

Operating Manual - Model 1115HD

TABLE OF CONTENTS

SAFETY INSTRUCTIONS	1
INSTALLATION & SET-UP	4
MOUNTING BRAKE DRUMS	6
OPERATING LATHE (DRUMS)	8
MOUNTING BRAKE ROTORS	11
COMPOSITE ROTORS	12
NON-DIRECTIONAL FINISH	12
OPERATING LATHE (ROTORS)	14
ARBOR REMOVAL & INSTALLATION	17
SERVICE & MAINTENANCE	18
TROUBLE SHOOTING	19
STANDARD TOOLING	
SCHEMATICS	
BENCH & BACKBOARD ASSEMBLY INSTRUCTIONS (OPTIONAL ITEMS)	

IMPORTANT SAFETY INSTRUCTIONS

Before operating this lathe, basic safety precautions should always be followed, including the following:

READ ALL INSTRUCTIONS

Do not operate equipment with a damaged cord or if equipment has been dropped or damaged, until it has been examined by a qualified service man.

To reduce the risk of electric shock, do not use on wet surfaces or expose to rain.

GROUNDING INSTRUCTIONS

In the event of a malfunction or breakdown, grounding provides a path of least resistance for electric current to reduce the risk of electric shock. This machine is equipped with an electric cord having an equipment-grounding conductor and a grounding plug. The plug must be plugged into a matching outlet that is properly installed and grounded in accordance with all local codes and ordinances. Do not modify the plug provided – if it will not fit the outlet, have the proper outlet installed by a qualified electrician. Improper connection of the equipment-grounding conductor can result in a risk of electric shock. The conductor with insulation having an outer surface that is green with or without yellow stripes is the equipment-grounding conductor. If repair or replacement of the electric cord or plug is necessary, do not connect the equipment-grounding conductor to a live terminal.

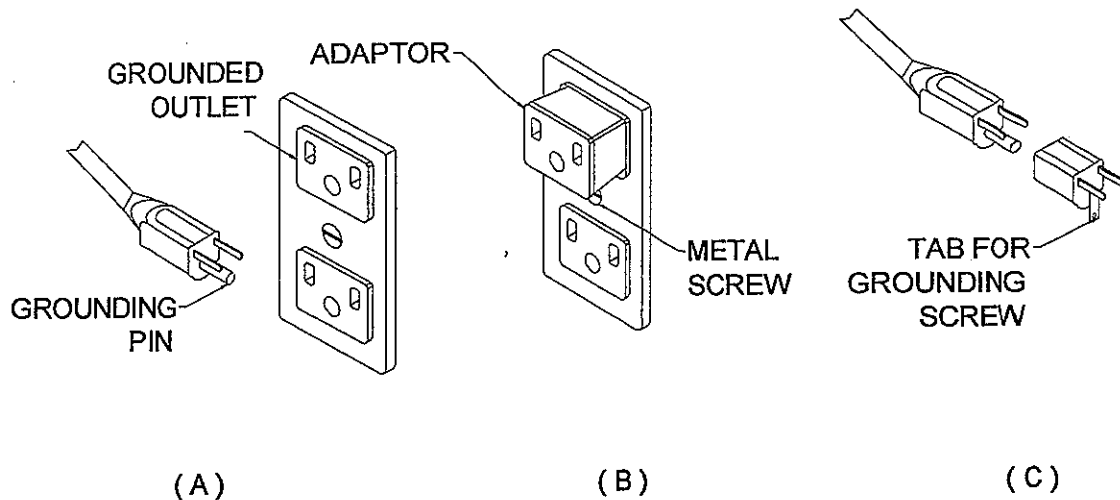
Check with a qualified electrician or serviceman if the grounding instructions are not completely understood, or if in doubt as to whether the tool is properly grounded.

EXTENSION CORDS – If necessary use extension cords for 120V-16AWG and a maximum length of 50 feet only. Cords rated for less than the equipment may overheat. Care should be taken to arrange the cord so that it will not be tripped over or pulled. Extension cords are not normally recommended.

Grounded, cord-connected tools intended for use on a supply circuit having a nominal rating less than 150 volts.

This machine is intended for use on a circuit that has an outlet that looks like the one illustrated in Sketch A. The machine has a grounding plug that looks like the plug illustrated in Sketch A. A temporary adaptor, which looks like the adaptor illustrated in Sketches B and C may be used to connect This plug to a 2-pole receptacle as shown In Sketch B if a properly grounded outlet is not available. The temporary adaptor should be used only until a properly grounded outlet can be installed by a qualified electrician. The green colored rigid ear, lug, etc. extending from the adaptor must be connected to a permanent ground such as a properly grounded outlet box.

GROUNDING METHODS



Note: In Canada the use of a temporary adaptor is not permitted by the Canadian Electrical Code.

REDUCE THE RISK OF UNINTENTIONAL STARTING – Make sure switches are in the “OFF” position before plugging cord in.

ALWAYS UNPLUG EQUIPMENT – from electrical outlet when not in use. Never use the cord to pull the plug from the outlet. Grasp plug and pull to disconnect.

SERVICING MACHINE – Disconnect machine before servicing as well as when changing accessories such as tool bits, carbide cutters, etc.

TO REDUCE THE RISK OF FIRE – Do not operate equipment in the vicinity of open containers of flammable liquids (i.e. gasoline).

WEAR PROPER APPAREL – No loose clothing, gloves, neckties, rings, bracelets or other jewelry which may get caught in moving parts. Wear protective hair covering to contain long hair. Non-slip footwear is recommended. Keep all parts of body away from moving parts of machine.

KEEP WORK AREA CLEAN – Cluttered areas and benches invite accidents. Do not let cord hang over edge of table, bench or counter.

REMOVE ADJUSTING KEYS & WRENCHES – Form a habit of checking to see that keys and adjusting wrenches are removed from tool before turning machine on.

DON'T FORCE MACHINE – Don't force machine or attachments to do a job for which they were not designed.

DON'T OVERREACH – Keep proper footing and balance at all times.

ALWAYS USE SAFETY GLASSES – Everyday eyeglasses only have the impact-resistant lens..they are **NOT** safety glasses.

KEEP GUARDS IN PLACE – and in working order. These are installed for your safety.

NEVER LEAVE MACHINE RUNNING UNATTENDED – Turn power OFF. Do not leave machine until it comes to a complete stop. Keep hands away from moving parts.

MAINTAIN MACHINE WITH CARE – Keep machine clean and in good condition for the best and safest performance. Follow instructions for lubricating and changing accessories.

CLEANING MACHINE – DO NOT USE COMPRESSED AIRLINE – use brush or shop vac when machine is not in use.

CHECK DAMAGED PARTS – Any part, guard or adaptor that is damaged should be carefully checked to determine if it will operate properly and perform its intended function. A guard, adaptor or other part that will not fulfil its intended purpose should be replaced or repaired.

NORMAL OPERATION – Machine must be bolted to bench before operation, thus eliminating the possibility of tipping, slipping and vibration on supporting surface.

READ INSTRUCTION MANUAL – on set-up and operation of machine **BEFORE** using. Use only as described in this manual. Use only manufacturers' recommended attachments.

SAVE THESE INSTRUCTIONS.

INSTALLATION AND SET-UP

- 1 Uncrate the lathe and remove from the box.

CAUTION: Do not remove lathe by lifting up on the lathe arbor. There is danger of distorting the arbor and causing runout.

This machine is supplied with a lifting hook. There is a threaded plug located between the carriage and the head, just below the oil level indicator. Remove the plug and install the hook that is supplied. When the lathe is mounted, remove the hook and re-install the threaded plug.

NOTE: Do not run this machine with the hook installed as it will cause damage to the carriage.

- 2 Check the lathe thoroughly and report any damage to the carrier immediately.
- 3 Bolt the lathe onto the bench. This will avoid possible vibrations when operating the lathe. **NOTE:** If the lathe bench is used and placed on an uneven floor, it should be leveled or shimmed and bolted to the floor. If the floor is flat, it is not necessary to bolt bench to floor.

- 4 Place lamp on mounting lug located at the rear of the machine. Plug lamp into lamp receptacle located on the right side of the control panel.

NOTE: The receptacle is for lamp use only. Do not plug other equipment into the outlet.

- 5 Be sure the lathe is plugged into a grounded, 120-volt electrical outlet.

NOTE: The plug must fit into a matching outlet that is properly installed and grounded in accordance with all local codes and ordinances. Do not modify the plug provided. If it will not fit the outlet, have the proper outlet installed by a qualified electrician.

CAUTION: Do not cut off grounding prong. An improper connection can result in a risk of electric shock.

- 6 Check oil level in spindle housing window (1, figure 1) before starting the lathe. Oil level is correct when window indicator shows half full in window. To fill, remove top plate (5, figure 1). Use S A E 90 gear oil.

- 7 Lubricate tool carriage ways and ALL lube points (2 & 3, figure 1) with a good grade SAE 10 oil. **NOTE:** Lathe should be cleaned and oiled daily when in use.

- 8 Clean the lathe arbor, the arbor threads, adaptors, cones and collars of protective coating. Then lubricate adaptors and threads with light oil to protect against corrosion.

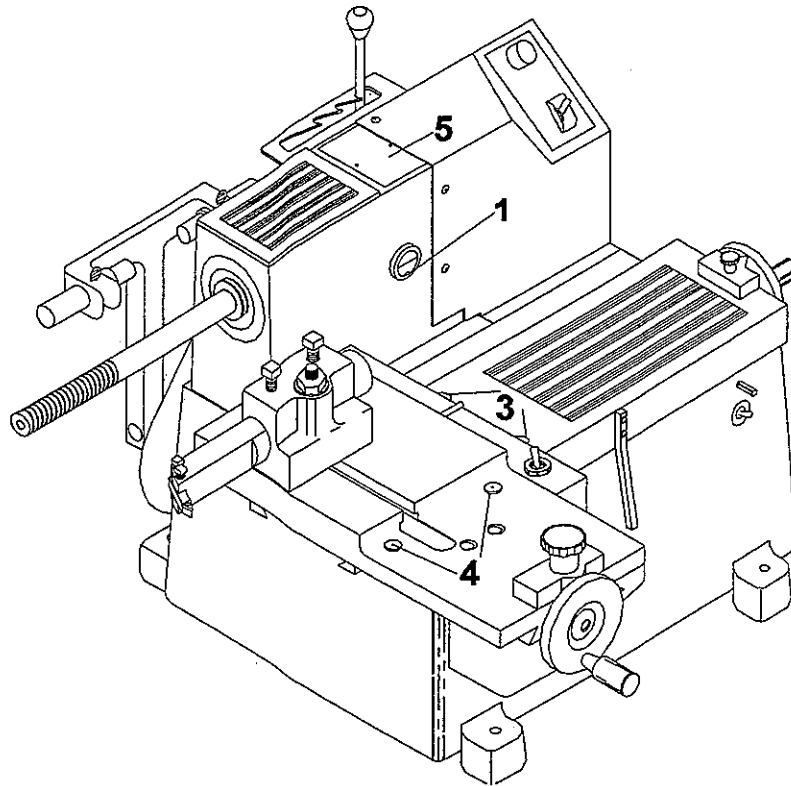


Fig.1 Lubrication points

MOUNTING BRAKE DRUMS

1 DRUM WITH HUB

Remove the wheel bearings from the hub and clean the outer bearing races thoroughly. Select the bearing adaptors that fit the bearing races, one for each end of the hub. Mounting is similar to rotors with hub – see A, figure 6.

2 DRUM WITHOUT HUB

Select the taper cone that fits the center hold from inside the drum. Mount the drum on the lathe arbor using a hubless adaptor and spring. See A, figure 2.

CAUTION: Be sure the surfaces of the tapered cone and drum center are thoroughly cleaned. It is often necessary to dress the center hole inner and outer wheel mounting flange with a fine file or sand paper. Dirt or buildup of rust in drum center will cause inaccurate truing of drum surfaces.

NOTE: The tapered cone and spring can be mounted on either side of drum. On small drums they are always mounted on the outside of drum See B, figure 2.

..Mount the brake drum on the arbor using the adaptor(s) and spacers.

NOTE: The brake drum should be mounted as close to the lathe housing as possible. This provides a good stable mounting for best refinishing results.

..Tighten the spindle locking nut tightly. Do not use excessive force.

..Install the drum chatterband tightly around the outside of the drum. Chatterbands must be used to eliminate vibrations.

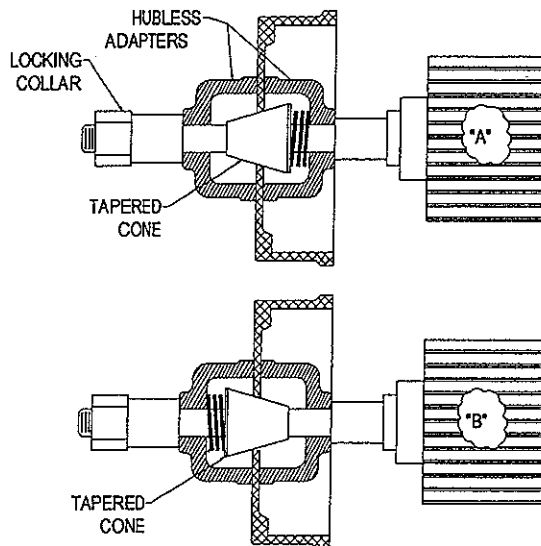


Fig.2 Typical mounting of drums on lathe arbor

SPINDLE SPEEDS

This machine is equipped with variable spindle speeds. There are four speed selections – 85/110/140/185 RPM. The speed change lever (10, figure 4) is located at the rear of the machine behind the control panel. The lever rides in a speed selector plate (11, figure 4) that is notched for each speed. High speed (185) is all the way to the right and low speed (85) is on the left. To change speeds, position lever in the notch labeled with the desired speed.

NOTE; SPINDLE MOTOR SHOULD BE ON WHEN CHANGING SPEEDS.

APPLICATIONS

85 RPM – For use on large diameter discs or drums found on trucks and buses.

TYPICAL SIZES – 13" dia or larger

110/140 RPM – This is the normal operating range for resurfacing discs and drums on most cars and light trucks up to 1 ton.

TYPICAL SIZES – 8" – 13" dia

185 RPM – For resurfacing smaller discs and drums found on compact cars.

TYPICAL SIZES – 8" dia or less

NOTE: Resurfacing large discs and drums at high spindle speed will result in premature wear of carbide tips.

OPERATING THE LATHE (Brake Drums)

1 Brake Drum Turning Attachment Setup:

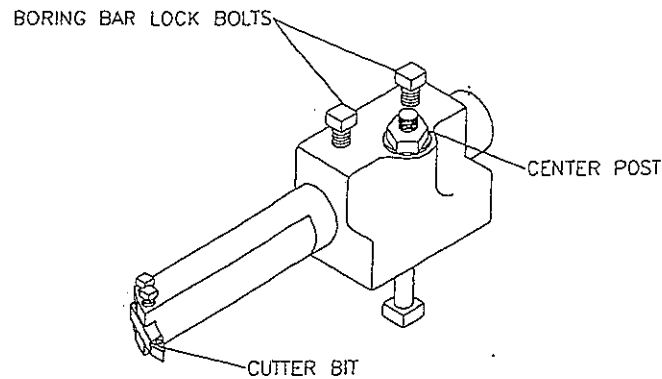


Fig.3 Drum turning attachment

..install the Brake Drum Turning Attachment on the carriage mounting plate. Insert the center post into the groove of the mounting plate and slide the attachment onto the plate.

..adjust the drum turning attachment so that the boring bar and cutter bit are in line with the drum braking surface.

2 To set the cutting tool (carbide insert) inside the drum:

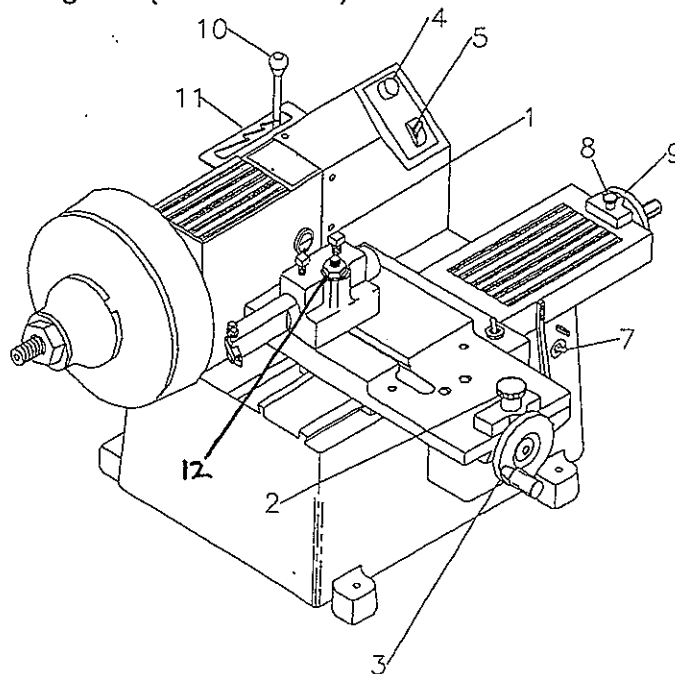


Fig.4 Lathe controls for refinishing drums

..loosen the boring bar lock bolts (1, figure 4) and both cross-slide and main-slide carriage feed locking knobs (2 and 8, figure 4)

..slide the boring bar inward or outward and turn the cross-slide and main-slide carriage feed handwheels (3 and 9, figure 4) to position the cutting tool bit over the braking surface of the drum.

NOTE: Be sure the cutting tool will travel over the full surface of the drum before the automatic feed switch (7, figure 4) shuts off and stops the travel of the carriage.

..tighten the drum turning attachment center post locking nut (12, figure 4). Then tighten the two boring bar lock bolts (1).

3 To set desired depth of cut:
..turn both carriage feed switches to "OFF"

..start the brake lathe by moving the spindle selector switch to the drum position (down)

..turn the handwheel (3, figure 4) counter-clockwise until the cutting tool touches the drum surface

..turn the main-slide carriage feed handwheel (9, figure 4) and move the carriage in until the cutting tool bit is just inside the undercut of the drum.

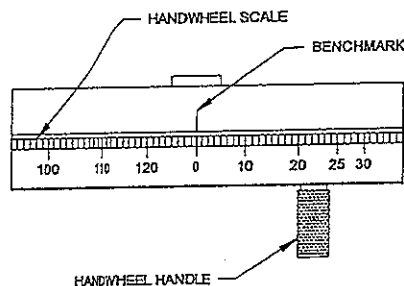


Fig.5 Handwheel scale

..hold the cross-slide carriage feed handwheel to keep it from turning and adjust the handwheel sleeve until one of the reference numbers on the scale aligns to the benchmark located on the support block. See figure 5

NOTE: Each graduation on the handwheel equals .002" (.05mm)

..now turn the handwheel to the desired depth of cut noting the number of graduation lines past the set reference number. **NOTE:** Recommended depth of cut is .006-.016 or three to eight graduation lines

..turn variable speed feed control (4, figure 4) to a desired setting. **NOTE:** The carriage feed speed ranges from 0" to .008" per revolution. Do not try to cut too much at one time. Smaller cuts (low carriage feed speed) produce a finer finish.

..with depth of cut set, tighten the carriage feed locking knob (2, figure 4). After initial setup, tighten all locks and turn the automatic carriage feed switch "ON" (7, figure 4) **NOTE:** The carriage feed will stop automatically when the cut is complete. The cutting tool boring bar and cutting tool bit feeds from inside of the drum outward.

..if a second cut is necessary, loosen the carriage feed locking knobs (2 and 8, figure 4) and repeat above procedure

..when the drum braking surface is refinished and trued, move the lathe spindle selector switch to "OFF" (center position)

CAUTION: Do not shut off while cutting tool is in contact with the drum. This will cause the carbide cutter (insert) to chip and render it useless.

CAUTION: Arbor, cones, adaptors and spacers must be kept clean and free of nicks to ensure proper alignment of the drum on the arbor. Failure to follow this procedure will result in drums not running true with bearings, thereby causing problems in the braking system of the vehicle.

CLEANING THE LATHE

Be sure lathe is turned "OFF". Brush or vacuum chips from the lathe and bench.

CAUTION; Never use compressed air for cleaning this lathe.

MOUNTING BRAKE ROTORS

Special Instructions

1 Rotor with hub

Remove the wheel bearings from the hub and clean the bearing cups thoroughly. Select the bearing adaptor that fits the bearing bore one for each end of the hub. See Figure 6A.

CAUTION: Be sure the surfaces of the cones and bearing cups are thoroughly cleaned. Dirt or foreign matter will cause inaccurate truing of the rotor surfaces.

2 Rotor without hub

Select the taper cone that fits the center hole of the rotor. Select the proper hubless adaptors to fit the inside and outside of the rotor. Use the coil spring as shown in figure 6C.

CAUTION; Be sure the surfaces of the tapered cone and rotor center are thoroughly cleaned. It is often necessary to dress the center hole, inner and outer wheel mounting flange with a fine file or sandpaper. Dirt or buildup of rust on rotor centers will cause inaccurate truing of the rotor surfaces.

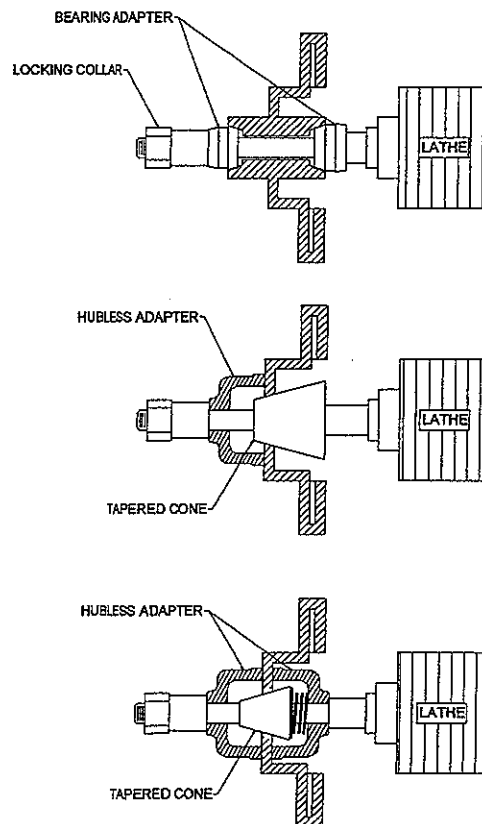


Fig.6 Typical mounting of rotors

COMPOSITE ROTORS

Some late model automobiles use "composite " rotors. To resurface these rotors within manufacturers specifications, special tooling has been developed. This tooling clamps the rotor so that close machine tolerances can be kept and a proper surface is produced. Failure to use this special tooling will result in an out of tolerance rotor surface. The rotor may exceed specifications concerning parallelism and runout. This can cause brake pedal pulsations, noise and reduce life of the brake components.

NON-DIRECTIONAL ROTOR REFINISHER

To follow the recommendation of some automobile manufacturers specifications, a non-directional or "swirl" finish may be required. This finish is to be applied to a resurfaced rotor. Always check the manufacturers specifications.

Composite rotor tooling and non-directional finishing tools are available upon request.

1. Select the proper tooling and mount the rotor on the spindle shaft.
NOTE: Rotor should be positioned as close to the lathe housing as possible. This provides a good stable mounting for best refinishing results.
2. Position the rotor stabilizer over the rotor and adjust the spring-loaded bronze plungers of the stabilizer to provide light tension against the surfaces of the rotor.
NOTE: The stabilizer is used in place of the standard chatterband for rotors. The stabilizer is designed to eliminate chatter on rotors of varying thickness and diameters. Spring loaded bronze fingers press against the rotor surfaces during the refinishing operation.

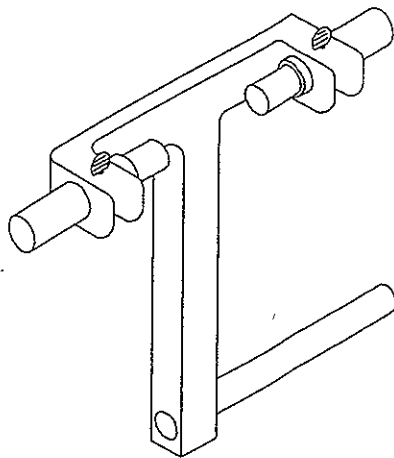


Fig.7 Rotor stabilizer

2 Rotor Turning Attachment Setup

- a. Install the disc Brake Rotor Turning Attachment on the carriage mounting plate. Insert the center post into the groove of the mounting plate and slide the holder onto the plate
- b. Rotate both cross-slide and main drive carriage feed handwheel(s) (1 and 2, figure 9) inward or outward to position the cutting tool bits so that the rotor is centered between them.

NOTE: Be sure the cutting tool bits will travel over the full surfaces of the rotor before the automatic feed switch (3, figure 9) shuts off and stops the travel of the carriage.

- c. Tighten rotor turning attachment center post locking nut firmly (4, figure 9)

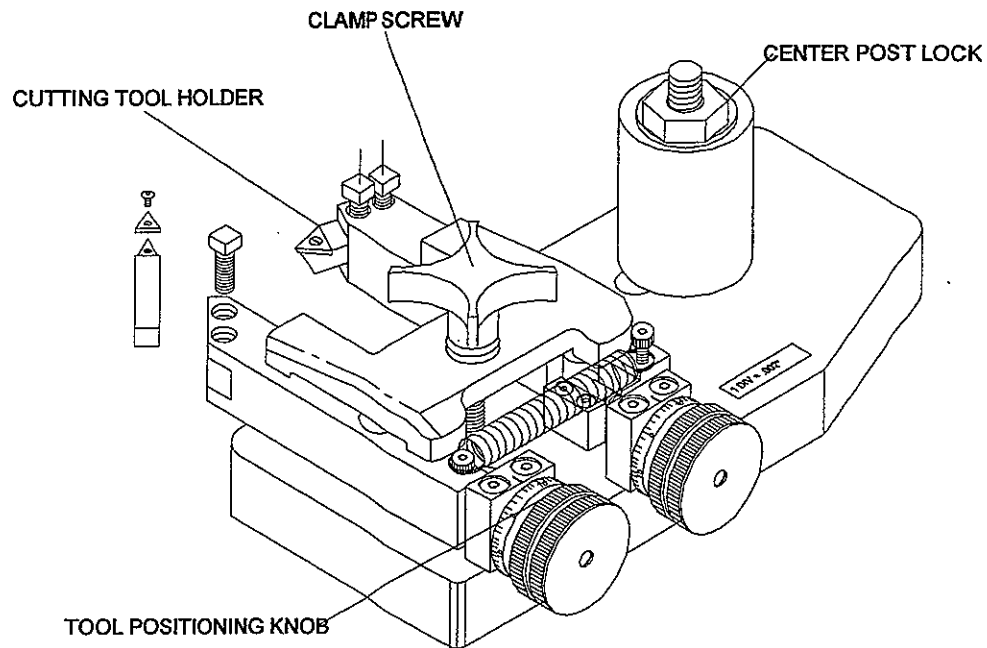


Fig.8 Rotor turning attachment

OPERATING THE LATHE (Brake Rotors)

- 1 To set the cutting tools (carbide inserts) to the undercut of the rotor surfaces:
 - a. Start the lathe by moving the spindle selector switch to the "Disc" position (up)
 - b. Turn the cross-slide carriage feed handwheel (1, figure 9) and move carriage in until the cutting tool bits are positioned over the braking surfaces of the rotor.

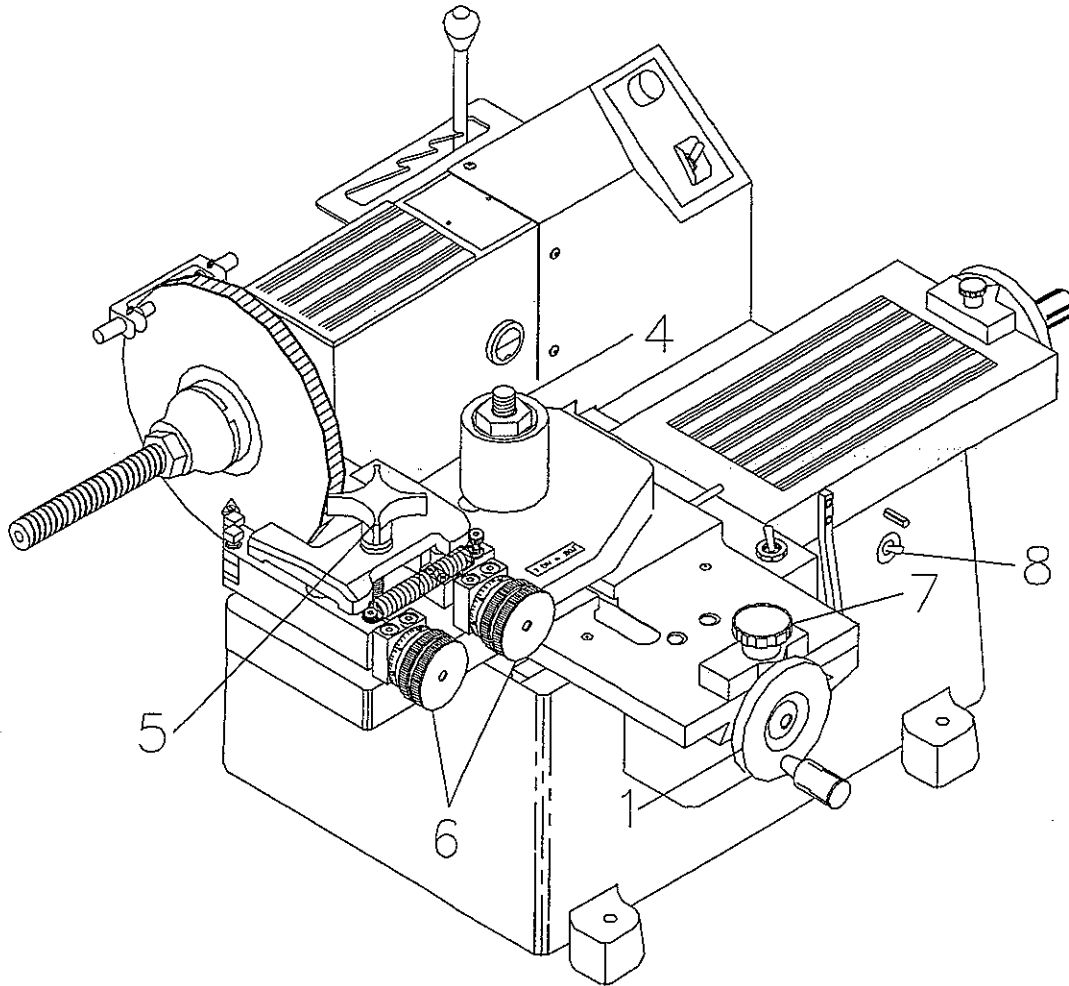
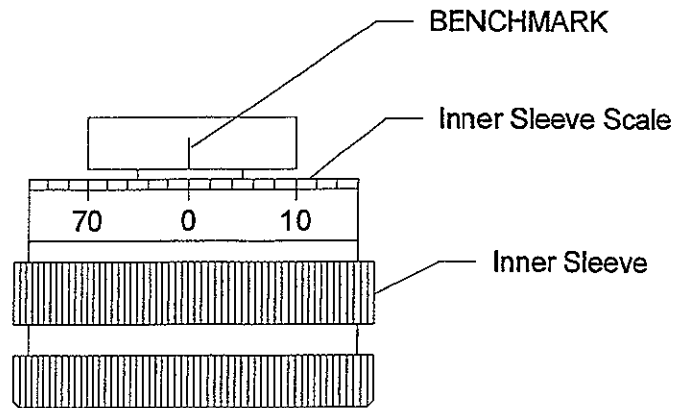


Fig.9 Lathe controls for refinishing discs

- c. Turn tool positioning knob (6, figure 9) on one side, until the cutting tool bit touches the surface of the rotor. Set the cutting tool bit on the other side of the rotor the same way.
 - d. Then move the carriage in until the cutting tools are just inside the undercut of the rotor.

- 2 To set the desired depth of cut:

Fig.10 Tool positioning knob



A Turn both carriage feed switches to "OFF"

B Hold the tool positioning knob to keep it from turning and adjust the inner sleeve until zero or one of the reference numbers on the scale aligns to the benchmark located on the support block. See Figure 10. Repeat on the other positioning knob.

NOTE: Each graduation line on the inner sleeve of the tool positioning knob is .002" (.05 mm)

C Now turn the tool positioning knob to the desired depth of cut, noting the number of graduation lines past the set reference number.

NOTE: Recommended depth of cut is .006"-0.010" on each rotor surface or three to five graduation lines.

D Turn the variable speed control to a desired setting.

NOTE: The carriage feed speed ranges from 0" to .008" per revolution. Do not try to cut too much at one time. Smaller cuts (low carriage feed speed) produce a finer finish.

E With depth of cut set, tighten the tool holder clamp screw (5, figure 9)

F Tighten the carriage feed locking knob (7, figure 9). After initial setup, tighten all locks and turn the automatic carriage feed switch "ON" (3, figure 9)

NOTE: The carriage feed will stop automatically when the cut is complete.

G If a second cut is necessary, loosen the carriage feed locking knob and cutting tool holder clamp screw. Turn the carriage feed handwheel and move the carriage in until the cutting tool bits are just inside the undercut of the rotor. Then repeat above procedure, Steps A-E.

H When the rotor braking surfaces are refinished and trued, move the spindle selector switch to "OFF (center position)"

CAUTION: Do not shut lathe off while cutting tool is in contact with the rotor. This will cause the carbide cutters to chip and render them useless.

CAUTION: Spindle shaft cones, adaptors and spacers must be kept clean and free of nicks to ensure proper alignment of the rotor on the spindle. Failure to follow this procedure will result in rotors not running true with bearings, thereby causing problems in the braking system of the vehicle.

NOTE: All standard drum and rotor adaptors and spacers are interchangeable.

CLEANING THE LATHE

Be sure the lathe is turned "OFF". Brush or vacuum chips from the lathe and bench.

CAUTION; Never use compressed air for cleaning this lathe.

ARBOR REMOVAL AND INSTALLATION

The Combination Brake Lathe is equipped with a standard 1" diameter arbor. The lathe allows the removal of the standard and the installation of one of the optional arbors.

TO REMOVE:

- 1 Loosen the draw bolt three or four turns using an Allen wrench. See fig.11.
- 2 Place the W110 cone on the spindle shaft and screw the spindle nut on. With one hand, slide the cone from right to left hard enough to loosen the shaft taper.
NOTE: Care must be taken not to crush a finger between the spindle nut and the cone when loosening the taper.
- 3 Hold the arbor and unthread the draw bolt. The arbor will slip free of the tapers of the spindle.

TO INSTALL;

- 1 Clean both tapers (arbor and spindle) to remove any foreign material. Dirt on these surfaces will cause shaft runout.
- 2 Slide the arbor into the spindle. Align the "O" marks on both until they are in line with each other as shown in Figure 10 and tighten the draw bolt.

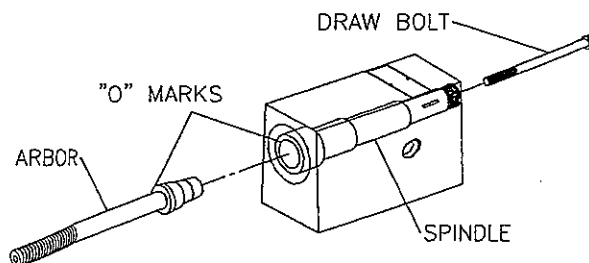


Fig.11 Changing lathe arbor

SERVICE AND MAINTENANCE

LUBRICATION

A Check oil level periodically by checking the window in the lathe housing. Oil level is correct when indicator window shows half full. Use S A E 90 gear oil.

B Lubricate tool carriage ways and ALL lube points with a pressure type oil can using 10W30 oil.

NOTE: Lathe should be cleaned and oiled daily when in use. This will assure minimum wear of lathe gibs and ways.

CLEANLINESS

Clean the lathe daily when in use. Use a suitable brush or cloth. A vacuum cleaner may also be used.

CAUTION; Never use compressed air.

CUTTER BITS (Carbide Inserts)

The tri-corner tool bits allow for three cutting edges.

To replace or to rotate to a new cutting edge, remove the cutter bit mounting screw. Be sure mounting screw is tightened firmly after changing the cutter bit.

NOTE: It is recommended to maintain a chart or record whenever cutter bits are replaced or rotated.

NOTE: Cutter bits are changed whenever a rough or wavy finish appears on the braking surfaces of the drum or rotor. This indicates a worn or chipped cutting edge.

TROUBLE SHOOTING

PROBLEM; Main motor will not run

CAUSE: The overload switch on the motor cuts in due to overloading the motor with a large cut or using a very long extension cord between the power source and the machine

REMEDY: Let motor cool down, and then push reset button on back of the motor

NOTE: The reset button may be reached through hole provided in the top of the bench

.....

PROBLEM: Rough finish on disc and drum

CAUSE #1: Worn or broken tool bit

REMEDY: Index carbide to new corner or replace

CAUSE #2: Excessive play in the drum carriage

REMEDY; The cross slide is adjustable for play by means of a row of bolts along the lower front edge of the carriage. These bolts have locknuts to keep them in place. Loosen the locknuts and adjust screws until there is a slight drag when moving the carriage back and forth. Tighten the locknuts while holding the adjusting screws in place.

NOTE: Carriage must be over dovetail plate while adjusting carriage for excessive play

CAUSE #3: Drum boring bar or tool holder is not a proper angle

REMEDY: Loosen locking bolts on center post of the drum turning attachment and position it to obtain a more optimum angle (inward toward drum surface)

CAUSE #4: Excessive play in main slide carriage

REMEDY: The main slide carriage is adjustable for play by means of a row of bolts along the lower left edge of the carriage. These bolts have locknuts to keep them in place. Loosen the locknuts and adjust the screws until there is a slight drag when moving the carriage back and forth. Tighten the locknuts while holding the adjusting screws in place.

NOTE: Carriage must be over dovetail plate while adjusting the carriage for excessive play.

CAUSE #5: Cut is too large.

REMEDY: Do not try to cut too much at one time. Smaller cuts produce a finer finish

CAUSE #6: Speed control set on rough cut

REMEDY: Slow feed down

.....

PROBLEM; The end of the arbor wobbles when a drum or rotor is mounted

CAUSE: Sometimes when a rotor flywheel or drum is mounted the end of the shaft will wobble. When the arbor nut is loosened the shaft will run true. This is **NORMAL**. Rotor and drum surfaces are rarely flat. When tightening the arbor nut, the arbor will twist toward the lowest part of the mounting surface.

REMEDY: What can you do to reduce arbor wobble?

- 1 Prepare the surfaces the tooling will touch to insure they are flat and smooth. If machining a hubless part, use a file to dress the center hole at the point where the mounting cone will touch. If a hub type, wipe out the old grease and inspect the bearing races for wear or unevenness. Replace if necessary. Remove sharp edges and burrs.
- 2 Use the self-aligning washers (W223 & W224) found in the tooling supplied with the lathe. Place the self-aligning washers on the arbor just after the last cup, bearing adaptor or cone.
- 3 Insure that the tooling is clean and free of nicks.
- 4 If machining a rotor, use a dial indicator with the rotor mounted on the vehicle to find the high spot on the friction surface. Mark the high spot. Remove the rotor, mount it on the brake lathe and use a dial indicator to check for the location of the high spot. If they differ, readjust the tooling and adjust until the high spot agrees with the mark found when mounted on the vehicle.
- 5 As an alternate method to 4 or when machining a drum, do a scratch test:
 - a Mount the drum, rotor or flywheel and switch the lathe on
 - b Adjust the cutting bit until it just touches the friction surface
 - c Back the cutter from the surface and turn the lathe off. The scratch in the surface will indicate the high spot.
 - d Loosen the tooling and rotate the part 180 deg.(without rotating the tooling). Tighten.
 - e Move the line cutter to another spot on the friction surface and make another scratch test. If the scratches line up, the part is properly mounted and can be machined. If the scratches do not line up, loosen and adjust the tooling until they do.

PROBLEM: The arbor wobbles without a drum or rotor mounted.

CAUSE #1: The arbor has not been properly installed.

REMEDY: To insure true running, insure that the "O" witness marks found on the arbor and lathe shafts are aligned and the arbor is tight. See the **ARBOR REMOVAL AND INSTALLATION** section of this manual.

CAUSE #2: The arbor is bent. Using a dial indicator, measure the runout of the arbor about six inches from the headstock. The allowed tolerance is 0.001" (0.025mm)

REMEDY: Replace the arbor

.....
PROBLEM; Fish scale pattern in the machined surface.

IF ROTOR ONLY:

CAUSE #1: The rotor stabilizer has not been used or used incorrectly

REMEDY: The rotor stabilizer should be attached so that the plungers are pushing against the friction surface with even pressure. When machining thin, solid, non-vented rotors, the silencer bands can be used with the stabilizer to give extra vibration dampening.

IF DRUMS & FLYWHEELS ONLY:

CAUSE #1: The angle of the boring bar is incorrectly positioned.

REMEDY: Adjust the bar in the holder so that a minimum of the bar at the cutting bit end is exposed. Adjust the angle of the boring bar holder so the cutting bit is pointing as close as possible to a right angle to the friction surface. The tip of the bit should be used for machining, not the side.

CAUSE #2: If a drum, the silencer band was not used or is attached incorrectly.

REMEDY: Attach the band tightly so that it covers as much of the drum as possible. If turning especially wide drums, it may be necessary to use a second silencer band, BDL 140, or optional wide band, BDL 140-1.

IF DRUMS, FLYWHEELS OR ROTORS;

CAUSE #1: The part has been mounted too far out on the arbor.

REMEDY; Always mount the part to be machined as close to the headstock as possible.

CAUSE #2: The bench is not tightly bolted together. The lathe is not bolted to the bench or the bench can rock on the uneven floor.

REMEDY: Tighten the bench hardware. Make sure the lathe is bolted securely to the bench. Adjust the legs to insure the bench will not rock.

CAUSE #3: The carriage feed speed is set too low.

REMEDY: Increase the feed speed. Acceptable machining is usually maintained with the adjustment knob set to the 3 o'clock scale position.

CAUSE #4: The cutter bit(s) is loose or chips are lodged between the bit and the holder or the holder(s) is loose.

REMEDY: Remove the carbide bit(s). Clean any chips from the holder. Tighten the bit attachment screw and the holder mounting screws.

CAUSE #5: The arbor drive motor v-belt is defective or the motor is loose, causing a vibration throughout the lathe and bench.

REMEDY: Replace the v-belt. Tighten the motor.

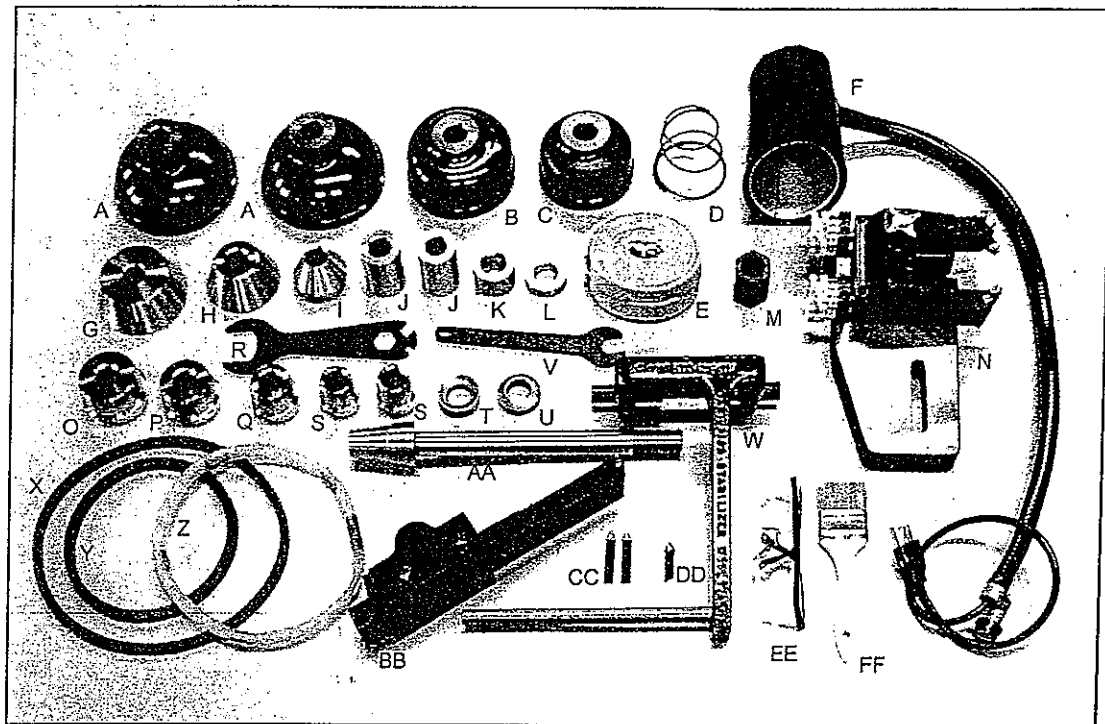
CAUSE #6: The depth of cut is set too small.

REMEDY: Adjust depth of cut to remove at least 0.002".

CAUSE #7: The wrong carbide cutter bits and/or holder are used.

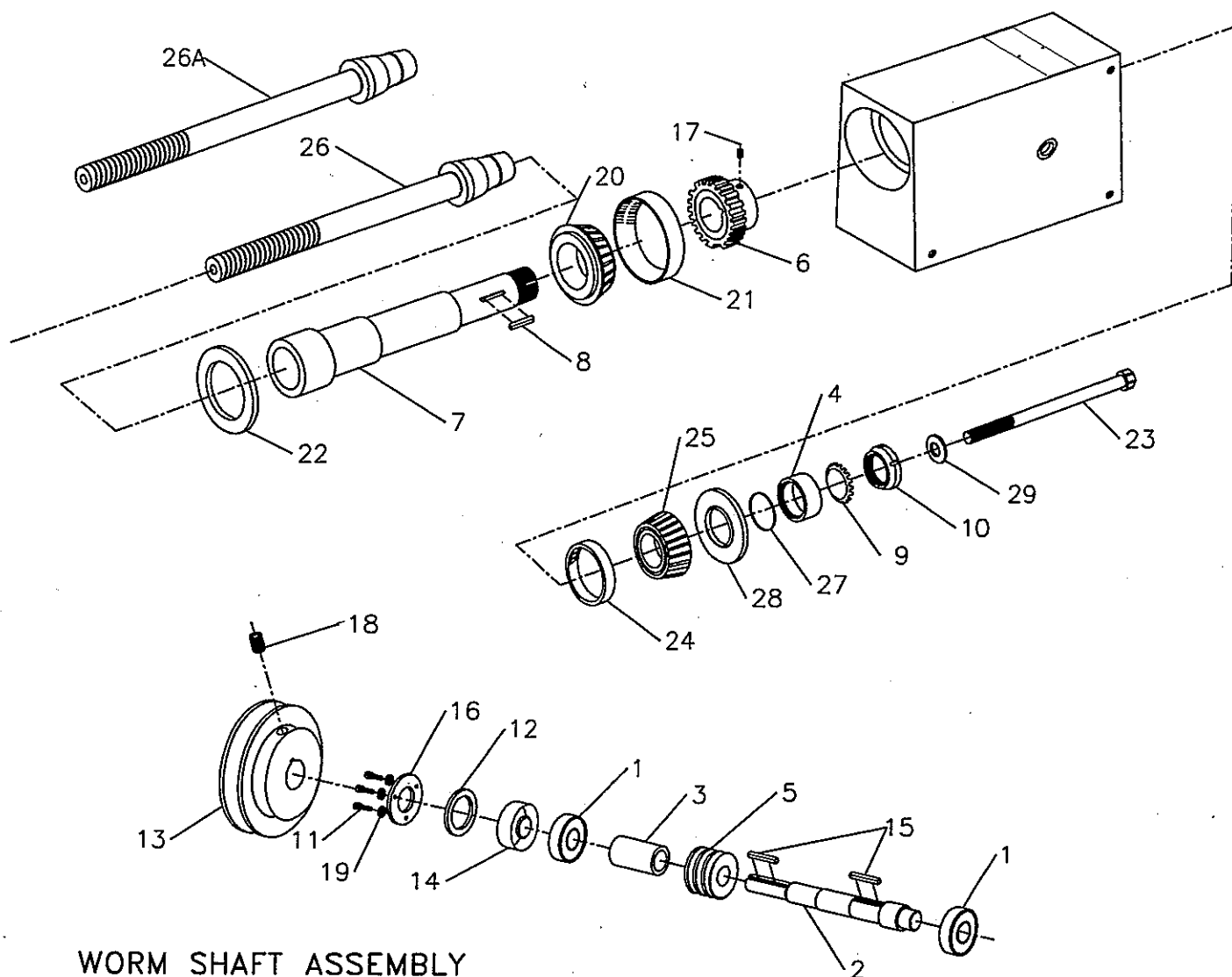
REMEDY: Use the proper bits and holder. The correct bits are positive with a 0.015" radius, p/n W139. The holder part number is W140 for rotors or W140-1 for drums.

STANDARD TOOLING / ACCESSORIES



A CW96	Hubless adaptor 1" bore, 5.500" (2)	Q W133	Bearing adaptor 1" bore, 1.659" to 2.033"
B W115	Hubless adaptor 1" bore 4.750"	R W221	Wrench
C W114	Hubless adaptor 1" bore 4.000"	S W118	Bearing adaptor 1" bore, 1.285" to 1.659" (2)
D W108	Spring	T W224	Self-Aligning Spacer
E BDL140	Chatter band, Drum	U W223	Self-Aligning Spacer
F BDL251-1	Lamp	V W230	Wrench 3/4"
G W110	Cone 1" bore, 3.00" to 4.00"	W CL503A	Disc Stabilizer Assly.
H W111	Cone 1" bore, 2.00" to 3.125"	X W116	Chatterband 9 3/4"
I CW94	Cone 1" bore, 1.150" to 2.350"	Y W131	Chatterband 7"
J W101	Spacer 1" bore, 2.00" Long (2)	Z W117	Chatterband 10 3/4"
K W099	Spacer 1" bore, 1.00 long	AA CL538	Mounting Shaft 10.5"
L W098	Spacer 1" bore, 1/2" long	BB CL502 A	Boring Bar Assly . (includes item DD)
M W220	Lock nut, left	CC W140	Tool Holder (2) - (included in item N)
N CL605A	Tool Plate Assly (includes item CC)	DD W140-1	Tool Holder (drum) - (included in item BB)
O W129	Bearing adaptor 1" bore, 2.047" to 2.781"	EE W231	Safety Glasses
P W119	Bearing adaptor 1" bore, 2.033" to 2.407"	FF W232	Brush

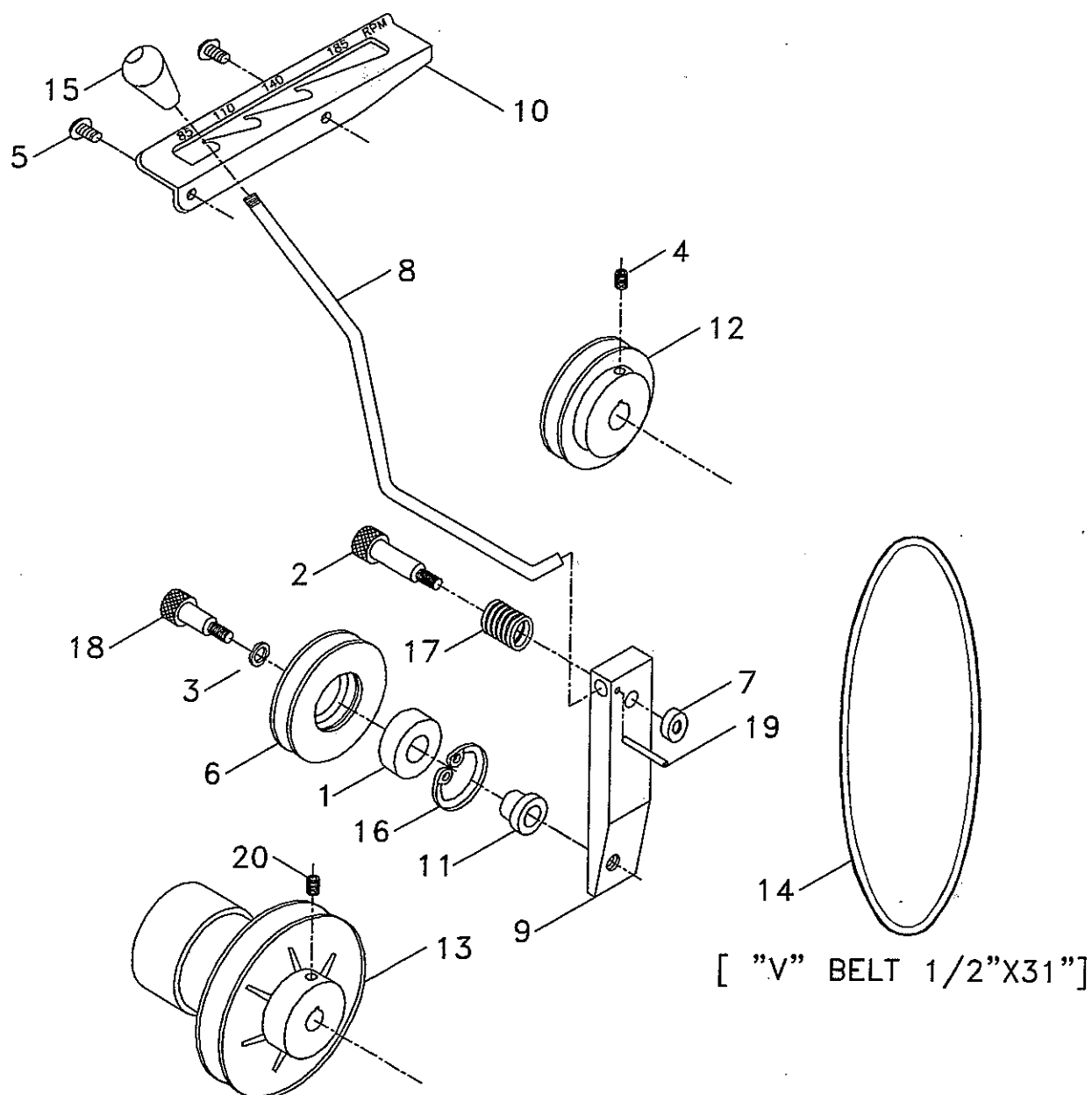
SPINDLE SHAFT ASSEMBLY



WORM SHAFT ASSEMBLY

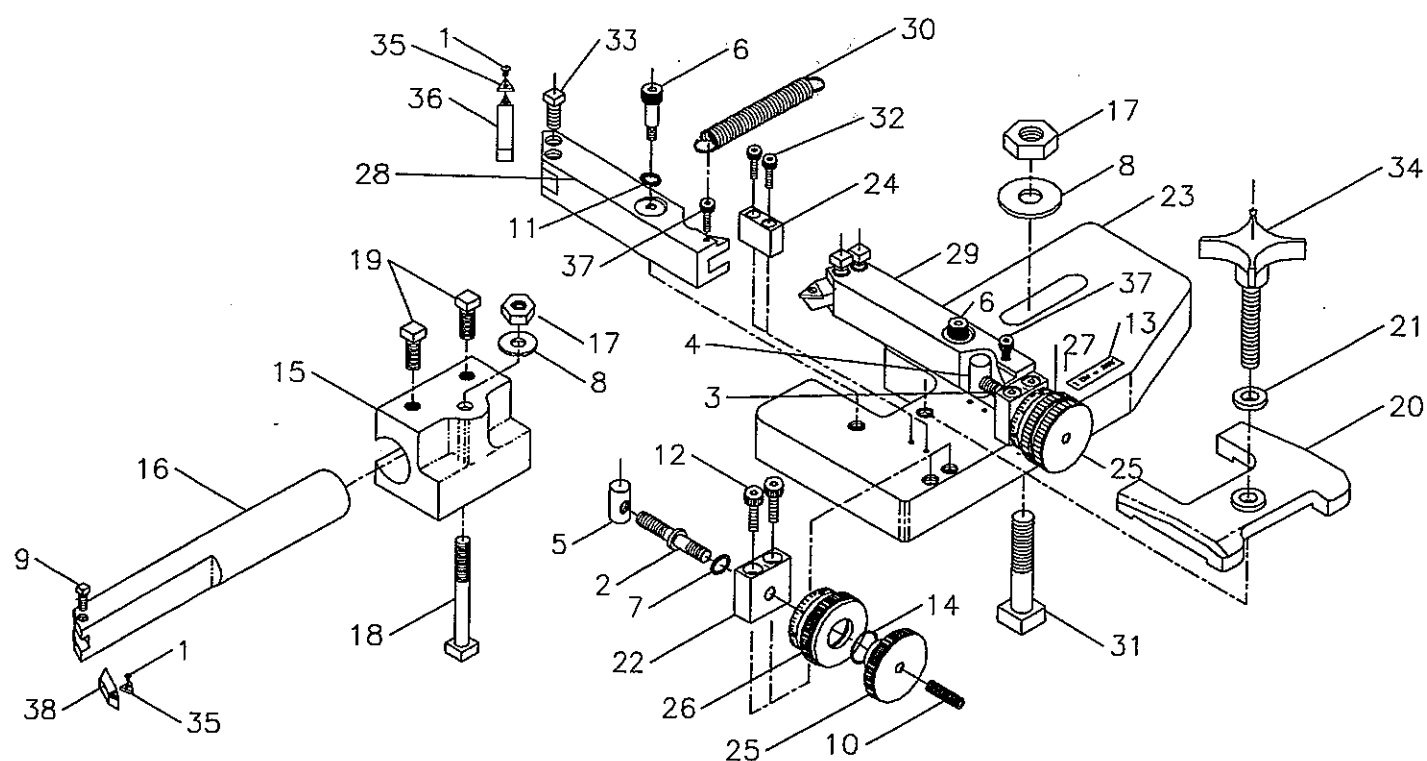
NO.	PART NO.	DESCRIPTION	NO.	PART NO.	DESCRIPTION
1	CL020	BEARING	17	CL193	5/16-18X5/16SSS
2	CL027-1	WORM SHAFT	18	CL192	1/4-20X1/4 SSS
3	CL028-1	SPACER	19	CL201	# 6 LOCK WASHER
4	CL030-1	SEAL SPACER	20	CL261	BEARING CONE
5	CL031	WORM GEAR	21	CL262	BEARING CUP
6	CL032	BRONZE GEAR	22	CL263	SEAL
7	CL033-2	SHAFT	23	CL264-2	DRAW BOLT
8	CL034	KEY	24	BDL276-1	BEARING CUP
9	CL035	LOCK WASHER	25	BDL276-2	BEARING CONE
10	CL036	LOCK NUT	26	CL538	1"ARBOR STANDARD 10.5"LONG
11	CL039	6/32X3/8 RHMS	26A	CL538-1	1"ARBOR OPTIONAL, 14.5"LONG
12	CL040	SHIM	27	CL636	"O" RING
13	CL683	PULLEY	28	CL038	SEAL
14	CL042	SEAL	29	CL695	1/2" SAE FLAT WASHER
15	CL043	KEY			
16	CL047	RETAINER PLATE			

SPEED CHANGER ASSEMBLY



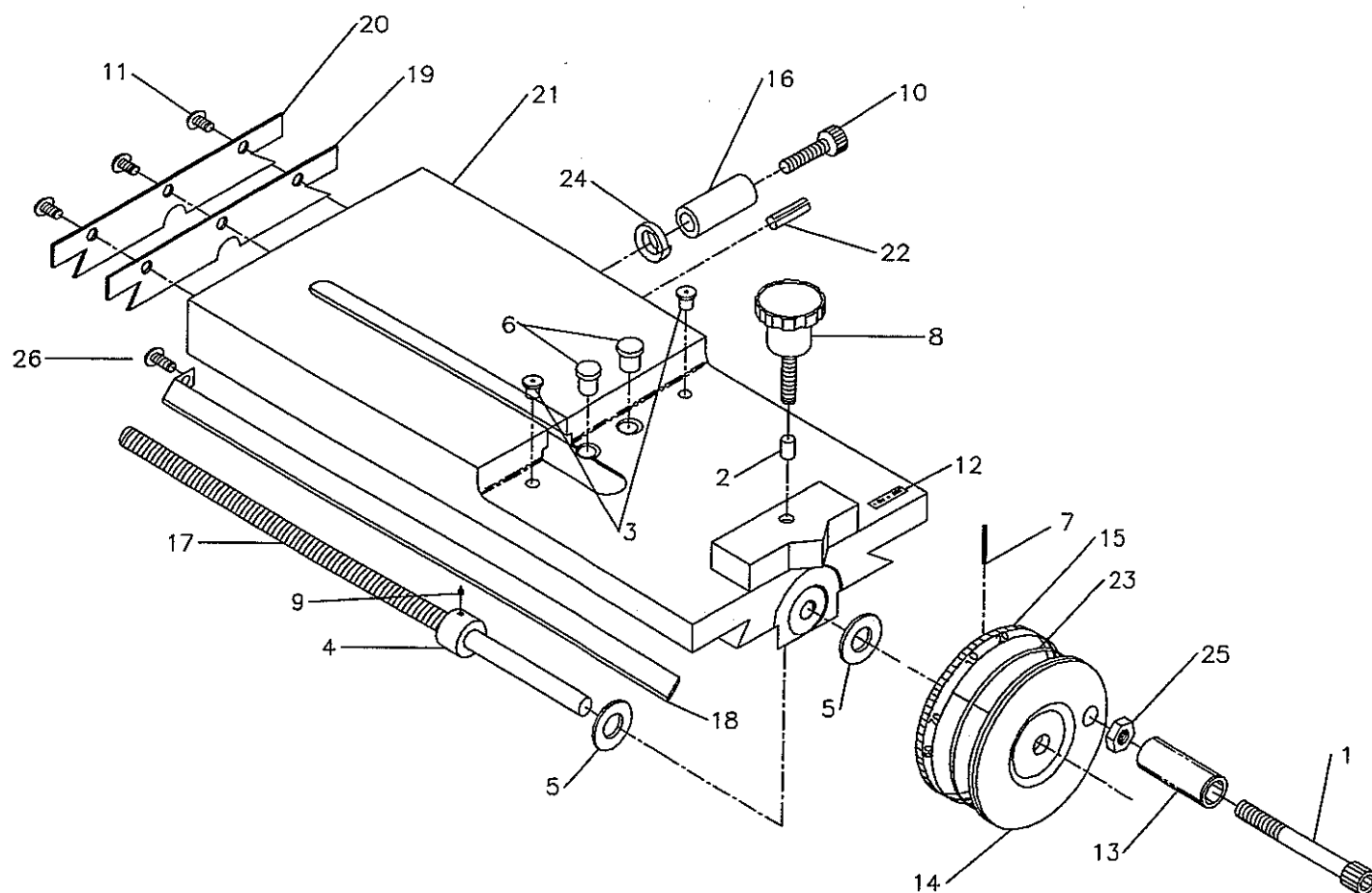
NO.	PART NO.	DESCRIPTION	NO.	PART NO.	DESCRIPTION
1	CL020	BEARING	11	CL682	BUSHING
2	CL174-1	SHOULDER BOLT	12	CL683	PINION PULLEY
3	CL182	SPRING WASHER	13	CL686	DRIVE PULLEY
4	CL192	1/4-20 X 1/4 SSS	14	CL697	"V" 1/2"X31" BELT
5	CL656	1/4-20 X 1/2 BSHCS	15	CL688	PLASTIC KNOB
6	CL673	IDLER PULLEY	16	CL689	SNAP RING
7	CL674	SPACER	17	CL690	SPRING
8	CL675	SPEED CHANGE LEVER	18	CL691	SHOULDER BOLT
9	CL676	IDLER PULLEY BRACKET	19	CL692	SPRING PIN 1/8 X 1/2
10	CL677	SPEED CHANGE BRACKET	20	CL727	HALF DOG

TOOL PLATE ASSEMBLY



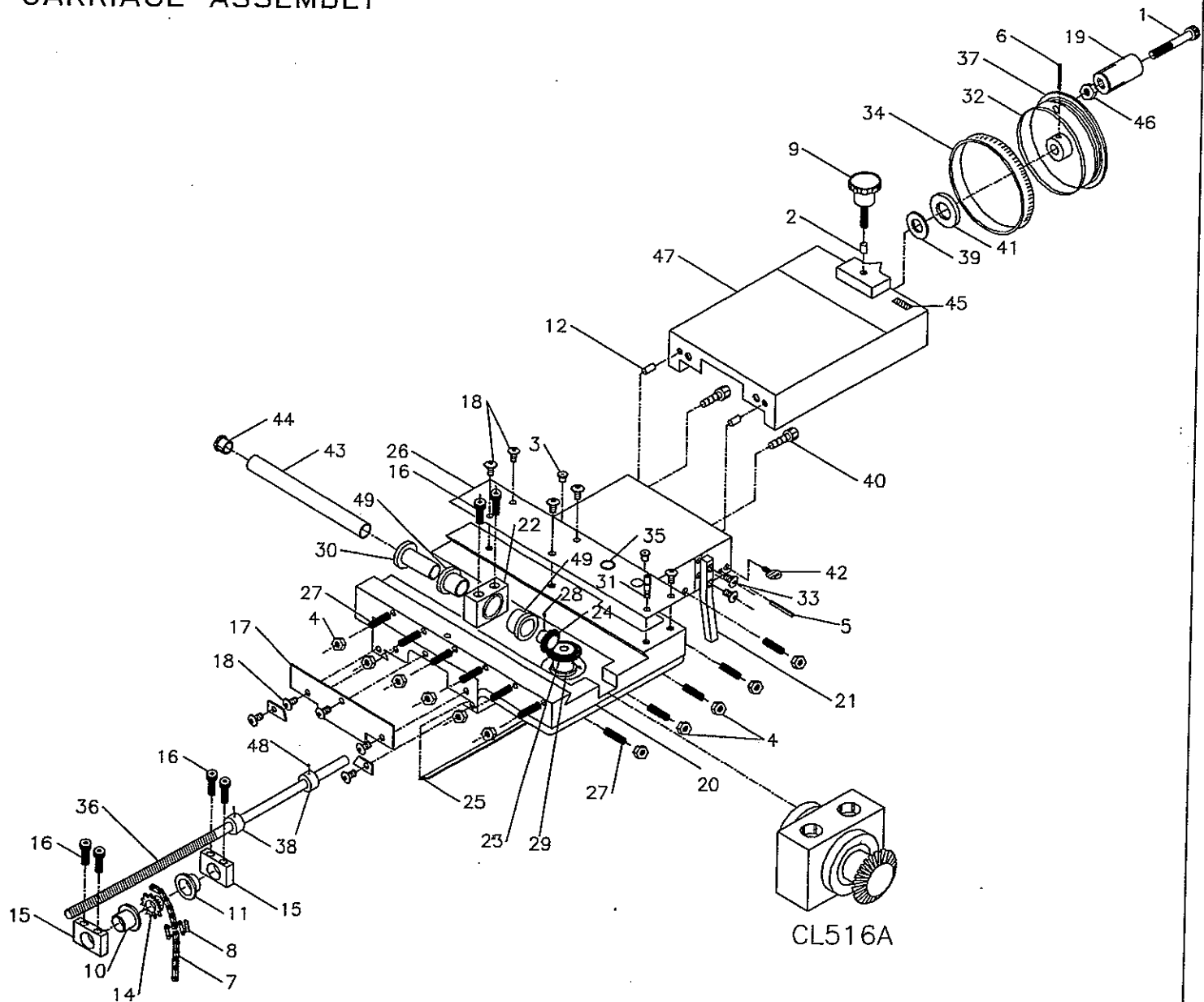
NO.	PART NO.	DESCRIPTION	NO.	PART NO.	DESCRIPTION
1	CL039	TOOLBIT SCREW 6/32X3/8	20	CL575	TOOL HOLDER CLAMP
2	CL056-1	TOOL POSITIONING SCREW(L)	21	CL596	WASHER (3/8 SAE)
3	CL057-1	TOOL POSITIONING SCREW(R)	22	CL604	SUPPORT BLOCK
4	CL070	TOOL ADJUSTING NUT (R)	23	CL605	TOOL PLATE
5	CL071	TOOL ADJUSTING NUT (L)	24	CL606	ALIGNING BLOCK
6	CL075-1	STRIPPER BOLT 5/16-1	25	CL607	TOOL POSITIONING KNOB
7	CL142	SPRING WASHER	26	CL608	INDICATOR DIAL (L)
8	CL156	WASHER	27	CL609	INDICATOR DIAL (R)
9	CL170	SQ. HD. SS 5/16-18X3/4	28	CL610	TOOL HOLDER - LEFT
10	CL191	5/16-24X3/4 SSS	29	CL611	TOOL HOLDER - RIGHT
11	CL211	SPRING WASHER	30	CL612	SPRING
12	CL223	1/4-20X1 1/4 SHCS	31	CL776	"T" BOLT - 2 1/2"
13	CL245-1	DIVISION LABEL (.002)	32	CL623	8/32X3/4" SHCS
14	CL254	"O" RING	33	CL624	SQ. HD. SS 5/16-18X1/2
15	CL502	BORING BAR HOLDER	34	CL625	LOCKING SCREW & KNOB
16	CL523	BORING BAR	35	W139	CARBIDE INSERT TOOLBIT
17	CL527	HEX NUT 1/2-13	36	W140	TOOL BIT HOLDER (DISC)
18	CL528	"T" BOLT - 4 1/2"	37	CL077	10/32X1/2 SHCS
19	CL566	SQ. HD. SS 1/2-13X1	38	W140-1	TOOL BIT HOLDER (DRUM)

CROSS SLIDE ASSEMBLY



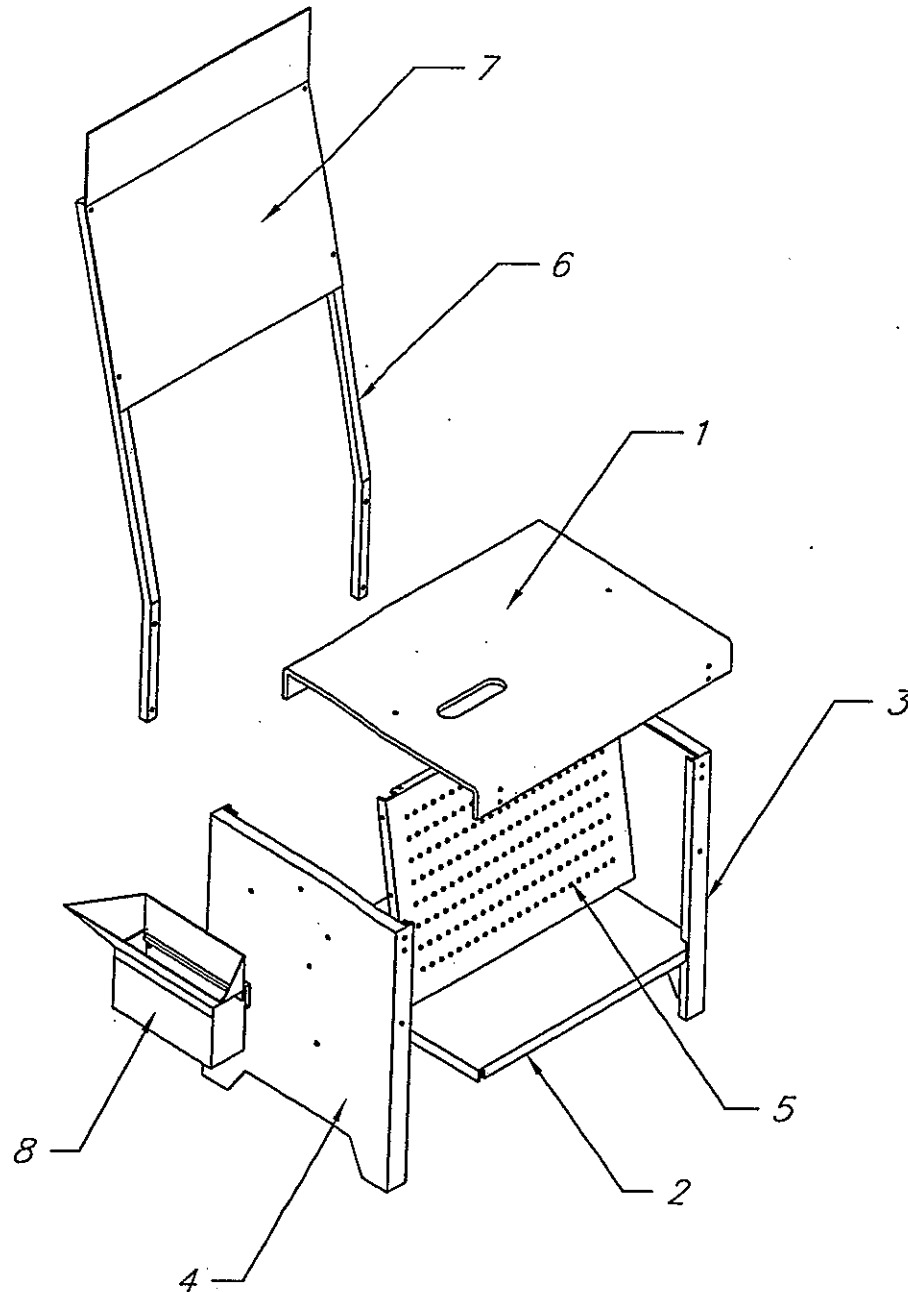
NO.	PART NO.	DESCRIPTION	NO.	PART NO.	DESCRIPTION
1	CL011-1	HANDLE 5/16-18X3 SHCS	15	CL510	INDICATOR DIAL
2	CL012	BRASS PLUG	16	CL513	SWITCH SHUT OFF ARM
3	CL015-1	OILER	17	CL522-1	LEADSCREW
4	CL059	COLLAR	18	CL699-1	GIB
5	CL067-1	THRUST WASHER	19	CL661	WIPER
6	CL073	RUBBER PLUG	20	CL660	RETAINING PLATE
7	CL081	1/8X1 SPRING PIN	21	CL584	CARRIAGE
8	CL141-1	LOCKING SCREW KNOB ASSY	22	CL588	SWITCH SAFETY STOP 1/4X1
9	CL192	1/4-20X1/4 SSS	23	CL602	"O" RING
10	CL223	1/4-20X1 1/4 SHCS	24	CL185	1/4" LOCK WASHER
11	CL225	10/24X1/4 BSHCS	25	CL098	5/16 JAM NUT
12	CL245-1	DIVISION LABEL (.002)	26	CL741	10/24 X 3/8 BSHCS
13	CL265-2	PLASTIC HANDLE			
14	CL509	HANDWHEEL			

CARRIAGE ASSEMBLY



NO.	PART NO.	DESCRIPTION	NO.	PART NO.	DESCRIPTION
1	CL011-1	5/16-18 X 3" SHCS	26	CL544-2	SWITCH COVER PLATE
2	CL012	BRASS PLUG	27	CL562	1/4-20 X 1 SSS OVAL POINT
3	CL015-1	OILER	28	CL568	10-32 X 1/4 SSS
4	CL017	1/4- 20 JAM NUT	29	CL571	BUSHING
5	CL021	SPRING PIN 1/8 X 7/8	30	CL585	GEAR SLEEVE
6	CL081	SPRING PIN 1/8 X1	31	CL587	SAFETY STOP
7	CL786	CHAIN	32	CL602	O RING
8	CL087	CONNECTING LINK	33	CL626	1/4-20 X 5/8 BSHCS
9	CL141-1	LOCKING SCREW ASSEMBLY	34	CL647	INDICATOR DIAL DRUM
10	CL159-1	BUSHING	35	CL662	INDICATOR LIGHT
11	CL159-2	BUSHING	36	CL672	LEAD SCREW
12	CL204	1/4 X 3/4 DOWEL	37	CL681	HANDWHEEL
14	CL167-1	SPROCKET	38	CL684	COLLAR
15	CL216	BLOCK	39	CL685	THRUST WASHER
16	CL223	1/4-20 X 1-1/4 SHCS	40	CL693	5/16-18 X 1-1/4
17	CL224-1	WIPER	41	CL694	SPACER
18	CL225	10-24 X 1/4 BSHCS	42	CL643	THRUMB SCREW
19	CL265-2	PLASTIC SWIVEL	43	CL658	LEAD SCREW TUBE
20	CL501-1	CARRAIGE	44	CL659	LEAD SCREW TUBE PLUG
21	CL514-2	SHUT OFF ARM	45	CL245-2	DIVISION LABEL
22	CL516	BLOCK	46	CL098	5/16 JAM NUT
23	CL812	FEED MOTOR GEAR	47	CL680	CARRAIGE EXTENSION
24	CL519-1	GEAR	48	CL192	1/4-20 X 1/4 SSS
25	CL525-1	GIB	49	CL159-1A	BUSHING

BENCH AND BACKBOARD



BILL OF MATERIALS

NUMBER	DESCRIPTION	QTY.	NUMBER	DESCRIPTION	QTY.
1	TOP	1	8	CHIP CATCHING ASSEMBLY	1
2	BOTTOM	1	9	5/16-18 X 1.5 HEX HEAD	4
3	RIGHT SIDE	1	10	1/4-20 X .5 HEX HEAD	32
4	LEFT SIDE	1	11	5/16-18 NUT	4
5	TOOLING BOARD	1	12	1/4-20 LOCK NUT	32
6	POST	2	13	HOOK	20
7	BACKBOARD	1	14	1/4-20 X 1.5 HEX HEAD	4

NOTE: ASSEMBLY INSTRUCTION ON REVERSE SIDE

BENCH ASSEMBLY INSTRUCTIONS:

1. Remove the components from the box and identify the top bottom shelf, tooling panel and side panels. Reference illustration for assembly positioning.
NOTE: Do not tighten the hardware until Step 7.
2. Using the packing carton to protect the finish, lay the side panels and the bottom shelf on the floor with the fronts facing up.
Assemble them using (26) 1/4" x 1/2" hex bolts and nuts.
3. Place the center tooling panel between the side panels and assemble.
4. Install the leveling bolts (4) 5/16" x 1 1/2" and jam nuts into the bottom of the left and right panels. Set the bench upright.
5. Attach the top to the tooling panel and side panels.
NOTE: If the optional Accessory Backboard has been purchased, attach the posts at the holes provided in the rear of the bench top and side panels using (4) 1/4" x 1 1/2" hex bolts and nuts.
6. Attach the chip catcher bracket to left side panel with (2) 1/4" x 1/2" hex bolts and nuts.
7. Tighten all the hardware. Move the bench into the working position and level. Tighten the jam nuts on the leveling bolts.
8. Attach the lathe to the bench using the (4) 5/16" x 2 1/2" carriage bolts, nuts and washers supplied in tooling kit.
9. Put hopper in places as shown on illustration.

BACKBOARD ASSEMBLY INSTRUCTIONS:

1. Remove backboard components from box.
2. Dis-assemble top support arms (2) from the backboard.
3. Slide top support arms (2) into the bottom support arms (2) and fasten to backboard using (4) 5/16" x 1 1/2" hex bolts and nuts. (See illustration.)
4. Fasten backboard to rear of bench assembly using (4) 1/4" x 1 1/2" hex bolts and nuts.
5. Tighten all fasteners.