

WELLS

DENTAL, INC.

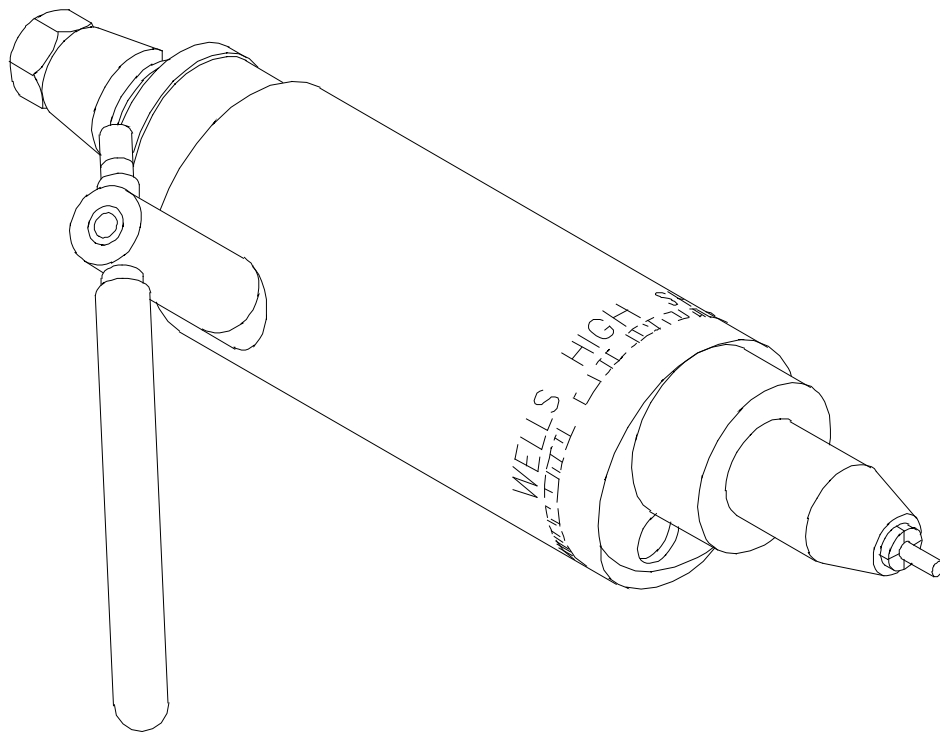
TECHNICAL BULLETIN
S802-022510

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



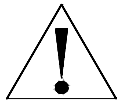
WELLS HIGH SPEED SPINDLE

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 MOTOR. The motor 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, motor 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, motor, 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 High Speed Spindle is intended for use by trained professional laboratory personnel.

2.0 PRODUCT DESCRIPTION

The WELLS High Speed Spindle is designed for heavy duty laboratory service, quiet operation, and low maintenance. Tool changes are quick and safe. A quarter turn of the handle disengages the clutch, stops the shaft and opens the collet while the motor is running.

There are several different WELLS High Speed Spindles manufactured to fit various makes and models of finishing machines and alloy grinders. This manual covers the operation and maintenance of all WELLS Spindles: S011, S012, S013, S018, S019, S020, S021, S028, S029, S030, S036 and S042.

New spindles include the S250 ACCESSORY KIT which consists of:

- 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

The ACCESSORY KIT is not included with serviced or exchanged spindles.

3.0 SPECIFICATIONS

COLLET SIZES	3/32" (standard), 1/16", 1/8" or 3mm
TYPICAL OPERATING SPEED	10,000 to 24,000 RPM
MAXIMUM SPEED.....	24,000 RPM
UNIT DIMENSIONS (without motor)	approx. 1.5 x 3 x 6.5"
WEIGHT (without motor)	1.9 lbs
SHIPPING WEIGHT (without motor)	3 lbs

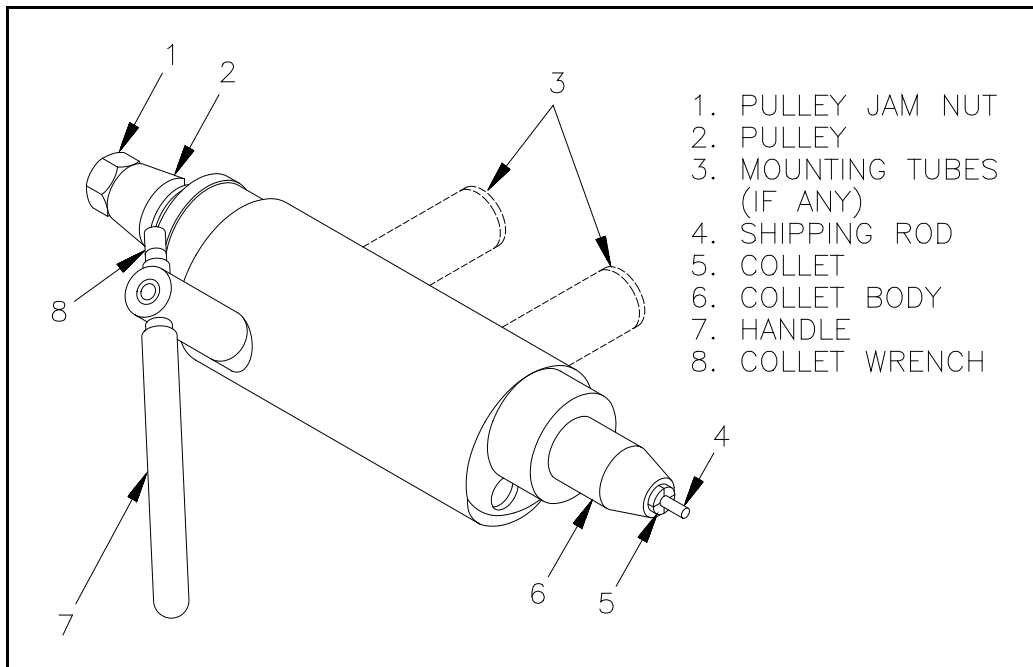
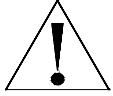


Figure 1. Spindle features

4.0 INSTALLATION

Please refer to the separate technical bulletin for the particular application or the instructions supplied by the manufacturer of the finishing machine or alloy grinder. Call Wells Dental, Inc. at 1-800-233-0521 or (707) 937-0521 for assistance.

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: High Speed Spindles are driven by a belt that increases the speed by three to seven times the motor speed depending upon the pulley sizes. Most Spindles run at 10,000 to 24,000 RPM. Because of this high speed, 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. An over extended tool can bend sharply, break or fly out of the collet. 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 a 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 Work is done with the handle in the operating position at approximately 5:00 o'clock. See Figure 2.
- 5.2.3 The clutch disengages when the handle is moved clockwise to approximately 6:00 o'clock (straight down).
- 5.2.4 The brake is applied when the handle is moved to approximately 7:30 o'clock.
- 5.2.5 The collet opens when the handle is moved to 9:00 o'clock (straight back).

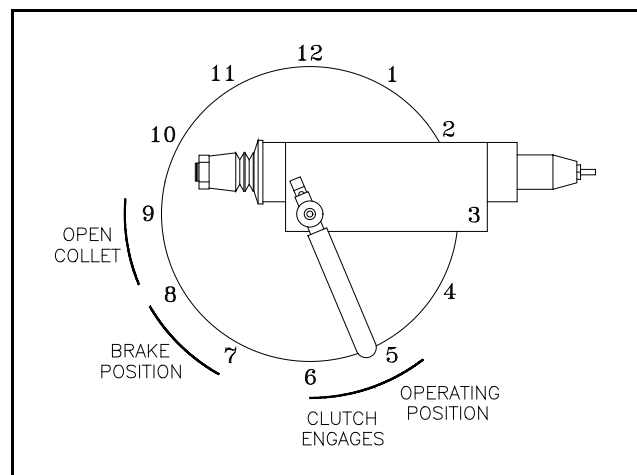


Figure 2.

5.3 CHANGING A TOOL

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

5.3.1 From the operating position move the handle clockwise to the open collet position (9:00 o'clock). See Figure 2.

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.

5.3.5  **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.

5.4 CHANGING POINTS, STONES AND PARTING DISKS

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

5.4.1 Turn the motor 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.

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 motor 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 3.
- 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 3.) 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.

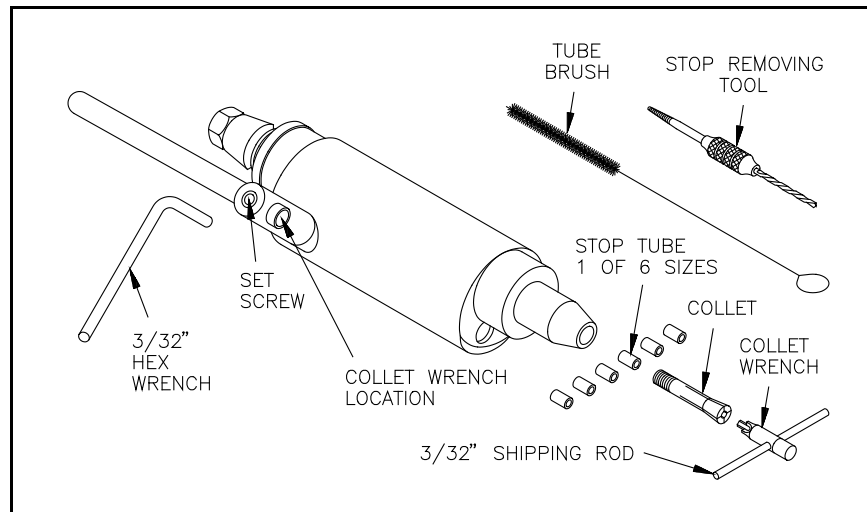


Figure 3.

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 motor and disconnect the 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 4.

6.4.4 If the collet cannot be removed by this method, the Spindle must be sent in for factory service.

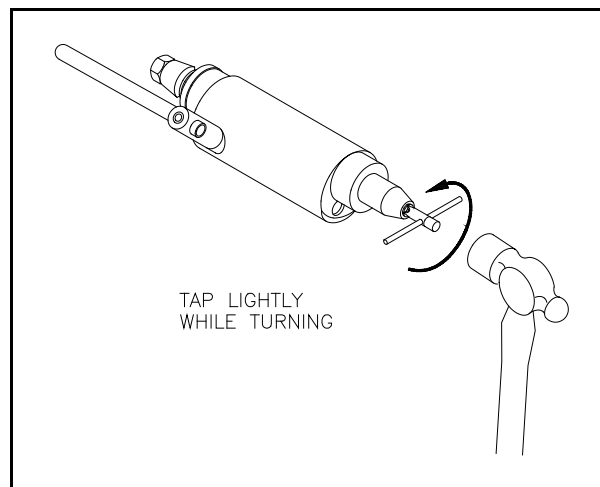


Figure 4.

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. The belt should have about 3/8" to 1/2" deflection when lightly pressed halfway between the pulleys. The belt should be tensioned as loose as possible but tight enough to prevent slipping and excess vibration.
- 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

Pulleys with vee grooves should be replaced when the vees are worn to a sharp edge. A worn pulley can drastically reduce belt life. Pulleys for flat belts should have a noticeable crown to keep the belt centered. If the crown has been worn flat, the belt will have a tendency to wander off the pulleys.

- 6.6.1 To replace the spindle pulley, disconnect the power cord and remove the belt.
- 6.6.2 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. (To remove a low speed pulley that acts as the nut, wrap the pulley with a rag or sheet of rubber and unscrew the pulley.)
- 6.6.3 Install the new pulley, tighten the pulley jam nut and install the belt.
- 6.6.4 Adjust the belt tension. The belt should have about 3/8" to 1/2" deflection when lightly pressed halfway between the pulleys.
- 6.6.5 Connect the power cord.

6.7 EXCESSIVE NOISE

Noise can be a symptom of various problems. The most common are listed below.

- 6.7.1 Check that the belt has the correct tension. See section 6.5.1.
- 6.7.2 Make sure the mounting system is properly adjusted. Consult the instructions for your particular finishing machine or alloy grinder. Try tightening or loosening the mounting screws a little.
- 6.7.3 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.
- 6.7.4 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 Spindle to WELLS DENTAL, INC. for factory service.

7.0 FACTORY SERVICE

Our service policy assures prompt estimates and repairs for all major WELLS products. We process estimates in one working day and most repairs within two days (plus shipping time).

When we receive your equipment, it is thoroughly checked to determine the appropriate service level. Minimum repairs are suggested when possible. WELLS equipment can always be rebuilt to factory specifications with a fully reinstated warranty at a significant savings over a new purchase.

You can exchange for already rebuilt equipment or we can loan you equipment while yours is being serviced to keep you in production.

7.1 BEFORE YOU SEND YOUR EQUIPMENT

- 7.1.1 Consult the technical bulletin or user's manual that came with your equipment. Problems are often solved by simple maintenance procedures.
- 7.1.2 Call our toll-free number and ask for service assistance. Our experience may save you extra work and delay.
- 7.1.3 If the equipment needs service beyond your means, ship it to us and we will be happy to provide an estimate if requested before commencing work.

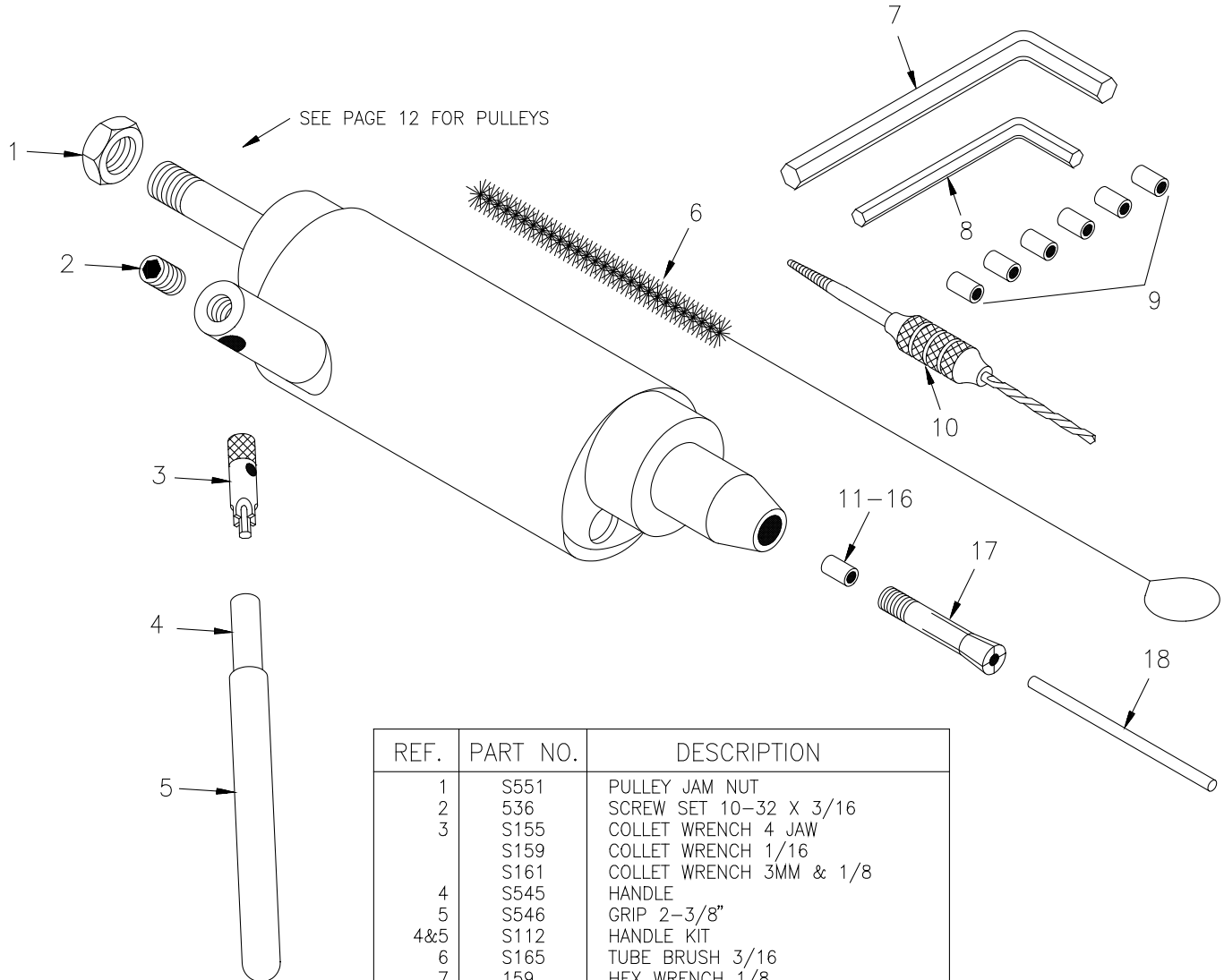
NOTES

WELLS

DENTAL, INC.

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 P.O. BOX 106
 COMPTCHE, CA USA 95427
 PHONE (707) 937-0521
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PARTS LIST for WELLS HIGH SPEED SPINDLES
All models



REF.	PART NO.	DESCRIPTION
1	S551	PULLEY JAM NUT
2	536	SCREW SET 10-32 X 3/16
3	S155	COLLET WRENCH 4 JAW
	S159	COLLET WRENCH 1/16
	S161	COLLET WRENCH 3MM & 1/8
4	S545	HANDLE
5	S546	GRIP 2-3/8"
4&5	S112	HANDLE KIT
6	S165	TUBE BRUSH 3/16
7	159	HEX WRENCH 1/8
8	151	HEX WRENCH 3/32
9	S152	STOP TUBES SET OF 6
10	S153	STOP REMOVING TOOL
6-10	S250	ACCESSORY KIT
11	S142	STOP TUBE .245 BLUE
12	S143	STOP TUBE .255 YELLOW
13	S144	STOP TUBE .265 ORANGE
14	S146	STOP TUBE .275 RED
15	S148	STOP TUBE .285 GREEN
16	S150	STOP TUBE .295 BLACK
17	S106	COLLET 3/32
	S105	COLLET 1/16
	S108	COLLET 3MM
	S110	COLLET 1/8
18	138	SHIPPING ROD 3/32

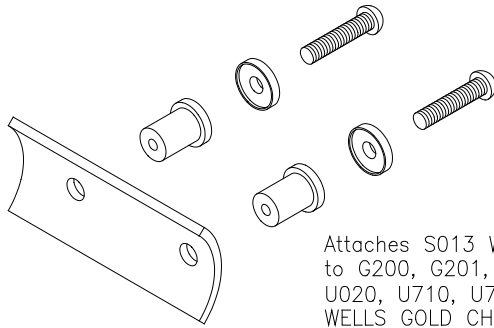
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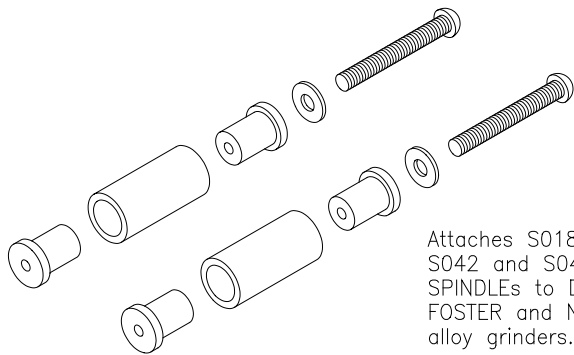
MOUNTING HARDWARE for WELLS HIGH SPEED SPINDLES

S220 SPINDLE MOUNTING KIT



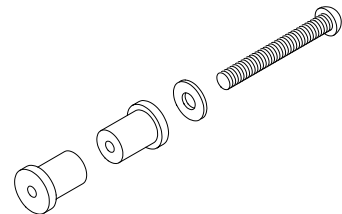
Attaches S013 WELLS SPINDLE to G200, G201, U011, U015, U020, U710, U711 and U712 WELLS GOLD CHROME finishing machines.

S230 MOUNTING TUBE SMOOTH PKG-2

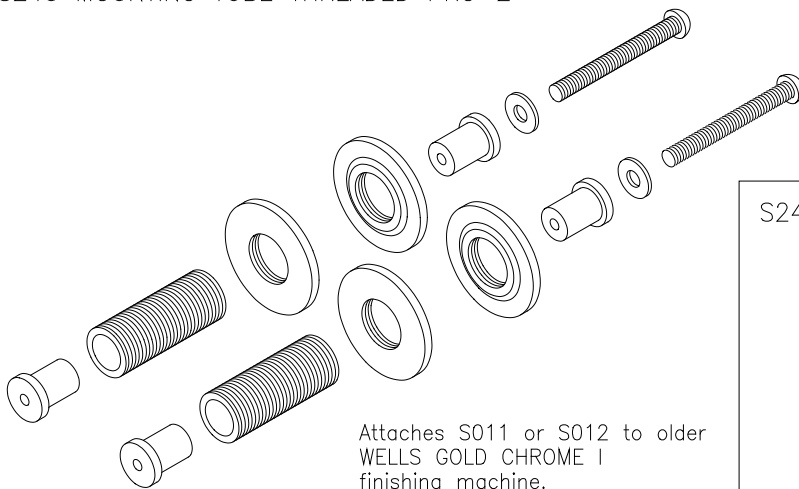


Attaches S018, S028, S030, S042 and S043 WELLS SPINDLES to DEMCO B1, FOSTER and NIRANIUM alloy grinders.

S231 SMOOTH TUBE REBUILD KIT

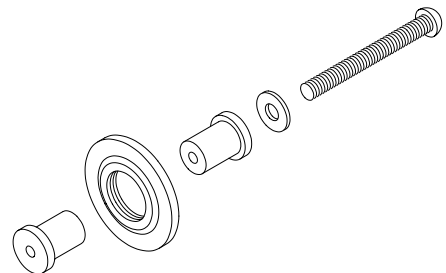


S240 MOUNTING TUBE THREADED PKG-2



Attaches S011 or S012 to older WELLS GOLD CHROME I finishing machine.

S241 THREADED TUBE REBUILD KIT



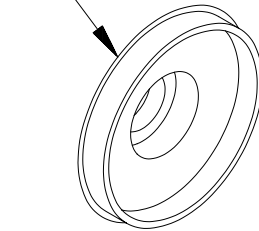
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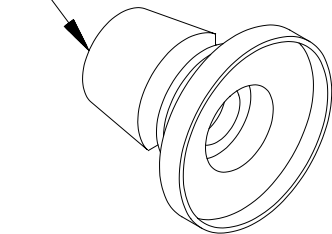
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PULLEYS for WELLS HIGH SPEED SPINDLES

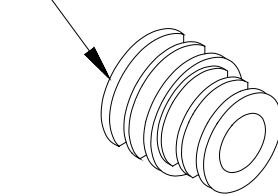
S141
PULLEY SHIELD
FOR ALL PULLEYS
EXCEPT S114 & S134



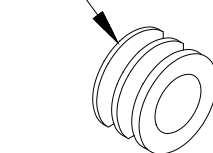
S114
PULLEY FOR S012/S013
WELLS 2 VEE BELT



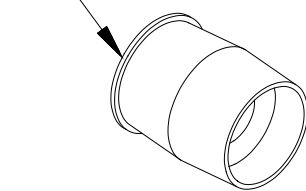
S116
PULLEY FOR S020
DEMCO E96



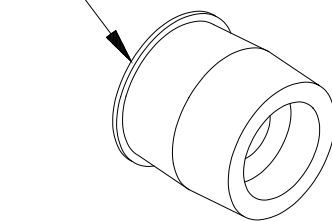
S118
PULLEY FOR S018/S021/S049
DEMCO B1
DEMCO 2 VEE BELT
TICONIUM



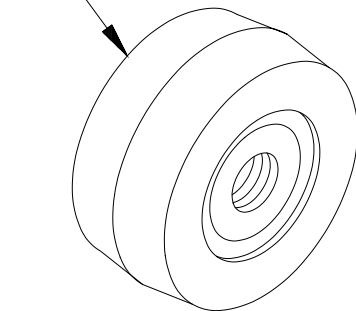
S120
PULLEY FOR S011/S019/S036
WELLS FLAT BELT
DEMCO FLAT BELT
BEGO



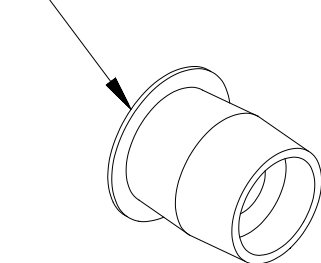
S128
PULLEY FOR S029
FOSTER PE3 & PEA
FOSTER FLAT BELT
(OLDER MODELS)



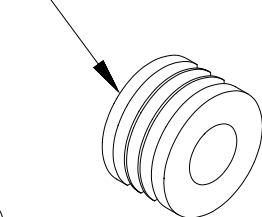
S130
PULLEY FOR S028/S029
FOSTER PE3 & PEA
FOSTER FLAT BELT
LOW SPEED ALUMINUM PULLEY



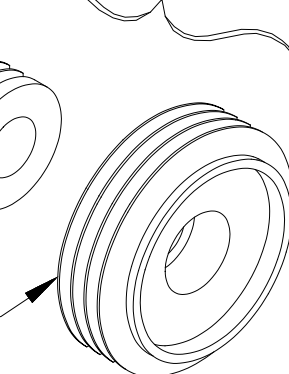
S132
PULLEY FOR S028
FOSTER FLAT BELT



S519
SMALL HIGH
SPEED PULLEY



S134
PULLEYS FOR S030
FOSTER 3 VEE BELT



S520
LARGE LOW
SPEED PULLEY



S136
PULLEY FOR S042/S043
NIRANIUM

