



MANUFACTURING

SG8

**SEAT AND GUIDE MACHINE**

OPERATIONS AND MAINTENANCE  
MANUAL



MANUFACTURED BY:

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**NOTE:** WHEN ORDERING REPLACEMENT PARTS,  
PLEASE GIVE THE MODEL AND SERIAL NUMBER.

ORDER BY PART NUMBER.

**THERE IS A MINIMUM ORDER OF \$25.00**

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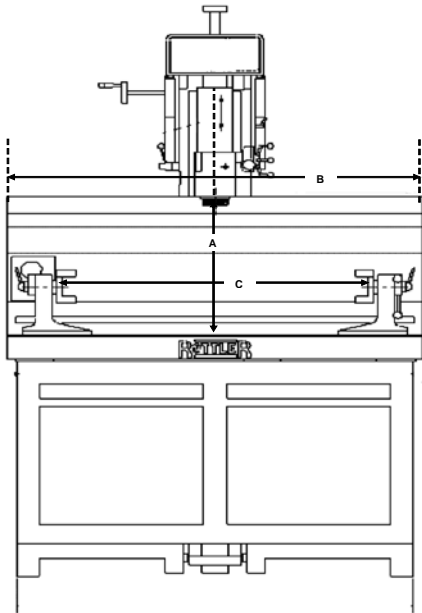
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Note: Rottler reserves the rights to change any specifications and over all product design out any notice.

### SGF8 Specifications

DRIVE SYSTEM	Double reduction two poly "V" belt
MOTOR	Motor-180 volt DC 1 HP Baldor Input voltage; 220V-single phase 50 / 60 Hz
SPINDLE ROTATION SPEED	Variable and reversible from 0 - 400 RPM
SPINDLE TRAVEL	8"
SPINDLE DIAMETER	3.150"
TAPER IN SPINDLE	Rottler Special ISO - 30
SPINDLE TILT	15° ± .01° in both directions for a total of 30°
SPINDLE TO TABLE CLEARANCE	16 ¼"
MAXIMUM WORK PIECE HEIGHT <b>A</b>	15" with Toolholder over the pilot 13" with Toolholder on the spindle
MAXIMUM CYLINDER HEAD LENGTH ON 360° ROLLOVER FIXTURE <b>C</b>	43" on out side locking handles 48" on inside locking handles (unlimited without fixture)
OVERALL LENGTH ON UPPER SURFACES	53"
OVERALL HEIGHT	83"
AIR REQUIREMENT	100 P.S.I.
FLOOR SPACE REQUIREMENTS	33" deep x 93" wide with tool box and sharpener
SHIPPING WEIGHT	2600 lbs. machine only

## **Chapter 2 Introduction / Safety / Installation:**

### **Introduction:**

This manual is divided into sections as listed in the table of contents.

It is required that the new user of the SG8 read this manual, in particular the sections concerning safety, before operating the machine.

### **Limited Warranty:**

Rottler Manufacturing Company Model **SG8** parts and equipment is warranted as to materials and workmanship. This limited warranty remains in effect for one year from the date of delivery, provided the machine is owned and operated by the original purchaser and is operated and maintained as per the instructions in the manual.

Tools proven to be defective within the warranty period will be repaired or replaced at the factory's option.

We accept no responsibility for defects caused by external damage, wear, abuse, or misuse, nor do we accept any obligation to provide compensation for direct or indirect costs in connection with cases covered by the warranty.

Freight charges on warranty items (non-air shipment only) will be paid by Rottler Manufacturing for a period of 60 days only from the date of installation or set-up by a qualified service technician or sales representative.

Freight charges after the 60 day period are the customer's responsibility.

**Safety Information:**

This machine is capable of causing severe bodily injury or death if EXTREME care is not used when operating!

The operator of the SG8 should be a skilled machinist craftsman who is well versed in the caution, care, and knowledge required to safely operate metal cutting tools.

The operator and nearby personnel should be familiar with the location and operation of the Emergency Stop Button.

This manual has been prepared for the owner and those responsible for the maintenance of this machine. It's purpose aside from proper maintenance and operations is to promote safety through the use of accepted practice. READ THE SAFETY AND OPERATING INSTRUCTIONS THOROUGHLY BEFORE OPERATING THE MACHINE.

In order to obtain maximum life and efficiency from your machine; follow all the instructions in the operating manuals carefully.

The specifications put forth in this manual were in effect at the time of publication. However, owing to Rottler Manufacturing's' policy of continuous improvement, changes to these specifications may be made at any time without obligation.

**Electrical Power:**

Make sure all electrical equipment has the proper overload protection. The SG8 should have **a fully isolated** power supply to prevent damage and uncontrolled movement of the machine. If the SG8 is on the same power lines that are running to other electrical equipment (grinders, welders, and other AC motors) electrical noise can be induced into the SG8 electrical system. Electrical noise can cause the controller to see false signals to move. Not supplying a fully isolated supply to the machine may void factory warranty. Refer to the Power supply section later in this chapter for voltage and amperage requirements of the.

**Machine Operator:**

The operator of the SG8 should be a skilled machinist craftsman who is well versed in the caution, care, and knowledge required to safely operate metal cutting tools.

**Eye Safety:**

Wear an approved safety face shield, goggles or safety glasses to protect eyes when operating the machine.

**Work Area:**

Keep the floor around the machine clean and free of tools, tooling, stock scrap and other foreign material and oil, grease or coolant to minimize the danger of tripping or slipping. ROTTLER recommends the use of anti-skid floor strips on the floor area where the operator normally stands and that each machine's work area be marked off. Make certain the work area is well lighted and ventilated. Provide for adequate workspace around the machine.

**Guards:**

Keep all machine guards in place at all times when machine is in use.

**Overreach:**

Maintain a balanced stance and keep your body under control at all times.

**Hand Safety:**

NEVER wear gloves while operating this machine.

**Machine Capacity:**

Do not attempt to use the machine beyond its stated capacity or operations. This type use will reduce the productive life of the machine and could cause the breakage of parts, which could result in personal injury.

**Avoid Accidental Starting:**

Make certain the main switch is in the **OFF** position before connecting power to the machine.

**Careless Acts:**

Give the work you are doing your undivided attention. Looking around, carrying on a conversation and horseplay are careless acts that can result in serious injury.

**Job Completion:**

If the operation is complete, the machine should be emptied and the work area cleaned.

**Replacement Parts:**

Use only Rottler replacement parts and accessories; otherwise, warranty will be null and void.

**Misuse:**

Do not use the machine for other than its intended use. If used for other purposes, Rottler Manufacturing disclaims any real or implied warranty and holds itself harmless for any injury or loss that may result from such use.

**Emergency Procedure:**

Assuming one of the following has occurred: Work piece or spindle base not clamped, depth of cut not set correctly, these mistakes will become obvious the minute the cut starts

**PRESS THE EMERGENCY STOP BUTTON (on the front control panel) IMMEDIATELY!**

“REMEMBER” metal cutting tools have the speed and torque to severely injure any part of the human body exposed to them.

**Preparation for Placement:**

Air supply is connected at the right, rear of the machine, at base of upper casting. Connection can either be a quick disconnect or permanent threaded connection. Be certain to use an adequately sized air line, permitting proper operation of float. Air pressure should never drop below 90 PSI at any time. Failure to provide adequate air supply may cause improper floating and clamping.

At this time, some customers will install a T fitting or manifold at the regulator, allowing another air hose to be connected, providing a connection point for air tools. The auxiliary hose, if fitted, should be of sufficient length to easily reach the entire front of the machine.

This machine comes pre-wired and ready to be connected to the power source. The power source should meet all local and national electrical codes. This service should connect to its own circuit breaker or fuse. In most cases the machine will require **220 VAC, 15 amp**, single-phase service but you should verify voltage requirements by inspecting the electrical tag located on the rear of the machine.

## Chapter 3 Machine Installation:

### Location:

The productivity of this machine will depend a great deal on it's proper initial installation, particularly the means by which cylinder heads are lifted into the machine as well as the material handling to and from other operations in your shop.

The proper loading arrangement and location for your SG8 machine is extremely important.

A slow travel (6 to 10 feet / min.) power hoist operated from either a bridge crane or a jib crane arrangement works very well.

### Unpacking:

Carefully uncrate the machine. Remove all tooling from storage compartments and unpack. Locate the leveling bolts and leveling pads. Clean all surfaces with solvent and rags to remove protective shipping coatings.

### Positioning the Machine:



Machine is very top heavy. Extreme caution should be used at all times when lifting and positioning the machine!

.Move the skidded machine as close as possible to its final location.

Remove shipping bolts securing machine to pallet. Using the forklift cut-outs provided in base of machine, raise machine above pallet and remove pallet from under machine. When lifting machine always make sure that forks protrude all the way under and extend beyond the base of the machine.

At this time the machine should be lowered and adequately supported so as to allow access inside of cabinet to install the front leveling bolts. Jam nuts should be installed on the leveling bolts then the bolts should be threaded through from the top side. Install leveling bolts at rear of machine in the same fashion.

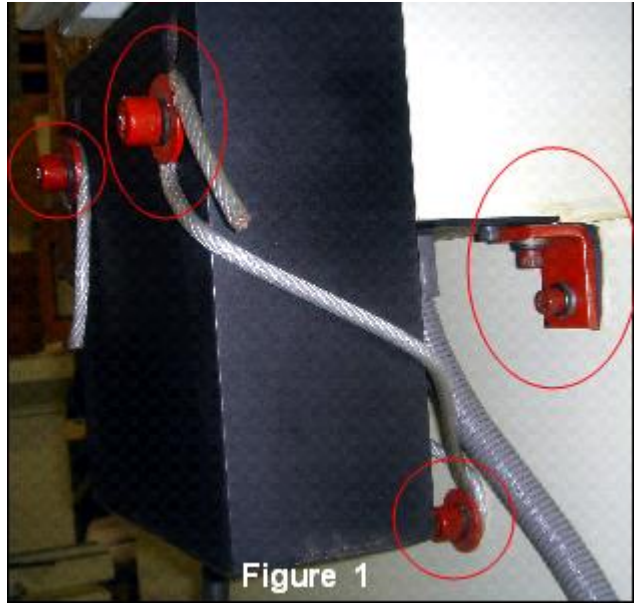
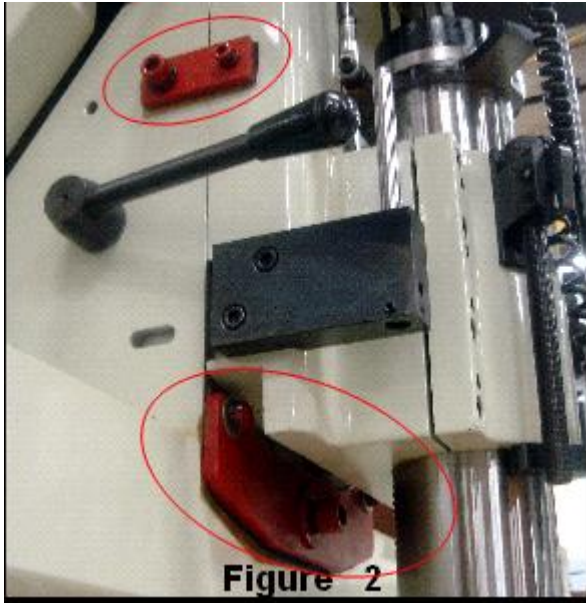
Raise the machine and move carefully to the final location. Be certain to allow sufficient clearance to allow access for leveling and also for connecting air and electrical lines. Lower machine onto leveling pads making certain that the leveling bolts engage into counterbore on leveling pads.

Be certain nothing interferes with air or electrical lines running from the floating head assembly to the cabinet. Determine there is no possibility of air or electrical lines dragging on wall surfaces or adjacent machinery.

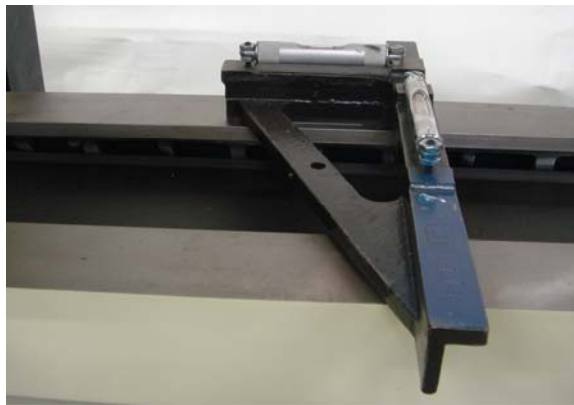


## Leveling the Machine:

Before leveling the machine, loosen and remove the shipping brackets securing the air float Workhead. (Figures 1 & 2). The air float clamp plate bolts may need to be loosened also. Access to these bolts is gained by tilting the spindle assembly to the left and loosening the bolts on that side approximately 1 turn. Access to the right side bolts is obtained by tilting the spindle to the right. Caution: Do not loosen more than necessary to allow the head to float. Clamp assembly will not clamp tight if bolts are loosened too much. It is best to hold nylock locking nut secure on top side and loosen bolt with wrench from underside of clamp plate.



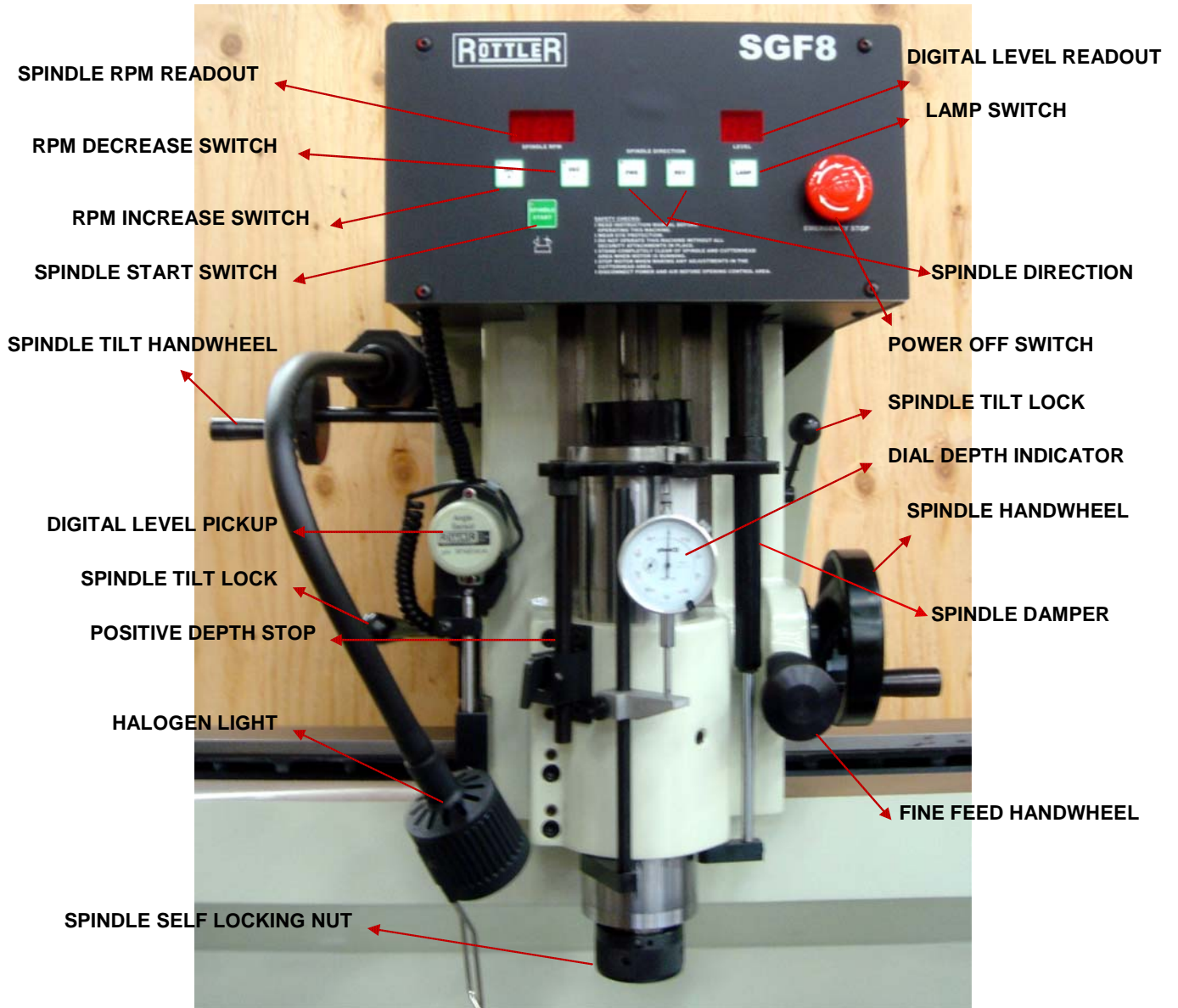
Required machinist level. (Starret 98 or better).



Use the level on the upper float surface, level the machine as precisely as possible, front to back and side to side. Level is obtained fastest when using a three point leveling method. To utilize a three point leveling method, use only the front outside leveling bolts and the middle bolt in the rear. Use a socket wrench to turn the leveling bolts. After the machine is leveled bring in the other leveling bolts. Be certain all leveling bolts are effectively supporting the machine. Tighten jam nuts on leveling bolts and recheck level.

## Chapter 4 Control Definitions:

### SGF8 Control Definitions



## Chapter 5 Operating Instructions:

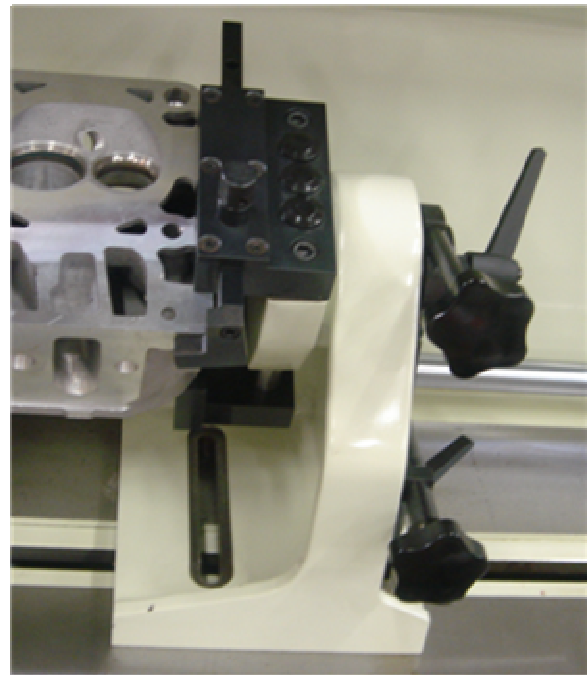
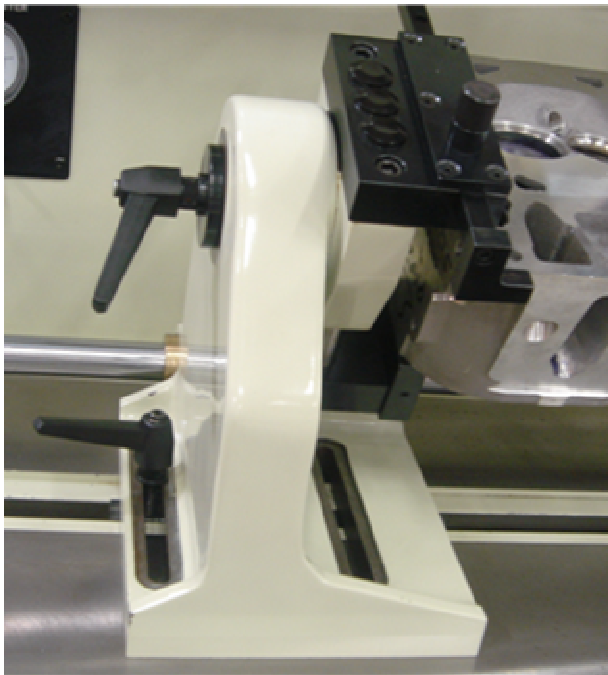
### Mounting Cylinder Heads:

Initial clamp height adjustments to the head trunions can be accomplished by measuring the head thickness then raising the turning clamping block assembly to the appropriate height using the clamping block acme screws. A 5/16" t-handle allen wrench works well.

Measure the length of the cylinder head. Spread the trunion assemblies apart from each other so that the cylinder head can be clamped in between the trunions.

Each support has an adjustable stop, located to the front. The stops have indents, allowing a number of different settings. Position of the stops must be checked for each cylinder head put on the supports. In most cases we will install the cylinder head deck side down with the exhaust side of the head against the adjustable stops. This is particularly true of wedge style heads. It is necessary for the clamps to thrust the cylinder head against the stops when clamped. When heads are mounted in this fashion, the tallest portion of the combustion chamber will be at the rear of the machine when the head is rotated into the working position. Try to keep the valve guide center line parallel to the trunion centerline. (Figure 4)

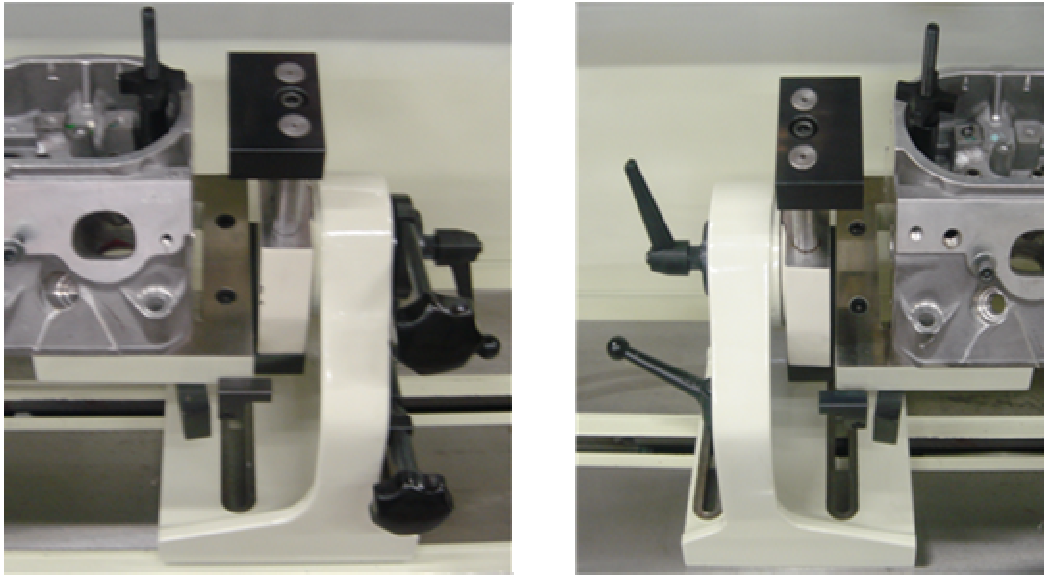
FIGURE 4



Utilize the grooves in the table to align the trunion supports square to the machine.

The Rottler-Klump head mounting fixture is provided to accommodate cylinder heads that are difficult to mount directly into the trunions. Some machine operators prefer to use the Rottler-Klump fixture for the majority of heads as the mounting is very quick. The Rottler-Klump frame is mounted between the trunions and clamped using the clamping plates. (Figure 5) The cylinder head is then held to the frame with the swivel clamp assemblies through the appropriate head bolt holes.

**FIGURE 5**



#### **Alignment and Setup:**

Alignment and setup applies to both the cylinder head and the machine's floating head. The goal is to perfectly align the spindle centerline to the centerline of the area of the head to be machined. Most machining operations on cylinder heads use the valve guide centerline as the reference point so we will use that as an example.

**Note: think of the digital electronic level as a comparator. Because the leveling pin is square to the machines spindle, as long as you achieve the same readings front to rear and side to side then the spindle will be in perfect alignment.**

#### **Front to Rear Cylinder Head Alignment:**

Position the level on level pin to read front to rear and take a reading. Rotate the cylinder head so that the valve seats are facing up. Now place the level on a pilot in the cylinder head and position the level to read front to rear. Loosen the lock levers on the supports. Be certain the fine adjustment lock screw is loosened. Coarse adjustment is made by turning the work piece manually, until the level reading is within a couple of degrees of the reading on the leveling post.

Lightly tighten the lock levers on the supports to remove any play. Now tighten the clamp on the fine adjustment screw. Turn the adjustment knob to achieve the exact reading that was observed on the leveling post. You can now completely tighten both the left and right support locks.

**Note: An optional alignment bar is available that helps establish the front to back alignment on canted valve cylinder heads. The bar is held against two pilots in two adjacent guides. Use the alignment post to adjust the angle.**

#### **Left to Right Alignment:**

Obtain the left to right reading from a pilot mounted in a guide in the cylinder head. Now place the level on the leveling post. Loosen both of the tilt lock levers on each side of the quill housing. Use the tilt adjusting hand wheel to adjust the reading to be the same as that found on the pilot in the cylinder head. Tighten the tilt lock levers.

### Selecting the right Pilot:

**IMPORTANT:** the pilot is the only link between one fixed part - the clamped cylinder head and pilot and a moving and heavy part, the workhead.

The centering accuracy and the machining accuracy depend on the carbide pilot you select.

Choosing the right pilot will ensure the accuracy of the machining.

The pilot is selected according to the actual guide and not according to the original guide diameter or the valve stem diameter.

### Three Angle Seat Cutting:

Place the ball drive adapter in the spindle.

Align spindle to valve guide.

Place a valve in the setting fixture. Position the pointer on the valve where you wish to place the top of the seat.

Remove the valve; replace it with the correct pilot.

Select the proper diameter tool holder. Place the carbide insert in tool holder. Slide tool holder onto ball head.

Place ball head over the pilot in setting fixture. Use radial adjusting screw to set diameter of cutter to correspond to position of pointer on setting fixture. Tighten hex socket screws on bottom of ball head. See figure 9

Remove ball head assembly from setting fixture. Place fixed carbide pilot in cylinder head.

Center the spherical ball head toolholder over the pilot shank.

Required spindle rotation speed will vary, depending on seat hardness. As seat hardness increases, so does the required spindle speed. Some will require full speed.

Special care should be taken in centering the floating head above the valve guide, to achieve a concentric seat.

### Cut seat only enough to clean up surface.

Too much cutting will sink the valve too far in the head. Many operators prefer to use the spindle fine feed when machining seats as extreme control of spindle down feed can be accomplished.

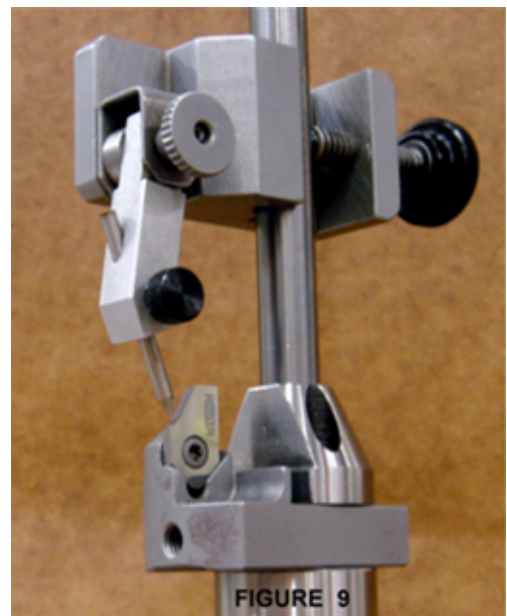
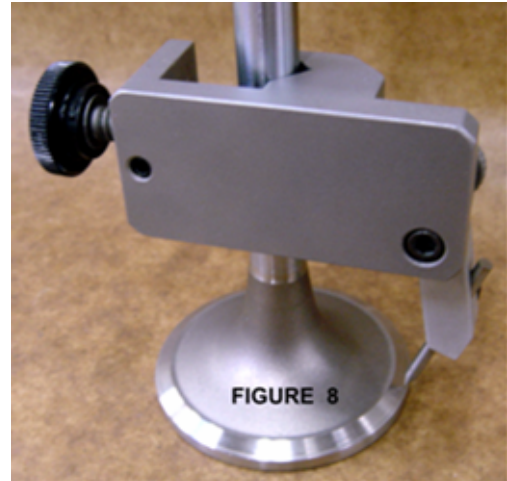
### Changing the Spindle Adapters:

Once that you have the toolholder setup, fit the ball head toolholder into the spring free spindle adapter.

The SG8 spindle was engineered to allow ultra fast tooling changes .Make sure the that spindle spring free locking nut is in the off lock position, line up the two ears of the spindle adapter and insert into the spindle ISO 30 taper, the locking nut automatically will be on the lock position, to remove turn the self locking nut to the left position, hold the spindle adapter, it may drop on the machine table. Damage will result.

### Installing the Spherical self Aligning toolholder:

Once the spring free adapter is in the spindle, fit the Rottler Spherical Self aligning Toolholder assembly into the spindle adapter; make sure to align the locator pins before you fit it into the spindle adapter and push it until you feel that is lock.



## Chapter 6 Spindle to Work:

When the cylinder head is clamped properly on the table and adjusted, move the workhead to the first valve guide by pushing on the foot pedal.

At this point the spindle and workhead should be level according to the position of the cylinder head.

Most machining operations require the spindle to be directly centered over the work to be performed. This is usually accomplished by air floating the workhead above the area to be machined then manually lowering the spindle to the pilot shank with the spindle adapter sleeve on the down position, once that you have the toolholder about 1/2" in to the pilot shank release the sleeve to the upper position to achieve perfect centering according to the position of the pilot and lower the toolholder into the pilot manually until reach the proper height or until the carbide tip is a few thousands from the seat. Do not make contact with the seat surface, the work head should be floating at all the time; once it's down release the foot pedal to **Note:** when machine the seat, the sleeve should be in upper position. The work head should be in float mode at all times



### ⚠ CAUTION

If the pedal is released too quickly, the float head may bounce. True centering may not be achieved if this happens. Slowly releasing the air float pedal gives the best results. Removing your hands completely from the work head during the final seconds of centering will insure that you do not negatively influence centering accuracy.

### Fine Feed Engagement:


To engage the fine feed mechanism it is necessary to push inward on the spindle feed handwheel while rotating the fine feed handwheel until engagement is achieved. To disengage the fine feed simply pull outward on the spindle feed handwheel.




### Core Drilling and Reaming Valve Guides:

A special drive adapter is supplied to accept core drills and reamers.

Align core drill with valve guide by inserting core drill pilot in guide as head of machine is floated and centered

Push green button **Spindle Start**  to start the spindle, verify correct rotation. Operate at 85 RPM, feed with moderate pressure until it clears the bottom of the guide.

Raise Quill to bring core drill above upper end of valve guide. Stop spindle by pushing  **Spindle Start** button. Select and install correct reamer. Repeat step 2 at 150 RPM.

### Cutting Counter Bores for Seat Rings:


Align the work piece as explained previously. Cylinder head deck surface must be up.

Insert correct pilot into the valve guide. Mount the correct milling head cutter on the milling head Adapter, Install milling head adapter into spindle adapter

Float the machine workhead while feeding the spindle down into the pilot until milling head is few thousand from contacting the seat, release the foot pedal to lock the floating head, rest the cutter gently on the surfaces and set the positive stop with the seat ring between the stop rod and the quill clamp. This will ensure that quill travel will be limited to the correct amount; or use the following alternative method:



Set dial indicator for feed depth to zero, being certain the indicator has sufficient travel to allow the proper depth of cut.


Push the green **Spindle Start**  button to start the spindle rotation. Turn the spindle at approximately 80 RPM - larger seats may require a slower speed; smaller seats may be run faster. Observe dial indicator or positive stop. Cut to proper depth.

Swing the indicator out of the way after completing the procedure.


### Tapping Operations:

Place the Jacobs chuck or Collet Holder in the spindle as explained previously. Install tap in the chuck, and tighten.

Center over the hole to be tapped

Push green button **Spindle Start**  to start rotation of the spindle and feed down the hole.

Choose a spindle speed sufficient for the tap (approximately 50 RPM), and allow the tap to feed the spindle as it threads the hole.

When the proper depth is achieved,  press to reverse the spindle rotation and left spindle return the tap off the hole.

## Chapter 7 Maintenance:

### Calibrating the Digital Level:

NOTE: Even though the level has been carefully calibrated at the factory, it is a good idea to recheck calibration before putting the machine into service. In the event that the level is dropped or handled roughly then the following recalibration methods should be implemented.

The level assembly is referenced to the spindle via the level pin. It is important to check alignment of pin in reference to the spindle. This is accomplished by mounting a magnetic base dial indicator to the machine spindle and sweeping the pin vertically by raising or lowering spindle to check alignment. Pin alignment should be checked in two positions at 90 degrees to each other. If the pin alignment needs correcting, do so with the set screws located at base of pin block.

Install level on pin. Orient level to read left to right. Tilt head left or right until level reads 0.00. Now rotate level 180 degrees. The reading should be 0.00, if not then it will be necessary to calibrate the inclinometer to the level body. This is accomplished by loosening the inclinometer's two retaining screws and pivoting the inclinometer until it repeats when level is rotated 180 degrees. Example: level reads 0.04 to the left, when rotated 180 degrees to the right it should read minus 0.04.



Check the level reading with the pickup oriented front to back. It should read 0.00 if the machine has been properly leveled with a machinist level.

If the LED does not read 0.00 then chances are the machine's leveling procedures have not been properly followed or there are internal problems with the level's electronics.

The sensitivity of the level is so great that it may not zero totally, even while the machine is not being touched. The alignment tolerance for installing guides is plus or minus .04 degrees, and for forming three angle seats is plus or minus .08 degrees.

The

New

Chip

em:





## **Chapter 8 Troubleshooting:**

### **Eccentricity Problems when Cutting Three Angle Seats:**

Spindle floated to improper center location.

Excessive pressure when machining the seat.

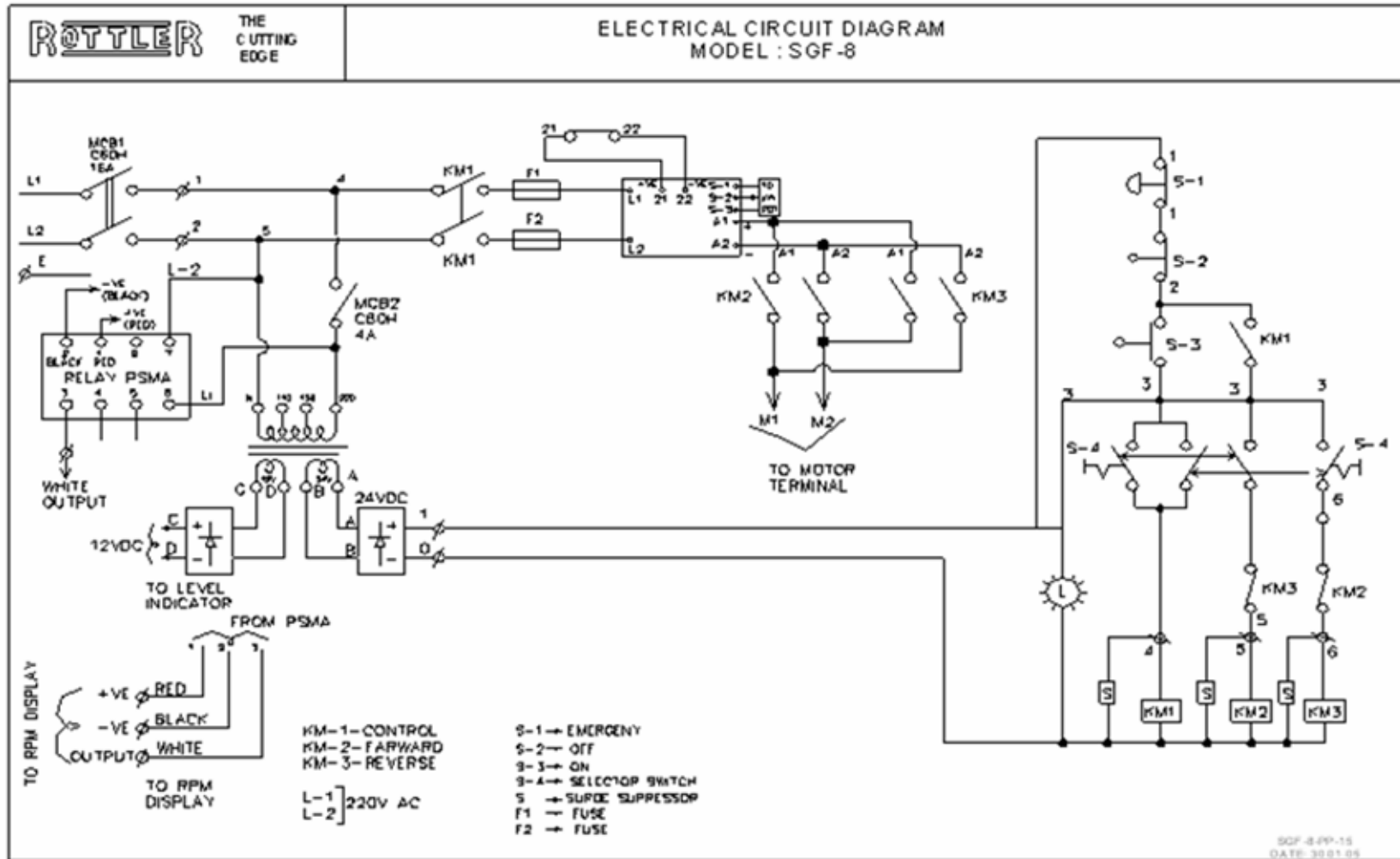
Incorrect spindle speed.

Worn or improperly selected pilot.

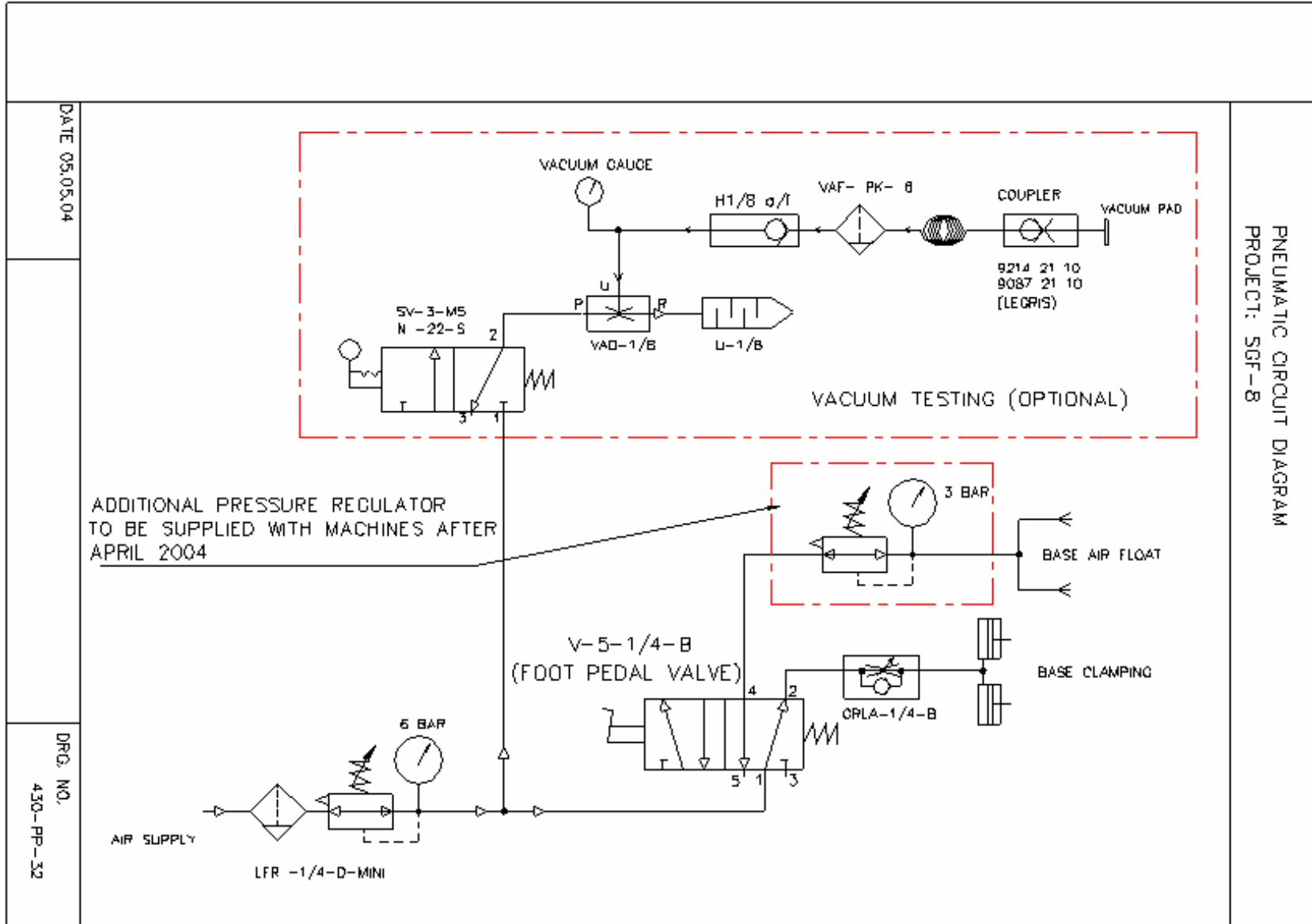
Worn Valve Guide.

# Chapter 9 Wiring Diagram

## Wiring Diagram

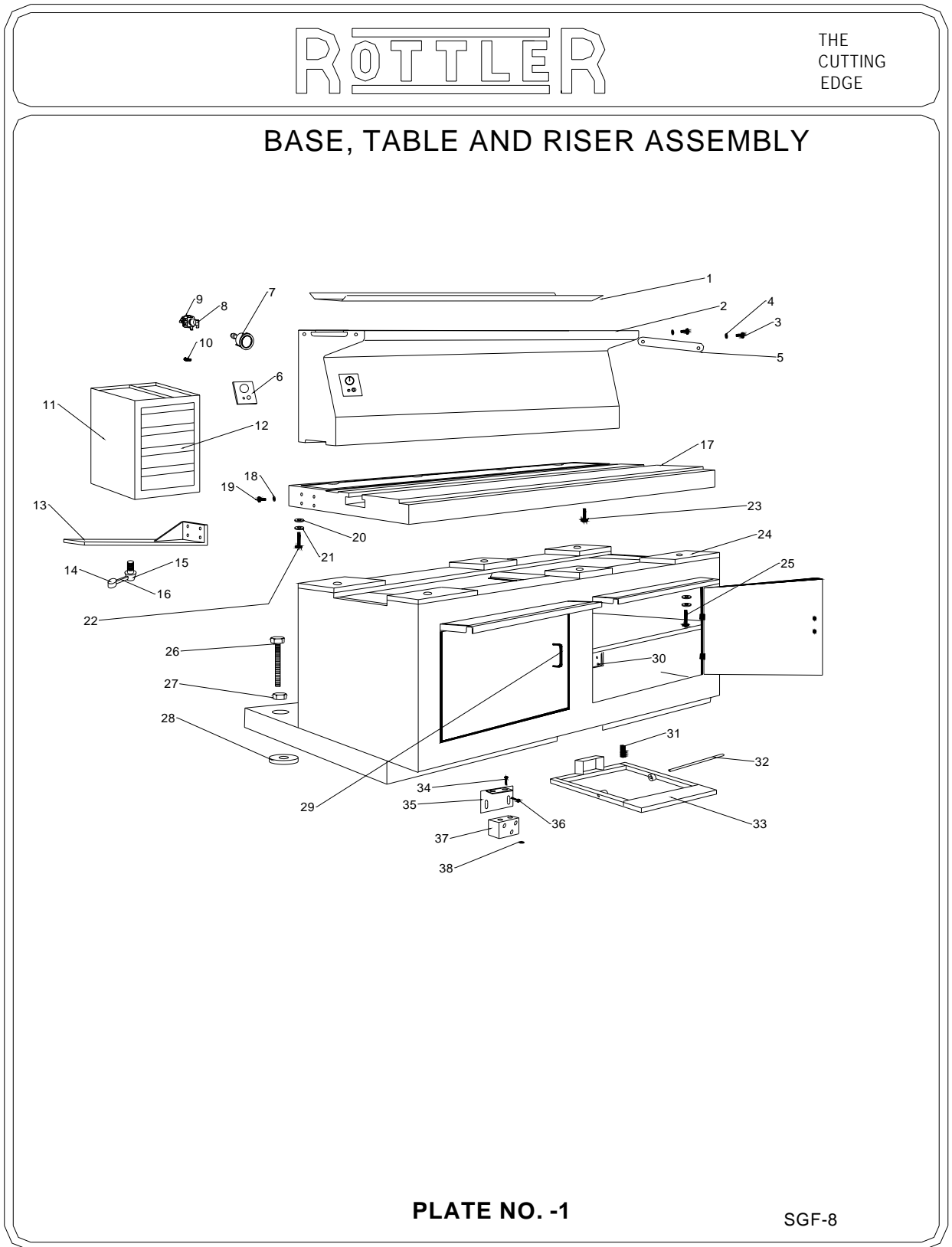


### Chapter 10 Pneumatic Drawings



# Chapter 11 Machine Parts

## Base, Table and Riser Assembly





# WORKHEAD ASSEMBLY

# ROTTLER

THE  
CUTTING  
EDGE

## BASE ASSEMBLY

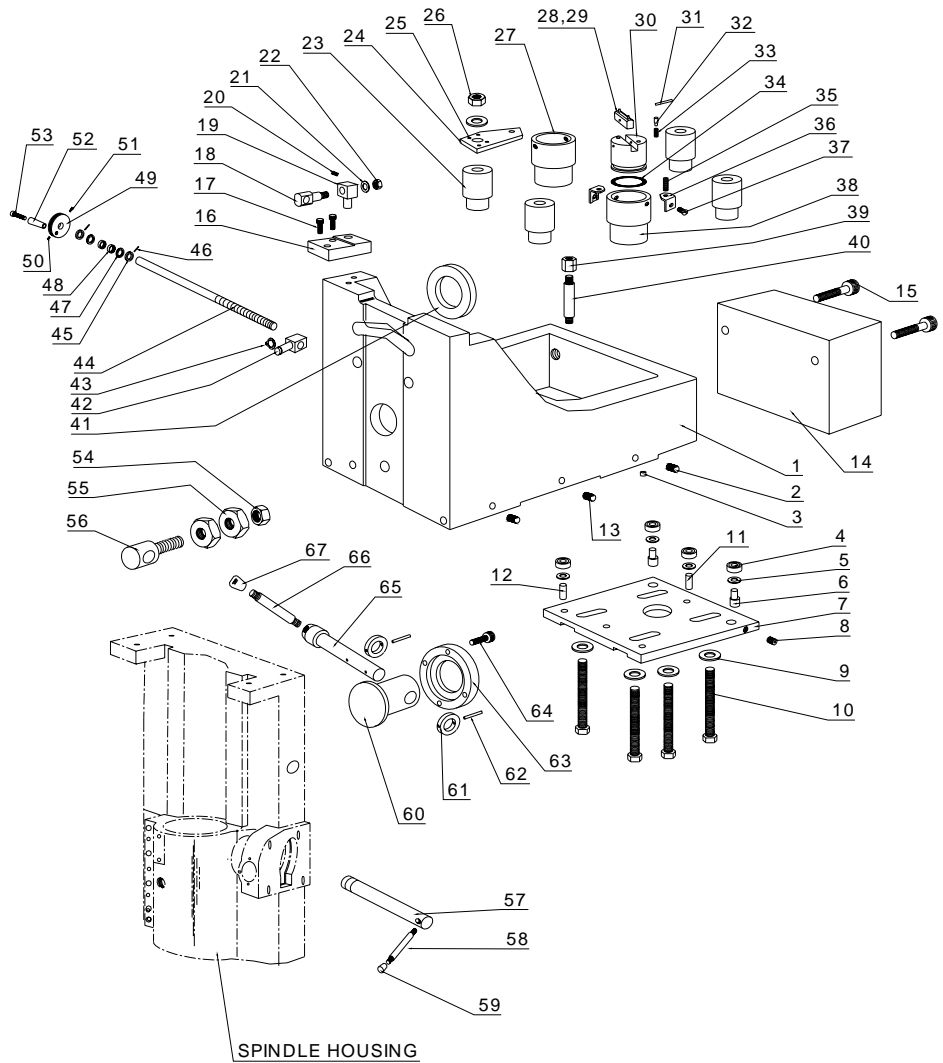


PLATE NO. - 2

SGF-8

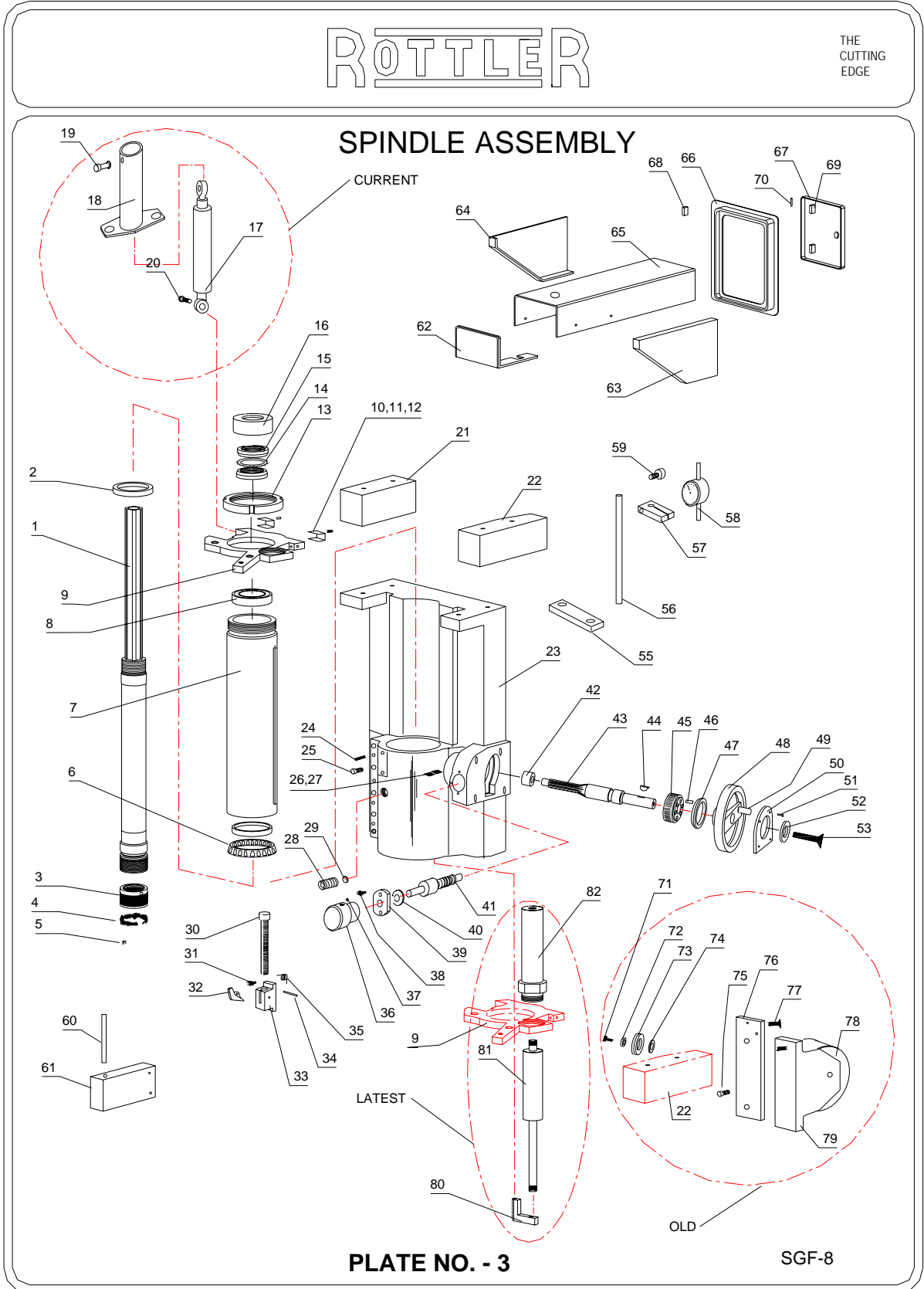
WORKHEAD ASSEMBLY  
PLATE NO. - 2

S. NO.	DESCRIPTION	QTY/M/C
1	BASE	1
2	SET SCREW 5/16" NF X 3/8"	4
3	PLUG (BRASS)	16
4	BALL BEARING	6) 555-14-29
5	WASHER OD 0.350", ID 0.203" X 0.05" THK	8) 555-14-30
6	ECCENTRIC PIN	2) 555-14-31
7	PLATE	2) 555-14-32
8	GRUB SCREW 10-32 X 1/4" DOG PT.	2) 555-14-33
9	WASHER 3/8"	8) 555-14-34
10	HEX. HD. SCREW 3/8" BSW X 5"	4
11	PIN	2) 555-14-35
12	PIN	2) 555-14-36
13	GRUB SCREW 10-32 X 1/4" FLAT PT.	2
14	WEIGHT	1
15	ALLEN HD. SCREW (1/2" UNC X 2.5")	2
16	SWIVALING BLOCK	1
17	ALLEN HD. SCREW	2
18	SWIVALING PIN	1
19	PIN HOLDER	1
20	GRUB SCREW 1/4" BSW	1
21	WASHER	1
22	NUT 3/8" BSW	1
23	BUSH	4
24	LEVER	4
25	HAMMER RIVIT	16
26	NYLOCK NUT 3/8" BSW	4
27	CYLINDER (LH)	1
28	GUIDE PIN	4
29	LEVER	2
30	PISTON	2
31	PIN	2
32	PISTON PIN	4
33	SPRING	4
34	'O' RING	2
35	GRUB SCR. 8-32 X 20mm F. POINT	4
36	BRACKET	4
37	BUTTON HD SCR 10-32 X 1/4"	4
38	CYLINDER (RH)	1
39	NUT ( NEST)	1
40	STUD	1
41	SPACER	1
42	ADJUSTING NUT	1
43	RETAINING RING	1
44	INCLINATION ROD	1
45	RETAINING RING	2
46	SPRING PIN 1/8" X 3/4"	2
47	NEEDLE BEARING	1
48	THRUST BEARING	2
49	KNOB	1
50	GRUB SCR. 1/4" BSW X 1/4" FLAT PT.	1





# SPINDLE ASSEMBLY



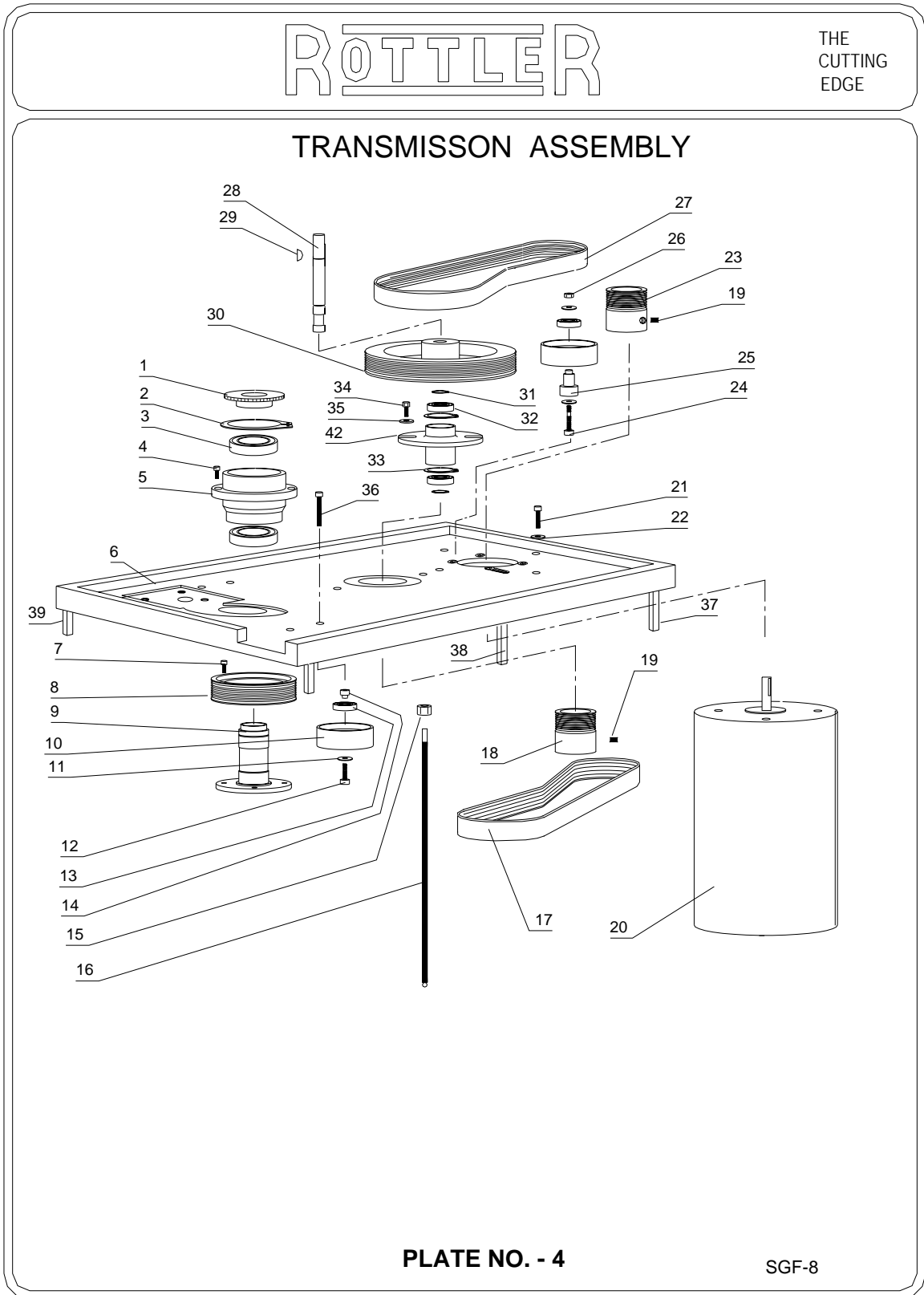
SPINDLE ASSEMBLY  
PLATE NO. - 3

S. NO.	DESCRIPTION	QTY/M/C
1	DRIVE SHAFT	1
2	RUBBER SEAL	1
3	QUICK NUT	1
4	SPRING	2
5	PAD	1
6	TAPER ROLLER BEARING	1
7	COLUMN	1
8	BALL BEARING	1
9	PLATE	1
10	BRASS PAD	2
11	C.PT. GRUB SCR. 3/16" X 1/2" BSW	2
12	F.PT GRUB SCR. 3/16" X 1/2" BSW	1
13	STOP PLATE LOCK NUT	1
14	LOCK WASHER	1
15	LOCK NUT	2
16	END STOPPER	1
17	TENSION GAS SPRING (150N)	1
18	SUPPORT TUBE WELED	1
19	HINGE	1
20	ALLEN SCREW 3/16" BSW X 1/2" LONG	1
21	EXTENSION BLOCK LEFT	1
22	EXTENSION BLOCK RIGHT	1
23	SPINDLE HOUSING	1
24	GRUB SCR. D.PT. 5/16" NF X 1.25" LONG	4
25	ALLEN SCREW 5/16" NF X 1.5" LONG	5
26	GRUB. SCR. D. PT. 5/16" NF X 1/2" LONG	1
27	GRUB SCR. F. PT. 5/16" NF X 0.200" LONG	1
28	GRUB SCREW 3/8" BSW X 1/2" LONG	1
29	BRASS PLUG	1
30	CONTROL STOP SCREW	1
31	C'SINK SCR. 1/4" X 1/2" BSW	2
32	CONTROL STOP LATCH	1
33	CLAMP	1
34	PIN	1
35	SPRING	1
36	KNOB	1
37	SET SCR. F. PT. 5/16" NF X 3/8" LONG	1
38	C' SINK SCR. 10-32 X 1/4" LONG	1
39	END COVER	1
40	WASHER	1
41	WORM SHAFT	1
42	BUSH	1
43	PINION	1
44	WOODRUF KEY	1
45	WORM WHEEL	1
46	PIN	2
47	SPACER	1
48	HAND WHEEL	1
49	KNOB	
50	COVER PLATE	1
51	C' SINK SCREW	4

SPINDLE ASSEMBLY  
 PLATE NO. - 3

S. NO.	DESCRIPTION	QTY/M/C
52	WASHER	1
53	C'SINK SCR.1/4" X 1/2" BSW	1
54	M4-BALL PLUNGER SCREW	1
55	INDICATOR MTG. FLAT	1
56	INDICATOR MTG. ROD	1
57	DIAL CLAMP	1
58	INDICATOR	1
59	KNOB	1
60	LEVELING PIN	1
61	PLATE (LEVELING PIN)	1
62	CONTROL PANEL MOUNTING	1
63	RIGHT SIDE COVER	1
64	LEFT SIDE COVER	1
65	TOP COVER	1
66	BACK COVER FRAME	1
67	BACK DOOR	1
68	FIX BLOCK	2
69	SWING BLOCK	2
70	PIN	2
71	SCREW 3/8" BSW X 1.00"	1
72	BALL BEARING	1
73	CUNTER WEIGHT PULLEY	1
74	WASHER 1/4"	1
75	ALLEN SCREW 1/4" X 1/2"	2
76	COUNTER WEIGHT PLATE	1
77	C'SINK SCR. 10-32 X 1/2" LONG	3
78	COUNTER WEIGHT BKT .	1
79	PULLEY COVER (COUNTER WEIGHT)	1
80	HOLDER	1
81	GAS SPRING (150N)	1) Shock-SG8
82	GAS SPRING MTG.	1) 555-14-37

# TRANSMISSION ASSEMBLY





# HEAD SUPPORT ASSEMBLY

# ROTTLER

THE  
CUTTING  
EDGE

## HEAD SUPPORT ASSEMBLY

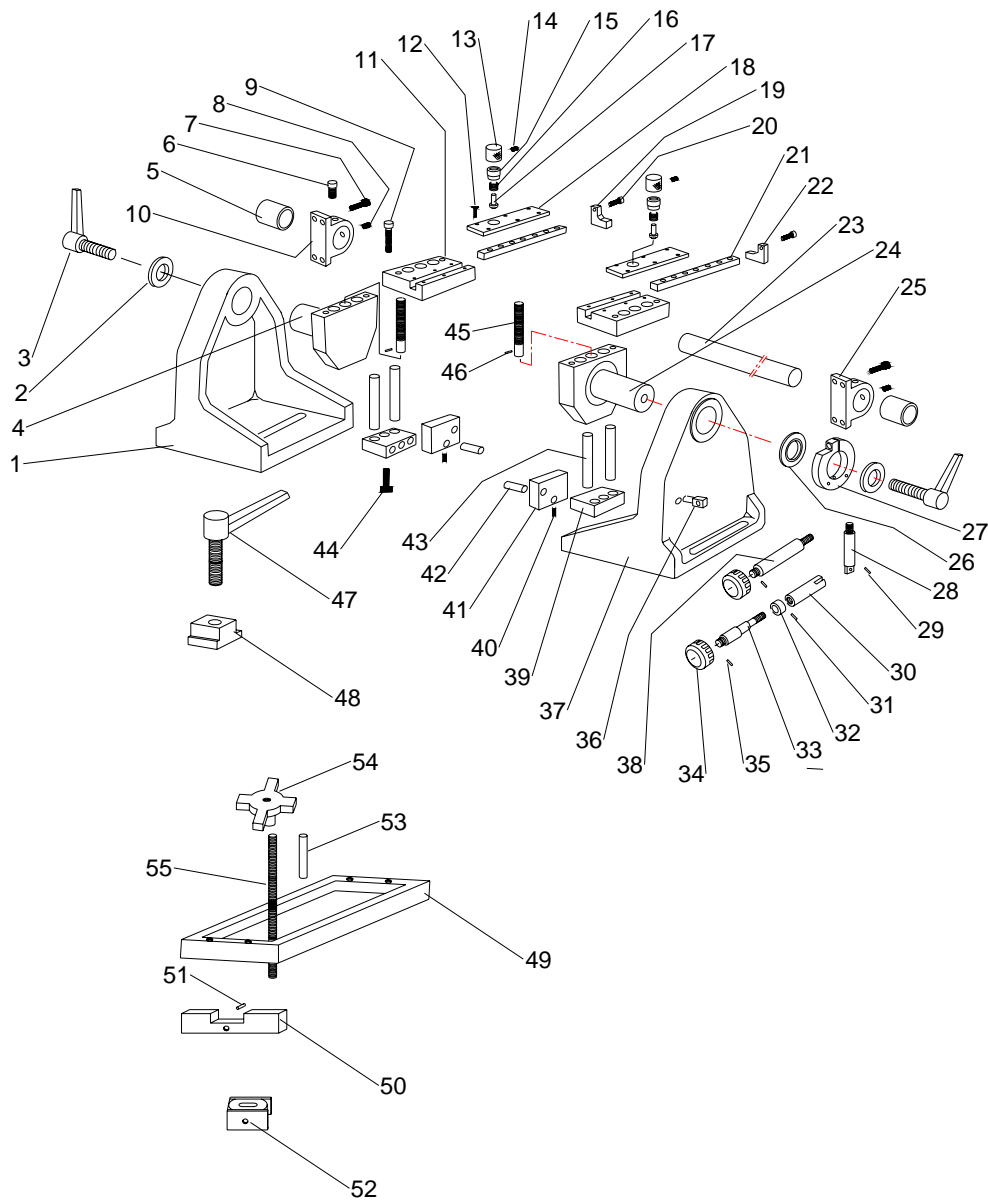


PLATE NO. - 5

SGF-8

HEAD SUPPORT ASSEMBLY  
PLATE NO. - 5

S. NO.	DESCRIPTION	QTY/M/C
1	HEAD SUPPORT LEFT	1
2	WASHER	2
3	CLAMP BOLT	2 EACH
4	HOLDER LEFT	1
5	BUSH	2
6	SCREW	1
7	SCREW	8
8	GRUB SCREW	2
9	SCREW	4
10	BEARING BUSH LEFT	1
11	PLATE	2
12	C'SINK SCREW	12
13	KNURLING COLLAR	2
14	SCREW 1/4"-20	2
15	PIN HOLDER	2
16	SPRING (SAME AS #100-057)	2
17	PLUNGER	2
18	PLATE	2
19	STOP PLATE (LH)	1
20	JACK	1
21	FLAT	2
22	STOP PLATE (RH)	1
23	GUIDE ROD	1
24	HOLDER RIGHT	1
25	BEARING BUSH RIGHT	1
26	SPACER	1
27	COLLAR	1
28	ARM	1
29	PIN	1
30	CLAMP	1
31	PIN	1
32	RETAINER RING	1
33	ADJUSTING SCREW	1
34	KNOB	1
35	PIN	1
36	PIVOT BLOCK	1
37	HEAD SUPPORT RIGHT	1
38	LOCK COLLAR SCREW	1
39	CLAMP PLATE	2
40	GRUB SCREW	2
41	CLAMP	2
42	PIVOT PIN	2
43	GUIDE PIN	4
44	SCREW	2
45	SCREW	2
46	PIN	2
47	HANDLE	2
48	T-NUT	2
49	HEAD SUPPORT	1
50	BAR	2
51	ROLL PIN	2
52	SWIVEL CLAMP	2

HEAD SUPPORT ASSEMBLY  
PLATE NO. - 5

S. NO.	DESCRIPTION	QTY/M/C
53	TUBE	2
54	KNOB	2
55	TAKE UP ROD	2



## Chapter 12 Fixed Carbide Pilots On Stock

Part Number	Description
FCPM0399	3.99mm .1570" Fixed Carbide Pilot with 6.00mm Shank Diameter
FCPM0400	4.00mm .1575" Fixed Carbide Pilot with 6.00mm Shank Diameter
FCPM0449	4.49mm .1768" Fixed Carbide Pilot with 6.00mm Shank Diameter
FCPM0450	4.50mm .1772" Fixed Carbide Pilot with 6.00mm Shank Diameter
FCPM0499	4.99mm .1964" Fixed Carbide Pilot with 6.00mm Shank Diameter
FCPM0500	5.00mm .1968" Fixed Carbide Pilot with 6.00mm Shank Diameter
FCPM0547	5.47mm .2153" Fixed Carbide Pilot with 6.00mm Shank Diameter
FCPM0548	5.48mm .2157" Fixed Carbide Pilot with 6.00mm Shank Diameter
FCPM0549	5.49mm .2161" Fixed Carbide Pilot with 6.00mm Shank Diameter
FCPM0550	5.50mm .2165" Fixed Carbide Pilot with 6.00mm Shank Diameter
FCPM0551	5.51mm .2169" Fixed Carbide Pilot with 6.00mm Shank Diameter
FCPM0552	5.52mm .2173" Fixed Carbide Pilot with 6.00mm Shank Diameter
FCPM0597	5.97mm .2350" Fixed Carbide Pilot with 6.00mm Shank Diameter
FCPM0598	5.98mm .2354" Fixed Carbide Pilot with 6.00mm Shank Diameter
FCPM0599	5.99mm .2358" Fixed Carbide Pilot with 6.00mm Shank Diameter
FCPM0600	6.00mm .2362" Fixed Carbide Pilot with 6.00mm Shank Diameter
FCPM0601	6.01mm .2366" Fixed Carbide Pilot with 6.00mm Shank Diameter
FCPM0602	6.02mm .2370" Fixed Carbide Pilot with 6.00mm Shank Diameter
FCPM0658	6.58mm .2590" Fixed Carbide Pilot with 6.00mm Shank Diameter
FCPM0659	6.59mm .2594" Fixed Carbide Pilot with 6.00mm Shank Diameter
FCPM0660	6.60mm .2598" Fixed Carbide Pilot with 6.00mm Shank Diameter
FCPM0661	6.61mm .2602" Fixed Carbide Pilot with 6.00mm Shank Diameter

**.375" Shank Diameter Fixed Carbide Pilots**

FCP0500	5.00mm .1968" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0544	5.44mm .2141" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0547	5.47mm .2153" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0548	5.48mm .2157" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0549	5.49mm .2161" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0550	5.50mm .2165" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0551	5.51mm .2169" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0552	5.52mm .2173" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0594	5.94mm .2338" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0597	5.97mm .2350" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0598	5.98mm .2354" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0599	5.99mm .2358" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0600	6.00mm .2363" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0601	6.01mm .2366" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0606	6.06mm .2386" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0634	6.34mm .2496" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0635	6.35mm .2500" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0636	6.36mm .2504" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0650	6.50mm .2559" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0657	6.57mm .2587" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0658	6.58mm .2591" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0659	6.59mm .2594" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0660	6.60mm .2598" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0661	6.61mm .2602" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0662	6.62mm .2606" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0694	6.94mm .2732" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0695	6.95mm .2736" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0696	6.96mm .2740" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0697	6.97mm .2744" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0698	6.98mm .2748" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0699	6.99mm .2752" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0700	7.00mm .2756" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0701	7.01mm .2756" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0702	7.02mm .2764" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0703	7.03mm .2768" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0714	7.14mm .2811" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0715	7.15mm .2814" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0716	7.16mm .2818" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0719	7.19mm .2830" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0720	7.20mm .2835" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0725	7.25mm .2854" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0777	7.77mm .3059" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0785	7.85mm .3091" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0786	7.86mm .3094" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0787	7.87mm .3098" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0788	7.88mm .3102" Fixed Carbide Pilot .375" (9.52mm) Shank Dia

FCP0789	7.89mm .3106" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0790	7.90mm .3110" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0791	7.91mm .3114" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0792	7.92mm .3118" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0793	7.93mm .3122" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0794	7.94mm .3126" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0795	7.95mm .3130" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0796	7.96mm .3134" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0797	7.97mm .3138" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0798	7.98mm .3142" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0799	7.99mm .3146" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0800	8.00mm .3150" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0801	8.01mm .3154" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0802	8.02mm .3157" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0803	8.03mm .3161" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0804	8.04mm .3165" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0805	8.05mm .3169" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0806	8.06mm .3173" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0808	8.08mm .3181" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0811	8.11mm .3192" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0825	8.25mm .3248" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0830	8.30mm .3268" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0831	8.31mm .3272" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0832	8.32mm .3276" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0833	8.33mm .3279" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0834	8.34mm .3283" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0836	8.36mm .3291" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0838	8.38mm .3299" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0849	8.49mm .3342" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0850	8.50mm .3346" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0851	8.51mm .3350" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0858	8.58mm .3378" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0859	8.59mm .3382" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0860	8.60mm .3386" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0865	8.65mm .3405" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0867	8.67mm .3413" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0868	8.68mm .3417" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0869	8.69mm .3421" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0870	8.70mm .3425" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0871	8.71mm .3429" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0872	8.72mm .3433" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0873	8.73mm .3437" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0874	8.74mm .3441" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0875	8.75mm .3445" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0876EL9	8.76mm .3449" Fixed Carbide Pilot .375" (9.52mm) Shank Dia (9.00" extended length) <b>Detroit 60</b>
FCP0877EL9	8.77mm .3453" Fixed Carbide Pilot .375" (9.52mm) Shank Dia (9.00" extended length) <b>Detroit 60</b>
FCP0878EL9	8.78mm .3457" Fixed Carbide Pilot .375" (9.52mm) Shank Dia (9.00" extended length) <b>Detroit 60</b>

FCP0876	8.76mm .3449" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0892	8.92mm .3512" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0894	8.94mm .3519" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0895	8.95mm .3523" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0896	8.96mm .3527" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0897	8.97mm .3531" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0898	8.98mm .3535" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0899	8.99mm .3539" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0900	9.00mm .3543" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0901	9.01mm .3547" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0906	9.06mm .3566" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0907	9.07mm .3571" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0908	9.08mm .3575" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0909	9.09mm .3579" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0910	9.10mm .3583" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0911	9.11mm .3587" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0935	9.35mm .3681" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0936	9.36mm .3585" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0943	9.43mm .3713" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0944	9.44mm .3717" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0945	9.45mm .3720" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0946	9.46mm .3724" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0947	9.47mm .3728" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0948	9.48mm .3732" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0949	9.49mm .3736" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0949EL9	9.49mm .3736" Fixed Carbide Pilot .375" (9.52mm) Shank Dia (9.00" extended length) CAT 3500
FCP0950EL9	9.50mm .3740" Fixed Carbide Pilot .375" (9.52mm) Shank Dia (9.00" extended length) CAT 3500
FCP0950	9.50mm .3740" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0951	9.51mm .3744" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0951EL9	9.51mm .3744" Fixed Carbide Pilot .375" (9.52mm) Shank Dia (9.00" extended length) CAT 3500
FCP0952	9.52mm .3748" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0952EL9	9.52mm .3748" Fixed Carbide Pilot .375" (9.52mm) Shank Dia (9.00" extended length) CAT 3500
FCP0953	9.53mm .3752" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0954	9.54mm .3756" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0955	9.55mm .3760" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0956	9.56mm .3764" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0957	9.57mm .3768" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0958	9.58mm .3772" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0959	9.59mm .3776" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0960	9.60mm .3780" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0961	9.61mm .3783" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0963	9.63mm .3791" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0964	9.64mm .3795" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0968	9.68mm .3811" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0969	9.69mm .3815" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0974	9.74mm .3834" Fixed Carbide Pilot .375" (9.52mm) Shank Dia

FCP0978	9.78mm .3850" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0979	9.79mm .3854" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0980	9.80mm .3858" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0983	9.83mm .3870" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0984	9.84mm .3874" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0985	9.85mm .3878" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0986	9.86mm .3882" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0987	9.87mm .3886" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0988	9.88mm .3890" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0989	9.89mm .3894" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0990	9.90mm .3898" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0991	9.91mm .3902" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0993	9.93mm .3909" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0994	9.94mm .3913" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0995	9.95mm .3917" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0997	9.97mm .3925" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0998	9.98mm .3929" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP0999	9.99mm .3933" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1000	10.00mm .3937" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1002	10.02mm .3945" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1004	10.04mm .3953" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1005	10.05mm .3957" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1006	10.06mm .3961" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1020	10.20mm .4016" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1021	10.21mm .4020" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1024	10.24mm .4031" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1027	10.27mm .4043" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1051	10.51mm .4138" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1054	10.54mm .4150" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1096	10.96mm .4315" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1097	10.97mm .4319" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1098	10.98mm .4323" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1099	10.99mm .4327" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1100	11.00mm .4331" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1103	11.03mm .4344" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1104	11.04mm .4346" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1105	11.05mm .4350" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1107	11.07mm .4358" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1108	11.08mm .4362" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1109	11.09mm .4366" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1110	11.10mm .4370" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1111	11.11mm .4374" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1132	11.32mm .4457" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1140	11.40mm .4488" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1144	11.44mm .4504" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1145	11.45mm .4508" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1146	11.46mm .4512" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1147	11.47mm .4516" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1148	11.48mm .4520" Fixed Carbide Pilot .375" (9.52mm) Shank Dia

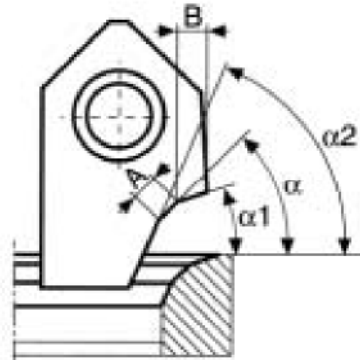
FCP1149	11.49mm .4524" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1150	11.50mm .4528" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1151	11.51mm .4531" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1168	11.68mm .4598" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1198	11.98mm .4717" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1199	11.99mm .4720" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1200	12.00mm .4724" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1202	12.02mm .4732" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1204	12.04mm .4740" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1260	12.60mm .4961" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1261	12.61mm .4965" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1262	12.62mm .4968" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1263	12.63mm .4972" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1265	12.65mm .4980" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1267	12.67mm .4988" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1268	12.68mm .4992" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1269	12.69mm .4996" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1270	12.70mm .5000" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1271	12.71mm .5004" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1274	12.74mm .5015" Fixed Carbide Pilot .375" (9.52mm) Shank Dia
FCP1401EL12	14.01 mm .5515" Fixed Carbide Pilot .375" (9.52mm) Shank Dia (extended length)
FCP1423EL12	14.23 mm .5602" Fixed Carbide Pilot .375" (9.52mm) Shank Dia (extended length)

## Chapter 13 Seat and Guide Carbide Inserts:

### Carbide Profile Tips:

Replacement carbide tips for forming valve seats are individually specified by: Seat angle & seat width, top angle & top width, and throat angle.

Identify the proper tip for your application. The chart on this page, and those following, provide this information, as well as cross-reference data to allow you to convert from part numbers used by other suppliers.



Part Number	Description
RCA 001	Carbide Seat Insert 30-45-60 / 1.2 -1.0
RCA 002	Carbide Seat Insert 30-45-60 / 2.0 -1.0
RCA 003	Carbide Seat Insert 30-45-60 / 1.2 -1.3
RCA 004	Carbide Seat Insert 30-45-60 / 1.6 -1.3
RCA 005	Carbide Seat Insert 37-45-52 / 2.0 -1.3
RCA 006	Carbide Seat Insert 30-45-52 / 2.0 -1.3
RCA 007	Carbide Seat Insert 37-45-52 / 1.8 -1.5
RCA 008	Carbide Seat Insert 15-45-60 / 1.8 -1.5
RCA 009	Carbide Seat Insert 30-45-52 / 1.8 -1.5
RCA 010	Carbide Seat Insert 30-45-60 / 2.0 -1.5
RCA 011	Carbide Seat Insert 30-45-60 / 3.0 -1.5
RCA 012	Carbide Seat Insert 30-45-52 / 1.2 -1.6
RCA 013	Carbide Seat Insert 30-45-60 / 1.2 -1.6
RCA 014	Carbide Seat Insert 30-45-60 / 1.4 -1.6
RCA 015	Carbide Seat Insert 15-45-60 / 1.6 -1.6
RCA 016	Carbide Seat Insert 30-45-52 / 1.6 -1.6
RCA 017	Carbide Seat Insert 30-45-60 / 2.0 -2.2
RCA 018	Carbide Seat Insert 30-45-52 / 1.8 -1.6
RCA 019	Carbide Seat Insert 15-45-60 / 2.0 -1.6
RCA 020	Carbide Seat Insert 30-45-52 / 2.0 -1.6
RCA 021	Carbide Seat Insert 30-45-60 / 2.0 -1.6
RCA 022	Carbide Seat Insert 30-45-60 / 3.0 -1.6
RCA 023	Carbide Seat Insert 30-45-60 / 3.0 -1.8
RCA 024	Carbide Seat Insert 30-45-52 / 1.2 -1.9
RCA 025	Carbide Seat Insert 30-45-60 / 1.2 -1.9
RCA 026	Carbide Seat Insert 30-45-60 / 1.6 -1.9
RCA 027	Carbide Seat Insert 30-45-52 / 1.8 -1.9
RCA 028	Carbide Seat Insert 30-45-52 / 2.0 -1.9
RCA 029	Carbide Seat Insert 30-45-60 / 2.0 -1.9
RCA 030	Carbide Seat Insert 30-45-70 / 1.6 -2.0
RCA 031	Carbide Seat Insert 30-45-75 / 1.6 -2.0
RCA 032	Carbide Seat Insert 30-45-60 / 0.6 -2.2
RCA 033	Carbide Seat Insert 30-45-60 / 2.0 -2.3
RCA 034	Carbide Seat Insert 30-45-60 / 2.0 -2.5

RCA 035	Carbide Seat Insert	25-45-60 / 1.4 -1.0
RCA 036	Carbide Seat Insert	25-45-60 / 1.8 -1.0
RCA 037	Carbide Seat Insert	35-45-52 / 1.6 -1.0
RCA 038	Carbide Seat Insert	35-45-55 / 1.6 -1.0
RCA 039	Carbide Seat Insert	35-45-60 / 1.6 -1.0
RCA 040	Carbide Seat Insert	30-45-60 / 2.0 -1.3
RCA 041	Carbide Seat Insert	30-45-60 / 1.0 -1.3
RCA 042	Carbide Seat Insert	30-45-60 / 1.0 -1.4
RCA 043	Carbide Seat Insert	30-45-60 / 1.8 -1.5
RCA 044	Carbide Seat Insert	30-45-60 / 1.4 -1.5
RCA 045	Carbide Seat Insert	25-45-60 / 1.4 -1.6
RCA 046	Carbide Seat Insert	25-45-60 / 1.8 -1.6
RCA 047	Carbide Seat Insert	30-45-60 / 1.0 -1.6
RCA 048	Carbide Seat Insert	30-45-60 / 2.0 -1.7
RCA 049	Carbide Seat Insert	30-45-60 / 1.6 -1.8
RCA 050	Carbide Seat Insert	30-45-52 / 0.8 -1.9
RCA 051	Carbide Seat Insert	25-45-60 / 1.4 -2.0
RCA 052	Carbide Seat Insert	25-45-60 / 1.8 -2.0
RCA 053	Carbide Seat Insert	30-45-60 / 1.2 -2.0
RCA 054	Carbide Seat Insert	25-45-60 / 1.4 -2.5
RCA 055	Carbide Seat Insert	25-45-60 / 1.8 -2.5
RCA 056	Carbide Seat Insert	30-45-60 / 1.8 -1.0
RCA 057	Carbide Seat Insert	37-45-52 / 2.0 -1.0
RCA 058	Carbide Seat Insert	25-45-52 / 1.9 -1.6
RCA 059	Carbide Seat Insert	25-45-52 / 2.3 -1.7
RCA 061	Carbide Seat Insert	25-45-60 / 1.4-1.5
RCA 067	Carbide Seat Insert	30-45-60 / 1.4-3.0
RCA 300	Carbide Seat Insert	15-30-45 / 1.0 -1.3
RCA 301	Carbide Seat Insert	15-30-45 / 2.0 -1.3
RCA 302	Carbide Seat Insert	15-30-60 / 2.0 -1.3
RCA 303	Carbide Seat Insert	15-30-45 / 1.4 -1.5
RCA 304	Carbide Seat Insert	15-30-45 / 1.8 -1.5
RCA 305	Carbide Seat Insert	15-30-60 / 2.0 -1.5
RCA 306	Carbide Seat Insert	15-30-45 / 1.2 -1.6
RCA 307	Carbide Seat Insert	15-30-45 / 1.8 -1.6
RCA 308	Carbide Seat Insert	15-30-52 / 1.8 -1.6
RCA 309	Carbide Seat Insert	15-30-45 / 2.0 -1.6
RCA 310	Carbide Seat Insert	15-30-60 / 2.0 -1.6
RCA 311	Carbide Seat Insert	15-30-60 / 2.2 -1.6
RCA 312	Carbide Seat Insert	15-30-45 / 2.0 -1.8
RCA 313	Carbide Seat Insert	15-30-45 / 1.0 -1.9
RCA 314	Carbide Seat Insert	15-30-60 / 2.0 -1.9
RCA 315	Carbide Seat Insert	15-30-45 / 1.2 -2.0
RCA 316	Carbide Seat Insert	15-30-45 / 2.0 -2.0
RCA 317	Carbide Seat Insert	15-30-60 / 2.0 -2.2
RCA 318	Carbide Seat Insert	20-30-45 / 3.0 -3.8
RCA 321	Carbide Seat Insert	20-30-52 / 1.6 -1.0
RCA 322	Carbide Seat Insert	0-30-60 / 2.0 -1.5
RCA 323	Carbide Seat Insert	15-30-60 / 1.8 -1.5
RCA 324	Carbide Seat Insert	15-30-60 / 2.2 -1.5



RCA 325	Carbide Seat Insert	20-30-60 / 3.0 -1.5
RCA 326	Carbide Seat Insert	15-30-60 / 1.4 -2.0
RCA 327	Carbide Seat Insert	15-30-60 / 1.8 -2.0
RCA 328	Carbide Seat Insert	15-30-60 / 1.8 -2.5
RCA 329	Carbide Seat Insert	15-30-60 / 2.0 -2.5
RCA 330	Carbide Seat Insert	15-30-60 / 1.4 -2.5
RCA 331	Carbide Seat Insert	15-30-60 / 1.4 -1.8
RCA 332	Carbide Seat Insert	0-30-60 / 2.0 -2.8
RCA333	Carbide Seat Insert	2.2-30-60
RCA 337	Carbide Seat Insert	15-30-60 top width 2mm , seat width 0.080"
RCA 338	Carbide Seat Insert	15-30-60 top width 2mm , seat width 0.180"
RCA 400	Carbide Seat Insert	30- <b>37.5</b> -60 / 1.4 -1.6
RCA 401	Carbide Seat Insert	30- <b>37.5</b> -60 / 2.0 -1.6
RCA 402	Carbide Seat Insert	30- 37.5 -60 / 1.4 -1.9
RCA 403	Carbide Seat Insert	30- <b>37.5</b> -60 / 2.0 -2.0
RCA 404	Carbide Seat Insert	18- <b>37.5</b> -52 / 0.6 -2.1
RCA 405	Carbide Seat Insert	15- <b>37.5</b> -60 / 1.4 -1.6
RCA 406	Carbide Seat Insert	20- <b>37.5</b> -52 / 1.2 -1.8
RCA 407	Carbide Seat Insert	15- <b>37.5</b> -60 / 1.4 -1.6
RCA 411	Carbide Seat Insert	37 degrees' / 9.3 mm
RCA 500	Carbide Seat Insert	15 degrees / 7.7mm
RCA 501	Carbide Seat Insert	20 degrees / 8.8mm
RCA 502	Carbide Seat Insert	30 degrees / 9.0 mm
RCA 503	Carbide Seat Insert	45 degrees / 8.9 mm
RCA 504	Carbide Seat Insert	45 deg 15 ' / 8.0 mm
RCA 505	Carbide Seat Insert	60 degrees' / 8.1 mm
RCA 506	Carbide Seat Insert	70 degrees' / 16.8 mm
RCA 507	Carbide Seat Insert	75 degrees / 8.3mm
RCA 508	Carbide Seat Insert	75 degrees' / 16.4 mm
RCA 509	Carbide Seat Insert	80 degrees' / 12.1 mm
RCA 510	Carbide Seat Insert	82 degrees' / 11.5 mm
RCA 511	Carbide Seat Insert	94 deg-R 0.8 / 12 mm
RCA512	Carbide Seat Insert	94 deg-R 0.8 / 15.3 mm
RCA 513	Carbide Seat Insert	94-R0.5 / 2.5-6.5
RCA 521	Carbide Seat Insert	25 degrees' / 8.5 mm
RCA 522	Carbide Seat Insert	70 degrees' / 7.7 mm
RCA 524	Carbide Seat Insert	82 degrees' / 7.07 mm
RCB 600	Carbide Seat Insert	R2.5-38- <b>45</b> -60 / 2.5-2.4-1.00
RCB 601	Carbide Seat Insert	R1-35- <b>45</b> -60-75 / 1.5-1.3-1.0-2.5
RCB 602	Carbide Seat Insert	R1.0-35- <b>45</b> -56 / 2.0-1.3
RCB 603	Carbide Seat Insert	R12 -45 deg
RCB 604	Carbide Seat Insert	R2-35- <b>45</b> -60-75-82 / 2.9-1.3-1.7-2.2
RCB 605	Carbide Seat Insert	35- <b>45</b> -55-65-75 / 2.5-1.0-2.5-2.5
RCB 606	Carbide Seat Insert	40-R1-45-55-65-75 / 1.5-1.3-1.0-2.5
RCB 607	Carbide Seat Insert	R1.5-35- <b>45</b> -R12-75-R3.5 / 1.9-1.5-1.5-3.0
RCB 608	Carbide Seat Insert	R1.5-35- <b>45</b> -R12-75-R3.5-45 / 1.9-1.5-1.0-3.0
RCB 609	Carbide Seat Insert	R1.5-35- <b>45</b> -R12-75 / 1.9-1.5-2.5-3.0
RCB 610	Carbide Seat Insert	R1.5-35- <b>45</b> -R12.2-85 / 1.8-1.5-1.5-3.0
RCA 611	Carbide Seat Insert	R1.5-15-30-45-60-75 / 2.2-0.8
RCA 612	Carbide Seat Insert	R1.2-25-45-65-75 / 1.2-0.8

RCA 613	Carbide Seat Insert	R2-30-45-60-R7 / 1.9-0.8
RCA 614	Carbide Seat Insert	R4 -15 / 5.52 mm
RCA 615	Carbide Seat Insert	R4 -30 / 5.70 mm
RCA 616	Carbide Seat Insert	R5 -15 / 5.00 mm
RCA 617	Carbide Seat Insert	R5 -30 / 6.00 mm
RCA 618	Carbide Seat Insert	R7 -15 / 4.4 mm
RCA 619	Carbide Seat Insert	R7 -30 / 4.4 mm
RCB 620	Carbide Seat Insert	R7 -15
RCB 621	Carbide Seat Insert	75 - R7 / 12.0 mm
RCA 622	Carbide Seat Insert	80 - R7 / 9.00 mm
RCA 623	Carbide Seat Insert	R0.8-30-45-60-R13-R1.5 / 1.3-1.0
RCA 624	Carbide Seat Insert	R1-32-45-60 / 1.3-0.8
RCA 625	Carbide Seat Insert	30-R1-32- <b>45</b> -60 / 1.0-0.8
RCA 626	Carbide Seat Insert	R1.5-30-45-60 / 1.6-1.0
RCA 627	Carbide Seat Insert	R1.5-15-45-75 / 1.0-1.0
RCA 628	Carbide Seat Insert	30-R1.5-15- <b>45</b> -75 / 1.0-1.0
RCA 629	Carbide Seat Insert	R1.5-38-45-60 / 1.3-1.1
RCA 630	Carbide Seat Insert	30-94-R1.5-38- <b>45</b> -60 / 1.3-1.1
RCA 631	Carbide Seat Insert	R1.5-30-45-60 / 1.6-1.3
RCA 632	Carbide Seat Insert	30-94-R1.5-30- <b>45</b> -60 / 1.6-1.3
RCA 633	Carbide Seat Insert	30-45-60 / 2.0 -1.4
RCA 634	Carbide Seat Insert	R1.6-30-45-60 / 1.6-1.5
RCA 635	Carbide Seat Insert	30-94-R1.5-30-45-60 / 1.6-1.5
RCA 636	Carbide Seat Insert	R1.5-32-45-60 / 1.6-1.0-1.0 (Offset Bit)
RCA 637	Carbide Seat Insert	R1.5-32-45-60 / 1.6-1.0-1.0
RCA 638	Carbide Seat Insert	R1.5-30-45-75 / 1.6-1.0
RCA 639	Carbide Seat Insert	30-R1.5-30- <b>45</b> -75 / 1.0-1.0
RCA 640	Carbide Seat Insert	R1.5-32-45-60 / 1.6-1.2
RCA 641	Carbide Seat Insert	R0.5-32-45-60 / 1.5-1.2
RCA 642	Carbide Seat Insert	R1.5-20-45-60 / 1.9-1.0
RCA 643	Carbide Seat Insert	30-R1.5-20- <b>45</b> -60 / 1.0-1.0
RCB 644	Carbide Seat Insert	R3-30-R13- <b>45</b> -75-R3 / 2.5-1.2-1.2-3.0
RCB 645	Carbide Seat Insert	R2-37-45-52-R7 / 1.5-0.8
RCB 646	Carbide Seat Insert	R2 -35- <b>45</b> -65 / 2.0-1.4 - 0.8
RCB 651	Carbide Seat Insert	30-94-30-45-60 / 3.1-1.5-3.0
RCB 652	Carbide Seat Insert	30-94-32- <b>45</b> -60 / 1.0-0.8
RCB 653	Carbide Seat Insert	30- <b>45</b> -60 / 1.2-1.0
RCB 654	Carbide Seat Insert	45-91 / 19.6-6.3 mm
RCA 655	Carbide Seat Insert	R 5.00' / 16.00mm
RCA 656	Carbide Seat Insert	30-45-R10 / 1.5-1.5
RCA 700	Carbide Seat Insert	5-20-60 top width 3mm , seat width 0.100"
RCA 723	Carbide Seat Insert	5-20-45 top width 2.0mm , seat width 2.0mm