

WELLS

DENTAL, INC.

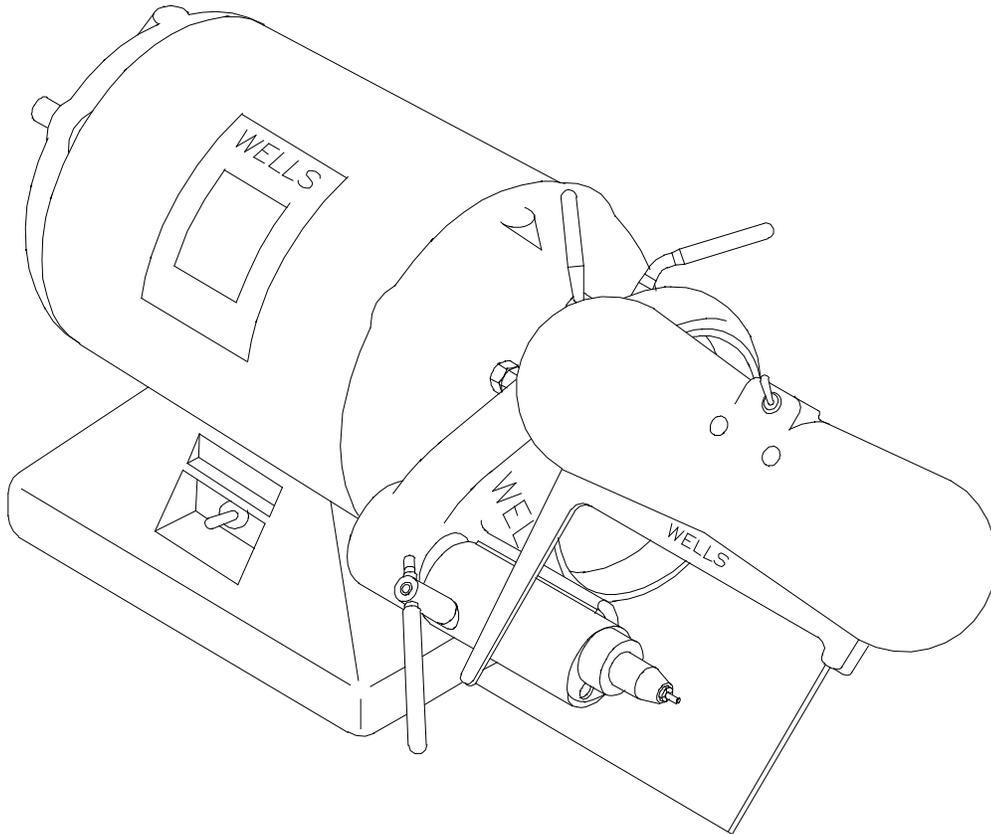
TECHNICAL BULLETIN
U802-022510

5860 FLYNN CREEK ROAD
P.O. BOX 106
COMPTCHE, CALIFORNIA, U.S.A. 95427

**READ ALL INSTRUCTIONS
BEFORE PROCEEDING
SAVE THIS FOR FUTURE REFERENCE**

THIS PRODUCT IS FOR PROFESSIONAL LABORATORY USE ONLY

USER'S MANUAL



**WELLS GOLD CHROME FINISHING MACHINE
PRODUCT NO. U712**

**SALES CUSTOMER SERVICE TECHNICAL ASSISTANCE
CALL TOLL-FREE: 1 800 233-0521**

**PHONE: (707) 937-0521, FAX: (707) 937-2809
MONDAY-FRIDAY, 8:00 a.m. - 4:30 p.m. P.S.T.**

DENTAL EQUIPMENT FOR TECHNICIANS WHO VALUE TIME AND QUALITY

1.0 SAFETY INSTRUCTIONS



WARNING: WHEN USING ELECTRIC TOOLS, BASIC SAFETY PRECAUTIONS SHOULD ALWAYS BE FOLLOWED TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK, AND PERSONAL INJURY INCLUDING THE FOLLOWING ITEMS:



1.1 GROUND THE LATHE. The Lathe must be grounded while in use to protect the user from electric shock. Plug into a three-hole grounded receptacle. If an adapter is used to accommodate a two-hole receptacle, the grounding lug must be connected to a known ground. Never remove the third prong. If in doubt, have a licensed electrician check the receptacle for **PROPER GROUNDING** and **POLARITY**.

1.2 HANDLE WITH DRY HANDS. Never handle the plug, power cord, Lathe or Spindle with wet hands.



1.3 DISCONNECT THE POWER CORD. Before servicing, unplug the power cord to prevent electric shock or unintentional starting.



1.4 ALWAYS USE SAFETY GLASSES. Wear industrial certified safety glasses for **ALL** work and maintenance. In addition, always put the clear safety shield between the Spindle and your face for protection in case of tool breakage.

1.5 SECURE LOOSE ARTICLES. Fasten long hair. Do not wear loose clothing, necktie or jewelry. They can get caught in rotating parts.



1.6 USE PARTICLE MASK when there is dust or particles in the air.

1.7 ALWAYS KEEP A TOOL IN THE COLLET. Never operate the unit without a tool.



1.8 DO NOT EXCEED THE MAXIMUM OPERATING SPEED OF THE TOOL. Use **ONLY** tools, parting disks or polishing wheels that are rated above the speed of your spindle. Insufficiently rated tools may break apart, bend or come loose causing serious personal injury.

1.9 MAINTAIN THE WHEEL OR TOOL. Never operate with a damaged or bent tool. It could break apart or come loose causing serious personal injury.

1.10 CHECK TOOL IS SECURE. Insert the tool shank into the collet to the **MAXIMUM** depth that will allow free rotation of the tool. An extended tool is likely to break or bend causing serious personal injury. Always check that the tool is securely held in the collet.



1.11 KEEP CHILDREN AWAY. All visitors should be kept a safe distance from the work area. Do not run the unit unattended.

1.12 MAINTAIN THE UNIT. Inspect periodically for damaged or worn parts. Follow the instructions for maintenance. Don't use if the power cord, lathe, switch, belt or other parts are in poor condition. Don't use if the unit has been dropped, damaged, or exposed to water. Have a qualified service person inspect and replace parts when necessary.

1.13 FOR LABORATORY USE ONLY. The WELLS Gold Chrome Finishing Machine is intended for use by trained professional laboratory personnel.

2.0 PRODUCT DESCRIPTION

The WELLS Gold Chrome Finishing Machine is designed for heavy duty laboratory service, quiet operation and low maintenance. Tool changes are quick and safe with the Wells High Speed Spindle. A quarter turn of the handle disengages the clutch, stops the shaft and opens the collet while the lathe is running. The Light Shield is a combination lamp and safety shield. A standard jeweler's taper is provided on the left end of the Wells Polishing Lathe.

- U712 GOLD CHROME MACHINE 115V 60HZ** consists of:
 R587 WELLS LATHE THREADED 115V 60HZ
 G201 BRACKET ASSEM & LIGHT SHIELD/W with:
 S406 BELT 2/3M475
 S220 SPINDLE MOUNTING KIT
 S013 WELLS SPINDLE with:
 S250 ACCESSORY KIT
 151 HEX WRENCH 3/32
 159 HEX WRENCH 1/8
 S152 STOP TUBES SET OF 6
 S153 STOP REMOVING TOOL
 S165 TUBE BRUSH 3/16
 U802 USER'S MANUAL for WELLS GOLD CHROME FINISHING MACHINE

3.0 SPECIFICATIONS

COLLET SIZES	3/32" (standard), 1/16", 1/8" or 3mm
SPINDLE SPEEDS	12,000 and 24,000 RPM
LATHE SPEEDS	1725 and 3450 RPM
ELECTRICAL RATING	115 Volts, 3.3 Amps, 60 Hz, Single Phase
UNIT DIMENSIONS	approx. 12 x 12 x 26"
WEIGHT	46 lbs
SHIPPING WEIGHT	55 lbs

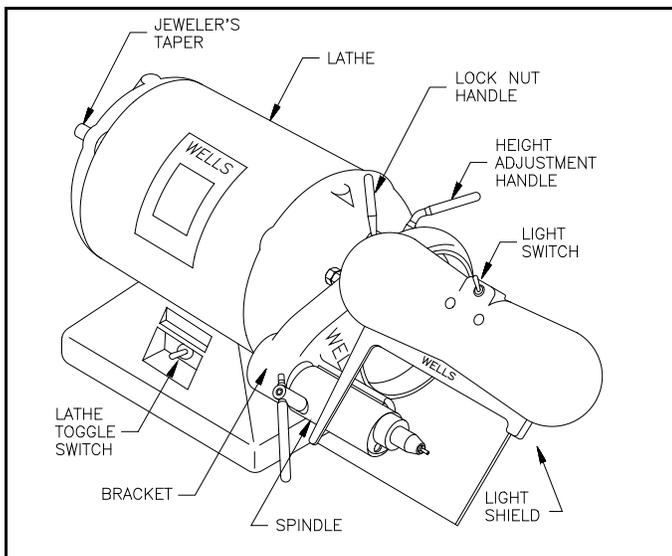


Figure 1. Gold Chrome Machine features

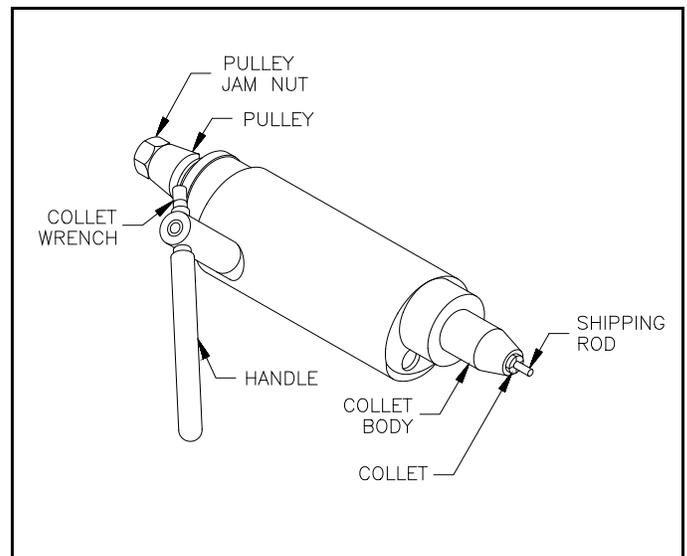


Figure 2. Spindle features

4.0 INSTALLATION

4.1 PREPARATION

- 4.1.1 Unpack and inspect all the components. Check that you were shipped all the items listed in the PRODUCT DESCRIPTION on page 3.
- 4.1.2 Tools needed for installation are: 1/4" straight blade screw driver and two 1/2" end wrenches.

4.2 INSTALL THE SPINDLE

- 4.2.1 Place the lathe on a sturdy bench and loosen the height adjustment handle. See Figure 3. Rotate the bracket to the position pictured and tighten the handle.
- 4.2.2 Loosen the lock nut handle, lift the bracket until it stops and tighten the handle.
- 4.2.3 Install the Spindle with the rubber mounting pad between the Spindle and the bracket.
- 4.2.4 Tighten the mounting screws alternately until the rubber bushings just begin to compress. Do not over tighten.
- 4.2.5 Install the belt over the motor pulley and the spindle pulley. Loosen the lock nut handle and let the weight of the Spindle tighten the belt. Do not apply additional pressure. The weight is sufficient to tighten the belt to the proper tension. Tighten the lock nut handle.

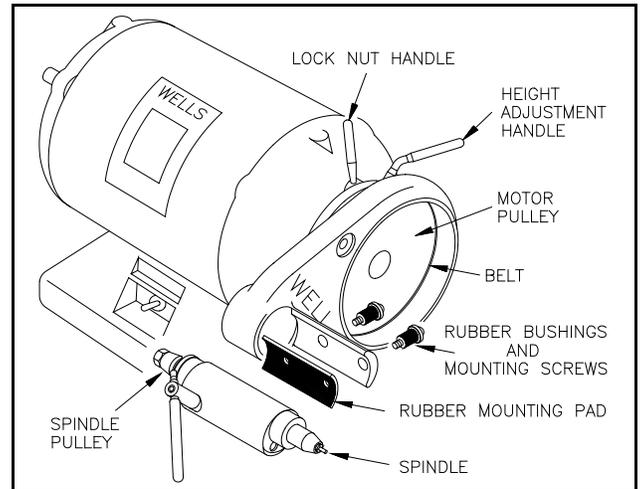


Figure 3. Install the spindle

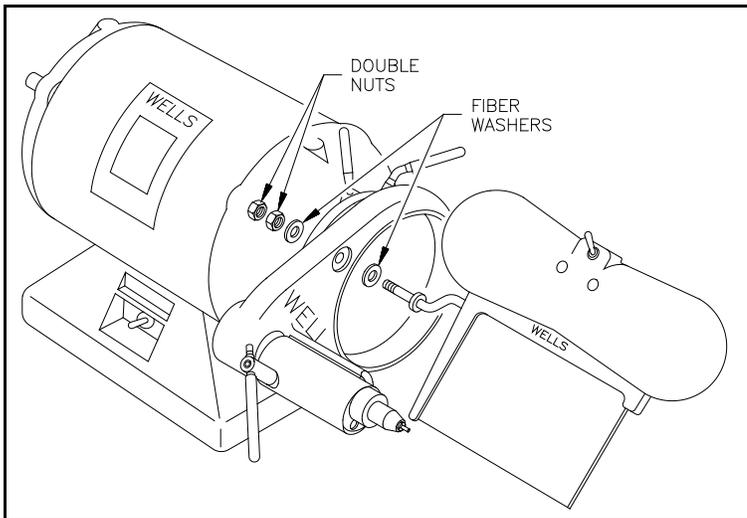


Figure 4. Install the light shield

4.3 INSTALL THE LIGHT SHIELD

- 4.3.1 Remove the two nuts and one fiber washer from the mounting arm on the Light Shield.
- 4.3.2 Put the arm through the hole in the bracket. See figure 4. Install the fiber washer and the two nuts on the end of the arm.
- 4.3.3 Tighten the first nut with a 1/2" end wrench so the Light Shield is held firmly in place but can still be moved.
- 4.3.4 Use a second 1/2" wrench to tighten the second nut while holding the first nut from turning.
- 4.3.5 Install two **ROUGH SERVICE** light bulbs, 60 watts maximum. Ordinary bulbs will not withstand the vibration.
- 4.3.6 Loosen the height adjusting handle and position the Spindle to the desired height. Tighten the handle. Adjust the Light Shield so the safety glass is between the Spindle and your face.

4.4 TEST AND ADJUST

- 4.4.1 Make sure the shipping rod is securely held in the collet and is not protruding more than 1/4".
- 4.4.2 Switch the lathe toggle switch to the **OFF** position (center).
- 4.4.3 Connect the power cord to a receptacle with **PROPER GROUNDING** and **POLARITY**.
- 4.4.4 **Put safety glasses on.**
- 4.4.5 Switch the lathe toggle to **SLOW**. After the Lathe is up to speed, switch the toggle to **FAST**. If there is excessive noise or vibration, tighten each of the mounting screws a quarter turn alternately until it stops.
- 4.4.6 Check that the belt tracks along the center of the edge of the motor pulley. If not, adjust the spindle mounting screws by loosening one and tightening the other a little until the belt is centered and there is no excessive noise.

5.0 OPERATION



WARNING: READ ALL INSTRUCTIONS BEFORE OPERATING. FAILURE TO COMPLY WITH INSTRUCTIONS COULD RESULT IN SEVERE PERSONAL INJURY AND/OR PROPERTY DAMAGE.



CAUTION: The High Speed Spindle is driven by a belt that increases the speed by seven times the Lathe speed. When the Lathe is on **SLOW** (1725 RPM), the Spindle runs at **12,000 RPM!** When the Lathe is on **FAST** (3450 RPM), the Spindle runs at **24,000 RPM!** Because of these high speeds, it is extremely important to take the following precautions:

5.1 HIGH SPEED PRECAUTIONS

- 5.1.1 Use ONLY tools that are rated above the speed of the Spindle. **Always consult the tool manufacturer's literature** for the maximum operating speed of the tool. For example, a thin parting disk with a diameter of 1-1/2" rated for 25,000 RPM is safe to use on either fast or slow speed. Heavier or larger diameter tools than this, however, are probably rated for lower speeds and are **extremely dangerous** if operated over their rated speed.
- 5.1.2 Make sure the tool is perfectly straight. A slightly bent tool will bend sharply, break or fly out of the collet.
- 5.1.3 Insert the tool shank into the collet to the **maximum depth** that will allow free rotation of the tool. Larger diameter and heavier tools especially must be held very closely to the collet.
- 5.1.4 Do not use excessive force on the tool.

5.2 GENERAL OPERATION



CAUTION: Always wear industrial certified safety glasses for all work and maintenance.

CAUTION: Always put the clear safety shield between the Spindle and your face for protection in case of tool breakage.

- 5.2.1 **Always keep a tool in the collet.** The Spindle may be damaged if the collet is closed without a tool.
- 5.2.2 To run the Lathe at **FAST** speed, always switch to **SLOW** first until the Lathe is up to speed, then switch to **FAST**. Do not switch directly from **OFF** to **FAST**.
- 5.2.3 Work is done with the handle in the operating position at approximately 5:00 o'clock. See Figure 5.
- 5.2.4 The clutch disengages when the handle is moved clockwise to approximately 6:00 o'clock (straight down).
- 5.2.5 The brake is applied when the handle is moved to approximately 7:30 o'clock.
- 5.2.6 The collet opens when the handle is moved to 9:00 o'clock (straight back).

5.3 CHANGING A TOOL

Any tool such as a burr or stone may be changed while the Lathe is running.

- 5.3.1 From the operating position move the handle clockwise to the open collet position (9:00 o'clock). See Figure 5.
- 5.3.2 Remove the tool.
- 5.3.3 Insert a selected tool that is rated for the speed of the Spindle.
- 5.3.4 Move the handle to approximately 7:00 o'clock to close the collet.



DANGER: REMOVE YOUR HAND from the tool before moving the handle past 7:00 o'clock. Holding a tool when the clutch engages could cause serious personal injury.

- 5.3.6 Ease the handle counterclockwise to the operating position. Do not let the handle snap shut.

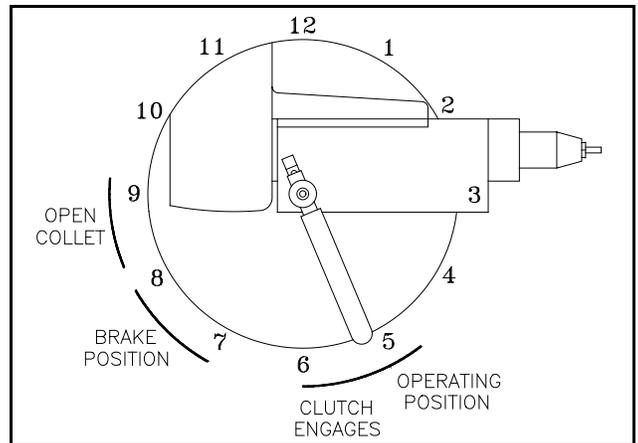


Figure 5.

5.4 CHANGING POINTS, STONES AND PARTING DISKS

By applying the brake, points, stones and parting disks may be loosened or tightened **when the Lathe is stopped only**.

5.4.1 Turn the Lathe off.

5.4.2 From the operating position move the handle clockwise to about 7:30 o'clock where the resistance of the brake is felt. This disengages the clutch, locks the shaft and keeps the collet closed.

5.4.3 Hold the handle in this position to loosen or tighten points, stones or parting disks.

5.5 ADJUSTING SPINDLE HEIGHT

5.5.1 Turn the Lathe off.

5.5.2 Hold the Spindle and loosen the height adjustment handle. See Figure 1.

5.5.3 Adjust the Spindle to the desired height and tighten the handle.

6.0 MAINTENANCE

CAUTION: The bearings in the WELLS High Speed Spindle are permanently lubricated with special compounds. If anything enters the bearings, they will be damaged. **KEEP OIL, SOLVENT AND COMPRESSED AIR AWAY** from the WELLS High Speed Spindle.



NO OIL



NO SOLVENT



NO AIR

CAUTION: There are no user serviceable parts inside the Spindle except as described below. **DO NOT DISASSEMBLE** the Spindle.

6.1 RUNNING HOT

A WELLS High Speed Spindle may run hot for several reasons:

- 6.1.1 A new or rebuilt Spindle will run hot when first put into operation until the bearings are broken in. This condition may last several days depending upon the amount of use.
- 6.1.2 A worn or loose collet or a stop that is too long may cause tools to slip. The brake may drag causing the collet to spin inside the collet body. The overheating will be noticed at the collet and front of the collet body. If the tools slips, follow the procedures in section 6.3, FITTING A STOP TO ADJUST THE COLLET DIAMETER.

6.2 CLEANING THE COLLET (MONTHLY)

To prevent the collet from sticking and slipping, periodic cleaning and lubrication is essential. Neglected collets can get frozen into the shaft requiring factory service.

- 6.2.1 Turn off the Lathe and disconnect the power cord.
- 6.2.2 Use a 3/32" hex wrench to loosen the set screw that holds the handle and remove the collet wrench. See Figure 6.
- 6.2.3 Insert a 3/32" rod into the hole in the collet wrench to make a tee handle.
- 6.2.4 Move the handle to the open collet position (9:00 o'clock). Remove the tool.
- 6.2.5 Insert the collet wrench into the collet and turn counterclockwise to unscrew. If the collet turns but will not unscrew, see section 6.4, REMOVING A STUCK COLLET.
- 6.2.6 To remove the small brass stop tube behind the collet, first clean out any packed dirt with the drill end of the stop removing tool provided in the accessory kit (see figure 6.) or use a #41 drill. Remove the stop tube with the threaded end of the stop removing tool or use a size #1 screw extractor (Easyout).
- 6.2.7 Wash the collet and stop tube in solvent. Solvent may be used on these parts **ONLY** when removed from the collet body. Dry the collet and stop tube thoroughly.
- 6.2.8 Clean the inside of the collet body so the collet will seat against the stop properly. Clean the threads using the tube brush provided in the accessory kit. Rotate the brush into the threads a few times. Use a pipe cleaner or Q-tip to clean out all the debris in the bottom of the hole. Do not use solvent here.
- 6.2.9 Put a **THIN** film of grease or Vaseline on the outside of the collet including the threads. **DO NOT** use oil.
- 6.2.10 Insert the stop tube and collet then tighten with the collet wrench.
- 6.2.11 Insert a tool into the collet and put the handle into the operating position.
- 6.2.12 Put the collet wrench in the end of the handle and tighten the set screw. Connect the power cord.

CAUTION: Do not run the Spindle without a collet.

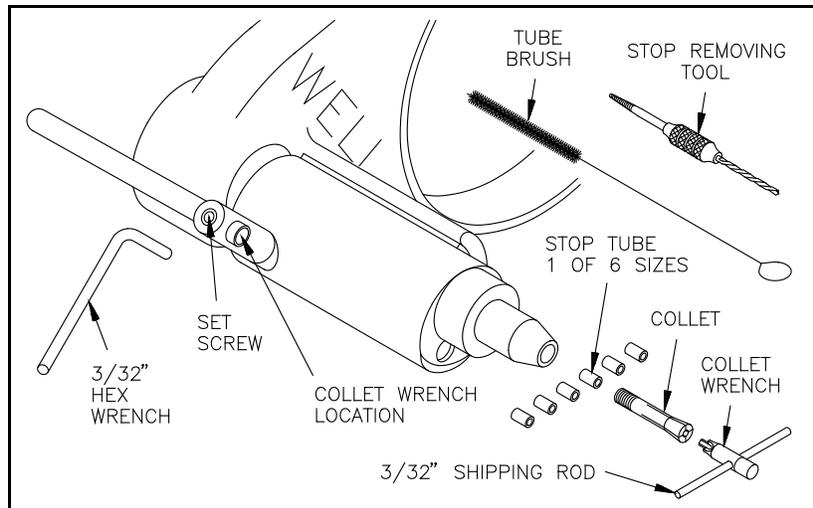


Figure 6.

6.3 FITTING A STOP TO ADJUST THE COLLET DIAMETER

When the collet wears, tools may slip. The brake may drag causing the collet to spin inside the collet body. A shorter stop must be installed to compensate for the wear. The shorter stop will allow the collet to thread further into the collet body so it grips more tightly. A set of 6 stops of different lengths, a stop removing tool and a tube brush are included with the accessory kit.

- 6.3.1 Follow steps 6.2.1 through 6.2.10 for CLEANING THE COLLET.
- 6.3.2 Make sure that the handle is in the open collet position (9:00 o'clock straight back). Insert a tool with the correct size shaft into the collet. If it is loose, remove the collet and replace the stop tube with the next shorter size. Check the fit again. If it is still loose, install a shorter stop tube. If it is too tight, install the next longer size. Install the shortest stop tube that will allow the tool to just slip into the collet.
- 6.3.3 With a tool in the collet, put the handle into the operating position. The collet should protrude a little from the face of the collet body. If it is flush or recessed, the collet is worn out and must be replaced.
- 6.3.4 Put the collet wrench in the end of the handle and tighten the set screw. Connect the power cord.
- 6.3.5 If the collet still slips or overheats, replace the collet. Follow the procedure above for fitting a stop when a new collet is installed.

6.4 REMOVING A STUCK COLLET

If the Spindle is run without a tool in the collet or the collet is not cleaned and lubricated periodically it may get stuck in the spindle shaft. The collet may turn but not unscrew.

- 6.4.1 Turn off the Lathe and disconnect power cord.
- 6.4.2 Move the handle to the open collet position (9:00 o'clock). Remove the tool.
- 6.4.3 Insert the collet wrench. Tap the end of the collet wrench **LIGHTLY** while turning the collet wrench counterclockwise. See Figure 7.
- 6.4.4 If the collet cannot be removed by this method, the Spindle must be sent in for factory service.

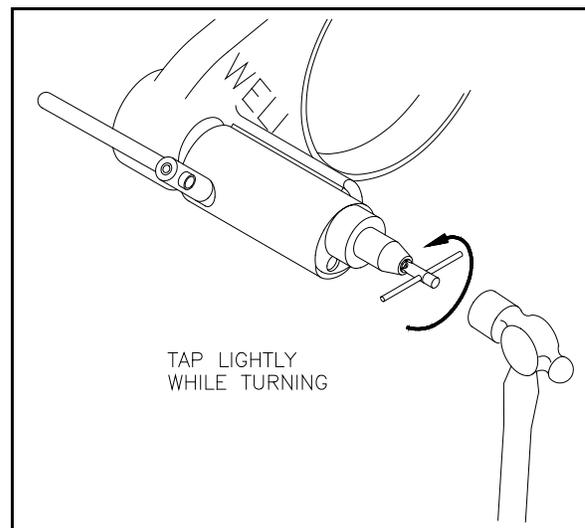


Figure 7.

6.5 BELT MAINTENANCE

The life of spindle bearings, motor bearings and pulleys are greatly affected by the tension of the belt. If the tension is too great, stress is put on the bearings that will considerably shorten their life. If the tension is too little, the belt will slip wearing both the belt and pulleys or will cause noise and vibration.

- 6.5.1 Check the tension of the belt regularly. Loosen the lock nut handle and let the weight of the Spindle tighten the belt. Do not apply additional pressure. The weight is sufficient to tighten the belt to the proper tension. Tighten the lock nut handle.
- 6.5.2 Belts become impregnated with grinding dust and may be replaced periodically to extend pulley life. The frequency depends on the type of dust and the severity of service. If a belt has cracks or is frayed, it should be replaced.

6.6 SPINDLE PULLEY REPLACEMENT

Spindle pulleys should be replaced when the vees are worn to a sharp edge. A worn pulley can drastically reduce belt life.

- 6.6.1 Disconnect the power cord.
- 6.6.2 Remove the two spindle mounting screws and remove the Spindle.
- 6.6.3 Insert a 1/8" hex wrench into the end of the spindle shaft and loosen the pulley jam nut with a 1/2" box wrench.
- 6.6.4 Install the new pulley and tighten the pulley jam nut.
- 6.6.5 Follow sections 4.2 INSTALL THE SPINDLE and 4.4 TEST AND ADJUST.

6.7 MOTOR PULLEY RECROWNING

When the edge of the motor pulley becomes worn so there are sharp vees, it should be replaced or sent to WELLS DENTAL, INC. to be recrowned.

- 6.7.1 Disconnect the power cord.
- 6.7.2 Loosen the lock nut handle and remove the belt.
- 6.7.3 Install a buffing wheel on the left end of the Lathe so it may be grasped to keep the lathe shaft from turning. (Or wrap the shaft with a thick towel and grasp the shaft with pliers.)
- 6.7.4 Press the palm of the hand firmly onto the end of the motor pulley and twist counterclockwise to loosen. If the motor pulley cannot be easily removed, send the Lathe and Bracket Assembly to WELLS DENTAL, INC. for factory service.
- 6.7.5 Check if there is a spacer washer behind the motor pulley. The same spacer washer(s) must be in place when the motor pulley is installed.
- 6.7.6 Install the new or recrowned motor pulley with the spacer washer(s) in place. Install and tension the belt. See 6.5.1.
- 6.7.7 Follow section 4.4 TEST AND ADJUST.

6.8 EXCESSIVE NOISE

- 6.8.1 Check that the belt has the correct tension. See step 6.5.1.
- 6.8.2 Make sure the mounting system is properly adjusted. Loosen the spindle mounting screws then follow step 4.2.4 and section 4.4 TEST AND ADJUST.
- 6.8.3 A stop that is too long will cause the collet to slip which will make a squealing noise. It may also cause the brake to drag which can squeak. See section 6.3 FITTING A STOP TO ADJUST THE COLLET DIAMETER.
- 6.8.4 Worn out spindle bearings will usually cause a high pitched noise. Also the spindle housing (the large main body of the Spindle) may get excessively hot with bad bearings. Bearing replacement requires factory service.

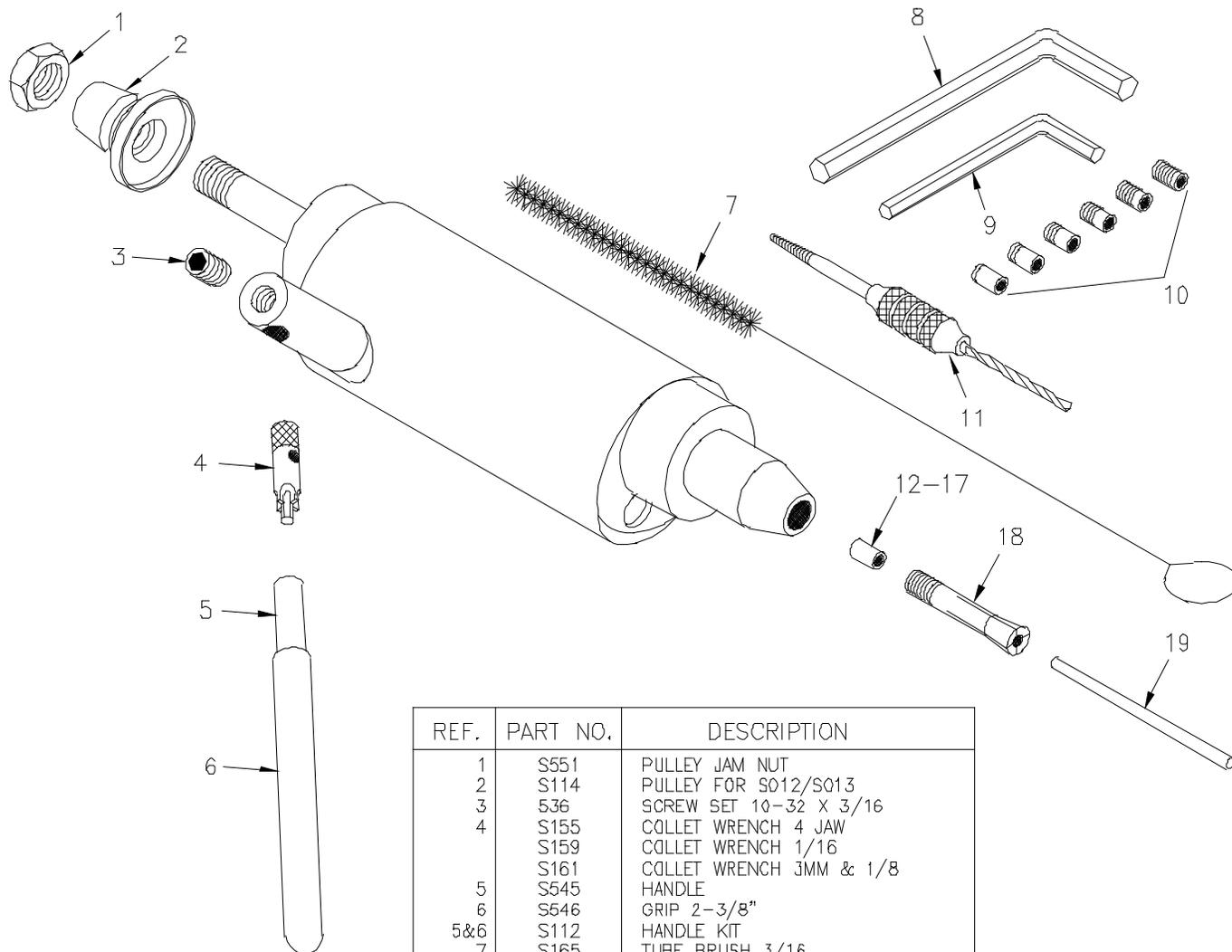
For further maintenance or repairs, send the machine to WELLS DENTAL, INC. for factory service.

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PARTS LIST for WELLS HIGH SPEED SPINDLE Product No. S013



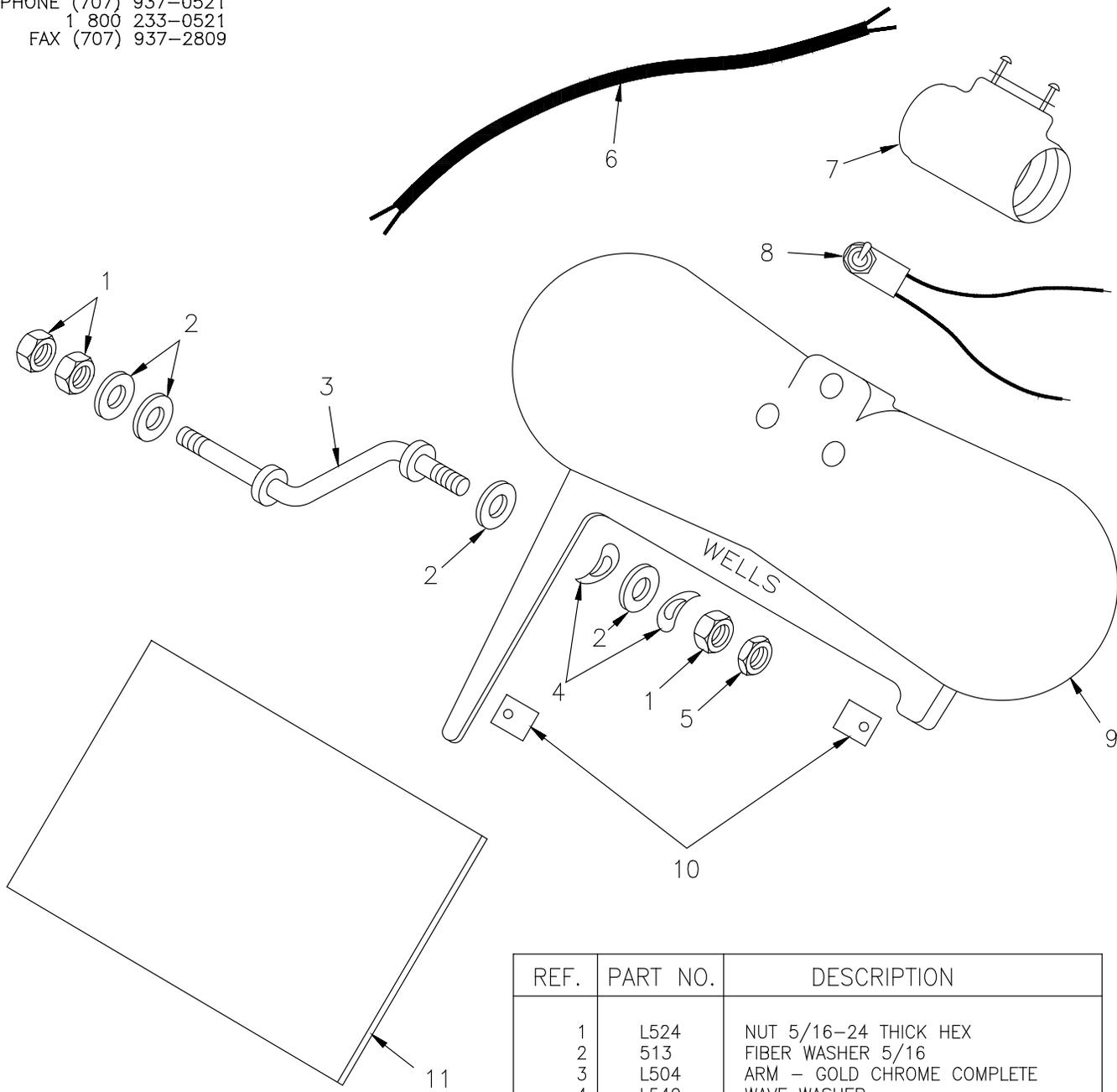
REF.	PART NO.	DESCRIPTION
1	S551	PULLEY JAM NUT
2	S114	PULLEY FOR S012/S013
3	536	SCREW SET 10-32 X 3/16
4	S155	COLLET WRENCH 4 JAW
	S159	COLLET WRENCH 1/16
	S161	COLLET WRENCH 3MM & 1/8
5	S545	HANDLE
6	S646	GRIP 2-3/8"
5&6	S112	HANDLE KIT
7	S165	TUBE BRUSH 3/16
8	159	HEX WRENCH 1/8
9	151	HEX WRENCH 3/32
10	S152	STOP TUBES SET OF 6
11	S153	STOP REMOVING TOOL
7-11	S250	ACCESSORY KIT
12	S142	STOP TUBE .245 BLUE
13	S143	STOP TUBE .255 YELLOW
14	S144	STOP TUBE .265 ORANGE
15	S146	STOP TUBE .275 RED
16	S148	STOP TUBE .285 GREEN
17	S150	STOP TUBE .295 BLACK
18	S106	COLLET 3/32
	S105	COLLET 1/16
	S108	COLLET 3MM
	S110	COLLET 1/8
19	138	SHIPPING ROD 3/32

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**PARTS LIST for LIGHT SHIELD
 for GOLD CHROME MACHINE**

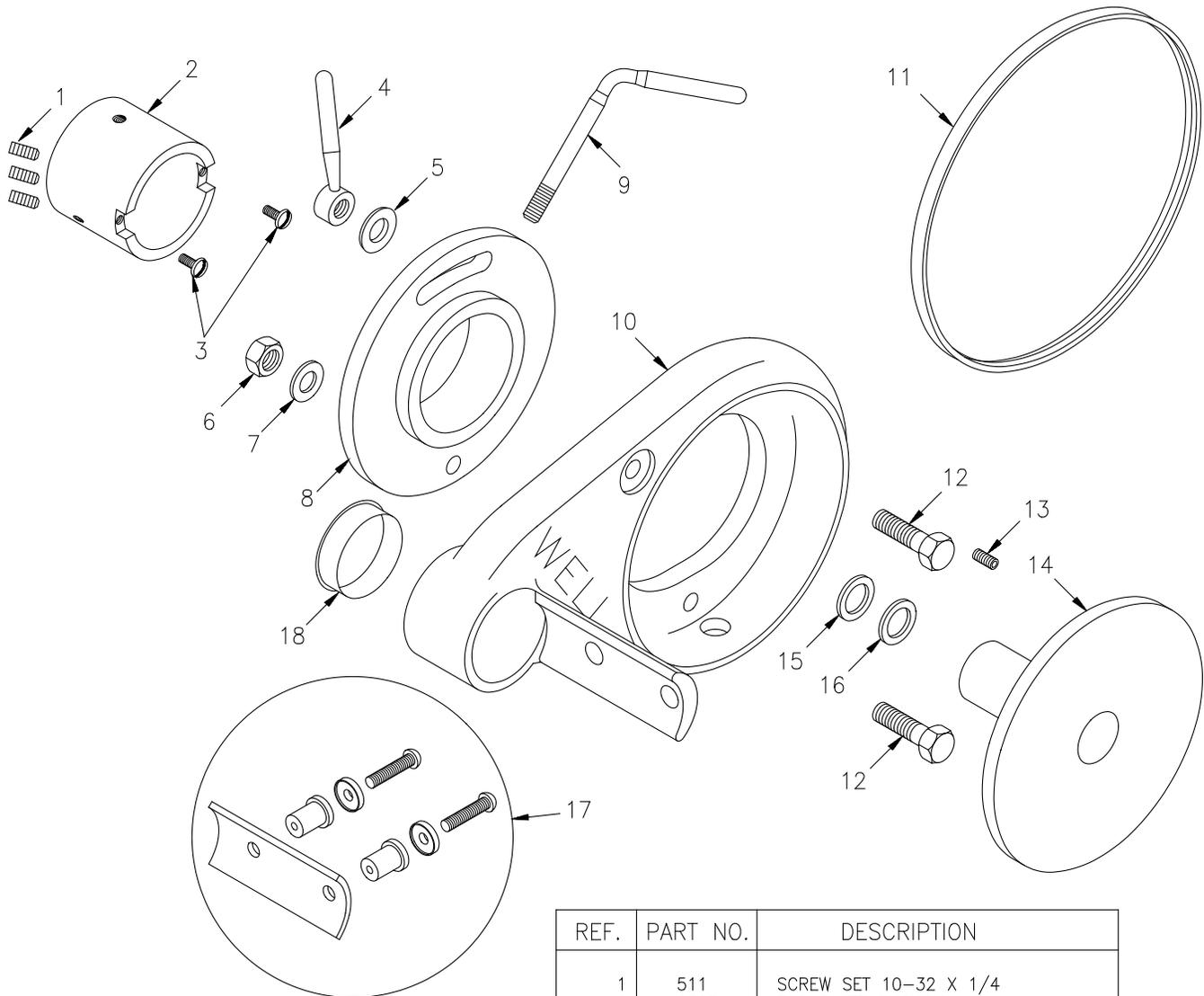


REF.	PART NO.	DESCRIPTION
1	L524	NUT 5/16-24 THICK HEX
2	513	FIBER WASHER 5/16
3	L504	ARM - GOLD CHROME COMPLETE
4	L540	WAVE WASHER
5	L526	NUT 5/16-24 THIN HEX
6	L106	LIGHT CORD KIT (with connectors)
7	L118	LIGHT SOCKET KIT (with screws)
8	L120	TOGGLE SWITCH KIT (with connectors)
9	L512	LIGHT SHIELD RH
10	L102	SHIELD CLIPS PKG-2 (with screws)
11	L110	GLASS SHIELD FOR WELLS

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**PARTS LIST for BRACKET ASSEMBLY
 for WELLS LATHE**



REF.	PART NO.	DESCRIPTION
1	511	SCREW SET 10-32 X 1/4
2	G505	END PLATE BUSHING
3	G517	SCREW 8-32 X 3/8 PHZC
4	G506	LOCK NUT HANDLE
5	G514	LOCK NUT WASHER
6	G507	PIVOT JAM NUT
7	513	FIBER WASHER 5/16
8	G500	FLANGE
9	G110	HEIGHT ADJUSTMENT HANDLE
10	G503	BRACKET
11	S406	BELT 2/3M475
12	G501	BOLT HEX 5/16-18 X 1-1/8 ZC
13	G512	SCREW SET 10-32 X 1/2
14	S480	MOTOR PULLEY 2V-V/WELLS
15	Q566-Q575	CLUTCH SPACER .010-.100 STEP
16	Q563-Q565	CLUTCH SPACER .015-.045 FLAT (to fit)
17	S220	SPINDLE MOUNTING KIT (to fit)
18	G120	HOLE PLUG