & ADJUSTMENTS

## LISTED BELOW ARE MAINTENANCE ITEMS TO BE PERFORMED:

1. Clean the tank and filter of the vacuum system. This should be done weekly or more often depending on the number of reels ground. Replace the vacuum bag and filter.
2. Use the grease fitting provided to grease the dove tail with high quality lithium grease. Wipe off excess grease. See FIG. 6. This should be done monthly.
3. Wipe and re-oil with spray lubricant, the grinding wheel diameter adjusting lead screw. This should be done every three months. Wipe off all excess lubricant. See FIG. 6.
4. Wipe and relube with never-seez, the vertical and horizontal alignment shafts and lead screws. This Should be done every six months. See FIG. 7. Move Adjust through full range of motion. If binding see page 19 for adjustments or page 20 for replacements of the shafts or other parts.
5. Lift the bellows and wipe off the bearing rails. Lubricate linear bearing, follow the lubrication procedure on the following pages. Generally, this will be every six months to a year.
6. Check the gib adjustment, see page 14 for details.

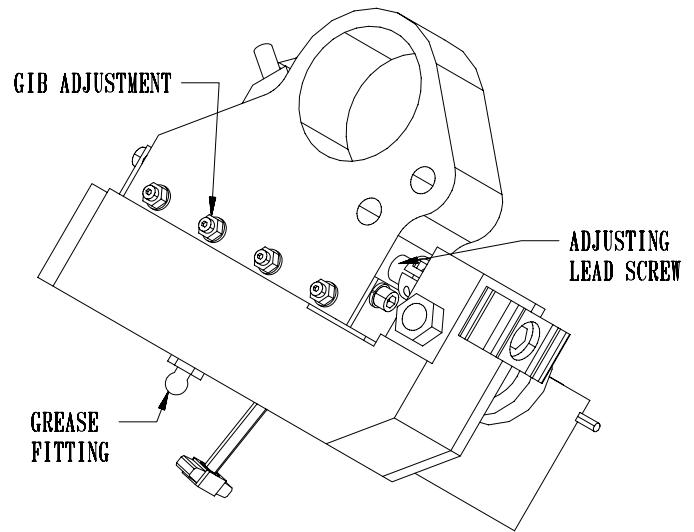


FIG. 6

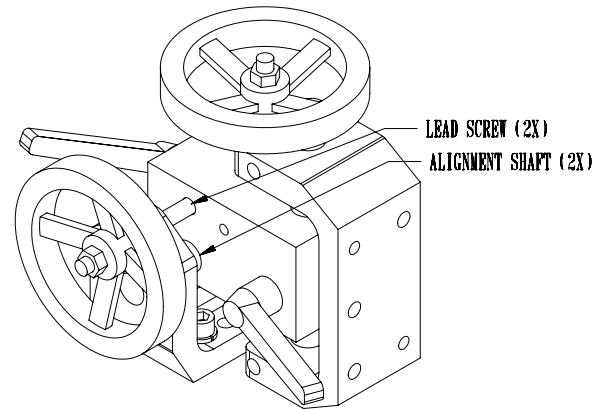


FIG. 7

**IMPORTANT REMINDER:**  
DAILY MAINTENANCE IS SPECIFIED  
ON PAGE 4 OF THE OPERATOR'S  
MANUAL, AND IS TO BE PERFORMED  
BY THE OPERATOR.

# LUBRICATION

## LUBRICATION OF LINEAR BEARINGS

STEP 1--Thoroughly clean the shafts.

STEP 2--Flood spray the two shafts with a spray lubricant (**do not use a teflon based lubricant**) until the lubricant is dripping off the shafts. See FIG. 8 Then run the carriage back and forth through its range of travel. This will carry the lubricant into the bearings.

STEP 3--With a clean rag, wipe off the excess amount of lubricant from the shafts. Run the carriage back and forth through its range of travel and wipe the shafts after each traverse. Repeat until the shafts are dry to the feel. This completes the lubrication process.

If the unit will be shut down for an extended period of time, more than four weeks, then the shafts and other appropriate parts of the unit should be flooded with lubricant and that lubricant left in place until the unit is brought back into service. When the unit is brought back into service the full lubrication procedure as stated above should be repeated.

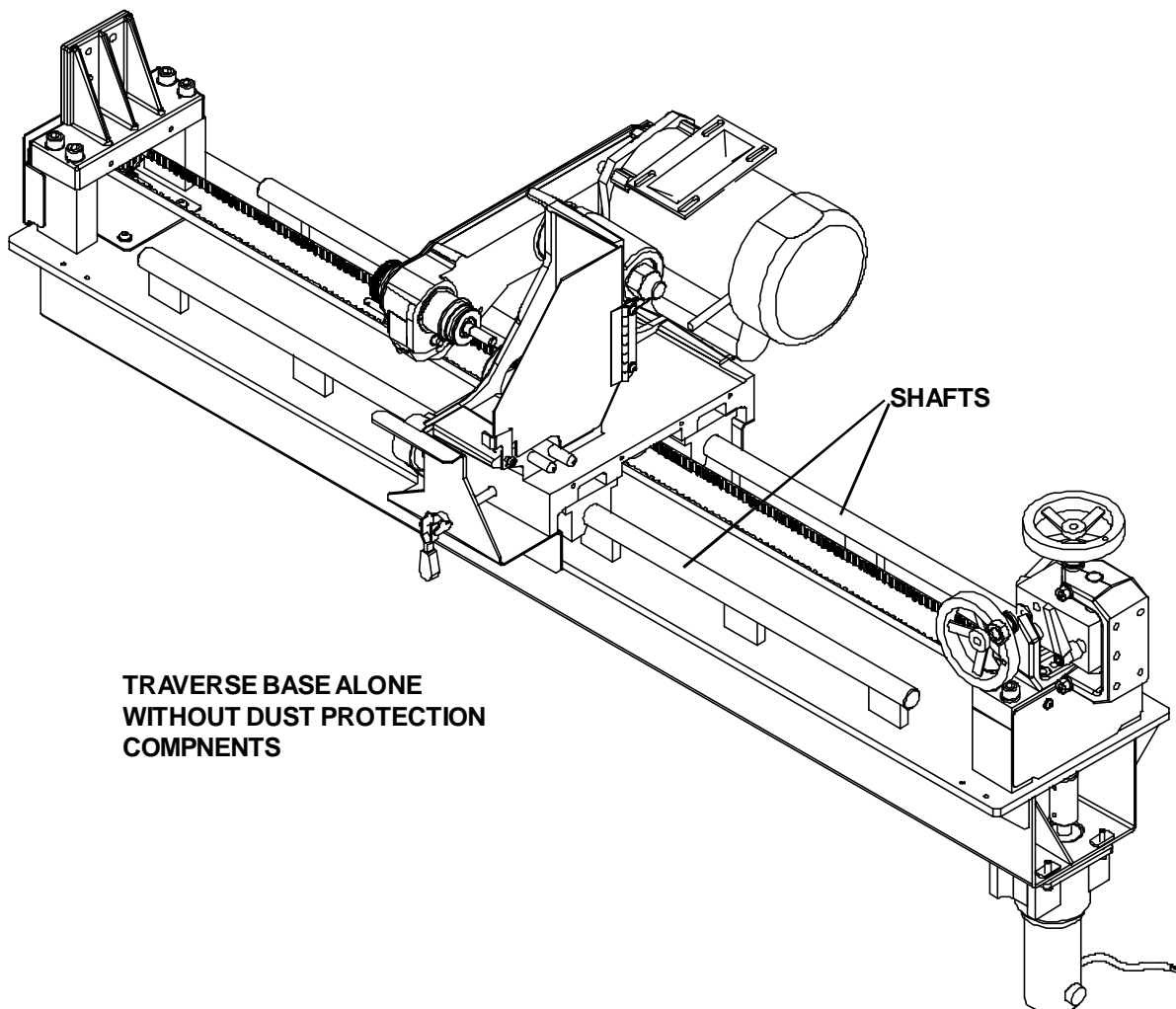


FIG. 8

# STORAGE PROCEDURE

It is important to follow the procedures below when placing your grinding in storage for an extended period of time. Proper care will help maintain the working functions of the grinder and decrease maintenance and problems that occur when storing the grinder.

## **BEFORE STORING THE GRINDER:**

-Clean the machine thoroughly. **(DO NOT USE COMPRESSED AIR OR A POWER WASHER TO CLEAN THIS MACHINE!)** See Maintenance section for instructions on cleaning polycarbonate.

-Lubricate the following parts by flooding the area with a spray lubricant and leaving it in place: (Do not use a Teflon based lubricant)

    Traverse Shafts & Linear bearings (see Lubrication section of manual)  
    Remove grinding wheel and spray the movable parts of the finger system  
    Cross slide shafts and adjustment screws (Right side of Traverse Base)  
    Scratches in the paint or any other bare metal surfaces

-Work the lubricant in by moving parts through their full range of motion.

-Make sure all controls are in the off position and unplug the unit from the wall. Turn off the digital alignment gage.

-Cover the unit if possible with a sheet or tarp.

## **BRINGING THE UNIT BACK INTO SERVICE:**

-Remove the cover and reapply lubricant to the items stated above. Wipe off all excess lubricant. (See Lubrication section for more details.)

-Plug the unit into the wall and test all electrical functions.

-Check the belts for cracking and adjust the tension if necessary.

-Check for damaged or missing parts.

# ADJUSTMENTS

## REEL FINGER DOVETAIL GIB AND ADJUSTING KNOB ADJUSTMENTS

The reel finger slide to the reel finger positioner has a dovetail with an adjustable gib for tensioning. Tighten the gib set screws on the side so there is no free play in the dovetail slide. Check for movement when pushing on the relief finger side to side with 20 lbs. (44kg) force. Make sure the knob assembly for adjusting the relief finger to the grinding wheel is rotatable by hand. The gib adjustment should be sufficient to maintain a rigid position of the reel finger. See FIG. 9.

Check the knob assembly rotating tension by checking the tightness of the nylon plug to the knob assembly threads. The tightness has to be sufficient so the knob assembly does not rotate during the relief grinding cycle. See FIG. 10.

NOTE: To adjust the nylon plug you must lock the index finger assembly down and then adjust the reel finger positioner so the clearance holes line up with the nylon plug set screw.

Take up any free play between the tee knob assembly, reel finger slide and .375 threaded split shaft collar. Loosen the shaft collar locking cap screw and rotate the shaft collar until there is no end play. Retighten locking cap screw on the threaded split shaft collar. See FIG. 9.

## GRINDING HEAD BELT TENSION ADJUSTMENT

The left side grip grinding wheel knob must be removed for belt tensioning adjustment. Remove the six screws holding, the two double tube clamps and the belt cover. For grinding motor belt adjustment, loosen the four socket head cap screws that attach the motor. Adjust the grinding motor for proper belt tension by pushing back on the motor and tighten the four socket head cap screws. The proper belt tension for the grinding head is to push down on the poly V belt half way between the two pulleys with 5 lbs. (2KG) of force and belt movement dimensions to be .12 inches (3mm). See FIG. 11. To verify belt tension mount the belt guard with two screws. Turn the motor on. If the belt is tensioned correctly, start-up torque of the motor through the pulley to the belt should have zero slippage. If there is belt slippage when turning on the motor there will be a slight squeal before the belt comes up to speed. When you achieve correct tension, reassemble all of the remaining parts that have been removed.

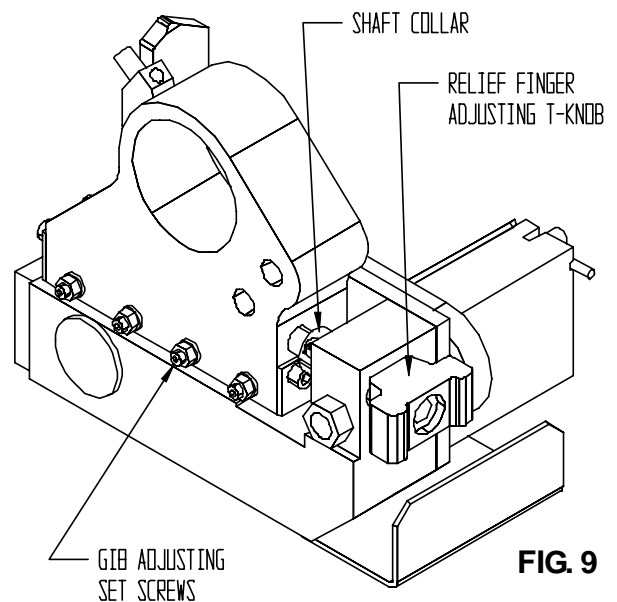


FIG. 9

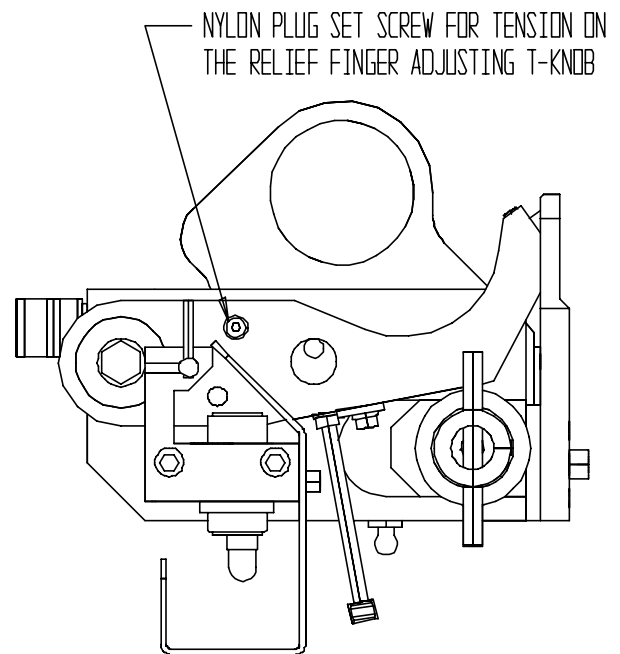


FIG. 10

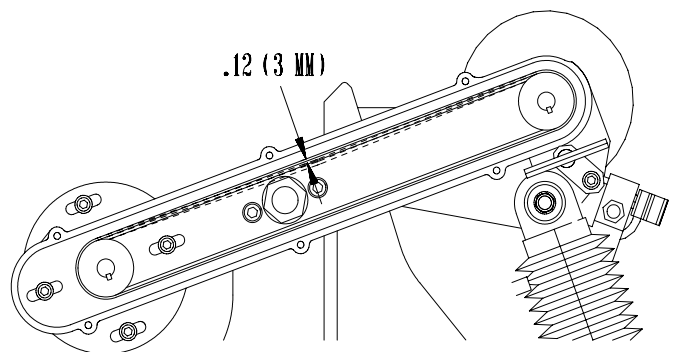


FIG. 11

## ADJUSTMENTS (Continued)

### ADJUSTABLE RELIEF TENSION

If the relief angle appears to vary during relief grinding, adjust the tension on the nylon plug and set screw. See FIG. 12.

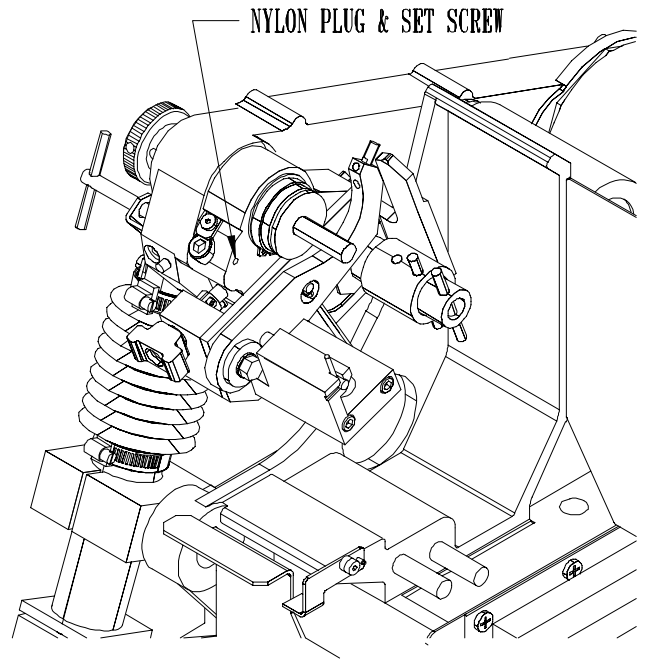


FIG. 12

### PROXIMITY SWITCH

For the proximity switch to perform properly and reverse the direction of the carriage at each end of the rails, a distance of  $\frac{3}{16}$ " (4 mm) to  $\frac{1}{4}$ " (6 mm) needs to be maintained between the carriage proximity flag bracket and the proximity switch. See FIG. 13.

**NOTE:** Light on proximity activates when metal crosses in front of switch sensor.

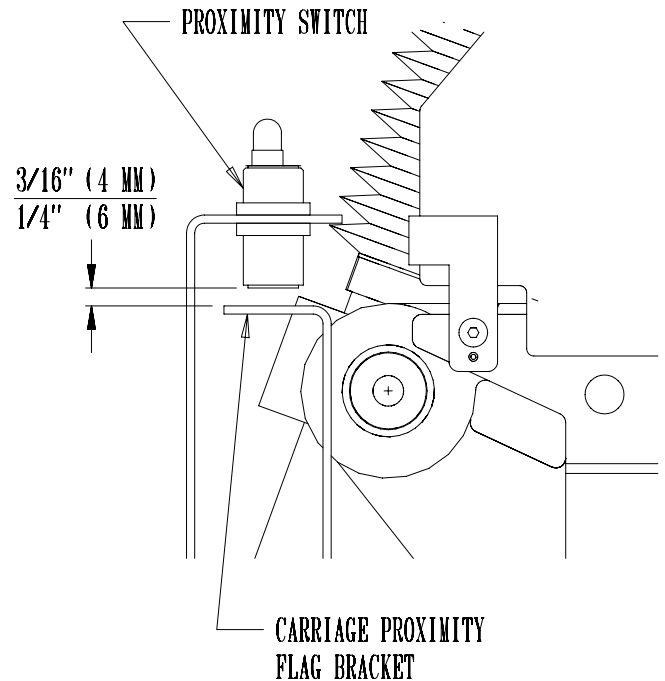


FIG. 13

## ADJUSTMENTS (Continued)

### LOCKING INDEX FINGER PIN

To align the Index Finger Locking Pin to the hole in the Index Finger Assembly loosen the two socket head cap screws so the index sensor block is movable. Push down on the index finger assembly until the spring loaded index finger locks into hole with no binding. Tighten the two socket head cap screws so the index sensor block is secured, and the locking pin moves freely. See FIG. 14.

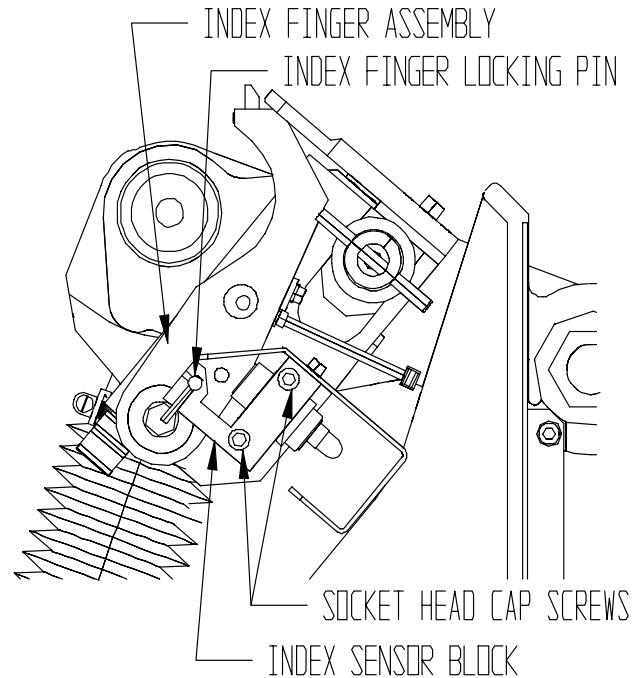


FIG. 14

### REDUCER MOTOR ADAPTER TO ACTUATOR DRIVE SCREW CLAMPING COLLAR POSITIONING

The lower clamp collar, next to the reducer motor adapter, is to be positioned flush to the end of the actuator screw shaft and tighten down with 6 ft. lbs (0.8 kg) of torque. See FIG. 15. The top clamp collar is factory adjusted and does not need any further adjustment. There is to be no slippage between the reducer motor adapter shaft and actuator screw when pushing down on grinding head and stalling the reducer motor.

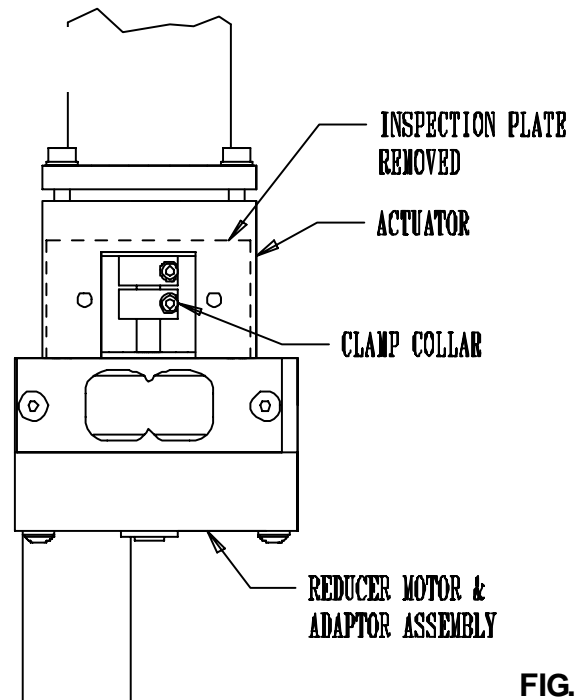


FIG. 15



## ADJUSTMENTS (Continued)

### SPIN GRINDING ATTACHMENT ADJUSTMENT

If play develops so crank handle wants to rotate in the scissor action on the spin grinding attachment, the play can be eliminated by tightening the set screw identified in FIG. 16.

If there is too much play in the spin drive pivot points, torque down the hex nut tight so conical washer is completely compressed, then back off 1/2 turn. See FIG. 16.

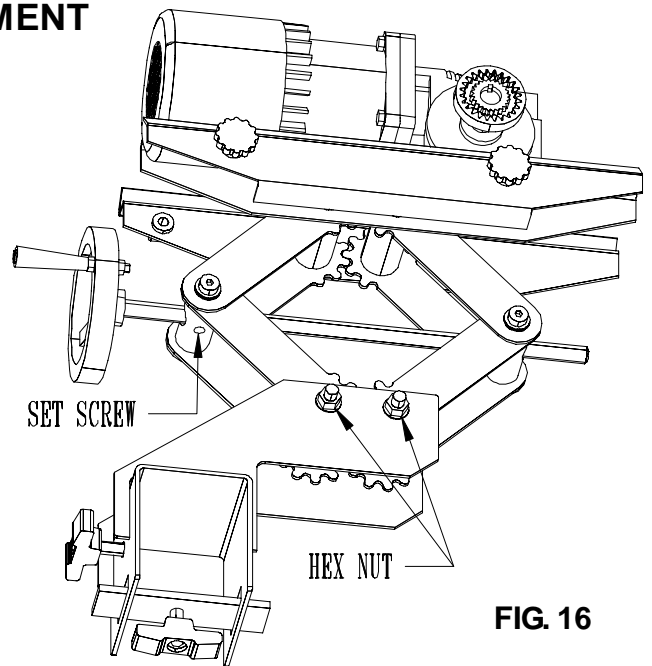


FIG. 16

### SAFETY SWITCH ALIGNMENT

For the safety switches to work properly they must be adjusted so the sender and receiver are parallel to each other with a maximum gap of .19 inches (5mm). (Adjust by moving the doors or brackers. If this does not help, a special wrench is needed to adjust the safety screws used to hold the switch in place.) See FIG. 17.

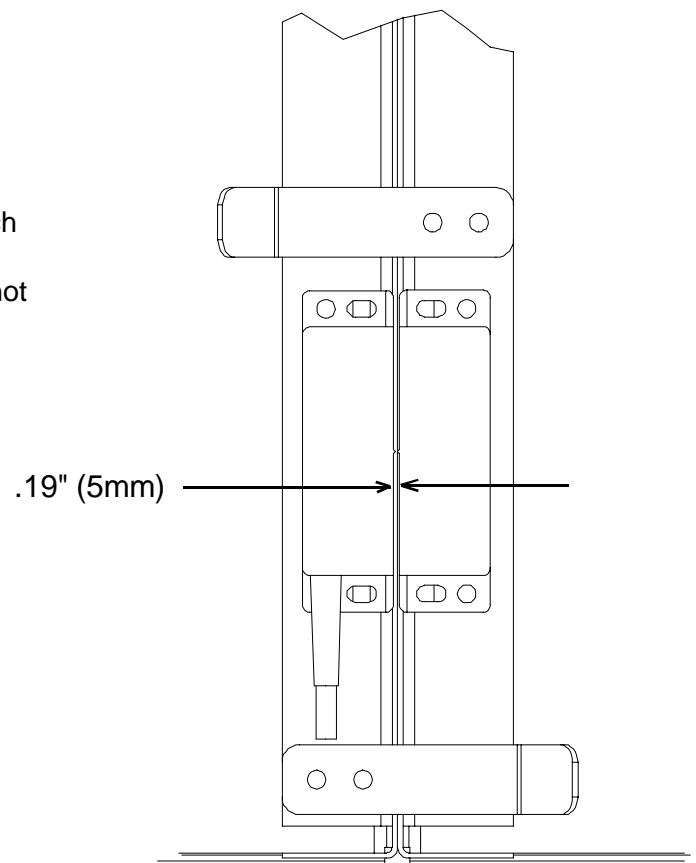


FIG. 17

## ADJUSTMENTS (Continued)

### TRAVERSE BELT TENSION

To adjust the tension on the traverse belt tighten the screws and nuts located at the left side of the traverse belt. Tighten nuts until the compression springs measure  $3/4"$ . See FIG. 18. If the springs are not tensioned equally, uneven loading on the traverse system may cause parts to fail.



**DO NOT OVERTIGHTEN. OVERTIGHTENING COULD DAMAGE THE BELT OR TRAVERSE DRIVE SYSTEM.**

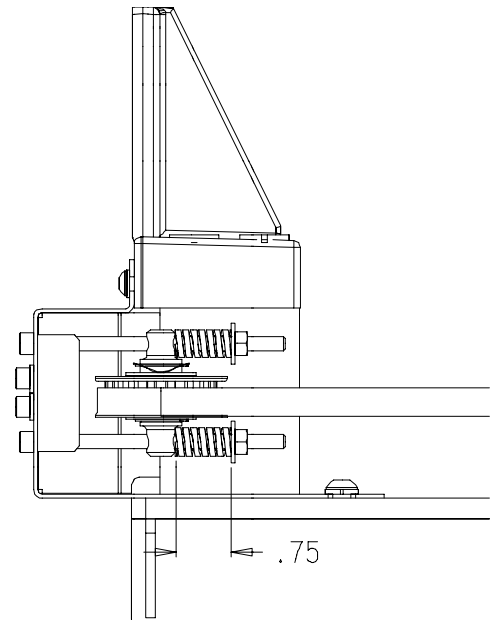


FIG. 18

### TRAVERSE CLAMP FORCE

If the traverse clamp is slipping during regular operation it may be necessary to tighten the clamp. To tighten, loosen the jam nut on the clamp tip. Screw the tip out so there is  $.10"$  gap between the tip and the Clamp Support Block. See FIG 19. Lock in place by tightening the jam nut against the clamp being careful not to move the tip. Verify the distance between the clamp tip and block is still  $.10"$ . The  $.10"$  setting allows slippage in a jam situation and damage can occur if this adjustment is set to narrow.



**CAUTION SHOULD BE USED AS ADJUSTING THE TIP WILL AFFECT THE SLIP LOAD AND COULD DAMAGE THE CLAMP TIP, BELT OR TRAVERSE DRIVE SYSTEM.**

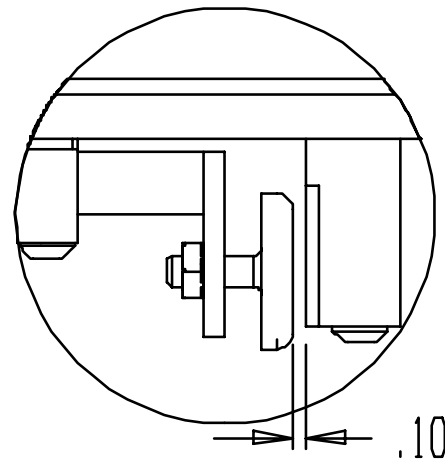


FIG. 19

# ADJUSTMENTS (Continued)

## ADJUSTING CROSS SLIDE ASSEMBLY

If the cross slide becomes very difficult to turn it may become necessary to adjust the assembly. To relieve the tension on the assembly follow the procedure listed below:

**STEP 1**--Using a hydraulic jack, raise the traversing carriage base just enough to alleviate the weight stress on the Cross Slide Assembly.

**STEP 2**--Knock the pins on either side of the Mounting Frame Adjuster and loosen the 4 bolts (B504801) that connect the Carriage Mounting Frame to the frame of the grinder.

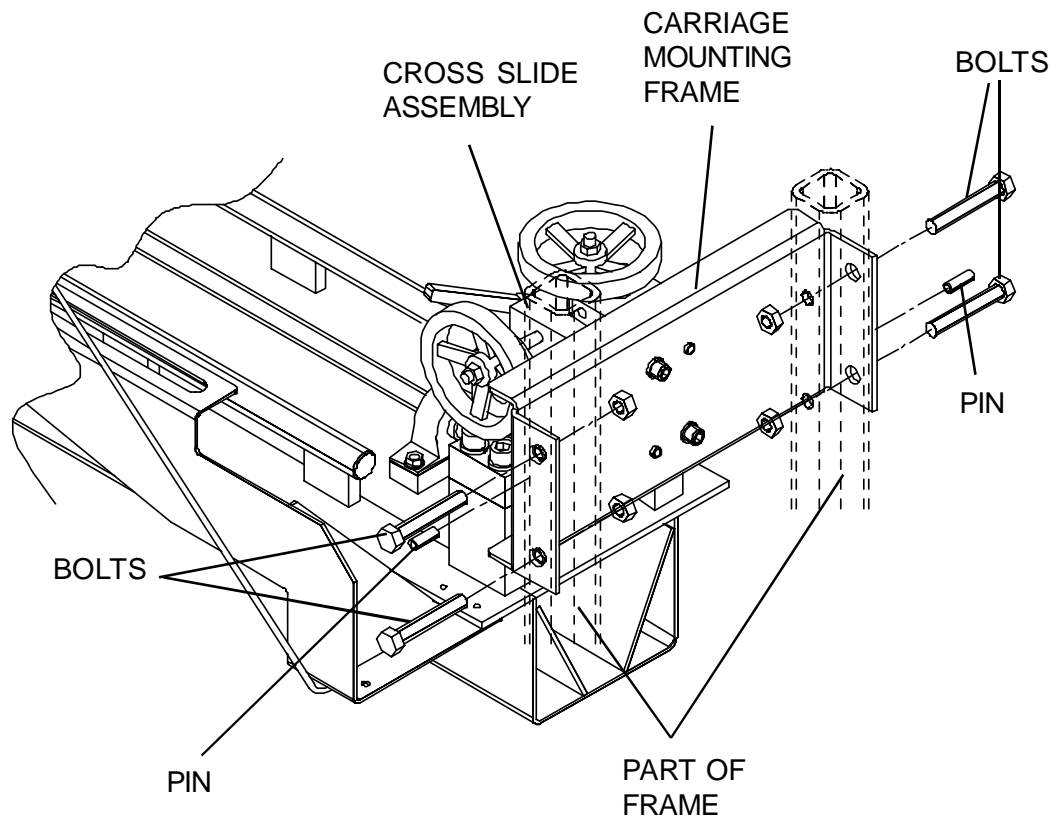
**STEP 3**--Jack the traversing carriage base up to put a preload on the Cross Slide Assembly.

**STEP 4**--Tighten the 4 bolts on the Carriage Mounting Frame to 75 ft-lbs.

**STEP 5**--Release the jack pressure and test the vertical and horizontal handwheels for ease of movement through their full range of motion.

**STEP 6**--If the Cross Slides tend to bind, repeat above steps jacking higher or lower (STEP 1) until the handwheels move freely.

**STEP 7**--When the Cross Slides move freely through their full range of motion, drill new holes and repin assembly.



# ADJUSTMENTS (Continued)

## CROSS SLIDE SHAFT REPLACEMENT

If the cross slide shafts become scarred or gnarled, replace them by the following procedure:

**STEP 1**--Use a hydraulic jack to raise the weight off the Cross Slide Assembly.

**STEP 2**--Loosen the two nuts on the support casting that hold the locking studs and tap with plastic hammer to loosen.

**STEP 3**--Loosen the locking handles and tap the center stud with a plastic hammer.

**STEP 4**--Loosen locknut and setscrew and remove the handwheel.

**STEP 5**--Remove the Slide Shaft.

**STEP 6**--Remove all burrs and resurface the shaft to a clean, smooth, polished surface.  
(OR REPLACE WITH A NEW SHAFT.)

**STEP 7**--Coat shaft with Never-Cease and re-install the shaft through the Support, Cross Slide Block and the three locking studs. The shaft must move freely inside the Cross Slide Block before reassembling.

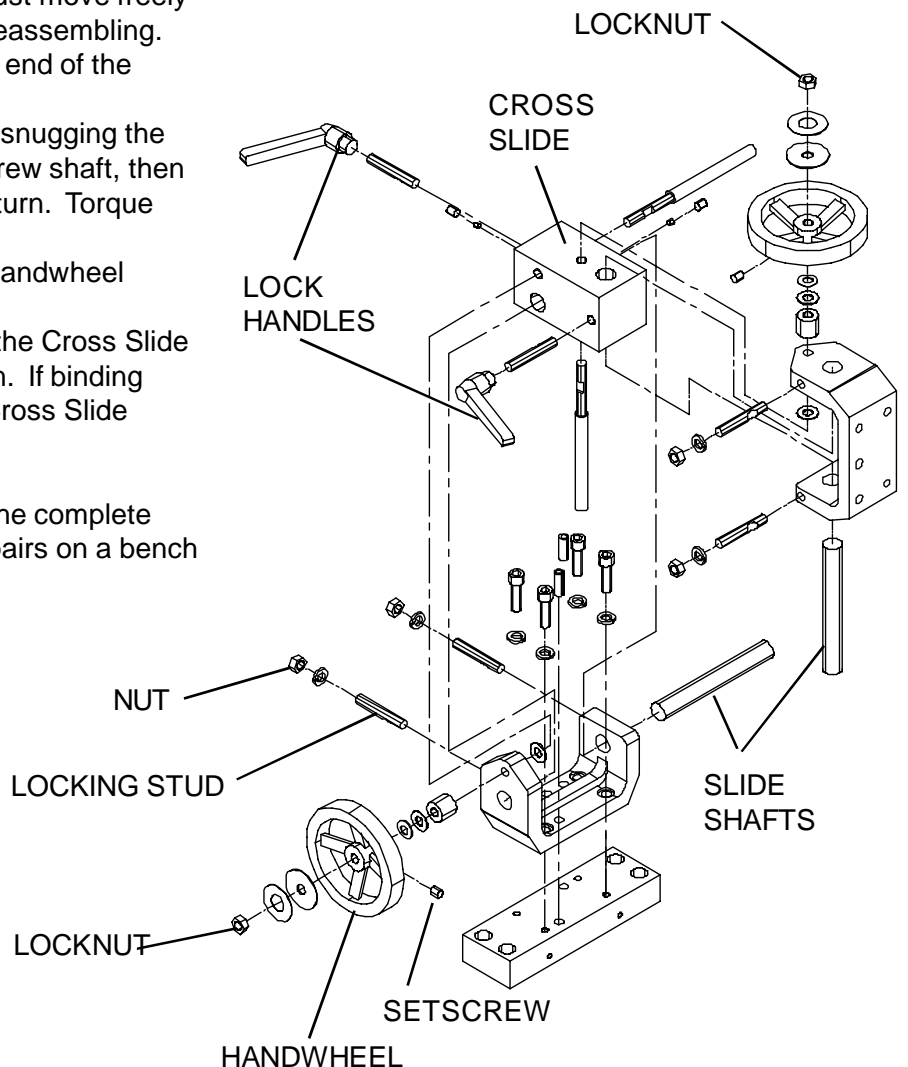
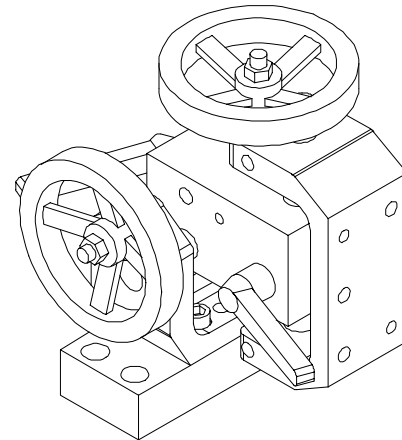
**STEP 8**--Retightening the nuts at the end of the locking studs to lock shaft in place.

**STEP 9**--Reinstall the Handwheel by snugging the setscrew to the flat located on the screw shaft, then torque nut until tight and back off 1/2 turn. Torque the setscrew to 70 in-lbs.

**STEP 10**--Test the Cross Slide, the handwheel should turn freely.

**STEP 11**--Lower the jack and retest the Cross Slide Assembly through full range of motion. If binding occurs, follow the procedure under Cross Slide Assembly located on page 19.

NOTE: It is also possible to remove the complete Cross Slide Assembly and do the repairs on a bench then reinstall.



# MAINTENANCE - POLYCARBONATE

## CLEANING AND MAINTENANCE GUIDELINES FOR POLYCARBONATE WINDOWS

### Cleaning Instructions

**DO NOT USE GASOLINE**  
Adherence to regular and proper  
cleaning procedures is recommended  
to preserve appearance and performance.

### Washing to Minimize Scratching

Wash polycarbonate windows with a mild dish washing liquid detergent and lukewarm water, using a clean soft sponge or a soft cloth. Rinse well with clean water. Dry thoroughly with a moist cellulose sponge to prevent water spots. Do not scrub or use brushes on these windows. Also, do not use butyl cellosolve in direct sunlight.

Fresh paint splashes and grease can be removed easily before drying by rubbing lightly with a good grade of VM&P naphtha or isopropyl alcohol. Afterward, a warm final wash should be made, using a mild dish washing liquid detergent solution and ending with a thorough rinsing with clean water.

### Minimizing Hairline Scratches

Scratches and minor abrasions can be minimized by using a mild automobile polish. Three such products that tend to polish and fill scratches are Johnson paste Wax, Novus Plastic Polish #1 and #2, and Mirror Glaze plastic polish (M.G. M10). It is suggested that a test be made on a corner of the polycarbonate window with the product selected following the polish manufacturer's instructions.

### Some Important "DON'TS"

- ◆ **DO NOT** use abrasive or highly alkaline cleaners on the polycarbonate windows.
- ◆ **Never** scrape polycarbonate windows with squeegees, razor blades or other sharp instruments.
- ◆ Benzene, gasoline, acetone or carbon tetrachloride should **NEVER** be used on polycarbonate windows.
- ◆ **DO NOT** clean polycarbonate windows in hot sun or at elevated temperatures.

### Graffiti Removal

- Butyl cellosolve, (for removal of paints, marking pen inks, lipstick, etc.)
- The use of masking tape, adhesive tape or lint removal tools works well for lifting off old weathered paints.
- To remove labels, stickers, etc., the use of kerosene, VM&P naphtha or petroleum spirits is generally effective. When the solvent will not penetrate sticker material, apply heat (hair dryer) to soften the adhesive and promote removal.

**GASOLINE SHOULD NOT BE USED!**

# MAINTENANCE - DIGITAL GAGE

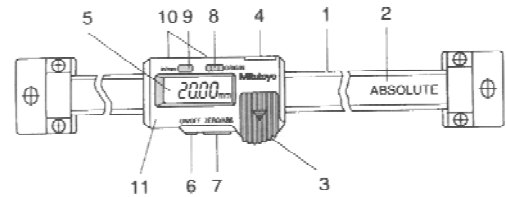
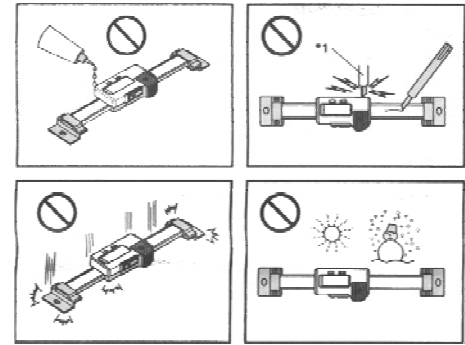
## DIGITAL GAGE

### Important

- Do not mark the scale unit with an electric engraver or scratch the scale.
- **Always use an SR44 battery (silver oxide cell)**
- If the scale will not be used for more than three months, remove the battery and store it properly. Otherwise, leakage, if any, from the battery may damage the unit.

### Description of Parts

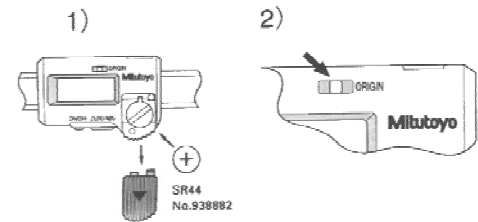
- |                        |                      |
|------------------------|----------------------|
| 1. Beam                | 2. Main Scale        |
| 3. Battery compartment | 4. Output Connection |
| 5. Display             | 6. ON/OFF Power      |
| 7. ZERO/ABS switch     | 8. Origin Switch     |
| 9. Inch/mm Switch      | 10. Tapped hole      |
| 11. Slider             |                      |



### Battery Installation and Origin Setting

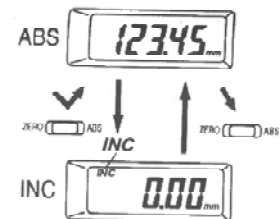
Set the origin of the scale after installing the battery. Otherwise, the error sign("E" at the least significant digit) may appear, resulting in incorrect measurements.

- 1) To install the battery, remove the compartment lid and install the SR44 battery with its positive side facing up. After the battery is installed, set the origin.
- 2) To set the origin, move the slider to an area you wish to set as your origin. Turn the power on. Hold the ORIGIN switch down for more than one second. The "0.00" display appears, indication Origin setting is complete. The origin will be retained even if the power is turned off.



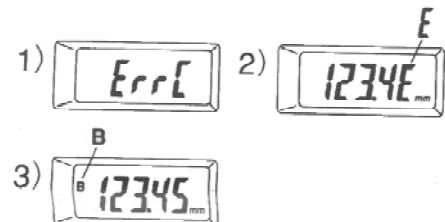
### Incremental (INC) & Absolute (ABS) mode

The LCD will display measurements from the origin when turned on (ABS mode). To set the origin see above. The display can be set to zero at any desired position by pressing the ZERO/ABS switch. INC indicator will appear in the display (INC mode), permitting measurements from this zero point. To return to the ABS mode hold the ZERO/ABS button for more than 2 seconds.



### Error Symptoms & Remedies

- **ERRC and display flickering:** Occurs when the scale surface is stained. Clean the scale surface and coat a thin film of low viscosity oil to keep out moisture.
- **E in the least significant digit:** This occurs when the slider is moved too quickly, but it does not affect the measurement. If it stays on when the slider stops, the scale surface is probably stained. If this is the case, take remedies as for ErrC.
- **B indication:** Battery voltage is low. Replace the battery as soon as possible.



### Cleaning

Clean gage with CRC 3-36 Cleaning and Lubrication Oil. Wipe off excess after cleaning. If CRC 3-36 is not available, use Denatured Alcohol to clean, then apply light oil and wipe off excess.

## MECHANICAL TROUBLESHOOTING (Continued)

### Possible Cause

### Checkout Procedure

#### **PROBLEM--Reels ground have high/low blades**

Traverse Speed set too fast.

Check roundness using a magnetic base dial indicator. Traverse speed should be set approximately 12 ft/min. (4 meters/ min.) if roundness is varying.

Lineal bearings for the grinding head carriage are out of adjustment (loose) or have grit buildup causing uneven traversing load.

Relubricate and adjust linear bearings per adjustment section. If problem persists, replace lineal bearings on the carriage base. Check for any holes in the bellows that would permit any grinding grit penetration. See adjustment section for lineal bearing replacement.

#### **PROBLEM--Excessive grinding stock being removed when traversing to the right in the relief grinding mode.**

Gib adjustment for the relief finger assembly is loose so reel finger has movement. When traversing to the right minimum grinding stock removal should be seen as compared with heavy stock removal when traversing to the left.

Tighten the set screws for the gib adjustment. See procedure in the adjustment section in the manual.

#### **PROBLEM-- Grinding stock removal from reel is irregular during spin grinding.**

Lineal bearings on the grinding head carriage are too loose .

The lineal bearing must be preloaded to the traverse shafts with no vertical movement. See manual adjustment section for carriage bearing adjustments.

#### **PROBLEM--Carriage traversing varies speed while grinding.**

Oil on carriage drive shaft.

Wipe oil completely from the traverse shaft. Spray down with a spray lubricant (do not use a teflon based lubricant) and wipe off completely.

Lineal bearings in the carriage do not rotate freely.

Check for grinding grit getting into the lineal bearings and cause excessive driving torque of carriage. Abrasive noise is detectable when excessive grit is in the lineal bearings. Replace the four lineal bearings in the main carriage. Check bellows for holes and replace if necessary.

Actuator bearings are not rotating freely.

Check bearings for free rotation or flat spots on the bearing outside diameter. Replace the six bearings if necessary. See adjustment section for bearing replacement.

# MECHANICAL TROUBLESHOOTING (Continued)

## Possible Cause

## Checkout Procedure

### PROBLEM--Too heavy a burr on cutting edge of reel blades.

Traverse speed set too high causing a heavy burr on the reel blade when spin grinding.

Traverse speed should be set lower approximately 12 ft/min. (meters/min.) for a smaller burr on cutting edge.

### PROBLEM--Cone shaped reel after grinding.

Grinding head travel not parallel to the reel center shaft.

Grinding head travel was not setup parallel to the reel center shaft in vertical and horizontal planes. See Align the Reel Section in operator's Manual

### PROBLEM--Relief grind on the reel blades do not go the full length of the reel.

The right side corner of the grinding wheel is always to be in contact with the reel blade. This is high point of the relief finger.

The right hand side of the grinding wheel is not in full contact for relief grinding. See Operators Manual for NORMAL HELIX AND REVERSE HELIX.

### PROBLEM-- Traverse speed is too slow.

#### Possible Cause

#### Remedy

#### Reason

Lineal bearing in the carriage are set too tight.

A. Readjust bearings for proper tension. (for more detail see lineal bearing replacement in the adjustment section of the manual.)

When bearing preload is too tight, it causes excessive loading to drive the carriage.  
When traverse belt is disengaged, the proper traverse load is 2 to 3 lbs. Use a tension scale to check. (A general guide only.)

### PROBLEM--Spin Drive cranks up and down too hard.

The two top and two bottom pivot screws are compressing the conical washer too tight.

A. Tighten down the locknut until it bottoms out and back off 1/2 turn. Check to see if there is a cone shape to the washer. Four (4) pivot points.

Have enough play so the crank turns snugly but during operation it is free.

Check screw adjustment tension on nylon plug riding against the screw thread.

B. Loosen set screw and check. (See adjustment section.)